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Environmental Permitting Team
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99 Parkway Avenue
Parkway Business Park
Sheffield
S9 4WF

Our Ref
KB/PSC/04

Tel (Direct)
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Date
6th October 2010

Dear Sir

Subject: Notification of a request for variation to Permit number EA/EPR/BW9999IG / V005, Case reference number: XP383OHX

Introduction

This letter is written in support of our request for a variation to the above permit. We have shared our plans with Julia Frost our local EA inspector and on the basis of our discussions she has stated that the permit variation is a Minor Technical Variation, with minimal changes to the conditions contained within the permit.

Proposed Change: To install a new surface water run-off lagoon beside our existing lagoons to take surface water from the new rail off loading facility (Phase 1) currently being constructed on our Logyard storage area. The remaining log storage area of 30'000 m² may be concreted in Phase 2. Construction could start as early as Feb-2011. The ground is going to be re-graded allowing water to run towards the collection point before construction of Phase 2 starts.

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1. The Logyard Facility

The Logyard stores up to 90,000 tonnes of logs and up to 30,000 tonnes of Sawmill wood wastes and residues. In terms of our Chipboard process wood wastes and residues are normally used but these can be supplemented or replaced by logs that

are chipped on the Logyard prior to processing. The material is put into a feed bunker and then a distribution bunker before being further processed in our Preproduction plant ready for use as the principal raw material in the Chipboard press.

The MDF process uses logs stored, debarked (the bark is used for horticultural use after further processing off site by specialist contractors), and chipped and the chips stored on the Logyard before being further processed in our MDF refining plant where it is screened, washed, refined and dried before being used as a raw material for one of our two MDF board presses.

2. The Logyard Rail sidings Project Description

We have already started work on a multi-million pound investment in Kronospan's existing rail siding facility at Chirk. Kronospan currently receives 100,000mt of timber annually via a railhead in Carlisle which will be increased to 250,000mt per year upon completion of the investment. We will build a new rail siding at our factory in Chirk, North Wales and an additional siding will also be built at the Carlisle railhead. This will allow us to increase our train length from 13 carriages to 21 carriages.

Following construction there will be a reduction in road traffic by 25 Lorries per day. This investment has qualified for a Freight Facilities Grant worth £2.1 Million from the Welsh Assembly Government and Department for Transport due to the switch of traffic volumes from road to rail, and the associated environmental benefits. As well as receiving support from Government, the scheme has also received full support from Network Rail and the wider rail industry. The scheme is due to be completed by January 2011.

2.1 Project Description

a) Rail siding extension Chirk:

- 2 x new sidings, length 303 m x 2

Including sewer diversion, a new lagoon, collection point, filter drain, sidings, unloading area, and access road).

b) Second rail siding Carlisle (Kingmoor):

- 1 x new siding, length 328 m

The combined facility will enable us to load a 21 carriage train instead of the current 13 carriages. This would increase a typical trainload to 1,000 mt.

2.2 Project Timescales

Chirk Railway siding construction

- Start date for construction 6th April 2010
- 38 week project

- Planned to be completed by 30.09.10 (end of 2010 at the latest).

2.3 Environmental Benefits

- Current rail deliveries 100,000mt p.a.
- Additional timber to be transported by rail 156,500mt p.a.
- Total timber received by Rail to become 256,500mt.

3. Kronospan Limited Drawings Related to the Project

Drawings and Documents appended to this request for variation are:

Append	Description	Drawing Number
A	General Arrangement Total Works Phase 1	A - 16147-H-100-02 Rev A
B	Drainage Layout and Collection Area	B - 16147 H-500-01 Rev F
C	Drainage Collection Point	C - 16147-H-S3-02 Rev D
D	Lagoon Inlet and Outfall	D - 16147-H-502-01 Rev J
E	Treatment Work Section	E - 16147-H-502-04 Rev C
F	Floating Arm Detail (Discharge Arm)	F - 16147-H-502-03 Rev H
G	Micro Drainage Analysis	
H	Correspondence between Designer Gifford and Neil Taunt from the Environmental Agency Wales	
I	Water Treatment & Lagoon Design Data	
J	Proposed Screening Equipment	

4. Existing Surface Water Lagoons and Management of Discharge to the Afon Bradley

4.1 Introduction

Currently surface water from the site, apart from the Pre-Production area, drains to two lagoons located on the northern boundary of the site. Each lagoon has an effective capacity of over 2000 m³.

4.2 Normal Lagoon operation

In normal operation, one lagoon would be potentially discharging while the other is filling. Each lagoon has an outlet valve but there is also a third valve known as Penstock A, located at the discharge point to the Afon Bradley. This valve is operated in automatic mode and is generally left open.

Once the filling lagoon had reached a preset level of 30%, the lagoon is sampled and tested in our laboratory to make sure that all permitted parameters are within consent limits. Assuming that the water quality meets the permit requirements, the

inlet to the filling lagoon is closed and outlet valve opened. The other lagoon that may have been discharging then has its outlet valve closed and inlet valve opened and then starts to fill. A further sample is taken at the Penstock A discharge point to the Afon Bradley after each lagoon is released to confirm that the actual release meets the PPC permit requirements.

4.3 Abnormal lagoon operation

Heavy Rainfall

Significant rainfall events have the potential to overwhelm the lagoon storage system, as incoming flow and volume exceeds outlet flow and available capacity. If the lagoons were operated as under normal conditions, there would be the potential for lagoons to fill and overflow, resulting in an uncontrolled release of water into the Afon Bradley. Therefore, under heavy rainfall conditions the management process is modified to maximise the rate of discharge and available capacity.

Prior to these events, lagoon capacity is maximised by ensuring that lagoons are as empty as possible. During the event, both lagoons are filled and discharged continuously, with regular sampling at the inlet and Penstock A to ensure that PPC permit conditions are met.

As soon as inlet flow has subsided, normal operation restarts.

4.4 Pollution Incidents

The majority of potential pollution incidents will involve one of the following parameters as detailed in our Environment Agency Permit: ammonia, formaldehyde, oil & grease or suspended solids. However, there are other substances held on site that have the potential to be released into the drainage system.

During normal operation the drainage system is isolated from the Afon Bradley as the filling lagoon outlet valve is closed. However, on report of an incident that has potential to pollute surface water, Penstock A (to the Afon Bradley) is also closed. Once release has been prevented, the incident is investigated to identify pollutants, and deal with the event.

4.5 Disposal of contaminated water

If water in lagoons is contaminated, it is unlikely to be practical to remove via bulk tanker, as up to 80 tankers would be required to completely empty a full lagoon. Therefore, subject to agreement from the sewerage undertaker, contaminated water would be pumped to foul sewer for treatment and final disposal.

Our existing water management procedures summarised above are detailed in our environmental management system and the COMAH Report (revision date: August 2007).

5. The New Rail Sidings Drainage Lagoon

5.1 Introduction

The water mass balance caters for the new rail siding as well as the concreted log storage area (Phase 2). Phase 2 of the project is a concreted area where logs will be stored, if given the go ahead to commence in February the project could be completed by October 2011 providing the business owners make available the required finance. The increase from both areas (Off-Loading area and Log-Storage area) will give us significantly more run-off water from the newly constructed site in a shorter period of time. The existing 2 lagoons will not be able to cope with the rate at which the additional waters will enter the surface water drainage system therefore additional capacity is required.

5.2 Rail Sidings Surface Water Management

A new lagoon (capacity 2,250m³) is proposed which will be situated at the north east corner of the site between the existing lagoons and the Canal water treatment plant which treats canal water prior to use within the sites manufacturing processes. All drainage will be channelled from the newly concreted rail sidings area to the corner of the Logyard adjacent to the Kronoplus warehouse from where it will feed into the new lagoon. Once the lagoon is full, water will pond/collect in the Northeast corner of the log yard which can capture an additional 850m³ of water. Total holding capacity is therefore 3100m³.

5.3 Normal Lagoon Operation

Lagoon and Drainage strategy is as follows:

When it rains on the 4-ha site, the water is collected on the north east corner of the site and funnels through a grizzly bar system (50mm gap). The water goes through an orifice plate of 310mm diameter that restricts the surface water discharge up to 224l/sec. The log yard has been designed to store water up to and including the 1 in 100 year event plus climate change. The storage requirement for the 1 in 100 year event plus climate change is approximately 729m³ based on the critical storm of 60min duration. Storage capacity on the Log Yard is approx 850m³. The water then goes through a water treatment system (Appendix E and F) that clears the water of wood debris and coarse wood splinters. The surface Water then discharges into a settlement lagoon (Appendix D) where further suspended solids can be cleared by gravity. The water discharges through a pumped system via a treatment plant back into the factory to be used for the industrial process.

The pumped discharge is restricted to approximately 16l/s. This water is cleaned in our existing Canal Water Treatment Plant which is beside the new lagoon to ensure that it is suitable for use as a process water. If the pump fails (breaks down), a second pump is activated (duty/standby) to ensure continuous discharge of 16l/s into the factory. There is an orifice plate overflow to enable water to discharge at a maximum rate of 7l/s into the existing lagoons if both pumps fail. This discharge is less than Greenfield rate for 4ha.

We are confident that we can use all the water collected in this lagoon as process water around the site. The average water usage on site is 45m³/h (with peak demands of 60m³/h) and treated water is stored in a 60m³ holding tank.

5.4 Abnormal lagoon operation

Heavy Rainfall

As with our existing lagoons, heavy rainfall (1 in 100 year storm event) could present an issue. As a result, to prevent an overflowing of the new lagoon, we need to have the facility to be able to discharge excess water to the Afon Bradley. We intend to do this via an overflow pipe that allows a flow of 7 l/sec into the existing lagoon. We are proposing that in the event of heavy rainfall, if the need requires, we open a penstock valve between the new lagoon and the existing lagoons. Excess water can then be managed by the current surface water lagoon management system (see section 4). The new system can cater for 4.3 hours of 1 in 100-year rainfall. A 1 in 100-year storm event would generate 729m³/h of water. The new lagoon could take 2250m³ or **three** hours worth of 1 in 100-year rainfall before the penstock to the screening plant needs to be closed (manual operation). A further 850m³ can be stored (ponded) on the Log yard allowing the storage of at least another hour. Relevant calculations are contained in Appendix G (Micro Drainage Analysis from Gifford LLP).

We would ensure that in the event of predicted heavy rainfall the levels in all three lagoons would be kept as low as possible to allow for increased water flow. Discharge to the Afon Bradley would be controlled using the current water management system which allows discharge only when all consented parameters are within their agreed and permitted limits.

6. Surface Water Mass Balance for the Site

Table below summarises the technical data for water cleanup and Lagoon:

Water run-off Area on Log yard (maximum catchment)	40'000 m ²
Storm Event	1 in 100 year
Catchment (ponding) of Water Area on Log yard	850 m ³

Max Volume of Water in New Lagoon	2250 m ³
Max storage Volume before overflow	3100 m ³
Max Flow from Log Yard to Cleaning Plant	806 m ³ /h
Diameter of Orifice Plate for flow restriction	0.310 m
Flow Rate in 1 in 100 year storm (for 60min)	729 m ³ /h
Storage time in Lagoon for 1 in 100 year storm	3.08 hours

7. Project Timeline

<u>AREA</u>	<u>FINISH DATE</u>
FS Diversions	16 Jul 2010
Installation of Rail	31 Aug 2010
Installation of Buffers	01 Oct 2010
Casting Concrete for Rail and Offloading Area	24 Sep 2010
Earthworks for Lagoon and treatment works	16 Jul 2010
Concreting of Lagoon and treatment works	30 Oct 2010
Installation of Plate Screen and Oil skimmer	29 Nov 2010
Commissioning of Equipment	13 Dec 2010

8. Environmental Impact of the proposed change

The proposed change to install a new lagoon and associated control systems and procedures will not change the environmental impact under normal operating and weather conditions.

Release to water will continue to be from the existing site lagoons discharging to the Afon Bradley at emission point W1 (point 1 on the site plan. DRG 7000/282-B) the final receiving water is the River Dee. Discharge is strictly controlled and only takes place when the waters to be discharged are within the permitted limits.

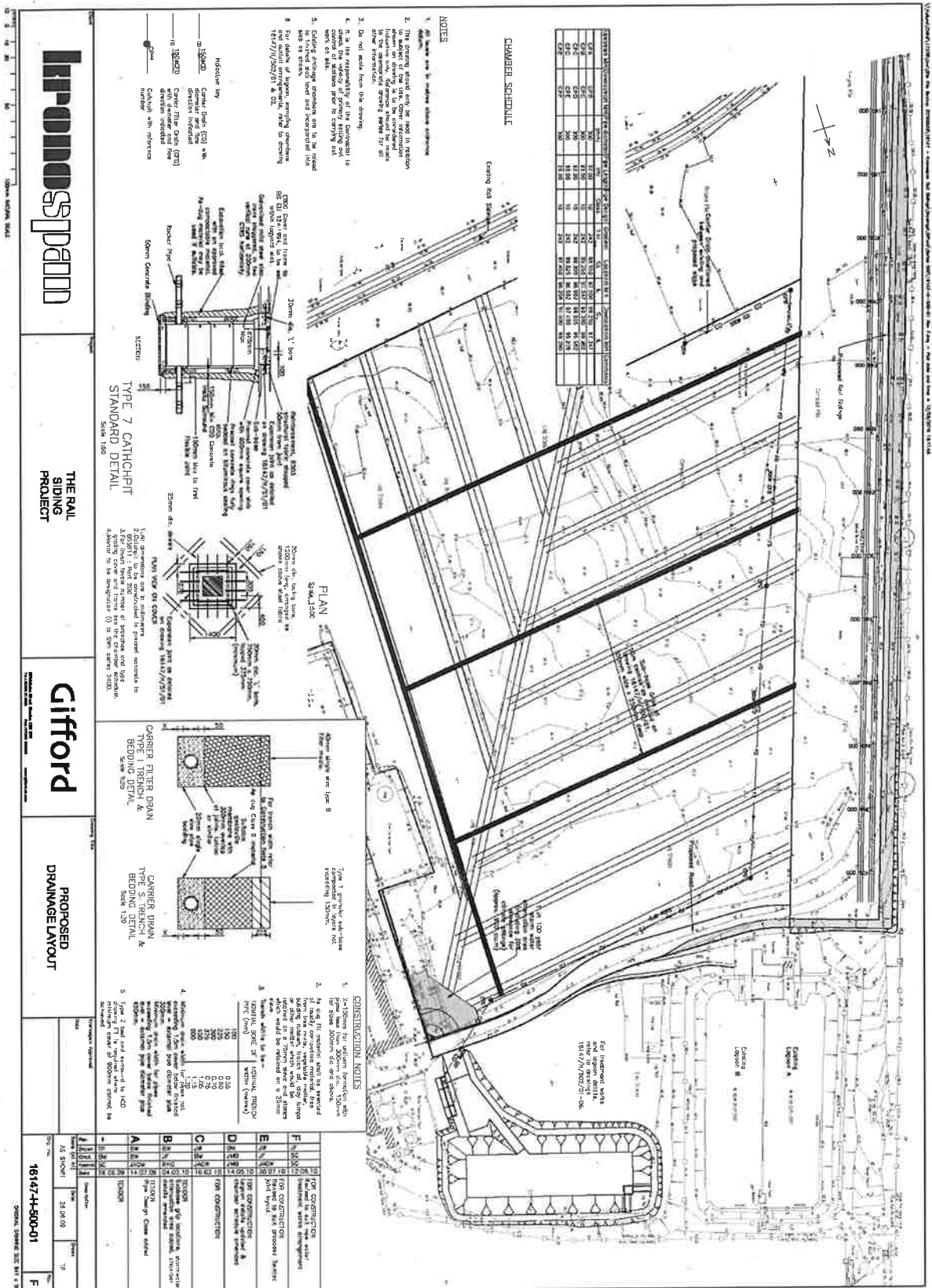
The limits for emissions to water as detailed in the permit will not be affected. The only potential impact would be that during periods of very heavy rainfall the total discharge volume leaving the site via emission point W1 may increase. We are currently not consented for either flow or volume in our permit.

I hope this meets with your approval.

Yours sincerely

K Baker
Safety Health and Environment Manager

APPENDIX B: Drawing 16147-H-500-01 Rev F: Drainage Layout and Collection Area



APPENDIX G: Micro Drainage Analysis (Page 1/7)

Gilco LLP

Carlton House
 Ringwood Road
 Southampton SO40 7LT
 Date 16 August 2010 17:12
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 Micro Drainage

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Global Variables

Region	FSK - England & Wales
Return Period (yrs)	100
M5-60 (mm)	17.000
Ratio R	0.300
Volumetric runoff coef	0.840
Profile Type	Winter
PIMP (%)	100
Areal Reduction Factor	1.000
Storm Duration (mins)	60
Hot Start (mins)	0
Hot Start Level (mm)	0
Manhole Headloss Coefficient	0.300
MADP Factor * 10m ² /ha Storage	2.000
Foul Sewage/hectare (l/s)	0.00
Additional Flow - % of Total Flow	20
Number of Input Hydrographs	0
Number of Time/Area Diagrams	0
Number of Bifurcations	0
Number of Overflows	0
Number of Off-Line Controls	0
Number of On-Line Controls	2

starting storm file name

\\LANNER\CHICGL\CHICM1 HIGHWAYS\16147 - KRONOSPAN RAIL
 SIDINGS\ANALYSTS\DRAINAGE\165_KRONOSPAN CHIRK COMPLETE MODEL.SWS

Freely Discharging Outfalls

outfall Pipe Number	outfall MH/No	C.Level (m)	I.Level (m)	D.I. (mm)	R (min)
1.004	4	96.500	92.024	1200	0

APPENDIX G: Micro Drainage Analysis (Page 2/7)

Gifford LLP
 Carlton House
 Ringwood Road
 Southampton SO40 7HT
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On-Line Control (Loss & Flow)

US/PN	Volume (m³)	Ctrl MH Name	Invert (m)	Headloss (m)	Flow (l/s)
2.000	12.399	2	96.020	0.1	224.0000
				0.2	224.0000
				0.3	224.0000
				0.4	224.0000
				0.5	224.0000
				0.6	224.0000
				0.7	224.0000
				0.8	224.0000
				0.9	224.0000
				1.0	224.0000
				1.2	224.0000
				1.4	224.0000
				1.6	224.0000
1.8	224.0000				
2.0	224.0000				
1.002	15.800	4	91.050	0.2	7.0000
				0.4	7.0000
				0.6	7.0000
				0.8	7.0000
				1.0	7.0000
				1.4	7.0000
				1.6	7.0000
				2.2	7.0000
				2.6	7.0000
				3.0	7.0000
				3.4	7.0000
3.6	7.0000				
4.2	7.0000				
4.6	7.0000				

APPENDIX G: Micro Drainage Analysis (Page 3/7)

Gifford LLP Carlton House Ringwood Road Southampton SO40 7HT		Page 3 Micro Drainage							
Date 15 August 2010 17:12 File 201006_r_FDM_KRONOSPAN CHI... Micro Drainage		Designed By pam.dor Checked By Simulation W: 1.3 rel							
Network Details									
* - Indicates pipe has been modified outside of WinDes's Storm/Foul & schedules									
PN	Length (m)	Fall (m)	Slope (1:x)	Area (ha)	T.E. (mins)	Rain Pro	k (mm)	Hyd Sect	Dia (mm)
1.000	130.00	0.009	14427.9	4.000	12.00	1	0.600	o	350
1.001	7.80	0.026	294.5	0.000	0.00	1	0.600	o	350
1.002	20.00	0.020	1000.2	0.000	0.00	1	0.600	1	-1
1.003	50.00	0.855	58.5	0.000	0.00	1	0.600	u	350
1.004	10.00	0.171	58.5	0.000	0.00	1	0.600	o	350
PN	USMH No.	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl No.	US/MH (mm)
1.000	1	96.200	96.200	1.650	97.800	96.191	1.259		1200
1.001	2	97.800	96.020	1.430	97.700	95.984	1.356	2	1050
1.002	3	97.700	95.184	1.516	96.500	95.164	0.236		1200
1.003	4	96.500	93.050	3.100	96.500	92.195	3.955	2	1200
1.004	5	96.500	92.195	3.955	96.500	92.024	4.126		1200
©1992-2005 Micro Drainage									

APPENDIX G: Micro Drainage Analysis (Page 4/7)

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 Ringwood Road
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 Date 16 August 2010 17:12
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 Micro Drainage

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The following hydraulic sections have been used in this network

NOTE: Diameters less than 66 refer to section numbers of hydraulic conduits. These conduits are marked by the symbols:- [] box culvert, V/ open channel, oo dual pipe, ooo triple pipe, 0 egg.


Section numbers < 0 are taken from the file channel section 1.0x1.0.sec

Section Number	Conduit Type	Major Dim. (mm)	Minor Dim. (mm)	Side slope (Deg)	Corner Splay (mm)	4*Hyd Radius (m)	XSect Area (m ²)
-1	1	1000	1000			1.333	1.000

APPENDIX G: Micro Drainage Analysis (Page 5/7)

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Micro Drainage				Designed By pamoor Checked By Simulator W 11.8 not					
PIPELINE SCHEDULES									
Upstream Manhole									
PN	Hyd Sect	Diam (mm)	MH No.	C.Level (m)	I.Level (m)	C.Depth (m)	MH DIAM. (mm)	L*W	
1.000	o	350	1	98.200	96.200	1.650		1200	
1.001	o	350	2	97.800	96.020	1.430		1050	
1.002	1	-1	3	97.700	95.184	1.516		1200	
1.003	o	350	4	96.500	93.030	3.100		1200	
1.004	o	350	5	96.500	92.195	3.955		1200	
Downstream Manhole									
PN	Length (m)	Slope (1:x)	MH No.	C.Level (m)	I.Level (m)	C.Depth (m)	MH DIAM. (mm)	L*W	
1.000	150.00	14227.9	2	97.800	96.191	1.259		1050	
1.001	7.80	294.5	3	97.700	95.994	1.356		1200	
1.002	20.00	1000.2	4	96.500	95.164	0.336		1200	
1.003	50.00	58.5	5	96.500	92.195	3.855		1200	
1.004	10.00	58.5	6	96.500	92.024	4.126		1200	
©1982-2008 Micro Drainage									

APPENDIX G: Micro Drainage Analysis (Page 6/7)


Clifford LLP Carlton House Ringwood Road Southampton SO40 7HT Date 15 August 2010 17:12 File 20100616_PDM_KRONOS-FAN CHI... Micro Drainage	Page 6 
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Summary of Results

Return Period (years) 100
 Storm Duration (mins) 60
 Profile Type Winter
 Margin for Flood Risk warning (mm) 300
 Analysis Time Step Fine
 DTS Status ON
 DVD Status OFF
 Inertia Status OFF

PN	Water Lev. (m)	Surcharged Depth (m)	Flooded vol (m³)	Flow/Capacity	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	98.929	2.379	729.161	3.84	0.0	193.9	FLOOD
1.001	97.579	1.209	0.000	2.83	0.0	193.7	FLD RISK
1.002	97.478	1.295	0.000	0.43	0.0	193.5	FLD RISK
1.003	97.474	4.074	973.614	0.03	0.0	7.0	FLOOD
1.004	92.245	-0.308	0.000	0.05	0.0	7.0	OK

APPENDIX G: Micro Drainage Analysis (Page 7/7)

Gilford IP Carfax House Ringwood Road Southampton SO40 7HT Date 16 August 2010 17:12 File 20100816_PDM_KRONOSPAN GH... Micro Drainage		Designed By pamoor Checked By Simulation W.1.3 net		Page 7 			
<u>Rainfall Hydrograph</u>							
Region		FSR - England & Wales					
Return Period (yrs)		100					
Mx-60 (mm)		17.000					
Ratio R		0.300					
Profile Type		Winter					
Storm Duration (mins)		60					
<u>Time</u> (mins)	<u>Rain</u> (mm/hr)	<u>Time</u> (mins)	<u>Rain</u> (mm/hr)	<u>Time</u> (mins)	<u>Rain</u> (mm/hr)	<u>Time</u> (mins)	<u>Rain</u> (mm/hr)
2	4.70	18	27.48	34	77.80	50	15.70
4	17.56	20	35.86	36	68.06	52	15.21
6	14.48	22	45.76	38	56.71	54	15.20
8	15.20	24	56.71	40	45.76	56	14.48
10	15.21	26	68.06	42	35.86	58	11.56
12	15.70	28	77.80	44	27.48	60	4.70
14	17.65	30	84.71	46	21.49		
16	21.49	32	84.71	48	17.65		

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APPENDIX H: Correspondence with Neil Taunt (EA) Page 1 / 2

Our Ref: 17378/CT/NF

26 August 2010

Neil Taunt
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Dear Neil

DRAINAGE STRATEGY

Following an Environment Agency email, dated 12 August 2010, asking for further information regarding the Environmental Permit Application prepared by Kronospan (reference BW9999/G/KP37355c), please see below your questions in italics and our answers below them.

- 1. From both drawings and the submitted report it is not clear what the proposal actual entails. Discussions with Charles Townsend from Gifford's would suggest that all surface waters generated from the site are stored on the concrete pad behind a wall structure. There will be a piped discharge from the drainage collection point into a new lagoon.*

Please find attached a sketch of a simplified drainage strategy (SK-WT-001) and updated drawings. The simplified drainage strategy is:-

- i. When it rains on the 4ha (impermeable yard) log yard, the water is collected in the north east corner of the site.
- ii. The water goes through an orifice plate of 310mm diameter which restricts the surface water discharge up to 224l/s. The log yard has been designed to store water up to and including the 1 in 100 year event plus climate change. The storage required for the 1 in 100 year event plus climate change is approximately 729m³ based on a critical storm of 60min duration (please see the Micro Drainage outputs in appendix A).
- iii. The water then goes through a water treatment system which clears the water of wood debris and coarse splinters.
- iv. The surface water then discharges into a settlement lagoon where further suspended solids can be cleared by gravity.
- v. The water discharges through a pumped system back into the factory to be used for the industrial process. The pumped discharge is restricted to approximately 16l/s. Before the water from the yard is used in the factory, it is cleaned to ensure that no pollutants in the yards end up in the industrial processes.
- vi. If the pump breaks down there is a second pump (duty/ stand-by) to ensure the discharge of 16l/s will continually discharge into the factory.
- vii. If both pumps break down there is an orifice plate overflow to enable the water to discharge at a maximum flow rate of 7l/s into the existing lagoons. This discharge is less than greenfield rate for 4ha.
- viii. The lagoon has been sized at 2250m³ to ensure rain water can be stored for use in the factory. The storage required for a 1 in 100 year event plus climate change on an outflow of 7 l/s is 974m³ based on a critical storm of 60min duration (please see Appendix A for

APPENDIX H: Correspondence with Neil Taunt (EA) Page 2/2

Our Ref: 17378/CT/NF

26 August 2010

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Micro Drainage calculations). The orifice plate overflow will be situated above the 1100m³ storage level to ensure that there is always available volume in the proposed lagoon for the 1 in 100 year event plus climate change.

2. *Drawing 16147-H-S3-02 would suggest 2x 420mm diam. Pipes with 200mm diam. orifice plates restricting flow from drainage collection area to feed into the new lagoon.*

That is incorrect please see the updated drawing 16147-H-S3-02 showing a 375mm pipe with an 310mm diameter orifice plate.

3. *This does not correspond to the Microdrainge sheets included within Appendix 1 and 2 which appears to make reference to a 310mm orifice plate leading from the drainage collection area.*

This is correct a 310mm orifice plate will be used.

4. *It would appear from Drawing 16147-H-S3-02 that the drainage collection area has a top of wall/structure level of 98.20m AOD. Is this the maximum water level that can be achieved when storing water in the concrete pad? If so then what total available storage volume does this produce and how does this compare to the storage required?*

The wall/structure level is 98.20m AOD. This holds 8623m³ and the storage required is 729m³ (please see 16147-H-SK-02).

5. *What controls exist to manage any flood risk if the new proposed lagoon is full prior to an event occurring? Will water weir freely from the lagoon or will all additional waters be contained within the concrete pad area?*

As explained previously if the pumps are not working due to a pollution incident or have broken down, the surface water will discharge into the existing lagoon at 7l/s. When the orifice plate overflow is being used there is a further 1000m³ storage to ensure that if the worst case scenario 1 in 100 year storm plus climate change occurs there will be enough storage.

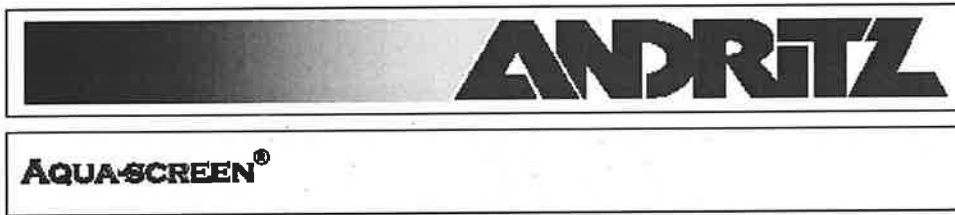
I trust this answers your questions but if you have any further queries please do not hesitate to call me directly on this number: 01244 311855.

Yours sincerely

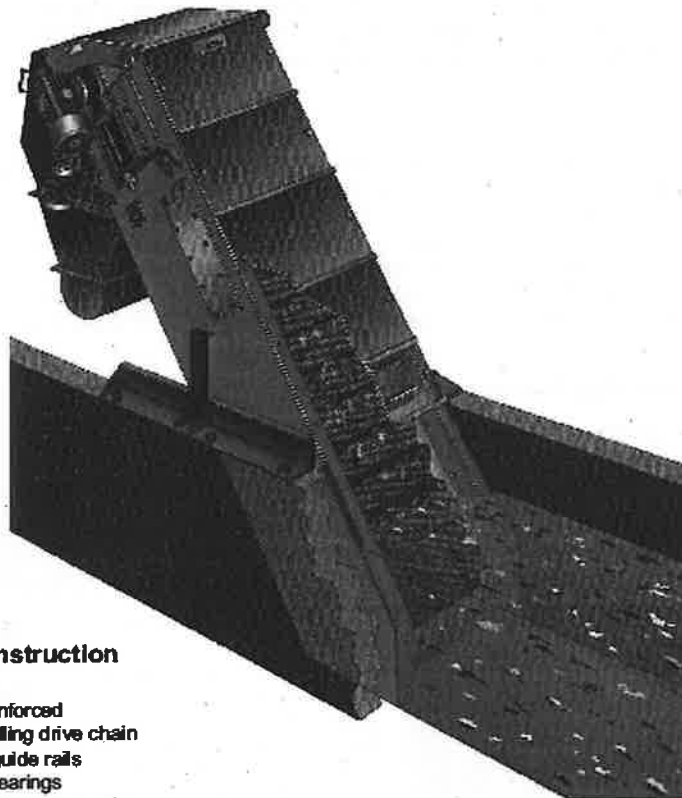


Charles Townsend
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Enc
Sw-WT-001



Perforated Plate Fine Screen



Mechanical/Construction advantages

- Robust frame reinforced
- Heavy duty travelling drive chain
- Hardened steel guide rails
- No submerged bearings
- Fully adjustable cleaning brush
- Interchangeable brush sections
- Customised screen sizing

Maintenance advantages

- Low maintenance requirements
- Perforated panels easily removed
- Spray bar or deluged washwater
- No "hairpinning" problems
- No "fating up" problems

Process advantages

- High capture rate
- Low head loss
- Low washwater consumption
- Low power requirements
- Intermittent operation
- Easy installation

The Andritz AQUA-SCREEN® is based on the design and construction of the Andritz AQUA GUARD® which has proved itself a durable and reliable fine screen with over 5000 units sold worldwide since 1980.

Operating Principle

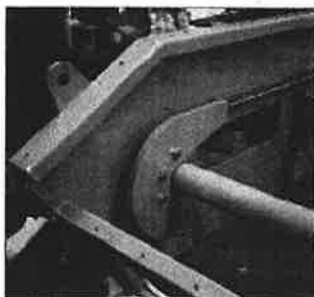
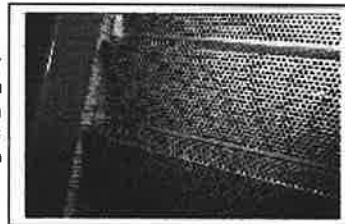
The AQUA-SCREEN® is a continuous belt fine screen, which can be easily installed in all types of channels. The flow capacity is dependant on the screen width, the perforation size, the open area of the filter panels and the upstream water level in the channel. Each screen can be designed exactly to suit the prevailing hydraulic conditions and can be operated either manually, on a timer basis or fully automatically using differential level controls. The AQUA-SCREEN® uses interlocking perforated plate panels to remove floating and suspended solids in the effluent flow. The stepped panels are carried on heavy duty traveling chains which are protected from the ingress of debris by Neoprene seals. The captured screenings are elevated out of the flow and automatically ejected down a totally enclosed twin discharge chute. Cleaning of the belt is done in two stages: firstly the screen panels are backwashed with a high pressure spraybar then the high speed rotating brush removes any remaining debris including fatty and fibrous material. The pendular adjustment on the brush allows it to be moved closer to the belt to compensate for any wear that may take place. All routine maintenance can be carried out above ground level (there are no submerged bearings) and the stepped panels can be easily replaced individually.

Construction

The AQUA-SCREEN® is of robust construction throughout and the heavy duty frame is fully reinforced. It is available in Epoxy Coated Carbon Steel or Stainless Steel whilst the traveling chain and filter plate panels are made in Stainless Steel. The guide rails for the chain are Hardened Steel as are the top sprocket and curved bottom guide. The twin discharge chute and protective close fitting front covers are fabricated in Stainless Steel with hinged inspection hatches. The rotating brush and bottom brush are in hard wearing Polyester. The chain incorporates overlapping stainless steel side plates against polyurethane seals. The drive motor and brush motor are both direct driven through integral reduction

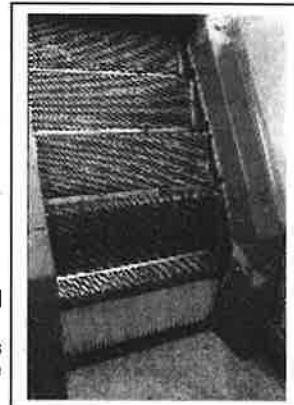
Perforated Panels

The interlocking filter panels are perforated with 6 mm diameter holes (other sizes available) and fabricated in either 2 mm or 3 mm thick Stainless Steel. The panels are available with a range of open areas which allows the optimum screen width to be selected thus achieving both the maximum flow and minimum headloss. The angled step on each panel ensures that large debris is captured.



Bottom Guide Rail

The traveling drive chain is guided round the base of the screen by a curved solid Hardened Steel rail, which is designed for an extended life and should require no routine maintenance. Submerged bearings are not fitted.

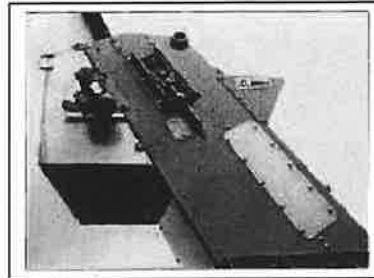


Channel Sealing

The Polyester bottom brush ensures that no solids pass under the screen. The screen frame is sealed against the channel sides by Stainless Steel plates with plastic inserts.

Discharge Chute

This is fabricated in Stainless Steel and completely encloses the discharge area which ensures safety from aerosoling. Hinged inspection hatches with wire mesh internal guards are provided so that a visual inspection of the cleaning brush and discharge chute areas can be made without removing the complete twin chute assembly.



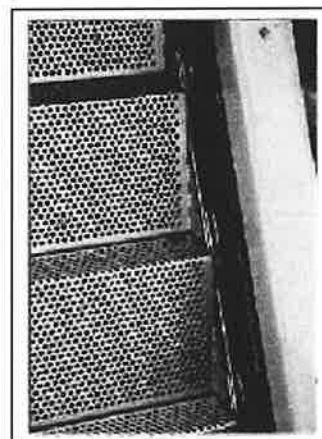
Washwater Options

The AQUA-SCREEN® is designed to use a minimum of washwater, the standard spray bar extends the full width of the screen. The nozzles are designed for use with filtered water (final effluent or potable water) and the washwater cycle is automatically controlled by a solenoid valve. When filtered water is not available the AQUA-SCREEN® can be fitted with a Deluge pumped washwater system instead of the conventional spraybar. This unique system uses screened effluent to backwash the filter panels which substantially reduces washwater costs, operates without blockages and creates no harmful aerosoling effect.



Cleaning Brush

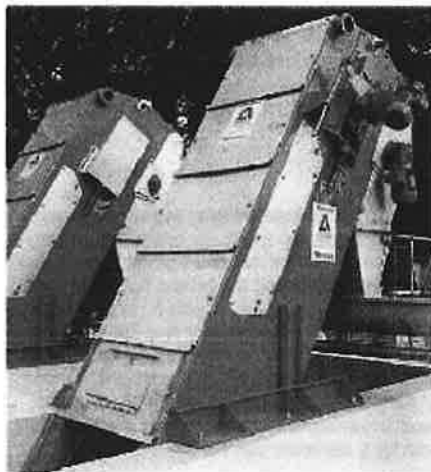
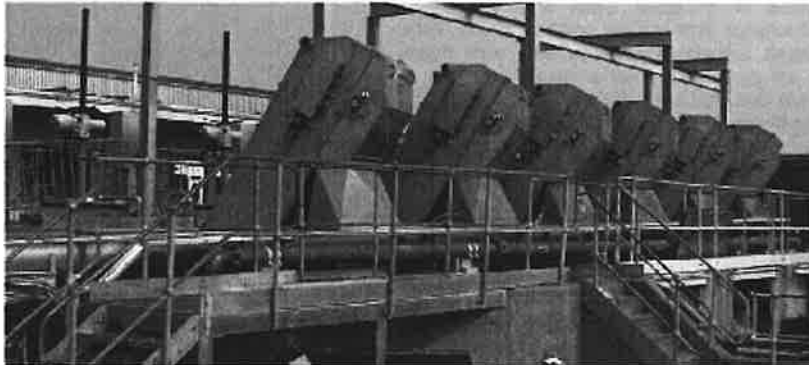
The high speed rotating brush comprises several individual brush elements mounted on a large diameter shaft. To ensure optimum coverage of the cleaning area individual brush segments can be fitted with differing lengths of bristles whilst the bristle flexibility can be easily changed to suit the effluent being handled. Typically, a more flexible bristle is better at removing grease and fat whilst a rigid bristle is more suited to effluents with a high rag content. Full pendular adjustment ensures that the brush can be moved closer to the belt to compensate for periodic wear thus ensuring cleaning efficiency is optimized and wash-water consumption is minimized. The brush is directly driven by a separate geared electric motor.



Traveling Chain

The perforated plate panels are connected to heavy-duty Stainless Steel double link traveling chains that run on Hardened Steel guide rails. The chains are protected from contamination from the debris by a continuous polyurethane seal.

Typical Installations



Typical Applications

Municipal

- River water intake
- Sewage screening at inlet works
- Screening works and imported sludge
- Screening before bio-filtration plants

**Industrial
(Chemistry – Pulp and Paper – Miscellaneous)**

- Intake water (from river, lake, channel)
- Screening before pumping stations
- Process water screening

Screen Sizes

Screen widths	Screen discharge heights	Screen mesh	Flow rates
0.5 metres to 2.5 metres (in 100mm increments)	1.5 metres to 10 metres	6mm diameter (Other sizes also available)	Up to 2500 litres/sec. (Dependant on water level)

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