Appendix J: Acoustic Report

THE HARLINGTON

RIBA STAGE 1 – ACOUSTIC FEASIBILITY REPORT

The Harlington (Fleet, UK)

Report
June 2025

CHARCOALBLUE
THEATRICAL INNOVATION | ESTD 2004

Executive Summary

This report sets out the feasibility stage works from Charcoalblue, relating to the acoustic design of The Harlington, in Fleet.

Room acoustic criteria and background noise criteria have been set out within the document, informed by the project brief/intended continued use of the building. Where the existing auditorium is a large volume for the regular programming of amplified speech and music, introduction of fixed sound absorbing finishes will provide appropriate levels of clarity and loudness control for these use cases. Introduction of variable finishes, such as drapes, will also help to balance conditions between the various proposed format types.

The following design stage will incorporate:

- Room acoustics design for key performance/public spaces;
- Initial coordination of mechanical services design approach;
- Establishment of sound separation criteria of internal partitions, and development of construction types;
- Undertaking of environmental noise survey;
- Coordination with local environmental health to establish design criteria for local noise impact;
- Development of building envelope sound separation performance and external plant selection, to align with noise criteria.

1. INTRODUCTION

Charcoalblue have been appointed by Burrel Foley Fischer architects to assist in the redevelopment of The Harlington, in Fleet.

Where the existing space caters to a range of use cases, including comedy, amplified music, and dance, it is understood that the primary aspiration of the operators of the space is to retain similar programming but with an updating of the building's facilities.

A major aspect of the proposed works is improvement/replacement of the existing roof, which will have significant acoustic operational implications. Consideration will need to be given to noise break-in, noise break-out, and impact from any new roof plant.

It is understood that increased capacity within the main space is not an immediate priority, however introduction of additional lettable spaces, alongside updating of the auditorium to allow for increased accessibility and ease of use is a priority.

1.1. The Site

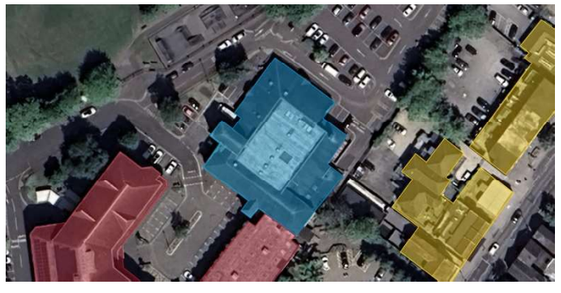
The Harlington is situated in Fleet. The building incorporates a 316 seated capacity auditorium, a dance studio, a function room, foyer/lobby spaces, and back of house and front of house ancillary spaces.

The building is directly connected to municipal buildings, including the Library and Court.

Mixed use commercial and residential properties are found to the East of the site, and are considered the nearest residential noise-sensitive receivers.

The site is surrounded on all sides by roads and car parks.

*Existing Site: The Harlington in **BLUE**, municipal buildings in **RED**, mixed commercial/residential in **YELLOW***



2. ROOM ACOUSTICS

A key indicator of room acoustic conditions is the reverberation time, the length of time required for sound to dissipate by a certain level. For the current use cases of the auditorium, including unamplified/amplified speech, and amplified music, a shorter reverberation time is desirable, to ensure clarity and to reduce perceived loudness.

The relationship between room volume, sound absorbing surfaces, and reverberation time, can be thought of indicatively as the volume per person. For the typical use case of The Harlington, target values would be 3-5m^3/person, to achieve appropriate reverberance and loudness levels for clarity of amplified speech and music.

The current proposals for updates to the auditorium provide a range of volume per person values, depending on the seating arrangement, and whether a balcony is introduced to the room. For fully occupied scenarios, with the seating rake deployed, the balcony installed, and trusses overhead, the volume per person would likely sit at 4.5m^3/person, achieving target levels. For lower occupancy scenarios however, such as with the rake stowed for banqueting, volume per person is likely to exceed 5.0m^3/person. Introduction of additional sound absorbing finishes will be required to achieve optimal room acoustic conditions in these scenarios. To balance the room acoustic condition between varying formats and levels of occupancy, installation of variable finishes, such as drapes, will be beneficial.

Reverberation Time Criteria

Room Type	Reverberation Time Criteria, T30 (s)
Auditorium	0.7-1.1
Multipurpose Studio	1.2
Sound & Light Lobby	1.0
Foyer/Café	1.5
Meeting Room/Office	0.8
Dressing Room	1.2
WC/Workshop/Store	1.5

The final design of all acoustically sensitive spaces, such as performance spaces and foyers, should all be free of anomalous acoustic artefacts, such as flutter echoes, that could negatively impact users of the space. As the design of the building continues, coordination of finish types/locations and room geometries will be further refined to ensure a good acoustic condition for all.

3. BACKGROUND NOISE LEVELS

Achieving appropriately low background noise levels is critical to spaces intended for concentration, such as auditoria or office spaces. Background noise levels are impacted both by noise intrusion from adjacent spaces/outside of the building, as well as noise produced within the room from mechanical and electrical services.

To minimise the impact of noise intrusion, sound separation design will need to be coordinated such that noise-producing/noise-sensitive spaces are not directly adjacent to one another, and that all elements of the room envelope are of appropriate performances of airborne and impact noise sound reduction.

Initial background noise criteria are set out below, both in terms of noise intrusion in LAeq (dB) levels and mechanical noise in rating systems of PNC or NR levels; These are seen as "not to exceed" criteria:

Background Noise Criteria

Room Type	LAeq,T	PNC/NR
Auditorium	30dBA	PNC-20
Multipurpose Studio	35dBA	PNC-25
Sound & Light Lobby	35dBA	PNC-25
Foyer/Café	40dBA	NR-30
Meeting Room/Office	35dBA	NR-25
Dressing Room	40dBA	NR-30
WC/Workshop/Store	45dBA	NR-40

4. SOUND SEPARATION

4.1. Internal Partitions

To minimise potential for disturbance between noise-producing and noise-sensitive spaces appropriate internal partition sound separation performances will need to be specified during the following design stages. This includes any improvements to existing walls, floors, and ceilings; specification of build-up/mass of new partitions; specification of door types and ironmongery/seals; and any penetrations from services.

The current design sets out buffer spaces between noise critical spaces, such as with sound and light lobbies to performance and rehearsal spaces. As the design progresses further interrogation of requirements of adjacencies will inform the overall performance requirements.

4.2. Building Envelope

The proposed scheme includes some replacement of/expansion of outer walls/windows/doors as well as replacement/improvement to the entire auditorium roof. Each of these construction types will need to be assessed against the current surrounding noise climate, to ensure that activities within the building don't negatively impact neighbours, as well as ensuring that external noise doesn't impact users of the building.

A key element discussed so far is the requirements of the auditorium roof for new roof plant. Through stiffening/propping of existing roof trusses or installation of new steel trusses, the overall deflection of the roof should achieve a maximum of 6mm, to minimise potential for transfer of unwanted vibration into the auditorium from new air handling units at roof level.

5. ENVIRONMENTAL NOISE IMPACT

During the following design stage the local council will need to be consulted to understand requirements relating to environmental noise impact.

It is expected that an unattended noise survey of a minimum of 24 hours will be required to establish existing noise levels in the local area. All new plant to be installed as part of the scheme, alongside any alterations to the building envelope, will then be assessed against these existing noise levels, to ensure no adverse impact to neighbouring properties following the development of The Harlington.

6. NEXT STEPS

In the following design stage the following shall be further developed and coordinated:

- Room acoustics design for key performance/public spaces;
- Initial coordination of mechanical services design approach;
- Establishment of sound separation criteria of internal partitions, and development of construction types;
- Undertaking of environmental noise survey;
- Coordination with local environmental health to establish design criteria for local noise impact;
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