

Acoustic Report

Environmental Noise Survey For Partial Demolition of Existing Garage and Erection of MOT Testing and Service Station at Rear of 588/594 Bradford Road, Batley

Our Reference – J2770

Survey Dates – 26th September 2018

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1.0 Agent

Tractus Architectural Design

Headfield Business Centre

Headfield Mills

Savile Road

Dewsbury

WF12 9LQ

2.0 Subject

Proposed partial demolition of existing garage unit and erection of an MOT Testing and Service Station at land to the rear of 588/594 Bradford Road, Batley, WF17 8LP

3.0 Aims

The aim of this report is to determine the existing baseline background noise environment levels, over a typical weekday period, affecting the proposed development above in order to inform the Planning Application No 2018/62/91945 relating to noise.

Provide an assessment of the results in accordance with the recommendations laid down in the National Planning Policy Framework, NPPF, for the proposed development site with respect to noise.

Provide mitigating noise control advice relating to the achievement of an acceptable internal environment for the development as recommended with World Health Organization's "Guidance for Community Noise, 1999".

Assess the likely noise sources to be introduced as part of the development on site with respect to the nearby noise sensitive residential premises.

4.0 Location and Description of Existing Noise Sources

The proposed site is the former location of a garage service station which is in limited use currently. The land is located to the northern side of Bradford Road, to the rear of existing industrial and commercial premises within a recognized industrial area of Batley with emphasis on the retail car sales and servicing businesses in the area.

The garage site under consideration is generally triangular in shape measuring a maximum 50m x 25m, with an access road leading from the south off Bradford Road. The site slopes up steeply north from Bradford Road and is bounded to the south and east by existing industrial premises. The northern site boundary is formed by a retaining wall where the land continues to slope up. The western site boundary is formed by the rear gable wall of the existing garage which consists of a blockwork inner façade, cavity and brick wall with a cavity to the site perimeter wall.

There are existing 2 storey back to back terraced residential premises located beyond the western site boundary at a distance of 7m from the existing garage rear façade, the closest of which are at No 3 and No 25 Carlinghow Hill. No 10 Hopewell Street residential property is located directly beyond the eastern site boundary, having the gable end overlooking the site with no windows or apertures present within the façade.

The primary noise sources within the vicinity of the site are predominantly due to traffic noise from Bradford Road and the nearby road network. There are industrial related noise sources audible within the vicinity of the site emanating from the existing units positioned along Bradford Road. Aircraft noise was also present during the monitoring period.

5.0 Guidance on the Assessment of Noise Levels

The purpose of any criterion or standard for environmental noise should be to safeguard against unacceptable levels of community response, deemed as a feeling of annoyance during daytime or disturbance at night. WHO defines annoyance as “a feeling of displeasure evoked by noise”

The main source of information relating to noise and the community response are field studies including noise measurements and social surveys. These surveys attempt to establish a correlation between the two sets of results.

In the absence of any definitive guidance and in order to establish suitable noise criteria, it is necessary to rely on general guidance and assessment methods used for community noise sources. Discussions on the current methods are given below.

5.1 BS4142:2014 'Method for Rating and Assessing Industrial and Commercial Sound'

This recently revised standard provides a method for rating and assessing sound of an industrial and/or commercial nature. The method uses outdoor sound levels to assess the likely effect of sound on people who might be inside or outside a dwelling or premises used for residential purposes. It is limited to applicable sounds and is not intended for noise amounting to nuisance or rating noise outside the scope of the Standard.

Unlike the previous version of the Standard, rating levels are not prescriptive, but more context based, with the following applicable to rating values:

- Typically, the greater this difference (variance between impact of background and rating level), the greater the magnitude of impact.
- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending upon the context.
- A difference of around +5 dB is an indication of an adverse impact, depending upon the context.
- The lower the rating level is relative to the measured sound level, the less it is that the specific sound source will have an adverse impact or a significant impact. Where the rating does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending upon context.

The Standard introduces additional rating elements, these being subject assessments of tonality, and impulsivity of a sound source, with weighted rating values accordingly applied at the judgment of the assessor.

The introduction of Uncertainty has been applied to the measured values; again, consideration of this is left to the professional executing the survey and assessment. However, steps are provided within the Standard for the reduction of uncertainty in both measurement and calculations of the sound source and rating value.

Actual meteorological conditions are now required to be recorded and reported upon for the survey and report.

5.2 National Planning Policy Framework, NPPF.

The newly incumbent National Planning Policy Framework, NPPF, provides advice to planning authorities in England on how they must seek to minimise the adverse impact of noisy activities on noise sensitive receptors. This NPPF, replacing PPG 24, and is not prescriptive with respect to specific noise levels, and is mainly concerned with the advising on good practice for environmental noise assessment.

In the absence of definitive noise criterion within the NPPF most Local Authorities in England default to the daytime noise levels inside dwellings not to exceed NR 35; and NR 25, to be achieved inside dwellings at night to avoid sleep disturbance, based upon ingress of external noise sources.

5.3 World Health Organization 1999 "Guidance for Community Noise"

This document provides a review of the effects of noise and a description of the principles of the WHO health criteria and guidelines for Community Noise.

The effects of noise in dwellings are identified as sleep disturbance, annoyance and speech interference. For bedrooms, the critical effect is sleep disturbance. Indoor guideline values for bedrooms are 30 dB LAeq for continuous noise and 45 dB LAmax for sound events. At night time, outside sound levels about 1 metre from facades of living spaces should not exceed 45 dB LAeq, so that people may sleep with bedroom windows open. This value is equivalent to that specifies in the Criteria 12 document; however it is now assumed that the noise reduction from outside to inside with the window open is 15 dB.

To enable casual conversation indoors during the daytime, the sound level of the interfering noise should not exceed 35 dB LAeq.

To protect the majority of people from being **seriously** annoyed during the daytime, the outdoor sound level from steady, continuous noise should not exceed 55dB LAeq on balconies, terraces and in outdoor living areas. To protect the majority of people from being **moderately** annoyed during the daytime, the outdoor sound level should not exceed 50 dB LAeq.

Table 1 of the document summarises the guideline values for community noise in specific environments and includes the noise indices to be adopted. Significantly, the corresponding time base to be used for the assessment is also included.

The relevant extracts of Table 1 are reproduced thus:

Specific Environment	Critical health effect (s)	LAeq dB	Time Base hours	LAMax dB
Outdoor living area	Serious annoyance, daytime and evening	55	16	-
	Moderate Annoyance, Daytime and evening	50	16	-
Dwelling, Indoors	Speech intelligibility & moderate annoyance daytime & evening.	35	16	-
	Sleep Disturbance, night-time	30	8	45
Outside Bedroom	Sleep disturbance, window open (Outdoor Values)	45	8	60

5.4 Subjective Impression of Noise Changes

The following Table provides a semantic scale that may be used to “subjectively” rate changes in sound pressure level.

Table 1: Subjective effect of changes in sound pressure level

Change in sound level dB	Change in Power		Change in apparent loudness
	Decrease	Increase	
3	1/2	2	Just perceptible
5	1/3	3	Clearly noticeable
10	1/10	10	Half / Twice as loud
20	1/100	100	Much quieter / louder

After Bies and Hansen

This table is taken from Professor Colin H Hansen’s publication “Fundamentals of Acoustics” page 41, for the Department of Mechanical Engineering, University of Adelaide.

This table also appears in “Engineering Noise Control” by Colin Hansen and David Bies, a comprehensive reference book, amongst others.

6.0 Survey Equipment

Integrating Sound Level Meter, RION NA-27, Type 1, Serial No 431986

RION UC-53A Microphone Serial No 307060

RION NC-74 Calibrator Serial No 530712

Windshield

Tripod

7.0 Survey Method

An attended pre-development environmental noise assessment survey was carried out encompassing the relevant daytime periods on 26th September 2018 by the author.

LA_{eq} , LA_{90} , LA_{10} , and LA_{max} sound measurements were taken using the sound analyser.

The measurement indices noted above are defined as follows:

$LA_{eq, T}$ the “A” weighted equivalent continuous noise level of sample period T

$LA_{10, T}$ the “A” weighted level exceeded for 10% of sample period T

$LA_{90, T}$ the "A" weighted level exceeded for 90% of sample period T
 LA_{max} The "A" weighted maximum level during the sample period T

Various sound measurements were taken using the sound analyser. The meter was calibrated before and after the measurements using the calibrator to ensure accuracy of the results. No fluctuations were noted between calibrations and the results obtained can be deemed to be an accurate representation of the levels recorded.

In order to ascertain the existing typical background noise climate, sound recordings were taken during the relevant daytime periods.

The meter was mounted on the tripod at a height of 1.5m above ground and at least 3m from any reflective plain. Refer to Appendix A for a marked up locational sketch for the survey points.

8.0 Prevailing Weather Conditions

26th September 2018 - Daytime – 15°C, 20% cloud cover, wind SW 0-4m/s, 79% rh, 1029 mb

9.0 Pre-Development Noise Survey Results

During the monitoring period separate noise samples were recorded, using a 1/1 Octave Centre Band analysis. These monitoring samples were collected from the closest residential premises to the proposed development site, considered as No 25 Carlinghow Hill and on site close to No 10 Hopewell Street. This was to establish the general noise levels experienced externally by the site at the most exposed position available and therefore likely to experience the worst case noise climate.

The table of results on the following page indicates the noise levels recorded for the monitoring location selected with a brief description of the noise sources contributing to the noise levels recorded.

The above monitoring location should be read in conjunction with the site layout appearing in Appendix A of this report.

Refer to Appendix B for the survey results frequency analysis table.

10.0 Noise Survey Results Table

Location	Data ID	LAmx	LAeq	LA10	LA90	Measurement Duration	Date	Time	Comment
		dB	dB	dB	dB				
1	1	71.2	54.3	56.9	50.7	00:15:00.00	26-09-2018	08:45:02	Traffic noise from Bradford Road and Carlinghow Hill dominant source. Existing industrial noise audible. Aircraft. Police sirens audible periodically. Children at play audible from Carlinghow Hill Pre-School
	2	67.0	54.5	57.0	50.8	00:15:00.00	26-09-2018	09:00:02	
	3	71.7	55.0	57.0	51.3	00:15:00.00	26-09-2018	09:15:02	
	4	79.4	57.3	59.1	51.2	00:15:00.00	26-09-2018	09:30:02	
	5	75.2	56.0	58.4	51.9	00:15:00.00	26-09-2018	09:45:02	
	6	64.8	53.9	55.9	51.3	00:15:00.00	26-09-2018	10:00:02	
	7	67.5	56.4	60.5	51.3	00:15:00.00	26-09-2018	10:15:02	
	8	58.7	54.1	55.6	52.8	00:15:00.00	26-09-2018	10:30:02	
	45	55.8	54.5	55.2	53.9	00:15:00.00	26-09-2018	17:20:59	
	46	57.1	54.7	55.5	54.0	00:15:00.00	26-09-2018	17:35:59	
	47	57.0	53.4	54.5	51.8	00:15:00.00	26-09-2018	17:50:59	
	48	56.2	51.8	53.1	50.9	00:15:00.00	26-09-2018	18:05:59	
	49	55.6	52.6	53.8	51.4	00:15:00.00	26-09-2018	18:20:59	
	50	67.9	54.6	56.9	51.4	00:15:00.00	26-09-2018	18:35:59	
51	68.8	56.3	59.0	52.1	00:15:00.00	26-09-2018	18:50:59		
52	69.4	55.6	58.2	51.4	00:15:00.00	26-09-2018	19:05:59		
2	9	62.8	57.0	59.1	54.2	00:15:00.00	26-09-2018	10:52:33	Traffic noise from Bradford Road dominant source. Existing industrial noise audible. Aircraft. Police sirens audible periodically.
	10	63.6	56.8	58.8	54.3	00:15:00.00	26-09-2018	11:07:33	
	11	68.5	56.6	58.4	52.9	00:15:00.00	26-09-2018	11:22:33	
	12	63.4	56.4	58.4	53.8	00:15:00.00	26-09-2018	11:37:33	
	13	62.4	57.2	59.5	53.5	00:15:00.00	26-09-2018	11:52:33	
	14	72.4	57.1	60.0	53.3	00:15:00.00	26-09-2018	12:07:33	
	15	70.9	56.3	57.9	54.0	00:15:00.00	26-09-2018	12:22:33	
	16	62.5	55.0	57.3	52.3	00:15:00.00	26-09-2018	12:37:33	
	37	66.1	55.1	57.1	51.5	00:15:00.00	26-09-2018	15:12:31	
	38	69.9	57.1	59.7	52.8	00:15:00.00	26-09-2018	15:27:31	
	39	73.0	58.6	61.3	52.6	00:15:00.00	26-09-2018	15:42:31	
	40	70.9	56.7	58.6	53.3	00:15:00.00	26-09-2018	15:57:31	
	41	65.1	54.8	57.1	51.4	00:15:00.00	26-09-2018	16:12:31	
	42	66.2	55.6	57.9	52.1	00:15:00.00	26-09-2018	16:27:31	
43	66.3	56.6	58.8	53.2	00:15:00.00	26-09-2018	16:42:31		
44	65.4	56.3	59.1	52.5	00:15:00.00	26-09-2018	16:57:31		

11.0 Results Analysis

The above noise survey, carried out on 26th November 2018, was chosen as a representative weekday period to reflect the typical noise climate for the area surrounding the proposed development site.

The noise survey results obtained for the site can, therefore, be deemed to be representative of normal activities for the area and will be used as the base for analysis and assessment purposes below.

Assessments of the individual results indicate that the existing premises of No 25 Carlinghow Hill and No 10 Hopewell Street are both affected primarily by traffic noise sources from the movements along Bradford Road and the local road network, with a high background level present from traffic movements along Bradford Road. Existing industrial activity is also audibel at each of these locations.

From the data acquired during the various assessment periods the following exposure noise level has been established for the noise sensitive site boundaries to the east and west. All other site boundary locations are not noise sensitive and as such will not be considered any further within the report.

Table of Calculated Total Exposure Levels for the Site Boundary

Boundary Location	Period	Noise Level
No 25 Carlinghow Hill Beyond West Site Boundary	Daytime (0700 – 2300 Hrs)	LAeq, 16 Hours – 55 dB LA90 – 52 dB Average
	Night-time (2300 – 0700 Hrs)	N/A
No 10 Hopewell Street Beyond East Site Boundary	Daytime (0700 – 2300 Hrs)	LAeq, 16 Hours – 57 dB LA90 – 53 dB Average
	Night-time (2300 – 0700 Hrs)	N/A

12.0 Site Considerations

There is a proposal for the change of use of an existing garage site to partially demolish the building and erect an MOT and service station.

It will be necessary to consider the proposed facility, as this change of use will introduce specific noise sources to the site. This is particularly necessary for the closest noise sensitive dwellings to the site, namely those beyond the western and eastern site boundaries to ensure that the amenity of the premises is not compromised as a result of the introduction of the MOT and service station facility.

12.1 Proposed MOT and Service Station Facility

The proposed MOT and Service Station facility is located within an industrial and residential area of Batley positioned on the northern side of Bradford Road behind established industrial units.

The advised operational times for the facility will be 09.00 to 17.00 hours Monday to Friday, with occasional Saturday mornings. There will be no use of the premises on Public Holidays or Weekends other than those indicated.

The primary introduced noise sources will consist of the following:

- 1 No 3 phase compressor unit – the existing unit monitored at 73.4 dBA at 1m
- 1 No Battery operated impact driver - the existing unit monitored at 83.0 dBA at 1m
- 1 No Electric car lift – the existing unit monitored at 68.5 dBA at 1m
- 1 No Hydraulic car lift – the existing unit monitored at 71.3 dBA at 1m

There are other items of equipment, however, these are hand tools that in themselves do not produce any significant noise and as such will not be included within the following assessment.

The modifications to the building will include for the partial demolition of the existing building and erection and extension of the building which will be approximately 18m x 17m x 6m high and the extended sections be primarily constructed using a composite metal wall and roof cladding system, similar to a Kingspan KS1000 panel. It will have an eastern frontage which includes 3 No roller shutter doors to allow access the work space. The unaffected building structure will remain a brick cavity block construction with the formed cladding fixed to this structure where necessary.

12.1.1 Calculation of Internal Noise Levels

The proposal is for the use of garaging and workshop facilities. As such there will be additional noise sources introduced within the building itself. In order to calculate the overall noise levels, likely to be experienced outside the building fabric at the closest noise sensitive location, we must firstly calculate the internal reverberant noise level.

The most commonly used theoretical model for predicting room sound fields are based upon diffuse-field theory. For enclosed spaces Sabine empirically developed a model that states that the intensity of a reflected sound will not vary because multiple reflections from surfaces result in uniform distribution of sound energy. A sound field with these properties is called diffuse.

In a diffuse field the direct sound dominates the total sound close to the source, but as the distance away from the source increases the reflected sound becomes dominant, resulting in the sound level remaining constant with increasing distance from the source. The Sabine theory may be expressed as follows:

Steady-State Conditions:

$$L_p = L_w + 10 \lg \left(\frac{Q}{4\pi r^2} + \frac{4}{Rc} \right)$$

(Direct Field) + (Reflective Field)

Where:

$$\alpha = \left(\frac{\sum S_i \alpha_i}{S} \right)$$

and

$$Rc = \left(\frac{\sum S_i \alpha_i}{1 - \alpha} \right)$$

Definitions:

L_p = sound pressure level, dB re 20 μ Pa

L_w = source sound power level, dB re 10⁻¹² W

Rc = room constant

Q = directivity factor

S = surface area

S_i = component Area

α = total mean absorption coefficient

α_i = component absorption coefficient

r = distance from source

The above calculation is frequency dependant and therefore provides a useful tool for predicting how a room will react to the internal noise levels produced within its space.

Making use of the above model and the recorded sound data for the noise levels adjacent to the external façade; we can calculate the predicted reverberant sound pressure level within the proposed extension, as this will be the noise contribution within the space formed.

Below is a copy of the calculation and predicted internal reverberant noise level due to the likely operations that will take place and is assuming **all** operations will be continuous and therefore a worst case scenario.

CALCULATION OF INTERNAL NOISE LEVELS FOR PLANT AND EQUIPMENT USE WITHIN GARAGE BUILDING

Using Sabine Diffuse Principle

$$L_p = L_w + 10 \text{ Log } ((Q/4\pi r^2) + (4/Rc))$$

	Area		63	125	250	500	1K	2K	4K
Room Constant Calculation									
Wall S ₁ - Wall Area - 102m ²		α ₁	0.05	0.05	0.04	0.04	0.04	0.05	0.05
Absorption Coefficient	102	S ₁ α ₁	5.1	5.1	4.1	4.1	4.1	5.1	5.1
Floor S ₂ - Floor Area - 306m ²		α ₂	0.02	0.02	0.02	0.02	0.04	0.05	0.05
Absorption Coefficient	306	S ₂ α ₂	6.1	6.1	6.1	6.1	12.2	15.3	15.3
Wall S ₃ - Wall Area - 108m ²		α ₃	0.05	0.05	0.04	0.04	0.04	0.05	0.05
Absorption Coefficient	108	S ₃ α ₃	5.4	5.4	4.3	4.3	4.3	5.4	5.4
Wall S ₄ - Wall Area - 102m ²		α ₄	0.05	0.05	0.04	0.04	0.04	0.05	0.05
Absorption Coefficient	102	S ₄ α ₄	5.1	5.1	4.1	4.1	4.1	5.1	5.1
Roof S ₅ - Roof Area - 306m ²		α ₅	0.05	0.05	0.04	0.04	0.04	0.05	0.05
Absorption Coefficient	680	S ₅ α ₅	34.0	34.0	27.2	27.2	27.2	34.0	34.0
Wall S ₆ - Wall Area - 33m ²		α ₆	0.05	0.05	0.04	0.04	0.04	0.05	0.05
Absorption Coefficient	33	S ₆ α ₆	5.1	5.1	4.1	4.1	4.1	5.1	5.1
Doors - 75m ²		α ₇	0.05	0.05	0.04	0.04	0.04	0.05	0.05
Absorption Coefficient	75	S ₇ α ₇	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Area S =	1406	m ²							
Mean α			0.05	0.05	0.04	0.04	0.04	0.05	0.05
Total Absorption Coefficient		Sα	60.8	60.8	49.9	49.9	56.0	70.0	70.0
		1 - α	0.95	0.95	0.96	0.96	0.96	0.95	0.95
Room Constant =		Rc	64.0	64.0	52.0	52.0	58.3	73.7	73.7

Since the plant items will be located on the ground Q = 2, assuming an average distance from the centre of each plant item to the outside façade wall is 2m.

The sound pressure level can be calculated:

Where r = 2m to façade	$\frac{Q}{4\pi r^2}$	(1)	0.040	0.040	0.040	0.040	0.040	0.040	0.040
and	$\frac{4}{Rc}$	(2)	0.063	0.063	0.077	0.077	0.069	0.054	0.054
with	$(1)+(2)$	=	0.103	0.103	0.117	0.117	0.109	0.094	0.094
Therefore	$10 \text{ Log } ((1)+(2))$		-9.9	-9.9	-9.3	-9.3	-9.6	-10.3	-10.3

Based upon the sound pressure level data for the plant items the resultant sound power level can be calculated thus

Recorded Sound Data		Some items recorded at 2m and adjusted for 1m							
Sound Pressure Level Compressor Unit	73.4 dBA	at 1m, dB	66	58	55	55	56	52	46
Sound Pressure Level Electric Car Lift	68.5 dBA	at 1m, dB	65	57	56	56	58	54	45
Sound Pressure Level Hydraulic Car Lift	73.1 dBA	at 1m, dB	59	65	62	69	67	63	60
Sound Pressure Level Battery Operated Impact Driver	83.0 dBA	at 1m, dB	54	49	49	55	66	77	77
		Lp at 1m, dB	69	66	64	70	70	77	77
Using SPL = SWL - 20Logr - 8 for hemispheric radiation, the resultant SWL is read as follows									
SWL = SPL + 20Logr + 8									
(A) Weight									
		using Lp at 1m,	69	66	64	70	70	77	77
Flat surface - Hemispheric Radiation =		+8	8	8	8	8	8	8	8
Therefore Global SWL		Lw, dB	77	74	72	78	78	85	85
Taking this global Lw and accounting for the room elements the resultant Lp will be as follows									
Room Reduction at 2m		dB	-9.9	-9.9	-9.3	-9.3	-9.6	-10.3	-10.3

Resultant Lp at 2m	Lp, dB	67	64	63	69	68	75	75
(A) Weighting		-26	-16	-9	-3	0	1	1
Resultant Lp(A) at Façade assumed to be an average 2m away from operation of the specific items	Lp(A), dB	41	48	54	66	68	76	76

12.1.2 Determination of Building Fabric Acoustic Properties

In order to determine the likely effect the worst case internal reverberant noise levels are going to have on the local environment around the site, the acoustic properties of the proposed building fabric will need to be established.

The internal noise produced can only be “contained” within the building, provided that the sound insulation, SRI, of the building fabric is high enough to provide a sufficient barrier against the transmission of the sound through the structure.

Based upon the proposed construction the extension areas of the development will be a Kingspan KS1000 range composite panel system. The manufacturer’s data for the SRI value of a Kingspan KS1000 panel system is provided below. This is likely to represent the lower acoustic properties when considered against the existing construction of the building, as such it is this material that will be considered for breakout purposes.

The acoustic performance of the KS1000 RW wall and roof panel provides a Weighted Sound Reduction Index of $R_w = 25$ dB. The frequency band reduction of the composite panel is as follows:

Sound Reduction Index (SRI)

Freq Hz	63	125	250	500	1000	2000	4000
SRI dB	20	18	20	24	20	29	39

12.1.3 Calculated Resultant

The purpose behind the above scenarios is so that an assessment of the likely noise levels at the closest noise sensitive dwelling can be made in advance of the actual development.

The appropriate model for the assessment of noise breakout from a building is given by considering the internal noise level within the room, the area of the wall likely to generate noise and the distance to the recipient. Additional to this is the consideration of the topography of the intervening land between source and recipient.

The calculation encompassing all these factors is given by:

$$L_2 = L_1 - R + 10\log S - 20 \log r - 14 - AS, \text{ dB}$$

Where **L₂** is the sound pressure level in dB at distance **r** metres from the wall under consideration;
L₁ is the sound pressure level inside the pressroom adjacent to the wall where the breakout will occur;
S is the area of wall, m²;
R is the Sound Reductive Index, SRI, of the wall, dB.
AS is the barrier effect of the intervening topography, dB

Assessment No 1 Carlinghow Hill Premises

Frequency, Hz	63	125	250	500	1K	2K	4K
L ₁ within Garage Unit, dB	67	64	63	69	68	75	75
KS1000 Wall System SRI, dB	-20	-18	-20	-24	-20	-29	-39
Eastern Wall Extension Area, 18m x 3m = 54m ²	17	17	17	17	17	17	17
Distance to recipient at 25 Carlinghow Hill, 7m	-17	-17	-17	-17	-17	-17	-17
Constant - 14	-14	-14	-14	-14	-14	-14	-14
Barrier Effect, dB	0	0	0	0	0	0	0
Resultant, dB	33	32	29	31	34	32	22

The above calculated noise contribution to the background level equates to **NR 38 dB, or 35 dBA**.

This level of contribution is **-17 dB below** the baseline background value recorded when considered at the 25 Carlinghow Hill to the east of the site.

If we take account of BS4142 rating a level of -10 below background is a clear indicator that noise is not likely to give rise to justifiable complaints, therefore a value of -17 dB below is a good indicator that noise is not an issue.

Assessment 2 Hopewell Street Premises

Frequency, Hz	63	125	250	500	1K	2K	4K
L ₁ within Garage Unit, dB	67	64	63	69	68	75	75
KS1000 Wall System SRI, dB	-20	-18	-20	-24	-20	-29	-39
Western Wall Extension Area, 18m x 6m = 108m ²	20	20	20	20	20	20	20
Distance to recipient at 10 Hopewell Street, 40m	-32	-32	-32	-32	-32	-32	-32
Constant - 14	-14	-14	-14	-14	-14	-14	-14
Barrier Effect, dB	0	0	0	0	0	0	0
Resultant, dB	21	20	17	19	22	20	10

The above calculated noise contribution to the background level equates to **NR 25 dB, or 22 dBA**.

This level of contribution is **-31 dB below** the baseline background value recorded when considered at the 10 Hopewell Street to the west of the site.

If we take account of BS4142 rating a level of -10 below background is a clear indicator that noise is not likely to give rise to justifiable complaints, therefore a value of -31 dB below is a good indicator that noise is not an issue.

12.1.4 Roller Shutter Doors

The above calculations have assumed that the building will be constructed using a composite panel construction throughout, however, it has not included the proposed roller shutter doors.

In order to provide attenuation against the internal noise produced within the building escaping out through the closed doors, the roller shutter doors will need to possess a similar sound reduction index, SRI, to the building as a whole.

Standard roller shutter doors only provide approximately 15 dB noise reduction when closed. This will be inadequate when considered against the internal noise produced.

It is therefore recommended the roller shutter doors are manufactured using a composite construction with tested and independently certified insertion loss characteristics.

A product that features noise reduction can be supplied by Crawford Doors and is their 542 composite acoustic panel type construction.

The door type 542 has a certified sound reductive index of 23 Rw, meeting the minimum requirements for the construction as a whole and as such maintaining the acoustic performance of the installation when the roller shutter doors are included.

The other area of concern relating to the roller shutter door sets, relates to the actual noise produced by the roller mechanism when operated. The 542 roller shutter door has the benefit of several seals to prevent noise during operation of the doors. There are three areas that benefit from seals, these include a Top Seal, ensuring that the door panel once closed does not rattle or allow noise to bypass the panel; Bottom Seal, this seal ensure that the panel fits tightly to the floor once closed avoiding both wind induced rattling and ensuring that noise does not bypass the panel at the base; Side Seals, these seals ensure that the panel is sealed into position when closed and provides a positive location seal and guide when the door is in operation, again ensuring that the door does not vibrate during operation or due to wind induced movement. These seals also provide an acoustic seal against the egress of sound from within. Refer to Appendix C for brochure details.

The door operating mechanism can be via an electrically operated drive motor located within the building.

The above is a recommendation only and other manufacturer's products are available and possess similar acoustic performance and seals. Provided that the above minimum Rw value is achieved by the roller shutter doors supplied for this development, with appropriate seals, then specific manufacturers are irrelevant.

The other primary recommendation is that the doors remain closed at all times when not in use in order to minimize internal noise from emanating towards the noise sensitive residential premises. Any noisy operations taking place within the building should not commence whilst the doors are open. Doors should only be opened to allow access and egress of vehicles and should become a condition of the site operations.

12.2 External Yard Activities

The vehicles, when not in use, will be parked within the yard in designated parking bays.

It is anticipated that there will be only 20 No vehicle movements per day in and out of the garage, however, this will be dependent upon the type of work required on each vehicle which would only be determined on a case by case basis.

This level of vehicle movement will be insignificant and is below the volume of traffic that can be calculated, based upon the methodology indicated within the Department of Transport, Welsh Office CTRN publication.

As such noise associated with the general movements of vehicles on site can be considered as an insignificant source, which is not likely to be noticeable above the typical background consisting primarily of traffic noise moving along Bradford Road.

Any engine revving, forming part of the vehicle maintenance or MOT process will need to take place inside the workshop with the doors closed so as not to become a significant adverse impact source, when considered at the nearby residential premises.

12.3 Fixed Plant Noise

Fixed plant items associated with the development usually include heating and ventilation equipment.

There are no proposals finalized for the development at the time of writing, therefore, the only course of action available is to place limiting noise output levels on the site with respect to fixed plant items.

Since the site is likely to be occupied from 09.00 hours, generally classified as daytime periods, the limiting values will need to account for this period.

The assessment indicates that the average recorded background level for the area is 52 LA90 dB.

In order not to increase the background level it is recommended that the limiting output level for all plant located on site is set at NR40 dB, equivalent to 45 dBA, when considered at the closest noise sensitive residential premises to the site, deemed as No 25 Carlinghow Hill.

By working to an NR value, this will ensure that there is no tonality present within the potential fixed plant noise source reducing the likelihood of unduly affecting the nearby residents.

The limiting sound spectrum for NR40 dB is provided below.

Frequency, Hz	63	125	250	500	1K	2K	4K	8K
NR 40 Limit, dB	67	57	49	44	40	37	35	33

The above limiting sound spectrum is for the total output of any plant and equipment when considered at the premises of No 25 Carlinghow Hill.

Provided that the limits are adhered to there will be no loss of existing amenity for the residents.

13.0 Report Summary

An attended pre-development acoustic assessment of the existing noise levels around the proposed development site at land to the rear of 588/594 Bradford Road, Batley has been undertaken in order to inform Planning Application No 2018/62/91945 for the site.

The noise survey established the pre-existing noise climate and sources for the area; which are primarily due to traffic movements along Bradford Road and the nearby road network. There is also a noise attributable to industrial activity from the existing units, significant noise due to ER Sirens and aircraft.

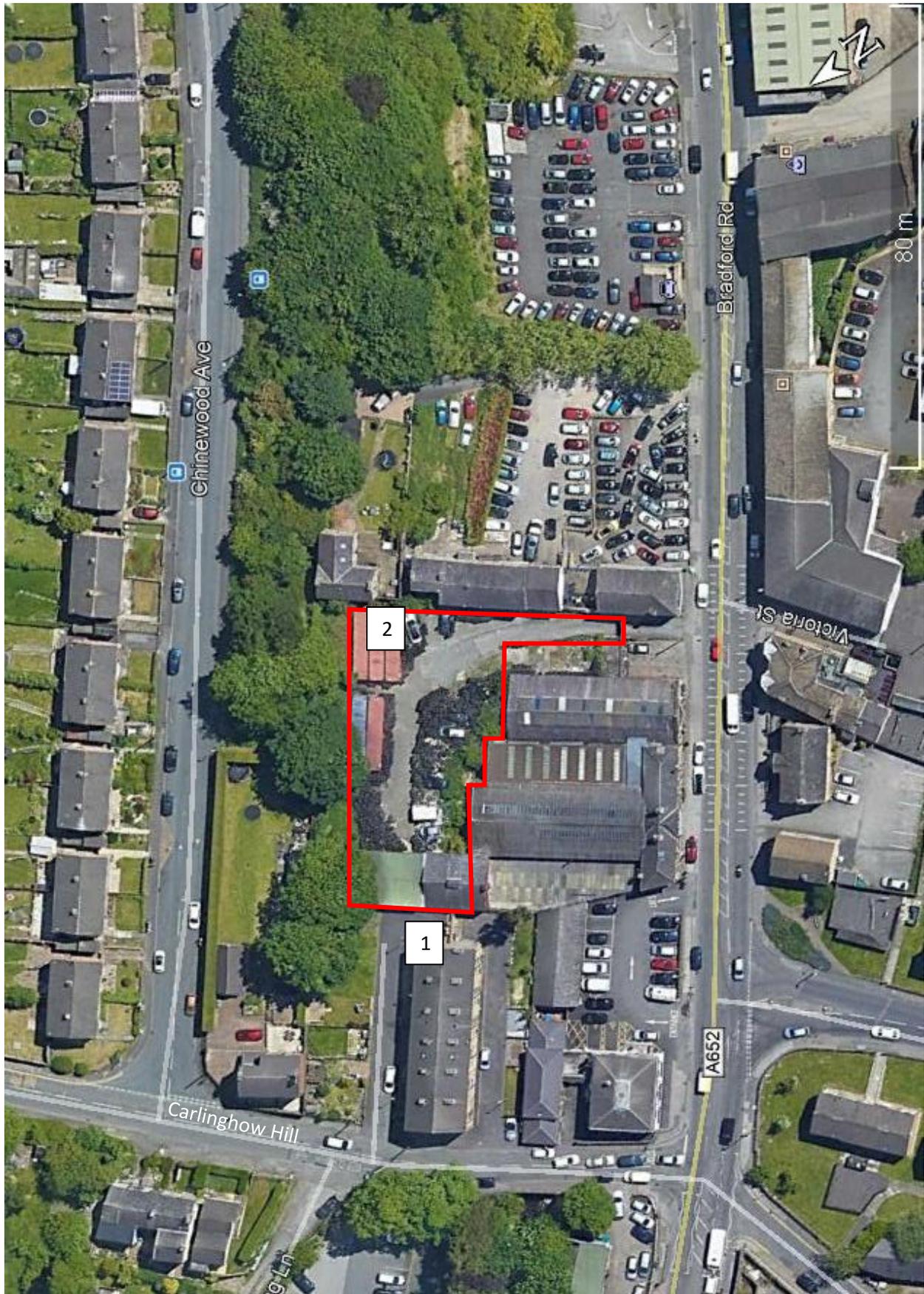
The development is to include for the partial demolition of the existing garage and the erection of an MOT and service station.

Consideration has been made of the likely worst case internal noise environment within the garage facility and calculations have indicated that the breakout and effect on the nearby residential premises will be of low or negligible significance with respect to noise or loss of amenity.

Based upon the results of the calculations completed for the site, there is not likely to be an adverse impact due to the change of use for the site into an MOT and service station.

Appendix A-1

Locational Outline and Monitoring Positions



Appendix B Noise Survey Frequency Analysis Results Table

Location	Data ID	LAmax dB	LAeq dB	Leq dB in Frequency Bands Hz								LA10 dB	LA90 dB
				63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz		
1	1	71.2	54.3	61.5	54.7	51.6	50.3	50.9	46.0	39.5	33.5	56.9	50.7
	2	67.0	54.5	62.7	52.7	51.4	50.0	51.4	46.1	40.5	31.8	57.0	50.8
	3	71.7	55.0	62.5	54.0	51.9	50.7	51.8	46.9	40.9	34.2	57.0	51.3
	4	79.4	57.3	62.8	56.3	52.3	51.1	53.6	51.4	42.7	36.7	59.1	51.2
	5	75.2	56.0	63.2	55.7	53.2	52.2	52.4	47.9	43.1	37.3	58.4	51.9
	6	64.8	53.9	61.9	52.8	50.8	49.5	50.8	45.4	39.2	32.9	55.9	51.3
	7	67.5	56.4	61.5	53.0	51.2	51.4	52.0	50.0	46.0	38.8	60.5	51.3
	8	58.7	54.1	62.8	52.4	50.0	49.8	51.2	45.7	37.8	31.2	55.6	52.8
	45	55.8	54.5	63.2	53.5	51.5	48.7	51.4	46.6	41.3	36.2	55.2	53.9
	46	57.1	54.7	64.1	56.2	52.9	49.4	51.8	46.0	38.9	32.1	55.5	54.0
	47	57.0	53.4	65.4	55.0	51.8	46.9	50.3	45.4	38.2	29.3	54.5	51.8
	48	56.2	51.8	65.9	55.1	51.4	46.0	48.2	43.9	36.2	29.2	53.1	50.9
	49	55.6	52.6	64.3	54.9	51.1	46.8	48.9	45.1	39.3	31.8	53.8	51.4
	50	67.9	54.6	65.7	56.3	53.1	51.2	51.1	45.5	37.7	30.6	56.9	51.4
	51	68.8	56.3	69.9	58.8	53.7	53.1	52.3	47.7	40.9	32.1	59.0	52.1
52	69.4	55.6	64.8	54.7	52.1	51.4	52.2	47.6	40.3	32.0	58.2	51.4	
2	9	62.8	57.0	65.2	55.1	52.4	53.0	53.1	49.3	45.3	40.6	59.1	54.2
	10	63.6	56.8	63.4	57.4	51.9	52.1	52.9	49.2	45.6	41.2	58.8	54.3
	11	68.5	56.6	63.8	54.9	52.0	52.3	52.8	48.8	45.2	41.1	58.4	52.9
	12	63.4	56.4	62.6	53.1	52.6	52.3	52.6	48.4	44.5	40.5	58.4	53.8
	13	62.4	57.2	61.9	53.5	51.4	54.9	53.3	48.2	43.7	38.8	59.5	53.5
	14	72.4	57.1	63.3	58.1	53.9	55.0	53.0	48.3	41.5	36.3	60.0	53.3
	15	70.9	56.3	64.2	55.3	51.8	52.1	52.5	48.5	43.9	39.0	57.9	54.0
	16	62.5	55.0	61.6	53.4	50.6	50.7	51.8	46.9	41.9	35.3	57.3	52.3
	37	66.1	55.1	63.0	53.7	50.7	50.9	51.5	46.7	43.8	39.0	57.1	51.5
	38	69.9	57.1	64.1	53.6	52.5	55.1	52.9	48.4	42.7	36.6	59.7	52.8
	39	73.0	58.6	63.8	68.1	59.3	55.0	53.7	47.9	44.8	36.9	61.3	52.6
	40	70.9	56.7	62.4	57.1	53.1	55.1	52.6	47.3	40.3	32.9	58.6	53.3
	41	65.1	54.8	64.5	56.6	50.5	52.1	51.3	46.1	38.1	30.2	57.1	51.4
	42	66.2	55.6	62.1	56.3	50.9	52.7	52.4	46.8	37.7	31.0	57.9	52.1
43	66.3	56.6	61.6	56.7	53.6	54.6	52.7	47.4	39.8	32.3	58.8	53.2	
44	65.4	56.3	61.0	52.2	51.3	52.8	52.9	48.3	41.8	35.4	59.1	52.5	

Appendix C Type 542 Roller Shutter Door Brochure and Seals

Crawford
542 Overhead sectional doors



2

 Crawford
Innovation that works

Crawford 542 Overhead sectional doors

Customer needs in focus

The Crawford 542 is an overhead sectional door designed to be used in applications like warehouses, logistics centres and all kinds of production plants. The design is optimal for customers who need robust, well-insulated and space-saving doors in the outer walls of industrial premises. The sectional door slides up under the roof when opened, allowing free space around the door opening and leaving it completely free.

A high quality, 42 mm thick, sandwich panel provides good insulation values and corrosion protection. This, together with a number of operational options, means that the Crawford 542 meets practically every individual demand.

In addition, the Crawford 542 is designed to meet all operational and safety requirements in the European Directives and the standards issued by the European Standardization Committee, CEN.

Modern panel design

The Crawford 542 sandwich panel has a microrilled design, which in combination with a glossy colour finish gives the door a modern, attractive and unique appearance.

Colours

The Crawford 542 is available in 8 standard colours (see page 5). The inside standard colour is off-white (RAL 9002). Optional colours are available on request.

Glazing

Glazing alternatives vary from full-vision panels to individual windows in a rectangular or oval shape. The windows are available in acrylic or hardened glass.

Fixed sections

Door openings are often changed to comply with new demands. Unnecessarily large door openings can advantageously be filled with fixed sandwich panels. The erected fixed sections are excellent for the positioning of pass doors.



Pedestrian traffic

For safety reasons we recommend separating pedestrian and vehicle traffic by installing a pass door next to the overhead door.

Should building space not permit such a separation, an integrated pass door is available.

Technical facts

Max size¹ (W x H)
8000 x 6000

Panel thickness
42 mm

Colour outside, pre-coated
8 Standard
see page 5

Colour inside, pre-coated
RAL 9002

Windows, optional
See page 6

Pass door, optional
see page 6

Access and Automation, optional

Wind load², EN12 424
Class 3 < 4250 x 4500
Class 2 > 4250 x 4500

Thermal transmittance³, EN12 428
Full panel door 0,8 W/(m²K)
With windows and pass door 1,25 W/(m²K)

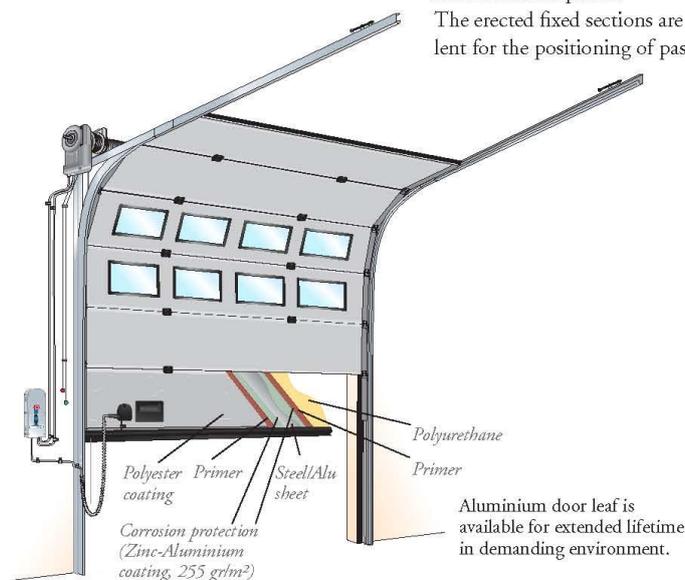
Water penetration³, EN12 425
Class 2

Air permeability³, EN12426
Class 2

¹ Other sizes on request

² Higher wind load classification on request

³ Door size 4000 x 4000



Crawford
Solutions that work

Crawford 542 Overhead sectional doors



Security

The Crawford 542 is equipped with a lock bolt, prepared for a padlock, as standard. Cylinder locks as well as various other security features are available as options.



Inside – no protruding parts

The inside of the Crawford 542 has no protruding parts where tools could be misplaced, causing injuries when the door is opened. When inside reinforcements are required, e.g. when a pedestrian pass door is integrated in the main door, the design of the reinforcement is made in such a way that the risks above are reduced.



Finger pinch protection

The horizontal joints between the door sections are designed in such a way that fingers cannot be pinched during door movement.



Drop-down protection

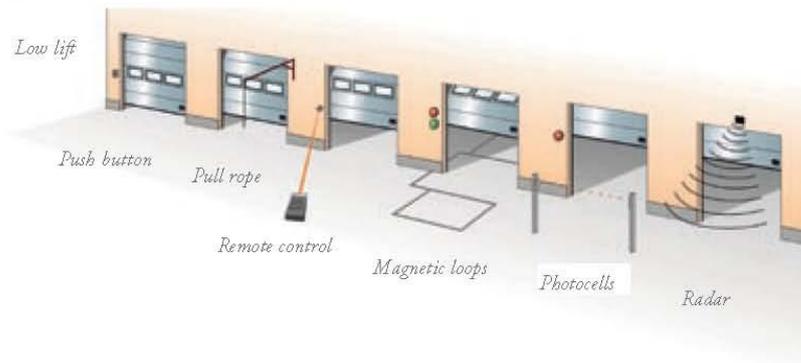
Crawford 542 is equipped with two special anti-drop devices as standard. They prevent the door from coming down in case of a spring or cable break.

Hardware

Hardware is the collective name for the wall and roof tracks. Different types of hardware are available to accommodate the best installation at your site. Standard lift is suitable for most buildings. Vertical and high lift designs utilise excess height of the wall above the door opening to save internal height in the building. Low lift is suitable for doors with limited headroom above the door opening.

Access and automation

Access to a building can be arranged in different ways: general or limited – permanent or temporary. A number of manual and automatic control systems for opening and closing commands are manufactured and supplied by Crawford. The safety level in these systems is determined by the environment in which they shall be installed.



Crawford 542 Overhead sectional doors



Finger pinch protection



Panel design



Spring break device



Cable break device



Lock bolt

Improved working environment

The top seal, bottom seal, side seals and intermediate seals between the door sections provide good tightness, thus lowering energy costs and improving the inside working environment.

Colours, pre-coated

The Crawford 542 is available in 8 standard colours. The inside standard colour is off-white (RAL 9002). Optional special colours are made to order.

Colour guide



PS 24W /RAL 3002



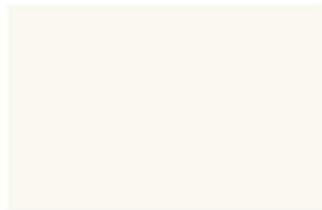
PS 28W /RAL 1021



PS 20W /RAL 5010



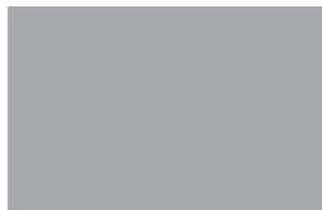
PS 38W /RAL 7016



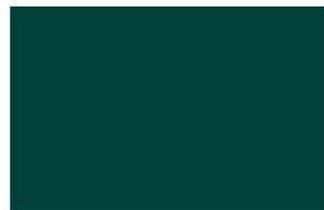
PS 21W /RAL 9010



PS 23W /RAL 9002



PS 25W /RAL 9006



PS 29W /RAL 6005

Colour differences may occur due to different printing methods.



Assisted manual operation

Two different types of chain hoist are available depending on door weight.



Cylinder



Electrical

Cylinder/Electrical Locks

Complete lock including handle and cylinder for both sides or inside only. Any door equipped with an electrical lock can be remotely locked by means of a switch or via a PC. The lock mode can be monitored.

Crawford 542



Top seal



Bottom seal



Side seal



Effective sealing is delivered on all doors as a standard, in order to improve tightness and working conditions behind the closed door.

Handle



Solid, easy to grip and step –on handle for manual operation.

Semi-auto lock



Standard on all manually doors, locking takes place from the inside.

Wall Track Cover - option



Available for all doors, Contributing to safety in use.

Cylinder lock - option

Inside view



Outside view



Cylinder lock (single- or double sided)

Ventilator - option



Free area 160 cm²