

Creative and Technical Benefits of Previsualization in Virtual Film Production: A Comparative Case Study of Videomatics for In-Camera Visual Effects

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Abstract

This paper explores how multiple film departments can benefit from using videomatics as a form of previsualization (previz) during virtual production (VP) shoots on in-camera visual effects (ICVFX) stages and in preproduction. It addresses common ICVFX-specific challenges and analyses solutions through two case studies. The videomatic production processes of these cases are compared in the context of their ICVFX utilization. This study demonstrates approaches that can enhance filmmakers' technical confidence and space for creative exploration in ICVFX projects.

1. Introduction

Virtual film production techniques are increasingly in demand and are being integrated into traditional film production workflows. ICVFX is now a key part of the VFX toolbox, used in blockbusters such as "Maverick"(2022), "Ant-Man 3"(2023), and "Poor Things"(2023). ICVFX is being described as an innovative technique where visual effects are captured in the camera instead of the traditional post-production process [NEP21]. Despite its promotion as a dynamic and adaptive method, ICVFX faces significant technical restrictions and challenges, making it slower than traditional shoots because of multiple factors.

Firstly, ICVFX shots may require additional time for VFX passes like clean plates, light reference captures, or 3D scans. [GTH22] Secondly, the LED wall's physical properties limit camera and actor positioning. The pixel structure can create a moiré pattern when in focus. [Kad22] Therefore, shots with a closed aperture, wide-angle shots, or those close to the LED wall are particularly problematic. Camera angles are also restricted by the LED wall's size, with low-angle and high-angle shots potentially revealing the studio ceiling or floor. [Gov23] Steep angles can cause color shifts due to the LED structure, while bright virtual scenarios can overheat the LED wall, and dark scenarios can cause dithering artifacts. [Epi21] Lastly, light fixtures that spill or reflect onto the LED wall reduce its contrast. [Kad21] Considering these factors, cameras, actors, and lights face significant limitations in their configuration, placement, and movement on an ICVFX set. Often, adjustments are necessary that lead directors and cinematographers to compromise their original visions. This can limit artistic expression, as filmmakers may feel hindered in executing their creative craft in such a technically demanding environment. Additionally, ICVFX stages are more expensive than traditional film studios, leading to heightened time pressure and leaving little room for creative tests or experiments. All this makes ICVFX a special case of film production.

Generally, previsualization (previz) is the visualizing of scenes

or sequences of a movie that occurs before filming to help envision the cinematic experience. Technical visualization (techviz) as a subcategory is focused on precise technical aspects such as camera movement and heavily relies on real-world measurements [OZ20]. Amongst multiple previsualization techniques, a videomatic can be described as a rough and cost-effective version of a scene that, in contrast to animatics (where drawings are sequenced to a video), uses video material (sometimes life-action footage) [MSF*13]. The term videomatic is not well-established even though it has been used in multiple large productions such as "Star Wars" [Ral14] and "The Lord of the Rings" [Jac02]. While a previsualization is generally known to help communicate complex visions, there seems to be a lack of shared, detailed knowledge.

This paper asks the question how previsualization can benefit specifically ICVFX productions. More precisely, it attempts to prove that the process of producing a videomatic can create a low-pressure creative environment and lead to confidence when facing the technical challenges of an ICVFX set. Two cases of videomatics and their productions are analyzed and compared: Immortal, an indie production shot at Halostage Babelsberg in 2022 with a budget of 30,000 euros, and Wingspan, three pilot episodes for a television show produced by Arkanum Pictures, and shot at Dark Bay in 2024 with a budget of 595,000 euros. The focus is on pre-production processes and the knowledge they bring to the movie set. The details about the videomatic editing, the footage generated at the ICVFX shoot and its postproduction are beyond the scope of this paper. Previsualization outside of the context of ICVFX virtual film production will only be discussed in the chapter about related work. Eventually, the technology surrounding ICVFX productions evolves rapidly, and may have changed after 2024.

2. Related Work

No present literature seems to address how previsualization, especially videomatics can help dealing with the technical chal-

lenges that are specific to ICVFX. However, significant research has been conducted presenting novel techniques for previsualization [MSF*13, IKK*06, BBS*14, GLA*19]. In addition, the practical use of VR for previs was researched as a user study [MFM18].

Multiple authors have been referring to advantages of previsualization in preproduction including Charlie Keil and Kristen Whissel. In their book they describe that previsualization integrates visual effects and cinematography early in the filmmaking process, allowing directors and VFX teams to design camera movements, lighting, and scene elements digitally before live-action shooting, effectively blurring the lines between traditional cinematography and visual effects work [KW16]. Renee Dunlop as well as Jeffrey Okun and Susan Zwerman point out in their books how previsualization helps fostering creativity, improving communication between departments, and reducing costly mistakes during filming [Dun14, OZ20, Won12].

3. Method

This chapter describes how knowledge is gained through a qualitative, comparative case study. Each case is presented through three types of artifacts: a video file, sheets of images, and a text-based observation log. The video files depict videomatics. Sheets of images can include stills representing video imagery, such as shotlists or storyboards in the form of sketches, photographs, or renderings. They can also include images representing floor or construction plans through sketches, drawings, or renderings. These videos and sheets of images are created as part of the production process. For better comparison, the artifacts for the case of Wingspan are narrowed down to one episode only. Episode three is considered the most representative due to its average length and number of shots, yet it still yields interesting edge cases. Observation logs are compiled after the production period from multiple sources, such as official meeting notes, chat histories from project servers, personal feedback notes, and calendar entries.

Printable artifacts are in the appendix of this paper. All artifacts are online and can be downloaded from:

<https://mab.to/MQA8tT2AuXR0H/eu1>

In the following chapters, artifacts are briefly analyzed and put into context. Patterns and trends are then extracted and compared within each case and against each other. Finally, the gathered observations are reflected upon in relation to the question how videomatics benefit ICVFX productions.

4. Case One: Immortal

In this chapter, the artifacts surrounding the case Immortal are presented, analyzed, compared for patterns, and synthesized.

4.1. Artifact: Observation Log

The artifact observation log (IM-A01) is a text table with six columns featuring the number, date, tasks, place, participants, and a description of ten observations. This table delivers contextual information of this case and further belonging artifacts.

ID nr.	Artifact Name	File Type	Date of Origin
IM-A01	Observation Log	pdf	12.08.2024
IM-A02	Videomatic	mp4	23.08.2022
IM-A03	Previz Sketch	jpg	19.07.2022
IM-A04	Videomatic Storyboard	jpg	27.07.2022
IM-A05	Previz Shotlist	jpg	02.09.2022
IM-A06	Virtual Floorplan	jpg	08.09.2022
IM-A07	Lighting Floorplan	jpg	27.09.2022
IM-A08	Halostage Floorplan	pdf	12.06.2021

Table 1: A list of artifacts through which this case is analyzed.

4.2. Artifact: Videomatic

The artifact videomatic (IM-A02) is a video with a length of three minutes and twenty-seven seconds, featuring sixty-five cuts and an average shot duration of 3.18 seconds. The video consists of clean images without text or additional information within the frame. Most shots depict live action with up to three people against a digital background containing a large grid structure. Some shots vary in visual style, including a slow-motion shot of a water droplet causing circular waves, a landscape shot of mountains, a still image of a water dam from a top perspective, and a 2D animation featuring a box. The video intercuts different environments and events, such as the recurring shot of the water droplet at the very beginning and two minutes and twenty-one seconds. The actors' performances include meaningful expressions, various poses, and physical actions like falling, exchanging props, and walking at different intensities and paces. The audio features a female and a male voice, with the female voice serving as the primary voiceover.

The videomatic, as noted in entry one of the observation log (IM-A01), constructs a dynamic preview of movement and narration over time, showing how shots and voiceover work together. The shots are either improvised live action in substitute environments or placeholder graphics from external sources (IM-A01, entries 3 and 4). The video material, produced over two days, underwent four revisions (IM-A01, entry 7).

4.3. Artifact: Previz Sketches

The artifact previz sketches (IM-A03) is a sheet of images organized into three columns and four rows. The left column features sketched structures, arrows, and shapes. The middle column assigns scene numbers one, two, three, and nine to the four rows. The right column contains collaged images of various sizes, depicting 3D renderings of puppets against backgrounds of primitive shapes, colors, and lighting. The sheet includes a total of thirty-four images.

Corresponding to IM-A01, entry 2, the previz sketches show the initial floorplans for possible positioning of actor performances and camera angles in relation to an LED wall. The 3D renderings depict quick ideas and environment bashes using primitive shapes. These sketches provide the first concepts of the spatiality and directions of each scene.

4.4. Artifact: Videomatic Storyboard

The artifact videomatic storyboard (IM-A04) is a sheet of images. The left side features vertically arranged white text indicating scenes from one to eight, placed on black or green boxes. The right side contains images ordered by scene structure, each labeled with two numbers in white text on black or green boxes. Some images include key points written below. The sheet contains fifty-six images, mostly photographs of people in various poses, often in front of a digital background with a large grid structure. Images 1.4 and 3.2 show only the digital content and grid. Five images differ in visual style, such as image 1.1 with water and circular waves, and image 3.1 with a mountain landscape. Shots 10.1, 10.2, and 10.3 depict a river with a hand holding a prop. Six images are crossed out with red lines, and images 5.3 and 5.4 are drawn over with grey waved lines.

The videomatic storyboard is a per-shot layout for each scene of the videomatic corresponding to IM-A01, entry six. Green boxes, in contrast to black boxes, indicate whether a shot or scene is expected to be shot outside of an LED Volume. Additionally, this document provides information about potentially added computer-generated imagery (CGI) elements and canceled shots.

4.5. Artifact: Previz Shot List

The artifact previz shotlist (IM-A05) is a sheet of images. The left side features vertically arranged white text on black or green boxes, indicating scenes from one to seven. The right side contains images ordered by scene structure, each labeled with two numbers separated by a dash symbol in white text on black, green, or purple boxes. Most images are tagged with sticky notes in green, orange, or red. In the lower right, three larger sticky notes are labeled “optional,” “important,” and “essential”. The sheet includes forty-nine images, mostly digital 3D puppet renderings, with photographs used for images 1.1, 3.1, 6.1, and 6.2. Some images are drawn over with colored lines, and smaller additional images are placed in the lower right corner of four images. Eight images are crossed out with red lines.

According to IM-A01, entry eight, the previz shotlist shows the camera frame and element positioning. Black boxes indicate shots in front of an LED wall, green boxes indicate that no LED wall is necessary, and purple boxes denote full CGI shots that exclude live-action elements. The document also highlights shot importance using colored sticky notes from three individuals.

4.6. Artifact: Virtual Floorplan

The artifact virtual floorplan (IM-A06) is a sheet of images divided into two sections: scene one and scene seven. Each section includes a large 3D scene rendering and a grid structure. Both the rendering and grid are overlaid with colored shapes, such as a yellow circle labeled “sun,” camera-shaped symbols with numbers and thumbnail images, and parallelograms in different colors labeled “VOL” followed by letters and numbers. These parallelograms appear both in the 3D rendering and as headlines in the grid structure. Under each headline, there is a round black structure with a gray box in the center and a yellow sun-labeled circle. These structures appear five times in scene one and twice in scene seven.

The virtual floorplan shows top-down 3D rendered views of the virtual environments for scenes one and seven. The overlaid shapes and symbols describe the actors’ and cameras’ movements and positioning within the virtual space. The sun icon indicates the light direction and the parallelograms outline where an LED Volume should be placed to cover the background for specific camera angles as referred to in IM-A01, entry nine. The grid structures below show how cameras, actors, and props need to be positioned relative to the LED wall for each virtual direction represented by the parallelograms.

4.7. Artifact: Lighting Floorplan

The artifact lighting floorplan (IM-A07) is a sheet of images, that repeats its fundamental structure twelve times in three columns and four rows. Each structure consists of a gray box partially surrounded by a rounded black shape. Between the box and the rounded shape, three symbols labeled “M40,” “Rollmops,” and “12x12 Ultrabounce” are placed. Along the rounded structure is a green sun-shaped symbol. The gray box is overlaid with a camera-shaped symbol, arrows, and further labeled shapes. Next to each structure is a rendered image of a 3D puppet and additional text.

The lighting floorplan shows top-down drawings of the actors’ (colored circles) and cameras’ positions and orientations for selected shots from scene one. The images of 3D puppets correspond to those from the previz shot list. This document provides information about light directionality through the green sun-shaped icons and details the planned setup of physical light fixtures for each shot as arranged on the film set as described in IM-A01, entry ten.

4.8. Artifact: Halostage Floorplan

The artifact Halostage floorplan (IM-A08) is a sheet of images composed of three architectural drawings, one 3D rendered image, and a table. The architectural drawings depict a rounded structure from different perspectives, one of them within the context of a room. Some drawings include details such as the number of modules and distances between specific points. The 3D rendering shows the room from a diagonal, orthographic view. The table, written in German, lists the name, article number, and quantity of three different components. In the lower right corner, the document includes details about its origin, printing format, and scale.

Halostage floorplan provides information about the LED Wall setup that Halostage built into Studio 10. This includes the quantity, arrangement, and types of LED panels used.

4.9. Immortal: Synthesis and Patterns

When comparing the quantity of shots shown in artifacts such as the previz sketches (IM-A03), the videomatic storyboard (IM-A04), and the previz shotlist (IM-A05), a recognizable pattern emerges. The previz sketches (IM-A03) contain thirty-four shots, the videomatic storyboard (IM-A04) includes fifty-six shots with six marked for deletion, and the previz shotlist (IM-A05) has forty-nine shots with eight marked for deletion. The videomatic storyboard has the highest number of shots. After removing the marked shots, forty-one shots remain for production. Out of these, thirteen shots (1.4,

1.6, 1.8, 1.9, 1.10, 1.11, 2.1, 3.2, 3.3, 3.5, 3.8, 7.11, 7.12) closely resemble shots originally shown in IM-A03. This indicates that from the date of origin of IM-A03 to the date of origin of IM-A05, forty-five days passed, and about 68.3 percent of the final shots were not designed before the production of the videomatic. Within this time-frame, approximately 68.9 percent of the time (31 days) was spent between the filming of the videomatic content and the completion of the fifth version of the videomatic. An iterative trend becomes evident through the presence of revisions such as re-editing of the videomatic or the removal and addition of shots in IM-A03, IM-A04, and IM-A05.

There are indicators that the videomatic and the subsequent previz shotlist provided valuable knowledge to various film departments. Drawn lines on shots 1.3, 1.4, 1.12, and 4.4 in IM-A05, as well as shots 5.3 and 5.4 in IM-A04, outline scenographic concepts leveraging the context of the camera frame. Additionally, it has been observed in IM-A01, entry eleven, that a particular shot frame has informed a scenographic decision regarding the size of a synthetic floor construction. Furthermore, when comparing IM-A03 and IM-A07, the floorplans gained more detail after the production of the videomatic. These details include the shape and size of stage elements and the LED wall, precise character and camera movements with corresponding reference images, and a setup for lighting fixtures. The quantity of floorplans for the first scene increased from one to twelve.

Lastly, when comparing the intentions behind the previz for IM-A02, IM-A03, IM-A04, and IM-A05, it appears that live-action photography was the preferred technique for exploring narrative dynamics. On the other hand, CGI was preferred for gaining technical knowledge, such as camera framing and light directions.

5. Case Two: Wingspan

In this chapter, the artifacts surrounding the case Wingspan are presented, analyzed, compared for patterns, and synthesized.

Code	Artifact Name	File Type	Date of Origin
WI-A01	Observation Log	pdf	20.08.2024
WI-A02	Videomatic Ep3	mp4	02.05.2024
WI-A03	Early Stills Ep3	pdf	28.03.2024
WI-A04	Shotlist Ep3	pdf	03.05.2024
WI-A05	Stage Design	jpg	13.05.2024
WI-A06	Techviz WIP	jpg	15.04.2024
WI-A07	Techviz Ep3	jpg	15.04.2024

Table 2: A list of artifacts through which this case was analyzed.

5.1. Artifact: Observation Log

The artifact observation log (WI-A01) is a text table with six columns featuring the number, date, tasks, place, participants, and a description of eighteen observations. This table delivers contextual information of this case and further belonging artifacts.

5.2. Artifact: Videomatic Ep3

The artifact videomatic ep3 (WI-A02) is a video with a length of eleven minutes and twenty-two seconds, featuring fifty-nine cuts and an average shot duration of 11.56 seconds. The frame contains burned-in information. Above the image frame, the video displays details about the shot name, virtual map, author, and engine version. Below the image, it shows the timeline timecode, frame count, camera data (including focal length, f-stop, and focus distance), and the shot's own timecode and frame count. The content features 3D-rendered digital human characters moving mechanically through a high-rise apartment. Their limbs move in restricted directions, and their faces are expressionless. The video includes three scenes: the first scene (until 8:50) shows two characters sitting opposite each other; the second scene (until 10:50) features a conversation at the balcony door with a different character; the third scene consists of one character and one shot. Each scene has different weather and times of day. Separate voices deliver the dialogue lines for each character in the audio. Some shots repeat but maintain continuity. Additional camera angles are sometimes shown in the lower right corner, featuring the same character performance.

The videomatic, as noted in WI-A01, entry one, previews camera and actor movements dynamically. It details camera settings, scales, element positions, and necessary shots for the narrative arc (WI-A01, 16). Shots are rendered in Unreal Engine with animated characters and camera movements (WI-A01, 6). The footage includes artistic weather, lighting designs, and a digital double of the stage. The editing underwent a second edit after improved footage was rendered (WI-A01, 17).

5.3. Artifact: Early Stills Ep3

The artifact early videomatic stills ep3 (WI-A03) is a sheet of images organized as a table with two columns: shot name and still. The left column contains three combinations of letters and numbers separated by a dash symbol in each row. The right column features a 3D-rendered image in each row. The structure is interrupted three times by text spanning both columns: Ep 3 Scene 1, Ep 3 Scene 2, and Ep 3 Scene 3. The images depict digital human characters in a high-rise apartment, with variations in lighting and weather but uniform style. All characters have hair, except for the image labeled EP3-SC2-SH050, which features a bald character. There are forty-three images in total.

According to WI-A01, entry twelve, early stills show a per-shot layout of the first version of the videomatic edit. The missing hair in the second-to-last shot is due to rendering issues with humanoid characters (WI-A01, 11). This document details potential camera and actor locations relative to the set, with lighting and weather as placeholders for later designs.

5.4. Artifact: Shotlist Ep3

The artifact shotlist ep3 (WI-A04) is a sheet of images organized as a repeating table, three times horizontally and eleven times vertically, separated by an orange line. Each table contains information about a shot, including the shot name, script-related details, technical level of complication, weather, additional info for various

departments, and a 3D-rendered image. The images depict digital human characters in a high-rise apartment, with variations in lighting and weather but uniform style. There are thirty-one images in total. The tables mostly have a light-blue shaded background, except for five that are grey, three that are dark blue, and one that is green. Some text is highlighted in red in seven tables.

The shotlist ep3 provides a detailed breakdown of the shots and their technical requirements for production. Shots marked in green can be shot without actors on set, shots marked in dark blue are merged results from multiple previously planned shots, and shots marked in gray are likely to be canceled if the schedule on set becomes too tight. The images are from the latest version of the videomatic and convey the visual elements of each shot. Multiple departments can rely on the details provided by the shotlist during preproduction and on set as described in WI-A01, entry eighteen.

5.5. Artifact: Stage Design

The artifact stage design (WI-A05) is a sheet of images featuring four images, each with a caption indicating the image number, source, and date. The images appear to be rendered through a 3D program and depict an architectural construct of walls and furniture in front of a green rounded structure. The construct is elevated by blocks. The background of image 1 is a dark gray grid pattern, while images 2, 3, and 4 have backgrounds of lines and numbers resembling a floorplan drawing. The floorplan's orientation is shifted 90 degrees clockwise in image 3. In image 1, the green rounded structure is straightened on the right side, and in image 2, it is shifted to the right side. The construct appears larger in images 1 and 2 with more walls than in images 3 and 4. Images 3 and 4 include stairs leading up to the blocks under the construct, with handrails in image 4.

The stage design artifact shows the progression from early versions of the stage construction concept (upper left), to later versions (upper right and lower left), and the final placement plan (lower right). The floorplan shows the metrics of the production studio. The architectural walls represent a physically built apartment-set and the green rounded shape the LED wall. The blocks that elevate the set are stage elements. This document provides information on the intended placement of the LED wall in relation to the scenographic apartment construction (WI-A01, 4).

5.6. Artifact: Techviz WIP

The artifact techviz WIP (WI-A06) is a sheet of images featuring three images: one in the upper middle, one in the lower left, and one in the lower right. The images appear to be rendered through a 3D program. The upper image and the lower right image are similar, both featuring two digital characters in an apartment with four large mirrors. The main difference is the ceiling color in the reflection: red in the upper image and blue in the lower right image. The lower left image shows a diagonal view of grey apartment walls on a wooden floor, surrounded by dark red, blue, and green shapes against a bright red background. A box in the lower right shows contextual information about a virtual actor and level.

According to WI-A01, entry fifteen, the techviz WIP is a work-in-progress depiction showing how elements of the physical set can

appear in the camera through the reflection of the apartment's windows. The dark red cube in the lower left image represents a light fixture, the longer and slimmer dark red cubes resemble trusses, the blue shape represents molton that could be hung on the light fixture, the green shape represents the LED wall, and the bright red background represents the studio environment. This document outlines possible challenges with elements visible in reflections and proposes a solution by adding molton to the light fixture.

5.7. Artifact: Techviz Ep3

The artifact techviz ep3 (WI-A07) is a sheet of images featuring eight images structured in two columns. The left column is tagged "LED Wall Coverage", and the right column is tagged "Light Fixture Reflectance". Each image is named with a caption featuring three combinations of letters and numbers separated by a dash symbol. The images appear to be rendered through a 3D program and show digital characters in different poses and camera angles in a dark apartment. The images in the left column show green and red fields reflected in a mirror or outside windows, while the images in the right column show red and blue fields outside windows.

The techviz ep3 is a feedback document showing potential challenges in shots of episode 3. The left category depicts shots that could reveal the limited coverage of the LED wall. Green shapes indicate areas where the LED wall covers the visible areas outside the apartment construction, while red shapes indicate areas that are not covered. The right category lists shots where the 12x12 light fixture could appear in the image frame through reflections. Red shapes indicate where this would happen, and blue shapes indicate where a molton blanket would cover the studio ceiling from being visible as mentioned in WI-A01, entry fifteen. This document provides information on possible unwanted elements that could appear in the camera image during production (WI-A01, 14).

5.8. Wingspan: Synthesis and Patterns

The artifacts of the early stills (WI-A03) and shotlist ep3 (WI-A04) can be compared to identify trends in the development of shots. The number of shots decreased in WI-A04, which contains thirty-one shots, compared to WI-A03, which contains forty-three shots. Eight shots in WI-A04 closely resemble shots in WI-A03, such as shot 3.1 to EP3-SC1-SH020, 3.3 to EP3-SC1-SH070, 3.5 to EP3-SC1-SH120, 3.19 to EP3-SC1-SH270, 3.21 to EP3-SC1-SH360, 3.22 to EP3-SC1-SH300, 3.24 to EP3-SC1-SH330, and 3.C1 to EP3-SC3-SH010. With twenty-three new shots, approximately 74.2 percent of the shots in WI-A04 are new.

WI-A04 contains significantly more written detail assigned to each shot, whereas WI-A03 only includes shot names. Additionally, there are noticeable changes in parts of the images, such as the digital humans, room furniture, lighting, and weather outside the window. For instance, in WI-A03, the character in shot EP3-SC1-SH070 has long hair partially covering their left eye, while in the similar shot 3.3 of WI-A04, the character's hair is in a bun, revealing their full face. In addition, WI-A04 does not feature a bald person, unlike shot EP3-SC2-SH050 in WI-A03. In WI-A03, shot EP3-SC1-SH120 shows two picture frames on the wall and no lamps, whereas in the similar shot 3.5 of WI-A04, there is only

one picture frame in a different format and a standing lamp. In WI-A03, the first scene shows a blue sky, and the second scene takes place at night. However, in WI-A04, the first scene features a dark sandstorm covering the sky, and the second scene takes place during the day. Clear iterations between WI-A03 and WI-A04 can be observed in camera shots, production details, and artistic decisions.

When examining the timeline of events, the time between the first character blocking work for the videomatic and the completion of the first edit spans thirty days, with nine days of videomatic production (excluding rendering and editing) as mentioned in WI-A01, entries 7 and 12. In comparison, according to WI-A01, entry 10, the second version spans seventeen days, with three days of videomatic production (excluding rendering and editing). In the context of three similar-scoped episodes being produced it could be said that for the videomatic of episode three, three days were spent designing the footage of the first version and one day for the second version (WI-A02).

The progression of the stage design (WI-A05) shows that the placement of the LED volume in relation to the set construction was adjusted frequently. The changes between the last two versions are incremental compared to the changes between earlier versions. The various orientations of the floor plan indicate that different ways of using the studio space were explored. The gradual addition of stairs and handrails reflects growing attention to set security in later periods of preproduction. When comparing the overall changes to the architectural set construction, the stage element arrangement, and its relative position to the LED wall, the smallest changes occurred between image three and image four, despite thirty-eight days between their dates of origin. Furthermore, it is worth mentioning that image three emerged just six days after the completion of the first videomatic edit (WI-A01, 13).

6. Comparison and Discussion

In this chapter the cases of Immortal and Wingspan are compared and reflected. The most conspicuous similarity between Immortal and Wingspan is that both utilized videomatics in their previsualization process to prepare for an ICVFX shoot. Both projects aimed to gain awareness of camera work dynamics and its editability through the videomatic. However, their further intentions differ due to varying production contexts.

As referred to in WI-A01, entry four, the production of Wingspan, a custom design for the LED wall's shape and positioning needed to be developed. Therefore, the videomatic was required to deliver technical insight into the visual impact of various wall designs on all planned camera angles. This was achieved by creating techviz, which relied on the camera angles created in the videomatic. This data was combined in Unreal Engine with that of the set construction and the LED wall setup. The presence of techviz shortly after the earliest videomatic version reinforces the technical focus of Wingspan's videomatic.

On the other hand, in the production of Immortal, as referred to in IM-A01, entry one, the videomatic was planned with the intention of gaining deeper insight into the project's emotional pace and narrative structure. The focus was on the interplay of visuals

and voiceover. Therefore, the use of live-action footage and placeholder material from external sources was reasonable. For instance, the emotionless faces of Wingspan's digital humans might not have fulfilled the demands of Immortal's videomatic. This could explain the observation from chapter 4.9 that live-action videography was the preferred technique for exploring narrative dynamics, whereas CGI was primarily used for technical tests. As referred to in WI-A01, entry four, Wingspan had only one set orientation towards the LED wall. Therefore, there was no need to decompose individual shots for light evaluation as done in the virtual floorplan of Immortal (IM-A06).

Despite the varying production contexts of Immortal's and Wingspan's videomatics, similar patterns emerged through the analysis of their artifacts in chapters four and five. Firstly, the shotlists of both cases have a significantly high percentage of new shots in the final previz compared to their first versions (Immortal 68.9 and Wingspan 74.2 percent). The difference of less than six percent can be considered low and could be due to their differing content, lengths, or preproduction workflows. Secondly, both projects have their peak number of shots in the first videomatic version, while their final shotlists feature fewer shots. Finally, there is a remarkably strong theme of iterations and improvements in the previz artifacts linked to the videomatic production.

These similarities could indicate that videomatic productions are processes with high creative output. The strong theme of iterations and improvements linked to the videomatic signals a shaping process, and the peak number of shots in the first videomatics indicates visual or narrative exploration. The high number of new shots in the final previz suggests that the prior process of creative exploration and shaping led to novel concepts. The small number of participants attending the videomatic shoots (IM-A01, WI-A01) as well as the low production costs and loosened time-pressure (compared to ICVFX shoots) support the statement that videomatic productions create low-pressure creative environments.

Limiting factors of ICVFX can be addressed and prepared for through videomatics. The utilization of camera angles and actor movement has been analyzed and reflected on in both cases. This was also done with additional techniques such as virtual floorplans, stage design, and techviz. These functioned through close reference to the videomatics and in a strong exchange of data. Filmmakers obtained highly detailed shotlists featuring shots that have been proven to work in the editing. As observed in WI-A01, entry 19, the ICVFX stage was entered with technical confidence.

7. Conclusion

This paper presents, analyzes, and compares artifacts from two cases using videomatics in preparation for ICVFX. It demonstrates how ICVFX productions can benefit from various previsualization approaches using videomatics. The data supports the idea that producing a videomatic fosters a low-pressure creative environment and builds confidence in handling the technical challenges of an ICVFX set. These previsualization processes may have useful applications in virtual film production, especially those utilizing ICVFX.

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APPENDIX A

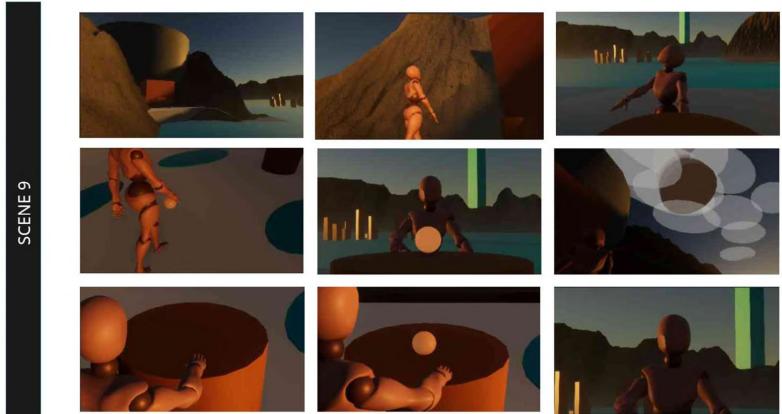
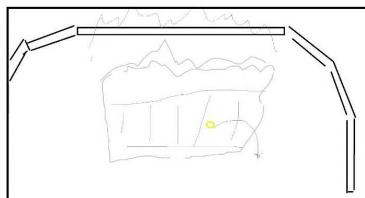
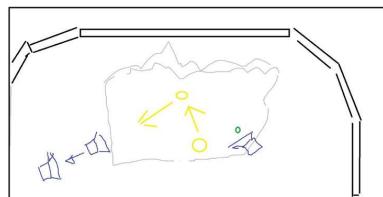
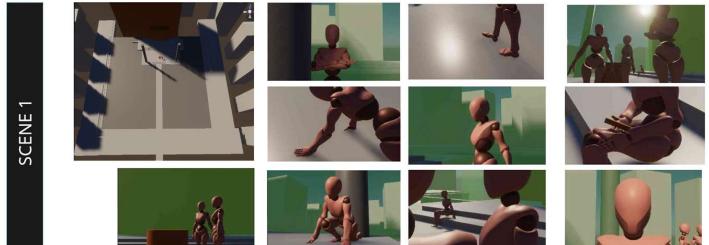
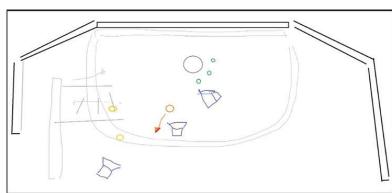
Immortal Artifacts

All artifacts including the videomatics are under:

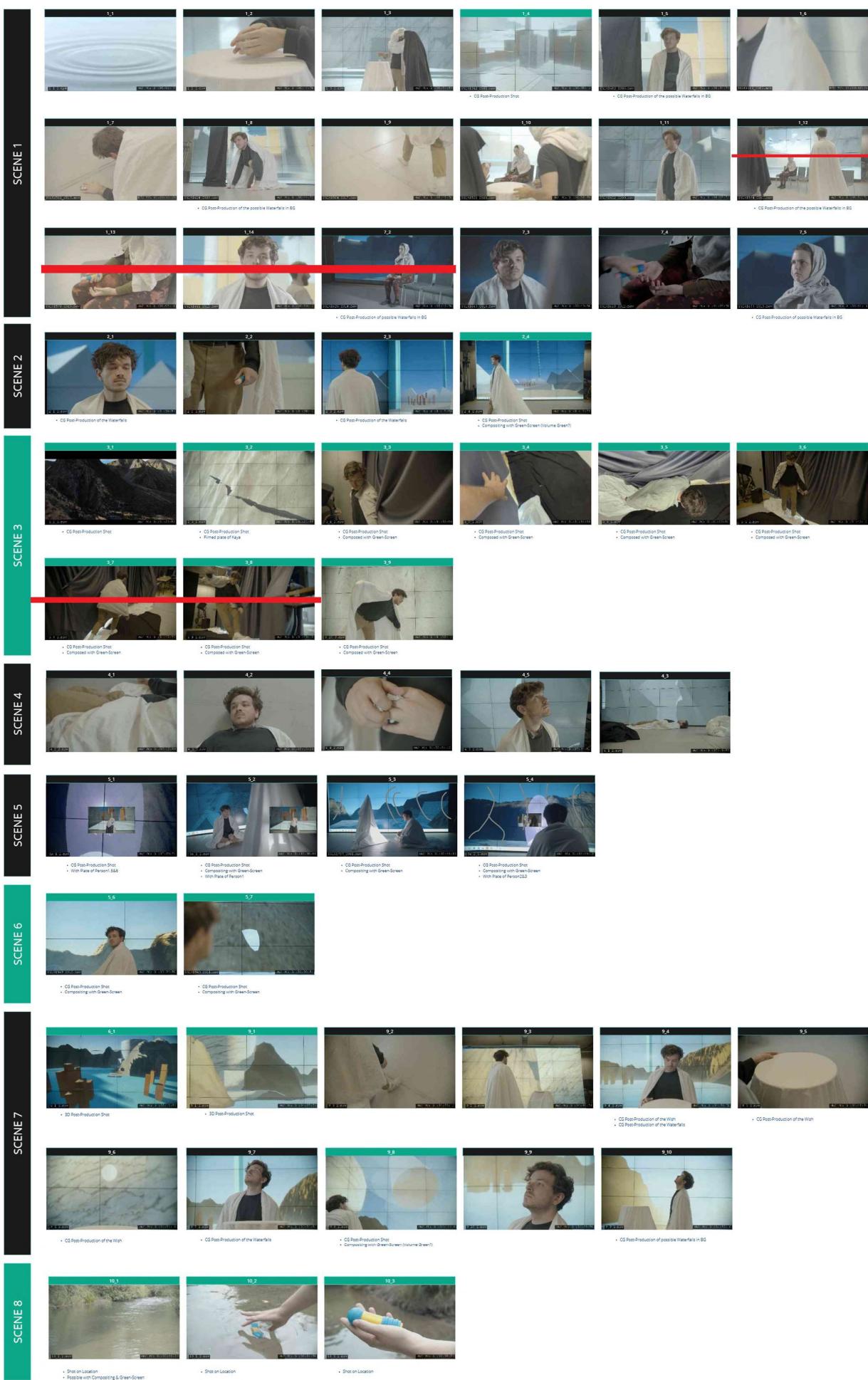
<https://mab.to/MQA8tT2AuXR0H/eu1>

IM-A01 Observation Log					
Nr.	Date	Task	Place	Participants	Observation Description
1	05.07.2022	Onboarding	Filmuni	DoP, VFX Sup	During estimations for feasibility and expense it became clear that the shots and narrative arc need to be tested. Previz sketches and a videomatic production are being planned. The goal the videomatic would be to construct a dynamic preview of movement, emotional flow, and narration over time, especially focusing on the voiceovers interplay with shots.
2	19.07.2022	Previz Sketching	Uni Weimar	DoP	Early visual concepts are being sketched using the game engine Unity to develop a sense of spatiality and directionality of each respective scene. The engine was picked because of the speed in which 3D characters can be put into poses and environments can be created out of primitive shapes. Furthermore, floorplan sketches were drawn using Microsoft Paint to layout possible camera and actor psitioning in relation to an LED wall.
3	23.07.2022	Videomatic Shoot	Uni Weimar	Director, DoP Editor	The virtual environment of the previz sketches is being displayed on a screen wall composed four by four large flat screens using the game engine Unity. Their seams are visible whenever they're filmed and generate a grid of lines. These virtual backgrounds are used for the videomatic shoot. All participants function as actors and colaborativley the planned scenes are shaped and captured. Bed sheets and a shirt wrapped around the head serve as improvised costumes and curtains as a rock wall.
4	24.07.2022	Videomatic Shoot	Uni Weimar	Director, DoP Editor	Most scenes have been captured. While the DoP and Director envision and discuss the final scenes that need to be captured, the Editor is recording the current voiceover and shaping the footage into its narrative structure. As the shooting is concluded, the first edit is being reviewed and two shots get re-shot to give the narrative structure more varriation.
5	26.07.2022	Narrative Revision	Online / Discord	CD, Director, Dop	The creative director (CD) has seen the current edit of the videomatic an has remarks on the voiceover. A new version of the screenplay is outlined and needs to be written and recorded.
6	27.07.2022	VFX Planning	Online / Discord	DoP, VFX Suo	The shots used in the videomatic were layed out as a storyboard of stills. Visual effects plans were discussed on a per-shot basis, notes were collected to the videomatic storyboard and shots were put into categories depending on their production demands for further planning.
7	23.08.2022	Videomatic Lock	Uni Weimar	DoP, Editor	The final version of the videomatic is being locked after 4 revisions in editing. Last comments and improvements have been implemented. A custom 2D animation and graphics from external sources have been intercut to test the narrative structure quickly without the need of further shottting sessions.
8	02.09.2022	Previs Creation	Uni Weimar	DoP	After filtering out shots from the videomatic storyboard, a more precise previsualization is generated to prepare the on-set production. The Unity project from the previz sketching was extended to create a rendering for each shot (except for scene 6 where it didn't seem necessary). In addition, full CGI shots were identified and marked purple. A rating was set up so that CD, Director and DoP can rate the importance of a shot. The results were used as a foundation to filter out more shots.
9	08.09.2022	Light Planning	Uni Weimar	DoP	The plan to shoot into all directions of the virtual scenes required planning to trick the direction of each shot so that phisically the camera can always face the LED wall. This ment that pieces of phisical sets need to be turned into the correct angle and the light directions need to adjust. For the two most complex scenes the directions were broken down and sketched by rendering top down views of the virtual environment and drawing in the character and actor movements as well as a couple of LED walls that would cover the backgrounds of respective shots. These directions were then recreated on floorplans of the physical sets taken from the Halostage floorplan (IM-A07) and eventually the light directions, actor movements and camera angels were marked.
10	12.09.2022	Light Planning	Online / Discord	DoP, Gaffer	The virtual floorplan was discussed and reviewed. The gaffer understood the visual requirements towards the lighting and planned to create more detailed floorplans of complex scenes including a rough plan for light fixture arrangement by 27.09.2023.
11	05.10.2022	Scenography Planning	Online / Discord	DoP, Scenographer	Floor material for the stage needed to be ordered and the exact size had a strong impact on the production budget. Through Unity two meaningful shots were analyzed and the required amount of floor material could be determined.

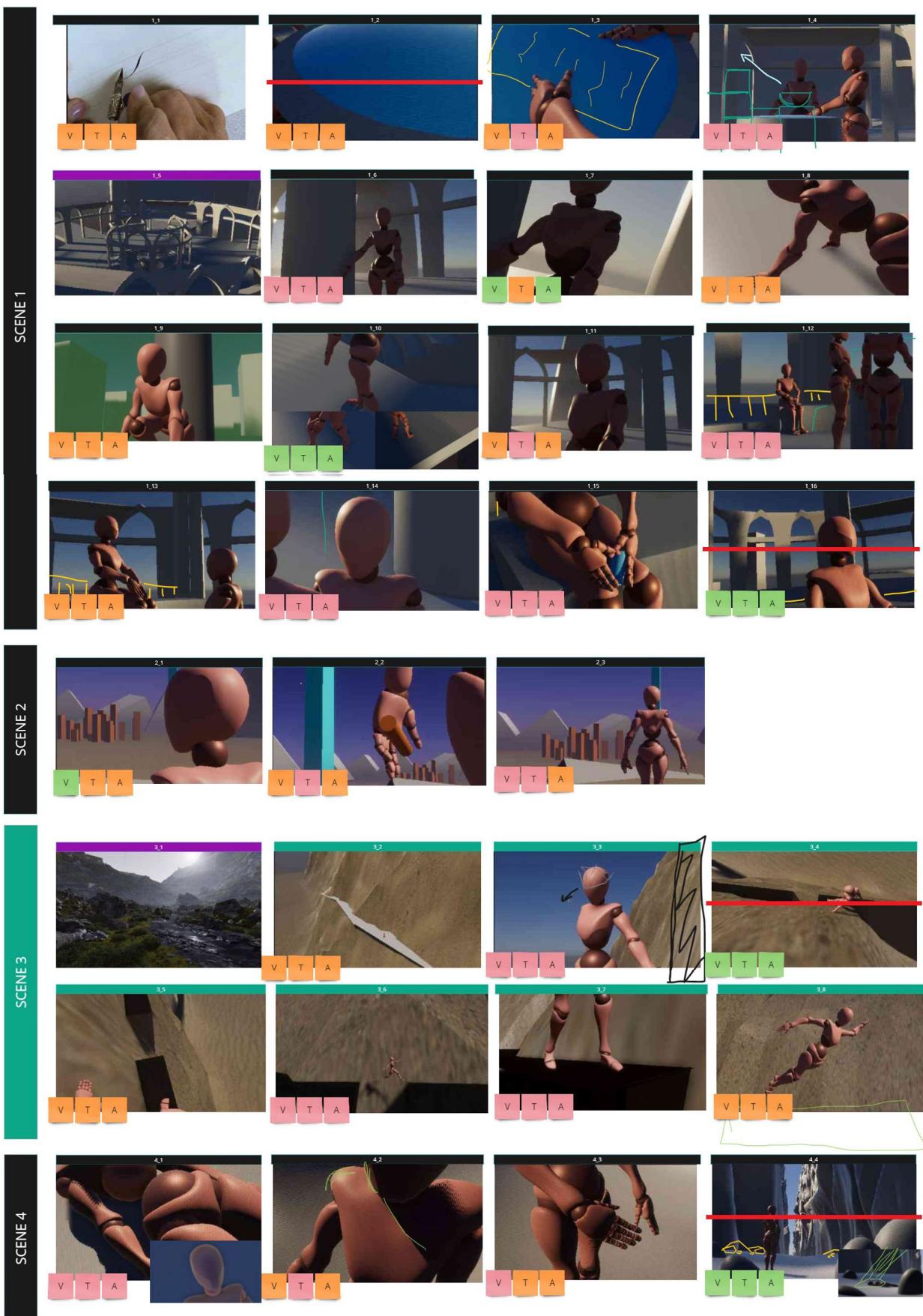
IM-A03 Previz Sketches

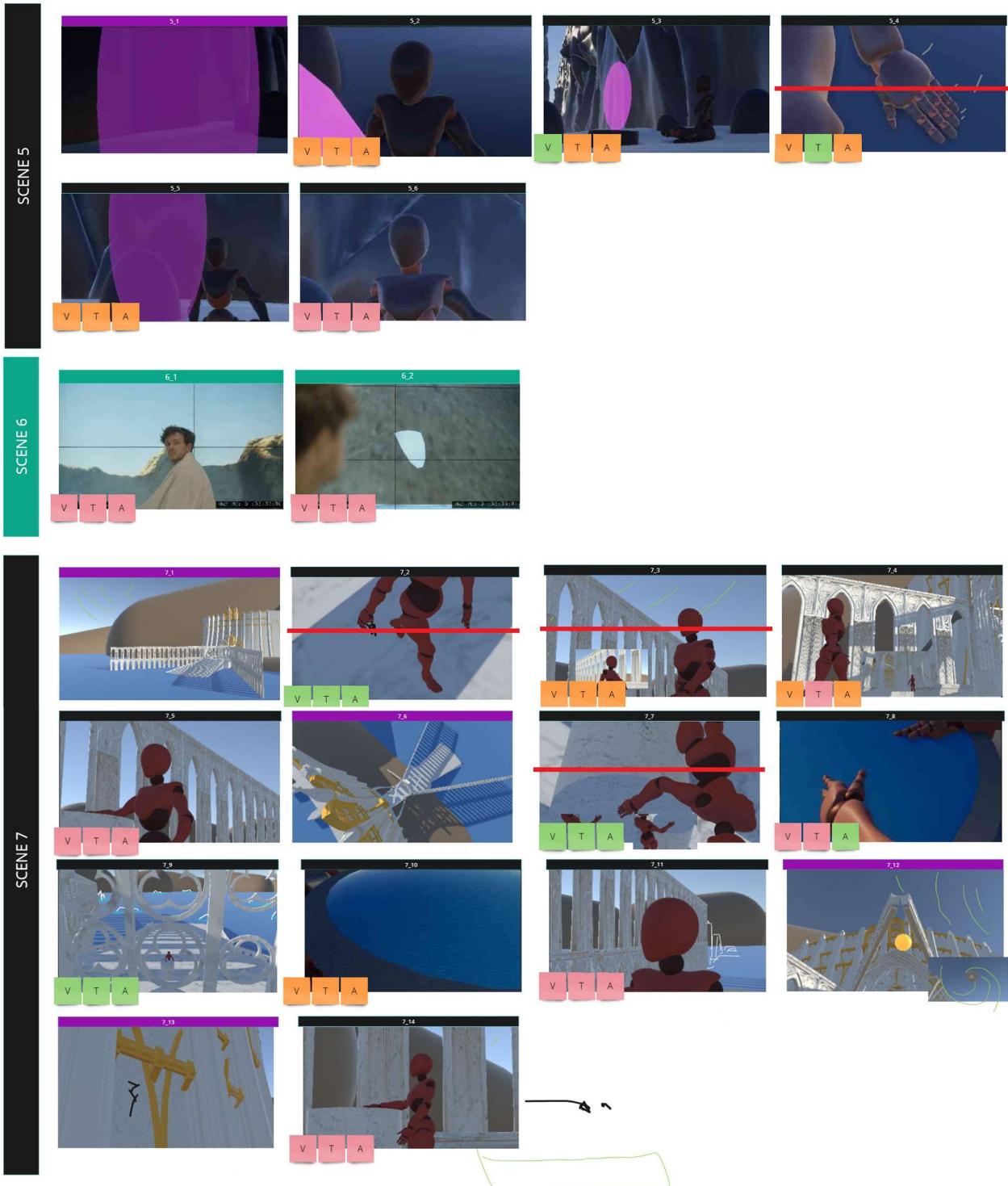


IM-A04 Videomatic Storyboard



IM-A05 Previz Shot List





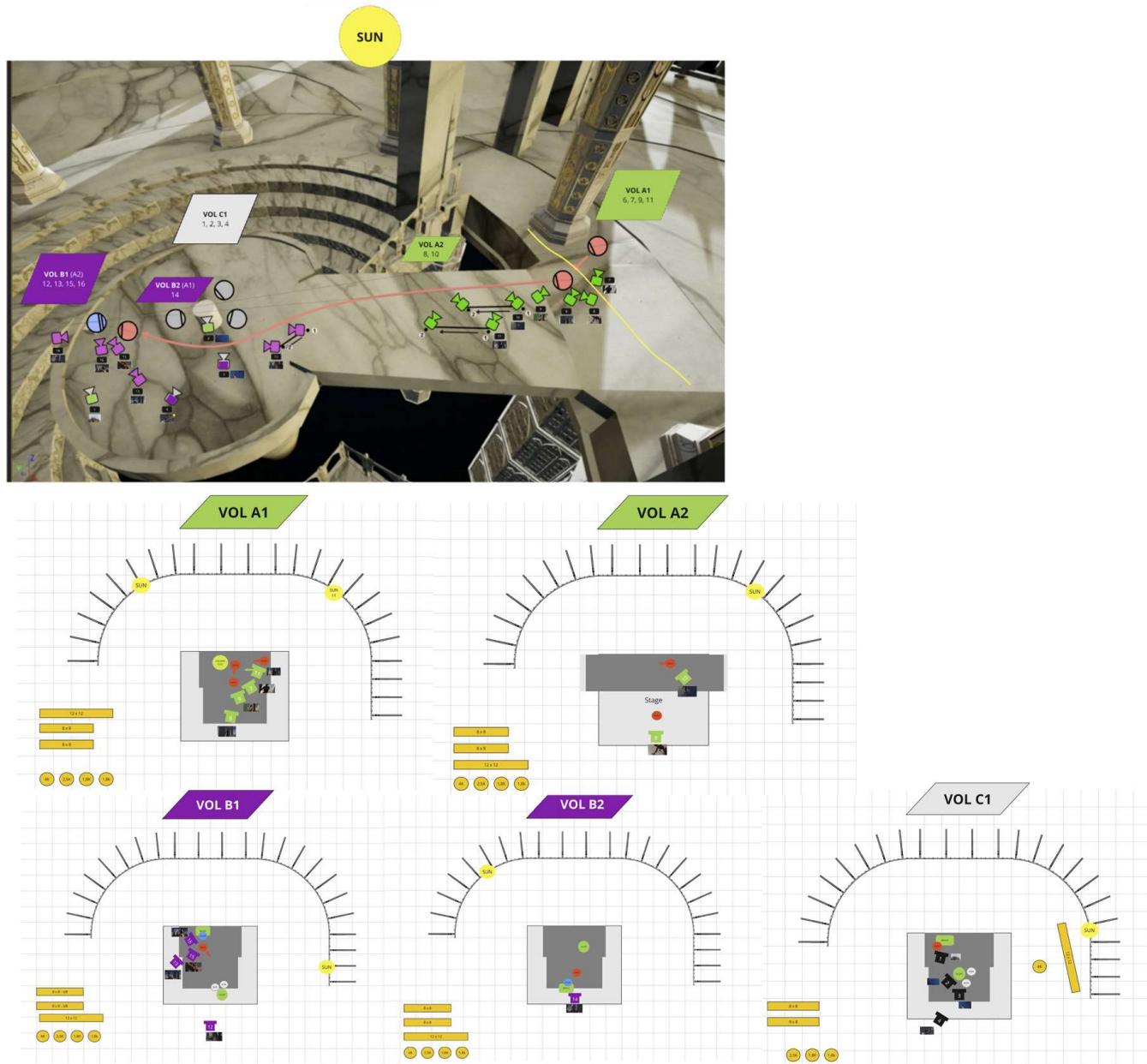
ESSENTIAL

IMPORTANT

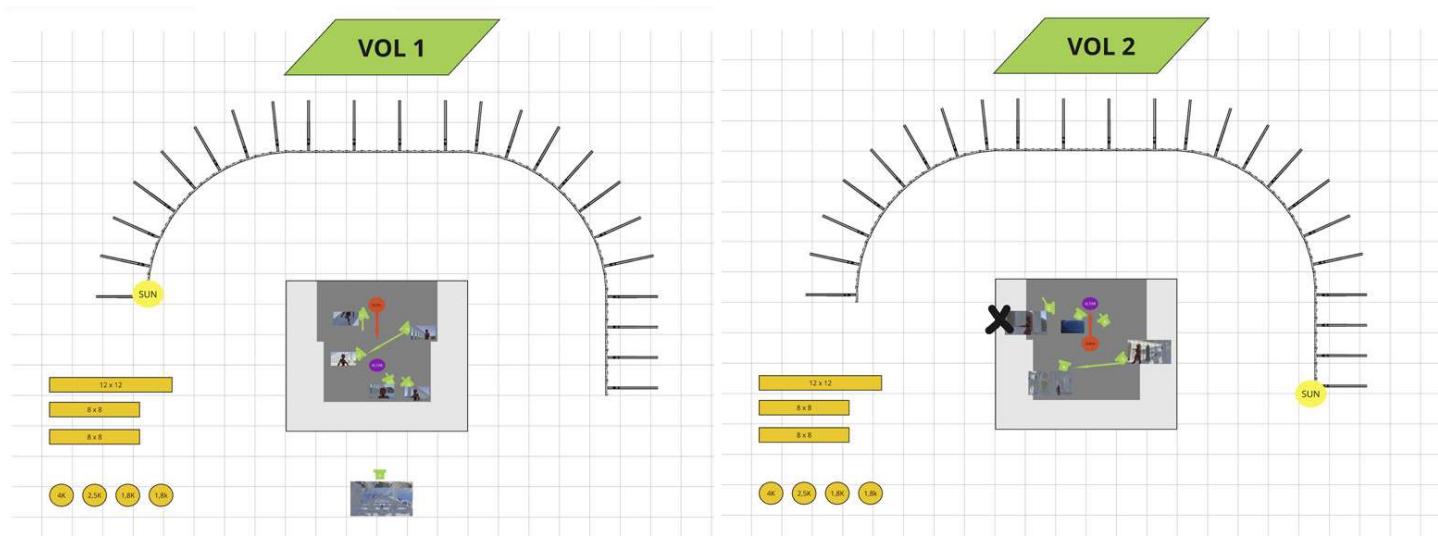
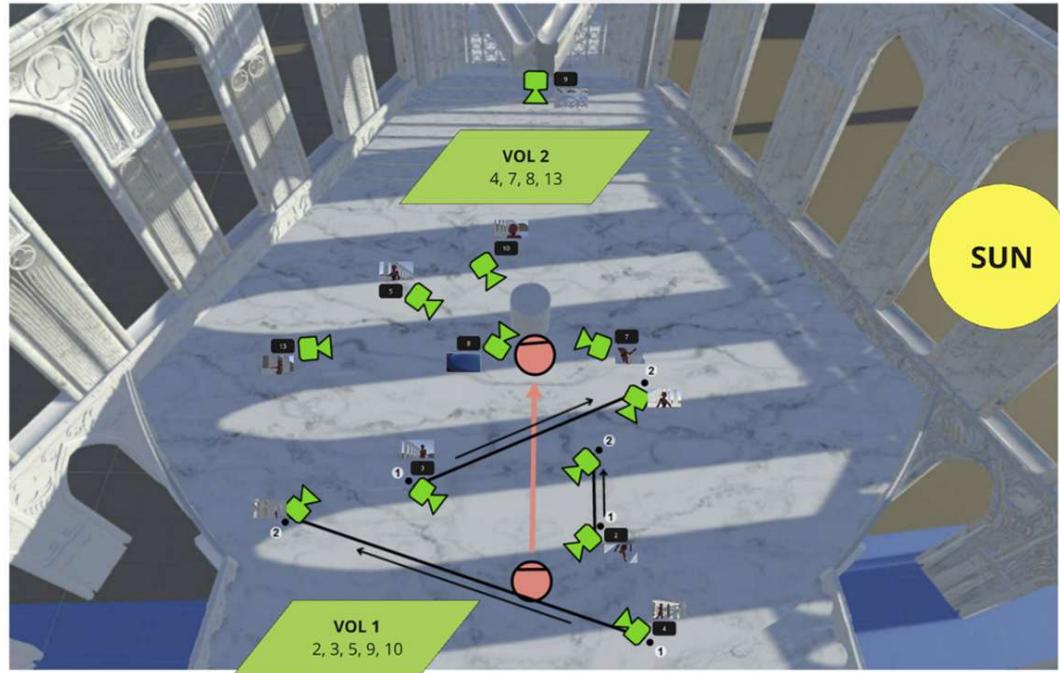
OPTIONAL

IM-A06 Virtual Floorplan

SCENE 1

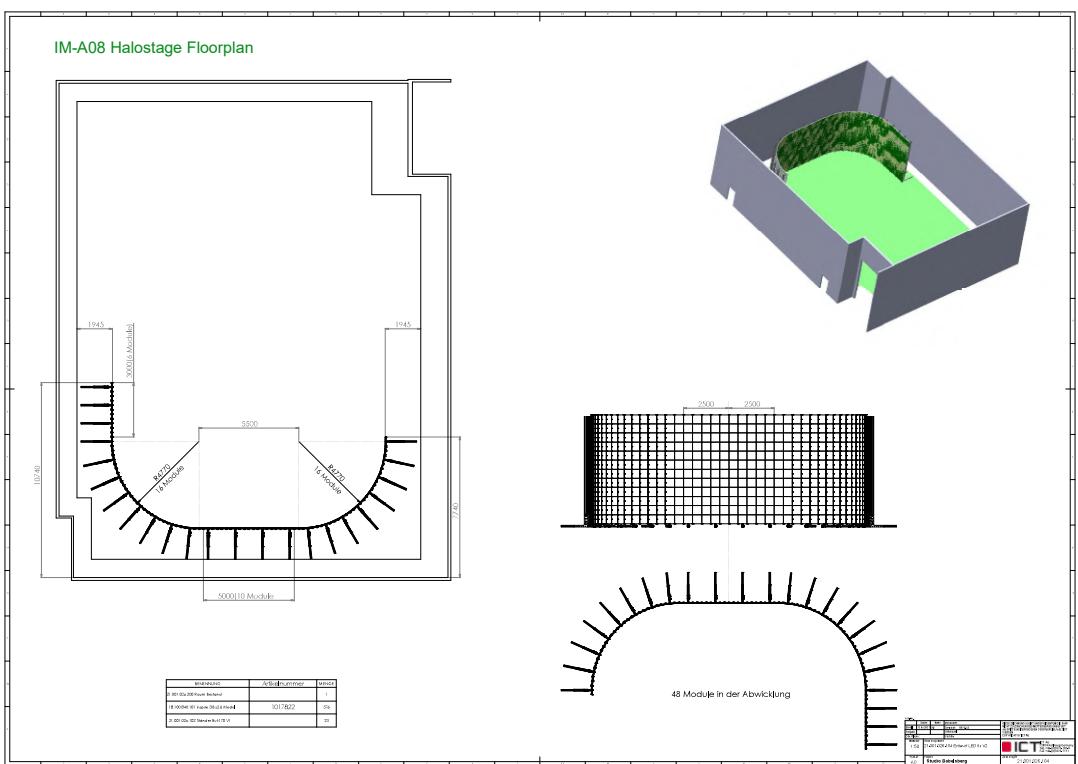


SCENE 7



IM-A07 Lighting Floorplan





APPENDIX B

Wingspan Artifacts

All artifacts including the videomatics are under:

<https://mab.to/MQA8tT2AuXR0H/eu1>

WI-A01 Observation Log					
Nr.	Date	Task	Place	Participants	Observation Description
1	25.10.2023	Introduction	Arkanum Office	Virtual Producer, VP Coordinator, VPTD	As the VPTD gets introduced to the project intention of Wingspan, they are asked for their previous experiences and describes the production process of Immortal including the a videomatic. The utility and cross-departmental benefit of a dynamic preview of the directors vision were highly emphasized.
2	08.12.2024	VAD Meeting	Filmuni	VAD	General technical approaches and pipelines are being brainstormed such as USD. It is being agreed that the VFX artists can start their work primarily in Blender 3D while eventually, all assets need to be brought together in Unreal Engine. The virtual art department (VAD) is being established.
3	13.12.2023	Production Meeting	Filmuni	All HoDs and VAD	A scenographer is being introduced. The necessity of building an apartment into the studio is being discussed. It becomes clear that they are proficient with 3D modeling in the software Rhino. First room versions are being planned.
4	15.01.2024	Jour Fixe	Arkanum Office	All HoDs and VAD	It is being discussed that optimally the physical set construction needs to be elevated to allow the camera more freedom of movement in high-angle shots. The VP Coordinator plans to supervise a Blender 3D Project where the digital representation of the set construction is placed along a representation of the LED wall to find optimal solutions of arrangement. As the physical set construction will have one fixed position in relation to the LED wall, the optimal positioning needs to be found.
5	20.01.2024	Design LED Wall	Online	VPTD	The virtual representation of the LED wall is being created using a procedural tool that takes the amount of max 400 LED panels into consideration. Optimal wall shapes and panel configurations are being tested.
6	05.02.2024	Jour Fixe	Online / Zoom	All HoDs and VAD	In preparation of the production of a videomatic the intentions and goals for it are openly discussed. It is being agreed that the videomatic should be a free creative process where technical limitations of ICVFX are only considered afterwards as the material is being analyzed. At focus should be the artistic vision and the placement and movement of the actors and camera.
7	19.02.2024	Jour Fixe	Online / Zoom	All HoDs and VAD	The first blocking and animation days for the videomatic are being scheduled for the days 29.02.-02.03. At focus is getting accustomed to the workflow and outlining the character blocking.
8	02.03.2024	Videomatic Blocking	CX Lab	Director, 1st AD, DoP, VPTD	It is becoming clear that narrative intentions and goals are not clear yet and major changes on the screenplay are to be expected. However, a workflow that only includes the DoP and VPTD has proven productive.
9	18.03.2024	Jour Fixe	Online / Zoom	All HoDs and VAD	New screenplay versions have been revisited and plans are being made for the videomatic production to happen from 19. to 21.03..
10	21.03.2024	Videomatic Shoot	CX Lab	DoP and VPTD	Character animation proves to be tedious and needs more time. Blocking has been finished but more than half the shots are still open. Plans are made for further videomatic shooting days for 25. to 27.03..
11	26.03.2024	Videomatic Shoot	CX Lab	Director, DoP, VPTD	The director reviewed the blocking and camera angles that have been designed. Blocking and camera changes are now being implemented. The prior decision to use metahumans as digital characters is viewed critically. The long hair of one character render as constantly blown sideways. This blocks the camera view in an over the shoulder shot and distracts from the themes of the film. Hair for this character seems hard to fix and get disabled so that the character appears bald.
12	28.03.2024	Footage Handover	Editor's Room	Editor, VPTD	The rendering of the individual shots including technical clean-ups took a full day. The video material, a shotlist and edl & xml files are being delivered to the editor. Intentions are being conveyed to the editor to have the videomatic as a tool that delivers artistic and technical insight rather than as a polished film.
13	30.03.2024	Checking Messages	Online / Discord	All Preproduction Members	The editor has posted the edits for all three episodes. They have been sitting with the director and experimented with the material creatively claims the editor.
14	08.04.2024	Jour Fixe	Arkanum Office	All HoDs and VAD	In preparation of the on-set producion the VPTD is tasked to run tech-checks on the camera shots of the videomatic. The goals are to find potential technical problems facing the limitations of ICVFX.
15	12.04.2024	Creating Techviz	CX Lab	VPTD	The VPTD has started the tech-checks in Unreal Engine. The VP Coordinators' Blender project that included light fixture constructs such as trusses and a 12x12 butterfly has been utilized together with the LED wall 3D representation to render Techviz. These elements are assigned signal colors in Unreal Engine and are put in a bright-red HDRi as a warning color.
16	15.04.2024	Videomatic Shoot	CX Lab	DoP and VPTD	New script versions came out and the DoP has planned with the VPTD to change weather, lighting, and camera shots. Not all episodes were completed but further work needs to be delayed due to the tight preproduction schedule. Finalizing is scheduled for the 22. and 23.04.
17	23.04.2024	Videomatic Shoot	Studio 17 Backroom	DoP and VPTD	The production of videomatic footage has been concluded. Current versions of the scenographers stage design, the VFX artists city and weather design and production lighting concepts are implemented. The rendering process has started.
18	03.05.2024	Checking Messages	Online / Discord	All Preproduction Members	The 1st AD releases a shotlist document, one day after the arrival of the new videomatic version where they took the image material from. They intend to bring together all important information with production relevancy for each shot in the shotlist document.
19	15.05.2024	Film Shoot	Darkbay Studio 17	All Production Members	The DoP mentioned to the VPTD that they have never been on a set where the camera shots to come were so clear during production. The modification times between the shots are described as smooth for the camera department.

SHOT NAME	STILL
Ep 3 Scene 1	
EP3_SC1_SH010	
EP3_SC1_SH020	
EP3_SC1_SH030	
EP3_SC1_SH040	
EP3_SC1_SH050	
EP3_SC1_SH060	
EP3_SC1_SH070	





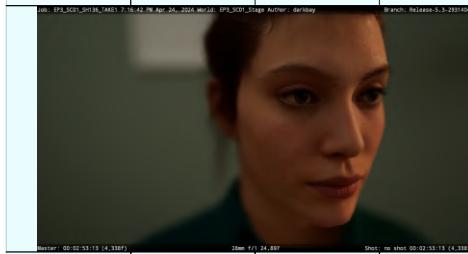






WI-A04 Shotlist Ep3

SHOT	SCRIPT TIME	UNREAL	D/N/DU	SHOT	SCRIPT TIME	UNREAL	D/N/DU	SHOT	SCRIPT TIME	UNREAL	D/N/DU
3.1	INN	SH030 T 1	DAY	3.2	INN	SH 060 T2	DAY	3.3	INN	SH 070 T2	DAY
	Master: 00:00:05:16 (148F)	Date: 12/25/319	Shot: no shot 00:00:05:16 (148F)		Master: 00:00:23 (148F)	Date: 12/25/545	Shot: no shot 00:00:23 (148F)		Master: 00:00:20 (20F)	Date: 12/25/106	Shot: no shot 00:00:20 (20F)
EQUIPMENT	LENS	DISTANCE	PAGE	EQUIPMENT	LENS	DISTANCE	PAGE	EQUIPMENT	LENS	DISTANCE	PAGE
NUTRON statisch	24 mm	close-up (CU)	1 (40s)	NUTRON statisch	35 mm	medium shot (MS)	1 (40s)	NUTRON bewegt	35 mm	medium shot (MS)	1 - 2 (120s)
LEVEL	MOOD	LEVEL	MOOD	LEVEL	MOOD	LEVEL	MOOD	LEVEL	MOOD	LEVEL	MOOD
NORMAL	Iood 1 - Nachmittag (vor) Gewitter	NORMAL	Mood 1 - Nachmittag (vor) Gewitter	NORMAL	Iood 1 - Nachmittag (vor) Gewitter	NORMAL	Iood 1 - Nachmittag (vor) Gewitter	NORMAL	Iood 1 - Nachmittag (vor) Gewitter	NORMAL	Iood 1 - Nachmittag (vor) Gewitter
SCENE	SCENE	SCENE	SCENE	SCENE	SCENE	SCENE	SCENE	SCENE	SCENE	SCENE	SCENE
Frederiks Panikattacke		Fredetik beruhigt sich langsam				Sadia beobachtet Frederik, bis Frederik hinter ihr zum Fenster geht					
LICHT		LICHT		LICHT		LICHT		LICHT		LICHT	
Effekt: Sonnenlicht streift ihn für Momente		Effekt: Sonnenlicht streift ihn für Momente									
ROLES	VIRTUAL PRODUCTION	CAMERA	VFX	ROLES	VIRTUAL PRODUCTION	CAMERA	VFX	ROLES	VIRTUAL PRODUCTION	CAMERA	VFX
Frederik		Effektklar, evtl. Diopter, if trav out, then we remove glass; (move out the camera when he ralexes)		Frederik		bisschen Glaseffekt noch		Sadia & Frederik		More sensation of being caged with the tiger, more movement	
ART DEPARTMENT	HAIR & MAKEUP	COSTUME	PRODUCTION	ART DEPARTMENT	HAIR & MAKEUP	COSTUME	PRODUCTION	ART DEPARTMENT	HAIR & MAKEUP	COSTUME	PRODUCTION
SW : Nein	Swet drops			SW : Nein	Swet drops			SW : Nein			
Von: Anfang		Von: Anfang				Von: Anfang					
Bis: F: "Darf ich noch eins haben?" stands up and leaves frame		Bis: F: "Darf ich noch eins haben?" stands up and leaves frame				Bis: S: "Es sieht so müheles aus, oder?" she looks at the window					
SHOT	SCRIPT TIME	UNREAL	D/N/DU	SHOT	SCRIPT TIME	UNREAL	D/N/DU	SHOT	SCRIPT TIME	UNREAL	D/N/DU
3.4	INN	SH 010 T2	DAY	3.5	EXT	SH120 T 1	DAY	3.6	INN	SH 126 T1	DAY
	Master: 00:01:04:07 (1,607F)	Date: 12/25/599	Shot: no shot 00:01:04:07 (1,607F)		Master: 00:10:20:14 (1,609F)	Date: 12/25/358	Shot: no shot 00:10:20:14 (1,609F)		Master: 00:02:09:22 (3,247F)	Date: 12/25/453	Shot: no shot 00:02:09:22 (3,247F)
EQUIPMENT	LENS	DISTANCE	PAGE	EQUIPMENT	LENS	DISTANCE	PAGE	EQUIPMENT	LENS	DISTANCE	PAGE
NUTRON bewegt	24 mm	long shot (LS)	1 - 2 (60s)	STATIC	50 mm	medium shot (MS)	2-3 (55s)	NUTRON statisch	28 mm	close-up (CU)	2 - 3 (45s)
LEVEL	MOOD	LEVEL	MOOD	LEVEL	MOOD	LEVEL	MOOD	LEVEL	MOOD	LEVEL	MOOD
NORMAL	Iood 1 - Nachmittag (vor) Gewitter	!COMPLICATED!	Mood 1 - Nachmittag (vor) Gewitter	NORMAL	Iood 1 - Nachmittag (vor) Gewitter	NORMAL	Iood 1 - Nachmittag (vor) Gewitter	NORMAL	Iood 1 - Nachmittag (vor) Gewitter	NORMAL	Iood 1 - Nachmittag (vor) Gewitter
SCENE	SCENE	SCENE	SCENE	SCENE	SCENE	SCENE	SCENE	SCENE	SCENE	SCENE	SCENE
Frederik getting water, he and Sadia talk until he walks behind her		Frederik by the window. They talk until he sits down again.				Frederik close, after he sits down again, until Sektkorken.					
LICHT		LICHT		LICHT		LICHT		LICHT		LICHT	
ROLES	VIRTUAL PRODUCTION	CAMERA	VFX	ROLES	VIRTUAL PRODUCTION	CAMERA	VFX	ROLES	VIRTUAL PRODUCTION	CAMERA	VFX
Sadia & Frederik		BIRDS		Sadia & Frederik		Stativ auf Praktikabel		Frederik			
ART DEPARTMENT	HAIR & MAKEUP	COSTUME	PRODUCTION	ART DEPARTMENT	HAIR & MAKEUP	COSTUME	PRODUCTION	ART DEPARTMENT	HAIR & MAKEUP	COSTUME	PRODUCTION
SW : Nein				SW : Nein				SW : Nein			
Wasserglad & Karrafe											
Von: F: "Darf ich noch eine haben?"		Von: S: "Haben Sie das Gefühl, dass Sie etwas schlimmes.."				Von: F: "Sind schlimme Dinge auch dann schlimm, wenn man Sie..."					
Bis: S; Wollen Sie mir erzählen, was vorgefallen ist?		Bis: F: "Mich hat meine Familie immer Sektkorken..." and he sits				Bis: F: "Mich hat meine Familie immer Sektkorken..." and he sits					
SHOT	SCRIPT TIME	UNREAL	D/N/DU	SHOT	SCRIPT TIME	UNREAL	D/N/DU	SHOT	SCRIPT TIME	UNREAL	D/N/DU
3.7	INN	SH 130 T 1	DAY	3.8	INN	SH 146 T1	DAY	3.9	INN	SH 145 T1	DAY
	Master: 00:02:25:10 (3,635F)	Date: 12/25/693	Shot: no shot 00:02:25:10 (3,635F)		Master: 00:02:25:10 (3,635F)	Date: 12/25/348	Shot: no shot 00:02:25:10 (3,635F)		Master: 00:02:25:10 (3,635F)	Date: 12/25/113	Shot: no shot 00:02:25:10 (3,635F)
EQUIPMENT	LENS	DISTANCE	PAGE	EQUIPMENT	LENS	DISTANCE	PAGE	EQUIPMENT	LENS	DISTANCE	PAGE

NUTRON bewegt	35 mm	long shot (LS)	2 - 4 (or 5?) (90s or 180s?)	NUTRON statisch	35 mm	medium shot (MS)	3 - 5 (160s)	NUTRON statisch	35 mm	medium shot (MS)	3 - 5 (160s)						
LEVEL		MOOD		LEVEL		MOOD		LEVEL		MOOD							
SEMI COMPLICATED		MAYBE TRANSITION		NORMAL		Transition 1->2 (main)		NORMAL		Transition 1->2 (main)							
SCENE				SCENE				SCENE									
Wide, Frederik in front of the window, then sitting, until before the weather transition starts.				Sadia Profil, Frederik sits down again until Sadia tells him she believes him.				Frederik Profil, sits down again until Sadia tells him she believes him.									
LICHT				LICHT				S									
Maybe Moodchange 1 - 2 F: "Beides" 1min duration				Moodchange 1 - 2 F: "Beides" 1min duration				Moodchange 1 - 2 F: "Beides" 1min duration									
ROLES	VIRTUAL PRODUCTION	CAMERA	VFX	ROLES	VIRTUAL PRODUCTION	CAMERA	VFX	ROLES	VIRTUAL PRODUCTION	CAMERA	VFX						
Sadia & Frederik	if we transition we need a render, can we use 3.9? the transition will have the camera static	sehr langsame Fahrt, links -> rechts (mitte?). Focus Angelegenheit	Birds.	Sadia	in worst case scenario we use the render from 3.9	lets make these shots two not sooo profile		Frederik		lets make these shots not sooo profile							
ART DEPARTMENT	HAIR & MAKEUP	COSTUME	PRODUCTION	ART DEPARTMENT	HAIR & MAKEUP	COSTUME	PRODUCTION	ART DEPARTMENT	HAIR & MAKEUP	COSTUME	PRODUCTION						
SW : Ja				SW : Nein				SW : Nein									
Ab: F guckt Fenster. F: Es sieht so mühelos aus. Oder?				Ab: S: Was meinte Ihre Familie Damit?				Ab: S: Was meinte Ihre Familie Damit?									
Bis: F:Beides // Longer?: "Aber ich glaube Ihnen."				Bis: S: Herr Stahl Ich kann nachvollziehen, dass Ihre...				Bis: S: Herr Stahl Ich kann nachvollziehen, dass Ihre...									
SHOT	SCRIPT TIME	UNREAL	D/N/DU	SHOT	SCRIPT TIME	UNREAL	D/N/DU	SHOT	SCRIPT TIME	UNREAL	D/N/DU						
3.10	INN	SH 136	DAY	3.11	INN	SH 135 T1	DAY	3.12	INN	SH 190 T2	DAY						
																	
EQUIPMENT	LENS	DISTANCE	PAGE	EQUIPMENT	LENS	DISTANCE	PAGE	EQUIPMENT	LENS	DISTANCE	PAGE						
NUTRON statisch	28 mm	close-up (CU)	3 - 8 (340s)	NUTRON statisch	28 mm	close-up (CU)	3 - 8 (340s)	NUTRON statisch	35 mm	medium close-up (MCU)	5 - 8 (200s)						
LEVEL	MOOD		LEVEL	MOOD		LEVEL	MOOD		LEVEL	MOOD							
NORMAL	Transition 1->2 (main)		NORMAL	Transition 1->2 (main)		NORMAL	Mood 2 - Nachmittag Gewitter										
SCENE				SCENE				SCENE									
Sadia Close, Frederik sits down again until Sadia tells him she believes him.				Frederik Close, he sits down again until Sadia tells him she believes him.				Sadia, she tells Frederik she knows flying until Frederiks flying attack									
LICHT				LICHT				LICHT									
Moodchange 1 - 2 F: "Beides" 1min duration				Moodchange 1 - 2 F: "Beides" 1min duration													
ROLES	VIRTUAL PRODUCTION	CAMERA	VFX	ROLES	VIRTUAL PRODUCTION	CAMERA	VFX	ROLES	VIRTUAL PRODUCTION	CAMERA	VFX						
Sadia	use render from 3.8 or 3.9	these can be more profile and still work		Frederik	use the render from 3.9?	these can be more profile and still work		Sadia		this one is actually more frontal right?							
ART DEPARTMENT	HAIR & MAKEUP	COSTUME	PRODUCTION	ART DEPARTMENT	HAIR & MAKEUP	COSTUME	PRODUCTION	ART DEPARTMENT	HAIR & MAKEUP	COSTUME	PRODUCTION						
SW : Nein				SW : Nein				SW : nein									
Ab: S: Was meinte Ihre Familie Damit?				Ab: S: Was meinte Ihre Familie Damit?				Von: F: Wenn Sie mir nicht glauben Verstehe ich									
Bis: F: Kann nicht atmen... Sadia steht auf				Bis: F: Kann nicht atmen... Sadia steht auf				Bis: F: "Nein! Nein, nein, nein! Ich..." Sadia is alarmiert									
SHOT	SCRIPT TIME	UNREAL	D/N/DU	SHOT	SCRIPT TIME	UNREAL	D/N/DU	SHOT	SCRIPT TIME	UNREAL	D/N/DU						
3.13	INN	SH 180 T2	DAY	3.14	INN	SH 210 T2	DAY	3.15	INN	SH 220 T2	DAY						
																	
EQUIPMENT	LENS	DISTANCE	PAGE	EQUIPMENT	LENS	DISTANCE	PAGE	EQUIPMENT	LENS	DISTANCE	PAGE						
NUTRON statisch	35 mm	medium close-up (MCU)	5 - 8 (200s)	NUTRON statisch	50 mm	Detail	6 (10s) and maybe 9	NUTRON bewegt	50 mm	Detail	6 (10s) and 9 (10s)						
LEVEL	MOOD		LEVEL	MOOD		LEVEL	MOOD		LEVEL	MOOD							
NORMAL	Mood 2 - Nachmittag Gewitter		NORMAL	Mood 2 - Nachmittag Gewitter		NORMAL	Mood 2 - Nachmittag Gewitter										
SCENE				SCENE				SCENE									
Frederik, Sadia tells him she knows flying until Frederiks flying attack				Frederiks feet lifting from joy. We can unite it with 3.22 feet from flight attack				Frederik grabbing the seat to not fly of joy. (2 different actions, one soft one more heavy. The 2nd take will be used at the flight attack									
LICHT				LICHT				Frederik, Sadia calming him down until he lifts off.									
Effekt: Sonnenlicht streift ihn für Momente				Effekt: Sonnenlicht streift ihn für Momente				Effekt: Sonnenlicht streift ihn für Momente									
ROLES	VIRTUAL PRODUCTION	CAMERA	VFX	ROLES	VIRTUAL PRODUCTION	CAMERA	VFX	ROLES	VIRTUAL PRODUCTION	CAMERA	VFX						
Frederik				Frederik				Frederik		POV & Effektlglas							
ART DEPARTMENT	HAIR & MAKEUP	COSTUME	PRODUCTION	ART DEPARTMENT	HAIR & MAKEUP	COSTUME	PRODUCTION	ART DEPARTMENT	HAIR & MAKEUP	COSTUME	PRODUCTION						

SW : Nein				SW : Nein				SW : Nein				
Von: F: Wenn Sie mir nicht glauben verstehe ich												
Bis: F: Kann nicht atmen... Sadia steht auf												
SHOT	SCRIPT TIME	UNREAL	D/N/DU	SHOT	SCRIPT TIME	UNREAL	D/N/DU	SHOT	SCRIPT TIME	UNREAL	D/N/DU	
3.16	INN	SH 200 T2	DAY	3.17	INN	SH 205 T1	DAY	3.18	INN	SH 230 T2 & 310	DAY	
												
Master: 00:07:19:22 (10,88FT) 24mm f/1 88,529 Shot: no shot 00:07:19:22 (10,88FT)				Master: 00:07:15:16 (10,88FT) 24mm f/1 111,019 Shot: no shot 00:07:15:16 (10,88FT)								
EQUIPMENT	LENS	DISTANCE	PAGE	EQUIPMENT	LENS	DISTANCE	PAGE	EQUIPMENT	LENS	DISTANCE	PAGE	
NUTRON statisch	24 mm	medium shot (MS)	6 (5?) - 8	NUTRON statisch	24 mm	medium shot (MS)	6 (5?) - 8	NUTRON bewegt	50 mm	long shot (LS)	8 - 9	
LEVEL	MOOD			LEVEL	MOOD			LEVEL	MOOD			
NORMAL	Mood 2 - Nachmittag Gewitter			NORMAL	Mood 2 - Nachmittag Gewitter			NORMAL	Mood 2 - Nachmittag Gewitter			
SCENE				SCENE				SCENE				
Sadia, Frederik almost flies of joy until Frederiks flying attack.				Frederik, he almost flies of joy until Frederiks flying attack.				Wide, Frederiks flying attack until he lifts off.				
LICHT				LICHT				LICHT				
				hartes bewegtes Licht trifft den Schauspieler in Kombination mit Wand				hartes bewegtes Licht trifft den Schauspieler in Kombination mit Wand				
ROLES	VIRTUAL PRODUCTION	CAMERA	VFX	ROLES	VIRTUAL PRODUCTION	CAMERA	VFX	ROLES	VIRTUAL PRODUCTION	CAMERA	VFX	
Sadia				Frederik				Sadia & Frederik	Lens Offset? Virtual Camera 50, real camera 35	movement towards Fr		
ART DEPARTMENT	HAIR & MAKEUP	COSTUME	PRODUCTION	ART DEPARTMENT	HAIR & MAKEUP	COSTUME	PRODUCTION	ART DEPARTMENT	HAIR & MAKEUP	COSTUME	PRODUCTION	
SW : Nein				SW : Nein				SW : Nein				
Von: F: Wenn Sie mir nicht glauben verstehe ich				Von: F: Wenn Sie mir nicht glauben verstehe ich				Ab: F: Nein! Nein, nein nein ich... Kann ich?				
Bis: F: Kann nicht atmen... Sadia steht auf				Bis: F: Kann nicht atmen... Sadia steht auf				Bis: S: Sie dürfen sich entspannen... Er entspannt sich...				
SHOT	SCRIPT TIME	UNREAL	D/N/DU	SHOT	SCRIPT TIME	UNREAL	D/N/DU	SHOT	SCRIPT TIME	UNREAL	D/N/DU	
3.19	INN	SH 270 T1	DAY	3.20	INN	SH 285 T 1	DAY	3.21	INN	SH 290 T 2	DAY	
												
Master: 00:09:20:23 (14,023FT) 24mm f/2 19,655 Shot: no shot 00:09:20:23 (14,023FT)				Master: 00:09:15:03 (14,876FT) 24mm f/2 19,506 Shot: no shot 00:09:15:03 (14,818FT)				Master: 00:08:57:17 (13,442FT) 24mm f/2 62,829 Shot: no shot 00:08:57:17 (13,442FT)				
EQUIPMENT	LENS	DISTANCE	PAGE	EQUIPMENT	LENS	DISTANCE	PAGE	EQUIPMENT	LENS	DISTANCE	PAGE	
NUTRON bewegt	24 mm	close-up (CU)	8 - 9	NUTRON statisch	24 mm	close-up (CU)	8 - 9 (50s)	NUTRON bewegt	28 mm	Detail	9 (5s)	
LEVEL	MOOD			LEVEL	MOOD			LEVEL	MOOD			
SEMI COMPLICATED	Mood 2 - Nachmittag Gewitter			NORMAL	Mood 2 - Nachmittag Gewitter			NORMAL	Mood 2 - Nachmittag Gewitter			
SCENE				SCENE				SCENE				
				Sadia, calming Frederik down until he lifts off.				Frederiks POV, his legs.				
LICHT				LICHT				LICHT				
hartes bewegtes Licht trifft den Schauspieler in Kombination mit Wand Effekt: Sonnenlicht streift ihn für Momente				Effekt: Sonnenlicht streift ihn für Momente				Effekt: Sonnenlicht streift ihn für Momente				
ROLES	VIRTUAL PRODUCTION	CAMERA	VFX	ROLES	VIRTUAL PRODUCTION	CAMERA	VFX	ROLES	VIRTUAL PRODUCTION	CAMERA	VFX	
Sadia & Frederik	BACKGROUND moving	Effekglas, 2 verschiedene		Sadia		focus pumping		Frederik, Sadia		bewegte POV Effekglas		
ART DEPARTMENT	HAIR & MAKEUP	COSTUME	PRODUCTION	ART DEPARTMENT	HAIR & MAKEUP	COSTUME	PRODUCTION	ART DEPARTMENT	HAIR & MAKEUP	COSTUME	PRODUCTION	
SW : Nein				SW : Nein				SW : Nein				
Von: F: Nein! Nein, nein nein ich... Kann ich?				Von: S: Hatten Sie schon mal eine ähnliche Reaktion?								
Bis: S: Sie dürfen sich entspannen... Er entspannt sich...				Bis: S: Sie dürfen sich entspannen... Er entspannt sich...								
SHOT	SCRIPT TIME	UNREAL	D/N/DU	SHOT	SCRIPT TIME	UNREAL	D/N/DU	SHOT	SCRIPT TIME	UNREAL	D/N/DU	
3.22	INN	SH 300 T1	DAY	3.23	INN	SH 370 T1	DAY	3.24	INN	SH330	DAY	
												
Master: 00:09:30:08 (14,956FT) 24mm f/2 37,167 Shot: no shot 00:09:30:08 (14,956FT)				Master: 00:10:00:16 (14,966FT) 24mm f/1 124,797 Shot: no shot 00:10:00:16 (14,966FT)				Master: 00:10:00:16 (15,241FT) 24mm f/2 64,014 Shot: no shot 00:10:00:16 (15,241FT)				

EQUIPMENT	LENS	DISTANCE	PAGE	EQUIPMENT	LENS	DISTANCE	PAGE	EQUIPMENT	LENS	DISTANCE	PAGE
NUTRON statisch	35 mm	Detail	9 (5s)	FLUGRIG	50 mm	head close-up	9 (10s)	NUTRON statisch	35 mm	Detail	9 (15s)
LEVEL SEMI COMPLICATED	MOOD Mood 2 - Nachmittag Gewitter	LEVEL !COMPLICATED!	MOOD Mood 2 - Nachmittag Gewitter	LEVEL !COMPLICATED!	MOOD Mood 2 - Nachmittag Gewitter	LEVEL !COMPLICATED!	MOOD Mood 2 - Nachmittag Gewitter	SCENE	LICHT	LICHT	LICHT
Frederiks Füße heben ruckartig ab (Spanngurte um Knie, werden angehoben?) / Frederiks Feet suddenly lifting up.	Frederik beruhigt sich, beginnt dann zu fliegen / Frederik lifting off. (Attached to the plate)	Sadia grabs Frederiks rising arm.									
Effekt: Sonnenlicht streift ihn für Momente	Effekt: Sonnenlicht streift ihn für Momente	Effekt: Sonnenlicht streift ihn für Momente									
ROLES Frederik	VIRTUAL PRODUCTION	CAMERA	VFX	ROLES Frederik	VIRTUAL PRODUCTION	CAMERA	VFX	ROLES Sadia & Frederik	VIRTUAL PRODUCTION	CAMERA	VFX
ART DEPARTMENT SW : Nein	HAIR & MAKEUP	COSTUME	PRODUCTION	ART DEPARTMENT SW : Nein	HAIR & MAKEUP	COSTUME	PRODUCTION	ART DEPARTMENT SW : Nein	HAIR & MAKEUP	COSTUME	PRODUCTION
SHOT 3.25	SCRIPT TIME INN	UNREAL SH 320 T1	D/N/DU DAY	SHOT 3.26	SCRIPT TIME INN	UNREAL SH 350 T2	D/N/DU DAY	SHOT 3B.1	SCRIPT TIME INN	UNREAL SH 010 T2	D/N/DU DAY
											
EQUIPMENT	LENS	DISTANCE	PAGE	EQUIPMENT	LENS	DISTANCE	PAGE	EQUIPMENT	LENS	DISTANCE	PAGE
NUTRON bewegt	35 mm	head close-up	9	NUTRON statisch	35 mm	Detail	9	NUTRON statisch	50 mm	Detail	10
LEVEL NORMAL	MOOD Mood 2 - Nachmittag Gewitter	LEVEL NORMAL	MOOD Mood 2 - Nachmittag Gewitter	LEVEL NORMAL	MOOD Mood 3 - Nachmittag (nach) Gewitter	SCENE	LICHT	SCENE	LICHT	SCENE	LICHT
Sadia looking up towards the flying Frederik.	Sadias knee hitting the object. (also insert of stuhlbein)	Sadia collecting the shards.									
Effekt: Sonnenlicht streift ihn für Momente											
ROLES Sadia	VIRTUAL PRODUCTION	CAMERA	VFX	ROLES Sadia	VIRTUAL PRODUCTION	CAMERA	VFX	ROLES Sadia	VIRTUAL PRODUCTION	CAMERA	VFX
ART DEPARTMENT SW : Nein	HAIR & MAKEUP	COSTUME	PRODUCTION	ART DEPARTMENT SW : Nein	HAIR & MAKEUP	COSTUME	PRODUCTION	ART DEPARTMENT SW : Nein	HAIR & MAKEUP	COSTUME	PRODUCTION
Bis: F: Loslassen!	Bis: F: Loslassen!										
SHOT 3B.2	SCRIPT TIME INN	UNREAL SH 030 T2 & SH	D/N/DU DAY	SHOT 3B.3	SCRIPT TIME EXT	UNREAL SH 050 T2	D/N/DU DAY	SHOT 3B.4	SCRIPT TIME INN	UNREAL SH 060 T1	D/N/DU DAY
											
EQUIPMENT	LENS	DISTANCE	PAGE	EQUIPMENT	LENS	DISTANCE	PAGE	EQUIPMENT	LENS	DISTANCE	PAGE
NUTRON bewegt	28 mm	head close-up	10 - 11	NUTRON statisch	35 mm	medium shot (MS)	10 - 11	STATIC	35 mm	medium shot (MS)	10 - 11
LEVEL SEMI COMPLICATED	MOOD bod 3 - Nachmittag (nach) Gewitt	LEVEL NORMAL	MOOD bod 3 - Nachmittag (nach) Gewitt	LEVEL !COMPLICATED!	MOOD bod 3 - Nachmittag (nach) Gewitt	SCENE	LICHT	SCENE	LICHT	SCENE	LICHT
Sadia, behind her Marina knocking, Sadia goes to the balcony.	Marina, whole conversation with Sadia on the balcony.	Sadia, whole conversation with Marina on the balcony.									
ROLES Sadia & marina	VIRTUAL PRODUCTION	CAMERA	VFX	ROLES Marina	VIRTUAL PRODUCTION	CAMERA	VFX	ROLES Sadia	VIRTUAL PRODUCTION	CAMERA	VFX
Fahrt von Sadia am Boden bis Sadia zur Tür / Movement from Sadia on the floor to Sadia on the door.				viability is missing				more via			

WI-A05 Stage Design



Image 1, Source: *Wingspan MyAirBridge Server, LED Stage v005* Date: 11.01.2024

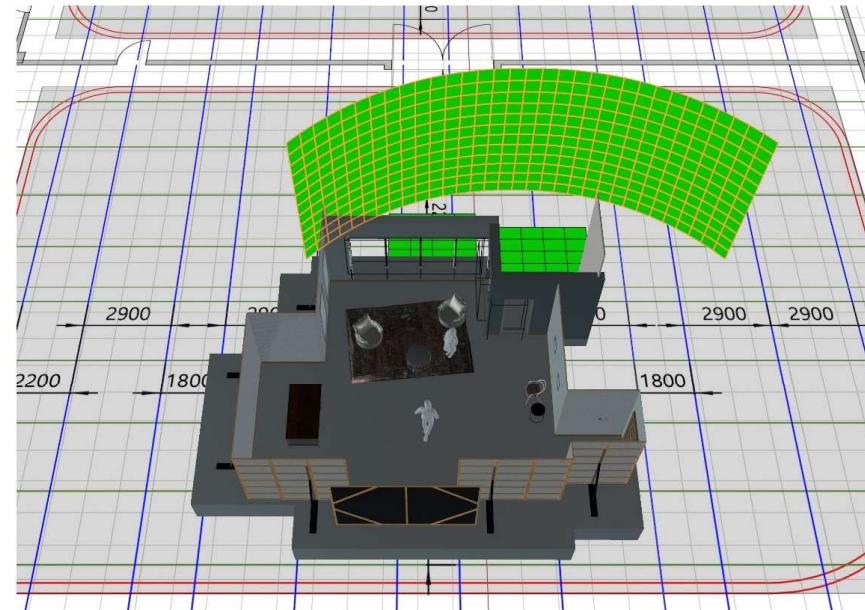


Image 2, Source: *Wingspan MyAirBridge Server, LED Stage v011* Date: 05.03.2024

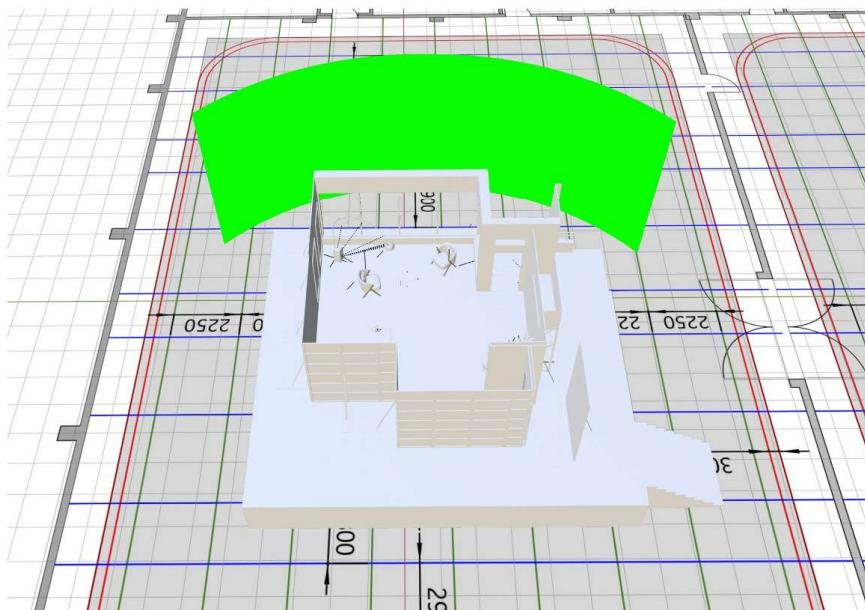


Image 3, Source: *Wingspan MyAirBridge Server, LED Stage v016* Date: 05.04.2024

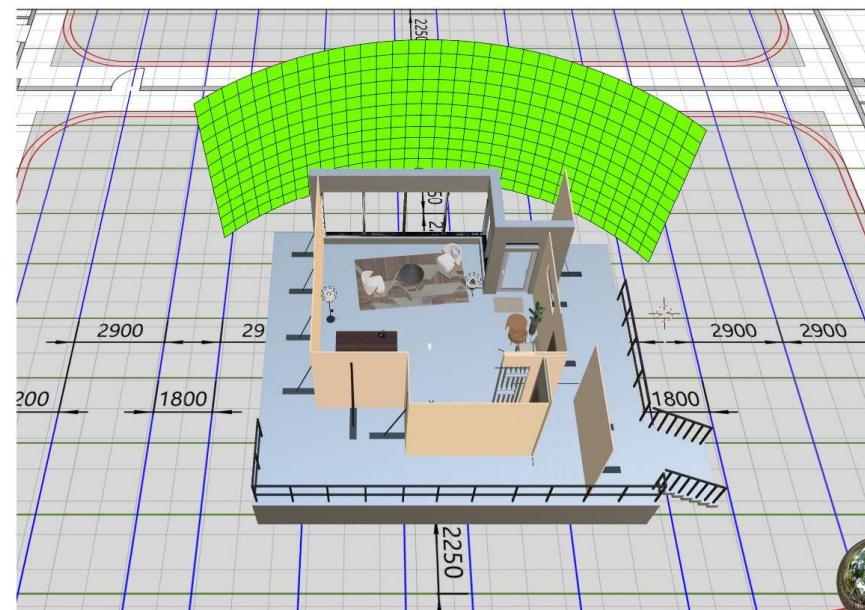
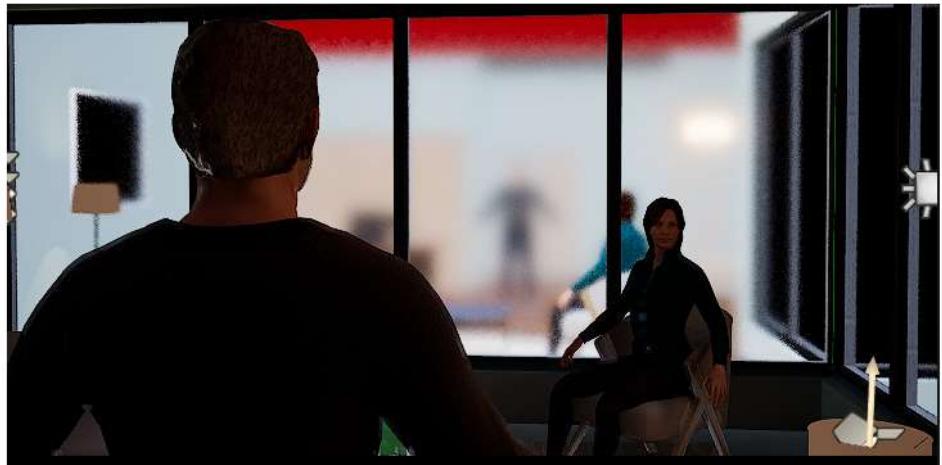


Image 4, Source: *Wingspan MyAirBridge Server, LED Stage v026* Date: 13.05.2024

WI-A06 Techviz WIP

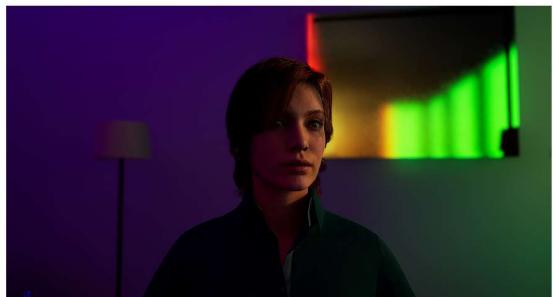


WI-A07 Techviz Ep3

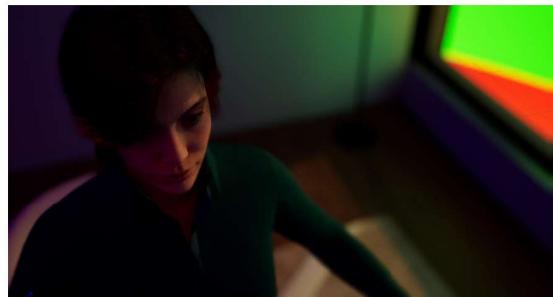
LED Wall Coverage



Ep3_Sc1_Sh070



Ep3_Sc1_Sh170



Ep3_Sc1_Sh320



Ep3_Sc1_Sh340

Light Fixture Reflectance



Ep3_Sc1_Sh010



Ep3_Sc1_Sh100



Ep3_Sc1_Sh310



Ep3_Sc1_Sh350