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**AUCKLAND HARBOUR BRIDGE  
CONTRACT PSMC 003**

**Resource Consents for Discharge of  
Abrasive Products**

**Annual Report**

**July 2001**

**OFFICE COPY**

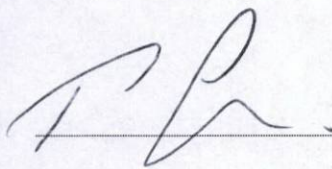
# AUCKLAND HARBOUR BRIDGE CONTRACT PSMC 003

## Resource Consents for Discharge of Abrasive Products

### Annual Report

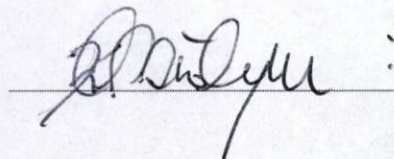
July 2001

Prepared By



Total Bridge Services  
11 Princes Street  
Northcote  
AUCKLAND

Reviewed By



Telephone: +64 9 481 0078  
Facsimile: +64 9 481 0079

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## 1 Introduction

This report has been prepared for the Auckland Regional Council in accordance with the special conditions of consent as set out in the Resource Consents for the Auckland Harbour Bridge (AHB). This is the final report for the current consent and covers the period of 1 July 2000 to 30 June 2001.

The Resource Consents have been granted to Transit New Zealand for the discharge of abrasive blasting products from abrasive blasting activities carried out on the Auckland Harbour Bridge. The discharge permits are as follows:

- Discharge Permit 938508, for discharge to water (expired 31 December 2000)
- Discharge Permit 938557, for discharge to air (expired 31 December 2000)
- Discharge Permit 938862, for discharge to ground (expired 31 December 2000)

These three consents have expired. We are currently in the progress of procuring the new consents. The application for the consent renewal was lodged on 27 March 2000. Until the new consents are issued an extension of time limit on the current consents has been granted (refer appendix A).

The conditions of these discharge permits are being complied with. In accordance with the special conditions of consent the following details are discussed in this report.

- The location and extent of blasting
- The estimated quantity of abrasive blasting products generated and likely contaminants contained within the removed paint and abrasive.
- Confirmation of the quantity of abrasive blasting products recovered and disposed of.
- The quantity and type of corrosion inhibitors used during wet blasting.
- Details of measures undertaken to avoid, remedy or mitigate any adverse environmental effects.
- Investigations into alternative paint removal techniques.
- Results of a public survey taken to assess the effectiveness of the permit conditions.

Total Bridge Services commenced work on the Harbour Bridge on 1 December 1998 with a ten year maintenance contract expiring on 30 November 2008. Total Bridge Services is a joint venture company comprising of TBS Farnsworth, Fulton Hogan and Opus International Consultants.

## 2 Discharge to Land and Water

### 2.1 Location and Extent of Blasting

Over the past twelve months the majority of the abrasive blasting, high pressure water blasting and maintenance painting was carried out on the West Extension and in Span 7. Some blasting was carried out over public areas at the southern end of the bridge, recovery of blast products and protection measures used are discussed later in this report.

The areas painted include:

Location	Surface Area	Percentage of total area painted
West Extension Exterior Outer Cantilever, boxes 61-72	4,525	13%
West Extension Exterior Inner Cantilever, boxes 55 – 72	4,525	13%
West Extension Internal, boxes 37-42	17,425	50%
East Extension Handrail, boxes 40-80	100	1%
Span 7, Above Walkways, Panels 0-1, 1-2, 2-3, 3-4, 4-5, 5-6, 6-7, 7-8, 8-9, 9-10	2,750	8%
Span 7, Below Walkways, Panels 0-1, 1-2, 2-3, 3-4 (commenced), 4-5 (commenced)	1,285	3%
Span 7, Apex Panel 9-10	50	1%
Span 6, Above Walkways, Panels 0-1, 1-2, 3-4, 4-5 (commenced), 5-6 (commenced)	922	2%
Southern Steel Viaduct Span 0-1	150	1%
East Face of Truss Bridge, Spans 4, 5 and 6	2,880	8%
<b>Total</b>	<b>34,612</b>	

The total quantity of blasting media used over the past twelve months was 51,000kg. This quantity is nearly double of that used last year. The primary reason for this is that last year painting activities focused on internal painting of the extensions and little was carried out on the original truss bridge.

The west extension internal maintenance has continued. This work has primarily been done when conditions are unsuitable for coating exterior steelwork. The internal coating work requires no abrasive blasting. The coating work includes the lower flange, both webs and the orthotropic deck plate. The internal coating philosophy for internal painting is based on encapsulation of the existing coating. The total area coated was 17,425m<sup>2</sup> making up 50% of all coating activities.

This is the first year since commencement of the contract that significant coating activities were undertaken on the original truss bridge. All painting of the original truss bridge used the patch repair followed by a full topcoat philosophy. The coating work included the repair and coating of all steelwork both above and below walkways in the locations shown in the above table. Due to the proposed commercial walkway operation programmed to commence in December 2001 we have commenced coating of the east face of the truss bridge. This work was commenced in order to reduce the impact of the tours on our maintenance operations. The total

truss area coated was 7,887m<sup>2</sup> making up 23% of all coating activities for this year. Only Garnet abrasive was used in the truss bridge work as all this work was undertaken at the southern end of the bridge. The Garnet was used due to the minimal powdering of the abrasive and hence minimum dust generation. The total volume of abrasive used was 23,575kg making up 46% of all abrasive used.

The west extension exterior maintenance works included the recoating of the web plates, outer and inner cantilevers, deck plate and longitudinal trough stiffeners. The coating philosophy used is the same as that used on the original truss bridge. The total area coated was 9050m<sup>2</sup> making up 26% of all coating activities. The total volume of abrasive used was 21,700kg making up 43% of all abrasive used. The high volume of abrasive use in this area is attributed primarily due to the extensive deterioration on the cantilevers and large areas of poor adhesion.

Work on the southern steel viaduct commenced this year. One span has been completed. The coating philosophy is similar to that used on the original truss bridge. The area coated was 150m<sup>2</sup> making up 1% of all coating activities. Garnet abrasive was used on the viaduct. The total volume of abrasive used was 3,625kg making up 7% of all abrasive used. In addition to this all drains in the areas were covered to prevent spent abrasive entering the stormwater system and on the completion of each days blasting activities all sealed areas were swept and the abrasive disposed of. The total volume collected and disposed of was 1,500kg.

Work on the recoating of the handrails on the east extension has commenced. The coating philosophy used when coating insitu rails includes waterblasting the handrails, patch repairs followed by a full coat. No abrasive blasting was carried out on the handrails and all coatings were brush applied. This philosophy was employed due to the close proximity of the traffic to the work face and residents properties below. The total surface area painted was 100m<sup>2</sup> this made up less than 1% of all coating undertaken this year. Some new panels were fabricated. These were coated at the southern abutment compound prior to installation. Prior to the blasting on the new panels all drains in the areas were covered to prevent spent abrasive entering the stormwater system and on the completion of each days blasting activities all sealed areas were swept and the abrasive disposed of. The total volume collected and disposed of was 1,325kg. The total volume of abrasive used was 2,050kg making up 4% of all abrasive used

## 2.2 Abrasive Blasting Products and Likely Contaminants

### Quantity of Abrasive Blasting Products Generated

Details of abrasive blasting carried out on the AHB between 3 July 2000 and 29 June 2001 have been tabulated in appendix B. For each day the location of the blasting, work hours, wind speed, amounts and type of abrasive and controls used are recorded. Table 1 below gives the approximate amount of blasting abrasive, period of work, and prevailing wind direction on each of the main painting packages discussed in the section above over the past year.

Table 1: Summary of Abrasive Blasting

Location of Blasting	Period	Approximate Amount of Abrasive Used	Prevailing Wind Direction
West Extension Internal	Intermittently from 5	Nil	N/A

Location of Blasting	Period	Approximate Amount of Abrasive Used	Prevailing Wind Direction
	September 2000 to 25 June 2001		
West Extension External	3 July 2000 to 28 November 2000.	21,700kg	SW
Original Truss Bridge	29 November 2000 to 29 June 2001	23,575kg	NE
South Steel Viaduct	12 February to 10 March 2001	3,625kg	NE
East Extension Handrail	3 July to 22 July 2000 and intermittently from 18 January to 12 March 2001	2,050kg	NE
<b>Total Abrasive Used</b>		<b>50,950kg</b>	

#### Likely Contaminants in Removed Paints and Abrasives

Over the past twelve months garnet abrasive was predominantly used with some basalt been used. The basalt abrasive has been used in two grades, Fine Blast and Min Blast. Impro Limited supplies the Min Blast, and Industrial Minerals Ltd supply the Garnet and Fine Blast.

As mentioned in the previous reports the basalt and garnet abrasive media do not contain any known toxic contaminants or free silica in excess of 1% and the concentrations of soluble materials are so low that they can be considered inert. The chemical and petrological composition of both abrasives have been included in previous reports.

The paint removed from the AHB structure over the past twelve months has been the original five coat system. The original system consisted of three coats of zinc chromate primer and two top coats of micaceous iron oxide. Particles of the original zinc spray coating system have also been removed by abrasive blasting and may be present in the discharge.

The blasting technique and type of coatings removed from the AHB structure over the past twelve months are the same as those when the resource consent was issued in 1994. The composition of the abrasive blasting products and concentrations of contaminants will therefore be essentially the same as at that time. See Works Consultancy Services Central Laboratories Report No 93/24730 for the results of the analysis of the abrasive blasting products.

### **2.3 Recovery, Disposal of Abrasive Blast Debris and Protective Measures**

Over the past twelve months blasting has been undertaken in areas where it was possible for debris to enter the storm water system and settle on sealed areas. This occurred mainly during the coating of handrails panels in the southern compound and the coating work completed on the southern steel viaduct. When this work was carried out covers were placed over all drains in the actual and potential debris drift zones. Prior to the uplifting of these covers to sealed areas were swept and captured debris was disposed of in an approved ARC waste site, a total of 2,825kg of abrasive was recovered. Other protective measures undertaken are discussed in section 2.5.

Over the 1999/2000 year recycling of garnet media was trialed. The results of this trial were promising, it allowed the garnet to be recycled a total of eight times and gave a suitable surface profile. With majority of the maintenance being undertaken on the west extension external and the original truss bridge, the recycling of the abrasive would have been uneconomical due to the cost of recovery and transportation.

This summer the final stage of the extension resurfacing project was undertaken. The surface preparation requirements for the laying of the membrane were very stringent. As a result of these requirements the majority of the blasting carried out was captive shot blasting. The recovery rate achieved was 95%. It was necessary to undertake some sweep blasting to remove bloom prior to the laying of the membrane. On completion of the sweep blasting all debris was swept, collected and disposed of by the resurfacing contractor.

## 2.4 Corrosion Inhibitors

Over the past twelve months corrosion inhibitors have not been used on the AHB. Where delays in coating applications have occurred a sweep blast has been used to remove the rust bloom.

Within our consent renewal application we are proposing the use of Chlor\*rid to remove salts to low levels prior to the application of coatings. Chlor\*rid is not a corrosion inhibitor, details of the product are included in our consent application.

## 2.5 Measures Undertaken to Avoid, Remedy or Mitigate Adverse Environmental Effects

Total Bridge Services over the past twelve months have continued as far as practicable to avoid, remedy and mitigate adverse effects on the environment from the abrasive blasting activities. Methods used include:

- Using the more expensive garnet abrasive when blasting south of pier 5 of north of pier 1 to reduce the volume of dust generated. The garnet abrasive is more efficient due to its hardness and angular profile and therefore a lesser quantity is used to prepare the steel surfaces compared to the basalt.
- High pressure water blasting has continued to be used over the past twelve months. It was used in the preparation of the handrail panels coated insitu on the east extension. This method was employed due to the close proximity of vehicles. This method of surface preparation will generally produce paint flakes rather than the dust generated from abrasive blasting.
- The handrails coated insitu were also painted by hand rather than spraying. This technique was used to prevent overspray damaging vehicles and also due to the nature of the steelwork been painted.
- During all blasting and coatings operations signage was displayed advising pedestrians and motorists that these activities were being carried out.



- In areas south of Pier 5 (no coatings maintenance was undertaken north of Pier1) during all blasting and coating operations where practicable screens were used to reduce the spread of debris. This was used during the painting of the southern steel viaduct, handrail panels coated at the southern compound and on the original truss bridge.
- Surrounding businesses and residents were kept informed during the year of proposed maintenance activities. This year extensive consultation was undertaken with all effected parties as part of the consent renewal process. Two local businesses had some concerns regarding the maintenance operations. These issues were worked through with the businesses concerned and the application approval forms for consent renewal were duly signed.
- As a result of the trial paint systems on the bridge one long life system is now the main coating system applied. Similar systems produced by various other manufactures are continuing to be trailed.
- The current blasting philosophy is based on spot blasting followed by a light sweep blast. This philosophy minimises the volume of material that is generated.
- The washdown of the structure has continued on a limited basis over the past twelve months. This reduces salt deposits and removes bird droppings which are detrimental to the coating life. By maximising the coating life the frequency of recoating is reduced and therefore the discharge of materials is reduced. This work is carried out when the weather does not permit other works to be carried out.
- We are currently investigating the use of a containment system. This system is being investigated as part of the proposed bridge walk tours. This system will allow the bridge walk operation to continue during maintenance activities. This system if advanced will greatly reduced our current discharges. Currently structural checks are being undertaken to determine if the bridge structure can withstand the additional imposed dead and wind loads. The systems investigated would be suitable for operation as a negative pressure system. This proposed system would also facilitate extensive recycling of abrasive.

### 3 Discharge to Air

#### 3.1 Current Paint System (used from 1 December 1998)

The current paint system applied by Total Bridge Services is a moisture cured urethane system. This system was selected by TBS due to its potential long life (expected to be a minimum of 15 years) and that it is an encapsulating system. The film thickness required for this system is also greatly reduced compared to the system in use prior to 1 December 1998 (225µm DFT vs 400µm DFT).

The specification for the application of this system was given in the July 2000 annual report.

#### 3.2 Alternative Moisture Cured Urethane Systems

Investigations into two alternative moisture cured systems are continuing. No change in the system currently applied is planned, at this stage or until such time as there is conclusive evidence that either of these systems are a suitable alternative to the Wasser MCU system.

- The first system is a Xymax MCU system supplied by Protech. An application trial of this system has been completed. A direct comparison with the Wasser system has not been undertaken at this stage. The application of the primer and top coats was found to be easier than the Wasser system, however the intermediate coat solids settled out much faster which led to unsatisfactory application characteristics. The Manufacturer has been advised of the problem and they are researching solutions. A trial of applying this system to an entire panel is programmed to be carried out within the next six months.
- The second system is a MCU system supplied by International. The desk top study of this product showed it characteristics to be unsatisfactory. Further evidence of suitability is required from the manufacturer before any on site trialing will be considered.

#### 3.3 Alternative Paint Systems

##### Paint Trials

The paint trials have now been discontinued. The MCU system we are currently using was part of this trial. The system rated highly against other trial systems due mainly to its beneficial environmental effects such as low VOC's and the application characteristics.

##### Zinc Metal Spray

The last zinc metal spray trials were applied in 1998. The trial areas include the top chord span 3 (1994), three west overarch apexes (1997), the underside of the Pier 1 east extension bracket (1997 and the west overarch top face (1998). The final treated area was also sealed with a single coat of AHB4. All trial sections were treated with a 85/15 zinc/aluminium metal spray.

No further trials are planned for the coming year. Monitoring of the trial areas is continuing as part of our annual inspection. The main area of breakdown of these systems is at the interface with the wet coatings where crevice corrosion is continuing.

*Appendix A*  
*Consent Extension of Time Limit*

COPY



PSMC 003/11

Vodafone House  
21 Pitt Street  
Private Bag 92 012  
Auckland  
New Zealand

28 FEB 2001

Auckland **Regional** Council

ENTERED  
29/02/01

DX CP 28 008 Pitt St  
tel 64 9 379 4420  
fax 64 9 366 2155

File Ref: 8862 8508 8557  
website www.arc.govt.nz

23 February 2001

TOTAL BRIDGE SERVICES  
PO BOX 56-416  
DOMINION ROAD  
AUCKLAND

RECEIVED  
01 MAR 2001  
AS

s9(2)(a)

Attention: Keith Stolberger

Dear Sir,

**RESOURCE CONSENT APPLICATION – EXTENSION OF TIME LIMIT**

**Application Details:**

Project:	Auckland Harbour Bridge Maintenance
Application number(s):	23954, 23955, 23956
Applicant(s):	TRANSIT NEW ZEALAND
Activity Type:	Industrial Waste Discharge
Location:	Auckland Harbour Bridge Auckland City

Section 37(5A) of the Resource Management Act 1991 allows the Council to extend the period specified in the Act in relation to the processing of consent application, with agreement of the applicant.

Accordingly, the Auckland Regional Council has extended the time period for by which the application must be notified until further notice. The status of the application(s) will be reviewed again on 23 March 2001.

The application has been put on hold until further notice to allow to undertake further consultation with neighbours in order to gain written approval.

If you have any queries regarding the application, please contact s9(2)(a)

Yours faithfully

Stuart Chapman  
Compliance Monitoring Officer

Richard Chilton Air Quality Section

*Appendix B*  
*Abrasive Blasting Data*

## Package Descriptions

### West Extension

<b>WXI9</b>	External Inner Boxes 49-54	<b>WYO11</b>	External Outer Boxes 61-66
<b>WXO9</b>	External Outer Boxes 49-54	<b>WXI12</b>	External Inner Boxes 67-72
<b>WXI10</b>	External Inner Boxes 55-60	<b>WYO12</b>	External Outer Boxes 67-72
<b>WYO10</b>	External Outer Boxes 55-60	<b>WXN7</b>	Internal Boxes 37-42
<b>WXI11</b>	External Inner Boxes 61-66	<b>WXN8</b>	Internal Boxes 43-48

### Above Walkways Span 7

<b>A701</b>	Panel 0/1	<b>A756</b>	Panel 5/6
<b>A712</b>	Panel 1/2	<b>A767</b>	Panel 6/7
<b>A723</b>	Panel 2/3	<b>A778</b>	Panel 7/8
<b>A734</b>	Panel 3/4	<b>A789</b>	Panel 8/9
<b>A745</b>	Panel 4/5	<b>A7910</b>	Panel 9/10

### Above Walkways Span 6

<b>A601</b>	Panel 0/1	<b>A634</b>	Panel 3/4
<b>A612</b>	Panel 1/2	<b>A645</b>	Panel 4/5
<b>A623</b>	Panel 2/3	<b>A656</b>	Panel 5/6

### Below Walkways Span 7

<b>B701</b>	Panel 0/1	<b>B756</b>	Panel 5/6
<b>B712</b>	Panel 1/2	<b>B767</b>	Panel 6/7
<b>B723</b>	Panel 2/3	<b>B778</b>	Panel 7/8
<b>B734</b>	Panel 3/4	<b>B789</b>	Panel 8/9
<b>B745</b>	Panel 4/5		

### Below Walkways Span 6

<b>B601</b>	Panel 0/1	<b>B612</b>	Panel 1/2
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### Miscellaneous

<b>EH1</b>	East Handrail	<b>CAP5</b>	Telstra Ducting
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PSMC 003 AUCKLAND HARBOUR BRIDGE

ABRASIVE BLASTING DATA 2000/2001

Date	Work Package	Work Hours		Wind Speed (m/s)			Abrasive Used (kg)					Controls	
		From	To	0830hrs	1400hrs	Direction	Garnet	Fine Blast	Minblast	ROM	Total		Recovered
3-Jul-00	EH1, WXI9	10:00	15:30	7	9	S	200	150			350	125	
4-Jul-00	EH1, WXI9, WYO9	10:00	14:00	10	10	SE		200	200		400		
5-Jul-00	EH1, WYO9-10, WXI9	09:30	14:30	8	9	SE/E			350		350	150	
6-Jul-00	EH1, WYO9-10, WXI9	10:00	15:30	6	8	SE/E			400		400	300	
7-Jul-00	EH1, WYO9-10, WXI9	09:00	14:00	7	9	E		400			400	200	
8-Jul-00	WYO9-10, WXI9	10:00	15:00	3	3	SE					0		
9-Jul-00	Weekend										0		
10-Jul-00	EH1, WXI9, WYO9	10:00	15:00	3	3	SE			400		400	300	
11-Jul-00	EH1, WXI9, WYO9	09:00	15:00	0	2	NE		450	150		600		
12-Jul-00	EH1, WXI9, WYO9	10:30	15:00	7	7	E		275	350		625		
13-Jul-00	EH1, WXI9, WYO9, A701	10:00	15:00	10	12	NE	200	400			600	200	
14-Jul-00	WYO9, WXI9, A701	08:45	14:15	9	12	NE			100		100	100	
15-Jul-00	Weekend										0		
16-Jul-00	Weekend										0		
17-Jul-00	EH1, WXI9, WYO9, A701	09:00	15:00	9	9	NE	250	300	150		700		
18-Jul-00	EH1, WXI9, WYO9, A701	09:00	14:30	10	15	NE	550	225	125		900		
19-Jul-00	EH1, WXI9, WYO9, A701	10:00	16:00	7	6	NE	200		150		350		
20-Jul-00	EH1	10:00	14:30	3	5	NE					0		
21-Jul-00	EH1, WYO9, WXI9	10:00	16:00	3	2	NW			275		275		
22-Jul-00	EH1, WYO9, WXI9	09:30	14:30	0	3	NW					0		
23-Jul-00	Weekend										0		
24-Jul-00	WXI9, WYO9	10:30	14:30	5	7	SW			400		400		
25-Jul-00	WXI9, WYO9	09:00	16:00	4	7	SW			150		150		
26-Jul-00	WXI9, WYO9, A701	09:00	15:00	10	7	SW	500				500		
27-Jul-00	WXI9, WYO9	09:30	15:00	5	6	NW		500			500		
28-Jul-00	WXI9, WYO9	09:00	14:00	3	2	NW		350			350		
29-Jul-00	Weekend										0		
30-Jul-00	Weekend										0		
31-Jul-00	WXI9, WYO9	11:00	16:00	5	4	SW		450			450		
1-Aug-00	WXI9, WYO9	10:30	16:00	3	4	W		200			200		
2-Aug-00	WXI9, WYO9	09:00	15:00	0	2	NE		500			500		
3-Aug-00	WXI10, WYO10	10:00	15:00	6	3	NE		600			600		
4-Aug-00	WXI10, WYO10	09:00	14:30	3	3	NE		600			600		
5-Aug-00	WXI10, WYO10	09:30	14:30	0	4	SW					0		



PSMC 003 AUCKLAND HARBOUR BRIDGE

ABRASIVE BLASTING DATA 2000/2001

Date	Work Package	Work Hours		Wind Speed (m/s)			Abrasive Used (kg)					Controls	
		From	To	0830hrs	1400hrs	Direction	Garnet	Fine Blast	Minblast	ROM	Total		Recovered
6-Aug-00	Weekend										0		
7-Aug-00	WXI10, WYO10	09:00	14:00	0	2	SW		550			550		
8-Aug-00	WXI10, WYO10	10:00	15:00	4	6	W		500			500		
9-Aug-00	WXI10, WYO10	10:30	15:30	3	5	SW		650			650		
10-Aug-00	WXI10, WYO10	10:00	14:30	5	9	SW		300	550		850		
11-Aug-00	No Blasting or Painting										0		
12-Aug-00	Weekend										0		
13-Aug-00	Weekend										0		
14-Aug-00	WXI10, WYO10-11	09:30	15:00	3	6	SW					0		
15-Aug-00	WXI10, WYO10, CAP5	10:00	13:30	2	5	NW					0		
16-Aug-00	WXI10, WYO10, CAP5	10:30	15:30	2	5	NW					0		
17-Aug-00	WXI10, WYO10, CAP5	09:00	14:30	5	7	NE					0		
18-Aug-00	WXI10, CAP5	10:00	15:00	4	2	NE					0		
19-Aug-00	Weekend										0		
20-Aug-00	Weekend										0		
21-Aug-00	CAP5	10:30	15:30	3	5	NW					0		
22-Aug-00	WXI11, WYO11	10:30	15:30	5	7	S/SW		550	400		950		
23-Aug-00	No Blasting or Painting			3	3	N					0		
24-Aug-00	WXI11, WYO11	09:00	15:30	6	6	SW		350			350		
25-Aug-00	WXI11, CAP5	09:00	15:30	7	10	N		200			200		
26-Aug-00	Weekend										0		
27-Aug-00	Weekend										0		
28-Aug-00	WXI11, WYO11	10:00	15:30	5	6	SW		350			350		
29-Aug-00	WXI11, WYO11, CAP5	10:30	14:30	3	3	NE		400			400		
30-Aug-00	WXI11, WYO11, CAP5	10:00	15:00	7	10	NE		250			250		
31-Aug-00	WXI11, WYO11, CAP5	10:00	14:30	6	7	W		300			300		
1-Sep-00	WXI11, WYO11, CAP5	10:00	15:00	3	7	SW/W		550			550		
2-Sep-00	WXI11, WYO11	10:00	14:00	5	2	SE		550			550		
3-Sep-00	Weekend										0		
4-Sep-00	WXI11, WYO11	10:30	14:00	5		SW		250			250		
5-Sep-00	WXN7 setup	09:30	15:00	6	15	SW					0		
6-Sep-00	WXN7 setup, CAP5	10:30	15:00	7		W					0		
7-Sep-00	WXN7, CAP5	11:30	14:00	7	7	W		350			350		
8-Sep-00	WXI11, CAP5	08:30	03:30	7	7	NW/W		550			550		

PSMC 003 AUCKLAND HARBOUR BRIDGE

ABRASIVE BLASTING DATA 2000/2001

Date	Work Package	Work Hours		Wind Speed (m/s)			Abrasive Used (kg)					Controls	
		From	To	0830hrs	1400hrs	Direction	Garnet	Fine Blast	Minblast	ROM	Total		Recovered
9-Sep-00	Weekend										0		
10-Sep-00	Weekend										0		
11-Sep-00	WXI11, WXO11, CAP5	10:00	15:30	2	3	SW		550			550	200	
12-Sep-00	WXI11, WXO11	07:00	14:00	4		NW		400			400		
13-Sep-00	WXI9, WXO9, A701, EH1	10:00	15:00	10	12	NE					0		
14-Sep-00	WXI11, WXO11	07:00	10:00	1.5	1.8	SW		450			450		
15-Sep-00	WXI11, WXO11	07:00	14:00	1	1	E		350			350		
16-Sep-00	Weekend										0		
17-Sep-00	Weekend										0		
18-Sep-00	WXI11, WXO11	07:00	14:00	2		NW					0		
19-Sep-00	WXI12, WXO12	07:00	10:00	1		SW	550				550		
20-Sep-00	WXI12, WXO12	07:00	14:00	3		NW	400				400		
21-Sep-00	WXI12, WXO12	08:00	15:00	3		W	300				300		
22-Sep-00	WXI12, WXO12	09:30	15:00	7	10	N	275				275		
23-Sep-00	Weekend										0		
24-Sep-00	Weekend										0		
25-Sep-00	WXI12, WXO12	09:30	15:00	7	10	N	550				550		
26-Sep-00	WXI12, WXO12	10:00	15:00	8	10	S	400				400		
27-Sep-00	WXI11, WXO11	10:30	15:00	5	3	S	425				425		
28-Sep-00	WXI11, WXO11	09:30	15:00	0+	0+	S	500				500		
29-Sep-00	WXI11, WXI12, WXO12	08:15	13:30	3	6	NW	300				300		
30-Sep-00	Weekend										0		
1-Oct-00	Weekend										0		
2-Oct-00	WXI12, WXO12	09:00	15:00	6	6	N					0		
3-Oct-00	WXI12, WXO12	09:00	14:30	8	10	NW					0		
4-Oct-00	WXI12, WXO12	10:00	15:00	15	15	W					0		
5-Oct-00	WXI12, WXO12	09:00	15:00	10	10	SW					0		
6-Oct-00	WXI12, WXO12	09:00	15:00	10	10	SW					0		
7-Oct-00	Weekend										0		
8-Oct-00	Weekend										0		
9-Oct-00	WXI12	10:00	15:00	8	10	SW					0		
10-Oct-00	WXI12, WXO12	09:30	15:00	8	7	SW					0		
11-Oct-00	WXI12, WXO12	10:00	16:00	7	10	NW					0		
12-Oct-00	WXN7	10:00	15:30	25	12	SW					0		

PSMC 003 AUCKLAND HARBOUR BRIDGE

ABRASIVE BLASTING DATA 2000/2001

Date	Work Package	Work Hours		Wind Speed (m/s)			Abrasive Used (kg)					Controls	
		From	To	0830hrs	1400hrs	Direction	Garnet	Fine Blast	Minblast	ROM	Total		Recovered
13-Oct-00	WXI12, WYO12	10:00	14:00	4	5	SW					0		
14-Oct-00	Weekend										0		
15-Oct-00	Weekend										0		
16-Oct-00	WXI12, WXN7	08:30	14:00	6	7	SW/W					0		
17-Oct-00	WXI12, WYO12	10:00	14:00	0	4	NE					0		
18-Oct-00	WXI12, WXN7	10:30	15:00	6	6	SE					0		
19-Oct-00	WXN7	09:00	14:30	5	6	E					0		
20-Oct-00	No Blasting or Painting										0		
21-Oct-00	Weekend										0		
22-Oct-00	Weekend										0		
23-Oct-00	Labour Day										0		
24-Oct-00	WXN7	10:30	14:30	6	10	SW					0		
25-Oct-00	WXN7	09:30	15:30	5	6	SW					0		
26-Oct-00	WXN7	09:15	15:30	5	3	SW/S					0		
27-Oct-00	WXN7	09:00	14:00	2	5	NW					0		
28-Oct-00	Weekend										0		
29-Oct-00	Weekend										0		
30-Oct-00	WXN7	10:00	15:00	5	9	NW					0		
31-Oct-00	WXN7	10:00	15:00	9	10	W					0		
1-Nov-00	WXN7	09:30	13:30	2	0	SW					0		
2-Nov-00	WXN7	08:00	15:00	10	11	E					0		
3-Nov-00	WXN7	08:30	14:00	6	0	E					0		
4-Nov-00	Weekend										0		
5-Nov-00	Weekend										0		
6-Nov-00	WXN7	10:00	15:00	7	7	SW					0		
7-Nov-00	WXN7	10:00	15:00	5	7	SW					0		
8-Nov-00	WXN7	08:00	14:00	7	3	SE					0		
9-Nov-00	WXN7	10:00	16:00	5	7	E					0		
10-Nov-00	WXN7	08:30	15:00	7	7	SE/S					0		
11-Nov-00	Weekend										0		
12-Nov-00	Weekend										0		
13-Nov-00	WXN7	09:30	15:00	2	3	SW					0		
14-Nov-00	WXN7	11:00	15:00	No Record							0		
15-Nov-00	WXN7	10:00	15:30	9	10	SW					0		

PSMC 003 AUCKLAND HARBOUR BRIDGE

ABRASIVE BLASTING DATA 2000/2001

Date	Work Package	Work Hours		Wind Speed (m/s)			Abrasive Used (kg)					Controls	
		From	To	0830hrs	1400hrs	Direction	Garnet	Fine Blast	Minblast	ROM	Total		Recovered
16-Nov-00	WXN7	10:30	13:30	5	6	SW					0		
17-Nov-00	WXN7	09:30	16:00	11	12	SW					0		
18-Nov-00	Weekend										0		
19-Nov-00	Weekend										0		
20-Nov-00	WXN7	08:00	15:00	0	9	SW					0		
21-Nov-00	WXN7	11:00	14:00	7	0	SW					0		
22-Nov-00	WXN7	11:00	14:00	0	5	SW					0		
23-Nov-00	WXN7	10:00	14:30	3	4	S					0		
24-Nov-00	WXN7, WXI12	09:00	15:00	3	7	W					0		
25-Nov-00	Weekend										0		
26-Nov-00	Weekend										0		
27-Nov-00	WXN7, WXI12	09:00	15:00	3	7	W					0		
28-Nov-00	WXI12, B701	11:00	15:30	4	2	W					0		
29-Nov-00	B701	10:00	14:30	5	7	W/SW	825				825		
30-Nov-00	B701	08:00	15:00	5	7	S/SW	500				500		Screens, signage
1-Dec-00	B701	08:30	15:30	6	9	SW	500				500		Screens, signage
2-Dec-00	Weekend										0		
3-Dec-00	Weekend										0		
4-Dec-00	B701	10:00	15:30	2	5	SE/NE	250				250		Screens, signage
5-Dec-00	B701	09:00	16:00	7	9	E	350				350		Screens, signage
6-Dec-00	B701	10:00	15:30	15	15	E	525				525		Screens, signage
7-Dec-00	B701	10:30	15:00	No Record			375				375		Screens, signage
8-Dec-00	B701	10:30	15:00	5	7	S	400				400		Screens, signage
9-Dec-00	Weekend										0		
10-Dec-00	Weekend										0		
11-Dec-00	B701	09:30	16:00	9	6	NW	650				650		Screens, signage
12-Dec-00	B712	11:00	15:00	6	7	NW/W					0		Screens, signage
13-Dec-00	B701	07:30	14:45	5	4	S	250				250		Screens, signage
14-Dec-00	B701	10:30	14:00	4	5	S	500				500		Screens, signage
15-Dec-00	B701	11:00	15:00	5	4	N	650				650		Screens, signage
16-Dec-00	Weekend										0		
17-Dec-00	Weekend										0		
18-Dec-00	B701	11:00	15:00	3	4	NE	550				550		Screens, signage
19-Dec-00	B701	10:30	16:00	3	4	NE	575				575		Screens, signage

PSMC 003 AUCKLAND HARBOUR BRIDGE

ABRASIVE BLASTING DATA 2000/2001

Date	Work Package	Work Hours		Wind Speed (m/s)			Abrasive Used (kg)					Controls	
		From	To	0830hrs	1400hrs	Direction	Garnet	Fine Blast	Minblast	ROM	Total		Recovered
20-Dec-00	B701	08:30	16:00	4	6	SE/NE	600				600		Screens, signage
21-Dec-00	No work										0		
22-Dec-00	No work										0		
23-Dec-00	Weekend										0		
24-Dec-00	Weekend										0		
25-Dec-00	Christmas Day										0		
26-Dec-00	Resurfacing										0		
27-Dec-00	Resurfacing										0		
28-Dec-00	Resurfacing										0		
29-Dec-00	Resurfacing										0		
30-Dec-00	Resurfacing										0		
31-Dec-00	Resurfacing										0		
1-Jan-01	Resurfacing										0		
2-Jan-01	Resurfacing										0		
3-Jan-01	Resurfacing										0		
4-Jan-01	Resurfacing										0		
5-Jan-01	Resurfacing										0		
6-Jan-01	Resurfacing										0		
7-Jan-01	Weekend										0		
8-Jan-01											0		
9-Jan-01											0		
10-Jan-01											0		
11-Jan-01											0		
12-Jan-01											0		
13-Jan-01	Weekend										0		
14-Jan-01	Weekend										0		
15-Jan-01											0		
16-Jan-01											0		
17-Jan-01											0		
18-Jan-01	EH1, B701	10:00	15:30		9	SW					0		Screens
19-Jan-01	EH1, B701	10:00	14:00	0	0						0		Screens
20-Jan-01	Weekend										0		
21-Jan-01	Weekend										0		
22-Jan-01	B701	10:00	15:00	7	7	SW/S					0		Screens

PSMC 003 AUCKLAND HARBOUR BRIDGE

ABRASIVE BLASTING DATA 2000/2001

Date	Work Package	Work Hours		Wind Speed (m/s)			Abrasive Used (kg)					Controls	
		From	To	0830hrs	1400hrs	Direction	Garnet	Fine Blast	Minblast	ROM	Total		Recovered
23-Jan-01	B701	10:00	15:00	5	5	S/SW					0		Screens
24-Jan-01	B701	10:00	15:30	4	10	W					0		Screens
25-Jan-01	General Maintenance										0		
26-Jan-01	EH1	12:00	15:00	15	10	W					0		
27-Jan-01	Weekend										0		
28-Jan-01	Weekend										0		
29-Jan-01	Public Holiday										0		
30-Jan-01	B701	11:00	15:00	6	7	NE					0		Screens, Signage
31-Jan-01	B701	08:45	15:00	6	4	NE					0		Screens, Signage
1-Feb-01	B701	10:30	14:00	5	6	SE					0		Screens, Signage
2-Feb-01	No work										0		
3-Feb-01	Weekend										0		
4-Feb-01	Weekend										0		
5-Feb-01	No work										0		
6-Feb-01	Waitangi Day										0		
7-Feb-01	B712, B723	10:00	14:30	2	4	NE/NW					0		Screens, signage
8-Feb-01	B712, B723	12:00	16:00	5	7	SE	375				375		Screens
9-Feb-01	B712	08:00	16:00	2	0	SE					0		Screens
10-Feb-01	Weekend										0		
11-Feb-01	Weekend										0		
12-Feb-01	TS10 setup	10:00	15:00	3	5	NE					0		
13-Feb-01	TS10	09:00	14:30	5	5	E	425				425		Screens, signage
14-Feb-01	B712, B723	10:00	13:00	5	7	E/NE					0		Screens, signage
15-Feb-01	No work										0		
16-Feb-01	No work										0		
17-Feb-01	Weekend										0		
18-Feb-01	Weekend										0		
19-Feb-01	B745, TS10	10:00	14:30	0	5	E	500				500	250	Screens, signs, sweep
20-Feb-01	TS10, A701	10:00	15:00	4	5	E/NE	400				400	100	Screens, signs, sweep
21-Feb-01	TS10, A701, B734	08:30	15:00	4	5	NE	600				600	200	Screens, signs, sweep
22-Feb-01	A701, TS10	08:30	13:00	3	6	NE	200				200	100	Screens, signs, sweep
23-Feb-01	A701, TS10	09:00	14:00	3	4	NW/SE					0		Screens
24-Feb-01	Weekend										0		
25-Feb-01	Weekend										0		

PSMC 003 AUCKLAND HARBOUR BRIDGE

ABRASIVE BLASTING DATA 2000/2001

Date	Work Package	Work Hours		Wind Speed (m/s)			Abrasive Used (kg)					Controls	
		From	To	0830hrs	1400hrs	Direction	Garnet	Fine Blast	Minblast	ROM	Total		Recovered
26-Feb-01	TS10	09:00	15:00	6	6	E/NE	500				500	200	Screens, signs, sweep
27-Feb-01	A701, TS10	08:30	15:00	3	4	S	500				500	200	Screens, signs, sweep
28-Feb-01	TS10	11:00	15:00	6	6	NE	500				500	200	Screens, signs, sweep
1-Mar-01	A701, TS10	10:30	14:30	6	7	E/NE					0		Screens, signage
2-Mar-01	A701, TS10	08:30	15:00	6	7	E					0		Screens, signage
3-Mar-01	Weekend										0		
4-Mar-01	EH1	21:30	02:00	3	3	NE					0		Signage
5-Mar-01	EH1	21:30	02:00	4	4	NE					0		Signage
6-Mar-01	EH1	21:30	02:00	4	6	E					0		Signage
7-Mar-01	No work										0		
8-Mar-01	A701, TS10	10:30	13:30	4	6	NE					0		Screens, signage
9-Mar-01	A701, TS10	10:00				NE					0		Screens, signage
10-Mar-01	A701, TS10	09:30				NE					0		Screens, signage
11-Mar-01	EH1	22:30				NE					0		Screens, signage
12-Mar-01	EH1	11:00				NE					0		Signage
13-Mar-01	No work										0		
14-Mar-01	No work										0		Signage
15-Mar-01	A712, A723	11:00	15:00	6	10	SW	600				600		
16-Mar-01	A712, A723	09:30	13:30	5	6	SE/E	550				550		
17-Mar-01	Weekend										0		
18-Mar-01	Weekend										0		
19-Mar-01	B712	10:00	13:30	5	6	E	550				550		Screens, signage
20-Mar-01	B712	08:30	15:30	2	4	E/NE	450				450		Screens, signage
21-Mar-01	B712	09:00	13:30	No Record			300				300		Screens, signage
22-Mar-01	A712, B712	10:30	14:30	0	0		450				450		Screens, signage
23-Mar-01	A712, A723, B712	10:00	13:00	0	0	E	400				400		Screens, signage
24-Mar-01	Weekend										0		
25-Mar-01	Weekend										0		
26-Mar-01	A712, B712	09:00	14:00	3	5	NE	200				200		Screens, signage
27-Mar-01	A723, B712, B723	08:00	16:00	5	6	NW	300				300		Screens, signage
28-Mar-01	Washdown	10:00	15:00	10	10	NW					0		
29-Mar-01	Washdown	10:00	15:00	No Record							0		
30-Mar-01	B701, Washdown	10:00	14:00	7	7	SW	300				300		
31-Mar-01	Weekend										0		

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ABRASIVE BLASTING DATA 2000/2001

Date	Work Package	Work Hours		Wind Speed (m/s)			Abrasive Used (kg)					Controls	
		From	To	0830hrs	1400hrs	Direction	Garnet	Fine Blast	Minblast	ROM	Total		Recovered
1-Apr-01	Weekend										0		
2-Apr-01	Washdown	10:00	15:00	10	13	NE					0		
3-Apr-01	Washdown	10:00	14:00	0	15	SW					0		
4-Apr-01	B723	08:30	14:00	10	10	SW					0		Setup Only
5-Apr-01	B723	08:30	14:00	10	7	SW	150				150		Screens, signage
6-Apr-01	B723	10:00	14:00	5	7	SW	100				100		Screens, signage
7-Apr-01	Weekend										0		
8-Apr-01	Weekend										0		
9-Apr-01	B723	11:00	13:00	4		NE	100				100		Screens, signage
10-Apr-01	B723, B734	10:00	15:00	2	3	NW	200				200		Screens, signage
11-Apr-01	B723, B734, Washdown	09:00	13:00	2	0	NW					0		Screens, signage
12-Apr-01	B723, B734, Washdown	09:00	14:00	6	10	NE	100				100		Screens, signage
13-Apr-01	Good Friday										0		
14-Apr-01	Easter Weekend										0		
15-Apr-01	Easter Weekend										0		
16-Apr-01	Easter Monday										0		
17-Apr-01	B723, B734	07:30	15:30	0	5	NE					0		Screens, signage
18-Apr-01	B723	09:00	15:00	4	5	E					0		Screens, signage
19-Apr-01	B723, B734	09:00	15:00	4	10	E					0		Screens, signage
20-Apr-01	Washdown										0		
21-Apr-01	Weekend										0		
22-Apr-01	Weekend										0		
23-Apr-01	A734, B723	09:00	13:30	0	3	SE	150				150		
24-Apr-01	A745, B723	09:30	13:30	3	1	SE/NW	350				350		
25-Apr-01	Anzac Day										0		
26-Apr-01	A745, B712, B723	10:30	14:00	5	5	E	250				250		Screens, signage
27-Apr-01	A745, A756	10:00	14:00	6	7	E	200				200		
28-Apr-01	Weekend										0		
29-Apr-01	Weekend										0		
30-Apr-01	A745, B745	09:30	14:30	10	6	E					0		Screens, Signage
1-May-01	A756, A745	10:00	14:00	10	13	E	500				500		
2-May-01	WXN7	10:00	15:00	10	13	E					0		
3-May-01	WXN7	10:30	14:30	6	7	NE					0		
4-May-01	WXN7	09:00	15:00	6	10	NE					0		



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ABRASIVE BLASTING DATA 2000/2001

Date	Work Package	Work Hours		Wind Speed (m/s)			Abrasive Used (kg)					Controls	
		From	To	0830hrs	1400hrs	Direction	Garnet	Fine Blast	Minblast	ROM	Total		Recovered
5-May-01	Weekend										0		
6-May-01	Weekend										0		
7-May-01	B712, B723	09:00	14:30	2	3	NE					0		Screens, Signage
8-May-01	B712, B723	09:00	15:00	2	4	SW/SE					0		Screens, Signage
9-May-01	B712, B723	09:00	15:00	2	4	SW/SE					0		Screens, Signage
10-May-01	WXN7	10:00	14:00	20	17	NE					0		
11-May-01	WXN7, A76-10, B745	10:00	14:00	5	7	NE/N	450				450		Screens, signage
12-May-01	Weekend										0		
13-May-01	Weekend										0		
14-May-01	WXN8	10:30	16:00	7	6	SW					0		
15-May-01	A767, A778	10:30	15:30	10	12	SW	500				500		
16-May-01	A767, A778	10:00	14:00	5	4	SW	500				500		
17-May-01	A789, A7910	11:00	14:00	5	6	SW	400				400		
18-May-01	WXN8	10:00	14:00	5	5	NW					0		
19-May-01	Weekend										0		
20-May-01	Weekend										0		
21-May-01	WXN7, A601, A612	10:00	14:03	10	15	SW	400				400		
22-May-01	WXN8	09:00	16:00	No Record							0		
23-May-01	A601, A612	09:30	13:30	3	3	W	350				350		
24-May-01	A623, A624, A778, A7910	09:00	13:00	4	3	W	400				400		
25-May-01	WXN8	09:00	13:00	4	5	W					0		
26-May-01	Weekend										0		
27-May-01	Weekend										0		
28-May-01	WXN8	09:00	13:00	4	5	W					0		
29-May-01	A734-767, A601-634	11:30	02:30	7	9	NE	500				500		
30-May-01	WXN8	08:20	13:30	6	10	NE					0		
31-May-01	WXN8	09:30	15:00	1	2	SW					0		
1-Jun-01	A734-767, A778-634	09:45	15:00	0	1	SW					0		
2-Jun-01	Weekend										0		
3-Jun-01	Weekend										0		
4-Jun-01	Queens Birthday										0		
5-Jun-01	A601, A656	10:00	14:00	0	0		500				500		
6-Jun-01	A601, A634	09:30	02:00	0	5	NE	500				500		
7-Jun-01	WXN8, A645, A656	10:00	14:30	No Record			250				250		

PSMC 003 AUCKLAND HARBOUR BRIDGE

ABRASIVE BLASTING DATA 2000/2001

Date	Work Package	Work Hours		Wind Speed (m/s)			Abrasive Used (kg)					Controls	
		From	To	0830hrs	1400hrs	Direction	Garnet	Fine Blast	Minblast	ROM	Total		Recovered
8-Jun-01	WXN8	11:00	15:00	2	2	SW					0		
9-Jun-01	Weekend										0		
10-Jun-01	Weekend										0		
11-Jun-01	A645, A56, EF4	09:30	15:00	6	5	SE	400				400		
12-Jun-01	EF5, EF6, B789, B7910	11:00	14:00	0+	0+	SW	500				500		Screens, Signage
13-Jun-01	B789, B7910	11:00	14:00	4	5	SW	600				600		Screens, Signage
14-Jun-01	CAP7, Apex7910, A645, A656, B789	10:30	15:00	5	3	E	600				600		Screens, Signage
15-Jun-01	WXN8	10:30	15:00	7	7	E					0		
16-Jun-01	Weekend										0		
17-Jun-01	Weekend										0		
18-Jun-01	WXN8, B789	10:30	15:00	11	7	SW	450				450		Screens, Signage
19-Jun-01	B789	10:00	13:30	2	4	SE	500				500		Screens, Signage
20-Jun-01	B789	09:00	13:30	2	2	NE	500				500		Screens, Signage
21-Jun-01	B789	10:00	15:00	0.2	2	NE	450				450		Screens, Signage
22-Jun-01	WXN9, B789	08:30	14:00	0.2	5	N	450				450		Screens, Signage
23-Jun-01	Weekend										0		
24-Jun-01	Weekend										0		
25-Jun-01	WXN9	09:00	14:00	9	7	SW					0		
26-Jun-01	B789, B612, B601	08:00	13:00	9	10	SW	300				300		Screens, Signage
27-Jun-01	B789	08:30	15:00	0	2	SW					0		Screens, Signage
28-Jun-01	B789	08:30	15:00	5	5	NE					0		Screens, Signage
29-Jun-01	B789	10:30	14:30	9	7	SW					0		Screens, Signage
<b>Totals</b>							32800	14000	4150	0	50950	2825	

Average abrasive used (kg) per square meter painted: 0.68