

DESIGN PRINCIPLES FOR VR GAMES

Barnaby Smith

BACKGROUND - WHO AM I?

Barnaby Smith

- Studio Tech Director of Soul Assembly
- 12 years industry experience, covering programming, design and various leadership roles



BACKGROUND - WHO ARE SOUL ASSEMBLY?



- Indie studio in the heart of Leamington
- Focused on XR (VR, AR and MR)









DESIGN PRINCIPLES FOR VR GAMES

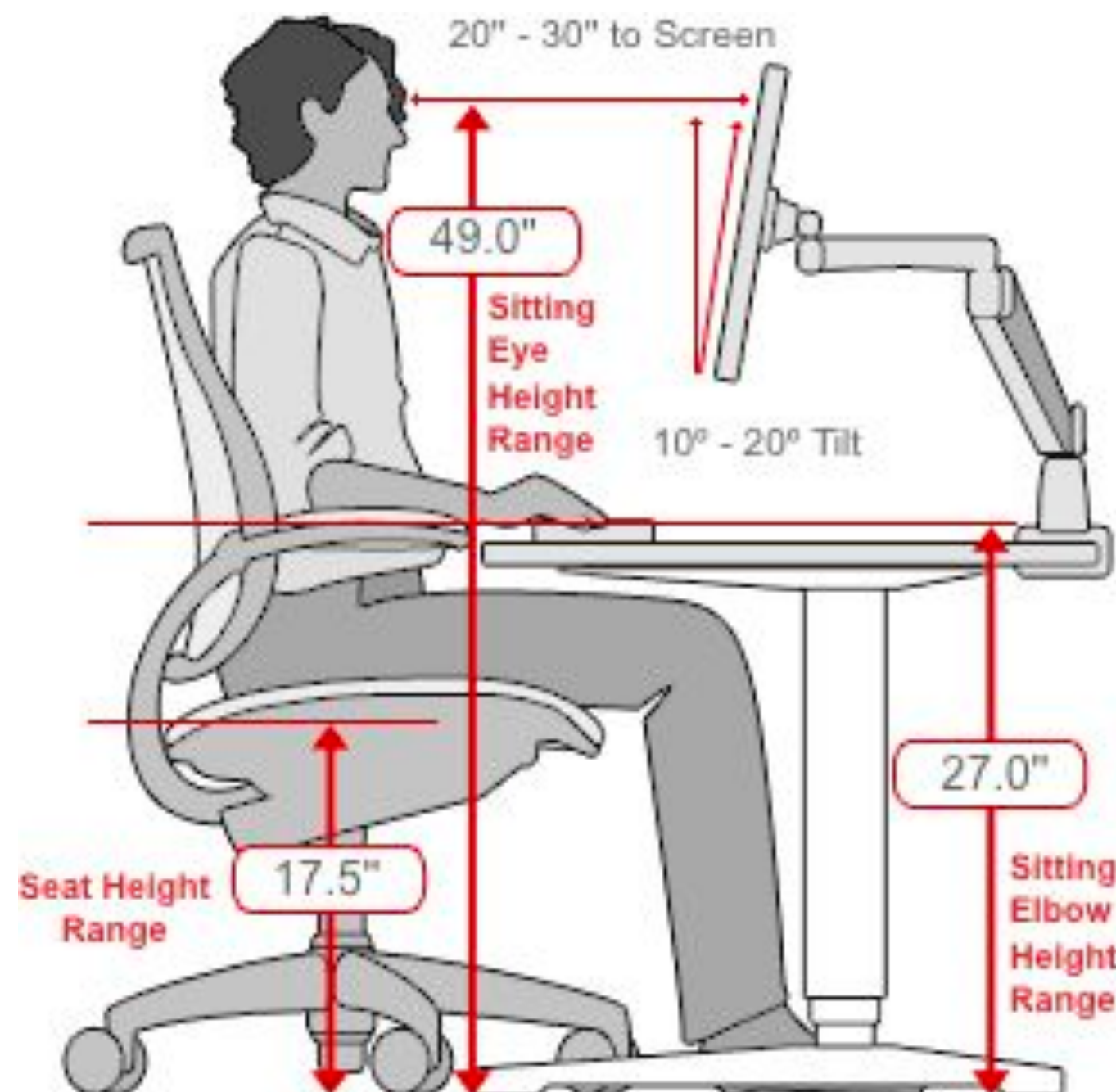
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**START WITH THE REAL
WORLD**

USE REAL WORLD SIZES AND STANDARDS

- For objects always start with the real equivalent
- ISO standards for many industrial objects
- Ergonomic standards for lots of objects
- Google standard sizes

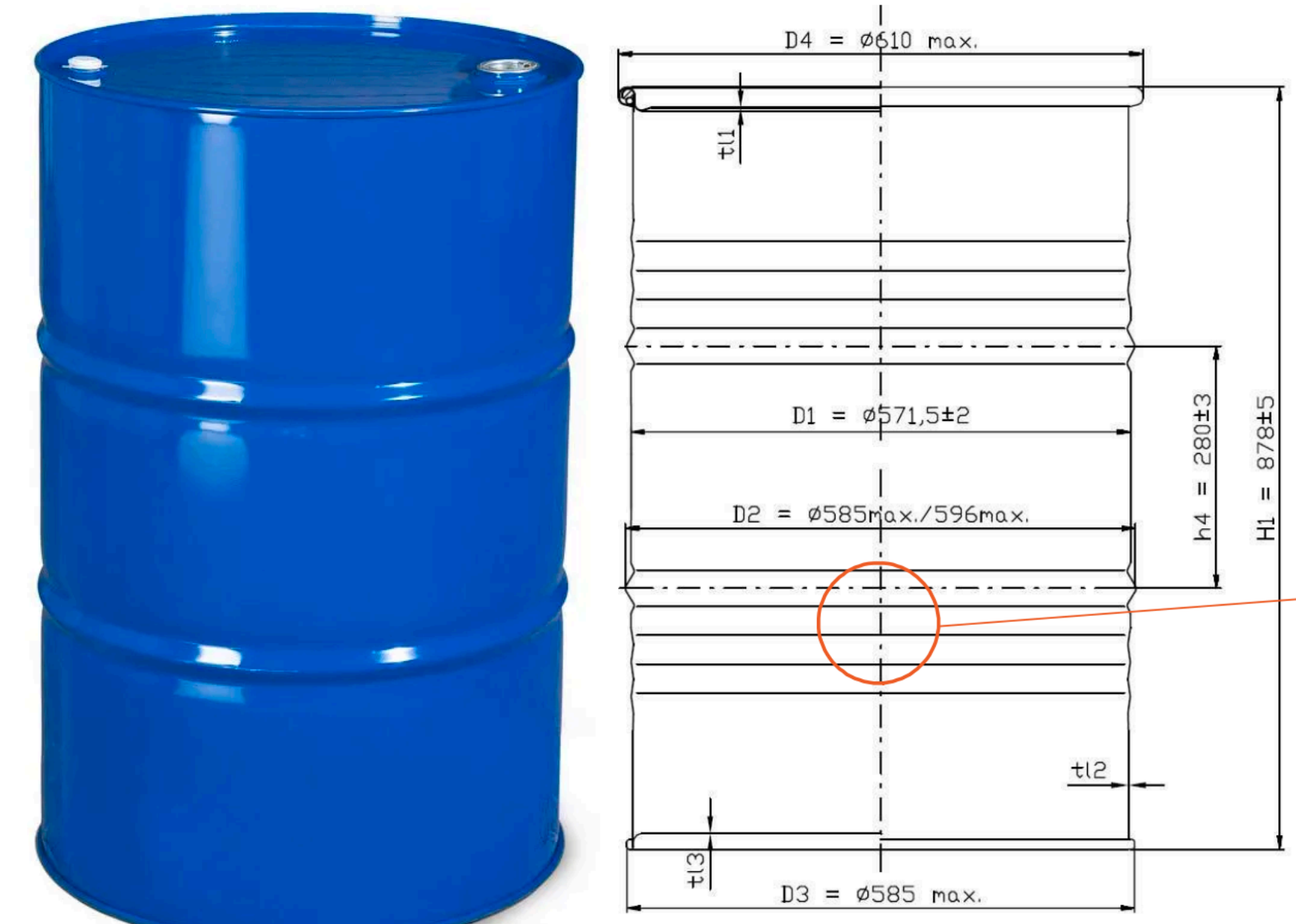


Staircase Building Regulations UK

When it comes to staircase design and the [Building Regulations](#) you should familiarise yourself with Approved Document K.

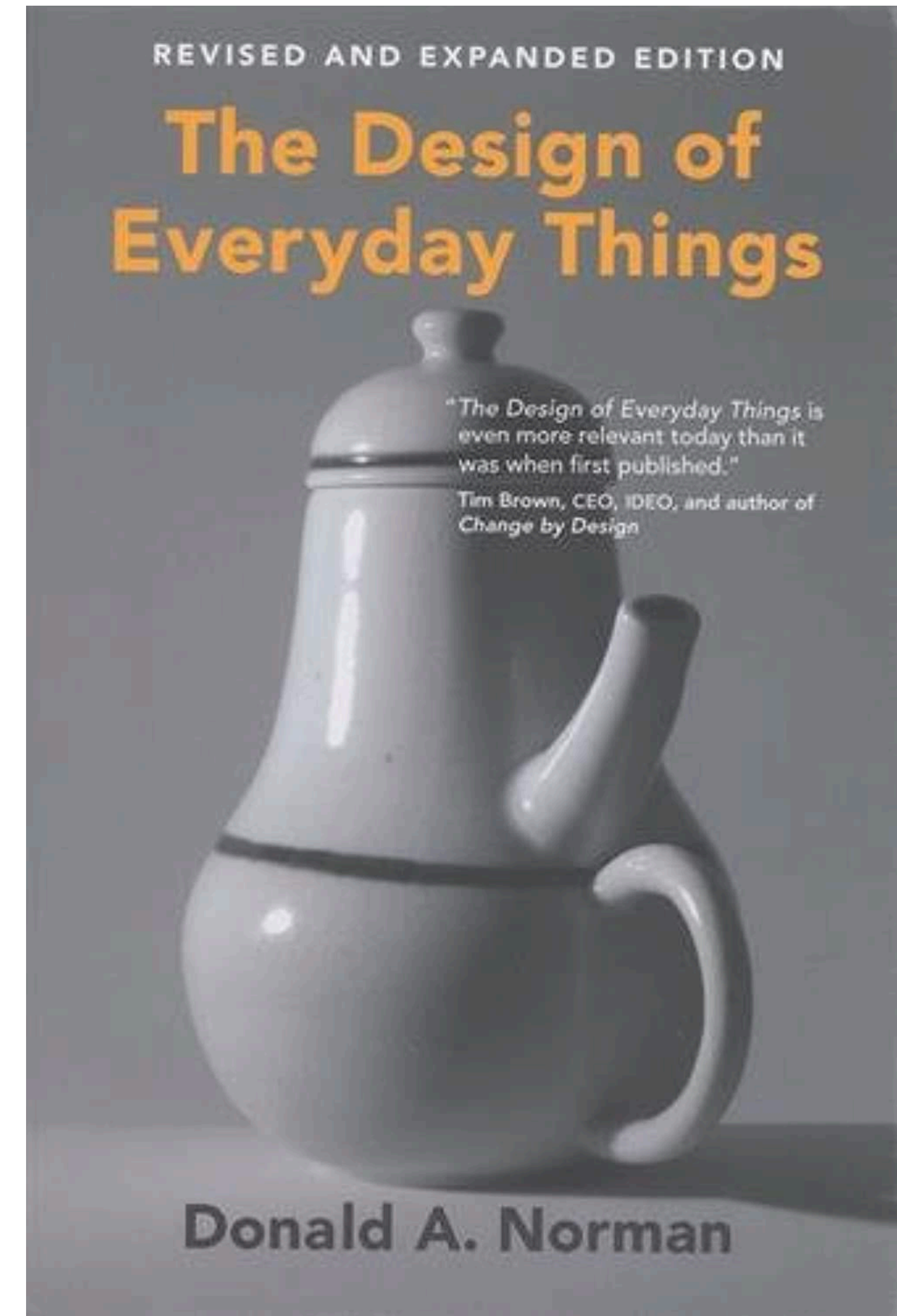
Staircases have the potential to be safety hazards if not designed properly. If you are buying from a staircase specialist they will be able to advise you — as will your architect or builder.

- Staircases should have a maximum rise of 220mm and a minimum going of 220mm
- They should have a maximum pitch of 42°
- Flights should have a handrail on at least one side if they are less than 0.75 metre wide and on both sides if they are wider than this
- Handrails on stairs and landings should have a minimum height of 900mm
- No openings of any balustrading should allow the passage of a 100mm sphere



AFFORDANCES & SIGNIFIERS

- Affordances are what actions an object allows
- Signifiers are how you discover them
- Generally if it's bad in VR it's bad in real life and vice versa



DIAGNETIC INTERFACES & WORLD

- Integrate into objects in the world, think about how it would work in real life
- Don't rely on HUD markers, find in world ways of directing the player



WORLD BUILDING AND LEVEL DESIGN

- Depth creates a very different experience in VR, good flatscreen level design != good VR level design
- Creating layers of depth in smaller environments feels great
- Smaller experiences tend to feel more effective than larger vistas









MAXIMISING PLAYER EXPERIENCE

HIGH QUALITY INTERACTIONS

- Intent is paramount -
Be careful around what
requires “skill” versus
what is janky
- Spend time on how
hands interact with
objects and the
environment, passively
and actively



SIM COMFORT

- Most new players will get sim sick
- Many players become tolerant over time, however not all
- Pick a level that you're willing to accept, however it will exclude players:
 - Too “comfortable” and the more hardcore players won't enjoy it
 - Too “intense” and newer players will feel sick
- There are ways to achieve both, e.g. Half Life Alyx's hybrid controls



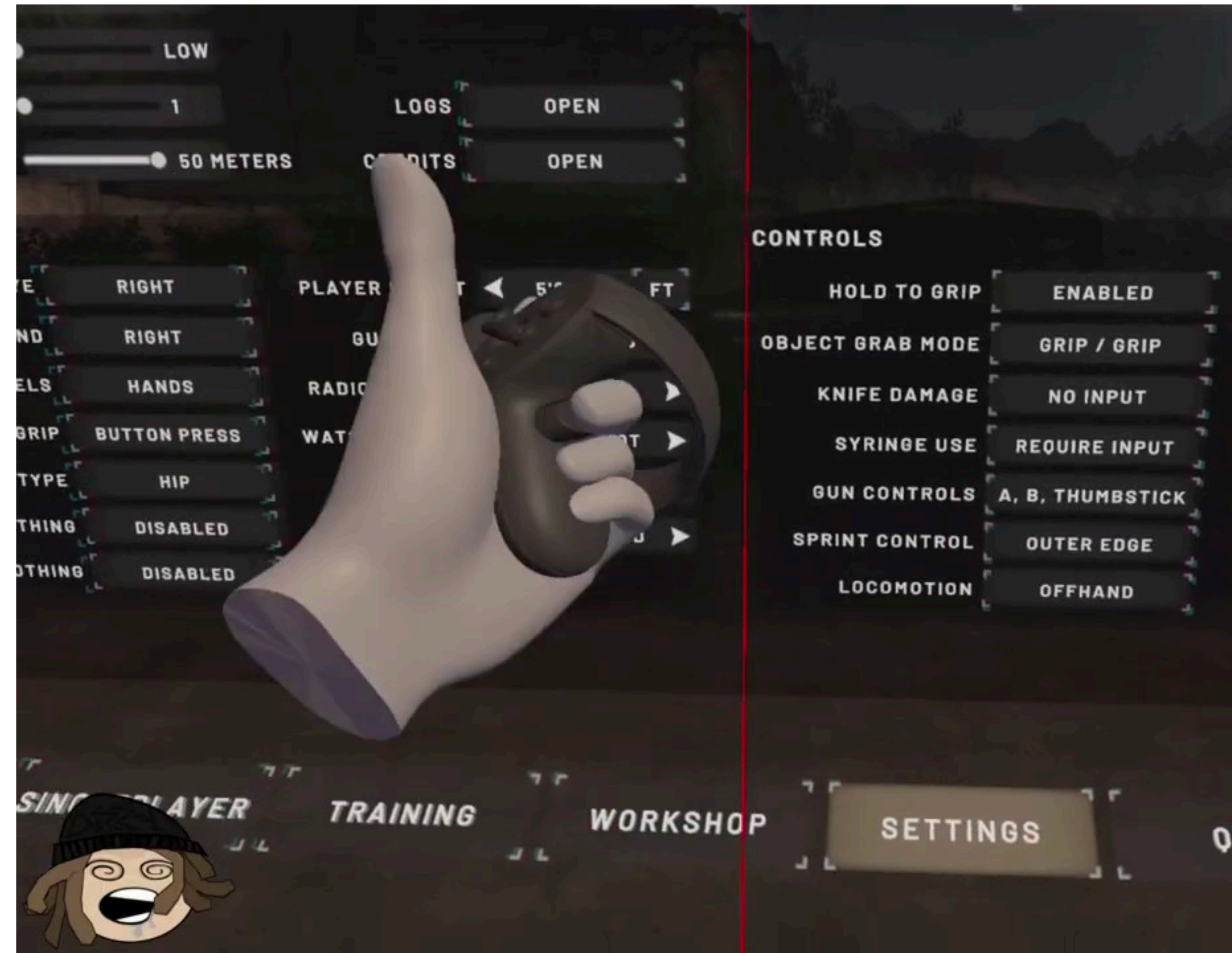
PHYSICAL COMFORT

- Keep play sessions short, 15 to 20 minutes for most players.
- Consider physical issues in encounter design, avoid enemies in hard to reach places
- Avoid large amounts of text and reading in VR
- Value player time, minimise load times and busy tasks/grinding



ACCESSIBILITY OPTIONS

- Player expectation for a broad range of options, including:
 - Snap vs Smooth Turn
 - Turn speed/angle
 - Head vs Controller move direction
 - Vignettes
 - Grip toggles
 - Height/Arm span overrides
 - Seated mode
 - Artificial crouch
- Make sure to cover the gamut of options



OTHER AREAS OF IMMERSION

- Cinematics in VR are hard to do well, interactivity adds a lot
- Spatial audio still has lots of opportunities
- Good haptics can also build immersion



PLAYER AVATARS

- Everyone's bodies are different, can be immersion breaking if your first person body is too different
- Opportunities here too for deliberately different first person experiences

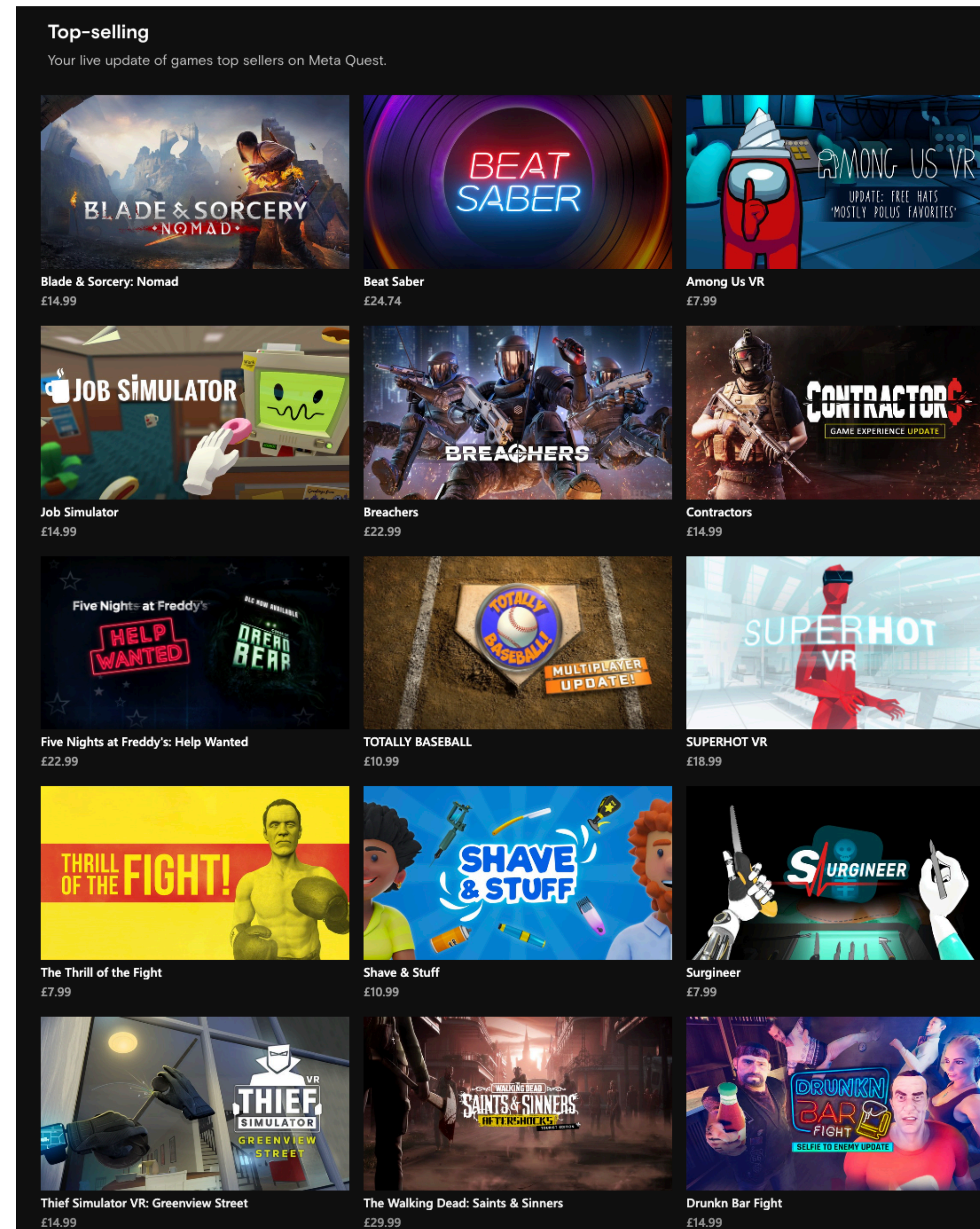




FINAL THOUGHTS

GENERAL TIPS FOR BUILDING FOR VR

- Play VR games, Play VR games, Play VR games
- Keep up to date with VR news, UploadVR's VR Download podcast is great
- Always build with VR in mind
- Find a way to iterate quickly



QUESTIONS

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