University of New South Wales
School of Surveying

SURV7051 SURVEY CAMP 3

MANGROVE CREEK 1993

Preliminary Information

1. The Mangrove Creek Camp will be held from Monday, 15 Feb 93 (11.00 h) to Friday, 26 Feb 93 (14.00 h).

2. The following students have been selected for this camp (by Dr. Harvey, based on preferences):

Brewer A, Burge A, Cleary MW, Cusack PP, Keywood JR, McCulloch D, Meharg GP, Nancarrow P, Newton WF, Philp T, Sprainger AJ, Wong KD

3. The attendance of above students is subject to successful enrolment in February 1993. Students must satisfy all pre-requisites of SURV7051, that is having passed all 1st, 2nd and 3rd year subjects.

4. Course venue: Yarramalong Manor, Linga Longa Road, Yarramalong NSW 2259, Phone: (043) 56 1066/1090. (15 km west of Wyong, 45 minutes drive from Hornsby.)

5. Shared accomodation has been booked for all students, based on the majority of preferences indicated at the meeting of 12 August 1992. The following will be provided for $ 40-00 per person per day:

Shared accomodation with breakfast (fruit juice, tea, coffee etc plus baskets of assorted cereals followed by various types of toasts with spreads and home-made jams) and hot home-cooked dinner (2 course).

The Manor has a total of 6 rooms with 2 to 4 beds each. Rooms have private ensuite, colour tv, direct dial telephone, tea/coffee making facilities, etc. One room will be occupied by the camp director. This leaves five rooms with a total of 15 beds for the 12 students. In consequence, only 2-3 students per room. Students pay individually for rooms.

The guest lounge will be used as a course centre for briefings and computing. The restaurant is not licensed, but a liquor shop is next door.

6. Breakfast scheduled for 07.00 h, dinner for 19.00 h. It is suggested that students buy their own lunch at a corner shop in Mangrove Mountain on their way to the dam. All groups will report after dinner on the work of the day and on the planned work of the next day. Field sheets should be checked in the evening, summarized and entered into computers. Data recorded electronically must be down loaded on PC (and floppy disk) each evening.

7. Groups of three students will be formed for the camp. All groups will work on projects on or around the Mangrove Creek Dam, operated by Gosford City Council. The following tentative projects will be allocated, according to preferences, as far as possible:

A: Precise levelling of dam levelling network

B: Connection of dam network to AHD using EDM Height Traversing from BMs in Mangrove Mountains (4WD vehicle of some advantage)

C: Direction and zenith angle measurements in inner monitoring network, incl. observations to marks on dam, organisation of distance measurements in net, organisation of measurements with motorized theodolite (4WD vehicle and abseiling experience of advantage)

D: Direction measurements in outer dam monitoring network + simultaneous reciprocal trig heighting of (outer) trig stations + organisation of GPS survey (connection of dam net

in position and height to ISG/AHD) (4WD vehicle of advantage)
All students will spend one day on measuring EDM in the dam network and one day on the GPS survey and will see the motorized theodolite in action.

8. A meeting on the Mangrove Creek Camp will be held:
Wednesday, 21 October 1992, 13.00 - 14.00 h, GAS 619A
At this meeting, groups of 3 students will be formed, individual projects allocated, motel rooms allocated and preparatory work specified.

Groups must hand in their reconnaissance/preparation reports (incl. equipment lists) by Wednesday, 9 December 1992.

9. Other Important Dates:
- Camp meeting on enrolment day: A 2 hour meeting will be held on 4th year enrolment day to fine tune groups, programs, equipment. If enrolment is a.m., meeting at 14.00 h GAS 619A; if enrolment p.m., meeting at 10.00 h GAS 619A.
- Friday, 12 February 1993: Collection of Group Equipment from Survey Store
- Friday, 26 February 1993 or Monday, 1 March 1993: Return of Group Equipment to Survey Store.

The 93'Mangrove Creek Camp Director

A/Prof J. M. Rüeger 19 August 1992

cc: JCT, BRH, SG
Ks, Aws

University of New South Wales
School of Surveying

SURV7051 SURVEY CAMP 3 / 1993

MANGROVE CREEK DAM
15 - 26 February 1993

Summary of Discussions of 21 October 1992

(1) Student groups have been formed. See list.

(2) Projects A, B, C, D have been allocated to groups

(3) Each group should book a 1-2 hour meeting with Dr. Rüeger between Monday 16 November 1992 and Friday 4 December 1992. All students of a group have to attend this meeting. At these meetings, the following matters will be discussed:

- Definition of Survey Camp Project, in some detail
- Some suggestions re equipment list
- Discussion of required office reconnaissance work
- Preparation of plan of work
- Selection of group manager
- Provision of list of student addresses + phone numbers (Jan 93)
- Issue of plans, coordinates etc to group

(4) By 18 December 1992 (note change of date), each group has to submit the following:

- List of equipment
- Report on reconnaissance (in writing)
- Suggested work schedule 15 - 26 February 1993

(5) Please refer the handout "Preliminary Information" of 19 August 1992 for further details and note, that:

- all students must attend a camp meeting on enrolment day
- all groups must collect their equipment (as per equipment list) on Friday 12 February 1993
- **all students must attend a 2-day GPS training course on Campus in February 1993 (in week from 8 to 12 Feb 1993) in preparation of the camp**
- all groups must return the equipment on Friday 26 February 93 or on Monday 1 March 1993
- each group has to submit its **Technical Report on the Camp Project** by **11 June 1993** (Friday Week 14).

22 October 1992 / JMR

University of New South Wales
School of Surveying

SURV7051 SURVEY CAMP 3 / 1993

MANGROVE CREEK DAM

STUDENT GROUPS and ALLOCATION OF PROJECTS

Group	Students	Project	Description
1	SPRAINGER Adam CLEARY Matt CUSACK Paul McCULLOCK D	**D**	**Outer Net**: directions, trig heighting, GPS Survey: Planning, Organisation, Analysis
2	MEHARG Greg KEYWOOD Jason WONG Kenneth	**B**	**EDM Height Travers**: planning, execution, analysis; EDM baseline
3	BURGE Andrew NANCARROW Peter BREWER Andrew	**C**	**Inner Net+Dam**: dir., (EDM) trig heighting; LSP: planning, organ., analysis; APS: assistance
4	....	**A**	**Precise Levelling** of dam levelling network

Common Survey Work (in 2nd week):

- each student assists with GPS survey for one day (23 or 24 Feb 93)
- each student assists with local Scale Parameter Method LSP (distance measurements in network) for one full day (Monday 22 Feb 93)
- each student attends APS demonstration for a few hours (25 Feb 93)

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19 November1992 JMR

School of Surveying Uni of New South Wales

SURV7051 SURVEY CAMP 3 / 1993

MANGROVE CREEK DAM
15 - 26 February 1993

SUMMARY EQUIPMENT LIST (as at 24 Dec 92, 13.00h)

a – Aws: Arthur, you will get groupwise list early in February 1993. Please use THIS list, in conjunction with a similar by BRH, to **check** if you have enough equipment. If not, **notify BRH and JMR** before the end of January 1993 so that **additional items can be purchased** in time for camp.

Collect equipment (groupwise): Friday, 12 February 1993
Return equipment (groupwise): Friday, 26 February 1993 (late) or Monday, 1 March 1993 (early)

No	Gr	Item	X = JMR	Y = Ks
4	1	Allan keys (3/8 inch) for trig station pillars		
2	X	Shifting spanners		
2	1	Clipboards		
2	2	Clipboards		
2	3	Clipboards		
2	X	Clipboards		
1	2	100 m band		
1	3	100 m band		
1	*1*	*100 m band*		
1	3	Spring balance		
1	2	Spring balance		
1	*1*	*Spring balance*		
1	2	30 m tape		
1	X	30 m tape		
1	3	30 m tape		
4	1	30 m tapes		
2	1	WILD T3000 electronic theodolites with cables and manual		
2	1	WILD traversing tagets with plate level carrier and tribrach		
2	1	large target plates fitting above		
1	2	WILD TC 1610 Electronic Tacheometer with cables + manual		
1	3	WILD TC 1610 Electronic Tacheometer with cables + manual		
1	3	WILD TC 1600 Electronic Tacheometer with cables + manual		
1	3	WILD GRE-4 data recorder incl. all cables for computer connection		
2	2	WILD GEB 77 batteries		
2	3	WILD GEB 77 batteries		
1	X	WILD GIF12 rec module reader and software		
1	X	WILD cable from GIF12 to PC		
1	2	Battery Charger WILD GKL 12		
1	3	Battery Charger WILD GKL 12		
2	1	Rec modules WILD GRM-10		
2	2	Rec modules WILD GRM-10		
1	3	Rec modules WILD GRM-10		
1	3	WILD GRE-3 data recorder with all cables for computer downloading		

1	2	12V car battery
2	3	12V car batteries
4	1	small 12V car batteries
2	1	Chargers for small 12V car battery
1	3	Charger for 12V car battery
1	2	Charger for 12V car battery
1	2	Centring rod for WILD GST20 tripod
3	1	WILD GST 20 tripods
3	2	WILD GST 20 tripods
2	3	WILD GST 20 tripods
1	3	ZEISS Ni2 automatic level with tripod
1	3	ZEISS 10 mm parallel plate micrometer
1	3	WILD industrial invar levelling staff (182 cm , with attachments + bubble)
3	2	Survey Umbrellas
3	2	Umbrella stands (matching above checked) and cords/pegs
3	3	Survey Umbrellas
3	3	Umbrella stands (matching above checked) and cords/pegs
3	1	Survey Umbrellas
3	1	Umbrella stands (matching above checked) and cords/pegs
2	X	Survey umbrellas
2	X	Umbrella stands (matching above checked) with cords/pegs
3	2	(Sledge) Hammers
2	1	(Sledge) Hammers
2	3	(Sledge) Hammers
2	X	(Sledge) Hammers
1	2	Barometer (Thommen Everest 6000m)
2	3	Barometers (Thommen Everest 6000m)
3	X	Barometers (Thommen Everest 6000m)
4	*X*	*Barometers AIR-HB-1A (from 440) with manual*
4	*X*	*9V Spare batteries (Duracell)*
1	*X(2)*	*9V Spare battery (Duracell)*
2	*X(3)*	*9V Spare batteries (Duracell)*
6	*X*	*9V Spare batteries (Duracell)*
1	2	Temperature/Humidity Probe (Väisälä HM 34, from store)
2	3	Temperature/Humidity Probes (Väisälä HM 34, from store)
1	X	Temperature/Humidity Probes (Väisälä HM 34, from store)
3	X	Rotronic Hygroskop GT-L (from 440)
2	X	Large Väisälä temperature/humidity probes (from 440)
2	X	Small Psychrometers (with spare wicks)
2	X	Squeeze bottles with distilled water
40	3	Plastic reflectors with stands (from 440)
2	2	Wild reflectors with target plates with tribrach (TC1610)
8	3	Wild reflectors with target plates with tribrach **
8	3	WILD reflector carriers (without bubble)**
		**(1xTC1610, 1xTC1600, Topcon, Nikon)
2	2	Reflector carrier with plate level WILD GZR2
4	*X*	*WILD reflector with carrier, tribrach, target plate, case **
		*** (from Pentax,Sokkisha)*
3	*X*	*WILD triple prism holder GPH-3 reflectors in case*
1	2	WILD reflector rod GLS11 with spot bubble
1	2	WILD 3 m invar levelling staff with staff bubble
2	2	Ranging rods
2	3	Ranging rods
2	3	Change spikes
4	1	REALISTIC TR-217 Transceivers with batteries
3	2	REALISTIC TR-217 Transceivers with batteries
3	3	REALISTIC TR-217 Transceivers with batteries
1	*X*	*REALISTIC TR-217 Transceiver with batteries*

4	*X*	*SHARP Model CBT-66, 2-channel transceivers with batteries*
4	X(1)	Full sets of spare batteries for transceivers (Duracell AA)
3	X(2)	Full sets of spare batteries for transceivers (Duracell AA)
3	X(3)	Full sets of spare batteries for transceivers (Duracell AA)
5	X	Full sets of spare batteries for transceivers (Duracell AA)
1	X	battery checker
50	2	Dumpy pegs
4	*1*	*Dumpy pegs*
50	2	Marker Stackes (60 cm long)
1	2	Pocket tape
2	3	Pocket tapes
4	1	Pocket tapes
1	X	Pocket tape
1	2	2m folding ruler
2	3	2m folding rulers
4	1	2m folding rulers
2	X	2m folding rulers
50	2	Sperical nails/screws (for temporary BMs)
2	*2*	*Plumbbobs*
2	*3*	*Plumbbobs*
4	*1*	*Plumbbobs*
2	*X*	*Plumbbobs*
2	3	Brush hooks
2	*1*	*Mattocks*
1	*2*	*Mattock*
2	*1*	*Spades*
1	*2*	*Spade*
3	*2*	*Road safety vests*
5	*2*	*Orange traffic cones*
2	*2*	*Street sign* "Surveyors on Road"
1	X	Box of GI nails
1	3	Axe
1	1	Axe
1	1	Saw
1	*2*	*Hacksaw*
1	*2*	*Bushman's saw (handsaw)*
2	*1*	*Bushman's saw (handsaw)*
20	1	red-and-whites
.	1	nails, ramsets and gins
4	1	magnetic compasses
4	1	clinometers
8	1	torches with batteries
2	X	torches with batteries
8	X(1)	Full sets of batteries for torches
2	X	Full sets of batteries for torches
10	X	Spare globes for torches
1	X	Folding camping chair (from store)
1	X	Reading lamp
1	3	Black paint
1	3	Steel wool
3	3	Crayons
1	1	box of crayons
3	3	Texta paint markers
2	3	Staff bubbles
1	3	WILD brocken eyepiece set (for T2/TC1610)
2	1	cans of spray paint
1	1	Claw hammer
6	X	KERN centring tripods

3	X	Wild-on-Kern adapter plates
2	X	WILD GDF21K tribrachs (from 440)
1	X	NEC APC-IV Powermate portable computer (APC-H7020, s/n 8z00056, with keyboard, power cable, cable to printer and
1	X	NEC external 5.25" floppy disk drive (Type APC-H7230 s/n 8y00024)
2	X	NEC 286 PC from 619 with power cable, printer cable
1	X	DOS manual
1	X	Survpack manual (from 619)
2	X	NEC P3 Pinwriters with power cable (from 619)
6	X	Ribbons for NEC P3
3	X	Boxes of computer paper
1	X	Box of A4 paper
.	X	PC programs CIVILCAD, AED, EDMRED, FIXIT, COORT, GRECV
1	X	Box of overhead transparencies
1	X	Selection of OHP pens
2	X	Extension cords
5	X	Powerboards
1	X	3M "Five "0" Eighty Eight" overhead projector Model 088/88 s/n 105097
1	X	Toolbox
1	X	Soldering iron and solder
1	X	Heat gun (for drying instruments)
1	X	APPLE Macintosh Plus 1Mb, S/N F7204U6M0001AP (P/C 62217)##
1	X	APPLE Keyboard, Model M0110A, S/N A717M0110A4374 (P/C 62217)##
1	X	APPLE Mouse, Model M0100, S/N G716M010002927 (P/C 62217)##
1	X	APPLE Imagewriter II, Model A9M0320, S/N Z072941 (P/C 62218)##
1	X	RODIME "20 PLUS" Hard Disk, s/n A0055581 (P/C 62217)##
1	X	QUANTUM 120Mb hard disk##
1	X	APPLE Personal Modem##
1	X	PLI SuperFloppy Drive 1.4## ## from 627: This Mac is for use by JMR, only.
.	Y	GPS equipment
1	Y	WILD theodolite T2 s/n 190934 (T107)
1	Y	WILD Distomat DI 3000 s/n 62961, with ancilliaries
1	Y	WILD T1000 Electronic Theodolite s/n 333198 with DI 3000 adapter tribrach, internal battery, external battery, battery chargers, carrying case, cable for ext. 12V battery (from Sydney Technical College)
1	Y	WILD DI 3000 s/n 67489 electronic distance meter in case, with cables (from Sydney Technical College)
1	Y	Complete equipment for motorized theodolite, incl. the following from store:
4	Y	12V car batteries
2	Y	12V car battery chargers
1	Y	Plane table with 5/8 inch thread
1	Y	KERN heavy duty (model 174B) centring tripod
1	Y	WILD GST 20 tripod

Prepared by J.M. Rüeger from student requests

24 December 1992

cc Aws, BRH

UNIVERSITY OF NEW SOUTH WALES

SCHOOL OF SURVEYING

SURV7051 Survey Camp 3 / 1993

Administrative Instructions (Please bring to Camp!)

The camp will be held at Manrove Creek Dam (near Wyong NSW) during the period from 11.00 h on Monday, 15th February 1993 to approx. 14.00 h on Friday, 25rd February, 1993.

As previously announced, accommodation has been arranged at the

Yarramalong Manor, Linga Longa Road, YARRAMALONG N.S.W. 22259 PHONE: **(043) 56-1066** (56-1090)

Accounts are to be settled with the motel individually.

1. GENERAL

All students must fill in a "Registration to Attend: SURV7051 Survey Camp 3" form.

Groups of 3-4 students have been formed. Motel room allocations have been made (2-3 students per room) and distributed.

No formal Technical Instructions will be issued. Work at camp will be as per pervious handouts and along the lines of the submitted work schedules, as amended.

As a part requisite to pass the Camp, each student has to pass a **Practical Test** involving the measurement of directions and zenith angles. Each student is to observe (and analyze) the measurements of the first of two days after ISO 8322-4 (Building construction — Measuring Instruments — Procedures for Determining Accuracy in Use — Theodolites). Students use the primary instrument allocated to the group for the purpose. Electronic data recording is to be used.

2. PROCEDURE FOR CHECKING-IN

Contact the Camp Director (A/Prof. J. M. Rüeger) at the Motel before 11.00 h on Monday, 15th February, 1993. On arrival each student is required to sign the register.

STUDENTS WHO DO NOT SIGN, BOTH, IN AND OUT ARE CONSIDERED NOT TO HAVE COMPLETED THE CAMP AND WILL BE REQUIRED TO REPEAT.

The registration numbers of cars and motorbikes brought to camp must be provided on signing in.

NOTE: A briefing (in the convention room) is scheduled for 11.00 h on 15th February 1993.

3. PROCEDURE FOR CHECKING-OUT

The motel is made available under the condition that it be cleaned up before leaving. Rooms must be vacated (by a time to be announced) on Friday, 26th February. The sequence of events will be as follows:

(1) The Camp Director will assign cleaning-up duties to groups, if necessary. Groups who have finished their cleaning-up duties report this to the Camp Director, who will inspect their work. If it has been done satisfactorily, clearance will be given, provided that:
   i. all technical exercises have been completed to a satisfactory standard, and
   ii. all accounts have been settled.

(2) Students sign out.

4. TRAVEL ARRANGEMENTS

Unlike the first and second year camps, most technical exercises are not carried out in the vicinity of the accommodation. The working areas are typically located at a distance of some kilometres from the Camp. Students are permitted to use their own vehicles. Perhaps just one or two group member(s) should bring a car to camp (preferably fitted with roof racks or roof bars for the transport of tripods, levelling staffs, umbrellas) and the group share the costs.

NOTE: The School does **not** provide transport for students at camp.

Should a student prefer to travel by train to Wyong, he/she should make arrangements with a colleague for his/her collection at the station.

5. PAYMENT OF ACCOMODATION

The University does not charge any fees for the Camp. As previously announced, each student is required to pay $40.00 for shared accomodation, breakfast and cooked 2-course dinner per day. (Obviously, students have to pay for additional services, such a outgoing phone calls.) The rooms have private facilities, colour TV, direct dial phones, tea/coffee making facilities, fridge, etc. **Accounts are to be settled individually with the motel management.**

Students whose camp fees are to be paid by their employers should pay the fees themselves and make arrangements to be reimbursed by their employers later.

6. WHAT TO BRING (AND WHAT NOT TO BRING)

(a) The motel rooms have refrigerators and coffe/tea making facilities, amongst other things.

(b) Old clothes and boots are most suitable for working in the field. A hat is strongly recommended. Sunburn cream, insect repellent, a thermos and a water bottle are useful items. Warm outer clothes should be brought. A rucksack is essential when working on less accessible stations (there are many of those). Please note that each student will spend most of a day on a trig station during the Local Scale Parameter Method Exercise. Bring everything you need for this event.

(c) Each student should bring his/her **textbooks, lecture notes, calculator, drawing instruments,** and in addition: -

operating instructions for EDM instruments
one or more 5.25" floppy disk for the NEC APC IV personal computer
one exercise book for briefing notes
a metric scale graduated with scales 1:100 to 1:500
pencils, straight edge
a field book (as used in Survey exercises on campus)

3 NEC-APC IV personal computers will be available at camp as well as 2 printers.

(d) Students should ensure that they wear appropriate footwear. Thongs or sandals in the field are not allowed as they do not provide adequate protection for field conditions. Injuries sustained owing to not wearing appropriate footwear and leading to absence from the exercises will not be considered as an excuse for unfinished work. Depending on the weather, precautions will be necessary against sunburn and mosquito bites.

(e) As a range of electronic distance meters (WILD DI 3000, WILD TC1600, WILD TC 1610) will be available at the camp, students should bring along **all** operating instructions of EDM instruments, as provided in SURV4011.

(f) Each group of students **should bring** an **alarm clock**. No bell will ring in the morning.

7. DAILY ROUTINE

07.00	Breakfast (all staff and students to attend)
07.45	Work begins
19.00	Dinner
21.00	Briefing sessions: will be held during most evenings and should be attended by everyone.

8. CAMP RULES

Camp rules are designed to provide a set of conditions which are conducive to the satisfactory completion of all work and the maximum privacy for occupants of the camp under the prevailing circumstances.

(a) **Surveying Equipment**: The instruments and equipment issued for the practical exercises are expensive and delicate and, if not handled with care and common sense, can be damaged easily. The need for careful handling cannot be over-stressed.

Each group of students is responsible to look after the equipment, which they have brought to Camp and which they will return to the Survey Store in Sydney after Camp.

Non-heat sensitive ancilliary equipment (such as hammer, tripods, umbrellas, etc) may be kept in locked cars overnight, preferably in boots and out of general view.

All precision equipment and all instrumentation (theodolites, barometer, thermometers, two-way radios, etc) must be brought to the motel room overnight and is not to be left unattended in cars, in general, and in cars exposed to full sunlight, in particular. Sensitive instruments must be removed from parked cars and stored in the shade.

(b) **Noise:** The evenings are generally reserved for the downloading of data, reduction of observations, computations and preparartion of reports and next day's work as well as briefings. Background noise must be kept as low as possible at all times.

(c) **Cleaning Duties:** If necessary, groups will be asked to take up such duties for one day. Details will be discussed in camp.

(d) **Telephone:** All motel rooms have telephones. Best time for incomming calls: before breakfast.

(e) **Firearms:** No fire arms will be allowed in Survey Camp.

(f) **Valuables** and/or large sums of money should not be brought into Camp.

(g) **Fire:** Students should take precautions against fire, particularly in extinguishing matches and cigarettes. Students **should not smoke** on farming properties because of the danger to crops and in native bushland because of the danger of bushfires. Because most survey marks are accessed on foot, bushfires are a serious danger.

(h) **Cleanliness:** Your cooperation is requested in keeping the interior of your quarters clean and tidy, as well as the survey sites SPOTLESS. Bring your rubbish back to Camp and place in the bins provided.

(i) **Illness and Injury:** Should be reported to a member of staff. First aid supplies are available in camp. Any students suffering from a medical condition which may require medical attention or hospitalisation must declare such on the registration form.

(j) **Motel: Students are personally liable for any damage to the motel facilities. Any damage should be reported to the Camp Director.**

(k) **Miscellaneous:** Drugs of dependence may not be brought into Camp.

(l) **Smoking:** Smoking is not permitted in the Work Room where thje computers ar located.

(m) **Misconduct:** Students not observing the above rules may be asked to leave the camp, in which case they automatically fail the camp.

(n) **Transceivers:** Keep communications over the two-way radios to a bare minimum. **As a rule, Channel 14** should be used on the Realistic TRC-217 as this channel corresponds exactly to **Channel 2** on our National Panasonic RJ-380 and **Channel B** on our Sharp Model CBT-66 transceivers. (Channel 24 on the Realistic is only close to the first channel on the two other models.)
Channels 8, 9, 11, 16 on the REALISTIC transceivers should not be used other than in emergencies. **Channel 9** is the primary **Emergency Channel** in the citizen band.

A/Prof. J. M. Rüeger
Director
1993 Survey Camp 3 Mangrove Creek
February 1993

REGISTRATION TO ATTEND : SURV7051 SURVEY CAMP 3

15th February to 26th February 1993

Tick ( ) appropriate box

NAME OF STUDENT : _____

Male	Female

[for accomm.purposes only]

CONTACT _____

POSTAL ADDRESS _____

DURING FIRST _____

SESSION 1993 _____

TELEPHONE No. : _____

1. DO YOU PROPOSE TO TRAVEL BY TRAIN?
   IF YOU CHANGE YOUR TRAVEL PLANS IT IS ESSENTIAL TO INFORM THE SCHOOL OFFICE.

YES	NO

2. DO YOU SUFFER FROM ANY MEDICAL CONDITION WHICH MAY REQUIRE MEDICAL ATTENTION OR HOSPITALISATION DURING SURVEY CAMP?

YES	NO

   IF YES, FULLY EXPLAIN YOUR CONDITION:

   _____

   _____

   _____

3. DO YOU HAVE ANY SPECIAL DIET RESTRICTION *

YES	NO

   * (You will have to make your own arrangement with the management of Yarramalong Manor.)

4. PLEASE LIST NAME AND ADDRESS OF NEXT OF KIN TO BE CONTACTED IN CASE OF AN EMERGENCY:

   _____

   _____

   _____

   TELEPHONE No. (include area code) : _____

SIGNATURE OF STUDENT : _____

DATE : _____

3 FEB 1993/JMR

Local Scale Parameter Method
Mangrove Creek Dam 1993

2 February 1993

AIM

To demonstrate (or otherwise) the power of the LOCAL SCALE PARAMETER METHOD, both in measurement and analysis.

OUTLINE OF OBSERVATIONS

In principle, the LOCAL SCALE PARAMETER MODEL requires the measurement of distances and the measurement of temperatures and pressures at the instrument station. In addition, centring and height of instrument must be known at all stations to 0.1 mm.

With students, the temperatures, pressures and humidities are also measured at all reflector stations, so that the students can compare the results of the LSP analysis with the normal EDM reduction with first velocity corrections.

SCHEDULE OF WORK

- Set-up a seven-station EDM calibration baseline of about 1 km length on a horizontal sight. Establish alignment and elevations to better than 0.5 mm.
- Inter-comparision of all barometers and thermoneters and humidity probes
- Measure EDM calibration baseline with all DI 3000s to be used in net (half a day per instrument). To cut down on travelling time, use 7 reflectors. (Might be done after the network measurements.)
- Inter-comparision of all barometers and thermoneters and humidity probes
- Measure network (with 2 instruments: one day)
- Inter-comparision of all barometers and thermoneters and humidity probes
- Remeasure EDM calibration baseline with all DI 3000s to be used in net (half a day per instrument). To cut down on travelling time, use 7 reflectors.
- Inter-comparision of all barometers and thermoneters and humidity probes

HEIGHT OF DI 3000s AND REFLECTORS

In case of 3 foot screw prisms, one of the footscrews should be set to the midposition, specially marked and not be turned again during the entire campaign. The height of the eight prisms above base should then be measured to 0.1 mm on a table.

Similarly, the trunnion axis height of the host theodolite of the DI 3000 should be determined to 0.1 mm from the bottom of the tribrach, after permanently fixing one foot screw in midposition. (The trunnion axis height of the theodolite is later used for all distance reductions.)

The vertical offset of the DI 3000 above the host theodolite is then measured as good as possible (to 1 mm). This is only required for the intercomparisons of the alignment checks, which are carried out on all network stations. It is NOT required for the distance reductions.

FIELD WORK ON INSTRUMENT STATION

Switch on distance meter (first thing after arriving on station!)

Setting up of station includes checking of centring of tripod (to ±0.1 mm) [if set-up is not on pillar], proper levelling of theodolite, setting-up of 2 umbrellas with anchorage in ground with strings, attachment of temperature probe (1.5 m from ground), measurement of trunnion axis of theodolite above mark to 1 mm (if on normal tripods), recording of serial numbers of all equipment (theodolite, EDM instrument, tribrachs, prism, barometer, temperature/humidity sensor). Sketch of set-up on separate field form.

In network only: With distance meter not on theodolite, measure and book one arc of zenith angles (in 2 faces) to all 7 reflectors (optical pointing to centre of prism).

Carefully attach distance meter to theodolite, so that it locks into proper position. Point theodolite telescope to centre of prism on one of the network stations. Record direction and zenith angle. Electronically point EDM instrument to maximum signal strength to same prism. Record again direction and zenith angle. **Note:** On the baseline, the distance meter is not removed from the theodolite during transport between stations. In consequence, this test need to be carried out only once, on the longest line.

Enter and store a scale correction of 0.0 ppm, a prism constant of 0.0 mm in the distance meter. Disable the automatic switch-off and set display to 4 decimals of metre. The DI 3000 is then continously operated for the full duration of a baseline measurement or for the complete measurement on a network station.

On each **network station**, then execute:

- temperature, pressure and humidity measurement,
- distances to all other prisms, clockwise from left-most prism, with sequence:
    - electronic pointing
    - 2 measurements
    - electronic pointing
    - 2 measurements
- temperature, pressure and humidity measurement,
- distances to all other prisms, anti-clockwise from right-most prism, with sequence:
    - electronic pointing
    - 2 measurements
    - electronic pointing
    - 2 measurements
- temperature, pressure and humidity measurement
- check centring (if off, measure and record)

On each **baseline station**, then execute:

- temperature, pressure and humidity measurement,
- distances to all other prisms, beginning with the station with the smallest number, using the sequence:
    - electronic pointing
    - 2 measurements
    - electronic pointing
    - 2 measurements
- temperature, pressure and humidity measurement,

- distances to all other prisms, beginning with station with highest number, with sequence:
  - electronic pointing
  - 2 measurements
  - electronic pointing
  - 2 measurements
- temperature, pressure and humidity measurement
- re-measure height of theodolite to 1 mm (if set-up on normal tripod)
- check centring (if off, measure and record; if normal tripod, recentre)

FIELD WORK ON REFLECTOR STATION

Setting up of station includes proper centring of tripod (with centring rod) [if set-up not on pillar], proper levelling of reflector, set-up of umbrella anchoring it with strings and beacon nails, attachment of temperature probe to umbrella at about 1.5 m from ground, measurement of reflector height to mm by two different means, recording of (serial) numbers of tribrach, prism, barometer, temperature/humidity probe. On separate field form, sketch of pillar/tripod with reflector.

After commencement of either network or baseline observations, record every 2 minutes:

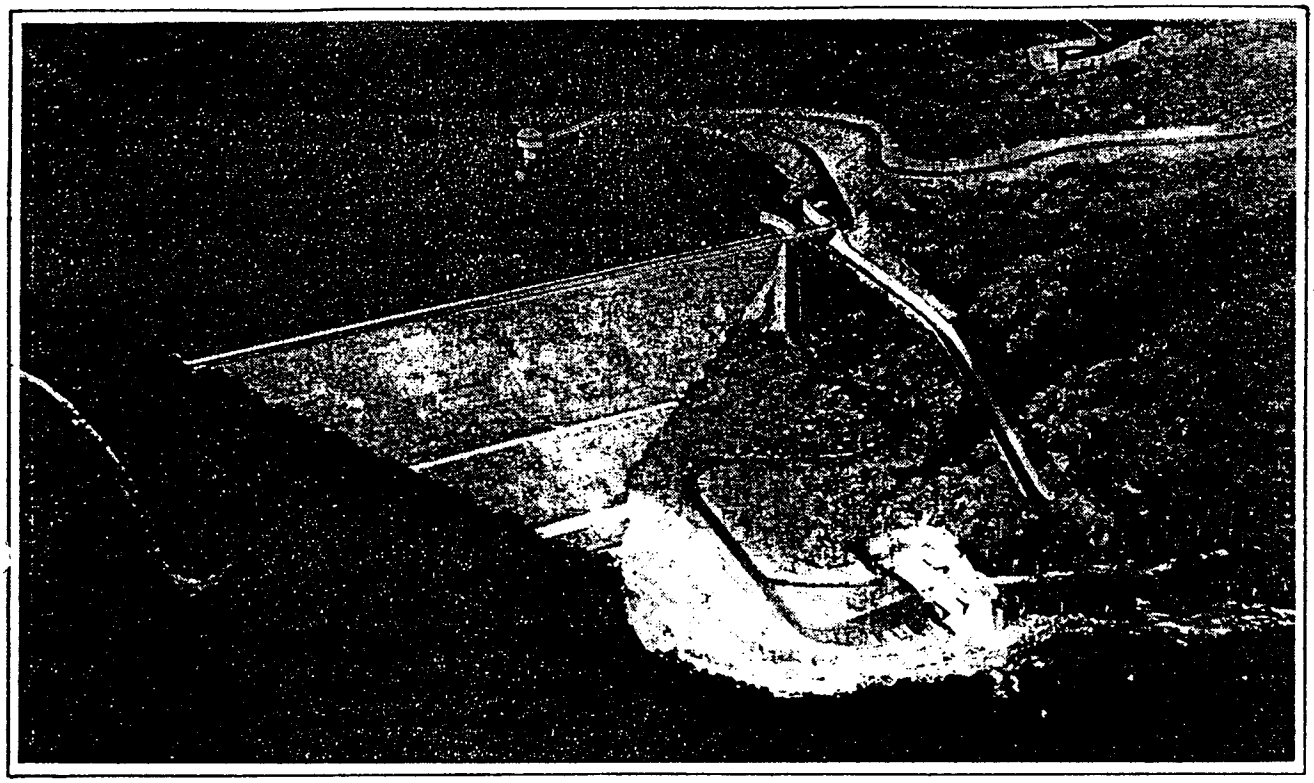
- time
- temperature (to 0.1 C)
- pressure (to 0.1 mb)
- visibility (in km)
- cloud type
- estimated wind direction and strength
- any precipitations (rain, snow)
- when using normal tripods:
  state of centring of reflector (if no longer centred, measure eccentricity in direction of line measured (e.g. .. mm in front of mark as seen from EDM instrument) and RECENTRE and repoint afterwards.
- times of any special events (such as sunset, begin of rain,..)

On completion of either network or baseline observations, record again height of reflector (to mm) by **two different means** (e.g. 2-m folding ruler, pocket tape).

Do not interrupt EDM beam when executing above observations.

16 April 1991/2 February 1993 **J. M. Rüeger**

Mangrove Creek Dam



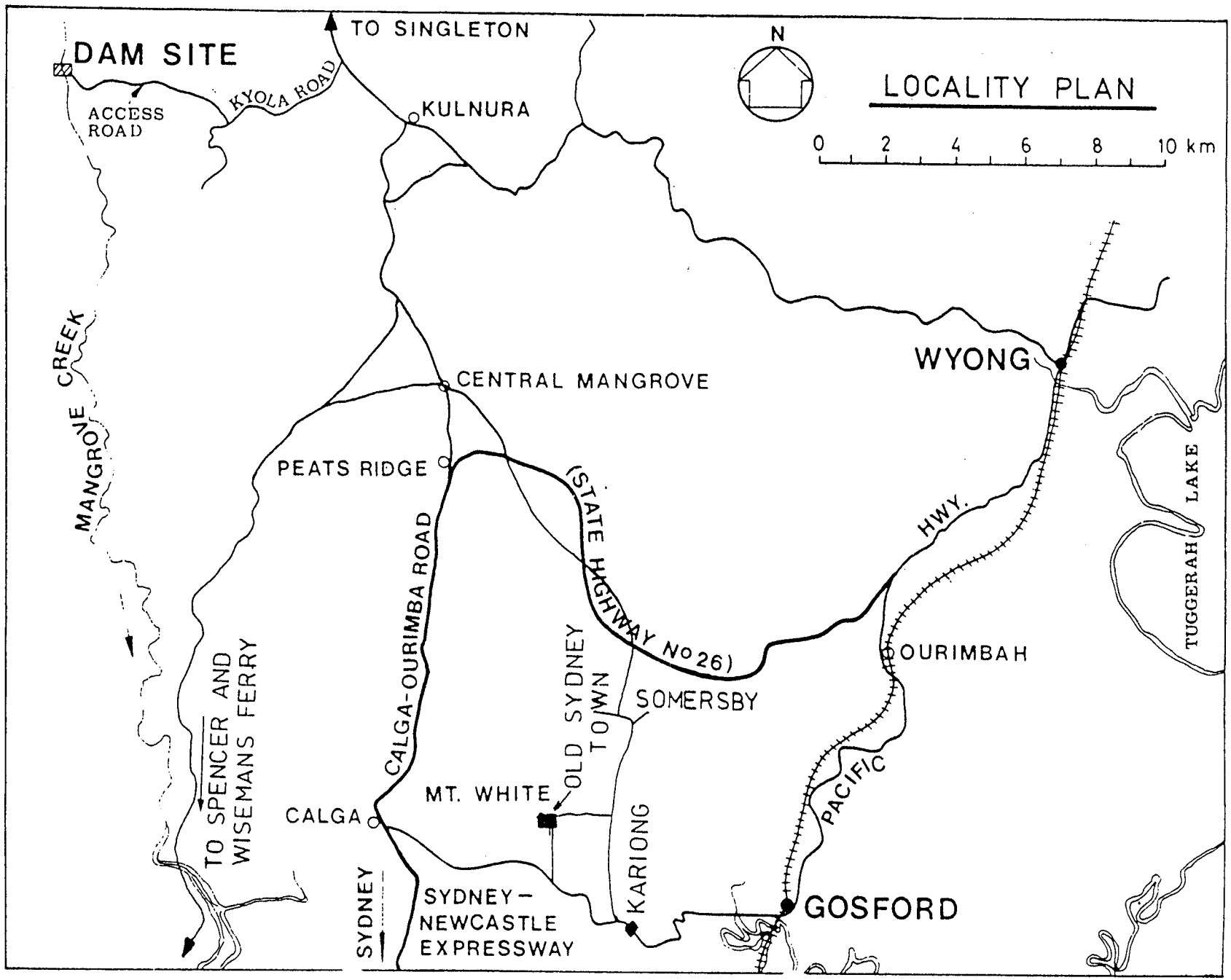
Mangrove Creek Dam is an 80 metre high rockfill dam, with a concrete face, which will store water for the City of Gosford and the Shire of Wyong. It is located approximately 50 kilometres north-west of Gosford, and will provide on-stream storage of water, which will be released upon demand to flow 20 kilometres downstream to the existing Mangrove Weir, from which water is currently pumped to Mooney Dam and then to Gosford, via the treatment plant at Somersby.

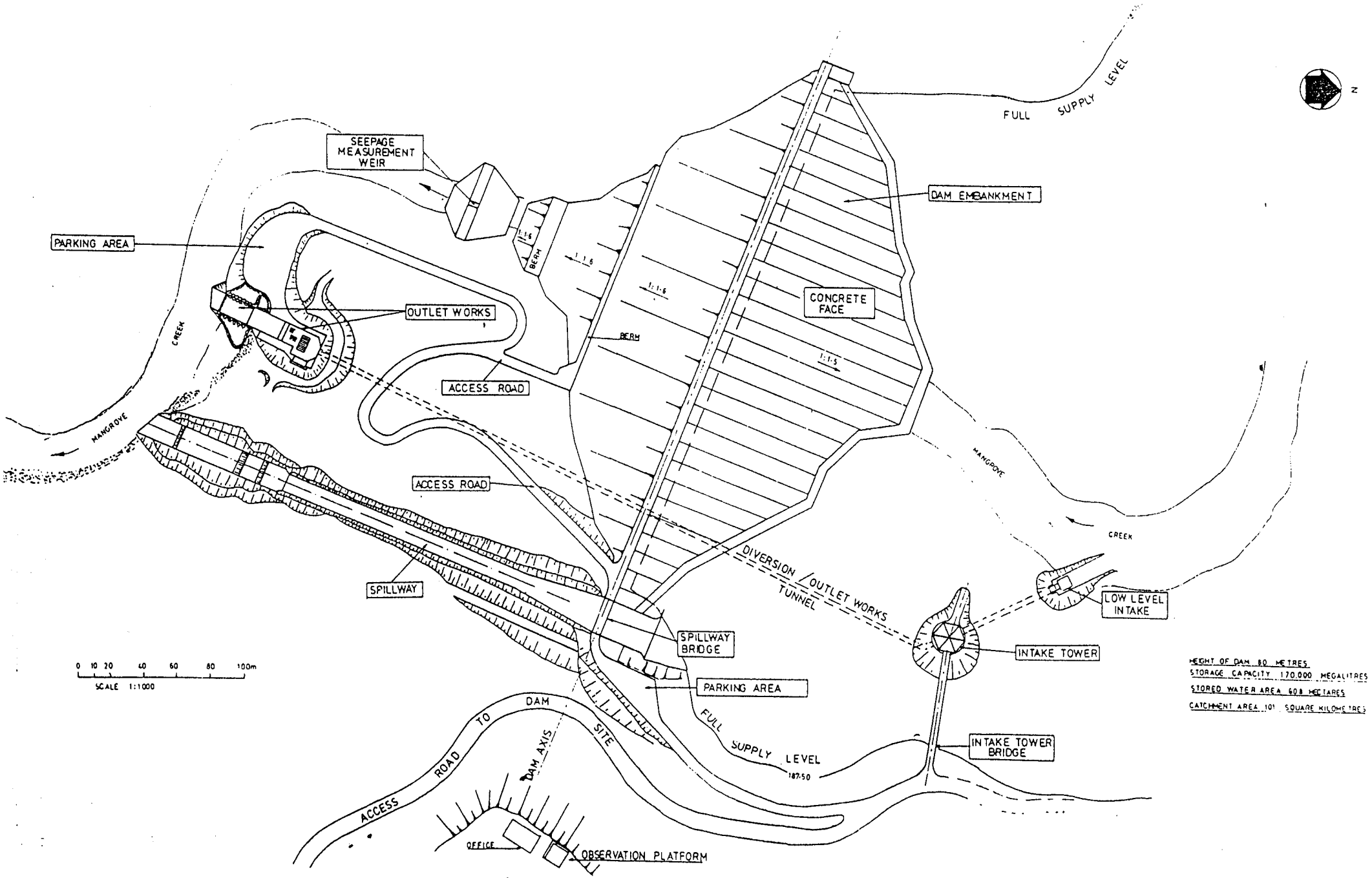
The catchment area of 10,000 hectares, or 100 square kilometres, is typical sandstone eucalypt bush and is bounded by George Downes Drive to the East, the St. Albans Road to the North and the Great North Road to the West. When completed, the Dam will be approximately 80 metres (260') high with a crest length of 380 metres (1,200'). The storage capacity of the dam will be approximately 170,000 megalitres (30% of the capacity of Sydney Harbour) and the stored waters will have a surface area of approximately 700 hectares (1,700 acres). Provision has been made in the current dam design for raising the dam a further 25 metres (80 feet), thereby increasing the capacity to 420,000 megalitres (approximately equal to the volume of Sydney Harbour), with a stored water area of 1,200 hectares or 3,000 acres. Construction of this stage is projected to commence in approximately 20 years time.

The suitability of various types of dam was examined in the early stages of the investigations. A concrete dam was ruled out on the basis of high costs and unsuitability of the site. Construction of an earth or clay core dam was not practical because of the insufficient quantity of suitable core material available in the locality. A rockfill type dam with an impervious membrane on the upstream face appeared to be the best solution. After comparing asphaltic concrete and reinforced concrete faced embankments, the latter type was selected as the most suitable, since the height of structure, the need for future raising of the dam, and cost comparisons all favoured this type.

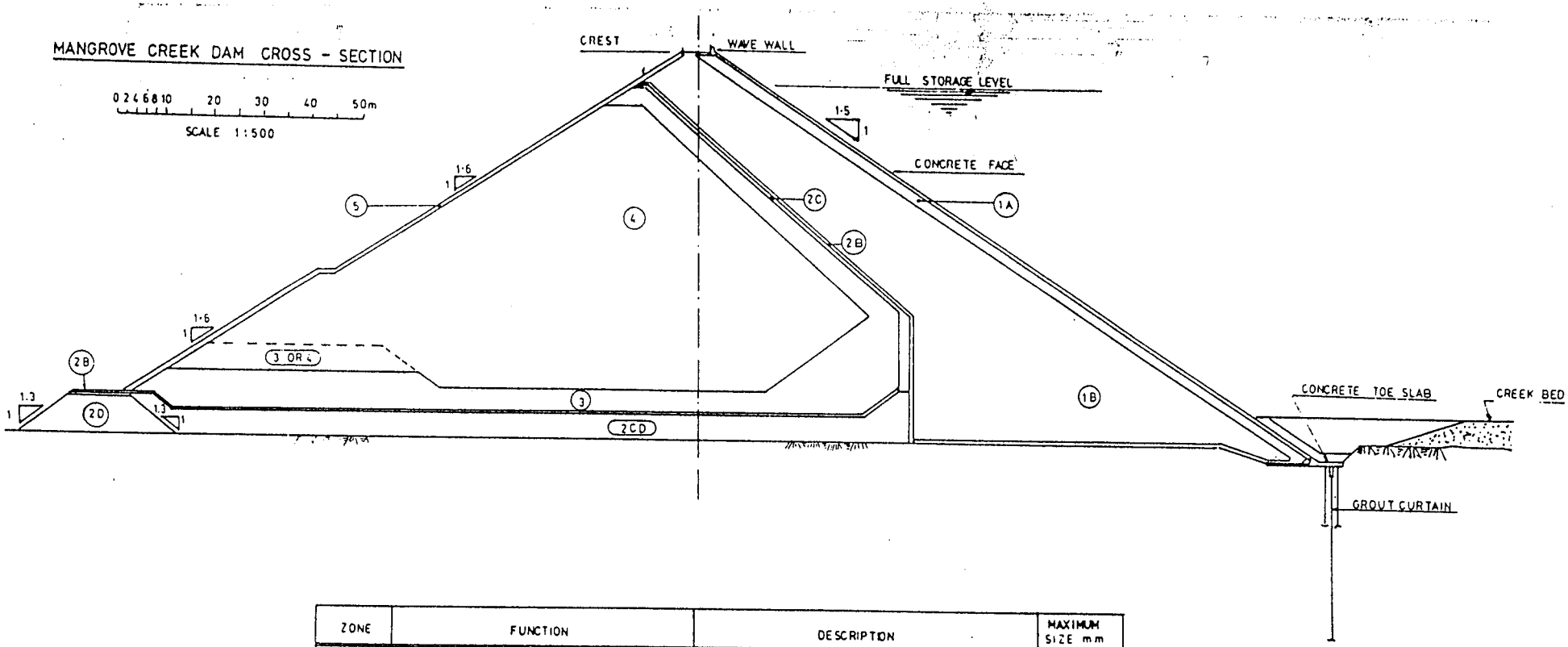
The dam is composed basically of rolled, soft rockfill, utilising the Narrabeen Group of sandstones and siltstones, of which 1.2 million cubic metres is required. This material is being obtained from a quarry located within the storage area. The embankment also contains approximately 100,000 cubic metres of processed basalt, obtained from quarries at Kulnura and Peats Ridge. This material is being incorporated into various filters and drains within the embankment to cope with seepage within the embankment and foundations. The concrete face which tapers from 600 mm at the base to 300 mm thick at the crest of the dam will contain approximately 13,500 cubic metres of concrete and cover an area of approximately 30,000 square metres.

The Spillway is located on the left abutment below the Resident Engineer's Office, and consists of a concrete lined channel, which varies in width from 20 metres to 10 metres. The channel is approximately 300 metres, (1,000') long, and will be used to carry overspill water when the dam is full. During construction, Mangrove Creek is being diverted through a tunnel in the left abutment. The tunnel is approximately half a kilometre long and 2.5 metres (8') in diameter. A 50 metre high Intake Tower, in conjunction with valves located at the downstream end of the tunnel, will facilitate the release of water from the dam into Mangrove Creek to supplement dry weather flows.


DAM SITE
ACCESS ROAD
KYOLA ROAD
TO SINGLETON
KULNURA
N
LOCALITY PLAN
0 2 4 6 8 10 km
MANGROVE CREEK
CENTRAL MANGROVE
WYONG
PEATS RIDGE
(STATE HIGHWAY No 26)
HWY.
TUGGERAH LAKE
CALGA-OURIMBA ROAD
OURIMBAH
TO SPENCER AND WISEMANS FERRY
OLD SYDNEY TOWN
SOMERSBY
MT. WHITE
CALGA
KARIONG
PACIFIC
SYDNEY
SYDNEY – NEWCASTLE EXPRESSWAY
GOSFORD


SEEPAGE MEASUREMENT WEIR
PARKING AREA
OUTLET WORKS
ACCESS ROAD
ACCESS ROAD
SPILLWAY
SPILLWAY BRIDGE
PARKING AREA
DAM EMBANKMENT
CONCRETE FACE
BERM
BERM
1:1·6
1:1·6
1:1·6
1:1·5
FULL SUPPLY LEVEL
CREEK
MANGROVE
MANGROVE
CREEK
DIVERSION / OUTLET WORKS TUNNEL
LOW LEVEL INTAKE
INTAKE TOWER
INTAKE TOWER BRIDGE
FULL SUPPLY LEVEL
187·50
ACCESS ROAD TO DAM SITE
DAM AXIS
OFFICE
OBSERVATION PLATFORM
N
0 10 20 40 60 80 100m
SCALE 1:1000
HEIGHT OF DAM 80 METRES
STORAGE CAPACITY 170,000 MEGALITRES
STORED WATER AREA 60.8 HECTARES
CATCHMENT AREA 101 SQUARE KILOMETRES

MANGROVE CREEK DAM CROSS - SECTION



ZONE	FUNCTION	DESCRIPTION	MAXIMUM SIZE mm
1A	SEMI - PERVIOUS ZONE	FRESH SILTSTONE	150
1B		FRESH SANDSTONE AND SILTSTONE	450
2A	FILTERS	FRESH BASALT	20
2B			75
2C	CHIMNEY DRAIN		300
2CD	BOTTOM DRAIN		600
2D	TOE DRAIN	FRESH BASALT FROM 100mm TO 1200 mm	1200
3	FREE DRAINING LAYER	FRESH SANDSTONE AND / OR SILTSTONE	600
4	RANDOM ZONE	FRESH OR WEATHERED, SANDSTONE AND SILTSTONE	450
5	DOWNSTREAM SLOPE PROTECTION	FRESH SANDSTONE FROM 600 mm TO 1200 mm	1200

6. Spillway Bridge

Length	20m
Width	4.7m kerb to kerb
Type	Single span composite pretensioned girders/RC deck

7. Intake Tower Bridge

Length	60m
Width	3.2m kerb to kerb
Type	Two span composite steel girder/RC deck

Stage I - Stage II comparison

	Stage I	Stage II
Storage Capacity at FSL	190,000 Ml	455,000 Ml
Maximum Water Depth	65 m	90 m
Surface Area	680 Ha	1,360 Ha
Embankment Height	80 m	105 m
Crest Length	380 m	490 m
Volume of Rockfill	1,340,000 m^3	2,740,000 m^3

LIST OF DAMS WHICH ARE EQUAL OR LARGER IN HEIGHT AND/OR CAPACITY

WHEN COMPARED WITH MANGROVE CREEK DAM

NAME	HEIGHT	CAPACITY MEGALITRES*	AUTHORITY
Jindabyne	72 m	688,287	S M E C
Burrendong	76 m	1,188,000	S M E C
Glenbawn	78 m	360,000	W R C
Mangrove Creek Dam	**80 m**	**190,000**	**P W D**
Nepean	81 m	81,400	M W S & D B
Devils Gate	84 m	180,000	H E C
Wyangla	85 m	1,220,000	W R C
Tumut Pond	86 m	52,793	S M E C
Upper Yarra	89 m	207,200	M B of W Vic
Gehi	91 m	21,043	S M E C
Blowerang	112 m	1,628,000	S M E C
Eucumbene	116 m	4,798,400	S M E C
Warragamba	137 m	2,091,800	M W S & D B

* One megalitre is one million (1,000,000) litres which is approximately two hundred thousand (200,000) gallons

GOSFORD CITY COUNCIL

MANGROVE CREEK DAM

Data Sheet

Stage I

1. General

Type of Dam	Concrete Faced Rockfill
Full Supply Level	RL 187.5m
Minimum Operating Level	RL 152.5m
Maximum Flood Level	RL 193.2m
Wave Wall Level	RL 194.5m
Crest Level	RL 193.3m
Catchment Area	101 km_2
Average Annual Rainfall	1200mm
Storage Capacity at FSL	190,000 Ml
Surface Area	680 Ha
Maximum Water Depth	65m

2. Embankment

Height of Dam (from lowest general foundation level to crest)	80m
Length of Crest	380m
Crest Width	6m
Volume of Rockfill	1,340,000m^3

3. Spillway

Width	20m tapering to 10m
Length	240m
Type	Concrete lined chute
Discharge Capacity	570m^3/s
Energy Dissipation	Flip Bucket

4. Intake Tower

Height	47m
Type	Wet Well (Selective withdrawal by in line shutter system)

5. Outlet Works

Tunnel Lining	Concrete and Mild Steel
Diameter	2.5m
Length	490m
Valves -	
Two Butterfly Valves	2000 and 900mm diameter
Two Fixed Dispersion Cone Valves	1524 and 530mm diameter