



*Hello! Thank you for downloading the slides of this GDC talk about Radial Design, puzzle setups and surprises!*

*All spoken content can be found in the slide notes of this PDF, although I recommend viewing the video of this presentation in the GDC Vault or downloading the original PowerPoint presentation from <https://www.guerrilla-games.com/tags/publication> to not miss out on the videos and animations that were originally part of this talk. However, some minor tweaks have been made in this PDF version to make sure all the important information you need is still in here.*

*With that said, let's get into "Relic Ruins: Creating Environmental Puzzles for 'Horizon Forbidden West'".*

*Enjoy the slides!  
- Daniel*



I wanted to start with this talk with some pretty ruins on the screen. Because these ruins have environmental puzzle spaces in them!

Here you can see Aloy, our protagonist, flying around the puzzle space on her Sunwing, her flying mount.

And if you are into puzzle design: today I'm going to talk about the design philosophy of these puzzle spaces!

I will explain a great method that we used to attract players to puzzle spaces and I will cover how we made them fun and engaging.

HELLO!  
I AM DANIEL

DESIGNING  
GAMES  
SINCE 2015



My name is Daniel Wewerinke.

I'm a Senior Game Designer and I'm a sucker for designing puzzles!

I mostly worked on indie puzzle games in the past, including the String Theory web series and Metrico+

I've been working at Guerrilla for almost 7 years now, where I worked on both Horizon Zero Dawn and Forbidden West, including the Burning Shores DLC, which we released last year as an epilogue to Horizon Forbidden West and is also bundled in "the complete edition", that is out now on PS5 and PC.

## I WORKED ON THESE WORLD ACTIVITIES



Co-designed with Stuart Billingham



Co-designed with Dennis Micka

Those of you who played the game probably know these activities that the player can find in the open world:

Relic Ruins, Tallnecks and Salvage Contracts.

I worked on these!

And I wanted to make this talk about Relic Ruins, since those are my “babies”; I worked on these from the early pitching process all the way to the final product.

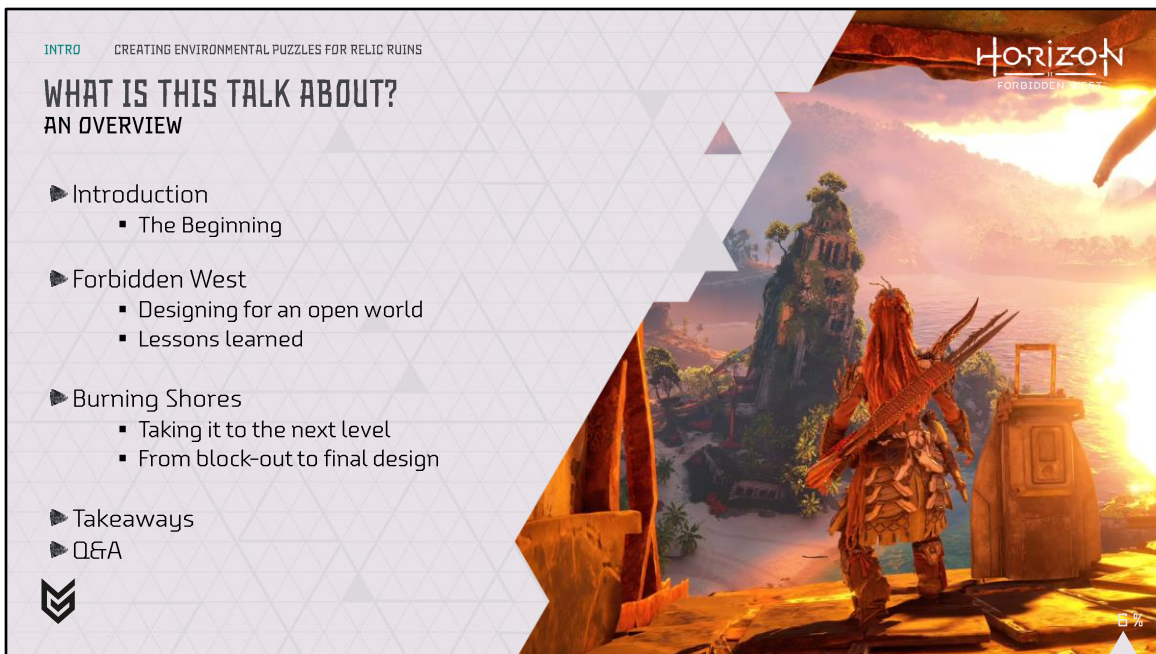


The environmental puzzle spaces that are located in the open world are called “Relic Ruins”.

These puzzles are always located inside destroyed buildings that are scattered throughout the open world.

In each of the Relic Ruins, your goal is to reach a mysterious Ornament (or Relic, hence the name “Relic Ruins”). You can see one of those laying here.

It typically takes 15 to 30 minutes to complete a Relic Ruin. And to do so, players must understand the space they are in, find the right elements in the space and use those to solve problems and overcome challenges.



And in this talk I'll be covering the following:

- I'll start with an introduction, in which I'll cover our team structure, how I originally pitched the Relic Ruins and where the inspiration came from
- In the first part I'll show how we approached designing puzzles specifically for an open world (focussing on the Relic Ruin "No Man's Land"). And I'll go over what we learned when designing the Relic Ruin puzzles for the base game
- In the second part I'll focus on the "Burning Shores" DLC and will explain how we took the design to the next level. (Here I'll zoom in on the Relic Ruin "Murmuring Hollow" and the side quest "A Friend in the Dark")
- We'll end with takeaways
- And hopefully there will be some time for Q&A at the end.

A little disclaimer before we start: This talk will feature some spoilers for the Relic Ruins, specifically the one in No Man's Land from the base game and Murmuring Hollow from Burning Shores. So with that out of the way...

# THE BEGINNING

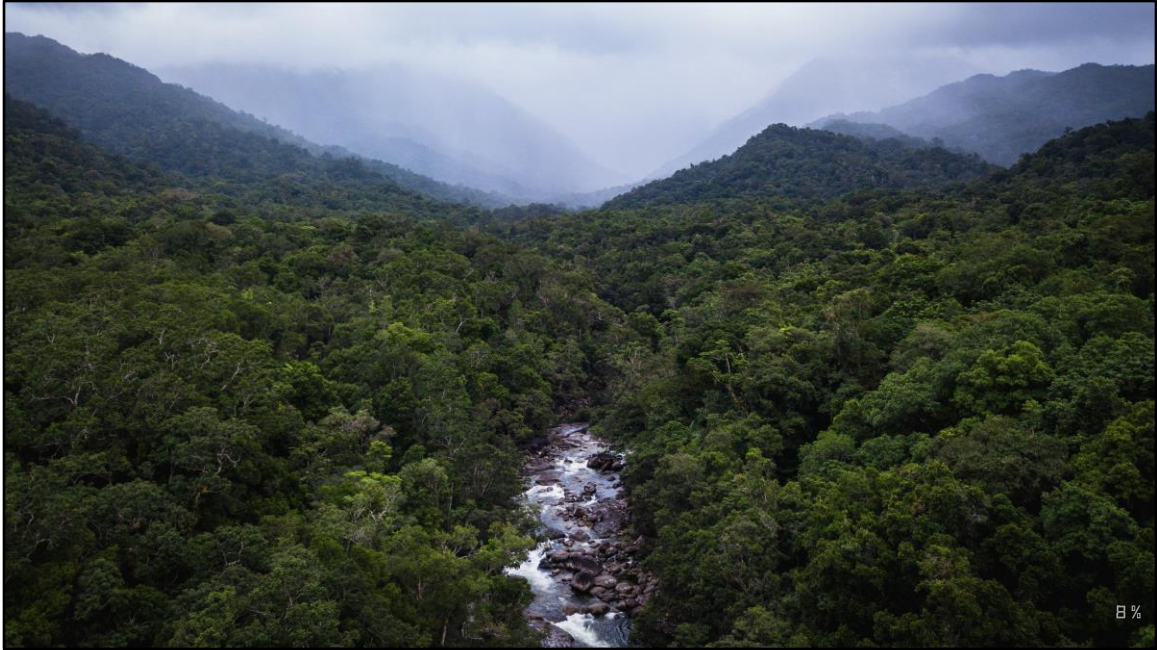
THE ORIGINS OF THE RELIC RUINS

HORIZON  
FORBIDDEN WEST



...let's start with the beginning.

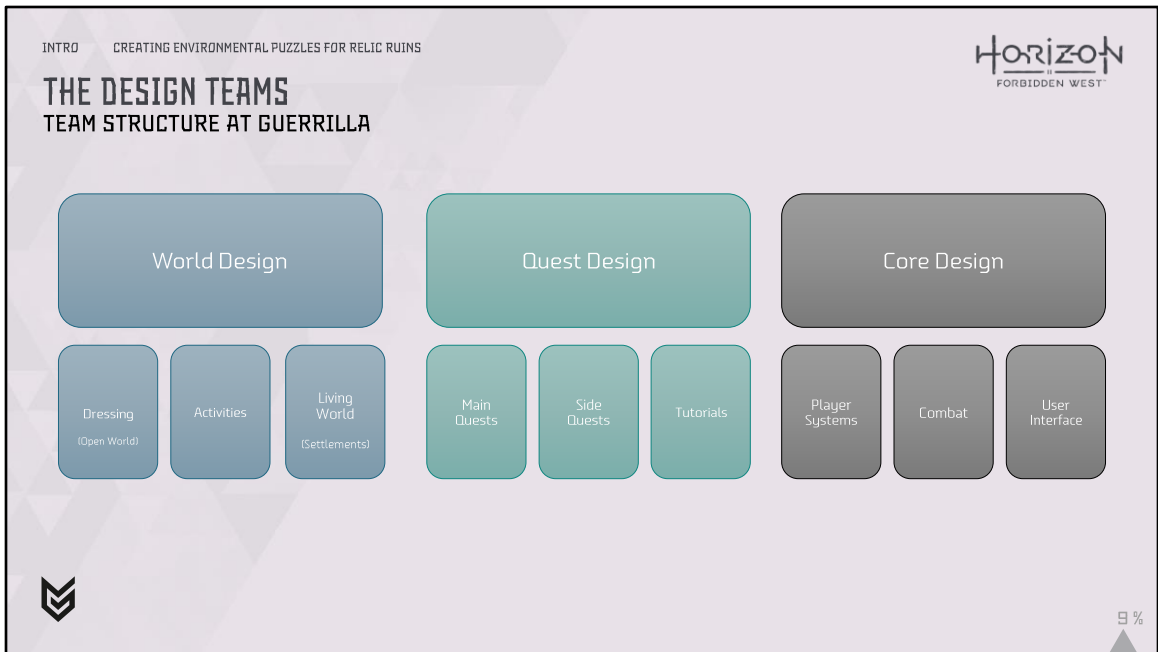
I remember very vividly that when I came to the project in early 2018, my colleague Cedric Chassang opened the first build of (what was then just called) "Horizon 2".



The game world looked like the Amazon forest. It was this vast world, completely filled with automatically generated trees.

There was no content in the world yet. And since I started out in the World Dressing Team, it would be our task to come up with interesting and novel content to fill it with.



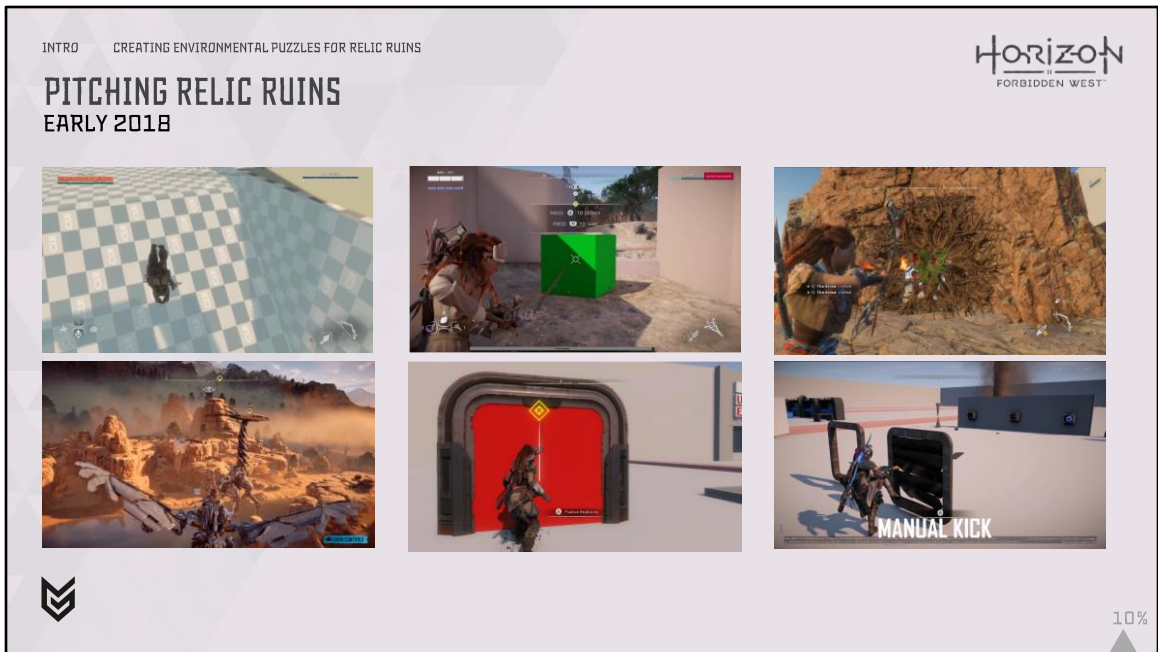


As you can see in this overview, the World Dressing team is part of World Design.

The Dressing team focusses on the design of the Open World:  
From high-level to low-level management of where the world content goes, to the placement of roads, encounters and collectibles.

Other teams, like Activities and Quest design create the bigger or more story-focused main and side content

While teams like Core Design figure the core mechanics for the game out.



In the early days of Forbidden West, our Core Design team was prototyping some core mechanics of the game.

I saw things like:

- Swimming underwater
- Flying
- Pulling things using The pull tool (which we later renamed to the Pullcaster)
- Explosives to blow up doors, C4 at the time (this would later be the Unstable Spores that we now have in the game)
- A vine cutter which could open gateways
- And the ability to kick in air vents, to name a few.

A lot of these mechanics at the time were just planned for use in traversal or combat, however – having worked as a puzzle designer in the past – to me these all screamed “puzzle design”.

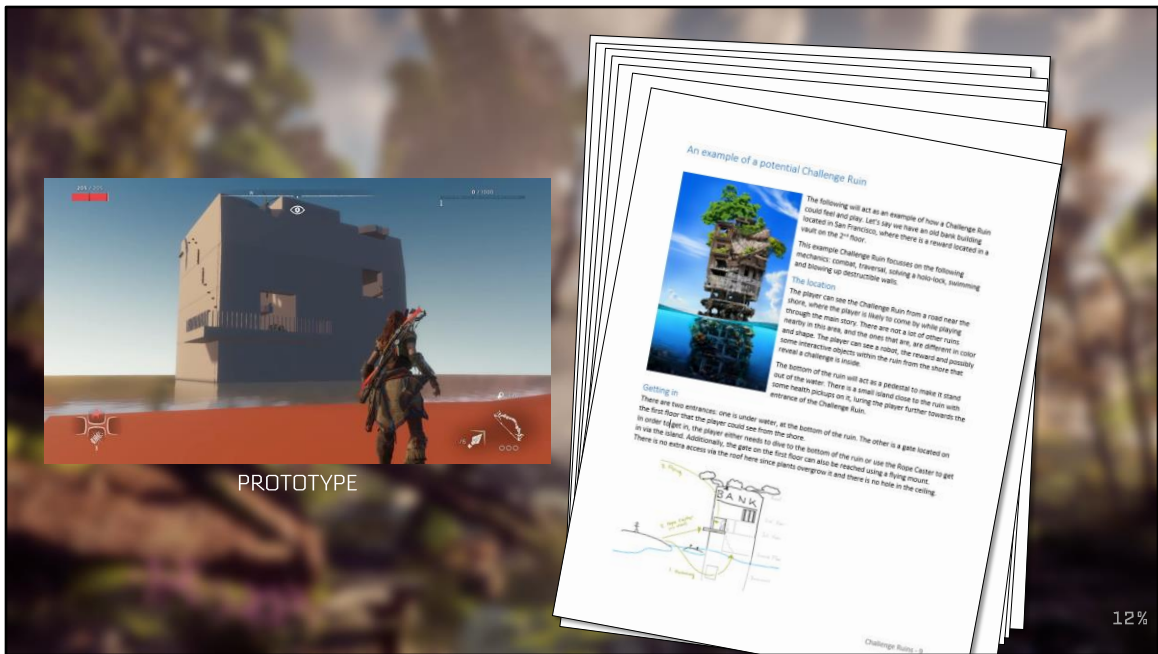
I knew I wanted to use these mechanics for puzzles and we started looking where this would fit...



The ruined cities from the first game looked really impressive, but they did not have any gameplay in them. And we wanted to change that for the sequel.

During pre-production, when I was asked to look at this area from the first game: “Devil’s Thirst”; which is based on Colorado Springs – to do an exercise in puzzle design, I was very excited. Because I could design puzzle stuff!

While I was briefed to create a concept for just a small 1-minute puzzle for one of the buildings here, I ended up writing this massive design document...



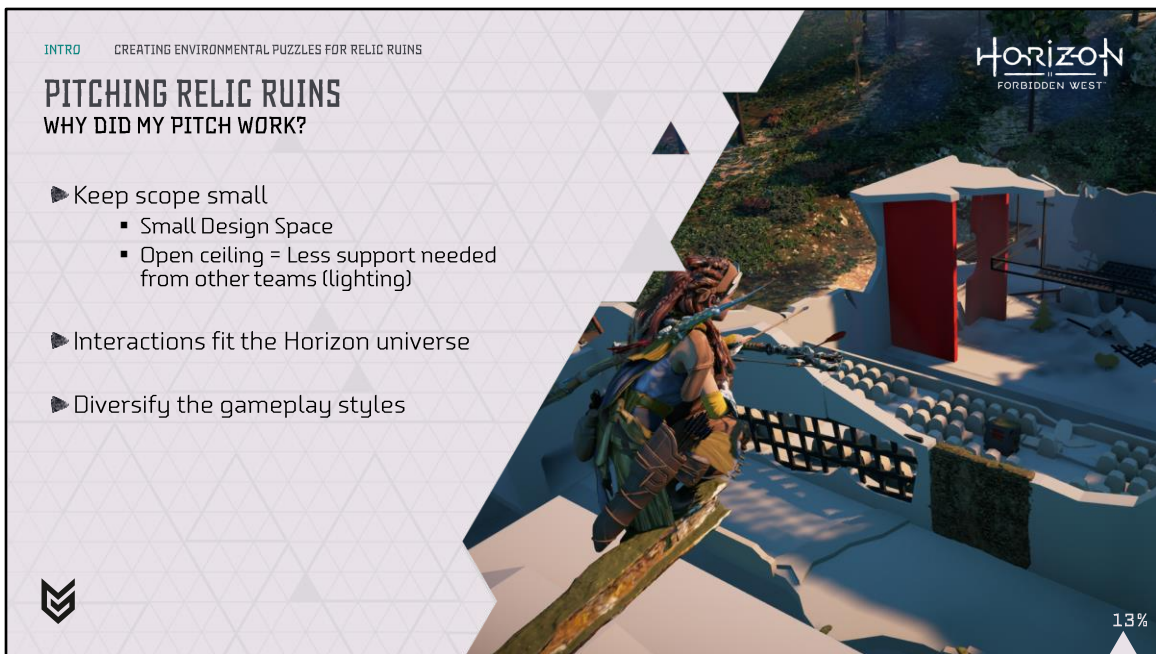
...describing how we could use the newly planned mechanics (from the core design prototypes) not just in one building, but in multiple old-world ruins. I called these puzzle spaces “Challenge Ruins”.

And before I knew it I was designing 9 elaborate puzzle ruins in the game world!

...But let’s take a little step back.

The first prototype that I build for these Relic Ruins already had a lot of puzzle elements in it: there was swimming, pulling objects, finding elements and moving them around. And it helped to sell the idea of these Relic Ruins!

While our game is action-focussed, this pitch showed that Horizon could be more than just fighting machines, conversing with NPCs and traversal. The puzzles would add nice variety in the game’s pacing.



My pitch was successful, and it allowed me to develop the Relic Ruins further.

I always try to keep the scope small, and reduce support from other teams when pitching

This improves the chances of getting my pitch greenlit.

And what helped here is that:

- The Relic Ruins wouldn't require a lot of space.
- And maybe more importantly: they would have open ceilings, meaning natural light could come in.

This way the lighting team would not have to set up custom lights in the space.

Note that once greenlit, I *might* have made some one or two puzzle spaces that were quite big and needed bespoke lighting. The small scope wasn't a hard restriction, but it did help to sell the pitch...

- I also made sure to pitch puzzle interactions that would fit the theme and the world of Horizon
- And finally: it would diversify the types of gameplay for our game.

We were already looking into races as an activity. And puzzling would be another nice addition.

Now note that I wasn't the first to pitch puzzles for Horizon.

There have been puzzles in quest spaces in the past, like the Ancient Armory quest and Shaman's Path; both created by my colleague Blake Rebouche.

But this was the first time that we were looking into creating environmental puzzle spaces as an activity in the open world!



After the pitching process, it was time to build those nine puzzle spaces...  
...but as with every design process, it can be intimidating to start with a blank canvas.

So for the Relic Ruins, I would try to get inspired by real-world buildings.



For example, the the Relic Ruin “Restless Weald”...





...was inspired by the Caliente Railway Depot. A real-world train depot in the little town of Caliente, Nevada.



Since the world of Horizon is based on the real world, I typically look up the real-world equivalent of the area that we wanted to have in game. And use Street View to search for interesting buildings. Or look up the buildings that the environment art team is interested in using.

In this case, when stumbling upon a train depot, it immediately sparked gameplay ideas:

like pushing trains, hopping over them, changing tracks, etc.

So I start working from there.

## BUILDING RELIC RUINS



1. The Daunt



4. The Dry Year



7. The Long Coast



2. No Man's Land



5. The Stillsands



8. Isle of Spires



3. Restless Weald



6. Runner's Wild



9. Murmuring Hollow



In the end, we built eight Relic Ruins for the base game and one more for the DLC.

And with each puzzle, we try to use the various mechanics of our game in different and unique ways.



Here you can see how the Relic Ruins are spread out over the game's world map.

The first ruin is located all the way in the east; in The Daunt, the starting area of the game.

This ruin is meant an introduction to the game's puzzles.

From here on the other Relic Ruins were spread out across the map, moving all the way to the Isle Of Spires, located deep in the Forbidden West; which housed the biggest puzzle space of them all.

(Fun fact: this one is based on the Hobart Building on Market Street, right here in San Francisco)

And since the Relic Ruins grew into much bigger pieces of content than originally briefed, they got their own quest system and I made the transition from World Dressing to the World Activities team.

Here I could design my Activities around the knowledge that I gathered from a team that manages the Open World.

# DESIGNING FOR AN OPEN WORLD

## LURING PLAYERS AND USING RADIAL DESIGN

HORIZON  
FORBIDDEN WEST

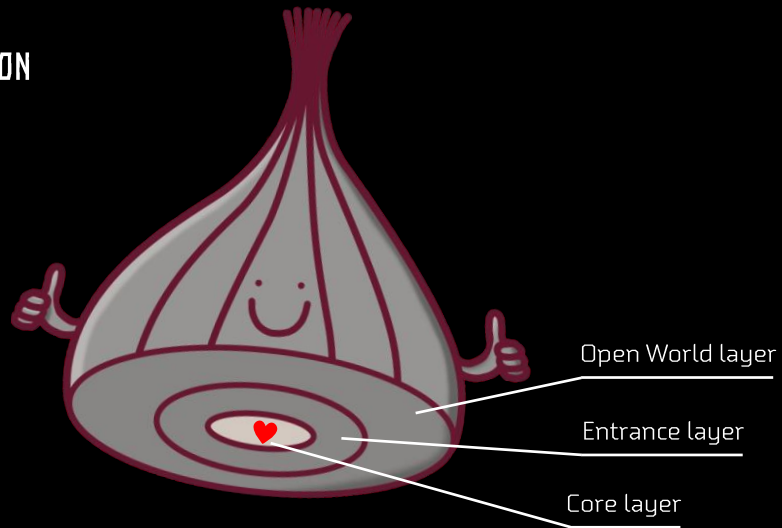


So now that you know about the beginning, let's go to the next chapter...

In which I'll explain how we approached "Designing for an open world",

I'll be discussing my design philosophy for the Relic Ruins from the outside to the inside. It's a bit like an onion...

## RADIAL DESIGN ONION



21%

This is my friend the Radial Design Onion! Hand-drawn by moi, anatomically correct, and all.

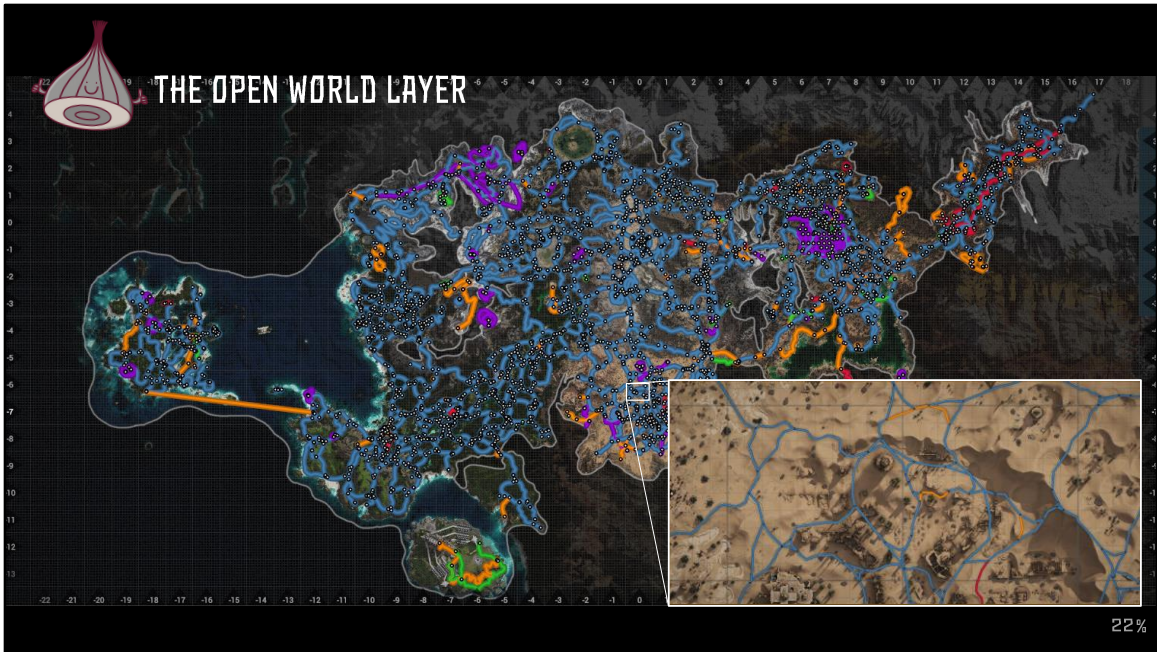
It will help to explain how I approach designing for an open world.

If we cut the onion in half, we can see that it has three layers:

- The outer layer represents the open world, in which we lure the player towards our content.
- Then comes the Entrance Layer, where the player gets into the puzzle space and might already find a puzzle element.
- And finally we get to the Core Layer. This is where the player uses all puzzle elements that they found to solve the puzzle...  
...and gets to the heart of the onion: the reward for solving a puzzle.

Now, you will see this onion appear a couple of times throughout my presentation. I will start talking about its outer layer, before getting to the other layers. But know that they are all connected!

So let's look at the Open World Layer...



We typically use roads to guide the players to our content in this layer.

Here you can see the many, many roads that we have in the game.  
All these little dots that you see are intersections

If we zoom into this small section, you get an idea of how HUGE our road network is.

When I was working in the World Dressing team, I did the first iteration of medium-level road placement (a bit more defined than the high level designs; others filled in the low-level details)

So I knew the techniques to steer a player through the open world. And while players could ignore the roads altogether and roam free...



...heat map data shows us that most players actually follow the roads.

And thus as designers, we can use the roads to create the best possible approaches to content!



## GUIDING THE PLAYERS TOWARDS WORLD CONTENT

### ► Creating the best approach

- Place the content along roads
- Create sightlines from the roads
- Use composition and framing, hide and focus, light and dark
- Reveal using parallaxing (or on downward facing surfaces)



HORIZON  
FORBIDDEN WEST



24%

And of course we wanted to apply that to each Relic Ruin: we wanted to make sure that when players would walk through the game world, they would see the ruins and want to engage with them!

So we placed a ruin next to a road, creating sightlines, using composition techniques like framing, hide and focus, light and dark to steer the player, and reveal the ruin using parallaxing to create the best possible approach.

Let me show an example: Aloy walks through the forest and all of a sudden, a Relic Ruin appears and sparks her interest on her right.

Now what we used here are all these techniques:

- Light and dark  
The upper area is lighter and draws the player's attention, which helps to look up
- The trees work as a parallaxing element  
When you walk past them, you will gradually see the ruin appear.
- And finally: There is an opening in the trees, which we made on purpose, to get a proper view to the building.
- Sometimes we even add directional elements in the world that all point towards

the content , focusing the player's attention on it even further.

Both designers and artists can use these compositional elements to create the perfect approach...



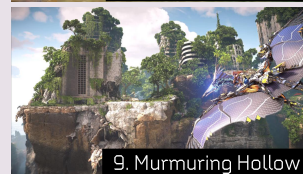
But while a certain approach might be the best one that we try to steer the player to, we need to accept that there can be other approaches as well: because again, this is an open world.

Players are always able to roam free and find a different approach...

...and that should not break the puzzle!

This is why it was so important for me to accommodate multiple ways into a building!

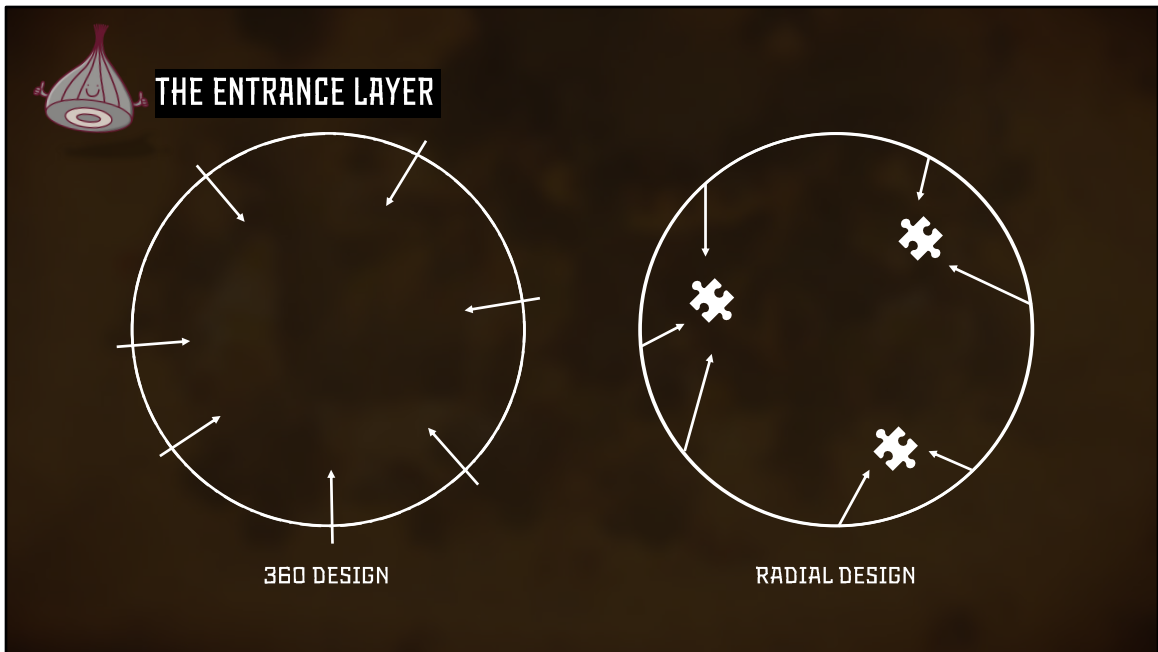
## THE RELIC RUINS



Let me show you an example by focussing on the second Relic Ruin – the one in “No Man’s Land”, from the base game.



[This video shows three possible approaches for the Relic Ruin in No Man's Land]



And this brings me to the second layer of the onion, the Entrance layer.

Designing a space multiple approaches is also known as “360 design”. But typically, you don’t *have* to use every entrance.

So we made an addition to this for our puzzle designs: We want every entrance to be rewarding and useful. So which each entrance we guide the player to a “puzzle piece”, that sparks curiosity to explore the space further.

And by doing so, we lure the player into the core of the puzzle space where they can use these pieces to start solving the puzzle once they have found all puzzle pieces.

We started calling this “radial design”.



## RADIAL DESIGN

PULLS THE PLAYER TO THE CORE OF A PUZZLE SPACE

Using Radial Design, we basically pull the player to the core of a puzzle space.

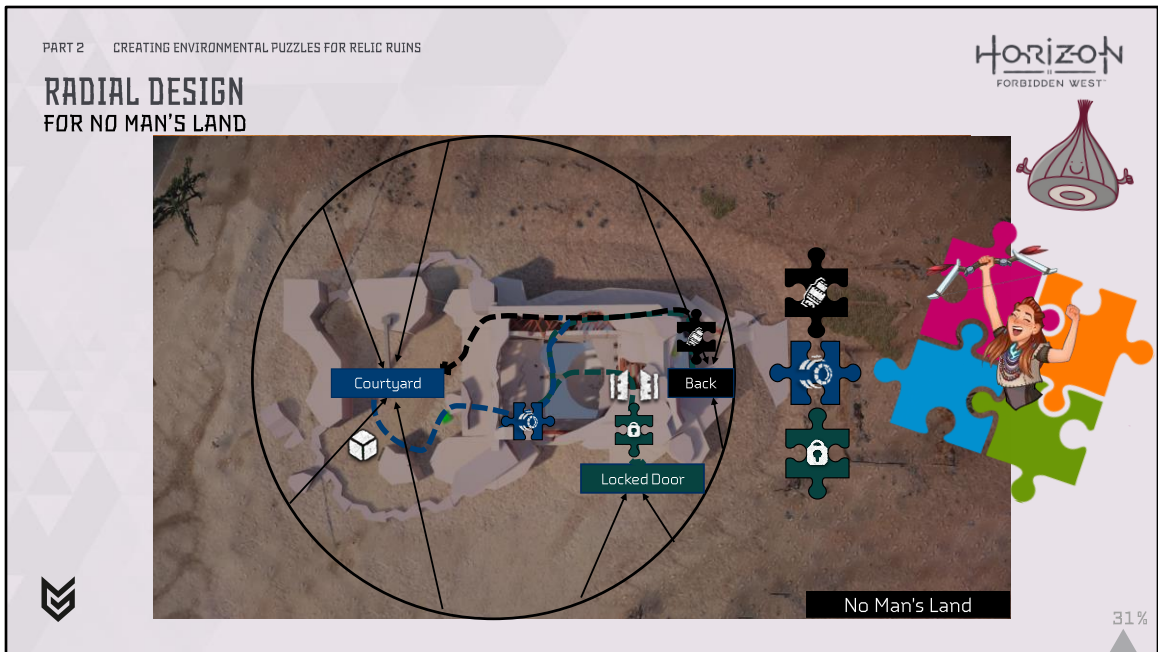
**RADIAL DESIGN  
FOR NO MAN'S LAND**



30%

Let's show how we used these techniques in the No Man's Land Relic Ruin when it was still in greybox phase.





Even though it was a greybox, there was already Radial Design in place.

Let's say this circle represents all possible angles from which the player could be approaching.

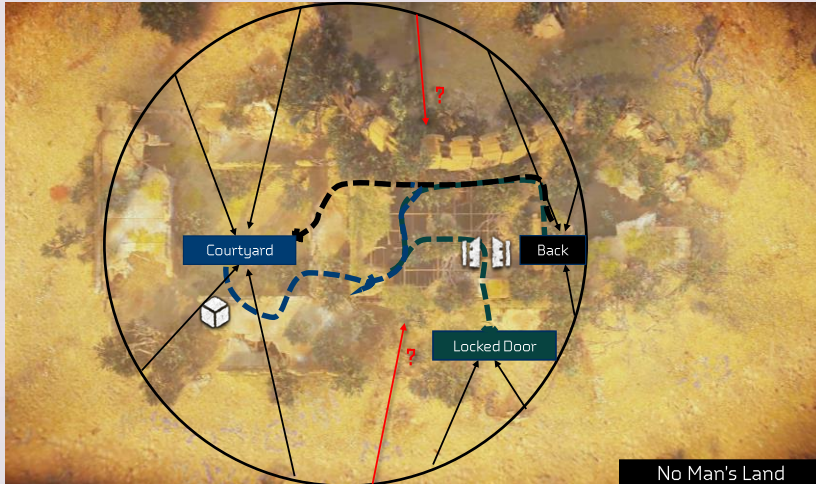
(Let's keep it at approaching from the ground for now, we'll get into approaches from the air by flying a bit later)

- If they approach the ruin from the front, they stumble upon a locked door, as you just saw in the video.  
Player would not know how to open it yet. While this is technically not an entrance, it *is* an important puzzle piece.
- If they approach from here, they go to the courtyard, solve a little puzzle using a crate, get into the ruin, and will find an Energy Cell Recepticle. But they can't use this without having an Energy Cell.
- And when approaching from the back, you can find an Energy Cell, but you don't know what it's for, without having accessed the courtyard.
- By connecting the routes we make it exciting to explore all areas of the puzzle.

So no matter how you enter the puzzle space, you will be given a "puzzle piece".

And only when you've seen all "puzzle pieces" you can start solving the puzzle.  
In this case: putting the Energy Cell in the Receptacle to get a final reward and open the previously locked door.  
And thus by combining the puzzle pieces, it can "click" and Aloy can solve the puzzle; happy Aloy!

## RADIAL DESIGN FOR NO MAN'S LAND



32%

Now note that although we tried to design for all possible approaches, there are still some that didn't work that well.

If you were to approach from the back for example, you would walk straight towards a wall (see: the red arrows).

Obviously this will not trigger the player's curiosity to explore the puzzle space, so we had to do something about it.



We used a classic game design trick to fix this:

We made the wall grated, so you could see what's behind the wall, and get a hint at the inner layer of the onion.

However, the player could not get there without taking one of the proper entrances!

And players typically accept that a grated wall signals: "find another way in".

We tried to make the proper entrances as appealing as possible, using classic game design tricks.

One that always gets the job done is by...



...applying yellow paint. Everyone loves yellow paint :')

But seriously, these climbables do invite the player to go up here.



A path of pick-ups can also be used, that act as breadcrumbs to lure the player somewhere...



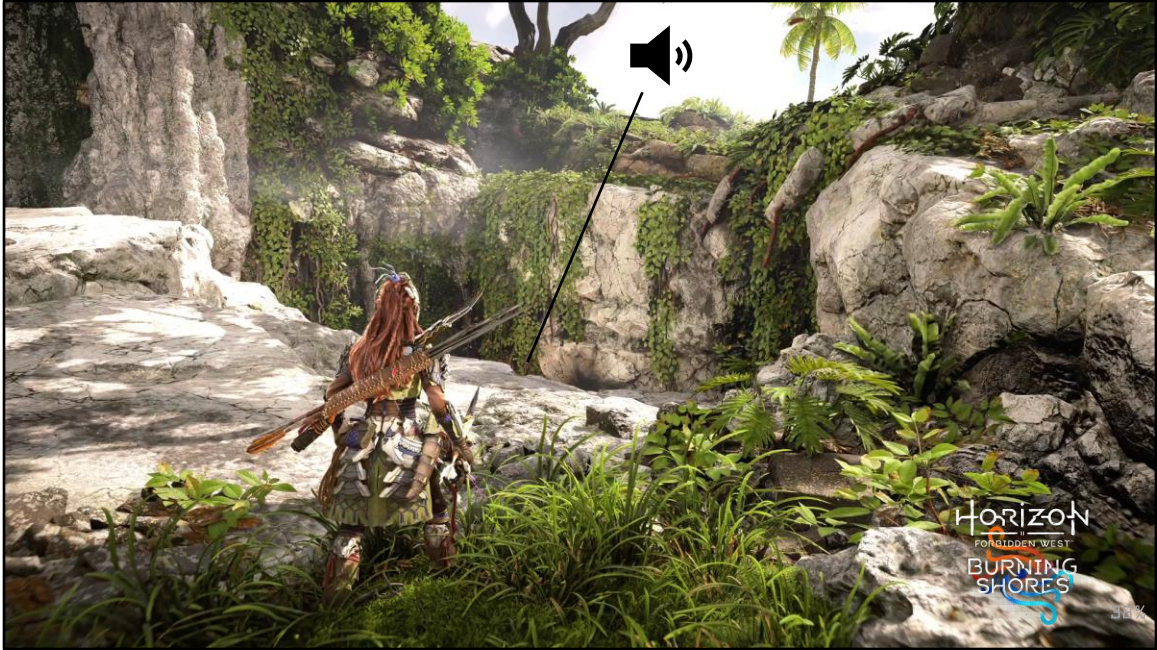
Important elements in a puzzle should light up so they can be seen from a distance too...



And in our game, the player can be the detective themselves:

When they see one interactive object, they can use the Focus – Aloy’s sci-fi earpiece – to see through walls to discover more interactive objects that might be hidden inside the puzzle space.





...in the DLC we also used audio to lure a player in.

The ancient recording coming from this hole quite literally invites the player to come in and see what's in there.

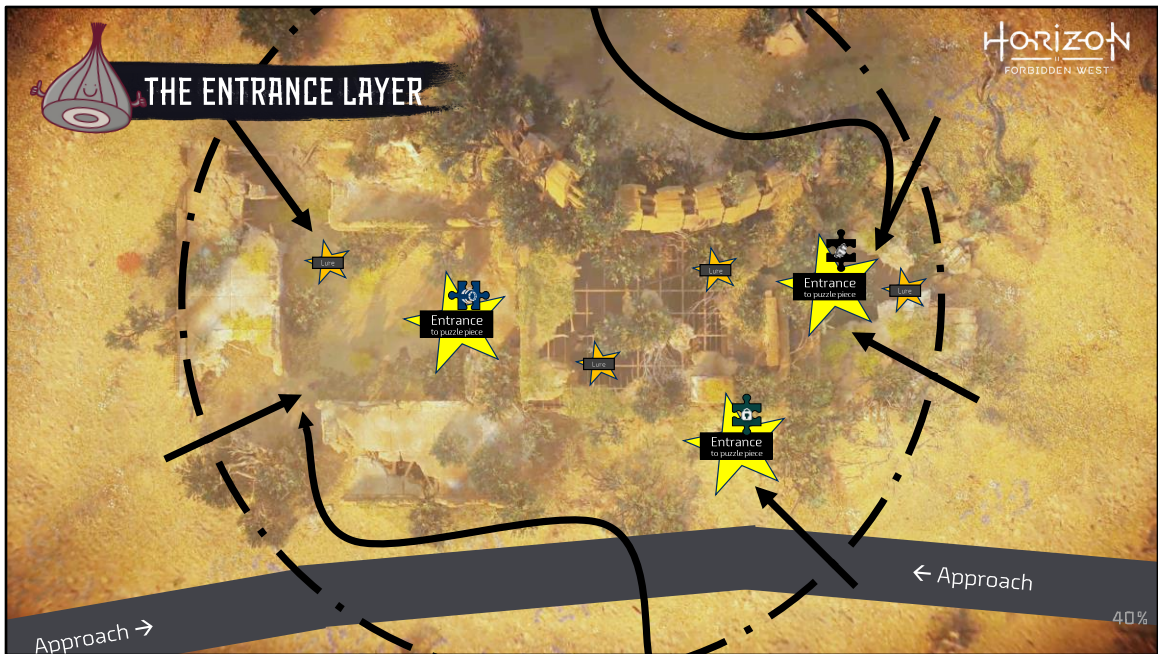


So even if the players are heading towards a wall, we try to give them the ingredients that spark their curiosity and guide them towards one of the proper entrances.

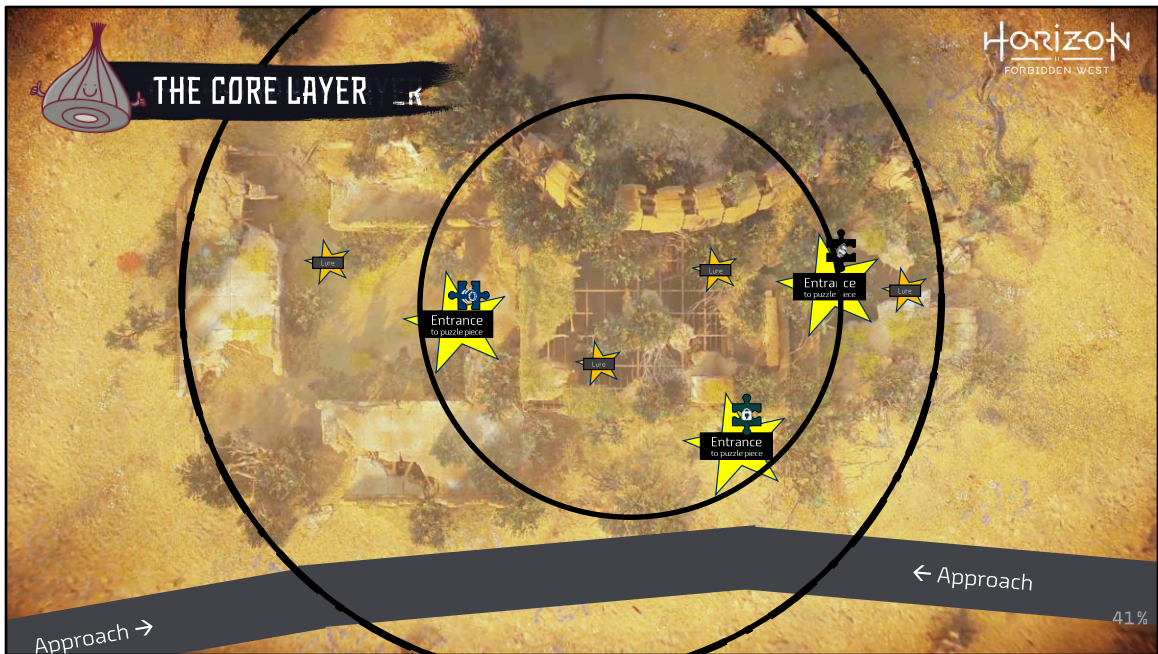
To summarize what we did thus far:

Looking at the outer layer of our design:

We tried to create the best possible approaches towards the content using roads and compositioning techniques

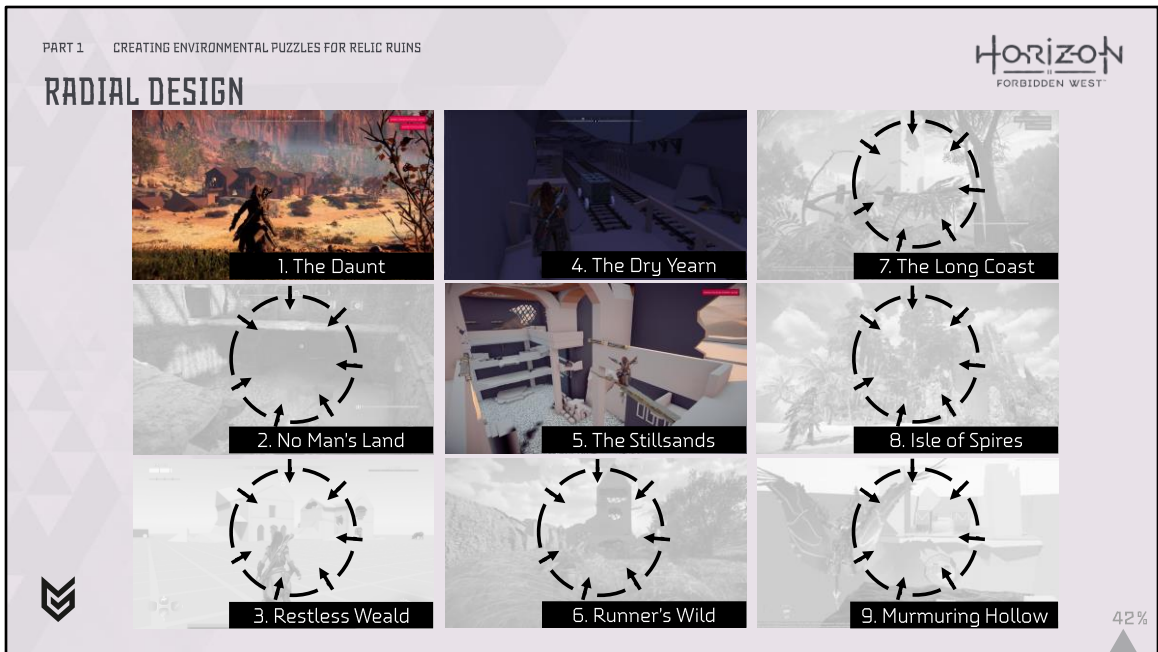


Looking at the middle layer: we designed the space in such a way that there are multiple entrances into the building: 360 design. But we also made sure that each entrance guides the player to a puzzle piece. And we lured the players into the proper entrances using classic game design tricks



And once players have found all the puzzle pieces, they can start solving the puzzle which is in the core layer of the onion.

All of this combined is what we call Radial design.

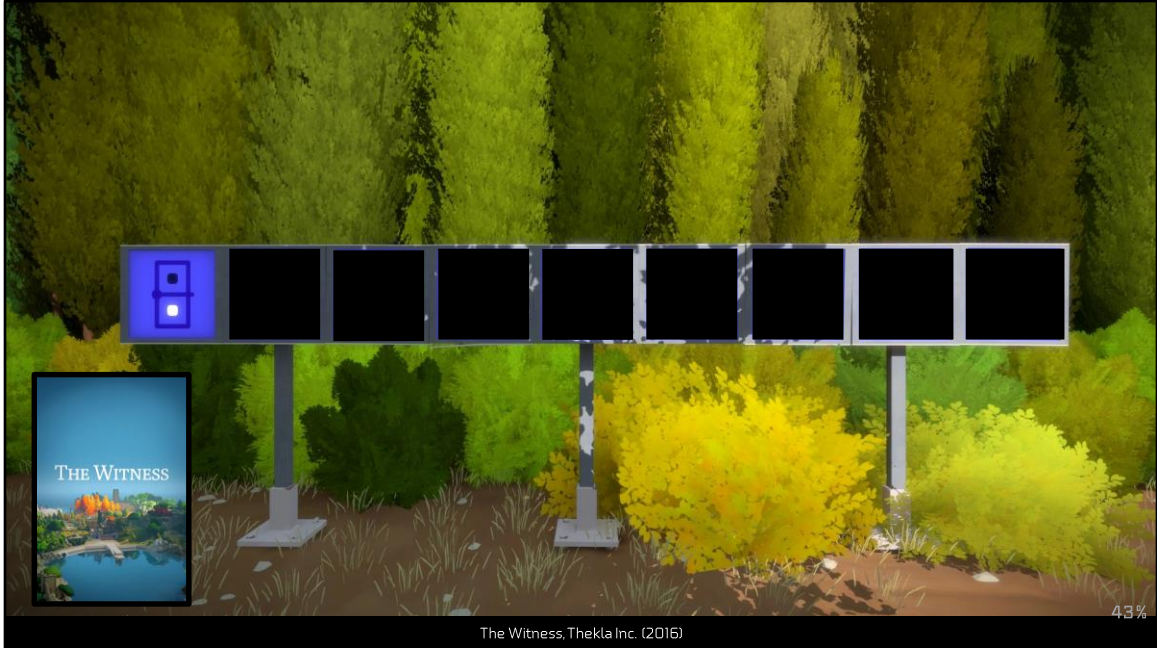


For the base game we used Radial Design for most of the Relic Ruin designs, as you can see here.

However, sometimes Radial Design is not the most effective way.

In the case of The Daunt, we wanted a puzzle that acted somewhat as a tutorial for the later challenges to come.

We found that introducing elements one after another worked better in a linear set-up, to introduce players to certain puzzle elements.



One of my favorite puzzle games, The Witness, does something very interesting.

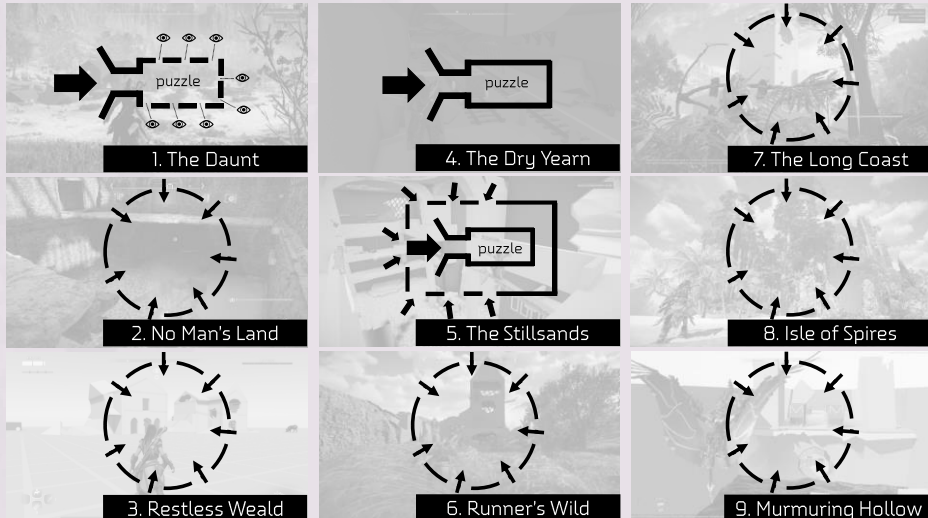
In this game, there are a lot of puzzle panels that you can find scattered across an island.

And sometimes you would find a series of panels, like this one, where they are all connected.

Only when you solve the very first panel on the left, you can start solving the next one in the series, and so on.

So this is basically a little linear section inside an open world game.

## RADIAL DESIGN



For the puzzle in the Daunt, we wanted to have something similar.

We added a funnel, so the ruin only had one entrance

And once you take that one entrance, you will be introduced to a series of linear puzzle rooms, one after another.

Also we did add a lot of little see-throughs on the outside walls, that encourages players to find that one entrance.

For the other two puzzle spaces, the lack of radial design was a necessity:

- The Dry Yearn was located in a mountain, so we only had space for one entrance.
- And The Stillsands ruin had its entrance at the roof  
We still used 360 design to get *onto* that roof, though.

And as mentioned, all the other designs fully embraced radial design.

## THE LESSONS LEARNED WHEN BUILDING RELIC RUINS

HORIZON  
FORBIDDEN WEST



45%

So that's Radial Design.

Now let's talk about the lessons that we learned, because we learned a lot when making these puzzles for the base game. Especially from the feedback of the 16 scheduled playtest sessions that we had in total throughout the development of Forbidden West.



## PLAYTESTING



Playtest footage from PlayStation Studios QA

46%

Here's a screenshot of video footage from our London QA team during a playtest. With each playtest, I try to watch as much footage as possible.

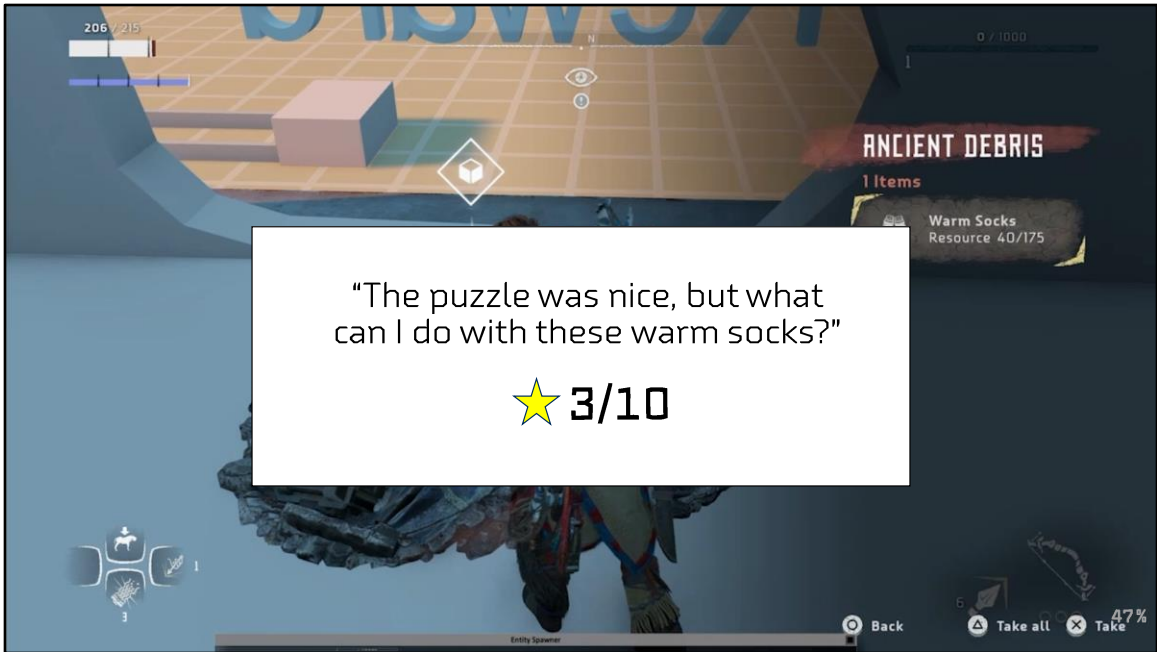
Puzzles are about "a-ha moments", I can only see those when being able to see playtesters play.

If the a-ha moments don't occur, then I try to figure out why and iterate on my puzzle space until it "clicks" for players.

Next to getting these videos, we also ask our playtesters to write reviews for each piece of content that they finish

And our wonderful QA team would send these to us.

These reviews could sometimes lead to surprising results...



For example, we learned the importance of having a proper (functional or narrative) reward for solving a puzzle.

In the early stages of development, we would give the player this obvious placeholder reward for solving a Relic Ruin: Warm Socks.

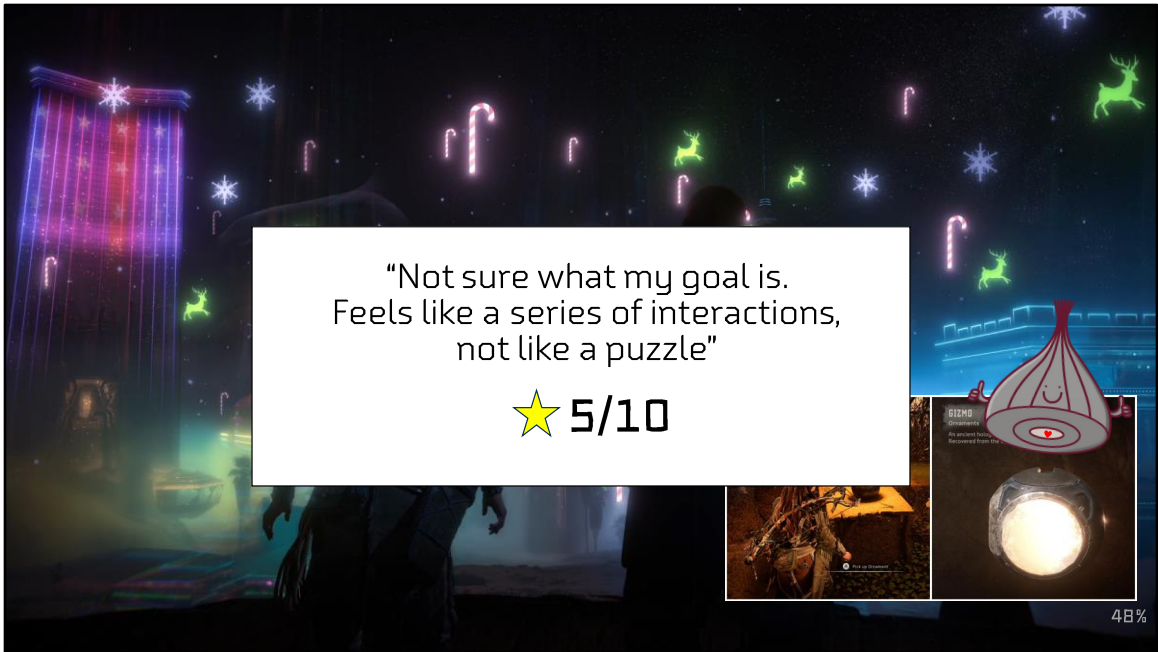
They did not have any use in the game.

And in the early playtests, it became obvious that players found this problematic: We would get reviews saying:

"The puzzle was nice, but what can I do with these warm socks?" - 3/10.

They rated the content a 3/10 while liking the puzzle?

Yeah, not very helpful if we wanted to know if the puzzle *itself* needs improvements...



So eventually we settled on these Ornaments:

Mysterious orbs that emit holograms, that you could hand in at the old ruins of Las Vegas to bring the ancient city to live with those holograms.

And by doing so, you get to spend a bit more time with Stemmur, who collects these orbs, which provides the player with an entertaining narrative reward.

Shoutout to my colleagues Andrew Simpson and Elisabeth Seigel who worked on the side quest where you hand in these Ornaments.

The Ornaments would be the *heart* of the onion.

They would provide the player with a narrative reward for completing a puzzle, which players would find a lot more appealing than getting those Warm Socks that didn't have

any use in game.

And with a nice reward for the Relic Ruins in place, our playtesters could focus their reviews on the enjoyment of the actual puzzles.

Although it became apparent that players were still not always enjoying them:  
“Not sure what my goal is. Feels like a series of interactions, not like a puzzle” – 5/10

Seems like we still had some work to do...



Remember the see-throughs?

We used them to show the reward early, on the critical path of a puzzle...

Additionally we added a callout when the Ornament is in sight, and we'd update the quest objective to "Gather the Ornament".

Note that this is the only quest telegraphing that we do for Relic Ruins.

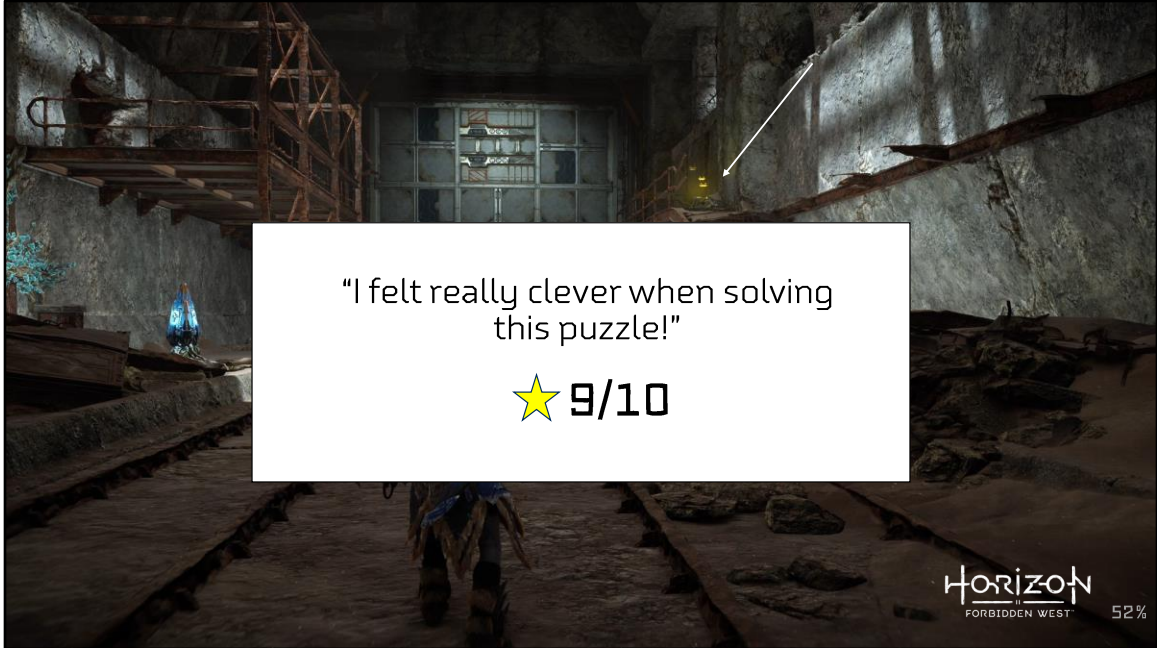
But by having this early in a puzzle, players would know what they would be puzzling for and could backtrack from their goal to find a proper solution.



Retroactively we made sure the reward was visible early on in all of the ruins, when walking by...



...or when climbing...



...or it would just be laying there when you enter this tunnel.  
(This is the mountain Relic Ruin, that I mentioned before)

And with a clear goal in view early in the puzzle, the playtest review scores were going up:

"I felt really clever when solving this puzzle!" – 9/10

Now that is something we'd like to hear; seems like the puzzle works a lot better now!

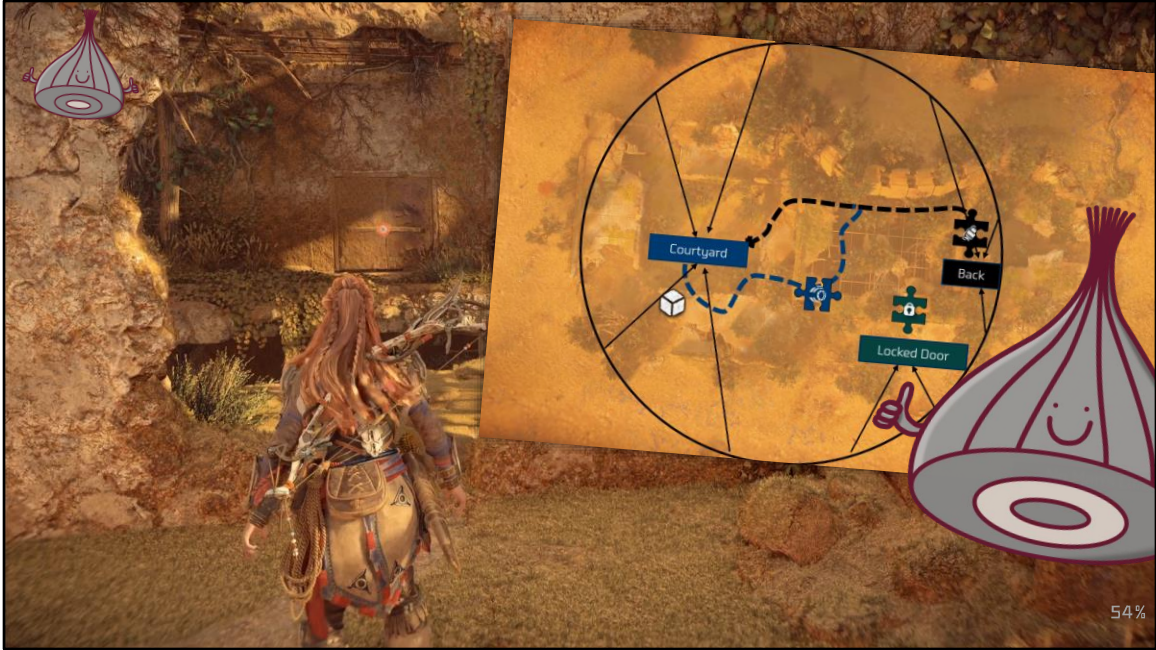


## THE RELIC RUINS



Let's take a look at what worked well in the designs.

I'll focus on the second Relic Ruin "No Man's Land" one more time...



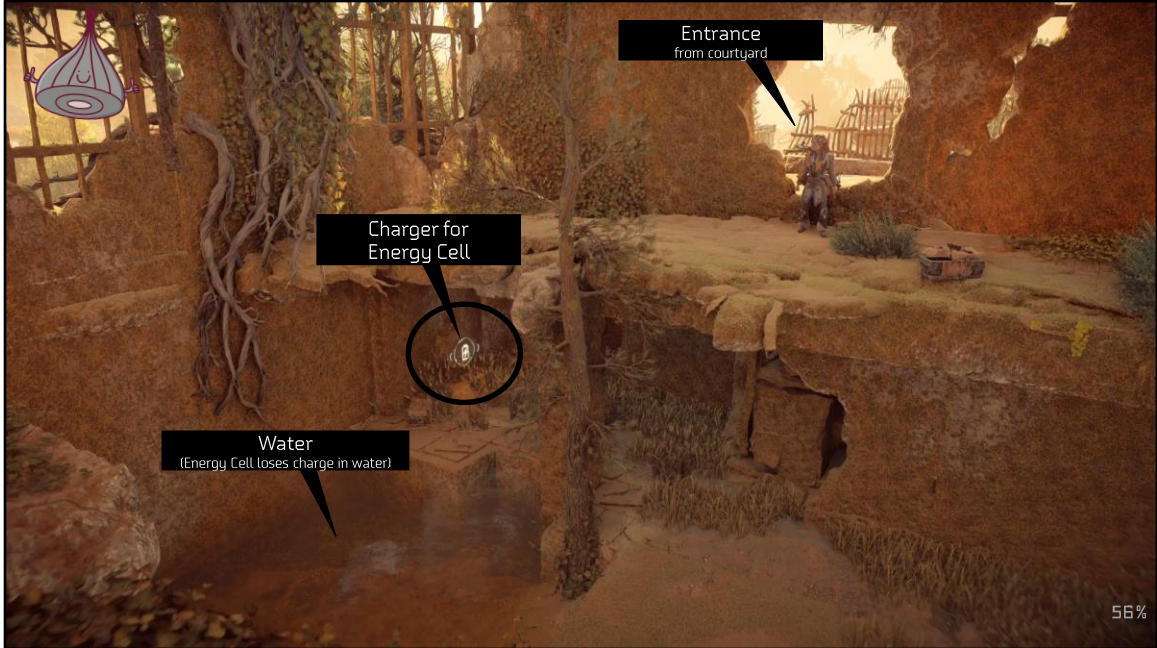
Remember, the goal here is to get a charged Energy Cell in a receptacle to open a door.

But finding that Energy Cell happens in the middle of the Design Onion – there’s a bit more to it if we focus on the **core** of the puzzle space, which goes a bit more into the low-level design.

When Aloy walks in from the courtyard, this is what we’re presented with...



- A locked door.  
The Ornament is behind this door (You could have seen this from the outside, through a window near the locked door), so we want to make sure the player's attention is at the door.
- To open the door, you have to power it up, using this generator. But it requires an Energy Cell.
- This hole in the wall is created by the player as a shortcut to the area that contains the Energy Cell.  
A puzzle piece from the middle layer of the Design Onion. But the Energy Cell that you find there is empty.
- There's also a crate up here. I will get back to this in a bit.



Now below the entrance, there is a place for the Energy Cell to charge up.

Now you might think; easy enough, just get that Energy Cell, charge it here and get it across to power the door.

But here comes the twist: there's water in the ruin!

And in our game's fiction, when an Energy Cell touches the water, it will lose its charge, so you cannot simply carry a charged Energy Cell across.

We ask the player how all the puzzle pieces that we've introduced here can be used to get that crate across the water.

So how to solve this? Well, that's the puzzle.

I'll get to the solution in a bit!



First, let's get back to Aloy.

When she enters the ruin, we want to make sure that that door on the other side is super visible.

To get up there, the ledges below seem like a logical route.

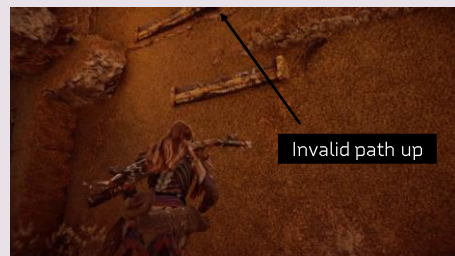
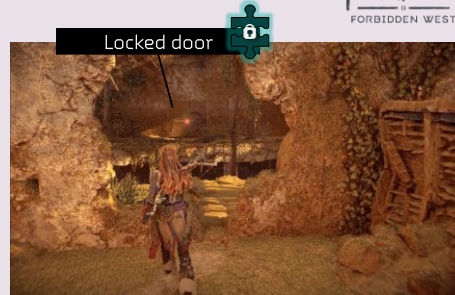
However, as a designer, I'm using a classic game design trick...



[This video shows that the first ledge will break when the player attaches to it]

## THE LESSONS LEARNED GUIDANCE AND NUDGING (1/2)

- ▶ Balancing understanding vs too obvious solution
  - Showing goal early
  - Visibility of puzzle pieces
  - Presenting invalid routes
- ▶ Plants an idea in the player's mind to get to the door via other means
  - Remember there was a crate?



Breaking ledges are a bit of a videogame trope, but they are effective:

The moment the player touches the first ledge and it breaks, the player starts thinking about a different way to get up there.

As a puzzle designer, I'm constantly trying to find the balance between telling the player where to go, but not making it too obvious on how to do so.

As I mentioned, we try to steer the player towards that door.

- We show it the moment the player walks in
- We frame it nicely
- And then we provide this invalid route there.

These methods all help to plant the idea in the player's mind on where to go and what to do.

...Remember there was a crate?



Players can get the crate by pulling it down, and can then use it as a stepping stone to get to the ledges above the one that just broke down.

And to get to the solution of the puzzle: you can also use the crate to safely transport the Energy Cell to the other side, so it does not lose its charge in the water. –Aha!

So that's how you solve the puzzle and power up the console to open the locked door!




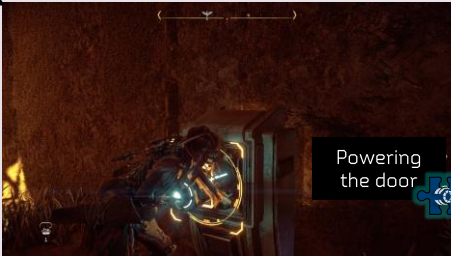
PART 1 CREATING ENVIRONMENTAL PUZZLES FOR RELIC RUINS

**HORIZON**  
FORBIDDEN WEST

## THE LESSONS LEARNED

### GUIDANCE AND NUDGING (2/2)

- ▶ Adding surprise & reuse puzzle elements to achieve aha-moment!
- ▶ Confirmation:  
Music telegraphs the right puzzle steps
- ▶ Hint callouts when stuck
  - Think about hints carefully!
  - We did not have hint opt-in/out choice for hints
  - Generic callouts can be misleading in a puzzle!

61%

Adding surprises and reusing puzzle elements in a different context like this, is something that helped achieving that aha-moment. It typically works very well for puzzles...

Music can telegraph if the player takes the right steps in a puzzle. Together with the audio team, we set up logic to let the music highlight the completion of important puzzle steps and when finishing the puzzle. For example, the music crescendo's when the player gets the crate across the water and puts it in the receptacle!

Additionally, we set up Aloy callouts to provide the player some hints when stuck. We are generally okay if players are stuck in a Relic Ruin for a couple of minutes. They are side activities after all and we want to give players a chance to think about the puzzle for themselves, but we do want to give them a subtle nudge when stuck.

The timing for being stuck is going to be different for everybody, but throughout playtests we did try to find a decent timeframe for giving hints.

However, we didn't always get everything right.

Our scripts for providing hints weren't flawless.  
And some players didn't want hints at all, but we had no system in place to opt-in or out for hints.

Additionally, we learned that it can be hard to get generic hints to always trigger correctly.

And this can be very misleading to a player.

For example, when the pullcaster detects that it cannot pull a thing because of a physics blocker.

Here you can see that this could lead to unfortunate results:



[This video shows that pulling the crate down can be tricky due to a false physics check when pulling from a certain angle]

Aloy's line "Yeah that's stuck" might make the player think that you cannot pull the box down here at all. But if you try again from a little further, it's actually very doable (and is actually what we want players to do!)

Thus, this generic callout can be misleading when fired in an unfortunate context.

In hindsight, we should have been more careful with systemically triggered hints like this one.

PART 1 CREATING ENVIRONMENTAL PUZZLES FOR RELIC RUINS

**THE LESSONS LEARNED**  
THE UNEXPECTED

- ▶ Embracing alternate puzzle solutions
  - Unless they are exploits...

Designer Tester

TikTok @frank\_miller

63%

What I think we did get right, was providing alternate puzzle solutions.

During playtests, our testers would often come up with a solution that is completely different from what we originally intended.

When this happened early in production, I'd often think: arrgh, that's not how it's supposed to be done, let's fix that!

(Like that meme where a playtester inserts a block into a differently shaped hole, but it fits perfectly)

But over time I realized that it can be a good thing: if the player comes up with an alternate solution, using all the elements that we gave them, that's great! Players felt clever and more in control. We should keep that in and embrace multiple solutions for a puzzle!

Unless those alternate solutions are exploits... Let me elaborate.



Here's an example that we were fine with.

Instead of using that crate to get across, players could use a well timed glider-jump to get across instead.

I initially did not account for this, because the glider came in a bit later during production.



Here's another one: the players grapple jump up --- then walk over the roof --- and fall down again!

These are both examples of methods that we embraced in our design over time, since they don't really harm the puzzle.  
(E.g. we made it easier to get onto the roof, by adding climbable legs there)

The player still needs to figure out how to get the Energy Cell across! They are not skipping any major puzzle steps here.

If they do harm the puzzle, and the player is able to skip parts of a story or a segment of a puzzle, then we define them as exploits.



Originally, the final room that's hidden behind the locked door used to have an opening in the ceiling as well.

If players dropped down there, they would skip the entire Energy Cell puzzle, which is something we wanted to avoid, since this was clearly an exploit.

(And additionally, they would get stuck in the reward room)





Finally, I want to take a moment to talk about readability.

We talked a lot about luring the players in this chapter, which typically works really well in greyboxing phase...

...But details of a puzzle design might get lost during development.

Especially if a space gets an art pass and suddenly everything has lots more detail.



It's important to work closely with other departments like art and lighting, to champion your designs together and make sure a puzzle space remains readable.

I'd often sit together with artists and go through my block-outs step by step, just like how I went over the puzzle space in No Man's Land in this presentation!

Successfully putting environment art on a block-out is a process of its own, but the takeaway is that it takes time and collaboration to get it right.

The time is something that we unfortunately did not always have.



In hindsight I wish we had more time to get the sightlines right in the Relic Ruin Isle of Spires, for example.

It can be quite hard to find all the important elements in this huge puzzle space that we created quite late during development.

## INSPIRATION FOR THE DLC

### TAKING RELIC RUINS TO THE NEXT LEVEL



So these are the lessons that we've learned from the base game...

Now let's get into the second part of this talk, where we will focus on the "Burning Shores" DLC.

We tried to take some of the lessons that we learned from the base game and on top of that, truly take the Relic Ruins to the next level.



...but I had a bit of a designer's block after releasing the base game.  
I was facing a blank canvas again and it took me a while to come up with creative ideas.

But then I started looking at the Tallnecks...

## LOOKING AT TALLNECKS EVOLUTION USING SET PIECES



Horizon Zero Dawn



Horizon Forbidden West



Horizon Zero Dawn: The Frozen Wilds



Horizon Forbidden West



These iconic creatures can be climbed by Aloy to reveal parts of the game map.

In The Frozen Wilds and Forbidden West, Stuart Billingham and I had designed the Tallneck gameplay around large set pieces, which made their experiences stand out compared to the first game.

I knew that for the Burning Shores, I wanted to give Relic Ruins a similar approach: making them feel epic using big set pieces.



And the inspiration for a big set-piece moment came when I was looking at concept art.

In this early concept art, I saw we were planning this volcanic landscape with lots of tectonic shifts: the earth masses were moved up and down and these sewer pipes were exposed.

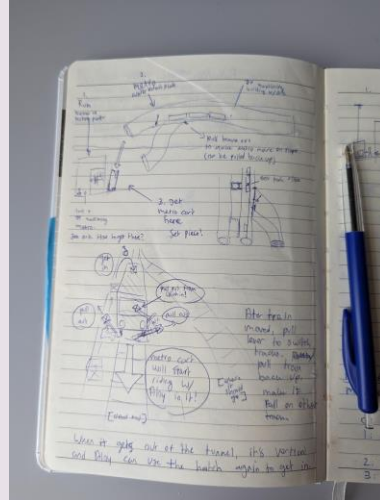
In this other piece of concept art I saw these trains and it made me think: what if we put these trains in those tunnels?

And from there it started rolling. I thought we can make this epic set-piece moment where the train would slide out of this tunnel, similar to those epic moments we had for the Tallnecks.

## SETTING DESIGN GOALS FOR THE DLC RELIC RUIN



Goal 1: Build a puzzle around a memorable set-piece experience



74%

I got inspiration from one of my favorite games: Uncharted 2. Everything that the protagonist Nathan Drake touches just breaks and collapses. And I thought: how cool would it be if the ancient train that Aloy is in would also fall apart when she tries to move it?

So I started sketching in my notebook to see how we could Horizon-fy this theme.

And I set two design goals for myself. The first goal was to build a puzzle, similar to how I did that before, but now building it around a memorable set-piece experience.



## SETTING DESIGN GOALS FOR THE DLC RELIC RUIN

Goal 1: Build a puzzle around a memorable set-piece experience

Goal 2: Rewarding exploration

- Finding the content is an exploration reward
- Best reward possible: more playable content!



75%

And the second goal was to truly reward exploration.

Finding the puzzle itself can be an exploration reward, but when solving the puzzle, what is a better reward than giving the player more playable content?

And in case of the DLC, that more content would be the hidden side-quest with the buddy NPC Gildun! I'll get to him in a little bit.

## THE RELIC RUINS



1. The Daunt



4. The Dry Yearn



7. The Long Coast



2. No Man's Land



5. The Stillsands



8. Isle of Spires



3. Restless Weald



6. Runner's Wild



9. Murmuring Hollow



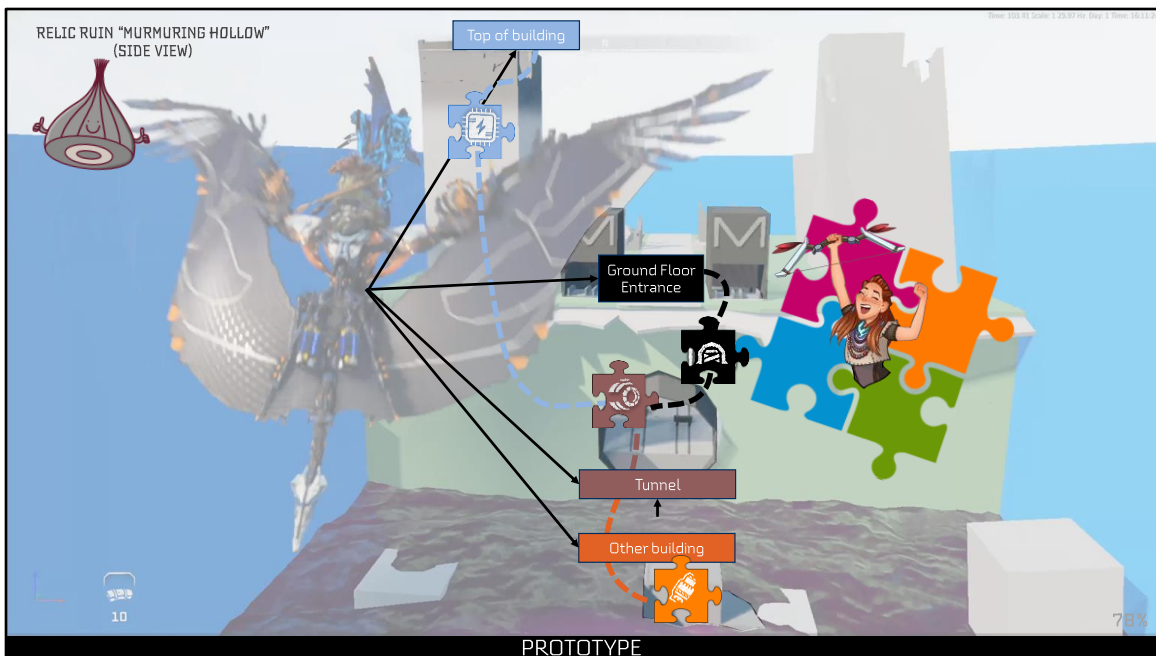
76%

Let's dive into the design of this Relic Ruin "Murmuring Hollow" that we made for the DLC, that has this epic set-piece moment and more playable content featuring Gildun as a reward.



Just like the Relic Ruins from the base game, we tried to set this one up using Radial Design.

(And coincidentally, just like the puzzle in No Man's Land, this one happens to involve an Energy Cell)



Let's start by looking at the middle layer of the Design Onion this time: the entrances. This is a side-view.

Aloy could use her Sunwing to approach the puzzle space in many ways...

- If she approaches from the ground floor and takes the entrance here, there will be gameplay that presents the first puzzle piece: a blocked path, by a train that's in the way to get to the Ornament.
- If she approaches by flying or climbing into the tunnel, there's a bit more gameplay that leads to another puzzle piece: an Energy Cell receptacle. But it can't be used without having an Energy Cell.
- If she were to fly onto the building up here and finds a way in, she would find a charger for Energy Cells: another puzzle piece.
- And if she gets into this building down here, she will find an Energy Cell. But if this is the first approach, she probably would not know what it's for.

By connecting the routes we make it exciting to explore all areas of the puzzle.

And only by connecting all puzzle pieces, Aloy can take the Energy Cell, charge it, put

it in the receptacle, and move the train to get to the reward! Happy Aloy again!

And additionally, she's now able to explore more parts of the tunnel now that the train is out of the way.

Let me show you some bits of the pitch video that I made for this ruin (do note that it has some placeholder callouts in it, and I'm not a writer...)



[Video showing early prototype footage of this Relic Ruin in action]



The prototype was nice, but there was one big issue here if we look at the *outer* layer of the design: I focussed on approaching from the sky this time, and even though we had multiple entrances here, I didn't truly take Radial Design into account.

If we take a look at the top-down view, you can see that this was all built in this test level, with only one true approach in mind.

In my test level you would always approach the content from the water on flying mount. This obviously did not work as well when approaching it from another side or on foot, which would be possible when we move this over to the open world.

# FROM BLOCK-OUT TO IMPLEMENTATION

## ART INTEGRATION & PLAYTEST FEEDBACK

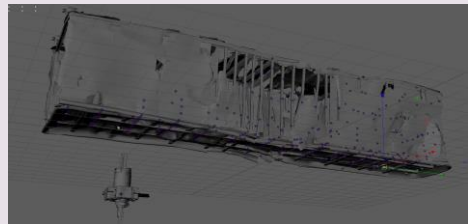


So let's take a look at what we changed when we go from block out to final implementation.



## RE-THEMING THE CONTENT TO FIT OUR ART BUDGET

- ▶ Adapt & Adjust
- ▶ LA is not known for its metros
  - No art budget for bespoke metro models
- ▶ Underground tunnels worked!
  - Salvaging existing art assets



82%

When developing Murmuring Hollow further, we had to adapt and adjust a lot.

First up, we had to re-theme the content.

Since LA is not known for its metros, our art department did not get the budget to invest into making bespoke metro models.

Luckily, we were able to use the underground tunnels of LA instead.

For the narrative team, it would make sense if these tunnels have been used by the military for cargo transfer.

We were able to keep everything within scope, by using existing truck model assets and put those in the tunnels instead.

Our environment art team just had to kitbash an undercarriage underneath and presto.

## ADJUSTING FOR A BETTER FLOW FEEDBACK FROM LEADS

### Problems

- ▶ Charging the Energy Cell and flying around with it was tedious
- ▶ The buildings felt disconnected from the tunnel with the trains in

### Solutions

- ▶ Energy cell would now just be in the tunnel
  - **Plant idea:** First train needs to move to reveal
- ▶ Elevator shaft added to connect the building:
  - **Invalid route:** Broken elevator in tunnel foreshadows that there's more up there



83%

Next, we had to adjust the content for an overall better flow:

During a leads review of my content, it became clear that charging the Energy Cell and flying around with it was tedious.

And that the buildings felt disconnected from the main space; the tunnel with the trains in them.

So to solve the first problem, we added the Energy Cell in the tunnel, so the player did not have to fly around with it anymore.

It now just lays in the first train, all charged and ready to go. But you can only reach it by taking the correct entrance and moving the train out of the way to reveal the Energy Cell.

Moving the first train additionally plants the idea in the player's mind that the player needs to do the same with the other one. And because the first train moves safely, the second one crashing comes more as a surprise.

To fix the disconnect between the buildings, I added an elevator shaft that would connect the tunnel with the building. With the broken elevator, we present an invalid path to the player, and it's up to them to find a different way up: flying. The player would need to fly up there to get a passcode to open the door to the reward room after crashing the train.

These all seemed like good improvements...



...but there was still the “there’s only one approach”-problem...



We added several points of interest in the environment to attract players to the various entrances.

Luckily the new theme helped here: since we couldn't have the escalator entrances anymore due to the space not being a metro station, we settled for a big hole in the ground that leads into the tunnels, where you could hear the ancient recording coming from.

And we made this tower with the elevator shaft in it look more interesting by cutting the bottom part out and turning it into a landmark.

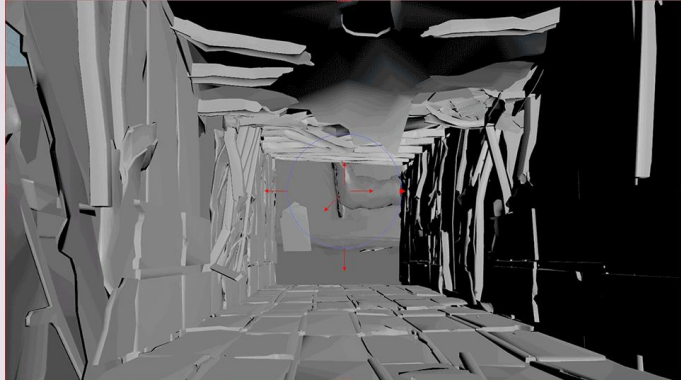
Additionally, we added this campsite that foreshadows that someone was here before.

The rappel point from the campsite is an additional way into the ruin and the hole would lead you in the puzzle space, regardless of where the player came from and whether this be from a road or from the sky.

And now we finally have the true radial design in place that we were aiming for.

## DEALING WITH SCOPE REDUCTIONS A MAJOR SET BACK!

- ▶ The train crash was cut...
  - ...or was it?
- ▶ Reflect on scope:
  - Could we do the train crash without Aloy in it?
  - What if only the front part breaks and crashes?



86%

But then came a major set-back: the train crash was cut!

We got this news in an e-mail, saying:

“It would take too much budget to get the train crash sequence with Aloy in it to work, which would not be worth it for a side-activity.”

One of our tech designers already started working on the crash simulation where it would fall down and break apart as you can see here, but sadly this work would be lost...

...Or would it?

As a designer, I’m constantly trying to reflect on my ideas, and where needed re-

adjust them, based on the scope.

In this case, we asked ourselves: what if only the first part of the train breaks and Aloy does not have to move along with it?

This might sound like a small change, since we'd still need this train crash simulation, right?

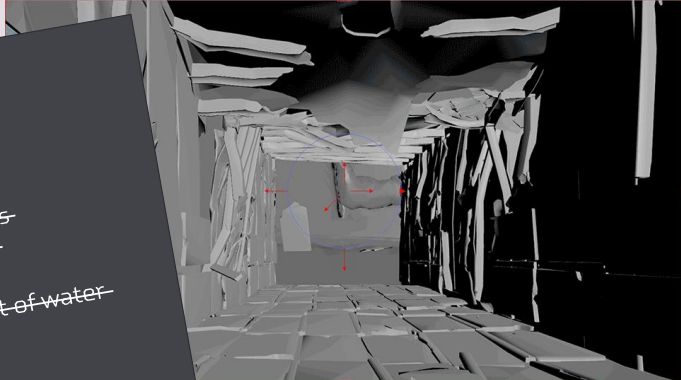
Correct, but it would massively reduce the scope!

## DEALING WITH SCOPE REDUCTIONS A MAJOR SET BACK?

- ▶ The train crash was cut...
  - ...or was it?

Removed to fit scope:

- ~~— Custom animations for Aloy~~
- ~~— Code support~~
- ~~— Custom camera~~
- ~~— Environment art adjustments~~
  - ~~— State before train crash~~
  - ~~— State after train crash~~
- ~~— Cinematic when getting out of water~~
- ~~— ...~~



87%

We would not need the following anymore

- Custom animations for Aloy when the train starts moving
- Code support
- Custom camera when in the train
- An adjustment to the environment art when the entire train leaves a crater in the ground
- A cinematic when getting out of water

And the list goes on...

By just adding a sequence where Aloy moves along with the train, then the front part breaks, we championed the design together.



We prevented the entire train crash from getting cut, and could keep the puzzle and that exciting moment.

Let's take a look at how this ended up in-game



[Video of what the final train crash sequence looks like]

## THE DESIGN GOALS WHEN INTRODUCING GILDUN

- ▶ Bending the Relic Ruin formula
  - Getting to the Ornament becomes side-goal



- ✓ Goal 1: Build a puzzle around a memorable set-piece experience
- ✓ Goal 2: Rewarding exploration  
By giving more playable content!



That voice coming from behind the door is Gildun, a goofy character that became a fan-favorite after introducing him in the DLC for the first game: The Frozen Wilds.

Now let's look back at those design goals.

We clearly got that set-piece moment in there.

And we would give the player more playable content when meeting Gildun!

But what I think truly makes this experience stand out, is that we bend the formula of Relic Ruins here:

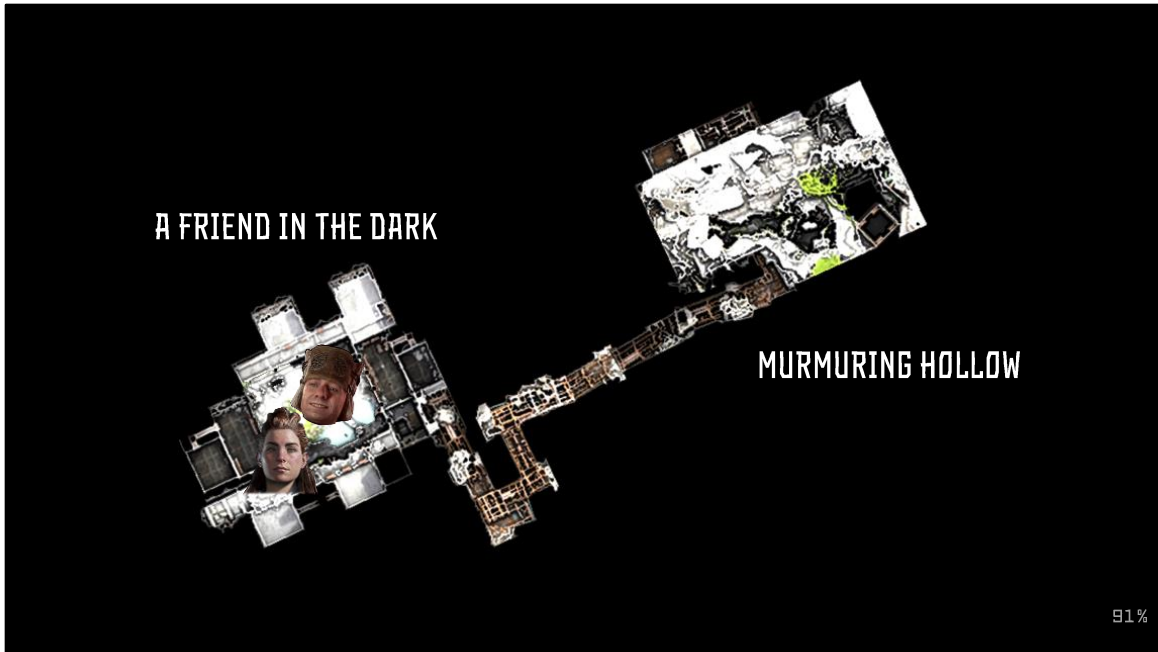
In the greybox version of the content, you would just pick up the Ornament after crashing the train to end the quest.

But now, you need to start thinking about how you can free this guy and getting to the Ornament becomes somewhat of a side-goal.

I think this unexpected twist is really cool, because it's a surprise, and the player is now focusing on what's behind that door...



...the "A Friend in the Dark" side quest.



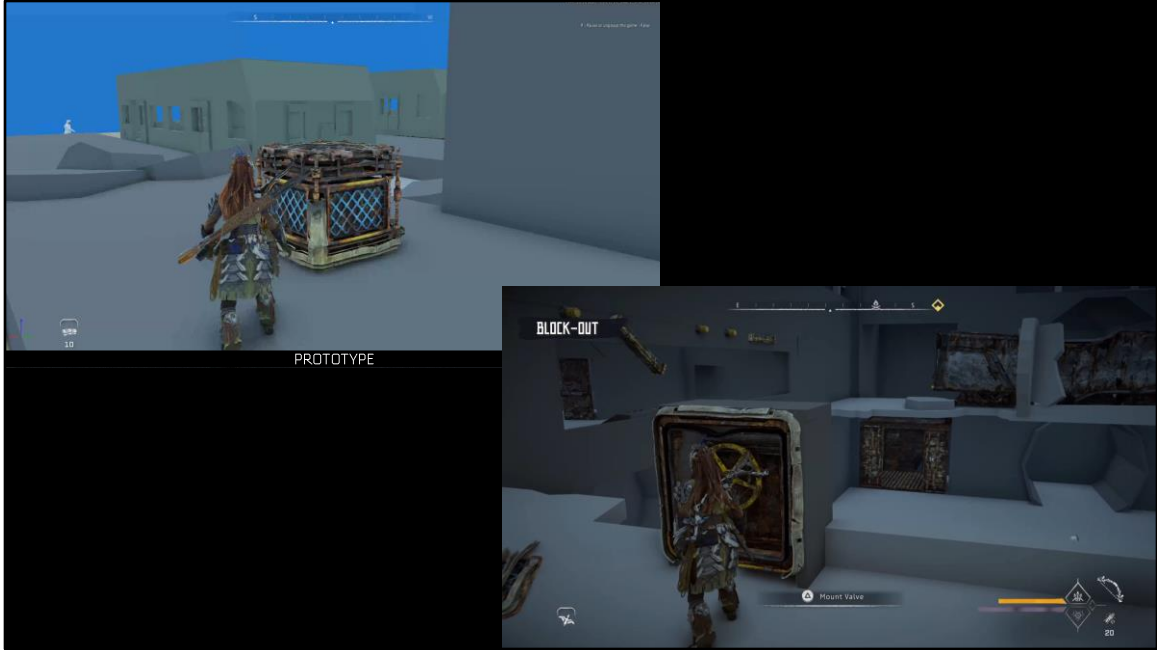
I won't go into details for this quest, for the sake of time.

But in short, the quest flow is as follows:

You follow Gildun through a series of tunnels to search for his lost friend.

You find access through the tunnels, you push some trains, do some climbing, use an elevator to get Gildun up, do some fighting, and finally, you talk to Gildun about what happened to his friend in an emotional finale.

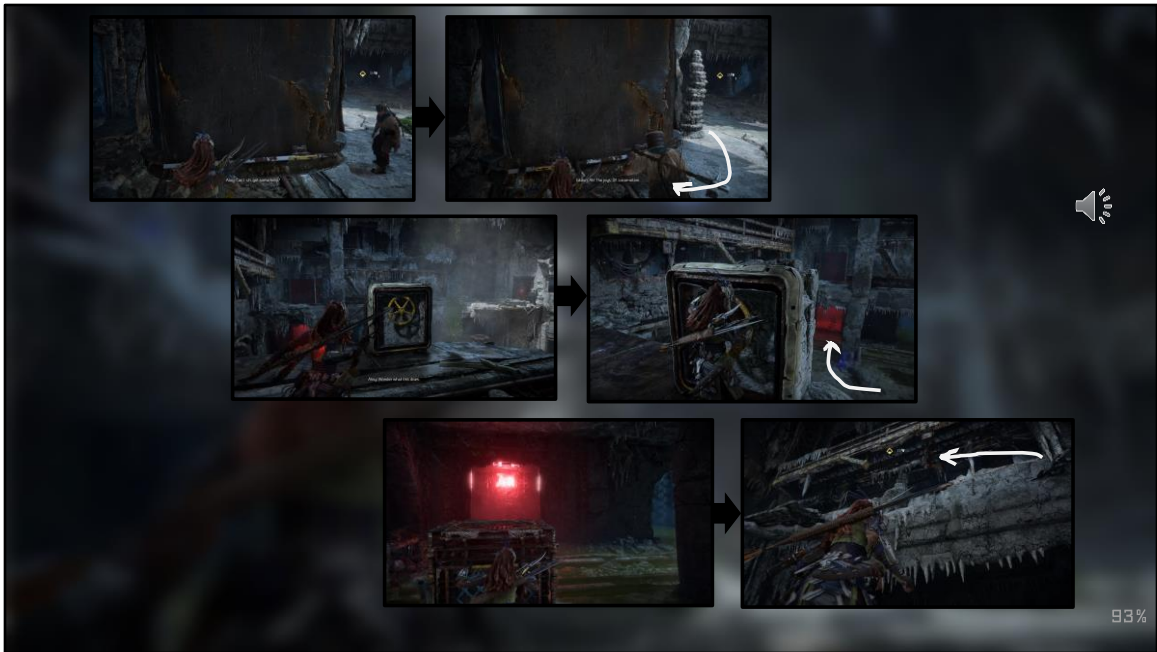
Of course there's a bit more to it, but what is important to note here is that this was the first time for me to design a puzzle that you solve together with a buddy (or ally) NPC.



And for that we wanted to come up with some new co-op mechanics.

The most important ones that we got in the quest are:

- Pushing a train that is too heavy for Aloy to push on her own.
- And moving an elevator up and down, that both Aloy and Gildun can control.



When creating a puzzle involving these elements, we bumped into a big challenge: for each interaction that Aloy could do, we would have to think about what Gildun would be doing at that point.

Push the train when Gildun is nearby? -> Gildun would walk to you and help you out.

Get to the elevator controls? -> Gildun would get in elevator, waiting for you to pull him up.

Move the crate in the elevator? -> Gildun would climb towards the elevator controls to move the crate up.

Originally, the player could be doing these interactions in any order, which could result in getting Gildun in the unfortunate state of climbing back and forth to the elevator controls.

This would take a long time and would feel really confusing to the player.

An open approach sounded cool on paper, but it was really hard to get this working properly within the time frame that we had for developing The Burning Shores.

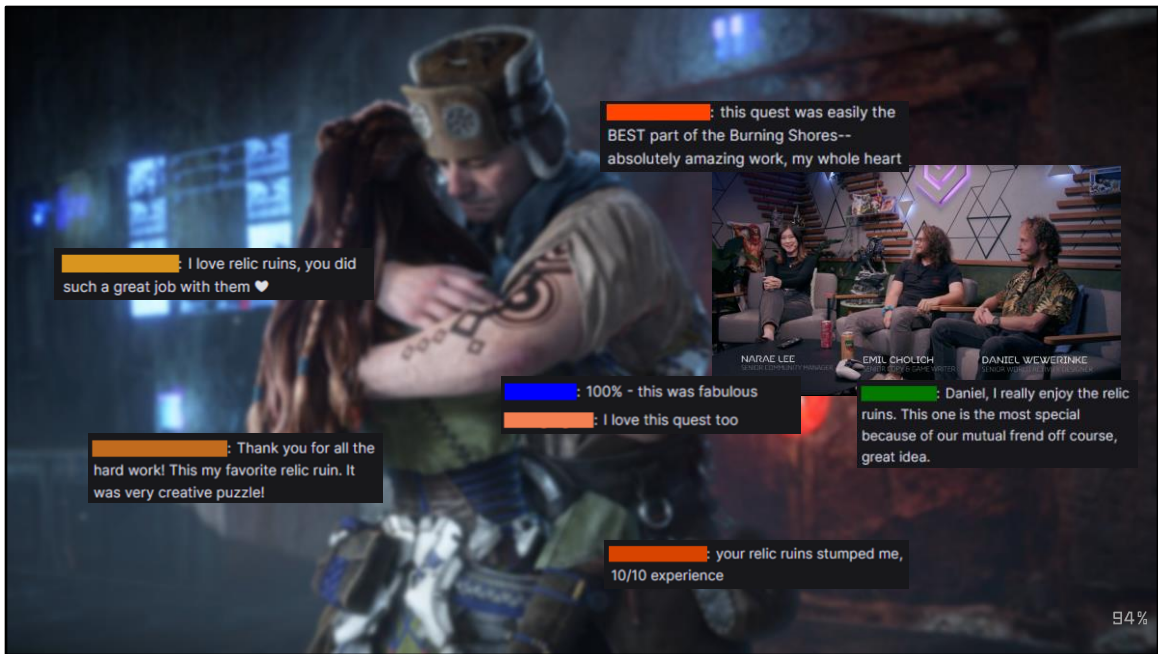
As a simple fix, we decided to make the execution of the puzzle steps a bit more linear.

It would still be a puzzle, but Aloy would have to do the execution steps in a certain order; otherwise Aloy would say: "I should help Gildun with that train car first."

And with this simple tweak, we eliminated the biggest buddy problem.

Sometimes simpler truly is better.





And the final version of the quest, which includes Gildun’s heartwarming personal story, worked out pretty well.

As you can see from the comments of this live stream that we did last year, our fans truly like this quest.

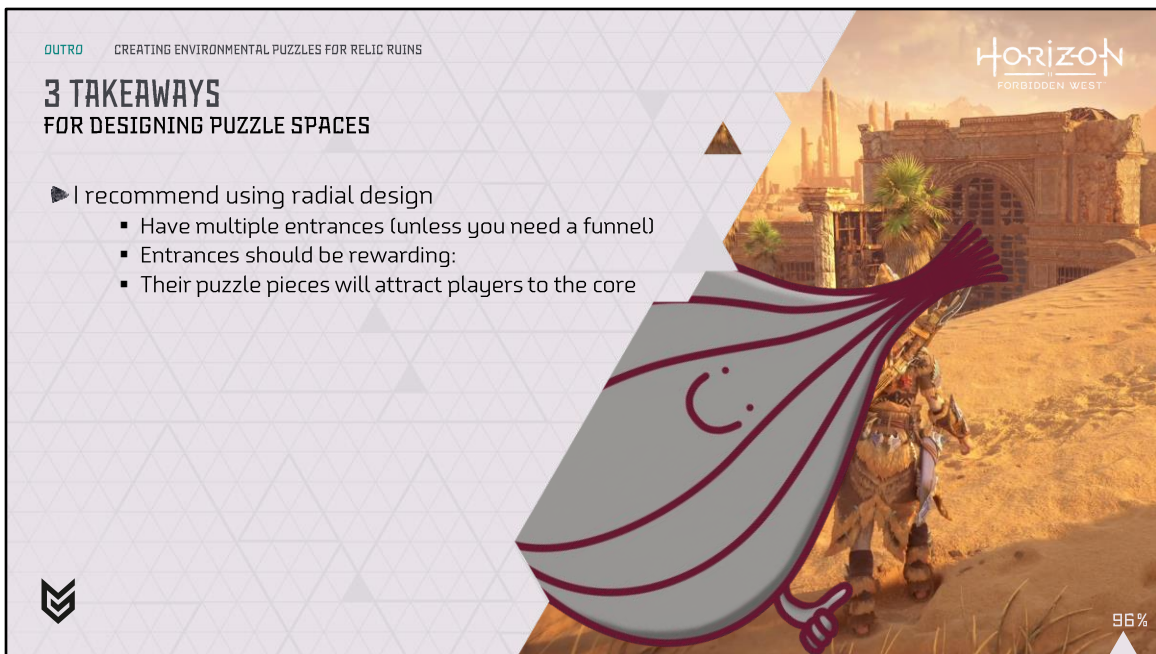
We’re very thankful to the Horizon community for these kind words! <3

# TAKEAWAYS



So to wrap this up, let's get to the takeaways.

I've got 3 in total for you:



1. I recommend using radial design for open world (or open-area) content.
  - You can have multiple entrances that each lead to a piece of a puzzle (unless you need a funnel; for example when creating a linear tutorial space)
  - Those entrances can be made rewarding
  - By giving puzzle pieces that the player can use to solve the puzzle in the core of the space



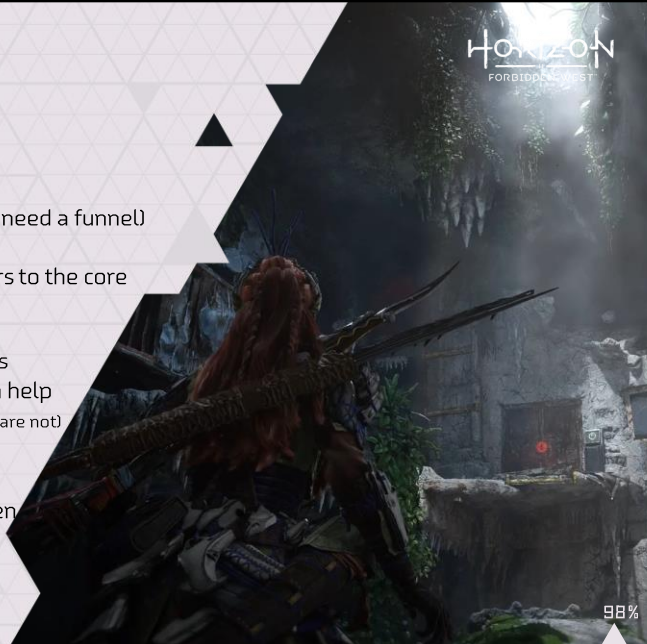
2. Try to place an idea in the player's mind on where to go and what to do.

- Players should know their goal or subgoal early on in a puzzle, like the Ornament or an important door.
- For me, framing and letting the players find alternate paths helped! Dialogue with a buddy can also be used.
- Alternate solutions are a good thing... Unless they are exploits.

OUTRO CREATING ENVIRONMENTAL PUZZLES FOR RELIC RUINS

## 3 TAKEAWAYS FOR DESIGNING PUZZLE SPACES

- ▶ I recommend using radial design
  - Have multiple entrances (unless you need a funnel)
  - Entrances should be rewarding:
  - Their puzzle pieces will attract players to the core
- ▶ Plant an idea on where to go
  - It's important to have clear (sub)goals
  - Framing, invalid paths & dialogue can help
  - Alternate solutions are good! (Exploits are not)
- ▶ Champion your designs together
  - Collaborate & playtest early and often
  - Less complex designs can be better
  - Continuously reflect on the scope

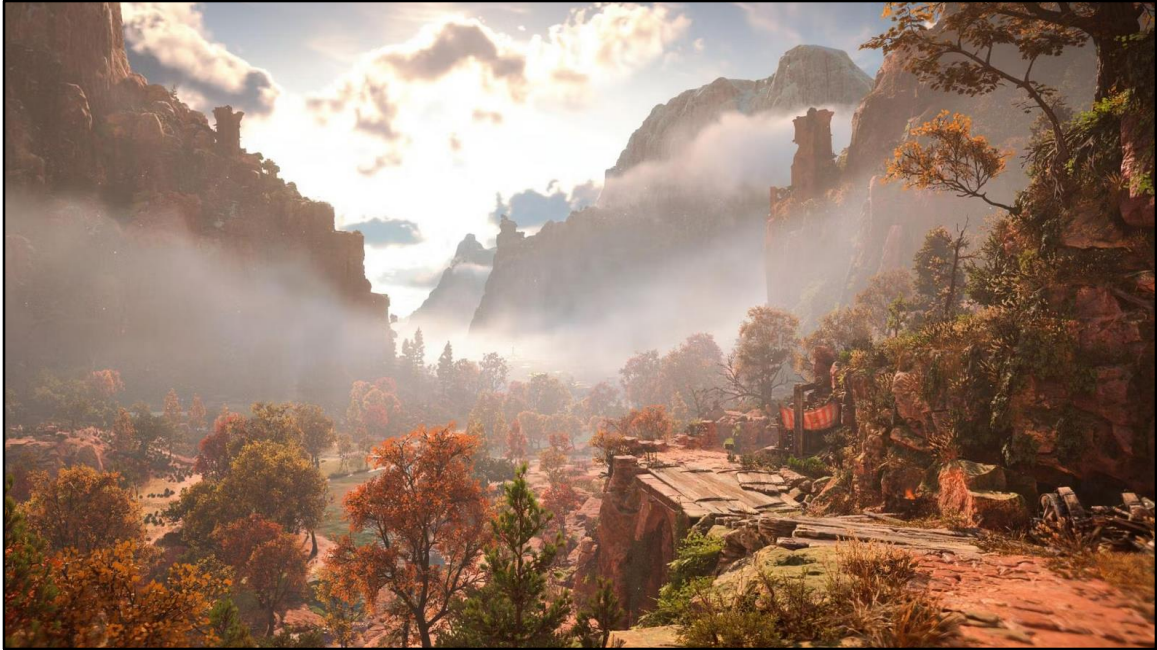


HORIZON FORBIDDEN WEST

98%

### 3. Champion your designs together!

- This goes for both collaborating early and often with other departments, as well as playtesting early and often.
- Often a less complex design is better (As we saw with the Gildun buddy puzzle for example)
- Make sure to continuously reflect on the scope and adjust the designs when needed. Both in the early days when pitching, as well as during development. (Example: we adjusted the scope for the train crash to fit it in)



And when looking back at that empty game world that we started with, it's clear that we've come a long way!

We created fresh and novel Activity content to fill the game world with.

I'm truly proud to be part of Guerrilla's World Design team

And proud that the Relic Ruins have been received so well by our players.

I also think they turned out really cool!

I also hope that this talk inspired you to create more clever puzzle set-ups in open world (or open area) games in the future!

**THE END!**  
THANK YOU FOR LISTENING!



Thank you so much for reading!

# CONTACT

Feel free to reach out!



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If you have any questions, feel free to reach me on LinkedIn or by e-mail.