Parrearra Lake Management Plan

2019 - 2029

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Disclaimer

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1 Introduction

This Lake Management Plan has been prepared by Sunshine Coast Council to promote effective long-term management of the Parrearra Lake system. It is a 10 year plan that supersedes the original Lake Management Plan developed by Lensworth in 2001.

1.1 Purpose

The purpose of the Lake Management Plan is to:

- outline the rights and responsibilities of the lake owners, residents and users;
- develop an appropriate inspection and maintenance schedule to meet objectives and performance standards;
- provide guidelines and management actions for ensuring the lake continues to function as an effective flood bypass channel (based on previously accepted and approved criteria);
- provide guidelines and management actions for ensuring compliance with secondary contact water quality guidelines;
- provide guidelines for acceptable use of the lake such as sport and recreation; and
- define permitted uses subject to approval such as commercial operations and private structures.

1.2 Objectives

The objectives of the Lake Management Plan are specified in Table 1 below.

Table 1: Management plan objectives

Objective	Performance standard	Refer
Public use complies with guidelines outlined in this management plan	• Public, residents and sporting bodies are informed of acceptable uses, their rights and responsibilities	Section 5
Water quality is maintained to a standard suitable for secondary contact recreation use[1]	• Compliance with water quality guidelines • Effective operation and maintenance of tidal exchange system and weir • Growth of undesirable marine organisms is absent or regulated	Section 6
The lake functions as an effective flood bypass channel	• No flooding above Q100 level • Compliance with design criteria for lake operation as a flood channel • Effective operation and maintenance of tidal exchange system and weir • Maintain lake to acceptable tolerances from design profile	Section 7
Amenity and visual quality of the lake is of an acceptable standard	• The lake is free of litter and debris and/or removed in a timely manner • Growth of undesirable marine organisms is absent or regulated • Structures are designed and located suitably	Section 6 and 9
Lake assets are maintained in a structurally sound and safe condition	• Routine inspections and maintenance are undertaken in accordance with relevant schedules • Sinking fund adequate to maintain assets	Section 9

[1] Secondary contact recreation is any activity where only the limbs are regularly wet, and swallowing water is unusual. Examples of secondary contact recreation are boating, fishing, rowing, kayaking, dragon boating, wading etc.

2 Background

2.1 Site overview

Parrearra Lake Reserve is a brackish artificial tidally restricted lake, 48.6 ha in area, built in accordance with the relevant planning approvals granted by the Department of Natural Resources and Mines and the former Caloundra City Council.

The land abutting the Reserve was developed for urban purposes in accordance with DCP1 - Kawana Waters, except in the south and south east where industrial uses have been established.

The lake is defined as the area contained within the concrete revetment walls upstream of the lock and weir structure adjacent to Chelsea Crescent in the north (Structure Z) to the weir adjacent to the Kawana Industrial Estate in the south (Structure Y). Figure 1 represents the Parrearra Lake system and locality.

The lake has a restricted tidal range of about 300mm and rock protection exists along areas of the bank where design velocities determined such protection was needed when the lake functions as a flood control structure.

Stormwater drainage enters the lake from the adjoining land development through controlled outlet structures and pipes into the lake.

Residents can navigate their powered vessels to Mooloolah River via the lock structure to the north (Structure Z). Public access is available at designated places along the eastern bank and along the substantial majority of the western bank. All public access areas are created as public park abutting the lake. Use of the lake system for recreational purposes is an added benefit and subject to guidelines outlined in this management plan.

2.2 Exclusion

The entry channel between the Mooloolah River and the upstream Structure Y is not included in this Management Plan. This area is designated Drainage Reserve.

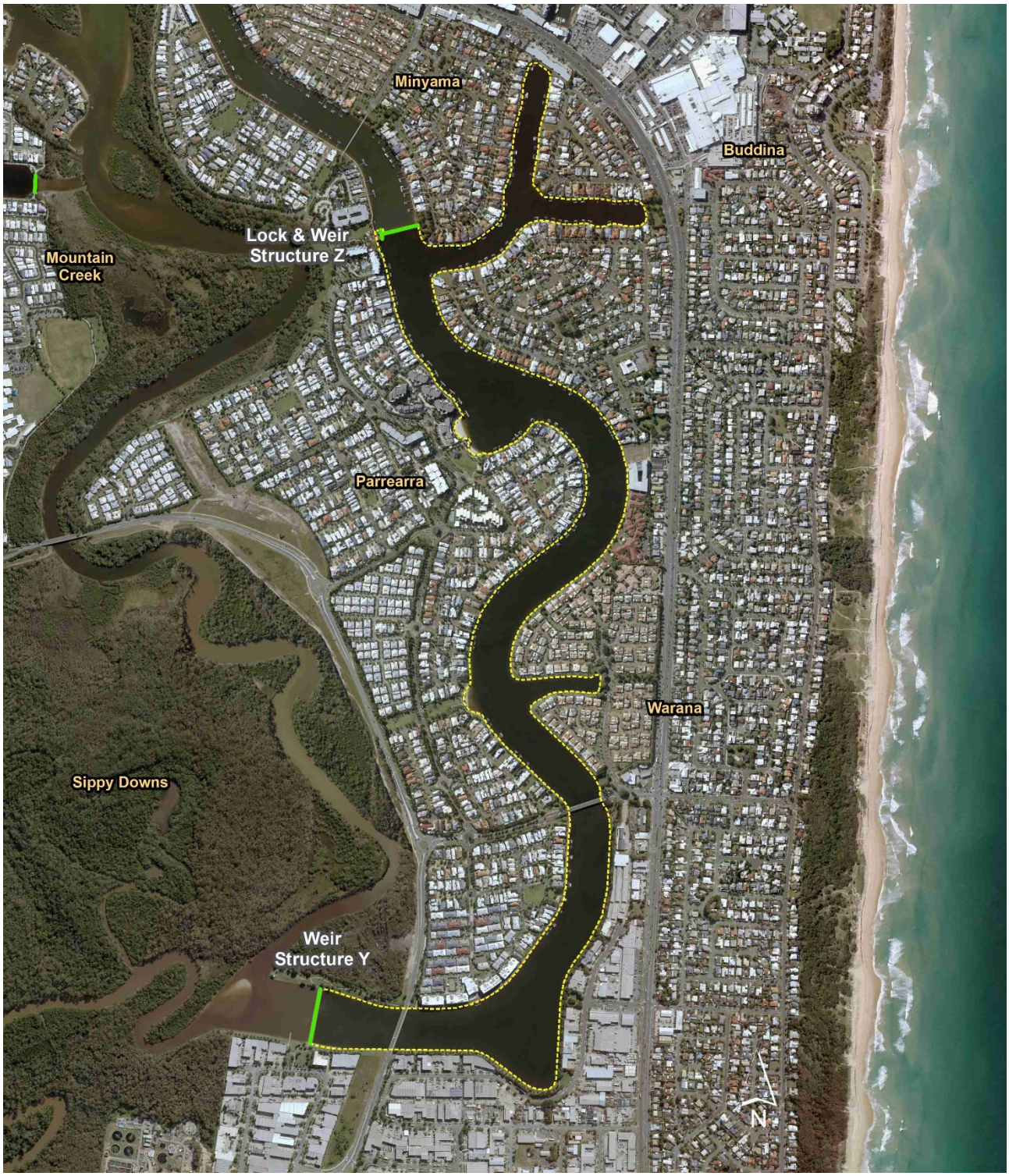


Figure 1: Locality plan

2.3 Assets

The assets included in this management plan are specified in Table 2 below.

Table 2: Lake assets

Assets	Description	Quantity
Southern weir (structure Y)	A broad crested weir that controls the entry of flood flows to the Parrearra Channel. Refer design drawings in Appendix A.  	1

Assets	Description	Quantity
Northern weir (structure Z)	A broad crested weir that was constructed to restrict the increase in the tidal prism of the Mooloolah River caused by the construction of the Parrearra Channel. Refer design drawings in Appendix B. 	1
Lock (structure Z)	Allows vessels of a size up to 15 m in length, 4.5 m in width and 2 m draft to pass through safely. There is no height limitation for vessels using the lock, however the bridges within the lake and those further downstream in the Mooloolah River will cause a height restriction. Refer design drawings in Appendix B. 	1

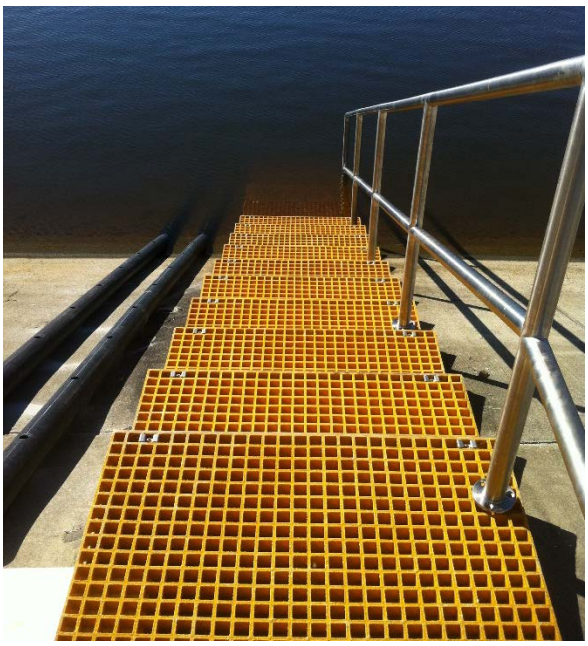
Assets	Description	Quantity
Revetment walls	Lake edge abutting public land only - required to maintain the stability of the lake edge, whilst contributing to the aesthetics and usefulness of the lake. In accordance with the Building Regulations for slab on ground the Finish Floor Level is 0.225m above natural ground level. The top of the revetment wall to residential properties is RL 0.9m AHD.  	Approx. 5,500m

Assets	Description	Quantity
Rock scour	Rock scour provides protection to revetment walls and associated land assets. 	Approx. 8,500 m
Salinity exchange system (northern*)	Salinity exchange system includes pipe, pit and fittings, including an actuated penstock to control flows. 	1

Assets	Description	Quantity
Pontoon	Floating platforms built over the water to faciliate lake access and enjoyment.  	2

Assets	Description	Quantity
Viewing platform	Platforms built partially over or adjacent to the water to faciliate lake viewing and enjoyment.  	2

Assets	Description	Quantity
Constructed beaches	Beach artificially created to facilitate enjoyment of the lake foreshore areas.  	5

Assets	Description	Quantity
Portages	Steps built into the southern weir to faciliate waterway access for non-motor powered craft.  	2

Assets	Description	Quantity
Waterway access	Infrastructure facilitating access from public land to the water, e.g. stairs and ramps. There are only 2 accesses in Parrearra which are both stairs for human powered craft.  	2

Assets	Description	Quantity
Gross pollutant trap (GPT)	Gross pollutant traps (GPT's) are provided at most outlets from stormwater drainage systems to the lake. The GPT's provide primary treatment to all road runoff and secondary treatment to surface runoff. Includes those on the western side of the lake only, as those on the east are maintained by the state government (draining a state-owned road).  	23
Stormwater pipe outlet	Stormwater pipes draining directly into the lake. 11 on western side and 20 on eastern side.	31

Assets	Description	Quantity
Aids to navigation	Aids to navigation are usually in the form of a channel marker, buoy or pile and may house a sign, light or beacon. 28 piles are located approximately 30m either side of both weirs, with 16 of those housing a beacon. 2 blue channel markers are located either side of Kawana Island Blvd bridge. 	28 piles 16 beacons 2 channel markers
Signs	Public signage associated with lake use and safety.  	10

Note: Any assets managed by state government agencies are not included in this management plan e.g. channel markers on Kawana Way Bridge and GPT's draining Nicklin Way.

** the southern salinity exchange at structure Y forms part of the Lake Kawana Management Plan*

3 Land tenure and statutory requirements

3.1 History

As a result of a Design Approval granted by the Department of Natural Resources and Mines on the 26 June 1998 for the creation of a waterway (lake) as shown on plan P-2780-54A, plus an earlier similar approval on 20 October 1997 for additional waterway (lake) as shown on plan P-2780-498, the constructed lake was surrendered out of Development Lease No. 2 in stages for the purpose of a Sport and Recreation Reserve under the provisions of the Land Act 1994.

From 1959 to 2001, the land was held as part of Development Lease No. 2 granted to Lensworth Kawana Waters Ply Ltd and was dedicated as a Sport and Recreation Reserve under council's control on 26th April 2002.

3.2 Lake ownership details

Name: State of Queensland (DNRME)

3.3 Lake owner's responsibilities

As trustee of the Reserve, council is responsible for ensuring that the lake system and its infrastructure:

- is maintained to a safe and reasonable standard to the best of council's ability;
- provides adequate amenity for residents and general public;
- maintain its function as an effective flood bypass channel; and
- residents can access downstream Mooloolah River via their powered craft.

Facilitating water-based recreational use is not a responsibility of council, however guidelines are provided in this plan to allow for this additional community benefit of the lake (refer section 5).

3.4 Private landowners responsibilities

Private landowners abutting the lake are responsible for:

- their private property and infrastructure, including any constructed ramp, jetty, deck and/or pontoon;
- stormwater management within their property boundary;
- any pollution or run-off from their property that adversely affects lake water quality; and
- revetment walls fronting their property.

If any maintenance of privately owned revetment walls are required, owners are advised to first speak with council staff and also refer to the following:

- *Sunshine Coast Council Residents' Handbook: Artificial Waterways;*
- standards in section 9.3; and
- recommended typical revetment wall section, as designed in Appendix A.

3.5 Legislation

The Lake Management Plan complies with the following statutory legislation and its associated regulations and policies:

- Local Government Act 2009
    - Sunshine Coast Council Local Laws
- Coastal Protection and Management Act 1995
- Planning Act 2016
- Environmental Protection Act 1994
- Waste Reduction and Recycling Act 2011
- Fisheries Act 1994
- Nature Conservation Act 1992
- Transport Operations (Marine Safety) Act 1994
- Transport Operations (Marine Pollution) Act 1995
- Aboriginal Cultural Heritage Act 2003

4 Lake purpose and function

4.1 Intent for use

The primary purpose of Parrearra Lake is to provide an effective flood control solution for the surrounding urban development (flood bypass channel). Secondary to that is to provide resident's navigational access to Mooloolah River via the lock and maintain amenity and visual quality of public spaces. Additional water-based recreation presents an opportunity for added benefit, however it's not the purpose of the lake.

The lake is intended to be used by the community in a responsible way for their recreational enjoyment, with minimal adverse impact upon the amenity of those dwellings in proximity to the lake. Contact with the water is proposed as secondary contact only (e.g. kayaks, canoes and stand-up paddle board).

4.2 Function of lake as a flood bypass channel

Parrearra Lake forms an essential component of the flood solution for the Kawana Waters development. The lake, together with the Parrearra Canal and the channel between Structure Y and the Mooloolah River form the Parrearra Flood Bypass channel. The development on the flood plain and the associated flood solution incorporating the bypass channel were the subject of extensive hydraulic model testing.

Model testing was undertaken by the University of New South Wales, Water Research Laboratory, under the guidance of the Mooloolah River Hydraulic Model Technical Committee. This committee consisted of representatives of the following organisations:

- Land Administration Commission (Joint Principal)
- Kawana Estates Pty Ltd (Joint Principal)
- Co-ordinator General's Department
- Department of Harbours & Marine
- Department of Local Government
- Landsborough Shire Council
- Maroochy Shire Council
- Cardno & Davies Australia Pty Ltd

At its final meeting on 10 March 1983, the Committee accepted the Water Resource Laboratory report on the testing and commended to the joint principals the ultimate development proposal and flood solution.

The flood solution compensates for the loss of flood storage due to the reclamation on the flood plain by providing additional flood conveyance. This is achieved by the construction of a flood bypass channel through the development.

The lake conveys floodwaters from the river just downstream of the sewage treatment works to re-join the river on the northern side of the Nicklin Way. Downstream of this point, the additional conveyance is provided by dredging the river.

The entry of flood flows to the Parrearra Channel is regulated by a flood control structure located within the channel near its upstream end. The structure is a broad crested weir and has been designated Structure Y. To restrict the increase in the tidal prism of the Mooloolah River caused by the construction of the Parrearra Channel to the limit imposed by the approving authorities, a second broad-crested control structure, Structure Z, was constructed near the downstream end of the channel, approximately 1.5km from its junction with the Mooloolah River. The waterway between the control structures is a tidally restricted lake. Boating access to the lake is provided by a navigation lock incorporated in Structure Z. The Parrearra Canal forms the fully tidal reach of the Parrearra Channel between Structure Z and the river.

5 Lake use

Permitted and prohibited uses are detailed in the following section and must be adhered to at all times.

5.1 Permitted uses

Lake use is open to the general public or 'sports-based' user groups providing the use is a 'permitted use' as described below.

With the exception of enforcement/safety/disaster response craft in emergency situations, the maximum speed must not exceed 6 knots.

Access to the lake is provided via the navigation lock, from private dwellings with direct frontage to the lake, from parks or road reserve.

Council, as the trustee, may from time to time utilise the lake and/or surrounding open space for public events (e.g. markets, public displays etc.).

The following uses and/or actions are permitted in or on the lake:

- human powered craft (e.g. canoe, kayak, row boat and stand-up paddle board);
- small wind powered sail craft;
- model boat;
- motor powered pleasure craft;
- recreational fishing, except as precluded in section 0;
- mobile structures (e.g. dry docks, seapens and float bricks) that are secured to an approved privately owned pontoon or jetty;
- approved maintenance, safety, disaster response and enforcement craft;
- approved construction craft (e.g. barges, dredges and support craft);
- flood storage purposes and to control flood discharge at the weir;
- use of lake water for fire control purposes (e.g. helicopter fire services); and
- any other activity prescribed by council from time to time.

Please note:

All lake users are encouraged to exercise a personal duty of care when accessing the lake system and/or participating in water-based recreation. Recreating in constructed tidal lakes has inherent risks, including but not limited to potentially hazardous marine creatures such as sharks and stingers.

The water quality in the lake is maintained to a secondary contact standard. At times post major rainfall events the water quality within the lake may be diminished below secondary contact standards (refer section 6 for an overview of council's water quality management of the lake).

Due to the above reasons, direct exposure through swimming is not advised.

5.2 Permitted uses subject to approval

5.2.1 Events, recreational clubs and commercial operations

Council may agree to allow certain low-use/low-impact events, group/club recreational activities and commercial operations to occur on the lake that do not negatively impact on surrounding residents and the overall amenity. The activity must be a permitted use as specified in section 5.1, including (but not limited to) water taxi, vessel hire and other water-based activities/events e.g. SUP lessons, dragon boat user groups, model boats etc. For such operations to be considered for approval, council requires a written submission detailing the type of activity and any potential impact the activity will have on surrounding residents, other users of the lake, water quality, council-owned assets and overall amenity.

Refer to council's Community Land and Complementary Commercial Activity Policy for more information.

5.2.2 Structures and permanent moorings within the lake

The location of private structures, namely a boat ramp, pontoon, deck or jetty for lot owners abutting the lake, must be approved by council. All works must comply with the standards outlined in the Planning Scheme Policy for Development Works within the Sunshine Coast Planning Scheme 2014.

A Quay Line Plan defines the allowable location of any structures available to an adjacent landowner. All works must be constructed in accordance with the Quay Line Plan in Appendix C.

5.2.2.1 Tenure

Prior to any adjoining lot owner lodging an application for approval to construct a boat ramp, pontoon, deck or jetty on part of the lake, they must enter into a lease over the area containing the proposed structure or works and its appurtenances, from council, in accordance with the provisions of Section 57 of the Land Act 1994. Council will charge an application fee and an annual lease fee for the leased area as determined by council from time to time. The lease term would be to a maximum of 30 years.

The registration on title of the lease into the name of the adjoining lot owner, must be completed before any applications to council for the proposed structure may be made.

5.2.2.2 Approval of works

Private boat ramps, pontoons, decks and jetties contained within the quay line designated area may be approved by council on application by that lot owner, subject to lodgement of engineering plans for the proposed structure and any/all conditions applied by Council.

For lots that directly abut the lake, if part of a pontoon, deck or jetty is proposed to be located within 1.5 metres of the rear boundary of the lot an application for relaxation under the Standard Building Law 1993, will also be required.

Pontoons may be approved by council for allotments abutting the park fronting the lake in the case of Kawana Island.

Construction of any permanent works must be approved by council and a private building certifier before any onsite work commences. Use of the works or structure must not commence until a final inspection and approval to use has been granted by the relevant authority. Failure to obtain the relevant approval or the carrying out of works to a lesser standard than required, may result in an order to remove the offending works.

The use of standard appropriate design structures is encouraged and provided in Appendix D.

5.2.2.3 Exclusivity and restrictions

By the action of granting a lease over the mooring structure or works, exclusivity of use is secured to the adjacent lot owner to whom the lease was granted, to the exclusion of any other user of the lake reserve.

As described in section 1.1, a lock access card is required should a vessel owner wish to use the lock facility to access Mooloolah River.

5.3 Prohibited uses and practices

The following uses or actions are prohibited in the lake:

- events/recreational clubs/commercial operations (SCC approved permits excepted, refer section 5.2.1);
- construction of ramps/pontoons/decks/jetties (SCC approved structures excepted, refer section 5.2.2);
- temporary moorings[2] (SCC approved event/recreational club/commerical permits excepted, refer section 5.2.1);
- diving or jumping off any structure over or in the lake;
- fishing from the following public infrastructure:
    - bridge;
    - deck/boardwalk;
    - jetty;
    - pontoon;
    - weir; or
    - lock structure.
- motor powered vessels navigating at speeds exceeding 6 knots (with the exception of enforcement/safety/disaster craft in emergency situations);
- waterskiing, freestyling or wave jumping whilst operating any watercraft;
- living on watercraft whether temporarily, intermittently or permanently;
- the construction, reconstruction, refitting or undertaking of structural repairs on or to watercraft;
- unmarked fishing equipment (e.g. crab pots and fish traps);
- refuelling of watercraft;
- dumping or depositing of any wastes (including garden wastes), contaminants or other pollutants into the lake, adjoining waterways or in a place (e.g. road-side gutter or stormwater drain) where it could reasonably be expected to blow or wash into the lake or adjoining waterways; and
- any other activity prescribed by council from time to time.

[2] Temporary moorings include the use of dry docks, seapens, float bricks etc. that are not secured to an approved pontoon or jetty.

5.4 Lock and weirs

The navigation lock allows vessels of a size up to 15 metres in length, 4.5 metres in width and 2.0 metres draft to pass through safely at low tide. Whilst there is no height limitation for vessels using the lock, the downstream bridges and bridges within the lake will cause a height restriction. The maximum speed limit for vessels navigating the lake is six (6) knots (with the exception of enforcement/safety/disaster response craft in emergency situations).

5.4.1 Lock access

The lock may only be accessed by using a lock access card. These cards must be purchased from the Caloundra and Maroochydore Office of the Sunshine Coast Council. An application form must be completed and the applicable fees need to be paid prior to the issue of the access card. For security and safety of both the lock and residents, a photo identification with permanent address must be attached to the application form.

All access cards include a 2 year replacement warranty and typically last 3-4 years depending on use.

The fees payable to obtain a lock access card can be found on council's website at https://www.sunshinecoast.qld.gov.au/Pay-and-Apply/Fees-and-Charges

5.4.1.1 Faulty access card

If an access card is faulty, the following applies:

1. access card to be returned to council;
2. application for replacement card to be completed;
3. if the card is more than 2 years old, pay replacement fee (refer link above);
4. if the card is less than 2 years old and a test confirms the fault, no charge will apply; and
5. new card will be issued

Further enquiries may be made to council's Customer Services Centre staff on 1300 007 272 (local calls) or (07) 5475 7272 (outside local area and mobile phones).

5.4.1.2 Commerciality

Income from the annual fee for lock access cards and annual lease fee for the leased area pursuant to Section 57 of the Land Act 1994, will be retained by council to assist in the maintenance of the lake and abutting public land.

The quantum of the fee or charge will be determined annually by council in association with normal budgetary considerations.

5.1 Abutting public land

Abutting public land is under the control of council. All normal activities that are permitted in parks and on roads are permitted on abutting public land fronting the lake except as may be restricted elsewhere in this Lake Management Plan, or by approved signs erected on such land.

5.2 Temporary restricted use

Council reserves the right to restrict lake use for a specific purpose at any time, if such action is required to either protect public health and safety or prevent pollution of the lake.

5.3 Future development

No further development within the Lake Reserve or on adjacent Reserves is intended by council, unless determined necessary to support the primary purpose and function of the lake.

6 Water quality management

The lake system is best described as a lower catchment flow through system i.e. an artificial waterway which acts as an estuary in some part, where the flow through rate is determined by a salinity exchange system and weir. As such, the water level and flushing can be controlled to ensure ideal conditions.

Influences on water quality in the lake system are therefore principally impacted by:

- appropriate exchange of water;
- up-stream catchment practices;
- surrounding urban runoff (i.e hydrocarbons, particulates, pesticides, herbicides etc.);
- activities associated with vessel maintenance; and
- colonisation by marine organisms. Certain species may proliferate at times of elevated nutrient levels and cause other environment and human health risks e.g. algal blooms

Table 3 provides a framework to effectively manage these influences to ensure acceptable water quality is maintained.

Table 3: Water quality management overview

Objective	Water quality is maintained to a standard suitable for secondary contact recreation
Performance standards	• Water quality is maintained in accordance with scheduled water quality objectives for secondary contact recreation in the Environmental Protection (Water and Wetland Biodiversity) Policy 2019 and Guidelines for Managing Risks in Recreational Water (NHMRC 2008) • Reactive water quality sampling is in accordance with the methods prescribed in the Queensland Monitoring and Sampling Manual (2018) • Growth of undesirable marine organisms is absent or regulated
Management controls	1. Maintain impervious and/or vegetated overland flow paths in accordance with routine inspection and maintenance schedules 2. Maintain stormwater drainage systems and GPTs in accordance with routine inspection and maintenance schedules 3. Maintain salinity exchange systems and weir in accordance with routine inspection and maintenance schedules 4. Educate residents and public to reduce pollutant run-off and/or input (e.g. signage, residents' handbook and website)
Corrective action	• If the relevant water quality guidelines are exceeded, or a trend of declining water quality develops over an extended period, it will be considered to indicate the need for reassessment of the appropriateness and effectiveness of existing water quality management controls • Erection of temporary signage if determined necessary
Monitoring	• Visual monitoring to be undertaken concurrent with routine inspections and/or maintenance schedules • Water quality sampling will be undertaken on a reactive basis if requested and determined necessary • Maintain customer service request records and incident/non-compliance register
Reporting	The results of monitoring will be made available to the public at council's discretion and by request only
Responsibility	SCC

7 Flood bypass management

During the design 100 year average recurrence interval flood event, the bypass channel conveys a peak discharge of 370m^3/s. Maximum water levels in the lake are RL 2.7m AHD just upstream of Structure Z and RL 2.8m AHD just downstream of Structure Y. At the peak discharge the average flow velocity in the lake is 0.55m/s.

The minimum level of blocks are RL 3.3m AHD just upstream of Structure Z and RL 3.5m AHD just downstream of Structure Y.

In accordance with the Building Regulations for slab on ground the Finish Floor Level is 0.225m above natural ground level. The top of the revetment wall to residential properties is RL 0.9m AHD.

Table 4 provides an overview of management to ensure the lake continues to provide an effective flood bypass solution.

Table 4: Flood bypass management overview

Objective	The lake continues to function as an effective flood bypass channel
Performance standards	• No flooding above Q100 level • Compliance with design criteria for lake operation as a flood channel • Effective operation and maintenance of tidal exchange system and weir • Maintain lake to acceptable tolerances from design profile
Management controls	1. Adherence to maintenance procedures in Appendix E 2. Adherence to asset management plans 3. Asset inspections and maintenance schedules met
Corrective action	• Undertake reactive inspection and maintenance of flood mitigation devices (salinity exchange system & weir) • Review incident and where required review procedures to ensure effective measures are in place to meet performance standards
Monitoring	• Visual monitoring undertaken during asset inspections and maintenance • View CCTV at structure Z • Maintain customer service request records
Reporting	• Contractor maintenance reports • Asset inspections logs
Responsibility	SCC and maintenance contractor

8 Incident, non-compliance and complaint management

Table 5: Incident, non-compliance and complaint management overview

Objective	To ensure prompt and efficient response to pollution, environmental incidents, complaints and non-compliance
Performance standards	• Prompt removal of pollution spillages from waterways with minimum risk to the public and the environment • All complaints and non-compliance are dealt with promptly and efficiently, in accordance with council's Compliance and Enforcement Policy 2018 • Appropriate investigations are undertaken to determine the source of pollution and the cause of environmental incidents (e.g. oil spills, fish kills and algal blooms)
Management controls	1. Adherence to asset management plans 2. Asset inspections and routine maintenance schedules met 3. Adherence to water quality management procedures (refer section 6) 4. Sufficient signage to communicate prohibitions outlined in this management plan (refer 0)
Corrective action	• Pollution spill, fish kill or other environmental incident - report to the Department of Environment and Science to ensure that appropriate investigations and testing are undertaken • Address and/or rectify incident, complaint and/or non-compliance • Review customer service requests and incident/non-compliance register and implement improvement to processes and/or signage where deemed necessary
Monitoring	• Follow up monitoring to be undertaken in the event of an environmental incident • Maintain customer service request records and incident/non-compliance register
Reporting	Complete the appropriate incident report/debrief when required or requested
Responsibility	SCC

9 Maintenance

9.1 General

Maintenance of the lake and its assets are the responsibility of council and includes routine, planned and reactive maintenance work activities.

Maintenance work is managed through an asset management system and includes activities such as inspection, assessing condition, prioritising, scheduling, actioning the work and reporting what was done to develop a maintenance history and improve maintenance and service delivery performance.

Routine maintenance is performed on a regular cycle to upkeep visual amenity and/or replacement of components/sub-components of assets. This work generally falls below the capital threshold. Planned maintenance comprises larger scale repair work (below the capial threshold) or asset renewal (capital work). Reactive maintenance is unplanned repair work carried out in response to service requests and management/supervisory directions.

Types of maintenance may include:

- on-going maintenance of the navigation locks and inlet/outlet weirs;
- on-going maintenance of the salinity exchange system;
- removal of siltation from bed and banks of the lake, as required, to ensure that it does not become a constraint on the function of the lake;
- removal of debris, rubbish and undesirable marine organisms/weeds from the lake and public foreshore areas;
- maintaining the revetment walls where they front public lands;
- maintaining scour that supports all revetment walls; and
- maintaining navigation aids within the lake etc.

Refer Table Table 6 which outlines the entire maintenance framework and regimes.

9.2 Maintenance management

The following section provides an overview of the maintenance framework for lake features and assets to meet specific management plan objectives outlined in Table 1. Refer Appendix E to view associated weir and lock maintenance procedures.

Table 6: Maintenance framework overview

Feature / asset	Performance standard	Performance indicator	Comments / considerations	Inspection frequency	Routine maintenance frequency	Responsibility
Waterway feature						
Litter, debris etc.	Waterways are free of litter and debris that are impacting on amenity, health and/or safety	a) Inspection and maintenance schedules met b) Reactive works undertaken in a timely manner c) No complaints	• Officers undertaking litter removal should ensure that appropriate precautions are taken against hazardous objects such as discarded hypodermic syringes • Collected litter should be recorded in AMDI database and disposed of at council's refuse tip • A public education programme should be considered by council if litter is a persistent problem • If fishing equipment (e.g. crab pot or fish trap) is found either unmarked and/or in state of disrepair to a point of it being non-functional then it shall be removed as marine litter (report to DAFF for their agency to remove)	Monthly	Monthly	SCC Waterways team
Undesirable marine organisms / weeds	Growth of undesirable marine organisms is absent or regulated	a) Inspection schedule met b) Reactive works undertaken in a timely manner c) No complaints	• Any vegetation or plant material, living or dead, located below the level of the highest astronomical tide (approximately RL 1.05m AHD) is classified as "marine vegetation" under the Fisheries Act. Refer to relevant fisheries *accepted development requirements* before undertaking any works involving marine vegetation • Although herbicides are a possible means of weed control, only herbicides registered for use in aquatic environments should be used • All removed vegetation should be disposed of at council's refuse tip • In the event of algal blooms, refer to Queensland Harmful Algal Bloom Response Plan 2014. Appropriate laboratory testing should be undertaken to determine the species present and likely cause of the outbreak. If testing indicates the presence of toxic species, specialist advice should be sought regarding any necessary health precautions.	6 monthly	No routine maintenance. Any required works are determined based on inspection condition assessment	SCC Lakes and Wetlands team
Lake profile	Lake is maintained to acceptable tolerances from design profile	a) Survey completed as scheduled b) Maintenance is undertaken in a timely manner before degradation of waterway profile affects vessel movement or the stability of revetment walls c) No complaints	• Appropriate geotechnical and chemical testing should be undertaken of material proposed to be dredged or excavated in maintenance operations • Approvals to undertake dredging, or other excavation, within a waterway are required under the Planning Act 2016 (Tidal Works) and the Environmental Protection Act 1994 (ERA 16) (dependant on volume of material to be managed)	7 yearly	No routine maintenance performed. Any required works are determined based on visual observation and 7 yearly lake survey	SCC Coast & Canals team
Constructed beaches	Accessible, safe and provides adequate amenity and visual quality	a) Open for use 90% of the time b) Clear of marine fouling and debris c) Safe d) Inspection schedule met e) Reactive works undertaken in a timely manner f) No complaints	• Weeding is performed by physical / mechanical means, no herbicides to be used • Sand profiles are maintained as designed	6 monthly	No routine maintenance. Any required works are determined based on inspection condition assessment	SCC Coast & Canals team
Infrastructure						

Feature / asset	Performance standard	Performance indicator	Comments / considerations	Inspection frequency	Routine maintenance frequency	Responsibility
Tidal exchange system	The system is operating as designed and providing effective flood management and water flows	a) Water is turned over every 60 days b) Floods successfully mitigated c) Inlet and outlet structures are not impeded by marine growth or sedimentation d) Inspection and maintenance schedules met e) Reactive works undertaken in a timely manner f) No complaints	Underwater inspections of the structures are likely to be required. This applies particularly to the inlet structure. A qualified commercial diver should be employed for this work and the required safety measures implemented	Fortnightly	Annual	SCC Coast & Canals team
Lock	Provides effective and safe access for marine vessels transporting in and out of the lake system	a) Inspection and maintenance schedules met b) Reactive works undertaken in a timely manner c) No complaints from lock access card holders	Refer Appendix E for maintenance procedures. Refer Section 5.4.1 for more information on lock access and cards	Fortnightly	As per maintenance procedures	SCC Coast & Canals team Contractor
Weirs	The system is operating as designed and providing effective flood management	a) Floods successfully mitigated b) Inspection and maintenance schedules met c) Reactive works undertaken in a timely manner d) No complaints	Refer Appendix E for maintenance procedures	Fortnightly	As per maintenance procedures	SCC Coast & Canals team
Revetment wall	Revetments are maintained in a suitable condition to provide satisfactory protection to adjacent land and assets	a) Structure maintained to design b) Inspection schedules met c) Reactive works undertaken in a timely manner d) No complaints	• The stability of revetment walls and other concrete structures is heavily reliant on the condition of the associated scour (see scour maintenance below) • The maintenance of revetments is the responsibility of the abutting landowner (i.e. council for public land only). However, council are responsible for the associated scour and thus must ensure it is adequate to protect private landowners' revetment	Annually	No routine maintenance. Any required works are determined based on inspection condition assessment	SCC Coast & Canals team
Scour	Scour are maintained in a suitable condition to provide satisfactory protection to revetment walls	a) Structure maintained to design b) Inspection schedules met c) Reactive works undertaken in a timely manner d) No complaints	• The stability of revetment walls and other concrete structures can be rapidly compromised due to the loss of foundation support if the associated scour are not well maintained • Council are responsible for maintaining all scour including those abutting private land	Annually	No routine maintenance. Any required works are determined based on inspection condition assessment	SCC Coast & Canals team
Stormwater outlets	Provides effective drainage of stormwater run-off	a) Structure maintained to design standards b) Inspection and maintenance schedules met c) Reactive works undertaken in a timely manner d) No complaints	Piping failures, resulting in loss of support behind and beneath stormwater drainage outlet structures can result in rapid deterioration of these structures. This damage can quickly spread to adjacent revetment walls. It is important, for the longevity of these structures, to ensure that piping problems are promptly addressed	Annually	Annually	SCC Stormwater Services team
GPT's	Provides an effective pollutant trap to minimise litter, debris and sediment from entering the lake system	a) Structure maintained to design b) Inspection and maintenance schedules met	Refer to manufacturer for design standard details	Monthly	Annually	SCC Stormwater Services team

Feature / asset	Performance standard	Performance indicator	Comments / considerations	Inspection frequency	Routine maintenance frequency	Responsibility
		c) Reactive works undertaken in a timely manner d) No complaints e) Minimal litter, debris and sediment entering the lake directly from stormwater outlets				
Viewing platform	Accessible and safe, providing additional enjoyment of the lake amenity	a) Structure maintained to design b) Open for use 90% of the time c) Inspection schedule met d) Reactive works undertaken in a timely manner e) No complaints		6 monthly	No routine maintenance. Any required works are determined based on inspection condition assessment	SCC Transport Infrastructure team
Jetty/pontoon	Accessible, user-friendly and safe, providing additional access and enjoyment of the lake	a) Structure maintained to design b) Open for use 90% of the time c) Clear of marine fouling and debris d) Inspection schedule met e) Reactive works undertaken in a timely manner f) No complaints		Annually	No routine maintenance. Any required works are determined based on inspection condition assessment	SCC Coast & Canals team
Waterway accesses (including portages)	Accessible, user-friendly and safe, providing additional access and enjoyment of the lake	a) Structure maintained to design b) Open for use 90% of the time c) Clear of marine fouling and debris d) Inspection schedule met e) Reactive works undertaken in a timely manner f) No complaints		Annually	No routine maintenance. Any required works are determined based on inspection condition assessment	SCC Coast & Canals team
Signs	Signs are reader-friendly, clearly visible, safe, and do not impact on the visual qualities of the lake	a) Structure maintained to design b) Inspection schedule met c) Reactive works undertaken in a timely manner d) Vessel operators are compliant with marine safety laws e) No complaints	If non-compliance and/or complaints register indicate a growing trend of users whom are not complying with regulations, assess suitability of all forms of public education, including signage. Implement any improvements where determined necessary (see more section 8)	Annually	No routine maintenance. Any required works are determined based on inspection condition assessment	SCC Coast & Canals team
Beacons, piles and channel markers	Effectively assist vessel operators to safely navigate the lake, without negatively impacting on vessel traffic or amenity	a) Structure maintained to design b) Inspection schedule met c) Reactive works undertaken in a timely manner d) No complaints or on-water incidents		Annually	No routine maintenance. Any required works are determined based on inspection condition assessment	SCC Coast & Canals team

9.3 Standards and specifications

Maintenance work is carried out in accordance with the following standards and specifications.

1. Building Code of Australia
   a) BCA Vol 2 Part 3.1.2.0 – Drainage (AS 3500.3.2)
   b) BCA Vol 2 Part 3.1.2.2 (d) – Excavation and Piling near Sewers and Drains
   c) BCA Vol 2 Part 3.1.1 – Earthworks
2. Australian Standards
   a) AS 1141.Methods for sampling and testing aggregates
   b) AS 1428: Design for Access and Mobility
   c) AS 1604: Treatment of piles
   d) AS 1664.1: Aluminium Structures Code
   e) AS 1665: Welding
   f) AS 1170.1 and 1170.2: Loading Codes
   g) AS 1650 Galvanising
   h) AS 1720: Timber Structures Code
   i) AS 2159: Piling Code
   j) AS 2239: Galvanic (Sacrificial) Anodes for Cathodic protection
   k) AS 2312 Two Pack Epoxy Paints
   l) AS 2832.3 Guide to the Cathodic protection of metals-fixed immersed structures.
   m) AS 3500: Part 3.2, Stormwater Drainage – Acceptable Solutions
   n) AS 3600: Concrete Structures Code
   o) AS 3700: Masonry Structures Code
   p) AS 3706: Geotextiles Methods of test
   q) AS/NZ 3004: Marinas and Recreational Boats
   r) ANZECC: Guidelines for fresh and Marine Water Quality
   s) AS 3962: Guidelines for Design of Marinas Code
   t) AS 4110: Steel Structures Code
   u) AS 4133: Methods of testing rocks for engineering purposes
   v) AS 4997: Guidelines for the design of maritime structures
3. SEQ Restoration Framework, Guideline & Manual
4. Healthy Waterways – Water sensitive Urban Design – Technical Design Guidelines for SEQ
5. Healthy Waterways – Water by Design Construction and Establishment Guidelines
6. Any other relevant regulations, policies, codes and/or guidelines that fall under the Acts listed in section 3.5.

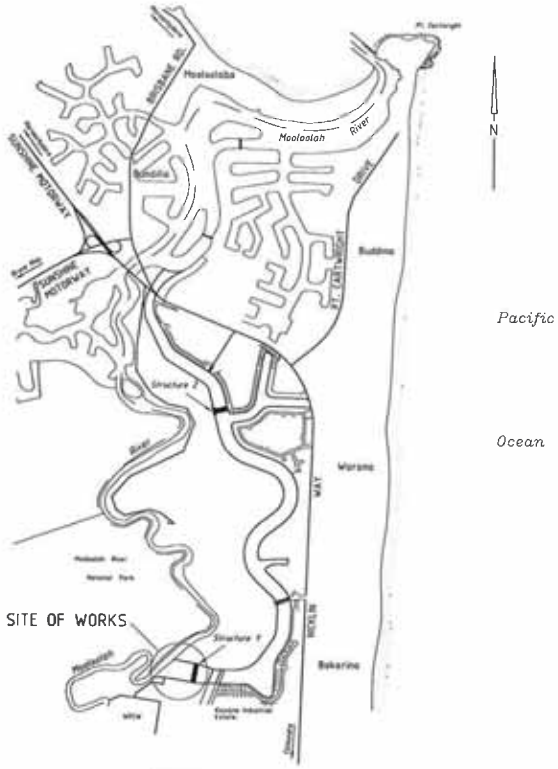
10 Contacts

Entity	Contact details	Enquiry type
Sunshine Coast Council - Customer Service	(07) 5475 7272 1300 007 272	All
Maritime Safety Queensland	(07) 5373 2310 A/H (07) 3305 1700	Marine safety and marine pollution, including oil spills
Mooloolaba Coast Guard	Radio: 88-90, 16-67-21-73-80 (07) 5444 3222	Marine safety
Sunshine Coast District Water Police	(07) 5457 6711 A/H 0438 200 705	Search and rescue, on-water criminal matters and marine safety complaints
Queensland Boating and Fisheries Patrol	(07) 5444 4599 (Mooloolaba)	Marine safety and fisheries complaints
Department of Environment & Science	1300 130 372	Involving pollution, environmental harm, fish kills and marine strandings
Department of Agriculture and Fisheries	(07) 3404 6999	Involving marine plants
RSPCA QLD	1300 ANIMAL (1300 264 625)	Involving injured wildlife. Will likely be attended by Queensland Parks and Wildlife Service (QPWS)

11 Review

This document may be reviewed and updated as determined necessary by council in response to new information, challenges in implementation or changing external factors such as technology, land use, the environment, legislation and community values.

Appendix A: Structure Y Design Drawings



LOCALITY PLAN
Scale 1 : 20000

SCHEDULE OF DRAWINGS

PROJECT DRAWINGS

DWG. No.	DESCRIPTION
478/95-100	SCHEDULE OF DRAWINGS AND LOCALITY PLAN
478/95-101	GENERAL PLAN
478/95-102	EARTHWORKS AND EXISTING LEVELS PLAN
478/95-103	CONTROL LINE 1 - LONGITUDINAL SECTION AND CROSS SECTIONS
478/95-104	CONTROL LINE 1 - CROSS SECTIONS
478/95-105	SCOUR PROTECTION PLAN
478/95-106	TYPICAL REVETMENT AND BANK PROFILES
478/95-107	WEIR STRUCTURE - GENERAL ARRANGEMENT PLAN
478/95-108	WEIR STRUCTURE - CONDUIT PLAN AND DETAILS
478/95-109	WEIR STRUCTURE - SHEET PILING AND WEIR FILL PROFILES
478/95-110	WEIR STRUCTURE - JOINTING PLAN AND DETAILS - SHEET 1
478/95-111	WEIR STRUCTURE - JOINTING PLAN AND DETAILS - SHEET 2
478/95-112	WEIR STRUCTURE - JOINTING SECTIONS AND DETAILS
478/95-113	WEIR STRUCTURE - BOTTOM REINFORCEMENT - SHEET 1
478/95-114	WEIR STRUCTURE - BOTTOM REINFORCEMENT - SHEET 2
478/95-115	WEIR STRUCTURE - TOP REINFORCEMENT - SHEET 1
478/95-116	WEIR STRUCTURE - TOP REINFORCEMENT - SHEET 2
478/95-117	WEIR STRUCTURE - REINFORCEMENT DETAILS
478/95-118	WATER QUALITY BYPASS CONDUIT - TYPICAL SECTION AND DETAILS
478/95-119	WATER QUALITY BYPASS CONDUIT - VALVE CHAMBER PLAN AND SECTIONS
478/95-120	WATER QUALITY BYPASS CONDUIT - HEADWALL 'A' AND SECTIONS
478/95-121	WATER QUALITY BYPASS CONDUIT - HEADWALL 'B' AND SECTIONS
478/95-122	ACCESS PATH AND BAFFLE WALL DETAILS
478/95-123	NAVIGATION AIDS

CALOUNDRA CITY COUNCIL
APPROVED
ENGINEER [signature] DATE 14/7/98

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SCALE BEFORE REDUCTION

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A	16-03-98	General revisions.			

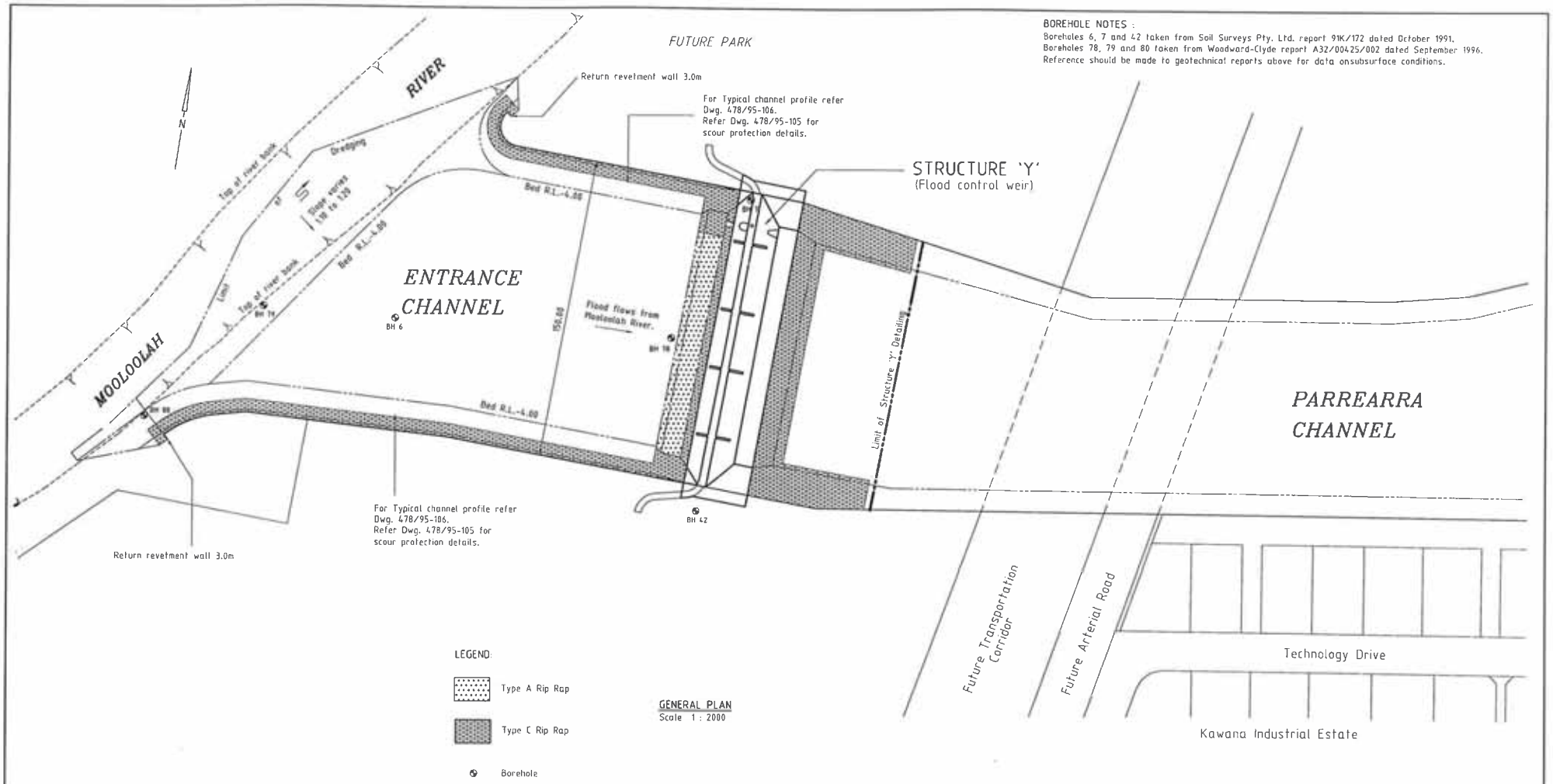
DESIGNED C.F. May
DRAWN C.F. May
CHECKED
RECOMMENDED
APPROVED
A1
DATUM A.H.D.

Cardno & Davies Queensland Pty. Ltd.
ACN 051 074 992
Consulting Engineers

OFFICES / TELEPHONE / FAX
Brisbane (07) 3369 9822 FAX (07) 3369 9722
Gold Coast (07) 5571 1033 FAX (07) 5538 6647
Sunshine Coast (07) 5476 5033 FAX (07) 5443 5862
Townsville (077) 71 2000 FAX (077) 21 2500
Hervey Bay (071) 25 1000 FAX (071) 24 5155
Tweed Heads (067) 55 6538 FAX (067) 55 6539
Port Moresby (675) 321 1543 FAX (675) 321 1719
SUNSHINE COAST OFFICE: (07) 5476 5033 FAX (07) 5476 5353
Postal address: PO Box 1332, Maroochydore, Queensland 4558

KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 'Y'
SCHEDULE OF DRAWINGS AND LOCALITY PLAN

DATE 21-03-1997
DRAWING No: 478/95 - 100



BOREHOLE NOTES :
Boreholes 6, 7 and 42 taken from Soil Surveys Pty. Ltd. report 91K/172 dated October 1991.
Boreholes 78, 79 and 80 taken from Woodward-Clyde report A32/00425/002 dated September 1996.
Reference should be made to geotechnical reports above for data onsubsurface conditions.

LEGEND:

- Type A Rip Rap
- Type C Rip Rap
- Borehole

GENERAL PLAN
Scale 1 : 2000

CALOUNDRA CITY COUNCIL
APPROVED
ENGINEER _____ DATE 14/7/98

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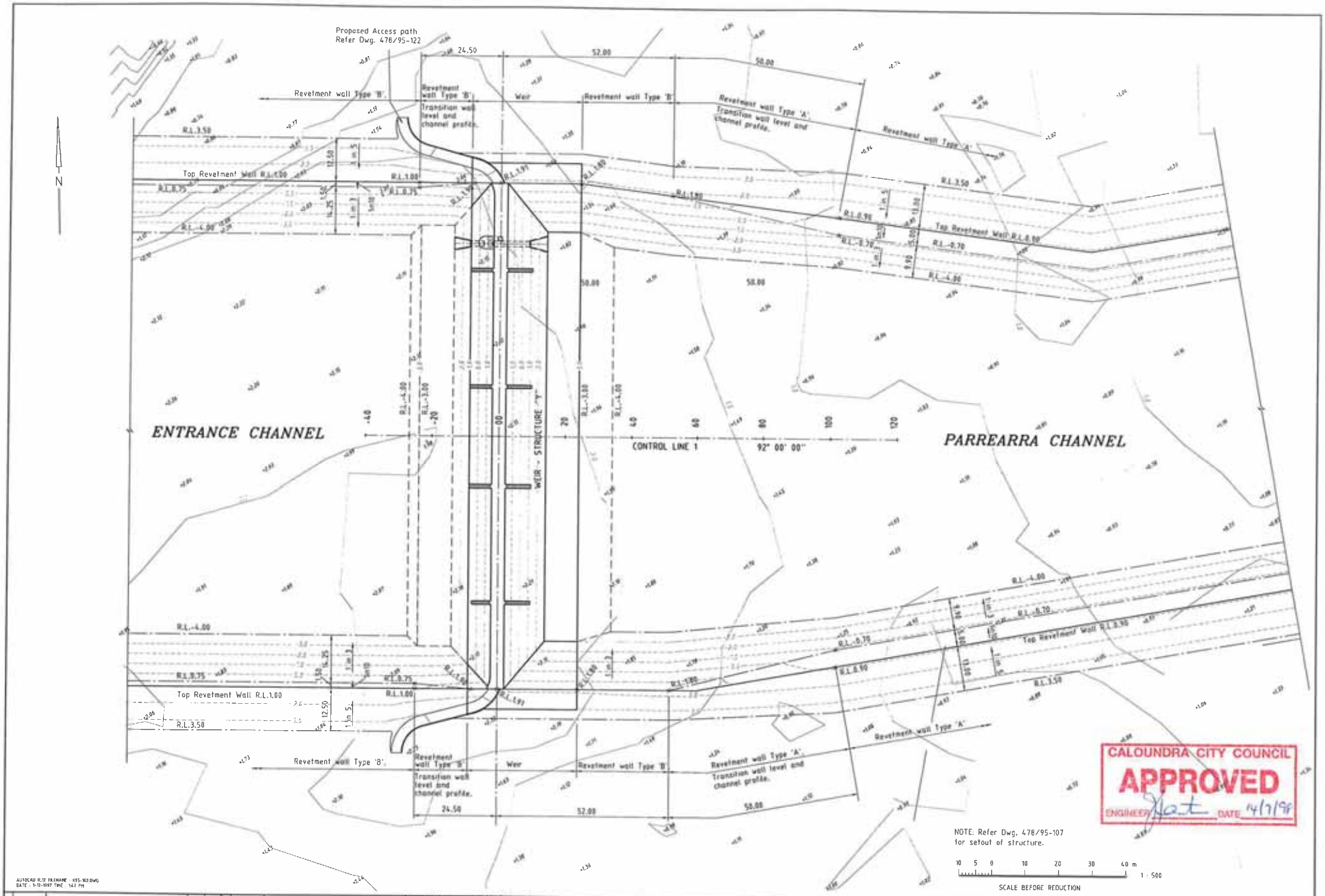
CHECKED: CJB
RECOMMENDED: 23/4/98
A1
DATUM: A.H.D.
APPROVED:

Cardno & Davies
Queensland Pty. Ltd.
Consulting Engineers

KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 'Y'
AND ENTRANCE CHANNEL
GENERAL PLAN

DATE: 5-12-1997
DRAWING No: 478/95 - 101
A



CALOUNDRA CITY COUNCIL
APPROVED
ENGINEER DATE 14/7/98

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DRAWN: E.J.H.
CHECKED: C.J.H.
RECOMMENDED: C.J. Hannam
SIZE: A1
DATUM: A.H.D.
APPROVED: [signature]

Cardno & Davies Queensland Pty. Ltd.
ACN 051 074 992
Consulting Engineers

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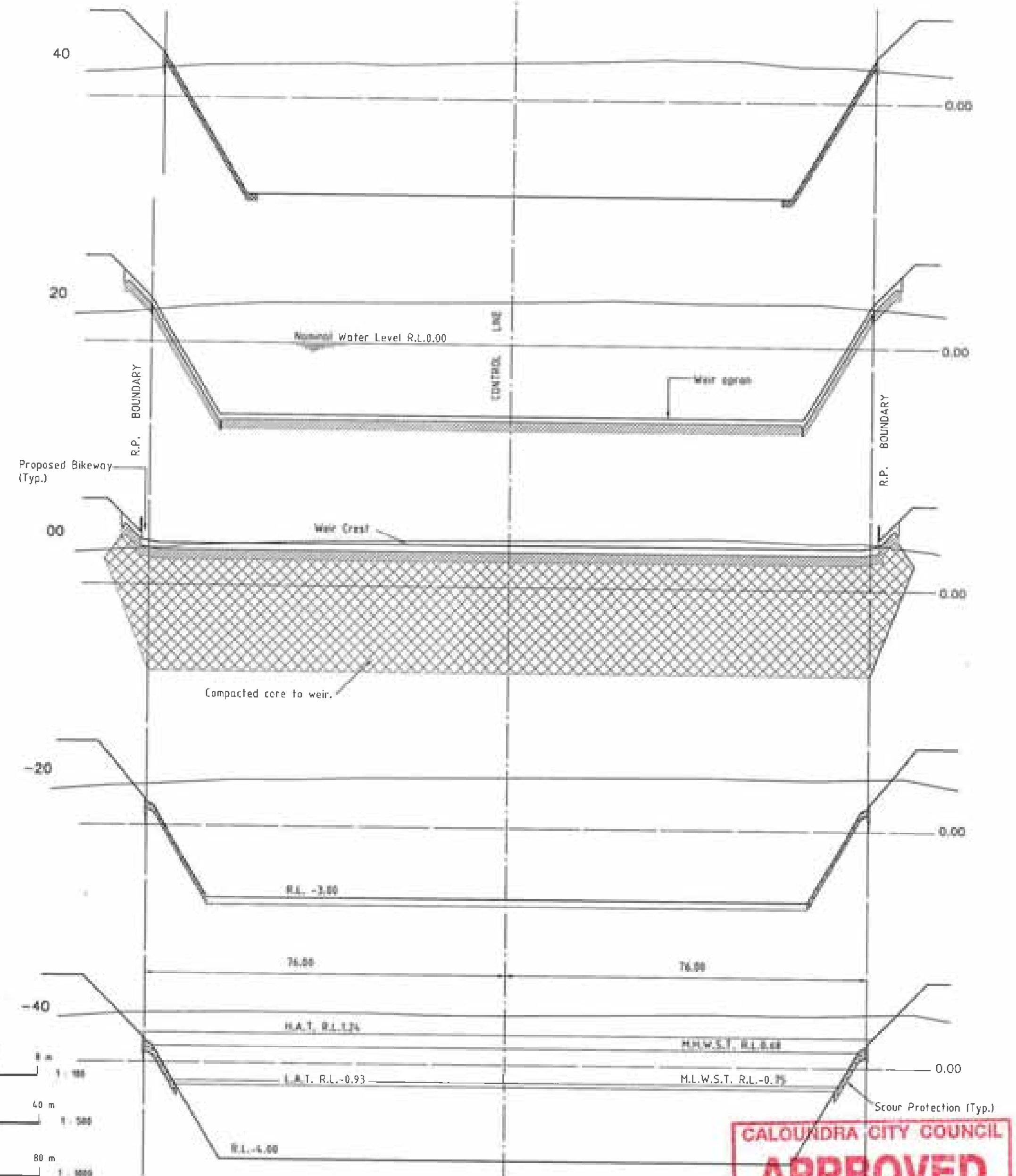
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 'Y'
EARTHWORKS AND EXISTING LEVELS PLAN

DATE: 21-07-1997
DRAWING No: 478/95-102



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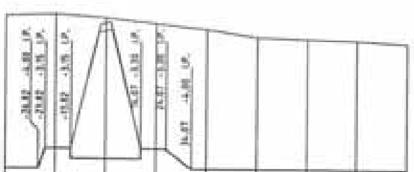

DATUM R.L. -7.00

EARTHWORK QUANTITIES (In Cubic Metres) CUT									
EARTHWORK QUANTITIES (In Cubic Metres) FILL									
CUT (Depth of)	6.08	5.13	5.59	4.77	5.55	5.25	5.19	5.18	5.02
FILL (Height of)									
EXCAVATION LEVELS	-4.000	-3.000	-3.600	-3.000	-4.000	-4.000	-4.000	-4.000	-4.000
SURFACE LEVELS	2.077	2.128	1.986	1.769	1.552	1.253	1.187	1.177	1.017
PEGGED DISTANCE	-40.00	-20.00	00	20.00	40.00	60.00	80.00	100.00	120.00

LONGITUDINAL SECTION

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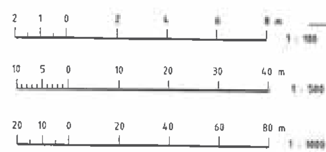

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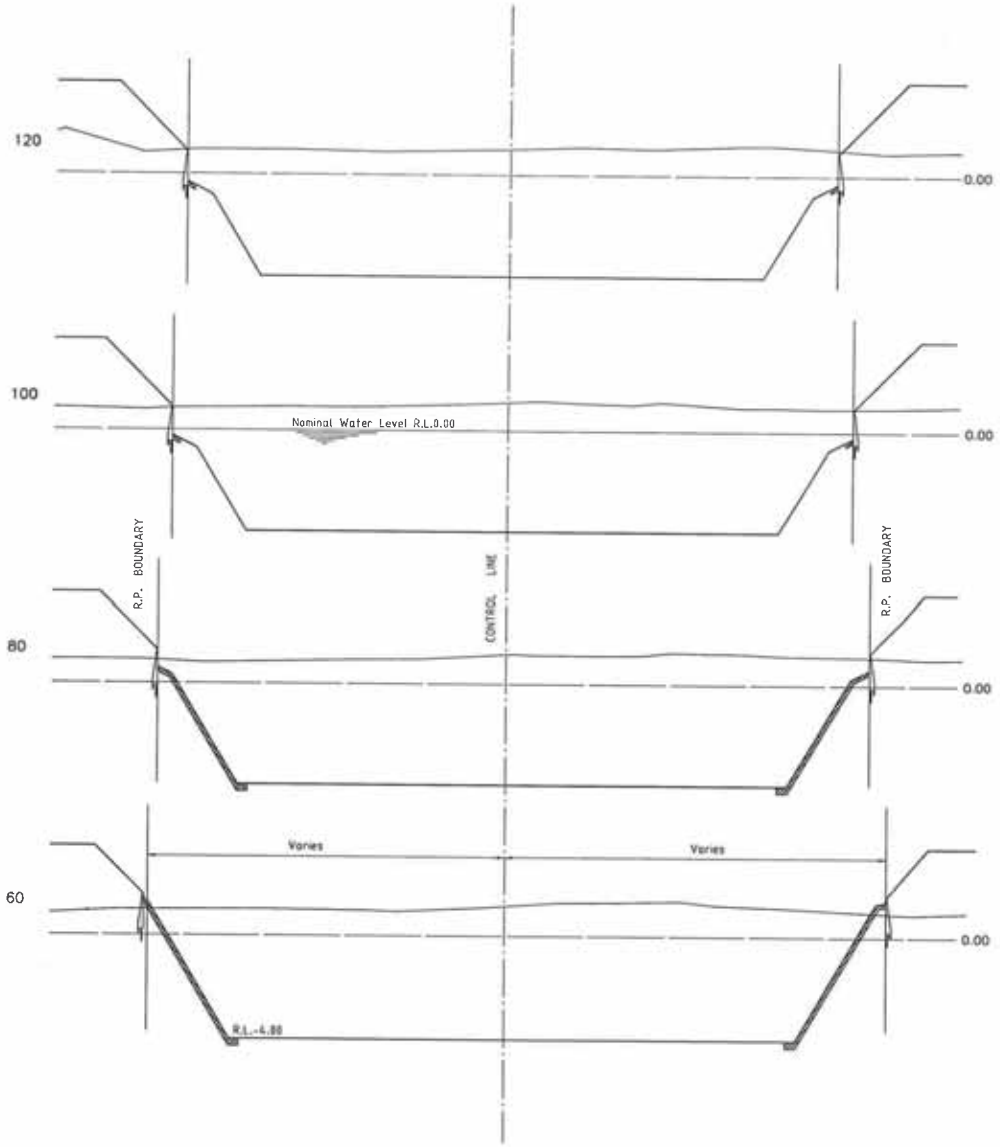
CHECKED: [signature]
RECOMMENDED: [signature]
APPROVED: [signature]
A1
DATUM: A.H.D.

C&D Cardno & Davies Queensland Pty. Ltd.
ACN 051 074 992
Consulting Engineers
SUNSHINE COAST OFFICE: 66 Duporth Avenue, Maroochydore
Postal Address: PO Box 152

KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 'Y'
CONTROL LINE 1
LONGITUDINAL SECTION AND CROSS SECTIONS

DRAWING No: 478/95-103 A



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ENGINEER _____ DATE 14/7/98

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DRAWN: E.J.H.				PARREARRA DEVELOPMENT	DRAWING No: 478/95-104
CHECKED: E.J.H.				STRUCTURE 'Y'	
RECOMMENDED: E.J. Hoare		APPROVED:		CONTROL LINE 1	
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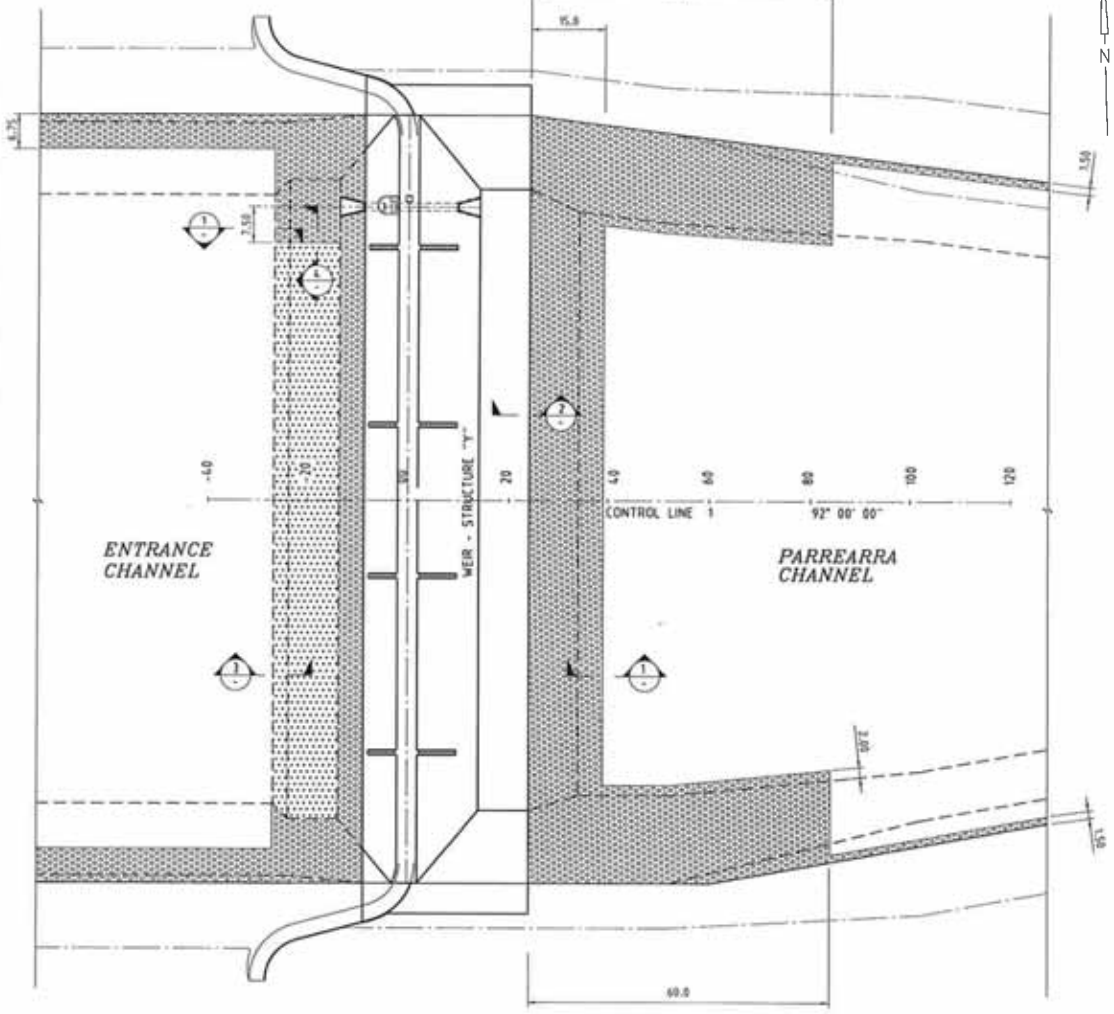

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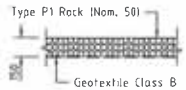
LEGEND:

Type A

Type C



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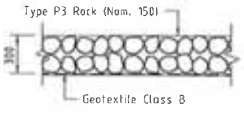

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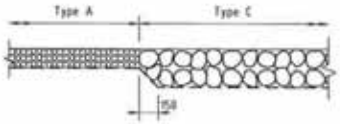

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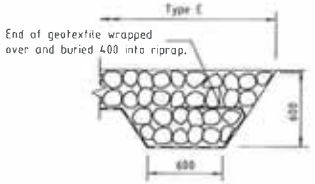

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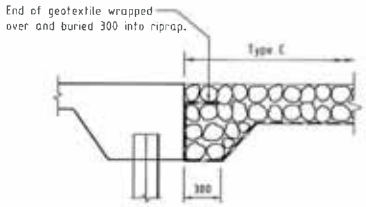

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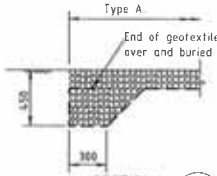

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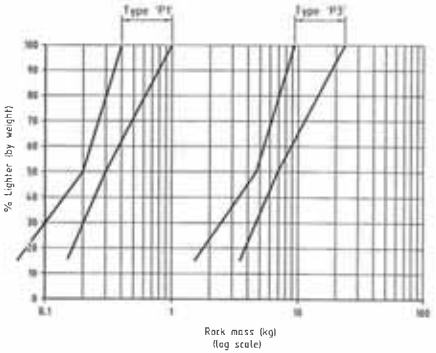

ROCK GRADING GRAPH

ROCK GRADING TABLE

PARAMETER		ROCK TYPE	
SIZE	RANGE	P1	P3
W_{15}	min.	0.06	1.50
	max.	0.15	3.50
W_{50}	min.	0.20	4.70
	max.	0.30	7.00
W_{100}	min.	0.40	9.40
	max.	1.00	24.00

All gradings given in dry mass (kg.)

GEOTEXTILE SPECIFICATION TABLE

Property	Test	Geotextile Class B
Minimum grab tensile strength (N)	AS2001.2.3	1000
Minimum G Rating	Austroads	3000
Minimum trapezoidal tear strength (N)	AS3706.3	400
Maximum pore size (EOS µm)	AS3706.7	200
Minimum permittivity (s^{-1})	AS3706.9	0.5

Refer Note No.8

NOTES

1. A representative sample of rock shall be obtained from the quarry in accordance with AS1141.3.
2. The dry density of the rock shall not be less than 2500 kg/m in accordance with AS4133.2.1.2.
3. The ratio of maximum to minimum dimensions of any rock shall not exceed three.
4. The Los Angeles value of the rock shall not exceed 20 in accordance with AS1141.23.
5. The maximum permissible loss for each fraction shall be 12% in accordance with AS1141.24.
6. Geotextile fabric shall be lapped 1000mm minimum and shall be keyed at the edges to the satisfaction of the Superintendent.
7. Rock of larger size may be substituted if approved by the Superintendent. If larger rock is used, specified layer thicknesses must be increased whilst maintaining nominated finished levels and profiles.
8. Geotextiles shall be non-woven, needle punched fabrics consisting of polyester or polypropylene polymers.

CALOUNDRA CITY COUNCIL
APPROVED
ENGINEER DATE 14/7/98

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10 5 0 10 20 30 40 m 1 : 500
SCALES BEFORE REDUCTION

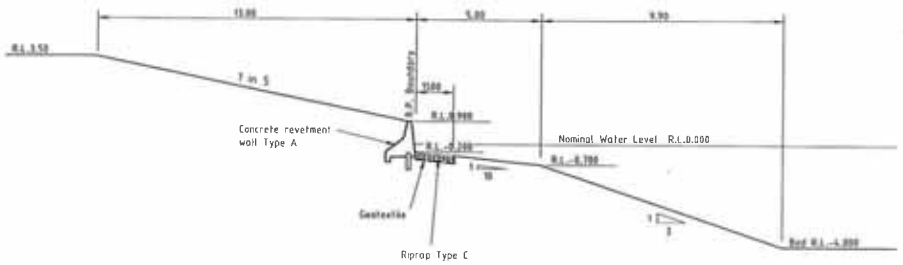
AUTOCAD R.12 FILENAME : R95-105.DWG
DATE : 1-12-1997 TIME : 3:55 PM

DESIGNED:		DATUM:		KAWANA ESTATES PTY. LTD.	
DRAWN:		A1	A.H.D.	PARREARRA DEVELOPMENT	DATE: 21-07-1997
CHECKED:				STRUCTURE 'Y'	DRAWING No: 478/95-105
RECOMMENDED: PROJ. MAN.		APPROVED: PROJ. DIR.		SCOUR PROTECTION PLAN	
A 13-05-98 Minor revisions.					

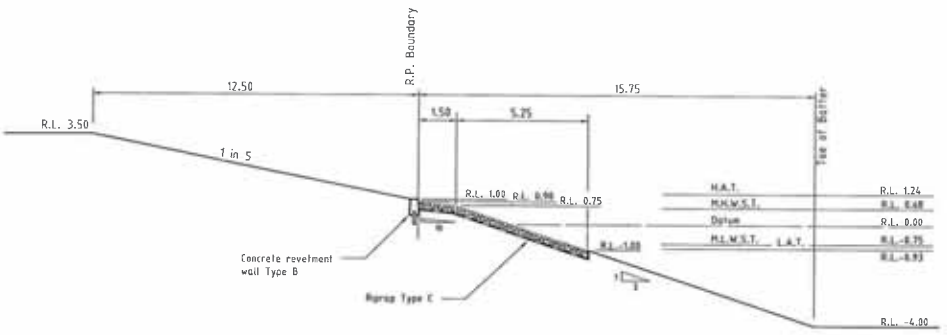
Cardno & Davies Queensland Pty. Ltd.
ACN 051 074 992
Consulting Engineers

Brisbane (07) 3369 9822
Gold Coast (07) 5539 9333
Sunshine Coast (07) 5443 7555
Townsville (077) 71 5092
Hervey Bay (071) 24 5455
Fraser Heads (077) 9529 7800
Port Kennedy 1800 675 325 232 F

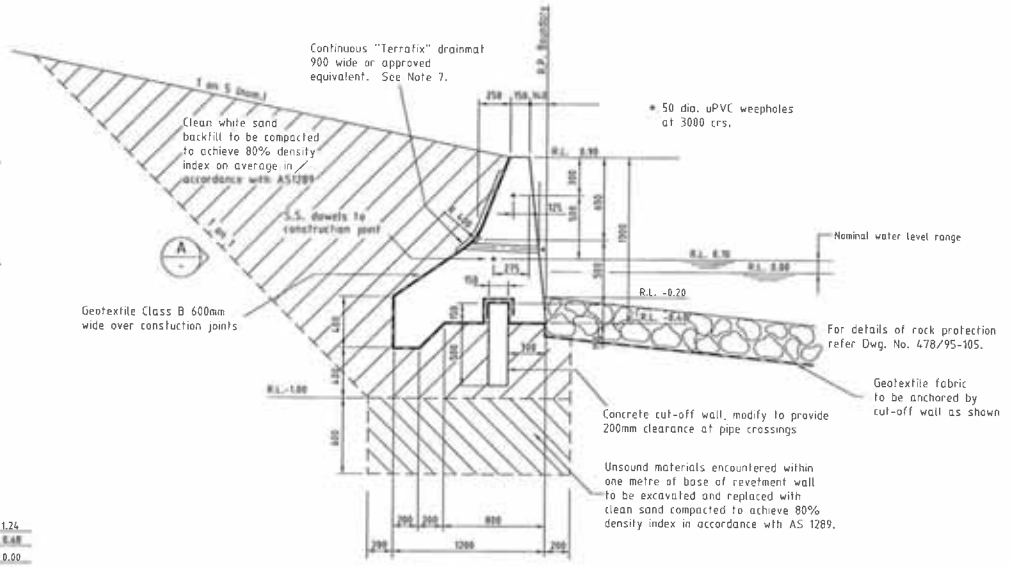
SUNSHINE COAST OFFICE:
68 Duporth Avenue, Maroochydore
Postal Address: PO Box 152



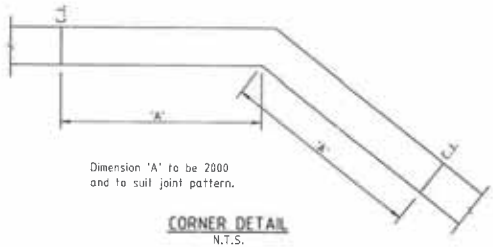
TYPICAL PARREARRA CHANNEL PROFILE
1:100



TYPICAL ENTRANCE CHANNEL PROFILE
1:100

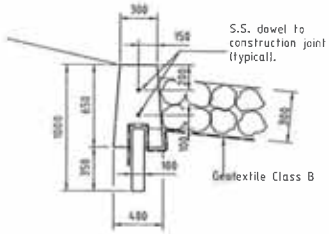


REVETMENT WALL TYPE 'A'
Scale 1 : 20



Dimension 'A' to be 2000 and to suit joint pattern.

CORNER DETAIL
N.T.S.



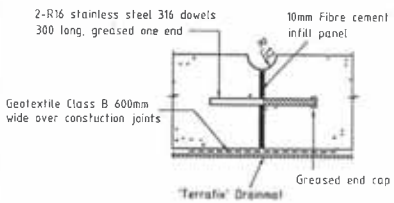
REVETMENT WALL TYPE 'B'
Scale 1:20

NOTES:

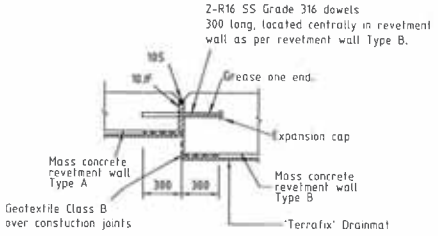
1. All concrete quality and construction procedures shall be in accordance with A.S.3600
2. Concrete shall be Class S40 as specified.
3. Concrete to be sprayed with approved curing membrane at the application rate specified by the manufacturer. Apply within 1 hour of concrete pour or as directed by the Superintendent.
4. All exposed edges shall be chamfered 25mm.
5. Construction joints to revetment walls to be at 6.00m centres.
6. A 3.00m return wall shall be constructed at the end of each stage of construction and backfilled to the specified standards.
7. 'Terrafix' drainmat to be continuously sealed with approved sealant. Lap in accordance with manufacturer's specifications.

LEGEND:

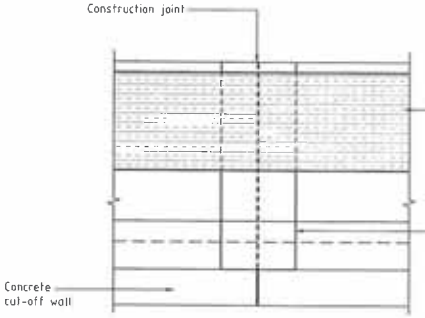
BC	2 Coat Bitumen Paint before pouring second concrete
10JF	10 Joint Filler (fixed to one face with 30 long copper nails at 200 centres)
10S	Sealant 10x10 with bond breaker and backing strip
CJ	Construction Joint



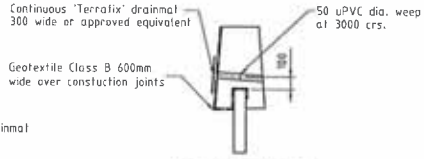
CONSTRUCTION JOINT (C.J.)
N.T.S.



CONSTUCTION JOINT
REVETMENT WALL TYPE A to TYPE B
1:10



VIEW (A)
1 : 20



WEEPHOLE DETAIL
Scale 1:20

CALOUNDRA CITY COUNCIL
APPROVED
ENGINEER
DATE 14/7/98

1000 500 0 1000 m
1 : 20
2 1 0 2 4 6 8 m
1 : 100

SCALES BEFORE REDUCTION

AUTOCAD R.12 FILENAME KRS-106.DWG
DATE 1-12-1997 TIME 4.26 PM

A	11-12-98	Minor revisions.					

DESIGNED C.J.H.
DRAWN C.J.H.
CHECKED C.J.H.
RECOMMENDED
APPROVED

A1
DATUM: A.H.D.

Cardno & Davies
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Sunshine Coast (07) 5443 5955 (07) 5443 5842
Townsville (077) 21 5209 (077) 31 2508
Torquay Bay (071) 24 5455 (071) 26 5155
Tweed Heads (07) 5536 7855 (07) 5536 7158
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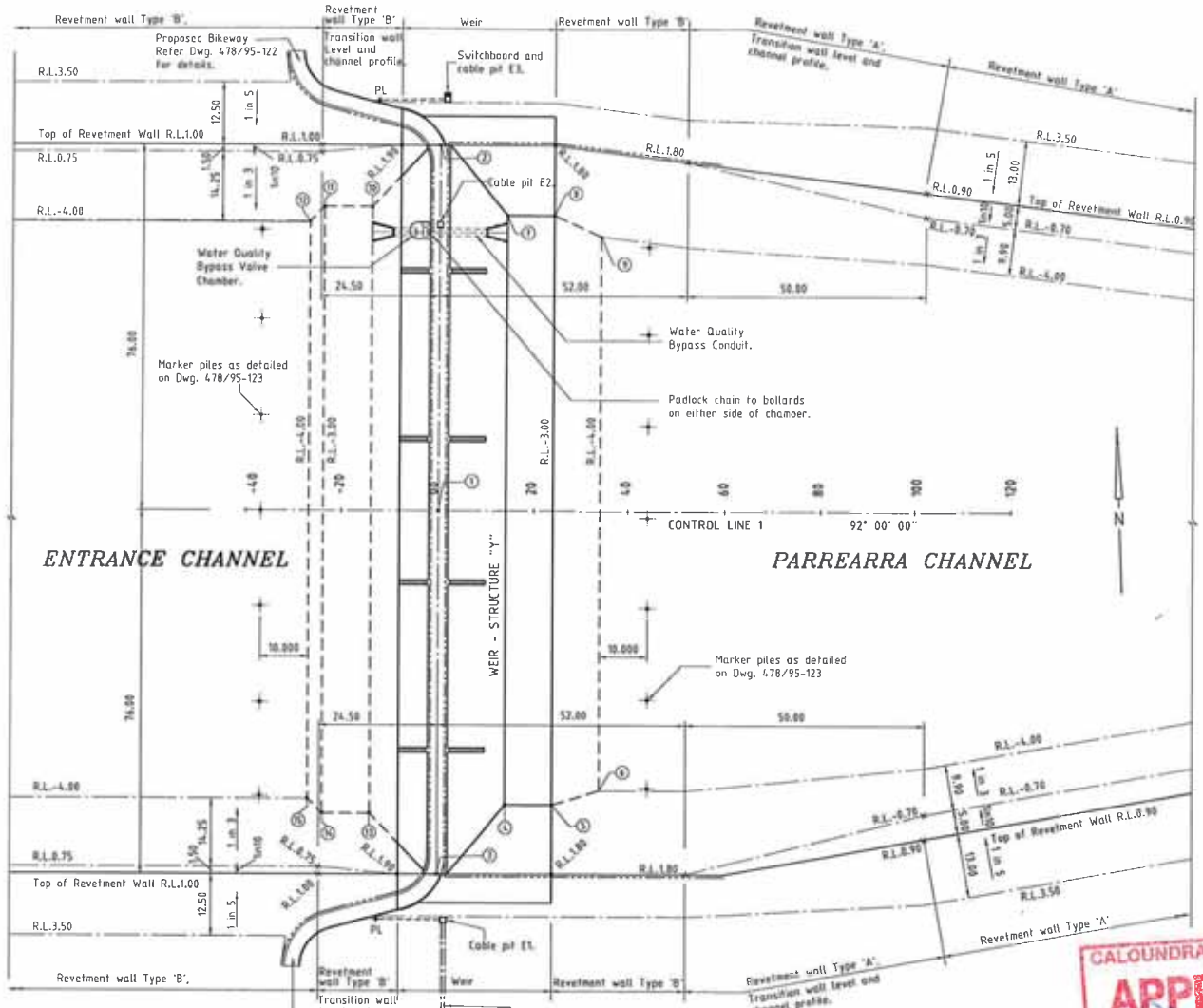
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 'Y'
TYPICAL REVETMENT AND BANK PROFILES

DATE: 17-11-1997
DRAWING No: 478/95-106



PLAN

Scale 1 : 500

Conduits through weir between Cable pits E1, E2 and E3 are detailed on Dwg. 478/95-108.

LEGEND:

PL Pole Light

Bollard and Chain Barrier

Tubular Handrail

100ø UPVC conduit.

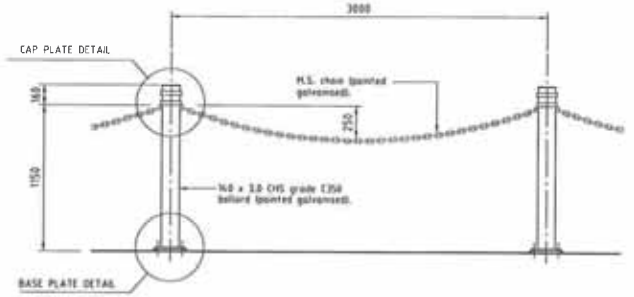
50ø UPVC conduit.

SCALES BEFORE REDUCTION

1 : 5

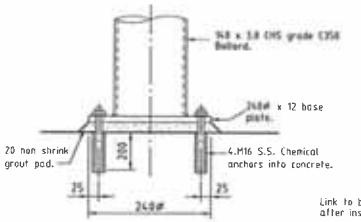
1 : 20

1 : 500



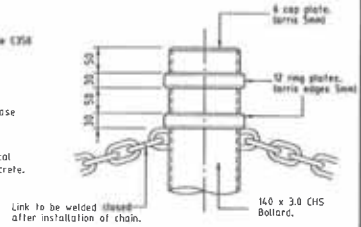
TYPICAL ELEVATION

1:20



Base Plate Detail

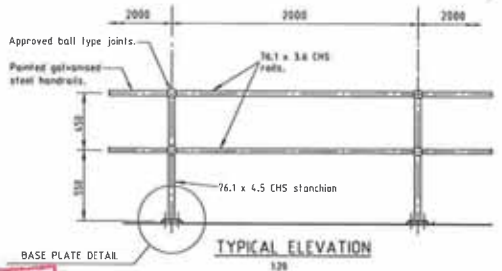
1:5



Cap Plate Detail

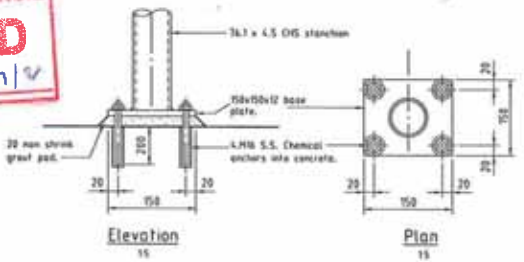
1:5

BOLLARD AND CHAIN BARRIER



TYPICAL ELEVATION

1:20



Elevation

1:5

Plan

1:5

BASE PLATE DETAIL

TUBULAR HANDRAIL

CALOUNDRA CITY COUNCIL APPROVED ENGINEER DATE 14/7/98

WEIR SET-OUT DATA

Point No	E	N	RL	Point No	E	N	RL
1	190.529	370.560	1.790	9	226.576	426.461	=4.000
2	193.181	446.514	1.910	10	178.919	434.254	=3.000
3	187.876	294.606	1.910	11	168.925	434.603	=3.000
4	202.448	308.596	=3.000	12	165.823	431.710	=4.000
5	212.442	308.247	=3.000	13	174.505	307.831	=3.000
6	222.541	310.897	=4.000	14	164.511	308.180	=3.000
7	206.742	431.541	=3.000	15	161.617	311.283	=4.000
8	216.736	431.192	=3.000				

AUTOCAD R14 FILENAME : K95-107B.DWG
DATE : 30-6-1998 TIME : 9:47 AM

REVISIONS					
B	17-06-98	Ballard barrier added.			
A	15-01-98	Minor revisions.			

DESIGNED: C.J. Hoyt
DRAWN: C.J. Hoyt
CHECKED: C.J.H.
RECOMMENDED: PROJ. MAN. R.J. Newman
APPROVED: B.G. Taylor

A1

DATUM: A.H.D.

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ACN 051 074 992
Consulting Engineers

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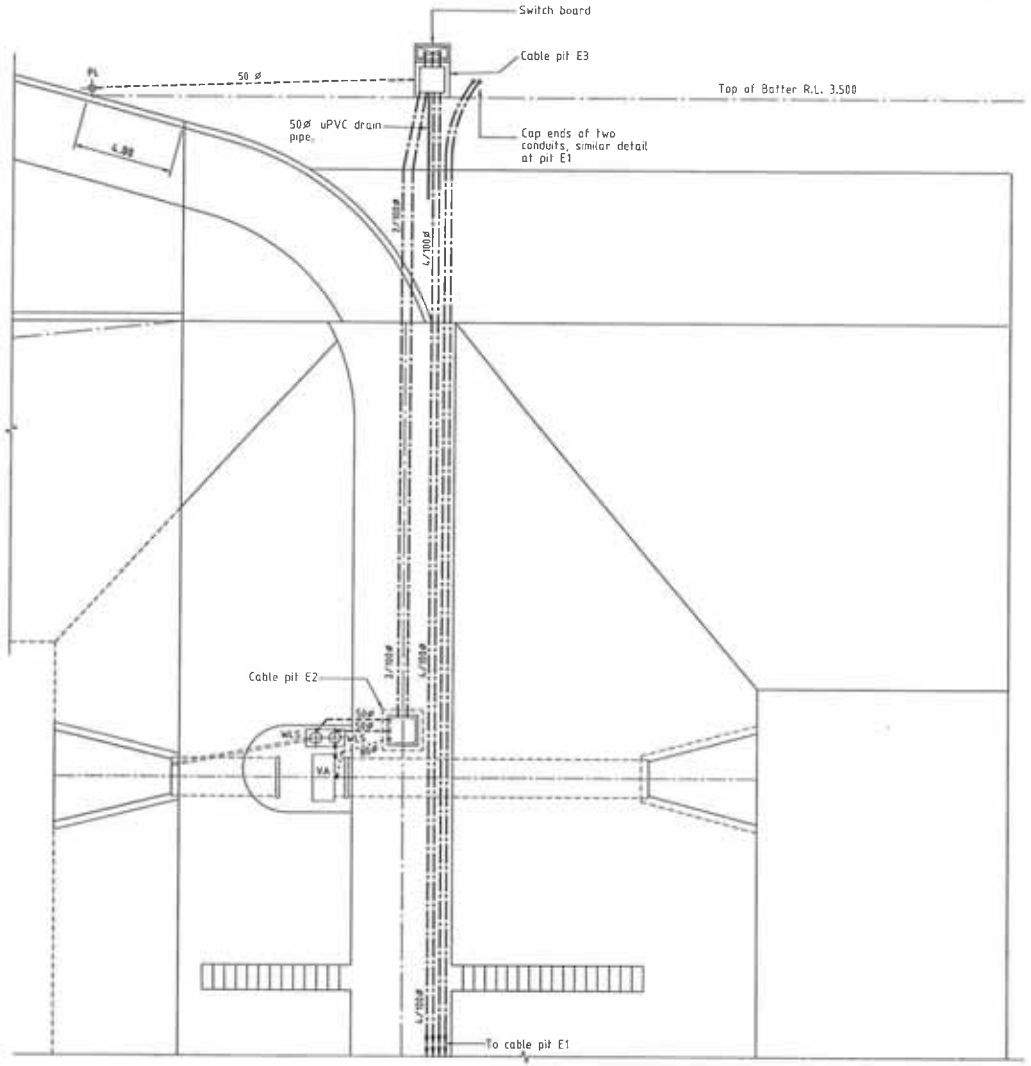
HERVEY BAY (07) 4124 5755
PORT MORESBY (00) 675 325 2322
SUNSHINE COAST OFFICE: 56 Dupath Avenue, Maroochydore
Postal Address: PO Box 152

KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 'Y'
WEIR STRUCTURE
GENERAL ARRANGEMENT PLAN

DATE: 17-11-1997
DRAWING No: 478/95-107



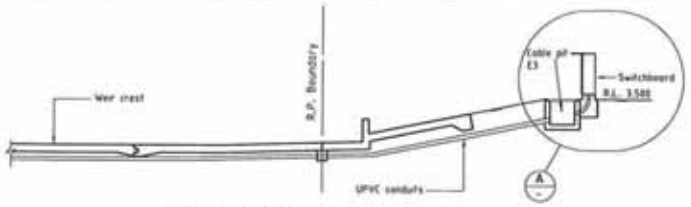
PLAN
1:100

LEGEND

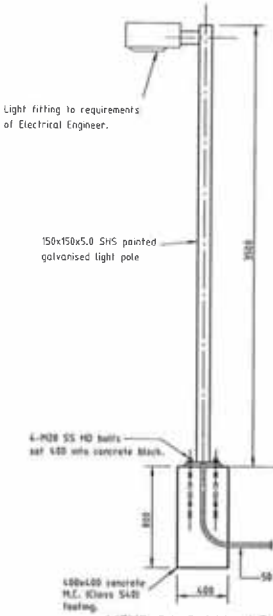
100 ø	100 dia. UPVC Conduit
80 ø	80 dia. UPVC Conduit
50 ø	50 dia. UPVC Conduit
PL	Pole Light
VA	Valve Actuator
WLS	Water Level Sensor

NOTE :
1. Concrete to in-ground pits (except for weir cable pit E2) foundations and slabs shall be Class N25.
2. All conduits entering cable pit E2 and valve chamber to be sealed with 2 strips of SS0220 Hydrotite pipe seal or approved equivalent.

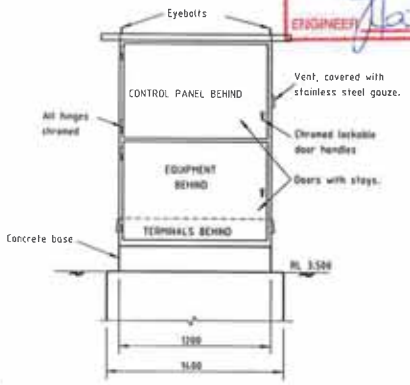
1000 500 0 1000 mm 1 : 20
2 1 0 2 4 6 8 m 1 : 100
SCALES BEFORE REDUCTION



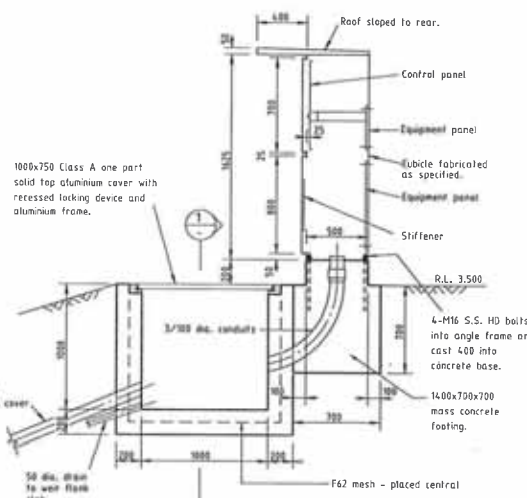
TYPICAL ELEVATION
1 : 100



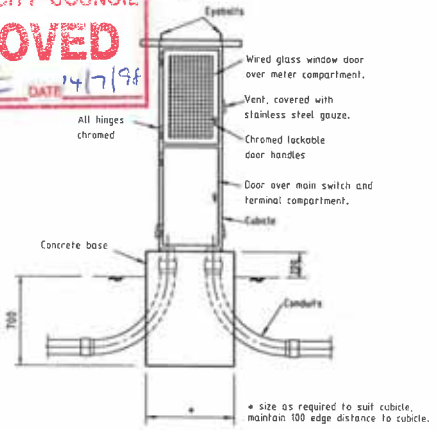
LIGHT POLE DETAILS (PL)
1:20



SWITCHBOARD ELEVATION
1:20



DETAIL A
1:20



ELECTRICITY METER AND MAIN SWITCH CUBICLE
1:20
All other details similar to switchboard

CALOUNDRA CITY COUNCIL
APPROVED
ENGINEER Nat DATE 14/7/98

AUTOCAD R.12 FILENAME : R95-108.DWG
DATE : 1-12-1997 TIME 5:03 PM

A	10-03-98	Minor revisions.	DESIGNED:		A1	DATUM: A.H.D.	
			DRAWN:				
			CHECKED:				
			RECOMMENDED:			APPROVED:	

Cardno & Davies Queensland Pty. Ltd.
ACN 051 074 992
Consulting Engineers

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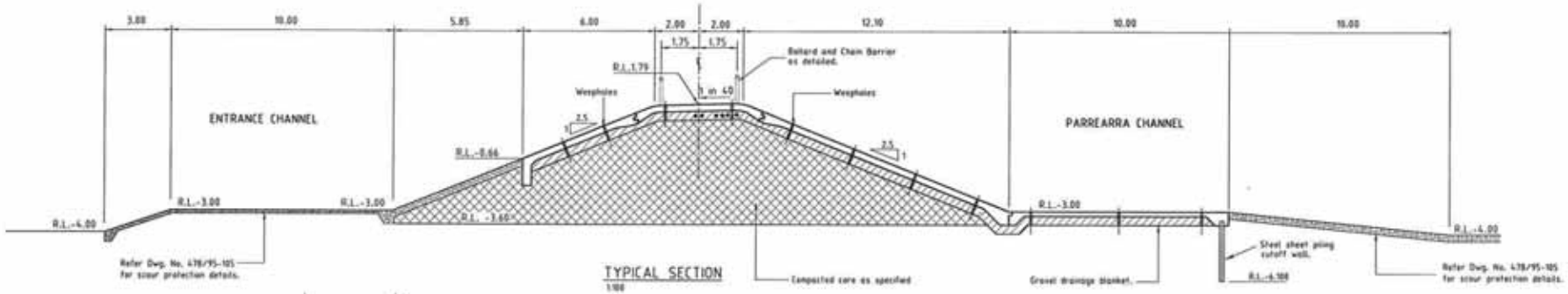
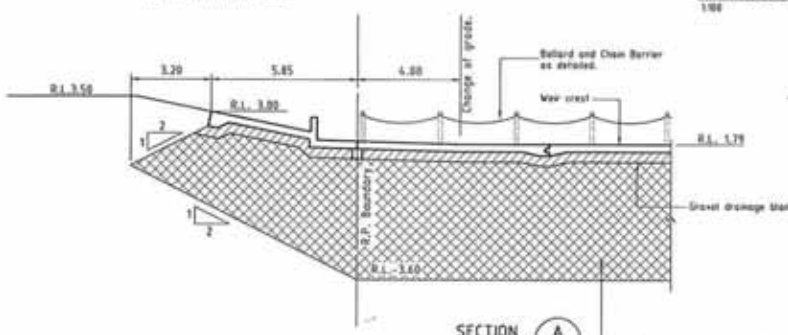
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 'Y'
WEIR STRUCTURE
CONDUIT PLAN AND DETAILS

DATE: 10-11-1997
DRAWING No: 478/95-108
A

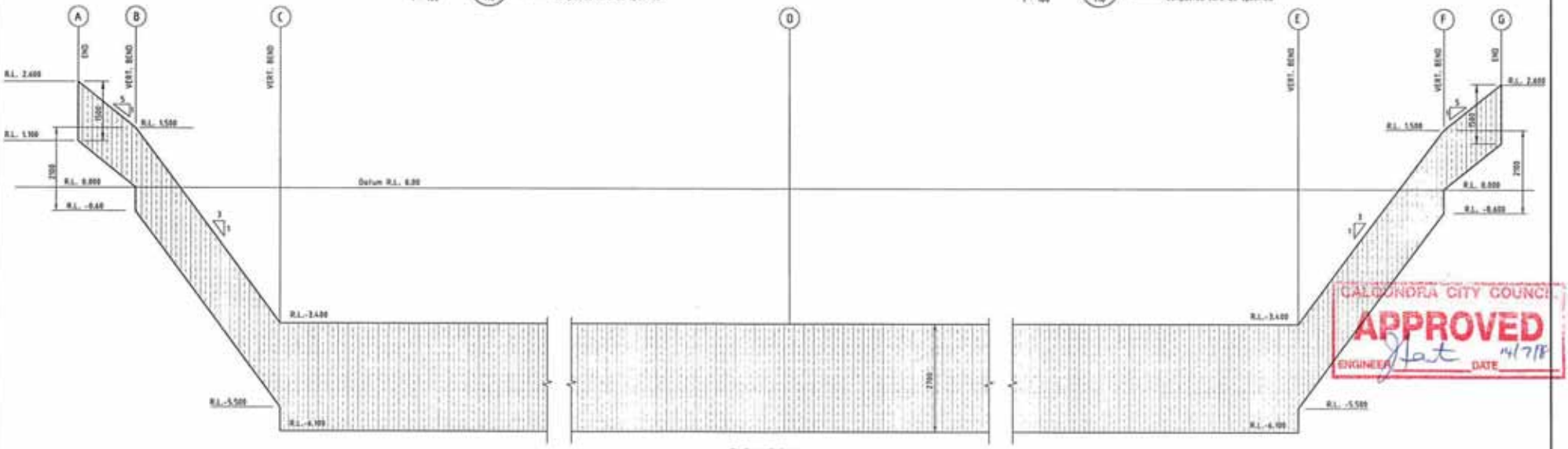


TYPICAL SECTION
1:100



SECTION A
1 : 100 110

SECTION B
1 : 100 110



ELEVATION
STEEL SHEET PILING
HOR. 1:200
VERT. 1:50

HOR. 2000 0 2000 10000 20000 mm 1:200
VERT. 500 0 500 2500 5000 mm 1:50

1000 0 1000 5000 10000 mm
SCALES BEFORE REDUCTION 1:100

CALOUNDRA CITY COUNCIL
APPROVED
ENGINEER DATE 14/7/98

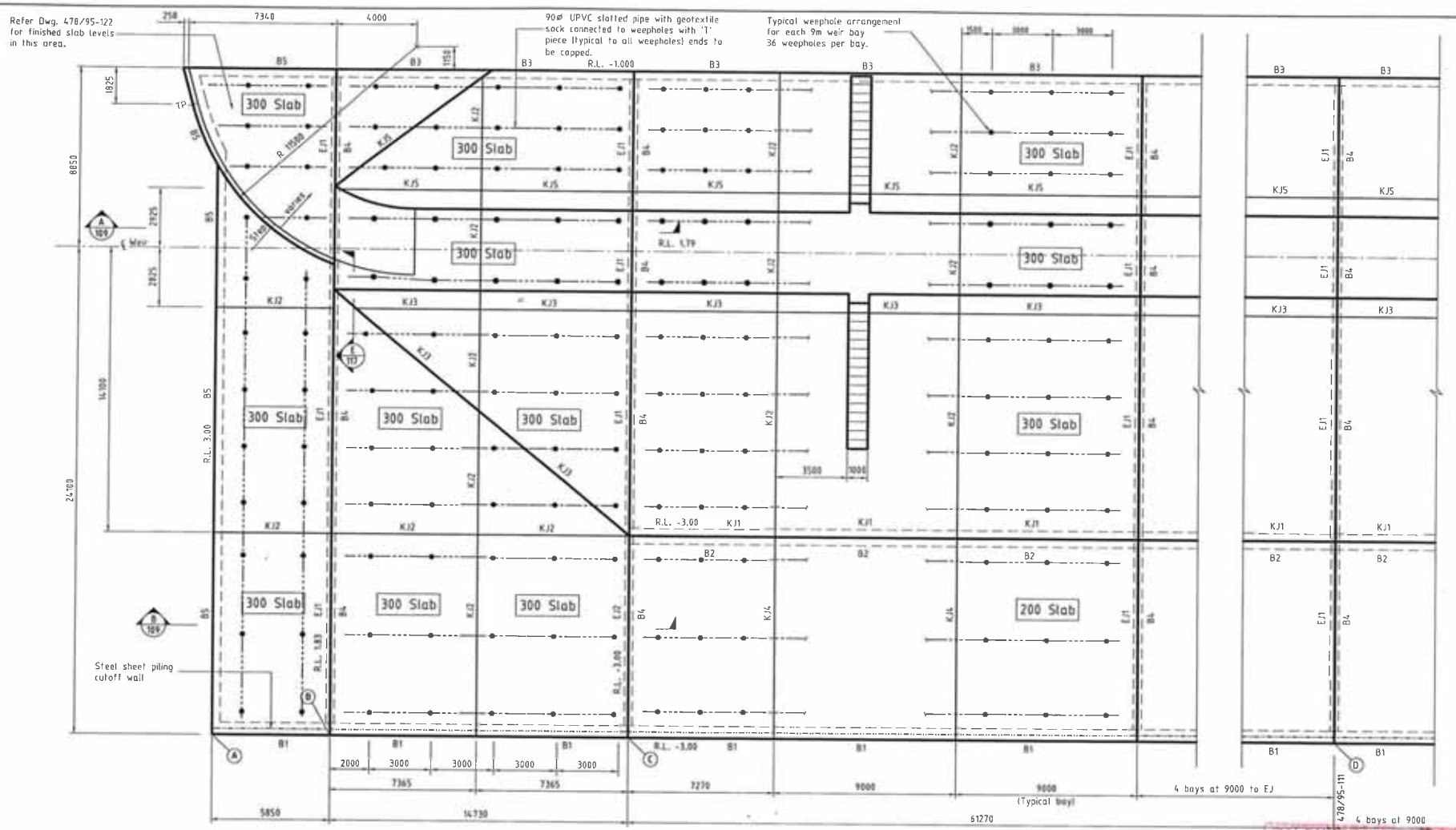
REVISIONS	REC. APPR.	No.	DATE
B 17-06-98 Bollard barrier added.			
A 10-03-98 Minor revisions.			

DESIGNED: C.J. King
DRAWN: C.J. King
CHECKED: C.J.K.
RECOMMENDED: C.J. Kingwell
APPROVED: G.C. Tamblyn
SIZE: A1
DATUM: A.H.D.

Cardno & Davies
Queensland Pty. Ltd.
ACN 051 074 801
Consulting Engineers

KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 'Y'
WEIR STRUCTURE
SHEET PILING AND WEIR FILL PROFILES

DATE: 19-11-1997
DRAWING No.: 478/95-109



LEGEND

KJ	Contraction Joint
EJ	Expansion Joint
BC	2 Coat Bitumen Paint before pouring second concrete
B	Beam
----	Steel sheet piling cut off wall.
————	90ø UPVC Slotted pipe with geotextile sock.
•	Weephole as detailed
10 JF	10 Joint Filler (fixed to one face with 30 long copper nails at 200 centres)
15S	Sealant 15x15 with bond breaker and backing strip.

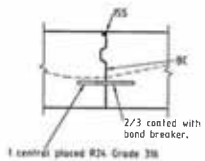
BEAM JOINT SCHEDULE

BEAM No.	Location						
	KJ1	KJ2	KJ3	KJ4	KJ5	EJ1	EJ2
B1							
B2		BJ1		BJ1		BJ2	BJ2
B3		BJ3				BJ4	
B4	BJ5	BJ5	BJ5		BJ5		
B5		BJ1					

1000 500 0 1000 mm 1 : 20

2 1 0 2 4 6 8 m 1 : 100

SCALES BEFORE REDUCTION

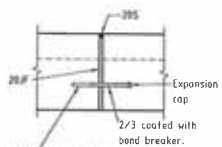


1 central placed R24 Grade 316 S.S. dowel, 450 long (note provide S.S. dowel to each side of KJ1, as per Detail D on Dwg. 478/95-112)

BJ1
1:20

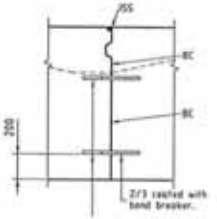
PART PLAN
1:100

Note: Refer Dwgs. 478/95-113, 114, 115, 116 & 117 for reinforcement details.



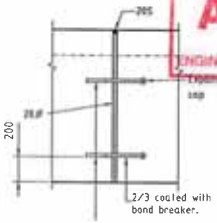
1 central placed R24 Grade 316 S.S. dowel, 450 long (note provide S.S. dowel to each side of KJ1, as per Detail D on Dwg. 478/95-112)

BJ2
1:20



2 central placed R24 Grade 316 S.S. dowel, 450 long.

BJ3
1:20



2 central placed R24 Grade 316 S.S. dowel, 450 long.

BJ4
1:20

BJ5
1:20

BEAM CONTRACTION JOINTS

CALOUNDRA CITY COUNCIL
APPROVED
ENGINEER
DATE 14/7/92

AUTOCAD R12 FILENAME K95-110.DWG
DATE : 2-12-1991 TIME 10:48 AM

A	10-03-92	Minor revisions.			

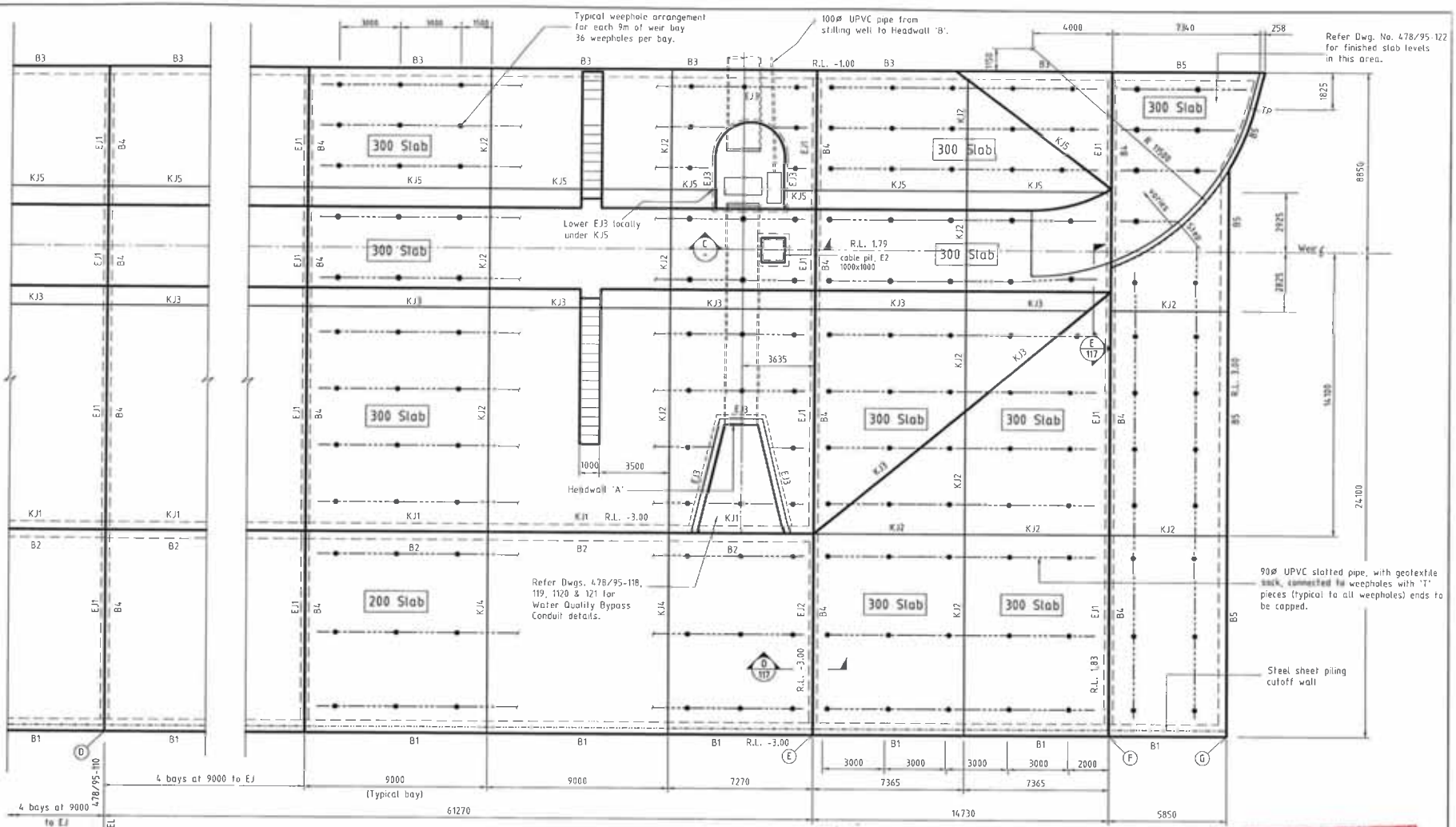
A1 DATUM: A.H.D.

Cardno & Davies Queensland Pty. Ltd. ACN 051 074 992
Consulting Engineers

KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 'Y'
WEIR STRUCTURE
JOINTING PLAN AND DETAILS - SHEET 1

DATE: 12-11-1991

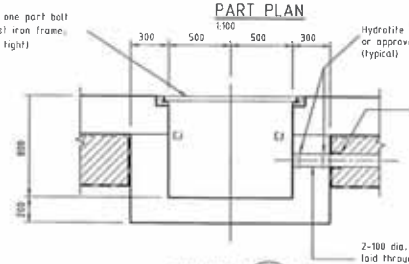
478/95 –110



LEGEND:

- KJ Contraction Joint
- EJ Expansion Joint
- BC 2 Coat Bitumen Paint before pouring second concrete
- B Beam
- CJ Construction Joint
- Geotextile Type A
- Polyethylene Sheet
- Steel sheet piling cut off wall.
- 90ø UPVC slotted pipe with geotextile sock.
- Gravel Drainage Blanket
- Weephole as detailed
- 10 JF 10 Joint Filler (fixed to one face with 30 long copper nails at 200 centres)
- 15S Sealant 15x15 with bond breaker and backing strip.

PART PLAN 1:100



1000x1000 Class 'C' one part bolt down cover and cast iron frame. (cover to be water tight)

SECTION C 1:20

CALOUNDRA CITY COUNCIL APPROVED ENGINEER DATE 14/7/98

Note: Refer Dwgs. 478/95-113, 114, 115, 116 & 117 for reinforcement details.

SCALES BEFORE REDUCTION 1:20 1:100

AUTOCAD R13 FILENAME 478-111.DWG DATE 2-12-1997 TIME 11:21 AM

A	12-03-98	Minor revisions.			

DESIGNED CJ Hay A1 DATUM: A.H.D.
DRAWN
CHECKED
RECOMMENDED
APPROVED

Cardno & Davies Queensland Pty. Ltd. ACN 051 074 992
Consulting Engineers

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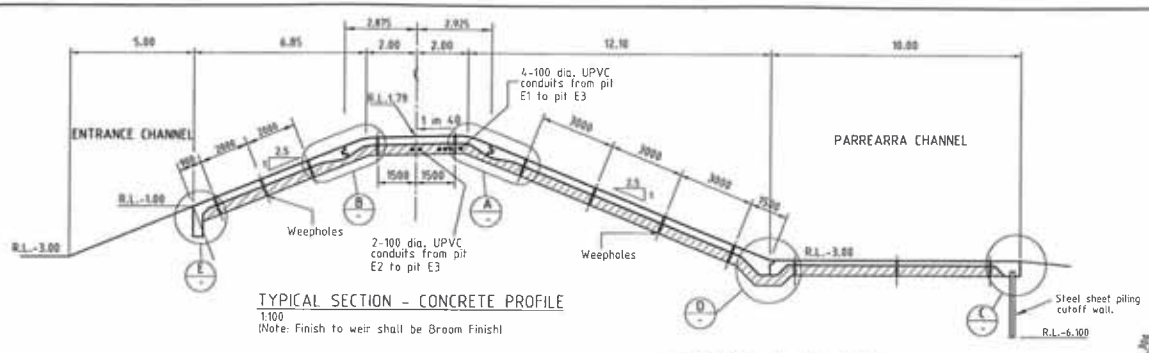
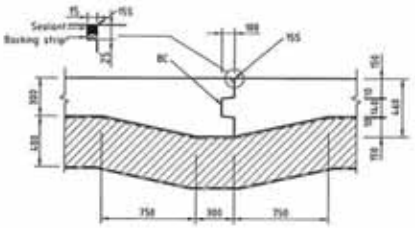
SUNSHINE COAST (07) 5443 2555 (07) 5443 2662
TOWNSVILLE (077) 71 3592 (077) 21 2508
MACKAY (07) 4124 5455 (07) 4124 5755
TWEED HEADS (07) 5523 7855 (07) 5536 1573
PORT MORESBY (675) 325 2322 (675) 325 3095
SUNSHINE COAST OFFICE: 86 Duporth Avenue, Maroochydore
Postal Address: PO Box 152, Maroochydore, Queensland 4558

KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 'Y'
WEIR STRUCTURE
JOINTING PLAN AND DETAILS - SHEET 2

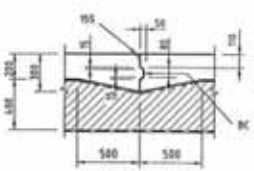
DATE: 18-11-1997
DRAWING No. 478/95 - 111



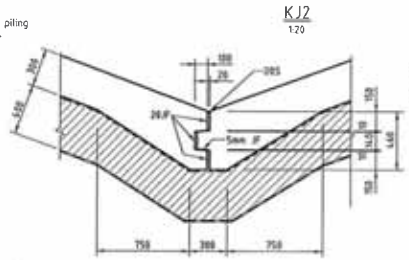
TYPICAL SECTION - CONCRETE PROFILE
1:100
(Note: Finish to weir shall be Broom Finish)



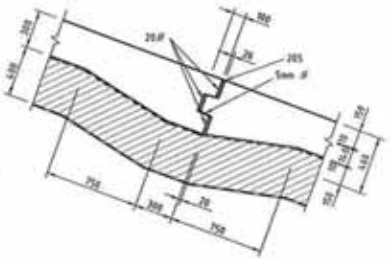
KJ2
1:20



KJ4
1:20



KJ3 VALLEY JOINT (KJ5 SIMILAR - MIRRORED)
1:20



KJ3, (KJ5 SIMILAR - MIRRORED)
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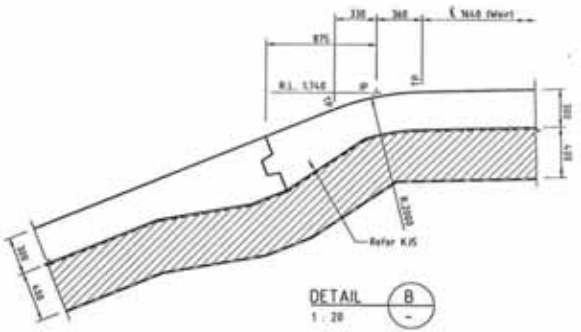
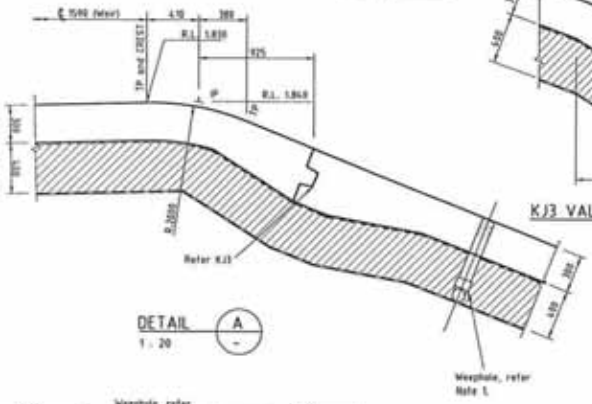
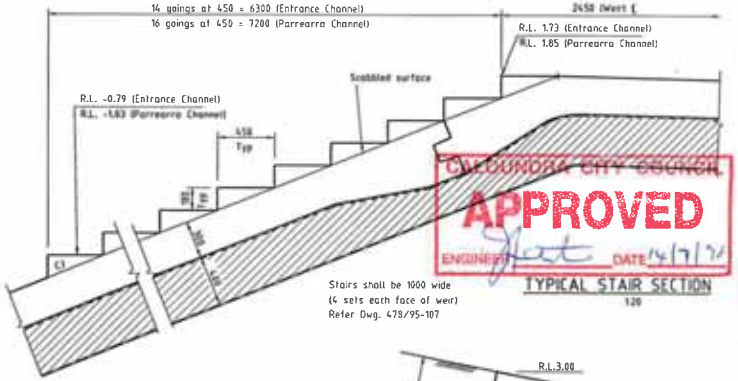


DETAIL B
1 : 20

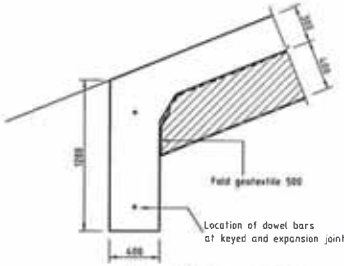


DETAIL A
1 : 20

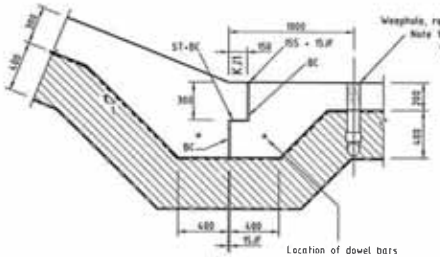
CONTRACTION JOINTS (KJ)



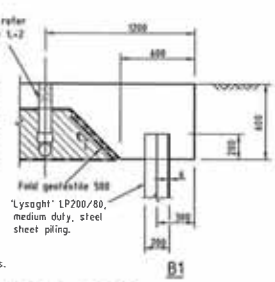
TYPICAL STAIR SECTION
1:20



B3 DETAIL E
1 : 20



B2 DETAIL D
1 : 20



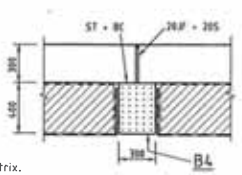
B1 DETAIL C
1 : 20

LEGEND:

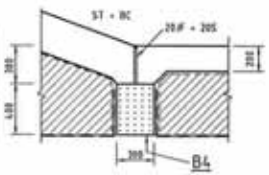
ST	Steel Trowelled Surface
BC	2 Coat Bitumen Paint before pouring second concrete
	Geotextile Type A
	Polyethylene Sheet
	Gravel Drainage Blanket
10JF	10 Joint Filler (fixed to one face with 30 long copper nails at 200 centres)
15S	Sealant 15x15 with bond breaker and backing strip.
	Mass concrete
	Reinforced concrete

NOTES

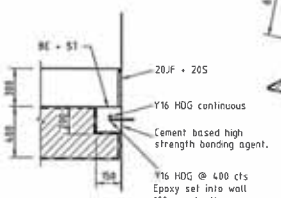
1. Weepholes shall be 90 dia. slotted uPVC pipe with geotextile sock, 600 long in 200 thick slabs and 700 long in 300 thick slab, with 'T' pieces connected to horizontal slotted pipe.
2. Weepholes to be fitted with 150 long "no fines" concrete plug consisting of dainage blanket gravel in cementitious grout matrix. Weepholes above a level of R.L. -1.00 AHD to be topped with additional 50mm of 10mm 'no fines' mix.
3. All chamfers shall be 20x20 unless shown otherwise.
4. All hot dip galvanised reinforcement shall be passivated



EJ1
1:20

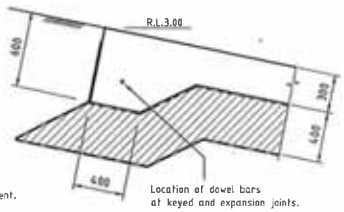


EJ2
1:20



EJ3
1:20

EXPANSION JOINTS (EJ)



BEAM B5
1:20

200 0 200 1000 2000 mm
1:20
1000 0 1000 5000 10000 mm
SCALES BEFORE REDUCTION 1:100

CALOUNDRA CITY COUNCIL
APPROVED
ENGINEER
DATE 14/7/98

AUTOCAD R12 FILENAME : K95-112.DWG
DATE : 2-12-1997 TIME : 1.50 PM

No.	DATE	REVISIONS	REC'D	APPD
A	16-03-98	Minor revisions.		

DESIGNED:
DRAWN: C.J. Hay
CHECKED:
RECOMMENDED: PROJ. MAN. A.J. Hawson
A1
DATUM: A.H.D.
APPROVED: PROJECT MGR.

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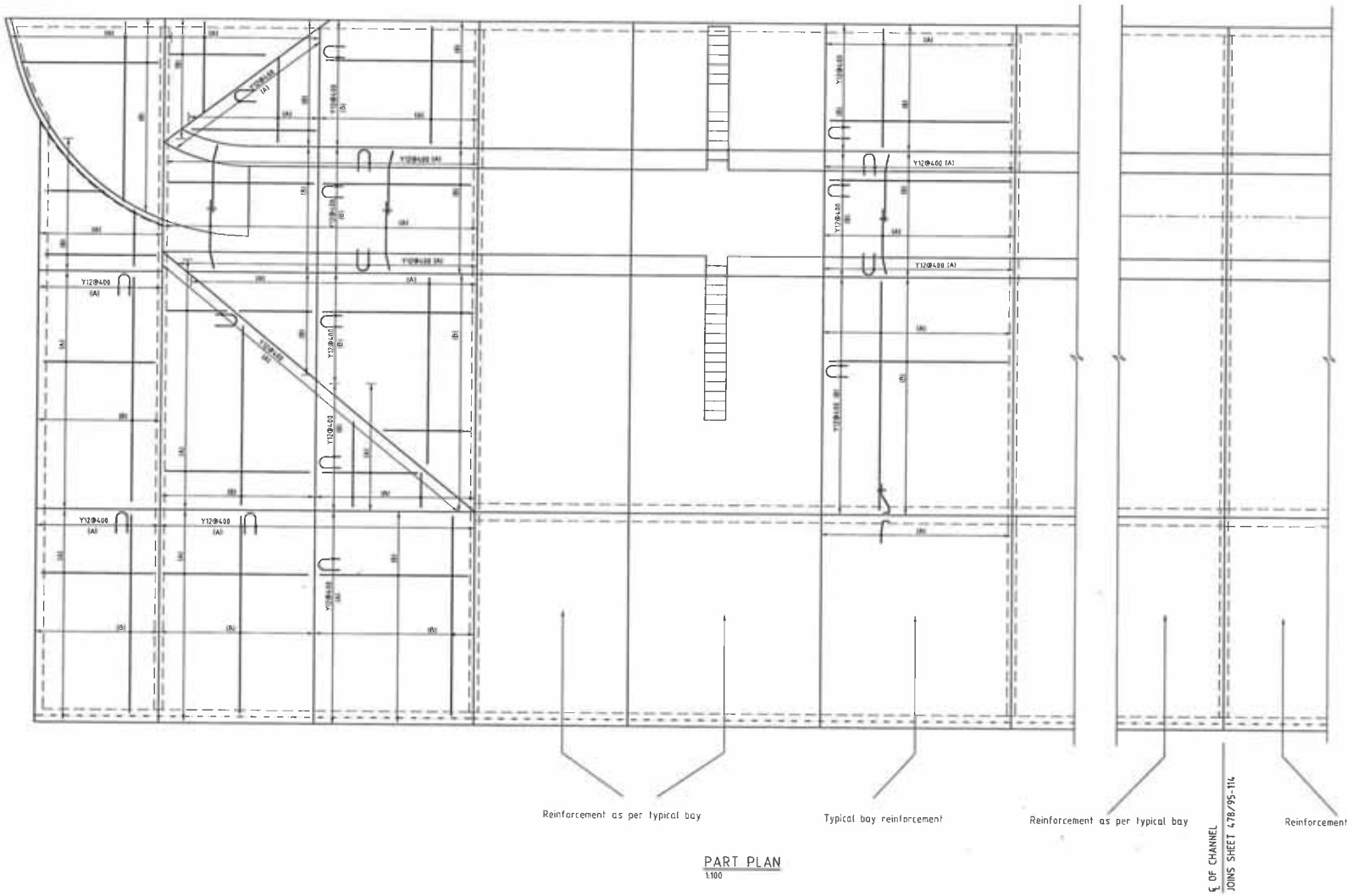
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 'Y'
WEIR STRUCTURE
JOINTING SECTIONS AND DETAILS

DATE: 18-11-1997
DRAWING No: 478/95 - 112
A



PART PLAN
1:100

Reinforcement into keys not shown for clarity.

All reinforcement to be Y16@200 E.W. U.N.O.
Maintain 70 min. cover to reinforcement.

CALOUNDRA CITY COUNCIL
APPROVED
ENGINEER DATE 14/7/98

1000 0 1000 5000 10000 mm
SCALE BEFORE REDUCTION 1:100

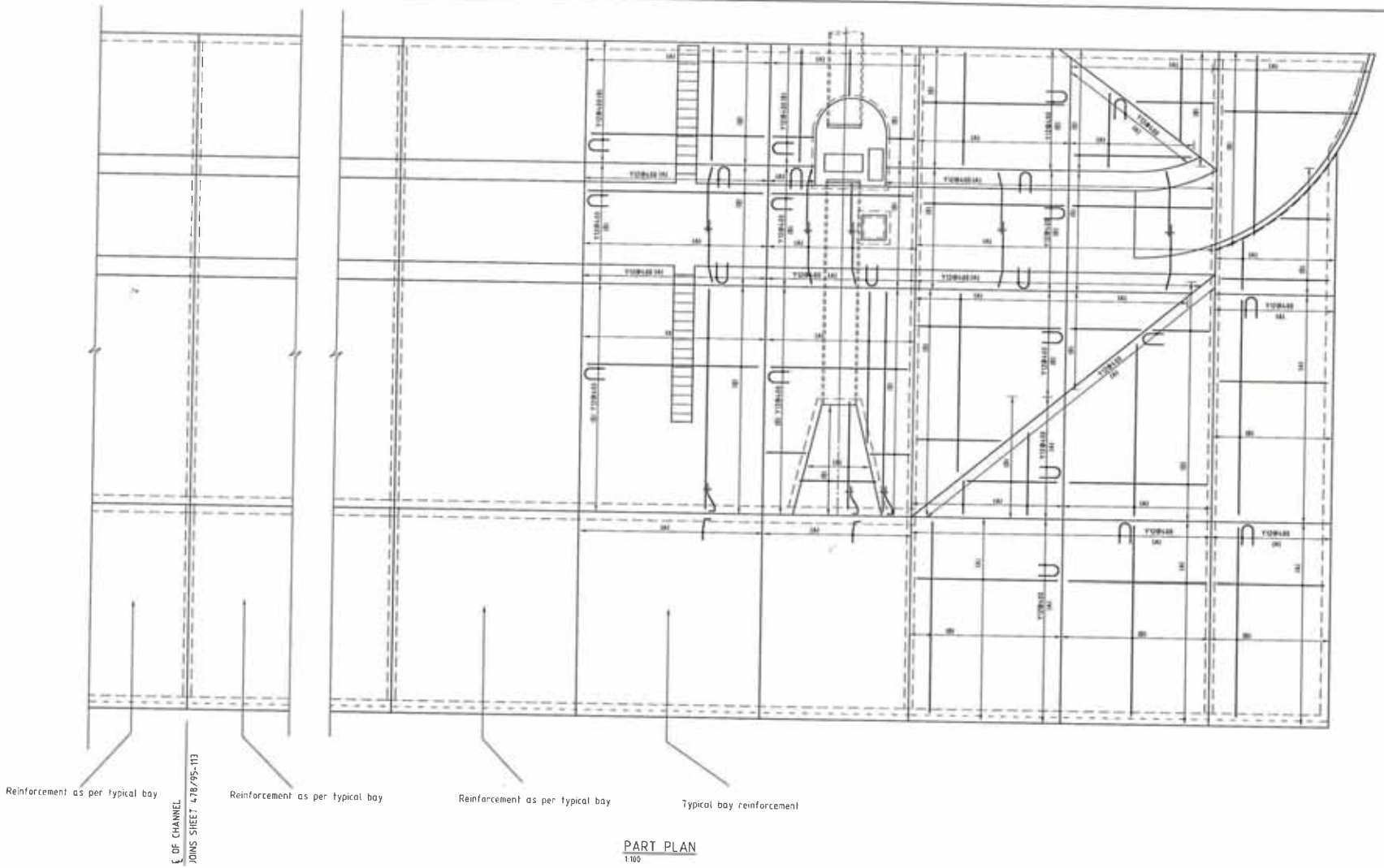
AUTOCAD R.12 FILENAME : KPS-113.DWG
DATE : 2-12-1997 TIME : 2:37 PM

		A 10-03-98	Minor revisions.		
DESIGNED		A1	DATUM: A.H.D.		
DRAWN					
CHECKED					
RECOMMENDED					
APPROVED					

Cardno & Davies Queensland Pty. Ltd.
ACN 051 074 992
Consulting Engineers

KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 'Y'
WEIR STRUCTURE
BOTTOM REINFORCEMENT - SHEET 1

DRAWING No: 478/95 - 113



PART PLAN
1:100

All reinforcement to be Y16@200 E.W. U.N.O.
Maintain 70 min. cover to reinforcement.

Reinforcement into keys not shown for clarity.

CALOUNDRA CITY COUNCIL
APPROVED
ENGINEER DATE 14/7/98

SCALE BEFORE REDUCTION 1:100

AUTOCAD R 12 FILENAME K95-114.DWG
DATE 2-12-1997 TIME 2:42 PM

No.	DATE	REVISIONS	REC'D	APPR'D	DATE
A	10-07-98	Minor revisions.			

DESIGNED: M.H.
DRAWN: C.J.H.
CHECKED:
RECOMMENDED:
PROJ. MGR: C.J. Howard
A1
DATUM: A.H.D.
APPROVED: A.H.D.

Cardno & Davies
Queensland Pty. Ltd.
ACN 051 074 992
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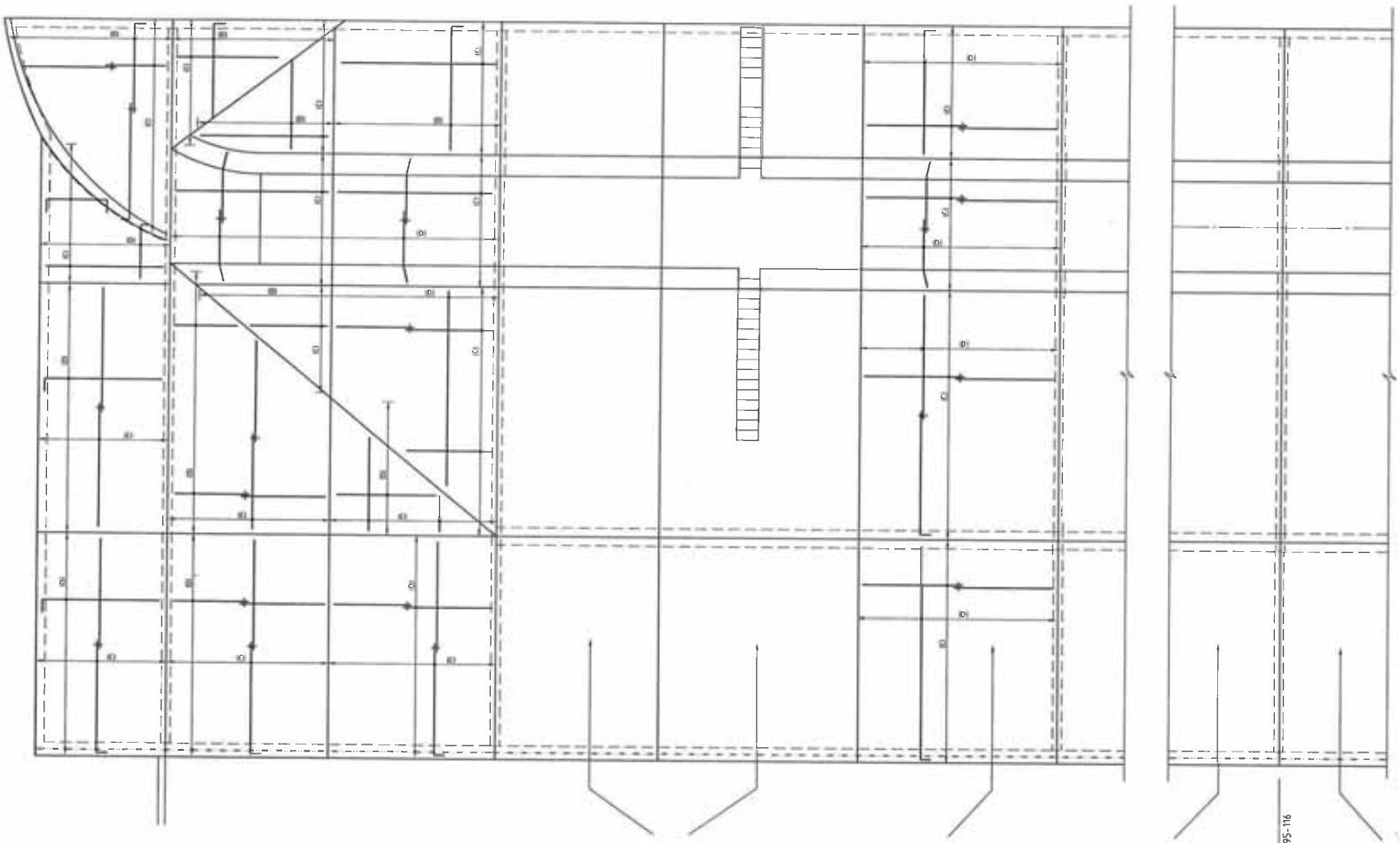
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 'Y'
WEIR STRUCTURE
BOTTOM REINFORCEMENT - SHEET 2

DATE: 10-11-1997
DRAWING No: 478/95 - 114
A



PART PLAN
1:100

(C) Bars laid third

(D) Bars laid last

Reinforcement into keys not shown for clarity.

All reinforcement to be Y16@200 E.W. U.N.O.
Maintain 70 min. cover to reinforcement.

CALOUNDRA CITY COUNCIL
APPROVED
ENGINEER DATE 14/7/98

1000 0 1000 5000 10000 mm
SCALE BEFORE REDUCTION 1:100

AUTOCAD R.12 FILENAME : K95-115.DWG
DATE : 2-12-1997 TIME : 2.49 PM

No.	Date	Revisions	Rec'd	Appd
A	10-03-98	Minor revisions.		

DESIGNED
DRAWN
CHECKED
RECOMMENDED
APPROVED

A1
DATUM: A.H.D.

Cardno & Davies
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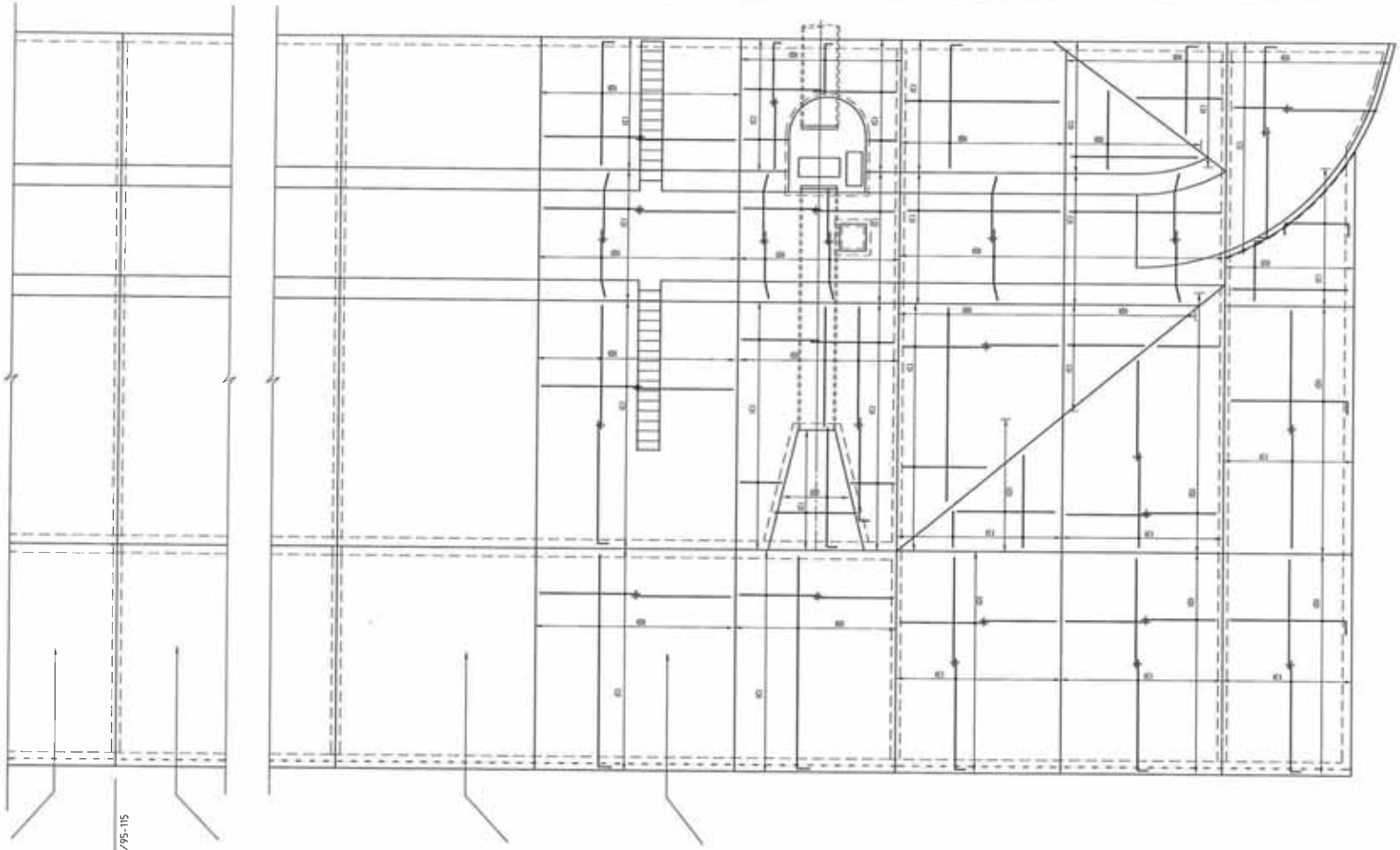
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 'Y'
WEIR STRUCTURE
TOP REINFORCEMENT - SHEET 1

DATE: 19-11-1997
DRAWING No:
478/95 - 115
A



PART PLAN
1:100

(C) Bars laid third

(D) Bars laid last

Reinforcement into keys not shown for clarity.

CALOUNDRA CITY COUNCIL
APPROVED
ENGINEER ____ DATE 14/7/98

All reinforcement to be Y16@200 E.W. U.N.O.
Maintain 70 min. cover to reinforcement.

10 00 1000 5000 10000 mm
SCALE BEFORE REDUCTION 1:100

AUTOCAD R.12 FILENAME : R95-116.DWG
DATE : 2-12-1997 TIME 2:51 PM

NO.	DATE	REVISIONS	REC.	APPR.
A	11-03-98	Minor revisions.	CDN	

DESIGNED C.J. Thorp
DRAWN
CHECKED
RECOMMENDED
APPROVED C.J. Thorp

A1

DATUM: A.H.D.

Cardno & Davies
Queensland Pty. Ltd.
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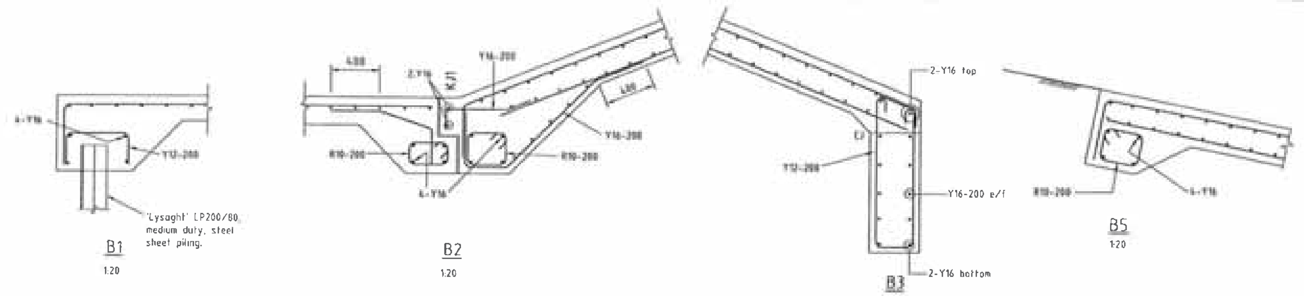
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 'Y'
WEIR STRUCTURE
TOP REINFORCEMENT - SHEET 2

DATE: 18.11.1997
DRAWING No:
478/95 - 116
A



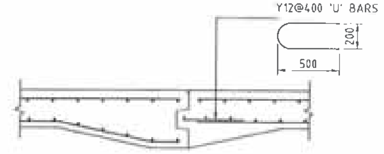
B1
1:20

B2
1:20

B3
1:20

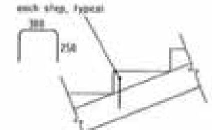
B5
1:20

BEAM REINFORCEMENT

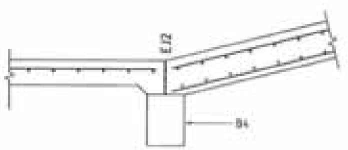


KJ2
1:20

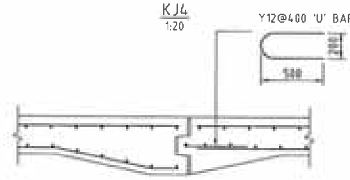
KJ4
1:20



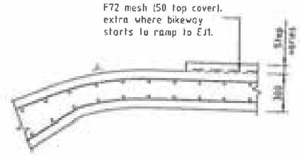
TYPICAL STAIR SECTION
1:20



SECTION D / 111
1 : 20

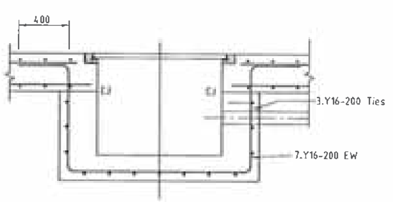


KJ3, (KJ5 SIMILAR - MIRRORED)
1:20
Valley joint reinforcement similar



SECTION E / 110
1 : 20

CONTRACTION JOINTS (KJ)



SECTION THROUGH CABLE PIT E2
1:20

ALL REINFORCEMENT:
Y16-200 E.W. U.N.O
70 COVER U.N.O.

NOTES :

1. All dimensions to be checked by the Contractor before fabrication and construction. DIMENSIONS SHALL NOT BE SCALED.
2. All dimensions are in millimetres and reduced levels in metres unless stated otherwise.
3. Workmanship and materials shall comply with the S.A.A. Standards, or to such statutory requirements as are deemed to apply to the works.
4. During construction the structure shall be maintained in a stable condition and no part shall be overstressed.
5. No penetrations, chases or temporary fixtures are permitted without prior approval of the Superintendent.
6. All props and formwork for beams and slabs shall be removed before construction of any permanent loading on the slab.
7. Concrete shall comply with the requirements of AS3600. Concrete grade refers to the minimum 28 day compressive strength f'c in MPa and the prefix N or S refers to Normal Class or Special Class concrete as specified, refer specification.
8. No construction joints, other than those shown on the drawings, shall be used without the approval of the Superintendent.
9. Refer specification for finishes to be applied to concrete surfaces. Where not specified, formed finishes shall be Class 3 to AS3610 and unformed surfaces shall be a steel trowelled finish.
10. Exposed edges shall be chamfered 20mm.
11. Reinforcing bars shall comply with AS1302 and reinforcing fabric shall comply with AS1304. Hard drawn wire shall comply with AS1303.
12. Reinforcement Symbols
    Y - Hot Rolled Grade 410Y Deformed Bar
    R - Structural Grade Round Bar
    F - Welded Wire Fabric
    W - Steel Wire
13. Bars shall be bent in accordance with AS3600.
14. Reinforcement is shown diagrammatically and is not necessarily shown in true projection.
15. Splices in reinforcement are to be made only in the positions shown on the drawings or as otherwise approved by the Superintendent.
16. Welding of reinforcement is not permitted without the approval of the Superintendent.
17. Reinforcement is to be supported in its correct position to within the tolerances specified in AS3600 by approved bar chairs, spacers or support bars.
18. Minimum lap lengths for Grade 410Y bars unless shown otherwise shall be
    Y12 - 400   Y20 - 800   Y28 - 1100   Y16 - 600   Y24 - 1000   Y32 - 1100

CALOUNDRA CITY COUNCIL
APPROVED
ENGINEER ... DATE

200 0 200 1000 2000 mm
SCALE BEFORE REDUCTION 1:20

AUTOCAD R.12 FILENAME K95-117.DWG
DATE : 2-12-1997 TIME 3:33 PM

No.	DATE	REVISIONS	No.	DATE	
			A	15-03-98	Minor revisions.

A1
DATUM: A.H.D.

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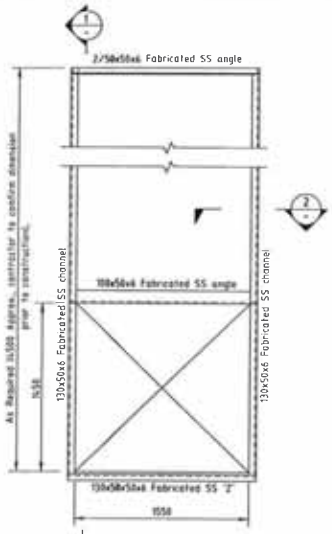
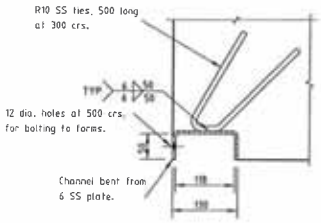
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 'Y'
WEIR STRUCTURE
REINFORCEMENT DETAILS

DRAWING No: 478/95 - 117

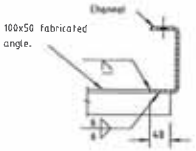


ELEVATION
1:20

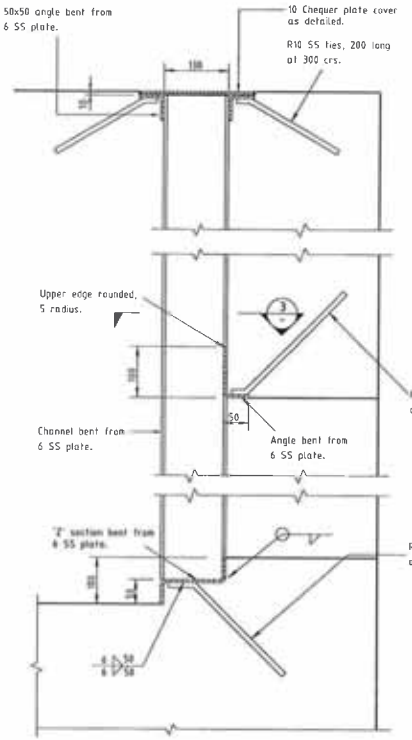
BULKHEAD GATE FRAME
2 OFF



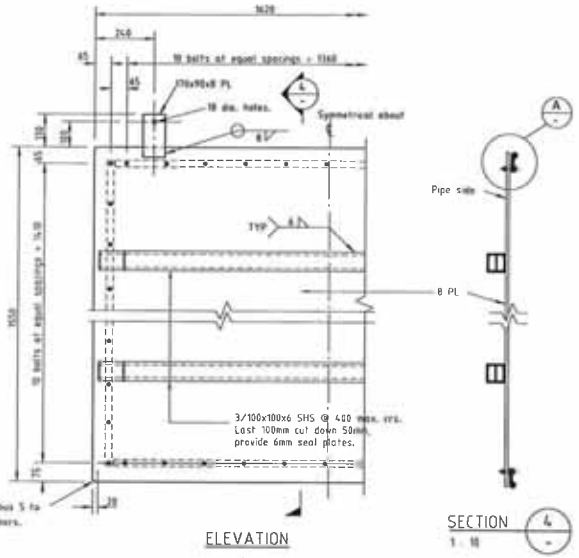
SECTION 2
1 : 10



SECTION 3
1 : 10



SECTION 1
1 : 10

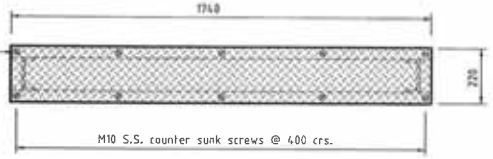


ELEVATION
1:10

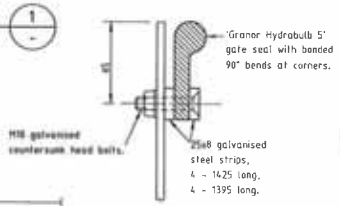
SECTION 4
1 : 10

VALVE CHAMBER BULKHEAD GATE
2 OFF

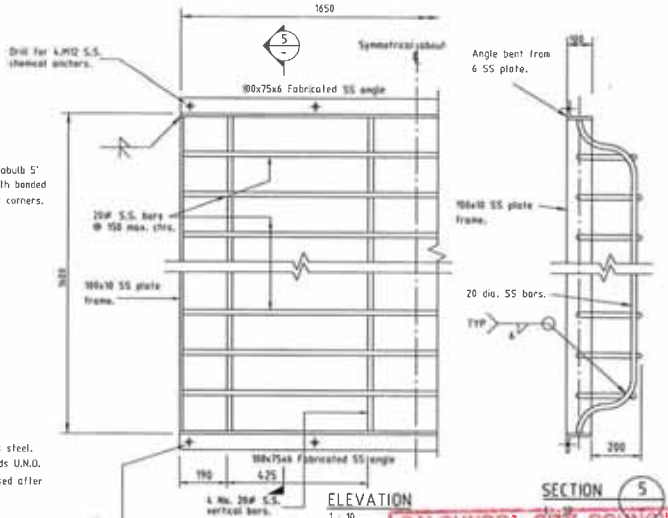
M10 S.S. counter sunk screws, tap S.S. angle below (provide blockout to concrete to allow screw penetration.



COVER TO BULKHEAD OPENING
1:10
Cover to be 10mm marine grade aluminium chequer plate.



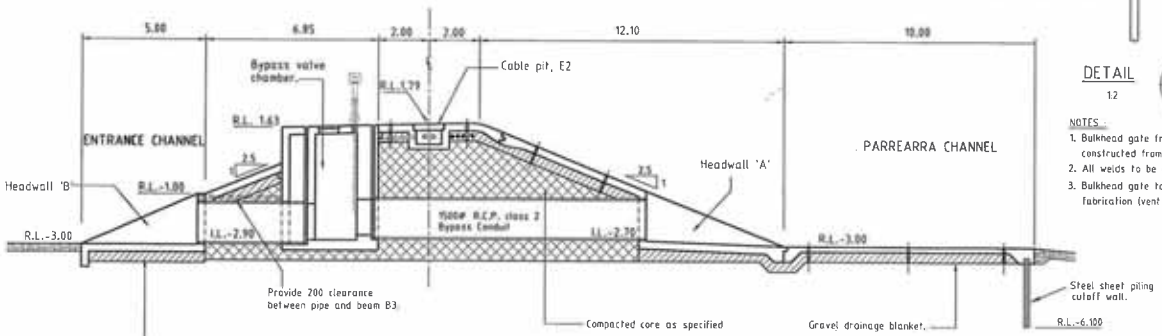
DETAIL A
1:2



ELEVATION
1 : 10

SECTION 5
1 : 10

S.S. SCREEN
2 OFF
6mm fillet welds to all joints
All stainless steel to be grade 316



BYPASS CONDUIT TYPICAL SECTION
1:100

NOTES:
1. Bulkhead gate frame shall be constructed from Grade 316 stainless steel.
2. All welds to be continuous fillet welds U.N.O.
3. Bulkhead gate to be hot dip galvanised after fabrication (vent closed sections).

CALOUNDRA CITY COUNCIL
APPROVED
ENGINEER
DATE 14/7/98

200 100 0 200 400 600 800 mm 1 : 10
100 50 0 100 mm 1 : 2
1000 500 0 1000 2000 3000 4000 5000 6000 mm 1 : 20
2 1 0 2 4 6 8 m 1 : 100
SCALES BEFORE REDUCTION

AUTOCAD R.12 FILENAME K95-118.DWG
DATE : 2-12-1997 12:42 3:55 PM

		A	11-03-98	Minor revisions.		
No.	DATE	REVISIONS	REC.	APVD.	No.	DATE

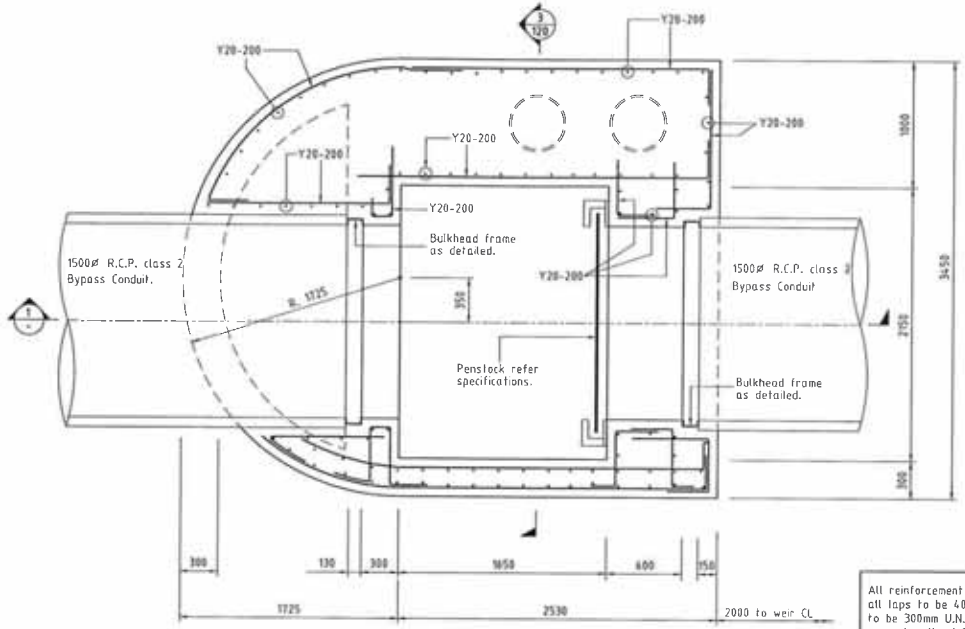
DESIGNED: C.J. Mas
DRAWN: C.J. Mas
CHECKED: C.J.M.
RECOMMENDED: A.T. Kwaan
APPROVED: A.H.D.
DATUM: A.H.D.
SIZE: A1

Cardno & Davies
Queensland Pty. Ltd.
ACN 051 074 992
Consulting Engineers

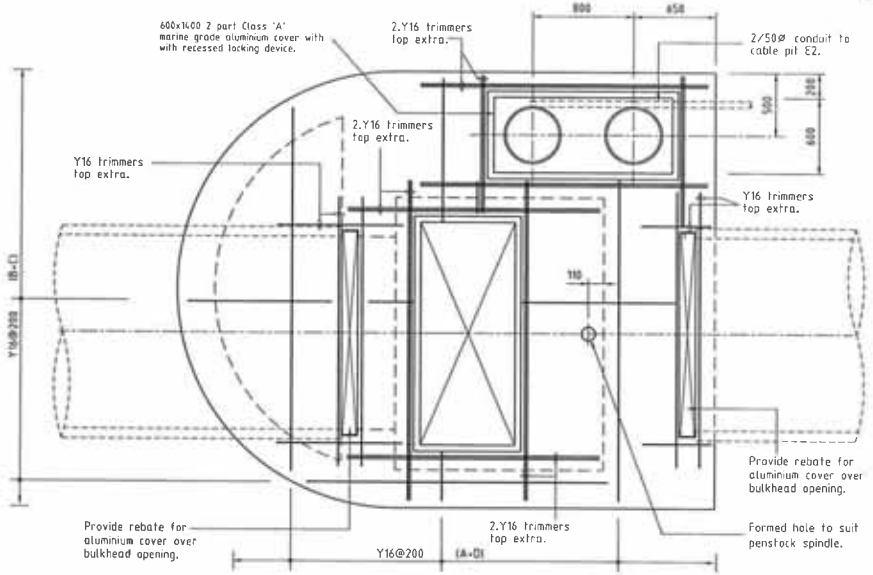
OFFICES: Brisbane, Gold Coast, Sunshine Coast, Toowoomba, Rockhampton, Mackay, Townsville, Cairns, Port Moresby, Suva, Auckland, Christchurch, Sydney
TELEPHONE: (07) 3846 6662 (07) 5592 8399 (07) 5479 1288 (07) 4638 1822 (07) 4957 4411 (07) 4724 2266 (07) 4031 1336 (07) 4054 1811 (675) 325 2693 (679) 330 1261 (09) 307 7226 (03) 379 3344 (02) 9929 7558
FAX: (07) 3846 6611 (07) 5592 8322 (07) 5479 1223 (07) 4638 1774 (07) 4957 4657 (07) 4724 2577 (07) 4031 1348 (07) 4054 1801 (675) 325 2695 (679) 330 1281 (09) 307 7227 (03) 379 3366 (02) 9929 7598
SUNSHINE COAST OFFICE: 80 Aerodrome Road, Maroochydore, Queensland 4558
Postal Address: PO Box 142, Maroochydore, Queensland 4558

KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 'Y'
WATER QUALITY BYPASS CONDUIT
TYPICAL SECTION AND DETAILS

DATE: 18-11-1997
DRAWING No: 478/95 - 118
A



BYPASS VALVE CHAMBER
1:20

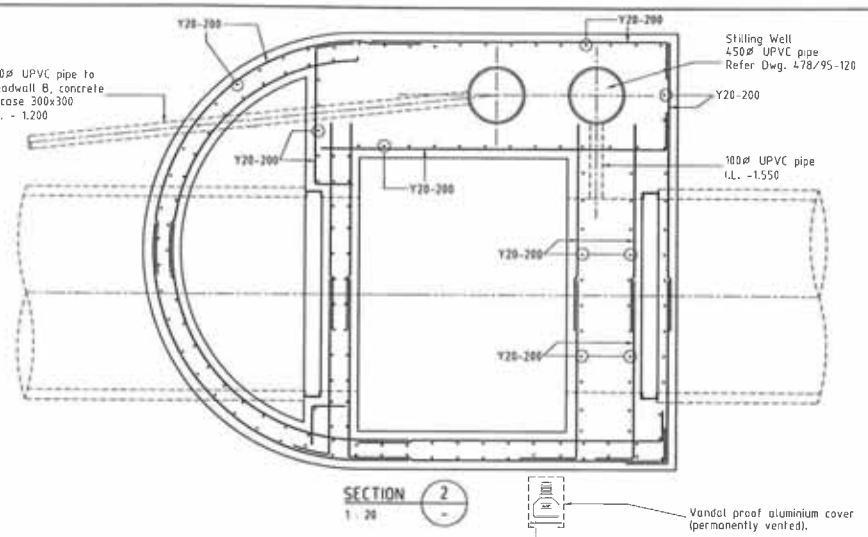


BYPASS VALVE CHAMBER
COVER SLAB (300 thick)
1:20

(A) Bars laid fist
(B) Bars laid second
(C) Bars laid third
(D) Bars laid last

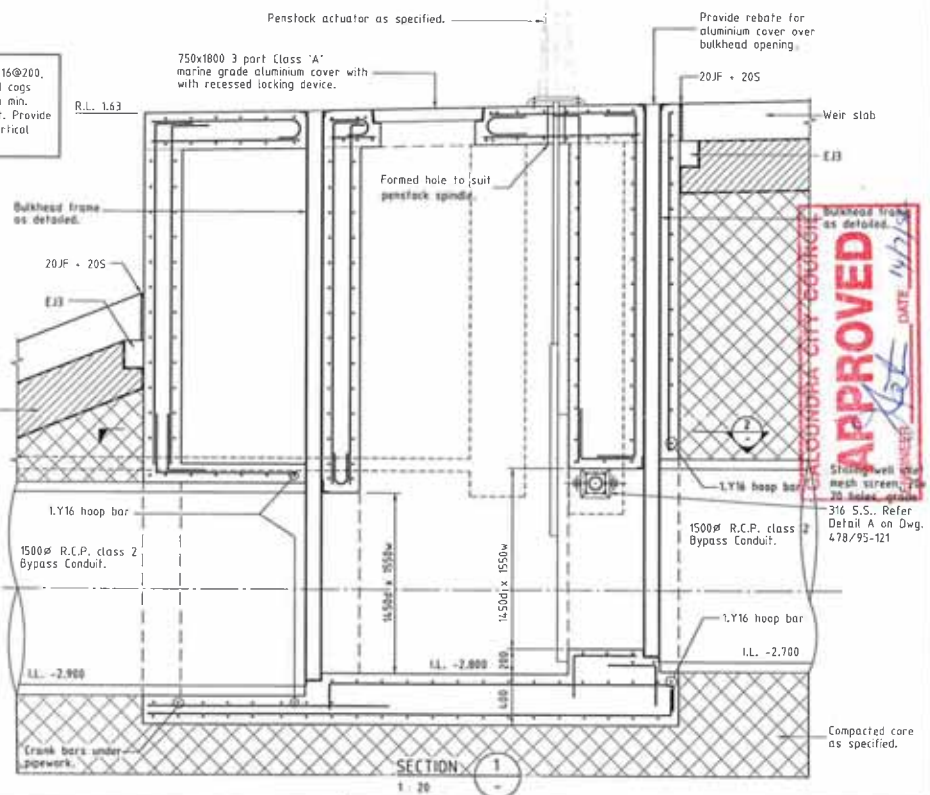
1000 500 0 1000 mm
SCALE BEFORE REDUCTION 1 : 20

All reinforcement to be Y16@200, all laps to be 400mm and cogs to be 300mm U.N.O., 70mm min. cover to all reinforcement. Provide starter bars to match vertical reinforcement, lap 500.



SECTION 2
1 : 20

Vandal proof aluminium cover (permanently vented).



SECTION 1
1 : 20

APPROVED
CALOUNDRA CITY COUNCIL
DATE 14/12/98

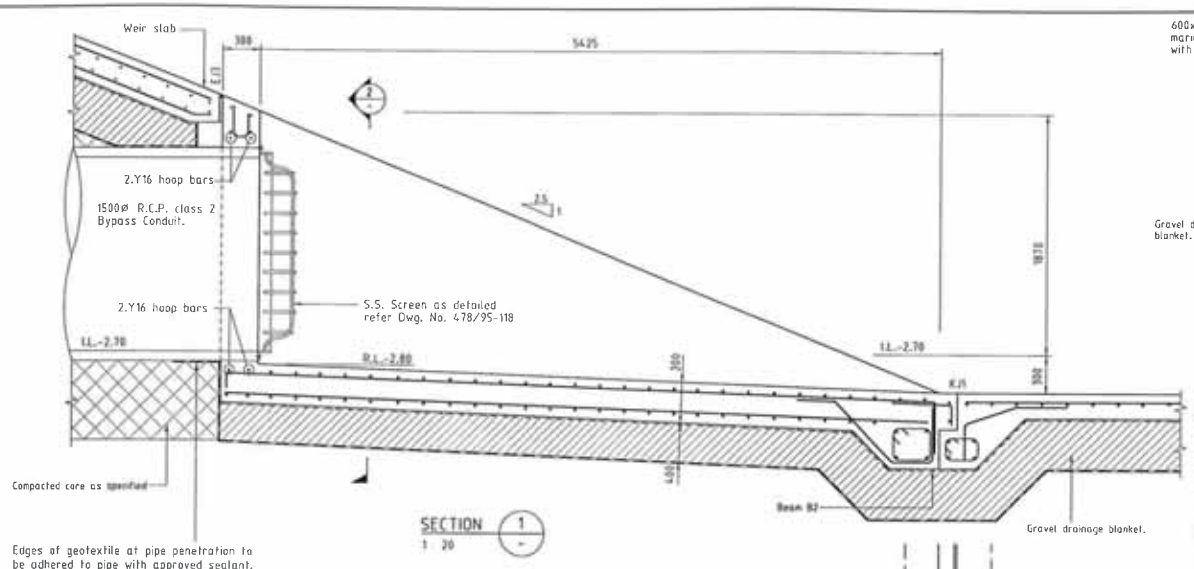
AUTOCAD R.12 FILENAME : K95-119.DWG
DATE : 3-12-1997 TIME : 11:28 AM

A	13-03-98	Minor revisions.	DESIGNED: C.J. Davies	A1	DATUM: A.H.D.
			DRAWN: C.J. Davies		
			CHECKED:		
			RECOMMENDED: C.J. Davies		
			PROJ. MGR:	APPROVED:	

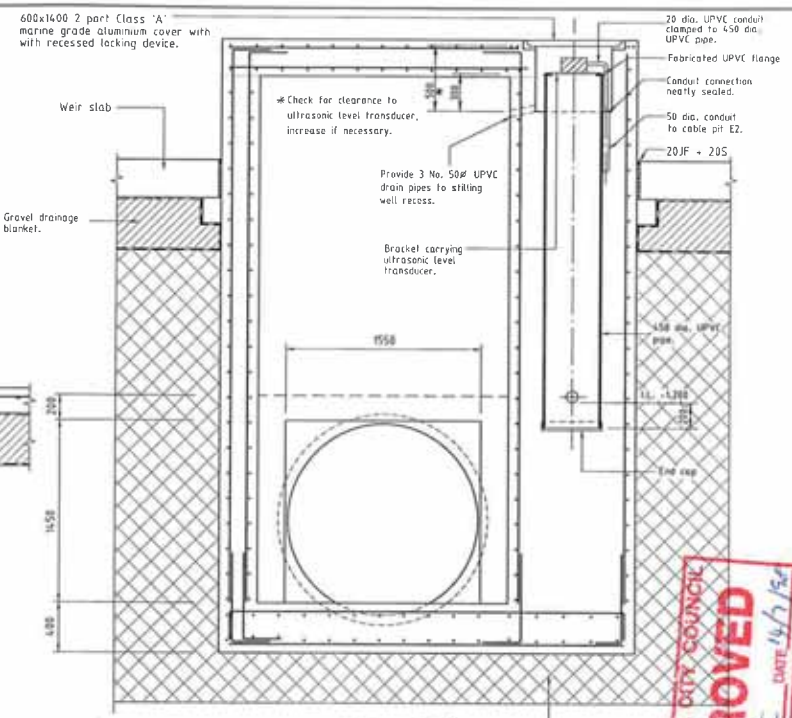
Cardno & Davies Queensland Pty. Ltd.
ACN 051 074 912
Consulting Engineers

KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 'Y'
WATER QUALITY BYPASS CONDUIT
VALVE CHAMBER PLAN AND SECTIONS

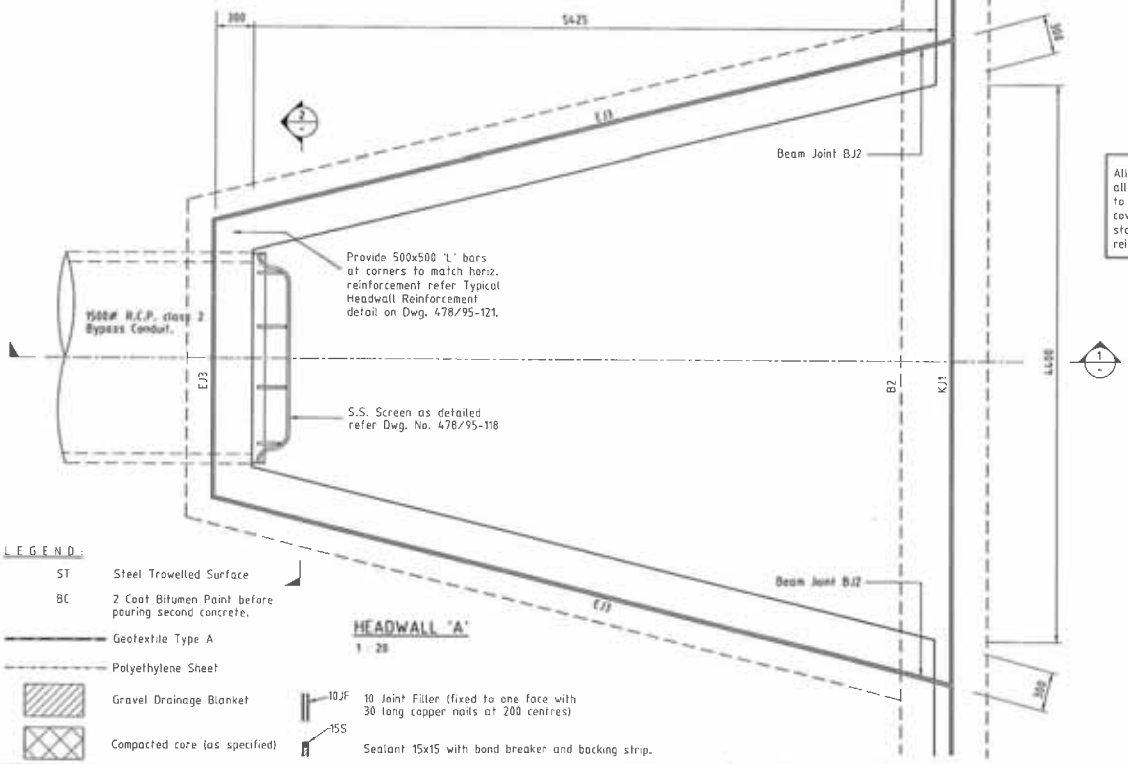
DATE: 18-11-1997
DRAWING No: 478/95 - 119



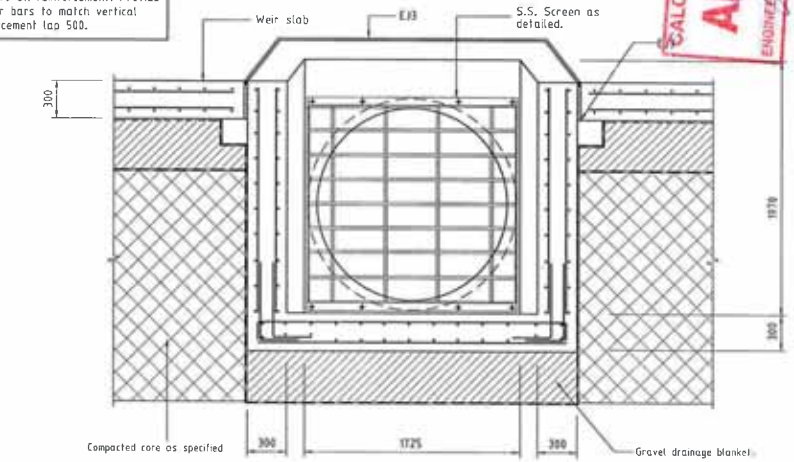
SECTION 1 / - 1 : 20



SECTION 3 / 119 1 : 20



All reinforcement to be Y16@200, all laps to be 400mm and cogs to be 300mm U.N.O., 70mm min. cover to all reinforcement. Provide starter bars to match vertical reinforcement lap 500.



SECTION 2 / - 1 : 20

1000 500 0 1000 mm 1 : 20
SCALE BEFORE REDUCTION

LEGEND:

ST	Steel Trowelled Surface	
BC	2 Coat Bitumen Paint before pouring second concrete.	
	Geotextile Type A	
	Polyethylene Sheet	
	Gravel Drainage Blanket	10JF 10 Joint Filler (fixed to one face with 30 long copper nails at 200 centres)
	Compacted core (as specified)	15S Sealant 15x15 with bond breaker and backing strip.

HEADWALL 'A'
1 : 20

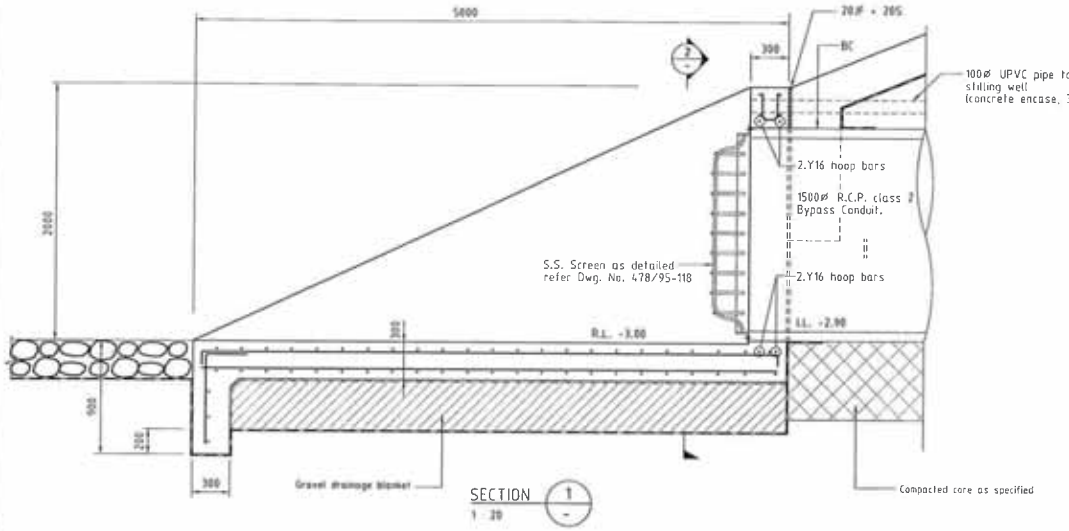
CALOUNDRA CITY COUNCIL APPROVED DATE 14/1/98 ENGINEER

			A1	A.H.D.	
A	17-03-98	Minor revisions.			

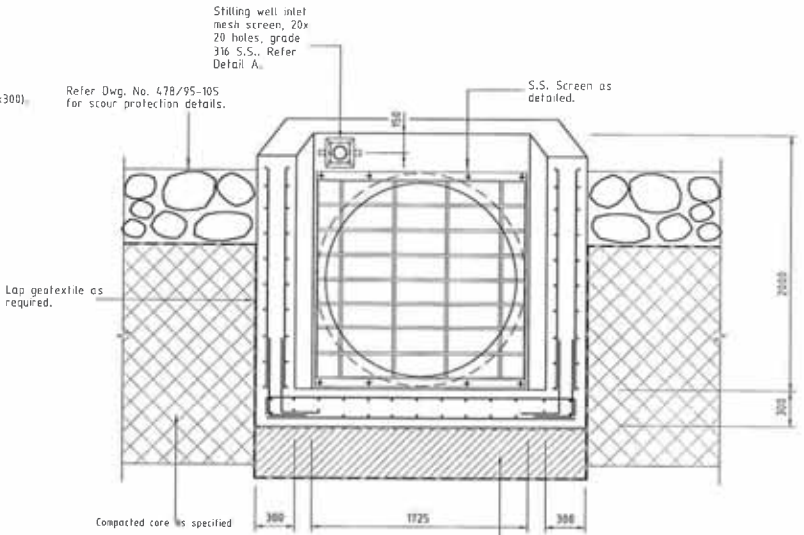
Cardno & Davies Queensland Pty. Ltd. ACN 057 074 992 Consulting Engineers

KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 'Y'
WATER QUALITY BYPASS CONDUIT
HEADWALL 'A' AND SECTIONS

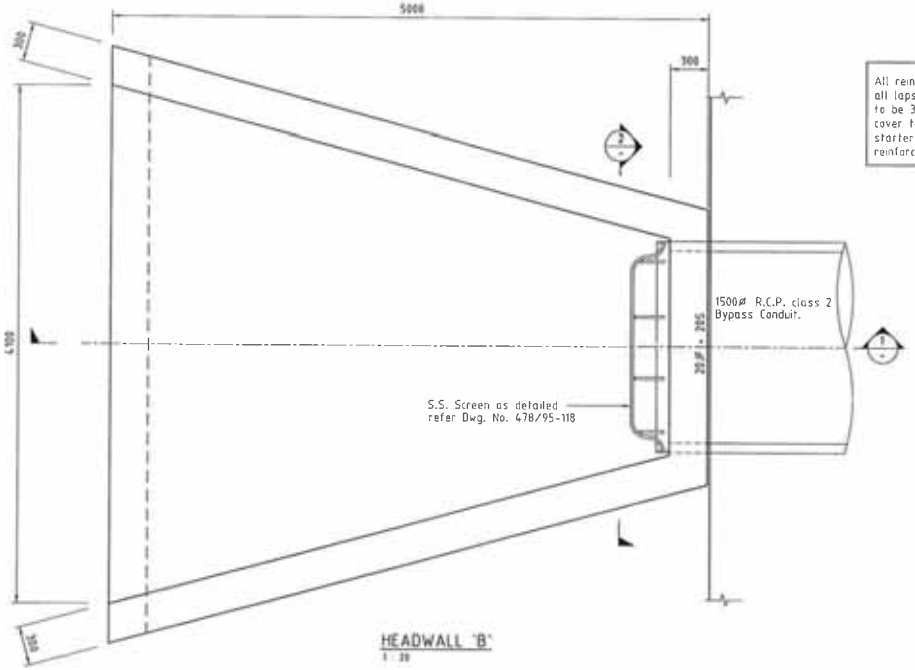
DRAWING No: 478/95-120



SECTION 1 / 1 : 20

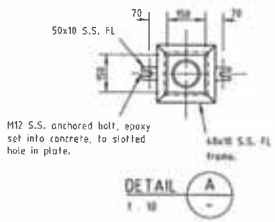


SECTION 2 / 1 : 20

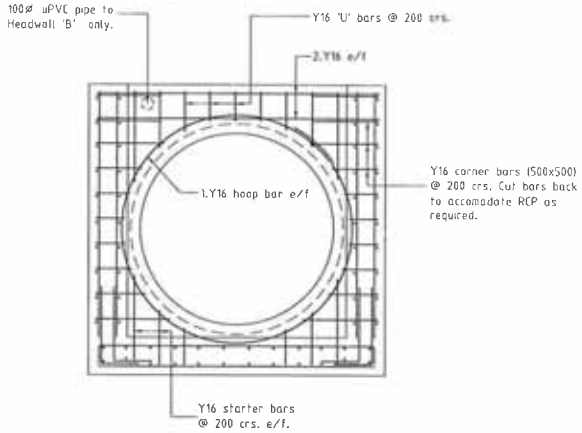


HEADWALL 'B' 1 : 20

All reinforcement to be Y16@200, all laps to be 400mm and cogs to be 300mm U.N.O., 70mm min. cover to all reinforcement. Provide starter bars to match vertical reinforcement lap 500.



DETAIL A / 1 : 10



LEGEND:

ST	Steel Trowelled Surface
BC	2 Coat Bitumen Paint before pouring second concrete.
	Geotextile Type A
	Polyethylene Sheet
	Gravel Drainage Blanket
	Compacted core (as specified)

TYPICAL HEADWALL REINFORCEMENT 1 : 20

CALOUNDRA CITY COUNCIL APPROVED 14/7/98

1000 500 0 1000 mm

1 : 20

SCALES BEFORE REDUCTION

AUTOCAD R.12 FILENAME #95-121DWG
DATE 14-12-1997 TIME 9:35 AM

No.	DATE	AMENDMENT	REC. APPD
A	13-03-98	Minor revisions.	

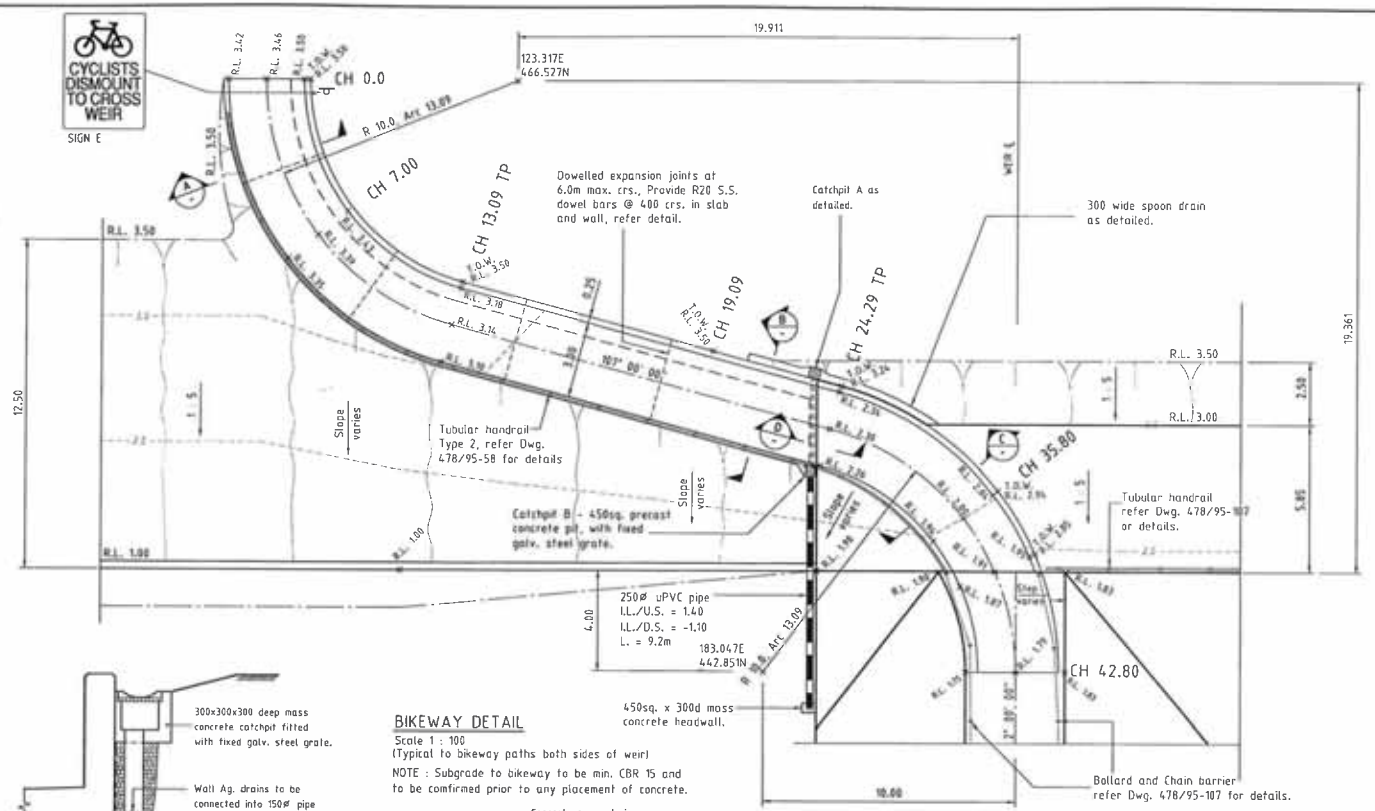
DESIGNED: DRAWN: CHECKED: RECOMMENDED: APPROVED: A1 DATUM: A.H.D.

Cardno & Davies Queensland Pty. Ltd. ACN 051 074 992 Consulting Engineers

BRISBANE, GOLD COAST OFFICES, TELEPHONE, FAX

KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 'Y'
WATER QUALITY BYPASS CONDUIT
HEADWALL 'B' AND SECTIONS

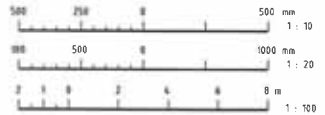
DATE: 10-11-1997
DRAWING No: 478/95 - 121
A



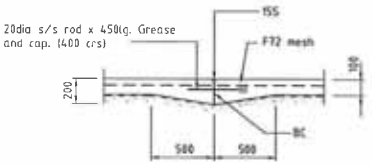
SIGN SPECIFICATION

SIGN	LETTERING SIZE(mm) SERIES	COLOUR	SIZE (mm)
E	50 EM	Black on white	500 x 700

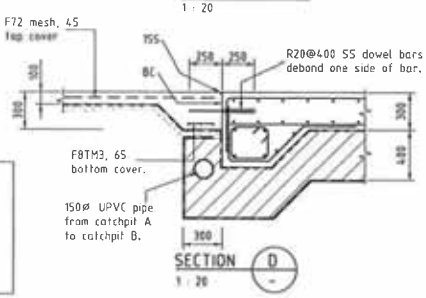
NOTE.
1) All signs are retroreflorised.
2) All signs shall meet the requirements of Queensland Department of Transport.
3) Ground clearance to underside of signs shall be 2.0m minimum.
4) All signs to be marine grade aluminium with stainless steel or marine grade aluminium fixings.
5) Refer Std Dwg No S15/4-5 for post and footing details for sign E.



SCALES BEFORE REDUCTION



DOWELLED JOINT
1 : 20

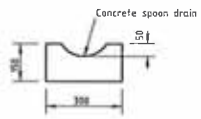


SECTION D
1 : 20

CATCHPIT A TYPICAL SECTION
1:10

BIKEWAY DETAIL

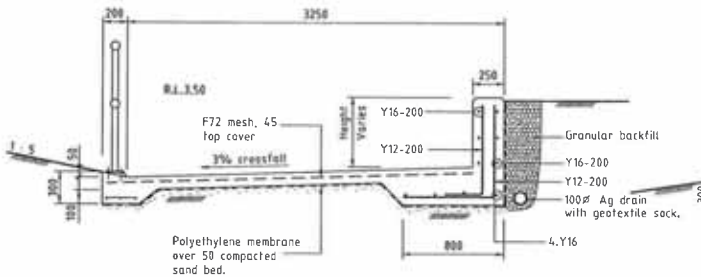
Scale 1 : 100
(Typical to bikeway paths both sides of weir)
NOTE : Subgrade to bikeway to be min. CBR 15 and to be comfirmed prior to any placement of concrete.



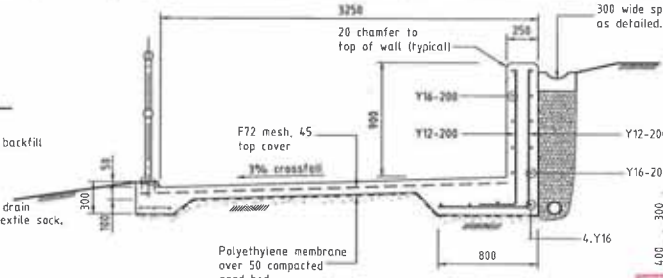
SPOON DRAIN DETAIL
1:10

LEGEND :

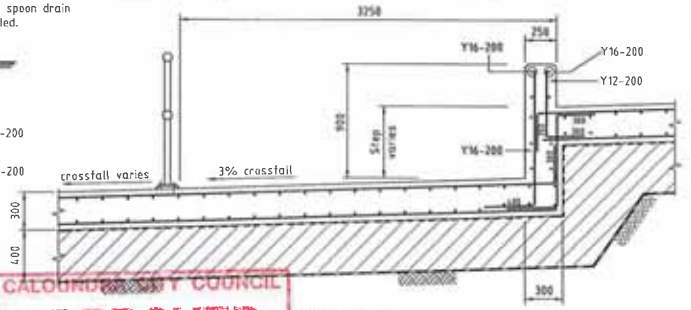
ST	Steel Trowelled Surface		Gravel Drainage Blanket
BC	2 Coat Bitumen Paint before pouring second concrete	10JF	10 Joint Filler (fixed to one face with 30 long copper nails at 200 centres)
	Geotextile Type A	15S	
	Polyethylene Sheet		Sealant 15x15 with bond breaker and backing strip.



SECTION A
1 : 20



SECTION B
1 : 20



SECTION C
1 : 20

ALL REINFORCEMENT TO WEIR: Y16-200 E.W. U.N.O
70 COVER U.N.O.

CALOUNDRA CITY COUNCIL
APPROVED
ENGINEER DATE 14/7/98

AUTOCAD R14 FILENAME 478-122B.DWG
DATE : 18-6-1998 TIME : 9.59 AM

B	17-06-98	Ballard barrier added.				
A	13-03-98	Minor revisions.				

DESIGNED C.J.Rice
DRAWN C.J.Rice
CHECKED C.J.R.
RECOMMENDED FOR APPROVAL
APPROVED

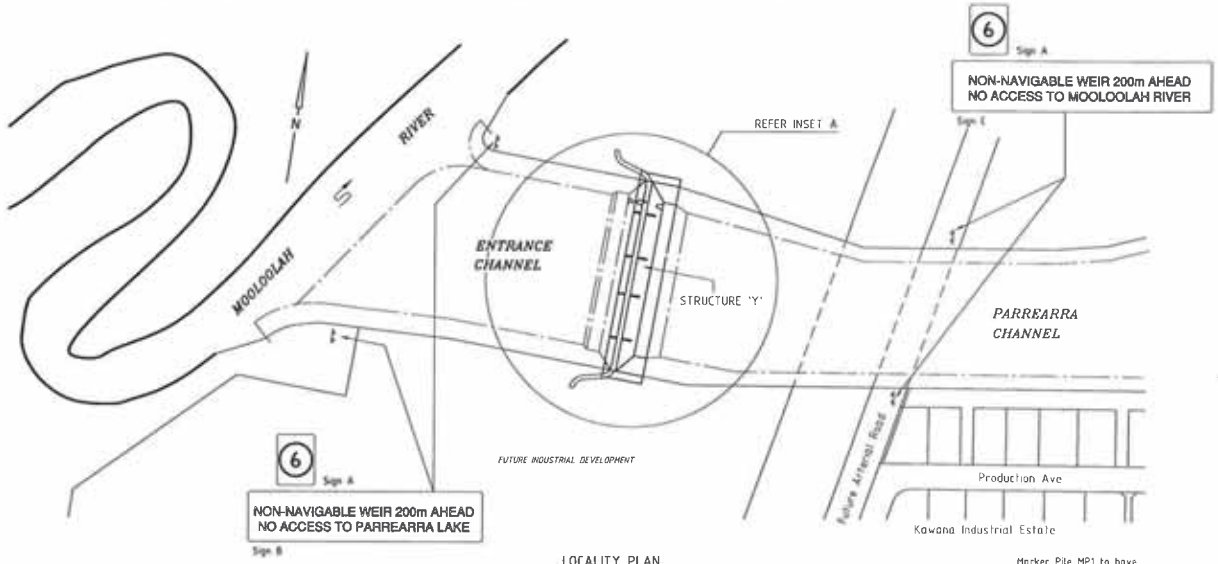
A1 | DATUM: A.H.D.

Cardno & Davies
Queensland Pty. Ltd.
ACN 051 074 992
Consulting Engineers

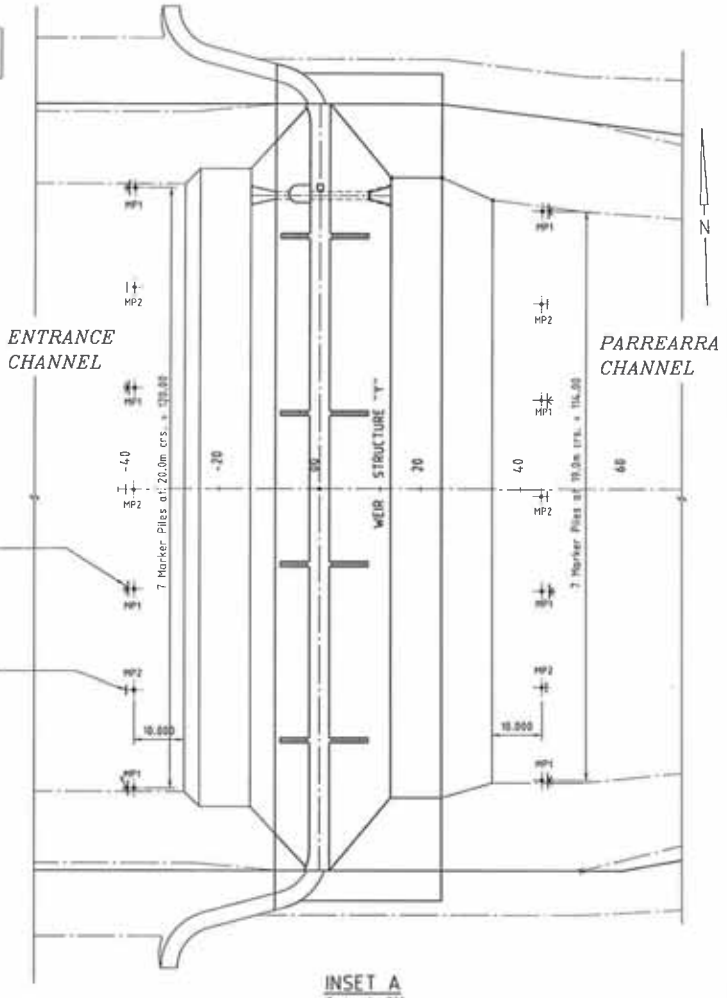
Brisbane, Gold Coast, Sunshine Coast, Townsville, Mackay Bay, Tweed Heads, Port Moresby

KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 'Y'
BICYCLE PATH AND BAFFLE WALL DETAILS

DATE: 19-11-1997
DRAWING No: 478/95-122



LOCALITY PLAN
Scale 1 : 2000

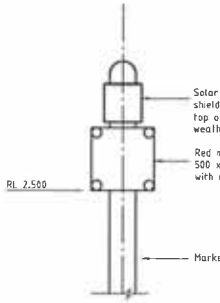


Marker Pile MP1 to have marker board and flashing red light, Refer Detail A

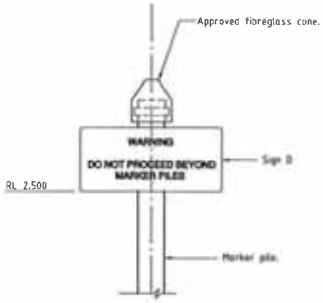
Marker Pile MP2 to have Sign D mounted to top of pile refer Detail B.

INSET A
Scale 1 : 500

MARKER PILE DETAIL
1:50



DETAIL A
1:20



DETAIL B

SIGN SPECIFICATION

SIGN	LETTERING SIZE(mm) SERIES	COLOUR	SIZE (mm)	QUANTITY (No.)
A	*	Black & red on white	450 x 600	4
B	50 EM	Black on yellow	1500 x 300 approx	2
C	50 EM	Black on yellow	1500 x 300 approx	2
D	75 EM	Black on yellow	1200 x 500 approx	6

NOTES :
1) All signs are relectorised.
2) All signs shall meet the requirements of Queensland Transport - Marine Operations.
3) Actual sign sizes to be confirmed by lettering requirements.
4) Ground clearance to underside of signs shall be 2.0m minimum.
5) All signs to be marine grade aluminium with stainless steel or marine grade aluminium fixings.
6) Refer Std Dwg No 515/4-5 for post and footing details for signs A, B & C.

CALOUNDRA CITY COUNCIL
APPROVED
ENGINEER DATE 14/7/98

1000 500 0 1000 mm 1 : 20
1 0.5 0 1 2 3 4 m 1 : 50
10 5 0 10 20 30 40 m 1 : 500
100 50 0 100 m 1 : 2000

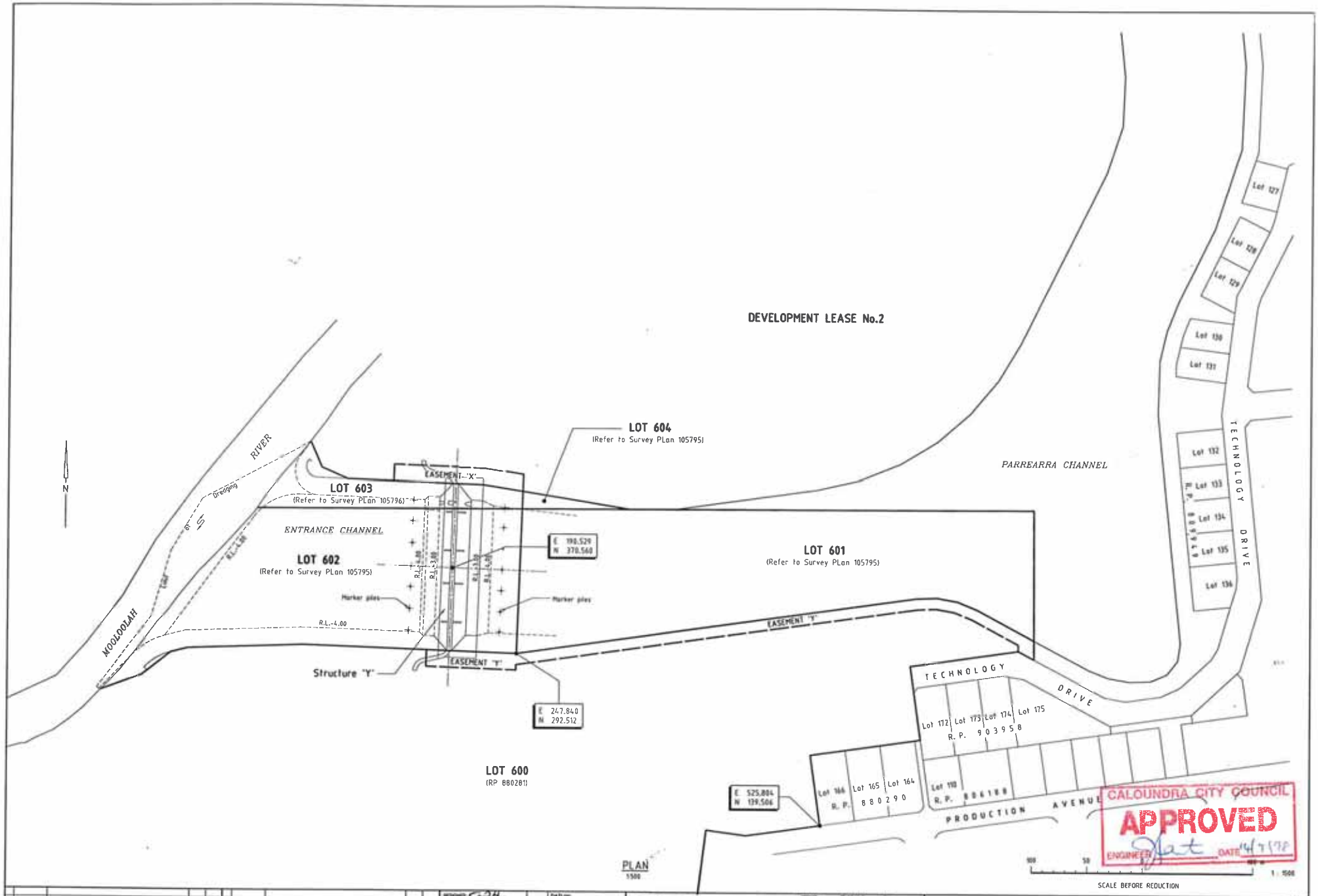
SCALES BEFORE REDUCTION

AUTOCAD R.12 FILENAME K95-W1DWG
DATE : 1-12-1997 TIME : 11:40 AM

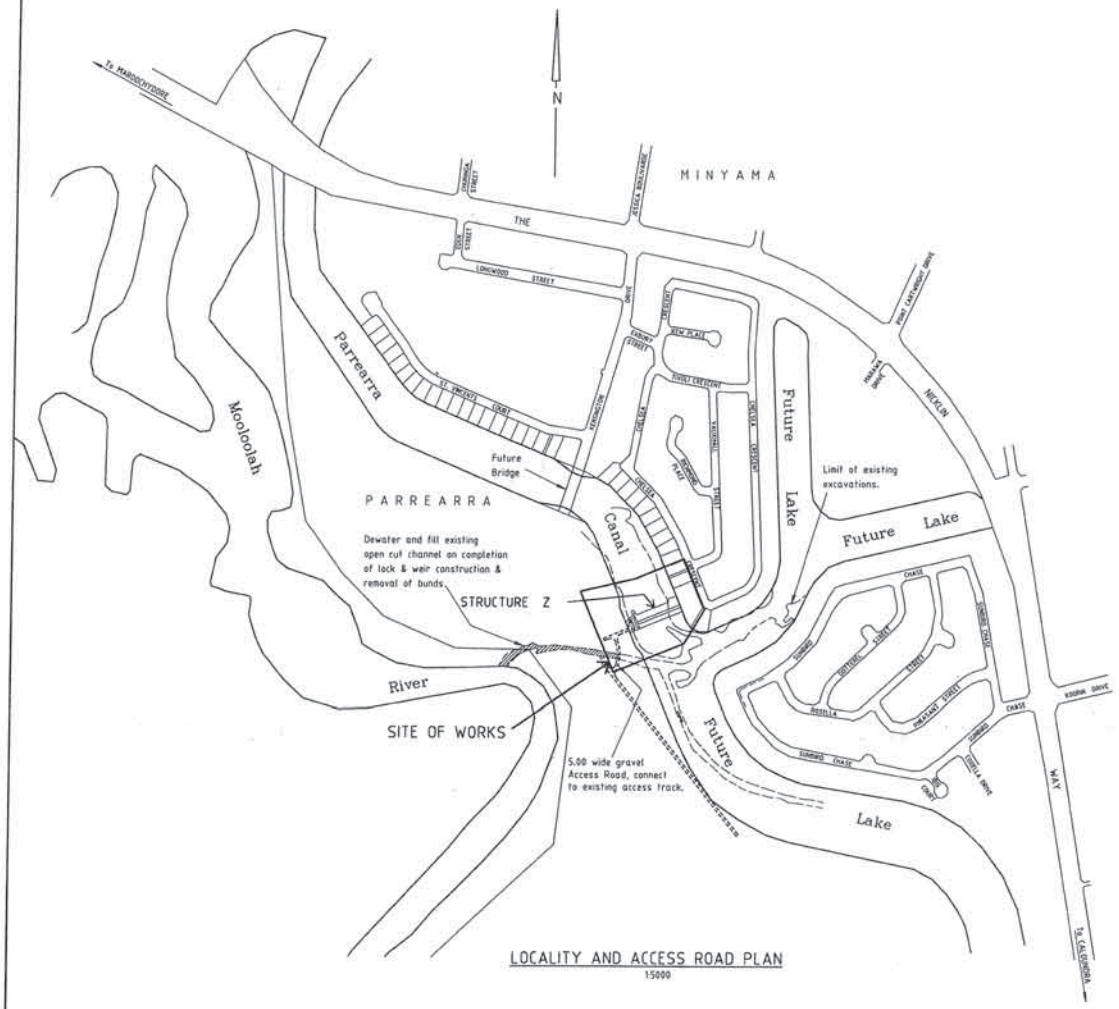
			DESIGNED: C.D.H.	A1	DATUM: A.H.D.	Cardno & Davies Queensland Pty. Ltd. ACN. 051 074 992 Consulting Engineers
			DRAWN: C.D.Hay			
			CHECKED: C.D.H.			
			RECOMMENDED: PROJ. MAN.		APPROVED: PROJ. DIR.	
A	13-01-98	Minor revisions.	C.J.H.			

KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 'Y'
NAVIGATION AIDS

DATE: 10-12-1997
DRAWING No.
478/95 - 123
A


DEVELOPMENT LEASE No.2
LOT 604
(Refer to Survey PLan 105795)
PARREARRA CHANNEL
LOT 603
(Refer to Survey PLan 105796)
EASEMENT 'X'
ENTRANCE CHANNEL
LOT 602
(Refer to Survey PLan 105795)
LOT 601
(Refer to Survey PLan 105795)
E 198.529
N 370.560
Marker piles
R.L.-4.00
EASEMENT 'Y'
Structure 'Y'
E 247.840
N 292.512
LOT 600
(RP 880281)
E 525.884
N 139.506
MOOLOOLAH RIVER
Dredging
TECHNOLOGY DRIVE
PRODUCTION AVENUE
Lot 172
Lot 173
Lot 174
Lot 175
R. P. 903958
Lot 166
Lot 165
Lot 164
R. P. 880290
Lot 110
R. P. 884188
Lot 127
Lot 128
Lot 129
Lot 130
Lot 131
Lot 132
Lot 133
Lot 134
Lot 135
Lot 136
CALOUNDRA CITY COUNCIL
APPROVED
ENGINEER
DATE 14/7/78
PLAN
1500
SCALE BEFORE REDUCTION
1 : 1500
A1
A.H.D.
Cardno & Davies
Queensland Pty. Ltd.
Consulting Engineers
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 'Y'
STRUCTURE 'Y' DRAINAGE RESERVE
10-03-1978
478/95-124

Appendix B: Structure Z Design Drawings



LOCALITY AND ACCESS ROAD PLAN
1:5000

50 0 50 250 500 mm 1:5
250 0 250 1000 2000 2500 mm 1:25
2 1 0 2 4 6 8m 1:100
100 50 0 100 200 300 400 m 1:5000
SCALE BEFORE REDUCTION

AUTOCAD NAME: K95-2.DWG
DATE : 8-7-1997 TIME : 4:28 PM

No.	DATE	REVISIONS	REC.	APPR.
A	11-04-97	General Revisions		

DESIGNED: G.B.
DRAWN: G.B.
CHECKED: G.B./+
RECOMMENDED: PROJ. MGR.
A1
DATUM: A.H.D.
APPROVED: PROJ. DIRECTOR

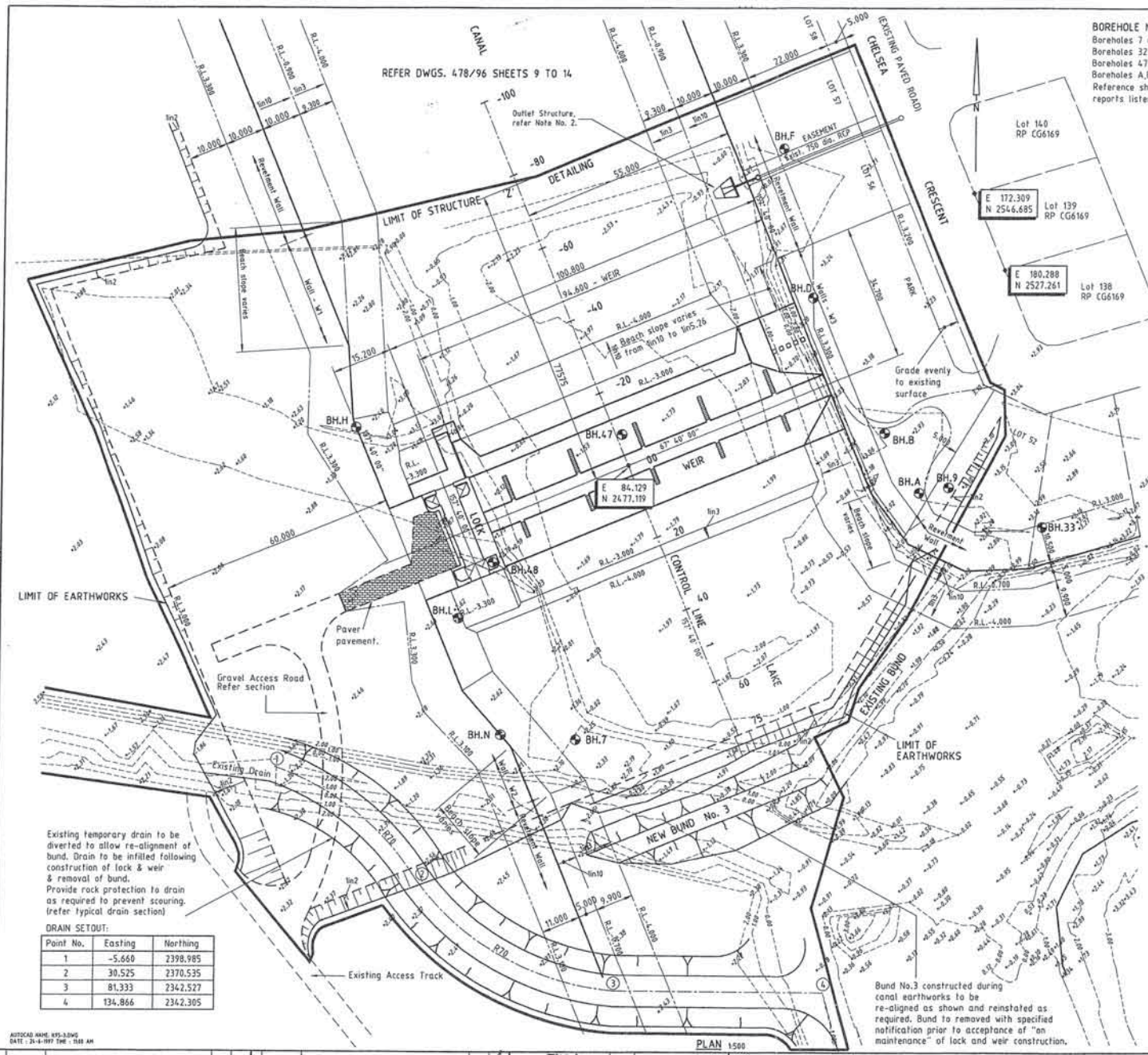
Cardno & Davies
Queensland Pty. Ltd.
ACN 051 074 703
Consulting Engineers

OFFICES: TELEPHONE: FAX:
Brisbane (07) 3369 9822 (07) 3369 9722
Gold Coast (07) 5539 5533 (07) 5538 5633
Sunshine Coast (07) 5441 2255 (07) 5443 5867
Townsville (077) 71 5092 (077) 21 2508
Hervey Bay (071) 24 9455 (077) 24 2295
Tweed Heads (071) 5536 1955 (071) 536 7778
Port Moresby (675) 675 325 2333 (675) 475 3153 (675)

SUNSHINE COAST OFFICE:
85 Duporth Avenue, Maroochydore
Postal Address: PO Box 152
Maroochydore, Queensland 4558

KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE Z
LOCALITY AND ACCESS ROAD PLAN AND DETAILS

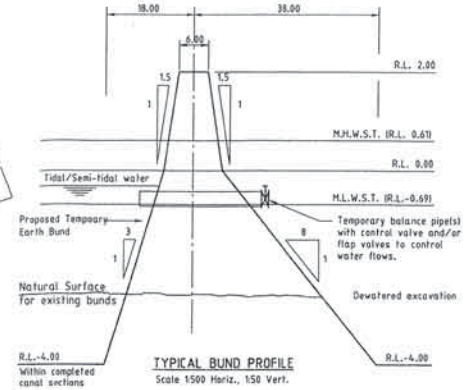
DATE: 11-12-1996
DRAWING No: 478/95 -2
No. A



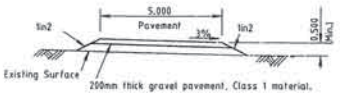
DRAIN SETOUT:

Point No.	Easting	Northing
1	-5.660	2398.985
2	30.525	2370.535
3	81.333	2342.527
4	134.866	2342.305

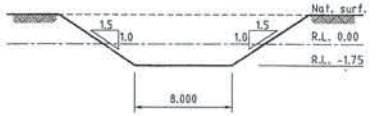
BOREHOLE NOTES :
Boreholes 7 and 9 taken from Geotechnics Pty. Ltd. report dated March 1989.
Boreholes 32 and 33 taken from Soil Surveys report dated 3 October, 1991.
Boreholes 47 and 48 taken from Golder Associates Pty. Ltd. report dated April, 1993
Boreholes A,B,D,F,H,I and N taken from Soil Surveys Pty. Ltd. report dated 10 March 1997
Reference should be made to the geotechnical reports listed above and listed in the specification for data on subsurface conditions.



TYPICAL BUND PROFILE
Scale 1:500 Horiz., 1:50 Vert.



GRAVEL ACCESS ROAD CROSS SECTION
1:100



TYPICAL DRAIN CROSS SECTION
1 : 200

NOTES:
1) Co-ordinates are on an arbitrary datum, refer to J.B. Goodwin, Midson and Partners.
2) Outlet structure approved under Canals Act, not included in application for Section 86 approval.

1 0.5 0 1 2 3 4 m 1 : 50
10 5 0 10 m 1 : 200
10 5 0 10 20 30 40 m 1 : 500
SCALE BEFORE REDUCTION

No.	DATE	REVISIONS	REC.	APPR.
D	23-09-97	Allotment and park fill levels revised.		
C	24-06-97	Co-ordinates added for Section 86, Note No. 2 added.		
B	06-05-97	Bypass conduit location changed, access road desr.		
A	11-04-97	General Revisions		

DESIGNED: PKM
DRAWN: C.J.Ness
CHECKED: SJC
RECOMMENDED: PROJ. MGR. C.J. Howson
DATUM: A.H.D.
A1
APPROVED: PROJ. DIR.

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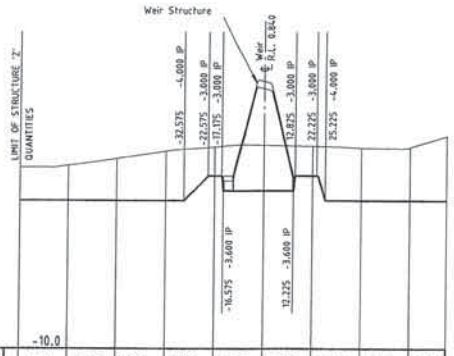
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE Z
EARTHWORKS AND EXISTING LEVELS PLAN

DATE: 17-12-1996
DRAWING No: 478/95 -3
Rev. D

AUTOCAD HAME: 695-3.DWG
DATE : 24-4-1997 TIME : 11:55 AM

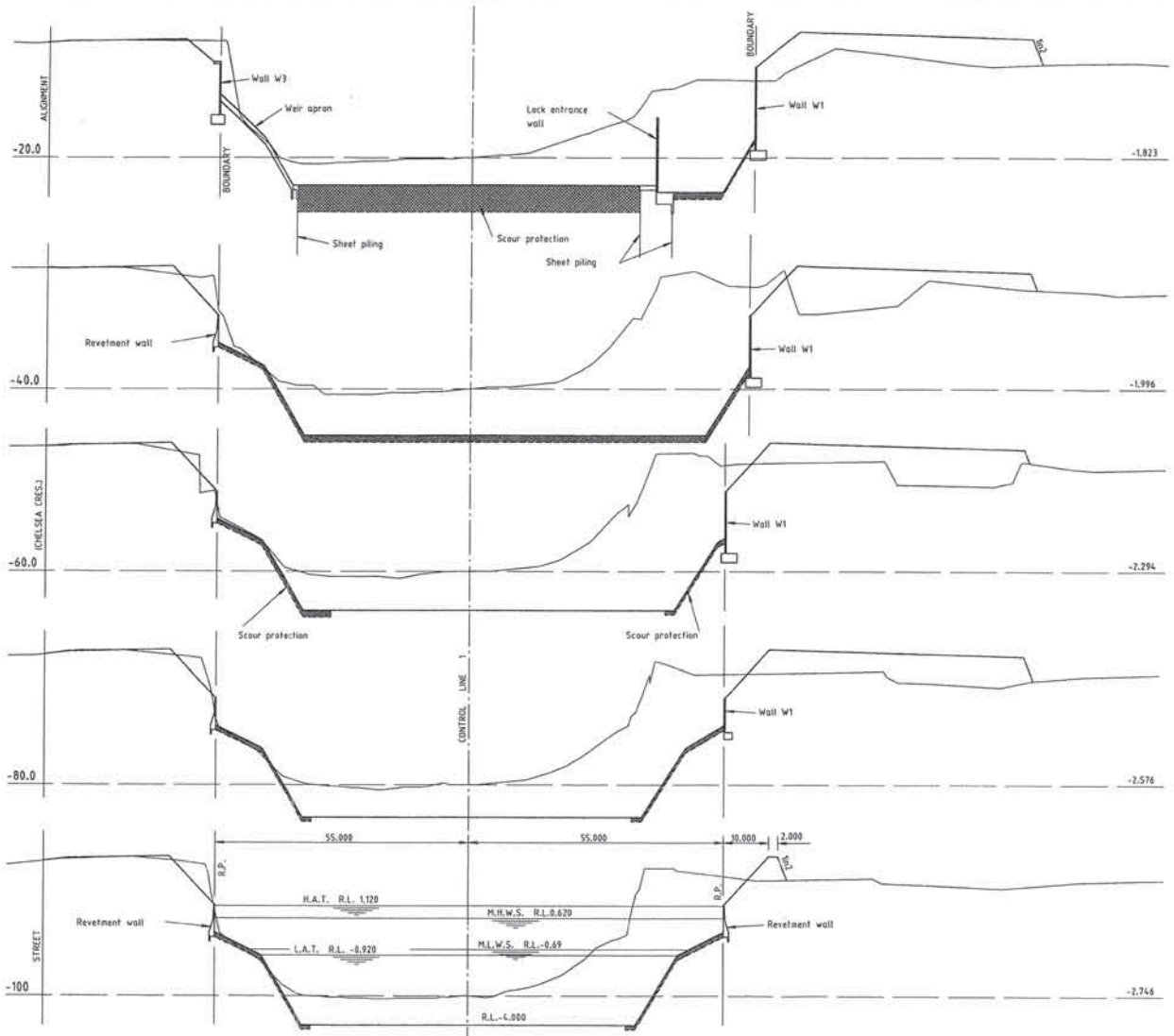


DATUM R.L.		-10.0								
EARTHWORKS QUANTITIES	CUT	740	4827	5974	5499	4807	5353	6588	7285	4464
	FILL	570	1399	1368	1334	1157	957	2002	4202	3628
CUT			1.424	1.707	2.865	1.178	1.869	1.206	2.141	2.963	2.828
FILL											
EXCAVATION LEVELS		-4.000	-4.000	-4.000	-4.000	-3.600	-3.600	-3.600	-4.000	-4.000	-4.000
SURFACE LEVELS		-2.648	-2.576	-2.294	-1.996	-1.823	-1.751	-1.795	-1.860	-1.837	-1.381
CHAINAGE		-100.00	-80.000	-60.000	-40.000	-20.000	0.000	20.000	40.000	60.000	75.000

CONTROL LINE 1

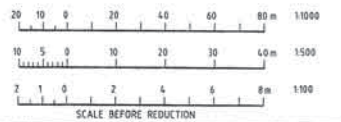
LONGITUDINAL SECTION

HOR. 1:1000
VERT. 1:100



CROSS SECTIONS

HOR. 1:500
VERT. 1:100



AUTOCAD NAME: KPS-4.DWG

Rv.	DATE	REVISIONS	REC.	APPR.
A	11-04-97	General Revisions		

DESIGNED: P.M.
DRAWN: C.J.D.
CHECKED:
RECOMMENDED: PROJ. MAN. C.J. Howard
A1
DATUM: A.H.D.
APPROVED: PROJ. DIR.

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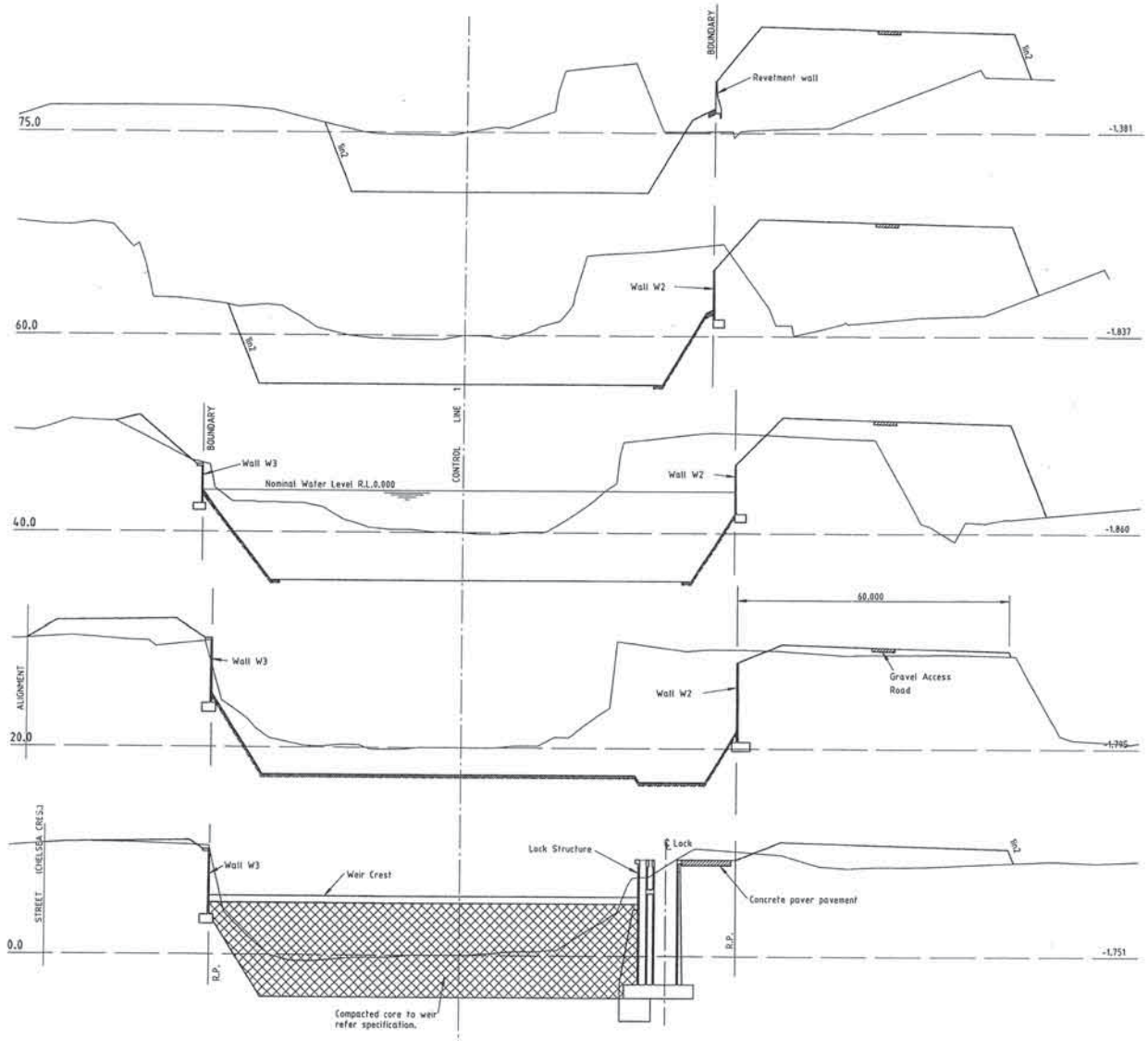
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE Z
CONTROL LINE 1
LONGITUDINAL AND CROSS SECTIONS

DATE: 11-12-1996
DRAWING No: 478/95 - 4
Rv. A



CROSS SECTIONS

HOR. 1:500
VERT. 1:100

AUTOCAD NAME: XYS-S.DWG
DATE : 11-4-1997 TIME : 3:00 PM

HOR. 10 5 0 10 20 30 40m 1:500
VERT. 2 1 0 2 4 6 8m 1:100

SCALE BEFORE REDUCTION

Rv.	DATE	REVISIONS	REC.	APPR.
B	29-09-97	Bypass port removed from lock (CH. 0.00)		
A	11-04-97	General Revisions		

DESIGNED: PHM
DRAWN: CJ.Nolan
CHECKED: SJC
RECOMMENDED: PROJ. MGR.
APPROVED: PROJ. DIR.
DATUM: A.H.D.
A1

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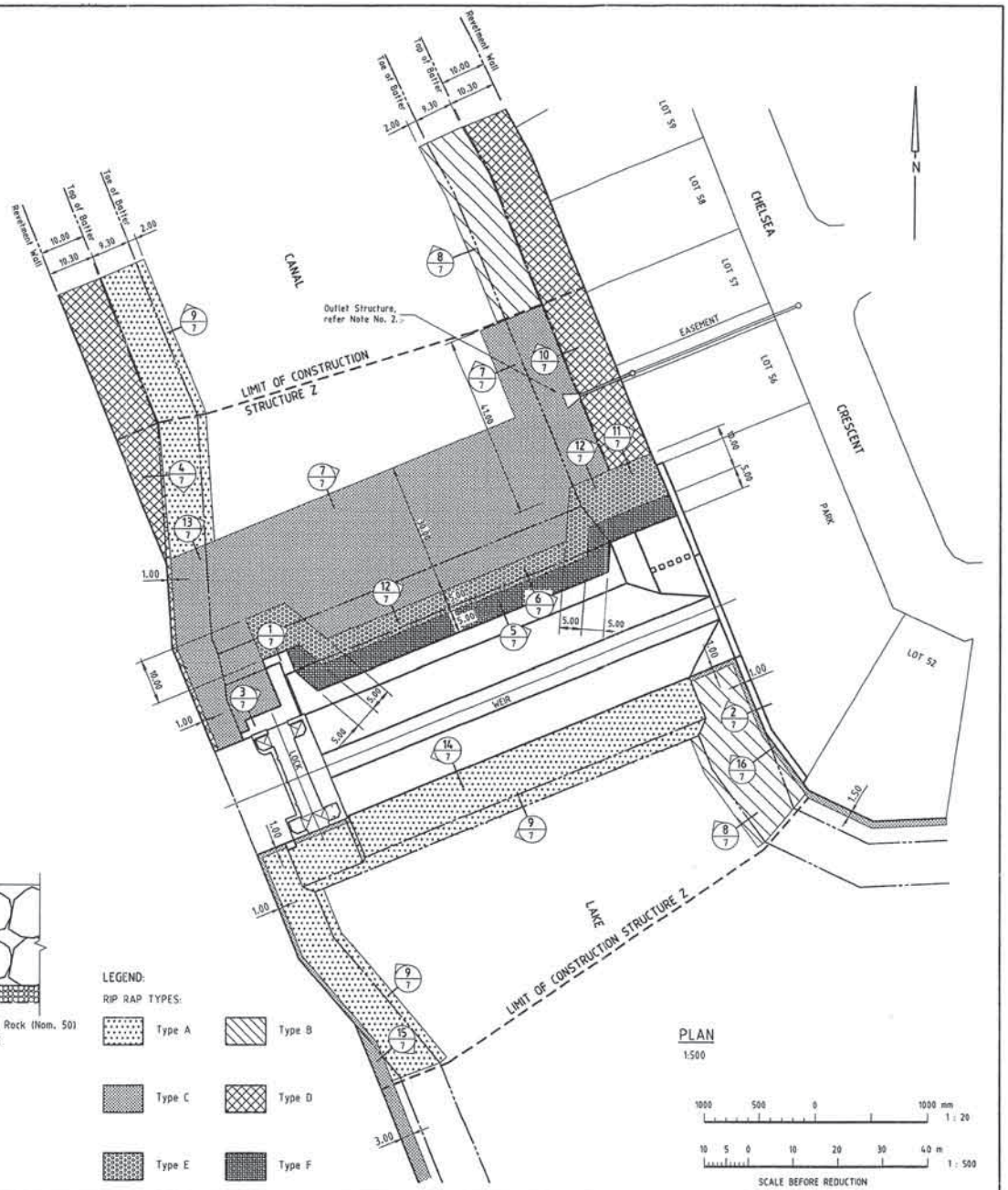
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE Z
CONTROL LINE 1
CROSS SECTIONS

DATE: 11-12-1996
DRAWING No: 478/95 -5
Rv. B

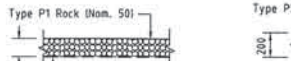


PLAN
1:500

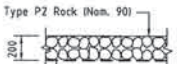
1000 500 0 1000 mm 1 : 20

10 5 0 10 20 30 40 m 1 : 500

SCALE BEFORE REDUCTION



TYPE A



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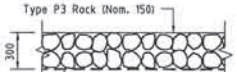
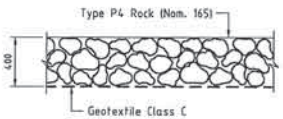


TYPE C



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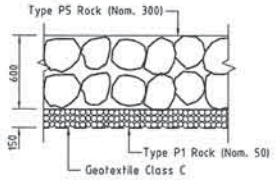

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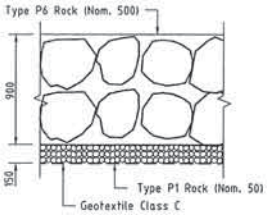

TYPE F

LEGEND:

RIP RAP TYPES:

Type A | Type B

Type C | Type D

Type E | Type F

NOTES:

1) Refer to Dwg. No. 478/95-7 for rock specifications.
2) Outlet structure approved under Canals Act, not included in application for Section 86 approval.

RIP RAP TYPE SECTIONS

Scale 1 : 20

AUTOCAD NAME: 695-6.DWG
DATE : 24-6-1997 TIME : 11:14 AM

No.	DATE	REVISIONS	REC.	APPR.
E	13-11-97	Rip Rap layout revised		
D	23-09-97	Batter width revised.		
C	24-06-97	Note No. 2 added.		
B	11-04-97	General Revisions		
A	31-01-96	Rip rap types and extents amended		

DESIGNED:
DRAWN:
CHECKED:
RECOMMENDED:
PROJ. MGR.

DATUM: A.H.D.
APPROVED:
PROJ. DIR.

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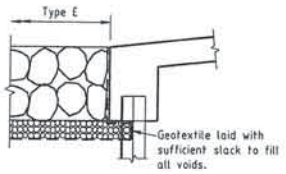
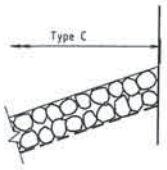
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 2
SCOUR PROTECTION PLAN

DATE: 11-12-1995
DRAWING No: 478/95 -6
Rev. E



SECTION 1:20 (1/6)



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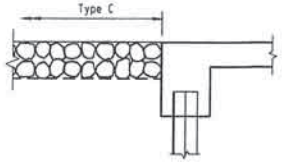

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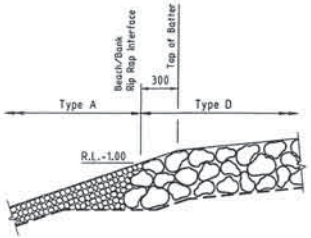
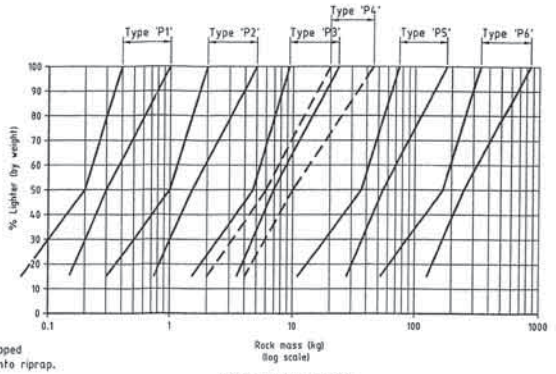
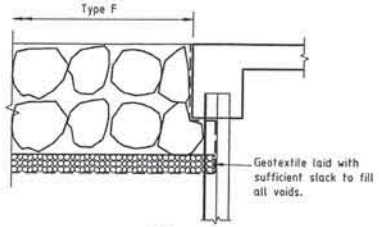


SECTION 1:20 (4/6)



ROCK GRADING GRAPH

Refer drawing 478/96-13 for explanation of gradings chart.



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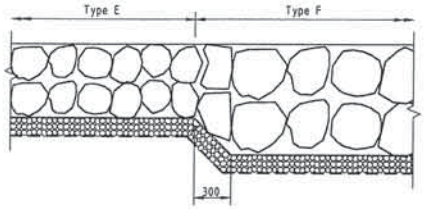
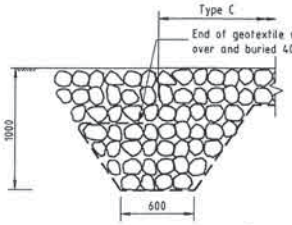


SECTION 1:20 (6/6)

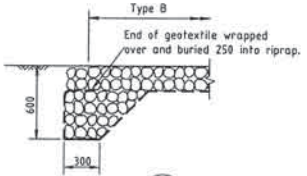


SECTION 1:20 (7/6)

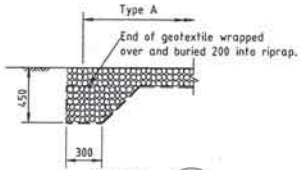
ROCK GRADING TABLE :

PARAMETER		ROCK TYPE					
SIZE	RANGE	P1 (Nom. 50)	P2 (Nom. 90)	P3 (Nom. 150)	P4* (Nom. 165)	P5 (Nom. 300)	P6 (Nom. 500)
W_{15}	min.	0.06	0.30	1.50	2.00	11	53
	max.	0.15	0.75	3.50	4.00	28	128
W_{50}	min.	0.20	1.00	4.70	6.00	37	170
	max.	0.30	1.50	7.00	10.00	56	255
W_{100}	min.	0.40	2.00	9.40	20.00	75	340
	max.	1.00	5.00	24.00	45.70	187	850

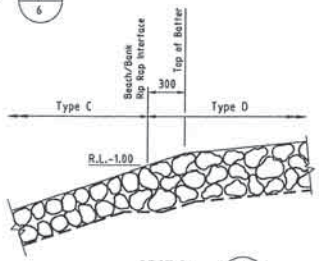
All gradings given in dry mass (kg.)



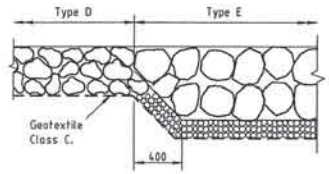
SECTION 1:20 (8/6)



SECTION 1:20 (9/6)



SECTION 1:20 (10/6)

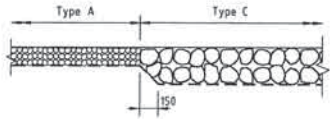


SECTION 1:20 (11/6)

GEOTEXTILE SPECIFICATION TABLE :

Property	Test	Geotextile Class	
		B	C
Minimum grab tensile strength (N)	AS2001.2.3	1000	1800
Minimum G Rating	Austroads	2500	4200
Minimum trapezoidal tear strength (N)	AS3706.3	400	600
Maximum pore size (EOS µm)	AS3706.7	200	200
Minimum permittivity (s^{-1})	AS3706.9	0.5	0.5

Refer Note No.8



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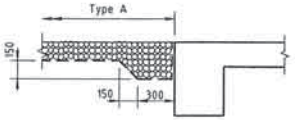
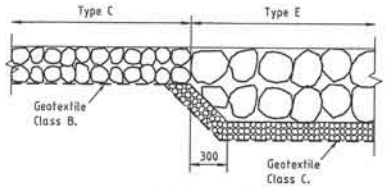


SECTION 1:20 (14/6)



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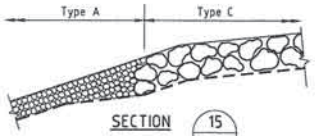

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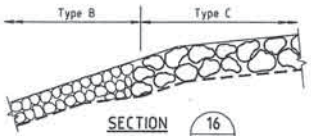

SECTION 1:20 (16/6)

NOTES:

1. A representative sample of rock shall be obtained from the quarry in accordance with AS1141.3.
2. The dry density of the rock shall not be less than 2500 kg/m^3 in accordance with AS4133.2.1.2.
3. The ratio of maximum to minimum dimensions of any rock shall not exceed three.
4. The Los Angeles value of the rock shall not exceed 20 in accordance with AS1141.23.
5. The maximum permissible loss for each fraction shall be 12% in accordance with AS1141.24.
6. Geotextile fabric shall be lapped 1000mm minimum and shall be keyed at the edges to the satisfaction of the Superintendent.
7. Rock of larger size may be substituted if approved by the Superintendent. If larger rock is used, specified layer thicknesses must be increased whilst maintaining nominated finished levels and profiles.
8. Geotextiles shall be non-woven, needle punched fabrics consisting of polyester or polypropylene polymers.

1000 500 0 1000 mm

1 : 20

SCALE BEFORE REDUCTION

AUTOCAD NAME: K95-7.DWG
DATE : 10-7-1997 TIME : 2:51 PM

No.	DATE	REVISIONS	REC.	APPR.
D	13-11-97	Rip Rap sections revised to suit layout changes.		
C	10-07-97	Geotextile Specification Table and Note No 8 amended.		
B	11-04-97	General Revisions		
A	31-01-96	Notes, rock and geotextile details amended		

DESIGNED: RJH
DRAWN: C.J.K.
CHECKED: GVE
RECOMMENDED: C.J. Kennerson
PROJ. MGR.
A1
DATUM: A.H.D.
APPROVED: W. Cordin

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KAWANA ESTATES PTY. LTD.

PARREARRA DEVELOPMENT

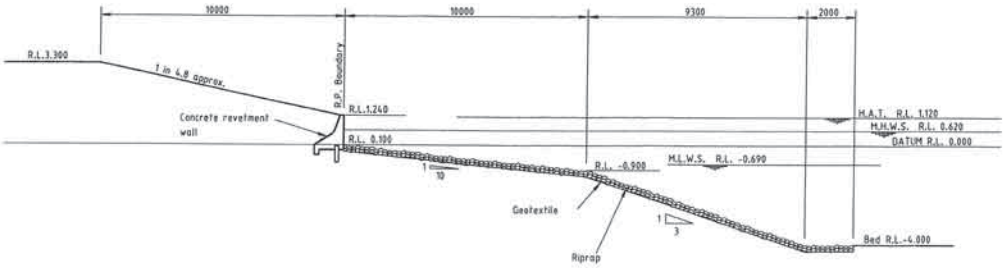
STRUCTURE 2

SCOUR PROTECTION SECTIONS AND DETAILS

DATE: 05-04-1996

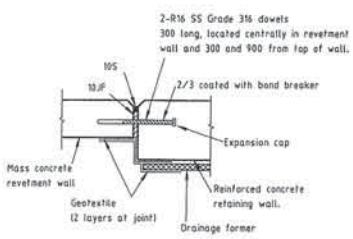
DRAWING No: 478/95 -7

Rev. D

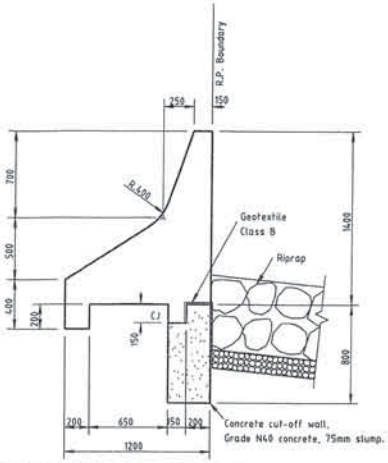


TYPICAL CANAL BANK PROFILE
1:100

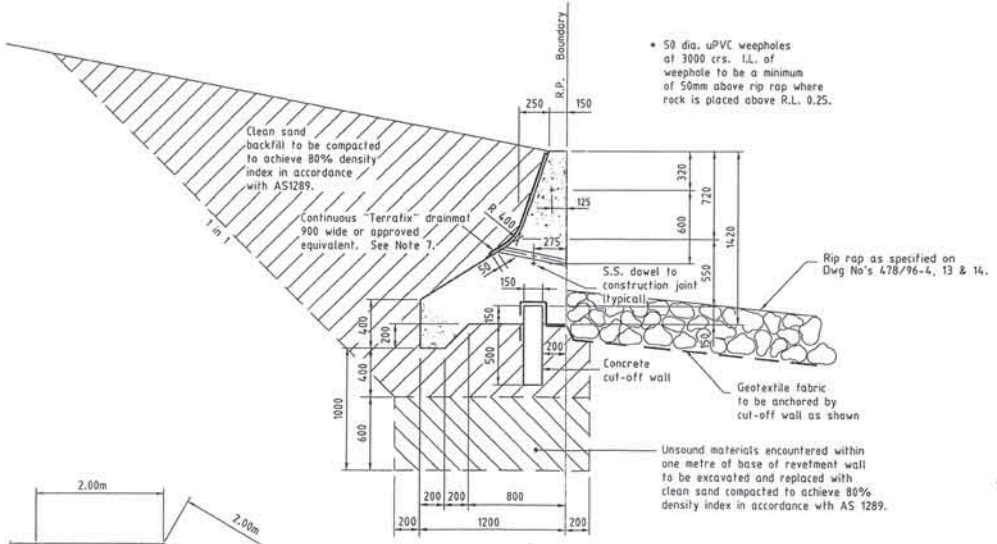
TYPICAL LAKE BANK PROFILE
1:100



EXPANSION JOINT - EJ 12
1:10



MODIFIED REVETMENT WALL AT TYPE E RIPRAP
1:20



REVETMENT WALL
Scale 1 : 20

LEGEND

BC 2 Coat Bitumen Paint before pouring second concrete

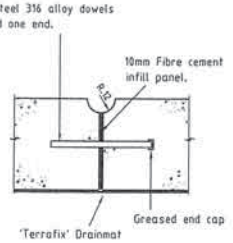
10JF 10 Joint Filler fixed to one face with 30 long copper nails at 200 centres)

10S Polyurethane Sealant 10x10 with polyethylene backing strip

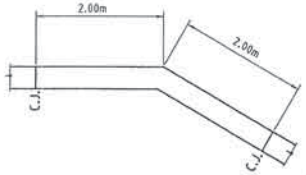
CJ Construction Joint

NOTES:

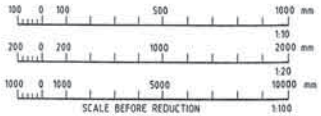
1. All concrete quality and construction procedures shall be in accordance with A.S.3600
2. Concrete shall be Class S40 as specified.
3. Concrete to be sprayed with approved curing membrane at the application rate specified by the manufacturer. Apply within 1 hour of concrete pour or as directed by the Superintendent.
4. All exposed edges shall be chamfered 25mm.
5. Construction joints to be at 6.00m centres.
6. A 3.00m return wall shall be constructed at the end of each stage of construction and backfilled to the specified standards.
7. 'Terrafix' drainmat to be continuously sealed each end with approved sealant. Lap in accordance with manufacturer's specifications.



CONSTRUCTION JOINT (C.J.)
N.T.S.



CORNER DETAIL
N.T.S.



AUTOCAD NAME: X95-82WS
DATE : 11-4-1997 TIME : 3:33 PM

Rv.	DATE	REVISIONS	REC.	APPR.
B	23-09-97	Typical profile levels revised.		
A	11-04-97	General Revisions		

DESIGNED: PLM
DRAWN: CJ
CHECKED: EJC
RECOMMENDED: PROJ. MAN.
A1
DATUM: A.H.D.
APPROVED: PROPRIETOR

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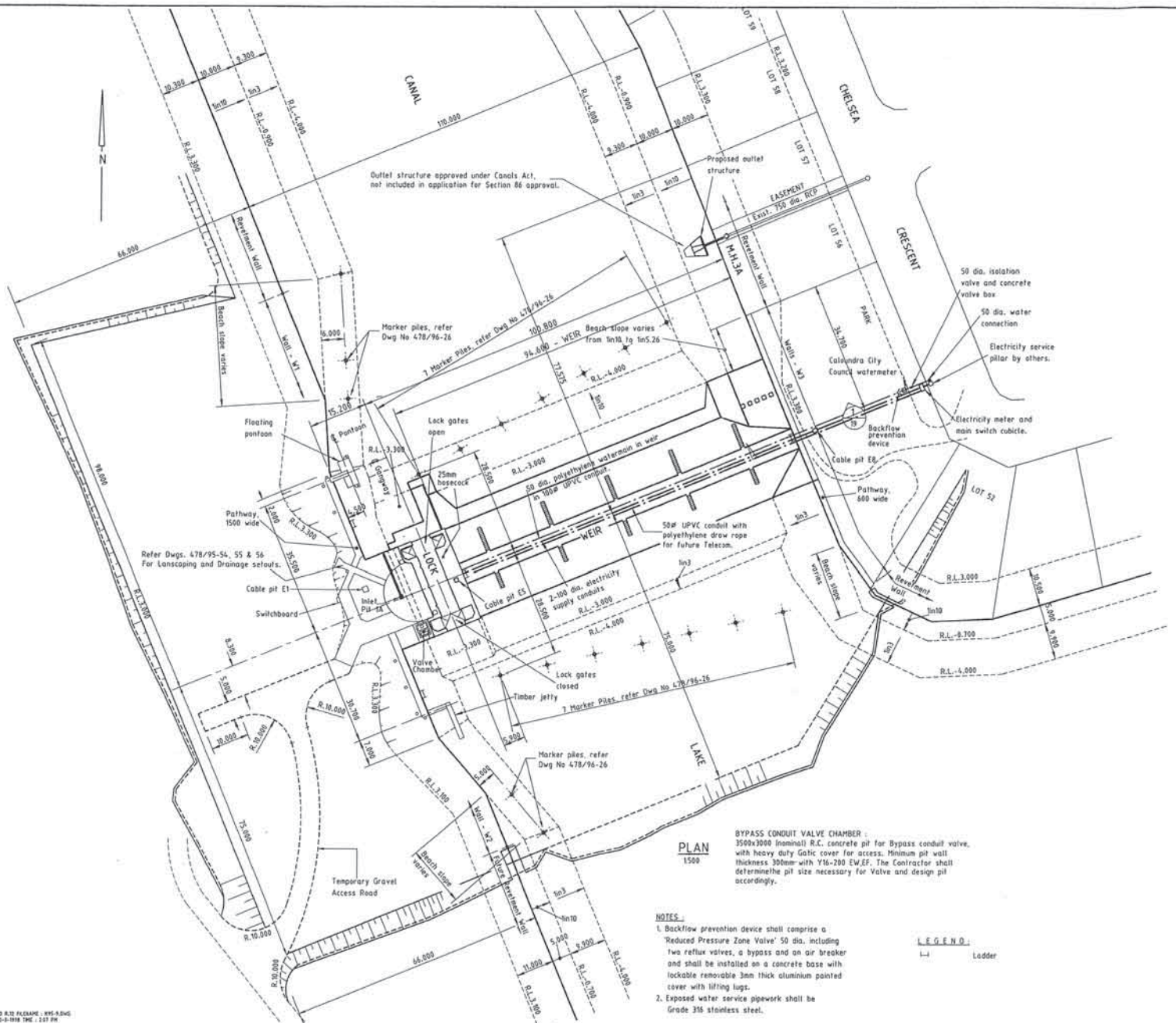
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 2
TYPICAL REVETMENT AND BANK PROFILES

DATE: 11-12-1996
DRAWING No: 478/95 -8
Rv. B



PLAN
1:500

BYPASS CONDUIT VALVE CHAMBER :
3500x3000 (nominal) R.C. concrete pit for Bypass conduit valve, with heavy duty Gatic cover for access. Minimum pit wall thickness 300mm with Y16-200 EW,EF. The Contractor shall determinethe pit size necessary for Valve and design pit accordingly.

NOTES :
1. Backflow prevention device shall comprise a 'Reduced Pressure Zone Valve' 50 dia. including two reflux valves, a bypass and an air breaker and shall be installed on a concrete base with lockable removable 3mm thick aluminium painted cover with lifting lugs.
2. Exposed water service pipework shall be Grade 316 stainless steel.

LEGEND :
Ladder

100 0 100 500 1000 mm
1:10
10 5 0 10 20 30 40 m
SCALES BEFORE REDUCTION 1:500

AUTOCAD R.13 FILENAME : KWS-9.DWG
DATE : 3-3-1998 TIME : 1:07 PM

Rv.	DATE	REVISIONS	REC.	APPR.
G	30-03-98	Cable pits E2 & E3 relocated.		
F	02-03-98	Drawing revised to suit Landscaping reqirements.		
E	29-10-97	Stormwater pipe from pit 1A revised.		
D	23-09-97	Allotment 181 and park levels revised. Cable pit E5 location changed.		
C	24-06-97	Marker pile details moved to Dwg No 478/96-26. Outlet structure note added.		
B	06-05-97	Bypass location changed.Lights changed.		
A	11-04-97	General Revisions		

DESIGNED:
DRAWN: C.J. Hoar
CHECKED: S.V.C.
RECOMMENDED: PROJ. MAN. C.J. Howarth
APPROVED: PROJ. DIR. Colin Tamblyn
DATUM: A.H.D.
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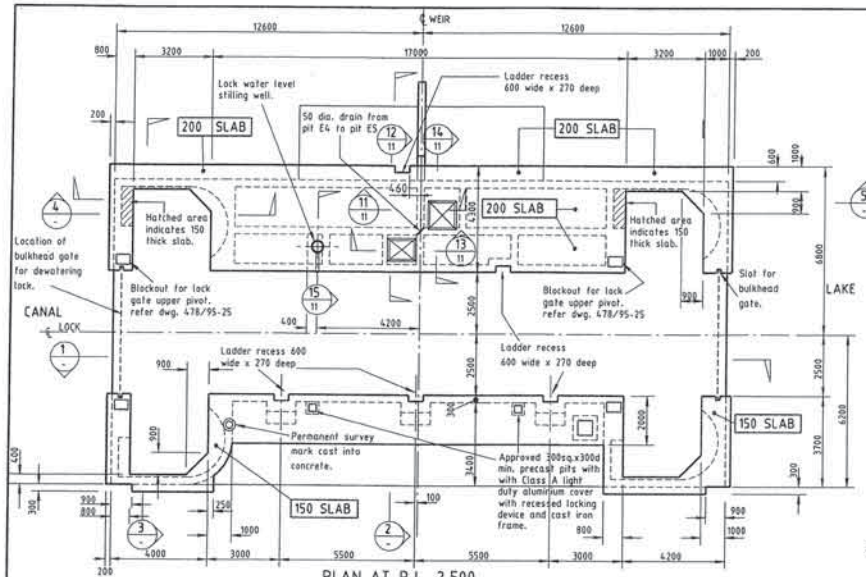
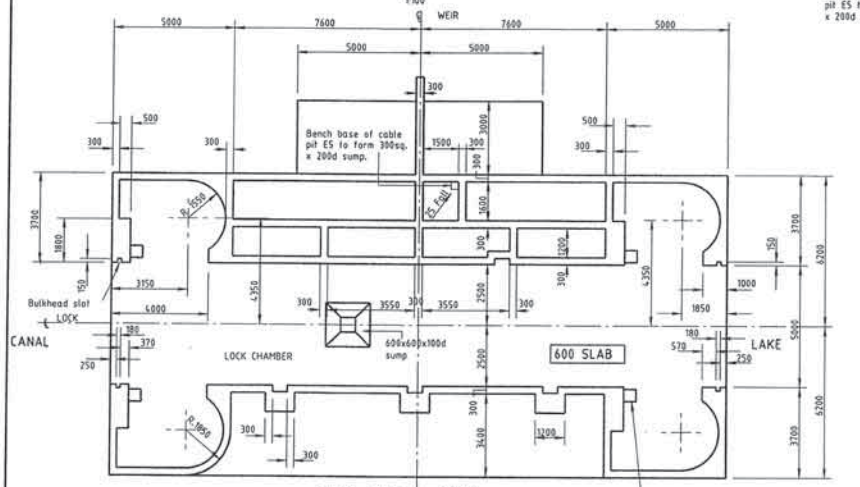
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 2
GENERAL ARRANGEMENT PLAN AND DETAILS

DATE: 11-12-1996
DRAWING No: 478/95 - 9
Rv. K J H G F E D C B A



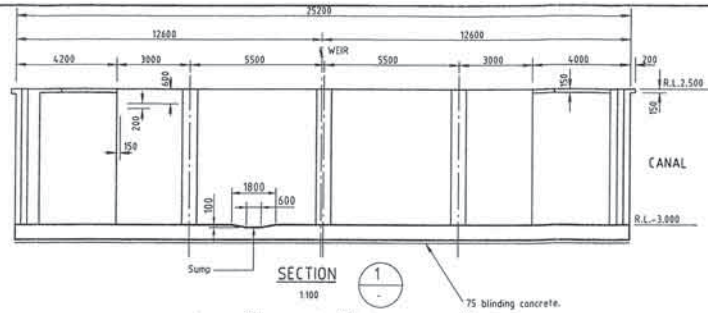
PLAN AT R.L. 2.500

1:100

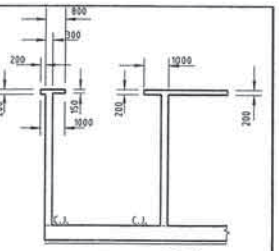


PLAN AT R.L. -3.000

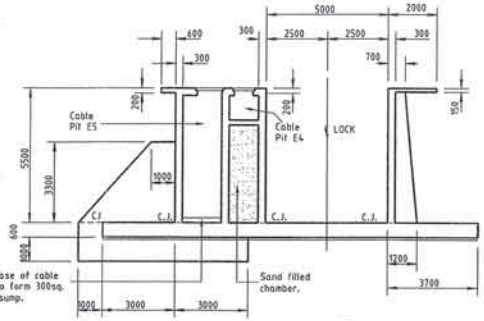
1:100



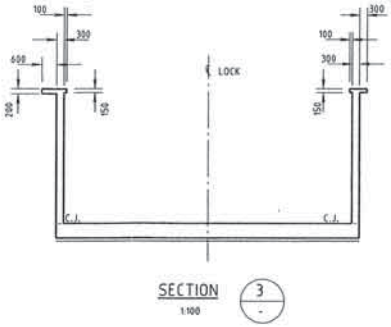
SECTION 1 1:100



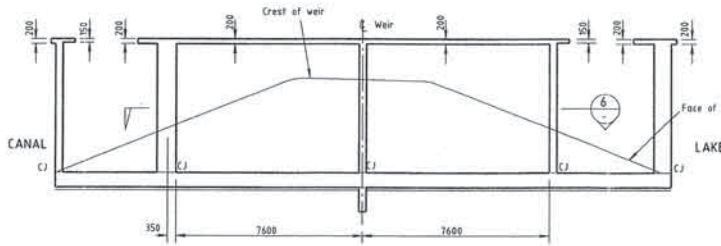
SECTION 4 1:100



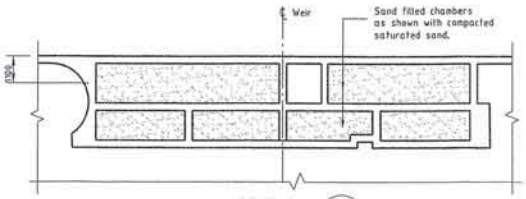
SECTION 2 1:100



SECTION 3 1:100



SECTION 5 1:100



SECTION 6 1:100

500 0 500 2500 5000 mm

1:50

1000 0 1000 5000 10000 mm

SCALE BEFORE REDUCTION 1:100

NOTES :

1. Concrete grades to lock, weir (except fibre reinforced concrete) and retaining walls shall be not less than :-
   (a) footings and base slabs - Grade N40
   (b) vertical walls - Grade N50 or S40 as specified
   (c) suspended slabs - Grade N40
2. Required cover to reinforcing steel shall be not less than :-
   (a) faces of vertical walls and other surfaces exposed to tidal or splash action - 65mm.
   (b) sides and upper surfaces of footings and base slabs - 50mm.
   (c) undersides of footings and base slabs - 60mm.
   (d) elsewhere - 45mm.
3. Design loading for concrete deck of lock - 5 kPa uniform loading
   - 10 kN concentrated load

LEGEND :
CJ Construction Joint

AUTOCAD NAME: K95-1LOWG
DATE : 11-4-1997 TIME : 3:25 PM

Rv.	DATE	REVISIONS	REC.	APPR.
F	02-03-98	Top slab revised, opposite to weir side of lock.		
E	28-01-98	Slab edge to weir side of lock changed to 200 thick.		
D	29-10-97	300sq. precast pits added.		
C	23-09-97	Cable pit E5 location revised.		
B	06-05-97	Bypass removed ladder recess added & minor rev.		
A	11-04-97	General Revisions		
G	27-03-98	Pit E3 moved to lock cover slab		

DESIGNED:
DRAWN:
CHECKED:
RECOMMENDED: PROJ. MAN.
APPROVED: PROJ. DIR.

A1 DATUM: A.H.D.

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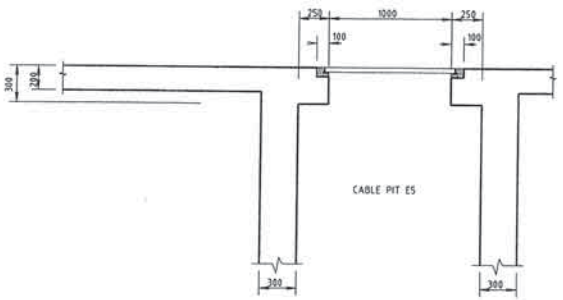
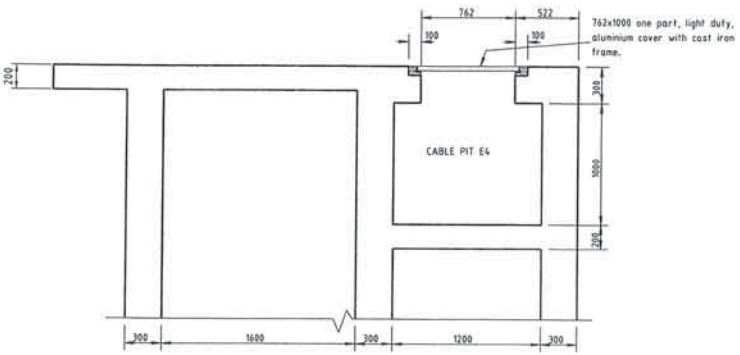
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE Z
LOCK STRUCTURE
CONCRETE PROFILES - SHEET No. 1

DATE: 11-12-1996
DRAWING No: 478/95 -10

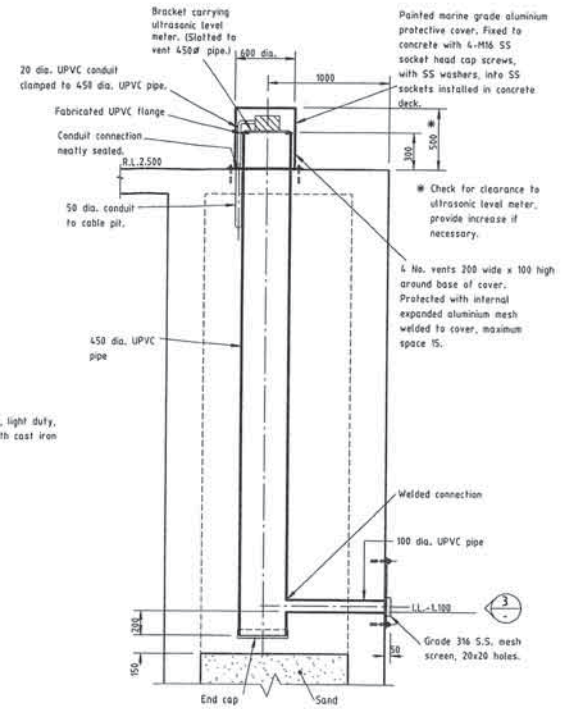
Rv. K J B K B G A



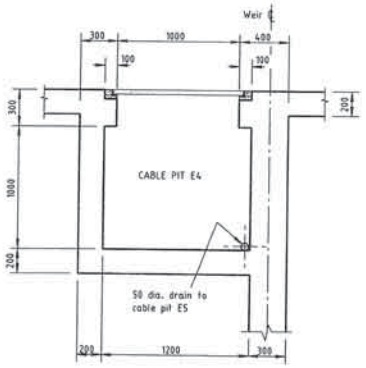
SECTION 1:20 11/10



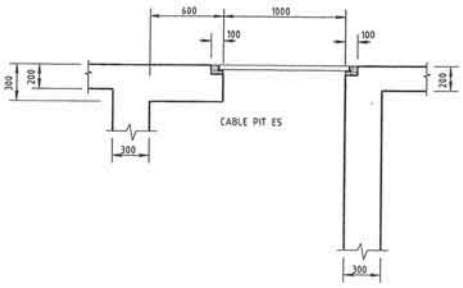
SECTION 1:20 12/10



SECTION 1:20 15/10

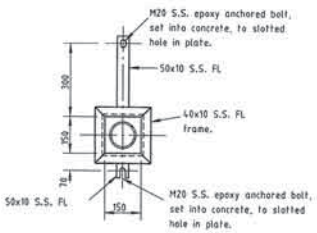


SECTION 1:20 13/10

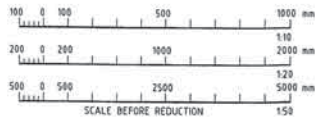


SECTION 1:20 14/10

STILLING WELL



ELEVATION 1:10 3/-



AUTOCAD NAME: KYG-11.DWG
DATE : 11-4-1997 TIME : 3:56 PM

Rv.	DATE	REVISIONS	REC.	APPR.
E	28-01-98	Stab edge at RL 2.500 at weir changed to 200 thick		
D	15-10-97	Notes on section 15 revised.		
C	23-09-97	Cable pit E5 added.		
B	06-05-97	Bypass channel removed		
A	11-04-97	General Revisions		

DESIGNED:
DRAWN: C.J. Nag
CHECKED:
RECOMMENDED:
APPROVED:
A1
DATUM: A.H.D.

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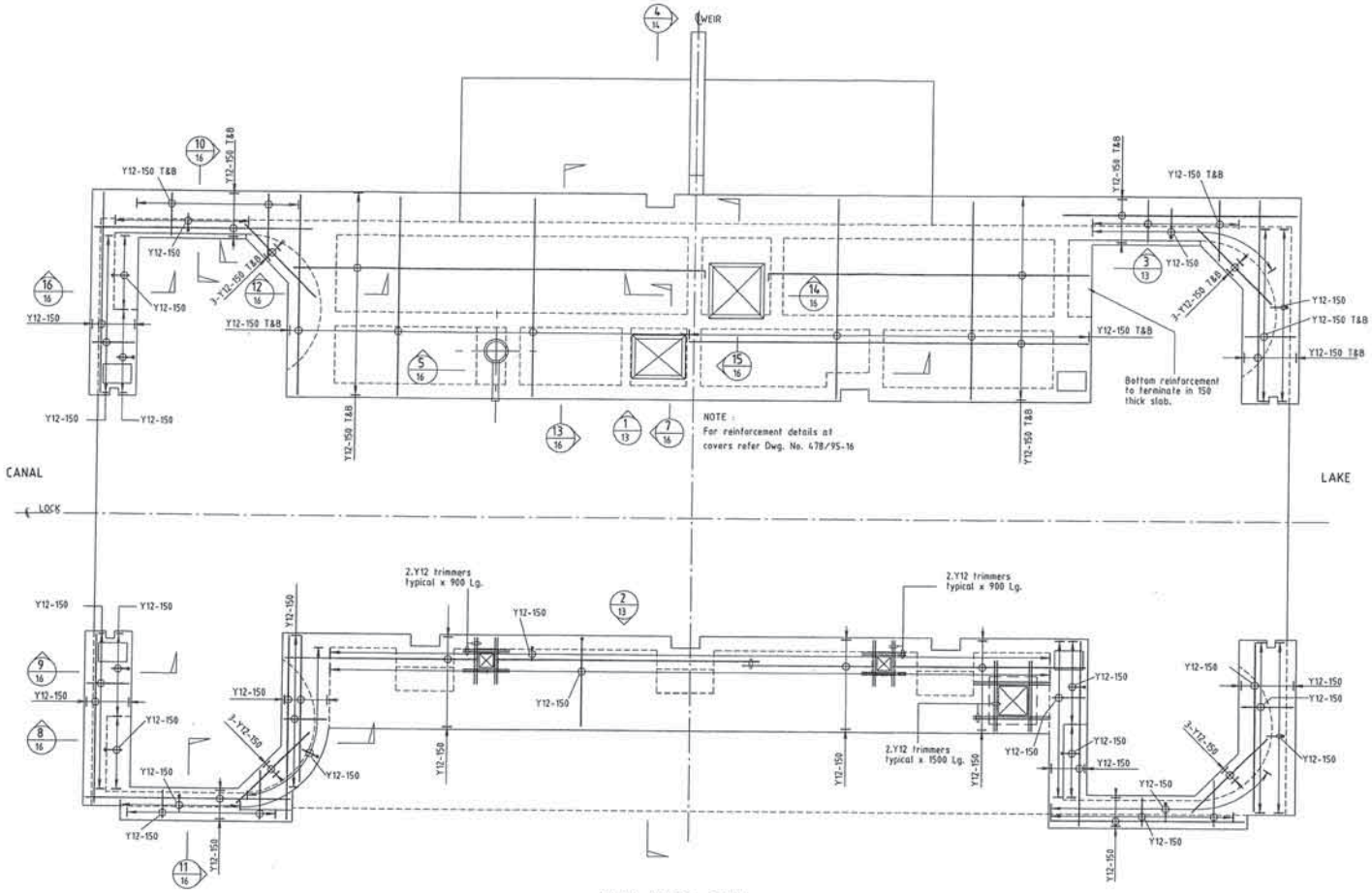
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 2
LOCK STRUCTURE
CONCRETE PROFILES - SHEET No. 2

DATE: 11-12-1996
DRAWING No: 478/95 - 11

Rv.



PLAN AT R.L. 2.500

1:50

NOTES :

1. Unless shown otherwise laps to wall reinforcement shall be:

Horizontal Bars :	Y12 = 375	Vertical Bars :	Y12 = 300
	Y16 = 500		Y16 = 400
	Y20 = 625		Y20 = 500
	Y24 = 750		Y24 = 600
	Y28 = 875		Y28 = 700
	Y32 = 1000		Y32 = 800

2. Unless shown otherwise laps to slab reinforcement shall be:

Top Face :	Y12 = 375	Bottom Face :	Y12 = 300
	Y16 = 500		Y16 = 400
	Y20 = 625		Y20 = 500
	Y24 = 750		Y24 = 600
	Y28 = 875		Y28 = 700
	Y32 = 1000		Y32 = 800

3. Locate reinforcement to clear blockouts for actuators, zero cover to blockouts permitted.
4. Check for embedded bolts, sockets, pipework, conduits, embedded metal etc. prior to pouring concrete.

500 0 500 2500 5000 mm

SCALE BEFORE REDUCTION 1:50

AUTOCAD NAME: K95-12.DWG
DATE : 11-4-1997 TIME : 3.07 PM

Rv.	DATE	REVISIONS	REC.	APPR.
G	27-03-98	Cable pit E3 moved to lock cover slab.		
F	24-02-98	Top slab revised, opposite to weir side of lock.		
E	28-01-98	Ladder recess added to eastern side of lock		
D	29-10-97	300sq. pits added.		
C	23-09-97	Cable Pit E5 added.		
B	06-05-97	Bypass channel removed, ladder recess added.		
A	11-04-97	General Revisions		

DESIGNED:
DRAWN: C.J. Harg
CHECKED:
RECOMMENDED: PROJ. MAN. D.J. Howard
APPROVED: PROJ. DIR. G.G. Tomlyn

A1 DATUM: A.H.D.

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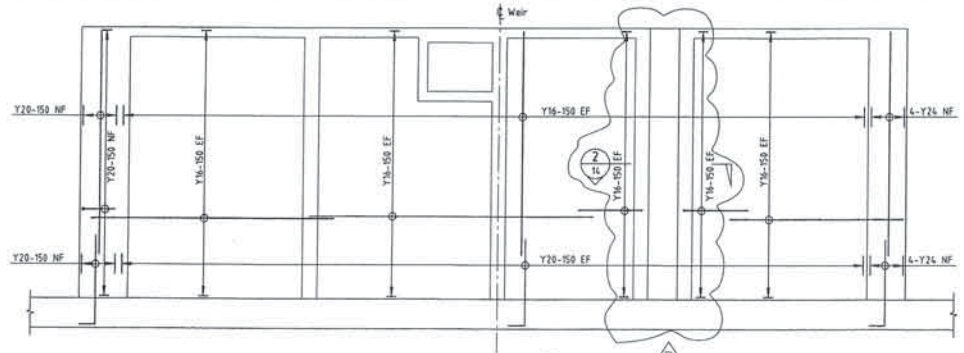
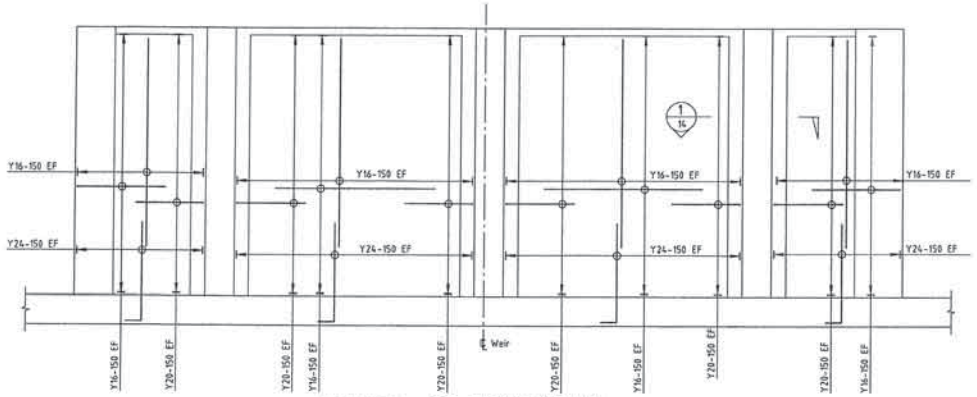
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 2
LOCK STRUCTURE
REINFORCEMENT DETAILS - SHEET No.1

DATE: 11-12-1996
DRAWING No: 478/95 -12
Rv. G

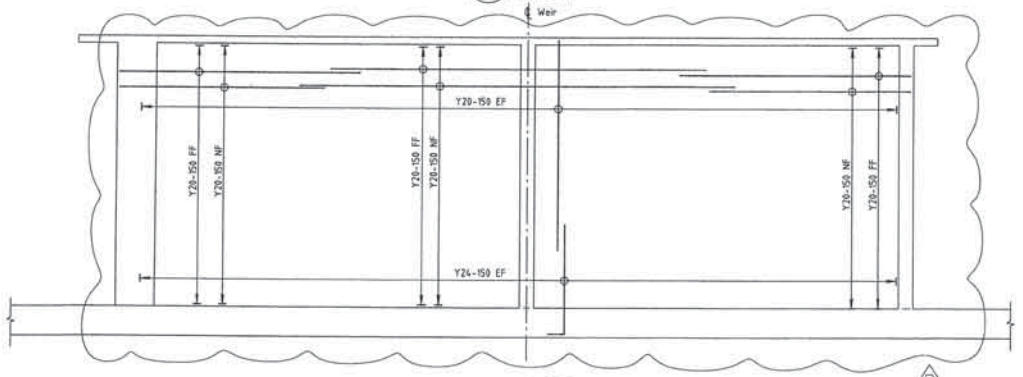


ELEVATION 1/12
1:50

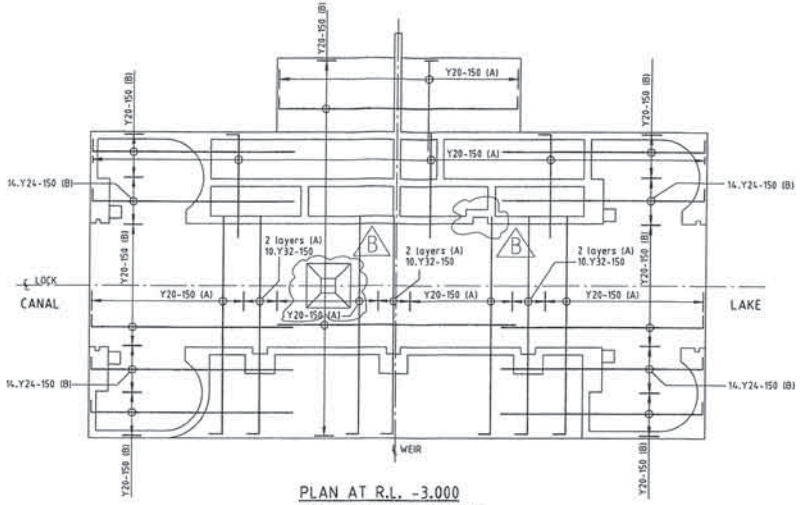


ELEVATION 2/12
1:50

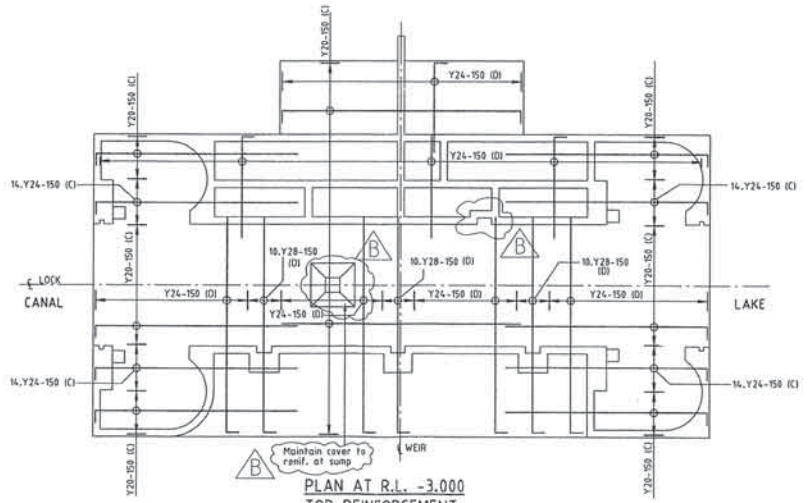
For Buttress Reinforcement
Refer Section 1 and Dwg. No.
478/95-14.



SECTION 3/12
1:50



PLAN AT R.L. -3.000
BOTTOM REINFORCEMENT
1:100



PLAN AT R.L. -3.000
TOP REINFORCEMENT
1:100

1 0 1 5 10 m
1:100
500 0 500 2500 5000 mm
SCALE BEFORE REDUCTION 1:50

AUTOCAD NAME: KRS-13.DWG
DATE : 31-4-1997 Time : 3:32 PM

No.	DATE	REVISIONS	REC.	APPR.
C	23-09-97	Cable pit ES added.		
B	06-05-97	Bypass channel removed, ladder recess added		
A	11-04-97	General Revisions		

No.	DATE	REVISIONS	REC.	APPR.

DESIGNED: PKM
DRAWN: C.J.Hay
CHECKED: GK
RECOMMENDED: PROJ. MAN. R.J.Hewson.

DATUM: A.H.D.
APPROVED: PROJ. DIR.

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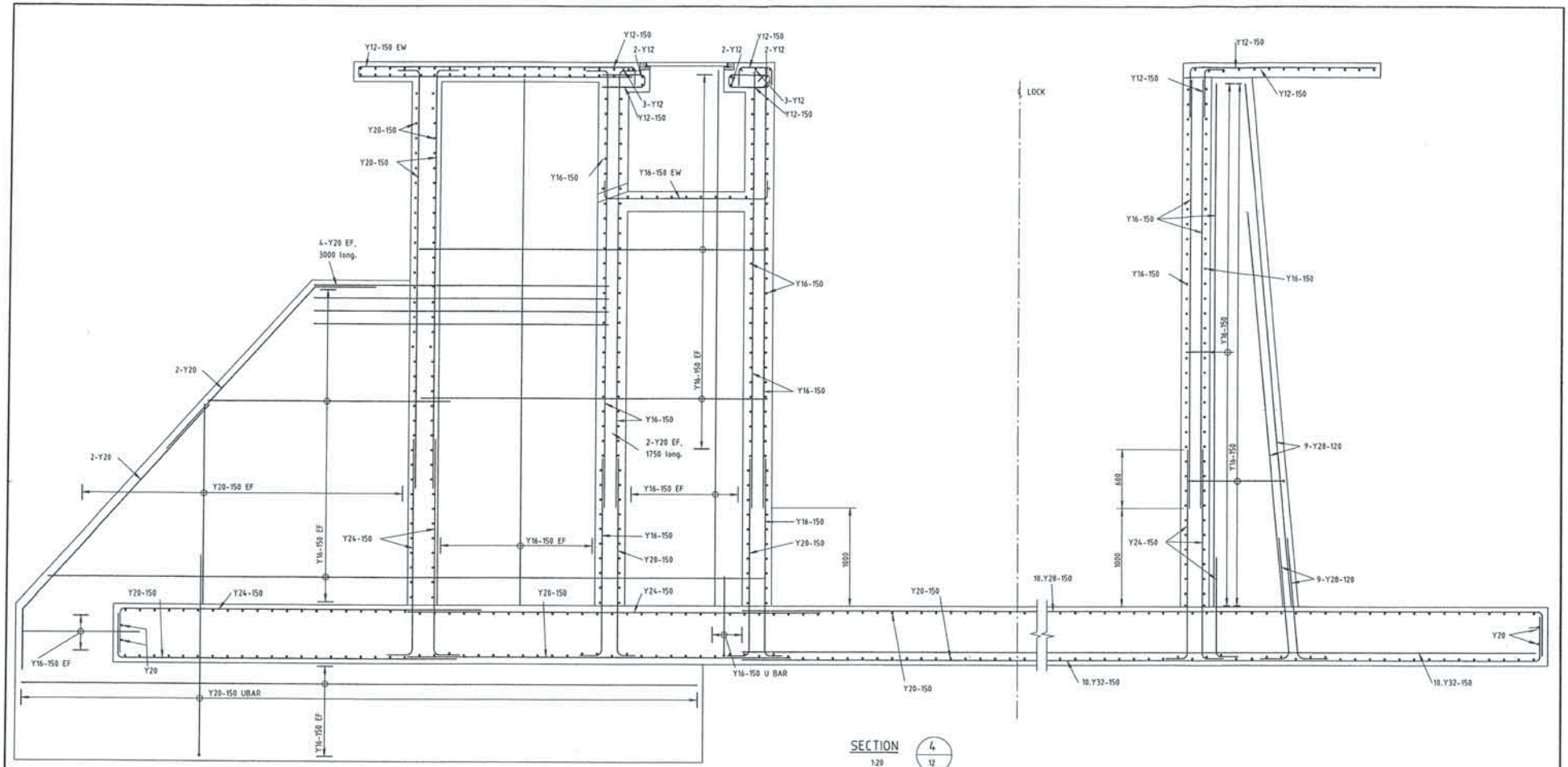
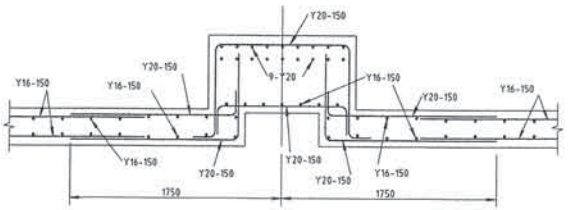
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 2
LOCK STRUCTURE
REINFORCMENT DETAILS - SHEET No.2

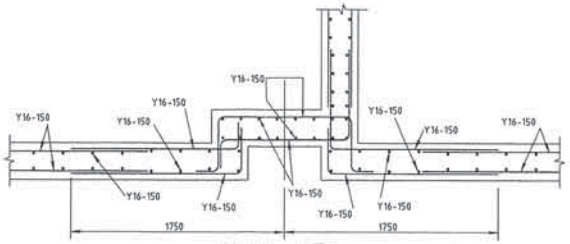
DATE: 11-12-1996
DRAWING No: 478/95 - 13
C
B
A
Rv.



SECTION 4 / 12
1:20



SECTION 1 / 13
1:20



SECTION 2 / 13
1:20

200 0 200 1000 2000 mm
SCALE BEFORE REDUCTION 1:20

AUTOCAD NAME: K95-14.DWG

Rv.	DATE	REVISIONS	REC.	APPR.
E	24-02-98	Top slab revised, opposite to weir side of lock.		
D	28-01-98	Slab edge at RL 2,500 at weir changed to 200 thick		
C	08-10-97	Notes to reinf. to section 4/12 revised		
B	06-05-97	Bypass channel removed, Ladder recess added		
A	11-04-97	General Revisions		

DESIGNED: [illegible]
DRAWN: [illegible]
CHECKED: [illegible]
RECOMMENDED: PROJ. MAN.: [illegible]
APPROVED: PROJ. [illegible]
A1
DATUM: A.H.D.

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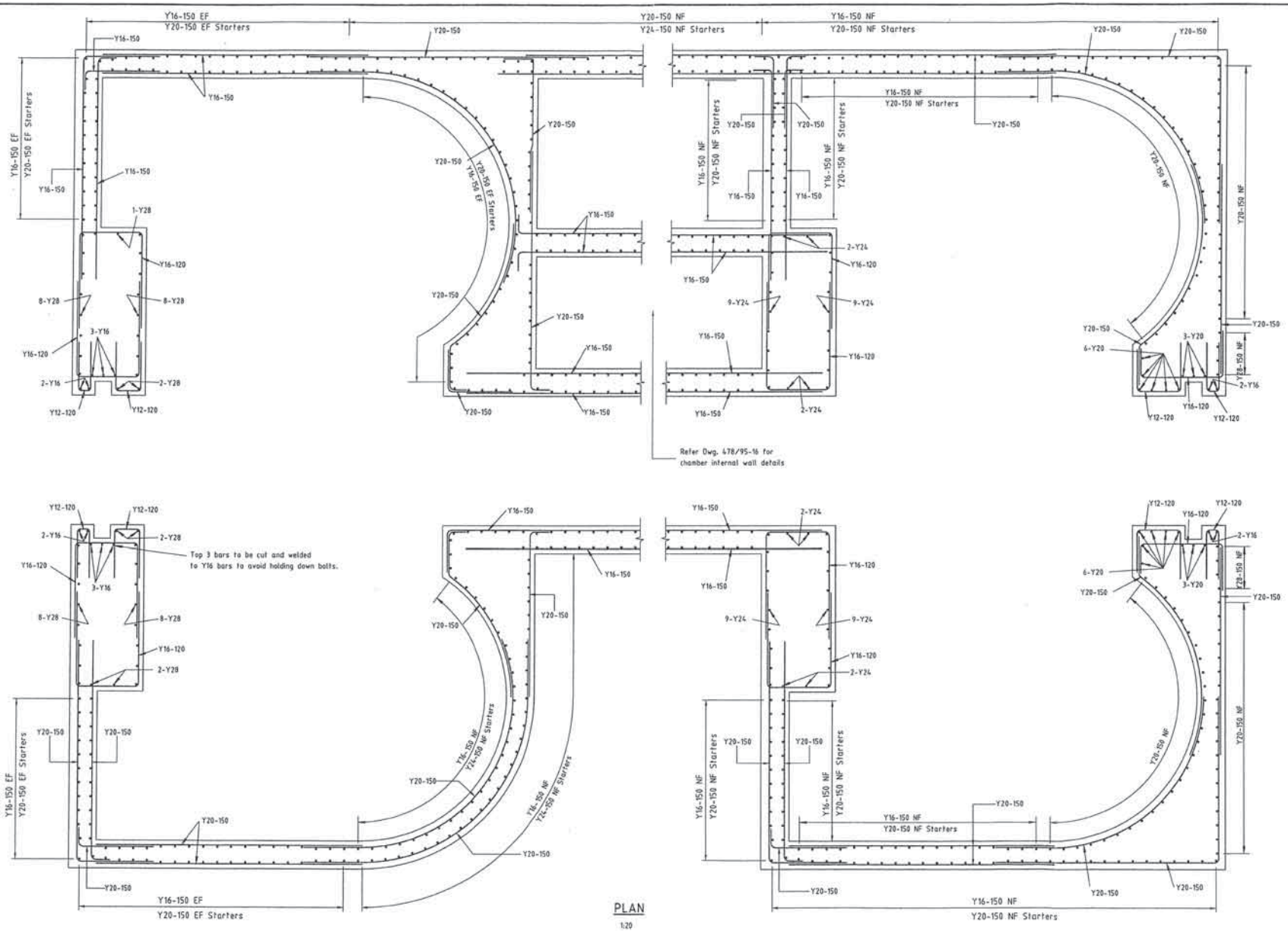
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE Z
LOCK STRUCTURE
REINFORCEMENT DETAILS - SHEET No.3

DATE: 11-12-1996
DRAWING No: 478/95 - 14



PLAN

1:20

REINFORCEMENT TO WALLS AT GATE RECESSES

(TOP SLAB NOT SHOWN FOR CLARITY)

NOTE:
Provide starter bars to match vertical wall reinforcement U.N.O.. 300 bottom cog. Lap as follows :- Y16 - 600, Y20 - 800 Y24 - 1000, Y28 - 1100.

SCALE BEFORE REDUCTION 1:20

Rv.	DATE	REVISIONS	REC.	APPR.
D	06-10-1997	Y20 horizontal reinf. shown		
C	29-09-97	Starter bar notes added		
B	06-05-97	Bypass channel removed		
A	11-04-97	General Revisions		

DESIGNED: DRAWN: CHECKED: RECOMMENDED: ROLL MAIN. APPROVED PROJ. MGR.

A1 DATUM: A.H.D.

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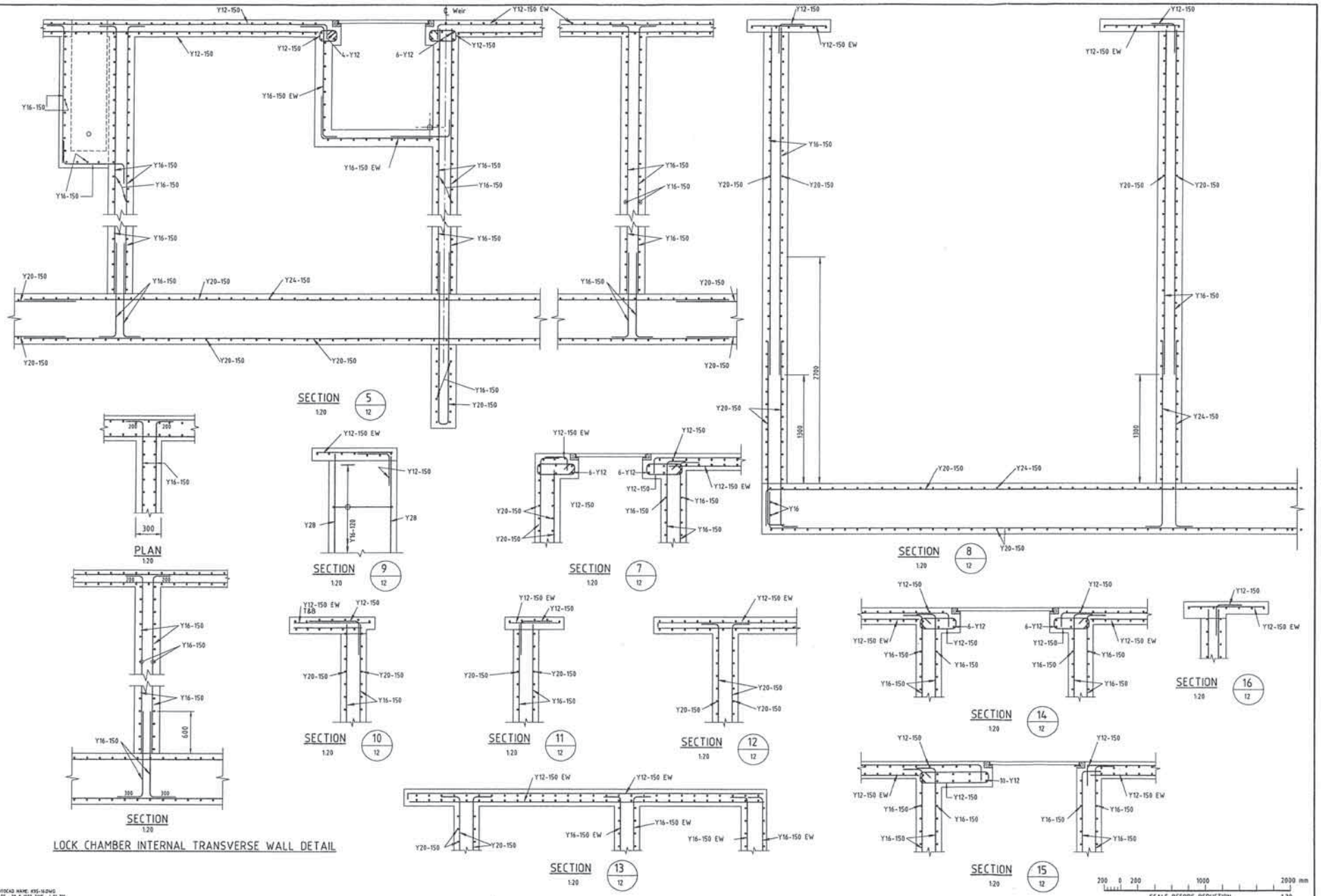
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE Z
LOCK STRUCTURE
REINFORCEMENT DETAILS - SHEET No.4

DATE: 11-12-1996
DRAWING No: 478/95 - 15



AUTOCAD NAME: KYS-16.DWG
DATE : 21-1-1997 TIME : 4:58 PM

No.	DATE	REVISIONS	REC.	APPR.
D	28-01-98	Section 16/12 added.		
C	29-09-97	Lock chamber internal wall details added.		
B	06-05-97	Bypass channel removed		
A	11-04-97	General Revisions		

DESIGNED: C.J. Hay
DRAWN:
CHECKED:
RECOMMENDED: ENGG. MGR.
APPROVED: CHIEF ENGR.
DATUM: A.H.D.
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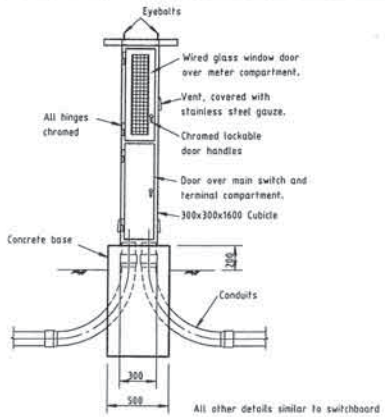
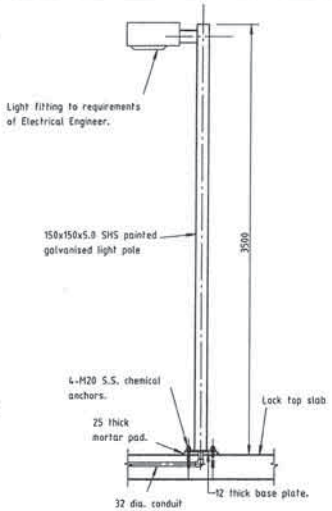
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 2
LOCK STRUCTURE
REINFORCEMENT DETAILS - SHEET No.5

DATE: 11-12-1996
DRAWING No:
478/95 - 16
Rv. D



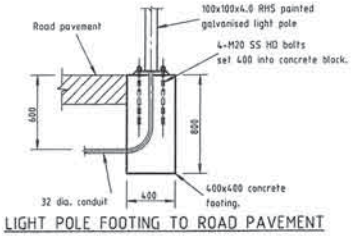
ELECTRICITY METER AND MAIN SWITCH CUBICLE

1:20



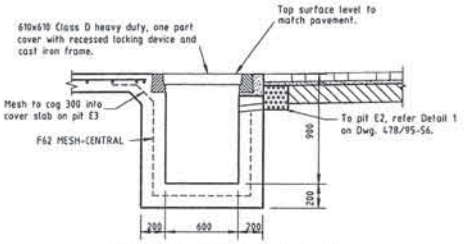
LIGHT POLE DETAILS (PL)

1:20



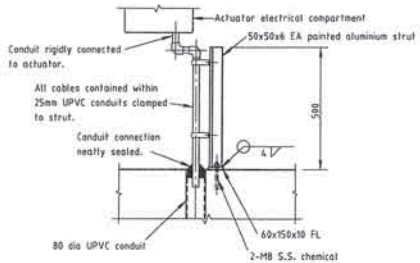
LIGHT POLE FOOTING TO ROAD PAVEMENT

1:20



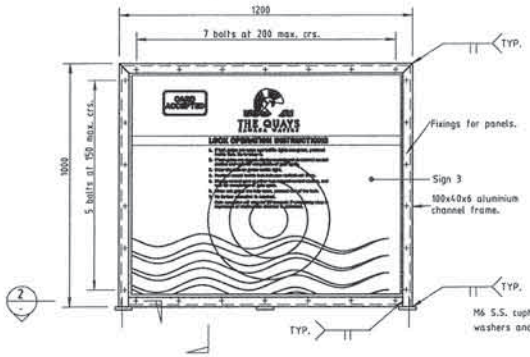
CABLE PIT E2 AND E3 DETAIL

1:20



CONDUIT CONNECTION TO GATE ACTUATOR

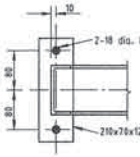
1:10



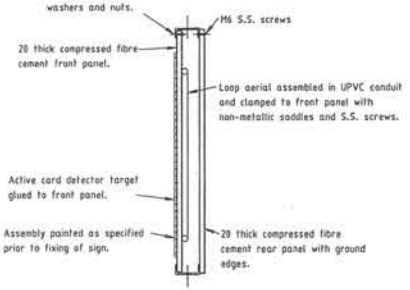
REMOTE CONTROL STATION TO TIMBER JETTY / FLOATING PONTOON

ELEVATION

1:10



SECTION 2 / 1:5



SECTION 1 / 1:10

200 0 200 1000 2000 mm — 1:20

100 0 100 500 1000 mm — 1:10

50 0 50 250 500 mm — 1:5

SCALE BEFORE REDUCTION

AUTOCAD R.14 FILENAME : KWS-18.DWG
DATE : 14-5-1998 TIME : 12:32 PM

Rv.	DATE	REVISIONS	REC.	APPR.
F	11-05-98	"Remote Control ____ Elevation" and Section 1 amended.		
E	30-03-98	Cable pit E2/E3 revised.		
D	29-10-97	Target size to Remote control station revised.		
C	30-09-97	Cover to cable E2 & E3 revised.		
B	06-05-97	Provisional detail removed		
A	11-04-97	General Revisions		

DESIGNED:
DRAWN: C.J. Hogg
CHECKED:
RECOMMENDED:
APPROVED:
DATUM: A.H.D.
A1

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KAWANA ESTATES PTY. LTD.

PARREARRA DEVELOPMENT

STRUCTURE 2

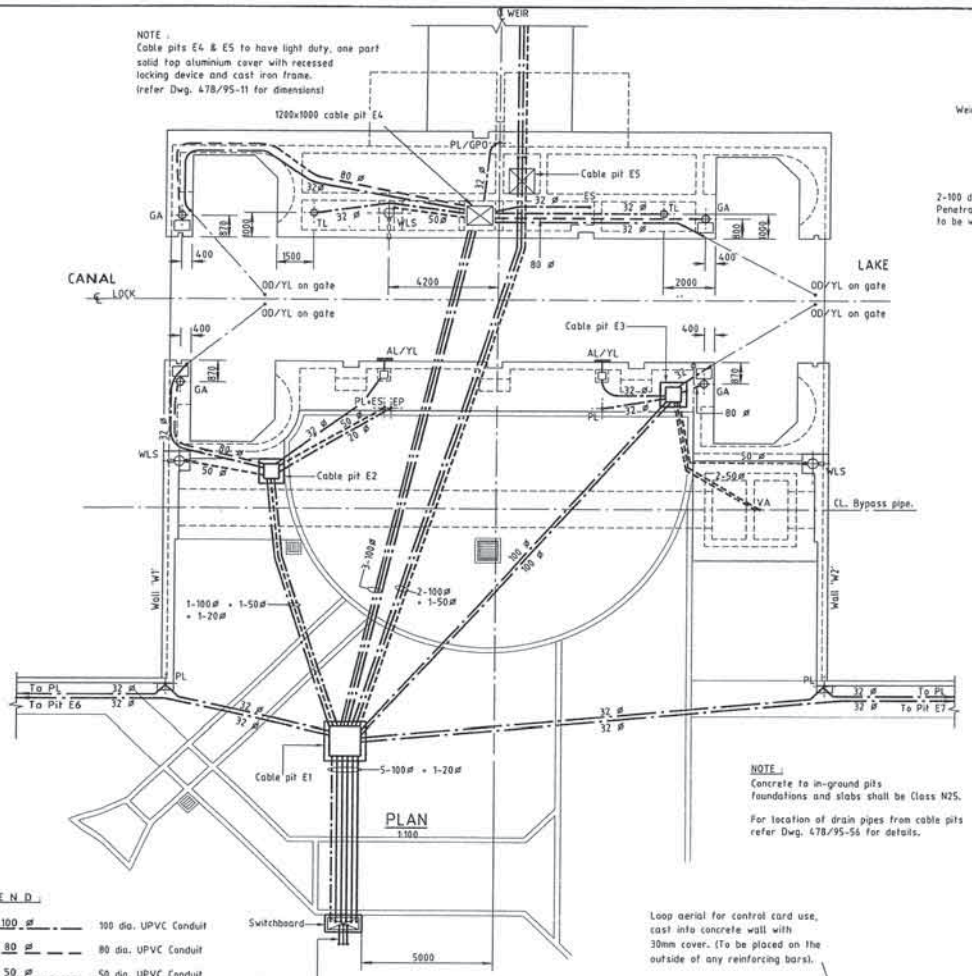
LOCK STRUCTURE

MISCELLANEOUS CONDUIT AND ELECTRICAL DETAILS

DATE: 12-12-1996

DRAWING No.: 478/95 - 18

Rv.
F
E
D
C
B
A



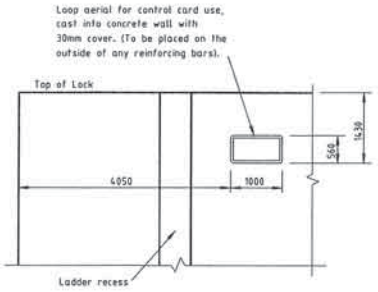
PLAN
1:100

NOTE
Concrete to in-ground pits foundations and slabs shall be Class N25.

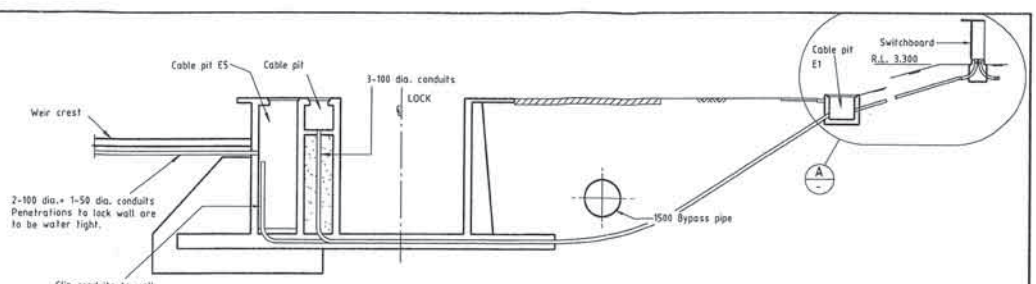
For location of drain pipes from cable pits refer Dwg. 478/95-56 for details.

LEGEND

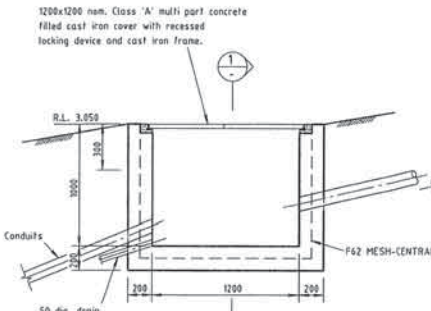
100 ø	100 dia. UPVC Conduit
80 ø	80 dia. UPVC Conduit
50 ø	50 dia. UPVC Conduit
32 ø	32 dia. UPVC Conduit
20 ø	20 dia. UPVC Conduit
AL	Local Loop Aerial for Lock Remote Control Station
EP	Emergency Phone
ES	Emergency Stop
GA	Gate Actuator
GPO	Waterproof Power Outlet (mounted on pole)
OD	Obstruction Detector
PL	Pole Light
TL	Traffic Lights
VA	Valve Actuator
WLS	Water Level Sensor
YL	Yellow Flashing Light



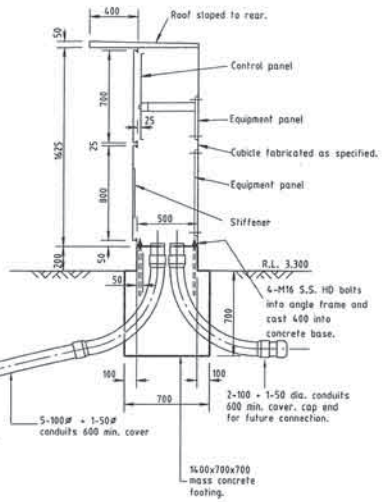
LOOP AERIAL FOR LOCK REMOTE CONTROL STATIONS (AL)
1:50

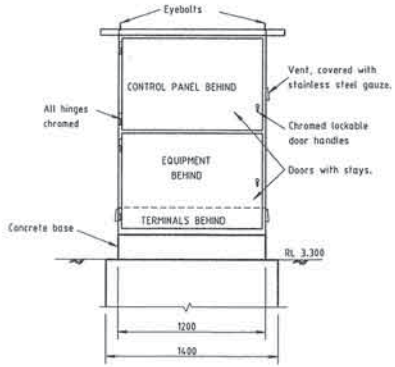


SECTION ALONG CONDUITS IN BASE SLAB
1:100

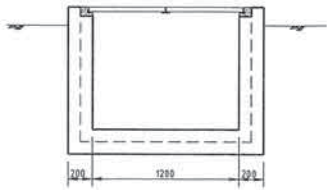


DETAIL A
1:20





SWITCHBOARD ELEVATION
1:20



SECTION 1
1:20

200 0 200 1000 2000 mm
1:20
500 0 500 2500 5000 mm
1:50
1000 0 1000 5000 10000 mm
SCALE BEFORE REDUCTION 1:100

AUTOCAD R.12 FILENAME : K95-17.DWG
DATE : 24-3-1998 TIME : 4:12 PM

Rev.	DATE	REVISIONS	REC.	APPR.
J	07-04-98	Cable pitE1 dimensions revised.		
H	27-03-98	Cable pits E2 & E3 moved, pit E1 dimensions revised.		
G	02-03-98	General Revisions to suit Landscaping requirements.		
F	28-01-98	General Revisions to suit Landscaping requirements.		
E	29-10-97	50ø drain from pits E2 & E3 revised. 300sq precast pit added.		
D	09-10-97	Conduit sizes and 50ø drain from pit E1 revised.		
C	22-09-97	Cable pit E5 location changed + minor revisions.		
B	06-05-97	Switchboard moved, changes to suit bypass pipe		
A	11-04-97	General Revisions		

DESIGNED:
DRAWN:
CHECKED:
RECOMMENDED:
APPROVED:
PROJ. DIR.
A1
DATUM: A.H.D.

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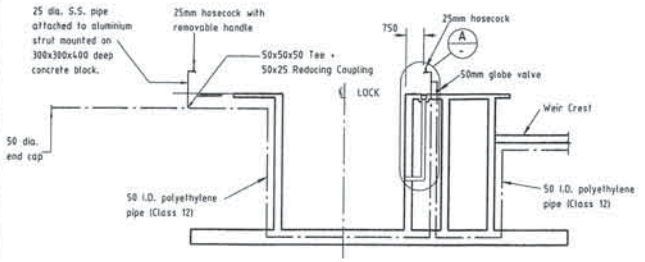
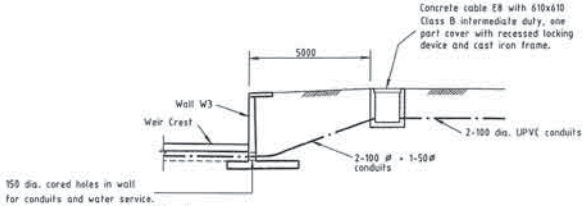
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 2
LOCK STRUCTURE
CONDUIT PLAN AND DETAILS

DATE: 11-12-1996
DRAWING No: 478/95 -17



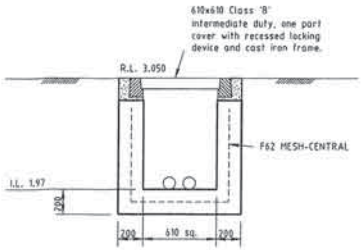
SECTION ALONG WATERSERVICE IN BASE SLAB

1:100



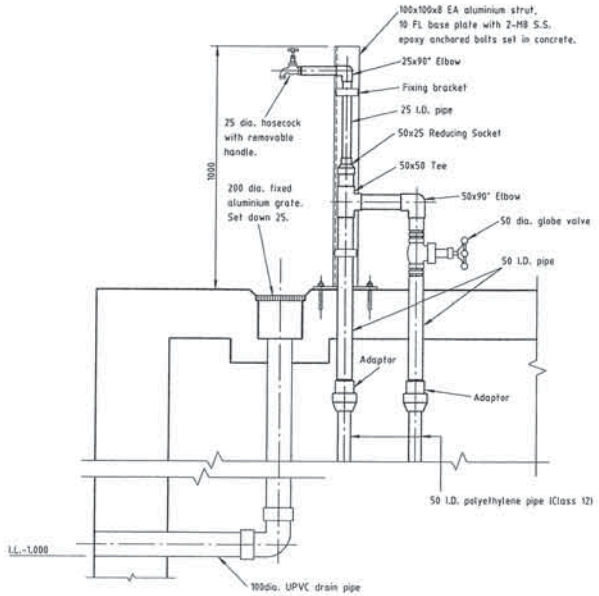
SECTION 1/9

1:100



CABLE PIT E8 DETAIL

1:20



DETAIL A

1:10

Note : Contractor shall allow for water supply to Hydraulic Actuators to bypass valve system if required by that system. This is not shown on the drawings.

NOTES :

1. All exposed pipework and fittings shall be Grade 316 stainless steel.
2. All buried pipework and fittings shall be polyethylene.

100 0 100 500 1000 mm

1:10

1000 0 1000 5000 10000 mm

SCALE BEFORE REDUCTION 1:100

AUTOCAD NAME: K95-10.DWG
DATE : 15-4-1997 TIME : 3:18 PM

Rv.	DATE	REVISIONS	REC.	APPR.
E	02-03-98	Section 3/9 revised and Cable Pit E8 Detail added		
D	29-10-97	Section 3/9 revised.		
C	23-09-97	Section 3/9 revised.		
B	6-05-97	Note added		
A	11-04-97	General Revisions		

DESIGNED:
DRAWN:
CHECKED:
RECOMMENDED:
PROJ. MAN.

A1

DATUM: A.H.D.

APPROVED:
PROJ. DIR.

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KAWANA ESTATES PTY. LTD.

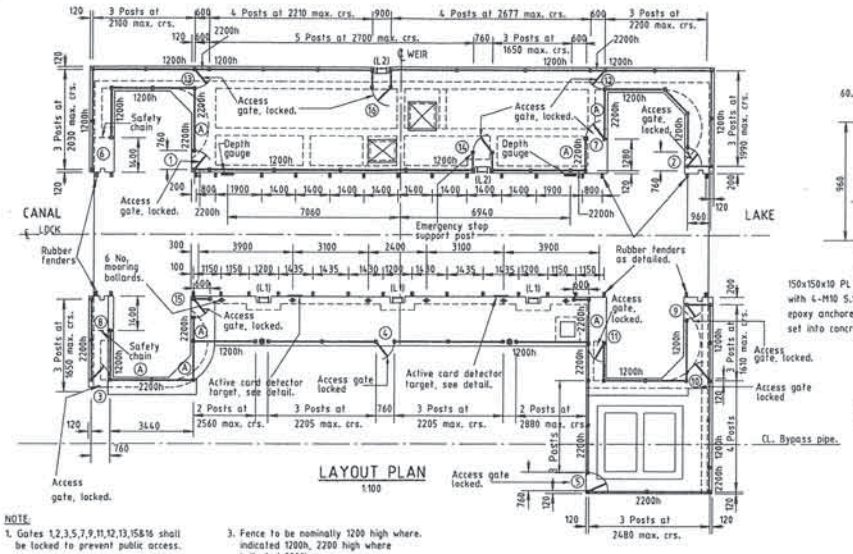
PARREARRA DEVELOPMENT
STRUCTURE 2
LOCK AND WEIR STRUCTURE
WATER SERVICE DETAILS

DATE: 12-12-1996

DRAWING No.

478/95 -19

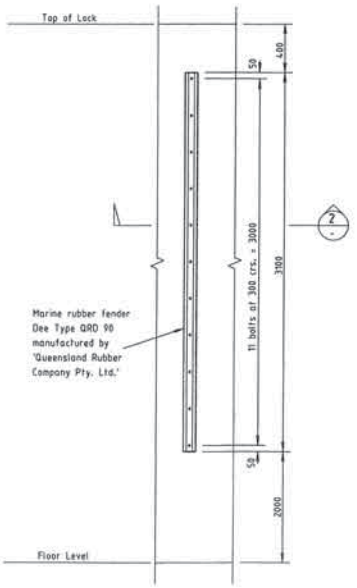
Rv.



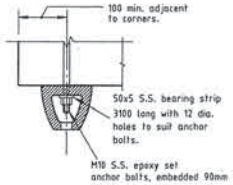
LAYOUT PLAN
1:100

NOTE:

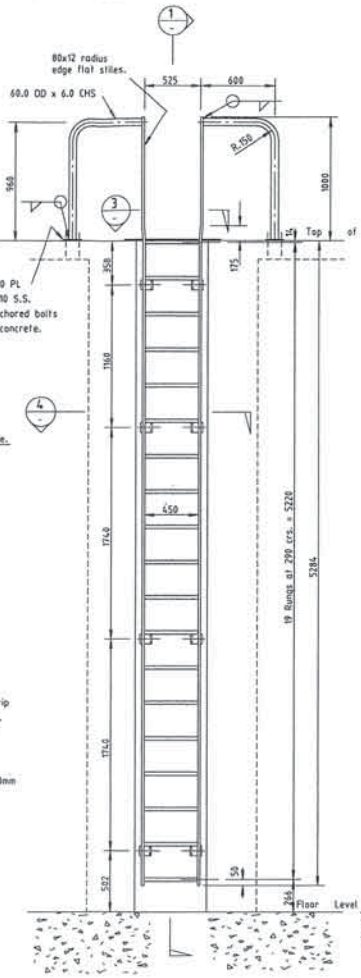
1. Gates 1,2,3,5,7,9,11,12,13,15&16 shall be locked to prevent public access.
2. Fence panels marked A & gates 1 & 7 shall have an additional bottom rail and vertical bars at 75mm crs.
3. Fence to be nominally 1200 high where indicated 1200h, 2200 high where indicated 2200h.
4. Ladders Type L1 and Type L2 as detailed, for base plate and bolt setout refer Dwg. 478/95-53.
5. Gates 1, 3, 5, 7, 12, 13 & 15 are to be 2200 high.



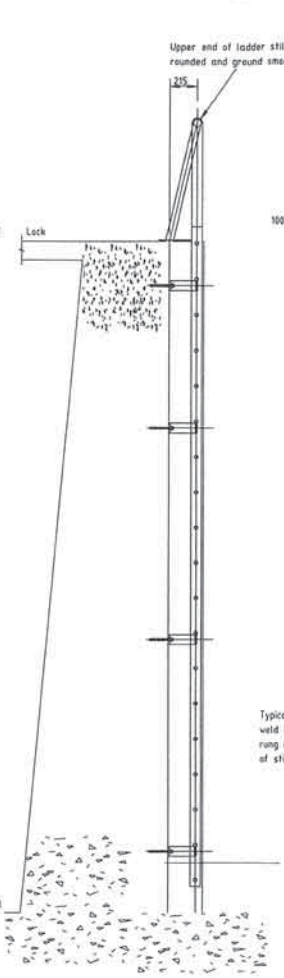
RUBBER FENDER DETAILS
NOT TO SCALE



SECTION
1:5



ELEVATION LADDER TYPE L1
1:20
Ladder Type L2 Similar Refer Elevation A for variation.

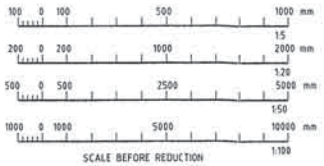


SECTION
1:20

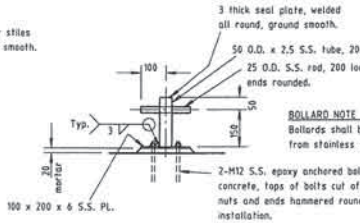
LADDER DETAILS

LADDER NOTES :

1. Ladders and brackets shall be fabricated from aluminium alloy 6061 to Temper T6.
2. All welds shall be 6mm continious fillet using filler alloy 5356.
3. Welding shall be in accordance with A.S.1665.
4. Bolts, nuts and washers shall be stainless steel Type 316.
5. Washers shall be used under all bolt heads and nuts.
6. Apply a slip resistant coating to all ladder rungs.

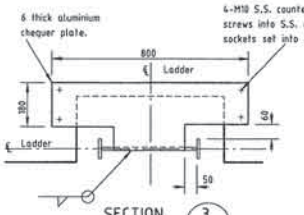


SCALE BEFORE REDUCTION

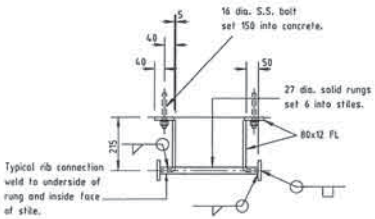


BOLLARD NOTE :
Bollards shall be fabricated from stainless steel Grade 316.

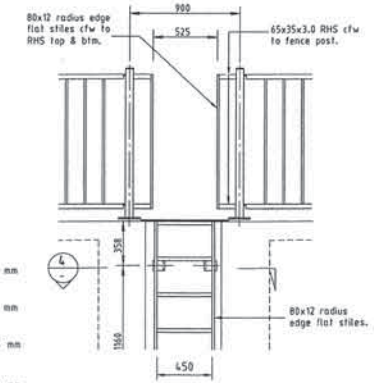
DETAIL OF BOLLARD
1:10



SECTION 3
1:10



SECTION 4
1:10



ELEVATION A
Ladder Type L2
1:20

AUTOCAD R/E FILENAME : KYS-26.DWG
DATE : 14-5-1998 TIME : 12:37 PM

Rev.	DATE	REVISIONS	REC.	APPR.
F	11-05-98	Details for Signs MK.1 and Caution sign deleted. Note 1 amended.		
		"Depth Gauge" and "Lock Remote Control Station" details deleted.		

Rev.	DATE	REVISIONS	REC.	APPR.
E	27-03-98	Cable pit E3 moved to lock cover slab.		
D	28-01-98	Fence layout revised to suit lock top slab.		
C	23-06-97	Cable pit E5 added.		
B	06-05-97	Fence heights changed, Bypass channel removed.		
A	11-04-97	General Revisions		

DESIGNED: [illegible]
DRAWN: C.J. Hagan
CHECKED:
RECOMMENDED: [illegible]
APPROVED: [illegible]
DATUM: A.H.D.
A1

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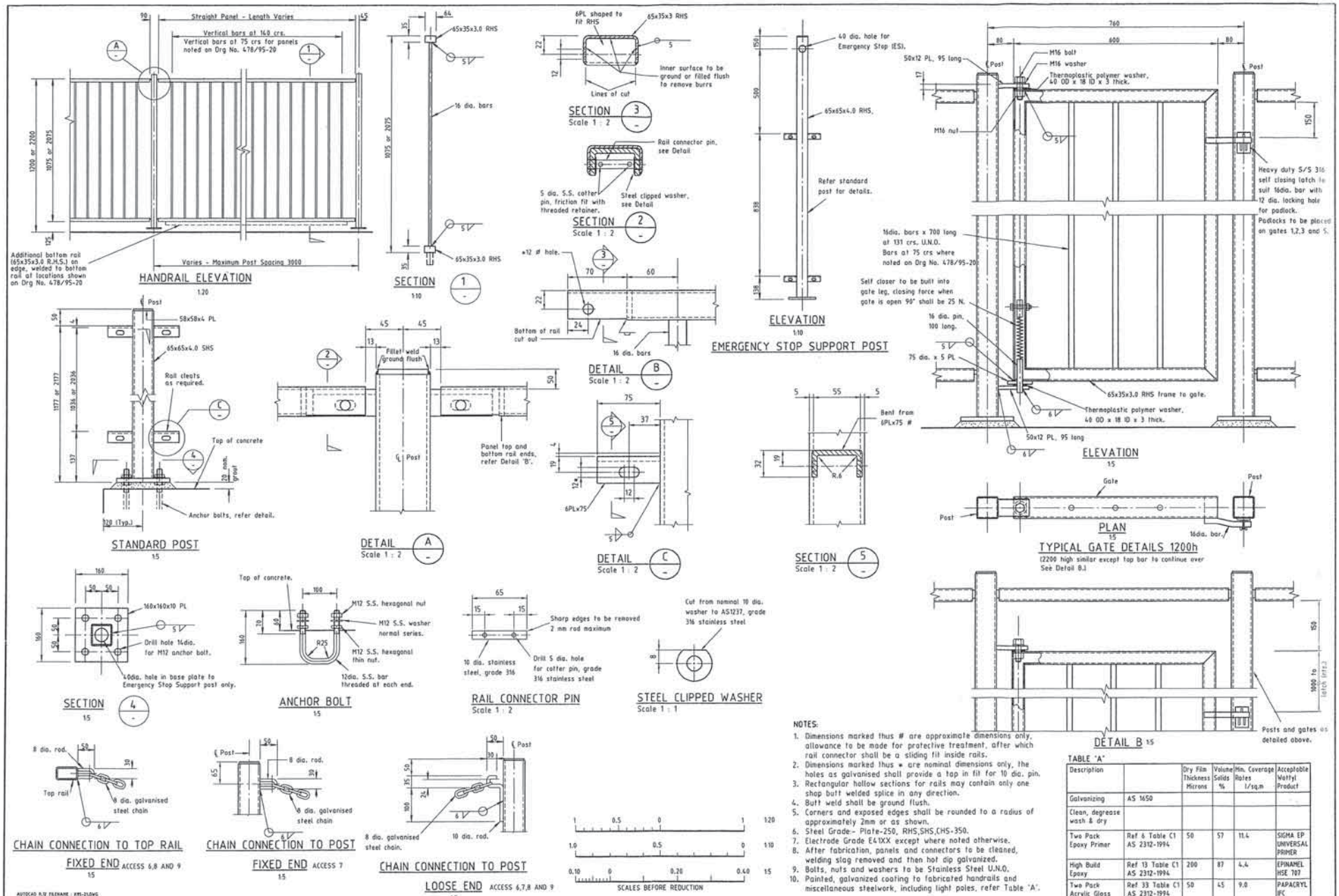
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE Z
LOCK STRUCTURE
MISCELLANEOUS DETAILS

DATE: 12-12-1996
DRAWING No: 478/95 - 20



NOTES:

1. Dimensions marked thus # are approximate dimensions only, allowance to be made for protective treatment, after which rail connector shall be a sliding fit inside rails.
2. Dimensions marked thus * are nominal dimensions only, the holes as galvanised shall provide a tap in fit for 10 dia. pin.
3. Rectangular hollow sections for rails may contain only one shop butt welded splice in any direction.
4. Butt weld shall be ground flush.
5. Corners and exposed edges shall be rounded to a radius of approximately 2mm or as shown.
6. Steel Grade:- Plate-250, RHS,SHS,CHS-350.
7. Electrode Grade E41XX except where noted otherwise.
8. After fabrication, panels and connectors to be cleaned, welding slag removed and then hot dip galvanized.
9. Bolts, nuts and washers to be Stainless Steel U.N.O.
10. Painted, galvanized coating to fabricated handrails and miscellaneous steelwork, including light poles, refer Table 'A'.

TABLE 'A'

Description		Dry Film Thickness Microns	Volume Solids %	Min. Coverage Rates l/sq.m	Acceptable Wattyl Product
Galvanizing	AS 1650				
Clean, degrease wash & dry					
Two Pack Epoxy Primer	Ref 6 Table C1 AS 2312-1994	50	57	11.4	SIGMA EP UNIVERSAL PRIMER
High Build Epoxy	Ref 13 Table C1 AS 2312-1994	200	87	4.4	EPINAMEL HSE 787
Two Pack Acrylic Gloss	Ref 33 Table C1 AS 2312-1994	50	45	9.0	PAPACRYL IFC

Rv.	DATE	REVISIONS	REC.	APPR.
C	03-02-98	Fence connection details revised.		
B	6-05-97	Gates revised.		
A	11-04-97	General Revisions		

AUTOCAD R.12 FILENAME : KRS-21.DWG
DATE : 23-2-1998 TIME : 2:18 PM

DESIGNED:
DRAWN:
CHECKED:
RECOMMENDED: PROJ. MAN.
A1
DATUM: A.H.D.
APPROVED: PROJ. DIR.

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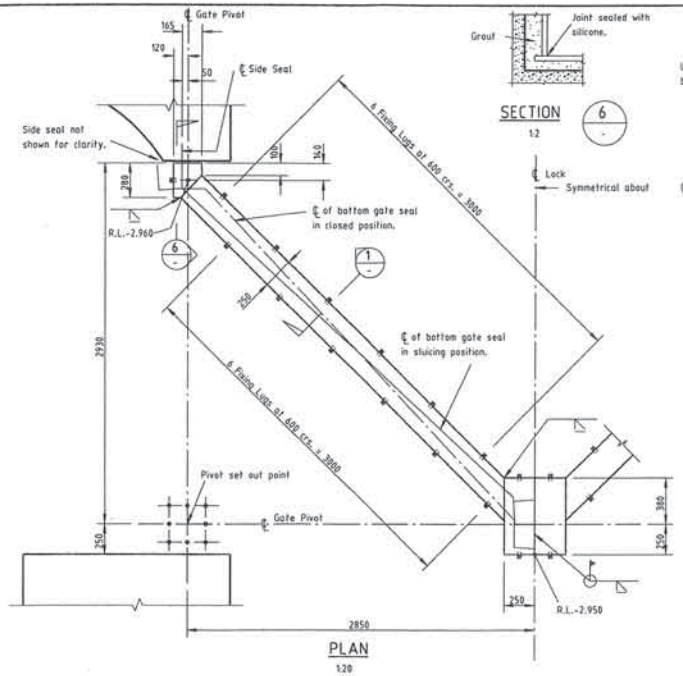
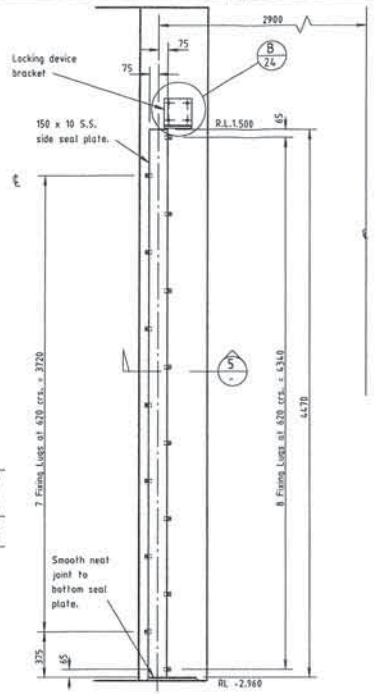
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE Z
LOCK STRUCTURE
HANDRAIL DETAILS

DATE: 12-12-1996
DRAWING No: 478/95 - 21
Rv.

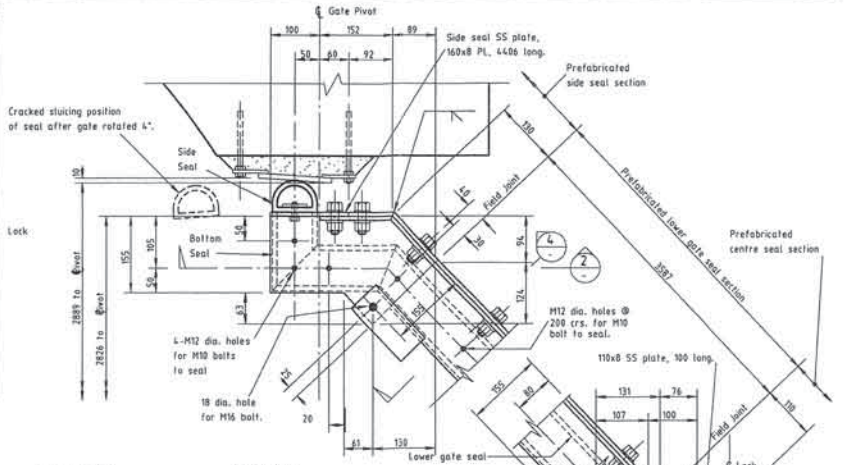


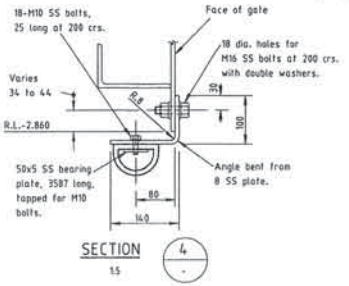
BOTTOM SEAL PLATE

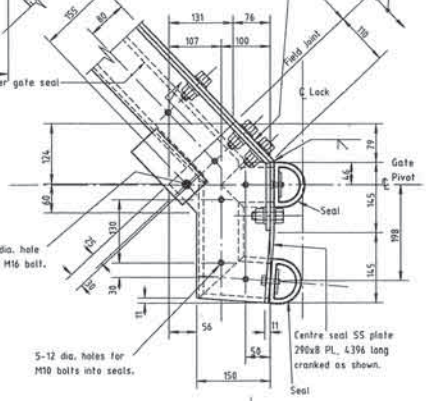
SECTION 6 / 1:2

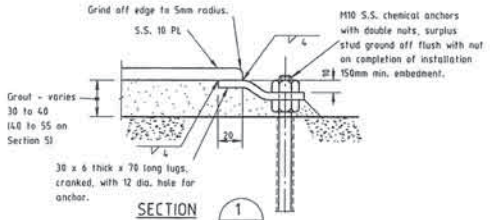


SIDE SEAL PLATE

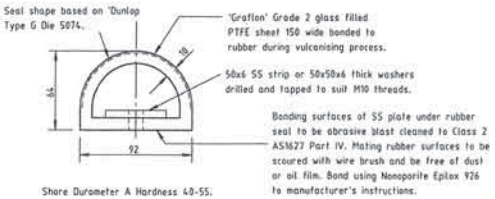




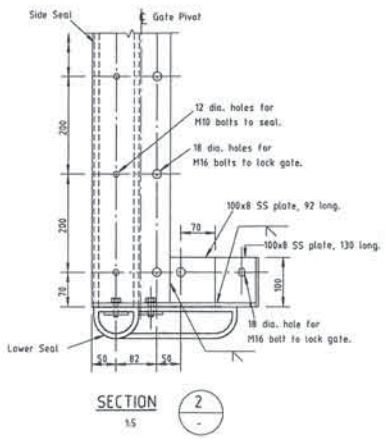


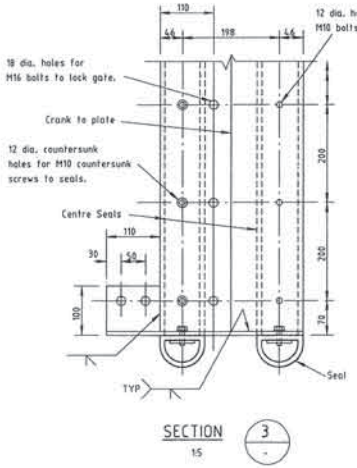


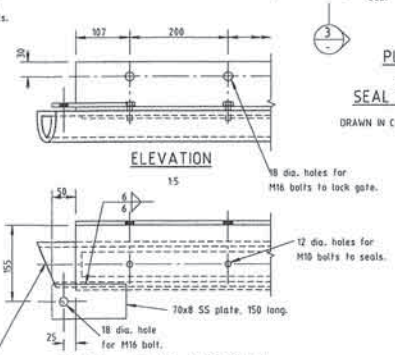
SECTION 5 SIMILAR (Refer Plan - Seal Details)

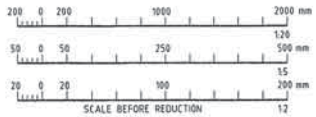


DETAIL OF SEAL
1:2









AUTOCAD NAME: KRS-22.DWG
DATE : 11-4-1997 TIME : 3:19 PM

Rv.	DATE	REVISIONS	REC.	APPR.
A	11-04-97	General Revisions		

DESIGNED: [illegible]
DRAWN: C.J. Bate
CHECKED:
RECOMMENDED: PROJ. MGR. D.J. Hanson
APPROVED: PROJ. DIR. [illegible]
A1
DATUM: A.H.D.

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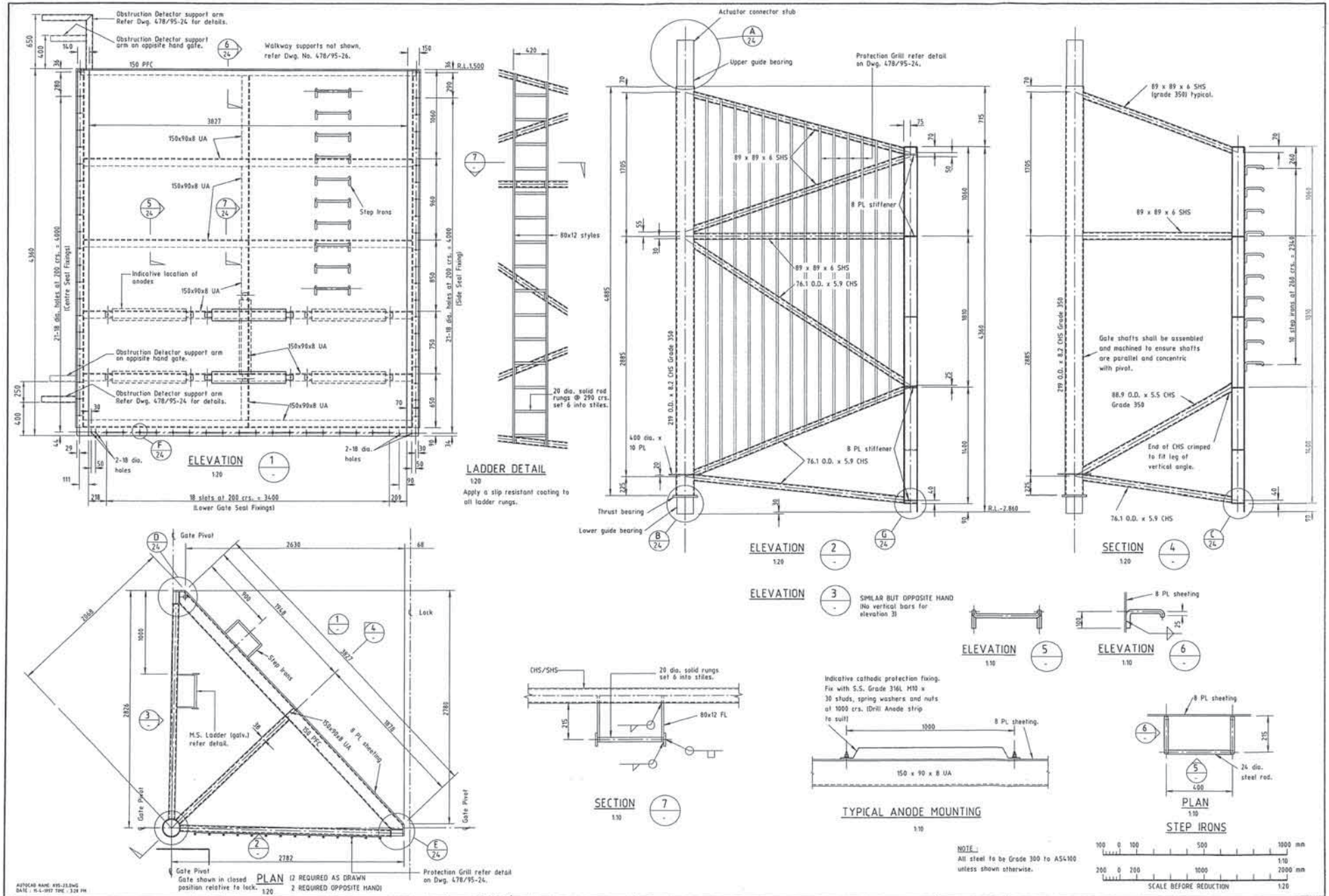
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 2
LOCK STRUCTURE
GATE SEAL PLATES AND SEALS

DATE: 12-12-1996
DRAWING No: 478/95 - 22



AUTOCAD NAME: K95-23.DWG
DATE : 15-4-1997 TIME : 3:28 PM

No.	DATE	REVISIONS	REC.	APPR.
C	03-03-98	Protection Grill & (OD) Support arms added.		
B	06-05-97	Ladder & protection bars added to gate		
A	11-04-97	General Revisions		

DESIGNED:
DRAWN: C.J.H.
CHECKED:
RECOMMENDED: PROJ. MAN. R.F.H.
A1
DATUM: A.H.D.
APPROVED: PROJ. DIR.

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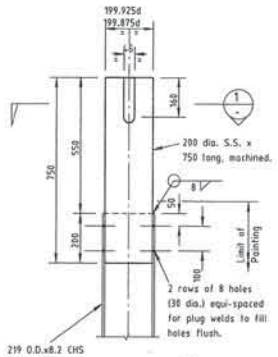
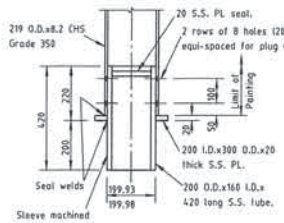
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 2
LOCK STRUCTURE
GATE FABRICATION DETAILS - SHEET No.1

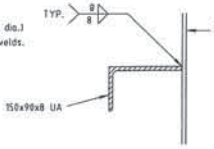
DATE: 12-12-1996
DRAWING No: 478/95 - 23



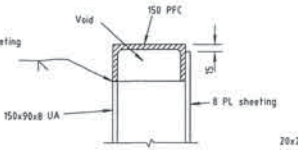
DETAIL A 1:10 (23)



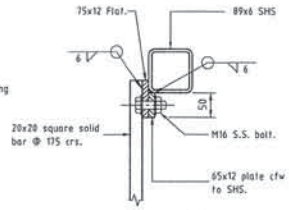
DETAIL B 1:10 (23)



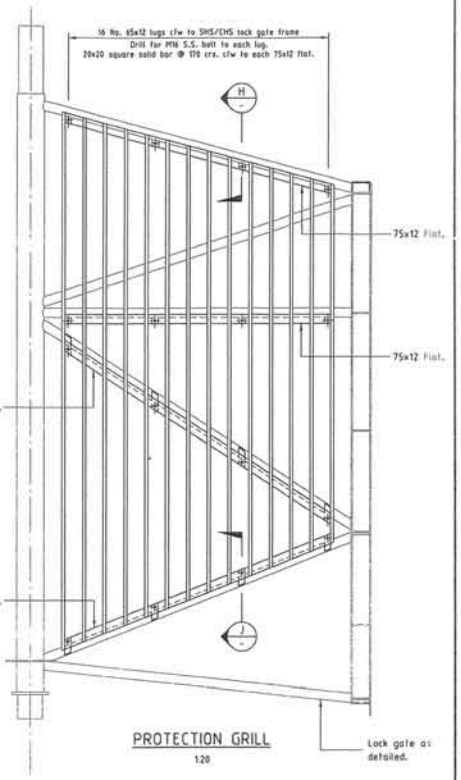
SECTION 5 1:5 (23)



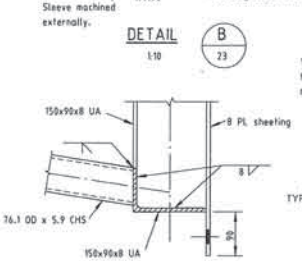
SECTION 6 1:5 (23)



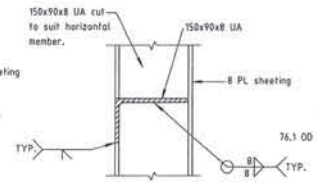
SECTION H 1:10 (-)



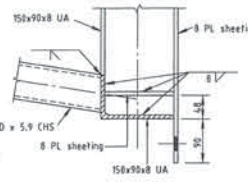
PROTECTION GRILL 1:20



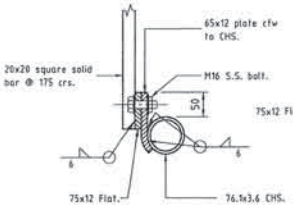
DETAIL C 1:5 (23)



SECTION 7 1:5 (23)



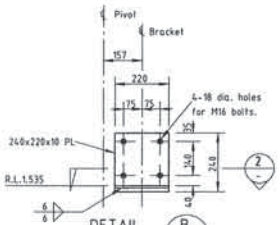
DETAIL G 1:5 (23)



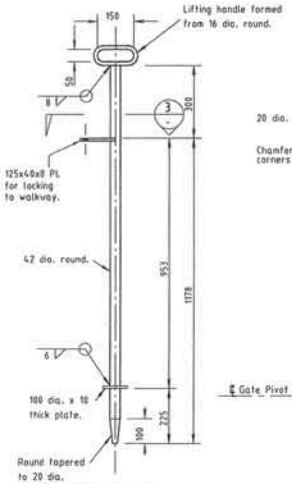
SECTION J 1:10 (-)

SECTION 1 1:10 (-)

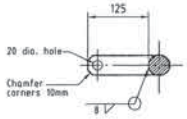
DETAIL F 1:5 (23)



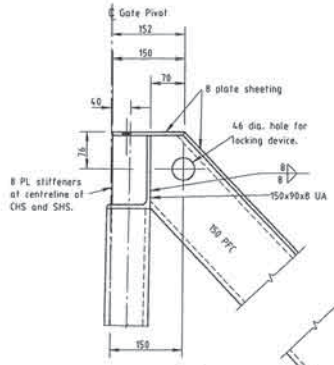
DETAIL B 1:10 (22)



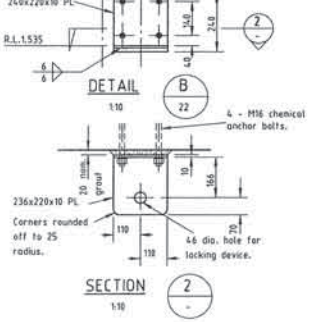
LOCKING DEVICE 12 OFF! 1:10



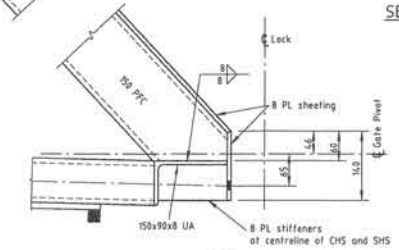
SECTION 3 1:5 (-)



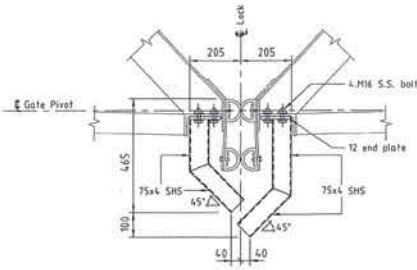
DETAIL D 1:5 (23)



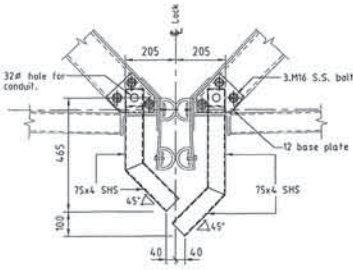
SECTION 2 1:10 (-)



DETAIL E 1:5 (23)



OBSTRUCTION DETECTOR LOWER SUPPORT ARMS. 1:10



OBSTRUCTION DETECTOR UPPER SUPPORT ARMS. 1:10

50 0 50 250 500 mm
1:5
100 0 100 500 1000 mm
SCALE BEFORE REDUCTION 1:10

AUTOCAD NAME: 495-24.DWG
DATE: 06/09/97 TIME: 11:20 AM

Rev.	DATE	REVISIONS	REC.	APPR.
C	03-03-98	Protection Grill & (00) Support arms added.		
B	06-05-97	Protection bars added		
A	11-04-97	General Revisions		

DESIGNED: P.Dunn
DRAWN: C.J.Davy
CHECKED: J.V.C.
RECOMMENDED PROJ. MAN: L.J.Howard
DATUM: A.H.D.
APPROVED PROJ. DIR.: M.R.Davies
A1

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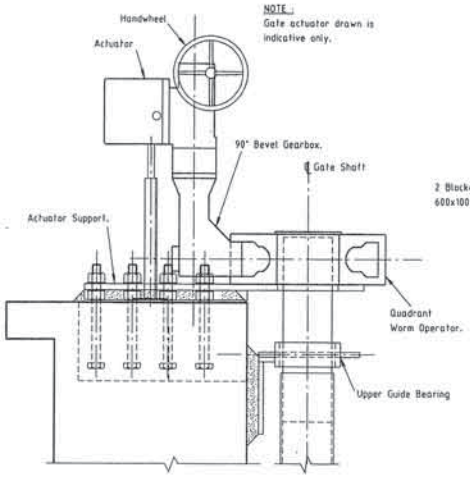
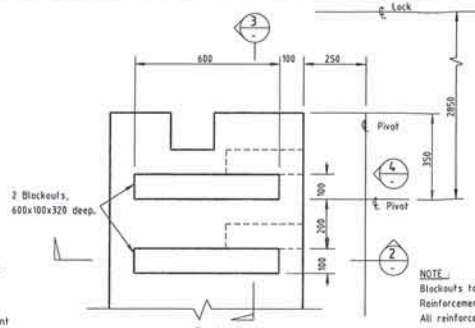
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE Z
LOCK STRUCTURE
GATE FABRICATION DEATAILS - SHEET No.2

DATE: 12-12-1996
DRAWING No: 478/95 - 24

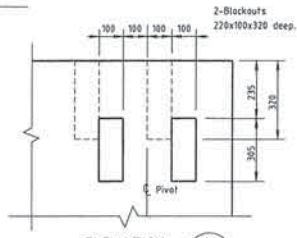


NOTE :
Gate actuator drawn is indicative only.

SECTION 1 1:10

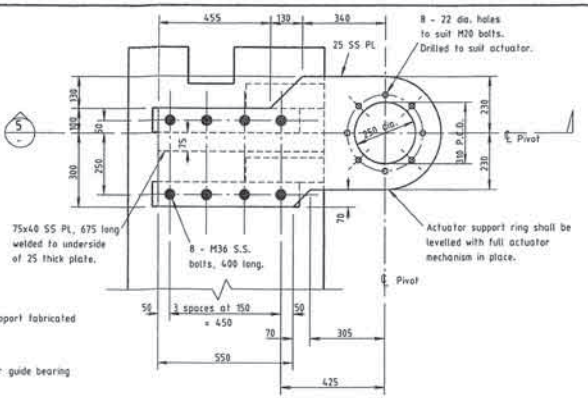


PLAN
BLOCKOUTS - UPPER PIVOT
1:10

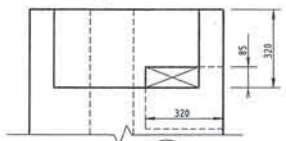


ELEVATION 4 1:10

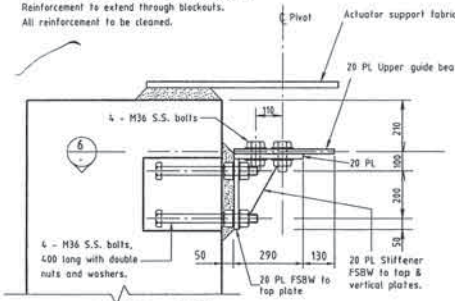
NOTE :
Blockouts to be cleaned out and lightly scabbled.
Reinforcement to extend through blockouts.
All reinforcement to be cleaned.



PLAN
ACTUATOR SUPPORT (UNPAINTED)
1:10

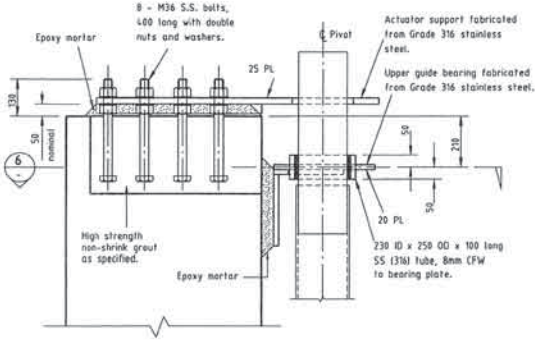


SECTION 2 1:10

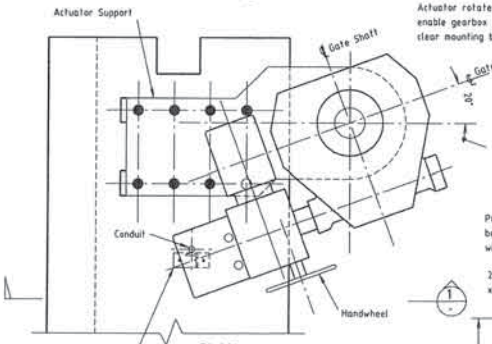


SECTION 9 1:10

NOTE: All 20 PL to be fabricated from Grade 316 stainless steel.



SECTION 5 1:10

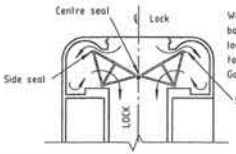


PLAN 1:10

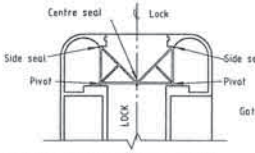
GATE ACTUATOR DETAILS

NOTE :
Gate actuator details are indicative only and will depend on type of actuator accepted by the superintendent.

GATES IN OPEN POSITION

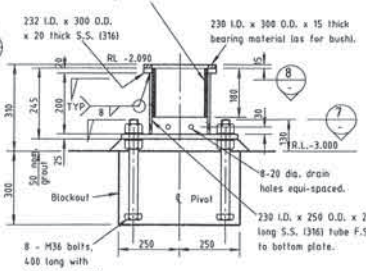


GATES IN SLUICING POSITION
FOR FILLING OR EMPTYING LOCK



GATES IN CLOSED POSITION

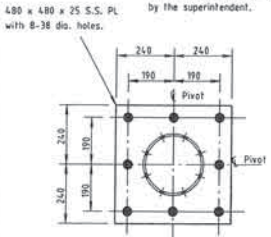
GATE OPERATION
NOT TO SCALE



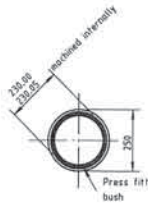
LOWER GUIDE AND THRUST BEARING (UNPAINTED)
1:10

NOTE :
Bush material shall be machined from a non-swelling thermoplastic polymer,Unasco Tuflclad 'Moly', Vesco Plastics 'Vesconite' or equivalent.
Bush machined dimensions :-

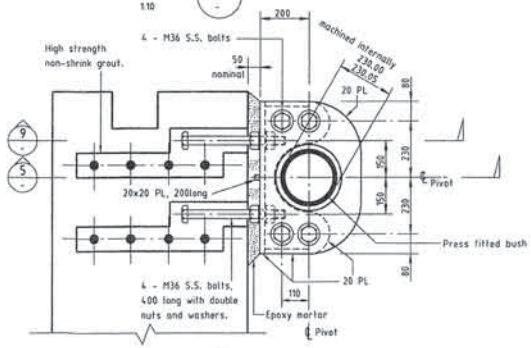
Housing	230.00 dia.
Shaft	200.00 dia.
Clearance	0.10 - 0.20
Bush	OD 230.10 - 230.20
	ID 200.20 - 200.30



SECTION 7 1:10



SECTION 8 1:10



SECTION 6 1:10

100 0 100 500 1000 mm
SCALE BEFORE REDUCTION 1:10

AUTOCAD NAME: K95-25.DWG
DATE : 11-1-1997 TIME : 3:29 PM

Rev.	DATE	REVISIONS	REC.	APPR.
A	11-04-97	General Revisions		

DESIGNED: R.K.Mott
DRAWN: C.J.Hayes
CHECKED: [illegible]
RECOMMENDED: PROJ. MAN. C.J.Hayward
REC. APPR.
A1
DATUM: A.H.D.
APPROVED: PROJ. DIR. [illegible]

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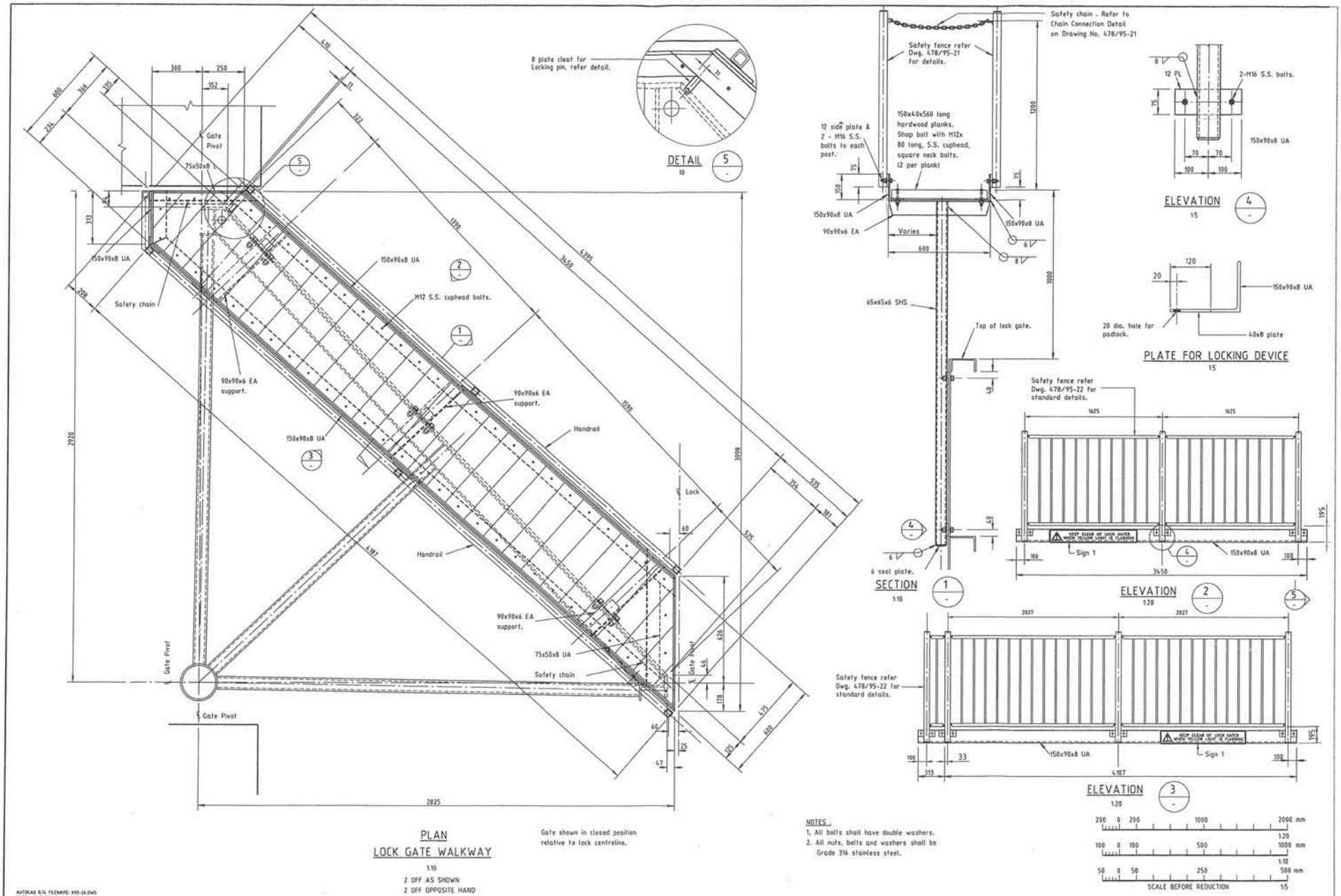
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 2
LOCK STRUCTURE
GATE ACTUATOR AND MOUNTING DETAILS

DATE: 12-12-1996
DRAWING No: 478/95 - 25
Rev. A



AUTOCAD R.14 FILENAME: KYS-26.DWG
DATE : 12-5-1998 TIME : 8:25 AM

No.	DATE	REVISIONS	REC.	APPR.
D	11-05-98	Sign 1 added to Elevations 2 and 3.		
C	03-03-98	Tubular hand rail changed to Safety Fence.		
B	6-05-97	Safety Chain added		
A	11-04-97	General Revisions		

DESIGNED:
DRAWN:
CHECKED:
RECOMMENDED: PROJ. MAN.
APPROVED: PROJ. DIR.
DATUM: A.H.D.
A1

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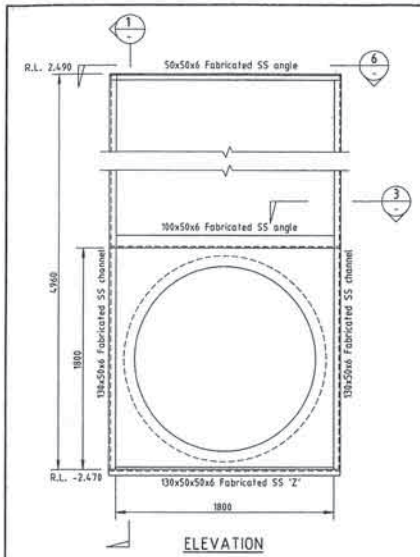
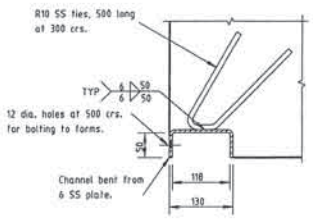
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE Z
LOCK STRUCTURE
LOCK GATE WALKWAY DETAILS

DATE: 12-12-1996
DRAWING No.
478/95 - 26

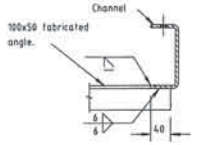


ELEVATION
1:20

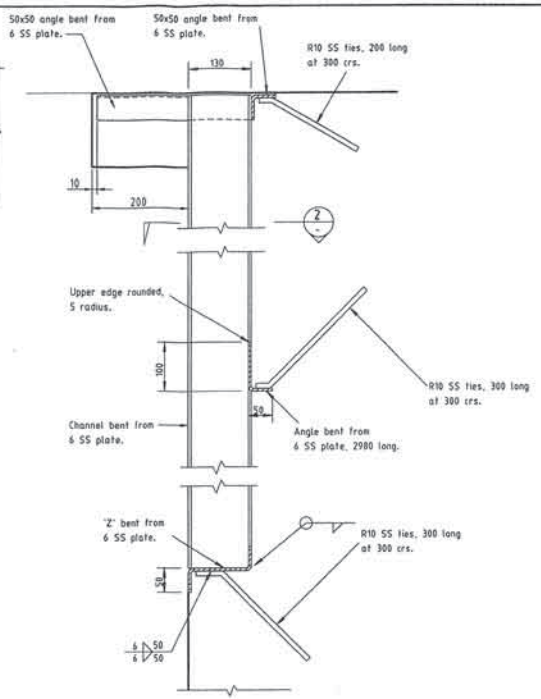
INLET AND OUTLET PORT FRAME
2 OFF



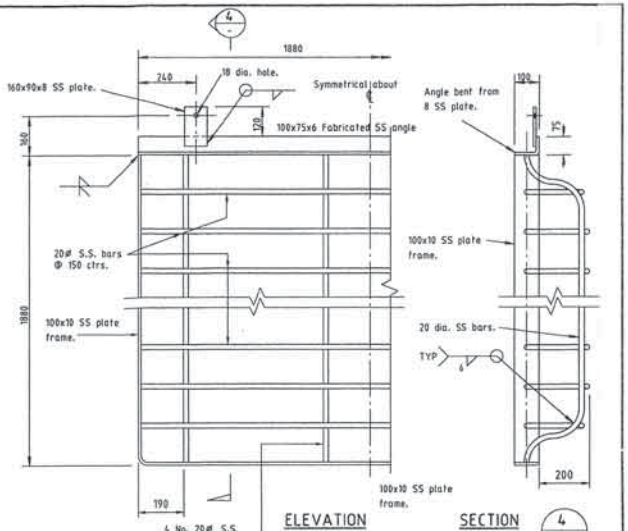
SECTION 2
1:5



SECTION 3
1:5



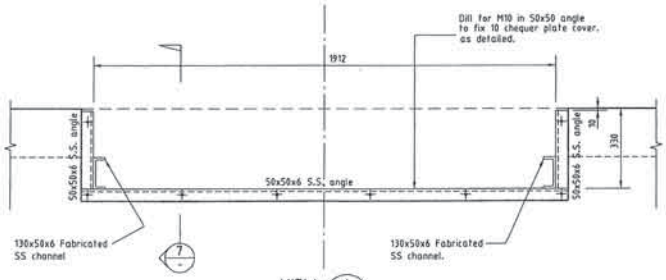
SECTION 1
1:5



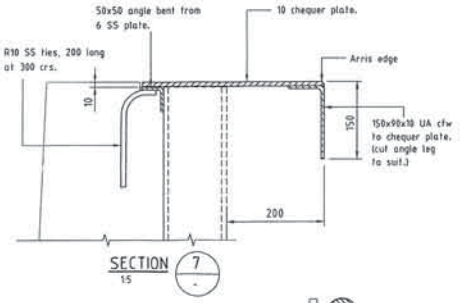
ELEVATION
1:10

SECTION
1:10

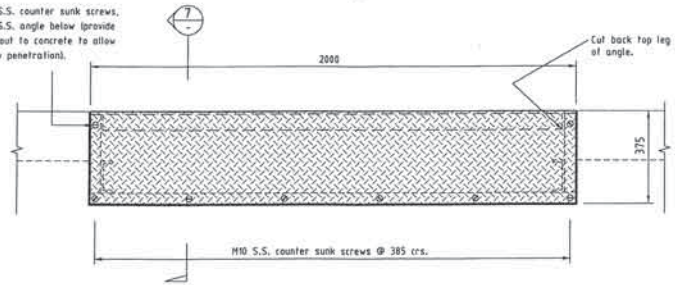
INLET AND OUTLET PORT SCREEN
2 OFF
6mm fillet welds to all connections.



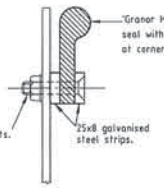
VIEW
1:10



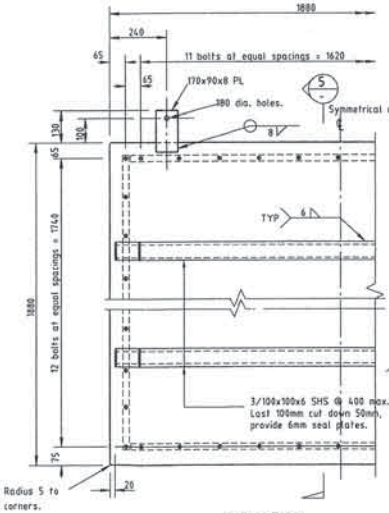
SECTION 7
1:5



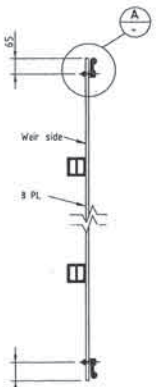
COVER TO WALLS W1-1 & W2-1
1:10
Cover to be hot dipped galvanised after fabrication



DETAIL A
1:2



ELEVATION
1:10



SECTION
1:10

INLET AND OUTLET PORT BULKHEAD GATE
2 OFF

NOTES:
1. Screen and port frame shall be constructed from Grade 316 stainless steel.
2. All welds butt with faces ground flush or fillet, all welds continuous unless shown otherwise.
3. Bulkhead gate to be hot dip galvanised after fabrication.

100 0 100 500 1000 mm
1:10
200 0 200 1000 2000 mm
1:20
SCALE BEFORE REDUCTION

50 0 50 250 500 mm
1:5
20 0 20 100 200 mm
1:2
SCALE BEFORE REDUCTION

AUTOCAD NAME: KPS-27.DWG
DATE: 13-12-1996 TIME: 11:35 AM

Rv.	DATE	REVISIONS	REC.	APPR.
D	09-02-98	Inlet/Outlet Port bulkhead seal revised.		
C	06-02-98	Inlet/Outlet Port frame revised.		
B	06-05-97	Screens & Bulkheads revised.		
A	11-04-97	General Revisions		

DESIGNED:
DRAWN: E.D.Vos
CHECKED:
RECOMMENDED: PROJ. MAN. A.J.Howard
A1
DATUM: A.H.D.
APPROVED: PROJ. DIR.

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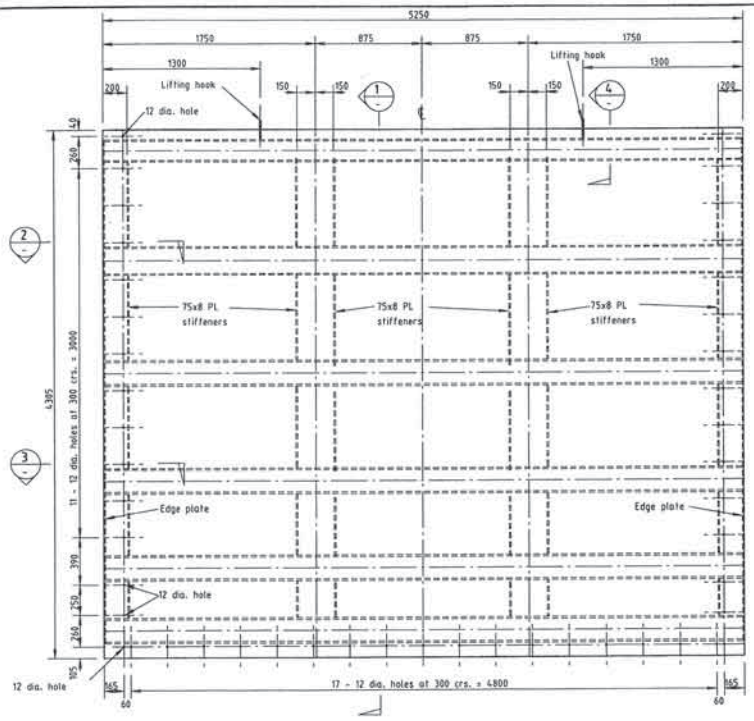
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 2
LOCK WATER QUALITY BYPASS CHANNEL
INLET AND OUTLET PORT SCREEN AND BULKHEAD GATE DETAILS

DATE: 12-12-1996
DRAWING No: 478/95 - 27
Rv.

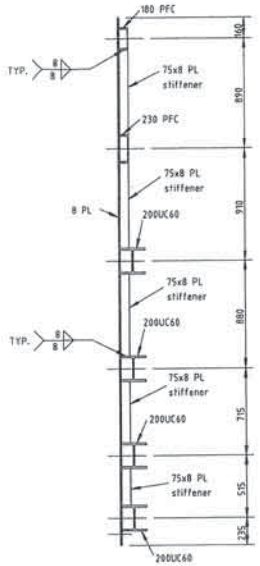


ELEVATION
1:20

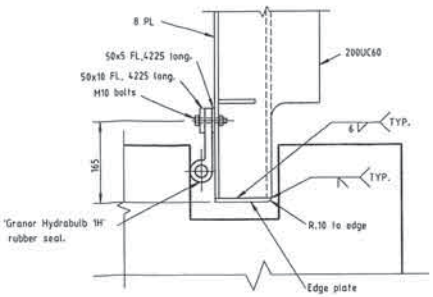
Rubber seals not shown

BULKHEAD GATE (2 OFF)

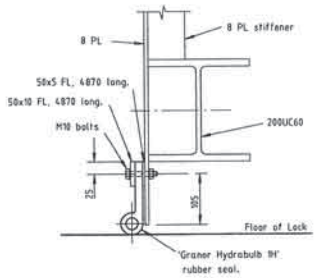
NOTE :
Cathodic protection system similar to Lock gates shall be installed on bulkheads (not shown on drawing).



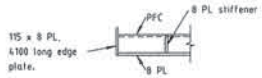
SECTION 1
1:20



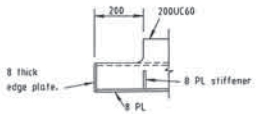
SIDE SEAL DETAIL
1:5



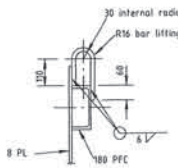
BOTTOM SEAL DETAIL
1:5



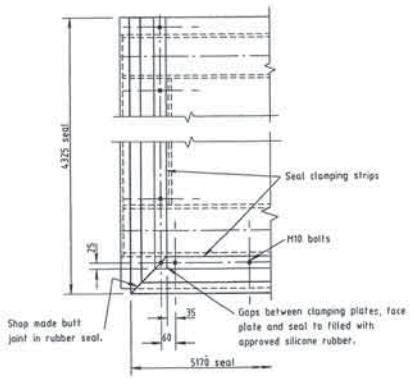
SECTION 2
1:10



SECTION 3
1:10



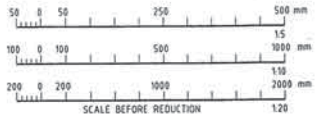
SECTION 4
1:10



ELEVATION
1:10

TOP AND CORNER SEAL DETAIL

NOTE :
Rubber seal shall be continuous around bulkhead gate with shop made butt welded 90° joints at corners.



AUTOCAD NAME: KP95-28.DWG
DATE : 12-12-1996 TIME : 11:37 AM

Rv.	DATE	REVISIONS	REC.	APPR.
A	11-04-97	General Revisions		

DESIGNED:
DRAWN:
CHECKED:
RECOMMENDED:
PROJ. MAN.

A1

DATUM: A.H.D.

APPROVED PROJ.

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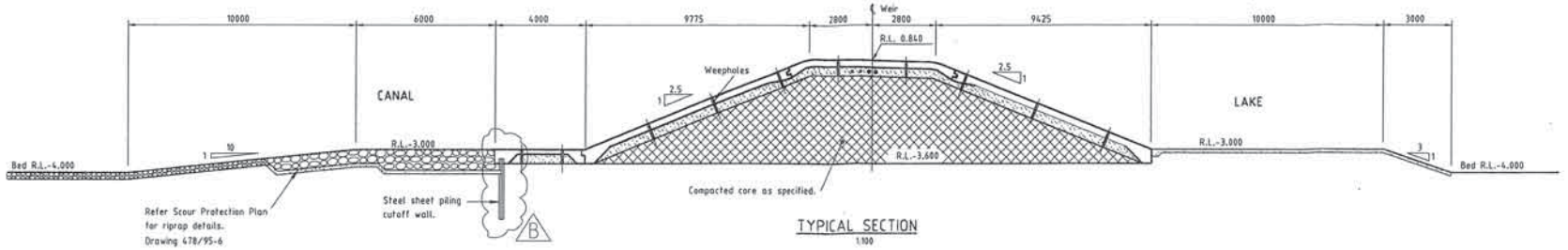
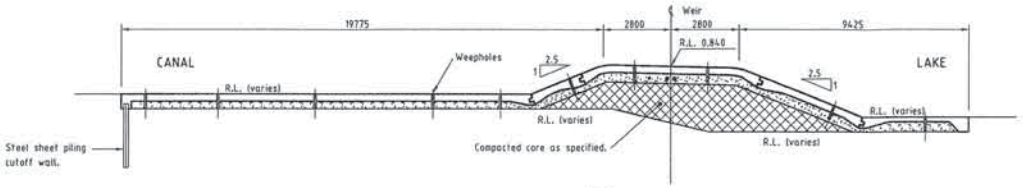
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 2
LOCK STRUCTURE
LOCK BULKHEAD GATE

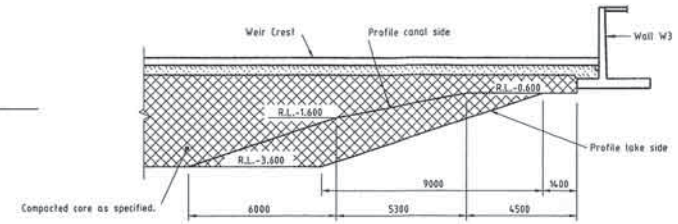
DATE: 12-12-1996
DRAWING No: 478/95 - 28
Rv. A



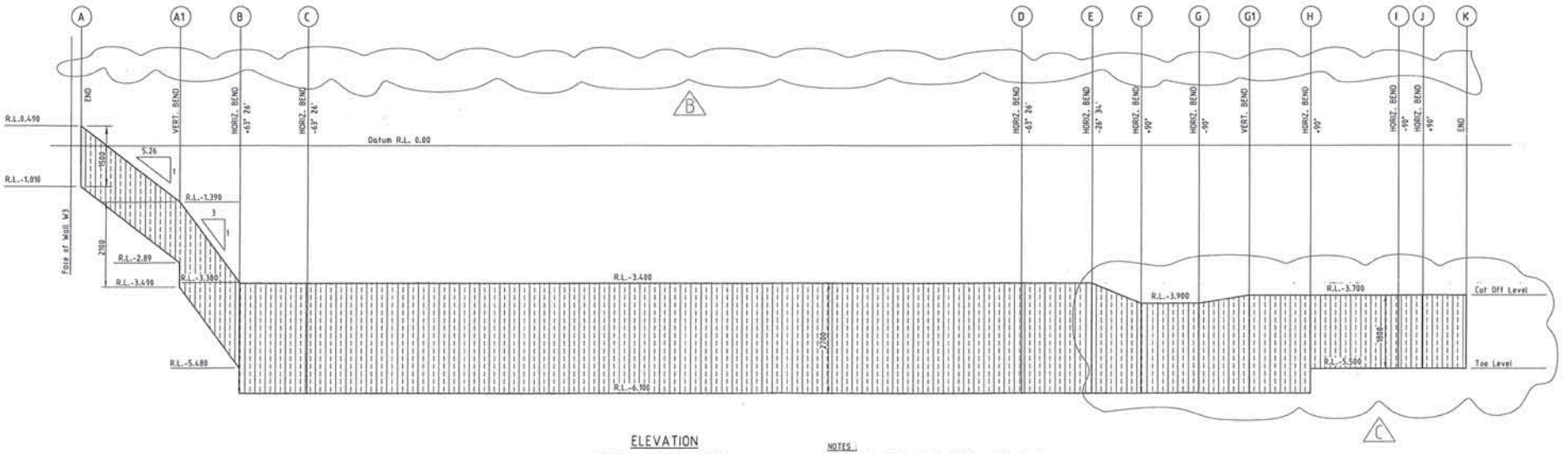
TYPICAL SECTION
1:100



SECTION 1
1 : 100 31



SECTION 2
1 : 100 31



ELEVATION
STEEL SHEET PILING
HOR. 1:200
VERT. 1:50

NOTES :
1. Bends for steel sheet piling shall be prefabricated by cutting and welding of pile sections to suit.

HOR. 2000 0 2000 10000 20000 mm 1:200
VERT. 500 0 500 2500 5000 mm 1:50
1000 0 1000 5000 10000 mm
SCALE BEFORE REDUCTION 1:100

AUTOCAD NAME: KYS-29.DWG
DATE : 8-5-1997 TIME : 3:13 PM

Rv	DATE	REVISIONS	REC.	APPR.
C	25-08-97	Sheet piling levels revised		
B	06-05-97	Sheet piling moved 100mm		
A	11-04-97	General Revisions		

DESIGNED: PKM.
DRAWN: C.J.Bray
CHECKED: SVC.
RECOMMENDED: P.K.Mawson
PROJ. MGR.
APPROVED:
PROJ. DIR.
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DATUM: A.H.D.

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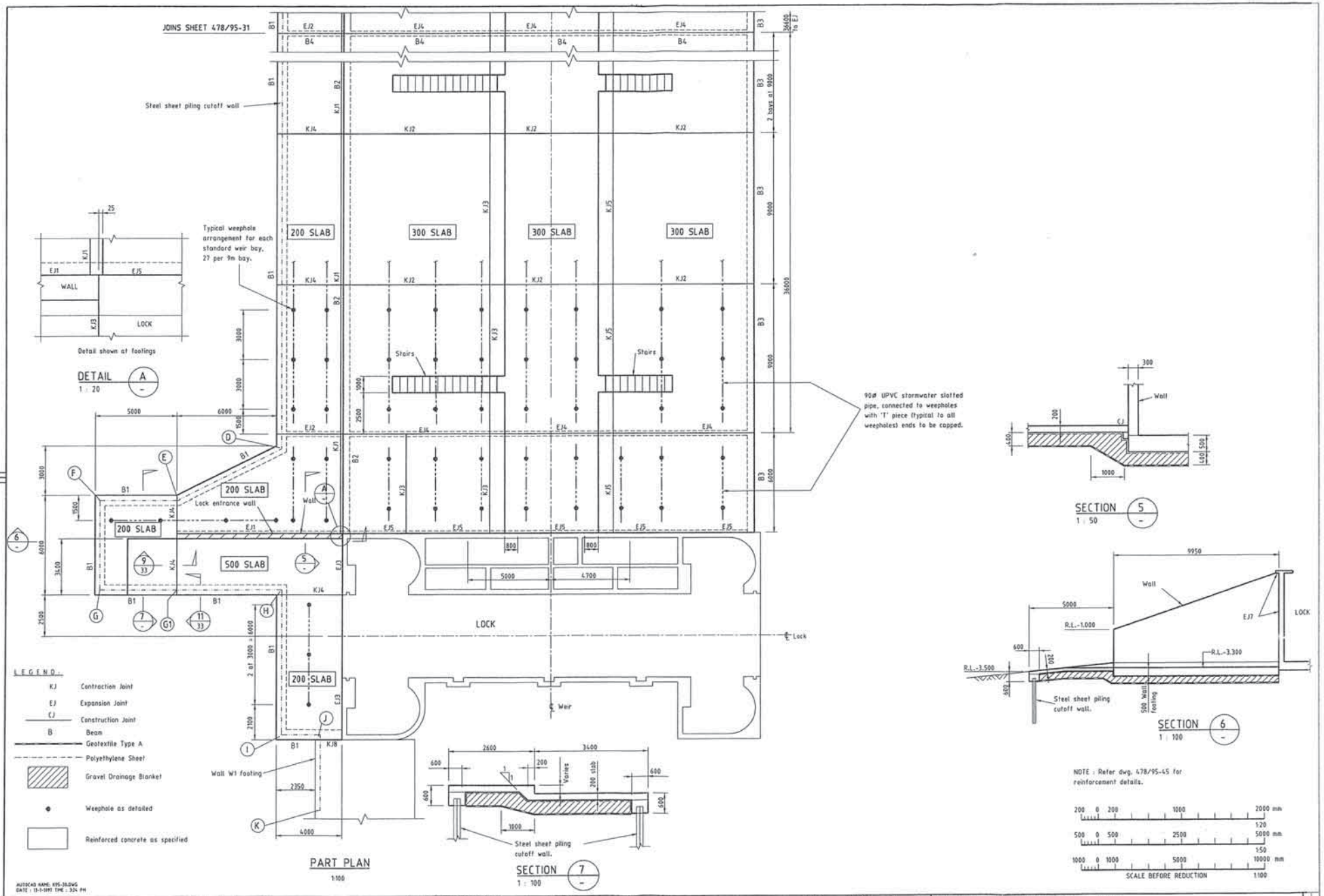
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE Z
WEIR STRUCTURE
SHEET PILING AND WEIR FILL PROFILES

DATE: 15-04-1997
DRAWING No:
478/95 -29



Rev.	DATE	REVISIONS	REC.	APPR.
D	23-09-97	Cable pit E5 moved.		
C	25-08-97	Mark G1 added		
B	06-05-97	Bypass channel removed, Sheet Piling moved 100mm		
A	11-04-97	General Revisions		

AUTOCAD NAME: K95-30.DWG
DATE : 13-1-1995 TIME : 3:24 PM

DESIGNED: PKM
DRAWN: C.A. Hogg
CHECKED: SC
RECOMMENDED:
APPROVED:
A1
DATUM: A.H.D.

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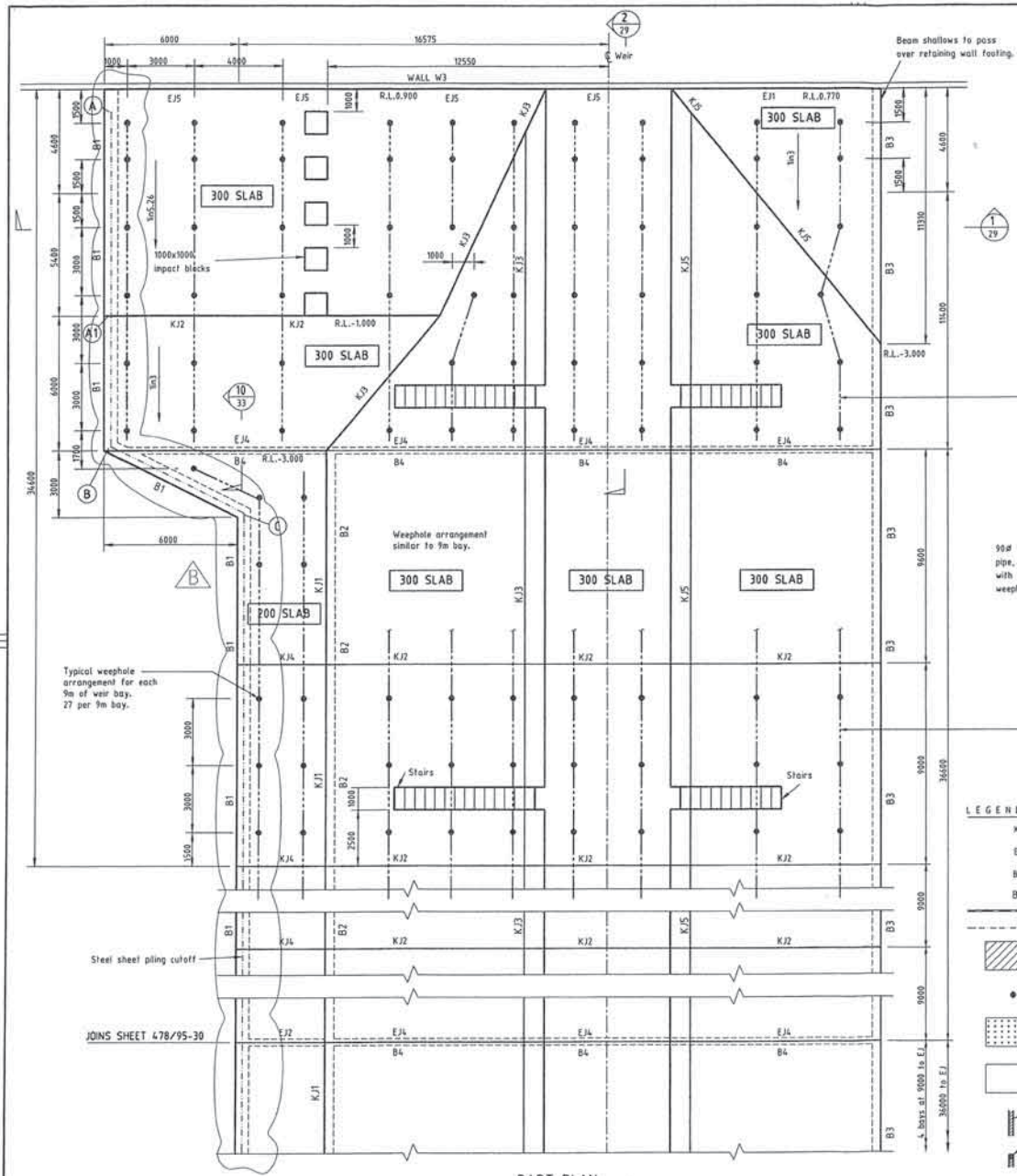
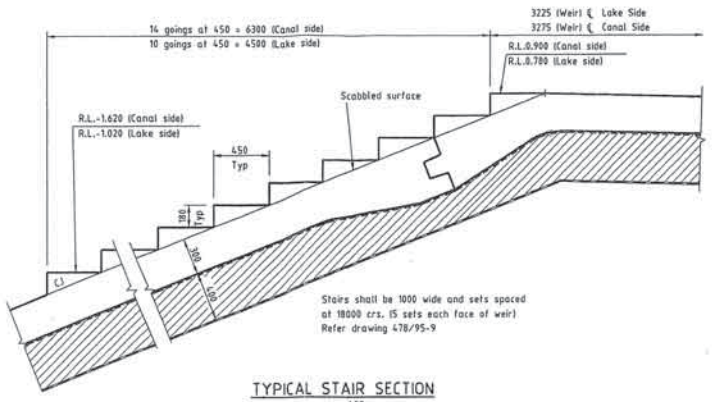
FAX: (07) 3369 9722, (07) 5538 4453, (07) 5445 5643, (077) 21 2588, (077) 34 9750, (077) 53 7578, (0011675) 253 6951
SUNSHINE COAST OFFICE: 88 Dupath Avenue, Maroochydore
Postal Address: PO Box 182, Maroochydore, Queensland 4558

KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 2
WEIR STRUCTURE
JOINTING PLAN AND DETAILS - SHEET NO.1

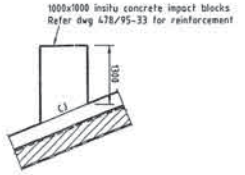
DATE: 5TH APRIL 1994
DRAWING No: 478/95-30



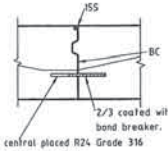
PART PLAN
1:100



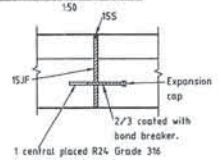
TYPICAL STAIR SECTION
1:20



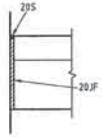
IMPACT BLOCK DETAIL
1:50



BJ1 1:20 In Beams B1,B2 and B3 at KJ2 and KJ4.

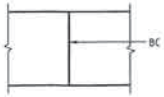


BJ2 1:20 In Beams B1,B2 and B3 at EJ2 & EJ4



BJ3 1:20 In Beams B1, B2, B3 and B5 at EJ1 & EJ5 .

BEAM CONTRACTION JOINTS



BJ4 1:20 In Beams B4 at KJ1, KJ3 and KJ5.

LEGEND:

- KJ Contraction Joint
- EJ Expansion Joint
- BC 2 Coat Bitumen Paint before pouring second concrete
- B Beam
- Geotextile Type A
- Polyethylene Sheet
- Gravel Drainage Blanket
- Weephole as detailed
- Mass concrete as specified
- Reinforced concrete as specified
- 10JF 10 Joint Filler (fixed to one face with 30 long copper nails at 200 centres)
- 15S Sealant 15x15 with bond breaker and backing strip.

200 0 200 1000 2000 mm 1:20
500 0 500 2500 5000 mm 1:50
1000 0 1000 5000 10000 mm
SCALE BEFORE REDUCTION 1:100

AUTOCAD NAME: DWG3.DWG
DATE : 9-5-1997 TIME : 5:58 PM

Rv.	DATE	REVISIONS	REC.	APPR.
C	28-10-97	BJ4 added & Impact Block revised.		
B	6-05-97	Sheet Piling moved 100mm.		
A	11-04-97	General Revisions		

DESIGNED:
DRAWN: C.J. Hoag
CHECKED:
RECOMMENDED: PROJ. MAN.
DATUM: A.H.D.
SIZE: A1
APPROVED: PROJ. DIR.

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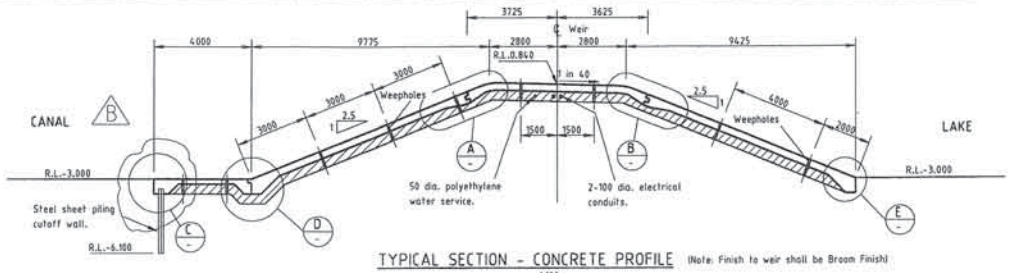
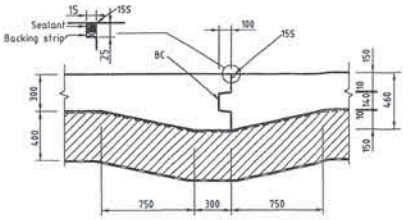
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 2
WEIR STRUCTURE
JOINTING PLAN AND DETAILS - SHEET NO.2

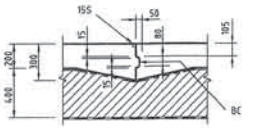
DATE: 6TH APRIL, 1994
DRAWING No: 478/95-31
Rv.



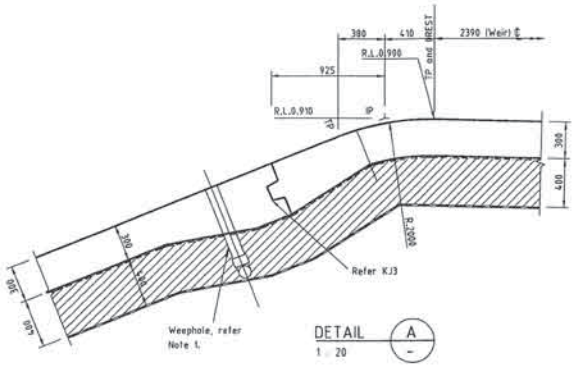
TYPICAL SECTION - CONCRETE PROFILE (Note: Finish to weir shall be Broom Finish)
1:100



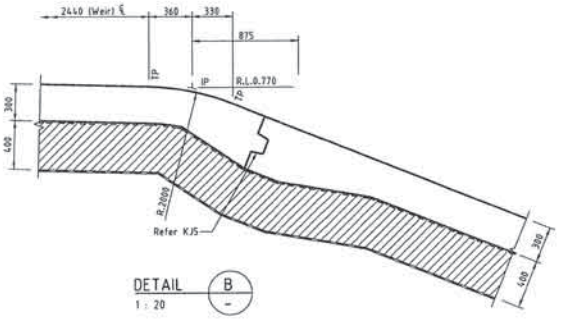
KJ2
1:20



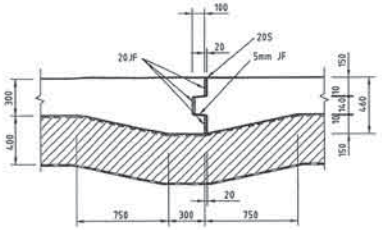
KJ4
1:20



DETAIL A
1 : 20

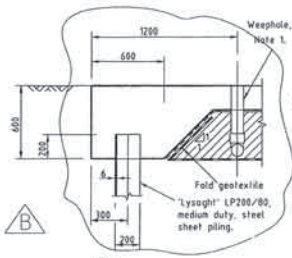


DETAIL B
1 : 20



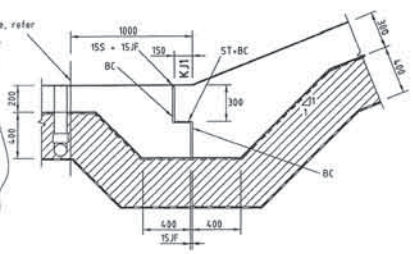
KJ3, (KJ5 SIMILAR - MIRRORED)
1:20

CONTRACTION JOINTS (KJ)



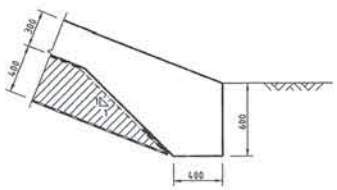
B1

DETAIL C
1 : 20



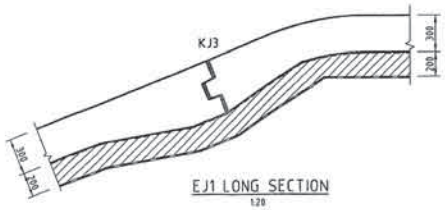
B2

DETAIL D
1 : 20

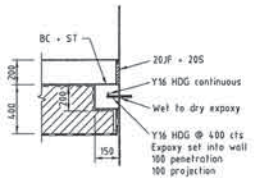


B3

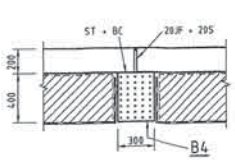
DETAIL E
1 : 20



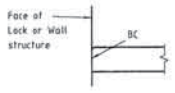
EJ1 LONG SECTION
1:20



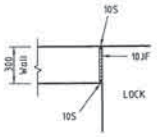
EJ1
1:20
(EJ5 SIMILAR BUT 300 THICK CONCRETE SLAB)
(EJ6 SIMILAR BUT 600 THICK CONCRETE SLAB)



EJ2
1:20
(EJ4 SIMILAR BUT 300 THICK CONCRETE SLAB)
(LOWER BEAM UNDER PERPENDICULAR KEY JOINTS)



EJ3
1:20



EJ7
1:20

EXPANSION JOINTS (EJ)

LEGEND:

- ST Steel Trowelled Surface
- BC 2 Coat Bitumen Paint before pouring second concrete
- Geotextile Type A
- Polyethylene Sheet
- Gravel Drainage Blanket
- 10JF 10 Joint Filler (fixed to one face with 30 long copper nails at 200 centres)
- 15S Sealant 15x15 with bond breaker and backing strip.
- Mass concrete
- Reinforced concrete

NOTES:
1. Weepholes shall be 90 dia. U.P.V.C. pipe, 600 long in 200 thick concrete slabs and 700 long in 300 thick concrete slabs, with 'T' pieces connected to horizontal slotted pipe.
2. All chamfers shall be 20x20 unless shown otherwise.
3. All hot dip galvanised reinforcement shall be passivated

200 0 200 1000 2000 mm
1:20
1000 0 1000 5000 10000 mm
SCALE BEFORE REDUCTION 1:100

AUTOCAD NAME: DWG32.DWG
DATE: 10-1-1997 TIME: 10:05 AM

Rv.	DATE	REVISIONS	REC.	APPR.
B	6-05-97	Sheet Piling moved 100mm.		
A	11-04-97	General Revisions		

DESIGNED: C.J. Davies
DRAWN: C.J. Davies
CHECKED:
RECOMMENDED: PROJ. MAN. C.J. Davies
DATUM: A.H.D.
A1
APPROVED: PROJ. DIR.

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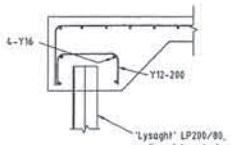
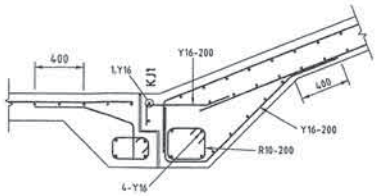
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE Z
WEIR STRUCTURE
SECTIONS AND DETAILS

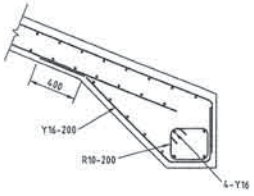
DATE: 6TH APRIL, 1994
DRAWING No: 478/95-32
Rv.



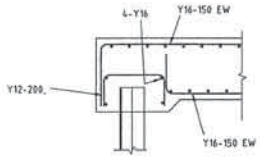
B1
1:20



B2
1:20

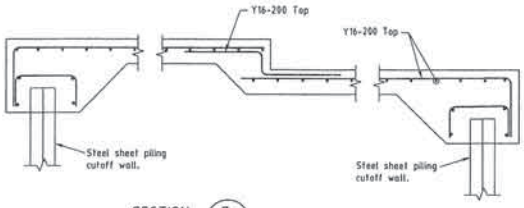


B3
1:20

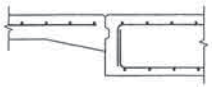


B5
1:20

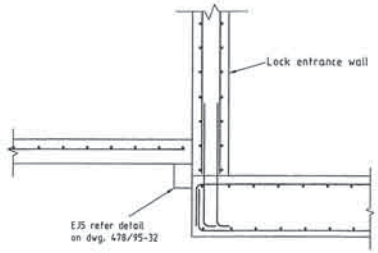
BEAM REINFORCEMENT



SECTION 7
1 : 20 30

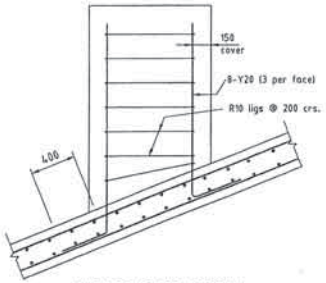


SECTION 9
1 : 20 30



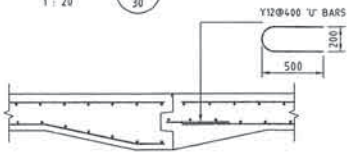
SECTION 5
1 : 20 30

ALL REINFORCEMENT:
Y16-200 E.W. U.N.O
70 COVER U.N.O.



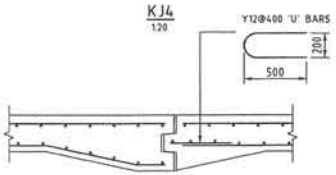
IMPACT BLOCK DETAIL
1:20

SECTION 11
1 : 20 30

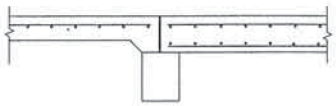


KJ2
1:20

KJ4
1:20



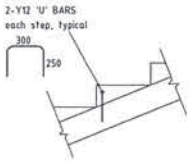
KJ3, (KJ5 SIMILAR - MIRRORED)
1:20



B4

SECTION 10
1 : 20 31

CONTRACTION JOINTS (KJ)



TYPICAL STAIR SECTION
1:20

500 0 500 2500 5000 mm
1:50
200 0 200 1000 2000 mm
SCALE BEFORE REDUCTION 1:20

AUTOCAD R
DATE : 28-

Rv.	DATE	REVISIONS	REC.	APPR.
E	25-10-97	Impact block revised.		
D	23-09-97	Cable pit ES deleted.		
C	15-05-97	Cover to impact block amended		
B	06-05-97	Bypass channel removed, Sheet Piling moved 100mm		
A	11-04-97	General Revisions		

DESIGNED:
DRAWN:
CHECKED:
RECOMMENDED: JOSHUA MANN
A1
DATUM: A.H.D.
APPROVED: PROJ.

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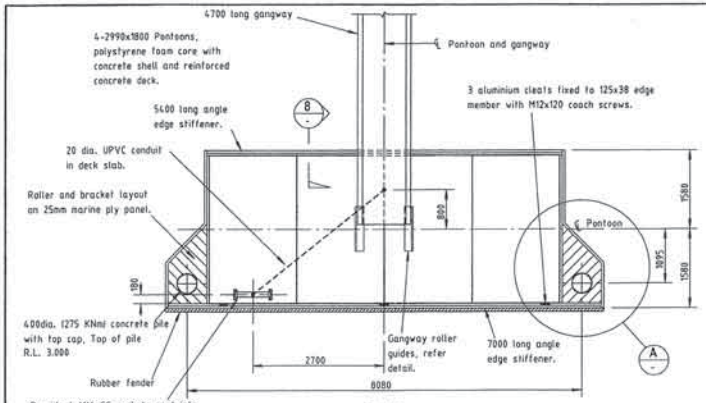
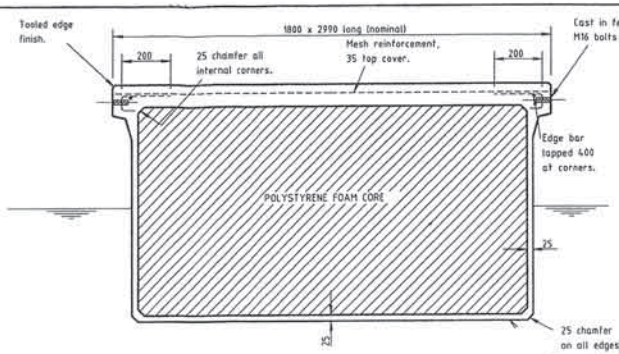
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE Z
WEIR STRUCTURE
REINFORCEMENT DETAILS

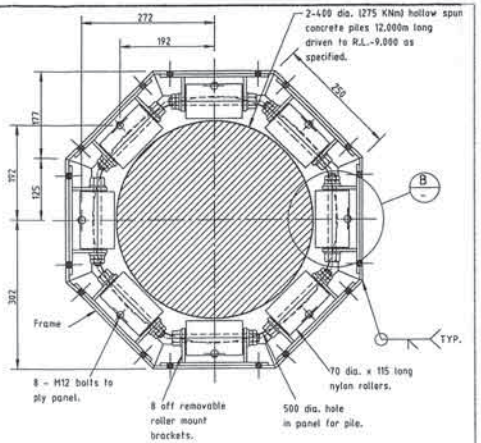
DATE: 28-11-1996
DRAWING No: 478/95 -33



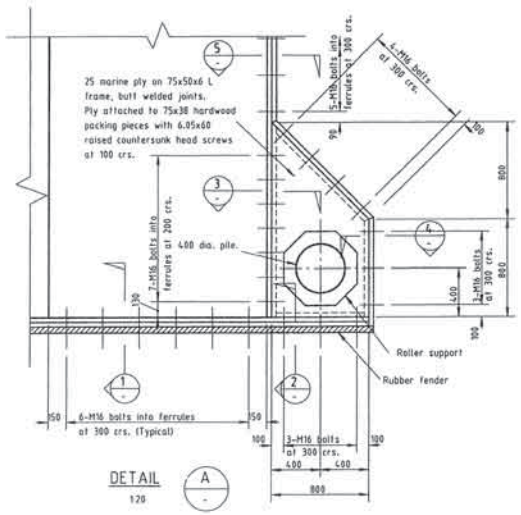
PLAN
1:50



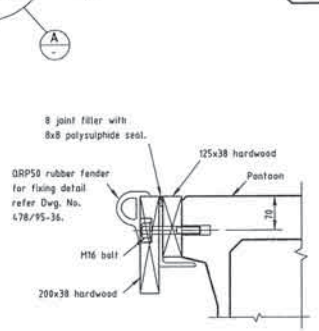
INDICATIVE PONTOON TYPICAL SECTION
1:10



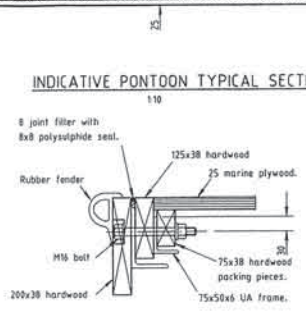
ROLLER SUPPORT DETAIL
1:5



DETAIL A
1:20

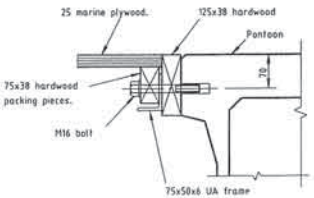


SECTION 1
1:5

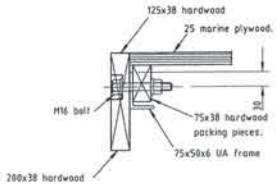


SECTION B - Similar but no rubber fender.

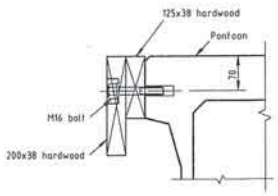
SECTION 2
1:5



SECTION 3
1:5



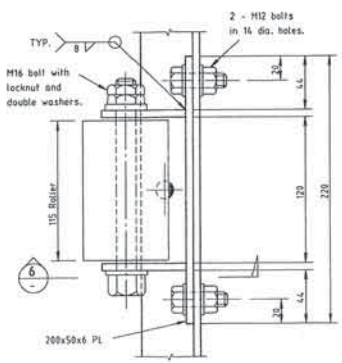
SECTION 4
1:5



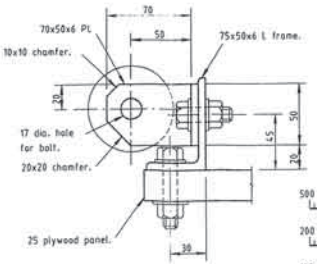
SECTION 5
1:5

NOTES :
1. Pontoon Design Live Load 3 kPa. distributed, 4.5 kN. concentrated.
2. All steelwork components shall be hot dip galvanised after fabrication.
3. All bolts and fixings shall be Grade 316 stainless steel.

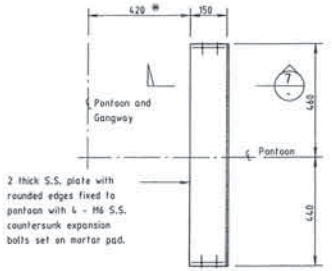
B



DETAIL B
1:2

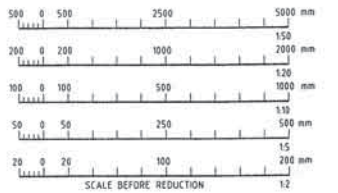


SECTION 6
1:2



SECTION
N.T.S.
7

GANGWAY ROLLER GUIDE DETAILS
1:10



AUTOCAD NAME: K95-34.DWG
DATE : 12-12-1996 TIME : 12:59 PM

Rv.	DATE	REVISIONS	REC.	APPR.
B	24-06-97	Notes revised.		
A	11-04-97	General Revisions		

DESIGNED: PKen
DRAWN: C.O'Rogers
CHECKED: EC
RECOMMENDED: S.J.Howard.
PROJ. MAN.
REC.

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DATUM: A.H.D.
APPROVED: PROJ. DIR.
APPR.

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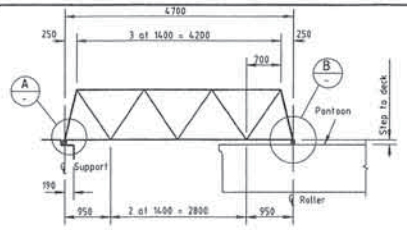
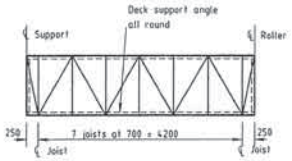
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE Z
FLOATING PONTOON DETAILS

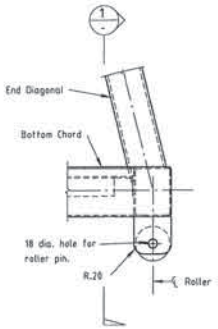
DATE: 12-12-1996
DRAWING No: 478/95 - 34
Rv. B



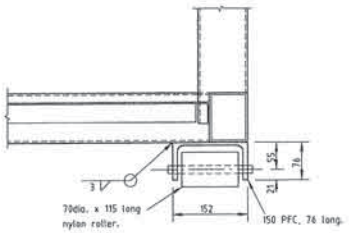
ELEVATION
1:50



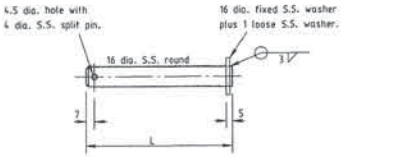
PLAN
1:50



DETAIL B
1:5

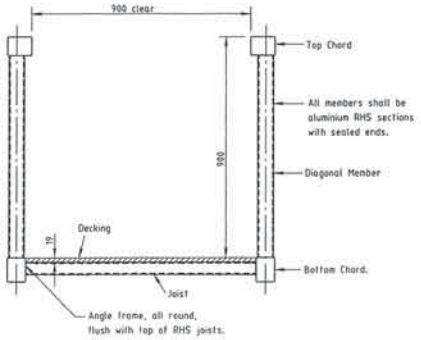


SECTION 1
1:5

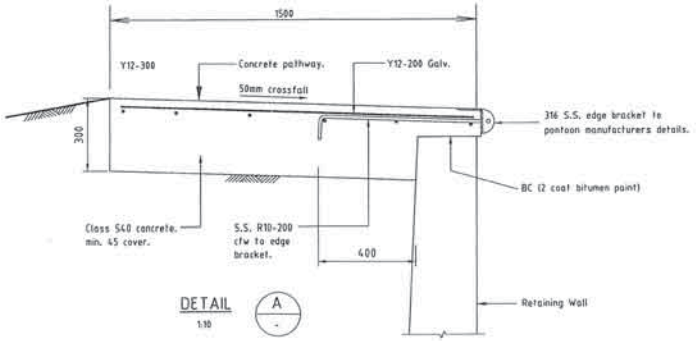


PIVOT PIN
1:2

2 OFF - L = 120 FOR PIVOT END
2 OFF - L = 172 FOR ROLLER END



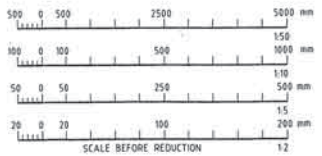
TYPICAL SECTION
1:10



DETAIL A
1:10

NOTES :
1. Gangway shall be fabricated from aluminium alloy 6061-T6.
2. All welds shall be 3mm continuous fillet using filler alloy 5356.
3. All butt welds shall be full penetration.
4. All stainless steel shall be Grade 316.
5. Decking to gangway shall be 19 thick sealed marine plywood with non-slip rubber sheeting surface fixed to frame with 6mm S.S. countersunk screws at 150 centres.

GANGWAY DESIGN LIVE LOAD :
4.0 kPa DISTRIBUTED
4.5 kN CONCENTRATED



AUTOCAD NAME: KYL-35.DWG
DATE : 12-12-1996 TIME : 12:58 PM

Rv.	DATE	REVISIONS	REC.	APPR.
B	03-03-98	Detail A revised		
A	11-04-97	General Revisions		

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DATUM: A.H.D.
APPROVED: PROJ. DIR.

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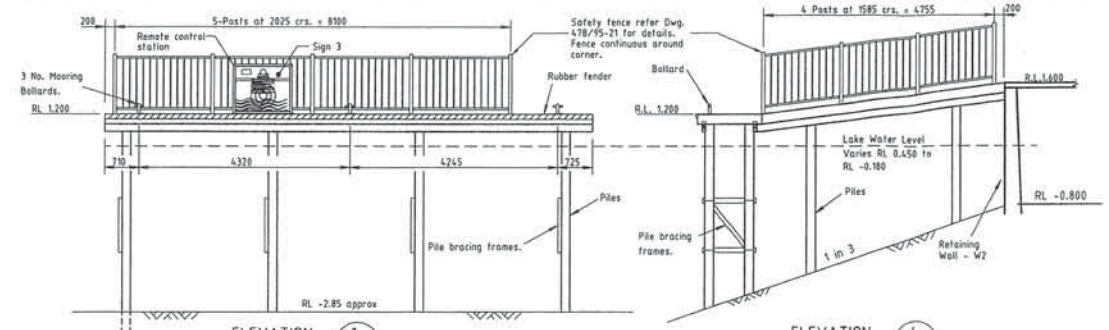
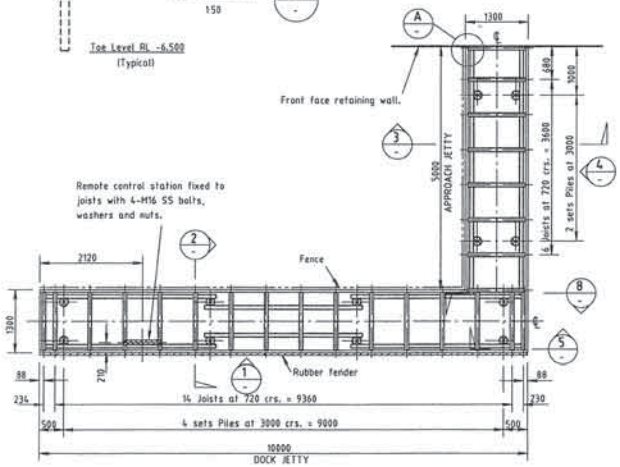
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 2
FLOATING PONTOON GANGWAY DETAILS

DATE: 12-12-1996
DRAWING No:
478/95 - 35
Rv. A

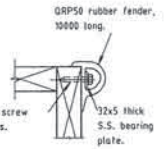


ELEVATION 1 (1:50)

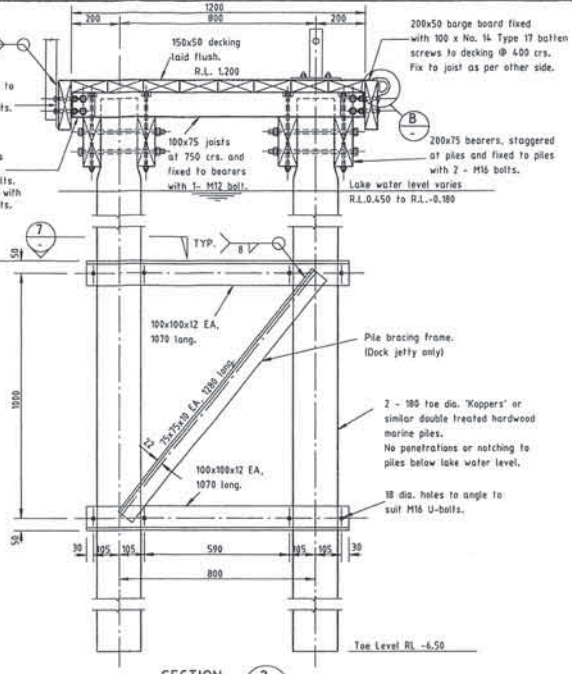
ELEVATION 4 (1:50)



FRAMING PLAN (1:50) Decking not shown for clarity.

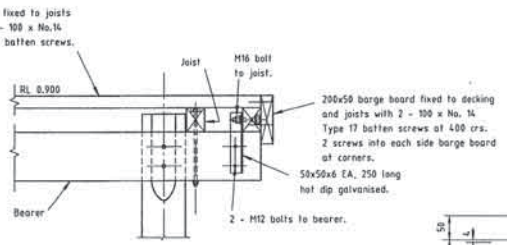


DETAIL B (1:5)

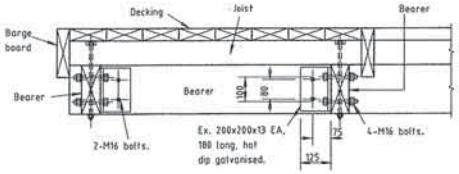


SECTION 2 (1:10)

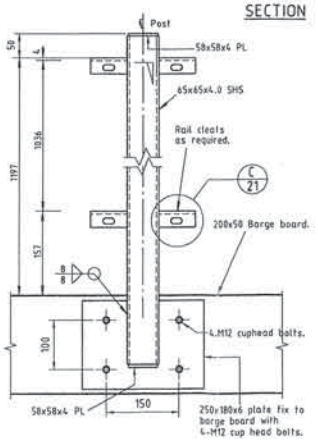
SECTION 3 SIMILAR



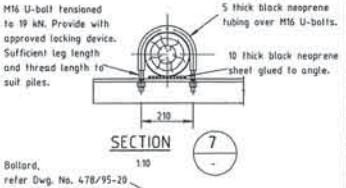
SECTION 5 (1:10)



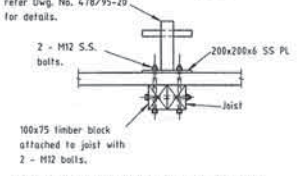
SECTION 8 (1:10)



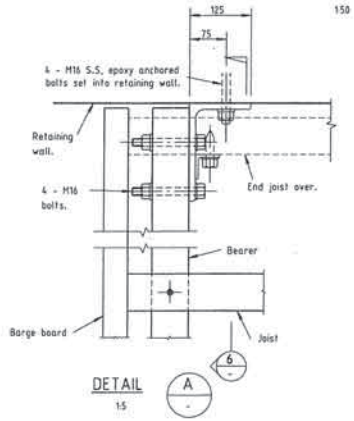
STANDARD POST (1:5)



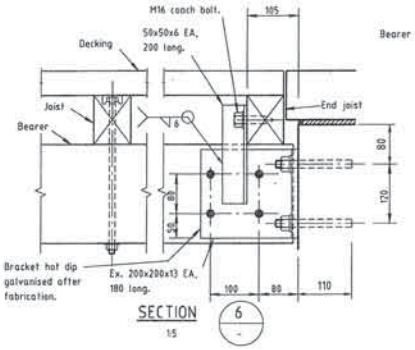
SECTION 7 (1:10)



MOORING BOLLARD FIXING DETAIL (1:10)



DETAIL A (1:5)



SECTION 6 (1:5)

NOTES :
1. All bolts,nuts and washers shall be hot dip galvanised unless shown otherwise.
2. Washers shall be used under heads of nuts.
3. All steelwork to pile bracing frame bolts, nuts and washers shall be hot dip galvanised after fabrication and painted before installation. Coating shall be touched up after installation.
4. Piles shall extend 200mm past final level and shall be capped with galvanised steel caps, until beams and joists are installed.

JETTY DESIGN LIVE LOAD :
5.0 kPa DISTRIBUTED
4.5 kN CONCENTRATED

1 0.5 0 1 2 3 4 1:50
1.0 0.5 0 1:10
0.10 0 0.20 0.40 1:5
SCALES BEFORE REDUCTION

AUTOCAD R.14 FILENAME : K95-36.DWG
DATE : 12-12-1996 TIME : 8:52 AM

Rv.	DATE	REVISIONS	REC.	APPR.
D	11-05-98	Elevation 1 amended.		
C	03-02-98	Tubular handrail changed to Safety fence.		
B	06-05-97	Note 3. changed		
A	11-04-97	General Revisions		

DESIGNED: [illegible]
DRAWN: [illegible]
CHECKED: [illegible]
RECOMMENDED: PROJ. MGR. A.J. Howard
APPROVED: [illegible]
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DATUM: A.H.D.

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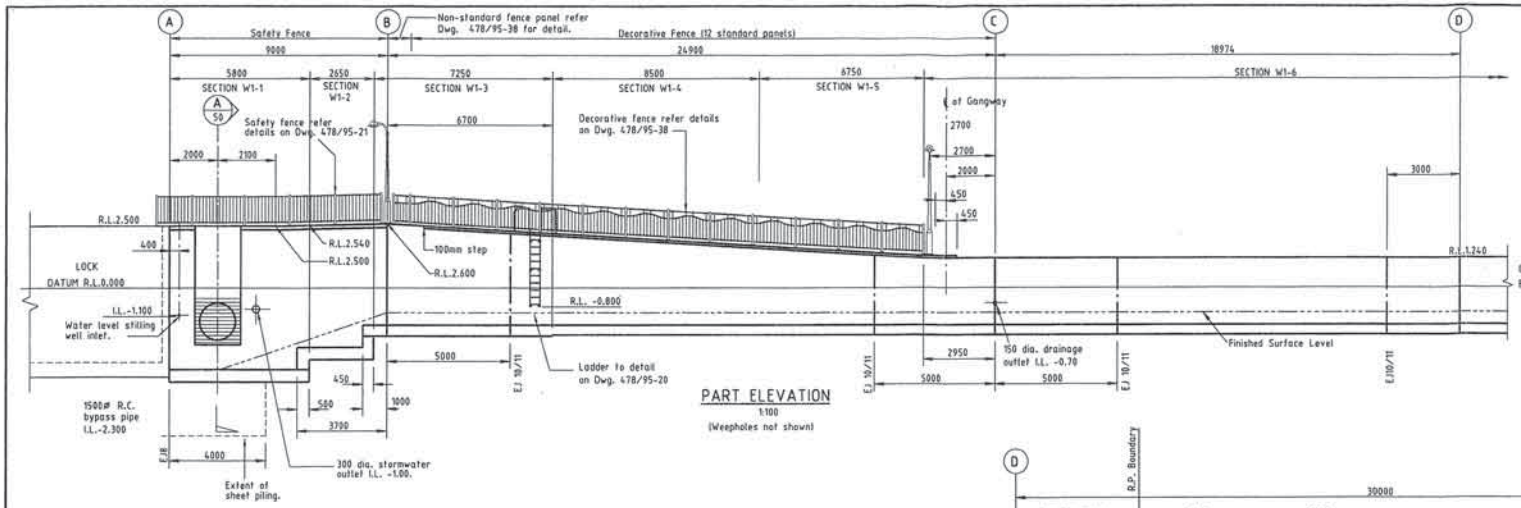
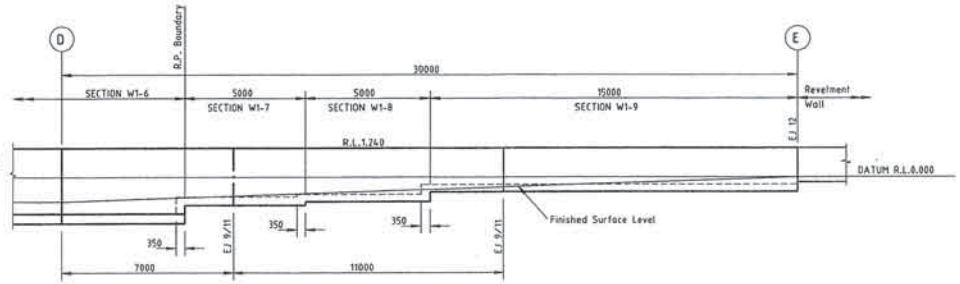
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE Z
TIMBER JETTY DETAILS

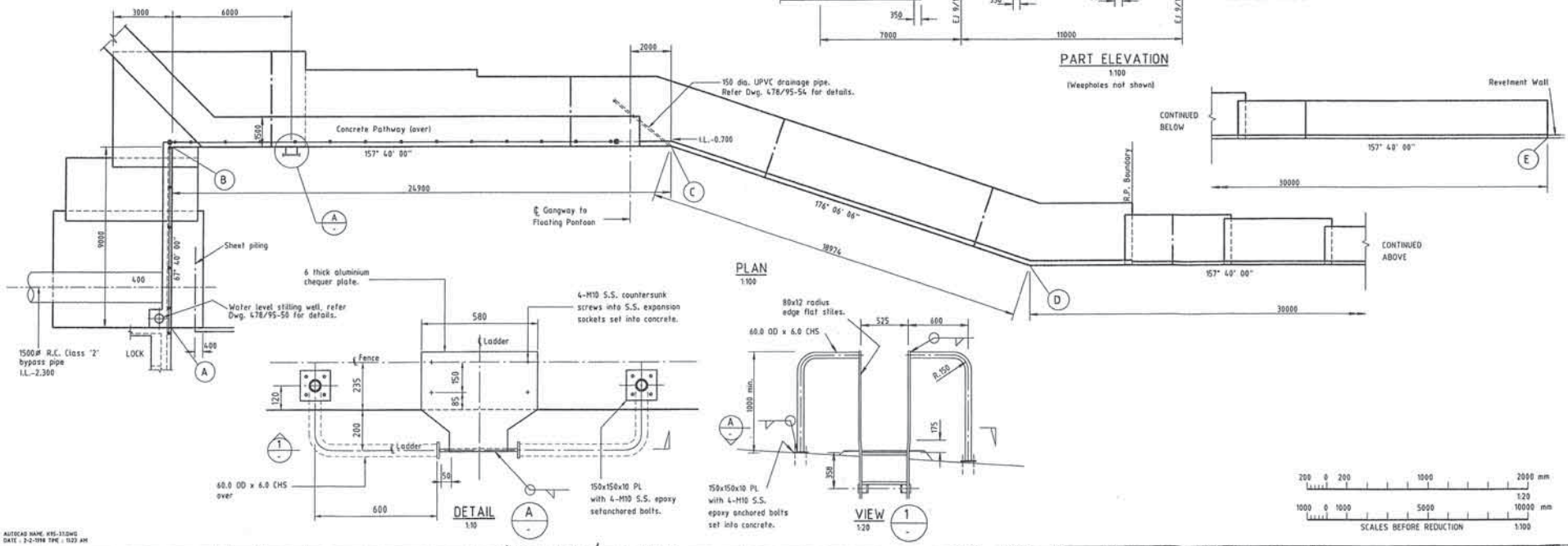
DATE: 12-12-1996
DRAWING No: 478/95 - 36
Rv. D



PART ELEVATION
1:100
(Weepholes not shown)



PART ELEVATION
1:100
(Weepholes not shown)



200 0 200 1000 2000 mm
1:20
1000 0 1000 5000 10000 mm
SCALES BEFORE REDUCTION 1:100

NOTES :

1. Concrete grades to retaining walls shall be not less than :-
   - (a) footings — Grade N40
   - (b) vertical walls — Grade as specified
   - (c) mass concrete walls — Grade N40
   - (c) in-ground pits, pathways and spoon drains — Grade N25
2. Required cover to reinforcing steel shall be not less than :-
   - (a) faces of vertical walls and other surfaces exposed to tidal or splash action — 70mm
   - (b) sides and upper surfaces of footings and slabs — 45mm
   - (c) undersides of footings and slabs — 55mm
   - (d) elsewhere — 45mm
3. All fence setout dimensions to be verified on site prior to the commencement of fabrication.

AUTOCAD NAME: KYS-31.DWG
DATE : 2-2-1998 TIME : 11:23 AM

Rv.	DATE	REVISIONS	REC.	APPR.
E	02-02-98	Fences & Levels to top of wall revised.		
D	28-09-97	Invert levels to pipework revised.		
C	22-09-97	Wall finished levels revised.		
B	06-05-97	Bypass pipe added. Ladder added.		
A	11-04-97	General Revisions		

DESIGNED: A.H.D.
DRAWN: C.J.H.
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DATUM: A.H.D.
APPROVED: PROJ. DIR.
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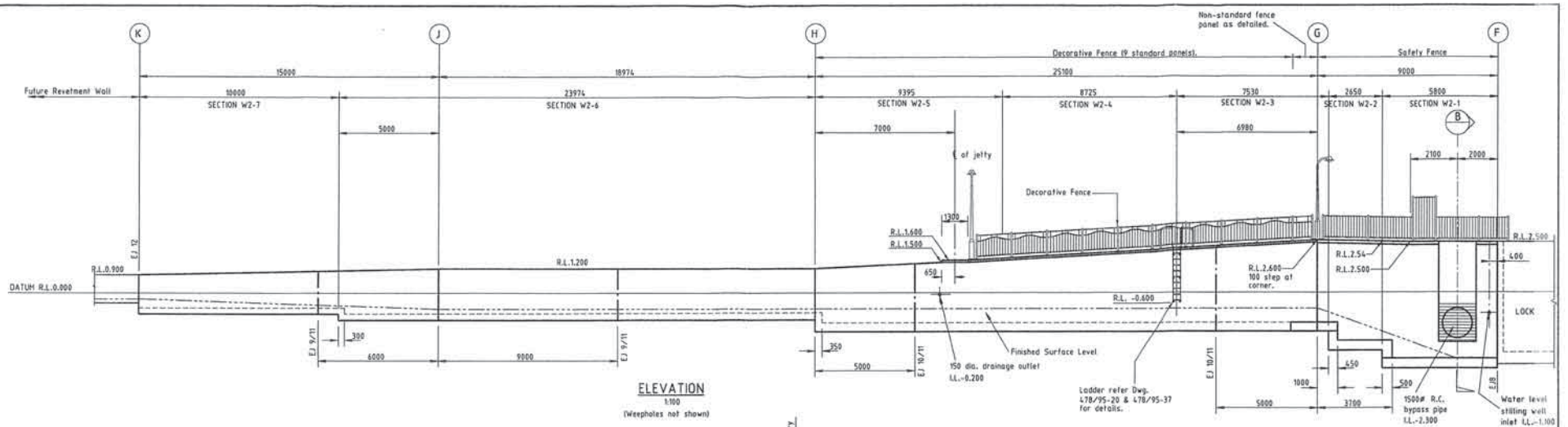
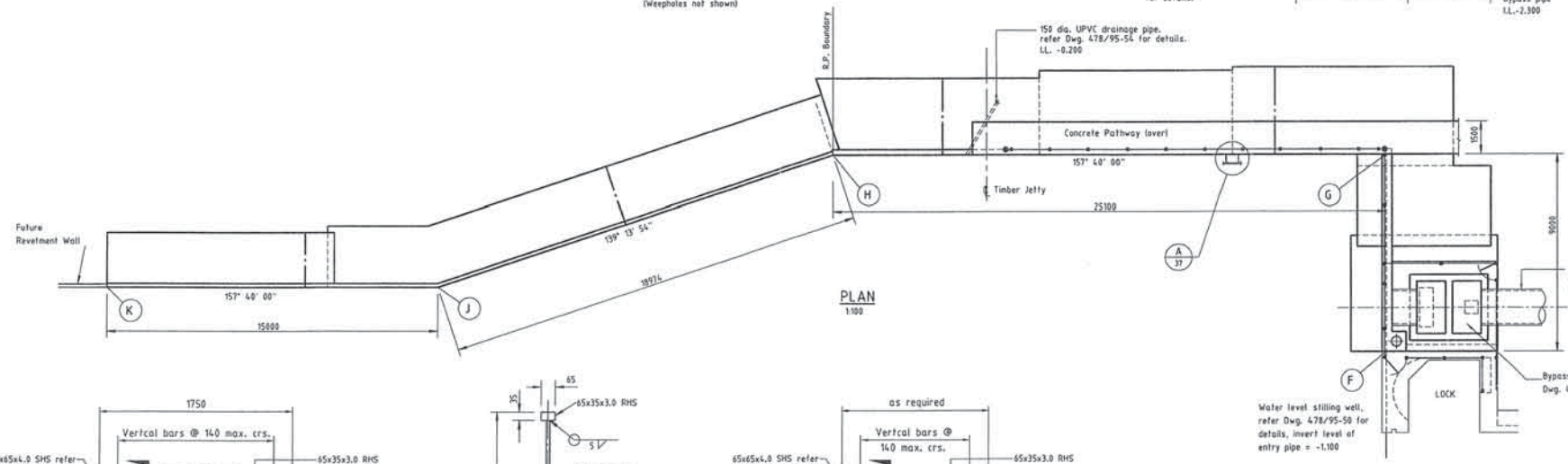
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE Z
RETAINING WALLS - WALL W1
PLAN AND ELEVATION

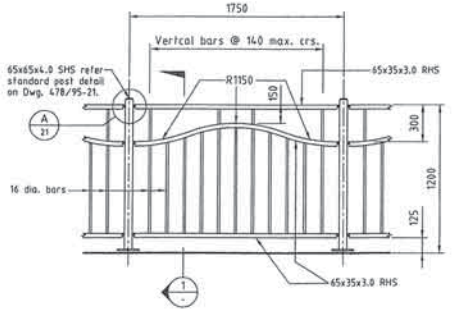
DATE: 12-12-1996
DRAWING No:
478/95 - 37
Rv.



ELEVATION
1:100
(Weepholes not shown)

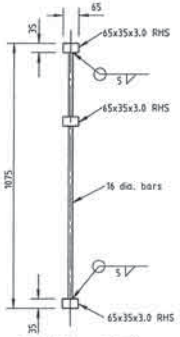


PLAN
1:100

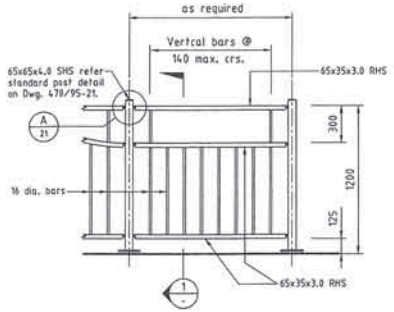


DECORATIVE FENCE
(Standard Panel)
1:20

All posts and bars are to be vertical. Rails are to be sloped to match wall profile.



SECTION
1:10
1



DECORATIVE FENCE
(Non-standard Panel)
1:20

NOTE: All fence setout dimensions to be verified on site prior to the commencement of fabrication

200 0 200 1000 2000 mm
1:20
1000 0 1000 5000 10000 mm
1:100
SCALES BEFORE REDUCTION

AUTOCAD NAME: K95-38.DWG
DATE : 10-12-1996 TIME : 10:58 PM

No.	DATE	REVISIONS	REC.	APPR.
C	02-02-98	Fences & Levels to top of walls revised		
B	06-05-97	Bypass pipe added, Ladder added.		
A	11-04-97	General Revisions		

DESIGNED:
DRAWN:
CHECKED:
RECOMMENDED:
PROJ. MAN.
A1
DATUM: A.H.D.
APPROVED:
PROJ. DIR.

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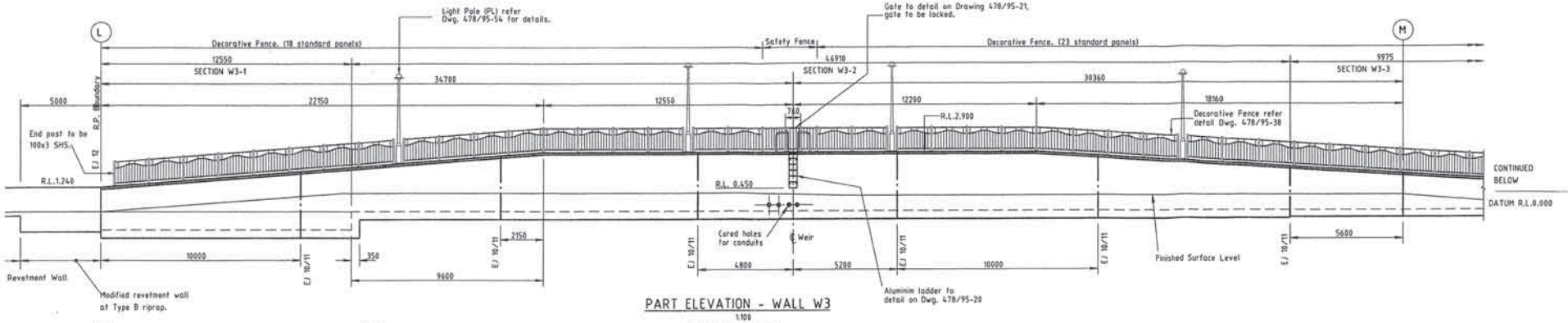
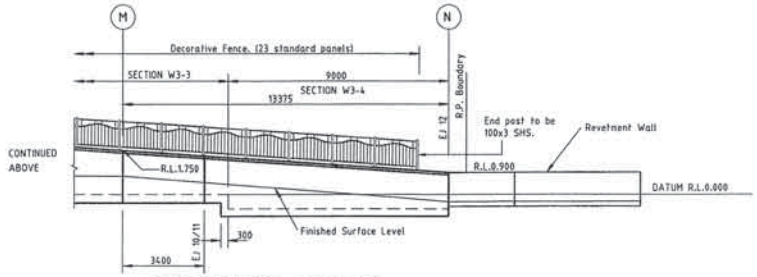
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 2
RETAINING WALLS - WALL W2
PLAN AND ELEVATION

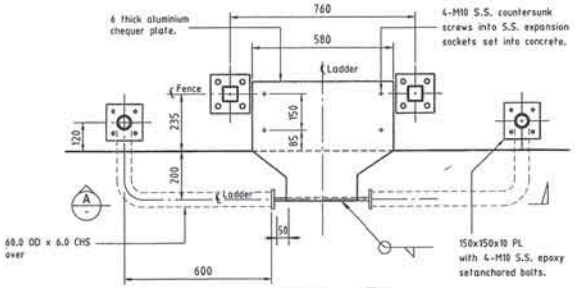
DATE: 12-12-1996
DRAWING No:
478/95 - 38
Rev.



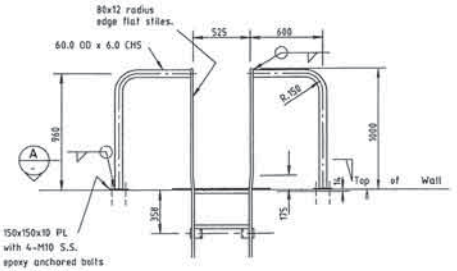
PART ELEVATION - WALL W3
1:100
(Weepholes not shown)



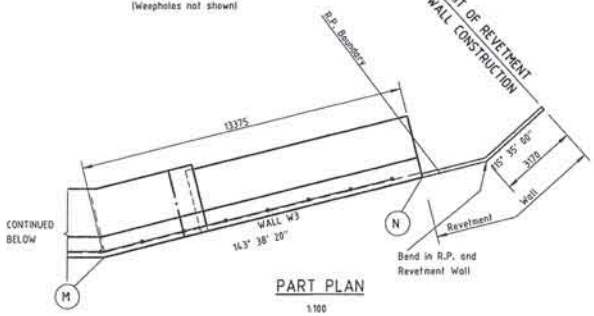
PART ELEVATION - WALL W3
1:100
(Weepholes not shown)



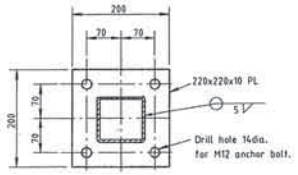
DETAIL A
1:10



VIEW 1/A
1:20

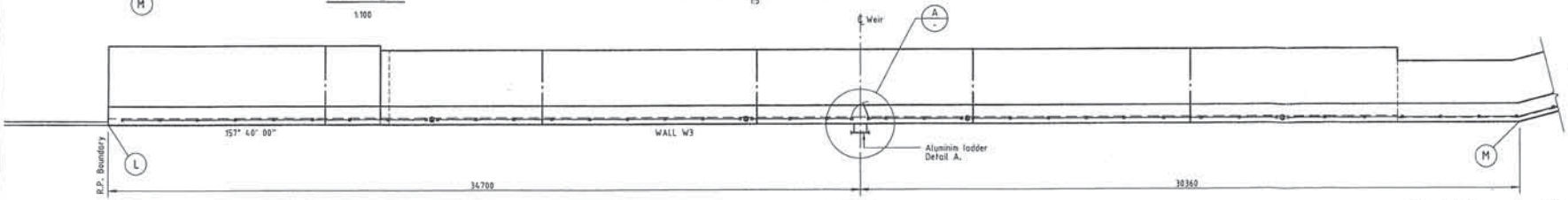


PART PLAN
1:100



BASE PLATE TO 100 SHS END POST
(Walls W3-1 & W3-4)
1:5

NOTE: All fence setout dimensions to be verified on site prior to the commencement of fabrication.



PART PLAN
1:100

1000 0 1000 5000 10000 mm
SCALE BEFORE REDUCTION 1:100

AUTOCAD NAME: 495-39.DWG
DATE : 12-12-1996 TIME : 1:55 PM

Rv.	DATE	REVISIONS	REC.	APPR.
D	02-02-98	Fences to top of wall revised.		
C	23-09-97	Wall finished level revised		
B	06-05-97	Ladder & Safety fence added.		
A	11-04-97	General Revisions		

DESIGNED:
DRAWN: G. Thorn
CHECKED:
RECOMMENDED: PROJ. MAN. A.J. Hawcroft
A1
DATUM: A.H.D.
APPROVED: PROJECT MGR.

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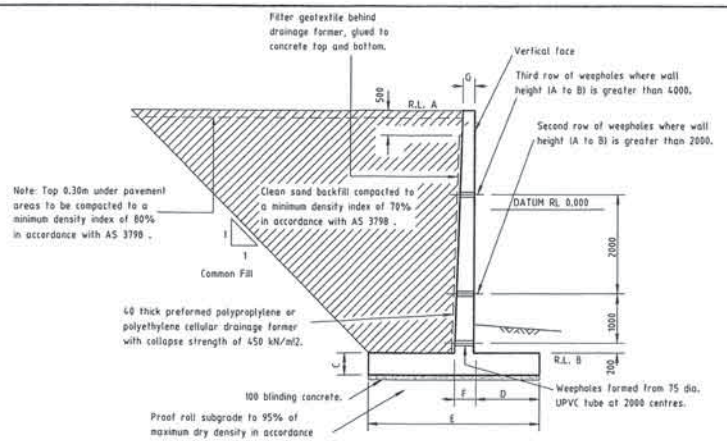
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE Z
RETAINING WALLS - WALLS W3
PLANS AND ELEVATIONS

DATE: 12-12-1996
DRAWING No: 478/95 - 39
Rv. A



TYPICAL SECTION - WALLS W1, W2 AND W3

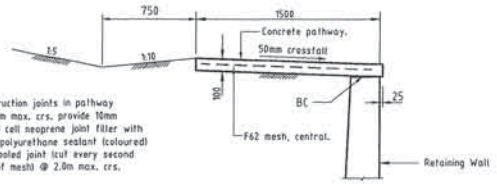
1:50

For dimensions, refer Table 1.

DIMENSION TABLE

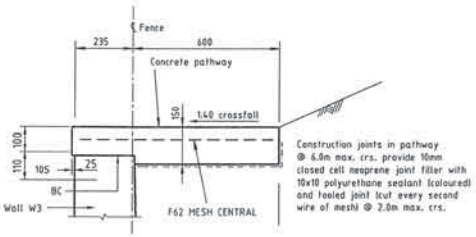
WALL SECTION	DIMENSIONS A ✱	B ✱✱	C	D	E	F	G
W1-1	2.500-2.540 #	-3.300	600	1800	7700	500	250
W1-2	2.540-2.590 #	-2.400	500	1500	6800	400	250
W1-3	2.600-2.100 #	-1.500	450	0	4750	300	300
W1-4	2.100-1.600	-1.500	350	0	3850	300	300
W1-5	1.600-1.240	-1.500	350	0	3500	300	300
W1-6	1.240	-1.500	350	0	3000	300	300
W1-7	1.240	-0.800	250	0	2500	200	200
W1-8	1.240	-0.700	250	0	2300	200	200
W1-9	1.240	-0.300	250	0	1900	200	200
W2-1	2.500-2.540 #	-3.300	500	1600	6600	500	250
W2-2	2.540-2.590 #	-2.400	400	1300	6000	400	250
W2-3	2.500-2.100 #	-1.500	400	0	4000	300	300
W2-4	2.100-1.600	-1.500	350	0	3850	300	300
W2-5	1.600-1.200	-1.500	350	0	3500	300	300
W2-6	1.200	-1.000	250	0	2800	200	200
W2-7	1.200-0.900	-0.750	250	0	2500	200	200
W3-1	2.060-1.130	-0.900	350	0	3600	300	300
W3-2	2.800-2.100	0.000	350	0	3400	300	300
W3-3	2.000-1.470	0.000	250	0	2800	200	200
W3-4	1.470-0.79	-0.600	250	0	2600	200	200

✱ Dimension A is the reduced level (R.L.) on top of the wall.
✱✱ Dimension B is the reduced level (R.L.) on top of the wall footing.
Refer to Dwgs. 478/95-37 and 38 for locations of level changes



TYPICAL FOOTPATH SECTION - WALL W1 & W2

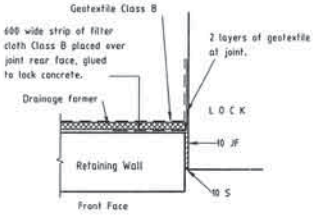
1:20



TYPICAL FOOTPATH SECTION - WALL W3

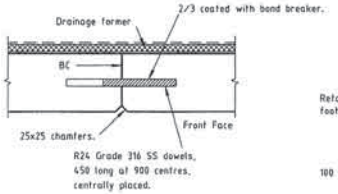
1:10

NOTE: Bolts to Safety and Decorative fences to be cast into slab.



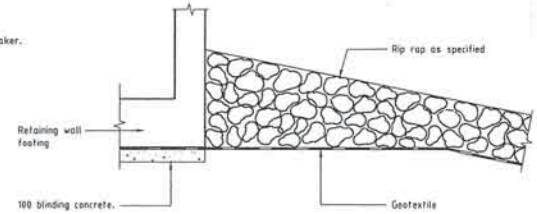
EXPANSION JOINT - EJ 8

1:10



EXPANSION JOINT - EJ 9

1:10



FOOTING / RIP RAP DETAIL

1:20

LEGEND:

ST Steel Trowelled Surface

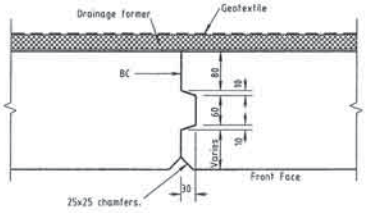
BC 2 Coat Bitumen Paint before pouring second concrete

10 JF 10 Joint Filler (fixed to one face with 30 long copper nails at 200 centres)

10S Polyurethane Sealant 10x10 with polyethylene backing strip

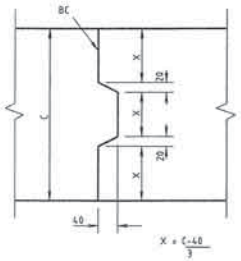
Geotextile Type A

Polyethylene Sheet



EXPANSION JOINT - EJ 10

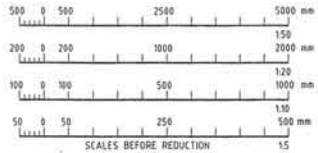
1:5



EXPANSION JOINT - EJ 11

(TO FOOTINGS ONLY)

1:5



AUTOCAD NAME: K95-40.DWG
DATE : 12-12-1996 TIME : 1:36 PM

Rv.	DATE	REVISIONS	REC.	APPR.
E	04-03-98	Joint filler removed from footpath typical sections.		
D	03-02-98	Footpath typical sections and wall levels revised.		
C	16-10-97	Dimension D & E revised on walls 1-1 & 1-2.		
B	23-09-97	Wall finished levels revised.		
A	11-04-97	General Revisions		

DESIGNED: [illegible]
DRAWN: C.J.Hay
CHECKED:
RECOMMENDED: PROJ. MANA.
A1
DATUM: A.H.D.
APPROVED: PROJ. DIR.

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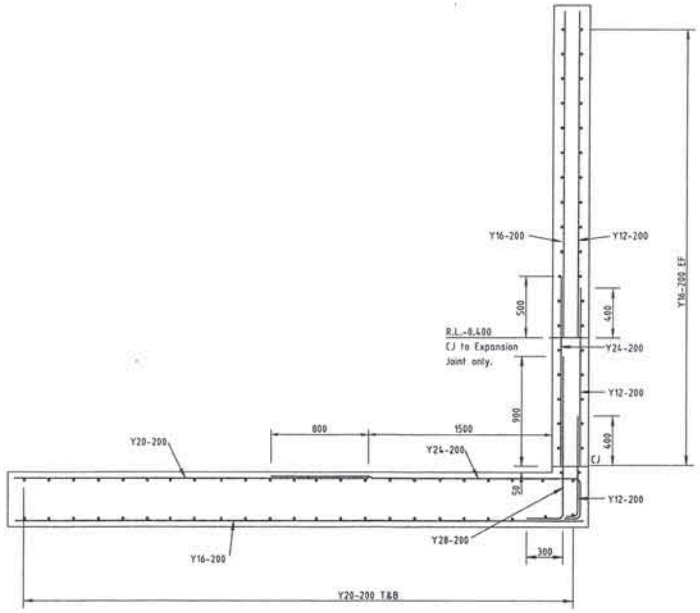
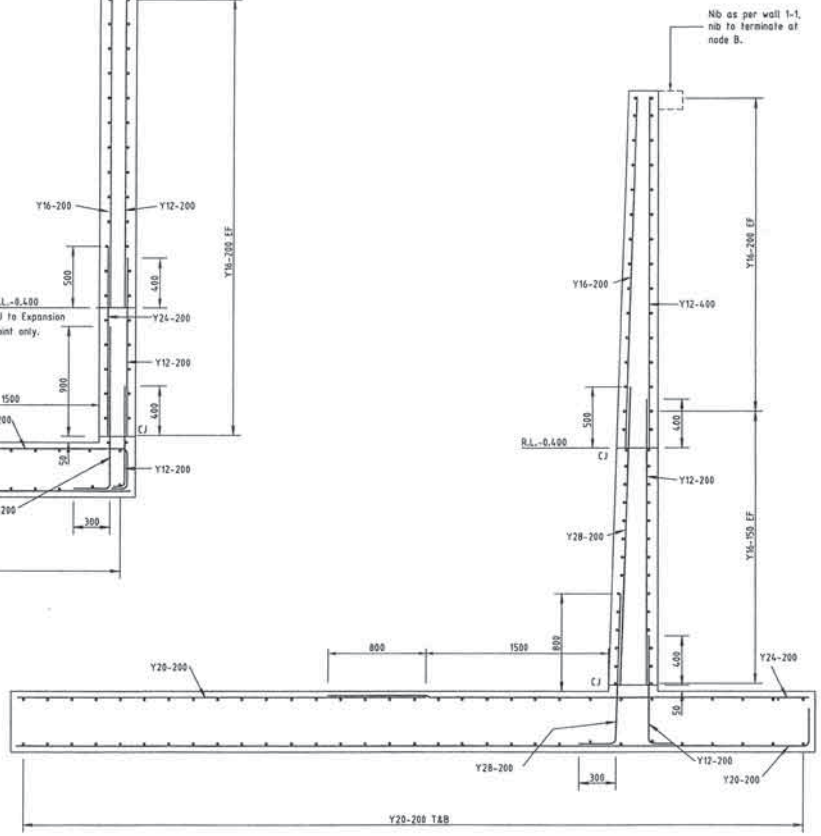
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 2
RETAINING WALLS W1, W2, W3 AND W4
SECTIONS AND DETAILS

DATE: 12-12-1996
DRAWING No.: 478/95 - 40



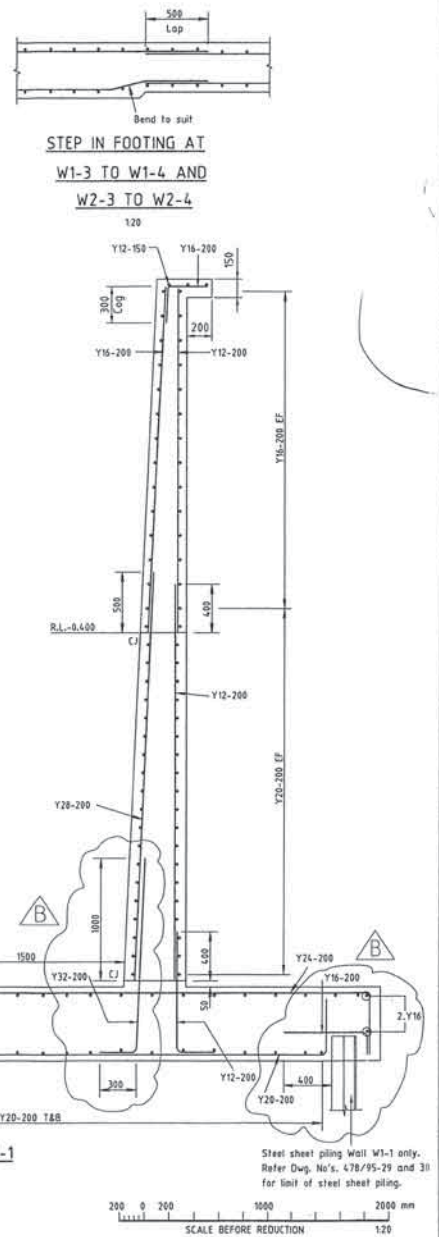
WALL W1-3

1:20



WALL W1-2

1:20



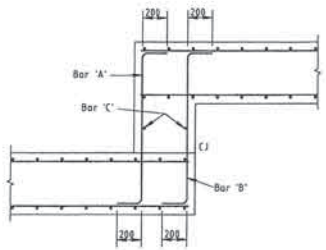
WALL W1-1

1:20

STEP IN FOOTING AT W1-3 TO W1-4 AND W2-3 TO W2-4

1:20

Steel sheet piling Wall W1-1 only. Refer Dwg. No's. 478/95-29 and 31 for limit of steel sheet piling.



FOOTING STEP DETAIL

NOT TO SCALE

FOOTING STEP TABLE

STEP IN FOOTING AT JUNCTION OF WALLS	BARS 'A'	BARS 'B'	BARS 'C'
W1-1 to W1-2	Y20-200	Y20-200	Y16
W1-2 to W1-3	Y20-200	Y20-200	Y16
W1-6 to W1-7	Y16-200	Y16-200	Y16
W1-7 to W1-8	Y16-250	Y16-250	Y16
W1-8 to W1-9	Y16-250	Y16-250	Y16
W2-1 to W2-2	Y12-250	Y12-250	Y12
W2-2 to W2-3	Y12-250	Y12-250	Y12
W3-1 to W3-2	Y12-300	Y12-300	Y12
W3-3 to W3-4	Y12-300	Y12-300	-

SCALE BEFORE REDUCTION 200 0 200 1000 2000 mm 1:20

AUTOCAD NAME: KYS-4-LDWG

DATE : 19-12-1996 TIME : 9:53:36 AM

Rv.	DATE	REVISIONS	REC.	APPR.
D	16-10-97	R.C. nib to wall 1-1 & 1-2 added.		
C	06-05-97	Sheet piling, starter bar		
B	11-04-97	General Revisions		
A	11-12-96	Revised Drawing Issue		

DESIGNED:

DRAWN:

CHECKED:

RECOMMENDED: PROJ. MAN.

A1

DATUM: A.H.D.

APPROVED: PROJ. DIR.

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KAWANA ESTATES PTY. LTD.

PARREARRA DEVELOPMENT

STRUCTURE 2

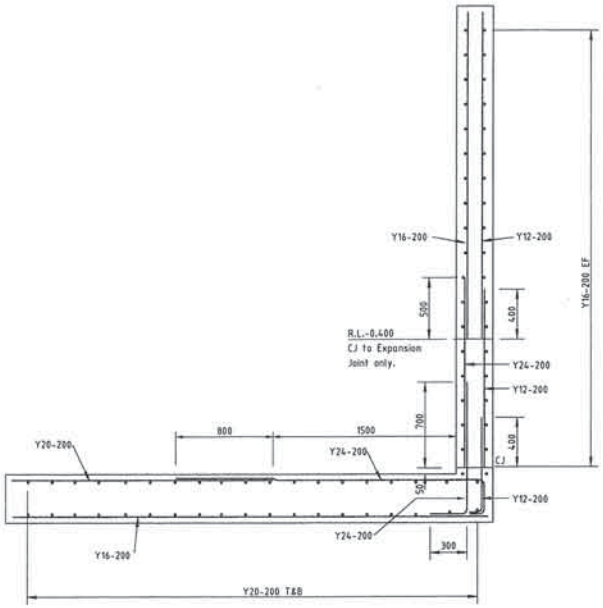
RETAINING WALLS

REINFORCEMENT DETAILS - SHEET No. 1

DATE: 12-12-1996

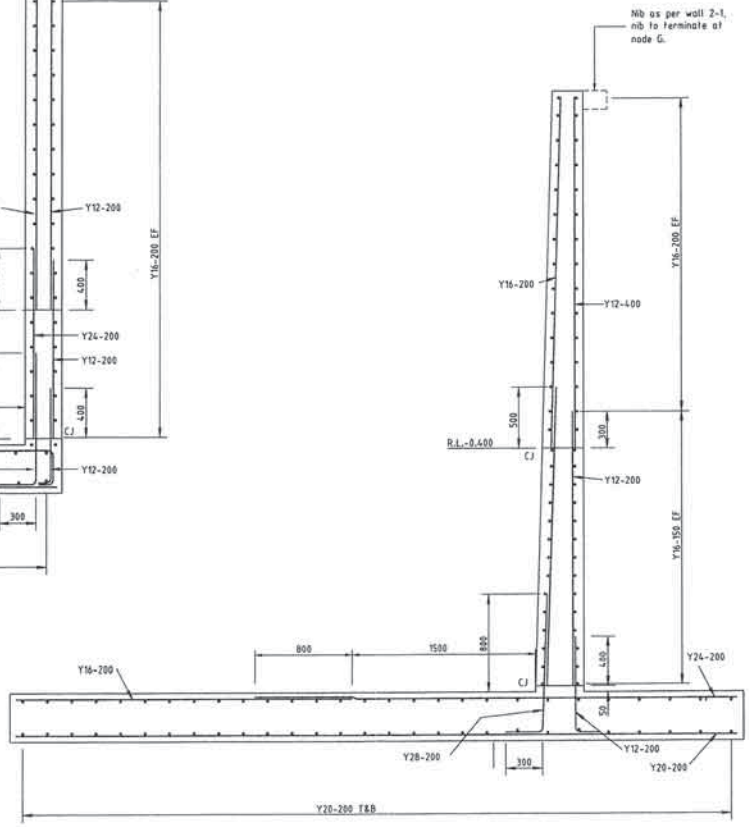
DRAWING No: 478/95 -41

Rv.



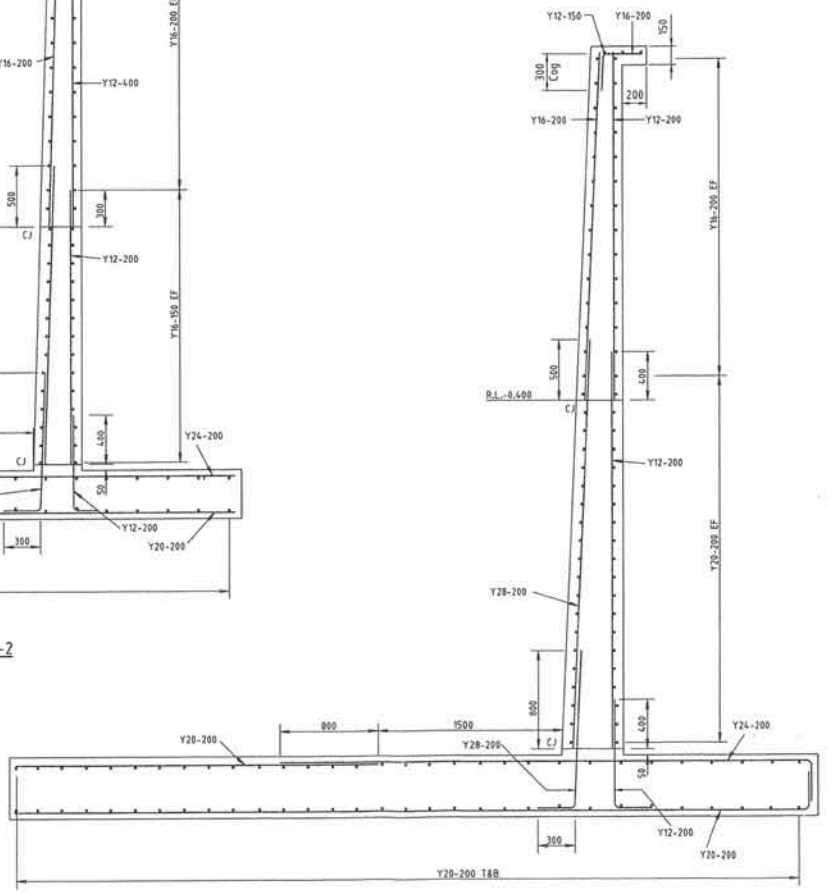
WALL W2-3

1:20



WALL W2-2

1:20



WALL W2-1

1:20

200 0 200 1000 2000 mm

SCALE BEFORE REDUCTION 1:20

AUTOCAD NAME: R95-42DWG
DATE : 16-12-1998 TIME : 11:03:34 AM

Rv.	DATE	REVISIONS	REC.	APPR.
D	03-04-98	R.C. nib added to Walls W2-1 & W2-2		
C	06-05-97	Sheet piling removed from wall 2-1		
B	11-04-97	General Revisions		
A	11-12-96	Revised Drawing Issue		

DESIGNED:
DRAWN:
CHECKED:
RECOMMENDED:
PROJ. MAN.

A1

DATUM: A.H.D.

APPROVED:
PROJ. DIR.

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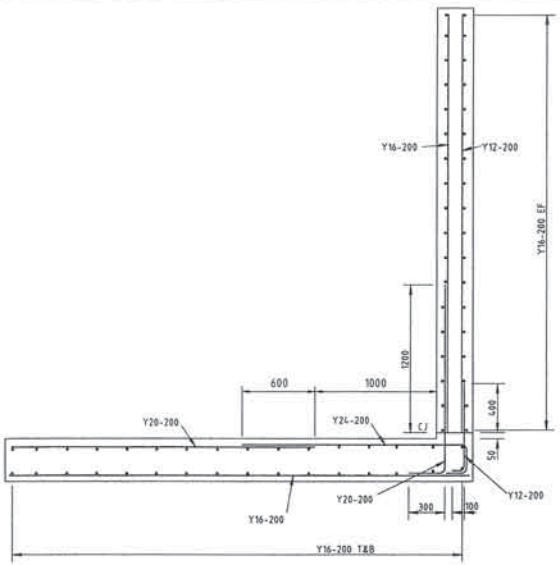
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 2
RETAINING WALLS
REINFORCEMENT DETAILS - SHEET No. 2

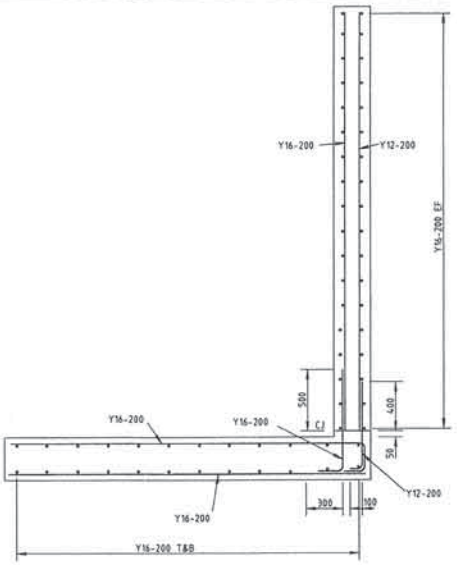
DATE: 12-02-1997
DRAWING No: 478/95 -42



WALL W1-4

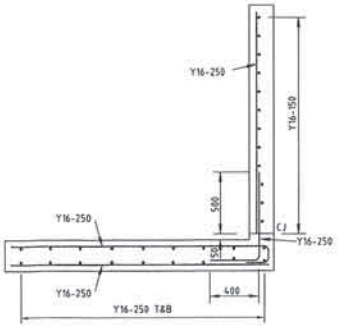
1:20

WALL W2-4 SIMILAR



WALL W1-6

1:20



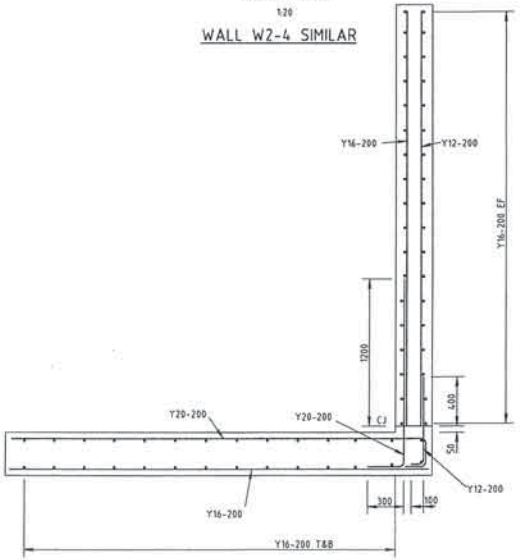
WALL W1-8

1:20

WALLS W1-7 AND W1-9 SIMILAR

WALL W2-7 SIMILAR

WALLS W3-3 AND W3-4 SIMILAR

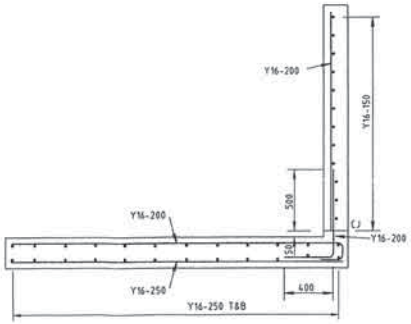


WALL W1-5

1:20

WALL W2-5 SIMILAR

WALLS W3-1 & W3-2 SIMILAR



WALL W2-6

1:20

200 0 200 1000 2000 mm

SCALE BEFORE REDUCTION 1:20

AUTOCAD NAME: KY5-43.DWG
DATE - 15-JAN-1996 TIME - 11:03 AM

Rv.	DATE	REVISIONS	REC.	APPR.
C	06-05-97	Stilling well detail moved to dwg. 478/95-50		
B	11-04-97	General Revisions		
A	11-12-96	Revised Drawing Issue		

DESIGNED: PJR
DRAWN: CG Pinz
CHECKED:
RECOMMENDED: PROJ. MAN. R.J. Hannan
DATUM: A.H.D.
A1
APPROVED: PROJ. DIR.

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Port Hedland (091) 73 2711 (091) 73 2700
Toowoomba (07) 4636 1010 (07) 4636 1178
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KAWANA ESTATES PTY. LTD.

PARREARRA DEVELOPMENT

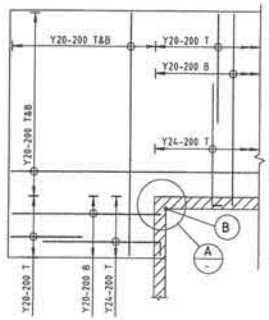
STRUCTURE Z

RETAINING WALLS

REINFORCEMENT DETAILS - SHEET No. 3

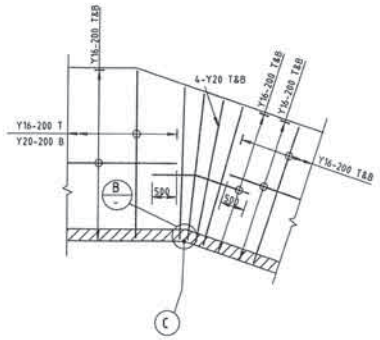
DATE: 12-12-1996

DRAWING No: 478/95 - 43



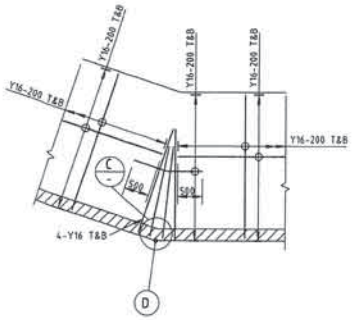
BEND IN WALLS W1-3 AND W2-3

1:50



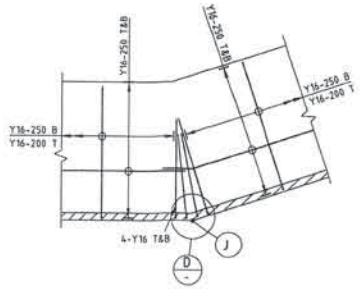
BEND IN WALL AT W1-5 AND W1-6

1:50



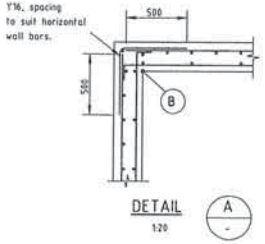
BEND IN WALL W1-6

1:50



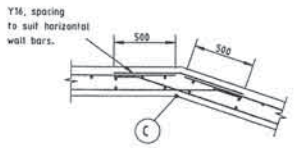
BEND IN WALL W2-6

1:50



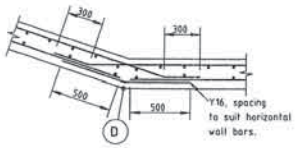
DETAIL A

1:20



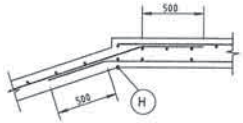
DETAIL B

1:20



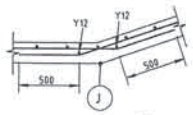
DETAIL C

1:20



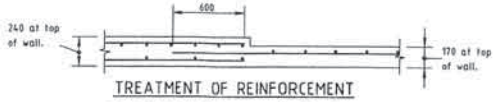
BEND IN WALL AT W2-5 AND W2-6

1:20



DETAIL D

1:20



TREATMENT OF REINFORCEMENT
AT CHANGE OF WALL THICKNESS

1:20

200 0 200 1000 2000 mm

1:20

500 0 500 2500 5000 mm

SCALE BEFORE REDUCTION 1:50

AUTOCAD NAME: KWS-44.DWG
DATE : 19-12-1996 TIME : 10:54 AM

Rv.	DATE	REVISIONS	REC.	APPR.
A	03-02-98	Recess Detail to Pontoon gangway deleted.		

DESIGNED: [illegible]
DRAWN: [illegible]
CHECKED: [illegible]
RECOMMENDED: PROJ. MANR.
APPROVED: PROJ. MGR.

A1

DATUM: A.H.D.

Cardno & Davies
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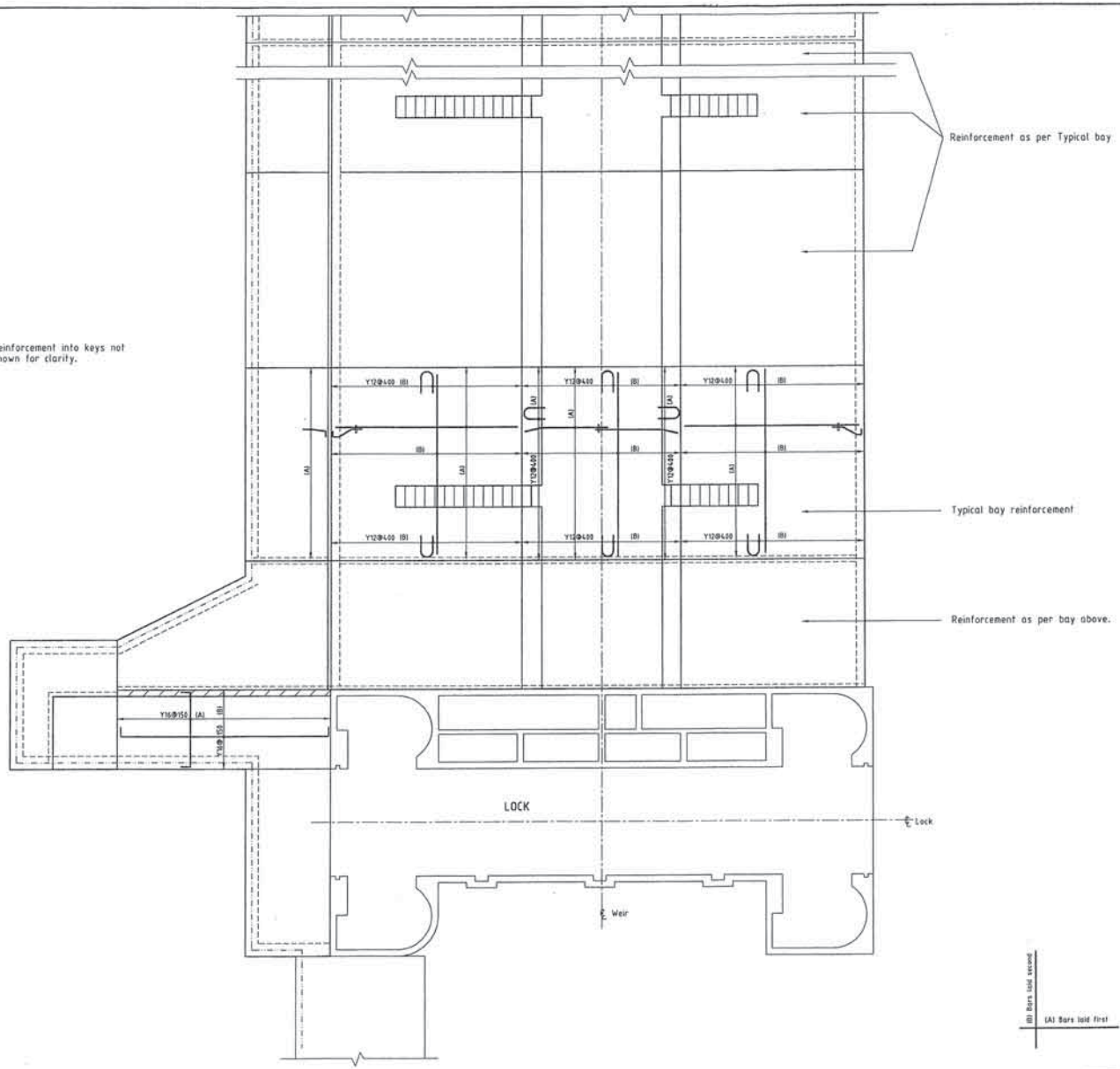
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 2
RETAINING WALLS
REINFORCEMENT DETAILS - SHEET No. 4

DATE: 13-01-1997
DRAWING No: 478/95 - 44 A
Rv.



PART PLAN

1:100

All reinforcement to be Y16@200 E.W. U.N.O.

1000 0 1000 5000 10000 mm

SCALE BEFORE REDUCTION 1:100

Rv.	DATE	REVISIONS	REC.	APPR.
B	23-09-97	Cable pit E5 moved.		
A	06-05-97	Bypass channel removed,Sheet Piling moved 100mm.		

DESIGNED: PKM
DRAWN: C.J.Thorn
CHECKED: E.V.C
RECOMMENDED: P.D.S.J. WAY
A1
DATUM: A.H.D.
APPROVED: PROJ. MGR.

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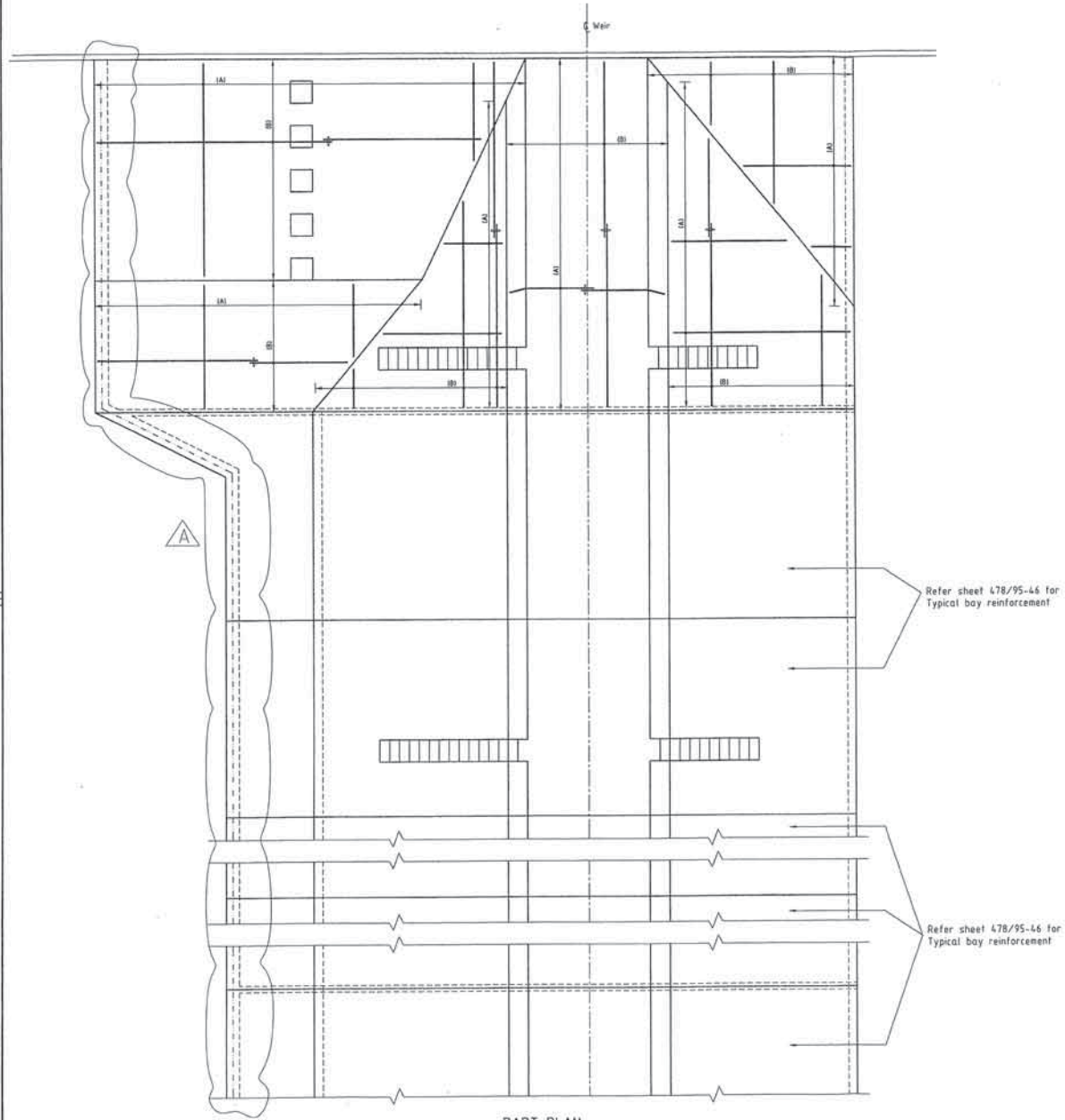
FAX: (07) 3369 9322, (07) 5538 1467, (07) 5443 5942, (077) 21 2588, (07) 54 5711, (07) 5526 7179, (0011)675)525 6951

KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 2
WEIR STRUCTURE
BOTTOM REINFORCEMENT DETAILS - SHEET No. 1

DATE: 13-02-1997
DRAWING No: 478/95 -46



PART PLAN
1:100

(B) Bars laid second

(A) Bars laid first

All reinforcement to be Y16@200 E.W. U.N.O.

1000 0 1000 5000 10000 mm
SCALE BEFORE REDUCTION 1:100

Rv.	DATE	REVISIONS	REC.	APPR.
A	6-05-97	Sheet Piling moved 100mm		

DESIGNED:
DRAWN: C.J. Bray
CHECKED:
RECOMMENDED: PROJ. MAN.
C.J. Hawson

A1

DATUM: A.H.D.

APPROVED: PROJ. DIR.

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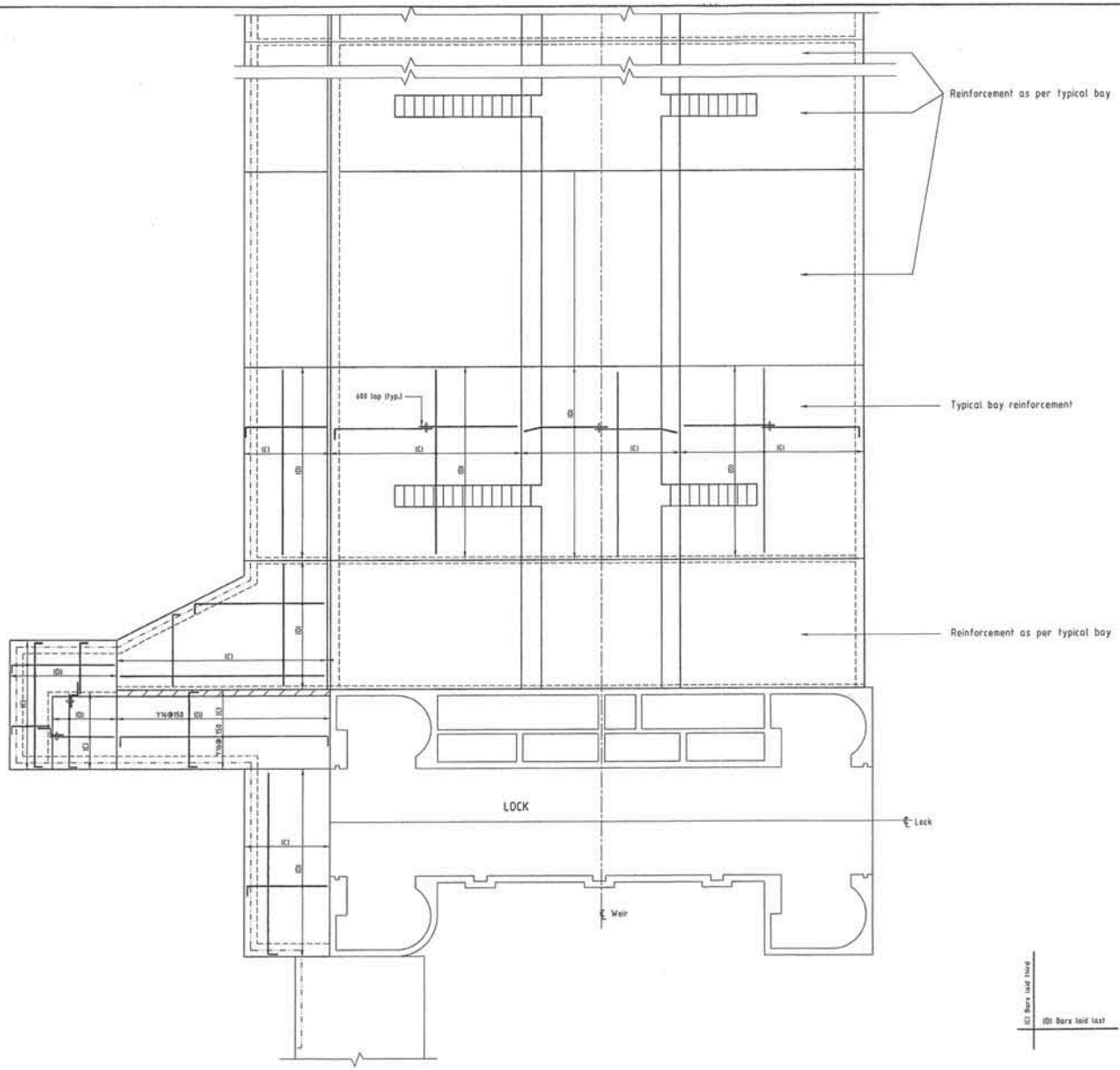
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 2
WEIR STRUCTURE
BOTTOM REINFORCEMENT DETAILS - SHEET No. 2

DATE: 13-02-1997
DRAWING No: 478/95 -47
Rv. A



(C) Bars laid third

(D) Bars laid last

All reinforcement to be Y16@200 E.W. U.N.O.

PART PLAN

1:100

1000 0 1000 5000 10000 mm

SCALE BEFORE REDUCTION 1:100

Rev.	DATE	REVISIONS	REC.	APPR.
B	23-09-97	Cable pit E5 moved.		
A	6-05-97	Bypass channel removed, Sheet Piling moved 100mm		

DESIGNED: PKM
DRAWN: C.J.Hay
CHECKED: BJC
RECOMMENDED: D.J.Howman
SIGNATURE:

A1

DATUM: A.H.D.

APPROVED: PROJ. MGR.

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Hervey Bay (07) 4124 5150
Tweed Heads (07) 5536 7179
Port Moresby (675) 325 3933

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86 Dupath Avenue, Maroochydore
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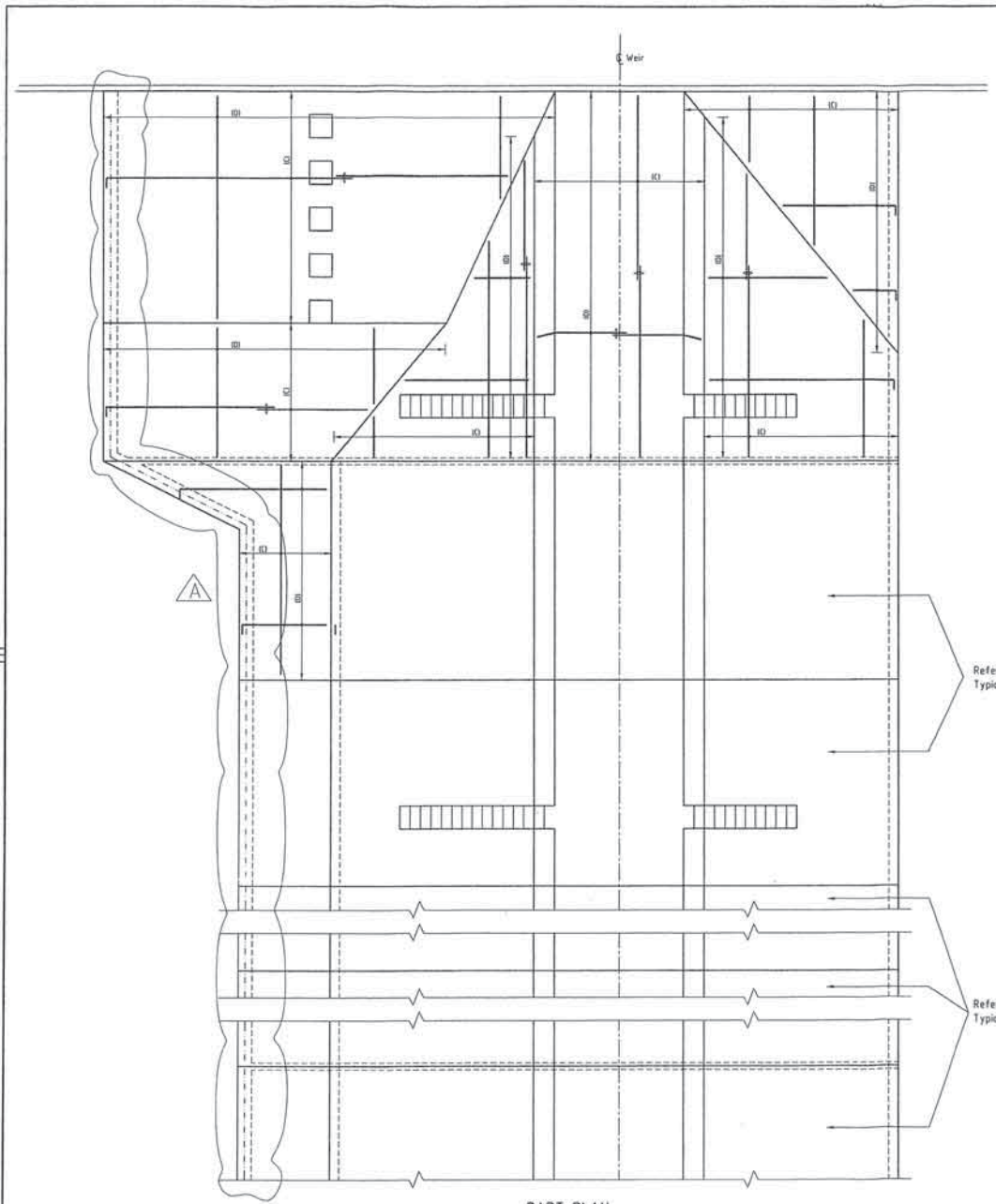
Maroochydore, Queensland 4558

KAWANA ESTATES PTY. LTD.

PARREARRA DEVELOPMENT
STRUCTURE 2
WEIR STRUCTURE
TOP REINFORCEMENT DETAILS - SHEET No. 1

DATE: 13-02-1997

DRAWING No: 478/95 - 48



Refer sheet 478/95-48 for Typical bay reinforcement.

Refer sheet 478/95-48 for Typical bay reinforcement.

(C) Bars laid third

(D) Bars laid last

All reinforcement to be Y16@200 E.W. U.N.O.

1000 0 1000 5000 10000 mm

SCALE BEFORE REDUCTION 1:100

PART PLAN

1:100

No.	DATE	REVISIONS	REC.	APPR.
A	06-05-97	Sheet Piling moved 100mm		

DESIGNED:
DRAWN: C.J. Rogers
CHECKED:
RECOMMENDED: PROJ. MAN. C.J. Howard
A1
DATUM: A.H.D.
APPROVED: PROJ. DIR.

Cardno & Davies
Queensland Pty. Ltd.
ACN 051 971 193
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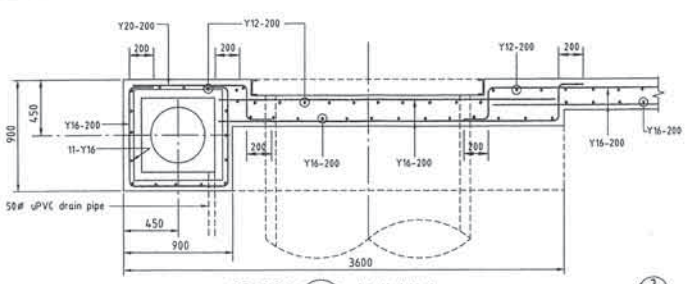
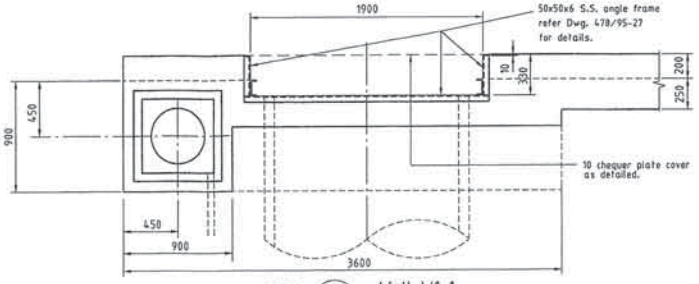
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 2
WEIR STRUCTURE
TOP REINFORCEMENT DETAILS - SHEET No. 2

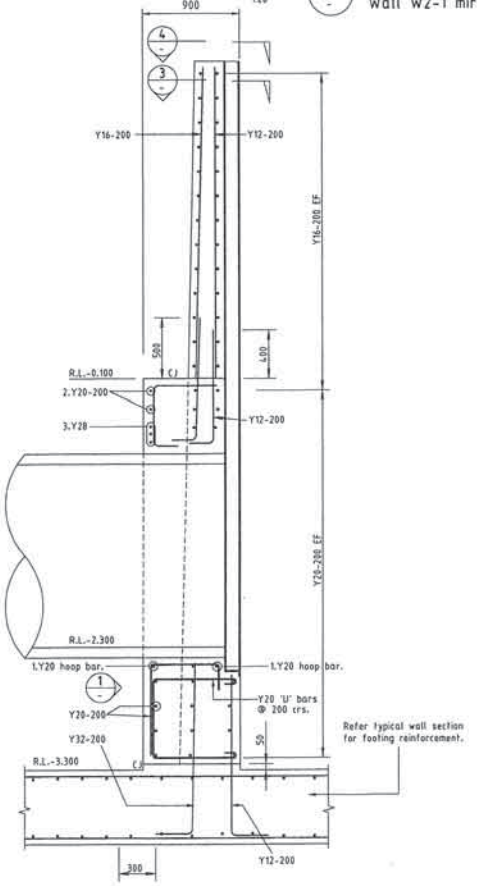
DATE: 13-02-1997
DRAWING No: 478/95 -49



SECTION 3 / - 1:20 Wall W1-1
Wall W2-1 mirrored

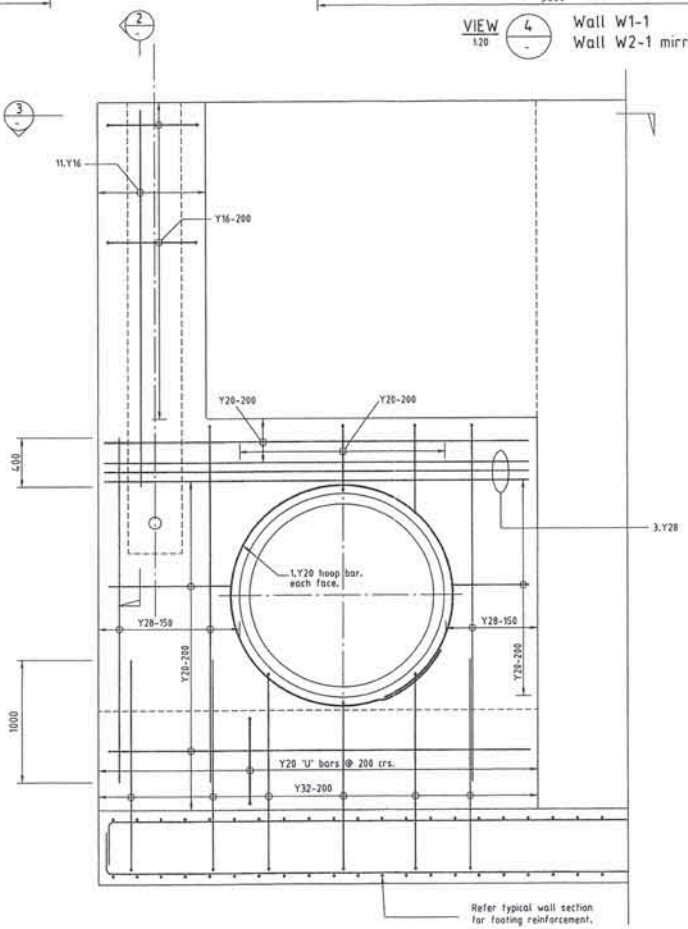


VIEW 4 / - 1:20 Wall W1-1
Wall W2-1 mirrored

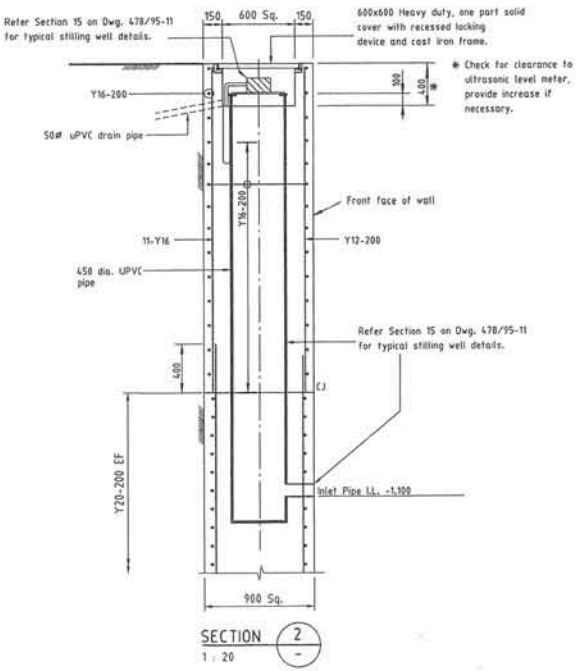


SECTION A / 37 1:20

SECTION B / 38 Similar



VIEW 1 / - 1:20



SECTION 2 / - 1:20

AUTOCAD R.12 FILENAME : R95-50.DWG
DATE : 15-5-1998 TIME : 9.28 AM

Rv.	DATE	REVISIONS	REC.	APPR.
D	09-02-1998	Section 3 & View 4 revised to suit 150 rib to W2-1		
C	03-11-1997	Top of stilling well revised.		
B	22-10-1997	Cover added to stilling wells. and wall W1-1		
A	06-10-1997	Reinforcement altered		

DESIGNED: [illegible]
DRAWN: C.J.Has
CHECKED: [illegible]
RECOMMENDED: PROJ. MAN. [illegible]
A1
DATUM: A.H.D.
APPROVED: PROJ. MAN. [illegible]

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FAX: (07) 3369 9722, (07) 5538 6655, (07) 5574 5863, (07) 4771 2109, (07) 4124 5155, (07) 5536 7179, (675) 325 3593
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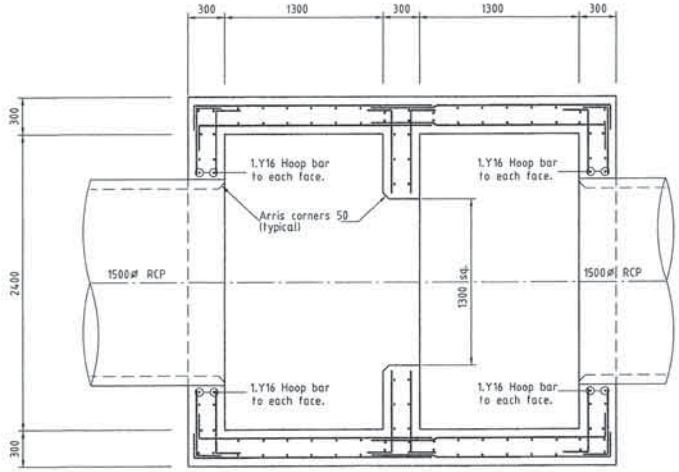
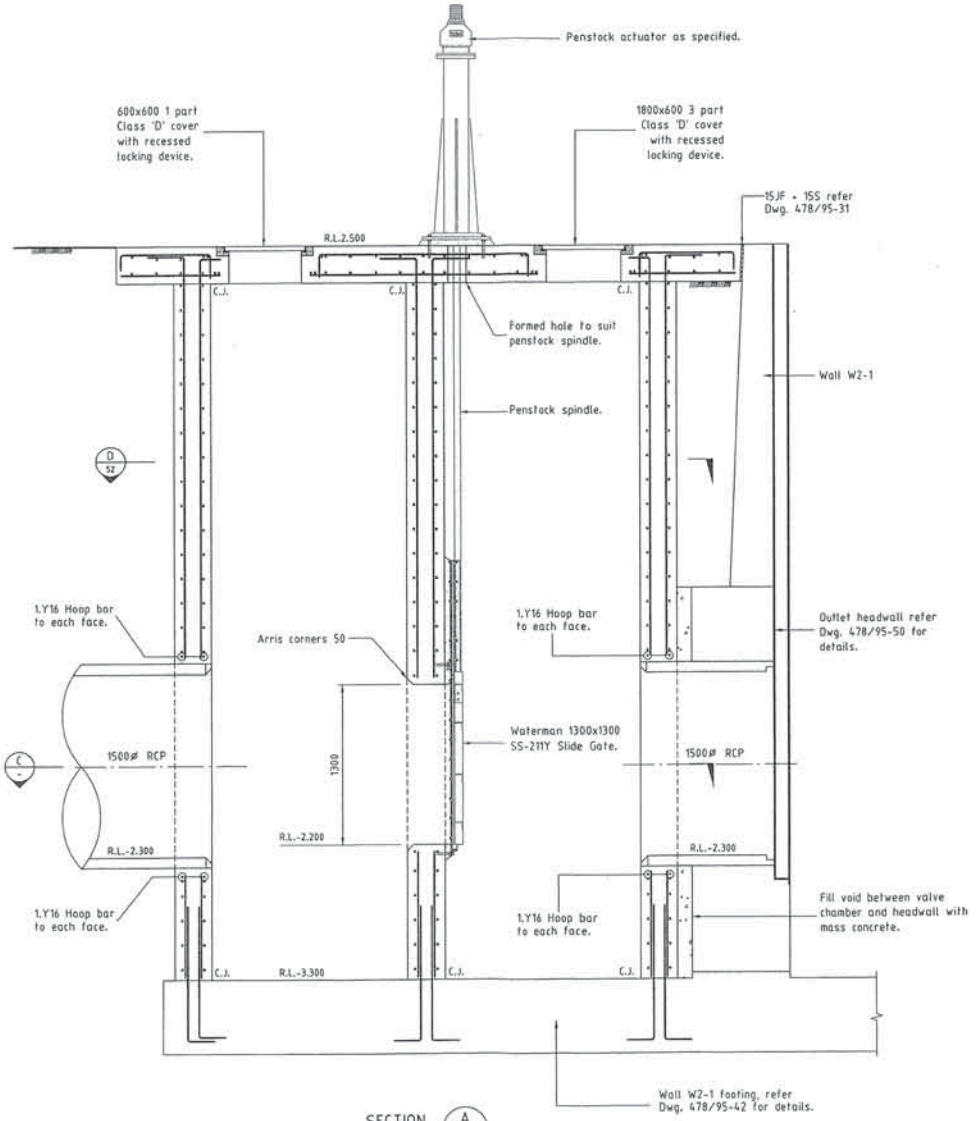
Postal Address: PO Box 153, Maroochydore, Queensland 4558

KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 2
BYPASS CHANNEL
INLET AND OUTLET HEADWALL DETAILS

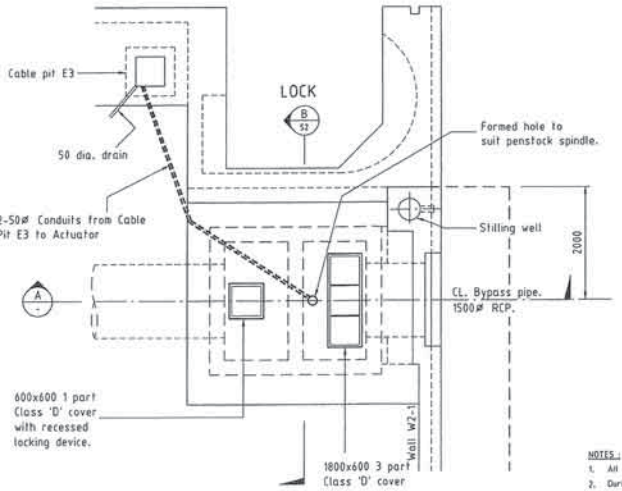
DATE: 05-05-1997
DRAWING No: 478/95 -50



SECTION C
1 : 20



SECTION A
1 : 20



LAYOUT PLAN
1 : 50

All reinforcement to be Y16@200, all laps to be 400mm and cogs to be 300mm U.N.O., 70mm min. cover to all reinforcement. Provide starter bars to match vertical reinforcement, lap 500.

R.C. Pipes to Bypass Conduit are not to be cut. (Specials are to be manufactured if required.)

NOTES :
1. All dimensions to be checked by the Contractor before fabrication and construction. DIMENSIONS SHALL NOT BE SCALED.
2. During construction the structure shall be maintained in a stable condition and no part shall be overstressed.
3. No penetrations, chases or temporary fixtures are permitted without prior approval of the Superintendent.
4. Concrete to be Class 40 as specified.
5. No construction joints, other than those shown on the drawings, shall be used without the approval of the Superintendent.

1 0.5 0 1 2 3 4 m — 1 : 50
1000 500 0 1000 mm — 1 : 20
SCALES BEFORE REDUCTION

Rv.	DATE	REVISIONS	REC.	APPR.
A	27-03-98	Cable pit E3 moved to lock cover slab.		

DESIGNED:
DRAWN:
CHECKED:
RECOMMENDED: PROJ. MAN.
A1
DATUM: A.H.D.
APPROVED: PROJ. DIR.

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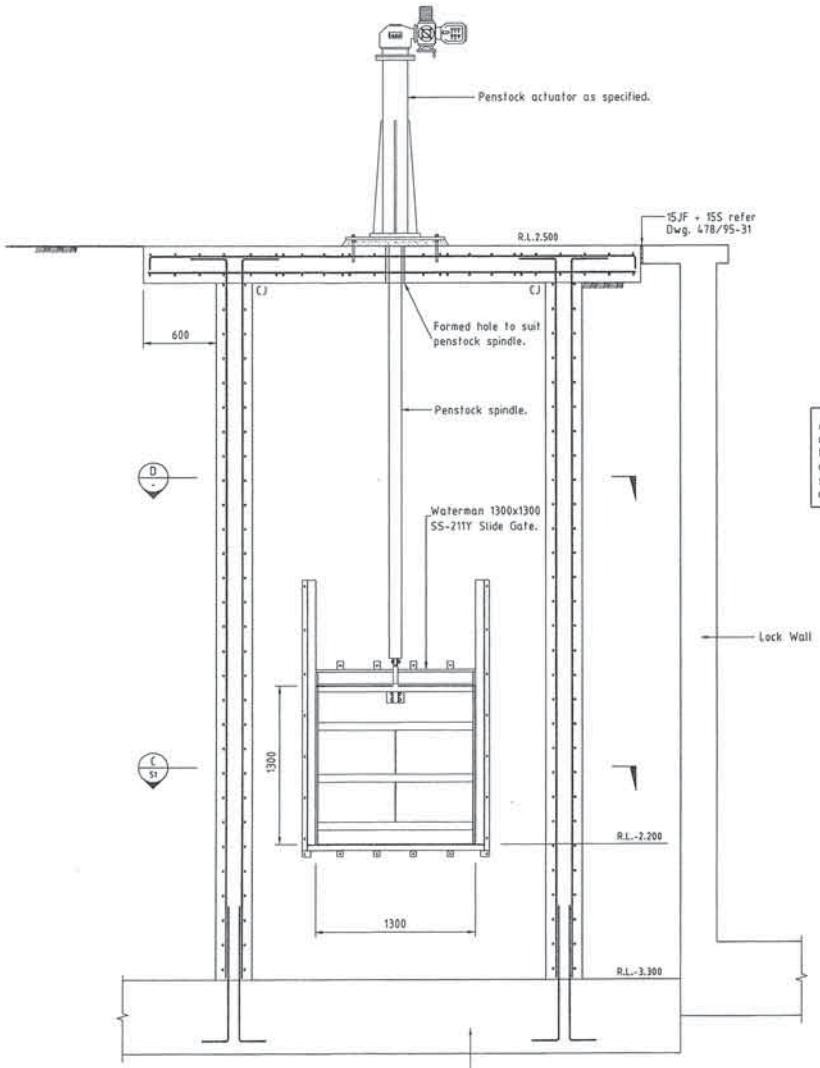
Postal Address: PO Box 132, Maroochydore, Queensland 4558

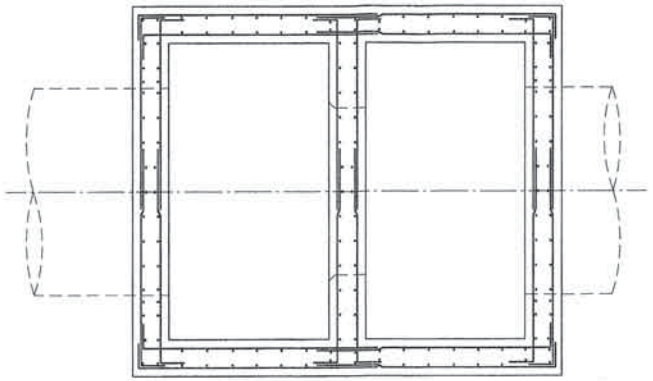
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 2
BYPASS VALVE CHAMBER
LAYOUT PLAN AND SECTIONS

DATE: 23-12-1997
DRAWING No: 478/95 - 51
A

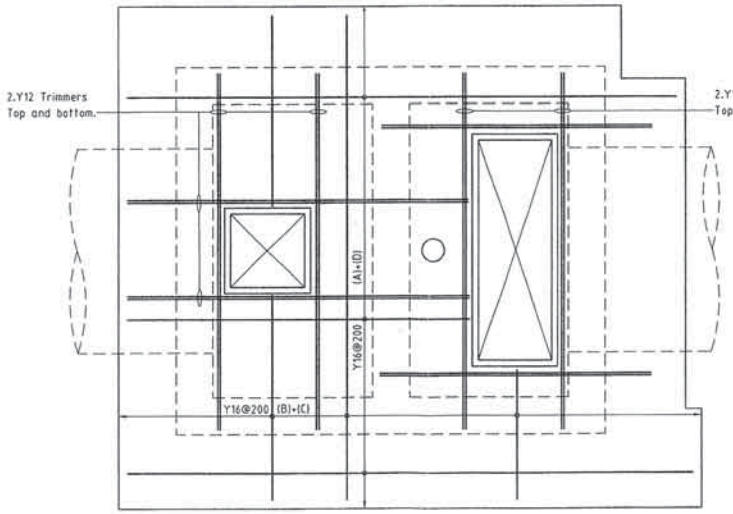


SECTION B / 51
1 : 20

All reinforcement to be Y16@200, all laps to be 400mm and cogs to be 300mm U.N.O., 70mm min. cover to all reinforcement. Provide starter bars to match vertical reinforcement, lap 500.



SECTION D / 51
1 : 20



BYPASS VALVE CHAMBER
COVER SLAB (300 thick)
1 : 20

Note: Top reinforcement to have 120 end cog at edges.

(B) Bars laid second
(C) Bars laid third
(A) Bars laid first
(D) Bars laid last

1000 500 0 1000 mm
1 : 20
SCALE BEFORE REDUCTION

Rv.	DATE	REVISIONS	REC.	APPR.

DESIGNED: [illegible]
DRAWN: C.J. Rasmussen
CHECKED: C.J.R.
RECOMMENDED: PROJ. MAN. [illegible]
A1
DATUM: A.H.D.
APPROVED: PROJ. DIR. [illegible]

Cardno & Davies
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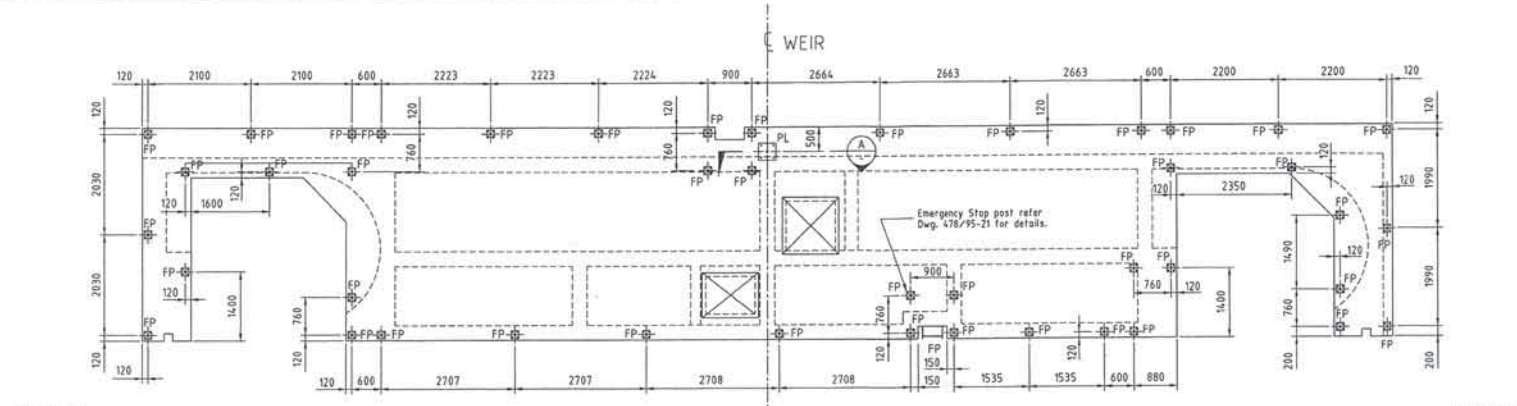
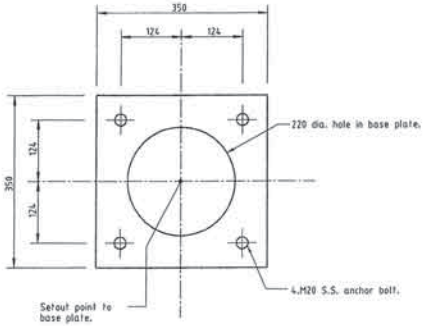
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 2
BYPASS VALVE CHAMBER
SECTIONS AND DETAILS

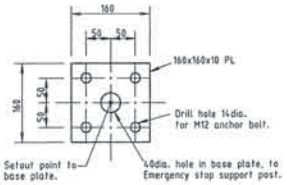
DATED: 23-12-1997
DRAWING No: 478/95 -52



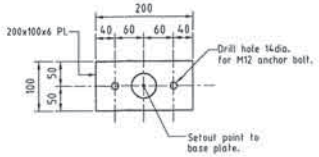
LAYOUT PLAN
1:50



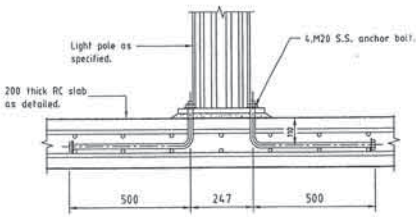
LIGHT POLE BASE PLATE (PL)
1:5



FENCE POST BASE PLATE (FP)
1:5



BOLLARD BASE PLATE (B)
1:5



SECTION A
1 : 10

Rv.	DATE	REVISIONS	REC.	APPR.
A	30-01-98	Dimensions revised to external face on eastern side of lock		
A	29-01-98	Dimensions revised to internal face on eastern side of lock		

DESIGNED: DRAWN: CHECKED: RECOMMENDED: PROJ. MGR.
A1
DATUM: A.H.D.
APPROVED: PROJ. DIR.

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ACN 051 074 192
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FAX: (07) 3368 9721, (07) 5538 9626, (07) 5451 5963, (07) 4615 2509, (07) 4636 5705, (07) 4638 5179, (0011675) 323 4951
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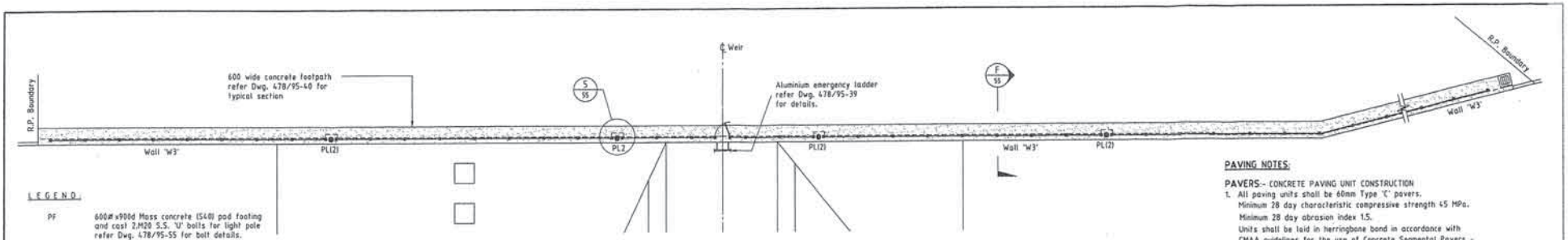
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE 2
LOCK STRUCTURE
BASE PLATE SETOUT PLAN FOR LOCK

DATE: 18-01-1998
DRAWING No: 478/95 -53
Rv. A



PLAN - CHELSEA CRESCENT SIDE OF WEIR
1:100

LEGEND.

PF	600#x900d Mass concrete (S40) pad footing and cast 2.M20 S.S. 'U' bolts for light pole refer Dwg. 478/95-55 for bolt details.
PL(1)	Light Pole - Sylvania Estate Pole (3.5m high) with B2223 Avenue Series street light and 80 watt mercury vapour globe.
PL(2)	Light Pole - Sylvania Estate Pole (3.5m high) with B2223 Avenue Series street light and 50 watt mercury vapour globe with individual PE Cell control.
	450sq. precast concrete drainage pit, with Class 'B' galv. grated covers.
	Broom Finished Coloured Concrete - colour to be CCS Fire Clay, 4% grey cement - terracotta.
	Paving - Besser Pioneer concrete paving (Brick Cobble - Pewter). Pavers to be laid in a herringbone pattern.
	Paving Header Course - Besser Pioneer concrete brick paving (Brick Cobble - Pewter & Coal). Pattern to be 2 pewter and 2 coal. Refer Dwg. 478/95-55 for detail.
	Decorative/Safety fence - refer Dwgs. 478/95-20, 21, 37, 38, & 39 for details.
-2.00	Finished surface levels
SCJ	Saw cut joint, cut every second wire of mesh.

PAVING NOTES:

PAVERS:- CONCRETE PAVING UNIT CONSTRUCTION

1. All paving units shall be 60mm Type 'C' pavers.
   Minimum 28 day characteristic compressive strength 45 MPa.
   Minimum 28 day abrasion index 1.5.
   Units shall be laid in herringbone bond in accordance with CMAA guidelines for the use of Concrete Segmental Pavers - Design Guide for Residential Accessways and Roads (March 1997)

2. BEDDING SAND GRADING

Sieve size	%Passing
9.52 mm	100
4.75 mm	95-100
2.36 mm	80 - 100
1.18 mm	50 - 85
600 microns	25 - 60
300 microns	10 - 30
150 microns	5 - 15
75 microns	0 - 10

3. JOINT FILLING SAND GRADING

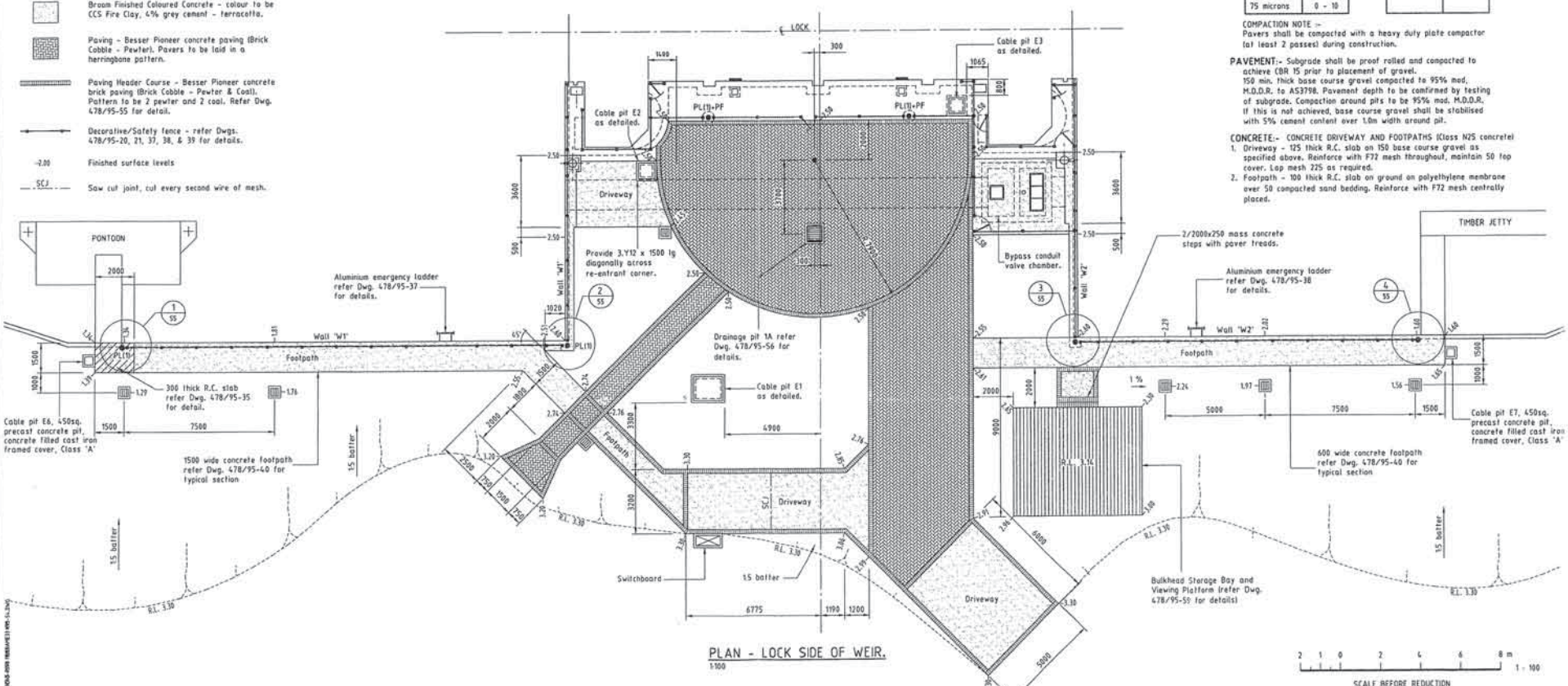
Sieve size	%Passing
2.36 mm	100
1.18 mm	90 - 100
600 microns	60 - 90
300 microns	30 - 60
150 microns	15 - 30
75 microns	0 - 10

COMPACTION NOTE :-
Pavers shall be compacted with a heavy duty plate compactor (at least 2 passes) during construction.

PAVEMENT:- Subgrade shall be proof rolled and compacted to achieve CBR 15 prior to placement of gravel.
150 min. thick base course gravel compacted to 95% mod. M.D.D.R. to AS3798. Pavement depth to be confirmed by testing of subgrade. Compaction around pits to be 95% mod. M.D.D.R. If this is not achieved, base course gravel shall be stabilised with 5% cement content over 1.0m width around pit.

CONCRETE:- CONCRETE DRIVEWAY AND FOOTPATHS (Class N25 concrete)

1. Driveway - 125 thick R.C. slab on 150 base course gravel as specified above. Reinforce with F72 mesh throughout, maintain 50 top cover. Lap mesh 225 as required.
2. Footpath - 100 thick R.C. slab on ground on polyethylene membrane over 50 compacted sand bedding. Reinforce with F72 mesh centrally placed.



PLAN - LOCK SIDE OF WEIR.
1:100

SCALE BEFORE REDUCTION 2 1 0 2 4 6 8 m 1 - 100

Rv.	DATE	REVISIONS	REC.	APPR.
C	18-05-98	Bulkhead storage bay & Viewing platform added		
B	27-03-98	Cable pits E2 & E3 moved.		
A	04-03-98	Minor revisions.		

DESIGNED: C.J. Hoag
DRAWN: C.J. Hoag
CHECKED: C.J.H.
RECOMMENDED: [illegible]
A1
DATUM: A.H.D.
APPROVED: [illegible]

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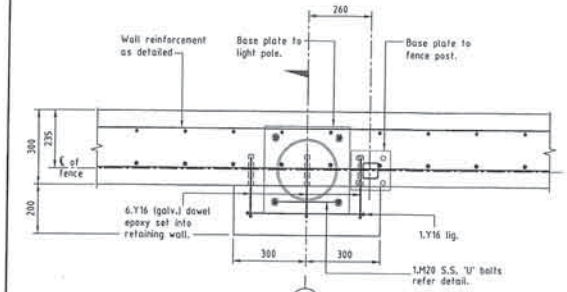
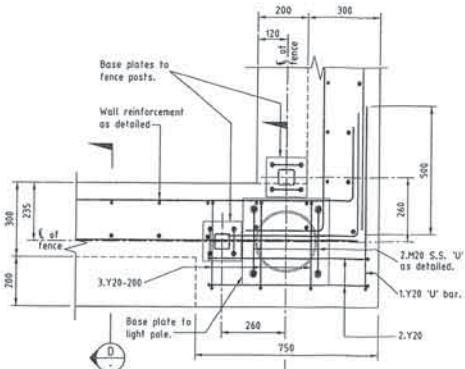
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE Z
LANDSCAPING
PAVING AND CONCRETE SETOUT.

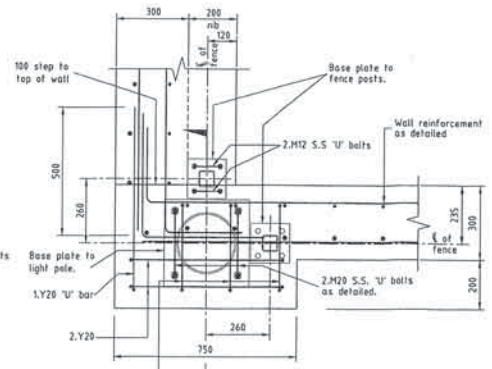
DATE: 09-02-1998
DRAWING No: 478/95 -54
Rv. C B A



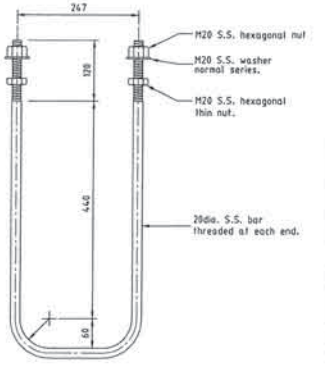
DETAIL 1 / 54 1:10



DETAIL 2 / 54 1:10

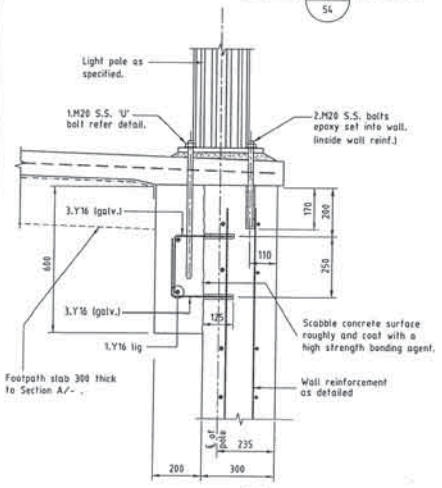


DETAIL 3 / 54 1:10

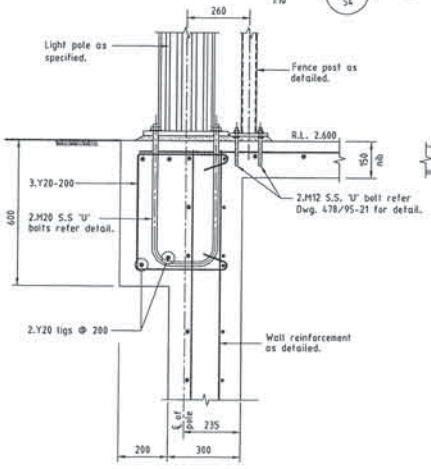


LIGHT POLE S.S. 'U' BOLT.
1:5

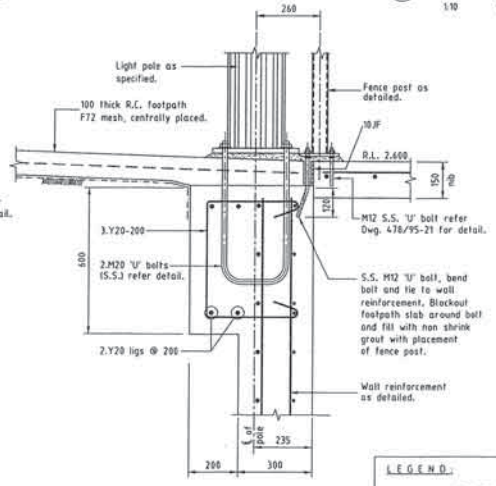
DETAIL 4 / 54 mirrored



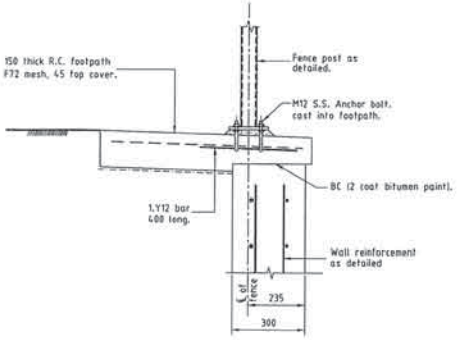
SECTION A / - 1:10



SECTION B / - 1:10



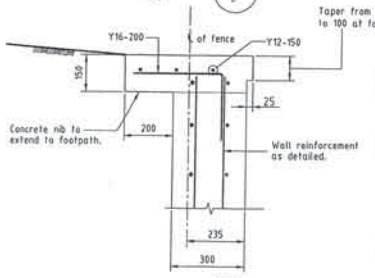
SECTION C / - 1:10



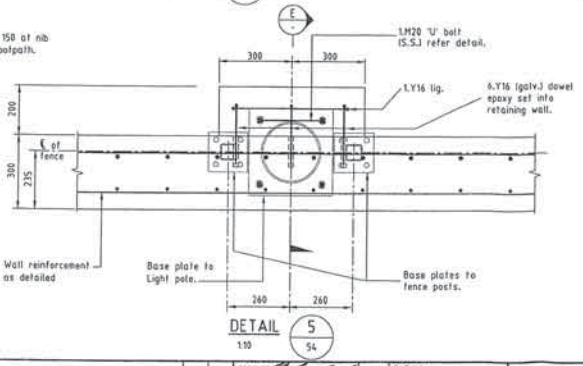
SECTION F / 54 1:10

SECTION A / - 1:10

SECTION E / - 1:10 Similar



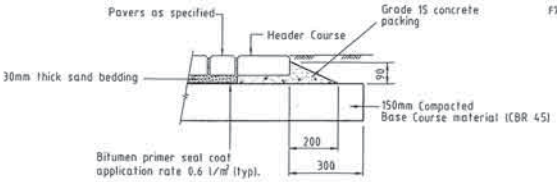
SECTION D / - 1:10



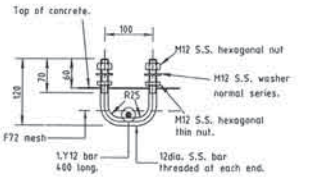
DETAIL 5 / 54 1:10

LEGEND:

- Polyethylene Sheet
- 10JF — 10 Joint Filler (fixed to one face with 30 long copper nails at 200 centres)
- SS — Sealant 15x15 with bond breaker and backing strip.



PAVEMENT AND EDGE RESTRAINT DETAIL
Scale 1:10



FENCE ANCHOR BOLT IN FOOTPATH
1:5

100 0 100 200 300 400 mm 1 : 5

200 100 0 200 400 600 800 mm 1 : 10

SCALES BEFORE REDUCTION

Rv.	DATE	REVISIONS	REC.	APPR.
A	04-03-98	Minor revisions.		

DESIGNED: C.J. Pitt
DRAWN: C.J. Pitt
CHECKED: A. Wheeler
RECOMMENDED: P.M.N. A.T. Howard
APPROVED: P.M.N.
PROJ. DIR.: P.M.N.
A1
DATUM: A.H.D.

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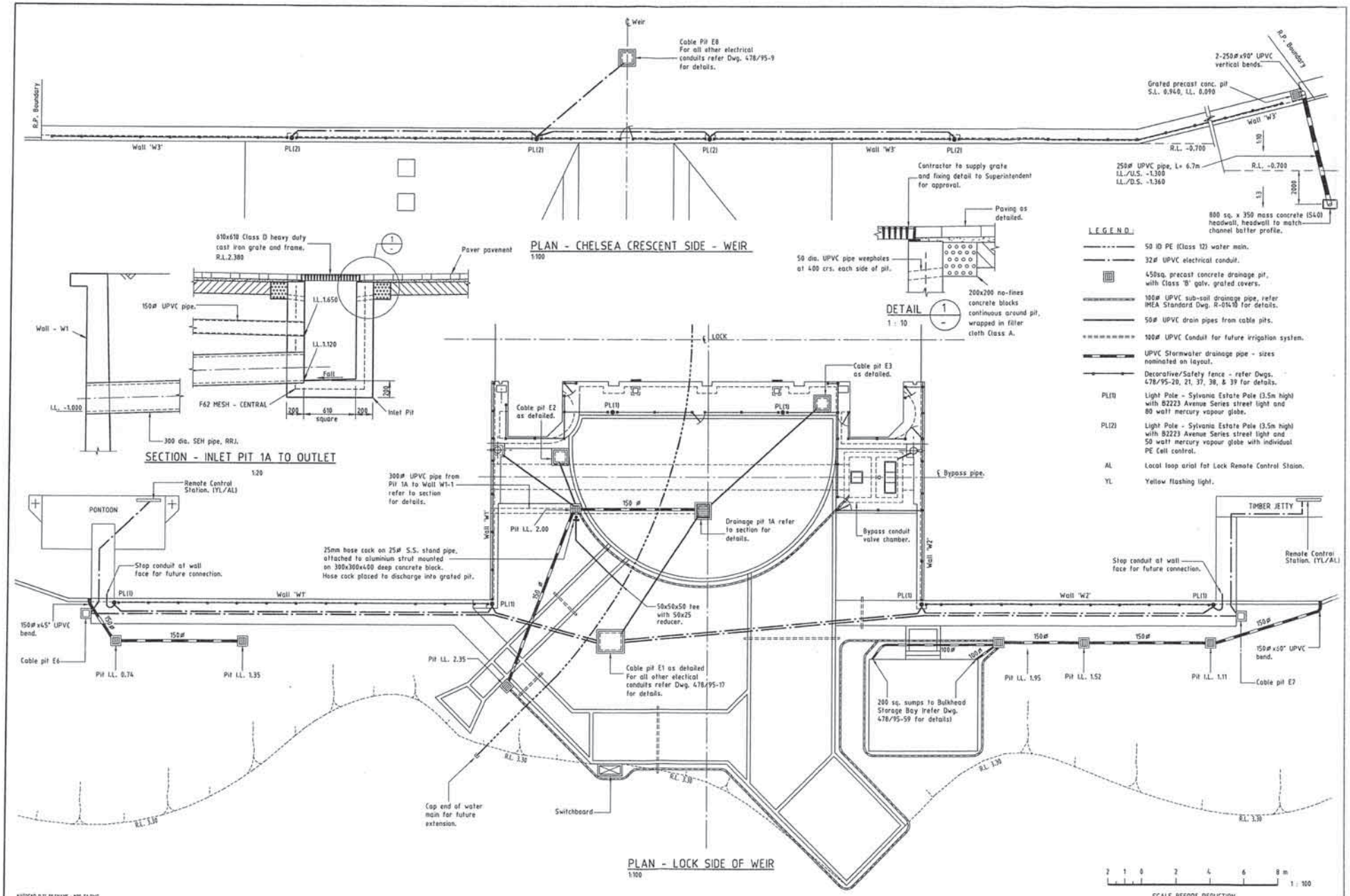
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE Z
LANDSCAPING
FIXING DETAILS FOR LIGHT POLES AND FENCES.

DATE: 13-02-1998
DRAWING No: 478/95 - 55
Rv. A



AUTOCAD R.12 FILENAME - KWS-56.DWG
DATE - 26-2-1998 TIME - 9:41 AM

Rv.	DATE	REVISIONS	REC.	APPR.
B	18-05-98	Bulkhead storage bay & Viewing platform added.		
A	27-03-98	Cable pits E2 and E3 moved.		

DESIGNED: C.J. Hay
DRAWN: C.J. Hay
CHECKED: C.J.H.
RECOMMENDED: [illegible]
A1
DATUM: A.H.D.
APPROVED: G.D. Tandy

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ACN 051 074 152
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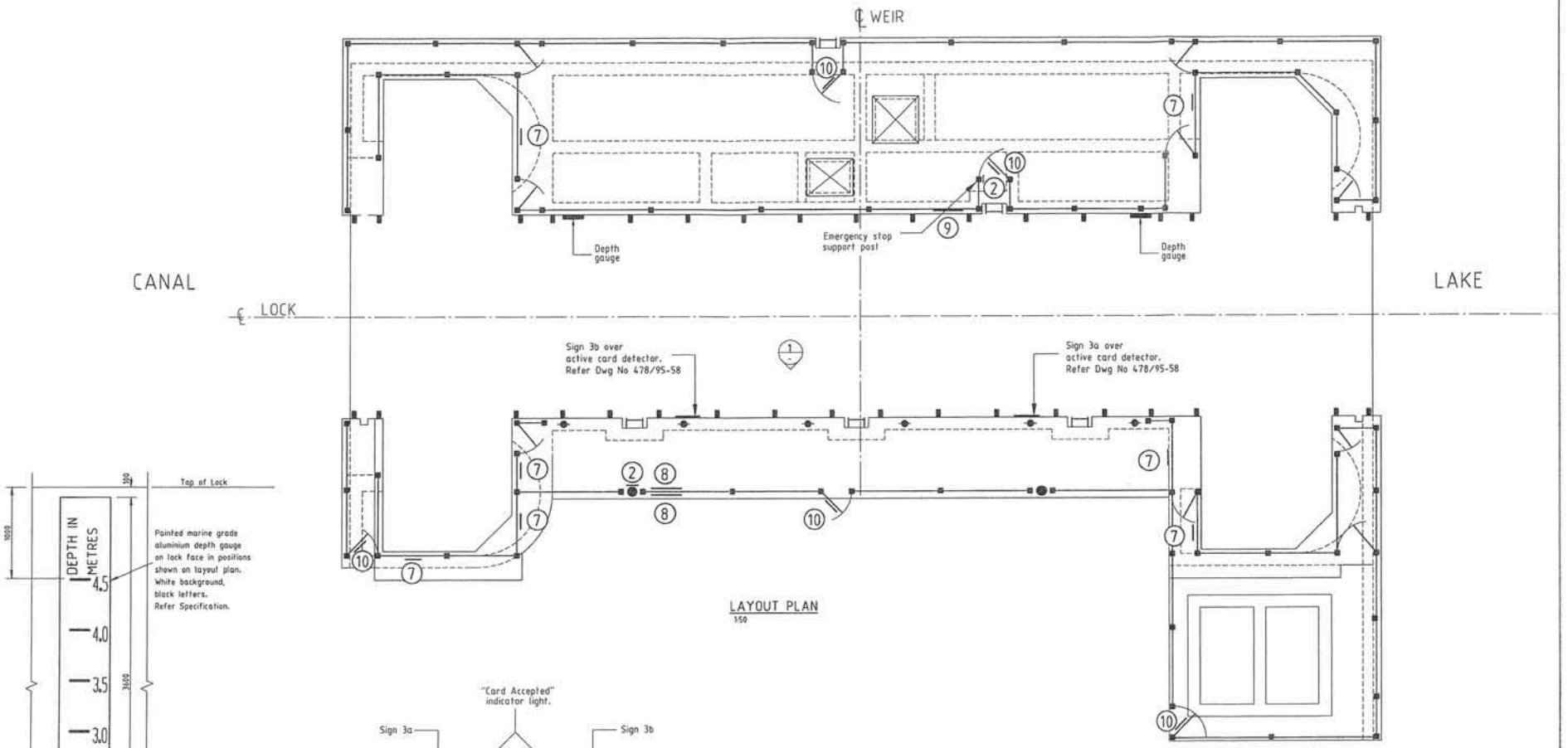
KAWANA ESTATES PTY. LTD.
PARREARRA DEVELOPMENT
STRUCTURE Z
LANDSCAPING
STORMWATER & CONDUIT LAYOUT

DATE: 19-02-1998
DRAWING No: 478/95 -56



AUTOCAD R.14 FILENAME : KWS-57.DWG
DATE : 14-5-1998 TIME : 4.15 PM

DESIGNED: M.E.	A1	DATUM: A.H.D.
DRAWN: M.E.		
CHECKED: G.J.H.		
RECOMMENDED: PROJ. MAN: G.J. Hayward	APPROVED: PROJ. DIR: G. F. Tomlyn	

No.	DATE	REVISIONS	REC.	APPR.
A	14-5-1998	Sign 3b added.	G.J.H.	G.F.T.

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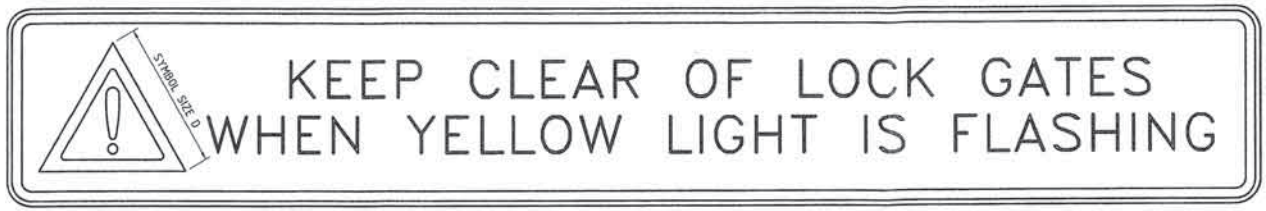
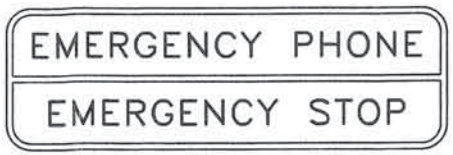
KAWANA ESTATES PTY LTD
PARREARRA DEVELOPMENT
STRUCTURE Z
SIGN LOCATIONS AND DETAILS

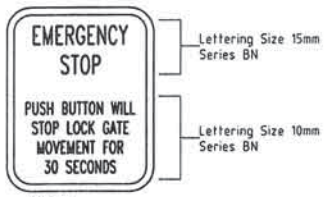
DATE: 11 - 05 - 1998
DRAWING No: 478/95-57
A



Sign 1



Sign 8



Sign 2

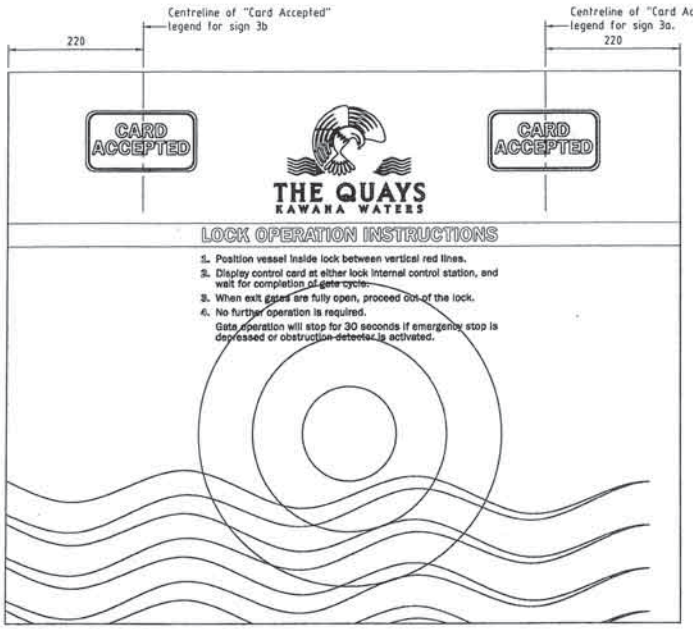
Sign 10

Sign 9

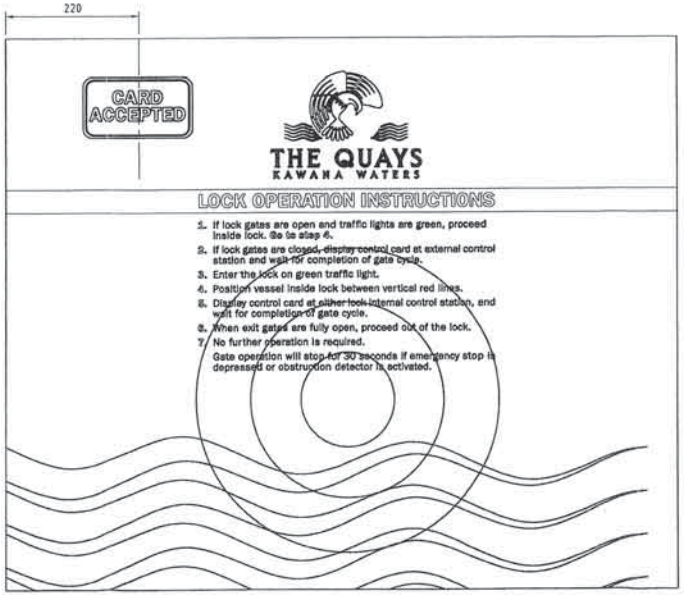
SIGN SPECIFICATION

SIGN	LETTERING SIZE(mm) SERIES	SYMBOL SIZE D (mm)	COLOUR - FACE OF SIGN	COLOUR - REAR OF SIGN	SIZE (mm)	BORDER (mm)	SURROUND (mm)	NUMBER REQUIRED
1	30 EM	120	Black on yellow	-	1030 x 160 approx.	8	4	8
2	Refer Detail	-	White on Green	Peacock Blue	150 x 120 approx.	6	3	2
3	Refer Detail	-	Refer Note No.7	-	1000 x 900 approx.	-	-	2
3a	Refer Detail	-	Refer Note No.7	-	1000 x 900 approx.	-	-	1
3b	Refer Detail	-	Refer Note No.7	-	1000 x 900 approx.	-	-	1
7	20 EM	150	Black on yellow	Peacock Blue	320 x 250 approx.	12	6	7
8	20 EM	-	White on Green	Peacock Blue	360 x 115 approx.	5	0	2
9	20 EM	-	White on Green	Peacock Blue	330 x 60 approx.	5	0	1
10	20 EM	-	Black on yellow	Peacock Blue	350 x 60 approx.	6	3	5

NOTE:
1) All signs shall comply with AS1319 and AS1744 unless noted otherwise.
2) Actual sign sizes to be confirmed by the requirements of AS1319 and AS1744.
3) Details of paint system to be provided to the Superintendent prior to manufacture.
4) Refer Dwg No 478/95-18, 26 and 57 for sign locations.
5) Colour Peacock Blue shall comply with AS2700S-T35 (BS381C-163).
6) Fixing details of signs shall be approved by the Superintendent prior to installation of signs.
7) Signs 3, 3a and 3b lettering and layout to be in accordance with artwork provided by Design Solutions Pty Ltd.
8) Signs 3, 3a and 3b to be manufactured from approved, durable, weather resistant, non-conductive material.



Signs 3a and 3b - Refer Notes No 7 and 8.



Sign 3 - Refer Notes No 7 and 8.

Sign 7

AUTOCAD R.14 FILENAME : K95-58.DWG
DATE : 14-5-1998 TIME : 2:38 PM

Rv.	DATE	REVISIONS	REC.	APPR.
A	14-5-1998	Sign 3a added , border and surround deleted for Signs 3 & 3a		

DESIGNED: M.E.
DRAWN: M.E.
CHECKED: C.J.H.
RECOMMENDED: PROJ. MAN. C.J. Hawman
A1
DATUM: A.H.D.
APPROVED: PROJ. DIR. G.G. Davies

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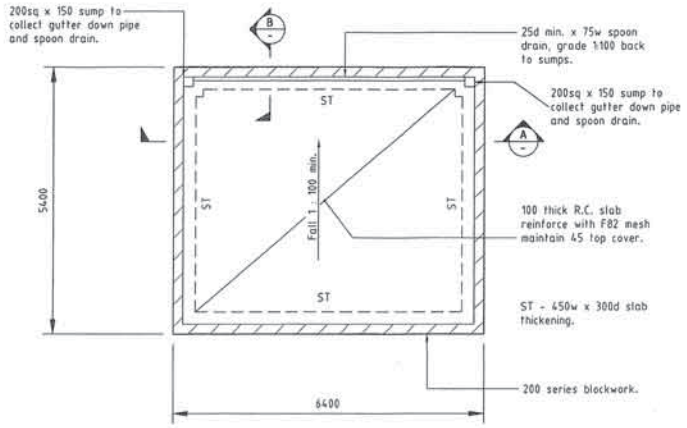
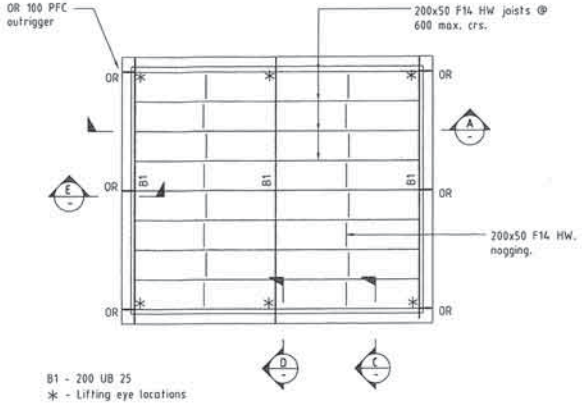
KAWANA ESTATES PTY LTD
PARREARRA DEVELOPMENT
STRUCTURE 2
SIGN DETAILS

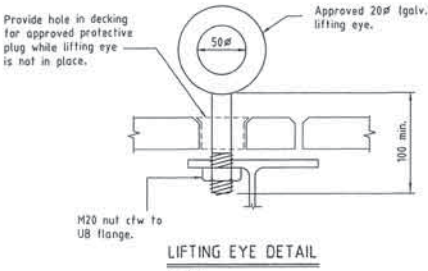
DATE: 11 - 05 - 1998
DRAWING No: 478/95-58
A



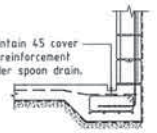
SLAB & FOOTING LAYOUT
1 : 50



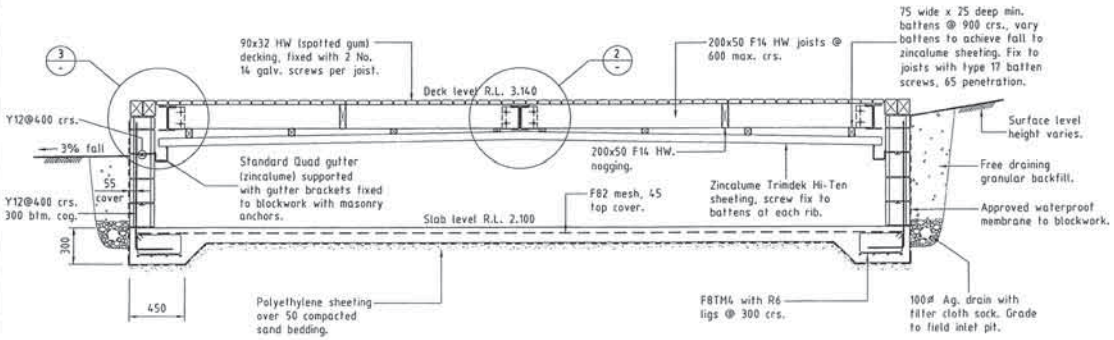
FRAMING LAYOUT
1 : 50



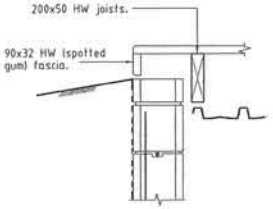
LIFTING EYE DETAIL
1 : 2.5



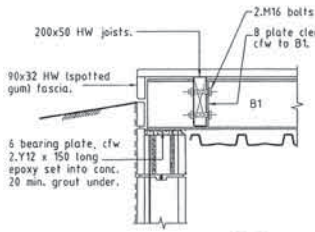
SECTION B
1 : 10



SECTION A
1 : 20

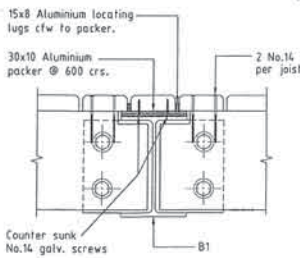


SECTION C
1 : 10

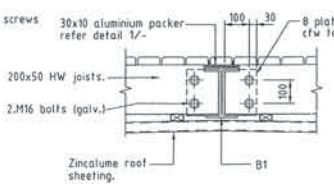


SECTION D
1 : 10

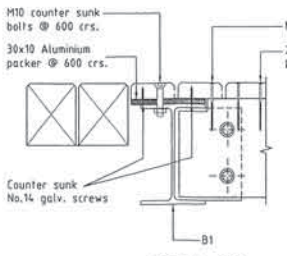
NOTES :
1. All steelwork to hot dipped galvanised after fabrication.
2. All bolts and screws to be galvanised.
3. After removal, timber platform is to be supported by blocks placed under outriggers & B1.



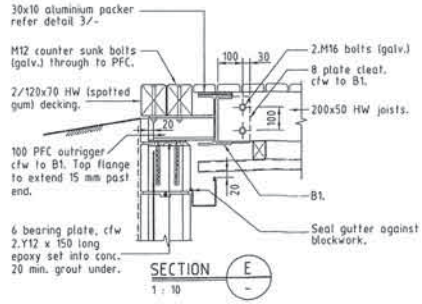
DETAIL 1
1:5



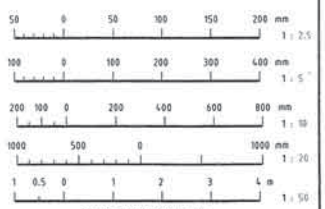
DETAIL 2
1:10



DETAIL 3
1:5



SECTION E
1 : 10



SCALES BEFORE REDUCTION

AUTOCAD R/N FILENAME : R95-58.DWG
DATE : 15-5-1998 TIME : 3:52 PM

Rv.	DATE	REVISIONS	REC.	APPR.
A	29-05-98	Minor revisions		

DESIGNED: C.J. Hayes
DRAWN: C.J. Hayes
CHECKED: A.H.D.
RECOMMENDED: PROJ. MGR.
APPROVED: PROJ. DIR.
DATUM: A.H.D.
A1

Cardno & Davies
Queensland Pty. Ltd.
ACN 051 074 992
Consulting Engineers

OFFICES: Brisbane, Gold Coast, Sunshine Coast, Townsville, Harvey Bay, Tweed Heads, Port Moresby
TELEPHONE: (07) 3369 9822, (07) 5539 9333, (07) 5443 2555, (07) 4721 5992, (07) 4124 5755, (07) 5536 7555, (680) 76755 325 7322
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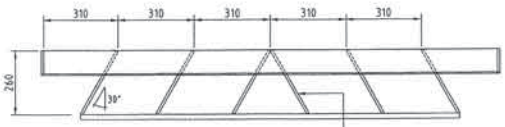
SUNSHINE COAST OFFICE: 66 Duporth Avenue, Maroochydore
Postal Address: PO Box 1522, Maroochydore, Queensland 4558

KAWANA ESTATES PTY LTD
PARREARRA DEVELOPMENT
STRUCTURE Z
LANDSCAPING
BULKHEAD STORAGE BAY

DATE: 11 - 05 - 1998
DRAWING No: 478/95-59
Rv. A



PLAN

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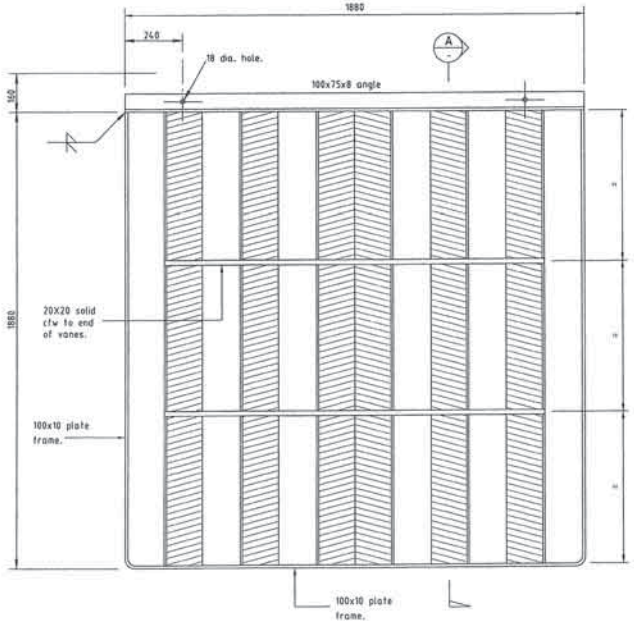

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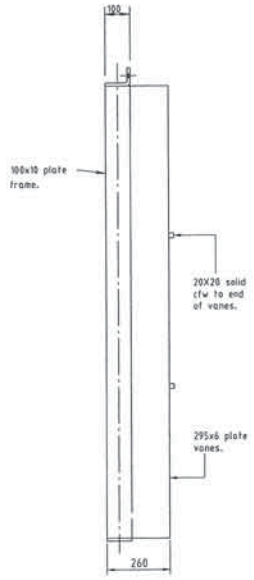

SECTION A-A

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Scale Before Reduction

Rv.	DATE	REVISIONS	REC.	APPR.	Rv.	DATE	REVISIONS	REC.	APPR.

DESIGNED: C.J.H.
DRAWN: C.J.H.
CHECKED: C.J.H.
RECOMMENDED: P.G.W.
APPROVED: S.S.T.
A1 DATUM A.H.D.
AUTOCAD R.14 FILENAME: K95-05.DWG DATE: 25-1-1999 TIME: 9:47 AM

Cardno + Davies

Cardno & Davies Queensland Pty Ltd
ACN: 051 074 992

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Gold Coast (07) 5536 9353 (07) 5536 4943
Sunshine Coast (07) 5443 5555 (07) 5443 5642
Townsville (07) 4772 1166 (07) 4721 2508
Harvey Bay (07) 4124 5456 (07) 4124 5155
Bundaberg (07) 4151 1211 (07) 4151 5710
Port Moresby (001 1675) 325 3322 (001 1675) 325 0951
SUNSHINE COAST OFFICE:
56 Dupont Avenue, Maroochydore
P.O. Box 152, Maroochydore, Qld 4558, Australia
Email: scc@wn.cardno.com.au

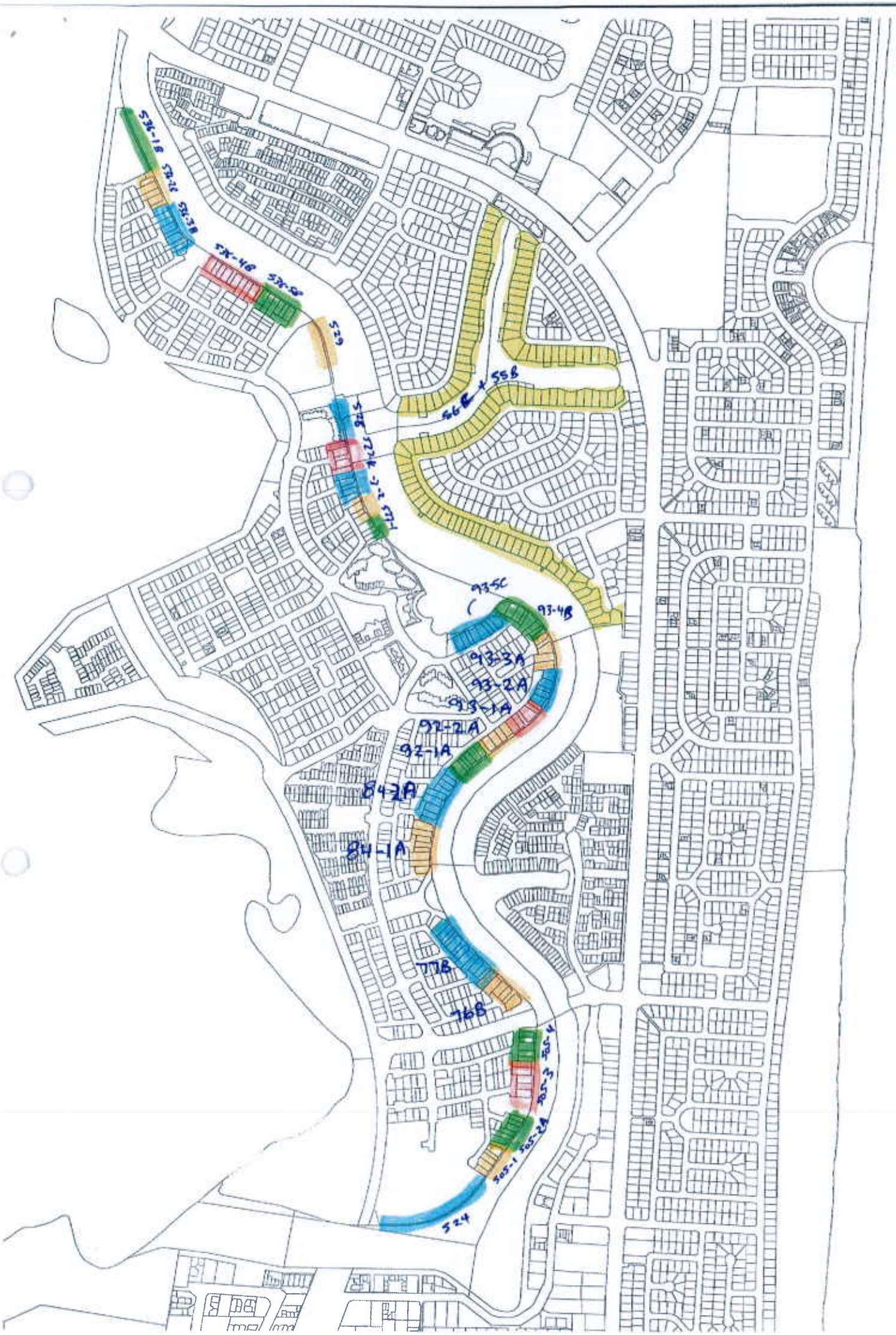
KAWANA ESTATES PTY. LTD.

PARREARRA DEVELOPMENT
STRUCTURE Z
LOCK WATER QUALITY BYPASS CHANNEL
BYPASS CONDUIT OUTLET DIFFUSER.

DATE: January 1999
DRAWING No: 478/95-60

Rv.

Appendix C: Quay Line Plan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53K-3B
53K-4B
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93-1A
92-2A
92-1A
84-2A
84-1A
77B
76B
505-3
505-2A
505-1
524

PARREARRA LAKE QUAY LINE PLANS

Drawing No:	Rev.	Date:	Stage
P-2780-55	B	15/11/2001	PLA2A, 2B & 2C
P-2780-56	C	15/11/2001	PLA2A, 2B & 2C
P-2780-76	B	15/11/2001	Stage 1
P-2780-77	B	15/11/2001	Stage 1
P-2780-84-1	A	15/11/2001	Stage 2
P-2780-84-2	A	15/11/2001	Stage 2
P-2780-92-1	A	15/11/2001	Stage 3
P-2780-92-2	A	15/11/2001	Stage 3
P-2780-93-1	A	15/11/2001	Stage 4
P-2780-93-2	A	15/11/2001	Stage 4
P-2780-93-3	A	15/11/2001	Stage 4
P-2780-93-4	B	15/11/2001	Stage 4
P-2780-93-5	C	15/11/2001	Stage 4
P-2780-505-1		20/02/2002	Stage 5
P-2780-505-2	A	28/02/2002	Stage 5
P-2780-505-3		20/02/2002	Stage 5
P-2780-505-4		20/02/2002	Stage 5
P-2780-524		7/02/2003	Stage 5
P-2780-527-1		26/02/2003	Stage 7
P-2780-527-2		26/02/2003	Stage 7
P-2780-527-3		26/02/2003	Stage 7
P-2780-527-4		26/02/2003	Stage 7
P-2780-528		7/06/2003	Stage 7
P-2780-529		6/03/2003	Stage 7
P-2780-536-1	B	5/05/2004	Stage 8
P-2780-536-2	B	5/05/2004	Stage 8
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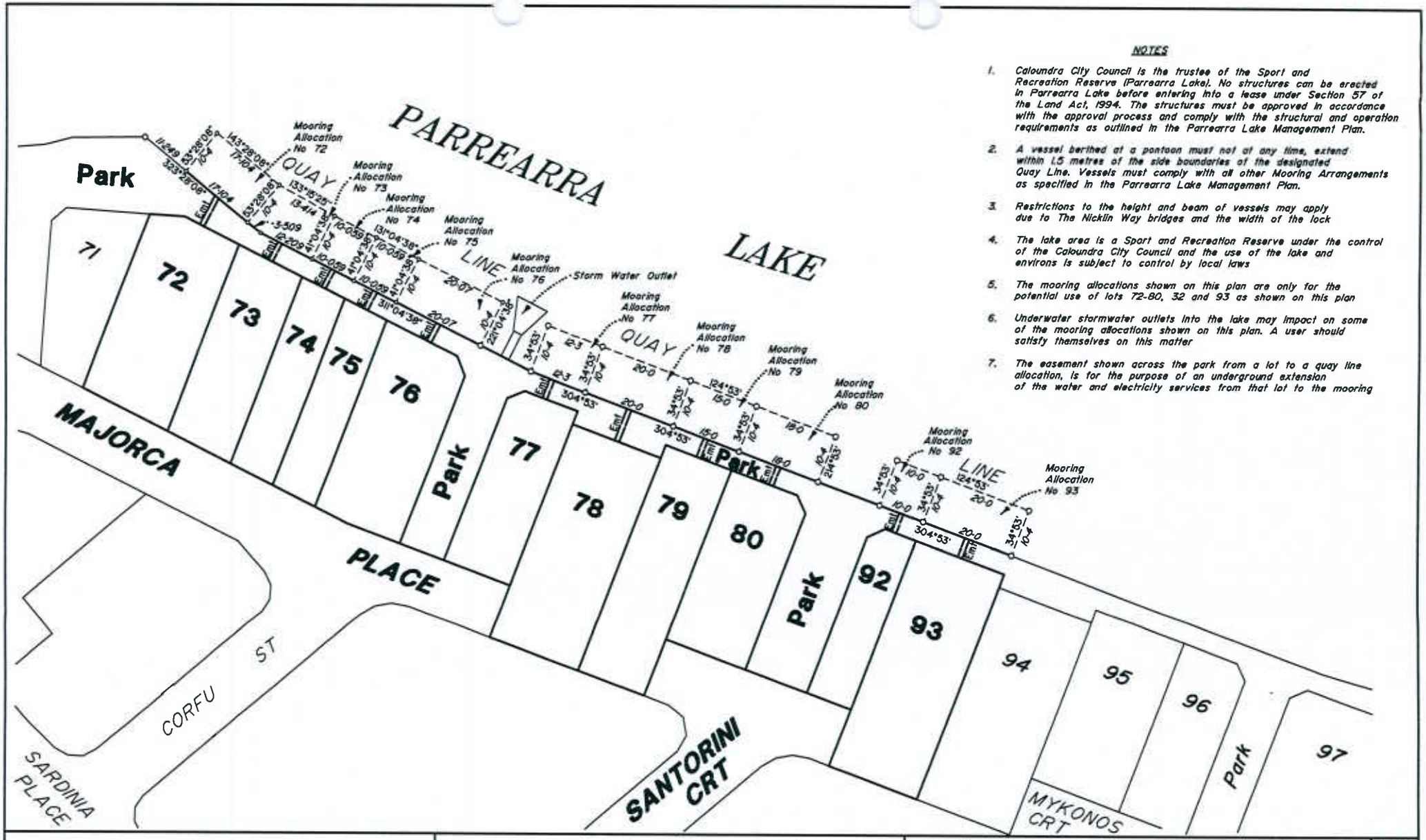

NOTES

1. Caloundra City Council is the trustee of the Sport and Recreation Reserve (Parrearra Lake). No structures can be erected in Parrearra Lake before entering into a lease under Section 57 of the Land Act, 1994. The structures must be approved in accordance with the approval process and comply with the structural and operation requirements as outlined in the Parrearra Lake Management Plan.
2. A vessel berthed at a pontoon must not at any time, extend within 1.5 metres of the side boundaries of the designated Quay Line. Vessels must comply with all other Mooring Arrangements as specified in the Parrearra Lake Management Plan.
3. Restrictions to the height and beam of vessels may apply due to The Nicklin Way bridges and the width of the lock
4. The lake area is a Sport and Recreation Reserve under the control of the Caloundra City Council and the use of the lake and environs is subject to control by local laws
5. The mooring allocations shown on this plan are only for the potential use of lots 72-80, 32 and 93 as shown on this plan
6. Underwater stormwater outlets into the lake may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter
7. The easement shown across the park from a lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from that lot to the mooring

J.B. Goodwin, Midson & Partners
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CMHP

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Boonah 2 Park Street Boonah 4310 Ph/Fax (07)5463 1598
member firm of the association of consulting surveyors

LENSWORTH KAWANA WATERS PTY LTD

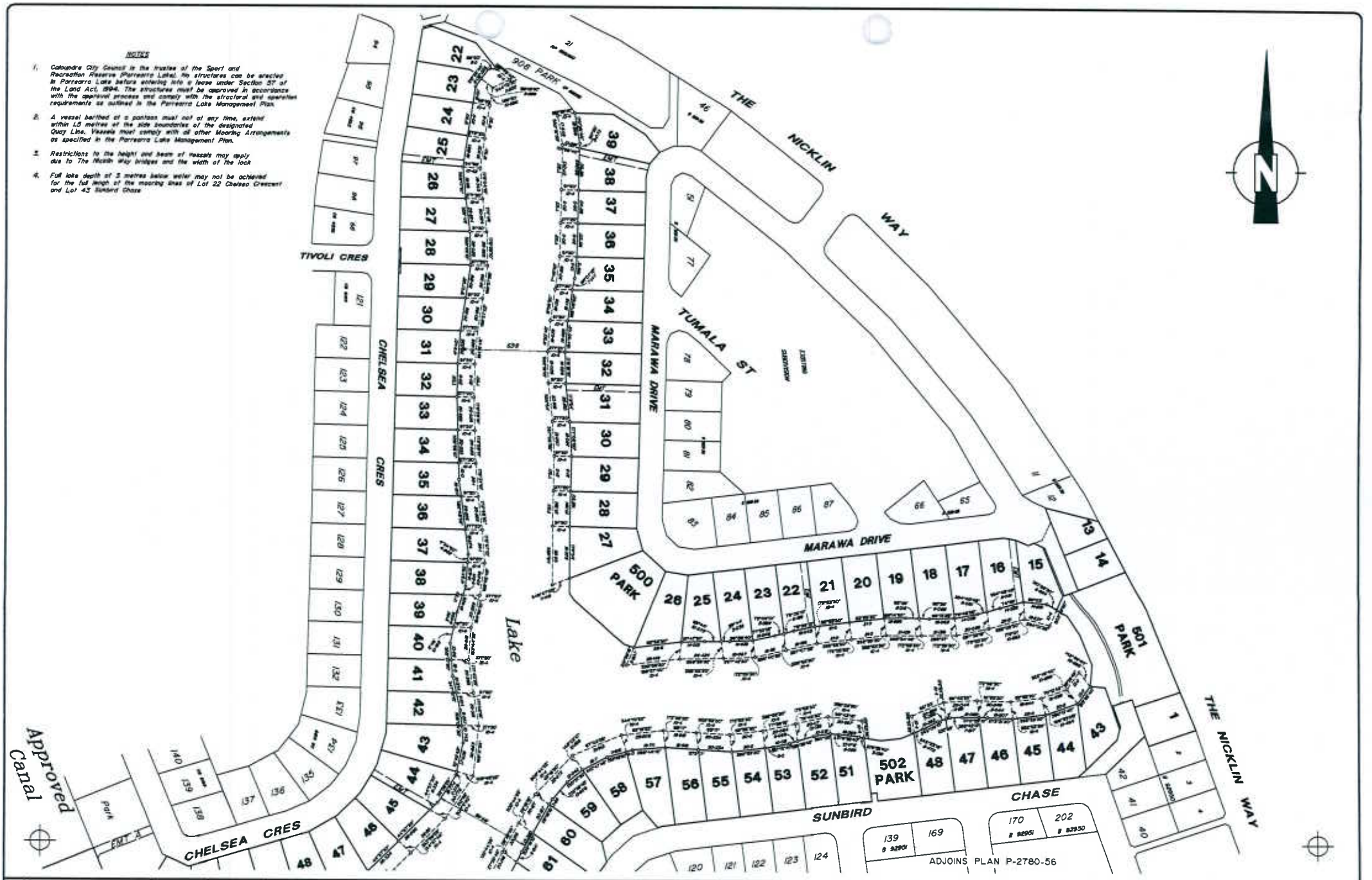
Plan of Mooring Layout for
Release 1 & 2 Stage 1, Kawana Island

AMDT B

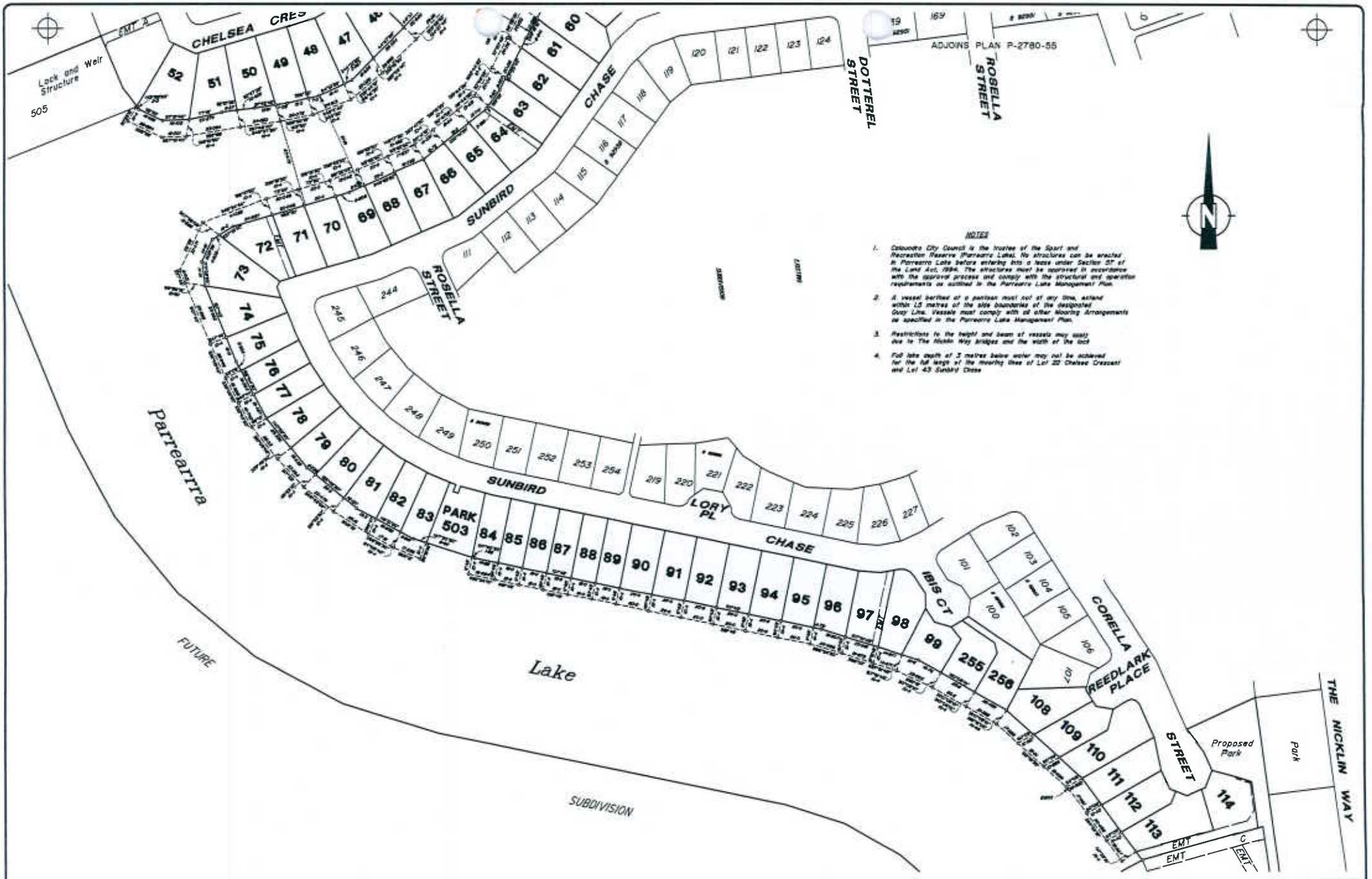
Surveyed			Designed	JBG	17/01/01	FBK	
Drawn	GJF	17/01/01	Checked			LBK	

scale: 1:750 | ref no P-2780-77 | A3

Amdt B 15-11-01 NK (CCC) Amend Notes
Amdt A 22-02-01 JBG Amend Quay Allocations Lot 77



revisions	surveyed	designed	assoc. consultants	datum	client	Brisbane 628 Coronation Drive Toowong 4066 Ph (07)3870 2181 Fax (07)3870 3644	J.B. Goodwin, Midson & Partners	project Stages PL2A, PL2B & PL2C PARREARRA
	drawn	checked	Cardno MBK		KAWANA ESTATES PTY LTD	Nowra The Nicklin Way Warrana 4575 Ph (07)5443 1707 Fax (07)5443 4660	consulting surveyors, planners and development consultants	scale 1:1000
	LA 13-2-98		Consulting Engineers		drawing title Plan of Mooring Layout Stage PL2A, PL2B & PL2C Parrearra Parish of Maroochy County of Canning	Boonah 2 Park Street Boonah 4310 Ph/Fax (07)5463 1360		ref no P-2780-55
25-2-98 MK 1000 Amend Notes	cad ref P-5-55.dwg					QBS member firm of the association of consulting surveyors		sht 8
28-1-98 MPH Minor Lot Amendments	A1							



revisions	surveyed	designed
	drawn	checked
	LJ 13-2-96	
	scale (unless otherwise stated)	
	A1	

assoc. consultants
Cardno MBK
Consulting Engineers

datum

client: KAWANA ESTATES PTY LTD

drawing title: Plan of Mooring Layout
Stage PL2A, PL2B & PL2C Parrearra
Parish of Mooloolah County of Canning

Brisbane: 628 Coronation Drive Toowong 4066 Ph (07)3870 2181 Fax (07)3870 3644
Kawana: The Nicklin Way Warana 4575 Ph (07)5483 1707 Fax (07)5483 4580
Boonah: 2 Park Street Boonah 4310 Ph/Fax (07)5463 1566
member firm of the association of consulting surveyors

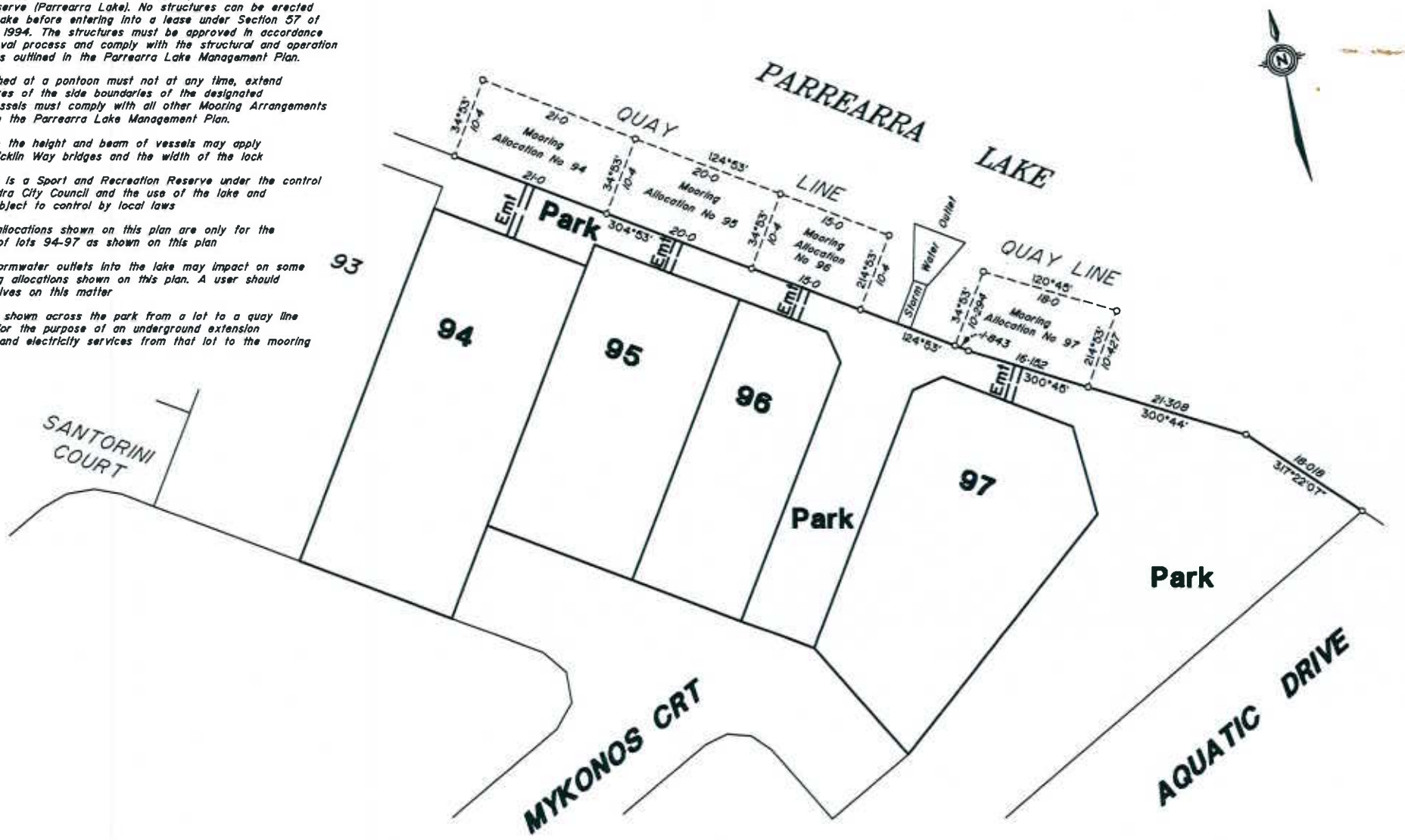
J.B. Goodwin, Midson & Partners
consulting surveyors, planners and development consultants

project: Stages PL2A, PL2B & PL2C PARREARRA

scale	ref no	unit
1:1000	P-2780-56	B

NOTES

1. Caloundra City Council is the trustee of the Sport and Recreation Reserve (Parrearra Lake). No structures can be erected in Parrearra Lake before entering into a lease under Section 57 of the Land Act, 1994. The structures must be approved in accordance with the approval process and comply with the structural and operation requirements as outlined in the Parrearra Lake Management Plan.
2. A vessel berthed at a pontoon must not at any time, extend within 1.5 metres of the side boundaries of the designated Quay Line. Vessels must comply with all other Mooring Arrangements as specified in the Parrearra Lake Management Plan.
3. Restrictions to the height and beam of vessels may apply due to The Nicklin Way bridges and the width of the lock
4. The lake area is a Sport and Recreation Reserve under the control of the Caloundra City Council and the use of the lake and environs is subject to control by local laws
5. The mooring allocations shown on this plan are only for the potential use of lots 94-97 as shown on this plan
6. Underwater stormwater outlets into the lake may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter
7. The easement shown across the park from a lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from that lot to the mooring



Amdt B 15-11-01 NK (CCC) Amend Notes
Amdt A 22-02-01 JBG Amend Quay line Allocation Lot 97

J.B. Goodwin, Midson & Partners
consulting surveyors, planners and development consultants
GMHP

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member firm of the association of consulting surveyors

Surveyed			Designed	JBG	17/1/01	FBK	
Drawn	GJF	17/1/01	Checked			LBK	

LENSWORTH KAWANA WATERS PTY LTD

Plan of Mooring Layout for
Release 3 of Stage 1, Kawana Island

AMDT B

scale: 1:500

ref no P-2780-76

A3

NOTES

1. Caloundra City Council is the trustee of the Sport and Recreation Reserve (Parrearra Lake). No structures can be erected in Parrearra Lake before entering into a lease under Section 57 of the Land Act, 1994. The structures must be approved in accordance with the approval process and comply with the structural and operation requirements as outlined in the Parrearra Lake Management Plan.

2. A vessel berthed at a pontoon must not at any time, extend within 1.5 metres of the side boundaries of the designated Quay Line. Vessels must comply with all other Mooring Arrangements as specified in the Parrearra Lake Management Plan.

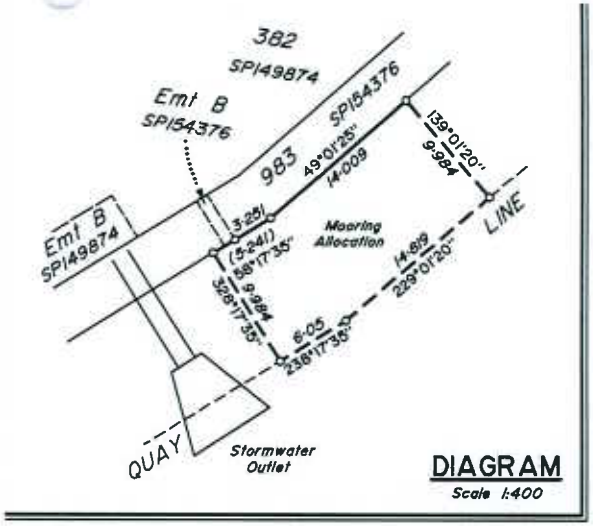
3. Restrictions to the height and beam of vessels may apply due to The Nicklin Way, Kawana Island Boulevard bridges and the width of the lock

4. The lake area is a Sport and Recreation Reserve under the control of the Caloundra City Council and the use of the lake and environs is subject to control by local laws

5. The mooring allocations shown on this plan are only for the potential use of lot 382 on SP149874

6. Underwater stormwater outlets into the lake may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter

7. The easement shown across the park from the lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from the lot to the mooring



Surveyed		
Drawn	ELH	7-2-03
Designed		
Checked	JBG	7-2-03
FBK	LBK	
Datum		

Brisbane 828 Coronation Drive Toowong 4066 Ph 07 38702161 Fax 07 38703944
Kawana 2/12 Technology Drive Warana 4575 Ph 07 54931707 Fax 07 54934860
Boonah 2 Park Street Boonah 4310 Ph/Fax 07 54631596
member firm of the association of consulting surveyors

J.B. Goodwin, Midson & Partners GM+P

consulting surveyors town planners and development consultants

Benchmark Plan IN QUALITY ASSURED ISO 9001

LENSWORTH KAWANA WATERS PTY LTD

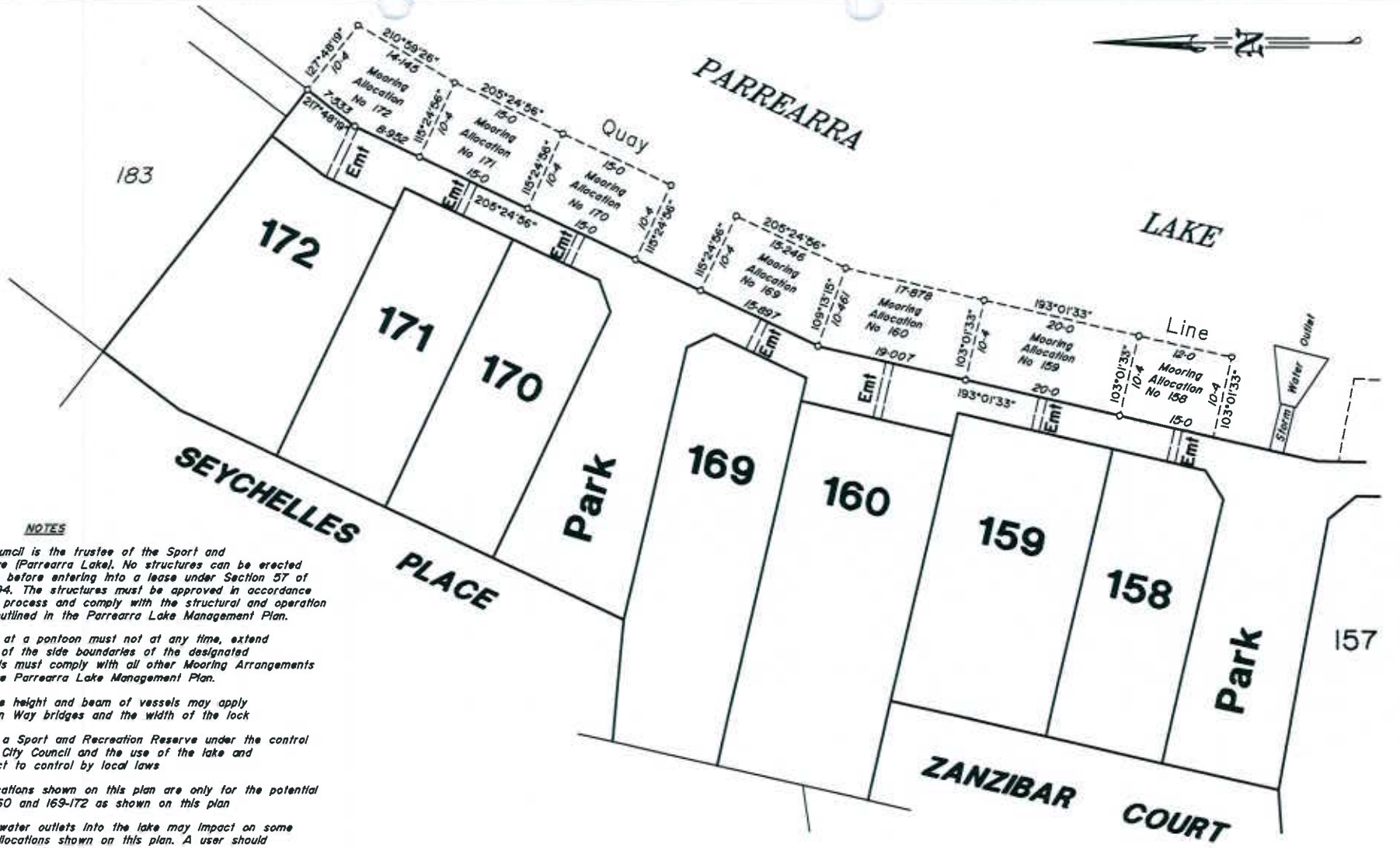
AMDT

Quay Line Plan for Lot 382
Stage 5 Kawana Island

scale: 1:1000

ref no P-2780-524

A3



NOTES

1. Caloundra City Council is the trustee of the Sport and Recreation Reserve (Parrearra Lake). No structures can be erected in Parrearra Lake before entering into a lease under Section 57 of the Land Act, 1994. The structures must be approved in accordance with the approval process and comply with the structural and operation requirements as outlined in the Parrearra Lake Management Plan.
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3. Restrictions to the height and beam of vessels may apply due to The Nicklin Way bridges and the width of the lock
4. The lake area is a Sport and Recreation Reserve under the control of the Caloundra City Council and the use of the lake and environs is subject to control by local laws
5. The mooring allocations shown on this plan are only for the potential use of lots 158-160 and 169-172 as shown on this plan
6. Underwater stormwater outlets into the lake may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter
7. The easement shown across the park from a lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from that lot to the mooring

Scale 1:500 Lengths are in Metres

5 0 10 20 30 40 50 60 70

Amdt A 15-11-01 NK (CCC) Amend Notes

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Surveyed			Designed			FBK	
Drawn	JAH	04-06-01	Checked	SJG		LBK	

LENSWORTH KAWANA WATERS PTY LTD

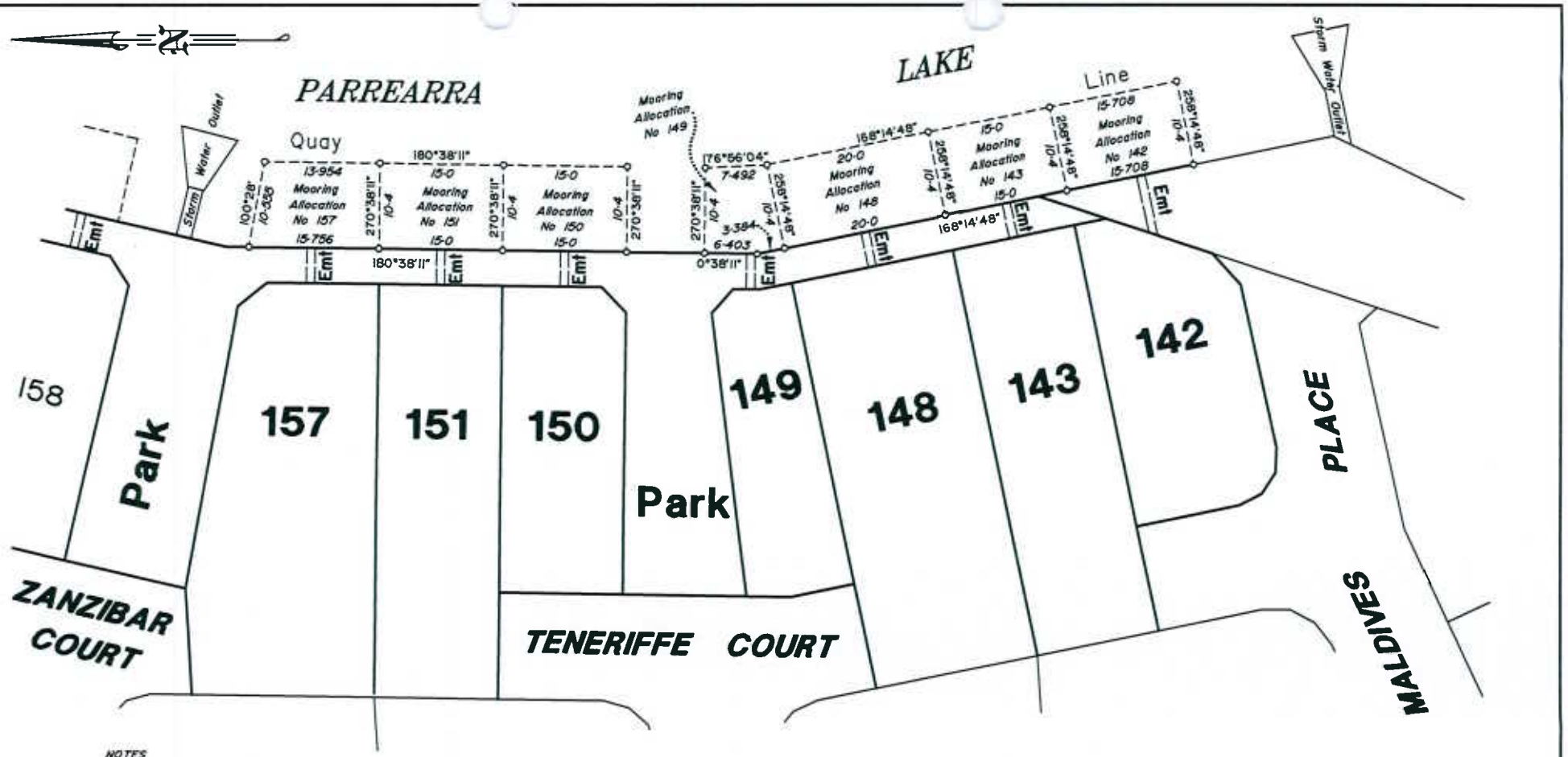
Plan of Mooring Layout
Stage 2 Kawana Island

AMDT A

scale: 1:500

ref no P-2780-84-2

A3



NOTES

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2. A vessel berthed at a pontoon must not at any time, extend within 1.5 metres of the side boundaries of the designated Quay Line. Vessels must comply with all other Mooring Arrangements as specified in the Parrearra Lake Management Plan.
3. Restrictions to the height and beam of vessels may apply due to The Nicklin Way bridges and the width of the lock
4. The lake area is a Sport and Recreation Reserve under the control of the Caloundra City Council and the use of the lake and environs is subject to control by local laws
5. The mooring allocations shown on this plan are only for the potential use of lots 142, 143, 148-151 and 157 as shown on this plan
6. Underwater stormwater outlets into the lake may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter
7. The easement shown across the park from a lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from that lot to the mooring

Scale 1:500 Lengths are in Metres

5 0 10 20 30 40 50 60 70

Amdt A 15-11-01 NK (CCC) Amend Notes

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member firm of the association of consulting surveyors

Surveyed			Designed			FBK	
Drawn	JAH	04-06-01	Checked	SJG		LBK	

LENSWORTH KAWANA WATERS PTY LTD

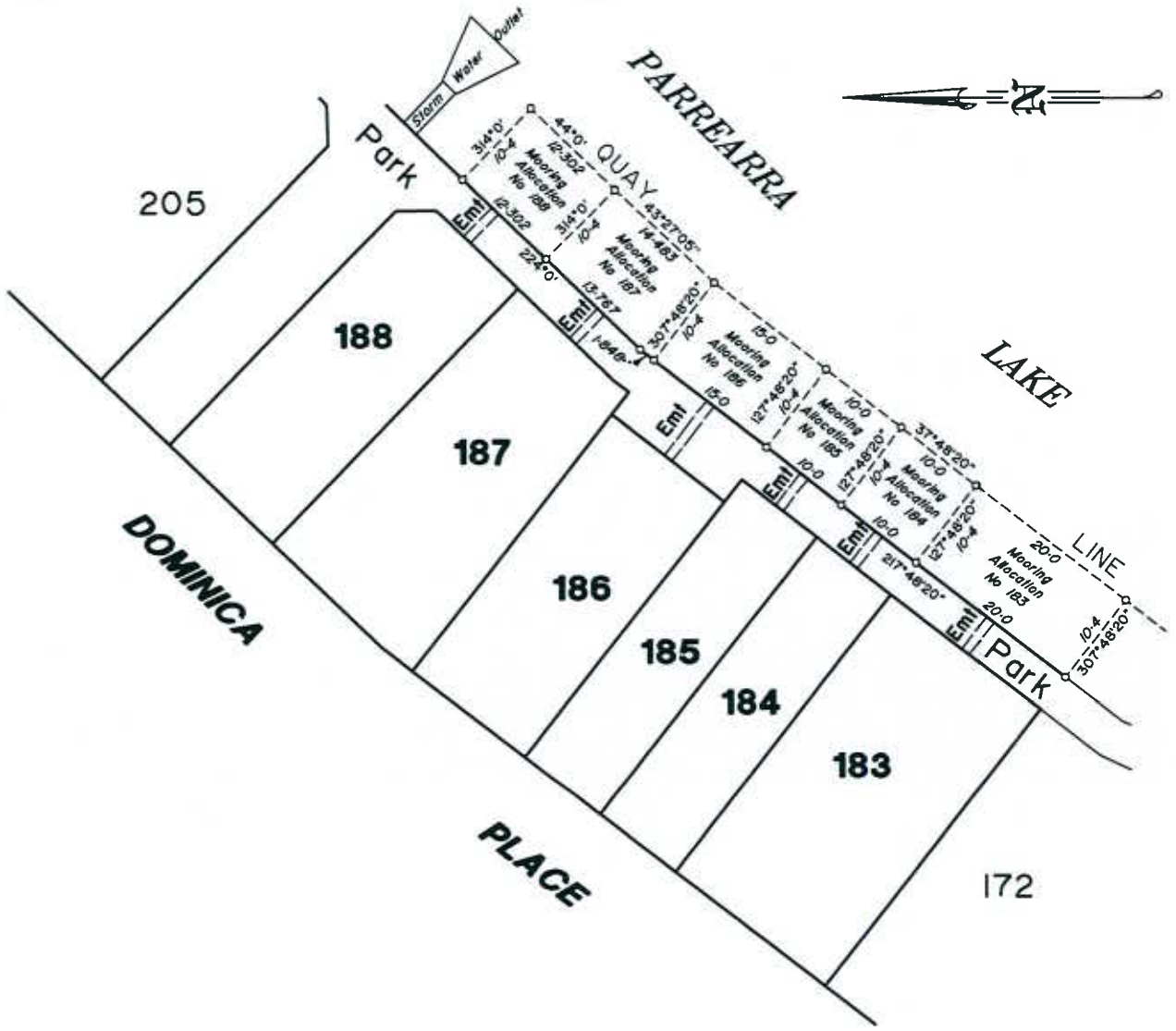
Plan of Mooring Layout
Stage 2 Kawana Island

AMDT A

scale: 1:500

ref no P-2780-84-1

A3



NOTES

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2. A vessel berthed at a pontoon must not at any time, extend within 1.5 metres of the side boundaries of the designated Quay Line. Vessels must comply with all other Mooring Arrangements as specified in the Parrearra Lake Management Plan.
3. Restrictions to the height and beam of vessels may apply due to The Nicklin Way bridges and the width of the lock
4. The lake area is a Sport and Recreation Reserve under the control of the Caloundra City Council and the use of the lake and environs is subject to control by local laws
5. The mooring allocations shown on this plan are only for the potential use of lots 183-188 as shown on this plan
6. Underwater stormwater outlets into the lake may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter
7. The easement shown across the park from a lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from that lot to the mooring

Amdt A 15-11-01 NK (CCC) Amend Notes

J.B. Goodwin, Midson & Partners
consulting surveyors, planners and development consultants
GM+P

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Boonah 2 Park Street Boonah 4310 Ph/Fax (07)5463 1596
member firm of the association of consulting surveyors

Surveyed			Designed			FBK	
Drawn	JAH	24-08-01	Checked	SJG		LBK	

LENSWORTH KAWANA WATERS PTY LTD

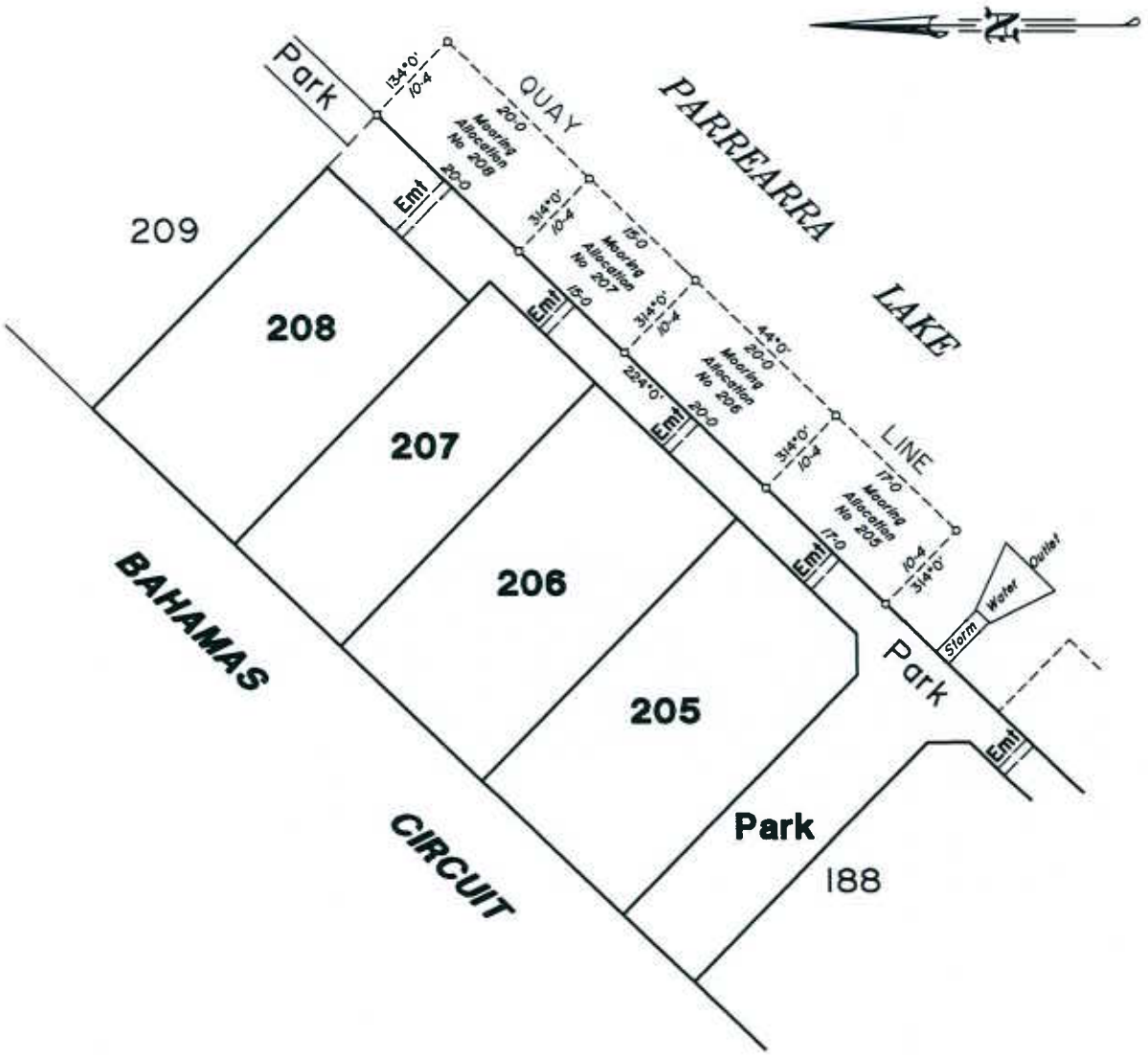
Quay Line Plan for Lots 183-188
Stage 3 Kawana Island

AMDT A

scale: 1:500

ref no P-2780-92-1

A3



NOTES

1. Caloundra City Council is the trustee of the Sport and Recreation Reserve (Parrearra Lake). No structures can be erected in Parrearra Lake before entering into a lease under Section 57 of the Land Act, 1994. The structures must be approved in accordance with the approval process and comply with the structural and operation requirements as outlined in the Parrearra Lake Management Plan.
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3. Restrictions to the height and beam of vessels may apply due to The Nicklin Way bridges and the width of the lock
4. The lake area is a Sport and Recreation Reserve under the control of the Caloundra City Council and the use of the lake and environs is subject to control by local laws
5. The mooring allocations shown on this plan are only for the potential use of lots 205-208 as shown on this plan
6. Underwater stormwater outlets into the lake may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter
7. The easement shown across the park from a lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from that lot to the mooring

J.B. Goodwin, Midson & Partners
consulting surveyors, planners and development consultants
GM+P
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member firm of the association of consulting surveyors

Surveyed			Designed			FBK	
Drawn	JAH	24-08-01	Checked	SJG		LBK	

LENSWORTH KAWANA WATERS PTY LTD

Quay Line plan for Lots 205-208
Stage 3 Kawana Island

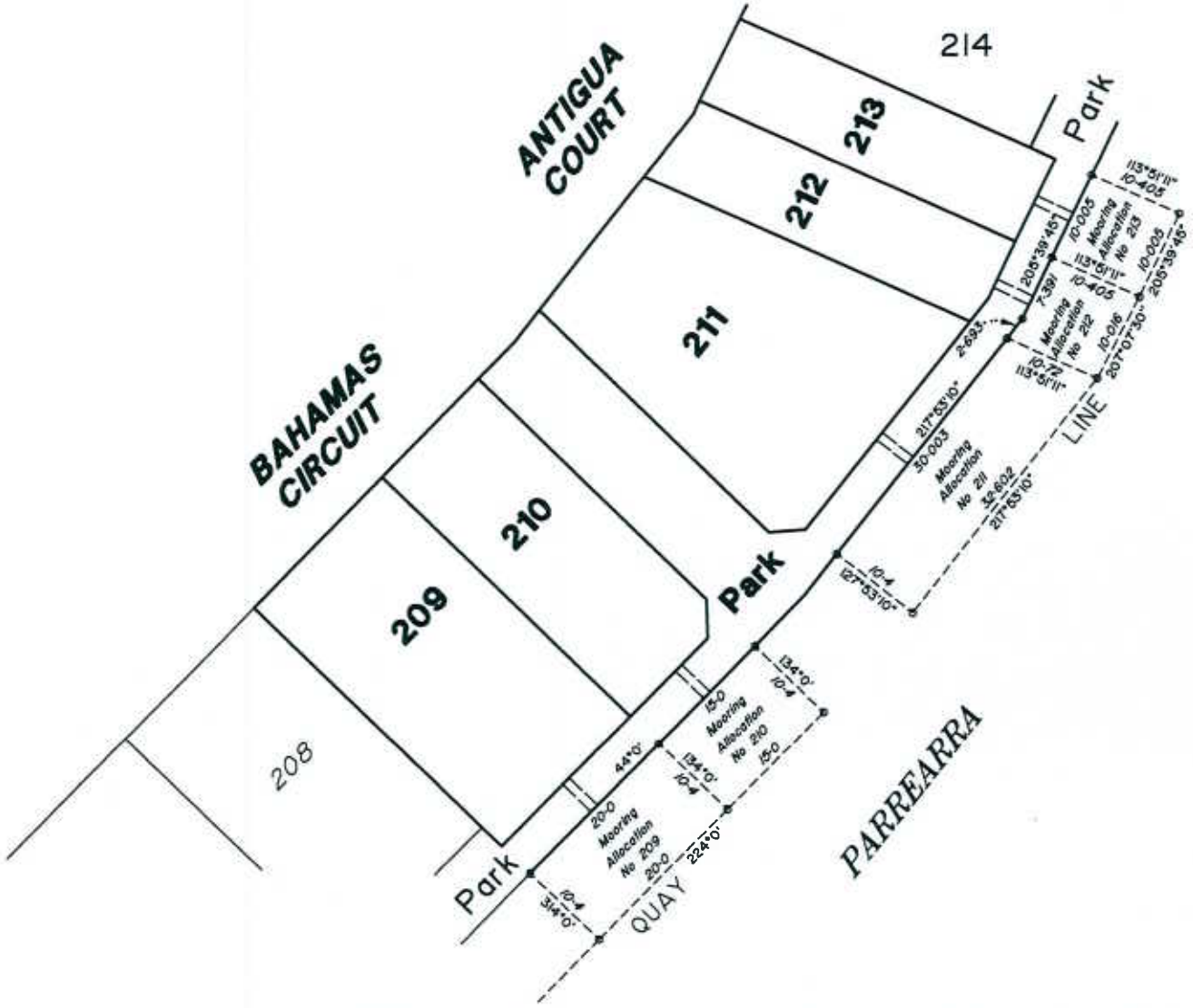
AMDT A

scale: 1:500

ref no P-2780-92-2

A3

Amdt A 15-11-01 NK (CCC) Amend Notes



NOTES

1. Caloundra City Council is the trustee of the Sport and Recreation Reserve (Parrearra Lake). No structures can be erected in Parrearra Lake before entering into a lease under Section 57 of the Land Act, 1994. The structures must be approved in accordance with the approval process and comply with the structural and operation requirements as outlined in the Parrearra Lake Management Plan.
2. A vessel berthed at a pontoon must not at any time, extend within 1.5 metres of the side boundaries of the designated Quay Line. Vessels must comply with all other Mooring Arrangements as specified in the Parrearra Lake Management Plan.
3. Restrictions to the height and beam of vessels may apply due to The Nicklin Way bridges and the width of the lock
4. The lake area is a Sport and Recreation Reserve under the control of the Caloundra City Council and the use of the lake and environs is subject to control by local laws
5. The mooring allocations shown on this plan are only for the potential use of lots 209-231 as shown on this plan
6. Underwater stormwater outlets into the lake may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter
7. The easement shown across the park from a lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from that lot to the mooring

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Boonah 2 Park Street Boonah 4310 Ph/Fax (07)5463 1598
member firm of the association of consulting surveyors

Surveyed			Designed			FBK	
Drawn	JAH	29-08-01	Checked	SJG		LBK	

LENSWORTH KAWANA WATERS PTY LTD

Quay Line Plan for Lots 209-213
Stage 4 Kawana Island

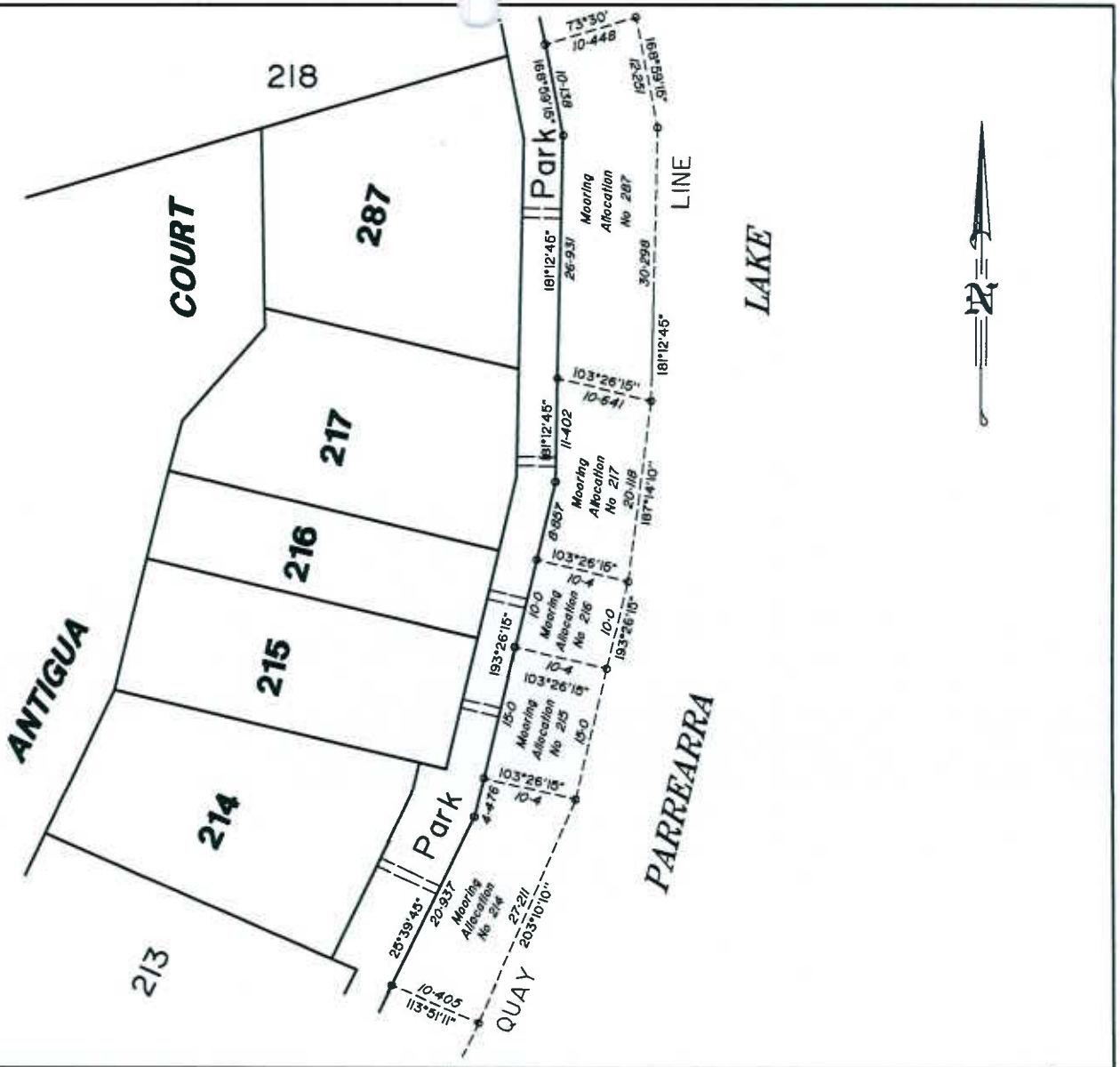
AMDT A

scale: 1:500

ref no P-2780-93-1

A3

Amdt A NK 15-11-01 (CCC) Amend Notes



NOTES

1. Caloundra City Council is the trustee of the Sport and Recreation Reserve (Parrearra Lake). No structures can be erected in Parrearra Lake before entering into a lease under Section 57 of the Land Act, 1994. The structures must be approved in accordance with the approval process and comply with the structural and operation requirements as outlined in the Parrearra Lake Management Plan.
2. A vessel berthed at a pontoon must not at any time, extend within 1.5 metres of the side boundaries of the designated Quay Line. Vessels must comply with all other Mooring Arrangements as specified in the Parrearra Lake Management Plan.
3. Restrictions to the height and beam of vessels may apply due to The Nicklin Way bridges and the width of the lock
4. The lake area is a Sport and Recreation Reserve under the control of the Caloundra City Council and the use of the lake and environs is subject to control by local laws
5. The mooring allocations shown on this plan are only for the potential use of lots 214-217and 287 as shown on this plan
6. Underwater stormwater outlets into the lake may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter
7. The easement shown across the park from a lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from that lot to the mooring

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Drawn	JAH	29-08-01	Checked	SJG		LBK	

LENSWORTH KAWANA WATERS PTY LTD

Quay Line Plan for Lots 214-217 and 287 Stage 4 Kawana Island

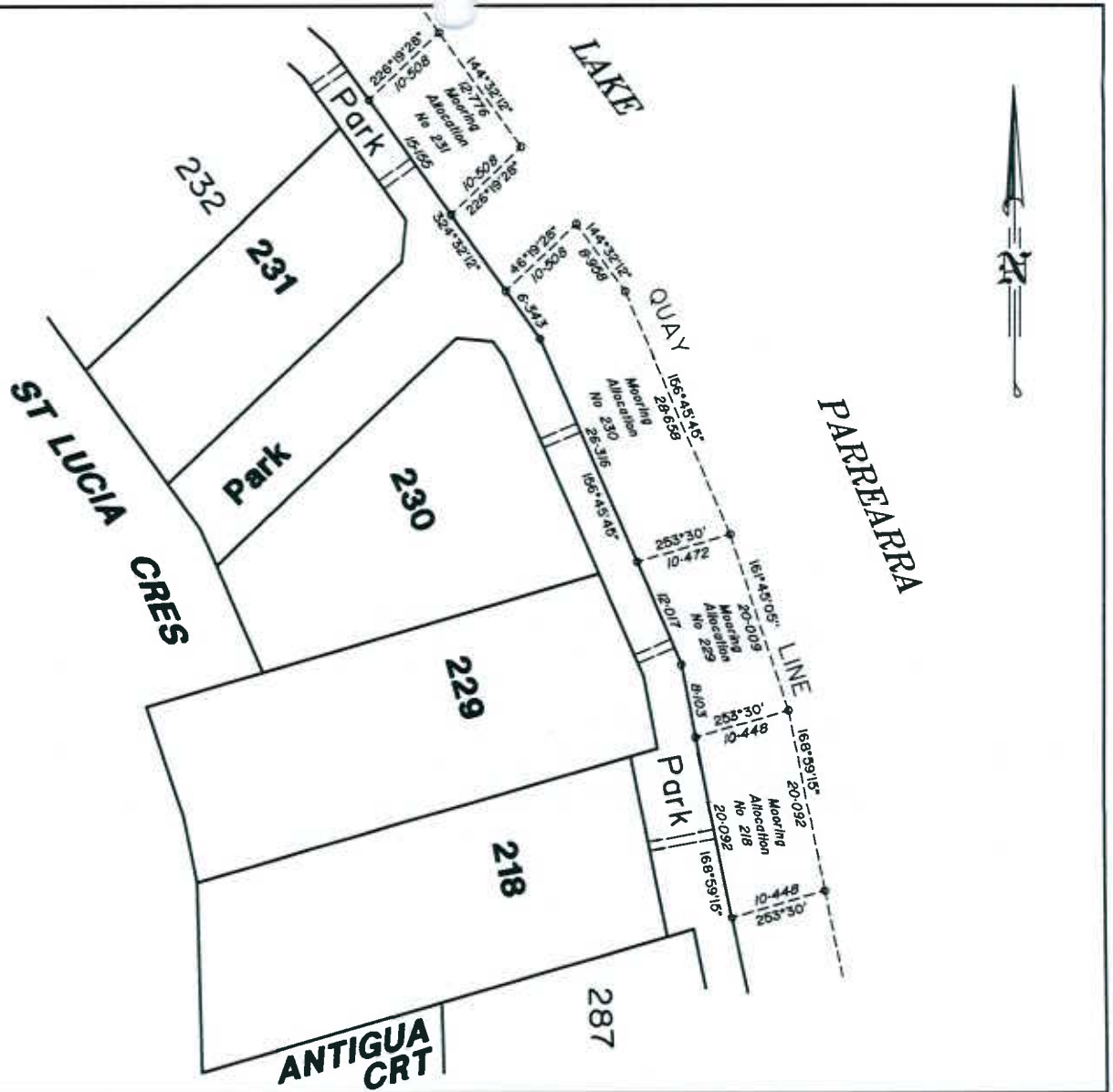
AMDT A

scale: 1:500

ref no P-2780-93-2

A3

Amdt A NK 15-11-01 (CCC) Amend Notes



NOTES

1. Caloundra City Council is the trustee of the Sport and Recreation Reserve (Parrearra Lake). No structures can be erected in Parrearra Lake before entering into a lease under Section 57 of the Land Act, 1994. The structures must be approved in accordance with the approval process and comply with the structural and operation requirements as outlined in the Parrearra Lake Management Plan.
2. A vessel berthed at a pontoon must not at any time, extend within 1.5 metres of the side boundaries of the designated Quay Line. Vessels must comply with all other Mooring Arrangements as specified in the Parrearra Lake Management Plan.
3. Restrictions to the height and beam of vessels may apply due to The Nicklin Way bridges and the width of the lock
4. The lake area is a Sport and Recreation Reserve under the control of the Caloundra City Council and the use of the lake and environs is subject to control by local laws
5. The mooring allocations shown on this plan are only for the potential use of lots 218, 229-231 as shown on this plan
6. Underwater stormwater outlets into the lake may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter
7. The easement shown across the park from a lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from that lot to the mooring

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LENSWORTH KAWANA WATERS PTY LTD

Quay Line Plan for Lots 218, and 229-231 Stage 4 Kawana Island

AMDT A

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Drawn	JAH	29-08-01	Checked	SJG		LBK	

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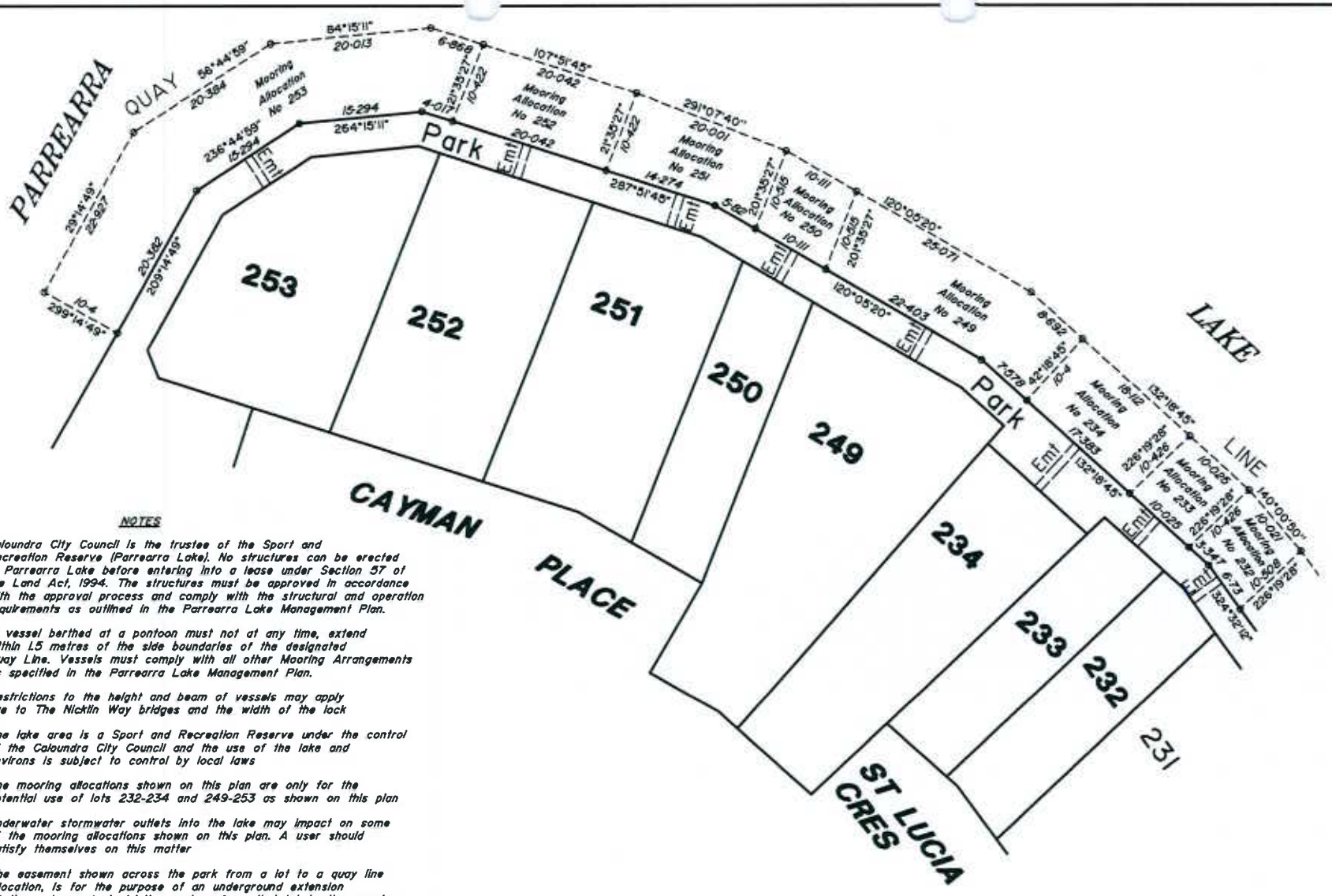
Amdt A NK 15-11-01 (CCC) Amend Notes



NOTES

1. Caloundra City Council is the trustee of the Sport and Recreation Reserve (Parrearra Lake). No structures can be erected in Parrearra Lake before entering into a lease under Section 57 of the Land Act, 1994. The structures must be approved in accordance with the approval process and comply with the structural and operation requirements as outlined in the Parrearra Lake Management Plan.
2. A vessel berthed at a pontoon must not at any time, extend within 1.5 metres of the side boundaries of the designated Quay Line. Vessels must comply with all other Mooring Arrangements as specified in the Parrearra Lake Management Plan.
3. Restrictions to the height and beam of vessels may apply due to The Nicklin Way bridges and the width of the lock
4. The lake area is a Sport and Recreation Reserve under the control of the Caloundra City Council and the use of the lake and environs is subject to control by local laws
5. The mooring allocations shown on this plan are only for the potential use of lots 232-234 and 249-253 as shown on this plan
6. Underwater stormwater outlets into the lake may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter
7. The easement shown across the park from a lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from that lot to the mooring

Amdt B NK 15-11-01 (CCC) Amend Notes
Amdt A 15-10-01 SJG Amend Mooring Allocation for Lot 232

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Boonah 2 Park Street Boonah 4310 Ph/Fax (07)5463 1598
member firm of the association of consulting surveyors

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Drawn	JAH	29-08-01	Checked	SJG		LBK	

LENSWORTH KAWANA WATERS PTY LTD

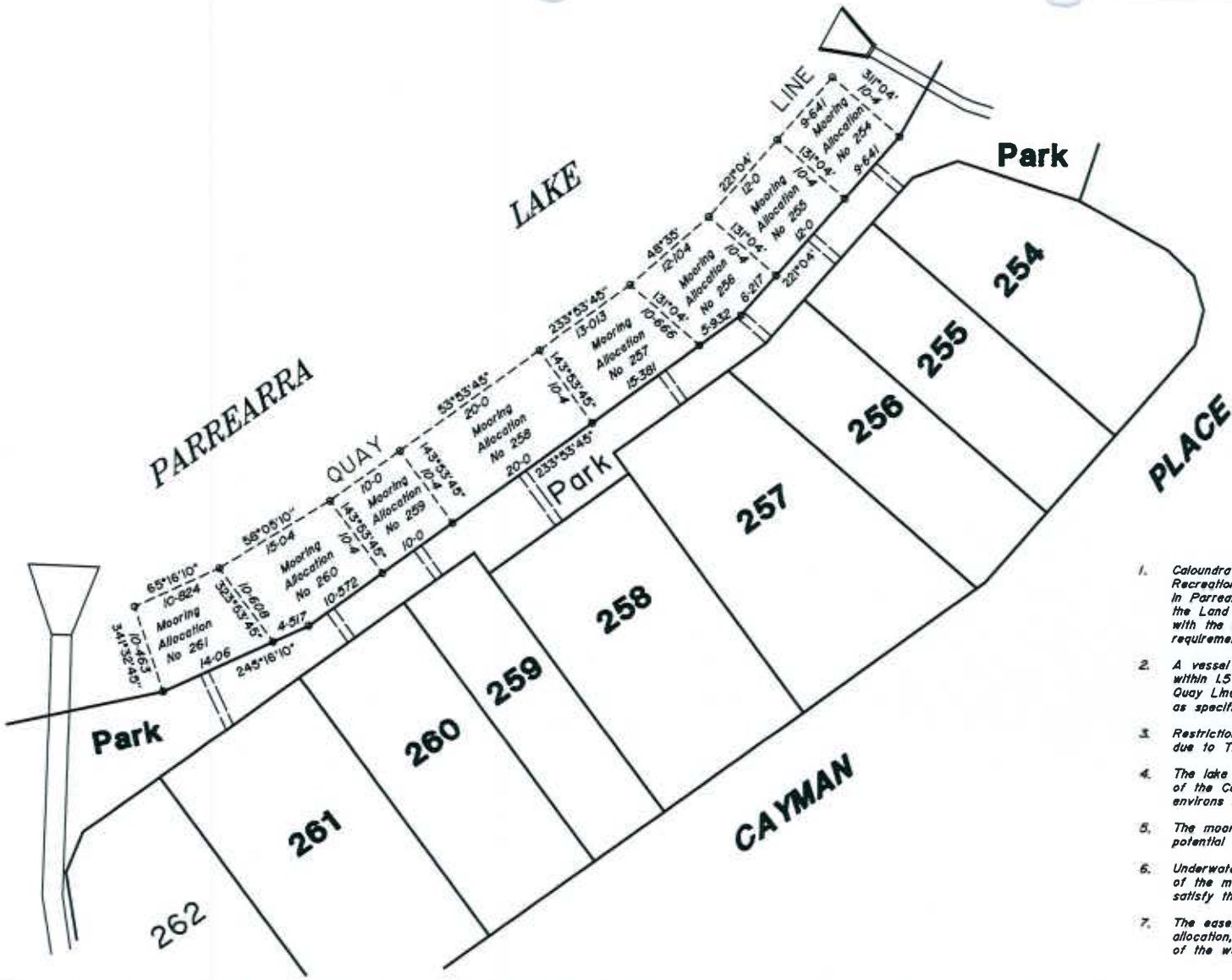
Quay Line Plan for Lots 232-234 and 249-253 Stage 4 Kawana Island

AMDT B

scale: 1:500

ref no P-2780-93-4

A3



NOTES

1. Caloundra City Council is the trustee of the Sport and Recreation Reserve (Parrearra Lake). No structures can be erected in Parrearra Lake before entering into a lease under Section 57 of the Land Act, 1994. The structures must be approved in accordance with the approval process and comply with the structural and operation requirements as outlined in the Parrearra Lake Management Plan.
2. A vessel berthed at a pontoon must not at any time, extend within 1.5 metres of the side boundaries of the designated Quay Line. Vessels must comply with all other Mooring Arrangements as specified in the Parrearra Lake Management Plan.
3. Restrictions to the height and beam of vessels may apply due to The Nicklin Way bridges and the width of the lock
4. The lake area is a Sport and Recreation Reserve under the control of the Caloundra City Council and the use of the lake and environs is subject to control by local laws
5. The mooring allocations shown on this plan are only for the potential use of lots 254-261 as shown on this plan
6. Underwater stormwater outlets into the lake may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter
7. The easement shown across the park from a lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from that lot to the mooring

Amdt C NK 15-11-01 (CCC) Amend Notes and SJG 15-11-01 Amend Mooring Allocation Lot 254

Amdt B SJG 15-10-01 Amend Mooring Allocations and Lots 255-257

Amdt A SJG 04-10-01 Amend Quay Line Allocation for Lot 261

J.B. Goodwin, Midson & Partners
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Quay Line Plan for Lots 254-261 Stage 4 Kawana Island

AMDT C

scale: 1:500

ref no P-2780-93-5

A3

NOTES

1. Caloundra City Council is the trustee of the Sport and Recreation Reserve (Parrearra Lake). No structures can be erected in Parrearra Lake before entering into a lease under Section 57 of the Land Act, 1994. The structures must be approved in accordance with the approval process and comply with the structural and operation requirements as outlined in the Parrearra Lake Management Plan.

2. A vessel berthed at a pontoon must not at any time, extend within 1.5 metres of the side boundaries of the designated Quay Line. Vessels must comply with all other Mooring Arrangements as specified in the Parrearra Lake Management Plan.

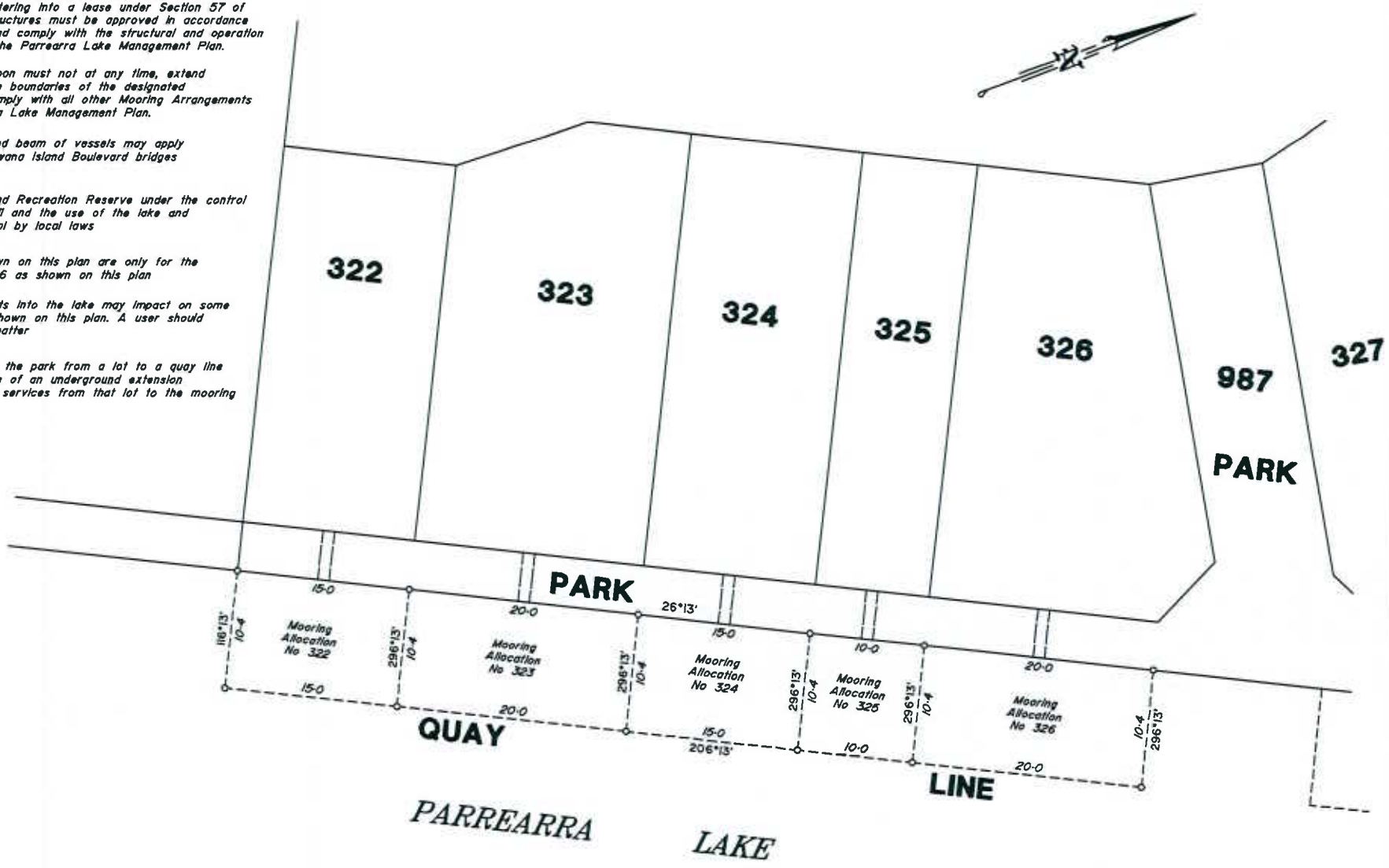
3. Restrictions to the height and beam of vessels may apply due to The Nicklin Way, Kawana Island Boulevard bridges and the width of the lock

4. The lake area is a Sport and Recreation Reserve under the control of the Caloundra City Council and the use of the lake and environs is subject to control by local laws

5. The mooring allocations shown on this plan are only for the potential use of lots 322-326 as shown on this plan

6. Underwater stormwater outlets into the lake may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter

7. The easement shown across the park from a lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from that lot to the mooring



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Drawn	JAH	20-02-02
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Checked	SJG	21-02-02
FBK	LBK	
Datum		

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consulting surveyors town planners and development consultants
Benchmark IN QUALITY ASMEC ISO 9001

LENSWORTH KAWANA WATERS PTY LTD

AMDT

Quay Line Plan for Lots 322-326
Stage 5 Kawana Island

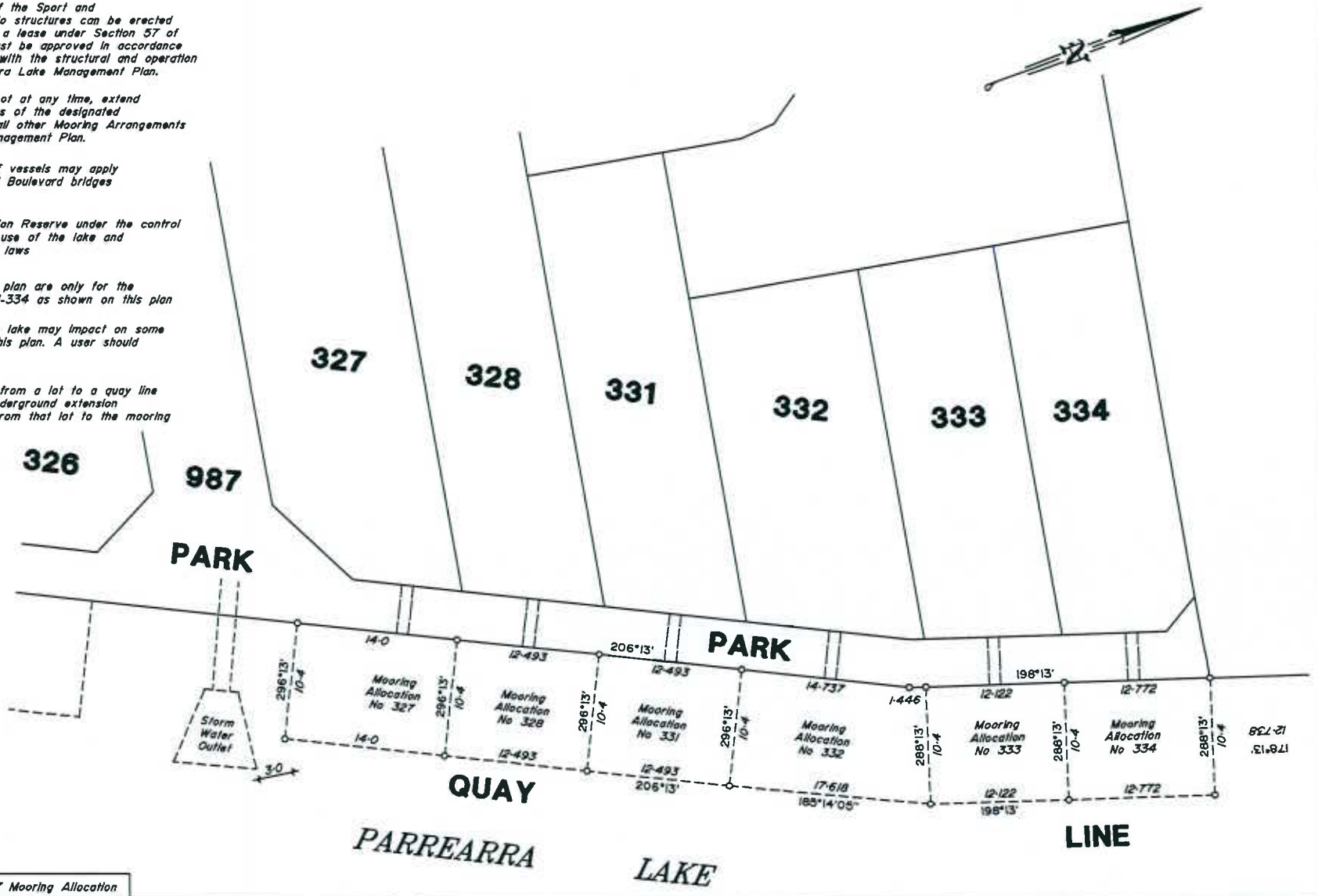
scale: 1:350

ref no P-2780-505-1

A3

NOTES

1. Caloundra City Council is the trustee of the Sport and Recreation Reserve (Parrearra Lake). No structures can be erected in Parrearra Lake before entering into a lease under Section 57 of the Land Act, 1994. The structures must be approved in accordance with the approval process and comply with the structural and operation requirements as outlined in the Parrearra Lake Management Plan.
2. A vessel berthed at a pontoon must not at any time, extend within 1.5 metres of the side boundaries of the designated Quay Line. Vessels must comply with all other Mooring Arrangements as specified in the Parrearra Lake Management Plan.
3. Restrictions to the height and beam of vessels may apply due to The Nicklin Way, Kawana Island Boulevard bridges and the width of the lock
4. The lake area is a Sport and Recreation Reserve under the control of the Caloundra City Council and the use of the lake and environs is subject to control by local laws
5. The mooring allocations shown on this plan are only for the potential use of lots 327, 328 & 331-334 as shown on this plan
6. Underwater stormwater outlets into the lake may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter
7. The easement shown across the park from a lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from that lot to the mooring



Amdt A 28-02-02 SJG Amend Lot 327 Mooring Allocation

Surveyed		
Drawn	JAH	20-02-02
Designed		
Checked	SJG	21-02-02
FBK	LBK	
Datum		

Brisbane 628 Coronation Drive Toowong 4066 Ph 07 38702161 Fax 07 38703944
Kawana 2/12 Technology Drive Warana 4575 Ph 07 54931707 Fax 07 54934660
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consulting surveyors town planners and development consultants

LENSWORTH KAWANA WATERS PTY LTD

Quay Line Plan for Lots 327, 328 & 331-334 Stage 5 Kawana Island

AMDT A

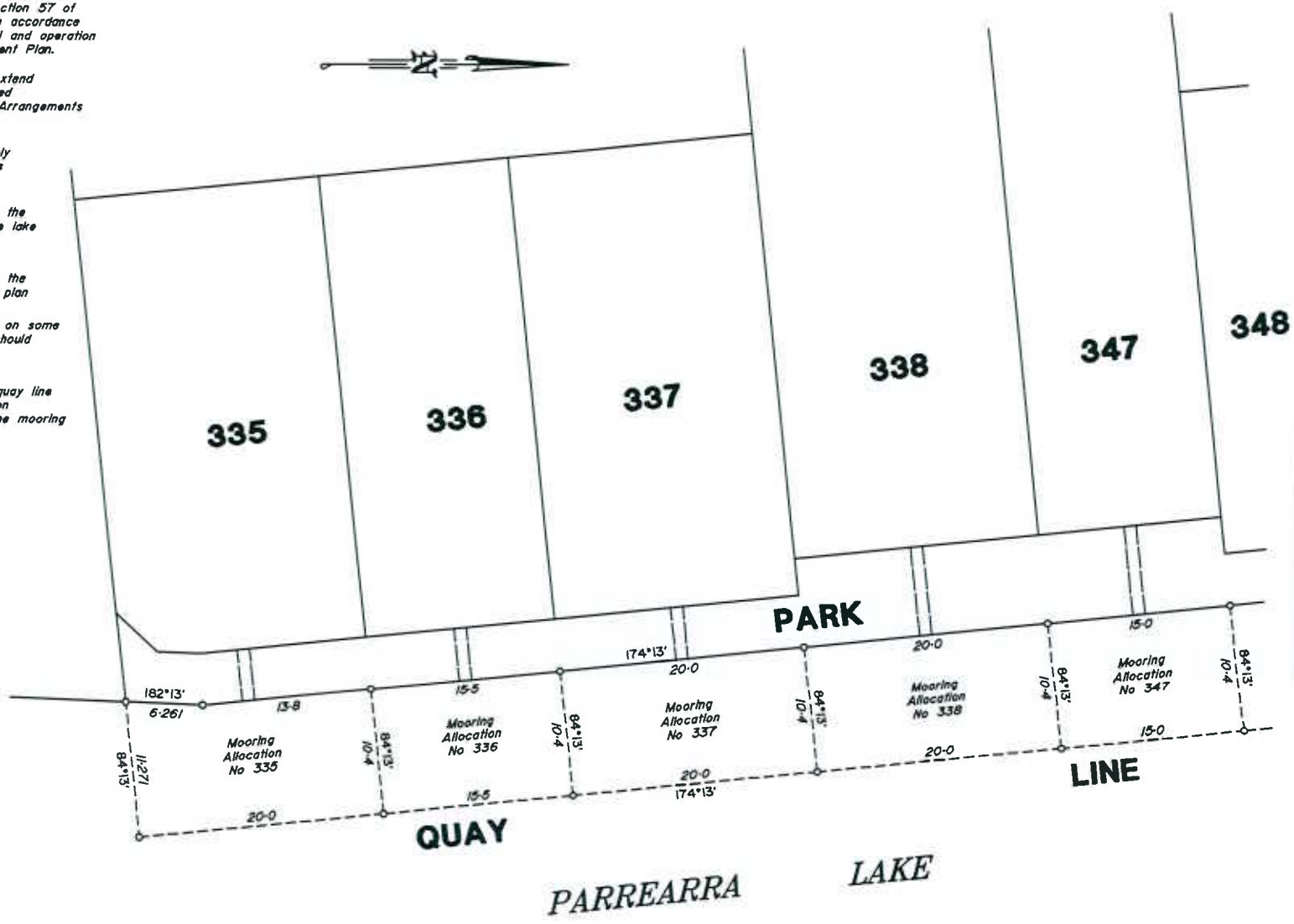
scale: 1:350

ref no P-2780-505-2A

A3

NOTES

1. Caloundra City Council is the trustee of the Sport and Recreation Reserve (Parrearra Lake). No structures can be erected in Parrearra Lake before entering into a lease under Section 57 of the Land Act, 1994. The structures must be approved in accordance with the approval process and comply with the structural and operation requirements as outlined in the Parrearra Lake Management Plan.
2. A vessel berthed at a pontoon must not at any time, extend within 1.5 metres of the side boundaries of the designated Quay Line. Vessels must comply with all other Mooring Arrangements as specified in the Parrearra Lake Management Plan.
3. Restrictions to the height and beam of vessels may apply due to The Nicklin Way, Kawana Island Boulevard bridges and the width of the lock
4. The lake area is a Sport and Recreation Reserve under the control of the Caloundra City Council and the use of the lake and environs is subject to control by local laws
5. The mooring allocations shown on this plan are only for the potential use of lots 335-338 & 347 as shown on this plan
6. Underwater stormwater outlets into the lake may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter
7. The easement shown across the park from a lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from that lot to the mooring



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Brisbane 628 Coronation Drive Toowong 4066 Ph 07 38702161 Fax 07 38703844
Kawana 2/12 Technology Drive Warana 4575 Ph 07 54931707 Fax 07 54934860
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LENSWORTH KAWANA WATERS PTY LTD

AMDT

Quay Line Plan for Lots 335-338 & 347
Stage 5 Kawana Island

scale: 1:350

ref no P-2780-505-3

A3

NOTES

1. Caloundra City Council is the trustee of the Sport and Recreation Reserve (Parrearra Lake). No structures can be erected in Parrearra Lake before entering into a lease under Section 57 of the Land Act, 1994. The structures must be approved in accordance with the approval process and comply with the structural and operation requirements as outlined in the Parrearra Lake Management Plan.

2. A vessel berthed at a pontoon must not at any time, extend within 1.5 metres of the side boundaries of the designated Quay Line. Vessels must comply with all other Mooring Arrangements as specified in the Parrearra Lake Management Plan.

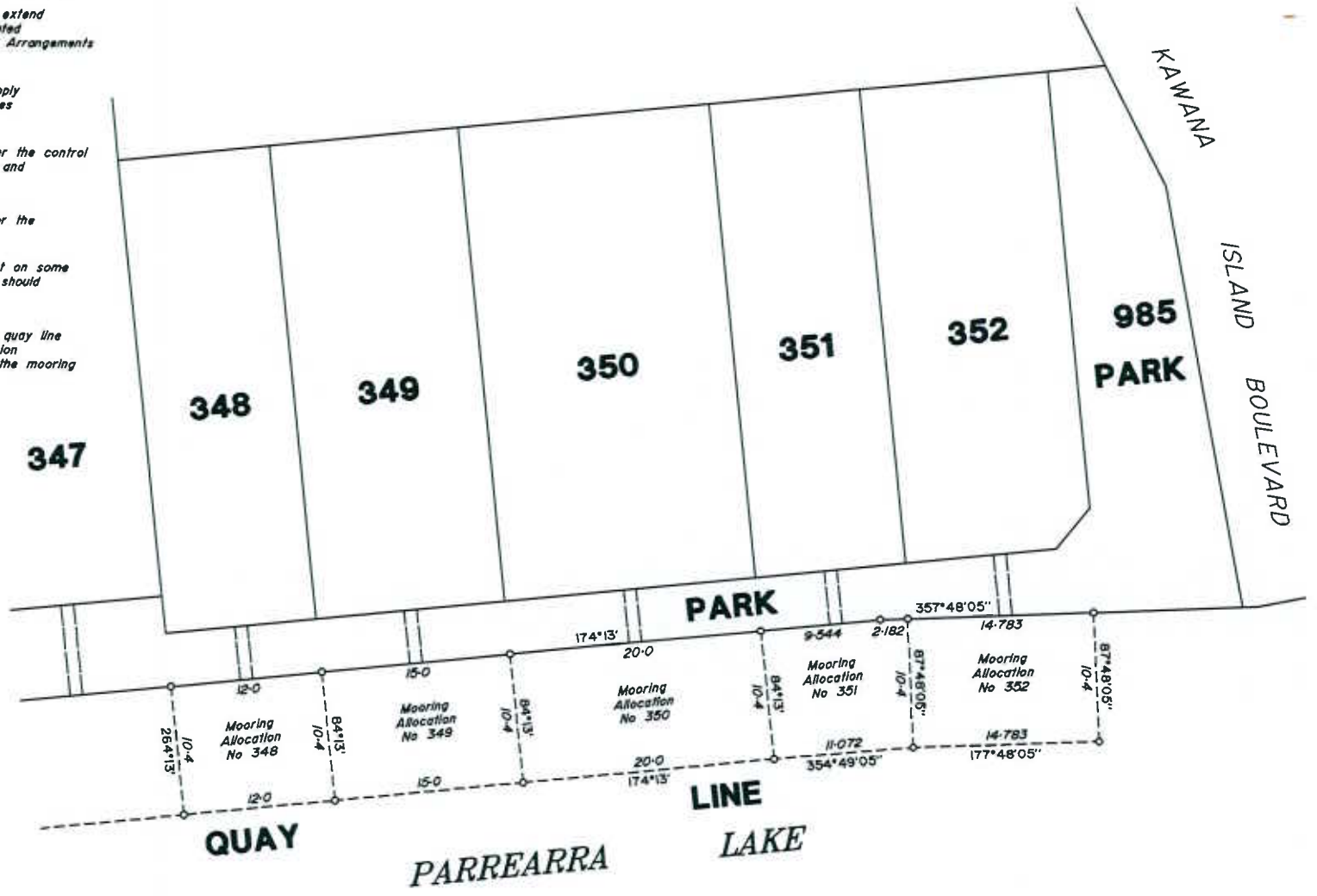
3. Restrictions to the height and beam of vessels may apply due to The Nicklin Way, Kawana Island Boulevard bridges and the width of the lock

4. The lake area is a Sport and Recreation Reserve under the control of the Caloundra City Council and the use of the lake and environs is subject to control by local laws

5. The mooring allocations shown on this plan are only for the potential use of lots 348-352 as shown on this plan

6. Underwater stormwater outlets into the lake may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter

7. The easement shown across the park from a lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from that lot to the mooring



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LENSWORTH KAWANA WATERS PTY LTD

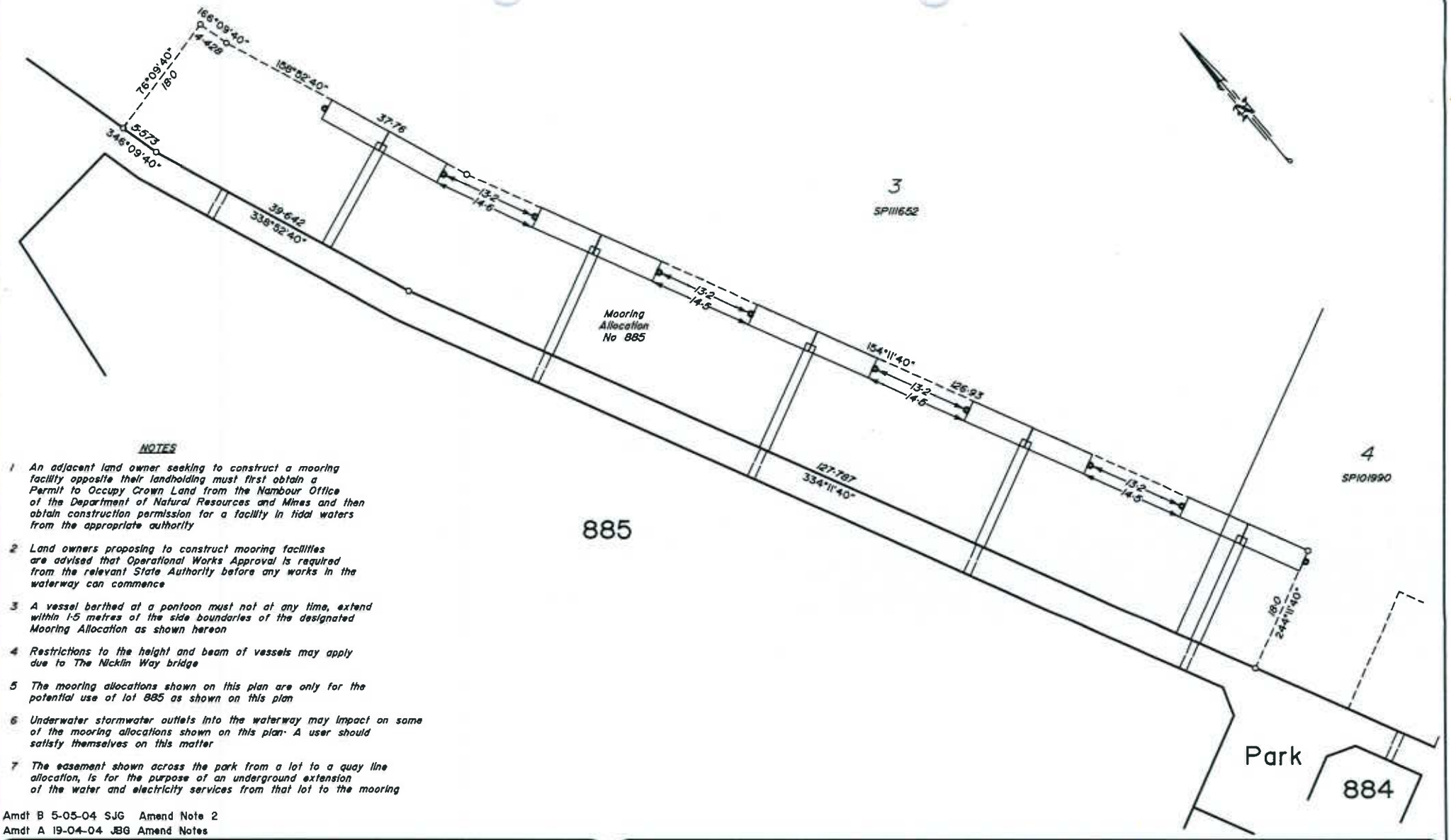
AMDT

Quay Line Plan for Lots 348-352
Stage 5 Kawana Island

scale: 1:350

ref no P-2780-505-4

A3



NOTES

1. An adjacent land owner seeking to construct a mooring facility opposite their landholding must first obtain a Permit to Occupy Crown Land from the Nambour Office of the Department of Natural Resources and Mines and then obtain construction permission for a facility in tidal waters from the appropriate authority
2. Land owners proposing to construct mooring facilities are advised that Operational Works Approval is required from the relevant State Authority before any works in the waterway can commence
3. A vessel berthed at a pontoon must not at any time, extend within 1·5 metres of the side boundaries of the designated Mooring Allocation as shown hereon
4. Restrictions to the height and beam of vessels may apply due to The Nicklin Way bridge
5. The mooring allocations shown on this plan are only for the potential use of lot 885 as shown on this plan
6. Underwater stormwater outlets into the waterway may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter
7. The easement shown across the park from a lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from that lot to the mooring

Amdt B 5-05-04 SJG Amend Note 2
Amdt A 19-04-04 JBG Amend Notes

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Drawn	JAH	03-10-03
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STOCKLAND KAWANA WATERS PTY LTD

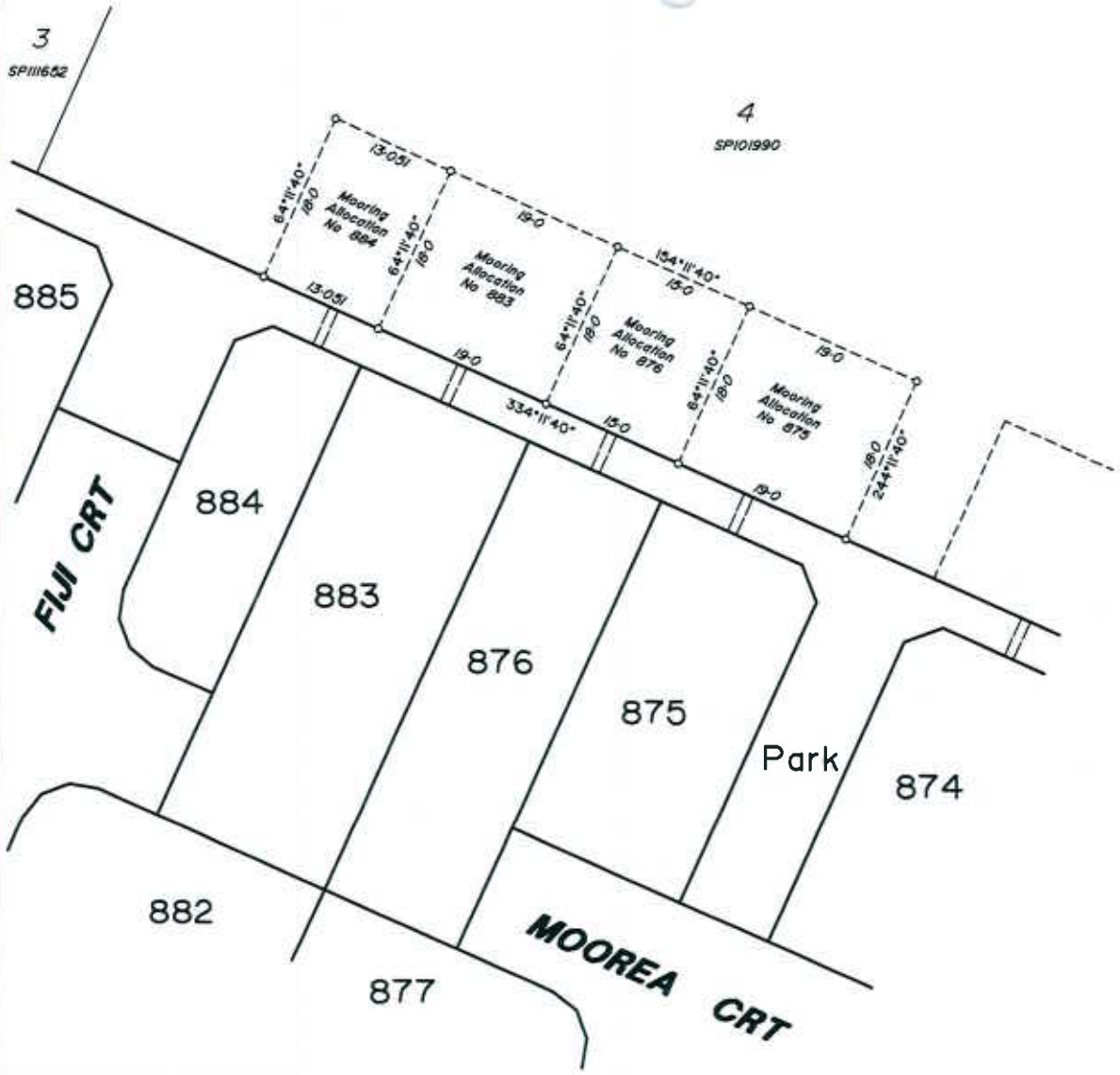
Mooring Allocation Plan for
Lot 885
Stage 8 Kawana Island

AMDT B

scale: 1:500

ref no P-2780-536 1 of 5

A3



Amdt B 5-05-04 SJG Amend Note 2
Amdt A 19-04-04 JBG Amend Notes

NOTES

1. An adjacent land owner seeking to construct a mooring facility opposite their landholding must first obtain a Permit to Occupy Crown Land from the Nambour Office of the Department of Natural Resources and Mines and then obtain construction permission for a facility in tidal waters from the appropriate authority
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3. A vessel berthed at a pontoon must not at any time, extend within 1·5 metres of the side boundaries of the designated Mooring Allocation as shown hereon
4. Restrictions to the height and beam of vessels may apply due to The Nicklin Way bridge
5. The mooring allocations shown on this plan are only for the potential use of lot 885 as shown on this plan
6. Underwater stormwater outlets into the waterway may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter
7. The easement shown across the park from a lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from that lot to the mooring

Surveyed		
Drawn	JAH	03-10-03
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Datum		

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Kawana 2/12 Technology Drive Warana 4575 Ph 07 54831707 Fax 07 54834860
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town planners and
development consultants
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STOCKLAND KAWANA WATERS PTY LTD

Mooring Allocation Plan for Lots
875, 876, 883 and 884
Stage 8 Kawana Island

AMDT B

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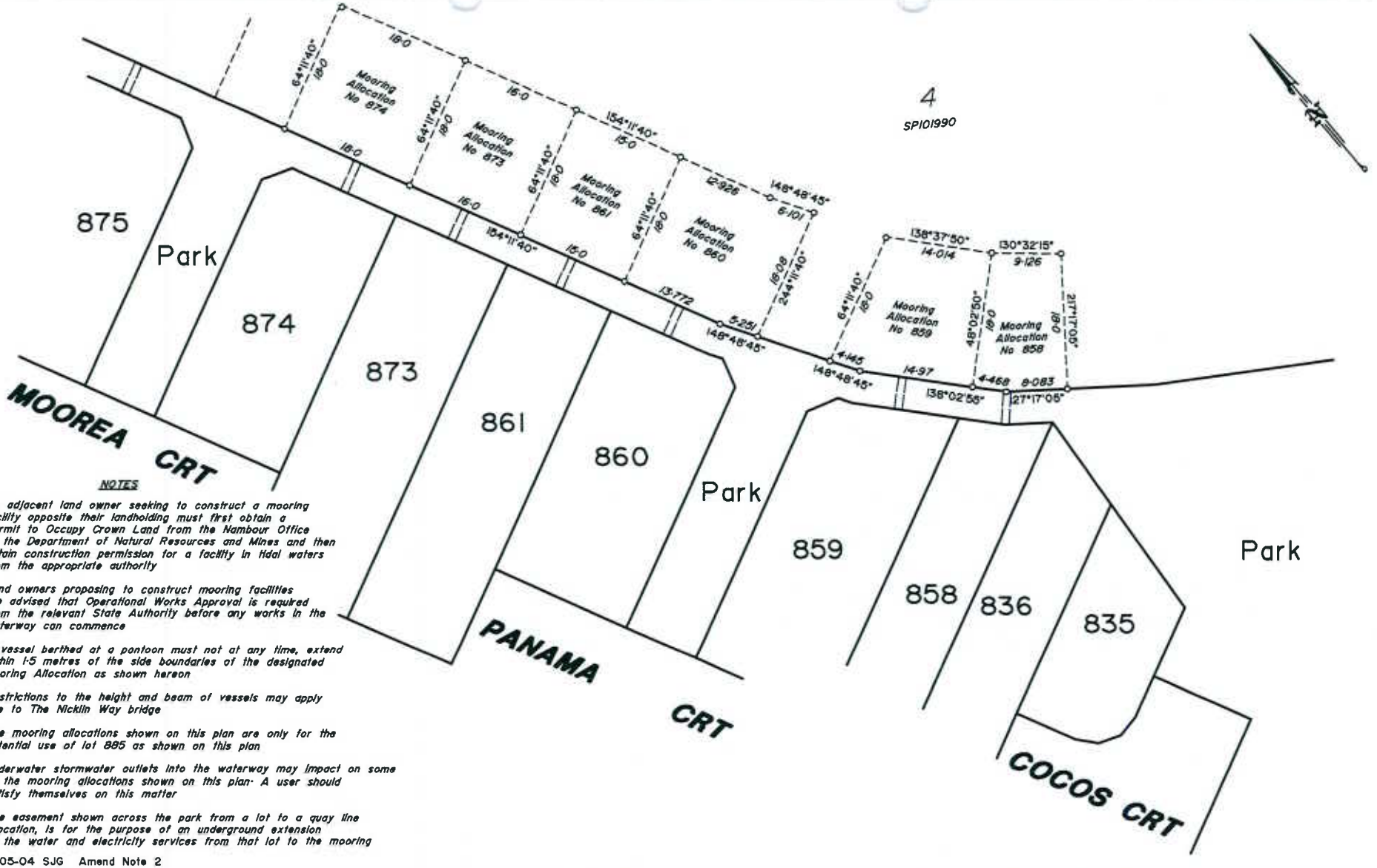
ref no P-2780-536 2 of 5

A3



NOTES

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4. Restrictions to the height and beam of vessels may apply due to The Nicklin Way bridge
5. The mooring allocations shown on this plan are only for the potential use of lot 885 as shown on this plan
6. Underwater stormwater outlets into the waterway may impact on some of the mooring allocations shown on this plan· A user should satisfy themselves on this matter
7. The easement shown across the park from a lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from that lot to the mooring

Amdt B 5-05-04 SJG Amend Note 2
Amdt A 19-04-04 JBG Amend Notes

Surveyed		
Drawn	JAH	03-10-03
Designed		
Checked	SJG	
FBK	LBK	
Datum		

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benchmark ISO QUALITY ADVICED ISO 9001

STOCKLAND KAWANA WATERS PTY LTD

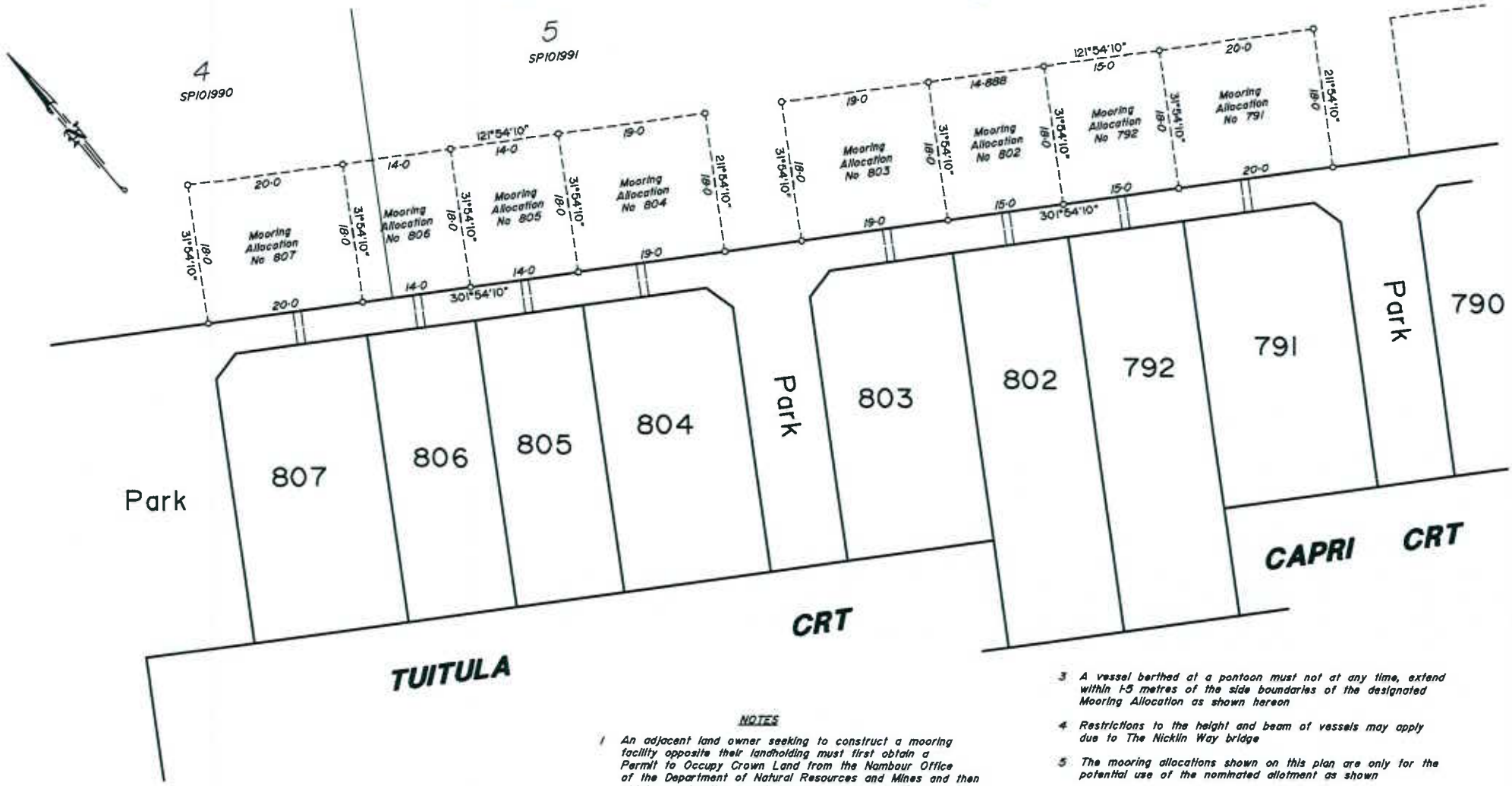
Mooring Allocation Plan for Lots 858-861, 873 and 874 Stage 8 Kawana Island

AMDT B

scale: 1:500

ref no P-2780-536 3 of 5

A3



NOTES

1. An adjacent land owner seeking to construct a mooring facility opposite their landholding must first obtain a Permit to Occupy Crown Land from the Nambour Office of the Department of Natural Resources and Mines and then obtain construction permission for a facility in tidal waters from the appropriate authority
2. Land owners proposing to construct mooring facilities are advised that Operational Works Approval is required from the relevant State Authority before any works in the waterway can commence
3. A vessel berthed at a pontoon must not at any time, extend within 1·5 metres of the side boundaries of the designated Mooring Allocation as shown hereon
4. Restrictions to the height and beam of vessels may apply due to The Nicklin Way bridge
5. The mooring allocations shown on this plan are only for the potential use of the nominated allotment as shown
6. Underwater stormwater outlets into the waterway may impact on some of the mooring allocations shown on this plan- A user should satisfy themselves on this matter
7. The easement shown across the park from a lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from that lot to the mooring

Amdt B 5-05-04 SJG Amend Note 2
Amdt A 19-04-04 JBG Amend Notes

Surveyed		
Drawn	JAH	03-10-03
Designed		
Checked	SJG	
FBK	LBK	
Datum		

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GM+P
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town planners and
development consultants
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STOCKLAND KAWANA WATERS PTY LTD

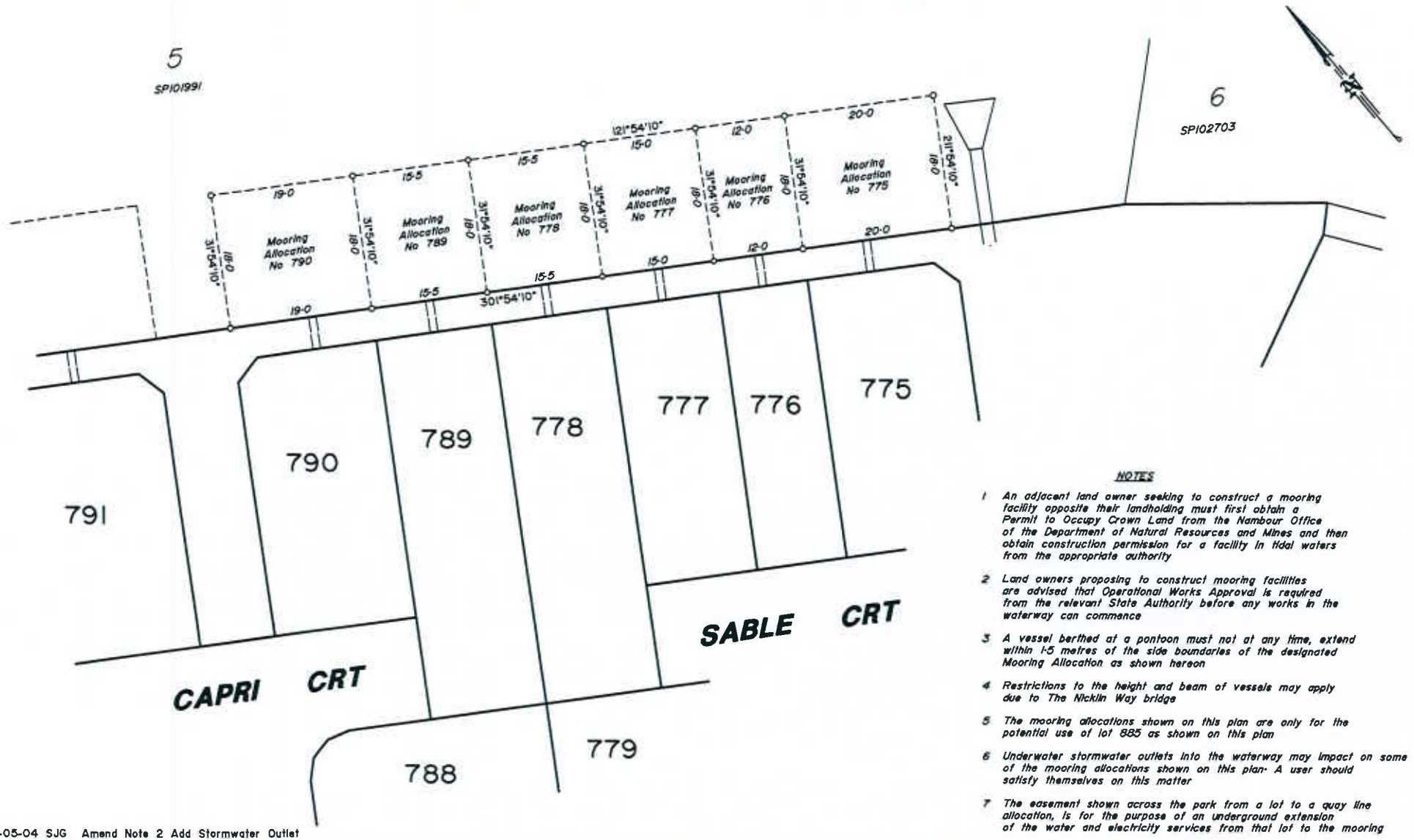
Mooring Allocation Plan for Lots
791-792 and 802-807
Stage 8 Kawana Island

AMDT B

scale: 1:500

ref no P-2780-536 4 of 5

A3



NOTES

1. An adjacent land owner seeking to construct a mooring facility opposite their landholding must first obtain a Permit to Occupy Crown Land from the Nambour Office of the Department of Natural Resources and Mines and then obtain construction permission for a facility in tidal waters from the appropriate authority
2. Land owners proposing to construct mooring facilities are advised that Operational Works Approval is required from the relevant State Authority before any works in the waterway can commence
3. A vessel berthed at a pontoon must not at any time, extend within 1·5 metres of the side boundaries of the designated Mooring Allocation as shown hereon
4. Restrictions to the height and beam of vessels may apply due to The Nicklin Way bridge
5. The mooring allocations shown on this plan are only for the potential use of lot 885 as shown on this plan
6. Underwater stormwater outlets into the waterway may impact on some of the mooring allocations shown on this plan· A user should satisfy themselves on this matter
7. The easement shown across the park from a lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from that lot to the mooring

Amdt B 5-05-04 SJG Amend Note 2 Add Stormwater Outlet
Amdt A 19-04-04 JBG Amend Notes

Surveyed		
Drawn	JAH	03-10-03
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Checked	SJG	
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Datum		

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STOCKLAND KAWANA WATERS PTY LTD

Mooring Allocation Plan for Lots 775-778, 789 and 790 Stage 8 Kawana Island

AMDT B

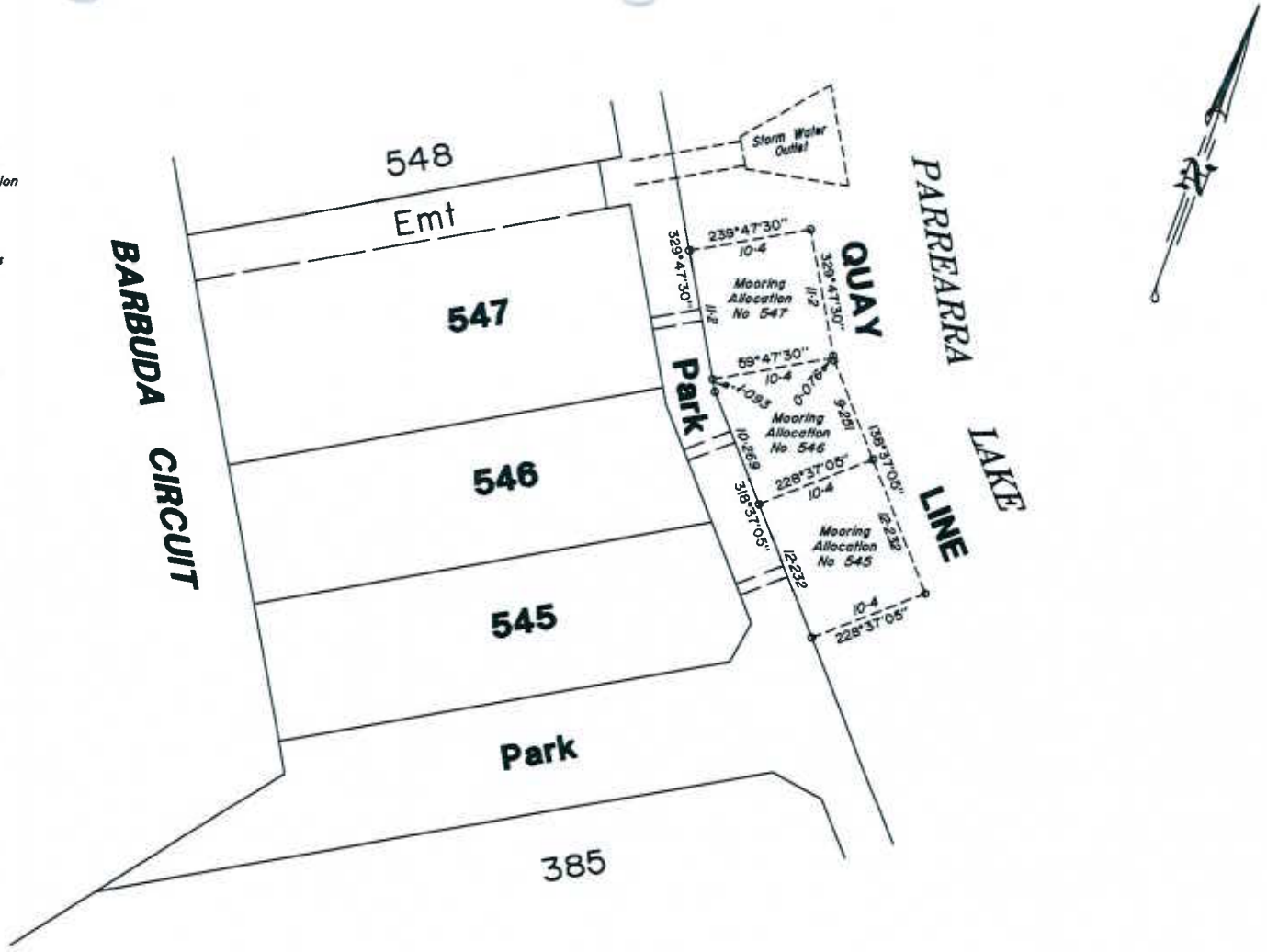
scale: 1:500

ref no P-2780-536 5 of 5

A3

NOTES

1. Caloundra City Council is the trustee of the Sport and Recreation Reserve (Parrearra Lake). No structures can be erected in Parrearra Lake before entering into a lease under Section 57 of the Land Act, 1994. The structures must be approved in accordance with the approval process and comply with the structural and operation requirements as outlined in the Parrearra Lake Management Plan.
2. A vessel berthed at a pontoon must not at any time, extend within 1.5 metres of the side boundaries of the designated Quay Line. Vessels must comply with all other Mooring Arrangements as specified in the Parrearra Lake Management Plan.
3. Restrictions to the height and beam of vessels may apply due to The Nicklin Way, Kawana Island Boulevard bridges and the width of the lock
4. The lake area is a Sport and Recreation Reserve under the control of the Caloundra City Council and the use of the lake and environs is subject to control by local laws
5. The mooring allocations shown on this plan are only for the potential use of lots 545-547 as shown on this plan
6. Underwater stormwater outlets into the lake may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter
7. The easement shown across the park from a lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from that lot to the mooring



Scale 1:400 Lengths are in Metres

10 5 0 10 20 30 40 50

Surveyed		
Drawn	JAH	26-02-03
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FBK	LBK	
Datum		

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LENSWORTH KAWANA WATERS PTY LTD

Quay Line Plan
Lots 545-547
Stage 7 Kawana Island

AMDT

scale: 1:400

ref no P-2780-527-1

A3

NOTES

1. Caloundra City Council is the trustee of the Sport and Recreation Reserve (Parrearra Lake). No structures can be erected in Parrearra Lake before entering into a lease under Section 57 of the Land Act, 1994. The structures must be approved in accordance with the approval process and comply with the structural and operation requirements as outlined in the Parrearra Lake Management Plan.

2. A vessel berthed at a pontoon must not at any time, extend within 1.5 metres of the side boundaries of the designated Quay Line. Vessels must comply with all other Mooring Arrangements as specified in the Parrearra Lake Management Plan.

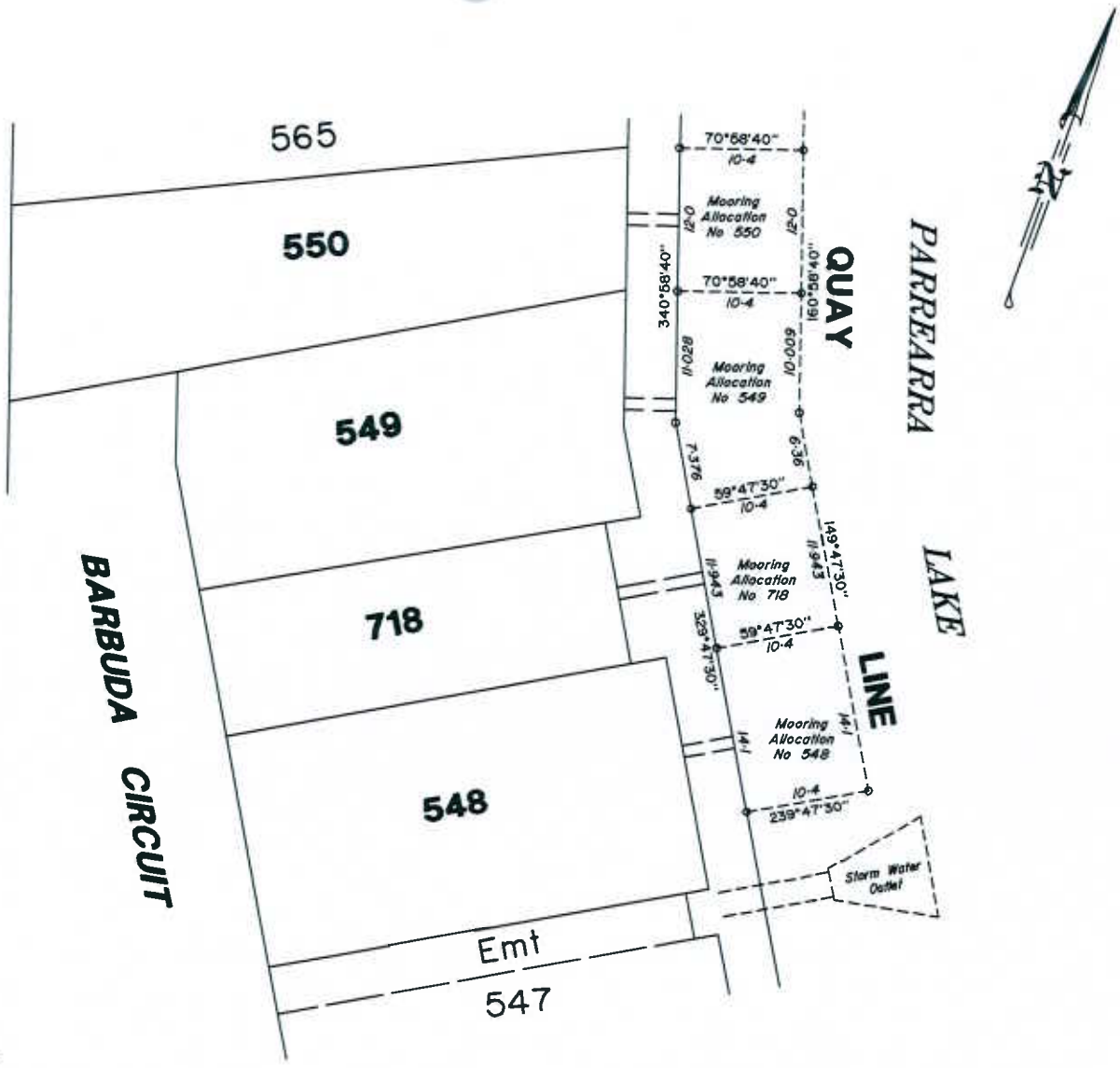
3. Restrictions to the height and beam of vessels may apply due to The Nicklin Way, Kawana Island Boulevard bridges and the width of the lock

4. The lake area is a Sport and Recreation Reserve under the control of the Caloundra City Council and the use of the lake and environs is subject to control by local laws

5. The mooring allocations shown on this plan are only for the potential use of lots 548-550 and 718 as shown on this plan

6. Underwater stormwater outlets into the lake may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter

7. The easement shown across the park from a lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from that lot to the mooring



Scale 1:400 Lengths are in Metres

10 5 0 10 20 30 40 50

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Drawn	JAH	26-02-03
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Benchmark in quality

LENSWORTH KAWANA WATERS PTY LTD

Quay Line Plan
Lots 548-550 and 718
Stage 7 Kawana Island

AMDT

scale: 1:400

ref no P-2780-527-2

A3

NOTES

1. Caloundra City Council is the trustee of the Sport and Recreation Reserve (Parrearra Lake). No structures can be erected in Parrearra Lake before entering into a lease under Section 57 of the Land Act, 1994. The structures must be approved in accordance with the approval process and comply with the structural and operation requirements as outlined in the Parrearra Lake Management Plan.

2. A vessel berthed at a pontoon must not at any time, extend within 1.5 metres of the side boundaries of the designated Quay Line. Vessels must comply with all other Mooring Arrangements as specified in the Parrearra Lake Management Plan.

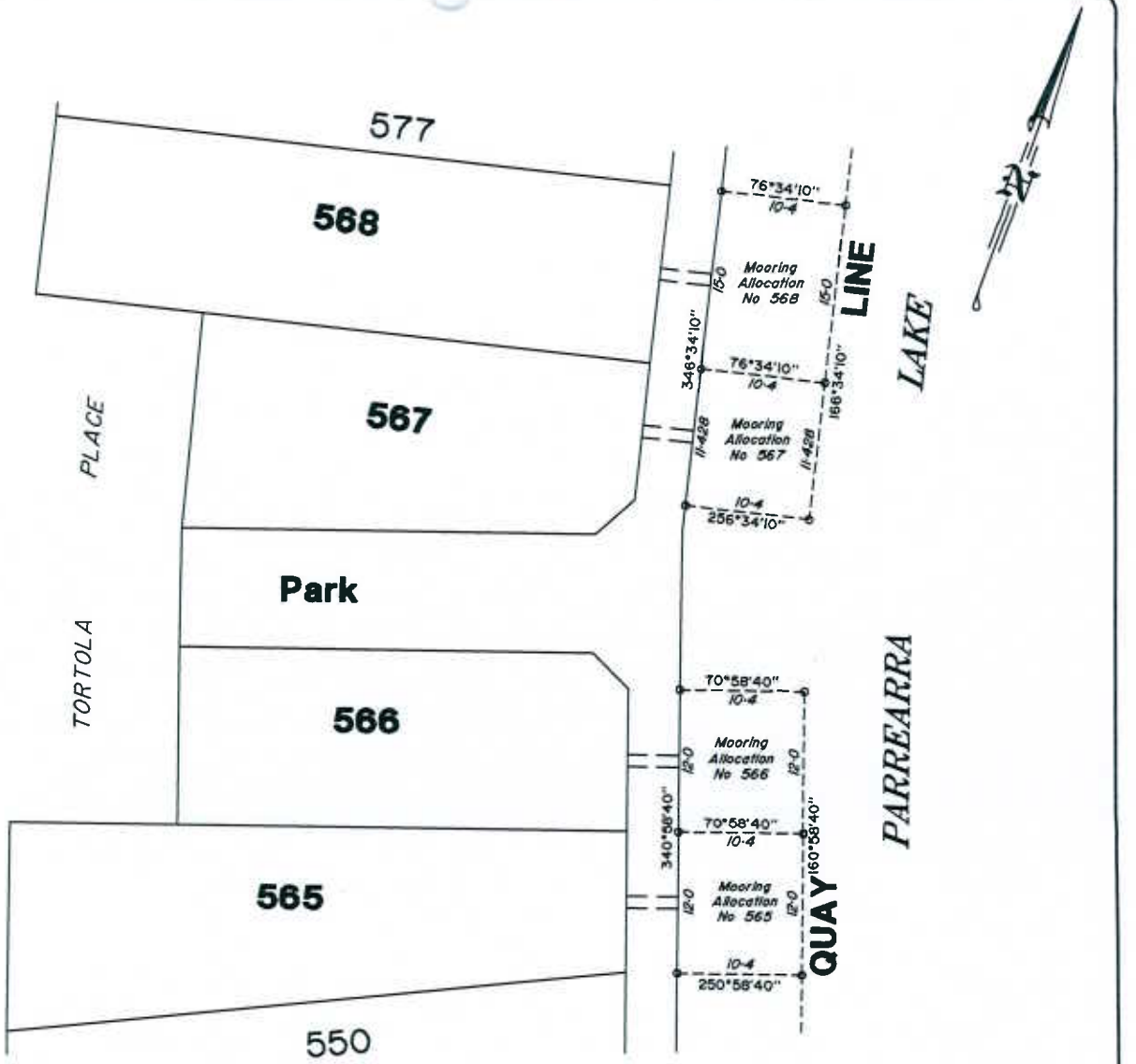
3. Restrictions to the height and beam of vessels may apply due to The Nicklin Way, Kawana Island Boulevard bridges and the width of the lock

4. The lake area is a Sport and Recreation Reserve under the control of the Caloundra City Council and the use of the lake and environs is subject to control by local laws

5. The mooring allocations shown on this plan are only for the potential use of lots 565-568 as shown on this plan

6. Underwater stormwater outlets into the lake may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter

7. The easement shown across the park from a lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from that lot to the mooring



Scale 1:400 Lengths are in Metres

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LENSWORTH KAWANA WATERS PTY LTD

Quay Line Plan
Lots 565-568
Stage 7 Kawana Island

AMDT

scale: 1:400

ref no P-2780-527-3

A3

NOTES

1. Caloundra City Council is the trustee of the Sport and Recreation Reserve (Parrearra Lake). No structures can be erected in Parrearra Lake before entering into a lease under Section 57 of the Land Act, 1994. The structures must be approved in accordance with the approval process and comply with the structural and operation requirements as outlined in the Parrearra Lake Management Plan.

2. A vessel berthed at a pontoon must not at any time, extend within 1.5 metres of the side boundaries of the designated Quay Line. Vessels must comply with all other Mooring Arrangements as specified in the Parrearra Lake Management Plan.

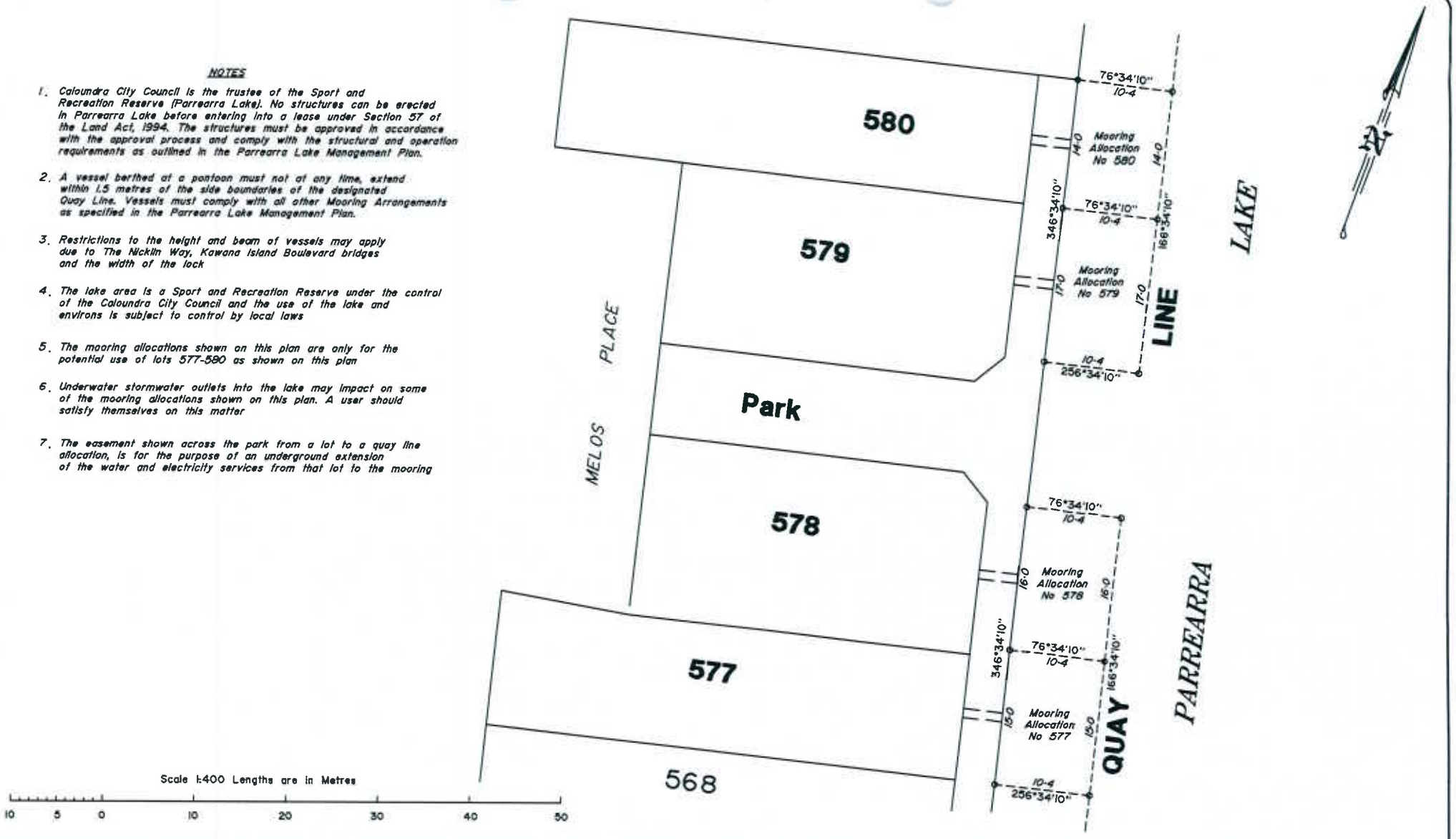
3. Restrictions to the height and beam of vessels may apply due to The Nicklin Way, Kawana Island Boulevard bridges and the width of the lock

4. The lake area is a Sport and Recreation Reserve under the control of the Caloundra City Council and the use of the lake and environs is subject to control by local laws

5. The mooring allocations shown on this plan are only for the potential use of lots 577-590 as shown on this plan

6. Underwater stormwater outlets into the lake may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter

7. The easement shown across the park from a lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from that lot to the mooring



Surveyed		
Drawn	JAH	26-02-03
Designed		
Checked	SJG	
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Datum		

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LENSWORTH KAWANA WATERS PTY LTD

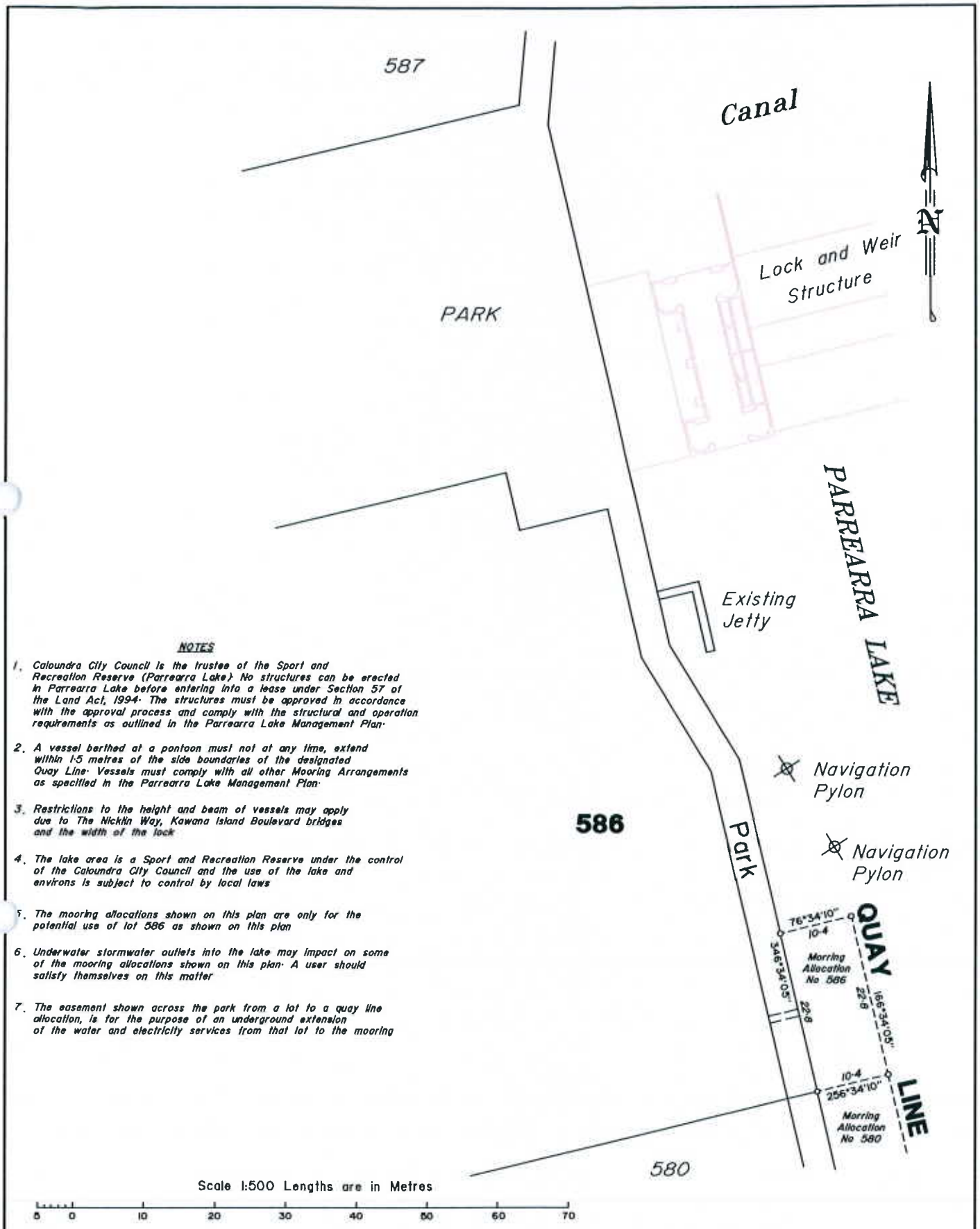
AMDT

Quay Line Plan
Lots 577-580
Stage 7 Kawana Island

scale: 1:400

ref no P-2780-527-4

A3



NOTES

1. Caloundra City Council is the trustee of the Sport and Recreation Reserve (Parrearra Lake). No structures can be erected in Parrearra Lake before entering into a lease under Section 57 of the Land Act, 1994. The structures must be approved in accordance with the approval process and comply with the structural and operation requirements as outlined in the Parrearra Lake Management Plan.
2. A vessel berthed at a pontoon must not at any time, extend within 1·5 metres of the side boundaries of the designated Quay Line. Vessels must comply with all other Mooring Arrangements as specified in the Parrearra Lake Management Plan.
3. Restrictions to the height and beam of vessels may apply due to The Nicklin Way, Kawana Island Boulevard bridges and the width of the lock
4. The lake area is a Sport and Recreation Reserve under the control of the Caloundra City Council and the use of the lake and environs is subject to control by local laws
5. The mooring allocations shown on this plan are only for the potential use of lot 586 as shown on this plan
6. Underwater stormwater outlets into the lake may impact on some of the mooring allocations shown on this plan. A user should satisfy themselves on this matter
7. The easement shown across the park from a lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from that lot to the mooring

Scale 1:500 Lengths are in Metres

5 0 10 20 30 40 50 60 70

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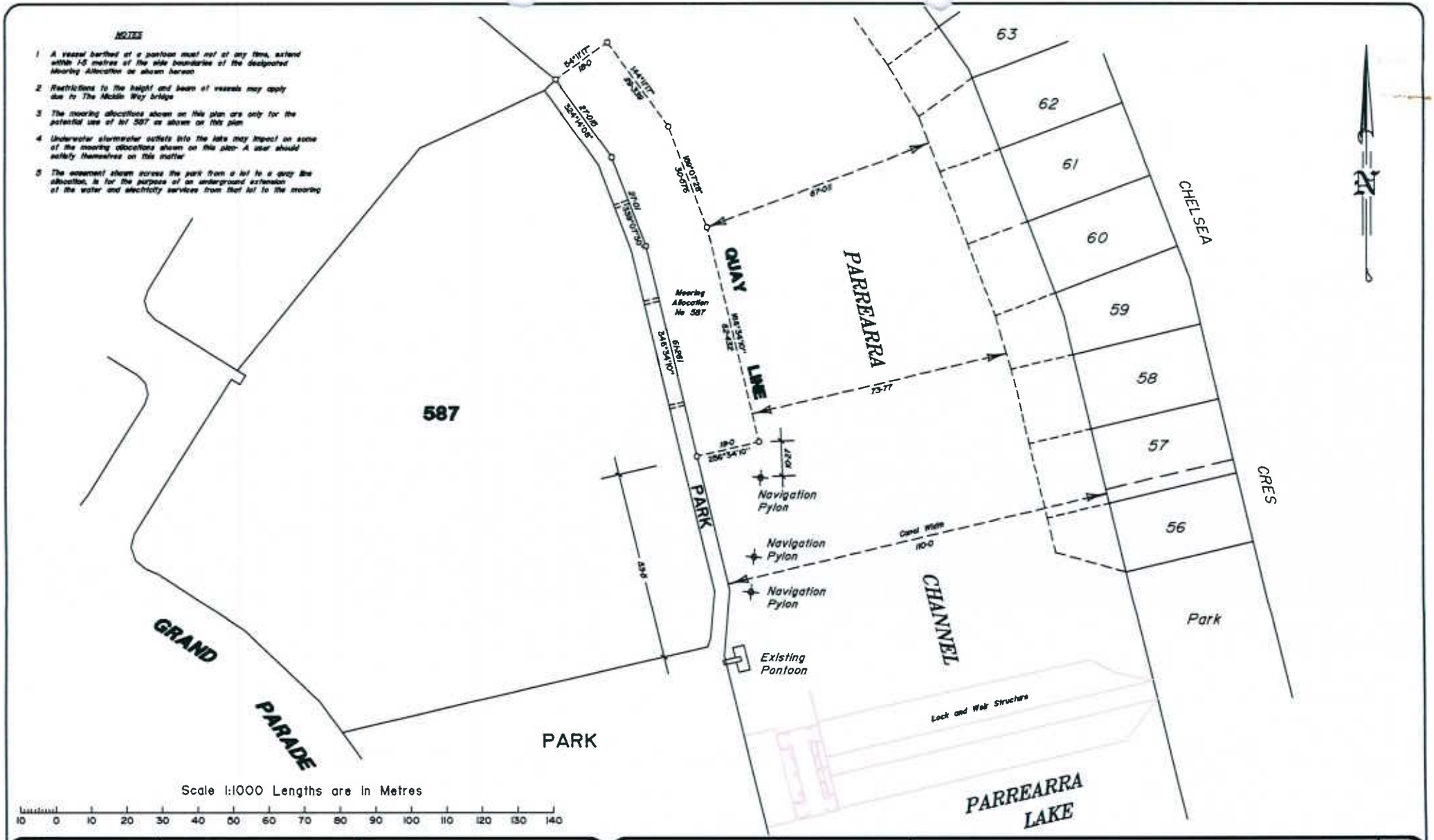
client
LENSWORTH KAWANA WATERS PTY LTD

Quay Line Plan
Lot 586
Stage 7 Kawana Island

drawn: JAH
07-06-03
checked: SJG
scale 1:500
A3
ref no P-2780-528

NOTES

1. A vessel berthed at a pontoon must not at any time, extend within 1·5 metres of the side boundaries of the designated Mooring Allocation as shown hereon
2. Restrictions to the height and beam of vessels may apply due to The Mickin Way bridge
3. The mooring allocations shown on this plan are only for the potential use of lot 587 as shown on this plan
4. Underwater stormwater outlets into the lake may impact on some of the mooring allocations shown on this plan- A user should satisfy themselves on this matter
5. The easement shown across the park from a lot to a quay line allocation, is for the purpose of an underground extension of the water and electricity services from that lot to the mooring



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Datum		

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Benchmark ISO 9001

LENSWORTH KAWANA WATERS PTY LTD

Mooring Allocation Plan for Lot 587 Stage 7 Kawana Island

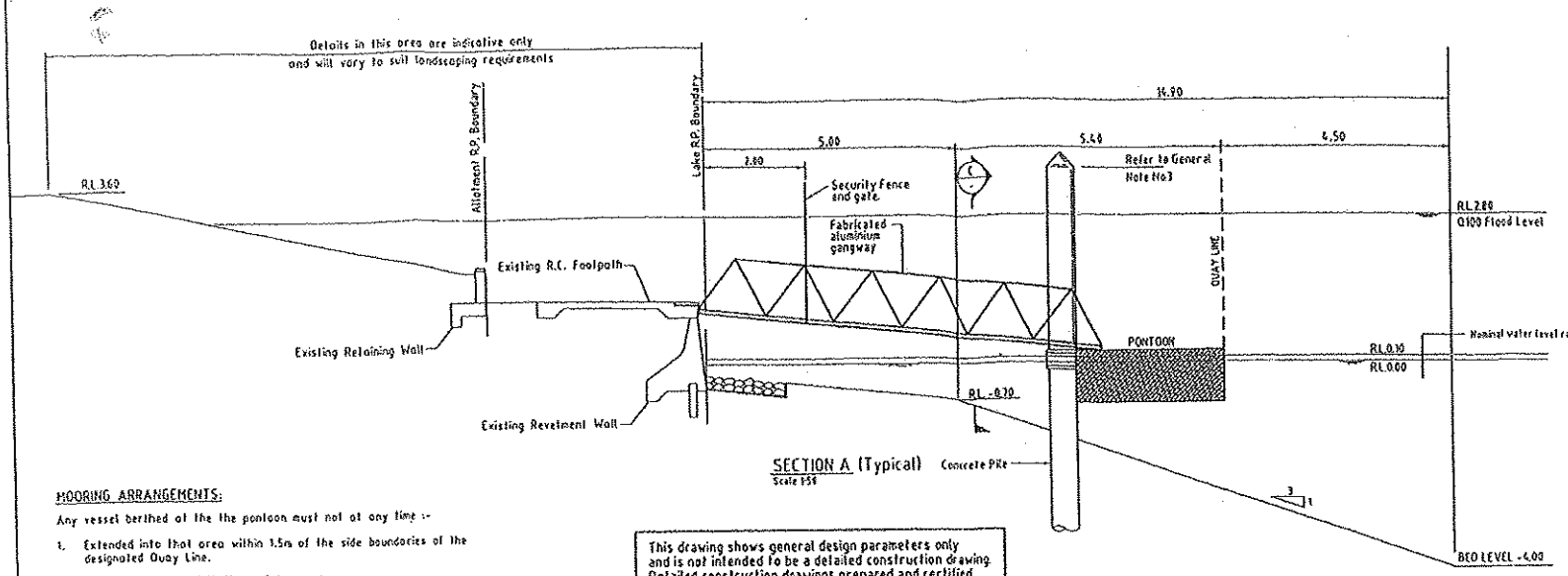
AMDT

scale: 1:1000

ref no P-2780-529

A3

Appendix D: Design Standards for Pontoons, Ramps and and Decks



SECTION A (Typical)
Scale 1:50

GENERAL NOTES:

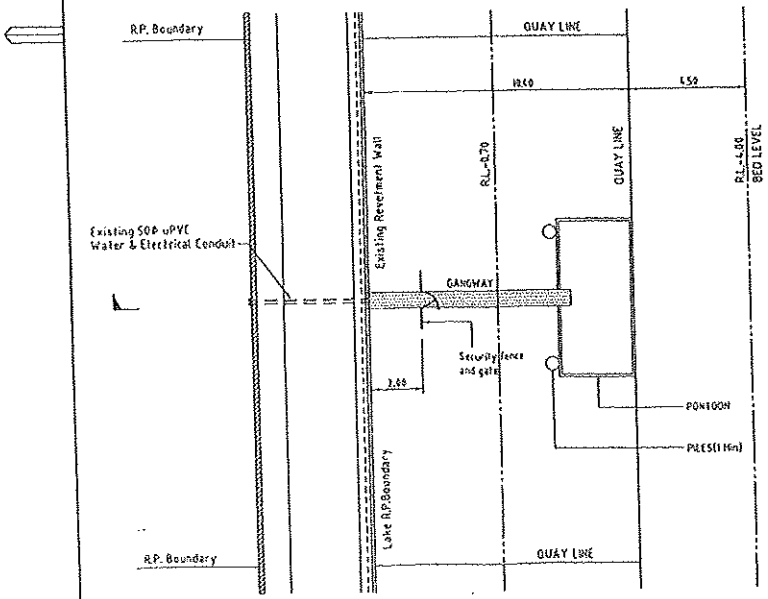
1. Design live loads for gangways and pontoons (Private use only):
   - single user residential site 2.0kPa
2. All structures shall be designed to withstand berthing impact and hydraulic loadings for a channel velocity of 0.75m/s.
3. Top Level of pontoon piles to be sufficient to provide adequate extension above pontoon rollers for a maximum lake level of RL. 2.80m AHD.
4. Pontoons must be stable at all times. When the specified live load is distributed over half the width of the pontoon and over the walkway, there shall be not less than 75 mm of reserve bouyancy; the bottom corner shall not emerge from the water and the angle of list shall not exceed 15°.
5. Pontoons must be constructed of materials suitable for the purpose. Thin walled steel oil drums shall not be permitted for pontoon floats. Pontoons must be protected against corrosion, attack by marine organisms and deterioration of the materials by abrasion or immersion in sea water.
6. All pontoons to be restrained by at least one driven pile, stay wires are not permitted.
7. Pontoons are not to extend beyond quay line or closer than 15m to the projection of the side boundary of the quay line.
8. The pontoon must contain fixed lighting sufficient to indicate the presence of the pontoon. The lighting must be adequately shielded as to not cause a risk to the safe navigation of other vessels or a nuisance to surrounding properties.
9. All piles are to be fitted with retro-reflective tape or a similar material, sufficient to be clearly visible from approaching vessels.
10. The length of the pontoon must extend to the outer edge of the Quay Line.

MOORING ARRANGEMENTS:

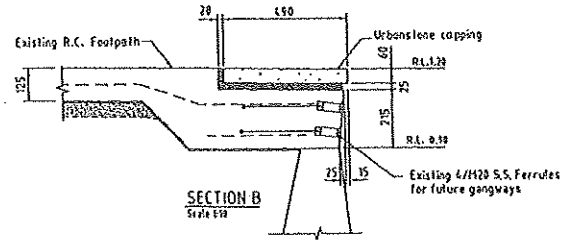
Any vessel berthed at the the pontoon must not at any time :-

1. Extended into that area within 1.5m of the side boundaries of the designated Quay Line.
2. Exceed the design limitations of the pontoon.
3. Impede the safe navigation of vessels that utilise the waterway.
4. Compromise the safe ingress and egress of vessels to and from neighbouring structures.

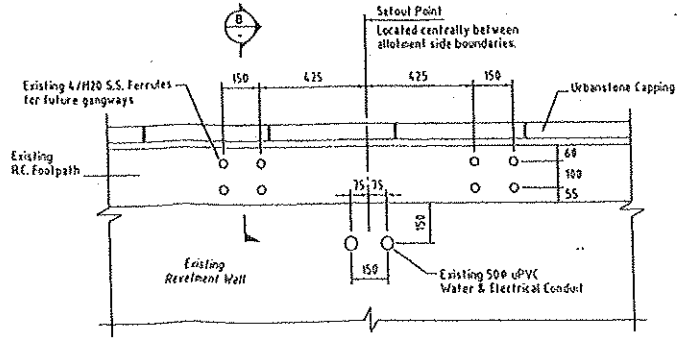
This drawing shows general design parameters only and is not intended to be a detailed construction drawing. Detailed construction drawings prepared and certified by a qualified structural engineer are required for each individual installation.



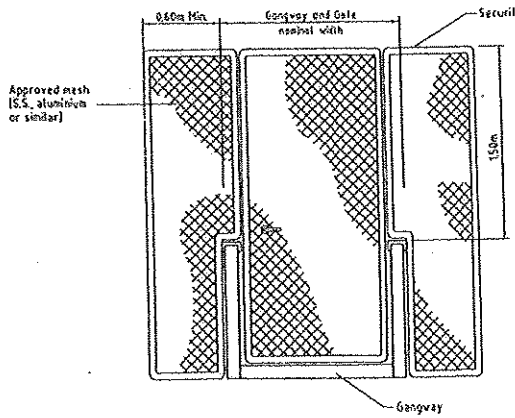
PLAN (Typical)
Scale 1:100



SECTION B
Scale 1:10



CONDUIT & FERRULE TYPICAL ELEVATION
Scale 1:10



VIEW C
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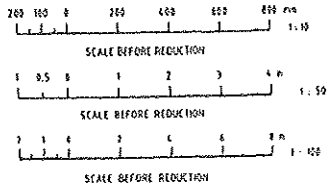

E	26/05/04	Note Inserted
D	08/04/04	Design live loads amended (Note 1)
C	15/11/01	Notes revised to suit councils requirements.
B	27/07/01	Revisions to notes
A	25/06/01	Drawing number changed from 478/95-5 to 478/97-J

DESIGNED: S.H.
DRAWN: S.H.
CHECKED: C.J.H.
RECOMMENDED - PROJ. MGR.: C.J. Kinnaird
APPROVED - PROJ. DIR.: C.J. Kinnaird

A1 DATUM: A.H.D.

Cardno MBK
Cardno MBK (Qld) Pty Ltd
ACN 051 074 852
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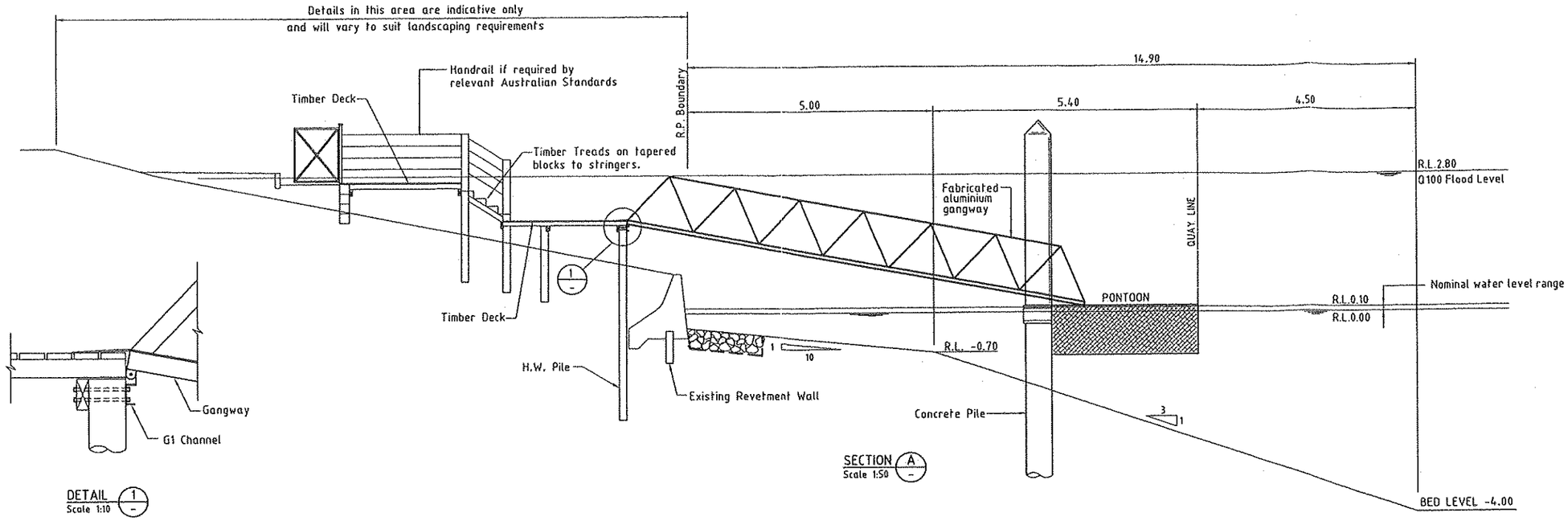
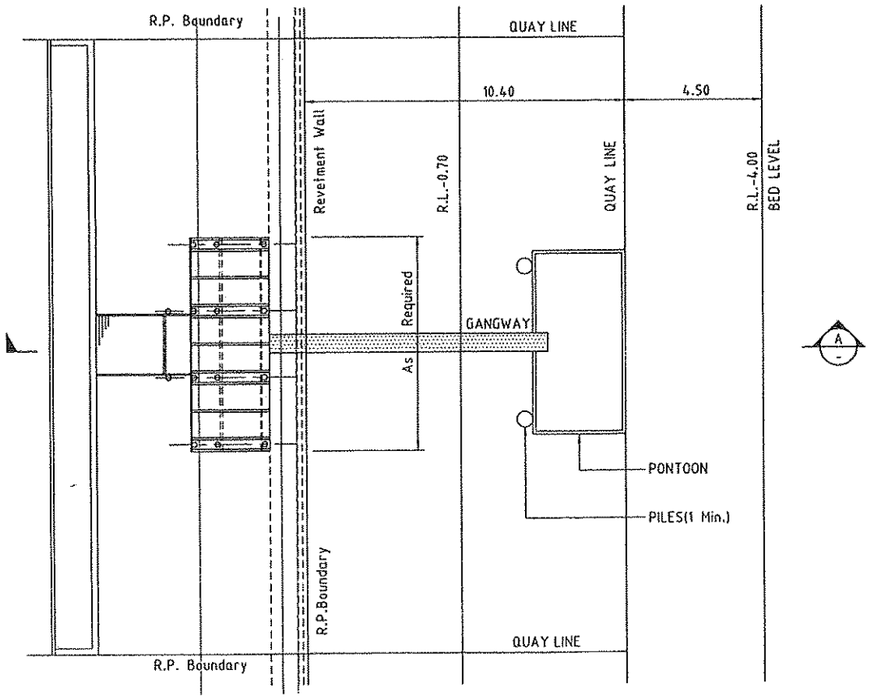
LENSWORTH KAWANA WATERS PTY LTD
KAWANA ISLAND
PRIVATE RESIDENCE

DATE: 03 - 03 - 2001
DRAWING No: 478/97-J

PONTOON DESIGN PARAMETERS - 10.4m QUAY LINE





PLAN
Scale 1:100

GENERAL NOTES:

1. Design live loads for gangways and pontoons (Private use only):
   - single user residential site 1.5kPa
   - multi user residential site 2.0kPa
2. All structures shall be designed to withstand berthing impact and hydraulic loadings for a channel velocity of 0.75m/s. No loads are to be imposed on revetment wall by deck or gangway.
3. Top Level of pontoon piles to be sufficient to provide adequate extension above pontoon rollers for a maximum lake level of R.L. 2.80m AHD.
4. Pontoons must be stable at all times . When the specified live load is distributed over half the width of the pontoon and over the walkway , there shall be not less than 75 mm of reserve bouyancy ; the bottom corner shall not emerge from the water and the angle of tilt shall not exceed 15°.
5. Pontoons must be constructed of materials suitable for the purpose . Thin walled steel oil drums shall not be permitted for pontoon floats. Pontoons must be protected against corrosion , attack by marine organisms and deterioration of the materials by abrasion or immersion in sea water.
6. Gangway shall be fabricated from aluminium alloy 6061-T6. All welds shall be 3mm continuous fillet using filler alloy 5356.
7. All pontoons within main channel to be restrained by at least one driven pile, stay wires are not permitted.
8. Staywire and strut restraints systems are permitted in branch channels (lot 8 on SP103463 & lot 11 on SP142007) .
9. Pontoons are not to extend beyond quay line or closer than 1.5m to the projection of the side boundary of the quay line.
10. No fixing or deck support shall be made onto the existing revetment wall.
11. Maximum deck level to be R.L. 2.0 AHD at revetment wall.
12. The pontoon must contain fixed lighting sufficient to indicate the presence of the pontoon. The lighting must be adequately shielded as to not cause a risk to the safe navigation of other vessels or a nuisance to surrounding properties.
13. All piles are to be fitted with retro-reflective tape or a similar material, sufficient to be clearly visible from approaching vessels.
14. The length of the pontoon must extend to the outer edge of the Quay Line.

MOORING ARRANGEMENTS:

Any vessel berthed at the the pontoon must not at any time :-

1. Extended into that area within 1.5m of the side boundaries of the designated Quay Line.
2. Exceed the design limitations of the pontoon.
3. Impede the safe navigation of vessels that utilise the waterway.
4. Compromise the safe ingress and egress of vessels to and from neighbouring structures.

This drawing shows general design parameters only and is not intended to be a detailed construction drawing. Detailed construction drawings prepared and certified by a qualified structural engineer are required for each individual installation.

200 100 0 200 400 600 800 mm 1 : 10
SCALE BEFORE REDUCTION

1 0.5 0 1 2 3 4 m 1 : 50
SCALE BEFORE REDUCTION

2 1 0 2 4 6 8 m 1 : 100
SCALE BEFORE REDUCTION

Rv.	DATE	REVISIONS	REC.	APPR.
B	15/11/01	Notes revised to suit councils requirements.		
A	27/07/01	Revisions to notes.		

DESIGNED: DRAWN: CHECKED: RECOMMENDED : PROJ. MAN. APPROVED : PROJ. DIR.
A1 DATUM. A.H.D.
AUTOCAD R15 FILENAME : K97-KDWG DATE : 25-6-2001 TIME : 3:13 PM

Cardno MBK
Cardno MBK (Qld) Pty Ltd
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Sunshine Coast	(07) 5443 2555	(07) 5443 5642
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Hervey Bay	(07) 4124 5455	(07) 4124 5155
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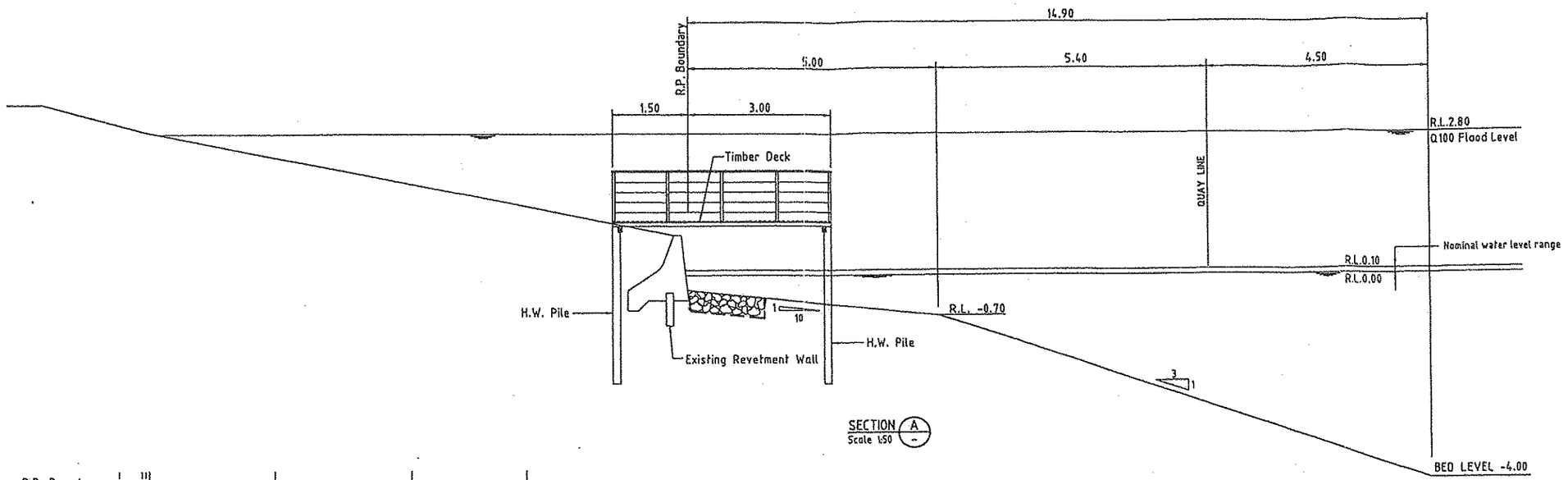
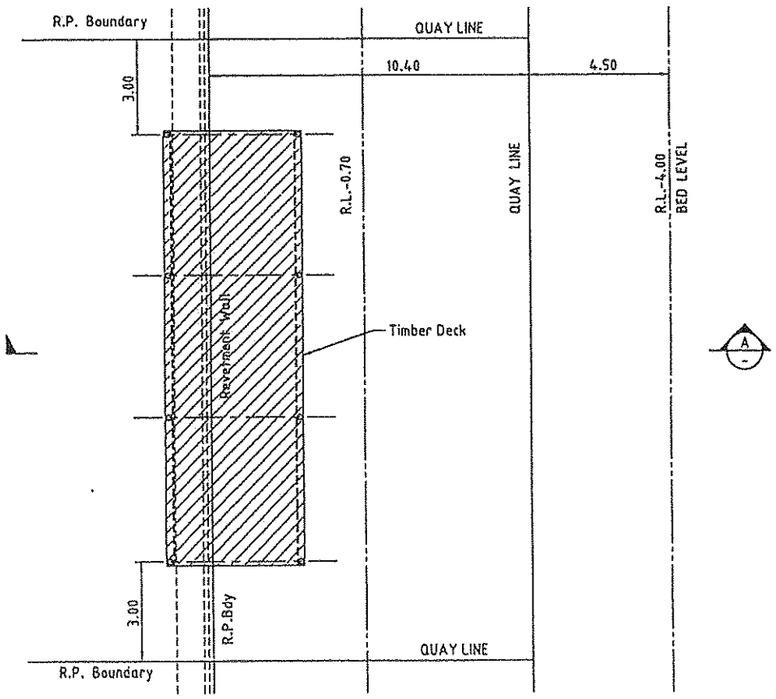
LENSWORTH KAWANA WATERS PTY LTD
PARREARRA LAKE
PONTOON DESIGN PARAMETERS
DATE: 25-06-2001
DRAWING No: 478/97-K
Rv. B A



SECTION A
Scale 1:50



PLAN
Scale 1:100

GENERAL NOTES:

1. All structures shall be designed to withstand hydraulic loadings for a channel velocity of 0.75m/s. No loads are to be imposed on revetment wall by deck.
2. Design live loads for decks (Private use only):
   - single user residential site 1.5kPa
   - multi user residential site 2.0kPa
3. No fixing or deck support shall be made onto the existing revetment wall.
4. Maximum deck level to be R.L. 2.0m AHD at the revetment wall.
5. No vessels are to be moored to decks.

This drawing shows general design parameters only and is not intended to be a detailed construction drawing. Detailed construction drawings prepared by a qualified structural engineer are required for each individual installation.

1 0.5 0 1 2 3 4 m
1 : 50
SCALE BEFORE REDUCTION

2 1 0 2 4 6 8 m
1 : 100
SCALE BEFORE REDUCTION

Rv.	DATE	REVISIONS	REC.	APPR.
A	15/11/01	Notes revised to suit councils requirements.		

DESIGNED: BJ Hearn
DRAWN: RKO.
CHECKED:
RECOMMENDED : PROJ. MAN. AHA
A1 DATUM. A.H.D.
APPROVED : PROJ. DIR. G.G. Cawley
AUTOCAD R.15 FILENAME : K:\1-DWG DATE : 25-6-2001 TIME : 3:13 PM

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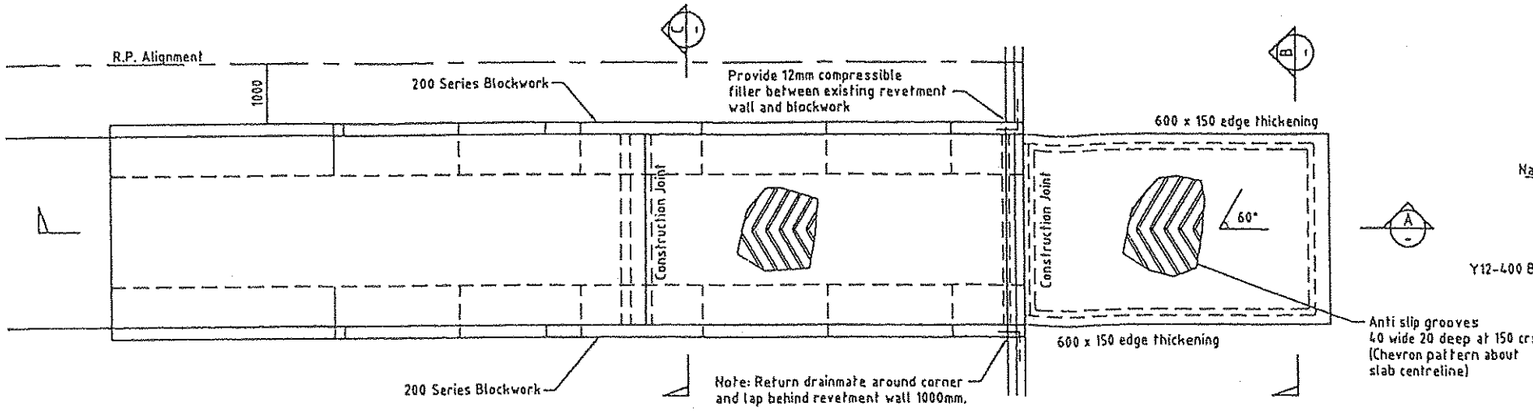
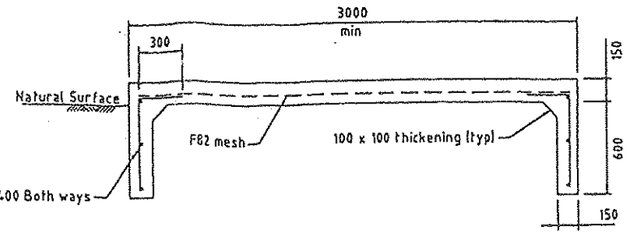
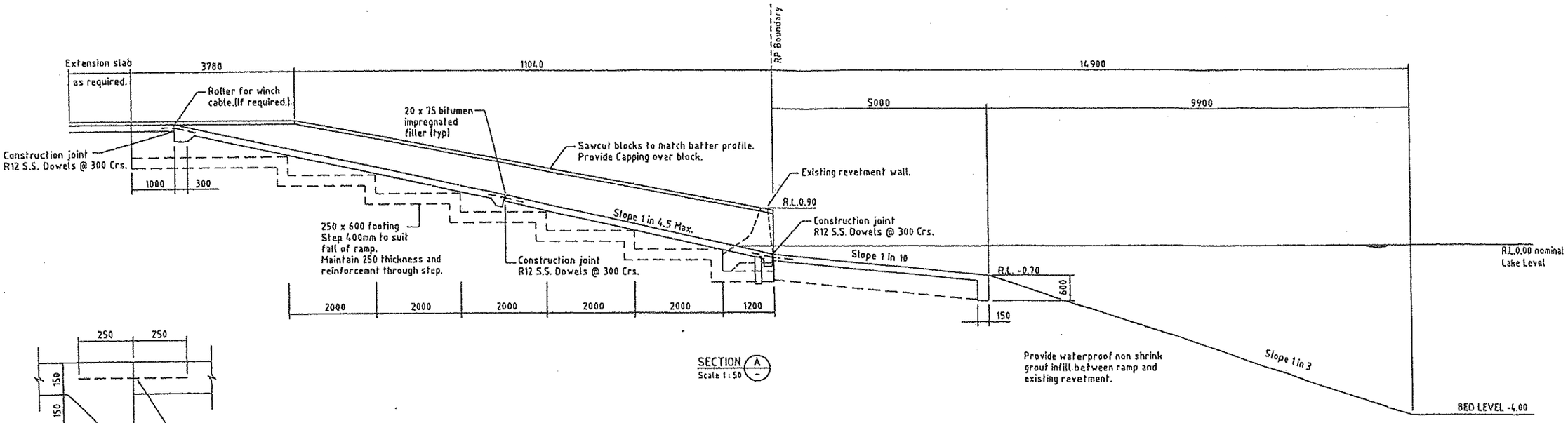
LENSWORTH KAWANA WATERS PTY LTD
PARREARRA LAKE
DECK DESIGN PARAMETERS
DATE: 25-06-2001
DRAWING No: 478/97-L
Rv. A





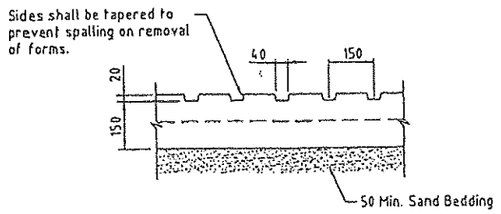
SECTION (B) Scale 1 : 20

PLAN (TYPICAL)
Scale 1 : 20

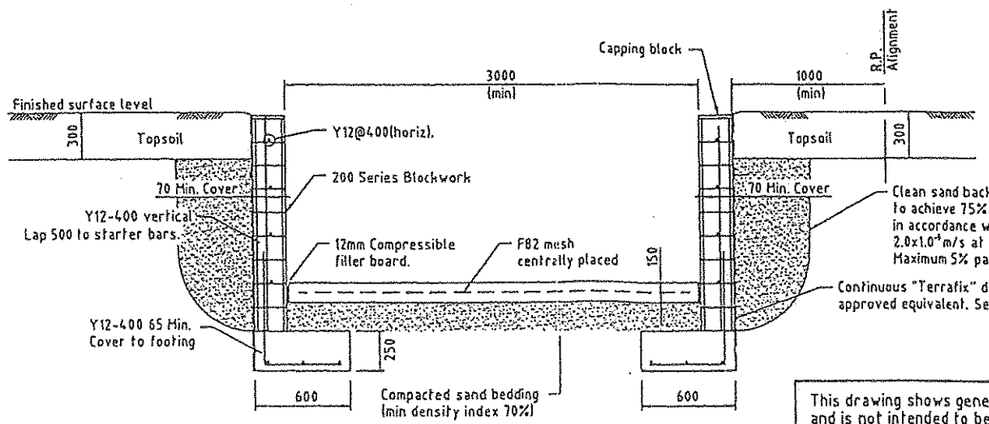


SECTION (A) Scale 1 : 50

CONSTRUCTION JOINTS
Scale 1:10



ANTI SLIP GROOVES (TYPICAL)
Scale 1:10



SECTION (C) Scale 1 : 20

GENERAL NOTES

1. All concrete quality and construction procedures shall be in accordance with AS 3600.
2. Concrete shall Class N40/20 80 and be suitable for durability exposure classification C.
3. Grout N20/10 230 ± 30mm slump
4. Laps, slab 250mm, wall & footing 500mm.
5. Cover, slab 55mm, footings 65mm, wall 70mm.
6. All cores grout filled.
7. Compact grout by rodding.
8. Blockwork to be 200 Series concrete blocks to manufacturers specifications.
9. "Terrafix " drainmat to be continuously sealed each end with approved sealant. Lap in accordance with manufacturer's specifications.
10. Blockwork Mortar shall be a M4 Mortar (C1, S3)

This drawing shows general design parameters only and is not intended to be a detailed construction drawing. Detailed construction drawings prepared and certified by a qualified structural engineer are required for each individual installation.

1 0.5 0 1 2 3 4 m 1 : 50
SCALE BEFORE REDUCTION

1000 500 0 1000 m/m 1 : 20
SCALE BEFORE REDUCTION

Rv	DATE	REVISIONS	REC.	APPR.
A	25-07-2001	Revisions To notes.		

DESIGNED: DRAWN: CHECKED: RECOMMENDED : PROJ. MAN. APPROVED : PROJ. DIR.
A1 DATUM. A.H.D.
AUTOCAD R.15 FILENAME : R97-HDWG DATE : 25-6-2001 TIME : 3:14 PM

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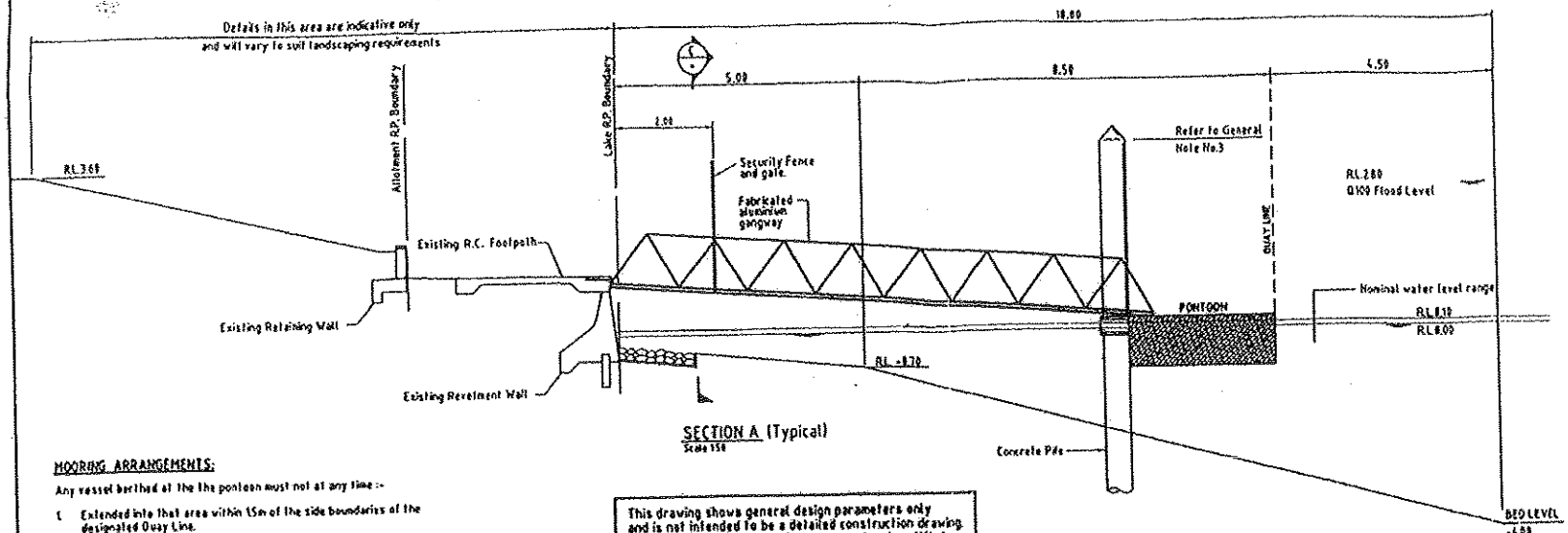
LENSWORTH KAWANA WATERS PTY LTD
PARREARRA LAKE
TYPICAL BOAT RAMP DETAILS
DATE: 25 - 06 - 2001
DRAWING No: 478/97-M
A



SECTION A (Typical)
Scale 1:50

GENERAL NOTES:

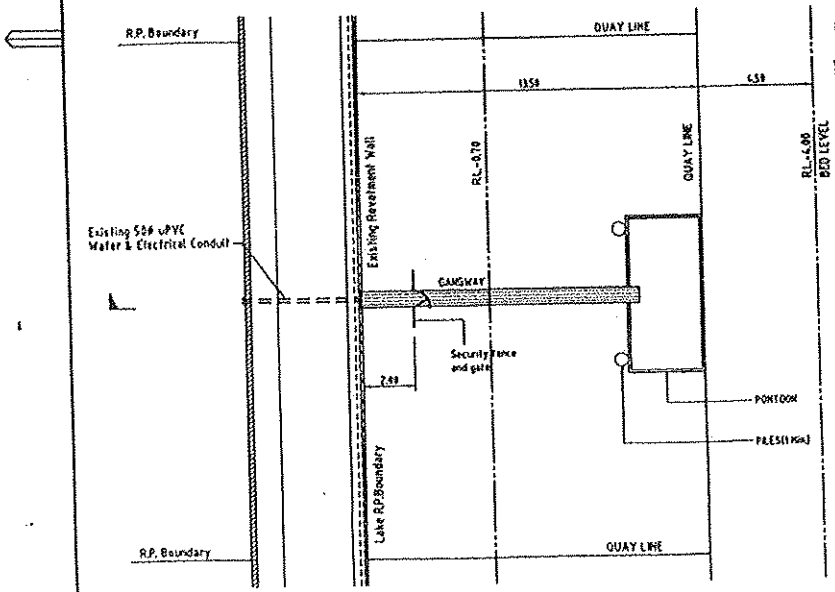
1. Design live loads for gangways and pontoons:
   - Public use and multi unit residential sites 3.0kPa
2. For pontoons to park areas, access arrangements are to comply with the disabled access requirements of AS 1428.1 - "Design for Access and Mobility".
3. All structures shall be designed to withstand berthing impact and hydraulic loadings for a channel velocity of 0.75m/s.
4. Top Level of pontoon piles to be sufficient to provide adequate extension above pontoon rollers for a maximum lake level of R.L. 2.80m AHD.
5. Pontoons must be stable at all times. When the specified live load is distributed over half the width of the pontoon and over the walkway, there shall be not less than 75 mm of reserve buoyancy; the bottom corner shall not emerge from the water and the angle of tilt shall not exceed 15°.
6. Pontoons must be constructed of materials suitable for the purpose. Thin walled steel oil drums shall not be permitted for pontoon floats. Pontoons must be protected against corrosion, attack by marine organisms and deterioration of the materials by abrasion or immersion in sea water.
7. All pontoons to be restrained by at least one driven pile, stay wires are not permitted.
8. Pontoons are not to extend beyond quay line or closer than 15m to the projection of the side boundary of the quay line.
9. The pontoon must contain fixed lighting sufficient to indicate the presence of the pontoon. The lighting must be adequately shielded as to not cause a risk to the safe navigation of other vessels or a nuisance to surrounding properties.
10. All piles are to be fitted with retro-reflective tape or a similar material, sufficient to be clearly visible from approaching vessels.
11. The length of the pontoon must extend to the outer edge of the Quay Line.

MOORING ARRANGEMENTS:

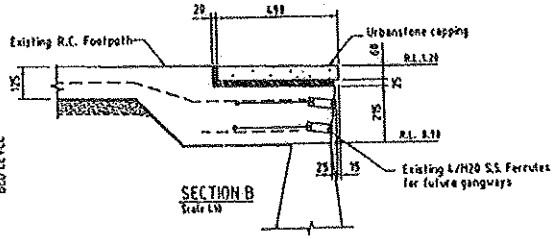
Any vessel berthed at the the pontoon must not at any time :-

1. Extended into that area within 15m of the side boundaries of the designated Quay Line.
2. Exceed the design limitations of the pontoon.
3. Impede the safe navigation of vessels that utilise the waterway.
4. Compromise the safe ingress and egress of vessels to and from neighbouring structures.

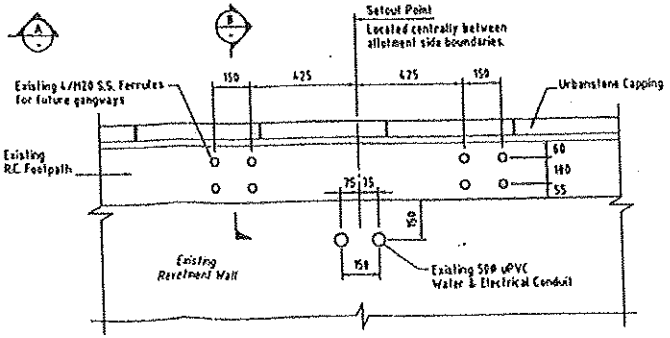
This drawing shows general design parameters only and is not intended to be a detailed construction drawing. Detailed construction drawings prepared and certified by a qualified structural engineer are required for each individual installation.



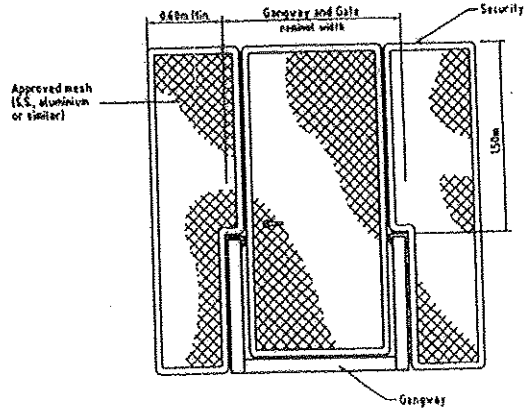
PLAN (Typical)
Scale 1:100



SECTION B
Scale 1:10



CONDUIT & FERRULE TYPICAL ELEVATION
Scale 1:10



VIEW C
N.T.S.

SCALE BEFORE REDUCTION 1:10

SCALE BEFORE REDUCTION 1:50

SCALE BEFORE REDUCTION 1:100

DESIGNED:		A1	DATUM: A.H.D.
DRAWN:	
CHECKED:	
RECOMMENDED:	PROJ. MGR.	APPROVED:	PROJ. DIR.

Cardno MBK (Qld) Pty Ltd
ACN 051 891 362

CALOUNDRA CITY COUNCIL
KAWANA ISLAND
MULTI UNIT RESIDENTIAL SITES AND PARK AREAS
PONTOON DESIGN PARAMETERS - 135m QUAY LINE

DATE: 14-05-2005
Drawing No.
2035/61-3
Rev.

Appendix E: Parrearra Navigation Lock and Weir Maintenance Procedures

PARREARRA LOCK
MAINTENANCE PROCEDURES

1.0 INTRODUCTION

1.1 The following sections set out suggested maintenance and inspection procedures for the Parrearra navigation lock.

Due to unforeseen circumstances, variations to the suggested procedures or additional procedures may be required.

Only suitably qualified and experienced personnel should undertake the inspection and maintenance procedures. It is recommended that the contractors and sub-contractors involved in the original construction are used wherever possible. All relevant safety regulations should be observed when undertaking this work.

In addition to the following procedures, reference should be made to the Installation, Technical, Operating and Maintenance Manual before undertaking any maintenance or inspections.

2.0 WEEKLY MAINTENANCE INSPECTIONS

2.1 Caloundra City Council shall establish a service agreement with a maintenance provider (MP) to undertake regular inspections and operational checks of the navigation lock. These inspections were previously undertaken on a fortnightly basis for Lensworth Kawana Waters Pty Ltd by Whelan Electrical Services Pty Ltd.

2.2 The inspections involved the following:

- Check operation of lock gates and load on each actuator
- Testing of trip wires
- Check operation of traffic lights
- Lubrication of lock gate seals above waterline
- Testing of emergency phone
- Testing of emergency stops
- Check penstock operation
- Provision of report sheet (Refer to Appendix A)

2.3 The inspection should also include a general inspection of the lock, weir, jetty and pontoon for vandalism or other damage. Items to be checked include:

- Condition of timber work
- Security fences and gates
- Pontoon gangway
- Pontoon pile oyster encrustation and condition of rollers
- Local area lighting
- Landscaping

Items requiring attention should be noted in the report and appropriate maintenance scheduled.

2.4 Using the services of a maintenance provider or its own staff, Council should log on to the remote computer at the lock and download the logged data. This data includes water levels, pH and lock usage.

The data should be reviewed for anomalous values or for error messages. Whilst connected to the remote computer the status of the penstock should be checked to ensure that it is operating in accordance with the programmed parameters.

It is particularly important that the penstocks are operating correctly during periods when the tides are expected to overtop the weir (Structure Z) adjacent to the navigation lock. This will occur for predicted tides above 1.9m at Mooloolaba.

When the weir is overtopped, the lake level will rise fairly rapidly by up to 0.5m. If the penstocks are not operating correctly to lower the lake level prior to the arrival of the next high tide, the revetment walls surrounding the lake will be overtopped.

The available hard drive space on the remote computer should regularly be reviewed and unnecessary data files deleted as required after they have been downloaded.

Regular backups of the lock access card user data base should be undertaken to enable rapid system recovery in the event of a failure of the remote computer. It is recommended that this function is performed by the maintenance provider responsible for the maintenance of the user database.

3.0 ONE YEAR MAINTENANCE PROCUEDURES

3.1 Caloundra City Council shall confirm time frame with maintenance provider (MP). Allow 3 days for shut down and 2 days for contingency.

3.2 Caloundra City Council to arrange for letter drop to card holders and residents in Parrearra lake area (Refer to Appendix B).

3.3 MP to subcontract the following works to undertake the one year maintenance program.

- Diving contractor.
- Crane contractor.
- General maintenance contractor.
- Cathodic protection consultant.
- Bowler Geotechnical.
- Naskam security.
- Cardno MBK to check report after completion.

3.4 Crane contractor (arranged and co-ordinated by the MP)

- Arrange for 20 tonne all terrain or 30 tonne or greater crane to lift and remove the bulkhead storage bay cover.
- Crane contractor to remove screens from each end of tidal exchange conduit.
- Crane contractor to install bulkhead gates to each end of lock chamber and to each end of tidal exchange conduit.
- Crane contractor to locate and remove the dewatering pump to the edge of the lock.
- Crane contractor to have dogman and associated lifting eyes and slings for all lifting operations.

3.5 Diving contractor (arranged and co-ordinated by the MP)

- Divers to inspect and clean all marine growth from bulkhead guide slots for lock chamber and tidal exchange conduit.
- Divers to check the seating of the bulkheads prior to pump out.
- Divers to inspect and clean weep holes of weir.
- Divers to connect slings and shackles when removing tidal exchange conduit.
- Advise in writing the results of all tests and inspections.

3.6 General Maintenance (arranged and co-ordinated by the MP)

- To supervise the pump out of the lock chamber and gate recesses.
- To remove all marine life caught in the process and release back into lake system. To include specimen for testing (co-ordinate with Bowler Geotechnical).
- Remove all marine growth from the rubber fenders within lock chamber.
- Remove significant marine growth from the aluminium ladders.
- Inspect and repair any areas (apart from the structural steel elements of the lock) that are affected by rust.
- Check and lubricate all locks.
- Inspect and clean the inlet screen to the water level sensor stilling well within the lock chamber.
- Inspect and clean the sump of the lock.
- Inspect, clean and repaint the red markers to the concrete walls.
- Inspect and clean the depth marker. Repaint as required.
- Re oil the timber cover to the bulkhead storage bay.
- Inspect and clean all manhole and pit covers.
- Advise the MP and Caloundra City Council of any works that require approval whilst lock is dry and undertake those works.
- Advise in writing the results of all tests and inspections.

3.7 Steel work contractor (arranged and co-ordinated by the MP)

- Inspect all steel work for damage.
- Inspect all steelwork for signs of rust. Clean and repair as necessary
- Remove any marine growth that may impede the operation of the lock gates.
- Inspect and clean lubrication holes for lock gate lower polymer bearings.
- Inspect and clean penstock gate and guides.
- Inspect and clean the tidal exchange conduit screens. Repaint with anti fouling agent as required.
- Inspect all bolts and nuts for tightness. Retighten where required.
- Advise the MP and Caloundra City Council of any works that require approval whilst lock is dry and undertake those works.
- Advise in writing the results of all tests and inspections.

3.8 Cathodic Protection Consultant (arranged and co-ordinated by the MP)

- Inspect and check the zinc anodes to the gates and bulkheads.
- Check the anode potentials.
- Advise the MP and Caloundra City Council of any works that require approval whilst lock is dry and undertake those works
- Advise in writing the results of all tests and inspections.

3.9 Bowler Geotechnical (arranged and co-ordinated by the MP)

- Undertake water quality samples at the beginning of the process within the lock area, lake and canal side of the lock. pH levels etc
- Analysis fish samples from the lock area.
- Advise the MP and Caloundra City Council of any works that require approval whilst lock is dry and undertake those works.
- Advise in writing the results of all tests and inspections.

3.10 Whelan Electrical to check electrical/data process and equipment.

- Supervise and co-ordinate the whole shutdown and cleaning process and re-commission the lock including full operational checks.
- Confirm with the Caloundra City Council that the letter drop has been undertaken.
- Check tides to ensure the high tide will not be higher than the level of the lock weir. If expected to be higher, ensure penstock is operational to control lake water level. Co-ordination with Cardno MBK maybe required.
- Shut down the lock from operating.
- Check lock operation in all operating modes.
- Inspect, check and clean the switchboard cubicle.
- Check alarm system to cabinet.
- Inspect clean and repair all lighting.
- Advise the Caloundra City Council of any works that require approval whilst lock is dry and undertake those works
- Advise in writing the results of all tests and inspections to the Facility Manager Caloundra City Council.

3.11 Naskam Security (arranged and co-ordinated by the MP)

- Check, clean and confirm operation of alarm system.
- Confirm with Whelan Electrical system alarms are working.
- Advise the MP and Caloundra City Council of any works that require approval whilst lock is dry and undertake those works
- Advise in writing the results of all tests and inspections.

3.12 Cardno MBK (arranged by Caloundra City Council)

- Check results of all the reports from the various subcontractors and advise of the standard and condition of the lock and weir structure. Report findings to MP and the Caloundra City Council.
- Conduct independent inspections on behalf of the Caloundra City Council.
- Advise the MP and Caloundra City Council of any works that require approval whilst lock is dry.

3.13 MP to assemble all reports from sub contractor and deliver a collated report of all results to Caloundra City Council Facility Manager and the nominated representative from Cardno MBK within 14 days of shut down.

3.14 The Caloundra City Council Facility Manager will confirm with Cardno MBK the results and commence any rectification works.

4.0 PROCEDURES FOR BULKHEAD INSTALLATION AND REMOVAL AND LOCK DE-WATERING

4.1 Bulkhead Installation and Lock De-watering.

- Open security gates for access to site.
- Unlock all gates to lock safety fences.
- Remove fence panels and steel chequer cover plates to tidal exchange conduit screen/bulkhead guides.
- Shut down the lock operation. Ensure that penstocks at both weirs (Structures Y and Z) are closed.
- Ensure both pairs of lock gates are closed.
- Remove bulkhead storage bay cover and move to a position where it will not impede operation. Eye bolts are located in switchboard cubicle.
- Divers to clean out bulkhead guide slots to lock chamber and tidal exchange conduit.
- Position dewatering pump and connect all pipework.
- Divers to connect slings to lake side tidal exchange conduit screen and crane to remove.
- Position lake side tidal exchange conduit bulkhead into position using crane.
- Divers to connect slings to canal side tidal exchange conduit screen and crane to remove (note position of grate fins towards shore).
- Position canal side tidal exchange conduit bulkhead into position using crane.
- Install lake side lock chamber bulkhead using crane.
- Install canal side lock chamber bulkhead using crane.
- Commence pump out of lock (3-5 hours). Direct pump discharge to lake.
- When water depth is less than 1m open lock gates to release water from gate recesses.
- When water depth is about 300mm stop pumping and remove fish.
- Commence pumping with submersible pump until lock chamber is dry.
- Commence maintenance operations.

4.2 Bulkhead Removal Sequence.

- Ensure all maintenance works are completed and checked by MP.
- Ensure divers are on site to connect slings to tidal exchange conduit bulkheads.
- Close lake side lock gates.
- Ensure canal lock gates are left in the open position.
- Commence pumping operation to refill stilling well chambers between lake side lock gates and the bulkhead. Water maybe pumped from the penstock chamber via gatic lid or from lake or river.
- Equalise water levels on both sides of lake side bulkhead.
- Remove lake side bulkhead using crane and lower onto rubber tyres for protection of anodes.
- Wash down bulkhead with fresh water and remove anodes.
- Reposition lifting equipment to lower bulkhead into storage area.
- Open lake side lock gates to the cracked position, slowly filling lock to level of lake. Once water level has stabilised close lake side gates.
- Close canal side lock gates.
- Equalise water levels on both sides of canal bulkhead using pump if required.
- Remove river side bulkhead using crane and lower onto rubber tyres for protection of anodes.
- Wash down bulkhead with fresh water and remove anodes.
- Reposition lifting equipment to lower bulkhead into storage area.
- Connect slings to tidal exchange conduit lake side bulkhead and remove from position and lay flat on tyres.
- Reposition slings and move lake side bulkhead into storage bay and place on top of lock bulkheads.
- Lift lake side tidal exchange conduit screen into position and replace lake side cover plate and hand railing.
- Connect slings to tidal exchange conduit canal side bulkhead and remove from position and lay flat on tyres.
- Reposition slings and move canal side bulkhead into storage bay and place on top of lock bulkheads.
- Lift canal side tidal exchange conduit screen into position and replace canal cover plate and hand railing.

- Replace timber cover to bulkhead storage bay noting correct orientation (markers on northern and southern sides).
- Remove eye bolts from cover and store in the switchboard cubicle.
- Check gate operations in all operating modes.
- Check all security locks are in place and secure.
- Recommission lock.
- Advise the Facility Manager of the Caloundra City Council that operation is complete.
- Advise Naskam security that lock is operational.

5.0 FIVE AND TEN YEAR MAINTENANCE INSPECTIONS

In addition to the procedures outlined in the preceding sections, it is recommended that the following inspection and maintenance operations are undertaken on the lock gate actuators and the penstock actuator. These operations would be arranged by the maintenance provider and would be undertaken by or in the presence of a representative of the actuator supplier.

The actuators were supplied by : Barron GJM Pty Ltd
P O Box 792
ARTARMON NSW 2064
Telephone: (02) 9436 1088
Fax: (02) 9439 3413

Unless major repairs are required, the following inspections should be able to be undertaken within the same timeframe as the annual inspections.

5.1 Five Yearly Procedures

Lock Gate Actuators:

- Remove one of the actuators, dismantle and check for wear.
- Inspect worm, worm wheel and motor coupling for wear, replace as necessary.
- Replace lubricant and all seals, reassemble actuator and test.
- Refit to gearbox and adjust switch operation.
- From knowledge gained, establish future maintenance plan.

Penstock Actuator:

- As for lock gate actuator

Penstock Linear Thruster Unit:

- The thruster was filled initially with 4 litres EP80 Gear Oil and one 250mm can of STP Oil Treatment.
- It is not intended that this lubricant be changed or topped up during the service life of the unit.
- It is recommended at 25,000 operations that the thruster be dismantled, checked for wear, reassembled and relubricated.

- It is important that the oil mixture (EP80 and STP) be admitted very slowly through the side inspection hole with the thruster vertical. This is to ensure that it can run through the nut vents into the lower part of the tube without overflowing into the outer tube.

5.2 Ten Yearly Procedures

Lock Gate Actuators and Gearboxes:

- Remove gearboxes from one gate, dismantle and inspect for wear. Replace as necessary.
- Replace lubricant, all seals and reassemble and test.
- Refit to gate and test.
- From knowledge gained, establish future maintenance plan.

6.0 OTHER MAINTENANCE INSPECTIONS

6.1 Navigation Lights

Caloundra City Council shall establish a service agreement with Queensland Transport for the maintenance of the navigation markers and beacons adjacent to the weir. The frequency of this maintenance shall be determined by Queensland Transport.

APPENDIX A

Weekly Maintenance Report

WHELAN ELECTRICAL SERVICES PTY LTD

LOCK MAINTENANCE CHECKLIST

NOTE:- Gates must be moved as a pair. Operating individually will damage Gates.

Tick where applicable

Site:- KAWANA			
Date 16/ 9/ 02	Performed by Signature -		
ITEM	**DONE**	**N/A**	**REMARKS**
Check for vandalism	✓		
Check for fault indicators and reset	✓		Details below
Operate Gates from locations	✓		Outer Canal ☑ Inner Canal ☐ Inner Lake ☑ Outer Lake ☑
Check Traffic Lights	✓		
Check Motor Current	✓		1A 1.5 Amps 1B 1.5 Amps 2A 1.5 Amps 2B 1.7 Amps
Check Voltage			..... Volts
Check inside Switchboard for over-heated damaged components/Dust	✓		
Check Computer Operation	✓		
Test Trip Wires	✓		1A.....☐ 1B.....☑ 2A.....☐ 2B.....☑
Lubricate Seals above Water Line	✓		
Test Emergency Stops	✓		East ☑ West ☑
Test Emergency Phone to Naskam	✓		
Test Penstock Manually	✓		
Check Gates set to Auto	✓		
Check security system set and Switchboard Locked	✓		
All entry gates locked	✓		

Details -

Faults if any - some conduit damage on Low voltage cables

Extra work required - Recover with Loom tube.

REF: LOCKCHECK.

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mail@sunshinecoast.qld.gov.au
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Locked Bag 72 Sunshine Coast Mail Centre Qld 4560