



ROPERHURST ODOUR TREATMENT CASE STUDIES

INTRODUCING ROPERHURST

Roperhurst is a UK in-house designer, manufacturer and installer of fume and odour control treatment plant and equipment, chemical storage vessels, dosing and delivery systems.

Roperhurst was founded in 1976. We are fast approaching 50 years of continuous trading and sustainable growth, closely working year-in, year-out, with a range of customers, big and small, global and local, on specialist plastic and environmental engineering projects.

Roperhurst is one of the few plastic ductwork specialists with its own in-house fibre-glass division, and specialist installation and testing teams. This means that we do not rely on sub-contractors to complete elements of the project, which can cause quality and compliance issues. Our plastics fabricator welders are time served certified to BS EN 13067; all our laminators have been assessed under BS 4994.

Roperhurst in 2015, following a sustained period of growth, the company relocated to new larger premises which allowed for investment in leading edge plastic fabrication technology, including a 4m butt welding machine, a CNC machine, a multi-wire hot line bender, as well as providing a modern environment for its growing workforce.

Roperhurst investment in scale and technology meant the company could take on more challenging projects, moving us away from many companies we might previously have considered competitors.



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ODOUR CONTROL & TREATMENT:



Overview:

AMP7 design, build, install, test and commission 11,000m³/hr. capacity HRF Odour Control System including PVC/GRP field ductwork of the following;
2off 5,500m³/hr capacity Activated Carbon Absorbers.
1off duty/standby Exhaust Fan Set.
1off free standing Discharge Stack.
1set of HRF Odour Control Ductwork internal of tricking filter.
1set of Field Odour Control Ductwork.

The Challenge:

To provide a robust OCS that meets the Works specification, on time and on budget. Coordinating the supply to site of the systems critical parts in the right sequence with correct access and lifting equipment for safe installation while maintaining efficient progress of the works.

Critical Elements:

Roperhurst brief was to design, fabricate, install, test and commission an 11,000m³/hr capacity odour control and treatment system complete with field ductwork, activated carbon filters, duty/standby fan units and free-standing discharge stack.



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THE CHALLENGE:

To provide an Odour Management System to prevent odour nuisance that is designed to comply with the specified odour control measures and exceed the requirements of the project Environmental Assessment Statement and the project Planning Consent.

SCOPE OF SUPPLY:

Design, build to BS:4994, factory test, supply, delivery and installation, testing and commissioning of the Odour Extraction Delivery System, Lava Rock Bio-Filter, Carbon Polishing Unit, Slab and Plant By-Pass Ductwork, Duty/Standby Fan Set, Free Standing Self-Supporting Discharge Stack and Odour Emission Monitor.

Process Design	Average	Maximum	Units
Air extraction rate	N/a	9200	m ³ /h
Hydrogen sulphide (H ₂ S)	88	321	ppm
Mercaptans (total) loading	10	33	ppm
Ammonia (NH ₃) loading	6	19	ppm
Inlet Odour	430,555	1,608,333	OU/m ³

ODOUR TREATMENT:

Primary	Bio-Filter – Lava Rock (Pumice).
Flow Rate	9200m ³ /hr.
PD	300Pa.
Design Pressure	1.5 times the fan pressure (negative).
Retention Time	22secs.
Media Design Life	25 years.
H ₂ S Removal	96%.
Size	8.0m x 8.0m x 2.0m height.
Material of Construction	Hot Pressed GRP Panels.
Operation	7 days per week, 24 hours per day.

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THE BRIEF:

To provide an Odour Management System fully compliant to the project specification to achieve the reduction odour emanations as stated, incorporate Best Practical Means to minimise any odour impact that may cause a statutory nuisance as defined by the Environmental Protection Act 1990. The Odour Management system was selected on the basis of fully compliant application and the least whole life costs.

SCOPE OF SUPPLY:

Design, build, factory test, supply, delivery and installation, testing and commissioning of the Odour Extraction Delivery System, Lava Rock Bio-Filter, Slab Ductwork, Duty/Standby Fan Set, Free Standing Discharge Stack, Local Control Panel.

Process Parameters	Bio-Filter	Carbon Filter
No. of Units	1off	Not Required
Plant Flow Rate	1050 m ³ /hr	
Compounds	Loadings Removal	
Hydrogen Sulphide	10mg/m ³ 96%	
Organic Sulphide	7ppm 96%	
Ammonia	10ppm 98%	
VOC's	20mg/m ³ 96%	
Minimum Removal Rate	96% of H ₂ S	
Operation	Continuous	
Media Life	The media shall achieve the minimum removal efficiency specified above for no less than 25yrs.	

ODOUR TREATMENT:

Primary	Bio-Filter – Lava Rock (Pumice) Stone.
Flow Rate	1050m ³ /hr.
Bed depth	3.25m
PD	450Pa.
Design Pressure	1.5 times the fan pressure (negative).
Retention Time	24secs.
Media Design Life	25 years.
H ₂ S Removal	96%.
Size	2.0m dia. x 5.0m total height.
Material of Construction	Hot formed rigid PVC externally reinforced with GRP.
Operation	7 days per week, 24 hours per day.

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THE BRIEF:

To provide an Odour Management System that is project specification specific. The Odour Management System shall prevent any odour nuisance at the 30m site boundary and be fully compliant with the projects Planning Consent.

SCOPE of SUPPLY:

Design, build, factory test, supply, delivery and installation, testing and commissioning of the Odour Extraction Delivery System, Lava Rock Bio-Filter, Carbon Polishing Unit, Slab and Plant By-Pass Ductwork, Duty/Standby Fan Set, Free Standing Discharge Stack, Local Control Panel, Stack Odour Monitor, BS:4994 3rd Party Inspection.

Process Parameters	Bio-Filter	Carbon Filter
No. of Units	1 off.	1 off.
Plant Flow Rate	2900 m ³ /hr	2900 m ³ /hr
Inlet Concentrations	23ppm H ₂ S average. 190ppm H ₂ S peak. 0.5 ppm NH ₃ average. 4ppm NH ₃ peak. 3.3 ppm R-SH average. 14.5ppm R-SH.	1.14 ppm H ₂ S average. 9.64 ppm H ₂ S peak. 3.3 ppm R-SH average. 14.5 ppm R-SH peak.
Minimum Removal Rate	96% of H ₂ S	99.9%
Operation	Continuous	Continuous
Media Life	The media shall achieve the minimum removal efficiency specified above for not less than 25years.	The activated carbon media shall achieve the minimum removal efficiency specified above for not less than 3years.

ODOUR TREATMENT:

Primary	Bio-Filter – Lava Rock (Pumice) Stone.
Flow Rate	2851m ³ /hr.
Bed depth	3.5m
PD	450Pa.
Design Pressure	1.5 times the fan pressure (negative).
Retention Time	26secs.
Media Design Life	25 years.
H ₂ S Removal	96%.
Size	3.0m dia. x 5.0m total height.
Material of Construction	Hot formed rigid PVC externally reinforced with GRP.
Operation	7 days per week, 24 hours per day.

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FROM THE ARCHIVE:



COMPOSTING:

34,560m³/hr. duty/standby fan units housed in an acoustic enclosure.

A secondary system was provided to ventilate odours from storage tanks and sumps with the fumes being treated by a carbon absorber unit.

DISTILLERY:

Design, build, factory test, supply, delivery and installation, testing and commissioning of the Odour Extraction Delivery System, Bio-Filter, Carbon Polishing Unit, Slab and Plant By-Pass Ductwork, Duty/Standby Fan Set, Free Standing Discharge Stack, Local Control Panel, BS:4994 3rd Party Inspection.



WASTEWATER TREATMENT WORKS:

Design, build, factory test, supply, delivery and installation, testing and commissioning of: Odour Extraction Delivery System, CIF Unit, Slab Ductwork, Duty/Standby Fan Set, Free Standing Discharge Stack.

PROCESS GASES:

Design, build, factory test, delivery and installation, testing and commissioning of 4-stage process gas odour scrubbing unit.



REFUSE COLLECTION POINT:

Design, build and factory testing of a NaOH/NaOCl Horizontal Odour Scrubbing Unit.