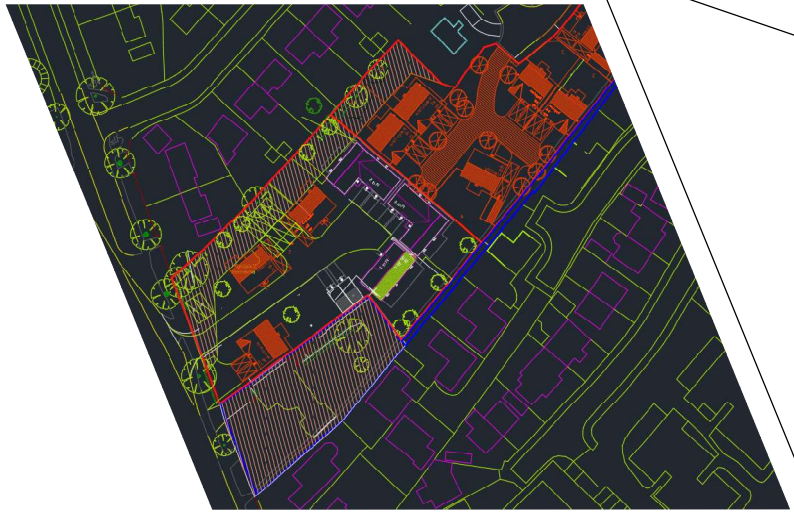


VR220 PROJECT

Ethan Baldwin

28/04/2022

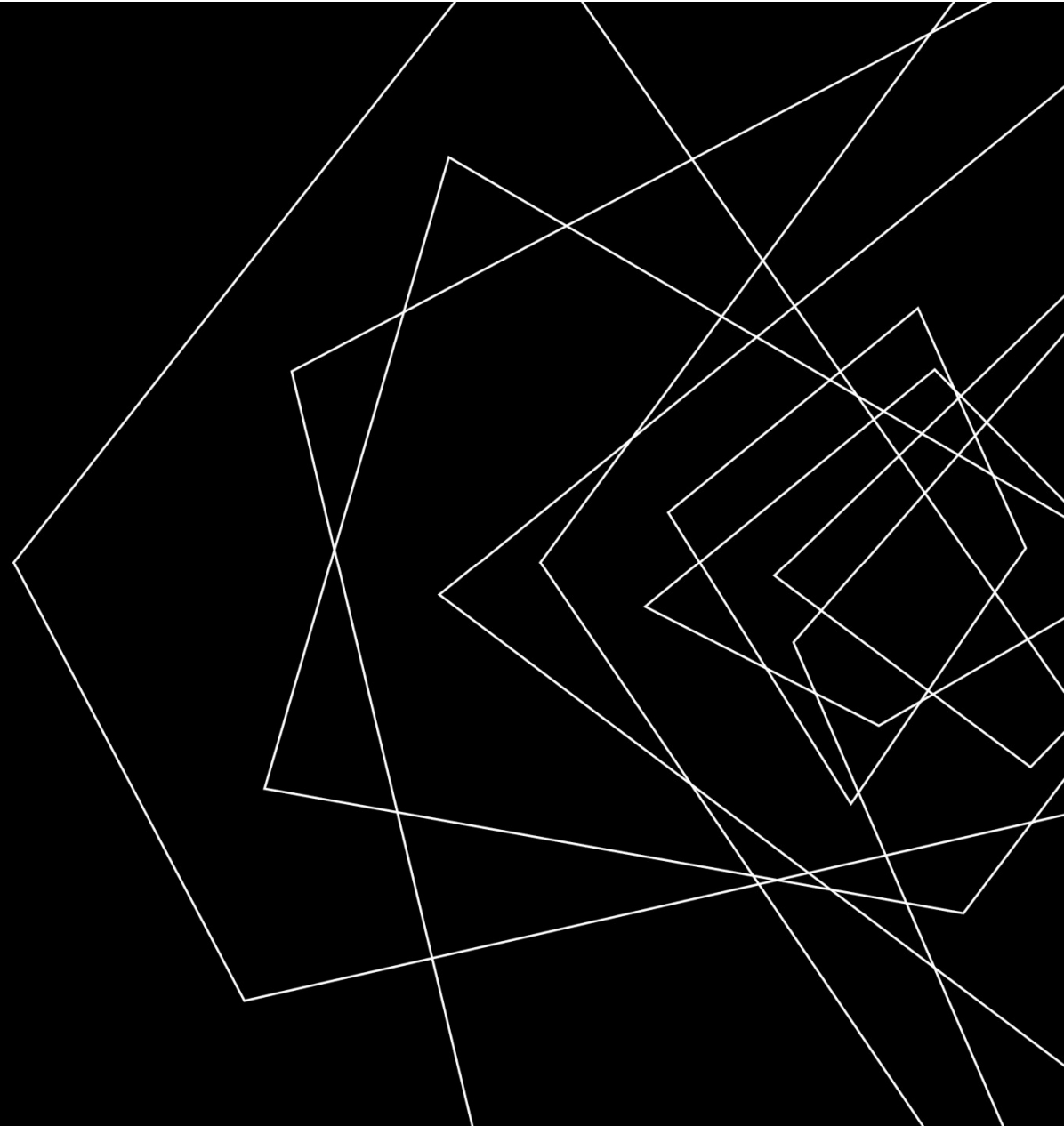


SUMMARY OF THE PROBLEM

Within the built environment sector there exists a problem wherein the current methods for visualizing the massing of a site and providing spacial context are becoming outdated and are not standing up to todays high precision standards. The methods that are currently used to combat this issue are either overly time consuming, expensive or are too technically complex to be easily understood. Due to the nature of initial site concepts changes are made frequently and thus methods of visualizing sites that have high turn around times can often lead to the product being obsolete by the time of its completion.

ABOUT THE ARTIFACT

My solution to this problem is a VR experience designed to showcase an upcoming housing development currently in the planning application stage. The intended use is as a visualisation tool allowing those working on the project and external planning officials to gauge the massing and spacial awareness of the site, taking into account any modification or updates made throughout the planning process.



ARTIST IMPRESSIONS

Artist's drawings were the traditional method for visualization projects however it is a fairly high cost and inflexible method, which lack the accuracy offered by modern CAD and BIM solutions

BIM MODELS

BIM models provide high levels of accuracy and lots of information but have very high initial investment, lack visual clarity and require specialist knowledge to properly understand. BIM models also take a very long time to create due to their complexity

PHYSICAL MODELS

These can be made with high degrees of accuracy using 3D printing and are good for seeing the comparative size of objects to one another however due to the model's small scale it is hard to visualize the site from a first-person perspective and are complex to amend

CGI RENDERS

CGI renders have exceptional visual fidelity and are good for showing how the final site will look however they are very time consuming to make and the viewer is normally limited to viewing the site from a few preassigned viewpoints.

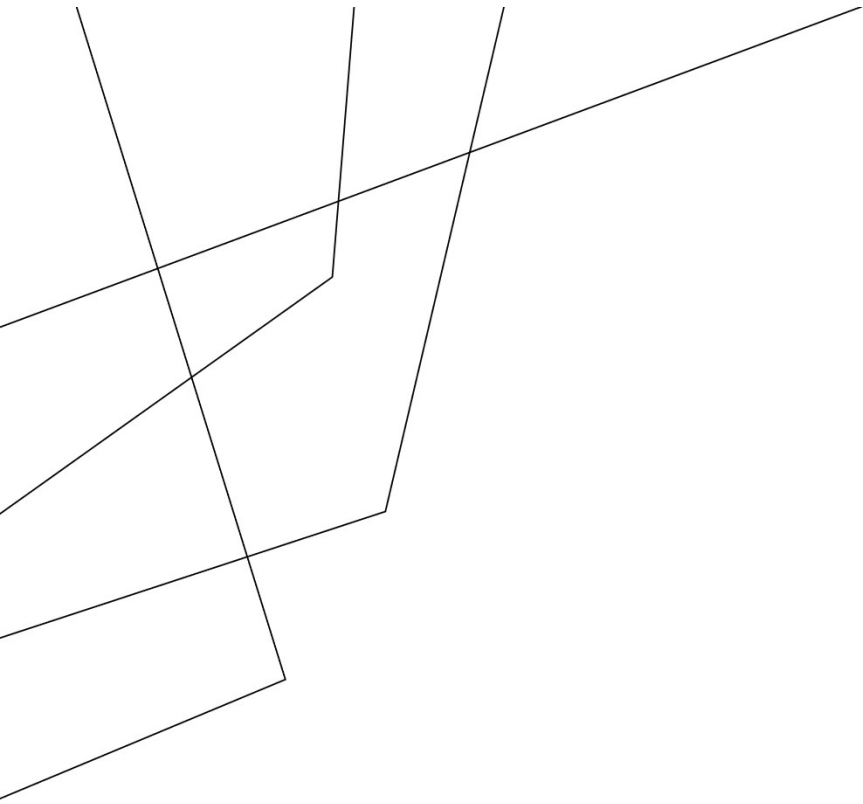
CAD DRAWINGS

2D CAD drawings are the industry standard way of communicating upcoming sites and have a good mix of a high level of detail, comparatively low turn around time and low cost. However, they are very hard to understand without specialist knowledge and doesn't provide visual perspective of the site

EXISTING SOLUTIONS

EXISTING SOLUTIONS





KEY FEATURES

Precision

It is imperative that the scaling of the experience be true to both reality and the proposed plans otherwise it won't be able to be used for planning purposes. To ensure this I stuck rigidly to the provided CAD data and drawings.

Simplicity of use and accessibility

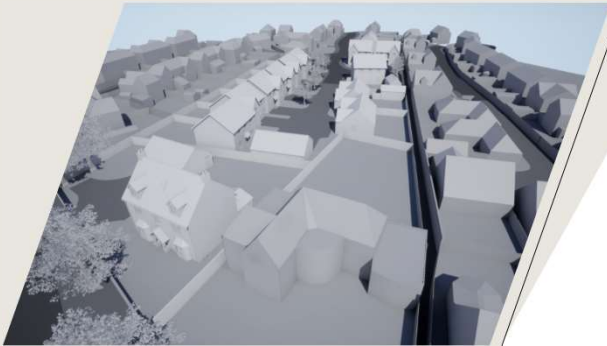
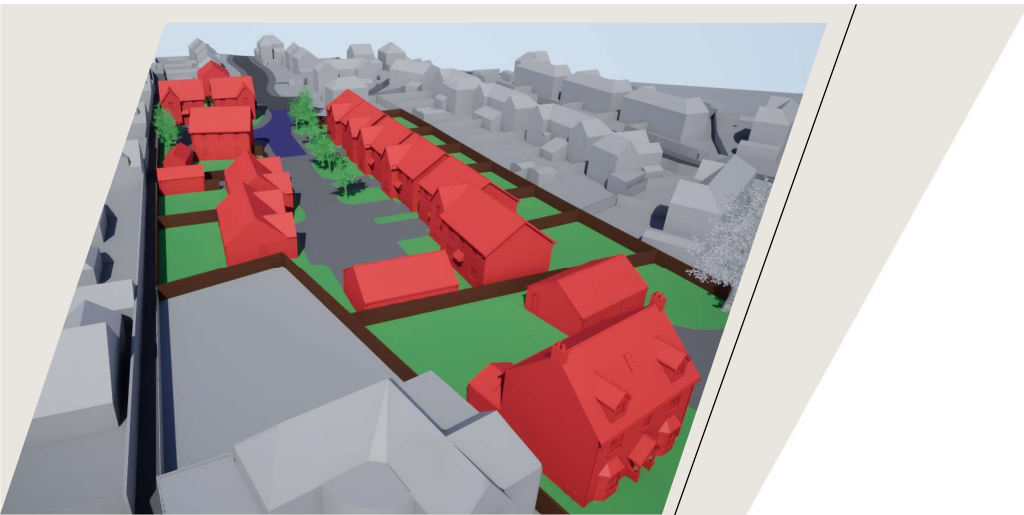
One of the biggest criticisms of current spatial visualisation methods is that they require specialist knowledge to properly understand and lack visual clarity. As a result it was important that my artifact be easy for any user to interact with and understand.

Easy of update

Owing to the rapidly changing nature of building projects in their initial design stages it is important that I ensure the project can be easily iterated upon to accommodate updates to the scheme. These can come in the form of changes to individual buildings or to the layout of the site as a whole.

Cost

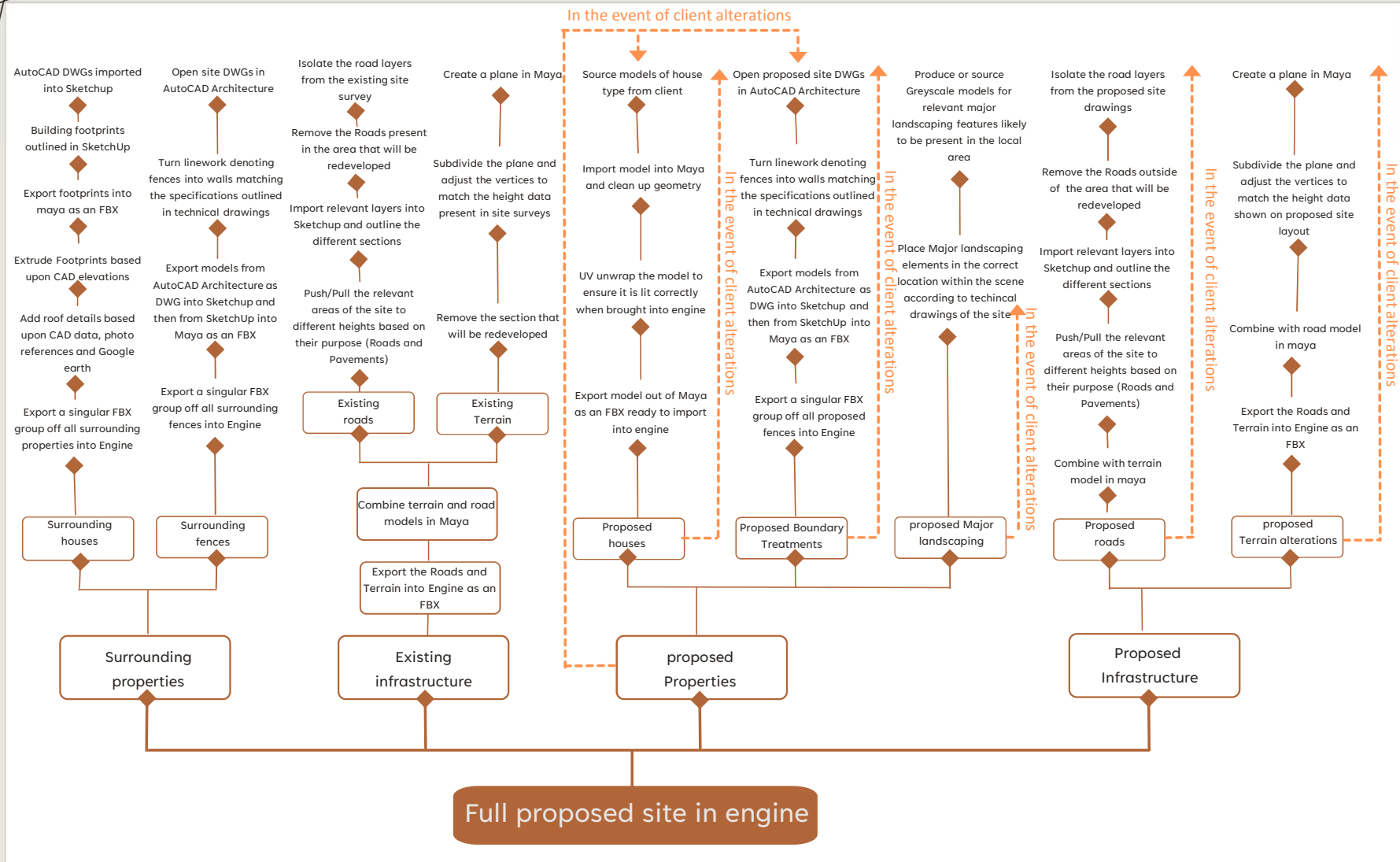
It is important that the artifact be produced in a realistic and efficient timescale to reduce the associated cost of the work. Not only is the initial creation time required to be kept low. It is imperative the firm has the ability to continually iterate upon their design and have these changes included within a short timescale to keep the continued costs manageable as well.

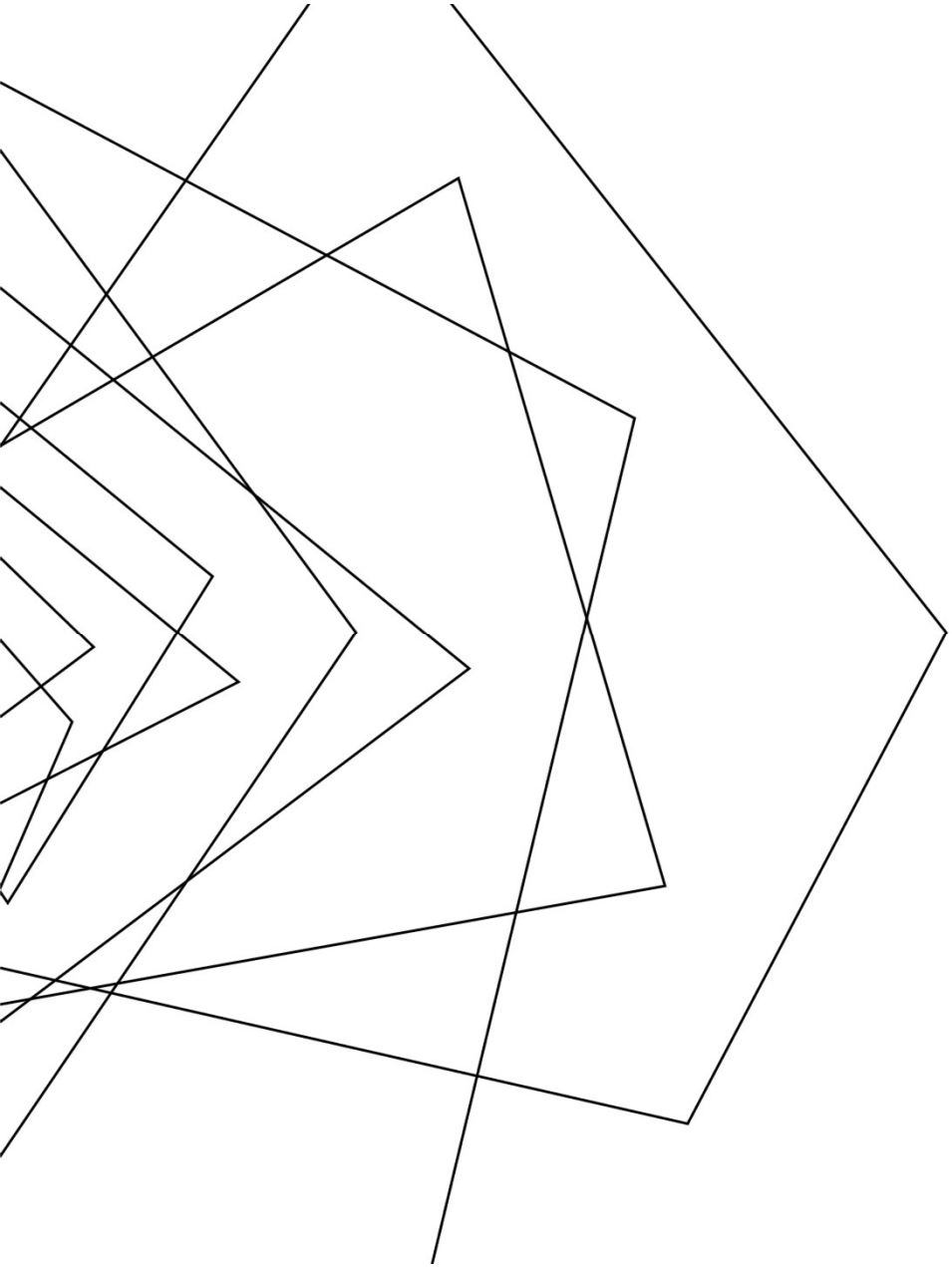


IMPORTANT DESIGN DECISIONS

- The experience contains only basic block colour textures to keep turn around time down and to ensure the projects focus remains on allowing the user to get an understanding of the spacial context of the site as opposed to the finished visuals
- The surrounding properties, whilst accurately scaled, were deliberately left with minimal detail
- The user was given full access to explore the site but also given the option to jump to key predetermined locations deemed most useful by the client with the intent of making it easier for users less familiar with vr
- A toggleable “planning mode” was added which dramatically changed the colour of the new sections of the project to better differentiate them

METHOD





USABILITY ISSUES

SECURITY AND FIREWALL CONCERNS

Due to strict company firewalls and security policies, there were issues deploying the artifact as due to it being an app from an unknown developer it gets flagged as a potential threat.

ACCESS TO VR HARDWARE

Due to VR technologies lacking widespread adoption within the built environment sector the client didn't have access to VR hardware so it was necessary to provide them with VR hardware as well as access to a non-VR version of the program which can be used to allow for testing of the artifact outside of a VR environment

INDUCTIONS INTO VR

Further to the previous issue, due to VR having not established a firm foothold in the built environment market there is a general lack of VR experience amongst the workforce and hence there needs to be a more robust onboarding process for an experience of this nature than this artifact provides. However, adding an onboarding portion to the experience would add extra time and cost to the project and so as this feature was not requested by the client It was not included

CLIENT EVALUATION

In order to assess the success of the project I requested the client evaluate the artifact and provide feedback on where it succeeds and where it requires further improvement. This testing was conducted

Key Feedback

- The Client was happy with the accuracy of the artifact and deemed it suitable to use it for planning purposes
- They found the Artifacts functionality easy to understand and helpful
- The Client was impressed by the ease with which the experience could be updated to accommodate changes to the site
- The clients main criticism was that they were not able to make full use of the artifact due to the security concerns



Assessment of VR220 project by Ethan Baldwin
Falmouth University, 28/03/2022

The original proposal was to construct a new 5-unit development on part of the site, and to utilise the model internally to convey from the technical department to the Sales & Marketing team what was envisaged and thus maximise the value potential for the dwellings.

However, during the Peveril design process, it became evident that the potential sales values anticipated were not sufficient to warrant the scheme originally envisaged. Hence the actual scope for the project changed during the design phase, which is common to almost all developments at the early stages.

The information provided to Ethan was normal for CGI artists, but with the specific instruction to avoid providing too much detail, as this would create to great an emphasis on minute details in preference to the proportion and massing for which the task was intended. The principal concern was whether this type of media could convey with sufficient accuracy the proportions of the new scheme, and the relative impact both from and to the surrounding houses.

Summary

In terms of what was achieved by the current composition, we have established the following:

1. The level of detail and extent of modelling of the surrounding area was much greater than originally envisaged, but this has provided a much greater context to the new scheme.
2. Having reviewed the existing survey data and referencing to Google Streetwise (plus live attendance on site) we believe the massing of the surrounding properties is reflecting of as built and should enable a true reflection of the visual impact.
3. The variation in the level of detailing between existing dwellings and the new properties makes it simple and is ideal for this purpose.
4. We particularly liked the flexibility in the model to amend and move components, which is usually very costly and time consuming in CGI commissions. This is probable most apparent from a scheme of 5 No. to a scheme of 13 No. units during the works.
5. We encountered several I.T. issues during the process, some of which are still ongoing, to enable the importing of the actual model into a commercial environment. Much of the software used are not mainstream architecture of business related and as such are not deemed as 'safe' for a commercial network.
6. The ability to export the model and move around the scheme in both V.R. & Non-V.R. has provided a much greater scope to share the information with other parties, without the nervousness of Virtual Reality use.
7. The on-screen selection of viewpoints makes it much simpler for novices to manoeuvre round the layout.
8. The later additions of the 'planning mode' switch creates a very beneficial function to explain what building are proposed, but with it turned off is shows simply how the development sits within the locality.
9. The Addition of Peveril Homes Logo and Site title brings a greater context to the business and enables a wider audience to view the results

Conclusions

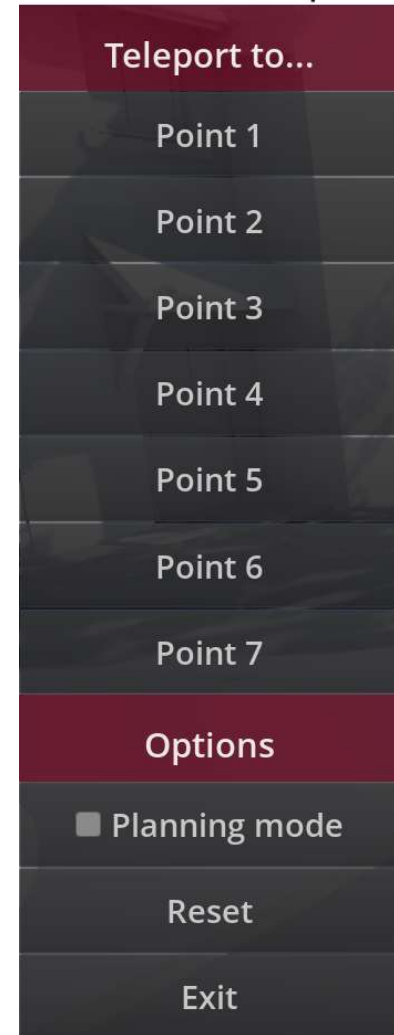
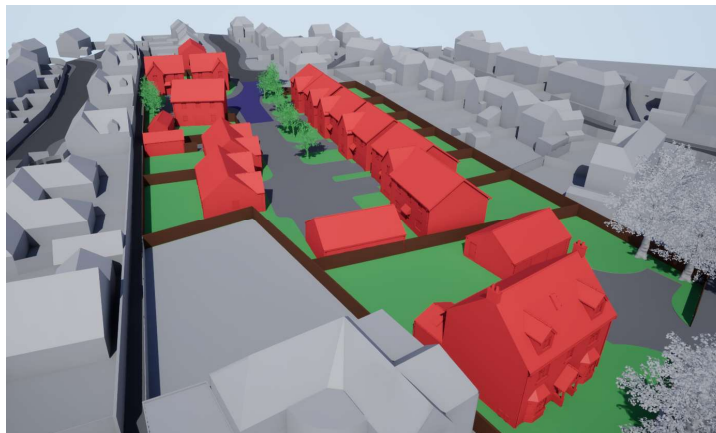
The assignment has created a product which has exceeded the original expectation, we are currently in discussions with the Local Authority planning department as to how this specific information can be included into the formal submission for this site, currently utilising screen shots of various views but aiming to progress to more (pending their I.T. abilities and security arrangements). We are also reviewing the option to utilise the modelling of other larger scheme going forward at this stage to aid the design process. This project has identified a huge benefit to the possibility of a simplistic 3D design method, which though available in some Architectural software (i.e., Revit) is not truly utilised as it becomes too complex, time consuming and detailed.

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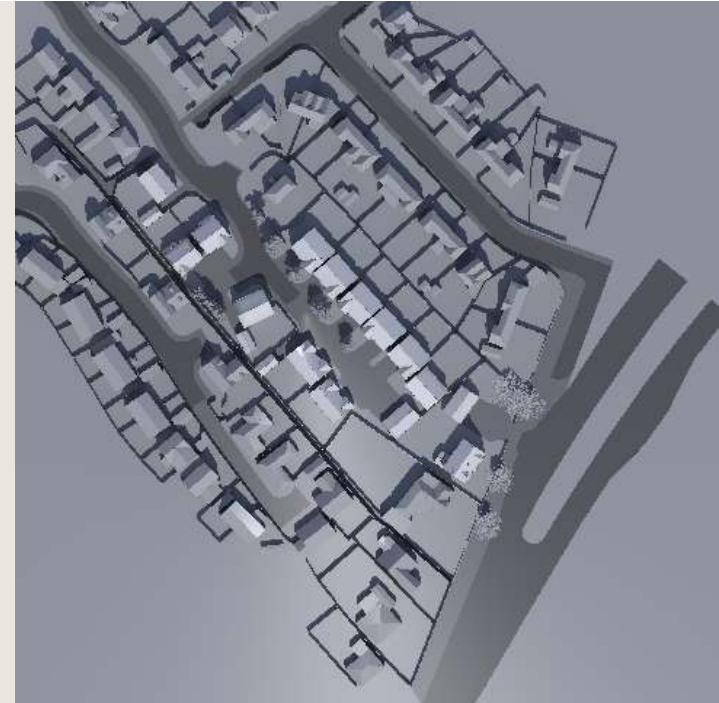
SIMPLICITY OF USE

Owing to the target audience of the artifact being professionals operating in an environment that is yet to adopt VR techniques in their day to day workflows it was imperative that the experience itself be kept simple and easy to understand and use. For this reason the artifact itself was designed to feature intuitive control systems and menus to ensure that the user be able to access the information they require regardless of their skill level. A teleportation based movement system was chosen due to its simple and easy to understand design whilst minimizing the prevalence of VR sickness which is much more prevalent in users new to VR (Kolasinski, 1995.) it was also decided that a simple menu be implemented to allow those users not comfortable with free teleportation to be placed in key locations around the site at the push of a button. These locations can be changed or additional locations added at client request. A planning mode was implemented part way through the development process which significantly changes the colours of the proposed aspects of the site to allow a planner or employee to better understand which parts Peveril will be working on. A non VR version of the project was also created to allow the client to utilize the artifact in environments where no VR hardware is present.



PRECISION

- The credibility of any artifact with respect to design decision is critically dependant of the accuracy of the information.
- The tolerance of the existing surrounding properties is slightly greater than the proposed dwelling, however any discrepancy would render the entire submission obsolete
- I utilized industry standard software featuring live plans and elevations to model the site to ensure that I was working to the same degree of accuracy as the client themselves.
- It is essential that the model be a true representation of the CAD drawings and thus there can be no artistic licence



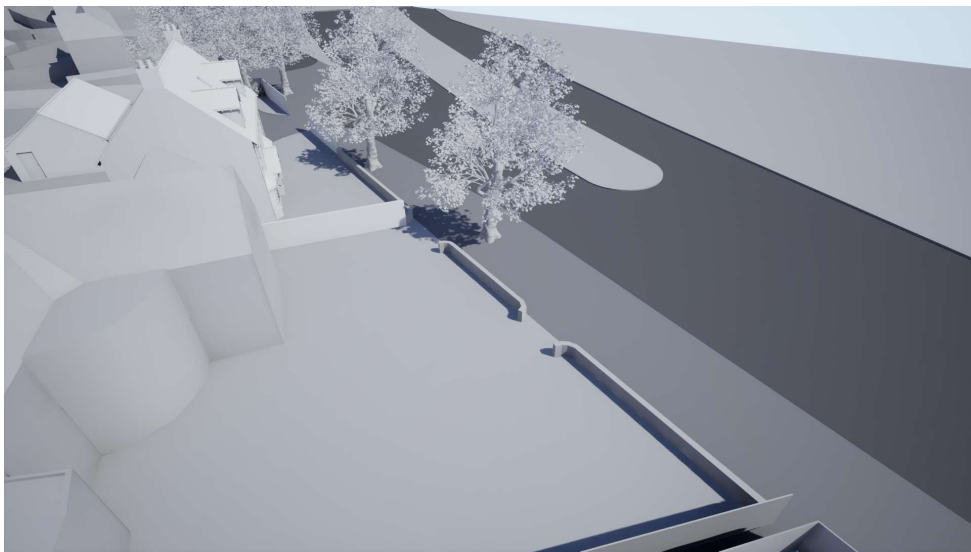
EASE OF UPDATE

In the initial briefing the client made it clear that there would be changes to the proposed site made over the development cycle of this artifact and as such I ensured that the artifact was separated into easily replaceable segments to allow me to quickly update the models of individual aspects of the project if they were to be changed. My artifact contrasts with existing methods such as the use of CGI renders or artists sketches of upcoming sites, in that only small portions of the artifact will need to be replaced when changes are made as opposed to a complete remake. This is because images such as the renders seen on this slide are created by layering textures on top of captures of 3D models within Photoshop, this allows for incredibly realistic realistic results in a shorter time than it would take to model a photorealistic virtual environment but also means there isn't the scope to easily incorporate changes into these renders at short notice



GOING FORWARD

After the deadline I have continued to work with Peveril homes to develop the project, whilst the core functionality hasn't changed there have been a number of quality of life changes and Design revisions. Whilst the project remains in the planning stages I fully intend to continue to work alongside the client to keep the artifact up to date and ensure it remains useful



Key changes

- Updated UI elements to match Peveril company colours and branding
- Made the “Planning mode” toggleable
- Updated the walls at the front of the site to accommodate changes made by the client
- Going Forward It is imperative that I find away to circumvent the security issue established by the client



THANK YOU

References

House Type & Layout Design – Peveril Homes, Beech Lawn, Green Lane, Belper, Derbyshire

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Surrounding Building Survey Data - Ordnance Survey, Adanac Dr, Southampton SO16 0AS

New Building Modelling, Peter Curran, Tetra Tech Manchester, Quay West at MediaCityUK, Trafford Wharf Road, Trafford Park, Manchester, M17 1HH.

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