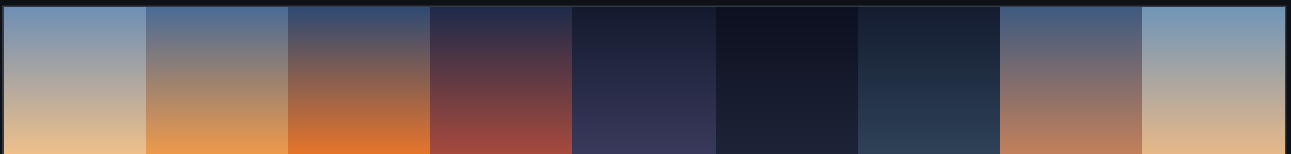


CARNY ISLAND · CROOKWOOD

STAGING A CROOKWOOD NIGHT

*The set, the studio, the cyclorama, the grids and
the lights — everything needed to build the stage
one night is played on.*



AT A GLANCE

Every locked number in the build, on one page. Nothing here is simulated — the world was used to find out what is beautiful and why, then the values were authored.

PLAYABLE YARD 50 × 50 × 50 m The cube. Everything else is outside it	STUDIO ENVELOPE 70 × 70 × 60 m Yard + 10 m wings + rigging	CYCLORAMA 40 m Coved, wraps upstage and both returns	MAIN GRID 52 m Clear of the ball's arc
BALL GANTRY 25 m AFL Hangs at centre. Travel ±25 m	BALL CLEARANCE 2 → 25 m Swept volume. Rig nothing into it	LATITUDE / DATE 55°N • late Oct Reference only. Values are authored	SUN RISE / SET 113° / 247° ESE to WSW. Peaks at 22°
RUNNING TIME 24:00 17:00 → 06:00 game time	THE DIG 12:00 A number, not a timer	CAMERA FRAME 9 m A fifth of the yard's width	FLOOR VALUE #0C1020 The darkest value in the game

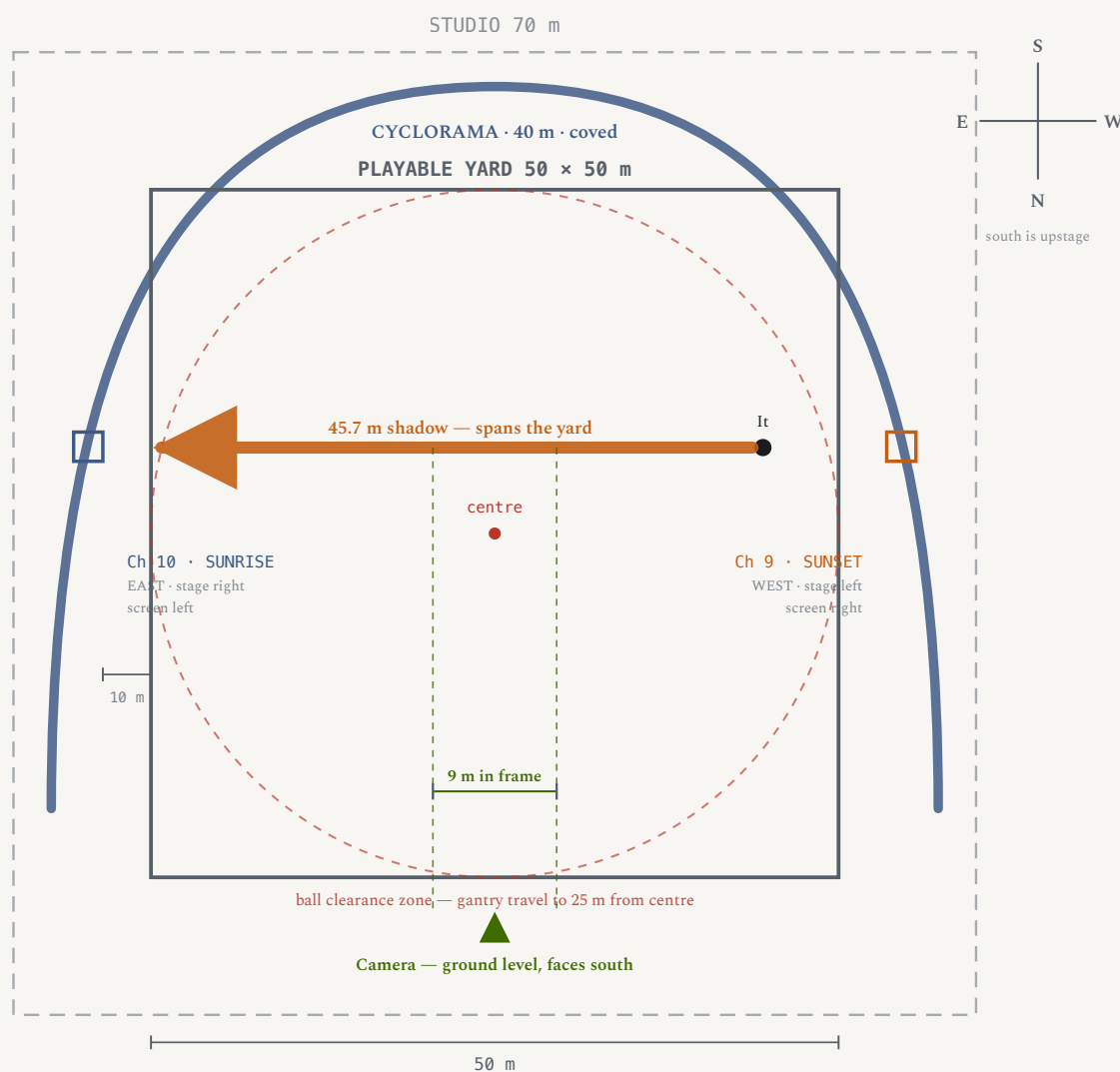
THE FRAME ABOVE EVERYTHING

Nobody wins Crookwood. It is an interactive show. A film-maker making a game, not a game-maker making a film — a social entertainment experience, staged as musical theatre. Running time, not timer. Numbers, not levels. Cues, not triggers. The house, not the UI.

Which sets the working rule for everything in this document: physics as a source, never as an authority. Use the world to find out what is beautiful and why; never let it say what is allowed.

THE ENVELOPE

The playable yard is the 50 m cube. The cyclorama, the wings and the grids all sit outside it — so the studio is 70 m across and 60 m tall.



Site plan. South is upstage, so the sun's whole arc plays across the cyclorama — which is why the camera faces that way. East is screen left, west is screen right. The camera frames 9 m of a 50 m yard; the rest exists so the shadow, the Villain and the ball all have somewhere to arrive from.

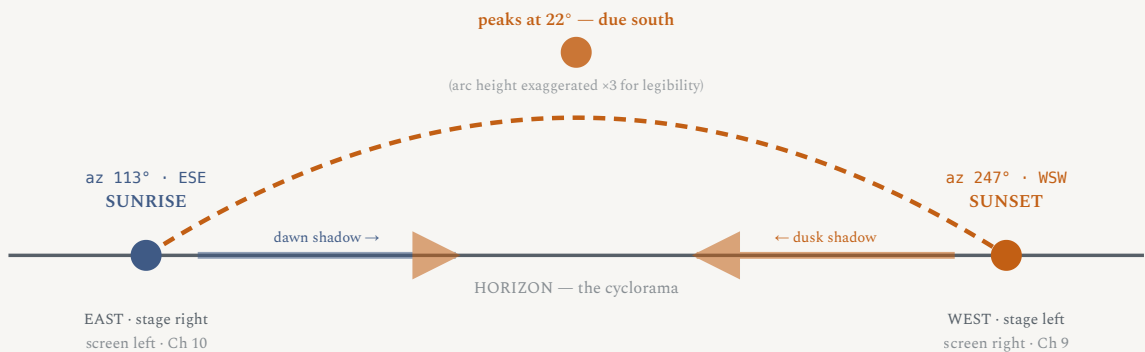


Nothing is rigged inside that envelope.

LEVEL	HEIGHT AFL	WHAT IS THERE
Deck	0 m	The yard. Sun keys stand on it at 1.10 m in the wings
Ball at rest	2 m	Body height. Lethal at the bottom of its arc
Cyc bar, low	12 m	Lower sky band
Cyc bar, mid	24 m	Middle sky band
Ball gantry	25 m	Hangs at centre; travels to 25 m from centre. Swept volume 2 → 25 m must stay clear
Cyc bar, high	36 m	Zenith band
Cyc top	40 m	Never in frame from a ground-level camera
Yard ceiling	50 m	Notional top of the playable cube
Main grid	52 m	Moon, rim bar, gobo wash, hazer, star field. Clear of the ball
Studio ceiling	60 m	Black. Where the torch beam goes to die

WHERE THE SUN RISES AND SETS

Crookwood quotes 55° north in late October. Not simulated — quoted. The astronomy earns its place as a source of what is beautiful, then every value in the plot is authored.



The sun never gets high. Peaking at 22°, shadows sit at three to five times height as a baseline — long shadows are the world, not a sunset trick. And the arc runs ESE to WSW, so the shadow points one way at dusk and the other at dawn. That flip is geography, not a flourish.

WHY THE CAMERA FACES SOUTH

At 55° north the sun's entire arc is in the southern sky. Put the camera facing south and the whole arc plays across the cyclorama — the backdrop is the sky the sun crosses. It also fixes the geography of the stage: **east is stage right and screen left, west is stage left and screen right.**

This is the easiest thing in the whole document to build backwards. It decides which wing each key stands in, which way the shadow falls, and the direction of the flip across the night. Check it against the site plan before rigging anything — the plan is drawn south-up precisely so its left and right match the screen's.

WHAT	VALUE	CONSEQUENCE
Sunrise azimuth	113° ESE	Ch 10 key stands in the east wing, screen left
Sunset azimuth	247° WSW	Ch 9 key stands in the west wing, screen right
Peak elevation	22°	Baseline shadows at 3–5× height, all day
Elevation for a 45.7 m shadow	1.13°	Key sits at 1.10 m on the deck, 10 m out
Twilight duration	35–40 min	Long, because the sun sets obliquely at this latitude
Full moon	sun + 180°	Rises as the sun sets, sets as it rises. Position derived, never authored

THE CYCLORAMA

The one thing in the room allowed to be a colour.

SPEC	VALUE	WHY
Height	40 m	Top never enters frame from a ground-level camera
Wrap	Upstage face + both side returns	No visible vertical edge from any camera position in the yard
Offset from yard	10 m	The wing. Houses the sun keys at deck level
Deck cove	4 m radius	No join where sky meets floor. A flat back wall reads as a wall the moment light rakes it — and every cue rakes
Corner cove	8 m radius	Kills the vertical seam in both corners
Surface	Matte, seamless, neutral	Takes colour cleanly; no specular hits under a low key

Show the machine, not the mistake. A carnival shows its scaffolding and still paints a good backdrop.

The lighting bars and the scaffold towers stay visible — that is the register, and hiding them would be dishonest about a world this size. But a visible seam where the sky meets the floor is not apparatus, it is a fault. The cove stays.

LIGHTING A 40 M CYC

A single bar cannot wash 40 m evenly; the throw needed would be a third of the height. Use **three stepped bars plus a groundrow**, each washing a band, crossfading into the next:

UNIT	HEIGHT	WASHES	CHANNELS
Cyc bar, high	36 m	Zenith band, 40 → 28 m	1–4
Cyc bar, mid	24 m	Upper blend, 28 → 16 m	2–4 (shared)
Cyc bar, low	12 m	Lower blend, 16 → 4 m	5–8
Groundrow	deck	Horizon band, 4 → 0 m	5–8

DRIVE IT IN COLUMNS, NOT AS ONE WASH

A sky is **two gradients**: horizon to zenith vertically, and brighter toward wherever the sun is horizontally. Four cells across on every bar is what lets you put the glow in the west at dusk and in the east at dawn — **a sun position without a sun in shot.**

THE INSTRUMENT SCHEDULE

Eighteen channels. What hangs where, what it does, and what it is in the engine.

CH	UNIT	POSITION	JOB	IN UNITY
1–4	LED cyc, 4-cell RGBA	Bars at 36 m and 24 m	Sky, upper. Zenith colour	Ambient gradient, top
5–8	LED cyc + groundrow, 4-cell	Bar at 12 m and deck	Sky, lower. Crossfade against 1–4 for the horizon glow	Ambient gradient, bottom
9	Fresnel / HMI, large	West wing, stage left, deck, 1.10 m	Sunset key. Distance buys parallel rays — crisp at length	Directional, low elevation
10	Fresnel / HMI, large	East wing, stage right, deck, 1.10 m	Sunrise key, cooler. Never runs with Ch 9	Directional, mirrored
11	Hard source, smaller	Grid 52 m, opposite the active key	Full moon. Position derived from the sun, never authored	Directional at sun +180°
12a	LED head torch	On the head bone	Cold hard cone. Casts the tool shadow into the hole — almost none of It. Red mode preserves dark adaptation	Spot, parented to head
12b	Kerosene lantern	On the deck, player-placed	The hero shadow. Magnification = cyc distance ÷ lantern distance. Cage throws bars; capped top spares the cyc	Point, world-placed
13–14	Rim bar	Grid 52 m, upstage, behind the action	Non-negotiable. A charcoal suit on a night cyc disappears without it	Rim light on bone
15	Strobe / hard bump	Grid, wildcard angle	Lightning. One frame of enormous shadow from a wrong direction	Timed directional strobe
16	Breakup gobo wash	FOH and grid	Supplement only — the claw trees throw the branch breakup physically. Fills where no tree stands	Light cookie
17	Hazer	Grid 52 m	Makes beams visible — turns the torch from a pool into a shaft	Volumetric fog
18	Star field	Above the cyc, 40–60 m	Real depth overhead rather than a painted top edge	Opacity curve on sun elevation

TWO PRACTICALS, AND THEY NEVER SHARE A RESOURCE

Crookwood is set today but mixes periods, the way a ride does — so a cheap modern head torch beside a stolen hurricane lantern is exactly right, and it is the same mismatched-kit logic as a character assembled from other people's parts. It buys a bigger split than any period-matched pair: ~6000 K against ~1900 K.

Each light fills the other's shadow — the lantern's reads blue, the torch's reads orange. That warm/cool pair is what makes a double shadow look deliberate rather than broken. Keep them unequal: lantern dominates, torch is a sharper, colder accent.

The torch runs on AAA cells bought at Gweedo's, and a set lasts many nights. That is deliberate — one resource per decision. Donuts drive the bones, AAAs drive the torch, and the two never meet.

SHOWING THE LIGHTS MAKES THEM ACCOUNTABLE

A hidden rig can cheat any angle. A visible one cannot. If a lamp hangs stage-left in shot, the shadows must point away from it. **Visible instruments have to be the actual sources, or agree with them exactly.**

And keep them **seen but not bright** — in a dark scene a working instrument is the brightest object on screen and the eye leaves the Villain. Fixtures and scaffold read as shape and structure, output shielded or angled off camera.

WHAT CASTS, AND WHAT MOVES

Crookwood is a collection of 2D and 2.5D flats with a crooked path weaving around them. Most of it is an illusion — and the set does not hide it.

CLASS	EXAMPLES	CASTS?	POSITION
3D solids	The Hump · The Pinnacle · Camel Back Ridge · headstones · graveboxes	Yes	Fixed. Navigation anchors
Cut-out casters (gobos)	The claw trees · trees inside the Howling Forest · ridge headstones	Yes — it is the point	All move
Scenic flats	Everything else	No	Moved between runs. Receive only

CASTING IS AUTHORED, NOT GEOMETRIC

The tempting rule is "3D casts, flats receive." **It is wrong.** The claw tree is a flat, cut as a silhouette precisely so it throws the claws — a **practical gobo standing in the scene**, which is more honest to the register than a gobo inside a lantern. The caster list is a deliberate set: the solids, the designated cut-outs, and the Villain.

SCENIC FLATS MUST NEVER CAST

A plain vertical flat lit from a low side angle throws a shadow **as wide as the whole flat**. Under a raking key a yard of them blacks out the entire deck and the 45.7 m shadow vanishes into a general blackout. One setting — and a week of confusion behind it if missed.

Nothing that casts a pattern is fixed. The three ridges stay put, but they are terrain — big soft mass. Everything with a character to its shadow moves. So **you navigate by mass and you read the yard by pattern**, and the four anchors (Hump, Pinnacle, Camel Back, and the Forest's position) carry all the navigation. Their silhouette profiles are load-bearing and must not be softened.

THE HOWLING FOREST IS A FIXED ROOM WITH MOVABLE FURNITURE

The forest is a fixture; the trees inside it move. First element that works on both tiers at once — anchor and maze. The trees move **between** runs, not during, so anything precomputed is composed at run start from the actual layout and cannot drift from the art, because it *is* the art.

Build reachable gobos as **real casters** — an alpha-clipped quad is about the cheapest caster there is, and a cookie cannot follow moving trees or respond to the lantern. Reserve cookies for a far background band nobody enters. The test is simply: *can a lantern get behind it?*

SCENERY IS CONSUMABLE — BUILD IT TO BE DESTROYED

The ball will wreck parts of the land, the flats and the gobos, and that is deliberate. So scenery is not permanent set: every flat and every cut-out is a **replaceable unit**, built to break and be swapped, with spares held.

Which deepens what the yard's reconfiguration actually is. The carnies do not only move the flats between runs — **they repair them**. Some of what is different tonight is different because it got destroyed last night.

The ball's behaviour, arc and rhythm are specified separately. This document owns only its clearance envelope and this requirement.

SILHOUETTE FIRST

Anything meant to cast is drawn as a silhouette before it is drawn as an object — **clean outline, generous negative space, no internal detail**. A shape that reads well in view but muddles in projection has failed at its only job.

THE CAMERAS, AND THE HOLE

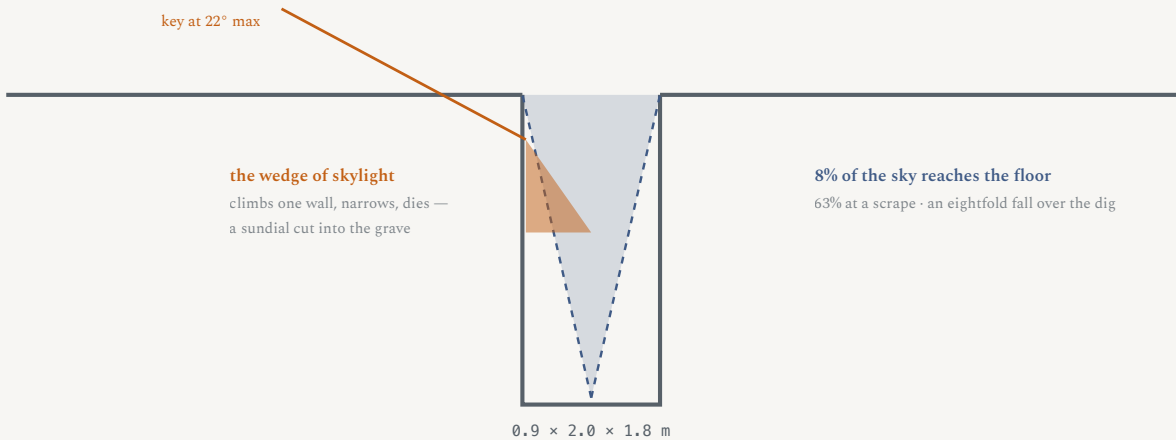
CAMERA	SEES WELL	SEES BADLY	FOR
Overhead 24 mm	Gobo patterns lying flat; the pit; what surfaces	The hero rake	The player
Side, ground level	The rake; the lantern rearing It up the flats; the descent	Ground patterns, foreshortened	The audience

The dig camera shows the **light**. The traversal camera shows the **shadows**. Ground level is the best possible height for the rake — the length compresses into the lower frame and runs to the vanishing point.

The descent is the shot. It drops below the horizon while the lantern stays up on the surface, so It sinks into its own shadow — skull, then just the torch beam, then a glow coming out of the ground.

Which makes the descent **the motivated camera cut**: you lose It at ground level and you are already in the hole on the overhead. Nobody designs that transition — the geometry does it. And below ground the only lights are the torch and Its own bones, so the energy ramp is also the light source in the hole. **As the dig runs, It becomes harder to see.** Bones dim while dawn comes on above.

THE SKY CLOSES AS IT DIGS



Two dimmings at once. The night gets darker and the hole gets deeper, and the player is causing one of them.

DEPTH	SKY VISIBLE	DEPTH	SKY VISIBLE
0.3 m	63%	1.2 m	15%
0.6 m	38%	1.5 m	11%
0.9 m	23%	1.8 m	8%

THE SUN NEVER REACHES THE BOTTOM OF A CROOKWOOD GRAVE

Direct sun needs roughly 42° along the long axis and 63° across the short one. Crookwood's sun peaks at 22° . It never gets close — and traditional east-west burial orientation puts the sun crossing the *short* axis at its highest, the 63° one.

So the sky lights the lip, the spoil heap and the top of the shovel. Below that it is the lantern, the torch, and bone. **The floor of that hole has never seen direct sunlight.**

THE OVERHEAD CAMERA GETS ITS OWN CLOCK

The wedge of skylight on the pit wall climbs, narrows and dies as the key moves — a sundial cut into the grave, in frame for the entire twelve minutes. Same doctrine at a different scale: **the player reads the time off the hole they are digging.**

THE CUE SHEET

Nine cues across a 24-minute running time. It is a curve sampled at nine points — the show crossfades between them, it does not cut.

CUE	ELAPSED	GAME	KEY	THE SHADOW
Q1 Yard closes	00:00	17:00	Ch 9 full, straw	Ordinary. Full colour — the only chance to read the yard
Q2 Magic hour	01:36	17:30	Ch 9 drops, warms to full CTO	Lengthening fast
Q3 The 150	04:37	18:20	Ch 9 at minimum height	50× height. Runs off the edge of frame
Q4 Sunset	04:48	18:30	OUT. Cyc only	None. Hard shadows genuinely vanish. Rim up
Q4a The dig begins	06:00	19:00	Cyc only, deepening	Still light enough to work — and it is going
Q5 Nightfall	09:36	20:00	Ch 11 moon in, steel	Soft, silver. First real torch decision
Q6 Deep night	10:06	20:30	Moon + practicals	The lantern does the work. Must not sit still
Q7 First light	18:00	04:00	Moon out. Cyc only	None again, colder
Q8 Dawn	19:30	04:30	Ch 10 in, ¼ CTO + steel	Second peak, raking the opposite way
Q9 Yard opens	24:00	06:00	Full wash	Colour floods back

Q4 AND Q7 ARE THE WHOLE REASON TO BUILD IT THIS WAY

Those two cues carry **no key light at all**. That is physically what twilight is — the sky becomes one enormous soft source and hard shadows vanish. Do not bridge them with a dim key: the dissolve is the effect. And with the instruments visible in shot, **the player watches the sun lamp die**. Not a lighting transition — something that happens on stage in front of them.

Q6 IS TWELVE MINUTES LONG AND MUST NOT BE STATIC

Drift the moon across the whole cue. Breathe the cyc a few percent. Pass cloud shadow on a long irregular cycle. Let the practicals flicker on their own rhythm, unsynced. None of these read individually — together they are the difference between a night and a screensaver.

THE COLOUR SCRIPT

Read bottom to top: groundrow at the horizon, top bar at the zenith. In Unity these are gradient keys at roughly 0.00 / 0.32 / 0.66 / 1.00.

Q1



YARD CLOSES
17:00 · 00:00

	#F0C08A
	#C79A86
	#8FA6BF
	#6E8FB5

Q2



MAGIC HOUR
17:30 · 01:36

	#F09A4A
	#C9713F
	#7A7F9A
	#4A6B96

Q3



THE 150
18:20 · 04:37

	#E8752A
	#A8542C
	#4E5C7E
	#2E4A73

Q4



TWILIGHT
18:30 · 04:48

	#A84A3C
	#6B3A45
	#2E3457
	#1E2A4A

Q5



NIGHTFALL
20:00 · 09:36

	#3A3A5C
	#252945
	#171F34
	#131A2E

Q6



DEEP NIGHT
20:30 · 10:06

	#1E2438
	#161C2C
	#0F1424
	#0C1020 floor

Q7



FIRST LIGHT
04:00 · 18:00

	#2E4258
	#22314A
	#182038
	#141C30

Q8



DAWN
04:30 · 19:30

	#C4805A
	#8A6560
	#4E6A8C
	#3E5A80

Q9



YARD OPENS
06:00 · 24:00

	#E8B888
	#BF9E91
	#8EA8C2
	#7095B8

INSTRUMENT COLOURS

CH 9 · SUNSET KEY · WEST, STAGE LEFT



Warms and drops together. Out entirely at Q4 — it goes, it does not fade to an ember.

CH 10 · SUNRISE KEY · EAST, STAGE RIGHT



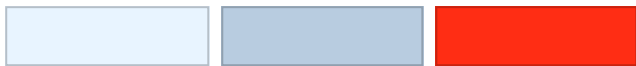
Paler and cooler than the sunset. Dawn light is bluer — matching them flattens the whole arc.

CH 11 · MOON



Low intensity, hard edge. Sits opposite whichever sun ran.

CH 12A · LED HEAD TORCH



Cold ~6000 K, hard cone. Off / red / white — red keeps dark adaptation.

CH 12B · KEROSENE LANTERN



~1900 K, far warmer than the torch — the gap is the point. Cage throws bars; capped top spares the cyc.

CH 13-14 · RIM

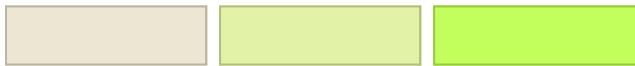


Held back most of the night; full at Q4 and Q7, where the rim is all that holds the silhouette.

THE BODY — THE ENERGY RAMP

The Villain's bones are a gauge. Donuts charge It and the bones go luminescent; digging spends it and they fall back to bone. The **surface** ramps cream to a pale luminous green while the **emissive** carries full Carny green — that split is what makes it read as fluorescence rather than paint, because real UV-lit bone is a bright pale core with a saturated halo.

SURFACE ALBEDO · 0 → 1



Value holds the whole way up; only the hue travels. It must never look painted.

EMISSIVE · ADDED ON TOP



Scales with charge. At full It is self-illuminating — visible with no external light at all.

LIGHTING NEVER CHANGES THE BONE. ENERGY DOES.

Two separate axes, and they must stay separate or someone will "fix" the bone when a cue looks off. The suit holds at #2E333A under every light in the plot.

And the glow is a **stealth cost**, not a **buff** — lit up in a dark graveyard It is a beacon. Donuts buy sight and spend concealment.

WEATHER RIDES OVER THE TOP

WEATHER	TRANSFORM ON THE SKY	INSTRUMENTS	THE TRADE
Clear	Base values	Full plot	Sees everything. Is seen
Overcast	Desaturate ~40%, lift the floor ~8%, kill the warm groundrow band	Moon out. Stars off. Lantern is the only key	Safest to work, worst to see
Fog	Compress all bands toward the low blend, lift the floor hard	Hazer full. The long shadow dissolves into the air	Cover, at the price of the horizon
Rain	Contrast down, slight cool shift	Levels down, breakup moving	Sound cover — and a slower dig
Storm	Overcast base	Lightning bumps; everything dips beneath the strike	The only big shadow at 2 am, and unplannable

STANDING RULES

The short list that keeps the whole thing standing. Everything else in this document is a value; these are constraints.

NEVER GO TO TRUE BLACK

#0C1020 is the darkest value in the game and it is deliberately not black. Rods need something to work with, and a black screen makes players raise their monitor, which destroys every other decision here. Nothing in Crookwood goes below it.

EVERYTHING THAT IS NOT THE CYC IS BLACK

One white surface anywhere in a 70 m volume bounces enough to lift the floor and the night goes grey. Walls, grid, ceiling, wings, the ball's gantry — duvetyne, black serge, matte black. The scaffold stays visible as *shape*, not as a lit surface.

NEVER DERIVE SHADOW LENGTH FROM THE REAL SUN

Shadow length is height $\div$ $\tan(\text{elevation})$ — 45° gives 1×, 5° gives 11×, 1° gives 57×. Staged entirely between sunset and sunrise, Crookwood lives permanently in the part of that curve that misbehaves. Length comes from an **authored curve with two peaks**, one at the end of dusk and one mirrored at first light. The clamp is a staging device, not a safety limit — the 45.7 m shadow is a hero shot placed deliberately, not an accident survived.

CALIBRATE TO THE PANEL, NOT THE ROOM

A dark room is a given. On PC the thing that breaks this is the monitor — an OLED shows true black, a mid-range IPS shows grey mud. Set the night floor above the worst panel's crush, and build the calibration into **the tunnel**, where It picks up the torch: tutorial, calibration and the start of dark adaptation in one walk.

TWO SHADOWS, TWO SURFACES

You cannot cast a ground shadow onto a cyclorama, because the cyclorama is the sky. **The deck** takes the long rake, from a key low and far. **The cyc and the headstones** take the rear-up, from the lantern low and close. Two shots, two sources — confusing them costs a week.

Physics as a source, never as an authority. Use the world to find out what's beautiful and why. Never let it tell you what's allowed.