Hayy: Creative Hub Cinema

Technical Design Guidelines
For Competition Submissions

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Introduction

The Hayy:Creative Hub Cinema facility will operate with a variety of media being shown, and will be an independent cinema providing the highest quality experience for all audience members.

The Hayy cinema facility's technical design submissions should meet or exceed the standards and technical expectations of the facility as set out in the Appendix- Technical Guideline document.

The intention is to create an immersive viewing environment, its physical design incorporating specific criteria such as 4K digital and 35mm projected media, maximised screen sizing for comfortable viewing angles and multi-channel immersive audio experience and acoustic correction, as well as ambient light control.

These technical guidelines are considered as a reference to best practise and wider industry guidelines, and submissions will be expected to adhere to these at all times.

The competition submissions should demonstrate a technical competency in terms of systems design approach, innovative use of technology is encouraged, and integration of this technology into the environment so as to ensure that an 'invisible integration' is desired wherever possible.

Appendix - Technical Considerations & Requirements

The following items are provided as an outline to the basic requirements that all submissions will be judged upon, and whilst there is a freedom in terms of design and manufacturer specification, careful consideration should be made to each area in turn, as well as demonstrated within the design submittal.

Seating Arrangements

Careful consideration should be made in relation to the appropriate audience viewing angles and comfort, therefore the seating arrangements, angles and sightlines employed by the designers should account for this basic criterion. No specific guidance is provided in terms of seating layouts as this will be based on the eventual room design.

Video Systems

It is intended that Hayy cinema will offer the ability to present a mix of video content, therefore digital as well as 35mm projection facilities should be allowed for within the design.

Native 4k RGB laser projection should be the primary digital projection system employed and be capable of reproducing all current video standards, inc HDR content, as well as being compliant with the latest DCI standard.

All projection systems employed will be capable of delivering a minimum of 14fL delivered luminance post calibration, and to be calibrated to ISF standards.

Appropriate video processing systems should be employed to ensure that all signals are processed as far as possible in a native format, allowing for different presets to be recalled depending on content, as well as adhering to all current video standards inc HDR content.

Media Content

It is expected that the cinema will show a mix of content ranging from local UHD Bluray and other DVD disc-based media, commercially distributed content using DCI standards, as well as 35mm films. Designers should make allowance for each type of media within their bid, clearly demonstrating each component item required for a completely unhindered signal path from media to projector.

Any DVD content playback devices should be Region Free.

A suitable DCI media server system should be specified, along-with a suitable management system that will enable the Hayy's staff to be able to schedule all DCI based content.

All digital signal paths to be capable of a maximum of 60Hz 18Gb 4:4:4 content pass through such as active optical fibre connections or similar forms of connection. All connections employed are to be kept to the minimum as per industry best practise in order to avoid any interference, artefacts or degradation.

Hard-drive based media servers for storage of movies require a redundant back-up, such as a RAID-5 storage appliance, is advisable. Offsite backup is preferred.

Screen Configuration

The screen will be of a fixed ratio of 2.40:1 and will be sized to suit the average viewing distances determined by the designer. To ensure the best possible viewing, THX specify a 36 degree viewing angle from the farthest seat in the auditorium should be designed.

A larger screen allows for a more immersive experience, as well as creating a wider placement of left and right audio channels, enhancing room acoustics and creating a more accurate audio experience. Designers should make sure that every seat has an unobstructed view with clear sight line whilst looking to ensure the screen image is maximised.

The vertical viewing angle is measured at seated eye height from the front row centre seat to the top of the tallest projected image and this angle should not exceed 35 degrees. SMPTE standard EG-18-1994 refers.

Immersive Audio Systems

Audio systems designs should be suitable for Dolby Atmos, DTS-X or Auro immersive 3D audio environments, but need not necessarily adhere exactly to these protocols if it can be proved that the design will deliver a sufficiently immersive experience.

Designers should account for and specify all speaker positions/heights/mounting considerations within their bid.

The chosen system's discreet channel count will depend on the immersive coding format chosen, however as a guide a minimum of 16 and a maximum of 32 discreet channels should be employed.

A dedicated cinema audio DSP device will form the heart of the audio system management and playback. Designers will ensure that the chosen DSP will allow for room correction and full audio calibration tools, as well as multiple systems inputs to allow for all media sources. Due to the varied media content to be shown within the cinema it is a specific requirement that DSP preset configurations based on differing content audio formats be available.

Screen baffle wall design and speaker housing designs are required within the submission. Attention must be paid to loudspeaker coverage patterns, peak handling capacity, frequency response and appropriate, associated amplifier specifications.

Audio systems should be calibrated to meet or exceed THX standards, delivering 85dB with a peak headroom capacity of at least 105dB with no distortion.

Room Acoustics & Background Noise

A cinema should be a quiet, pristine audio sanctuary isolated from the outside world. Designers will consider the acoustic impact of the space and make consideration the physical design in relation to the acoustic considerations, such as;

- Room reflections and absorbency characteristics in relation to target reverberation time (RT60) outcomes
- Bass nulls and management considerations
- Materials selection, types and considerations
- Internal and external isolation

The Designers will liaise with the Hayy:Creative Hub's team of architects, M&E designers and technical consultants in order to achieve the correct acoustics performance, and will be required to demonstrate an understanding of and consideration towards achieving the correct acoustic performance of the space.

Calibration & Testing

All video and audio systems will be calibrated to industry standards, and pre/post calibration documentation will be required for all projection and audio systems.

All video connections will be tested point to point using a fully calibrated video measuring tool, with a full report of all tests outcomes recorded based on individual cable idents being supplied.

Lighting design considerations

The lighting environment within a dedicated cinema space should not have any visible impact on the picture quality or contrast ratio during viewing. The room should be as dark as allowable while maintaining safety and code compliance.

Recommendations for cinema lighting are:

- No external light should be allowed to leak into the theater during viewing.
- Theater entry and egress lighting should be subdued and easily controlled from the viewing seating.
- Safety lighting has to meet any and all state or local codes
- There should be a minimum of three lighting settings within the theater:
    - Entry/Exit – Lights at approximately 50% dimmed
    - Watching Mode – Lights off whenever possible except for path lighting and exit illumination whenever required
    - Cleaning mode – All lights on

When possible, it is also recommended that a catastrophic event option is programmed into the lighting controls such that all persons should have no option but to identify that the smoke alarm, tornado siren or glass-break (as examples) has been triggered.

Room treatment recommendations and ambient light

Due to the reflectivity of most projection screens and the sensitivity to ambient and direct or indirect reflected light, room decor and wall treatments should be chosen to eliminate ambient light reflection.

Ambient light does reflect off screens therefore, it is suggested that the walls, ceiling and carpet be of a neutral or dark color to help increase light absorption, and thus maximize contrast ratio. Beyond reflections washing out the image, any walls with saturated colors can also affect both the perceived and the measured colour accuracy of the image. Decor should therefore not distract from the image. The preference is to use darkest and least saturated room colour selection with matte finish (e.g., dark green, dark red, etc.)

Miscellaneous Considerations

HVAC

Within a projection room it is advisable to keep the operating temperature of the projector at no more than 5.55° Celsius (10° Fahrenheit) above the ambient room temperature. If the projector is installed in any enclosure, it is suggested that a thermometer readily visible to a technician should be installed to monitor projector operating temperature environment.

For any enclosure, adequate ventilation should be installed. It is important to note that “ventilation” does not mean air conditioning. Proper ventilation should move the hot air and replace it with air at room temperature and not conditioned to a point of increasing humidity and/or causing condensation.

UPS

An Uninterruptible Power Supply (UPS) is strongly recommended for proper shut down and cooling of the projector and lamp in the event of a power failure.

Rack

A suitable equipment rack will be provided, allowing for all appropriate cable management, heat management and ventilation as well as access.

All cables will be ID'd at both ends, and correlate with all as fitted wiring diagrams. Cables will be secured using low tension ties at suitable intervals so as to avoid any crimping or physical distortion of cables and therefore signals. Terminations will meet industry standards, as will all bend radius, cable separation, etc.

Documentation

All winning contractors will allow for the below items as a minimum and account for the time and management of these requirements;

- Preparation of all AV, control, installation considerations and programming notes and guidance
- Design details of hardware to be included or incorporated into fabric or structure
- 1st stage liaison with M&E designers and contractors
- Issue of drawings, BOM and associated information
- Design and produce control and integration schematics
- All relevant documentation regarding the project deemed necessary for the construction and completion of the scheme, subsequent to tender review and comment

Management

It will be expected that the winning contractors specify a main contact for the AV aspects of the project, as well as indicate the team structure for the duration of the project.

This document is prepared by our advisers

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