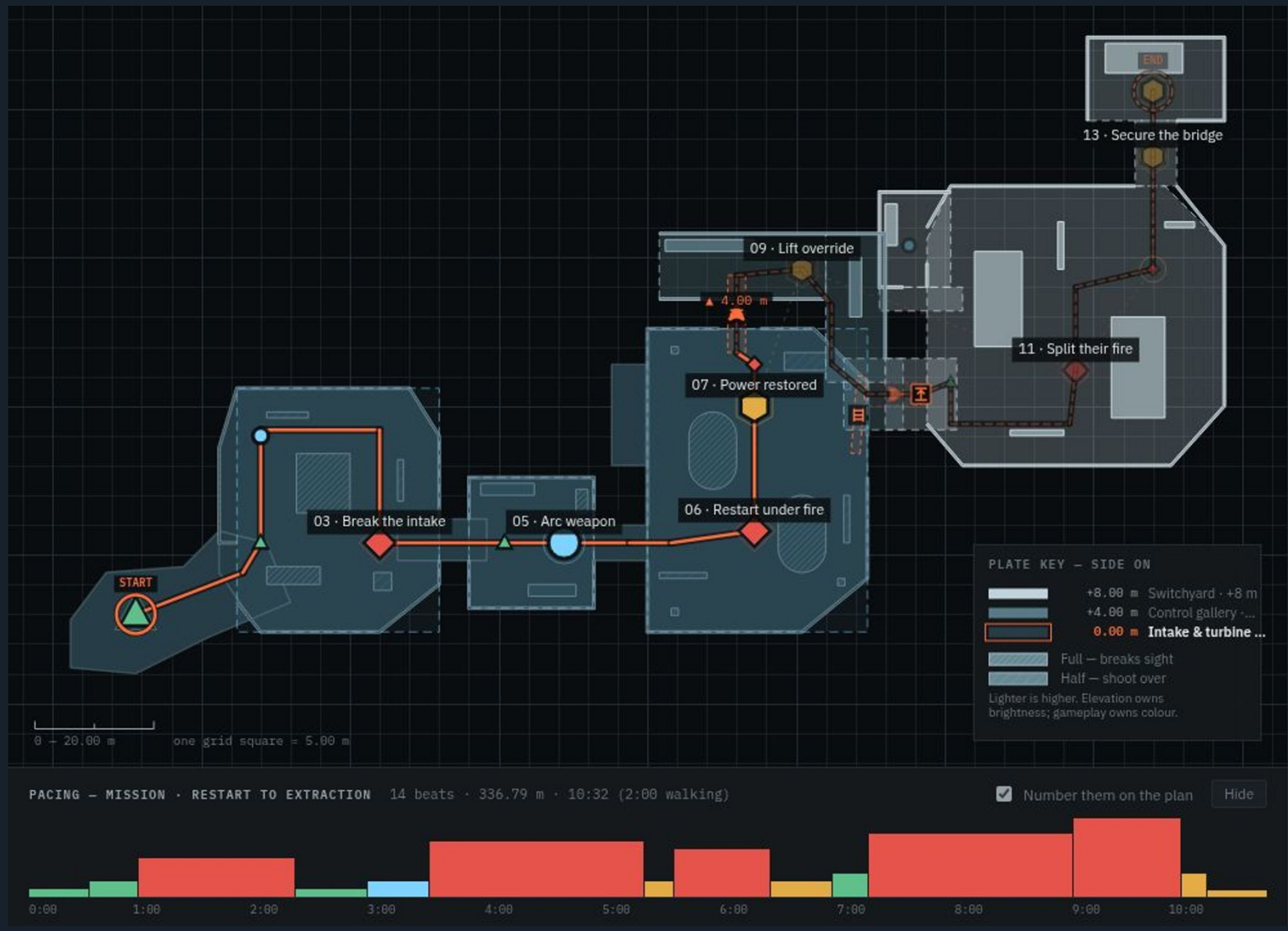
PROTOMAPPER

From top-down design to playable blockout

A designer-authored workflow that turns spatial intent, routes and reference art into labelled, per-actor Unreal blockouts, with evidence.



It starts with the designer’s vision

Before anything is built, the level designer plans the level in Protomapper.

SPACE	Rooms, elevations and cover
FLOW	Main and optional routes
GOALS	Objectives, encounters and pacing
REFERENCES	Notes, labels and art for each area

Everything labelled, in one plan

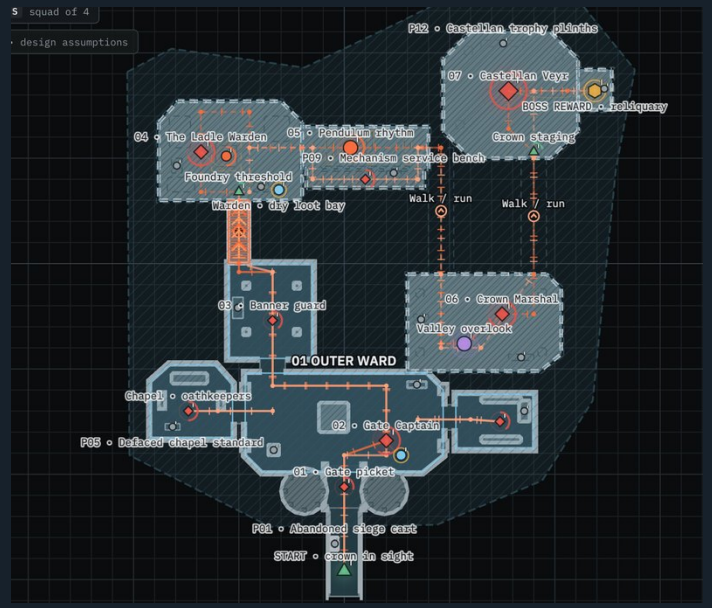
Protomapper lets the designer draw the level and label everything they want the team to know, so everyone reads the same vision.

The same plan prepares the blockout generation.

One plan, three artefacts

1 · PLAN

The designer draws it



Areas, heights, routes, pins and notes in the web editor. Cinder Crown, by Kelvin.

2 · INTERPRETER

Rules read it

01 OUTER WARD
43 actors → Datum / Outer Ward
"Twin gate towers frame the crown"
view check: 11 pieces in the way → 3

03 LADLE FOUNDRY
"One active lava pour; never add another hazard"
view check: clear

Every note, shape and route becomes a named entry in a manifest, with a written report.

3 · BLOCKOUT

Unreal builds it

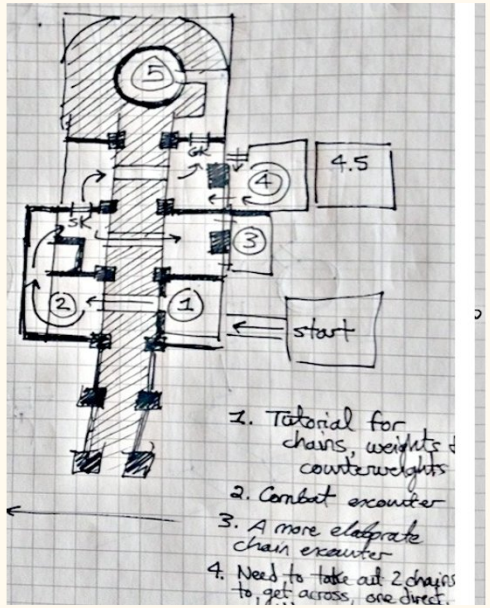


Each entry becomes its own actor in the editor, in folders that mirror the plan.

CINDER CROWN · 7,230 named actors · built in 28.6 min · every one traceable to the plan

A typical map shows where. Protomapper records why.

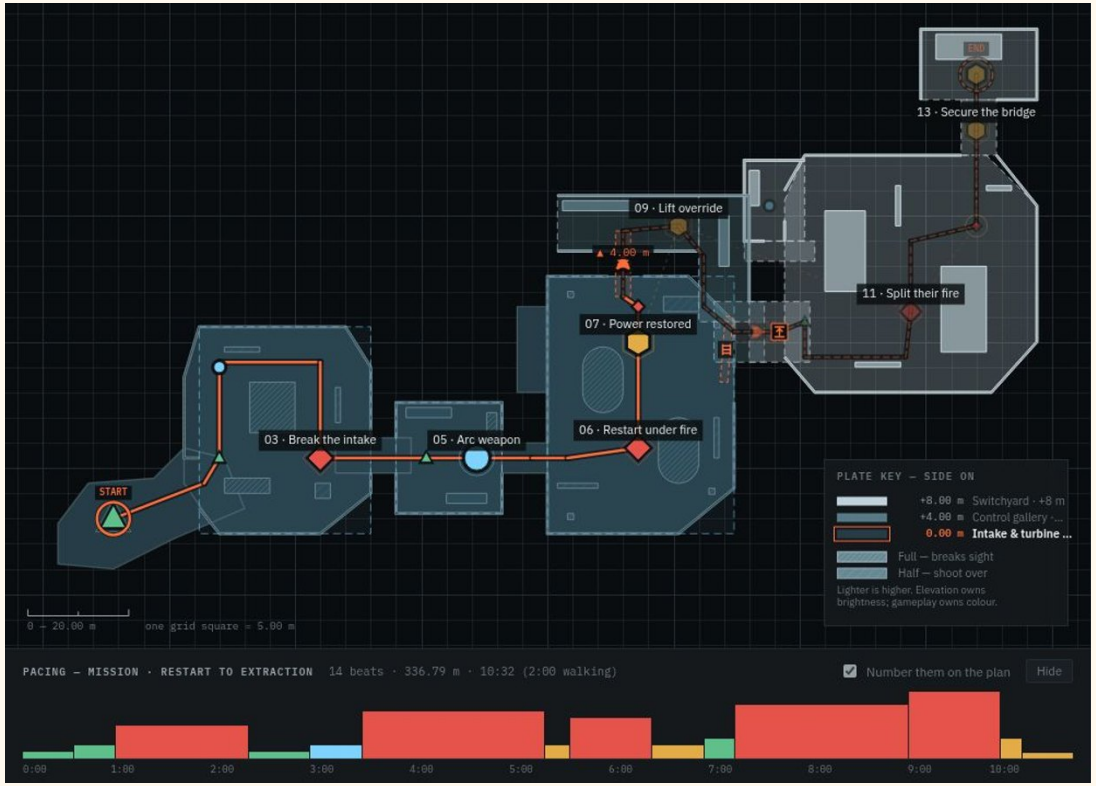
A TYPICAL TOP-DOWN MAP



Rooms and a key: where things are, but not how players move, how high anything is, or why

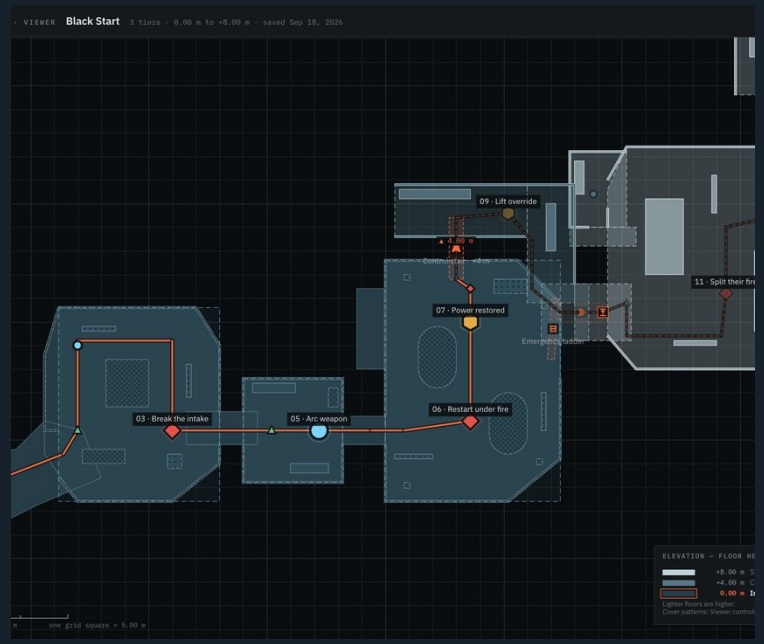
Example: a Quake level sketch by Andrew Yoder, from The Level Design Book (book.leveldesignbook.com). Permission needed before external use.

A PROTOMAPPER PLAN · BLACK SIGNAL



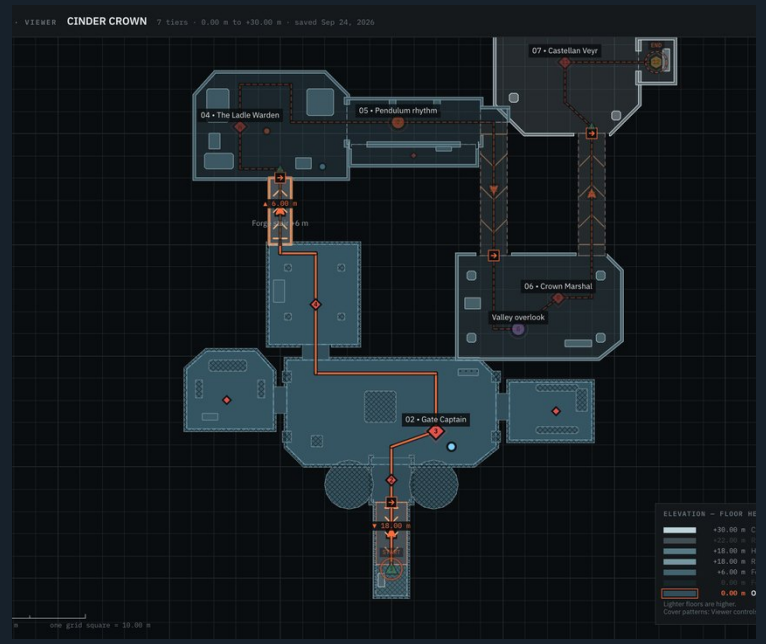
Measured space · elevation tiers · labelled pins · routes · an intensity curve for pacing · art references by area

Three views make the plan reviewable



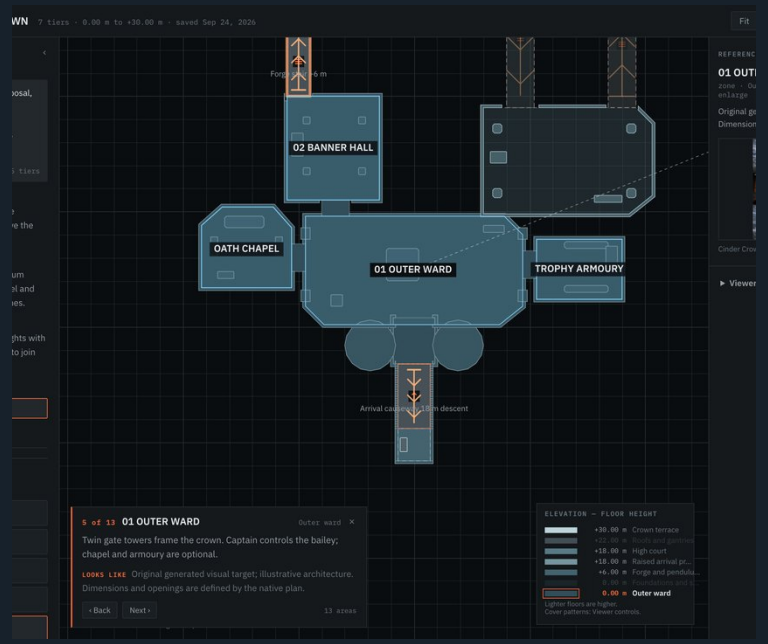
ROUTES

Main and optional paths, with every bend and turn the player takes



ELEVATION

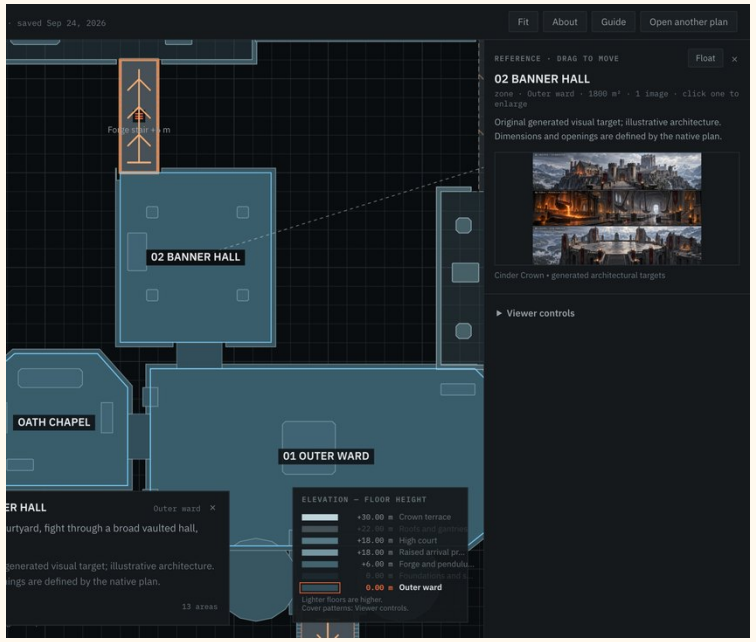
Height tiers and the stairs and ramps between them



AREA INTENT

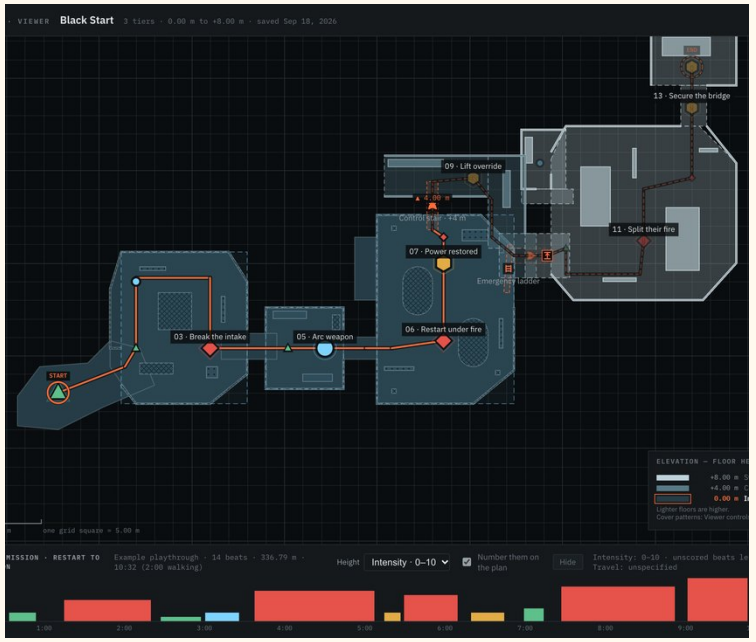
Named spaces, their roles and the designer's notes

Design logic is visible before the build



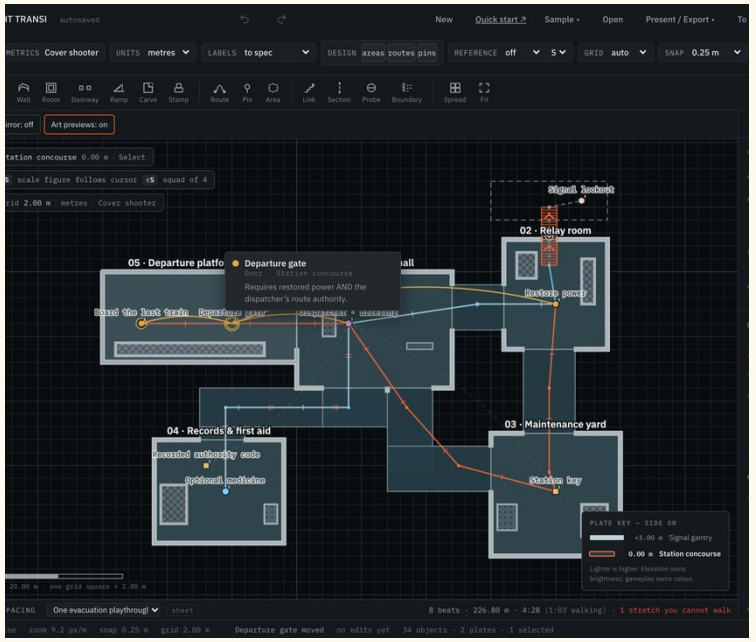
AREA REFERENCES

Reference art attached to each area, right in the editor



INTENSITY CURVE

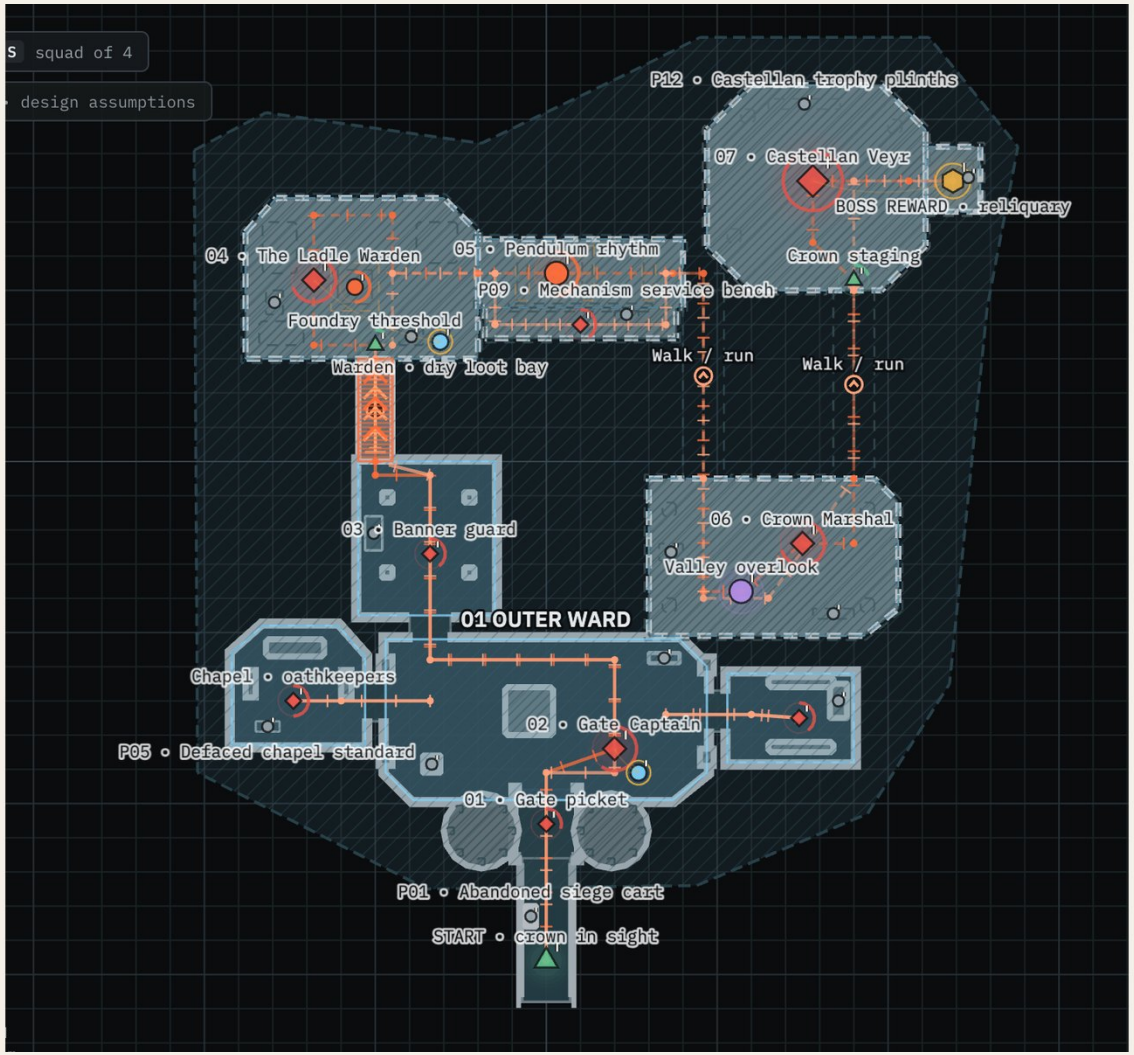
Pacing is designed along the route, not guessed



DOOR + KEY

Key or code → authorise → departure gate

This is the finished design handoff



A DESIGNER MUST HAVE FIGURED OUT:

- ✓ Room size and connections
- ✓ Primary and optional routes
- ✓ Encounters and objectives
- ✓ Elevation and traversal
- ✓ Pacing and intensity
- ✓ Reference art by area

Only then does the interpreter take over.

Explore it yourself: CinderCrown-viewer.html is attached with this deck.

How the interpreter plans a blockout

THE PLAN

Areas, heights, routes, pins and the designer's notes

AREA REFERENCES

The reference reader breaks each area's art down into shapes, materials and landmarks

ART CONTEXT

One file for the whole project: palette, signature pieces and the shape vocabulary

THE INTERPRETER

Read every shape, height, route and note

Analyse connections, slopes, cover, jump reach

Propose missing walls, roofs, supports, lights

Dress rocks, castle pieces, landmarks, role colours

THE BLOCKOUT PLAN

A list of every piece, each traced to its area and note, with a written report. Unreal builds it piece by piece, then checks sightlines, keep-outs and walked routes.

AI reads, rules build. AI helps read the references and draft the art context; the designer reviews both. The build itself follows fixed rules, so the same inputs always give the same blockout, and every new option is off by default.

Plain-language notes become geometry

THE DESIGNER WRITES	THE INTERPRETER BUILDS
"Banner hall", "corridor"	→ Roofed interior with door headers
"pitched slate roof"	→ Gable roof in place of a flat one
Setting mentions "castle"	→ Castle kit: crenellations, towers, braziers
Wall noted as a "parapet"	→ Capped at 1.1 m so players see over it
"Ruined" or rocky edge	→ Rubble clusters, kept 1 m off every route
Any note at all	→ Copied onto the actor, readable in Unreal

CINDER CROWN · OUTER WARD



Castle setting, gate towers, banners, braziers and a parapet causeway: all from the plan and its notes.

The designer’s requests are checked, not assumed

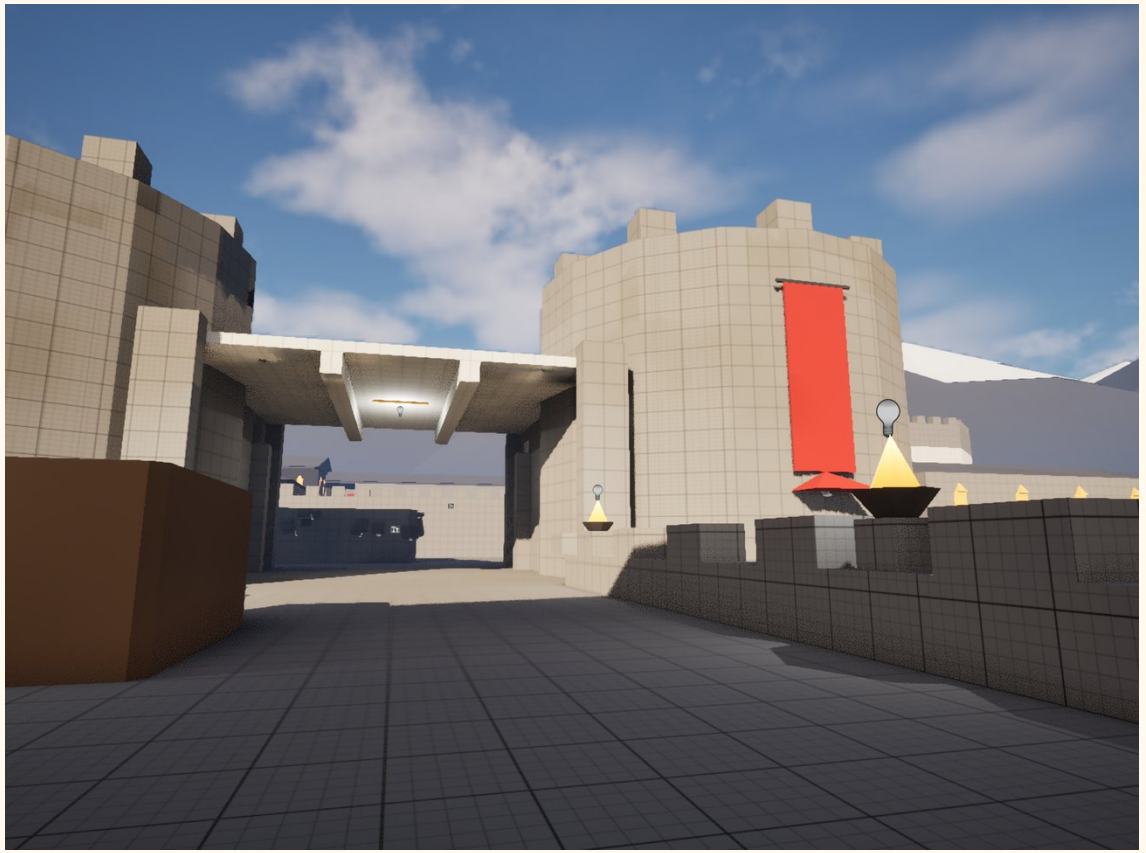
THE REQUEST · OUTER WARD

“Frame the crown destination between the twin gate towers.”

WHAT THE INTERPRETER DID

Cast a player-height sightline from the start pin to the crown. 11 pieces stood in it. Dressing was slid clear or dropped; the 3 left are structural, so they are reported to the designer instead of moved.

8	5	2	1
views checked	clear	improved	still blocked, flagged



Cinder Crown entry view. Captures with the intent pass on are being taken now.

Reference art guides the intent

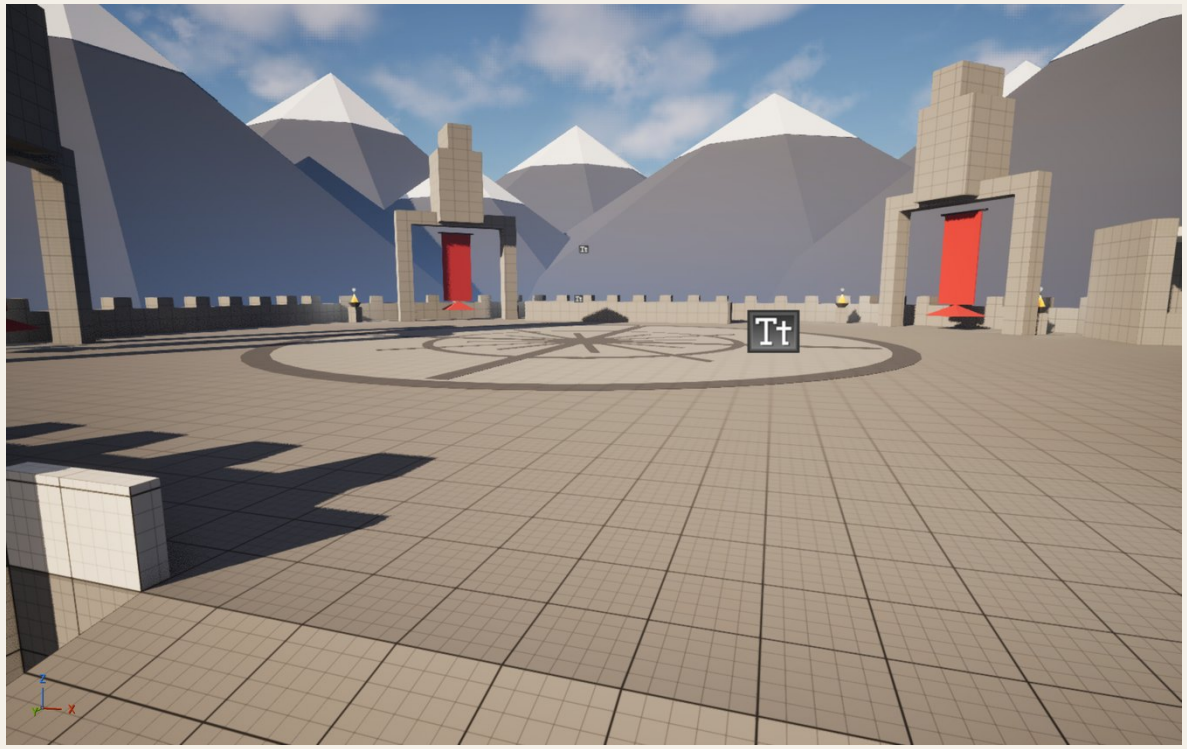
REFERENCE · CROWN TERRACE



MASSING	A ring terrace, flanking towers and one stair up to it
RHYTHM	A long climb, then the arena opens out
SURFACE	A compass inlay marks the centre of the boss floor
PROPS	Banners and braziers frame the edge

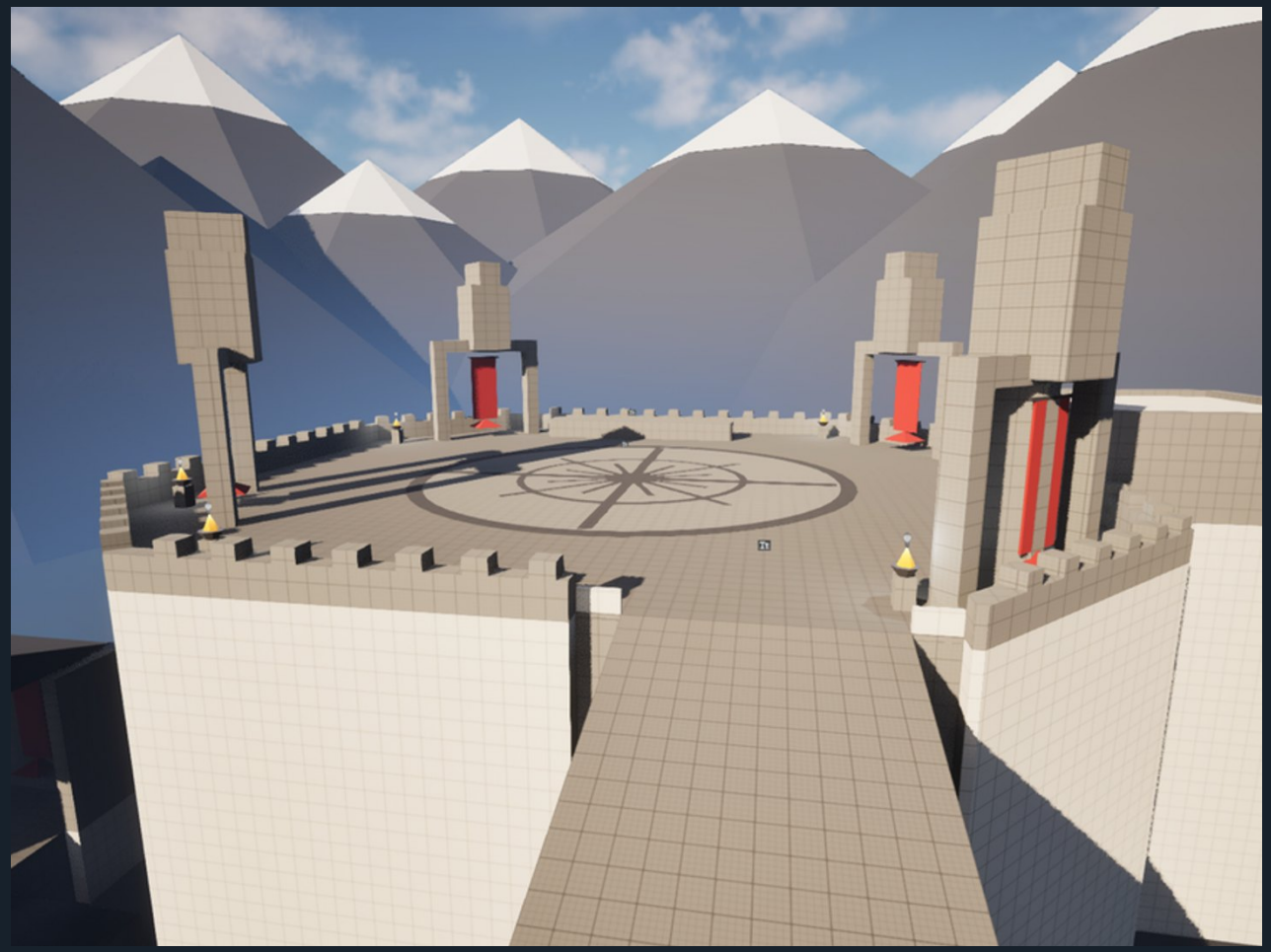
The reference reader turns this art into the art context the interpreter applies. It is in testing on Cinder Crown and the showcase maps.

UNREAL BLOCKOUT · EYE LEVEL



Cinder Crown, crown terrace: built from the plan and its notes.

Every piece is a named, editable actor



Crown Terrace, built from the plan with castle pieces on.

READABLE LABELS

"Gate tower west", "Parapet · High Court floor", "Primary ascent · seg 05". Now the default.

FOLDERS THAT MIRROR THE PLAN

Datum, Proposed and Annotations, split by area, so the outliner reads like the plan.

CASTLE PIECES

1,012 castle pieces in 182 groups. Move a group and its pieces follow exactly.

A LINK BACK TO THE PLAN

Each actor carries its source ID, height level and note, so any piece can be traced.

The interpreter delivers a usable Unreal blockout



PLAYABLE GEOMETRY

Floors, walls, ramps, openings and collision

PROJECT ORGANISATION

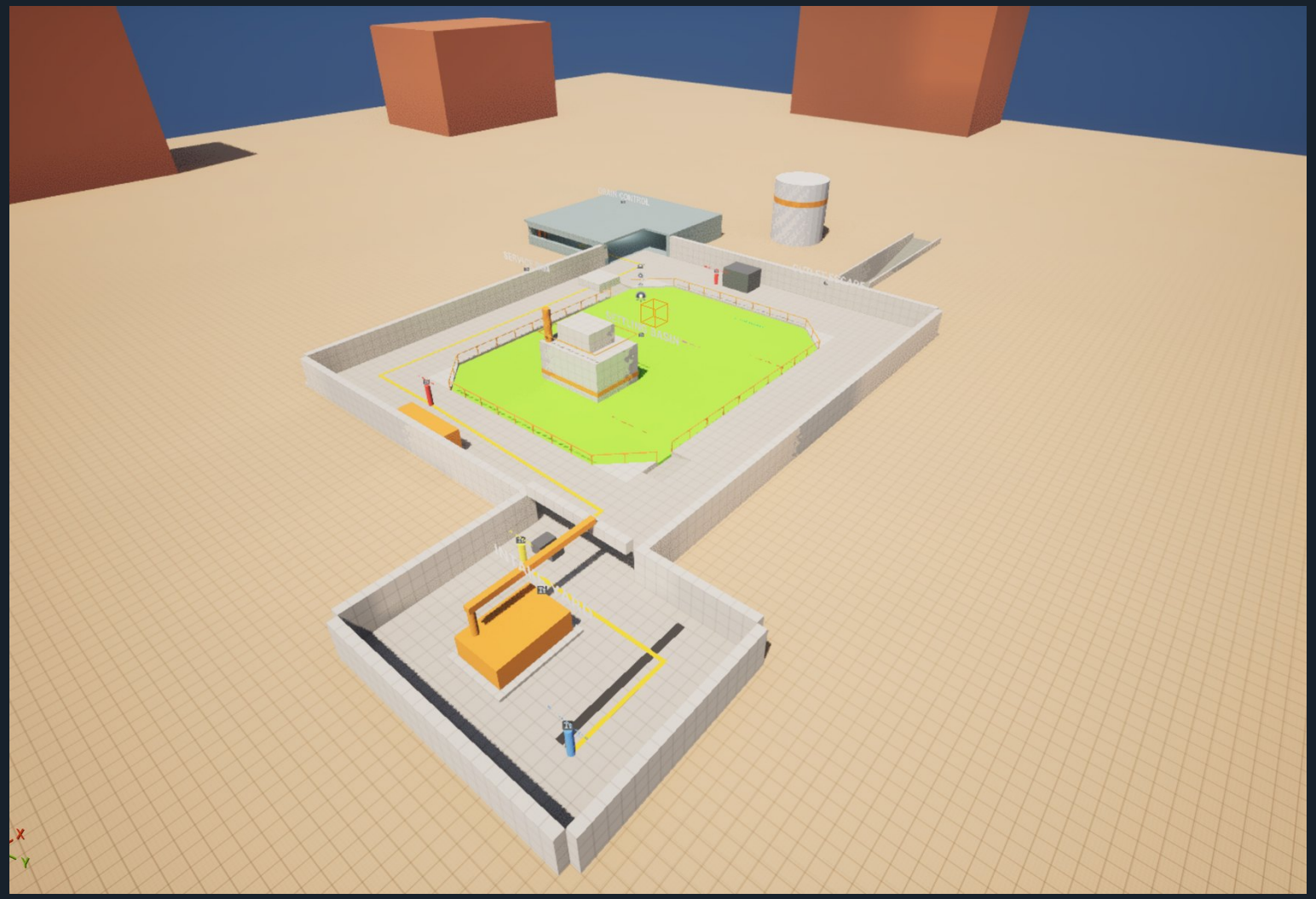
Correct map name, labelled actors and generated assets. Built via Unreal MCP.

DESIGN HELPERS

Routes, pins, materials and reusable gameplay actors

A structured map, ready for review

The design stays visible inside Unreal



ROUTES

Coloured splines preserve intended circulation

PINS

Spawn, encounter and objective markers remain reviewable

AREAS

Named spaces connect the map back to design intent

STATES

Authored states carry into Unreal for review; runtime switching is next.

A test character checks authored route reachability

1. **Build the map**
2. **Drop in a player-sized test character**
3. **Drive it through the requested route points**
4. **Report points the test did not reach**

BLACK SIGNAL

All tested targets reached

5/5 · 11/11 · 10/10

HEAT SINK

All tested targets reached

44/44 · 49/49

EYE LEVEL ON THE MAIN ROUTE · CINDER CROWN

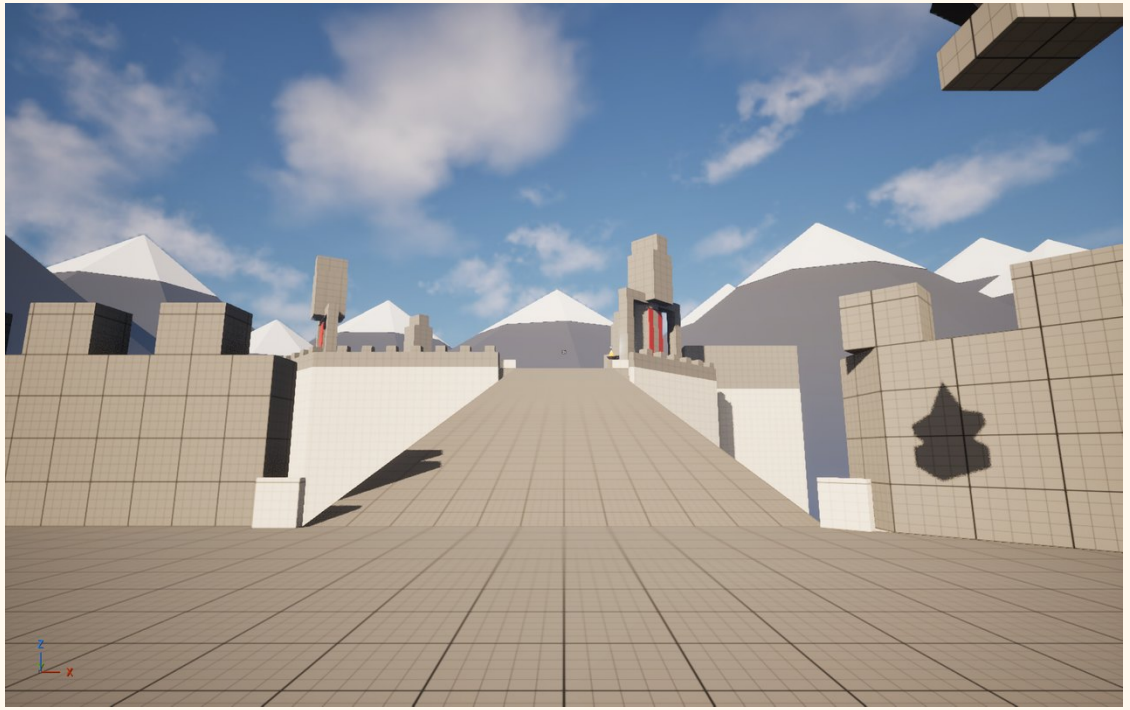


Illustration from Cinder Crown's own route check, at eye height (1.65 m), on the climb to the crown.

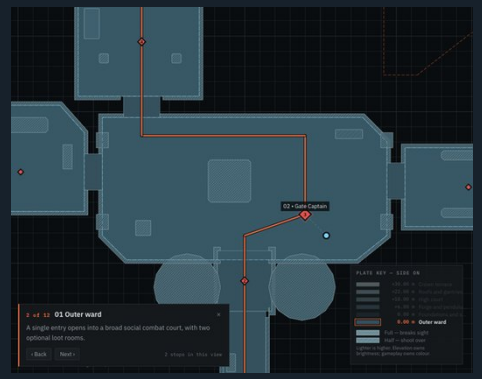
One check among several, not a full validator. A pass means a test character with a configured movement profile and no teleports reached the requested points in that build and state. Unreached points, game-specific traversal, combat, pacing and sightlines still need their own tests and play review.

Arrival: translating the gatehouse intent

REFERENCE



PLAN



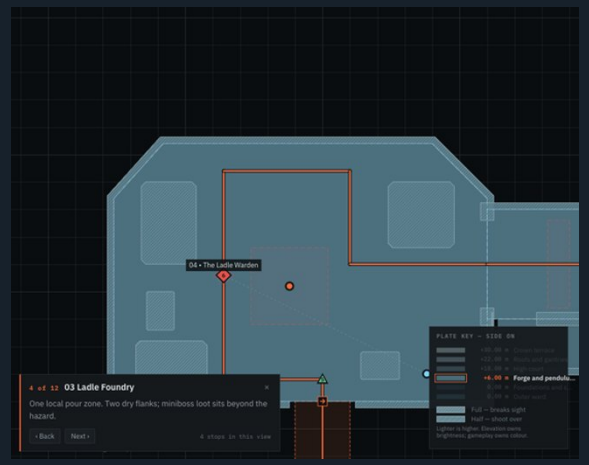
Twin 16-sided gate towers frame the gatehouse, each crowned with merlons and hung with a red banner. The causeway reads as the concept's bridge: parapet crenellations, braziers at the gate, one straight approach.

UNREAL BLOCKOUT

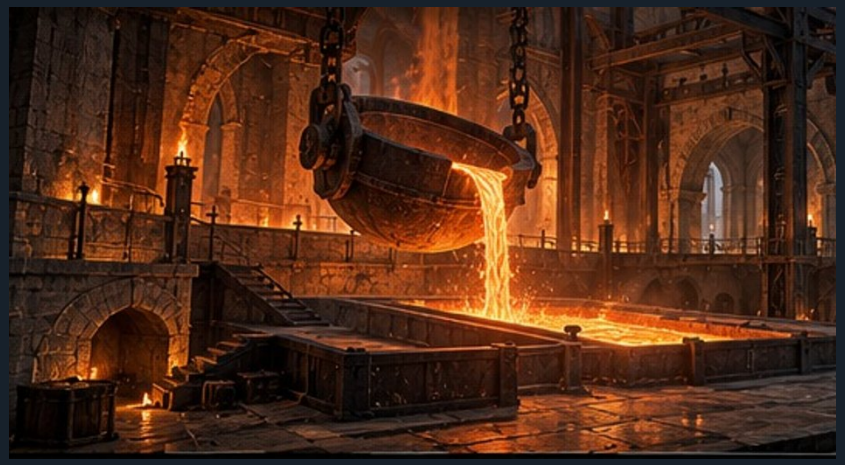


Inside: the foundry and the pendulum gallery

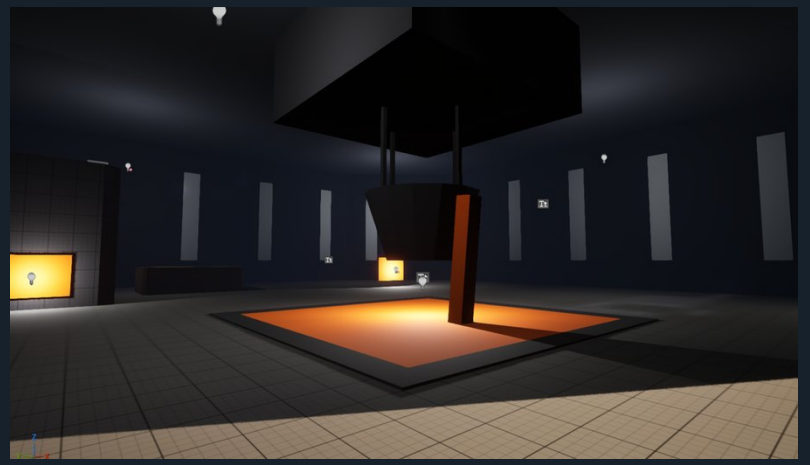
PLAN

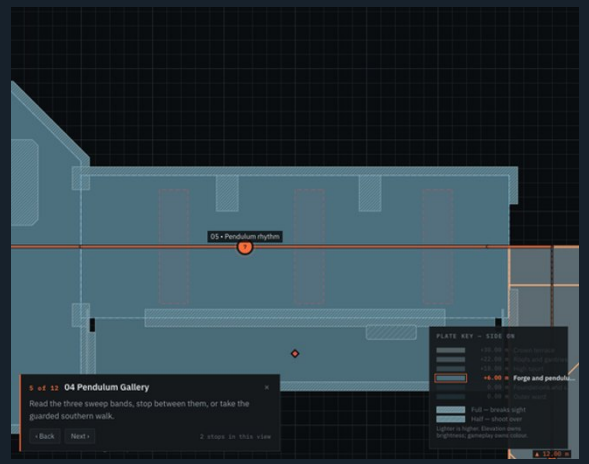


REFERENCE

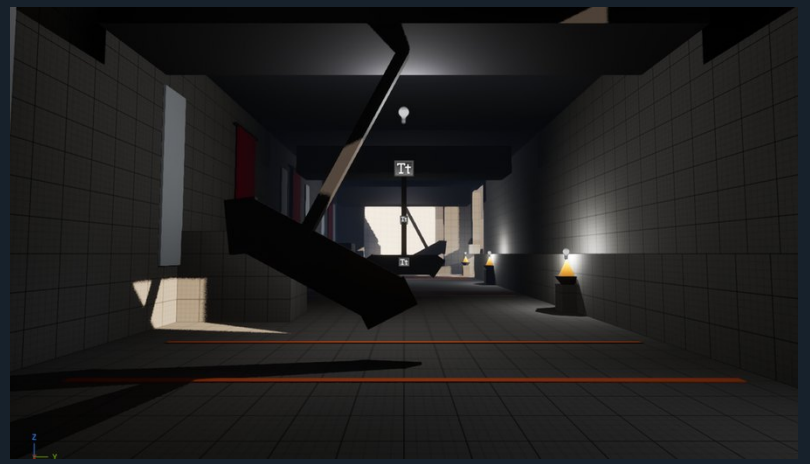


UNREAL BLOCKOUT









Ladle Foundry: one hanging ladle and a single glowing pour zone, as the note asked. Pendulum Gallery: three axes on their pivot beams, sweep areas marked on the floor, refuges between them.

The crown terrace, and what it took

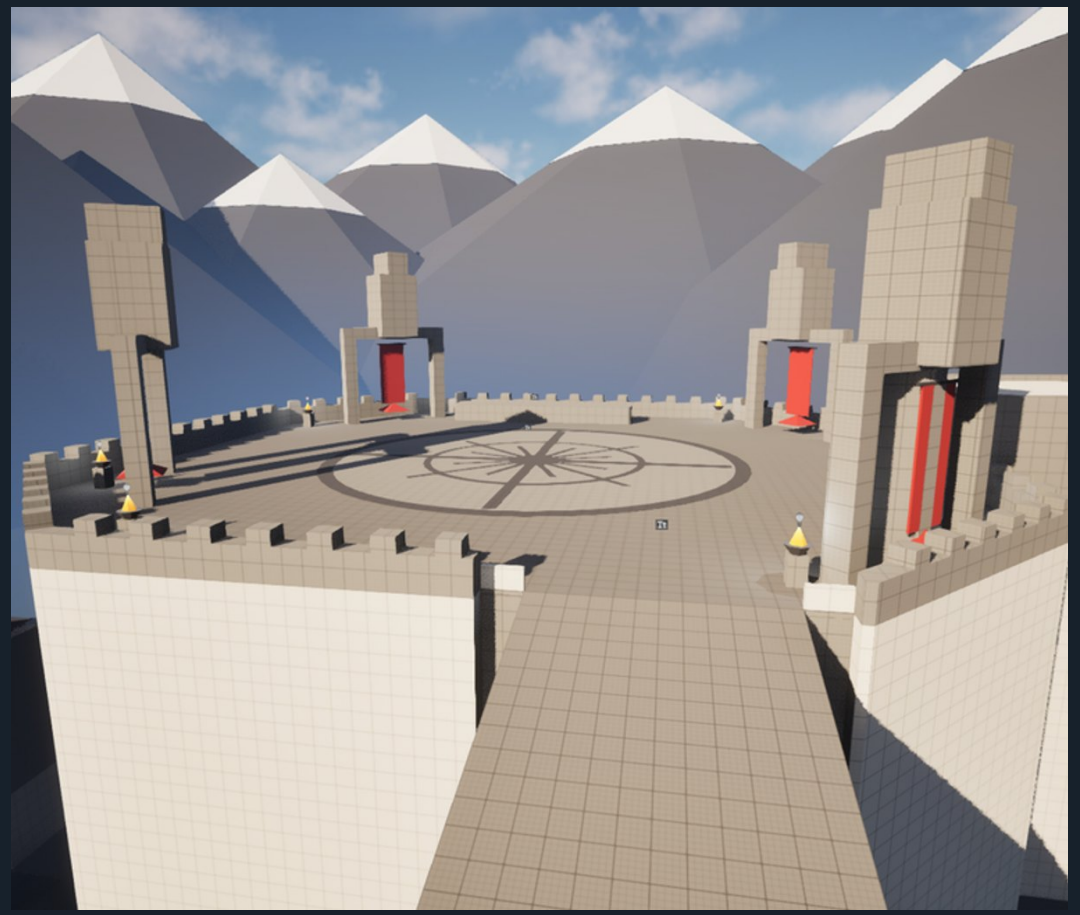
PLAN



REFERENCE



UNREAL BLOCKOUT



The crown approach climbs to the terrace edge as in the concept; a compass inlay marks the centre of the 60 m arena and the plan keeps columns off the boss floor.

7,230

named actors, every one per-piece

28.6 min

full rebuild, unattended

8

designer views checked

Illustrative estimate: about a week (40 h) for an experienced designer to hand-block a map like this.

From a reference board to a walkable arena

REFERENCE



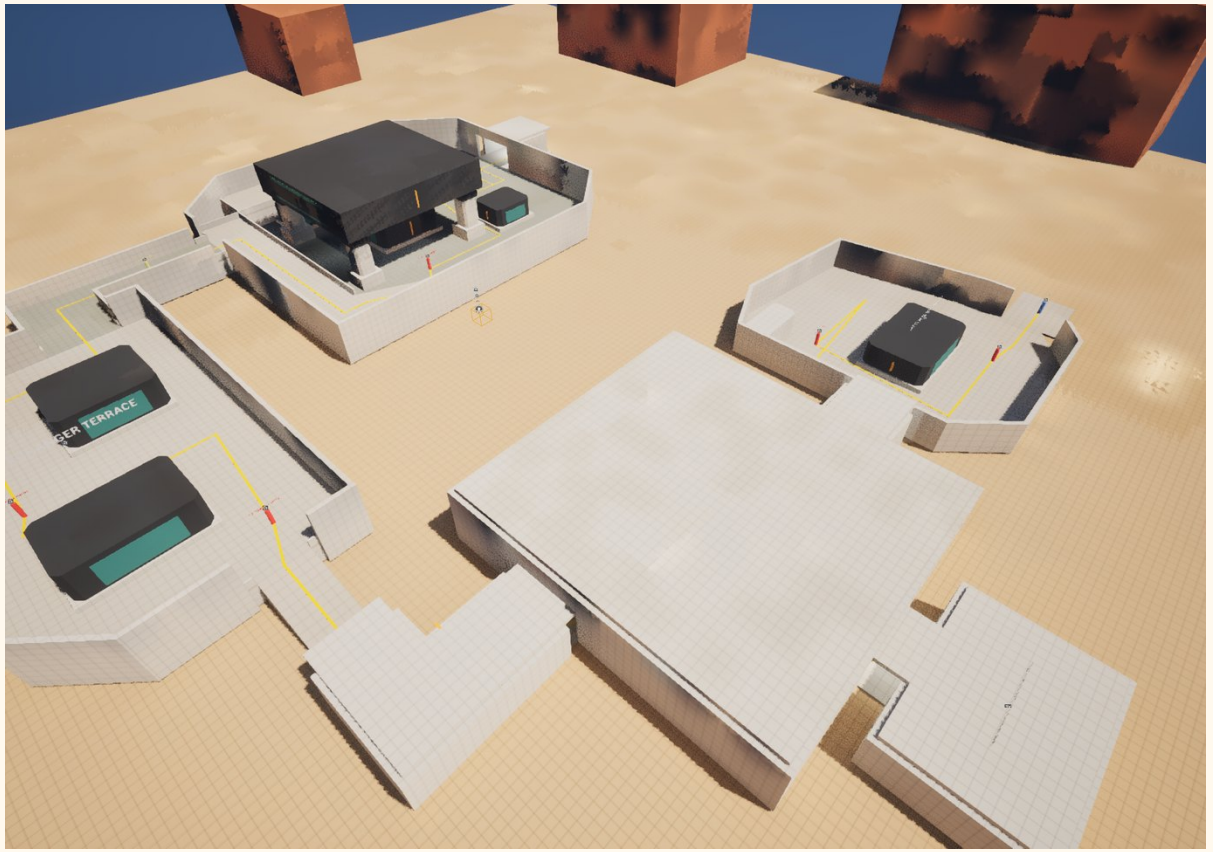
44 / 44

waypoints walked

0

keep-out hits in 0.70 M checks

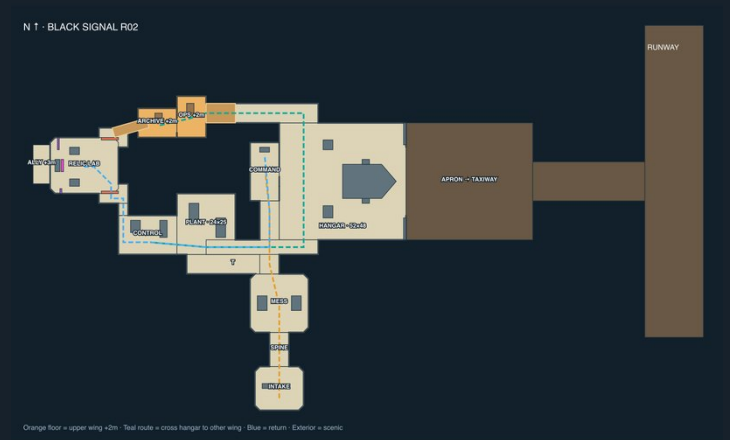
UNREAL BLOCKOUT · AERIAL



Four zones from the board (intake yard, compressor hall, exchanger terrace and heat sink basin) laid out as one loop arena.

A plan for pacing becomes a hangar you can play

PLAN



502

actors from 104 plan entities

26 / 26

route targets reached

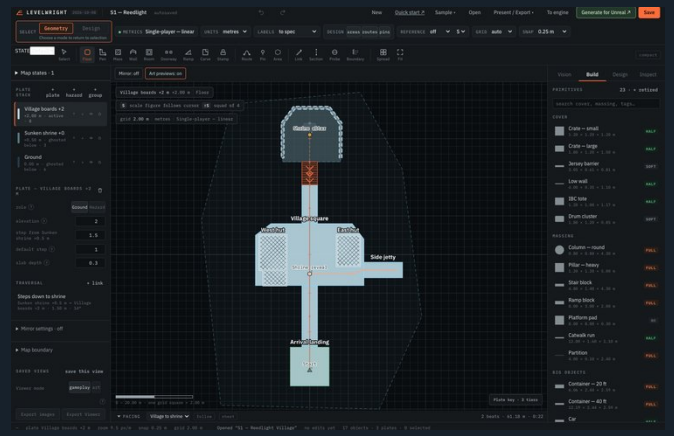
UNREAL BLOCKOUT · EYE LEVEL



The spine corridor's repeated gantries give the rhythm the plan's intensity curve asked for.

A swamp village, from a short plan

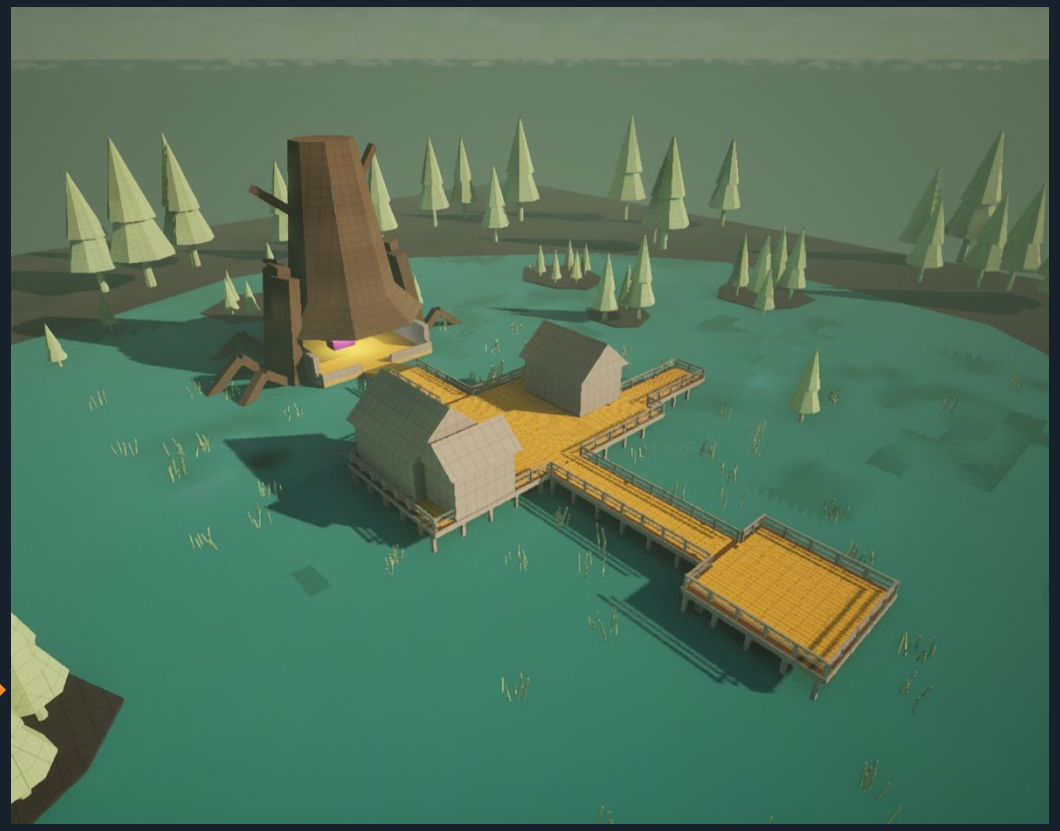
PLAN



BEFORE · PLAIN BUILD



AFTER · DETAIL PASS



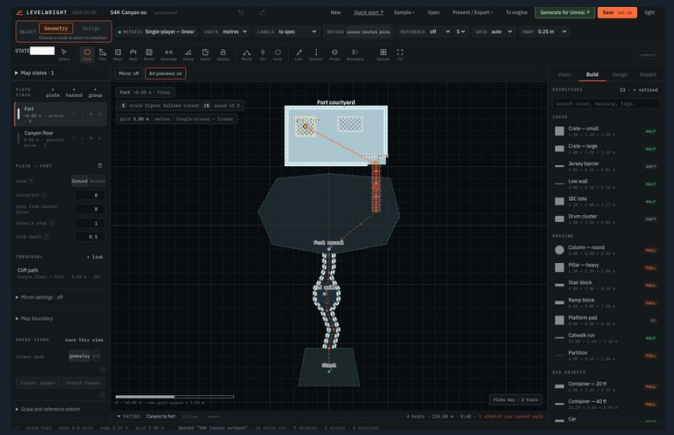
EYE LEVEL



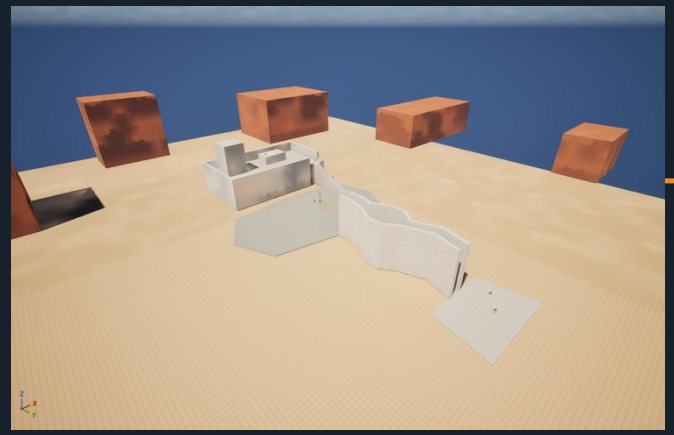
Same plan, same interpreter. The detail pass adds role colours, water, stilt huts with pitched roofs, plank walkways on posts, reeds and a tree line. Every piece is still its own actor; the shrine is the hollow cypress the note describes.

A colossus described in words, built in stone

PLAN



BEFORE · PLAIN BUILD



AFTER · DETAIL PASS



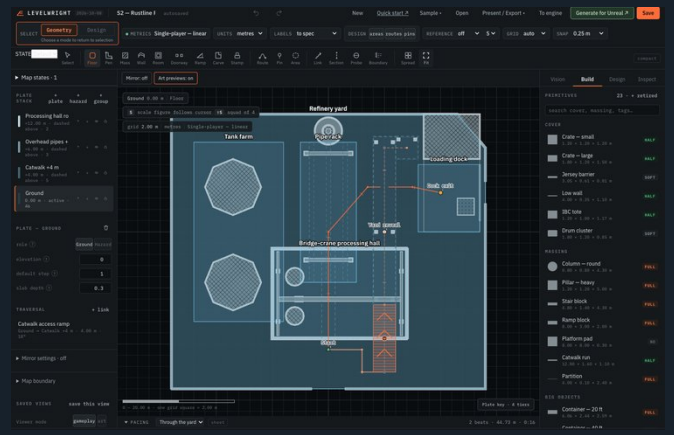
EYE LEVEL



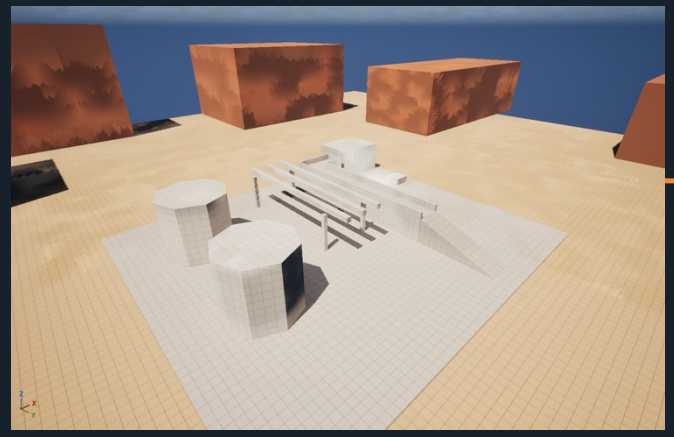
The plan names a half-buried colossus behind the fort. The art context gives it a head, shoulders and a raised hand: the hand shows above the canyon from the start, and the head is revealed from the basin.

A richer plan, a hall to walk under

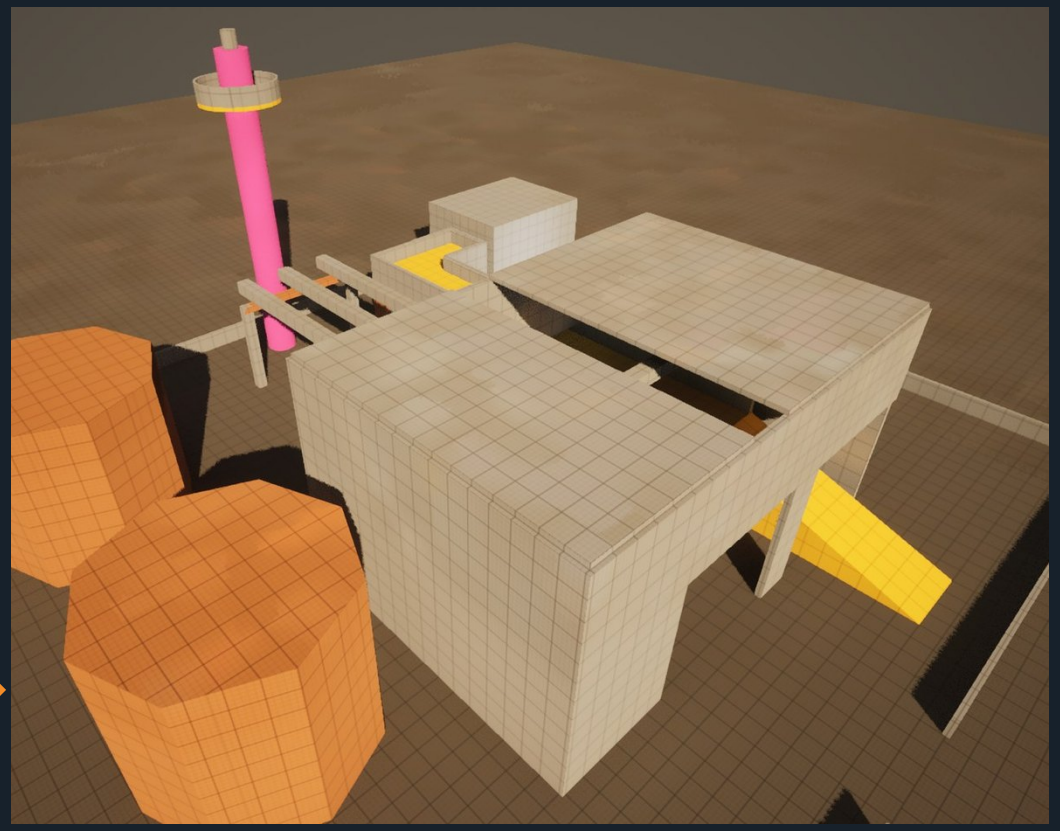
PLAN



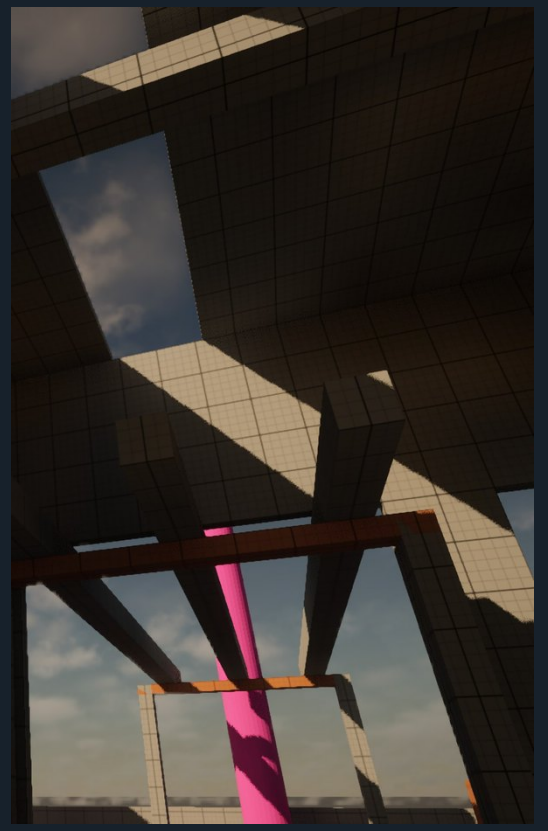
BEFORE · PLAIN BUILD



AFTER · REVISED PLAN



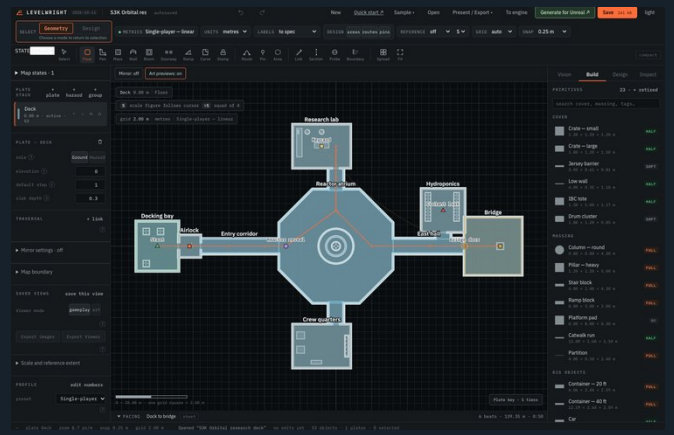
EYE LEVEL



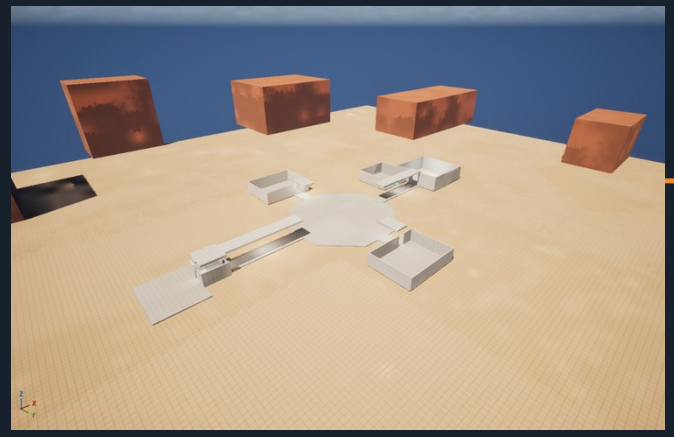
A revised plan, built once: the processing hall is now a 24 × 16 m shed with a 12 m roof, a bridge crane overhead and a catwalk at 4 m, and the flare stack marks the yard. Both routes, through the pipe portal and up the catwalk, stay open. The interpreter built only what the plan drew. The hall is still dim under its roof.

A richer plan, a complete station

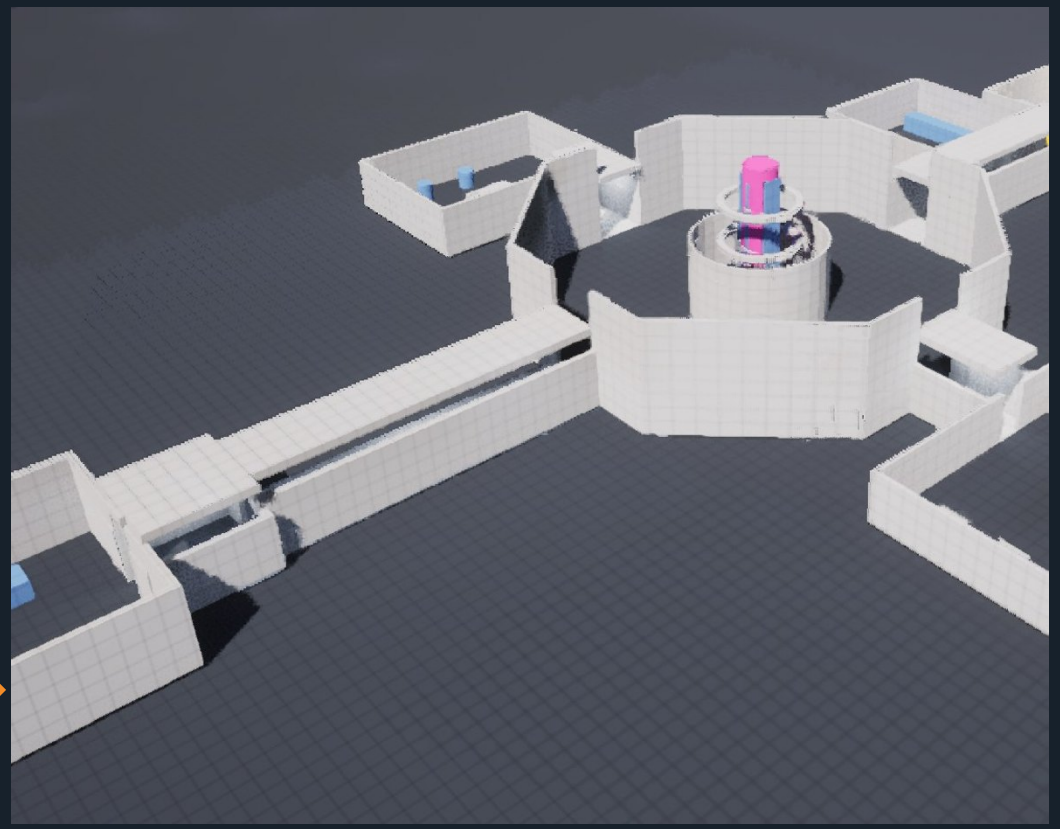
PLAN



BEFORE · PLAIN BUILD



AFTER · REVISED PLAN

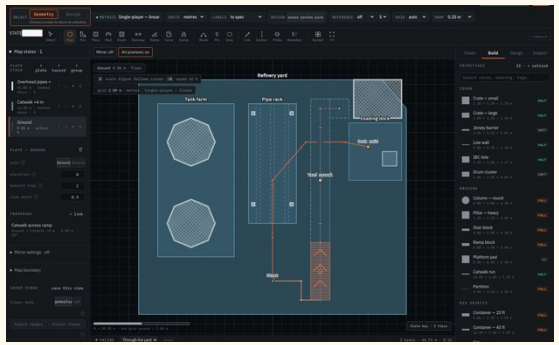


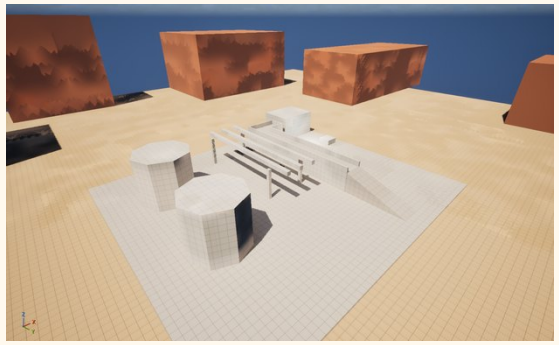
EYE LEVEL



A revised plan, built once: the atrium is now an eight-sided hall with doors to every corridor, and the reactor core rises inside its ring at the centre, visible straight down the entry corridor. The plan drew it; the interpreter built only what was drawn. Glass and glow are not yet rendered (the ring reads as a solid wall).

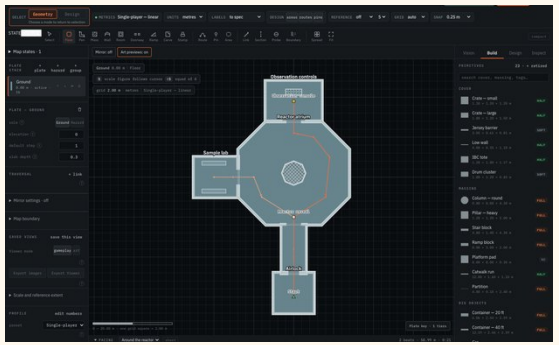
Four more plans, built as they were written





S2 · INDUSTRIAL

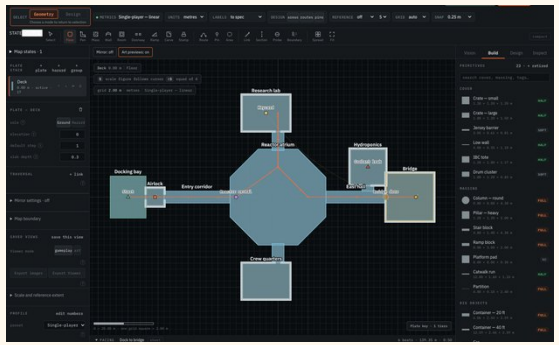
Refinery yard to the loading dock

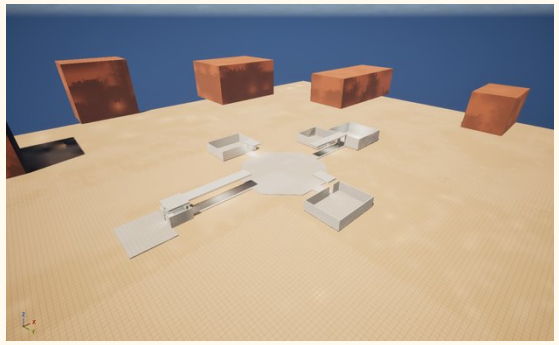




S3 · SCI-FI

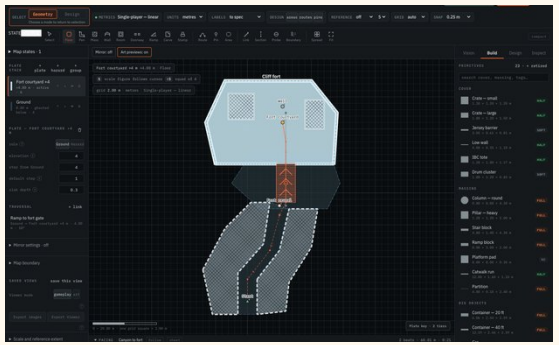
Airlock to the reactor atrium

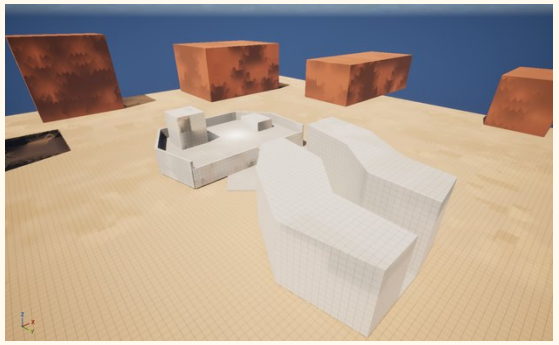




S3K · ORBITAL DECK

A second sci-fi plan, by another model





S4 · DESERT

Slot canyon to a cliff fort

Plain builds, before the detail pass. Each plan was written as a junior designer would, untuned to the interpreter.

CASE 5 · BLIND BENCHMARK

Ten plans written blind, rebuilt as the tool improved

ROUND 0

0 / 10

Boxes for rocks, trunks and caves; seven settings had no kit.

ROUND 1

8 / 10

Natural shapes and biome kits.

ROUND 2

10 / 10

Square columns and cave readability fixed.

ROUND 3

10 / 10

City kit, lighting, fill and materials. All ten pass keep-out checks.

Maps the art director judged usable as a blockout, scored against the organic blockout rubric. Same frozen plans and cameras every round.

THE TEST

Ten short briefs across swamp, desert, castle, industrial, sci-fi, forest, alpine, city, timber town and cave, written without looking at the interpreter. The plans never change; only the tool does.

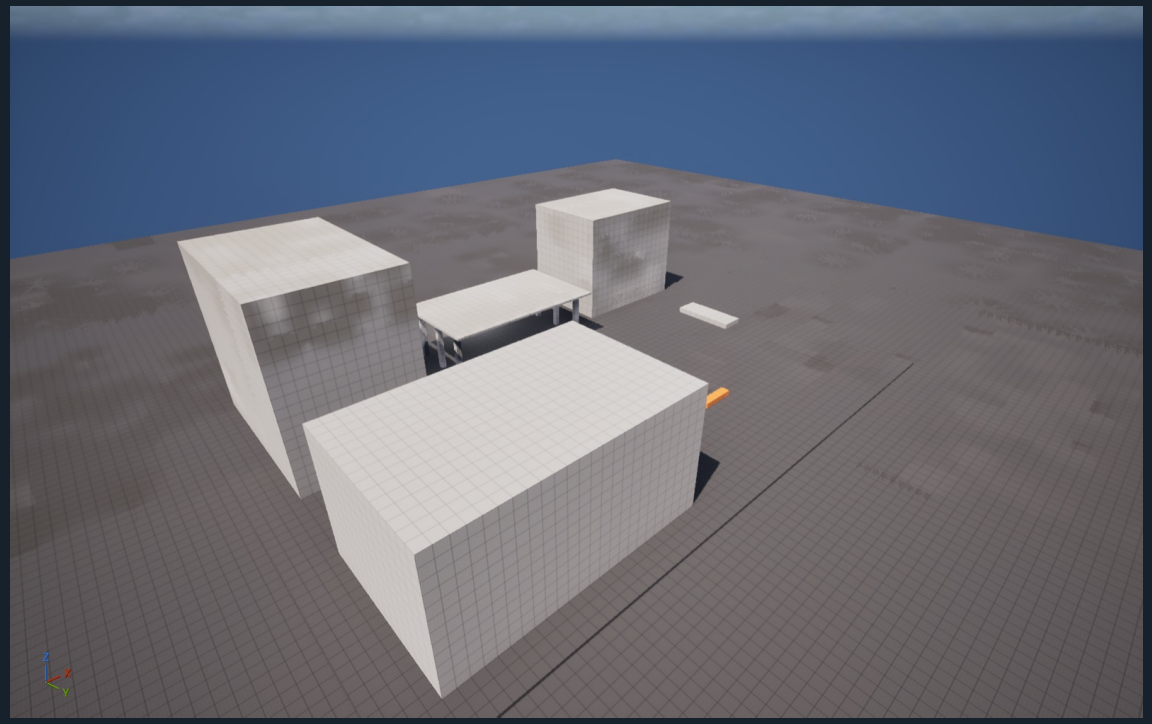
ROUND 3

All ten pass keep-out checks, up from 8 of 10. The collision probe confirmed 686 of 687 solid pieces, none walk-through. All ten built and captured in 40 minutes.

NOT THERE YET

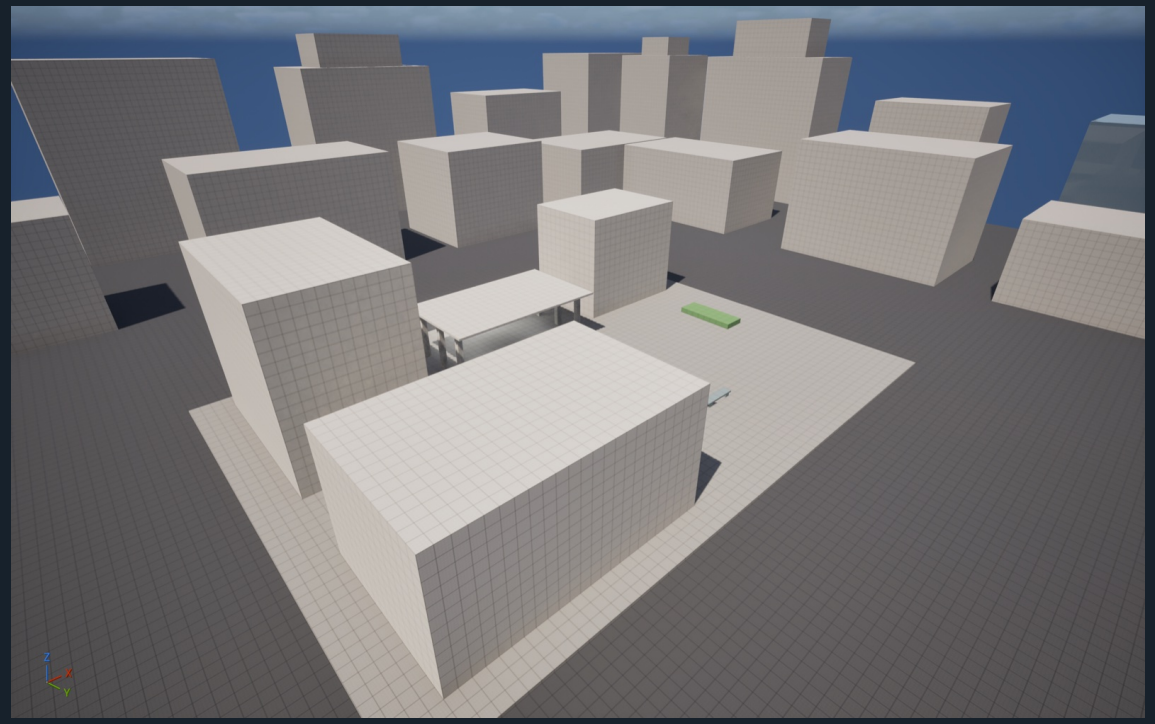
Four interiors came out darker than in round 2, and materials barely show at blockout distance. Full routes have not been played through.

Same plan, better tool: the city map gets a skyline



ROUND 2

Four bare blocks on an empty plain.



ROUND 3

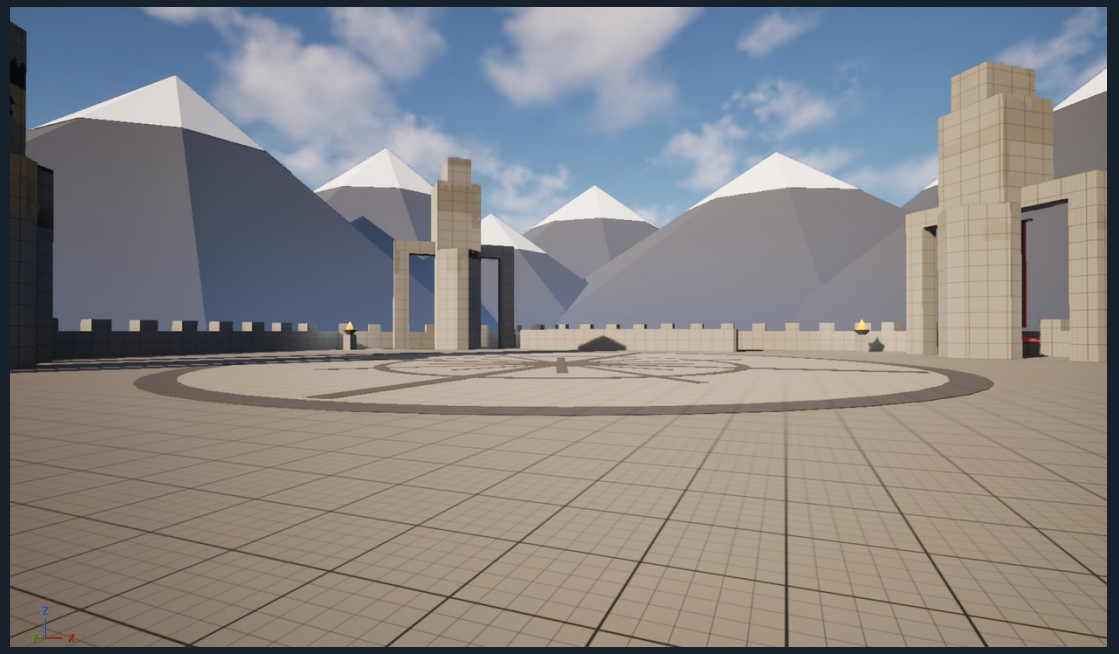
Setbacks and a skyline frame the plaza; the arcade still leads. Silhouette and massing 3 → 4.

Cinder Crown: validation can expose design gaps



ARRIVAL VIEW

Destination landmark is not yet visible



DESTINATION SPACE

Readable once the route reaches the crown

The blockout is traversable, but the intended early landmark reveal remains an open design issue.

This is the start of level design, not the end

WHAT PROTOMAPPER SAVES

- The first blockout, built from the plan
- Hours of placing pieces by hand
- Agreeing what each area should look like, before anyone builds it

WHAT STILL NEEDS PEOPLE

- Implementing and iterating on gameplay
- Playtesting and tuning the player experience
- Combat, pacing and sightlines, judged in play

Protomapper clears the hurdle of the first blockout, so the team's time goes into the parts only people can do.

Run one representative studio pilot

Measure the workflow from first top-down plan to accepted playable blockout.

AUTHOR

Designer builds the plan, pins, routes, elevations and intent

GENERATE

Interpreter produces named Unreal content and review helpers

VALIDATE

Routes, saved content and open design findings travel together

COMPARE

Track hours, revisions and designer satisfaction against baseline

Success means the designer spends the saved weeks improving the experience instead of reconstructing the blockout.

Illustrative blockout effort: 40 hours versus 12–16 hours

Compress a week of construction into days of iteration · illustrative planning model

TRADITIONAL BLOCKOUT · EXPERIENCED DESIGNER



40 h

PROTOMAPPER-ASSISTED



▪ Plan + intent ▪ Review ▪ Revise + validate

Recorded rebuild: Cinder Crown, 7,230 actors, 28.6 minutes wall time including assets and clear.

24–28 hours

potentially available for play review, in this scenario

Playtesting, encounter tuning, sightlines and experience review

60–70% less blockout production time in this scenario

Both bars end at a designer-reviewed, validated blockout and include setup, authoring, cleanup, iteration, review and validation; unattended build waits are not counted as labour. Replace with pilot data.

What comes next

IN PROGRESS

Change one room, rebuild one room

Stable IDs and the rebuild planner are in. Next: the Unreal side, so only what changed is rebuilt. Hand edits are kept and listed, never overwritten.

WORKING OFFLINE

The reference reader

Reference art and notes become a draft art context the designer approves before building. Shown on Cinder Crown and S4K; the live API path is not yet tested.

DONE

Kits, lighting and materials

Environment kits, steadier lighting, fill light in roofed rooms and approved materials, built on all ten blind-benchmark plans. Dark interiors are the next fix.

NEXT

States that switch at runtime

Authored map states already reach Unreal for review; switching them in play comes next.