



**BURO HAPPOLD**  
**COPPERHOUSE SLUICE GATE**

**DOCUMENT REVISION RECORD**

Document Number: **C0395/006/DOC**

Number of Pages: **31**

Document Title: **REPORT ON THE MECHANICAL SURVEY OF  
THE COPPERHOUSE SLUICE VERTICAL  
LIFT GATE**

Saved as: **K:\Contracts Working\351-400\C0395B Copper House  
Sluice\Documents\C0395B\_006\_DOC Rev A1.doc**

<b>REV</b>	<b>DATE</b>	<b>AUTHOR</b>	<b>CHECKED</b>	<b>APPROVED</b>
A	30.09.2006	C Appleton	R Digby	K Grubb

**Refer to the Revision Sheet at the rear of this document for details of  
modifications.**

## CONTENTS

<b>1.</b>	<b>INTRODUCTION .....</b>	<b>3</b>
<b>2.</b>	<b>SURVEY FINDINGS .....</b>	<b>4</b>
2.1	<i>Review of documentation.....</i>	<i>4</i>
<b>3.</b>	<b>SURVEY OF THE GATE STRUCTURE, CIVIL INTERFACES AND LIFTING GEAR.....</b>	<b>5</b>
3.1	<i>Gate Structure.....</i>	<i>5</i>
3.2	<i>Civil Work Interfaces.....</i>	<i>13</i>
3.3	<i>Gate Sealing System.....</i>	<i>18</i>
3.4	<i>Lateral Gate Guiding System.....</i>	<i>19</i>
3.5	<i>Gate Lifting Gear.....</i>	<i>20</i>
3.6	<i>Electrical Equipment.....</i>	<i>23</i>
<b>4.</b>	<b>ISSUES AND CONSTRAINTS .....</b>	<b>25</b>
<b>5.</b>	<b>RECOMMENDATIONS.....</b>	<b>27</b>
5.1	<i>Gate Structure.....</i>	<i>27</i>
5.2	<i>Civil Works Interfaces.....</i>	<i>27</i>
5.3	<i>Gate Sealing System.....</i>	<i>28</i>
5.4	<i>Lateral Gate Guiding System.....</i>	<i>28</i>
5.5	<i>Gate Lifting Gear.....</i>	<i>28</i>
5.6	<i>Electrical Equipment.....</i>	<i>29</i>
<b>6.</b>	<b>CONCLUSIONS .....</b>	<b>29</b>



## 1. INTRODUCTION

At the request of Buro Happold (BH) (the consultants retained directly by the Hayle Harbour site developer, ING), Kenneth Grubb Associates Ltd (KGAL) has undertaken a mechanical survey of the Vertical Lift Gate sited at Copperhouse Sluice on Copperhouse Pool and operated by the Environment Agency Operations Delivery Staff.

The survey was of a non-intrusive nature and undertaken during tidal conditions. There is some residual risk that problems relating to the gate were not uncovered.

Members of the Environment Agency (EA) staff were on hand to assist the surveyors with information regarding the history of the installation and the site in general. They were also able to provide information with regard to the operation and maintenance of the gates. In addition, Dave Turner of the EA was contacted and provided useful background information.

The purpose of the survey was to determine the condition and serviceability of the existing gate and drive mechanisms, take measurements of the installation, establish the need for any refurbishment work and ensure that no other problems exist. Also, to consider the possibility of the gate being capable of being used in a sluicing/scouring capacity.

As the gate is owned and operated by the Environment Agency, no attention was given to operational, management or Health and Safety issues, though problems in this regard are obvious on the site.

The survey was undertaken between 4<sup>th</sup> and 6<sup>th</sup> September 2006.

Personnel involved:	Chris Rose	(BH)	Part - time
	Ken Grubb	(KGAL)	
	Chris Appleton	(KGAL)	

The purpose of the vertical gate is, primarily, to act as a flood defence mechanism to prevent flooding of the area from tidal water.

The secondary purpose of the gate is to regulate the saltwater inundation within the Copperhouse Pool.

Note that historically the gate was used as a means of scouring sand from the harbour channels. Since that time the gate design has been changed by the EA. There may be some advantage to the potential Hayle harbour development if this functionality could be restored.

The gate was originally manufactured and installed in 1981 as the direct replacement for a pair of mitre gates. It was originally designed to work as a roller gate. The roller axles are still fitted to the ends of the gate.

