



**Chemical Business Association**

**CIA** | Chemical  
Industries  
Association

Working for chemical and  
pharmaceutical businesses



**WATER UK**

# TANKER COUPLING CODE OF CONDUCT FOR SODIUM HYPOCHLORITE

**Issue No: 2**

**June 2018**



# Disclaimer

The aim of this Code of Conduct and associated requirements is to increase the level of safety for all persons involved in the loading and unloading of sodium hypochlorite via bulk tanker or tank container. The information is given in good faith and belief in its accuracy at the time of publication, but it does not imply any legal liability or responsibility by the CBA, CIA or WATER UK

The document has been designed to provide companies with details of the Code for bulk tanker deliveries of Sodium Hypochlorite and should not be used in isolation.

Users of this guide should pay regard to any relevant legislation or authoritative recommendations, which may have evolved subsequently to the date of publication.

**Copyright © June 2018**

by the CBA, CIA and Water UK. All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, without permission from the publishers:



Working for chemical and pharmaceutical businesses

Group House  
Southmere Court  
Electra Way  
Crewe Business Park  
Crewe  
Cheshire  
CW1 6GU

Tel : +44 (0)1270 258200

Fax : +44 (0)1270 258444

[www.chemical.org.uk](http://www.chemical.org.uk)

Email : [cba@chemical.org.uk](mailto:cba@chemical.org.uk)

3rd Floor  
36 Broadway  
London  
SW1H 0BH

[www.water.org.uk](http://www.water.org.uk)

Email : [contact@water.org.uk](mailto:contact@water.org.uk)

Kings Buildings  
Smith Square  
London  
SW1P 3JJ

Tel : +44 (0)20 7834 3399

Fax : +44 (0)20 7834 4469

[www.cia.org.uk](http://www.cia.org.uk)

Email : [enquiries@cia.org.uk](mailto:enquiries@cia.org.uk)



## Foreword

The Health and Safety Executive (HSE) was involved with the Chemical Business Association in producing this guidance. HSE endorses the guidance as it follows a sensible and proportionate approach to managing health and safety.

Health and Safety inspectors seeking to secure compliance with the law may refer to this Guidance as illustrating good practice.

# CONTENTS

## Table of Contents

DISCLAIMER .....	2
CONTENTS .....	4
INTRODUCTION .....	5
OBJECTIVE.....	6
SCOPE .....	6
UNIQUE SODIUM HYPOCHLORITE COUPLING .....	7
GLOSSARY .....	11
APPENDICES.....	13

# INTRODUCTION

One of the safety challenges that transport companies are confronted with is the wide variety of couplings that are used at (un)loading installations.

Continuous efforts to enhance safety during transport of chemicals and their associated handling are part of the overall aim to improve the safety performance of both the chemical manufacturing and transport service industries.

There is no reliable recent data on the frequency of mis-delivery of hypochlorite, however we know that offloading incidents do occasionally happen and the consequences can be serious. A couple of more recent incidents in Europe and in USA (the latter in Atchison, Kansas in October 2016<sup>1</sup>) act as a valuable reminder that a residual risk remains. More historically, a HSE Report published in 2000 and covering a review 1992 – 1998<sup>2</sup> (*Ref in footnote*) indicated more than 200 incidents resulted from either the mixing of incompatible chemicals with hypochlorite, or errors where a driver offloaded into the wrong tank.

Since that report was published there has been a conscious effort to increase control measures in relation to the offloading of chemicals, specifically in the same location as hypochlorite tanks. However, despite all of these measures being in place there is still a residual risk due to the rotation of trained drivers and other elements such as ‘human factors’. Because the impacts could be significant, industry has agreed that a more robust solution is appropriate to reduce the risk to “as low as is reasonably practicable” (ALARP).

Industry agreed that a unique coupling for use with sodium hypochlorite deliveries would be a solution that would not entail excessive costs to suppliers and customers alike and could be introduced in a staged manner that would both enhance safety but also allow the costs and risks to be managed sustainably.

This Code of Conduct for Sodium Hypochlorite is intended to improve loading and unloading safety aspects. Compliance with the Code of conduct is mandatory on all CBA members.

---

<sup>1</sup> <http://www.csb.gov/mgpi-processing-inc-toxic-chemical-release/>

<sup>2</sup> HSE TD5/027 02/10/2000

## OBJECTIVE

This code of conduct specifies the requirements relating to a unique coupling assembly for use with bulk deliveries of sodium hypochlorite and associated recommendations on the use of the defined coupling at (un)loading installations, especially where other incompatible substances are handled.

This code describes a unique coupling that has been designed to reduce the risk of cross contamination of products at sodium hypochlorite installations. This will help operators of such installations with their duty to take all necessary measures to prevent major accidents and to limit their consequences for human health and the environment under the Control of Major Accident Hazards Regulations 2015 (COMAH).

The use of the unique coupling and application of this code of conduct does not remove the joint responsibility of both the delivery driver and site operators representative to ensure the discharge procedure including pre-delivery checks are undertaken to also reduce the potential for cross contamination

## SCOPE

This Code and associated recommendations is limited to the coupling for the loading and unloading of bulk sodium hypochlorite in UN portable tank or ADR road tanker operations.

This code of conduct does not apply to top loading operations of sodium hypochlorite into bulk tankers, where other safety features already exist. However, it shall apply where bottom loading operations are undertaken to improve the safety and reduce the risk of mis-coupling.

# UNIQUE SODIUM HYPOCHLORITE COUPLING

## GENERAL

This code defines the coupling which shall be used for all new installations, and upon refurbishment of existing installations. Existing installations may utilise a 'temporary' coupling as defined below, pending permanent modification. The interim use of the temporary couplings shall be phased as soon as reasonably practicable, but no longer than 5 years from adoption of the code.

## ENGINEERING AND MATERIALS OF CONSTRUCTION CONSIDERATIONS

The responsibility remains with the installation operator to ensure that the materials of construction, including gaskets and any necessary support structures to eliminate additional stresses from the weight of the coupling, are suitable and sufficient.

Competent engineering advice must be sought at the design stage of new installations and considered under management of change for existing installations.

## POST INSTALLATION INSPECTION AND MAINTENANCE

Couplings, including gaskets and any necessary support structures should be included in the written scheme of examination for the installation.

Any modification to the installation should be communicated in writing to the incumbent sodium hypochlorite supplier.

## PERMANENT COUPLING

The design drawings relating to the permanent unique coupling have been made freely available within Appendix I to this code. The coupling will replace the existing pipework terminus table 'D' flange.





## TEMPORARY COUPLING

The design drawings relating to the temporary unique coupling have been made freely available within Appendix II to this code. The temporary coupling will be affixed to the existing pipework terminus table 'D' flange.

The temporary coupling is secured in place by four bolts, where one bolt has been drilled to allow a padlock to be installed to prevent easy removal without the knowledge of operating staff.

The keys for the padlock will be retained by the operator of the installation. The operator should only remove the temporary coupling, to allow a table 'D' connection to be made, under strict permit to work (PTW) procedures.

All unloading must be supervised by both the discharging driver and a member of the installation operating staff

		Temporary coupling
		Tank inlet temporary coupling showing C-PVC blanking plate, padlocked bolt and locator pin





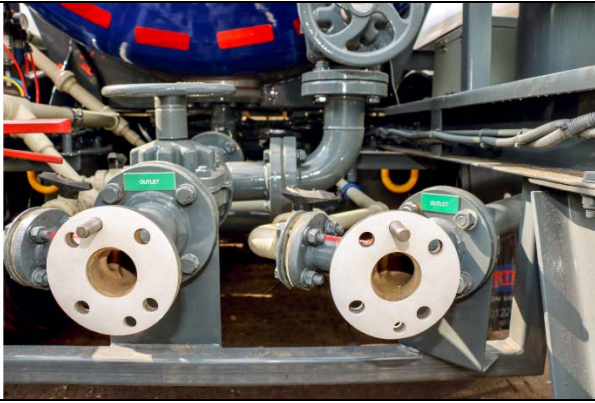
## TANKER HOSE

Once the permanent or temporary coupling has been fitted to the sodium hypochlorite installation inlet then specific tanker hoses will be necessary to connect to the unique coupling. The design drawings for these hose connections have been made freely available and are located in Appendix III.

To increase the safety of the overall system the tanker hose must have the locator pin fitted to both ends and the tanker outlet coupling modified to accommodate the locator pin on the hose.

Experience has shown that the fitting of the hose to the tanker has to be undertaken in a different way to normal operation. Firstly the hose is connected to the tanker outlet and the other end then connected to the installation. This is to allow the installation flange backing ring to be rotated because the hose run may not be perfectly straight and the locator pin will need to be aligned.

		Tanker product transfer hose showing second locator pin
		Completed coupling prior to delivery being commenced



Road tanker coupling showing locator pin and hole configuration

# GLOSSARY

## ADR Road Tanker

Means a vehicle built to carry liquids and comprising one or more fixed tanks. In addition to the vehicle proper, or the units running gear used in its stead, a tank vehicle comprises one or more shells, their items of equipment and the fittings for attaching them to the vehicle or to the running gear units. (Source - ADR 2017 edition)

## Competent person

A competent person is someone who has sufficient training and experience or knowledge and other qualities that allow them to enable the installation operator to meet the requirements of health and safety law.

## Permit to work system

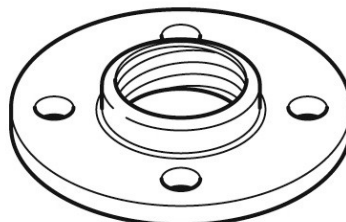
Where proposed work is identified as having a high risk, strict controls are required. The work must be carried out against previously agreed safety procedures, a 'permit-to-work' system.

The permit-to-work is a documented procedure that authorises certain people to carry out specific work within a specified time frame. It sets out the precautions required to complete the work safely, based on a risk assessment. It describes what work will be done and how it will be done; the latter can be detailed in a 'method statement'.

The permit-to-work requires declarations from the people authorising the work and carrying out the work. Where necessary it requires a declaration from those involved in shift handover procedures or extensions to the work. Finally, before equipment or machinery is put back into service, it will require a declaration from the permit originator that it is ready for normal use. (Source: Health and Safety Executive)

## Table D/E

British Standard BS10: 1962 – Specification for flange and bolting for pipes, valves and fittings. Table D, E, F and H of BS10 detail dimensions of flange, bore of pipe and number and diameter of bolts.



## Health and Safety Executive strategy - Helping Great Britain Work Well

The UK HSE five-year strategy commencing 2016 with six strategic themes

### The Six Strategic Themes

- **Acting together:** Promoting broader ownership of health and safety in Great Britain
- **Tackling ill health:** Highlighting and tackling the costs of work-related ill health
- **Managing risk well:** Simplifying risk management and helping business to grow
- **Supporting small employers:** Giving SMEs simple advice so they know what they have to do
- **Keeping pace with change:** Anticipating and tackling new health and safety challenges
- **Sharing our success:** Promoting the benefits of Great Britain's world-class health and safety system

### UN Portable tank

Means a multimodal tank used for the purposes of:

- Transport of Class 1 and Classes 3 to 9. The portable tank includes a shell fitted with service equipment and structural equipment necessary for the carriage of dangerous substances;
- Transport of non-refrigerated, liquefied gases of class 2, having a capacity of more than 450 litres. The portable tank includes a shell fitted with service equipment and structural equipment necessary for the carriage of gases;
- Transport of refrigerated liquefied gases, a thermally insulated tank having a capacity of more than 450 litres. The portable tank includes a shell fitted with service equipment and structural equipment necessary for the carriage of refrigerated liquefied gases;



The portable tank shall be capable of being filled and discharged without the removal of its structural equipment. It shall possess stabilising members external to the shell, and shall be capable of being lifted when full. It shall be designed primarily to be loaded onto a vehicle, wagon or sea going or inland navigation vessel and shall be equipped with skids, mountings or accessories to facilitate mechanical handling. Tank-vehicles, rail tank-waggon, non-metallic tanks, gas cylinders, large receptacles, and intermediate bulk containers (IBCs) are not considered to fall within the definition for portable tanks (source - 19<sup>th</sup> edition UN Model regulations)

### Written Scheme of Examination (WSE)

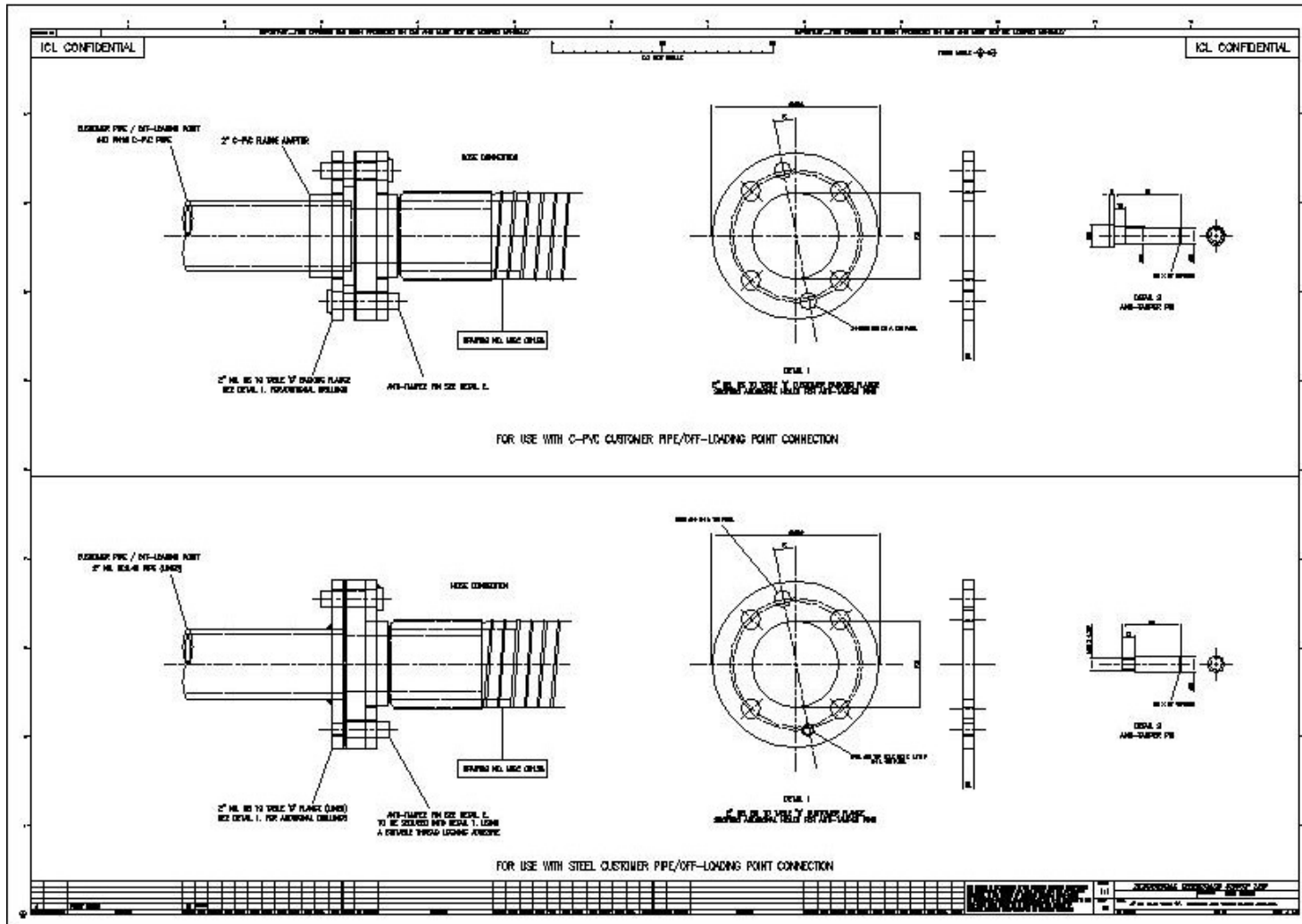
A plan used to define the scope and frequency of examinations to be carried out. (NB there are specific requirements for a WSE within the Pressure Systems Safety Regulations (PSSR), where they apply) It should be noted that different terms may be used for this 'plan' where PSSR does not apply.

# APPENDICES

## APPENDIX I – Permanent Coupling




 05692 ISSUE 'A'-Layout1.pdf	 05137 ISSUE B-Layout1.pdf
Permanent coupling drawings	C-PVC blanking cover drawings

# PERMANENT COUPLING DRAWINGS - 05692 ISSUE 'A' - LAYOUT 1



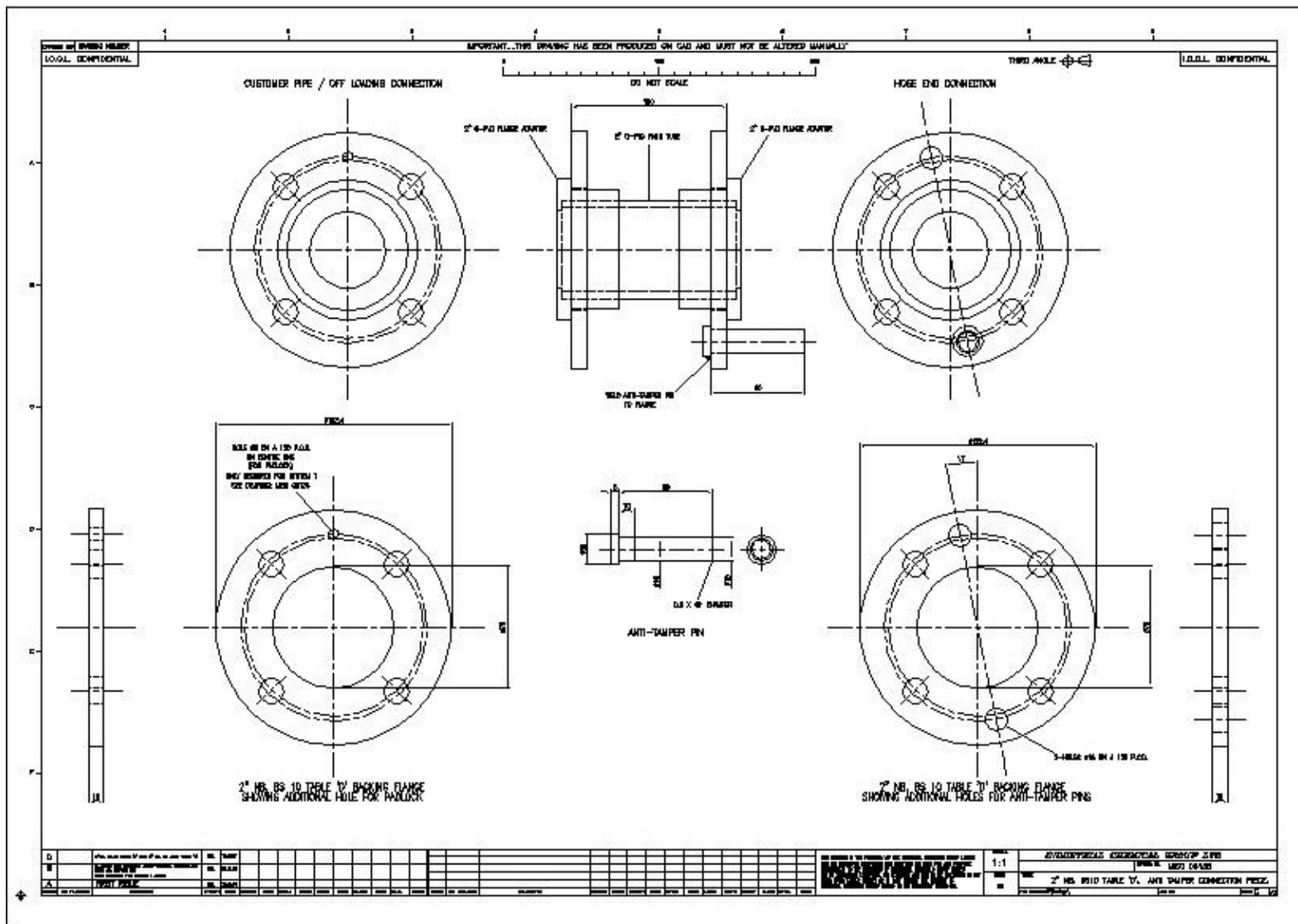


## APPENDIX II – Temporary Coupling

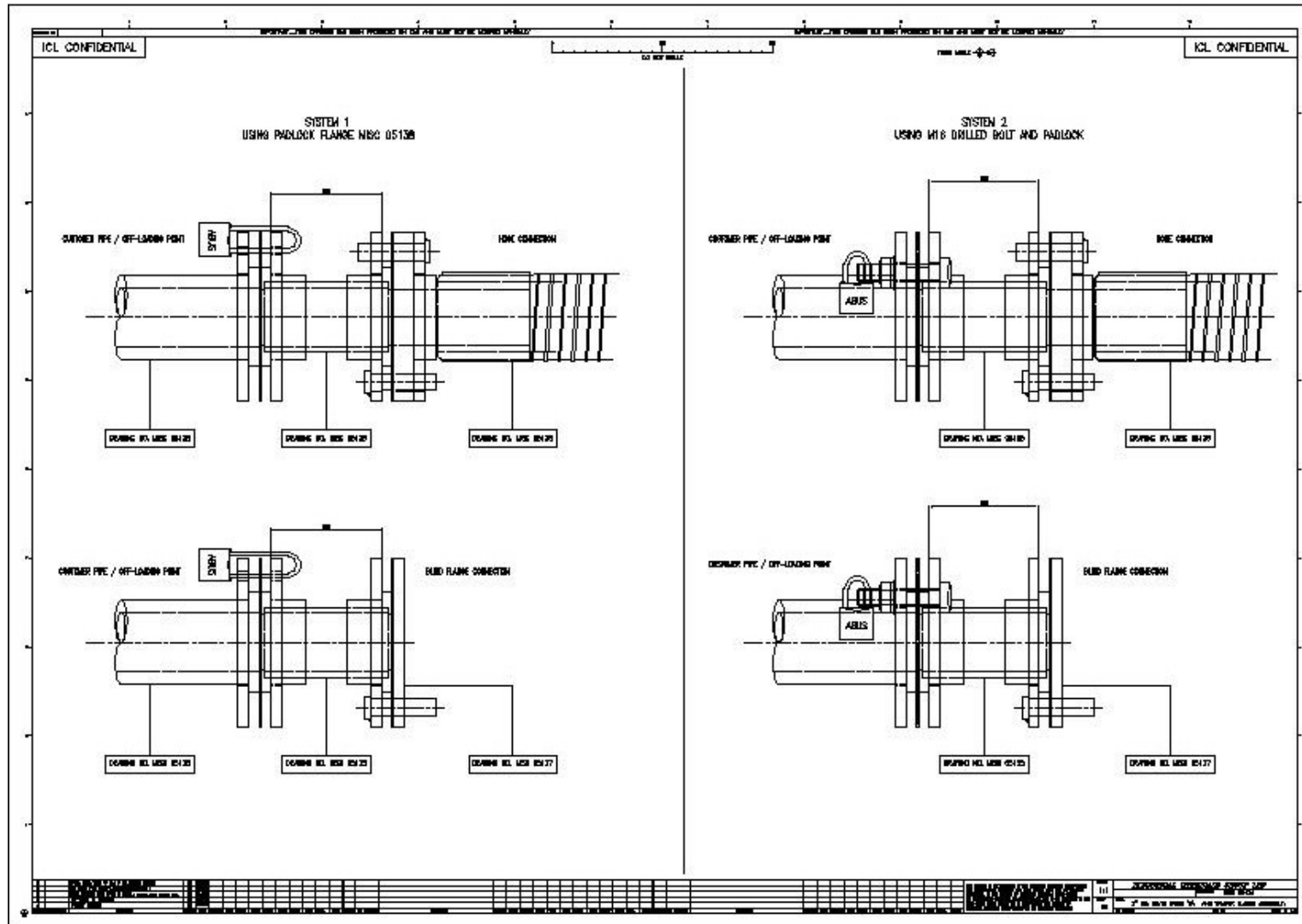
 <p>05135 ISSUE C-Layout1.pdf</p>	 <p>05134 issue E-Layout1.pdf</p>	 <p>05138 issue D-Layout1.pdf</p>
<p>Temporary coupling drawings</p>	<p>Locking system drawings</p>	<p>Customer flange drilling template for Padlocking through flange system</p>



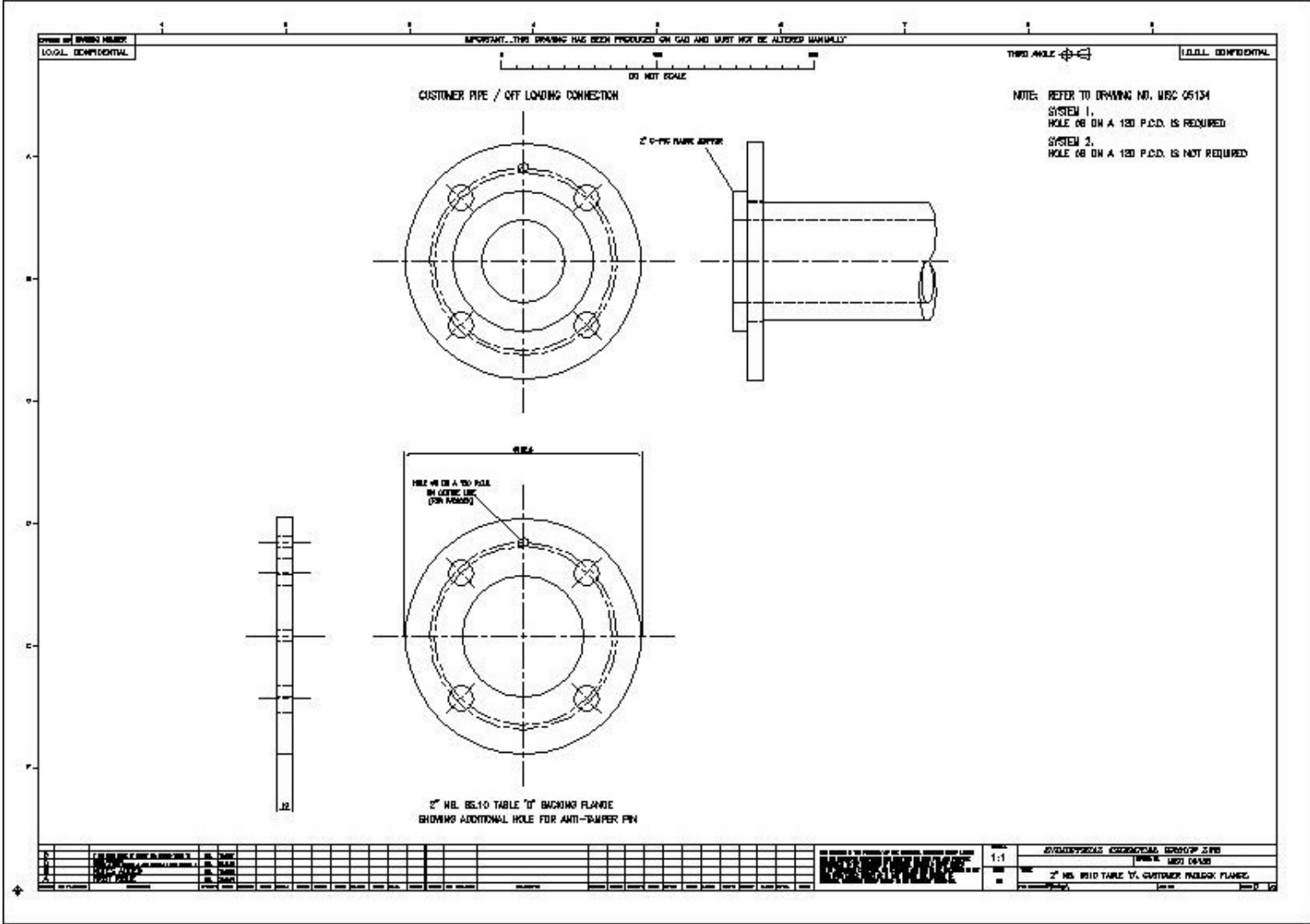
# TEMPORARY COUPLING DRAWINGS - 05135 ISSUE C - LAYOUT 1






# LOCKING SYSTEM DRAWINGS – 05134 ISSUE E – LAYOUT 1



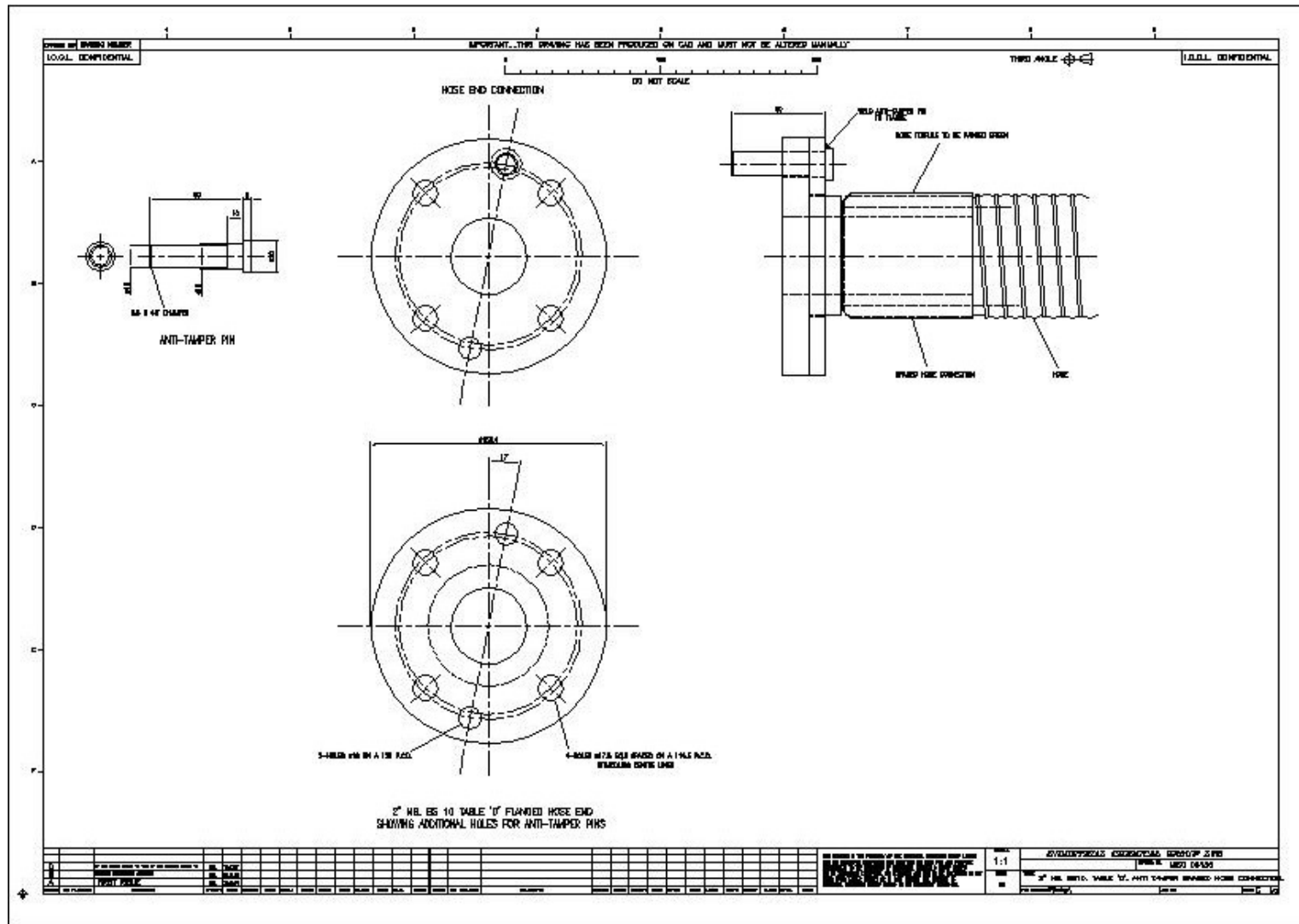
**CUSTOMER FLANGE DRILLING TEMPLATE FOR PADLOCKING THROUGH FLANGE SYSTEM – 05138 ISSUE D –  
LAYOUT 1**



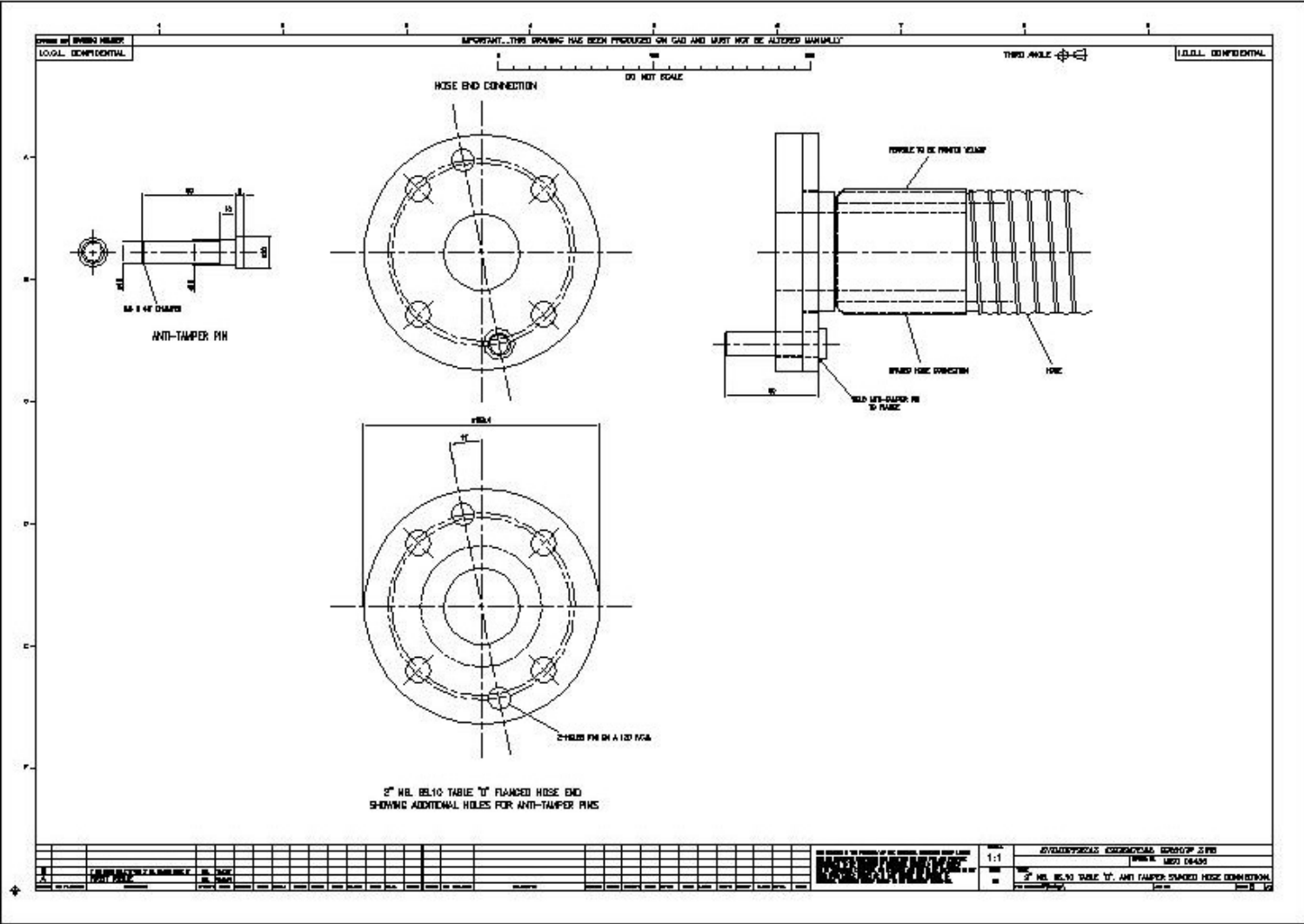
## APPENDIX III – Tanker Hose

 05136 ISSUE C-Layout1.pdf	 05436 ISSUE B-Layout1.pdf	 05437 ISSUE B-Layout1.pdf
Tanker hose drawing	Hose extension drawing	Coupled Hose drawings

# TANKER HOSE DRAWINGS - 05136 ISSUE C - LAYOUT 1



# TANKER HOSE EXTENSION DRAWINGS - 05436 ISSUE B - LAYOUT 1



# COUPLED TANKER HOSE DRAWINGS - 05437 ISSUE B - LAYOUT 1

