Could you project our Engineering Role Models' digital artwork?

Projecting an image can be a stunning way to create visual impact.

Here's a list of considerations to help you with the planning and execution of a digital projection: your AV team or technical department will be more than familiar with what is required. However, if you're new to this, we strongly recommend you consider working with a professional digital projection company to ensure a successful outcome.

1. Legal and Safety Requirements

If you are not the owner of the space or building you will need to obtain permission from the owner of the place or space, you want to project onto or into. There may also be a need to get permission from adjoining properties if a third-party owns them.

➢ Obtain written permission from the property owner if the building is not yours.
➢ Once the building owner is happy, you might then need to send an application to the council to gain their permission as well.
➢ If your projection will be featured in a public space, the local authority will need to give it their approval before the project can go ahead. Usually, it is the local Council's Planning or Environmental Health departments that you will need to liaise with to secure the apt permits for projecting onto a building.
➢ You'll also need to ensure that where you choose to project the image is compliant with local regulations regarding light pollution and noise, as some cities have restrictions on the brightness and duration of projections.
➢ In terms of public safety, when planning where and how to project the image you'll need to consider if the projection will impact on public safety or if it will be a nuisance in any way e.g. will it distract people using transport, or impair eyesight or is it in an area near airports, wildlife reserves, or dark sky regions, which may face stricter controls, with some projections prohibited during sensitive times within these areas.
➢ You'll also need to think about safety when setting up the projection. And don't forget to ensure you have liability insurance just in case of accidents of damage during the projection.

2. Equipment and Setup

➢ Projector
Use a high-lumen, high-resolution projector. For building projections, consider a laser projector with at least 10,000 lumens. LED projectors with high brightness are also an option. A projector with at least HD (1920x1080) resolution is recommended (this is the resolution of the digital artwork file). For a sharper image projection, consider 4K projectors. If you're projecting in harsh weather conditions, ensure the projector is designed for outdoor use or housed in a weatherproof enclosure.
➢ Lens Options
Some projectors allow for interchangeable lenses, which can be helpful to adjust the throw ratio (distance vs. image size) depending on the space available for setup. Short-throw or ultra-short-throw lenses are useful if space is limited, while long-throw lenses allow projection from greater distances. Lens calibration tools can be used to fine-tune focus and ensure the image fits the building correctly.

➢ Digital Artwork
The digital artwork will be provided in:

  o Landscape format - 16:9 (1920 x 1080 px)
  o File Formats – jpeg or png
  o Resolution – FHD or UHD
  o Size - max. 20 MB

➢ Media Player
You'll need a device to store and send the image to the projector, such as a laptop, which you'll connect to the projector via HDMI, DisplayPort, or wirelessly. If you want the projection to work with the contours or match the architecture (windows, doors etc.) of the building, you'll need to use mapping software like MadMapper, Resolume Arena, Blendy VJ, or HeavyM.

➢ Mounting
Use secure mounting systems – a tripod will suffice for smaller setups - or scaffolding to hold the projector in place. It's an obvious point, but make sure the projector and media source is stable and secured at the right angle and height, to avoid accidents. Furthermore, if projecting from a height, ensure all rigging equipment is certified and installed by professionals. If projecting outside, please consider how you will protect the electrical equipment from the elements.

➢ Power Supply
Another obvious point – it's very likely extension cables and possibly a generator if power is not easily accessible at the projection site. Ensure the projector's power supply is stable, as high-lumen projectors tend to draw a lot of power.

Positioning

➢ Height
Position the projector at a height that allows a clear view of the building's facade, typically from ground level or elevated platforms, and where the image can cover the entire facade.

➢ Width
Ensure the projector can cover the width of the building. Use multiple projectors if a single unit cannot cover the full width.

➢ Distance from the building
The throw ratio of the projector determines the distance from which the image will be projected. For example, a projector with a throw ratio of 1.5:1 means that for every meter of image width, you need 1.5 meters of distance. Calculate this based on your desired image size and the projector's throw ratio. Ensure the projector can focus sharply at the distance you choose. Use zoom features if available. Depending on the projector's brightness and the building's surface, you can project images ranging from small details to large-scale visuals. Aim for a projection that covers a significant portion of the building's facade, but avoid going beyond the edges to prevent distortion.

Projection site

➢ Aside from buildings, digital images are often projected onto screens, walls, floors ceilings, fabric, or canvas, both inside and outside. You can even project onto water screens, fog, or smoke for ethereal effects. What you choose is up to you but it's worth bearing the following in mind:
  o Smooth surfaces like glass or plaster work best for clear projections. Rough or textured surfaces can distort the image.

- o Light-coloured or neutral surfaces are preferable as they reflect light better, ensuring vivid colours.
- o For best effect, ensure the projection site surface is relatively flat, free of extreme textures, or dark-coloured areas that may distort the image. If the surface is uneven, projection mapping software can help compensate for distortions.

Testing and Execution

➢ Timing - schedule the projection for a time when the building is visible and when you have the necessary permissions. On 13 November 2024, sunset is at from 16:00 hrs (depending on where you are located). However, in the UK, digital light projections are often subject to timing restrictions to minimize disturbance, light pollution, and ensure public safety. Local councils regulate these displays through environmental health guidelines, which typically require that projections stop by 22:00 or 23:00hrs. Please do check with your local Council before proceeding.

➢ Ambient light - the more control you have over surrounding light (or the darker the environment), the better the projection will appear.

➢ Conduct a test run to check for focus, alignment, and image quality. Adjust the projector's position and settings as needed.

➢ Test during the time of day when the building is illuminated similarly to when the actual projection will take place.

➢ Monitor the projection throughout the event to ensure it remains sharp and properly aligned.

And finally, please do share any video and photos of your projection on social media, tagging This is Engineering and using the hashtags #NationalEngineeringDay #EngineeringRoleModels.