

Appendix I:
UXO Findings Report

Commercial in Confidence

POST ACTIVITY REPORT

For

**KIRIBATI ROAD REDEVELOPMENT PROJECT – BETIO
ISLAND**

**100% UNEXPLODED ORDNANCE REMEDIATION
SERVICES**

BETIO, TARAWA, REPUBLIC OF KIRIBATI

PREPARED FOR

McCONNELL DOWELL CONSTRUCTORS PTY LTD

PREPARED BY



Milsearch Pty Ltd
Level 1, Unit 5, 30 Mawson Place
Mawson, ACT, Australia, 2607
ABN: 44 007 106 881

Ph: (02) 6286 8299
Fax: (02) 6286 8266
www.milsearch.com.au

Document Status

Version 1

Copy 1 of 2

Commercial in Confidence



Commercial in Confidence

Kiribati Road Redevelopment Project – Betio Island

Documentation History and Status				
Version	Issue Date	Changes	Approved By	Signature
1	26 September 2014		Mike Ransom MLEP	

Distribution of Copies				
Copy	Date Issued	Issued To	Electronic	Quantity
1	26 September 2014	McConnell Dowell Constructors P/L	MS Word	1
2	26 September 2014	Milsearch P/L	MS Word	1

Document Details	
Project Reference:	KIR 29412
Document Title:	Post Activity Report – Kiribati Road Redevelopment Project-Betio Island
Client:	McConnell Dowell Constructors P/L
Printed:	26 September 2014
Last Saved:	27 September 2014 1:04 PM
Author:	Paul Wheeler
Document Version:	Version 1



Commercial in Confidence

Kiribati Road Development Project – Betio Island

DISCLAIMER AND COPYRIGHT NOTICE

DISCLAIMER

This Document is an important legal document. The use of this report is governed by and subject to this disclaimer.

Milsearch Client

The entity that commissioned this report, and who is Milsearch Pty Ltd's (Milsearch) client is the McConnell Dowell Constructors Pty Ltd, (The "Client").

Purpose of This Report

This report was commissioned for the purpose of detailing the activities undertaken by Milsearch on the Client's Site and the results of those activities (The Purpose).

Disclaimer

Milsearch accepts no responsibility or liability for any use of this report or any reliance upon this report by any person, other than the use of the whole report by the Client consistent with the Purpose. Milsearch accepts no responsibility or liability to any person who relies upon a part of this report. This report must at all times be considered in its entirety.

LIST OF DEFINITIONS

Definitions that may be used in this report:

Ammunition: A complete device charged with explosives, propellants, pyrotechnics, initiating composition, or nuclear, biological or chemical material for use in military operations, including demolitions.

Block: For this Project is defined as a discrete area of the site, typically 100m x 100m. The blocks were established to allow effective management of the site operations. Each block is provided with a distinct alpha numerical code to allow for future identification (e.g. H4, J3).

Booster: A separate (intermediary stage) component and placed next to the high explosives (HE) – it is activated by the fuse and/or primer. It initiates the HE.

Carrier Projectile: A projectile which is used to carry a payload to a target. The projectile becomes redundant when the payload has been dispensed.

Detection: The discovery by any means of the presence of UXO.

Detonation: A violent chemical reaction due to heat and pressure. A detonation is a reaction that proceeds through the reacted material towards the un-reacted material. The result of the chemical reaction is exertion of high pressure on the surrounding medium, forming a propagating shock wave that originally is of supersonic velocity. When the material is located on or near the surface of the ground, a crater normally characterises detonation.

Detonator: The component within an explosive train that, when initiated, detonates a less sensitive but larger high explosive charge (usually the booster), or when containing its own primer initiates the detonation.

Discrete Anomaly: For this Project a discrete anomaly target was defined as one 20 millimetre (mm) projectile at a depth less than 0.2 m or one 40 mm projectile at a depth less than 0.4 m.

Driving Band: A raised band on a projectile body which engages in the rifling of the barrel to form a gas seal and to impart spin to the projectile.

Explosive: A substance or mixture of substances that, under external influences, is capable of rapidly releasing energy in the form of gas and heat.

Explosive Ordnance (EO): All munitions containing explosives or explosives and chemical agents. This includes bombs and warheads; guided and ballistic missiles; artillery, mortar, rocket and small arms ammunition; all mines, torpedoes, depth charges and demolition charges; pyrotechnics, clusters and dispensers; cartridge and propellant actuated devices; electro-explosive devices; clandestine and improvised explosive devices; and all similar or related items or components explosive in nature.

Explosive Ordnance Disposal (EOD): The detection, identification, field evaluation, rendering safe and final disposal of unexploded ordnance. It may also include the rendering safe and/or disposal of explosive ordnance, which may have become hazardous by damage or deterioration.

EOD Technician: Appropriately qualified EOD technician who supervises excavations and advises on potential EO/UXO.

Explosive Ordnance Waste (EOW): Inert material remnant from the initiation or functioning of explosive ordnance generally comprising empty cartridge cases, inert/expended ordnance, etc. that has been certified by an EOD technician as Free From Explosives (FFE).

Fuze: A designed and manufactured mechanism to activate munitions. It can be designed for use by electrical, chemical or mechanical systems, by push, pull, pressure, release and time activation, singly or in combination. Usually consist of an igniter and detonator.

Geophysical Survey Techniques: Methods of investigating the spatial distribution of physical characteristics of the subsurface methods. These can be classified into two distinct types:

1. Passive - these that detect variations within the Earth, (eg, gravitational, magnetic); and
2. Active - those in which artificially generated signals are transmitted into the ground, (e.g. electrical and electromagnetic fields).

Geophysical Anomaly: A geophysical anomaly is the difference between the measured geophysical results and the value that would be observed at the same location if no target (or other material to distort the readings) was present and the local background response were recorded. More specifically an anomaly is usually taken to be readings that differ from the background according to certain criteria selected for that survey, generally an amplitude threshold but also anomaly shape or other anomaly characteristics. These criteria should be based on the target to be detected and interpreted.

Hazard: Source, situation, or act with a potential for harm in terms of human injury or ill health, or a combination of these.

High Explosive: An explosive that normally detonates rather than burns, i.e. the rate of detonation exceeds the velocity of sound.

Inert Ordnance: An item of ammunition that contains no explosive, pyrotechnic, lachrymatory, radioactive, chemical, biological or other toxic components or substances.

Intrusive Survey: A survey with some elements of the works taking place below the ground surface and requiring equipment to be progressed into the underlying soils.

Kriging: An interpolation technique in which the surrounding measured values are weighted to derive a predicted value for an unmeasured location. In this case it is used to produce a regular grid of points 20cm apart which can be coloured to make a detailed geophysical image.

Magnetometer: An instrument used to detect disturbances and irregularities in the Earth's magnetic field.

Metal Detector: An electronic instrument that detects buried metallic objects by inducing and measuring an electromagnetic field.

Military Use: Use of a site that relates to military activities, including storage of munitions at Ammunition Depots.

Munitions: A synonym for ammunition, i.e. bombs, missiles, warheads, etc.

Non-Intrusive Survey: Survey undertaken at the ground surface that does not require any below ground component to be effective.

Non-UXO Scrap: Local or cultural metal contamination in the ground not associated with UXO.

Preliminary Risk Assessment: An assessment that uses freely available sources of information to place a development site in context with events that may have led to the presence of an EO/UXO hazard and to identify an appropriate course for further action.

Ogive: The shaped part of a projectile from the shoulder forward.

Primer: A component either built within or next to the fuse.

Propellant: An explosive used to propel a projectile or missile, or to other work by the rapid expansion of high pressure gas produced by burning.

Projectile: A projectile is usually fired from a gun and it carries no integral propellant but may contain an explosive charge.

Pyrotechnic: A mixture of chemicals which, when ignited, is capable of reacting exothermically to produce light, heat, smoke, sound or gas, and may be used to introduce a delay into a firing system because of its known burning time.

Quality Assurance: Quality Assurance is all those planned and systematic actions carried out within a quality system and demonstrated as necessary to provide adequate confidence that an entity (ie, one that can be individually described and considered) will fulfil requirements for quality.

Quality Control: Quality control is a set of activities intended to ensure that quality requirements are actually being met.

Remediation: The process of reducing or removing an unacceptable contamination risk.

Risk: The effect of uncertainty on objectives often expressed in terms of a combination of the consequences of an event (including changes in circumstances) and the associated likelihood of occurrence.

Risk Assessment: Overall process of risk identification, risk analysis and risk evaluation. Usually includes the evaluation of the acceptability of the assessed risk including the consequences of a materialised risk and identifies potential risk reduction and control measures.

Risk Mitigation: Eliminating risk or reducing it from an identified unacceptable level of risk to an acceptable level.

Source: First of three components of risk, i.e. EO/UXO hazards that may exist on a site.

Small Arms Ammunition (SAA): Ammunition for small arms, i.e. all ammunition of less than 20 mm in calibre and all gauges of shotgun cartridges.

Target Investigation: An investigation used to confirm the findings of a UXO survey.

Technical Survey: The detailed investigation of known or suspected EO/UXO contaminated areas during the planning phase. These areas may have been identified during a general survey or have been otherwise reported.

Tracer: A pyrotechnic charge fitted to the base of a projectile which burns during the projectile's flight to enable the firer to observe its trajectory and impact point.

Unexploded Ordnance (UXO): Explosive ordnance that has been primed, fused, armed, or otherwise prepared for action, and have been fired, dropped, launched, projected or placed in such a manner as to constitute a hazard to operations, installation, personnel, or materiel but remains unexploded either by malfunction, design, or any other cause. UXO includes items of EO that have been removed from their original resting place for any reason, including souveniring by members of the public.

UXO Assessment Survey: An operation designed to determine, assess and report on all or some of the following:

1. whether an area is affected by UXO;
2. the boundaries of the affected area;
3. the densities of UXO, including the locations and characteristics of impact areas, within the affected area; and



Commercial in Confidence

Kiribati Road Development Project – Betio Island

4. the residual depths, types and natures of UXO and inert ordnance-related items within the affected area.

UXO Remediation: An activity to reduce, isolate, or remove UXO contamination from an environment with the goal of preventing exposure to people or animals and with regard to the planned use of the land.

LIST OF ACRONYMS & ABBREVIATIONS

Acronyms and abbreviations that may be used in this report:

ADF	Australian Defence Force
DEOS	Defence Explosive Ordnance Services
DGPS	Differential Global Positioning System
DoJ	Department of Justice
EM	Electro-Magnetic
EMP	Environmental Management Plan
EO	Explosive Ordnance
EOD	Explosive Ordnance Disposal
EOW	Explosive Ordnance Waste
ESA	Explosive Storage Area
FFE	Free From Explosive
GACA	Geophysical Anomaly Characterisation Assessments
HE	High Explosive
HP	High Power
HPGPS	High Precision Global Positioning System
Hz	Hertz
Illum	Illuminating
MFF	Maribyrnong Filling Factory
MIExpE	Member of the Institute of Explosive Engineers
mV	Milli Volt
PD	Project Director
PQP	Project Quality Plan
QA	Quality Assurance
QC	Quality Control
QMS	Quality Management System
PM	Project Manager
PMP	Project Management Plan
SAA	Small Arms Ammunition
SSI	Subsurface imaging
SWMS	Safe Work Method Statements
TA	Technical Advisor
TDEM	Time Domain Electromagnetic
UXO	Unexploded Ordnance
WI	Work Instruction
WWII	World War Two



Table of Contents

LIST OF DEFINITIONS.....	4
LIST OF ACRONYMS & ABBREVIATIONS	8
1.0 INTRODUCTION	11
1.1 GENERAL	11
1.2 SITE HISTORY	12
2.0 PROJECT OBJECTIVES.....	13
3.0 CONTRACTOR DETAILS	14
3.1 MILSEARCH STAFF	14
4.0 CONTRACTOR SERVICES	14
4.1 DATES OF CONDUCT.....	14
4.2 EQUIPMENT	15
4.3 100% UXO CLEARANCE–FEEDER ROADS, DRAINS & WATER MAIN ROUTE.....	15
4.3.1 Generic Site Works	15
4.3.2 Feeder Road Clearance Data – FR01	16
4.3.3 Feeder Road Clearance Data – FR02	17
4.3.4 Feeder Road Clearance Data – FR03	17
4.3.5 Feeder Road Clearance Data – FR04	18
4.3.6 Feeder Road Clearance Data – FR04A.....	19
4.3.7 Feeder Road Clearance Data – FR05.....	19
4.3.8 Feeder Road Clearance Data – FR06.....	20
4.3.9 Feeder Road Clearance Data – FR07	21
4.3.10 Feeder Road Clearance Data – FR08.....	21
4.3.11 Feeder Road Clearance Data – FR09.....	22
4.3.12 Feeder Road Clearance Data – FR10.....	23
4.3.13 Feeder Road Clearance Data – FR11.....	23
4.3.14 Other Clearance Data – WMR.....	24
4.3.15 Other Clearance Data – UD03.....	25
4.3.16 Other Clearance Data – UD01.....	26
4.3.17 Other Clearance Data – UD04.....	27
4.3.17 Other Clearance Data – SL	27
5.0 SIGNIFICANT FINDS	29
6.0 IMPEDIMENTS TO SEARCH	34
7.0 QUALITY CONTROL.....	38
8.0 CONCLUSIONS	38
9.0 RECOMMENDATIONS.....	38

List of Figures

FIGURE 1: SITE LOCALITY.....	11
FIGURE 2: BETIO MAP SHOWING FEEDER ROADS AND ADDITIONAL WORKS (SIGNPOST LOCATIONS NOT SHOWN)	12
FIGURE 3: WMR CLIENT SPECIFIED CENTRELINE.....	24
FIGURE 4: CLIENT SPECIFIED CENTRELINE FOR ALL UD (UNLESS OTHERWISE INDICATED BY CLIENT MARKING)	25
FIGURE 5: SL SPECIFIED SEARCH AREA (SL13-16, SL21-26, SL29-34, SL37, SL39-40, SL59)	27
FIGURE 6: SL SPECIFIED SEARCH AREA (ALL OTHERS)	28
FIGURE 7: CONSOLIDATED FINDS MAP.....	33

List of Plates

PLATE 1: THE ISLAND OF BETIO AFTER THE BATTLE FOR TARAWA	13
PLATE 2: SITE LAYOUT AND MAGNETOMETER USE	16
PLATE 3: FRO1 WORKS IMAGE	16
PLATE 4: FRO2 WORKS IMAGE	17
PLATE 5: FRO3 WORKS IMAGE	18
PLATE 6: FRO4 WORKS IMAGE	18
PLATE 7: FRO4A WORKS IMAGE	19
PLATE 8: FRO5 WORKS IMAGE	20
PLATE 9: FRO6 WORKS IMAGE	20
PLATE 10: FRO7 WORKS IMAGE	21
PLATE 11: FRO8 WORKS IMAGE	22
PLATE 12: FRO9 WORKS IMAGE	22
PLATE 13: FRO10 WORKS IMAGE	23
PLATE 14: FRO11 WORKS IMAGE	24
PLATE 15: WMR WORKS IMAGE	25
PLATE 16: UD03 WORKS IMAGE	26
PLATE 17: UD01 WORKS IMAGE	26
PLATE 17: UD01 WORKS IMAGE	28
PLATE 19: US MK2 HE GRENADE (FRO8) UXO	29
PLATE 20: JAP TYPE 90 PROJECTILE (FRO8) EO	30
PLATE 21: JAP 3" MK2 MOD2 PROJECTILE (FRO6) EO	30
PLATE 22: JAP 5 TH YEAR FUSE (FRO6) EO	31
PLATE 23: JAP 120MM PROJECTILE (FRO6) EO	31
PLATE 24: US AN-M41 20LB FRAG BOMB (FRO5) UXO	32
PLATE 25: EOW EXAMPLES	32
PLATE 26: SAA EXAMPLES	33
PLATE 27: SCRAP EXAMPLES	34
PLATE 28: CONTAINER IMPINGEMENT FRO2	35
PLATE 29: ELECTRICAL CABLE INTERFERENCE FRO6	36
PLATE 30: SHALLOW ELECTRICAL CABLE FRO7	36
PLATE 31: ELECTRICAL CABLE CONDITIONS FRO4	37

POST ACTIVITY REPORT

For

100% UNEXPLODED ORDNANCE REMEDIATION SERVICES KIRIBATI ROAD REDEVELOPMENT PROJECT – BETIO ISLAND

1.0 INTRODUCTION

1.1 GENERAL

MacConnell Dowell Constructors, a New Zealand based construction company is preparing to conduct road rehabilitation on Betio Island in the Republic of Kiribati. The road rehabilitation on Betio Island involves resurfacing or constructing approximately 4.2km of feeder roads and laying approximately 2.4km of water mains pipeline. As the island was subjected to Allied and Japanese bombing during World War II both from the air and sea there exists the potential for encountering UXO on the project site. Therefore prior to the commencement of any civil works a site wide unexploded sub-surface UXO survey was to be conducted. Milsearch Pty Ltd was awarded the contract to conduct the UXO remediation employing UXO search techniques. During the process of conducting those works, additional works were identified (additional Feeder Road, three "U" drains and 65 signpost locations) and also completed.

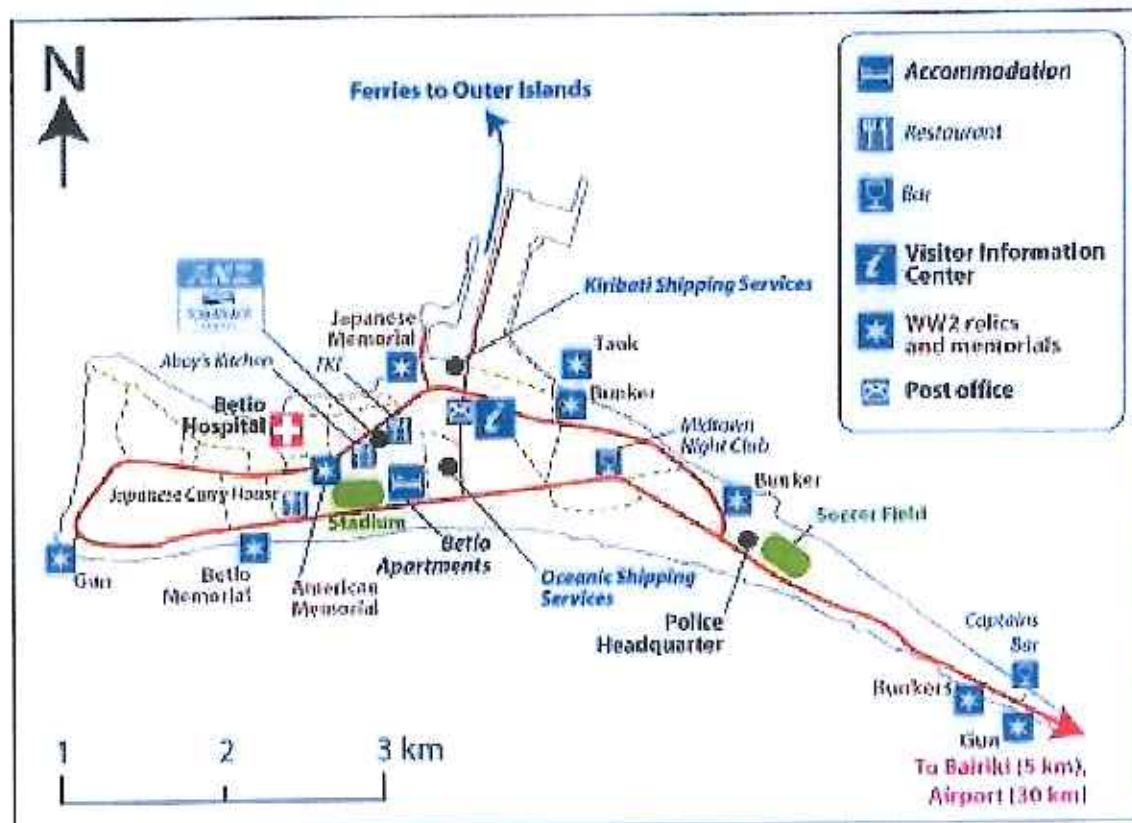


Figure 1: Site Locality

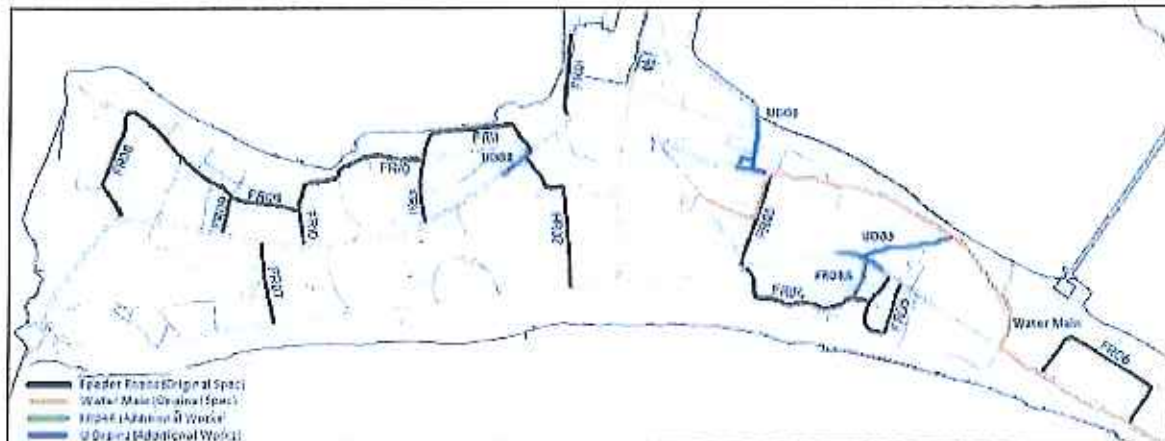


Figure 2: Betio Map showing Feeder Roads and Additional Works (Signpost Locations not shown)

1.2 SITE HISTORY

The Battle of Tarawa (US code name Operation Galvanic) was a battle in the Pacific Theater of World War II, fought from November 20 to November 23, 1943. It took place at the Tarawa Atoll in the Gilbert Islands, located in what is now the nation of the Republic of Kiribati. Nearly 6,400 Japanese, Koreans, and Americans died in the fighting, mostly on and around the small island of Betio.

The Battle of Tarawa was the first American offensive in the critical central Pacific region. It was also the first time in the war that the United States faced serious Japanese opposition to an amphibious landing. Previous landings met little or no initial resistance, but this time the 4,500 Japanese defenders were well-supplied and well-prepared, and they fought almost to the last man, exacting a heavy toll on the United States Marine Corps. The US had suffered similar casualties in other campaigns, for example over the six months of the Guadalcanal Campaign, but in this case the losses were incurred within the space of 76 hours.

The Japanese defended the island with weapons ranging from small arms right through crew served weapons such as the British 8" guns still evident on the island whilst the Americans attacked using small arms, all manner of ships guns up to and including 16", 75mm pack howitzer and aircraft bombs.



Plate 1: The Island of Betio after the Battle for Tarawa

2.0 PROJECT OBJECTIVES

The agreed objectives of the contracted works on Betio were as follows:

- Conduct analogue search of all Feeder Roads (FR) and remove ferrous anomalies within the client specified road width;
- Using a HPGPS, record boundaries of all FR;
- Conduct analogue search of Water Main Route (WMR) and remove ferrous anomalies within the client specified easment width;
- Using a HPGPS, record centreline of WMR; and
- Report on the findings and make recommendations.

During the clearance process several other tasks were identified and became the basis for a client variation. Agreed objectives of that variation were as follows:

- Conduct analogue search of an additional Feeder Road, remove ferrous anomalies within the client specified road width and, using HPGPS, record the boundary of that FR;
- Conduct analogue search of three proposed "U" Drains (UD), remove ferrous anomalies within the client specified drain width and, using HPGPS, record the centreline of that UD; and
- Conduct analogue search of 65 signpost locations (SL) around the Betio Island main road, remove ferrous anomalies within the client specified footing width and, using HPGPS, record the centrepont of each location.



3.0 CONTRACTOR DETAILS

The contracting firm is Milsearch Australia Pty Ltd (Milsearch), ABN 44 007 106 881. Milsearch is a Contracted member of the Defence Environment and Heritage Panel (DEHP) and, as part of that membership, is considered competent by, and has a contract with the Commonwealth of Australia, for the conduct of UXO assessment and remediation works.

3.1 MILSEARCH STAFF

The following Milsearch Staff were directly involved in the 100% UXO Search and Remediation operations of the Site:

- | | |
|------------------------------|----------------|
| • Project Director - | Michael Ransom |
| • Site UXO Project Manager - | Paul Wheeler |
| • EOD Technician - | Laith Stevens |
| • EOD Technician - | Jeff Newman |
| • EOD Technician - | Mark Reynish |

4.0 CONTRACTOR SERVICES

4.1 DATES OF CONDUCT

The Feeder Roads and Additional Works Areas were subjected to the requisite UXO clearance works over the period 28 July – 04 Sept 2014. Key dates on the project were as follows:

Key Dates	Activity
28 July 2014	Advance Party Mobilisation.
31 July 2014	Remaining team Mobilisation.
01 Aug 2014	Site familiarisation, inductions.
05-06 Aug 2014	FR03 Clearance conducted.
06-11 Aug 2014	FR10 Clearance conducted.
08-11 Aug 2014	FR11 Clearance conducted.
12 Aug 2014	FR09 Clearance conducted.
12-14 Aug 2014	FR08 Clearance conducted.
14-15 Aug 2014	FR07 Clearance conducted.
15-16 Aug 2014	FR01 Clearance conducted.
18-19 Aug 2014	FR06 Clearance conducted.
20-22 Aug 2014	FR04 Clearance conducted.
20-22 Aug 2014	FR05 Clearance conducted.
22-23 Aug 2014	FR02 Clearance conducted.
24-25 Aug 2014	WMR Clearance conducted.



Key Dates	Activity
26 Aug 2014	Variation Agreed.
27 Aug 2014	FR04A Clearance conducted.
27 Aug 2014	UD01 Clearance conducted.
28 Aug 2014	Part Team Demobilisation
28 Aug 2014	UD03 Clearance conducted.
28 Aug 2014	UD04 Clearance conducted.
29 Aug 2014	SL Clearance conducted.
04 Sept 2014	Demobilisation complete

4.2 EQUIPMENT

The Foerster 4032 Magnetometer was the primary analogue survey instrument for the site.

Within areas of the site where vegetation or other factors proved detrimental to the use of the 4032, a search was carried out utilizing the analogue Minelab Electronics F3 UXO metal detector.

All site boundary and search gridding was conducted utilizing sub-metre accurate High Precision Global Positioning systems (HPGPS).

Technical specifications for the search equipment are presented at Appendix A.

4.3 100% UXO CLEARANCE–FEEDER ROADS, DRAINS & WATER MAIN ROUTE

4.3.1 Generic Site Works

Each FR/UD/WMR had its centerline marked out by the clients surveyor at regular intervals along that route unless otherwise specified. Using the clients specified width, each task was then broken into 10-20m blocks and string lines used to break those blocks into 0.5m lanes. Each lane was then walked with a magnetometer and all ferrous items excavated and removed either manually or using mechanical means. Plate 2 shows the lane layout and the 4032 magnetometer in use.



Plate 2: Site Layout and Magnetometer Use

4.3.2 Feeder Road Clearance Data – FR01

FR01 has a specified width of 5m (kerb to kerb) and an overall length of 180m giving a total area of 900m². The centreline of this route was marked by the clients surveyor at regular intervals. Where possible working room was searched. UXO survey and investigation was conducted over the period 15-16 Aug 2014 with 163 anomalies investigated all of which were general scrap. There are eight anomalies remaining under the chipseal between CLO-20 however they are situated directly on top of or in the vicinity of HV power. Several other anomalies were removed in the vicinity of this power easement however the presence of interference from the HV power may mask deeper anomalies. HV Power bisects the road in several places and runs up the western edge of the road.



Plate 3: FR01 Works Image

4.3.3 Feeder Road Clearance Data – FR02

FR02 has a specified width of 5m (kerb to kerb) and an overall length of 348m giving a total area of 1738m². The centreline of this route was marked by the clients surveyor at regular intervals. Where possible working room was searched. UXO survey and investigation was conducted over the period 22-23 Aug 2014 with 353 anomalies investigated, all general scrap. Two shipping containers impinged upon the route and the area underneath them was not searched. Towards the Northern end of this route, power and other services bisect the route in several places.



Plate 4: FR02 Works Image

4.3.4 Feeder Road Clearance Data – FR03

FR03 has a specified width of 6m (kerb to kerb) and an overall length of 212m giving a total area of 1276m². The centreline of this route was marked by the clients surveyor at regular intervals. Where possible working room was searched. UXO survey and investigation was conducted over the period 05-06 Aug 2014 with 195 anomalies investigated resulting in two items of EOW being removed with the remaining anomalies general scrap. There is household power running down both sides of the road and the sewer main was discovered in the NE corner.



Plate 5: FR03 Works Image

4.3.5 Feeder Road Clearance Data – FR04

FR04 has a specified width of 3m (kerb to kerb) and an overall length of 340m giving a total area of 1020m². The centreline of this route was marked by the clients surveyor at regular intervals. Where possible working room was searched. UXO survey and investigation was conducted over the period 20-22 Aug 2014 with 342 anomalies investigated resulting in one item of EOW being removed with the remaining anomalies general scrap. The road narrows substantially in some sections so only those areas accessible were searched.



Plate 6: FR04 Works Image

4.3.6 Feeder Road Clearance Data – FR04A

FR04A has a specified width of 4m (kerb to kerb) and an overall length of 80m giving a total area of 320m². The centreline of this route was not marked and, on the clients instruction, the most suitable centreline was selected. Where possible working room was searched. UXO survey and investigation was conducted on 27 Aug 2014 with 61 anomalies investigated, all general scrap. The road does narrow significantly in places making it difficult to achieve the nominal width.



Plate 7: FR04A Works Image

4.3.7 Feeder Road Clearance Data – FR05

FR05 has a specified width of 4m (kerb to kerb) and an overall length of 290m giving a total area of 1158m². The centreline of this route was marked by the clients surveyor at regular intervals. Where possible working room was searched. UXO survey and investigation was conducted over the period 20-22 Aug 2014 with 399 anomalies investigated resulting in one item of UXCO and two items of EOW being removed with the remaining anomalies general scrap.



Plate 8: FR05 Works Image

4.3.8 Feeder Road Clearance Data – FR06

FR06 has a specified width of 4m (kerb to kerb) and an overall length of 413m giving a total area of 1651m². The centreline of this route was marked by the clients surveyor at regular intervals. Where possible working room was searched, UXO survey and investigation was conducted over the period 18-19 Aug 2014 with 1286 anomalies investigated resulting in 569 items of EO, 10 items of SAA and 340 items of EOW being removed with the remaining anomalies general scrap. Two Japanese skeletons were also exhumed on this route. Power runs bisects the road in several places and runs along the north eastern edge of the road. Sewer runs along the opposite edge.



Plate 9: FR06 Works Image

4.3.9 Feeder Road Clearance Data – FR07

FR07 has a specified width of 5m (kerb to kerb) and an overall length of 182m giving a total area of 910m². The centreline of this route was marked by the clients surveyor at regular intervals. Where possible working room was searched. UXO survey and investigation was conducted over the period 14-15 Aug 2014 with 247 anomalies investigated resulting in two items of EOW being removed with the remaining anomalies general scrap. There are numerous shallow services such as power, water and communications cables bisecting and running along this route.



Plate 10: FR07 Works Image

4.3.10 Feeder Road Clearance Data – FR08

FR08 has a specified width of 4m (kerb to kerb) and an overall length of 730m giving a total area of 2918m². The centreline of this route was marked by the clients surveyor at regular intervals. Where possible working room was searched. UXO survey and investigation was conducted over the period 12-14 Aug 2014 with 857 anomalies investigated resulting in one item of UXO, one item of EO, one item of SAA and 24 items of EOW being removed with the remaining anomalies general scrap. There are numerous shallow services such as power, water and communications cables bisecting and running along this route.



Plate 11: FR08 Works Image

4.3.11 Feeder Road Clearance Data – FR09

FR09 has a specified width of 3.5m (kerb to kerb) and an overall length of 80m giving a total area of 280m². The centreline of this route was marked by the clients surveyor at regular intervals. Where possible working room was searched. UXO survey and investigation was conducted on 12 Aug 2014 with 86 anomalies investigated resulting in two items of EOW being removed with the remaining anomalies general scrap. There is household power running along both verges of the road.



Plate 12: FR09 Works Image

4.3.12 Feeder Road Clearance Data – FR10

FR10 has a specified width of 4m (kerb to kerb) and an overall length of 426m giving a total area of 1705m². The centreline of this route was marked by the clients surveyor at regular intervals. Where possible working room was searched. UXO survey and investigation was conducted over the period 06-11 Aug 2014 with 398 anomalies investigated resulting in six items of EOW being removed with the remaining anomalies general scrap. A further 29 anomalies remain under the chipseal between CL355-425 as per the clients instructions. There is household power bisecting the road in several places, a sewer main outside Red Beach School and communications cables running along the Northern kerb.



Plate 13: FR10 Works Image

4.3.13 Feeder Road Clearance Data – FR11

FR11 has a specified width of 4.5m (kerb to kerb) and an overall length of 462m giving a total area of 2075m². The centreline of this route was marked by the clients surveyor at regular intervals. Where possible working room was searched. UXO survey and investigation was conducted over the period 08-11 Aug 2014 with 232 anomalies investigated resulting in five items of EOW and one item of SAA being removed with the remaining anomalies general scrap. A Japanese gun mount was discovered midway along the route approx 400mm below the surface and left in situ. A further 94 anomalies remain under the chipseal between CL0-200 as per the clients instructions. There is household power bisecting the road in several places and communications cables running along the Eastern kerb adjacent to FR10.



Plate 14: FR11 Works Image

4.3.14 Other Clearance Data – WMR

The WMR has a specified width of 2m, not including the gutter, (as per Figure 3) and an overall length of 2400m giving a total area of 4800m². The majority of the centreline of this route was not marked and, on the clients instruction, a specific measurement was taken from the kerb. No working room was searched. UXO survey and investigation was conducted during the period 24-25 Aug 2014 with 117 anomalies investigated, all general scrap. Several very large metallic anomalies between 1.5m-2m in depth were left in place. Power, communications and the Sewer also run along this same easement.

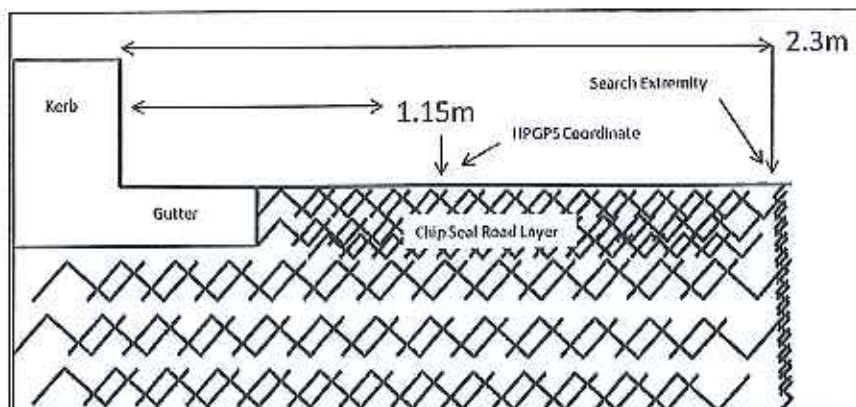


Figure 3: WMR Client Specified Centreline



Plate 15: WMR Works Image

4.3.15 Other Clearance Data – UD03

UD03 has a specified width of 2m (as per Figure 4) and an overall length of 240m giving a total area of 480m². The centreline of this drain was paint marked by the client but not surveyed. Minimal working room was searched. UXO survey and investigation was conducted on 27 Aug 2014 with 44 anomalies investigated, all general scrap. Power bisects this easement in several places.

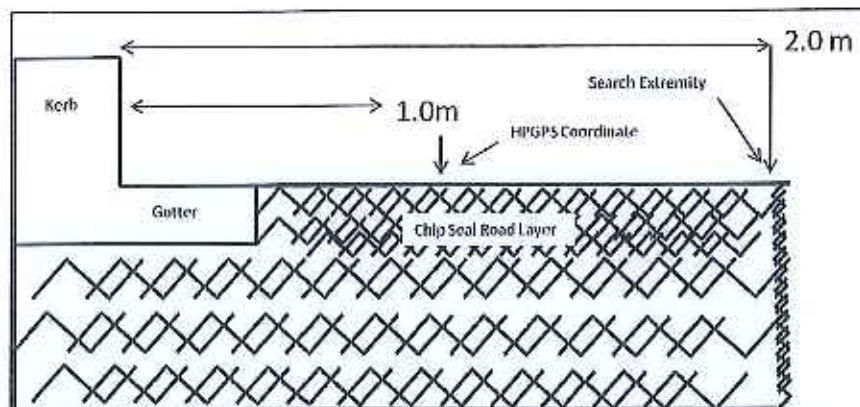


Figure 4: Client Specified Centreline for all UD (unless otherwise indicated by client marking)



Plate 16: UD03 Works Image

4.3.16 Other Clearance Data – UD01

UD01 has a specified width of 2m (as per Figure 4) and an overall length of 300m giving a total area of 600m². The centreline of this drain was paint marked by the client but not surveyed. Minimal working room was searched. UXO survey and investigation was conducted on 28 Aug 2014 with 28 anomalies investigated, all general scrap.



Plate 17: UD01 Works Image

4.3.17 Other Clearance Data – UD04

UD04 has a specified width of 2m (as per Figure 4) and an overall length of 85m giving a total area of 170m². The centreline of this drain was paint marked by the client but not surveyed. Minimal working room was searched. UXO survey and investigation was conducted on 28 Aug 2014 with two anomalies investigated, both general scrap. There is heavy electrical interference along this entire easement.

4.3.17 Other Clearance Data – SL

The SL have a specified distance from the kerb between 1.2-1.5m (varied as the ground allowed as per Figures 5 & 6) with a 1m² box cleared around the centrepoint. These points were not marked or surveyed by the client however a start point was indicated. Minimal working room was searched. UXO survey and investigation was conducted on 29 Aug 2014. In all, 65 points were identified at 100m spacing around Betio Island Main road with seven anomalies investigated, all general scrap.

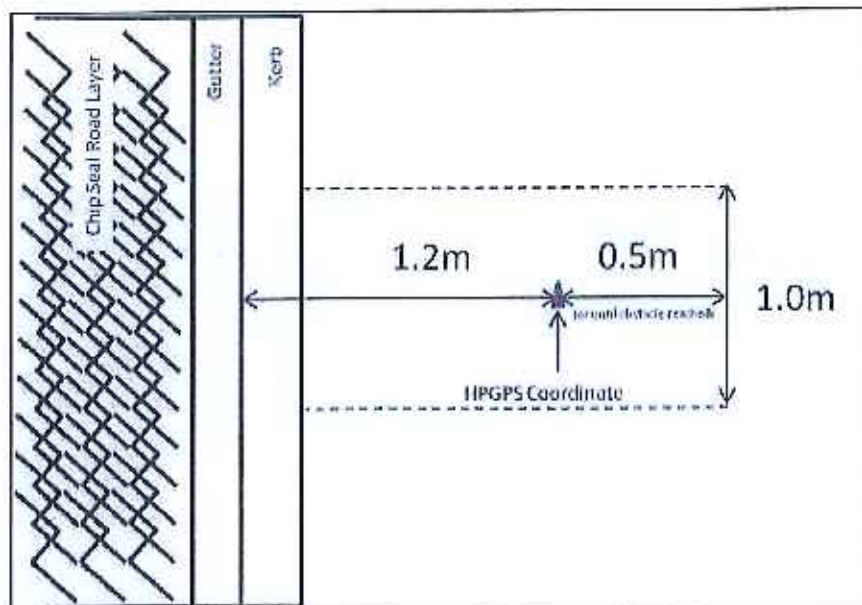


Figure 5: SL Specified Search Area (SL13-16, SL21-26, SL29-34, SL37, SL39-40, SL59)

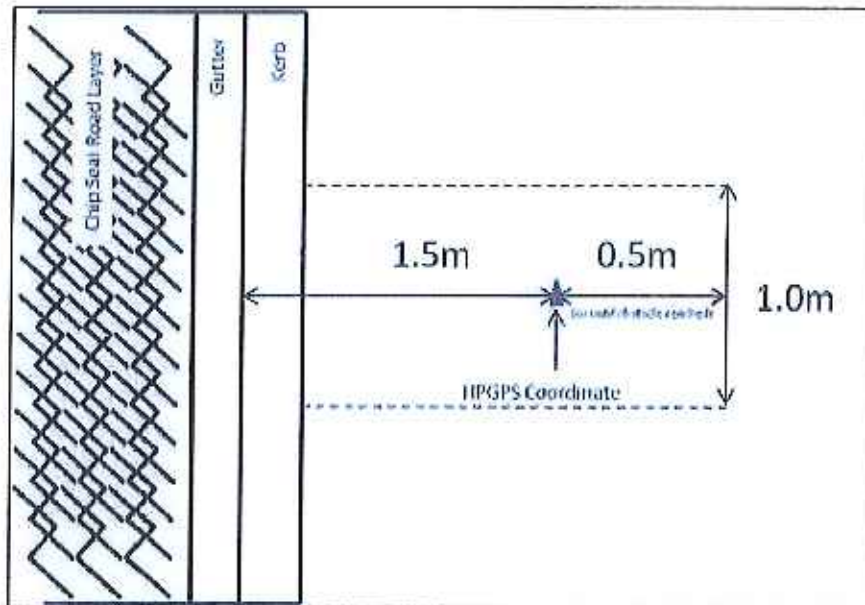


Figure 6: SL Specified Search Area (All Others)



Plate 18: UD01 Works Image

5.0 SIGNIFICANT FINDS

A total of 4,817 anomalies were investigated. Of these, two items were identified as UXO with a further 587 items identified as EO. In addition, a further 22 items of SAA and 384 individual items of EOW were removed. The location of these significant finds is pictured at Figure 7 and examples are shown in Plates 18-24. All items containing explosives or energetic materials were transported to Betio Police Station and stored in their bunker. All items of scrap were disposed of for recycling.

It is the professional opinion of Mitsearch that all items containing energetic material that were transported to and are now currently being stored in the Betio Police bunker pose no risk to the public currently, so long as no-one tampers with them.

Additionally, it is strongly recommended that all items of live UXO or EO only be handled, removed and disposed of by qualified and experienced EOD technicians. Should non-qualified personnel handle these items, the risk of an explosive incident occurring will be introduced.



Plate 19: US MK2 HE Grenade (FRO8) UXO



Plate 20: Jap Type 90 Projectile (FR08) EO



Plate 21: Jap 3\"



Plate 22: Jap 5th Year Fuse (FR06) EO



Plate 23: Jap 120mm Projectile (FR06) EO



Plate 24: US AN-M41 20lb Frag Bomb (FR05) UXO



Plate 25: EOW Examples



Plate 26: SAA Examples



Figure 7: Consolidated Finds Map

Many items identified during the Investigation process were scrap items arising from human habitation on the site as shown at Plate 27. In most instances the anomaly was removed during the clearance. The exceptions to this were large items such as reinforced concrete culverts, pipelines or, in the case of the WMR, large underground ferrous anomalies that were at a depth greater than the intended task depth or that were so large they extended beyond the specified width. Given these items were deeply embedded in the ground, once the anomaly was identified they were left in situ.



Plate 27: Scrap Examples

6.0 IMPEDIMENTS TO SEARCH

A number of areas were impeded as part of search due to narrowing of the specified route or due to impingement of services or other items on the specified search area. These are listed below and examples are shown at Plates 28-31. Generally, if power or sewer was encountered, or if warning tape was encountered, investigation ceased and the excavation was backfilled.

Route	Impediment
FR01	High Voltage Power between CL0-CL20 and along W edge of route
FR02	Two shipping containers impinged upon the route
FR04	Road narrows between CL50-100 & CL320-340
FR06	Power runs bisects the road. Runs along the north eastern edge of the road.
FR07	Numerous power cables across and along route
FR08	Numerous power cables across and along route
FR10	29 anomalies remain under the chipseal between CL355-425 as per the clients instructions.
FR11	94 anomalies remain under the chipseal between CL0-200 as per the clients instructions.
WMR	Several very large metallic anomalies between 1.5m-2m in depth were left in place. Power, communications and the Sewer also run along this same easement.
UD04	There is heavy electrical interference along this entire easement.



Plate 28: Container Impingement FR02



Plate 29: Electrical Cable Interference FR06



Plate 30: Shallow Electrical Cable FR07

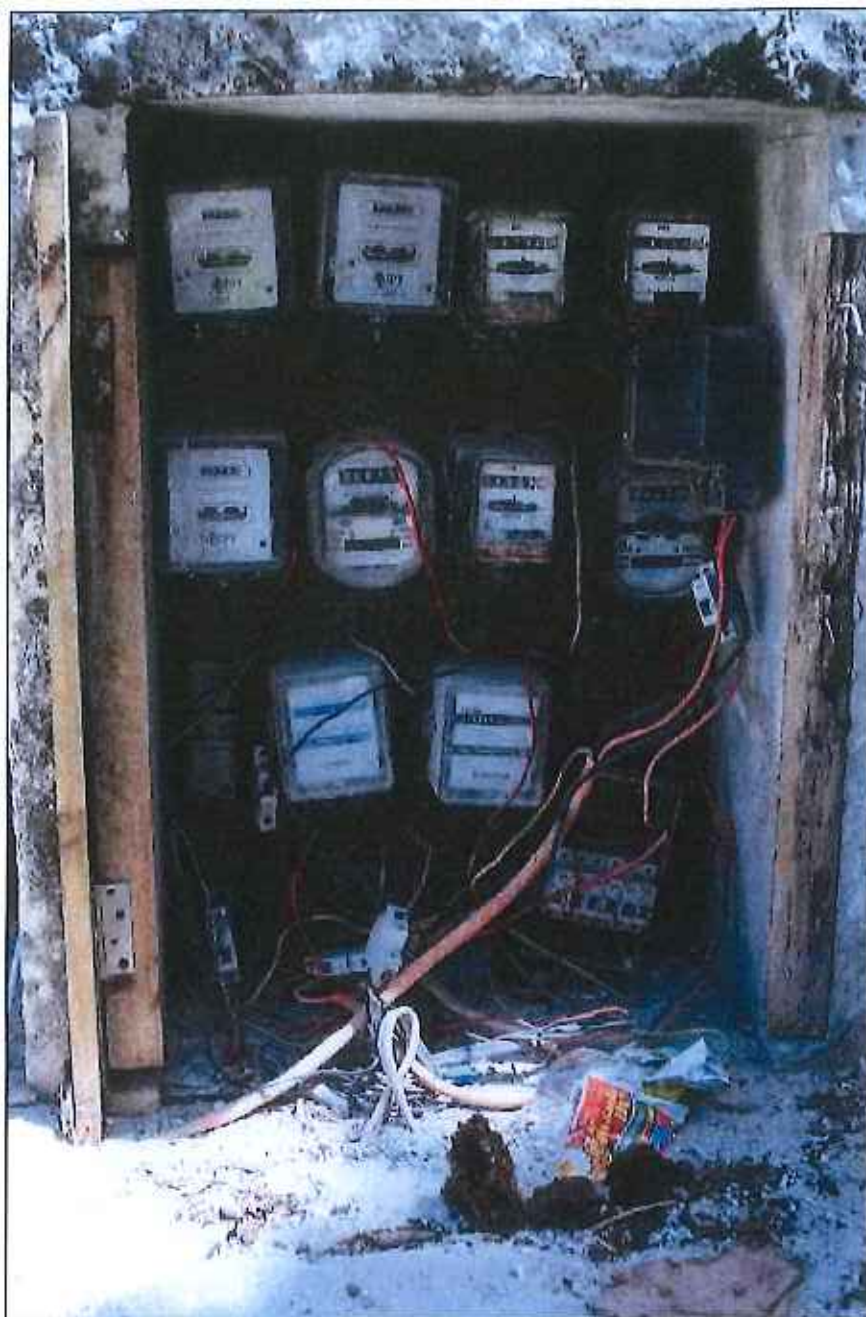


Plate 31: Electrical Cable Conditions FR04



7.0 QUALITY CONTROL

Milsearch is certified by Lloyd's Register Quality Assurance (LRQA) under AS/NZS ISO 9001:2008 Quality Management Systems – Requirements. Our Quality Management System (QMS) describes the processes and procedures used to satisfy the requirements and expectations of the Client and also, the objectives of the Project.

All search equipment was functionally tested prior to the commencement (start) and the completion (end) of each day's UXO operations using the manufacturers recommended testing procedure. This ensured the equipment was performing within the manufacturer's specifications at all times. Should a detector fail an end of day functional test, all target investigations utilizing that detector would be re-investigated using another like detector. For this Project, no detector failed either a daily start or finish functional test. The daily search equipment functional test logs (F-166) are presented at Appendix B.

Quality Control Investigations were also completed at the end of Investigation for each route or easement. Records of Quality Control Investigations are contained on the Project Quality Control Log (Form 187) and attached at Appendix C.

8.0 CONCLUSIONS

Milsearch has conducted a disciplined 100% Survey and Remediation of approximately 5km of feeder roads, 2.4km of water mains pipeline easement, 465m of "U" drain easement and 65 signpost locations totalling some 21,376m². Some 4817 anomalies were investigated resulting in the removal of 589 items containing explosives or energetic materials and a further 400 items of Explosive Ordnance Waste.

It is the professional opinion of Milsearch Pty Ltd that to the best of our knowledge and belief and within the limitations of the equipment, the areas as discussed in this report is considered safe to conduct further activities as required by the client.

9.0 RECOMMENDATIONS

The feeder roads, water mains easement, specified "U" drain easements and signpost locations have been thoroughly searched for UXO and any UXO existing therein has been removed. It is therefore recommended that development works in those locations, within the client specified easements are free to progress without constraints attributable to UXO.

Appendices:

- A. Search Equipment Technical Specifications
- B. Form 166 – Search Equipment Functional Test Log
- C. Form 187 - Quality Control Log
- D. Form 250 – Analogue Survey Interpretation and Investigation Reports (as required)

Appendix J:
**Import Permit &
Fumigation Certificates**

Rentokil Initial

PO Box 486
Suva, Fiji Islands
T: (679) 3340000
F: (679) 3395720
www.rentokil.com.fj

Certificate No: 24209

FUMIGATION CERTIFICATE

DESCRIPTION OF GOODS: **STC CRUSHER DUST (PAPS)**

CONTAINER MARKINGS: **AS ATTACHED**

FUMIGATION PREPARATION: **METHYL BROMIDE** FORMULATION: **GAS**

TOTAL VOLUME FUMIGATED: **(3751.60M³):113 X 20** VESSEL: **PAPUAN CHIEF V 320**

DOSAGE (CH₃Br): **REQUIRED 150g/m³** @ **21°C**

FUMIGATION DATA

DATE FUMIGATED: **19.09.14**

DATE RELEASED: **22.09.14**

EXPOSURE PERIOD REQUIRED: **72 HOURS**

GAS RELEASE: **5PPM**

CONSIGNOR

NAME: **STANDARD CONCRETES**
ADDRESS: **P O BOX 369**
SUVA

CONSIGNEE

NAME: **McCONNELL DOWELL CONSTRUCTION**
ADDRESS:

COMPANY REPS: **RAKESH RAJU**

BIO SECURITY OFFICER: **ASHIKA PRASAD**

SIGNATURE.....



SIGNATURE.....

DATE: **23.09.14**



THIS FUMIGATION WAS CARRIED OUT AT SCIL, NASINU YARD, NASINU.
'BRINGING EXCELLENCE AND QUALITY ASSURED'



Standard Concrete Container Markings as per Job Sheet: 24209

No:	Container Markings
1	TCKU 291081-8
2	TTNU 137713-1
3	GLDU 344148-5
4	TCKU 290243-2
5	BSIU 238596-9
6	CAIU 203396-2
7	TCKU 198234-6
8	CAIU 217933-0
9	TCKU 203973-8
10	CAIU 302112-2
11	TCKU 140693-1
12	ISSU 072059-8
13	FCIU 222027-8
14	CAIU 203348-0
15	FCIU 317966-7
16	CRXU 195701-6
17	XINU 107203-2
18	XINU 126711-6
19	CAIU 295628-1
20	DRYU 202464-2
21	TGHU 385744-2
22	CLHU 327568-3
23	CAXU 328230-2
24	CAXU 328257-6
25	FCIU 403062-0
26	GATU 039712-9
27	TCKU 245984-9
28	CAIU 327508-7
29	TGHU 307441-0
30	GLDU 323805-6





Standard Concrete Container Markings as per Job Sheet: 24209

No:	Container Markings
31	CAXU 683772-3
32	CAXU 295295-5
33	CRXU 330294-9
34	FCIU 314028-5
35	TCKU 209722-5
36	CAIU 203595-0
37	CRXU 107408-8
38	IPXU 364643-7
39	ISSU 061074-9
40	TCKU 283106-7
41	CRXU 343776-0
42	IPXU 375072-9
43	GATU 124390-9
44	CXDU 177080-9
45	TTNU 145759-8
46	TCKU 204321-3
47	CRXU 344073-7
48	CRXU 337418-9
49	FCIU 294820-0
50	FCIU 347873-4
51	CAIU 221585-9
52	CAIU 295705-6
53	TCKU 347180-7
54	ISSU 071373-1
55	CAIU 334004-8
56	CAXU 676724-6
57	CAXU 317404-1
58	TCKU 327030-9
59	CAIU 250435-8
60	TGHU 249761-3





Standard Concrete Container Markings as per Job Sheet: 24209

No:	Container Markings
61	FCIU 351403-0
62	TGHU 221851-3
63	TGHU 204141-2
64	TCKU 324500-8
65	TCKU 148290-5
66	DFSU 229900-2
67	TTNU 130139-4
68	TGHU 320118-2
69	CAXU 322870-2
70	GLDU 293373-1
71	AMFU 300328-6
72	GESU 370903-6
73	TTNU 138977-0
74	TTNU 375998-2
75	TTNU 398108-0
76	TGHU 276282-5
77	CAIU 217029-2
78	TTNU 180051-5
79	FCIU 306559-8
80	CAIU 205780-9
81	FSCU 793174-5
82	CAXU 649965-2
83	FCIU 226566-8
84	CAIU 230965-0
85	CAXU 326296-5
86	FSCU 332880-0
87	TTNU 169926-7
88	CAIU 246440-3
89	TCKU 252973-5
90	CRSU 154009-9





Standard Concrete Container Markings as per Job Sheet: 24209

No:	Container Markings
91	CXDU 182512-0
92	CRXU 327245-9
93	TTNU 384828-8
94	FSCU 398773-0
95	TCKU 134244-1
96	TGHU 006850-1
97	CAIU 327760-2
98	FCIU 331163-9
99	TCKU 316078-6
100	FCIU 350879-9
101	TGHU 243902-6
102	CAIU 295670-1
103	CAIU 250270-9
104	TCKU 321331-4
105	TTNU 412157-4
106	TEMU 283322-8
107	CAXU 656293-0
108	FCIU 388982-2
109	TTNU 372490-2
110	CLHU 292288-8
111	TCKU 246207-7
112	TGHU 089020-0
113	AMFU 310203-6





PO Box 486
Suva, Fiji Islands
T: (679) 3340000
F: (679) 3395720
www.rentokil.com.fj

Certificate No: 24210

FUMIGATION CERTIFICATE

DESCRIPTION OF GOODS: **STC SEALING CHIPS**

CONTAINER MARKINGS: **AS ATTACHED**

FUMIGATION PREPARATION: **METHYL BROMIDE** FORMULATION: **GAS**

TOTAL VOLUME FUMIGATED: **(265.60M³):8 X 20** VESSEL: **PAPUAN CHIEF V 320**

DOSAGE (CH₃Br): **REQUIRED 100g/m³** @ **21°C**

FUMIGATION DATA

DATE FUMIGATED: **19.09.14**

DATE RELEASED: **22.09.14**

EXPOSURE PERIOD REQUIRED: **72 HOURS**

GAS RELEASE: **5PPM**

CONSIGNOR

NAME: **STANDARD CONCRETES**
ADDRESS: **P O BOX 369**
SUVA

CONSIGNEE

NAME: **McCONNELL DOWELL CONSTRUCTION**
ADDRESS:

COMPANY REPS: **RAKESH RAJU**

BIO SECURITY OFFICER: **ASHIKA PRASAD**

SIGNATURE



SIGNATURE



DATE: **23.09.14**

THIS FUMIGATION WAS CARRIED OUT AT SCIL, NASINU YARD, NASINU.
'BRINGING EXCELLENCE AND QUALITY ASSURED'



Standard Concrete Container Markings as per Job Sheet: 24210

10 MM SEALING CHIPS

No:	Container Markings
1	TTNU 394559-1
2	BSIU 221307-0
3	FCIU 207125-6
4	CAIU 245411-2

7 MM SEALING CHIPS

No:	Container Markings
1	CRXU 343084-7
2	TCKU 316402-0
3	TCKU 247177-8
4	GESU 295955-5



Rentokil Initial

PO Box 486
Suva, Fiji Islands
T: (679) 3340000
F: (679) 3395720
www.rentokil.com.fj

Certificate No: 24046

FUMIGATION CERTIFICATE

DESCRIPTION OF GOODS: **STC CRUSHER DUST PAPS**

CONTAINER MARKINGS: **AS ATTACHED**

FUMIGATION PREPARATION: **METHYL BROMIDE** FORMULATION: **GAS**

TOTAL VOLUME FUMIGATED(863.20M³): **26 X 20** VESSEL: **HIGHLAND CHIEF V 1405**

DOSAGE (CH₃Br): **REQUIRED 150g/m³** @ **21°C**

FUMIGATION DATA

DATE FUMIGATED: **16.08.14**

DATE RELEASED: **19.08.14**

EXPOSURE PERIOD REQUIRED: **72 HOURS**

GAS RELEASE: **5PPM**

CONSIGNOR

NAME: **STANDARD CONCRETES**
ADDRESS: **P O BOX 369**
SUVA

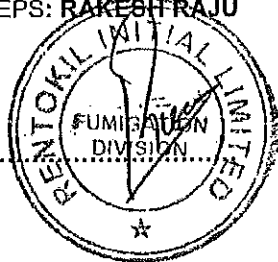
CONSIGNEE

NAME: **MCCONNELL DOWELL CONSTRUCTION**
ADDRESS:

COMPANY REPS: **RAKESH RAJU**

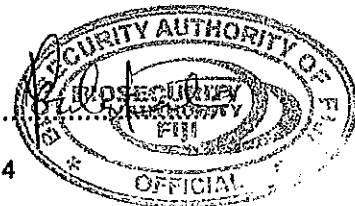
BIO SECURITY OFFICER: **VASEMACA ESTHER**

SIGNATURE.....



SIGNATURE.....

DATE: **25.08.14**

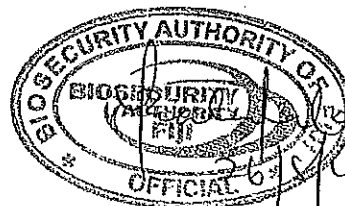
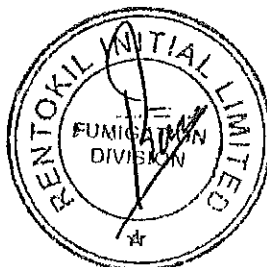


THIS FUMIGATION WAS CARRIED OUT AT SCIL, NASINU YARD, NASINU!
"BRINGING EXCELLENCE AND QUALITY ASSURED"

Rentokil Initial

Standard Concrete Container Markings as per Job Sheet: 24046

No:	Container Markings
1	FCIU 2468475
2	TGHU 2517617
3	TGHU 0607943
4	CRXU 1832019
5	GLDU 5475530
6	TCKU 2539055
7	TCKU 313340
8	TTNU 1587760
9	CAIU 2502761
10	FCIU 2642967
11	CRXU 3120203
12	TCKU 3186538
13	FSCU 7760940
14	TGHU 2555474
15	FCIU 3199196
16	CAIU 2745144
17	TGHU 0659593
18	GESU 2681926
19	CLHU 3232716
20	TCKU 2759126
21	TCKU 3259378
22	GLDU 3273720
23	CAXU 3265460
24	FCIU 3223899
25	CRXU 3399567
26	TCKU 3332020



Rentokil Initial

PO Box 486

Suva, Fiji Islands

T: (679) 3340000

F: (679) 3395720

www.rentokil.com.fj

Certificate No: 24047

FUMIGATION CERTIFICATE

DESCRIPTION OF GOODS: **STC AGGREGATE**

CONTAINER MARKINGS: **As Attached**

FUMIGATION PREPARATION: **METHYL BROMIDE** FORMULATION: **GAS**

TOTAL VOLUME FUMIGATED (**265.60M³**): **8 X 20** VESSEL: **Highland Chief V 1405**

DOSAGE (**CH₃Br**): **REQUIRED 100g/m³** @ **21°C**

FUMIGATION DATA

DATE FUMIGATED: **16.08.14**

DATE RELEASED: **19.08.14**

EXPOSURE PERIOD REQUIRED: **72 HOURS**

GAS RELEASE: **5PPM**

CONSIGNOR

NAME: **STANDARD CONCRETES**

ADDRESS: **P O BOX 369**

SUVA

CONSIGNEE

NAME: **MCCONNELL DOWELL CONSTRUCTION**

ADDRESS:

COMPANY REPS: **RAKESH RAJU**

BIO SECURITY OFFICER: **VASEMACA ESTHER**

SIGNATURE.....



SIGNATURE.....

DATE: **25.08.14**

**THIS FUMIGATION WAS CARRIED OUT AT SGIL, NASINU YARD, NASINU
BRINGING EXCELLENCE AND QUALITY ASSURED**

Rentokil Initial

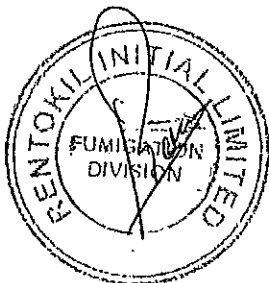
Standard Concrete Container Markings as per Job Sheet: 24047

10MM SEALING CHIPS

No:	Container Markings
1	CLHU 2950977
2	TCKU 2957610
3	TCKU 2881324
4	CAIU 2246968

7MM SAILING CHIPS

No:	Container Markings
1	TCKU 3304461
2	TGHU 1028627
3	FSCU 7448830
4	TTNU 1301331



Appendix K:
Contract Variations

Schedule of Variations:

Details		Status				Cost Implications		
Ref	Description	Potential	Preparation	Review	Approved	Increase	Decrease	Amount (AUD)
1	Work scope (1)				X		X	-1,350,777
2	Material supply by ESAT/PVU				X	X		100,000
3	Betio causeway remedial works				X	X		40,000
4	Coastal protection works				X	X		50,000
5	Standardisation of Water Supply Fittings				X	X		11,575
6	Solar Street Lighting – LED proposal				X	None	None	0
7	Valve chambers (KAP)				X	Yes		20,000
8	Valve chambers (STSISP)				X	Yes		120,000
9	Basecourse specification change				X	None	None	0
10	Deferral of Betio causeway pavement works				X	None	None	0
11	Prime				X	X		200,000
12	Deletion of selected Betio causeway works				X		X	-1,330,000
13	Work scope (2), includes Temaiku coastal sites 10 & 11				X	X		1,950,000
14	Chamber covers (TSKL)				X	X		20,000
15	KOIL building				X	X		11,500
16	Services initiatives (to mitigate conflict issues)				X	X		800,000
17	Chamber covers (KAP)				X	X		80,000
18	Airport road 'extension' (KAIP)				X	X		200,000
								922,298

Appendix L:
Contract Claims

Schedule of Claims:

Details		Status	Particulars	Review	Determination	Dispute	Cost Implications		
Ref	Description	Notice					Increase	Decrease	Amount (AUD)
1	Work scope (1)	X							
2	Betio causeway remedial works	X							
3	Damage to Betio causeway	X							
4	Deferral of Betio causeway pavement works	X	X	X	X		Claim rejected by Employer, works deleted – prompted new claim #19		
5	Introduction of VAT	X							
6	Prime	X							
7	Underground service obstructions	X	X	X			Claim for EoT of ~3 months and costs of ~\$2 million		
8	Survey controls and Setting out		X	X	X		No basis of claim so NO award		
9	Services, no power disconnection	X	X	X			Claim for EoT of 1 day		
10	Supply of local materials	X							
11	Services, Impact on clearing & u-drain works	X							
12	Ducts through seawalls	X							
13									
to	Underground service obstructions	X							
17									
18	Delay to TACL Contract	X							
19	Deletion of Betio causeway pavement works	X							
20									
To	Underground service obstructions	X							
33									

Appendix M:

Payments

Kiribati Road Rehabilitation Project**Contract No. KIR-12/01**

Interim Payment Certificate No. IPC 15

Period Ending:

30 June 2014

Bill Group Series	Work Item Variations	Amounts(Au\$) As Bid	Certified		
			Previous	Current	To Date
1000	General	12,827,618.89	6,951,124.35	340,220.13	7,291,344.48
2000	Drainage ¹	4,798,140.15	340,406.26	89,727.43	430,133.70
3000	Earthworks	613,730.00	15,814.17	0.00	15,814.17
3000	Pavement ¹	7,716,081.40	322,240.60	11,346.75	333,587.35
4000	Surfacing ¹	13,442,454.20	29,341.00	189,168.00	218,509.00
5000	Ancillary ¹	5,108,194.99	8,826.40	0.00	8,826.40
6000	Structures	1,106,239.54	414,361.41	0.00	414,361.41
8000	Water ⁵	1,058,305.05	243,424.08	75,255.17	318,679.25
9000	Dayworks ³	237,991.30	95,262.14	876.45	96,138.59
Total Bid Price Exclusive of local taxes and duties		46,908,755.52	8,420,800.42	706,593.93	9,127,394.35
Adjustments (1)				0.00	
Changes in Legislation				0.00	
Changes in Cost				0.00	
Total Adjustments (1)				0.00	
Totals after Adjustments (1)			8,420,800.42	706,593.93	9,127,394.35
Adjustments (2)				0.00	
Retention (@10%)			-842,080.04	-70,659.39	-912,739.43
Advance			4,819,795.72	0.00	4,819,795.72
Advance Repayment				0.00	
Materials on Site			937,709.53	-42,780.98	894,928.55
Total Adjustments (2)			4,915,425.21	-113,440.38	4,801,984.83
Totals after adjustments (1) & (2)			13,336,225.62	593,153.56	13,929,379.18

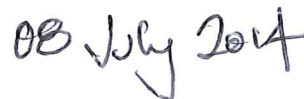
Amount of this Certificate**593,153.56**

I hereby certify that the foregoing is a true and proper statement of amounts due to McConnell Dowell (Aust) Pty Ltd. as at 30 June 2014



Ian Archer
Resident Engineer
on behalf of Roughton International Ltd

Date:



Kiribati Road Rehabilitation Project
Contract No. KIR-12/01

Interim Payment Certificate No. IPC 16

Period Ending: 31 July 2014

Bill Group Series	Work Item Variations	Amounts(Au\$) As Bid	Certified		
			Previous	Current	To Date
1000	General	12,827,618.89	7,291,344.48	359,993.96	7,651,338.44
2000	Drainage ¹	4,798,140.15	430,133.70	143,912.80	574,046.50
3000	Earthworks	613,730.00	15,814.17	3,146.07	18,960.24
3000	Pavement ¹	7,716,081.40	333,587.35	68,034.16	401,621.51
4000	Surfacing ¹	13,442,454.20	218,509.00	512,765.49	731,274.49
5000	Ancillary ¹	5,108,194.99	8,826.40	0.00	8,826.40
6000	Structures	1,106,239.54	414,361.41	61,758.58	476,119.99
8000	Water ⁵	1,058,305.05	318,679.25	49,915.18	368,594.43
9000	Dayworks ³	237,991.30	96,138.59	118,851.84	214,990.43
Total Bid Price Exclusive of local taxes and duties		46,908,755.52	9,127,394.35	1,318,378.08	10,445,772.42
Adjustments (1)				0.00	
Changes in Legislation				0.00	
Changes in Cost				0.00	
Total Adjustments (1)				0.00	
Totals after Adjustments (1)			9,127,394.35	1,318,378.08	10,445,772.42
Adjustments (2)				0.00	
Retention (@10%)			-912,739.43	-131,837.81	-1,044,577.24
Advance			4,819,795.72	0.00	4,819,795.72
Advance Repayment				0.00	0.00
Materials on Site			894,928.55	19,566.15	914,494.70
Total Adjustments (2)			4,801,984.83	-112,271.65	4,689,713.18
Totals after adjustments (1) & (2)			13,929,379.18	1,206,106.42	15,135,485.60

Amount of this Certificate

1,206,106.42

I hereby certify that the foregoing is a true and proper statement of amounts due to McConnell Dowell (Aust) Pty Ltd. as at 31 July 2014

Ian Archer

Ian Archer
Resident Engineer
on behalf of Roughton International Ltd

Date:

11th August 2014

Kiribati Road Rehabilitation Project

Contract No. KIR-12/01

Interim Payment Certificate No. IPC 17

Period Ending: 31 August 2014

Bill Group		Amounts(Au\$)	Certified		
Series	Work Item		Previous	Current	To Date
	Variations	As Bid			
1000	General	12,827,618.89	7,651,338.44	479,941.97	8,131,280.41
2000	Drainage ¹	4,798,140.15	574,046.50	79,788.51	653,835.01
3000	Earthworks	613,730.00	18,960.24	0.00	18,960.24
3000	Pavement ¹	7,716,081.40	401,621.51	396,670.38	798,291.89
4000	Surfacing ¹	13,442,454.20	731,274.49	23,186.37	754,460.86
5000	Ancillary ¹	5,108,194.99	8,826.40	11,668.80	20,495.20
6000	Structures	1,106,239.54	476,119.99	74,264.95	550,384.94
8000	Water ⁵	1,058,305.05	368,594.43	12,156.92	380,751.35
9000	Dayworks ³	237,991.30	214,990.43	1,340.36	216,330.79
Total Bid Price Exclusive of local taxes and duties		46,908,755.52	10,445,772.42	1,079,018.26	11,524,790.69
Adjustments (1)				0.00	
Changes in Legislation				0.00	
Changes in Cost				30,139.71	30,139.71
Total Adjustments (1)				30,139.71	30,139.71
Totals after Adjustments (1)			10,445,772.42	1,109,157.97	11,554,930.39
Adjustments (2)				0.00	
Retention (@10%)			-1,044,577.24	-110,915.80	-1,155,493.04
Advance			4,819,795.72	0.00	4,819,795.72
Advance Repayment			0.00	-221,831.59	-221,831.59
Materials on Site			914,494.70	-18,141.25	896,353.45
Total Adjustments (2)			4,689,713.18	-350,888.64	4,338,824.54
Totals after adjustments (1) & (2)			15,135,485.60	758,269.33	15,893,754.93

Amount of this Certificate

758,269.33

I hereby certify that the foregoing is a true and proper statement of amounts due to McConnell Dowell (Aust) Pty Ltd. as at 31 August 2014

Ian Archer

Ian Archer
Resident Engineer
on behalf of Roughton International Ltd

Date:

16th September 2014

Kiribati Road Rehabilitation Project

Contract No. KIR-12/01

Interim Payment Certificate No. IPC 18

Period Ending: 30 September 2014

Bill Group		Amounts(Au\$) As Bid	Certified		
Series	Work Item Variations		Previous	Current	To Date
1000	General	12,827,618.89	8,131,280.41	356,696.39	8,487,976.80
2000	Drainage ¹	4,798,140.15	653,835.01	133,053.91	786,888.91
3000	Earthworks	613,730.00	18,960.24	0.00	18,960.24
3000	Pavement ¹	7,716,081.40	798,291.89	15,582.24	813,874.13
4000	Surfacing ¹	13,442,454.20	754,460.86	520,422.36	1,274,883.22
5000	Ancillary ¹	5,108,194.99	20,495.20	598.40	21,093.60
6000	Structures	1,106,239.54	550,384.94	62,379.00	612,763.95
8000	Water ⁵	1,058,305.05	380,751.35	19,124.10	399,875.45
9000	Dayworks ³	237,991.30	216,330.79	66.00	216,396.79
Total Bid Price Exclusive of local taxes and duties		46,908,755.52	11,524,790.69	1,107,922.39	12,632,713.08
Adjustments (1)				0.00	
Changes in Legislation				0.00	
Changes in Cost			30,139.71	6,731.37	36,871.07
Total Adjustments (1)			30,139.71	6,731.37	36,871.07
Totals after Adjustments (1)			11,554,930.39	1,114,653.76	12,669,584.16
Adjustments (2)				0.00	
Retention (@10%)			-1,155,493.04	-111,465.38	-1,266,958.42
Advance			4,819,795.72	0.00	4,819,795.72
Advance Repayment			-221,831.59	-222,930.75	-444,762.35
Materials on Site			896,353.45	-128,870.73	767,482.72
Total Adjustments (2)			4,338,824.54	-463,266.86	3,875,557.68
Totals after adjustments (1) & (2)			15,893,754.93	651,386.91	16,545,141.84
Amount of this Certificate			651,386.91		

I hereby certify that the foregoing is a true and proper statement of amounts due to McConnell Dowell (Aust) Pty Ltd. as at 30 September 2014

Ian Archer
Resident Engineer
on behalf of Roughton International Ltd

Date:

4th November 2014

KIRIBATI ROAD REHABILITATION PROJECT

CONTRACT PRICE ADJUSTMENT

Tables of Adjustment Data

Currency **Australian Dollar (AUD)**

Index Details					Amount	Weighting
Code	Description	Source	Base Value	Date		
A	Non-adjustable	Australian Bureau of Statistics		3rd quarter 2012		0.15
B	Staff & Labour (local)	A2603589K	114.0		3,393,008	0.4
C	Bitumen					
D	Fuel	A3343978L	103.2		2,172,164	0.3
E	Equipment/Machinery					
F	Cement/Aggregates	A2309084V	101.4		849,005	0.15
G	Steel					
Total					6,414,177	1

Currency **New Zealand Dollar (NZD)**

Index Details					Amount	Weighting
Code	Description	Source	Base Value	Date		
A	Non-adjustable	Statistics New Zealand		3rd quarter 2012		0.15
B	Staff & Labour (foreign)	LCIQ.SG5IZ9	1061		6,484,065	0.4
C	Bitumen	NZTA Bitumen	3065		21,996,961	0.25
D	Fuel					
E	Equipment/Machinery	PPIQ.SQUEE1200	1084		13,588,789	0.1
F	Cement/Aggregates	PPIQ.SQUCC6100	1014		9,412,495	0.1
G	Steel					
Total					51,482,310	1

Currency **United States Dollar (USD)**

Index Details					Amount	Weighting
Code	Description	Source	Base Value	Date		
A	Non-adjustable	USA National Highway		3rd quarter 2012		0.15
B	Staff & Labour (foreign)	Construction Cost Index				
C	Bitumen					
D	Fuel					
E	Equipment/Machinery					
F	Cement/Aggregates	NHWCCI**	1.1315		2,638,622	0.85
G	Steel					
Total					2,638,622	1

Summary of Payment Currencies

Excludes Provisional Sums etc

Currency Type	Amount	Equivalent Local (AUD)	% of Net Bid Price
AUD	6,414,177	6,414,177	13.00
USD	51,482,310	40,156,202	5.58
NZD	2,638,622	2,754,193	81.42

KIRIBATI ROAD REHABILITATION PROJECT								
CONTRACT PRICE ADJUSTMENT								
Formula for adjustment:								
$P_n = a + b L_n/L_o + c E_n/E_o + d M_n/M_o + \dots$								
'P _n ' is the adjustment multiplier								
'a, b, c, ... g' are coefficients/weightings (stated in the adjustment data)								
'L _n , E _n , M _n' are current cost indices								
'L _o , E _o , M _o' are current cost indices								
Base index is that relevant 28 days prior to close of bids ie on or before 3rd August 2012								
Updated indices are those relevant 49 days prior to the last day of the period to which payment applies								
First adjustment 6 months after submission of bid, thereafter at 3 monthly intervals								
Bids closed on :		31 August 2012						
Adjustments due after:		28 February 2013						
Date	Date for relevant index	Quarter for relevant index	Date	Date for relevant index	Quarter for relevant index	Date	Date for relevant index	Quarter for relevant index
31 Mar 13	10 Feb 13	2013-Q1	31 Mar 14	10 Feb 14	2014-Q1	31 Mar 15	10 Feb 15	2015-Q1
30 Jun 13	12 May 13	2013-Q2	30 Jun 14	12 May 14	2014-Q2	30 Jun 15	12 May 15	2015-Q2
30 Sep 13	12 Aug 13	2013-Q3	30 Sep 14	12 Aug 14	2014-Q3	30 Sep 15	12 Aug 15	2015-Q3
31 Dec 13	12 Nov 13	2013-Q4	31 Dec 14	12 Nov 14	2014-Q4	31 Dec 15	12 Nov 15	2015-Q4
Index adjustment data								
	AUD			NZD				USD
	b	d	f	b	c	e	f	f
Contractor								
weightings	0.40	0.30	0.15	0.40	0.25	0.10	0.10	0.85
Indices								
Base	114.0	103.2	101.4	1,061	3,065	1,084	1,014	1.1315
31 Mar 13	115.6	98.4	101.8	1,070	3,065	1,078	1,016	1.1002
Weighted adjustment per currency								
	a (fixed)	b	c	d	e	f	g	overall
P _{AUD} =	0.1500	0.4056		0.2860		0.1506		0.9923
P _{USD} =	0.1500						0.8265	0.9765
P _{NZD} =	0.1500	0.4034	0.2500		0.0994	0.1002		1.0030
Currency weighted adjustment								
		Currency %						
P _{AUD} =	0.9923	13.00	0.1290					
P _{USD} =	0.9765	5.58	0.0545					
P _{NZD} =	1.0030	81.42	0.8167					
P _n			1.0002	apply to Mar, Apr & May 2013				

Index adjustment data								
	AUD			NZD				USD
	b	d	f	b	c	e	f	f
Contractor								
weightings	0.40	0.30	0.15	0.40	0.25	0.10	0.10	0.85
Indices								
Base	114.0	103.2	101.4	1,061	3,065	1,084	1,014	1.1315
30 Jun 13	116.7	95.6	102.2	1,074	2,957	1,082	1,017	1.1092
Weighted adjustment per currency								
	a	b	c	d	e	f	g	overall
P _{AUD} =	0.1500	0.4095		0.2779		0.1512		0.9886
P _{USD} =	0.1500						0.8332	0.9832
P _{NZD} =	0.1500	0.4049	0.2412		0.0998	0.1003		0.9962
Currency weighted adjustment								
		Currency %						
P _{AUD} =	0.9886	13.00	0.1285					
P _{USD} =	0.9832	5.58	0.0549					
P _{NZD} =	0.9962	81.42	0.8111					
P _n			0.9945	apply to Jun, Jul & Aug 2013				
30 Sep 13	117.7	100.3	100.1	1,079	3,047	1,093	1,023	1.1195
Weighted adjustment per currency								
	a	b	c	d	e	f	g	overall
P _{AUD} =	0.1500	0.4130		0.2916		0.1481		1.0026
P _{USD} =	0.1500						0.8410	0.9910
P _{NZD} =	0.1500	0.4068	0.2485		0.1008	0.1009		1.0070
Currency weighted adjustment								
		Currency %						
P _{AUD} =	1.0026	13.00	0.1303					
P _{USD} =	0.9910	5.58	0.0553					
P _{NZD} =	1.0070	81.42	0.8199					
P _n			1.0056	apply to Sep, Oct & Nov 2013				
31 Dec 13	118.3	99.3	100.2	1,083	2,977	1,099	1,027	1.1195
Weighted adjustment per currency								
	a	b	c	d	e	f	g	overall
P _{AUD} =	0.1500	0.4151		0.2887		0.1482		1.0020
P _{USD} =	0.1500						0.8410	0.9910
P _{NZD} =	0.1500	0.4083	0.2428		0.1014	0.1013		1.0038
Currency weighted adjustment								
		Currency %						
P _{AUD} =	1.0020	13.00	0.1303					
P _{USD} =	0.9910	5.58	0.0553					
P _{NZD} =	1.0038	81.42	0.8173					
P _n			1.0028	apply to Dec 2013 and Jan & Feb 2014				

Indice adjustment data								
	AUD			NZD				USD
	b	d	f	b	c	e	f	f
Contractor								
weightings	0.40	0.30	0.15	0.40	0.25	0.10	0.10	0.85
Indices								
Base	114.0	103.2	101.4	1,061	1,211	1,084	1,014	1.1315
31 Mar 14	119.3	104.1	101.2	1,087	2,977	1,104	1,018	1.1195
Weighted adjustment per currency								
	a	b	c	d	e	f	g	overall
P _{AUD} =	0.1500	0.4186		0.3026		0.1497		1.0209
P _{USD} =	0.1500						0.8410	0.9910
P _{NZD} =	0.1500	0.4098	0.2428		0.1018	0.1004		1.0049
Currency weighted adjustment								
		Currency %						
P _{AUD} =	1.0209	13.00	0.1327					
P _{USD} =	0.9910	5.58	0.0553					
P _{NZD} =	1.0049	81.42	0.8182					
P _n			1.0062	apply to Mar, Apr & May 2014				
30 Jun 14	119.3	104.1	101.2	1,087	2,977	1,104	1,018	1.1195
Weighted adjustment per currency								
	a	b	c	d	e	f	g	overall
P _{AUD} =	0.1500	0.4186		0.3026		0.1497		1.0209
P _{USD} =	0.1500						0.8410	0.9910
P _{NZD} =	0.1500	0.4098	0.2428		0.1018	0.1004		1.0049
Currency weighted adjustment								
		Currency %						
P _{AUD} =	1.0209	13.00	0.1327					
P _{USD} =	0.9910	5.58	0.0553					
P _{NZD} =	1.0049	81.42	0.8182					
P _n			1.0062	apply to Jun, Jul & Aug 2014				

KIRIBATI ROAD REHABILITATION PROJECT

ADJUSTMENT FOR CHANGES IN COST

Highlighted adjustment factors subject to update once information becomes available.

Certificate			Change in Cost (AUD)				
IPC No.	Year	Month	Amount (BoQ items less Prov Sums)	Adjustment Factor	Adjusted Amount	Difference Month	Cumulative
1	2013	April					
2		May	1,235,628.56	1.0002	1,235,875.69	247.13	247.13
3		Jun	933,110.89	0.9945	927,978.78	-5,132.11	-4,884.98
4		Jul	857,321.59	0.9945	852,606.32	-4,715.27	-9,600.25
5		Aug	498,424.26	0.9945	495,682.93	-2,741.33	-12,341.58
6		Sep	399,078.21	1.0056	401,313.05	2,234.84	-10,106.74
7		Oct	392,827.93	1.0056	395,027.77	2,199.84	-7,906.90
8		Nov	388,049.67	1.0056	390,222.75	2,173.08	-5,733.82
9		Dec	426,906.11	1.0028	428,101.45	1,195.34	-4,538.48
10	2014	Jan	660,549.61	1.0028	662,399.15	1,849.54	-2,688.94
11		Feb	392,671.80	1.0028	393,771.28	1,099.48	-1,589.46
12		Mar	622,018.78	1.0062	625,875.30	3,856.52	2,267.06
13		Apr	608,921.84	1.0062	612,697.16	3,775.32	6,042.38
14		May	923,183.10	1.0062	928,906.84	5,723.74	11,766.12
15		Jun	704,335.74	1.0062	708,702.62	4,366.88	16,133.00
16		Jul	1,188,598.59	1.0062	1,195,967.90	7,369.31	23,502.31
17		Aug	1,070,547.43	1.0062	1,077,184.82	6,637.39	30,139.71
18		Sep	1,085,704.12	1.0062	1,092,435.49	6,731.37	36,871.07
19		Oct					
20		Nov					
21		Dec					
22	2015	Jan					
23		Feb					
24		Mar					
25		Apr					
26		May					
27		Jun					
28		Jul					