

DOCUMENT TITLE Proposed Modification; Direct Quench; Colorcoat 1
INSTALLATION NAME Shotton Works
PERMIT NUMBER BR7321
AUTHOR Shaun McKenna
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OK FOR PUBLIC REGISTER	JB	20/2/14
COPIED TO PUBLIC REGISTER	JB	Edm

1.0 INTRODUCTION

It is planned to modify the existing quench system on Colorcoat Line 1 from a total loss system to a closed loop system. The following document presents an outline design for the proposed modification. It is planned to have completed a detailed design by March 2014 with commissioning in November 2014. This submission is being made to satisfy **Condition 1.5.1** of the Environmental Permit BR7321.

2.0 PROCESS DESCRIPTION/MODIFICATION

The existing quench system consists of two quench spray tanks, prime and finish, fed from the works Fresh Water Dee (FWD) supply. This water is sourced from the River Dee at Bretton, Cheshire. The current process is a total loss system i.e. the water is not recirculated. Once used, the quench water is directed through surface water drains to on-site lagoons. These on-site lagoons ("Tern Lagoons") are a designated SSSI. Overflow from these lagoons is discharged into the River Dee via the Broken Bank pumping station.

The proposal is to re-circulate the water, currently discharged to the lagoons, through a cooling tower, back into the process. A new 10m³ tank (hot well/cold well) will be located in an existing bunded area within the bay. From the cold well side, fixed speed pumps will deliver cooled water to both the prime and finish quench tanks via spray bars. This water will drain by gravity to the hot well from where it will be pumped by variable speed pumps to the cooling tower. A new cooling tower will be located within a purpose built bund external to the building. Cooled water will drain by gravity back to the cold well for further use in the quench system. Water losses resulting from evaporation will be managed using an automatic fill valve. A cooling tower conductivity monitor will control water condition to the tower and a bleed valve will be installed in the tower return pipe work. Control system instrumentation will monitor the water flow, temperature and pressure. Screens and filters have been installed to contain line debris within the system. A process flow diagram for the system is attached (**K21498801A**).

For legionella control 2x1000 L molded dosing tanks complete with integral bund will be located within the quench bund. The tanks will contain sodium bicarbonate and CA MB224 non-oxidising biocide for dosing into the system by diaphragm pumps. The tanks are fitted with ultrasonic sensors to monitor chemical levels. Two Sonoxide Plus units will treat the water by UV means within the hot and cold wells. Regular legionella tests will be carried out to monitor water conditions. Cleaning and chlorination of the system will be carried out at nominally eight-week periods.

The washings arising from chlorination of the system will be pumped, to an existing 45,000L effluent tank (installed 2013) within the Pre-Clean Annex, via an above ground pipeline using the cooling tower pumps. Spills/leaks from the unit operations (cooling tower & hot/cold well) and bleed water will be directed towards a newly built sump (6m³) via two existing 9" drains. The contents of the sump will be pumped to the Pre-Clean effluent tank.

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The new configuration will require modifications to the existing drains. **Drawing No. 319174** shows the layout and alterations required. A cross section of the sumps is shown in **Drawing No. K214988101A**.

3.0 CONTROL PHILOSOPHY

3.1 SUMP

Two submersible transfer pumps, a main and standby are to be installed within the new cooling tower sump. These will be fully level controlled with an additional point level sensor for an alarm condition. This arrangement will be monitored via the line SCADA system.

3.2 PRECLEAN EFFLUENT TANK

Effluent level within the tank is controlled by two pumps, which can be run separately but not at the same time. Both pumps are capable of being started and stopped, manually or automatically. When automatic is selected pumping using the selected pump will be controlled through the use of a Miltronics Multiranger 200 system. The multiranger will be used to control the pumps at 3 different levels; i) Low Level, ii) High Level & iii) High High (Alarm Level).

If the effluent rises in the tank then once the low level is exceeded the selected duty pump will start to pump. If the high level is exceeded the pump will continue to pump but an alarm / rotary flasher situated in the entry cabin on No 1 Colorcoat line and locally to the control cubicle will operate to indicate that there is a level fault. The alarm will be of the type that will voice a message. If the liquid continues to rise above the high level then the high high (alarm) level will be activated. In addition a float switch will operate in parallel with the high high (alarm) from the multiranger. A GSM Alarm+ pager system will activate and dial several phone numbers. The pump will continue to run until the effluent has gone below low level. The miltronics level device has a 4-20mA output this will be used to provide the operators with a mimic on the Entry Operators SCADA screen.

If liquid enters the bund then a 'Liquid in Bund Alarm' will operate, which will alarm in the cabin and dial numbers using the GSM Alarm+. There is a manually operated sump pump within the secondary containment that will discharge back to the tank. Phase failure relays (i.e. power cut) will be used to operate the auto dialler function. A rota-flash and klaxon are located in the No 1 Colorcoat entry cabin.

4.0 ENVIRONMENTAL RISK ASSESSMENT

The proposed modifications offer a number of environmental benefits relative to the existing line configuration; (A) a reduction in FWD water usage and (B) a reduced likelihood of contaminants from within the vicinity of the quench entering the drains feeding the Tern Lagoons.

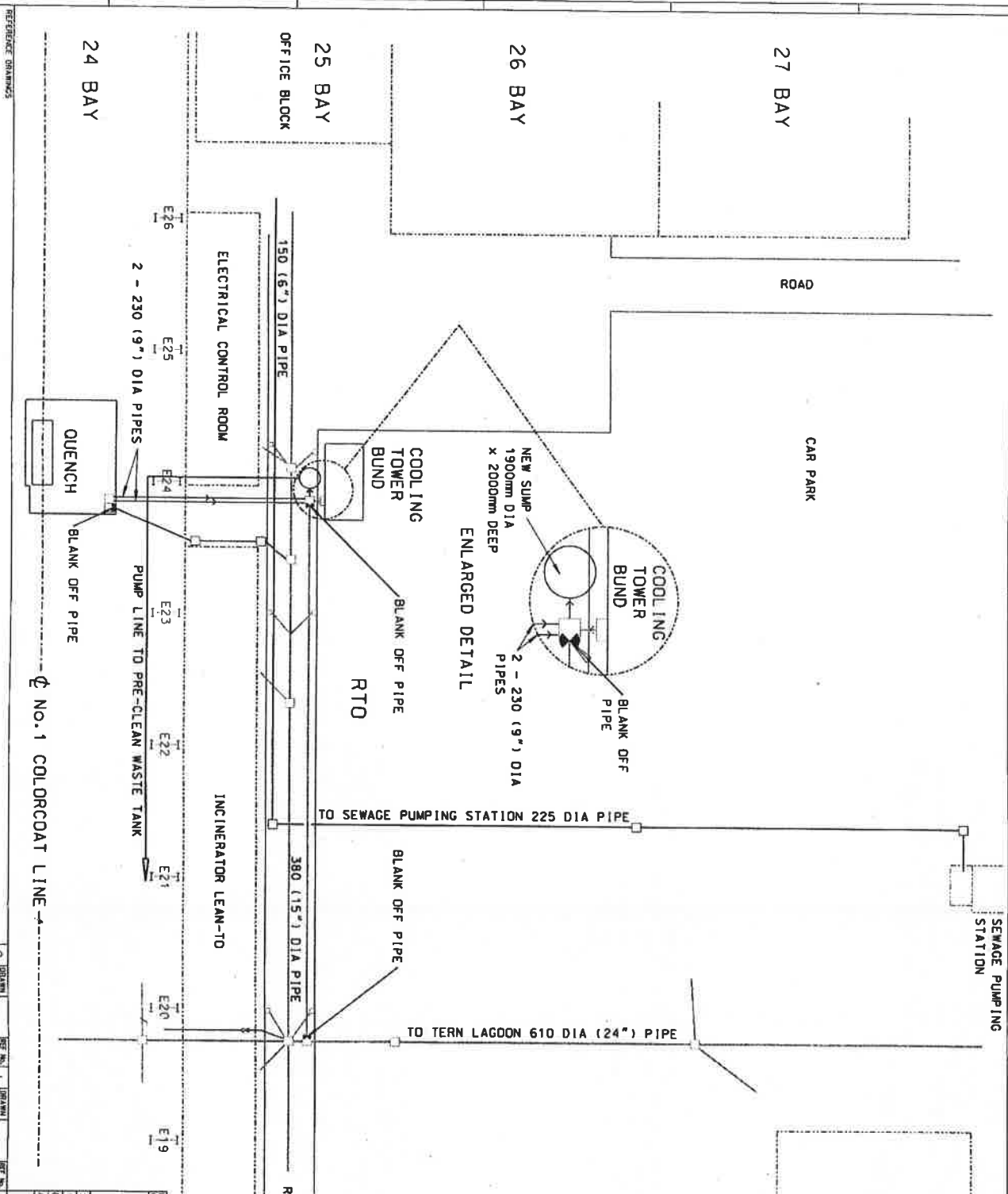
The proposed modifications present no significant change to the operations undertaken within the Colors Installation Boundary as a similar closed loop system is operated on Colorcoat Line 2. The design has been subject to an environmental risk assessment and HAZOP study. The risks associated with chemical storage have been addressed through the implementation of appropriate control measures. Sumps and drains will be integrity tested to minimise the risk of soil/groundwater contamination from chemical transfer operations.

The affect of the proposed process modifications on water levels within the Tern Lagoons has been considered. The Common Tern represents the most sensitive receptor. These process modifications



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return the quench to its original design (1980's). There is no historical evidence to suggest that the water level within the lagoons has been identified as an issue with respect to their viability as a breeding site for the Common Tern. The overall environmental risk is considered to be low. Tata will work with the Regulator and interested Stakeholders i.e. MRG to manage any future threat to the protected status of the Lagoons as they arise.



REFERENCE DRAWINGS

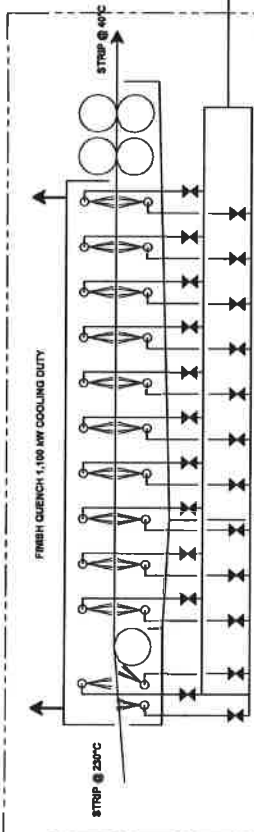
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Φ No. 1 COLORCOAT LINE

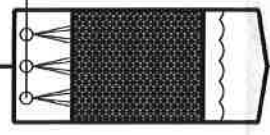
SITE DEVELOPMENT & ENGINEERING - PROJECTS	
TATA STEEL, SHOOTING WORKS, DEESIDE, RUMTHUR, CHS 2NH	
SCALE: A PAPER SIZE 1/250 @ A2 PLANT	SECTION: C2 MOLDOORCOAT
UNIT OF RESPONSIBILITY: MIM	SECTION: FRESH QUENCH
DATE: 06.03.2011	DESCRIPTION: FRESH QUENCH DRAINS
APPROVED:	PROJECT NO. 18436298
CONTROL OF DRAWINGS:	PROJECT NO. 18436298
DATE: 06.03.2011	PROJECT NO. 18436298
DATE: 06.03.2011	PROJECT NO. 18436298
DATE: 06.03.2011	PROJECT NO. 18436298

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DRG. NO.	319174
REV	

STRIP TRAVEL
(EQUIPMENT VIEWED FROM DRIVE SIDE OF LINE)

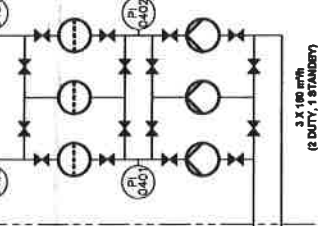
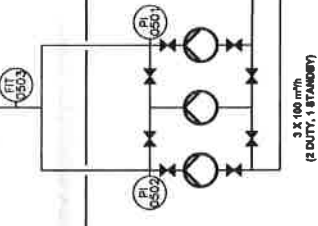
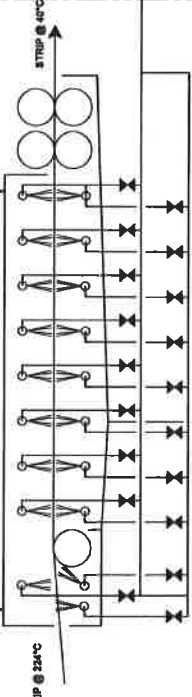


TO WASTE
HOLDING
PUMP AT
LINE ENTRY



STRIP @ 224°C

PRIME QUENCH 1,100 kW COOLING DUTY



NEW BUNGED AREA BENEATH COOLING TOWER

NEW TRANSFER PUMP & PUMPS BY TATA STEEL 8.0 m³ CAPACITY

KCS Herr Voss UK Ltd
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Customer TATA STEEL SHOTON WORKS
Project Title QUENCH COOLING SYSTEM FOR No 1 CCL

Machine COOLING SYSTEM
SCALE NTS
Eng. Title FLOW DIAGRAM

Also Used On
JOB No. -
Material -
Weight -
log

English A1 K2149 88 101
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REVISED TO SHOW NEW SUMP ARRAYS
A PRELIMINARY ISSUE

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