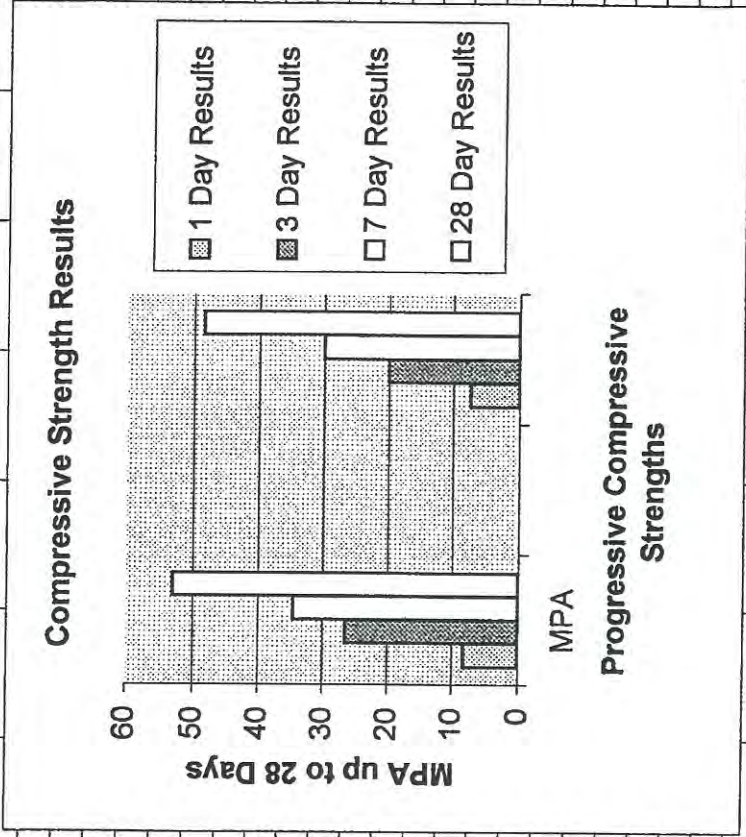


Test Results - Inner City Bypass Trials

MIX DESIGN - XYPEX		MIX DESIGN - TYPICAL		
S40MRXYP		N402GMRS		
AGE	COMPRESSIVE STRENGTH	COMPRESSIVE STRENGTH		
1 Day	8.2	7.3		
3 Day	26.5	20		
7 Day	34.5	30		
28 Day	53	48.5		
Xypex Mix Results 3 x samples cast		Mix Details August/Sept 2000		
1 Day	8.4	GP Cement - 260kg		
	8	Fly Ash - 110 kg		
	8.4			
3 Day	27	Water Reducer dosage 300ml per 100kg cementitious content		
	26			
	27			
7 Day	34.5	Water/Cement Ratio 0.42		
	35.5			
	33.5			
28 Day	53			
	53			
	52.5			



Test Results - Inner City Bypass Trials

MIX DESIGN - XYPEX S40MRXYP

MIX DESIGN - TYPICAL N402GMRS

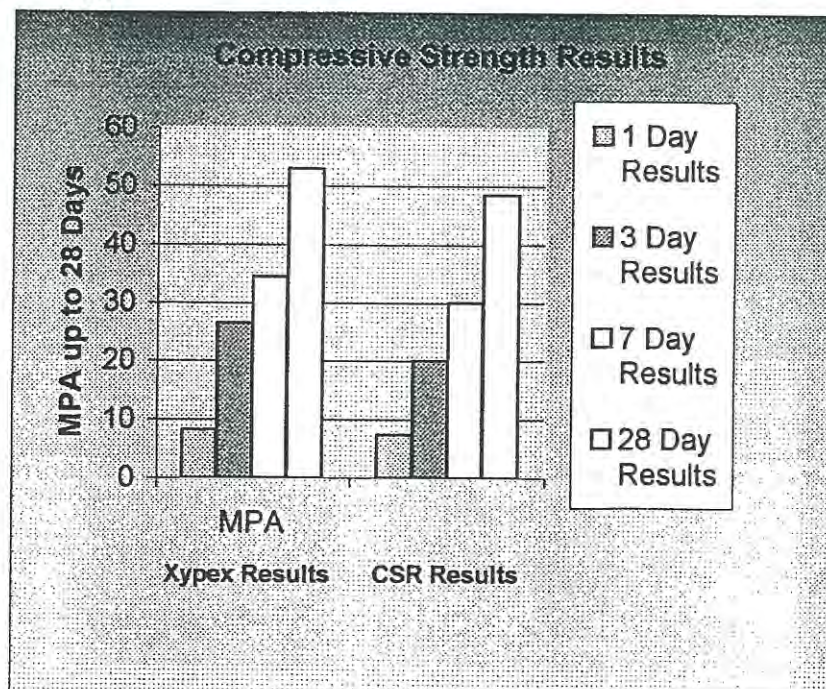
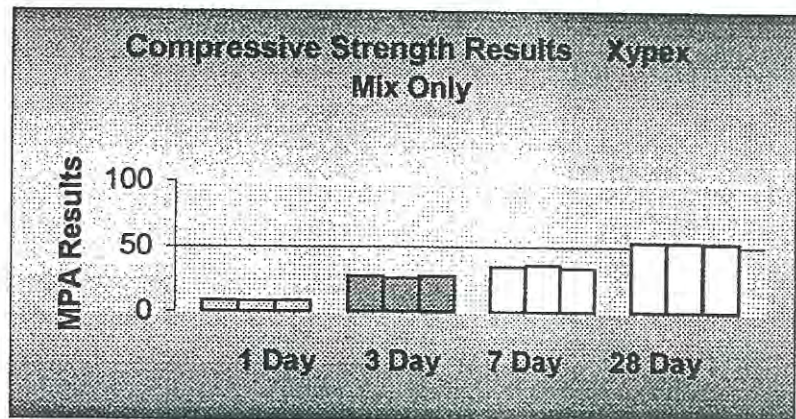
Mix Details
August/Sept 2000

AGE	COMPRESSIVE STRENGTH	COMPRESSIVE STRENGTH	GP Cement - 260kg Fly Ash - 110 kg
1 Day	8.2	7.3	Water Reducer dosage
3 Day	26.5	20	300ml per 100kg
7 Day	34.5	30	cementitious content
28 Day	53	48.5	

Water/Cement
Ratio 0.42
Xypex Admix C1000NF
dosed @ 0.8%
of total cementitious
content per m3

Xypex Mix Results 3 x samples cast

1 Day	8.4 8 8.4
3 Day	27 26 27
7 Day	34.5 35.5 33.5
28 Day	53 53 52.5

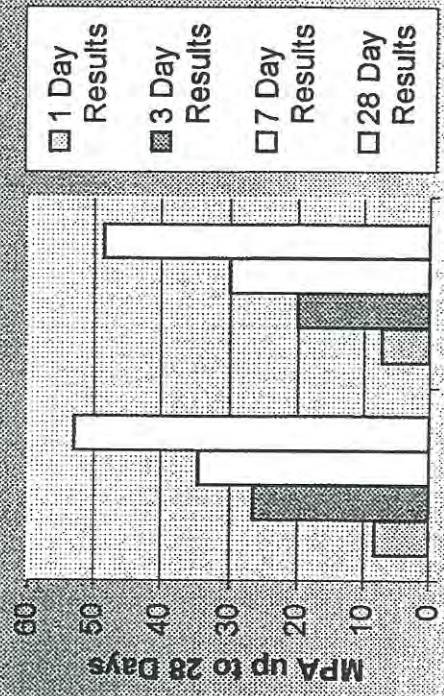


Results
Xypex Mix Trial Only

Test Results - Inner City Bypass Trials

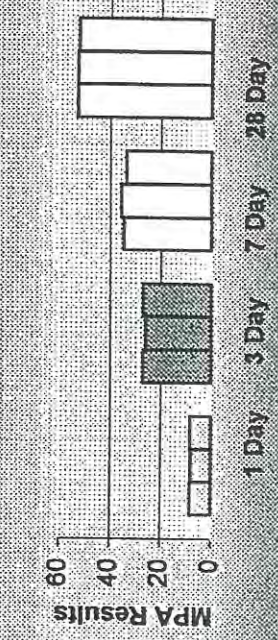
	MIX DESIGN - XYPEX S40MRXYP	MIX DESIGN - TYPICAL N402GMRS
AGE	COMPRESSIVE STRENGTH	COMPRESSIVE STRENGTH
1 Day	8.2	7.3
3 Day	26.5	20
7 Day	34.5	30
28 Day	53	48.5
	Xypex Mix Results 3 x samples cast	Mix Details August/Sept 2000
1 Day	8.4	GP Cement - 260kg
	8	
	8.4	Fly Ash - 110 kg
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	26	
	27	
7 Day	34.5	Water/Cement Ratio 0.42
	35.5	
	33.5	
28 Day	53	Xypex Admix C1000NF dosed @ 0.8% of total cementitious content per m3
	53	
	52.5	

Compressive Strength Results



Xypex Results CSR Results

Compressive Strength Results Xypex Mix Only



Results
Xypex Mix Trial Only

[illegible]

(XYPEX Form No 003)
(10-07-98) Ed. 2

LEIGHTONS INNER CITY BYPASS TRIAL

fax to: Maria 3266 6406

Date: 14-Aug-00
Time: 16:10

SAP SOUTHEAST QUEENSLAND (BCSDPM)
Ticket Detail Report

Page 1
CD/3E

Selection: Date MONDAY, 14-Aug-00 only
Ticket 17052137 only, Shipping plant number 3 only
Sequence : Weights report

Ticket Number	Plant No.	Truck No.	Batch	Mix Design	Slump	Hot Water	Amount	Design	Actual	Variance Unit	Percent	Mix Code
Plant 03 CROSBY RD												
17052137	67	01 of 01	S40HXYYP	80			03.00	03.00	03.00	0	0.00%	390PPE01
			PET20					002370	002380	10	0.42%	
			PET10					001071	001050	-21	-1.96%	
			TIVCS					001491	001500	9	0.60%	
			OXCFSW					001023	001040	20	1.96%	
			SULGP					000001	000006	5	0.62%	
			TARFA					000333	000340	7	2.65%	
			WR					003420	003400	-20	-0.58%	
			WATER					000200	000192	-8	-4.00%	

1 Ticket(s) on report

batch water = 2000 l \therefore 67 l/m³
 Slump stand + onsite = 50 + 40 l \therefore 30 l/m³
 materials = 60 l/m³
157 l/m³
 \therefore 0.42 w/c ratio

PRE CONCRETE POUR CHECKLIST

XYPEX ADMIX C-1000NF / C-2000NF

Date: 14/09/00

PROJECT NAME: Inner City Bypass

Location: Land Bridge - wing walls

Client: Leighton Contractors

Contact: Matt Killen

Address: off Gregory Terrace
(Centenary Pool)

Phone: 38722600

Fax:

CONCRETE COMPANY: CSR Readymix Concrete

Plant: Albion - Crosby Road, Albion

Batcher: Greg Hines

Phone:

Fax:

PLANT STAFF BRIEFING

XYPEX dose rates and mixing sequence checked

Use of other admixtures checked and possible effects explained

Contingency in place for possible plant breakdown or other batchers being aware of XYPEX requirements

MB

yes

MB

yes

MB

yes

MIX DESIGN DETAILS

1. Design strength: N40 mpa

Mix code: N40MR6X4P
(if possible supply mix design)

2. Total water (m³)

3. Total cementitious (m³): 380

4. Cement type (eg. Blend, F.A., Slag, SL): GP + ASH

5. Other admixtures WATER REDUCER

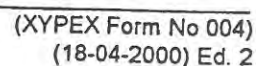
- Type GWR - GRACE AUST.

Dosage 300ml per m³

6. Xypex Admix Dose rate 3kg per 1m³ C-1000NF / C-2000NF (Circle product used)

Estimated total cubic metres to be dosed 5m³

XYPEX Applicator to sign Maria Bobeldyke (Print name) MARIA BOBELDYKE





DELIVERY DETAILS

(Where the applicator is providing on-site supervision)

Page No:..... of.....

[illegible]

N.B. Insert Pre-cast panel numbers in Remarks column

ON SITE CHECKLIST

(To be completed during on site supervision)

Project name: Inner City Bypass Pour / Casting No: Trial 14/09

1. To be answered and confirmed by responsible party, ie Site Supervisor / Project Engineer.

Reinforcement :

Design and placement conforms to requirement of AS 3600 –1994 or other pertinent standard / requirement where applicable.

Confirmed by:

(Signature) (Print Name)

(Position) (Date/Time) WINDHAUS – 14/09/00

2. To be answered and confirmed by Concrete Placement Supervisor:

Formwork:

Inspected – clean... yes Yes / No

Concrete Placement:

- Notate delays that may / will result in "cold joints"..... N/A
- If cold joints occurred what action taken..... N/A

Vibration:

Adequate vibration undertaken to conform to requirements. LS

Confirmed by:

(Signature) (Print Name)

(Position) (Date/Time)

ON SITE CHECKLIST

(To be completed during on site supervision)

Project name: Inner City Bypass Pour / Casting No: Trial 14/09

To be answered and confirmed by XYPEX Applicator.

3. Did temperature during placement reach or exceed 25° Celcius: (Yes) / No.
4. Was aliphatic alcohol employed? Yes / (No) FORMED WALL
5. Surface finish included "power trowel" or equivalent hand finishing: (Yes) / No
6. Was a subsequent finish applied? eg broom Yes / No (If Yes describe)
Concrete placed into formed wall. Surface hand trowel

7. Curing:

Time of commencement of curing... N/A

Duration and frequency if applicable... N/A

Who conducted curing eg Contractor, applicator? N/A

Type: Water / Curing compound If water, how applied, eg sprinkler, hand, hessian etc

If curing compound, Type..... Comply to AS 3799. Yes / No

8. Inspections:

Inspection performed (list time/date) TRIAL MIX Poured TO TAKE COMPRESSION CYLINDERS & SINKAGE BARS

Notate observation from inspections eg, No cracking evident

Cracking notated, treated with XYPEX Concentrate etc.

Confirmed by XYPEX Applicator:

(Signature) M. Bebel dyk (Print Name) MARIA BEBELDYK

(Company) Xypex Australia (Date/Time) 14/09/00 2.00pm

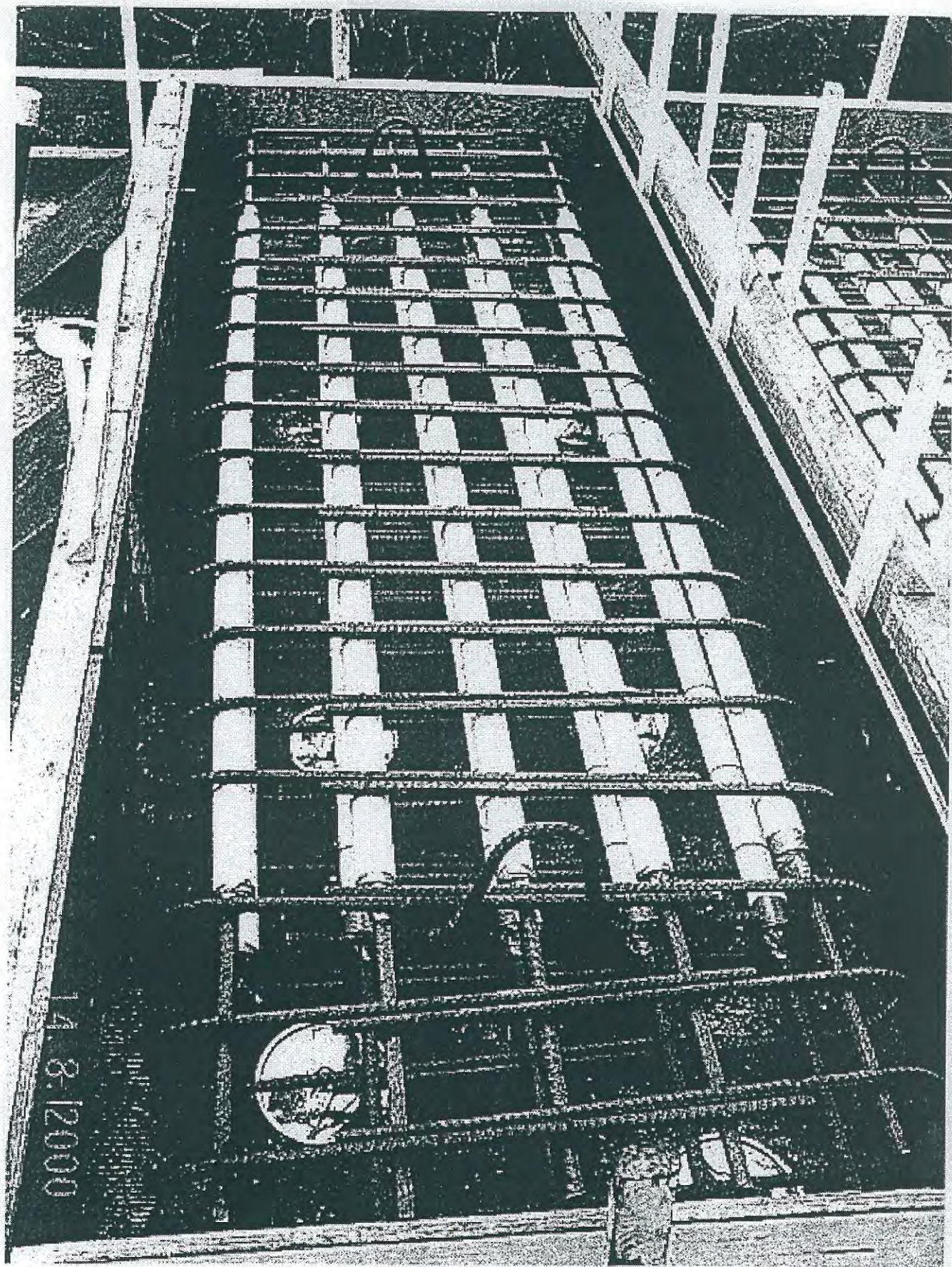
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Reproduction of CSR Readymix Batch Ticket for Xypex trials

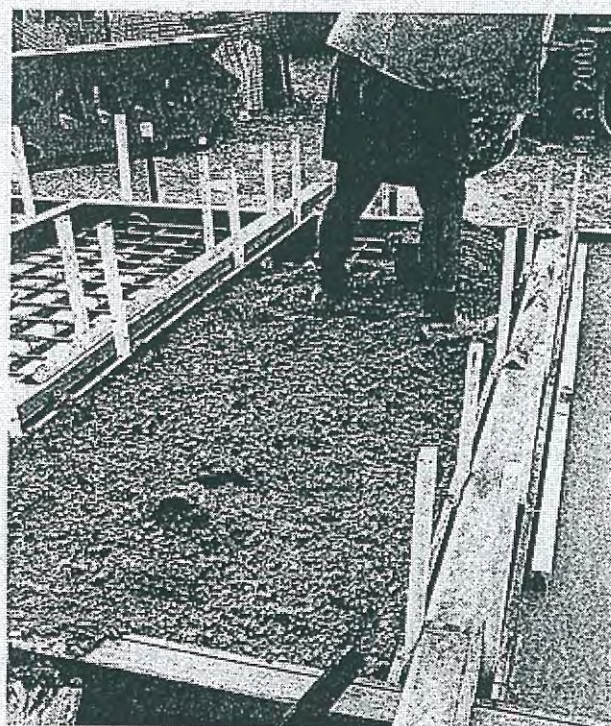
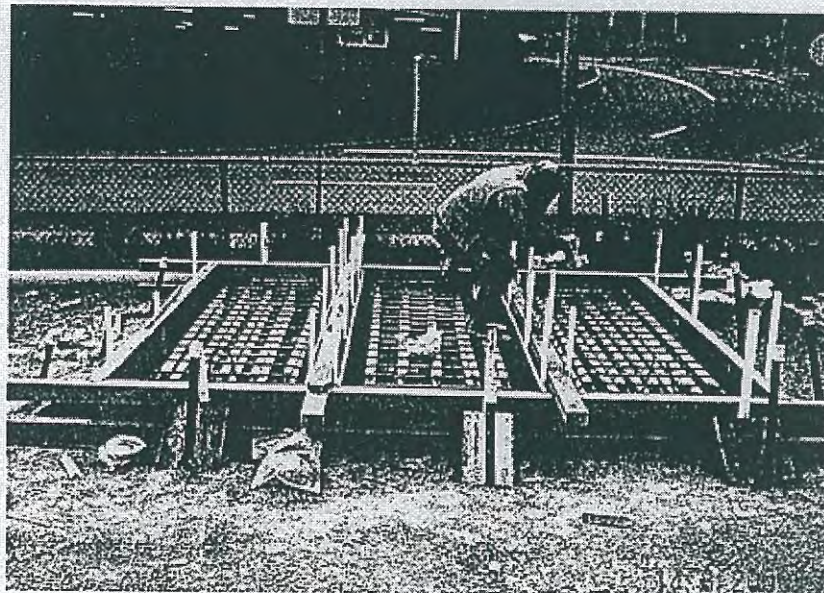
Selection:	Date THURSDAY 14-Sep-00 only												
Sequence:	Ticket 17055174 only, Shipping plant number 3 only												
	Weights report												
Ticket number	Plant No.	Truck No.	Batch	Mix Design	Slump	Hot Water	Amount	Design	Actual	Variance Unit Percent			
Plant 03 Crosby Road													
17055174		826	01 of 01	N402GMRS	100		04.60	04.60	04.60	0	0.00%		
				PET 20				003638	003630	-8	-0.22%		
				PET 10				001628	001630	2	0.12%		
				TIVCS				002281	002290	9	0.39%		
				OXCFSW				001550	001560	10	0.65%		
				BULGP				001242	001248	6	0.48%		
				TARFA				000529	000538	9	1.70%		
				WR				005313	005300	-13	-0.24%		
				WATER				000350	000356	6	1.71%		
				HWR				009200	009150	-50	-0.54%		
				Measured slump	110								
				Available water from materials									
				Batch water			246	litres					
				Slump stand			350	litres					
				On-site			65	litres					
							0	litres					
				TOTAL WATER			661	litres					
				Total cementitious			1786						
				W/C ratio =			0.37	compared with 0.47 design					
								Note reduced due to s/p					

Xypex batch docket Trial 2 N40
3/7/2001

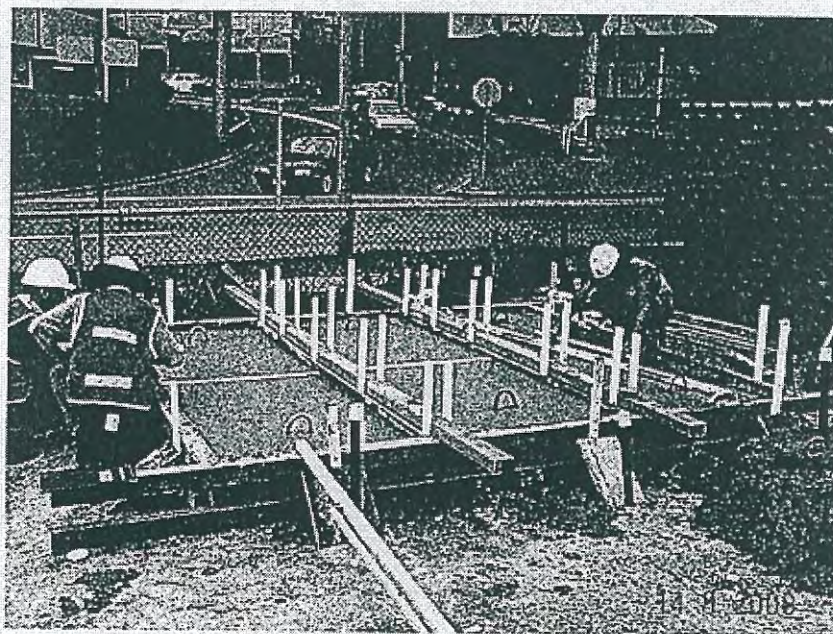
Page 1 of 1



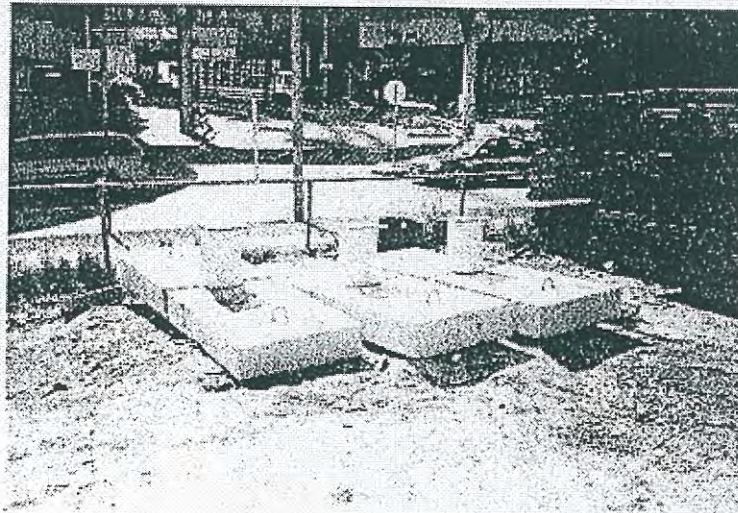
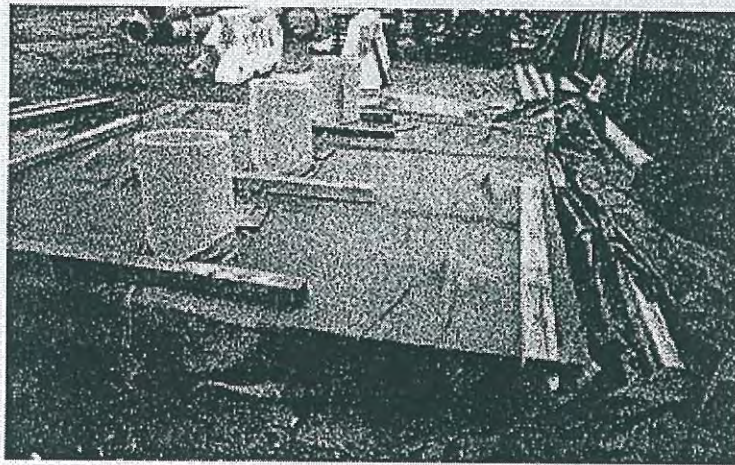
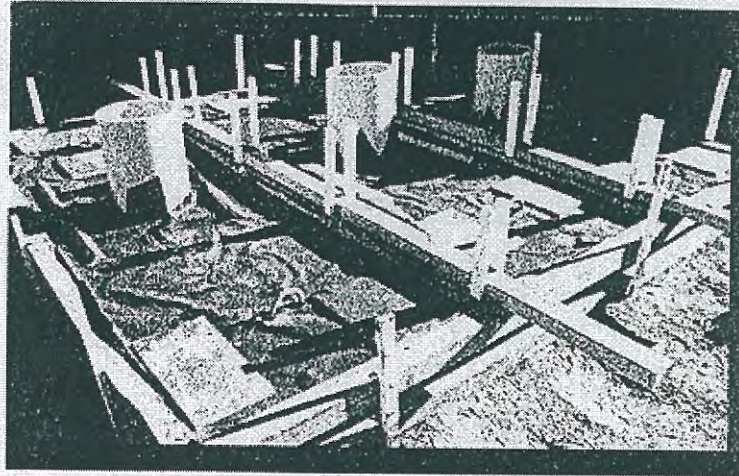
TRIAL PANELS

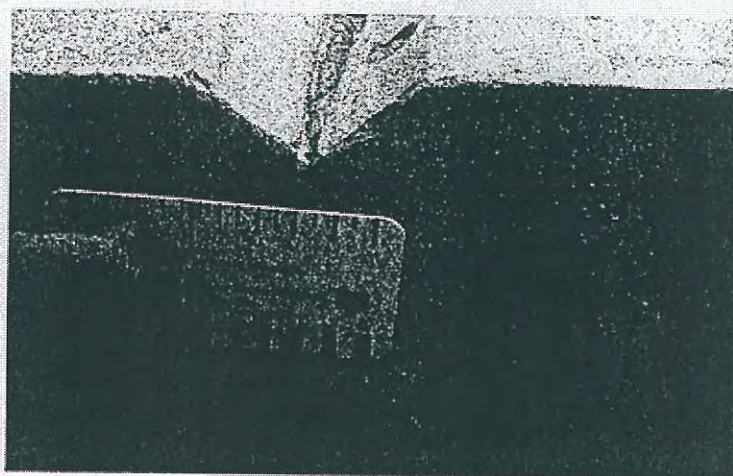


TRIAL PANELS



TRIAL PANELS

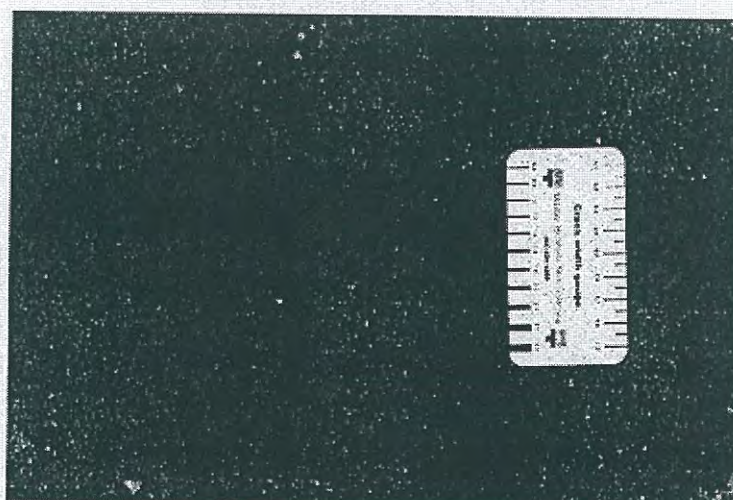




Test Panel – Side View

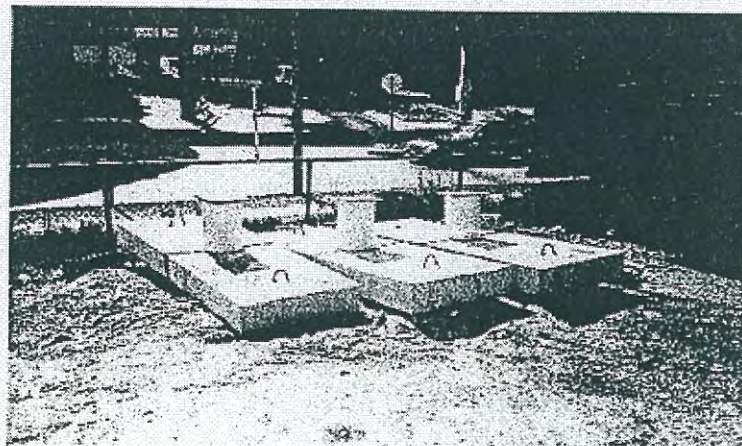
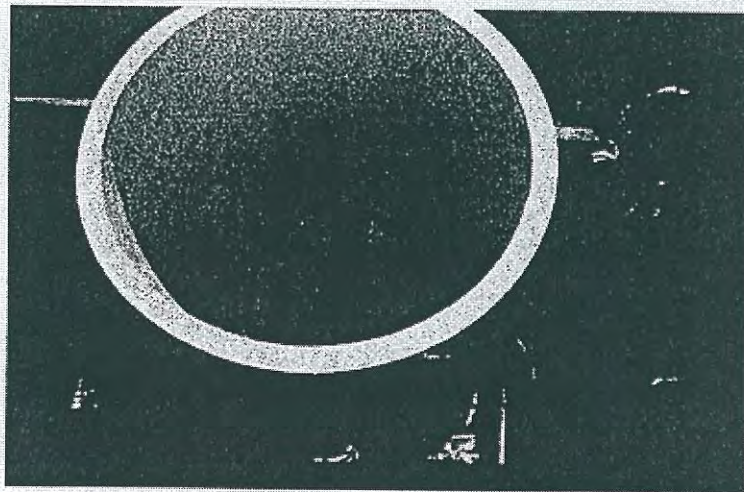
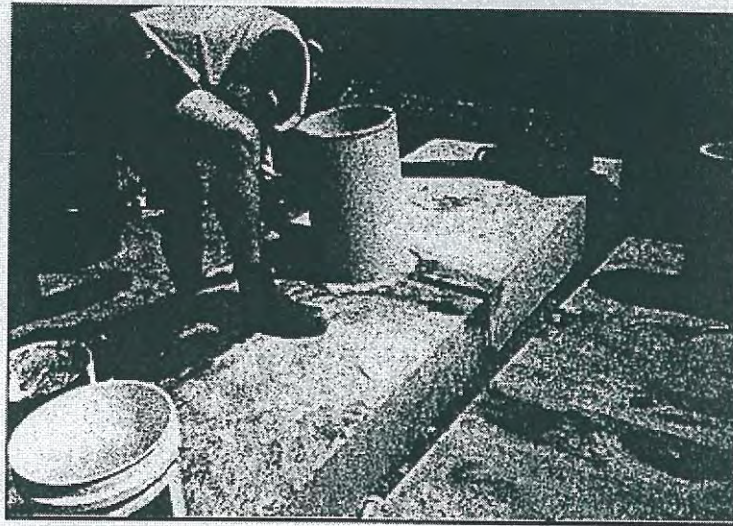


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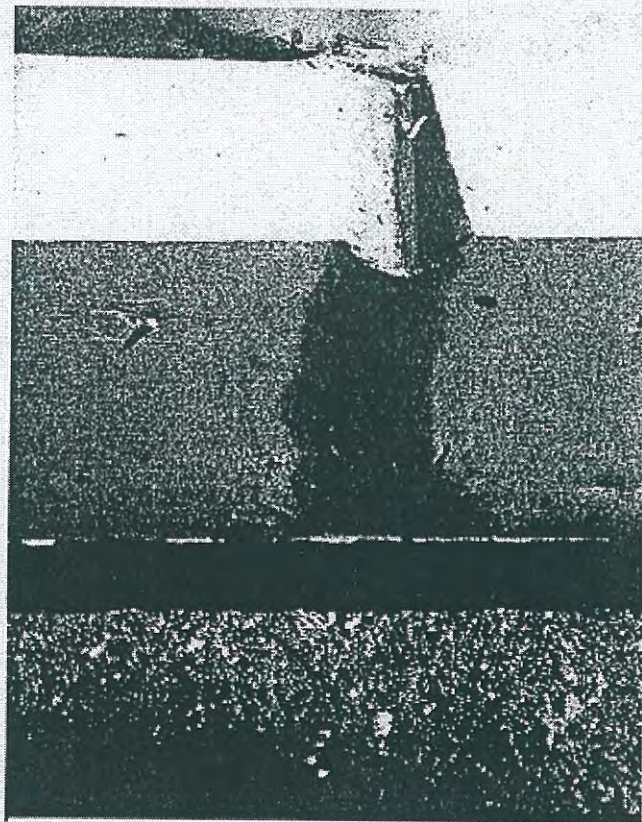
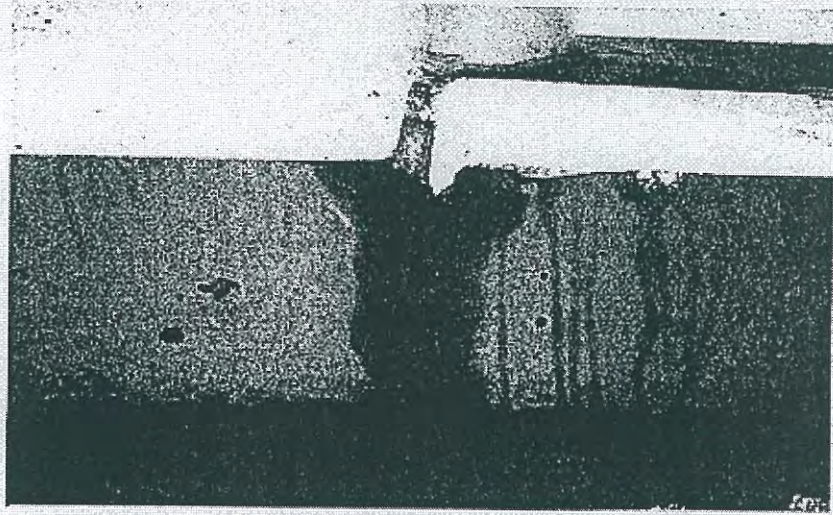


Test Panel - Surface View

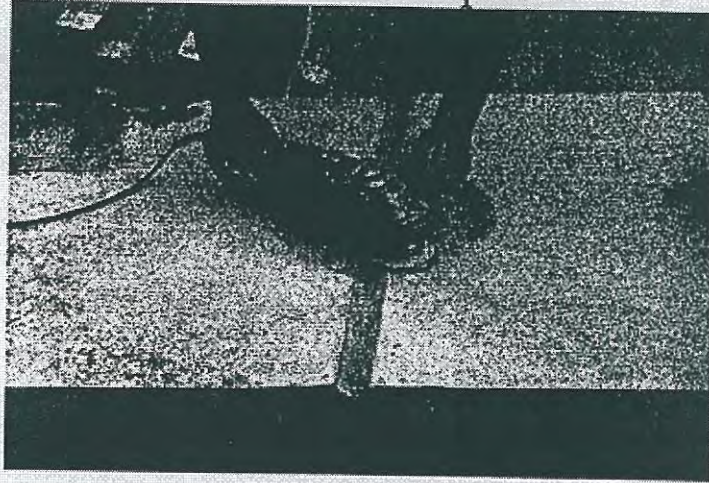
TRIAL PANELS



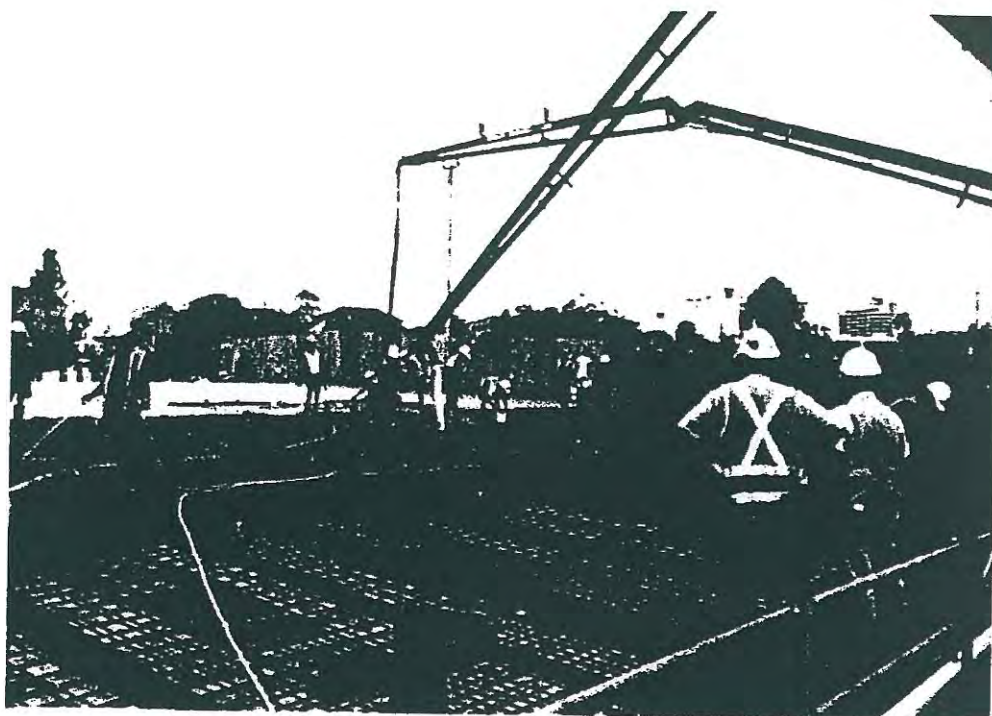
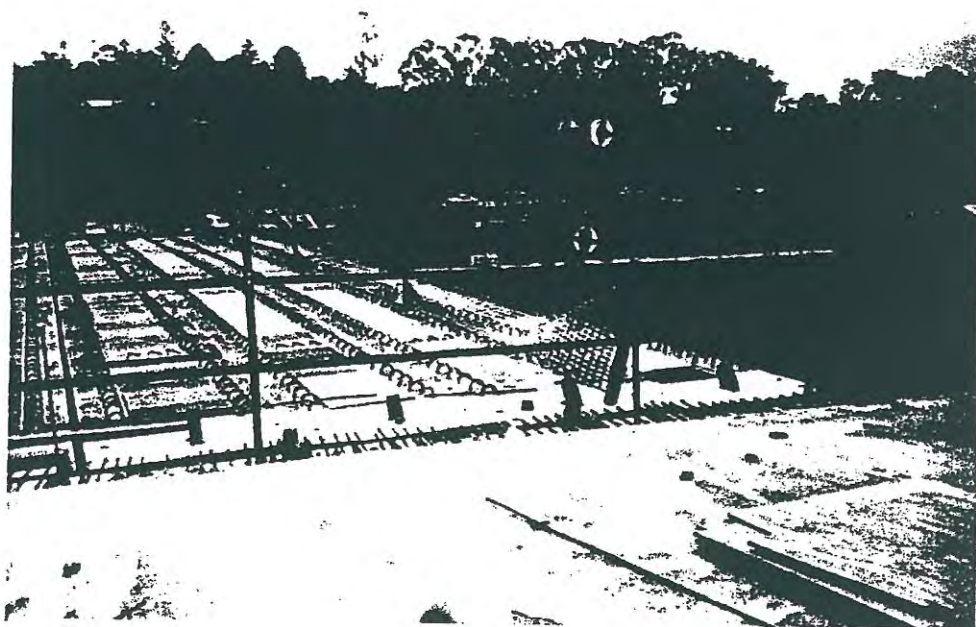
TRIAL PANELS



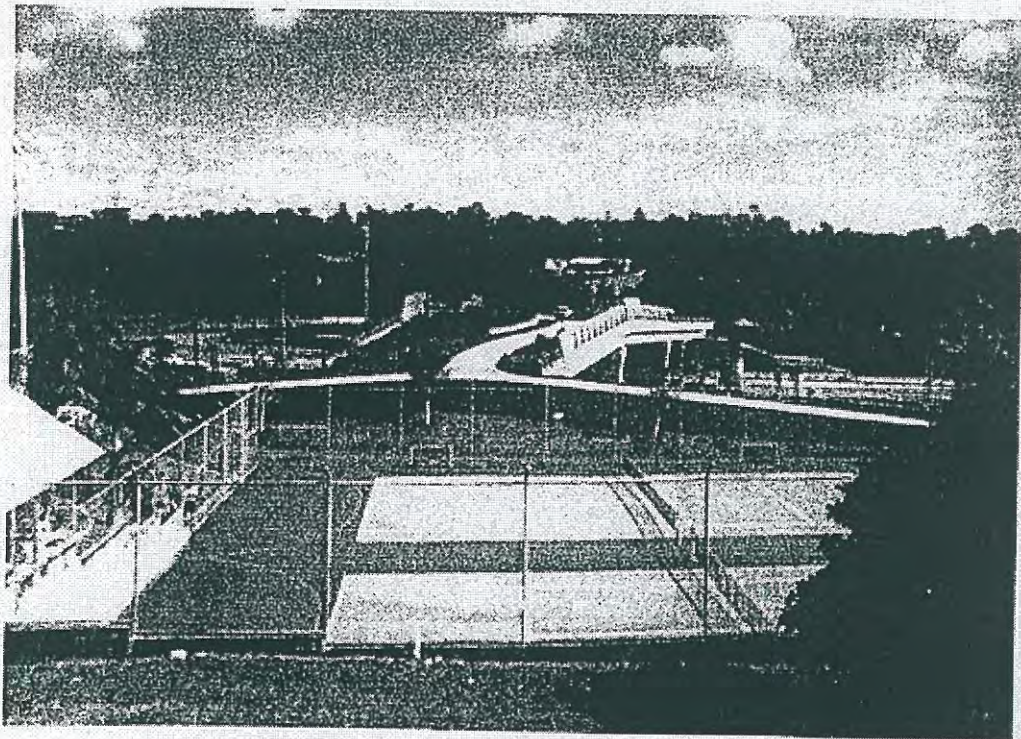
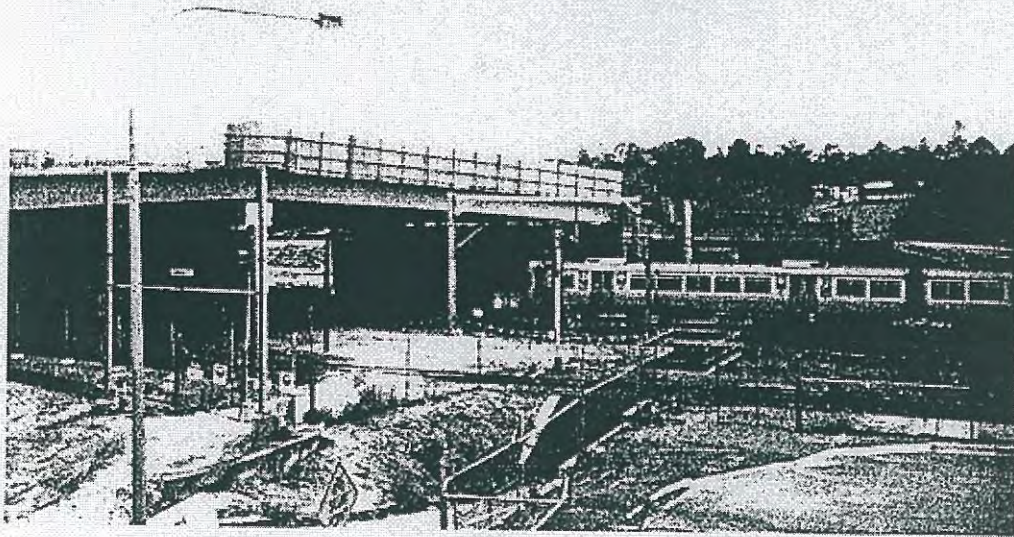
Trial Panel Repairs



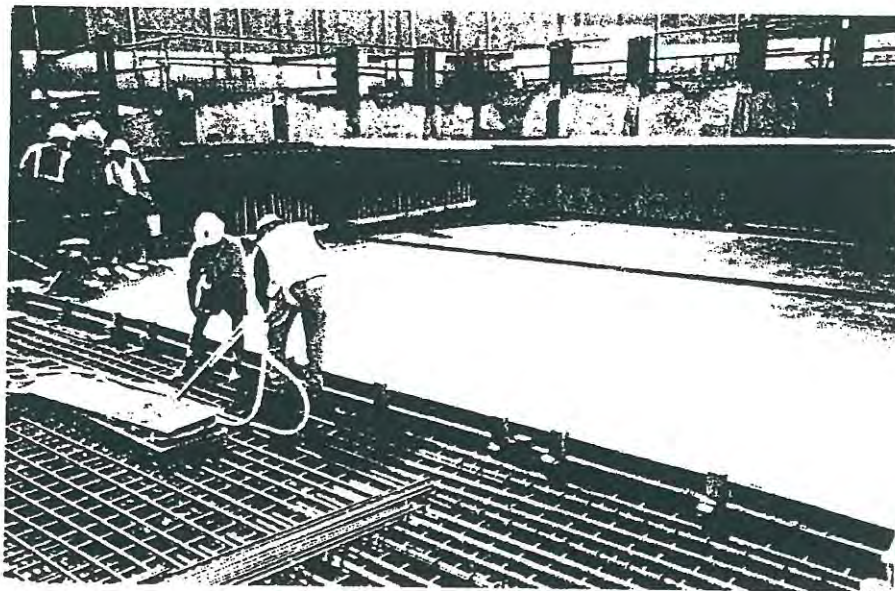
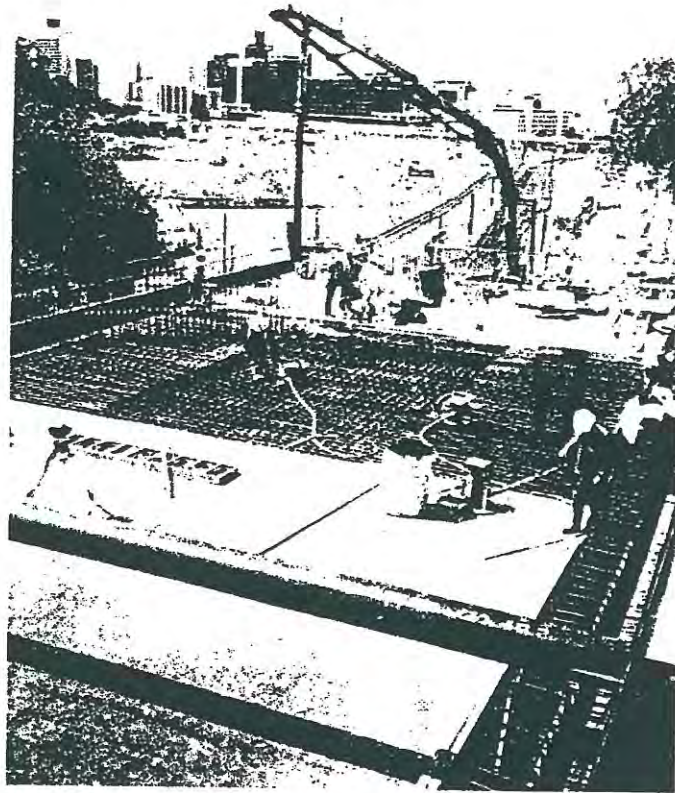
LANDBRIDGE



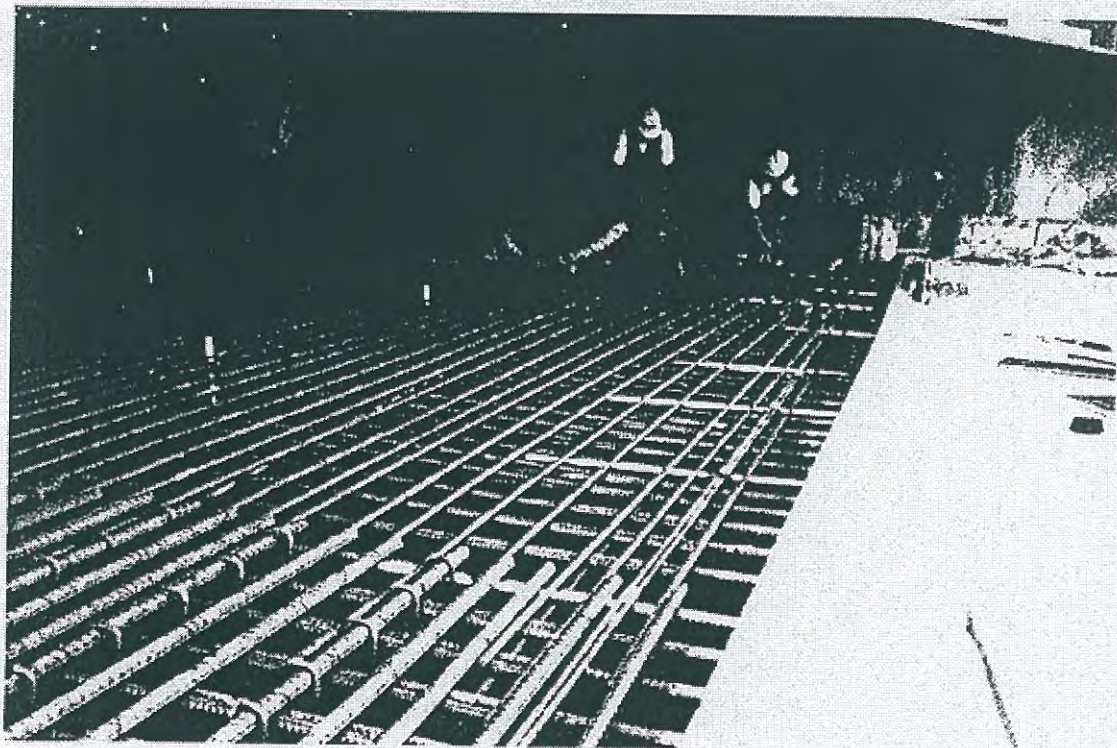
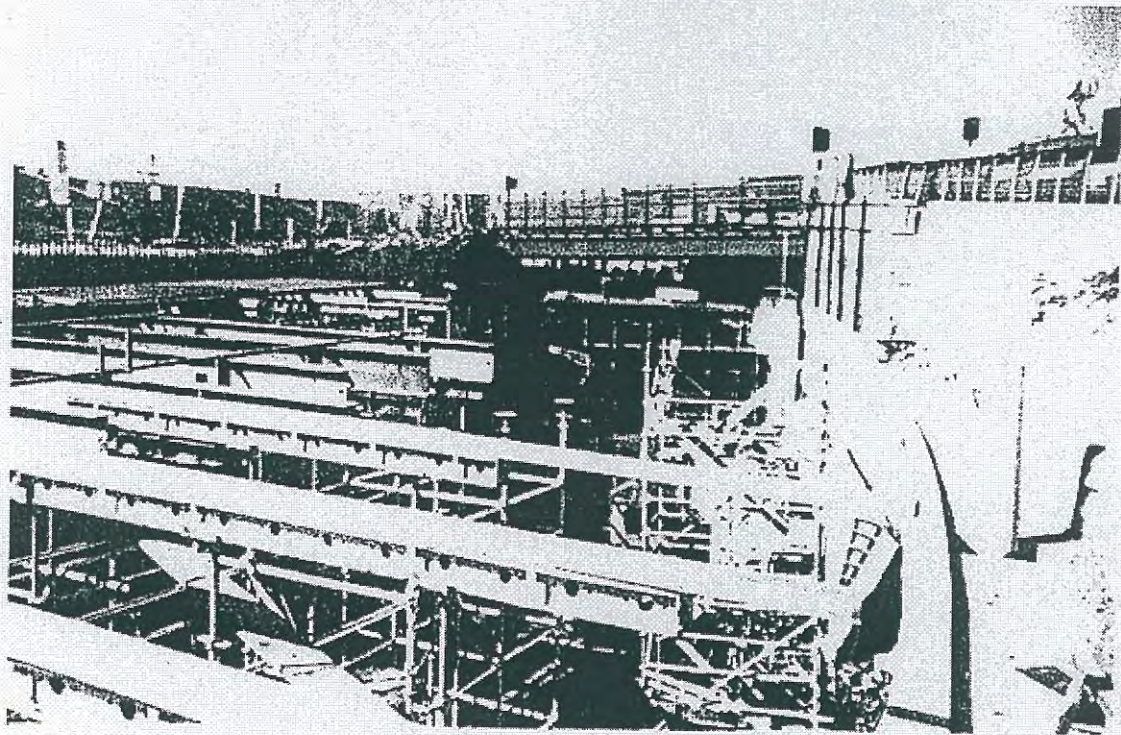
LANDBRIDGE



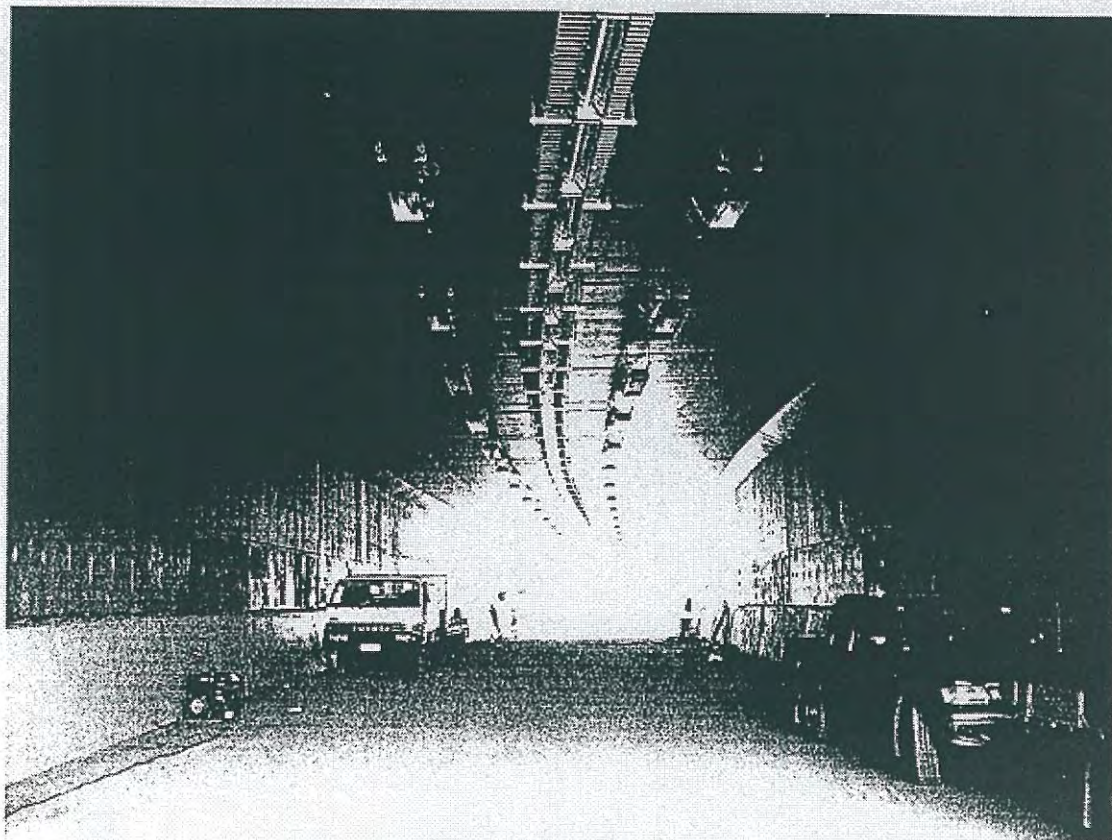
INNER NORTHERN BUSWAY TUNNEL



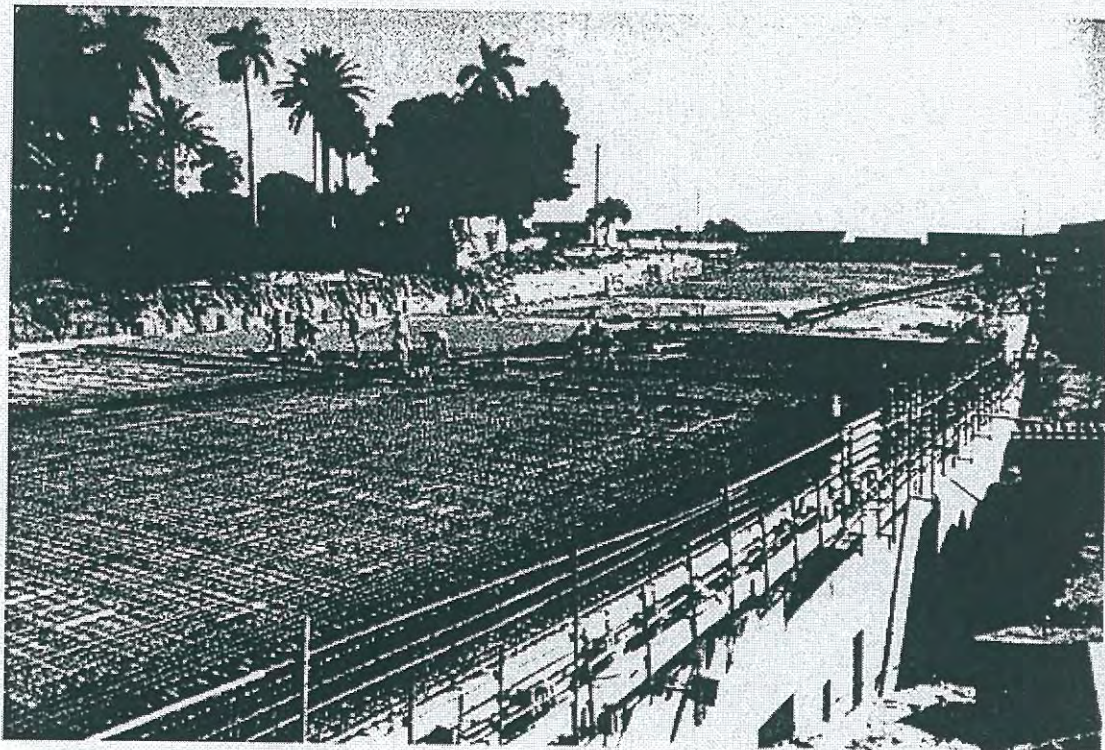
INNER NORTHERN BUSWAY – INB



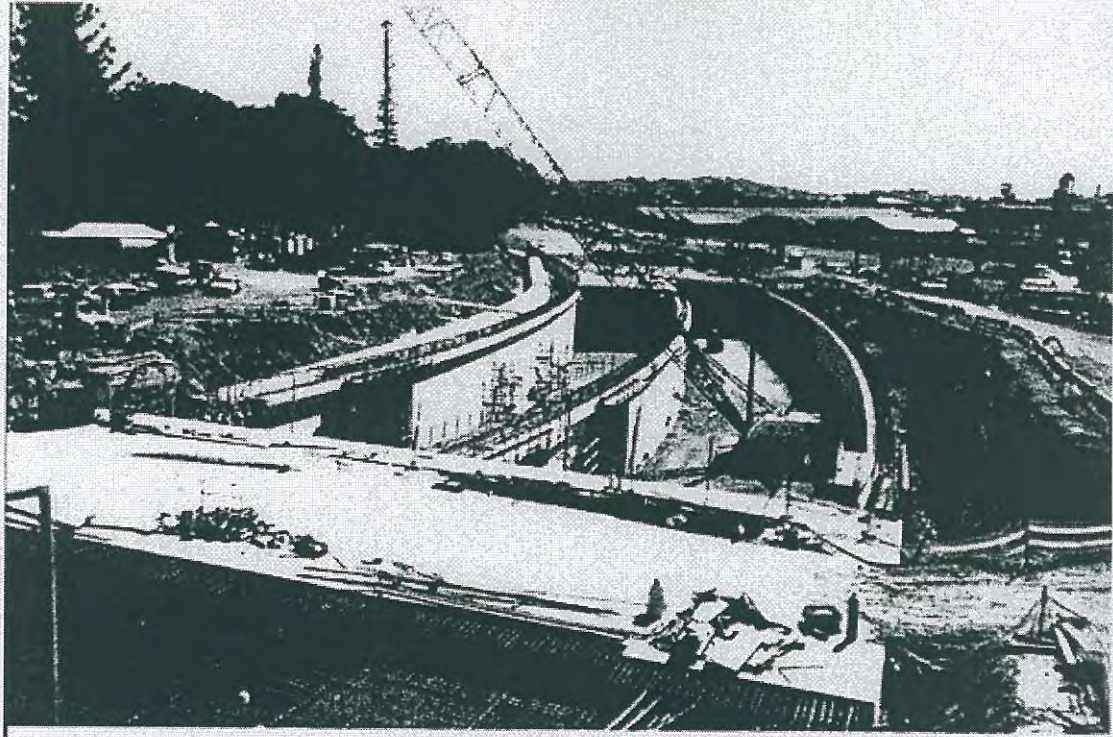
INNER NORTHERN BUSWAY TUNNEL



RNA TUNNEL



RNA TUNNEL



**Draft for consideration
To be used in conjunction with written workmanship warranty
from applicator**

WARRANTY

PROJECT:

APPLICATOR:

1. Concrete Waterproofing Manufacturing Pty Ltd, hereinafter called the Manufacturer warrants that the material as sold by the Manufacturer to the Supplier, shall be free from material defects and will be consistent with the Manufacturer's normal quality and manufacturing specifications.
2. The Manufacturer agrees to replace with a normal quality or, at the Manufacturer's option, refund the purchase price of any material sold that is either proven defective or fails to be consistent with Manufacturer's normal manufacturing specifications, provided the material has been stored and applied in accordance with the Manufacturer's written instructions. The Manufacturer shall not be liable for any direct, indirect or consequential cost, loss or damage however incurred or caused, including but not limited to damages for personal injury or death, damage to property or loss of profits.
3. This Warranty is void if the materials sold are applied by persons not authorized by the Manufacturer, or if the materials sold are applied more than 1 year after date of supply from the Manufacturer, or if the materials sold are improperly stored, altered, repaired or tampered with. This warranty expires year(s) from the date the materials are supplied to:
.....(INSERT APPLICATORS DETAILS HERE)

THIS WARRANTY IS ISSUED IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND ALL OTHER OBLIGATIONS AND LIABILITIES ON BEHALF OF XYPEX AUSTRALIA.

Dated this day of 2000



45 Union Road, PO Box 255
Lavington, NSW 2641, Australia

Concrete Waterproofing Manufacturing Pty Ltd
T/A XYPEX AUSTRALIA ACN 060 139 968

Telephone: 02 6040 2444
Facsimile: 02 6040 2411

STANDARD CONCRETE WATERPROOFING SPECIFICATIONS XYPEX ADMIX C-1000NF / C-2000NF

1. GENERAL

- 1.1 Summary:** This specification covers the requirements for waterproofing of all new concrete structures (as described in AS 3600 – 1994)

References:

- a. AS 3600 – 1994
- b. AS 3799 – 1990
- c. CIA Z9 Recommended Practice Curing of Concrete

- 1.2 System Description:** The concrete waterproofing material shall be manufactured by Concrete Waterproofing Manufacturing Pty Ltd trading as XYPEX Australia, and shall be of the cementitious crystalline type known as "XYPEX Waterproofing by Crystallization", (no known equal). The product chemically controls and permanently generates non-soluble catalytic multiplicative crystalline fibres throughout the capillary voids of the concrete. (Note: XYPEX crystalline products should not be considered to be flexible.)

- 1.3 Storage of materials:** Store manufacturers sealed and labeled material containers off the ground in a dry enclosed area at a minimum temperature of 7°C. The shelf life is one year when stored under proper conditions.

2. DOSAGE:

By weight: Percentage dosage rates of XYPEX Admix C-1000NF / C-2000NF to the cementitious (ordinary portland cement [O.P.C.] and reactive pozzolans {eg; reactive fly ash}) content of the concrete.

Dosage rate must be between 0.8% and 1.0% by weight of cementitious (BWC) unless otherwise specified.

Example; 230 kg O.P.C. and 75 kg Fly Ash, total cementitious = 305 kg.
Dose rate @ 0.8% = 2.44 kg and @ 1.0% = 3.05 kg.

Refer to Annex A for applicable number of bags to be dosed in regard to cementitious content. Instances where this chart does not apply require that XYPEX Australia be contacted for determination and advice.

NOTE: THE CEMENT (O.P.C.) CONTENT OF THE MIX SHALL NOT BE LESS THAN 10% BY WEIGHT.

**CHEMICAL STORAGE AND CONSTANT HIGH WATER PRESSURE APPLICATIONS
SHOULD BE REFERRED TO XYPEX AUSTRALIA FOR SUITABLE DOSE RATES.**

3. BATCHING AND MIXING:

Batching plant procedures, facilities and manpower will dictate the preferred / required batching technique. For example it is anticipated that the method described for Central mix plants is not generally feasible in Australian conditions.

3.1 Ready Mix Plant – Dry Batch Operation

Prior to batching, add XYPEX Admix in powder form to the drum of the ready-mix truck. After batching, mix the materials for 2-3 minutes to ensure the Admix is distributed evenly throughout the batch. (The batch must be agitated at high speed to ensure thorough dispersion.) A minimum of 10 minutes must elapse before discharge of the concrete. A further 1 minute of mixing at high speed immediately prior to discharge is recommended.

3.2 Ready Mix Plant – Central Mix Operation

Mix XYPEX Admix with water to form a thin slurry (e.g. 7.0 kg of powder mixed with 13.0 litres of water). Pour the required amount of material into the drum of the ready mixed truck. The aggregate, cement and water should be batched and mixed in the plant in accordance with standard practices (taking into account the quantity of water that has already been placed in the ready mix truck). Pour the concrete into the truck and mix for at least 5 minutes, to ensure even distribution of the XYPEX Admix throughout the concrete.

3.3 Precast Batch Plant

Add XYPEX Admix to the rock and sand, then mix thoroughly for 2 – 3 minutes before adding the cement and water. The total concrete mass should be blended using standard practices.

NOTE: It is important to obtain a homogeneous mixture of XYPEX Admix with the concrete. Therefore, do not add dry powder directly to wet concrete as this may cause clumping and thorough dispersion will not occur. It is however suitable to add wet concrete to dry powder ensuring that thorough mixing is achieved (as per Dry Batch Operation).

XYPEX soluble bags are most suited for use in the Dry Batch operation.

Maximum water cement ratio should not exceed 0.5. Requirements for higher water cement ratio's must be referred to XYPEX Australia.

The XYPEX Admix C-1000NF/ C-2000NF will act as a plasticiser and takes at least 10 minutes to become fully activated and will last approximately 30 minutes after placement of concrete.

Extension of set time may occur when using XYPEX Admix C-1000NF / C-2000NF. Amount of extension will depend on concrete mix design, temperatures and dosage rate of XYPEX. Care should be exercised when other admixtures are being used, when mixed with XYPEX extended set times can result. This category includes set retarders and may include water reducers, plasticisers etc.

4. REINFORCEMENT

- 4.1 General:** Shall be in accordance with the pertinent, current Australian Standards.
- 4.2 Concrete slabs:** All reinforcement shall be "Rib deformed bar" or "welded wire fabric" (other than fitments) and designed in accordance with Australian Standard AS 3600 – 1994.

NOTE: Exposed concrete decks (joint free) must contain reinforcement to minimise thermal movement, for which the content and placement of reinforcement steel required shall be sufficient to satisfy the requirements of AS 3600 - 1994 Clause 9.4.3.4. The attention of Specifiers, Engineers etc is drawn to AS 3600 – 1994 Section 4 para 4.3 (EXPOSURE CLASSIFICATION) in its entirety.

In the event that the requirements of AS 3600 –1994 be less than 1.0% (exposure classification A1 or A2) reinforcement steel requirement will in no case be less than 1.0% applied proportionately throughout the concrete and apportioned at not less than 0.5% on the top and 0.5% on the bottom face of the concrete.(ie; 0.25% either direction at both faces). 1.0% equates to a degree of crack control between moderate and strong as defined by AS 3600 - 1994 Clause 9.4.3.4.

- 4.3 Pre-stressing (Post Tensioning):** Is to conform to the above standards and or other current pertinent standard and requirements where applicable.

5. COMPACTION and FINISHING and CURING

Must comply with the provisions of AS 3600 –1994 Clauses 19.1.3.,19.1.4, and 19.1.5.(CIA RECOMMENDED PRACTICE NOTE Z9) respectively.

5.1 Compaction

The concrete shall be compacted until the following conditions are attained;

Entrapped air is expelled,

Formwork is completely filled to the intended level,

All reinforcement, penetrations and the like are completely surrounded, and

The required properties of the concrete are achieved.

5.2 Finishing

Note: Finishing of the concrete shall include the process of "re-working" the surface of the concrete. This will involve either power trowelling of the surface and or vigorous hand steel trowelling. Subsequent to this finishing any desired finish can then be applied.

In hot weather (above 25°C) aliphatic alcohol **must** be used during placement and finishing to control the early loss of bleed water, and which may also assist in the control of shrinkage.

5.3 Curing

The concrete shall be cured in accordance with the above references, to enable the achievement of maximum potential XYPEX crystalline growth.

Curing should begin immediately following the final set. The use of aliphatic alcohol does not take the place of standard concrete curing practices.

In formed concrete, formwork provides good protection and curing for concrete, and should be left in place for a period of seven (7) days, only exposed surfaces need to be kept moist.

5.4 Alternate Curing (Aus. Standards 3799)

Curing compounds complying with the above and having retention levels of 90% or more are a satisfactory curing agent for XYPEX Admix C-1000NF / C-2000NF treated concrete.

6. BACKFILLING

Normal backfilling procedures, after curing of the concrete, may take place. If backfilling takes place within seven (7) days after the initial set, the backfilling material must be moist so as not to draw moisture from the concrete.

7. APPLICATION OF PAINT, EPOXY, GROUT, CEMENT PARGET COAT, PLASTER OR STUCCO

XYPEX Admix C-1000NF / C-2000NF treated concrete will become completely and permanently waterproof. The crystalline formation of dendritic fibres will fill the pores and capillaries thus reducing the suction characteristics of the concrete. For this reason an additional bonding system may be required.

NOTE: It shall be the responsibility of the installer of the render or particular surface applied material to be applied over the concrete, to take whatever measures are necessary, including testing, to ensure acceptance by or adhesion to the concrete surface.

8. CORE FILL FOR CONCRETE BLOCK WALLS

Refer to XYPEX Australia for dosage rates for core fill applications in block walls, however, dose rate shall never be less than 3.0 kgs per cubic metre.

The core fill must have a slump between 200 and 220 mm (W/C not to exceed 0.5) and blocks must be damp before placement of core fill.

NOTE: Due to the nature of blocks, block wall construction and the inherent difficulties of core fill placement XYPEX Australia does not warrant the water proofing of the wall structure where only the corefill has been treated.

9. SHOTCRETE

Refer to XYPEX Australia for specification and dosage rates for XYPEX Admix shotcrete applications.



PRE CONCRETE POUR CHECKLIST

XYPEX ADMIX C-1000NF / C-2000NF

Date: 14/08/00	
PROJECT NAME: Inner City Bypass Trial Panels	
Location: Brisbane	
Client: Leighton Contractors	Contact: Iain Burgess
Address: Gilchrist Avenue	Phone: 38722600
Bowen Bridge	Fax: 38722700
CONCRETE COMPANY: CSR Concrete	
Plant: Crosby Rd, ALBION ①	
Batcher: Greg Hinge	Phone: 38621071 Fax: 38624055
PLANT STAFF BRIEFING	
XYPEX dose rates and mixing sequence checked	✓
Use of other admixtures checked and possible effects explained	✓
Contingency in place for possible plant breakdown or other batchers being aware of XYPEX requirements	N/A ✓
MIX DESIGN DETAILS	
1. Design strength: 40MPa	Mix code: 540MRxyp (if possible supply mix design)
2. Total water (m³)	
3. Total cementitious (m³): 370kg	
4. Cement type (eg. Blend, F.A., Slag, SL): GP + ASH	MAIN ROADS SPEC
5. Other admixtures: WATER REDUCER	
- Type: GRACE GNR	
Dosage: 300ml per 100kg cementitious	
6. Xypex Admix Dose rate: 0.8/3kg/m³	C-1000NF / C-2000NF (Circle product used)
Estimated total cubic metres to be dosed: 3m³	
XYPEX Applicator to sign: Maria Bobeldyk (Print name) MARIA BOBELDYK	

