



Figure 1: Half-Life 2 Logo

Level Design Document: Topsy-Turvy

Half-Life 2 – Jason Leary

Version 1.0

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Intended Level Delivery Date:	3/3/15

[illegible]

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Level Abstract

Quick Summary

"Topsy-Turvy" is a single player level for Valve Software's *Half-Life 2* that turns traditional Half-Life combat and platforming on its head. The level takes place in Black Mesa East after the Combine have invaded and begun eliminating the resistance fighters and scientists inside. Players take control of Gordon Freeman as he uses his new upgraded suit to reverse gravity, walk on the ceiling, engage enemies, and overcome platforming challenges in interesting and unique scenarios. Gordon must accomplish a series of tasks to launch the missile, open the doors to the silo, and escape the base.

Hook(s)

- Intense, multi-level combat
- Manipulate gravity to get a jump on enemies and overcome platforming challenges
- Launch a missile to open the silo doors and escape from the base

Gameplay Highlights

- Engage enemies in natural and reverse gravity scenarios all at the player's control
- Fast close to medium range combat with an emphasis on verticality
- Thrilling set piece moment as Gordon Freeman launches the missile and uses his negative gravity suit to escape the base.

Setting Summary

Theme	Reversing gravity
Mood	Agile aggression
Setting	Black Mesa East
Time of Day	Afternoon
Season	Fall
Weather	Mostly Sunny

Mission Difficulty

Position	Difficulty	Reasons
Beginning	3	Players learn the new mechanic and engage a limited number of enemies in a confined space
Middle	6	The battle moves to the more open environment of the missile silo where players have a greater area with which to manipulate gravity, but enemies have more angles of attack
End	3	Players engage a limited number of enemies in a confined space before falling up through the entire silo and out the doors on the roof.

Scale: 1-10 (1 is Easiest and 10 is Hardest)

Mission Metrics

Play Time	5 minutes
Critical Path	180 meters
Physical Area	41 meters long X 28 meters wide X 20 meters tall

Characters

Character	Description
Gordon Freeman	Gordon Freeman is the main protagonist of the Half-Life series. He is a nuclear physicist who fell into a web of combat, deceit and interdimensional threats. Living under the oppressive city-state of the Combine, Freeman has become a reluctant hero, fighting against those who seek to enslave humanity.
Lab Technician	The lab technician works with the resistance at Black Mesa East and Alyx's father entrusted him with the task of modifying Gordon's suit with its new anti-gravity capabilities.
Combine Soldiers	The Combine soldiers are the primary infantry for an interdimensional empire seeking to enslave humanity.

Visual Themes

Theme	Description
Experiment Room	The experimentation room is a high tech facility where the resistance fighters create and test new technology for combating the Combine. Its thick concrete walls and sleek technological equipment give it an almost subterranean bunker feel.
Observation Room	The observation room is a glass-enclosed chamber overlooking the Experiment room. It contains a series of computer terminals and banks of monitors all with the purpose of documenting the testing that takes place within the experiment room.
Missile Silo	The missile silo is an enormous structure with a titanic transcontinental missile at its heart, which provides effective cover for the player when engaging the enemy. Encircling the missile at various levels are catwalks, which allow for easy access and movement throughout the vertical space. Like the rest of the base, the silo is very sleek and high tech, composed mostly of concrete, steel, and glass.

Key Theme References



Experiment Room References

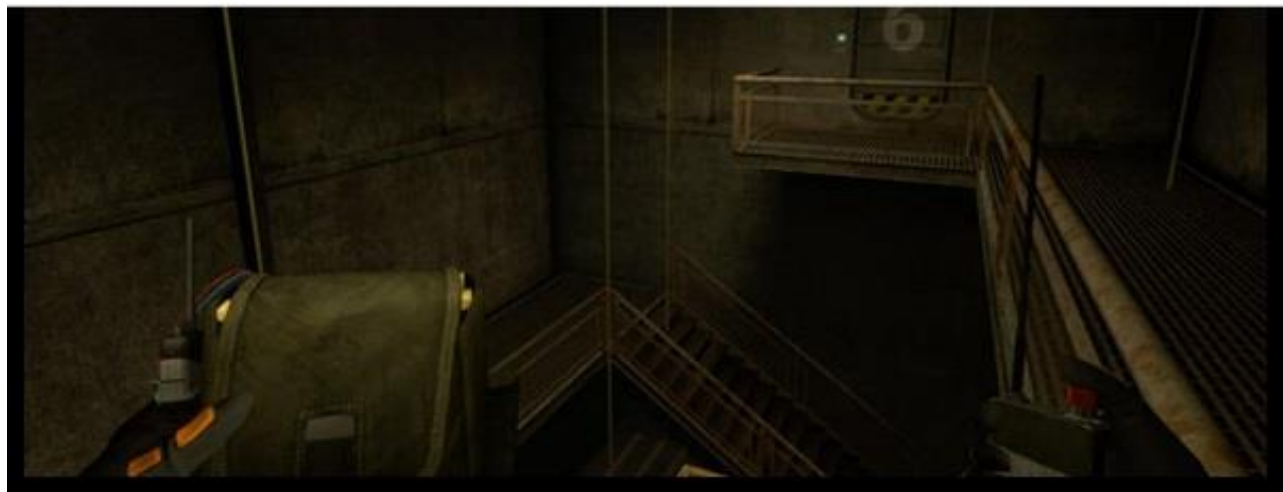


Figure 2: Experiment Room References

- Experiment Room References
 - Top Left – An example of the lighting, materials, and mood of the Experiment room
 - Top Right – The device in the experiment room used to modify Gordon Freeman's suit to reverse gravity
 - Bottom Center – The look, lighting, materials, and catwalks used in the transition room, which connects the experiment room to the missile silo



Observation Room References

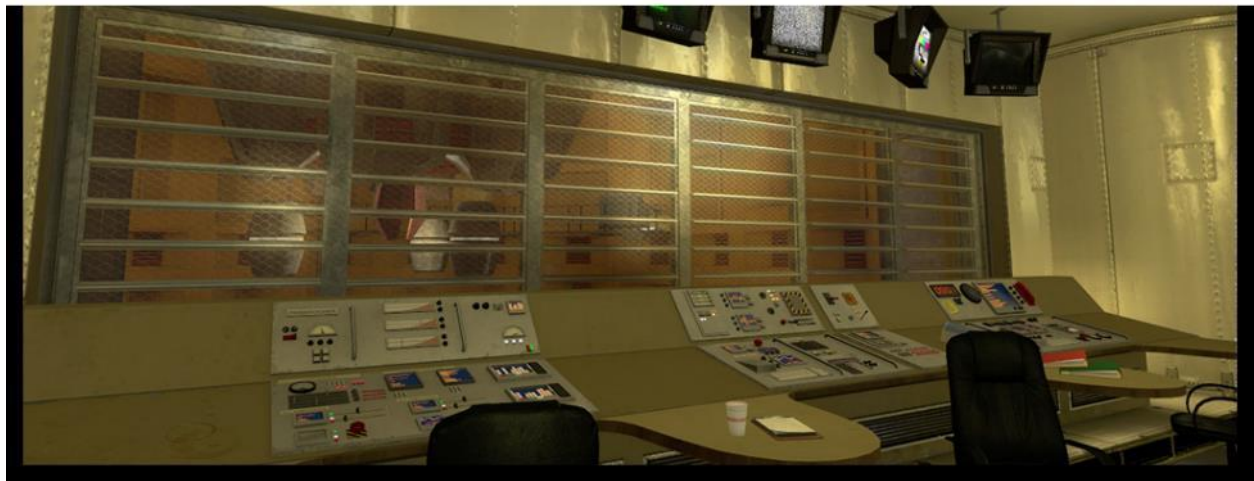
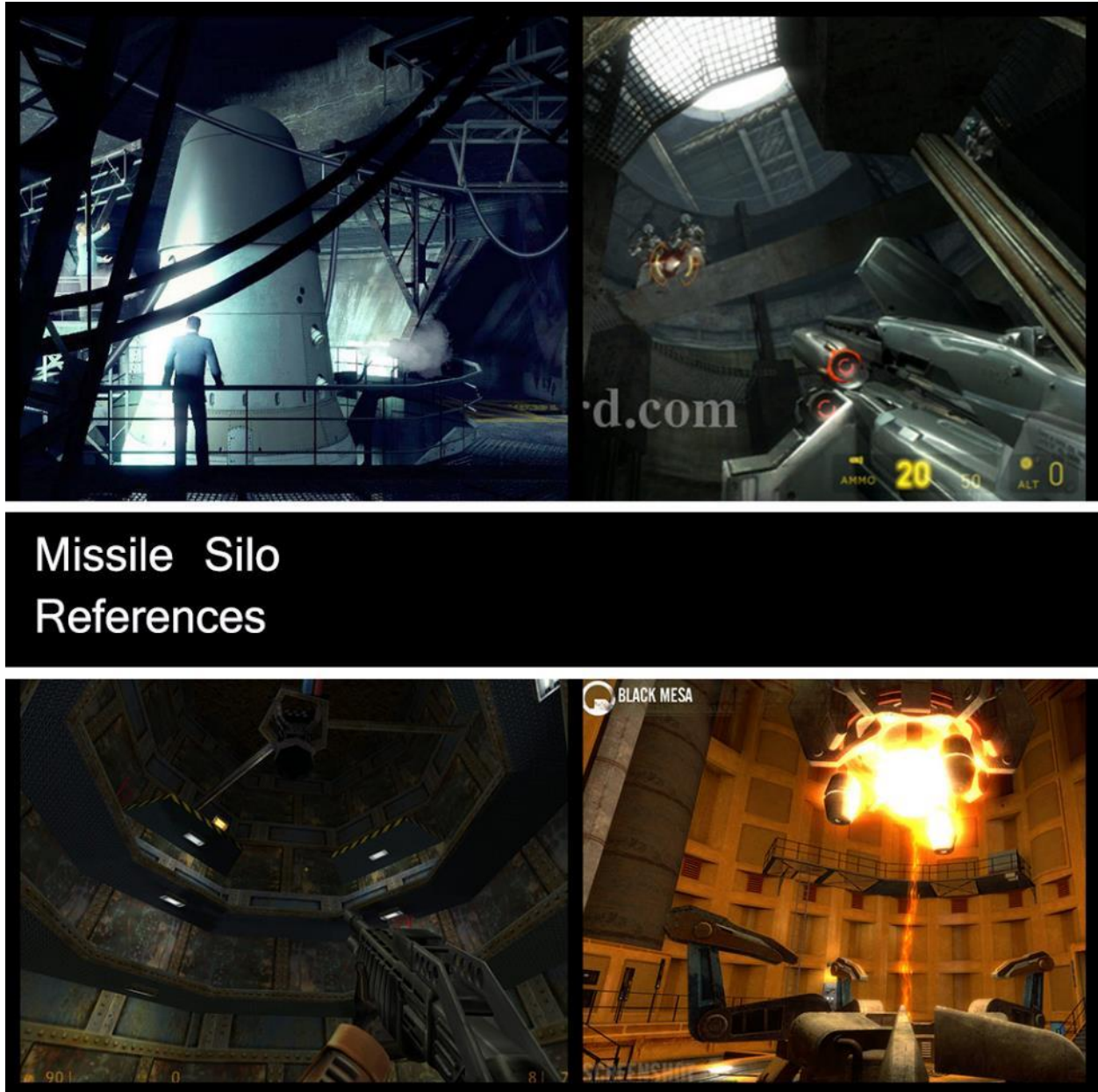


Figure 3: Observation Room References

- Observation Room Checkpoint References
 - Top Left – An example of the computer equipment, monitors, and materials of the observation room overlooking the experiment room
 - Top Right – Example of the lighting and pillars for the observation room
 - Bottom Center – Example of the architecture, office furniture, and very general layout of the observation room



Missile Silo References

Figure 4: Missile Silo References

- Missile Silo References
 - Top Left – An example of the missile providing cover in the center of the room as well as the catwalks encircling the missile at various levels
 - Top Right – An example of multilevel catwalks encircling the missile silo as well as the materials used to build it
 - Lower Left – The size and overall layout of the main missile silo
 - Lower Right – An example of the space and scale of the missile silo



Lab Exterior References



Figure 5: Lab Exterior References

- Lab Exterior References
 - Top Left – An example of the exterior architecture of the Lab
 - Top Right – Example of the lighting for the exterior Lab
 - Bottom Center – Example of the foliage and terrain surrounding the lab

Level Summary

Campaign

Context

The “Topsy-Turvy” mission is an early story mission in Valve’s new Half-Life 2 expansion pack. It is the first mission to introduce players to new gameplay mechanic of gravity manipulation.

Backstory

Gordon Freeman arrives at Black Mesa East intending to reunite with Alyx and the rest of the resistance forces. Instead he discovers that the base has been abandoned, with the exception of a single lab technician, in advance of an anticipated assault on the base by the Combine. The lab tech informs Gordon that he volunteered to stay behind to upgrade Gordon’s suit with the new gravity manipulation technology Alyx’s father developed. Just as the lab tech finishes the upgrade to Gordon’s suit the assault on the base begins.

Aftermath

After this mission, Gordon must work his way cross-country to rejoin the resistance.

Objective(s)

- Survive the invasion of the Combine and escape Black Mesa East
 - Use the suit’s upgraded gravity manipulation to escape the experiment room.
 - Prime the missile’s fuel pumps
 - Compromise the missile’s guidance system to make it crash into the ocean
 - Launch the missile
 - Manually open the first silo door
 - Manually open the second silo door
 - Use the suit’s negative gravity capabilities to follow the missile up and out of the base

Overview Map

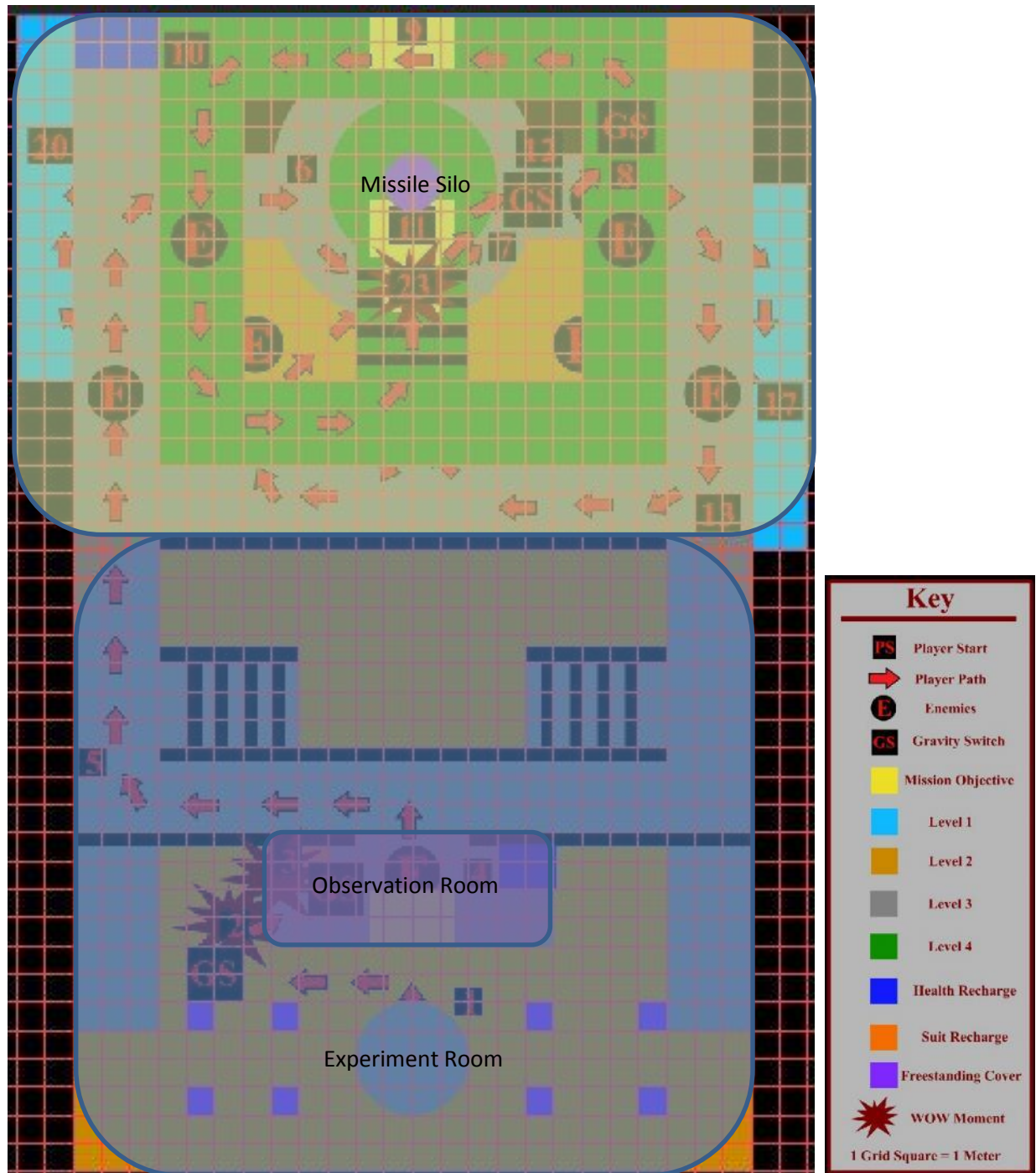


Figure 6: Full Overview Map & Key

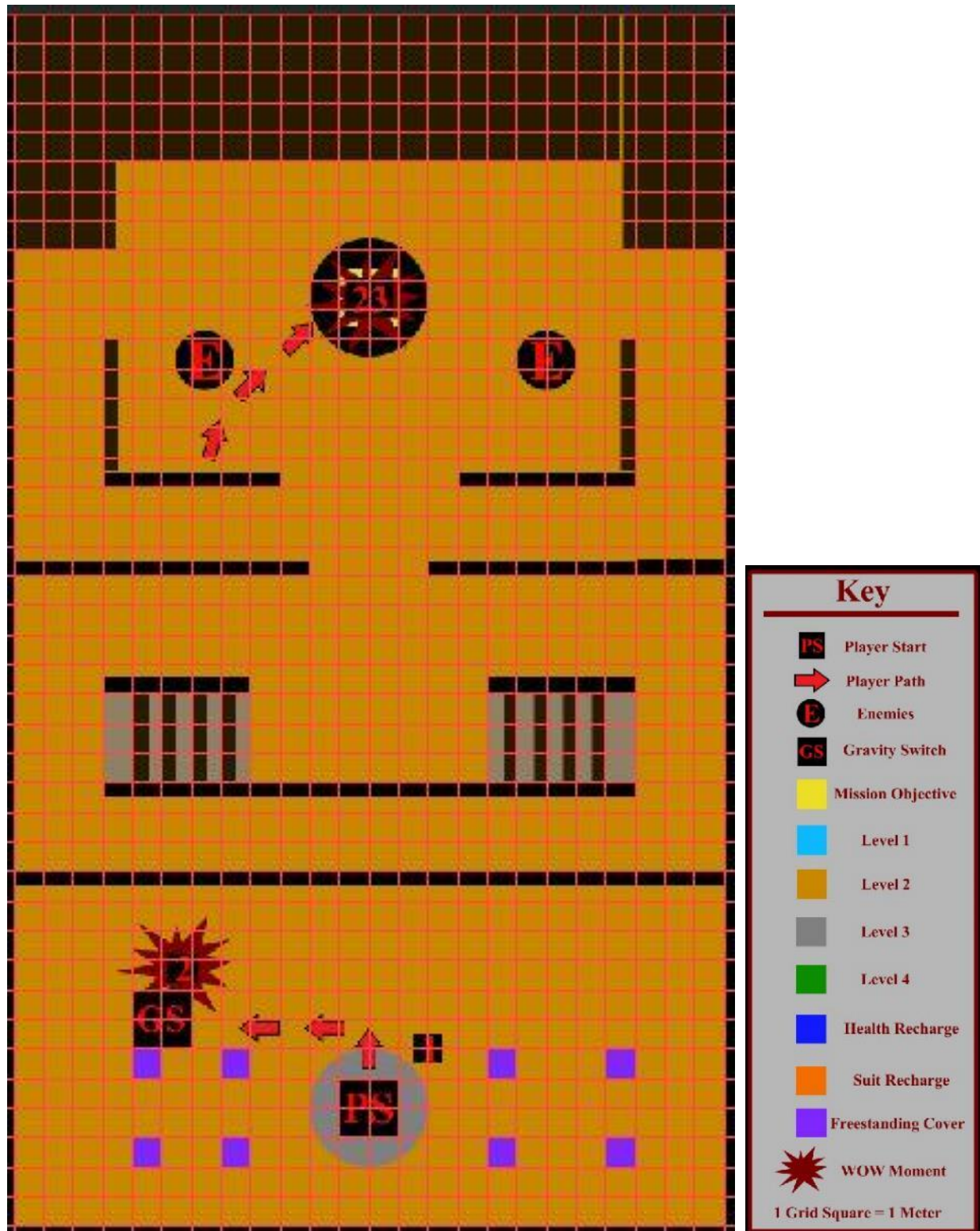


Figure 7: Level 2 Overview Map

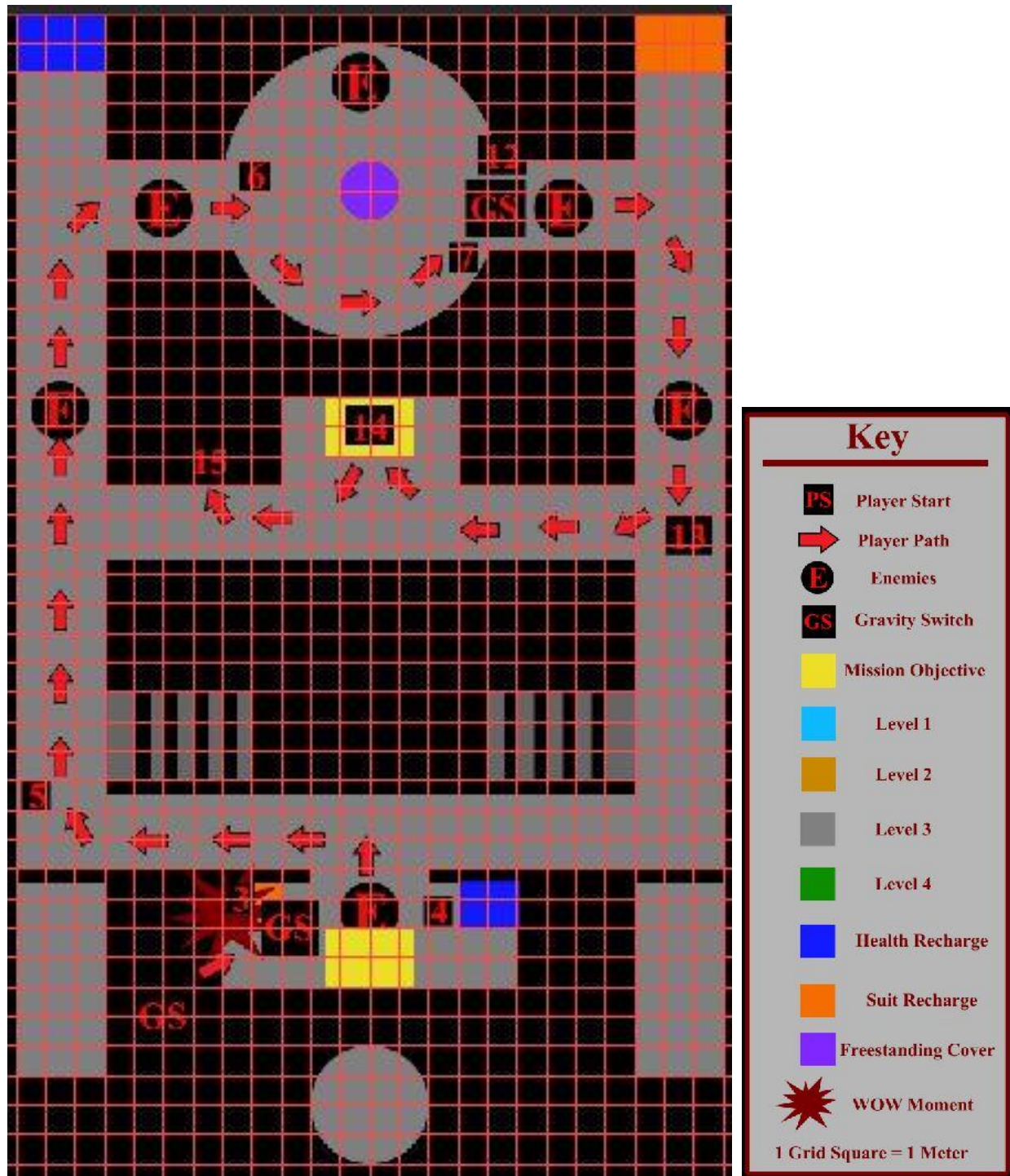


Figure 8: Level 3 Overview Map

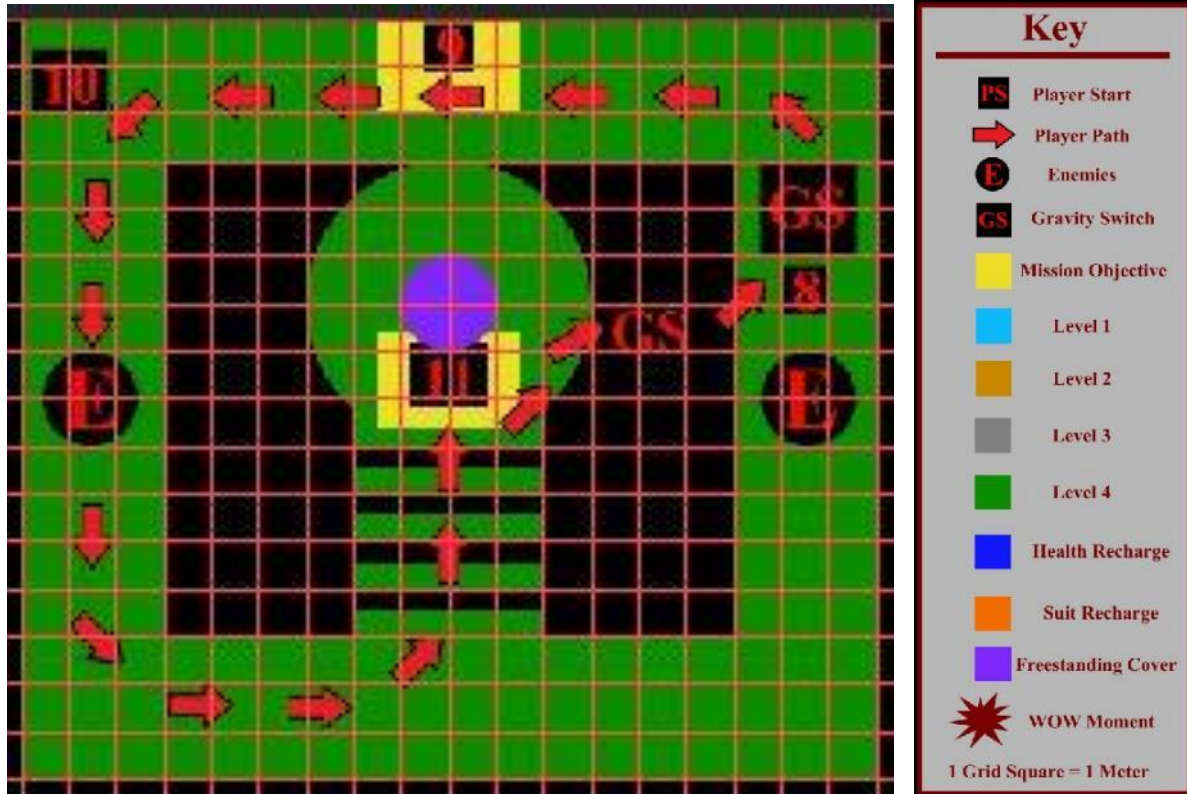


Figure 9: Level 4 Overview Map

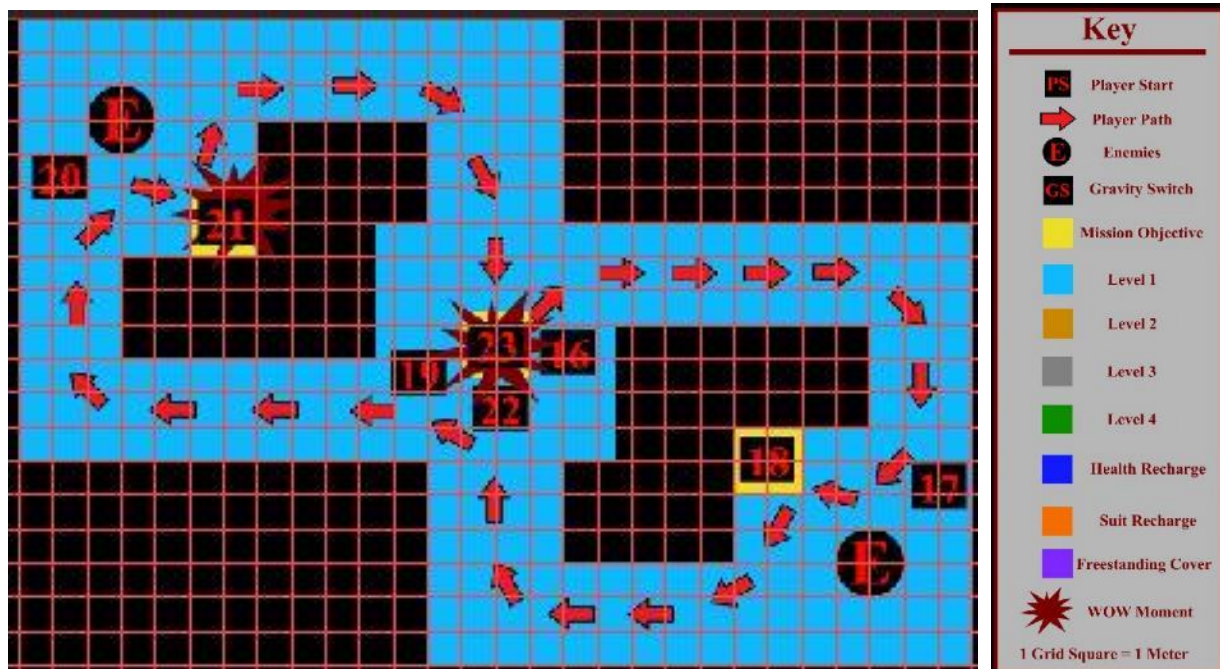


Figure 10: Level 1 Overview Map

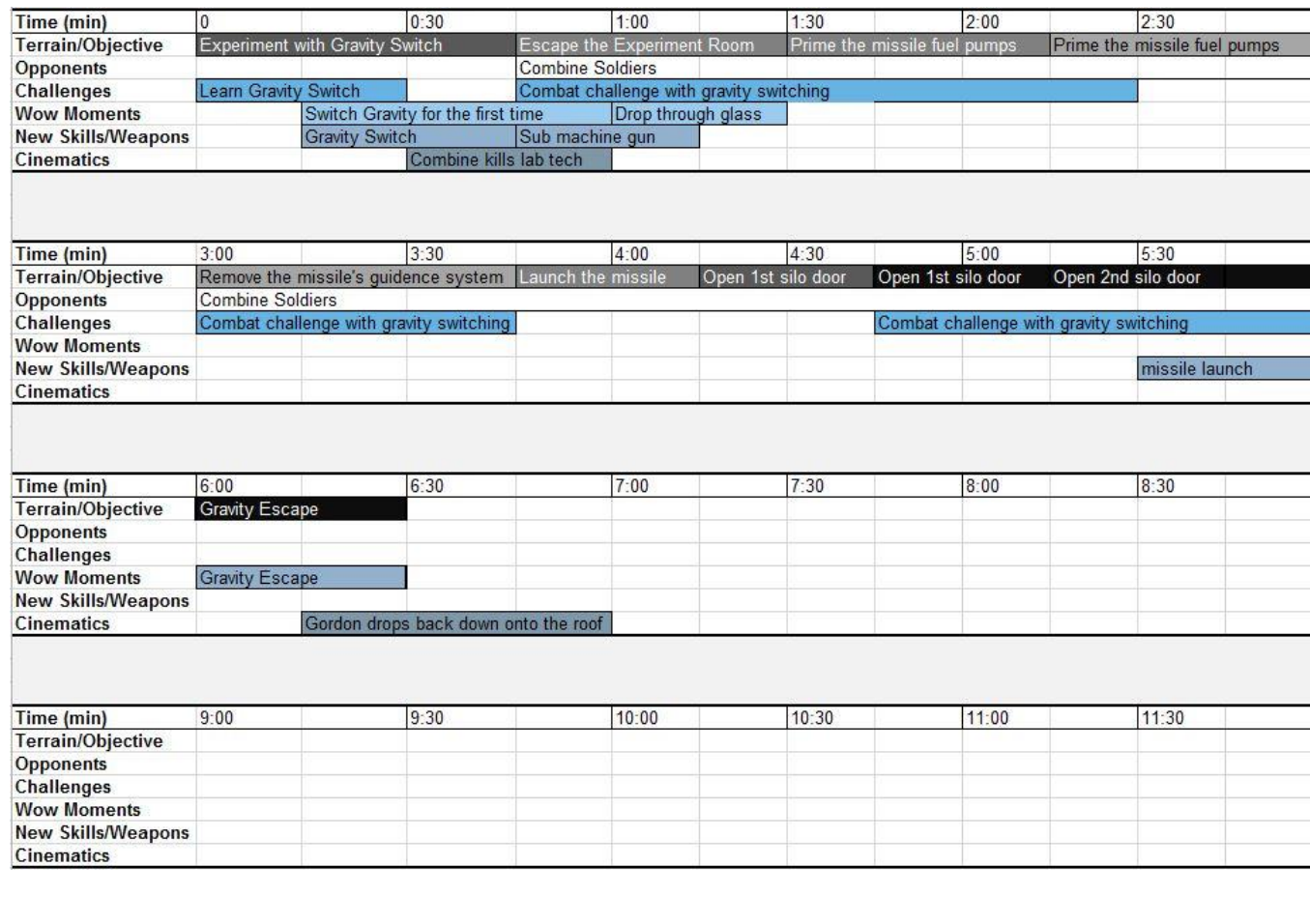
Level Flow

Flow Summary

1. As players step out of the suit upgrade machine the Lab tech who upgraded the suit tells Gordon to experiment with the gravity switch. He informs him that he can reverse gravity by jumping.
2. For the first time, Gordon triggers the gravity switch in his suit and falls up to the ceiling. (WOW Moment)
3. The lab tech panics and tells Gordon that the Combine have found them and infiltrated the base. He says they need to leave but the base is in lock down. He informs Freeman that the only chance they have is to launch the missile to open silo doors in the ceiling. Gordon looks down through the glass of the observation room and looks on as a Combine soldier breaks into the room and kills the friendly lab technician. Gordon shoots and kills the soldier through the glass, hits the gravity release and drops down, through the glass into the observation room. (WOW Moment)
4. Gordon uses the health and suit recharges on the wall of the observation room before moving out into the transition corridor.
5. As Gordon rounds the corner of the hallway, he sees two more Combine soldiers who have infiltrated the base. Gordon quickly eliminates both soldiers.
6. Gordon moves towards the center of the silo, using the missile as cover as he engages the enemies.
7. Gordon reverses gravity and falls up to the ceiling above the Level 4 catwalks.
8. Freeman eliminates the enemies on the catwalks and drops down to steel structure.
9. Gordon moves to computer terminal turns on the missile's fuel pumps.
10. As Gordon rounds the corner, he quickly eliminates the Combine there before continuing.
11. Freeman climbs the stairs to the missile's access panel, opens it, and removes the guidance chip. He then jumps off the catwalk and drops down to the level 3 catwalks.
12. Gordon falls to the level 3 catwalk and kills the Combine there.
13. As he makes his way to the next terminal, Gordon engages and eliminates the soldiers in his way.
14. Freeman activates the switch for the launch control. The system malfunctions and informs Gordon he must be open the silo doors manually.
15. Gordon jumps from the level 3 catwalks drops down to the second level.
16. Freeman eliminates the enemies on the second level before dropping down to the sublevel directly under the missile's engines.
17. Gordon makes his way around to the first manual release valve, eliminating the Combine soldier stationed there.
18. Freeman turns the valve opening one side of the silo doors.
19. Gordon makes his way through the central room and down the corridor on the opposite side.
20. Gordon eliminates the enemy guarding the second manual release.
21. Freeman turns the valve opening the silo doors completely. With the doors open, the missile's engines engage, engulfing the corridors in fire as Gordon takes cover. (WOW Moment)

22. Once the flames dissipate, Gordon moves back into the central room where he activates the gravity switch and falls up.
23. Gordon follows the missile's path all the way up through silo's doors in the ceiling, escaping the Black Mesa East. Freeman disengages his negative gravity switch, falls back down to the building's roof as the screen fades, and the level ends. (WOW Moment)

Level Progression Chart



Legend
1 square = 15 sec.
Level 1
Level 2
Level 3
Level 4
Challenge Highlight
Wow Moment
New Weapon/Skill
Cinematic

Figure 11: Level Progression Chart

Detailed Design

Level Details

Gameplay Area Breakdown Map

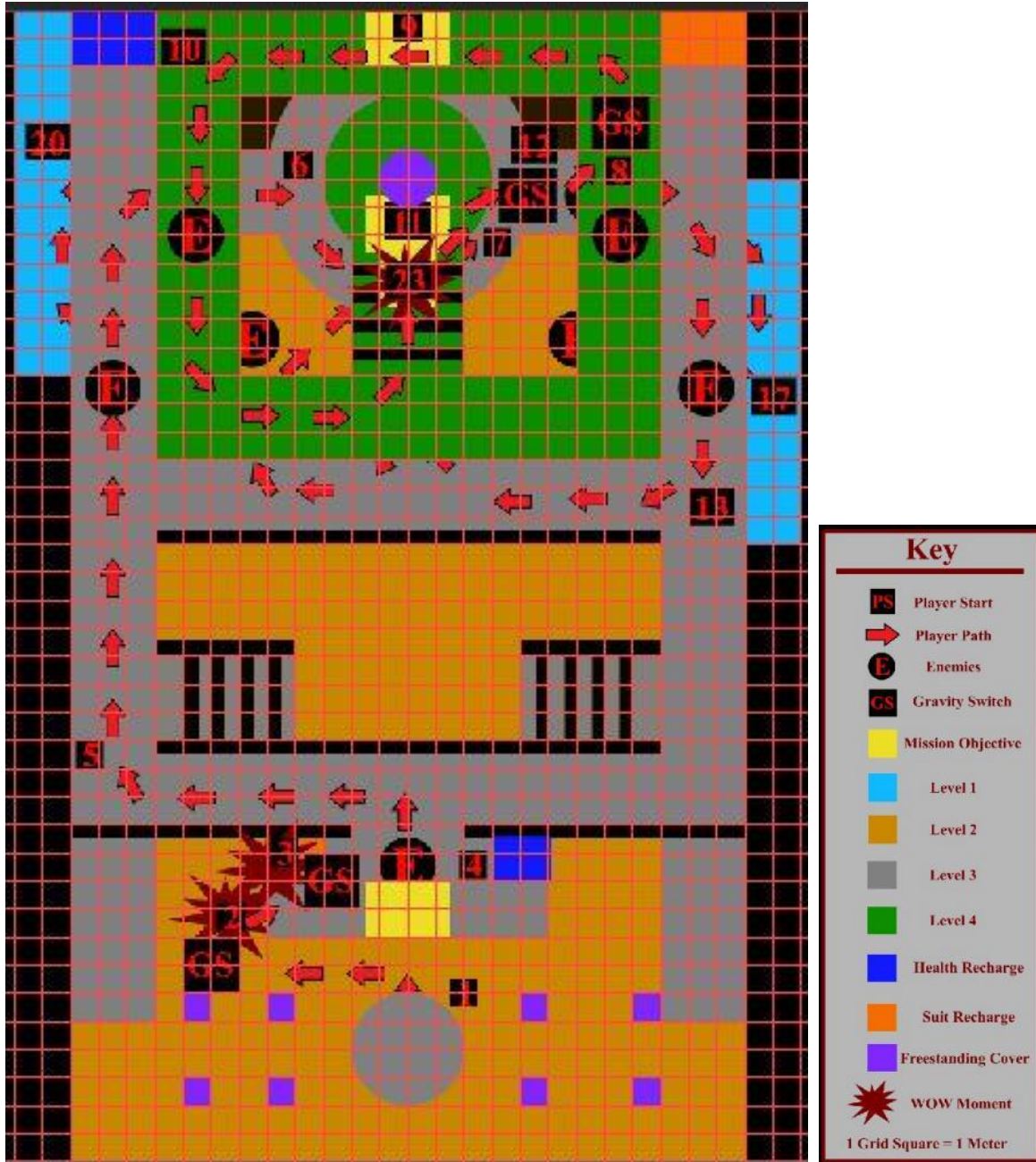


Figure 12: Full Overview Map & Key

Detailed Walkthrough

Area 1: Level 2

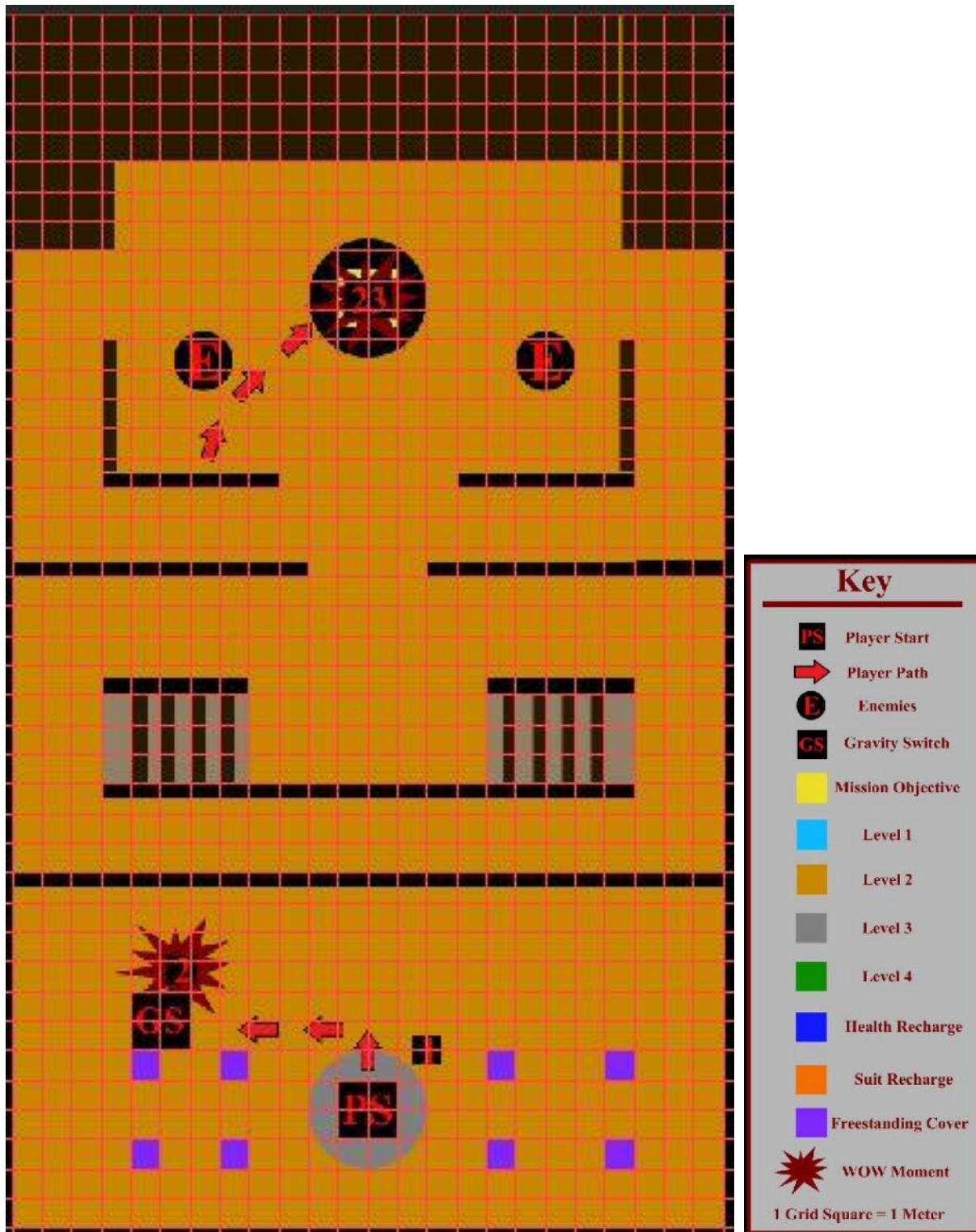


Figure 13: Level 2 Overview Map

Initial Loadout

Player Abilities

- Reverse Gravity Switch
- Armor

Weapons

- Shotgun

Gameplay/Story

1. As players step out of the suit upgrade machine the Lab tech who upgraded the suit tells Gordon to experiment with the gravity switch. He informs him that he can reverse gravity by jumping.
2. For the first time, Gordon triggers the gravity switch in his suit and falls up to the ceiling. The tech tasks Gordon with pushing two buttons on the catwalks above the Experiment Room floor and a third back on ground level. This gives players an opportunity to learn the new mechanic before progressing further into the level. (WOW Moment)

Text and Dialog

Objective Text

- N/A

Dialog/Script

- Lab Tech: "Okay, Gordon, according to Dr. Vance's notes, that should be it. Your suit should now be able to manipulate your local gravity. All you have to do is jump. Your suit and Isaac Newton should do the rest."
- Players switch gravity
- Lab Tech: "Careful. You'll want to take it slow. Dr. Vance said there may be some slight disorientation the first few times you reverse the polarity."
- Lab Tech: "Let's get you some practice moving around up there. Go ahead and press the button with the flashing red light for me."
- Gordon presses the first switch.
- Lab Tech: "Alright. Looking good. Now press the second button."
- Gordon presses the second switch.
- Lab Tech: "Okay, let's practice disengaging from the ceiling. Press the third button on the lab floor. All you have to do is jump, remember?"
- Gordon drops from the ceiling.
- Lab Tech: "Whoa, easy there, Humpty-Dumpty. Everyone else has bugged out. It's just you and me, and I don't have the medical training to put you back together again."
- Gordon presses the final button.
- Lab Tech: "Good. Everything looks like it's functioning properly... Wait a second. What in the hell is this! Gordon, looks like we have some company! The Combine have infiltrated the base! They're looking for us! Listen, we have to get out of here. The base is in full lock down. The only

way to get out now will be to launch the missile in the silo and override the silo doors. First, you'll need to prime the pumps at the terminal in the uppermost catwalk. Then you'll need to remove the guidance chip from the nosecone of the missile. We don't want this bird detonating over the civilian population. Finally, you'll need to launch the missile from the control room. Oh, God! Gordon, it's too late for me. The Combine are right outside the room! You need to leave now! Tell Alyx..." A Combine troops bursts into the room and kills the lab technician.

Visual References

Theme

Experiment and observation room

Characters/Vehicles Introduced



Figure 14: Gordon Freeman



Figure 15: Combine Soldier



Figure 16: Lab Technician

Environment References



Figure 17: Example of lab equipment models and the architecture of the Experiment Room



Figure 18: Experiment Room lighting example



Figure 19: An example of the kinds of textures in the Experiment Room

Perspective Shots

N/A

Area 2: Level 3

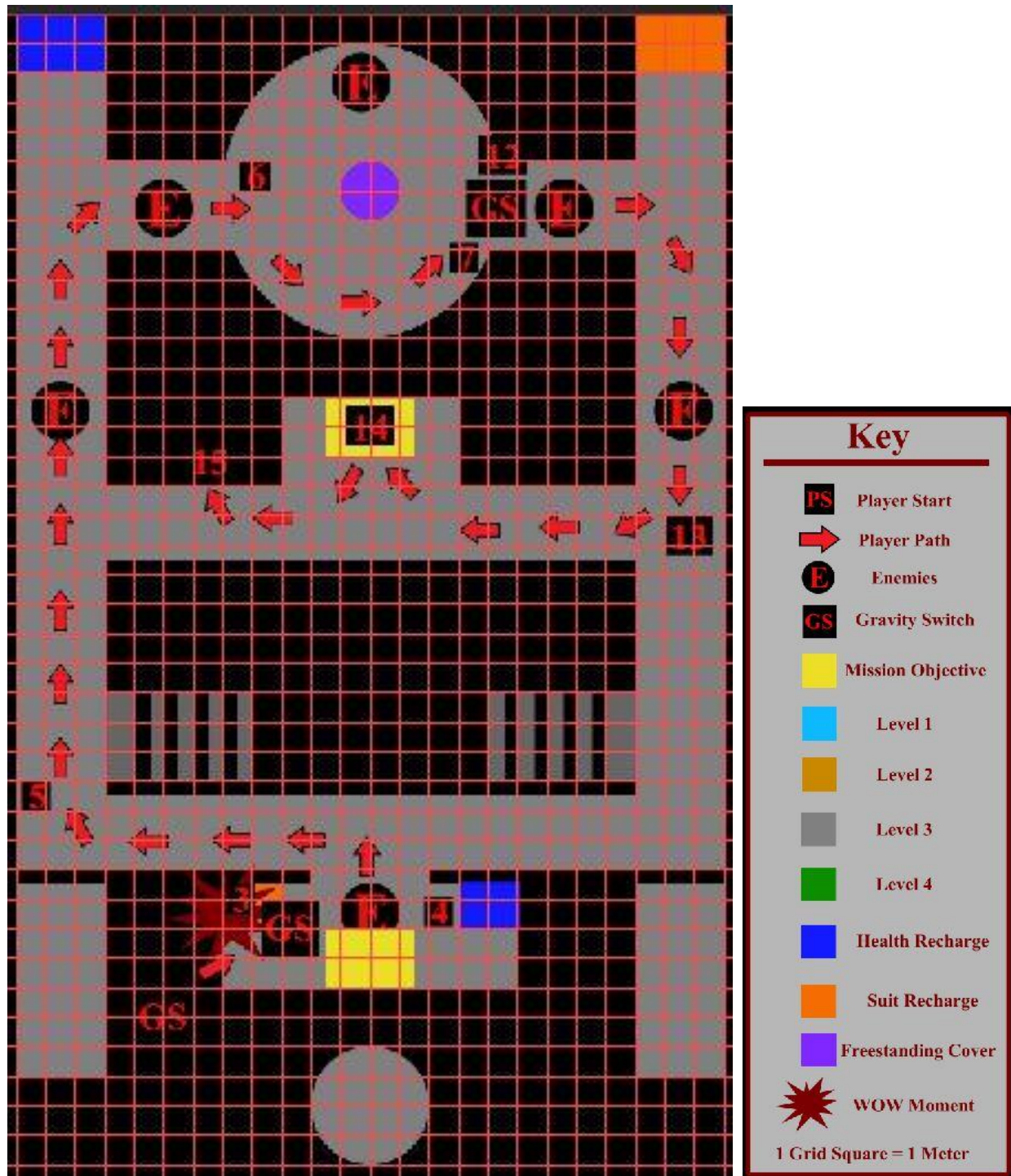


Figure 20: Level 3 Overview Map

Gameplay/Story

3. Gordon looks down through the glass of the observation room and looks on as a Combine soldier armed with a sub machine gun (SMG), breaks into the room and kills the friendly lab technician. Gordon shoots and kills the soldier through the glass, hits the gravity release and drops down, through the glass into the observation room. (WOW Moment)
4. Gordon picks up the soldier's SMG and uses the health and suit recharges on the wall of the observation room. Gordon checks the security monitors and sees on the screen that several soldiers have infiltrated the silo. He then moves out into the transition corridor.
5. As Gordon rounds the corner of the hallway, he sees two more Combine soldiers, one armed with a shotgun and the other with an SMG. Gordon quickly eliminates both soldiers and polices their dropped ammo.
6. Gordon moves towards the center of the silo, using the missile as cover as he engages another enemy armed with a shotgun.
7. Above him, Gordon witness two more Combine repel down from the roof of the lab and onto the level 4 catwalks. Gordon reverses gravity and falls up to the ceiling above the catwalks.

(Continued on Level 4)

12. Gordon falls to the level 3 catwalk and kills the shotgun Combine there.
13. As he makes his way to the next terminal, Gordon engages and eliminates the soldiers in his way, both of which have SMG's.
14. Freeman activates the switch for the launch control. The systems malfunctions, in a shower of sparks, and an electronic voice informs Gordon he must be open the silo doors manually.
15. Gordon jumps from the level 3 catwalks drops down to the second level.

(Continued on Level 1)

Text and Dialog

Objective Text

- N/A

Dialog

- Electronic Voice: "Warning! Launch malfunction. Silo doors inoperable. To commence launch, silo doors must be manually released using the valves beneath the missiles."

Visual References

Theme

Missile Silo

Characters/Vehicles Introduced

N/A

Environment References



Figure 21: Example of the catwalk meshes for the missile silo



Figure 22: Example of emergency lighting for the missile silo

Perspective Shots

N/A



Figure 23: Example of the architecture for the missile silo



Figure 24: Example of the verticality of the missile silo

Area 3: Level 4

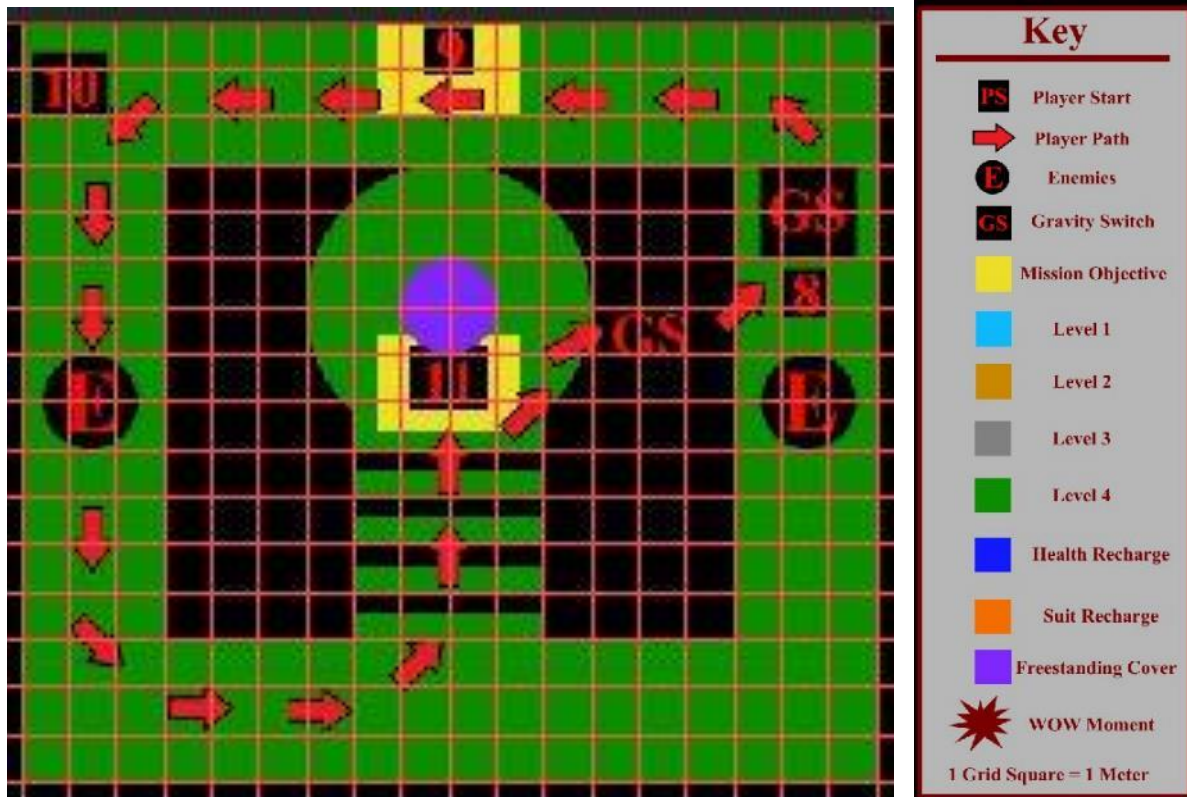


Figure 25: Level 4 Overview Map

Gameplay/Story

(Continued From Level 3)

8. Freeman eliminates the repelling enemies on the catwalks and drops down to steel structure.
9. Gordon moves to computer terminal turns on the missile's fuel pumps, which he identifies by a spinning red light similar to lights during the training exercise. Jets of steam activate on the missile, pulling the player's attention to the next objective.
10. As Gordon rounds the corner, he quickly eliminates the Combine there before continuing.
11. Freeman climbs the stairs to the missile's access panel highlighted by a spinning yellow light, opens it, and removes the guidance chip. He then jumps off the catwalk and drops down to the level three catwalks.

(Continued on Level 3)

Text and Dialog

Objective Text

- N/A

Dialog

- N/A

Visual References

Theme

Missile Silo

Characters/Vehicles Introduced

N/A

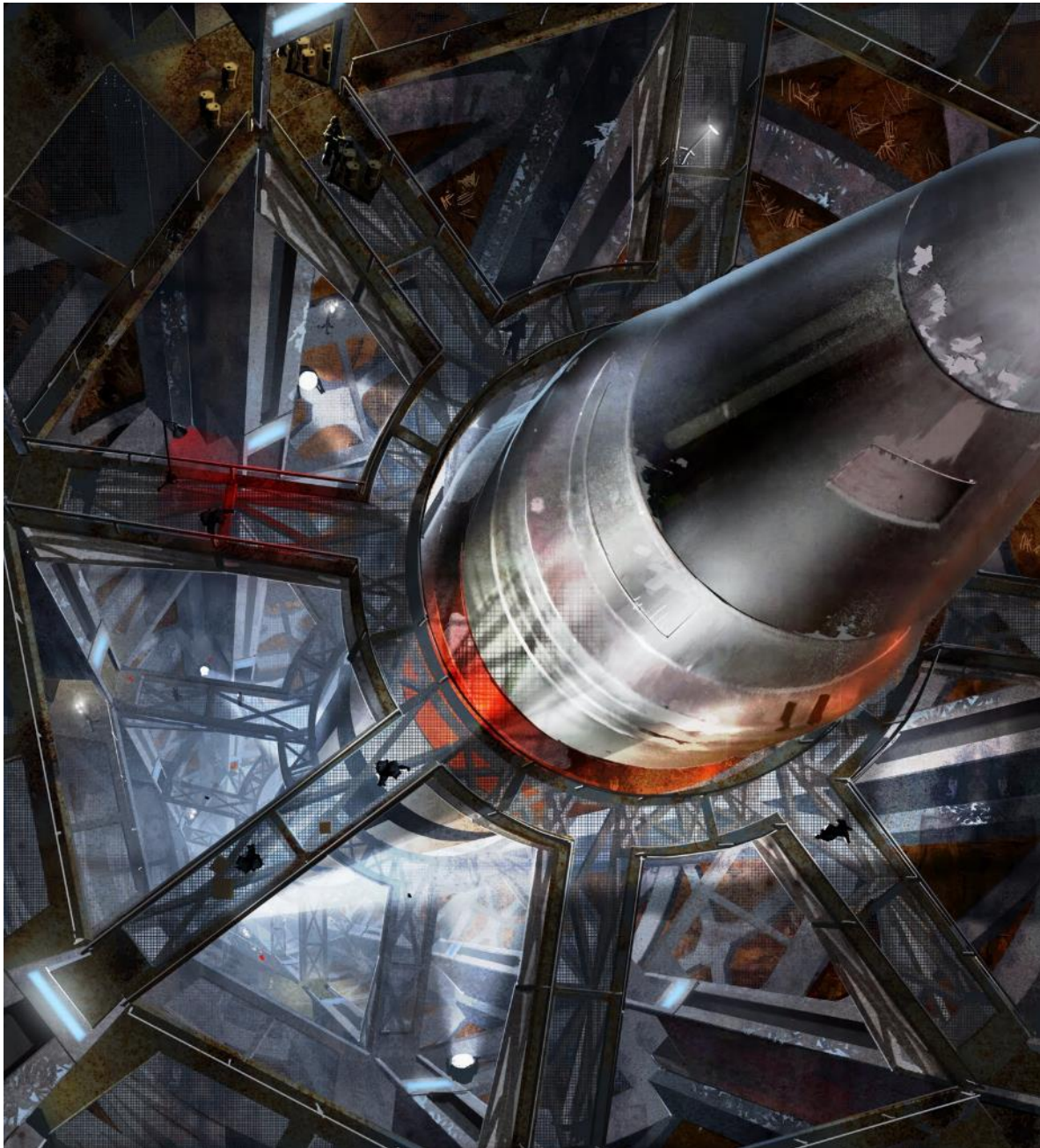
Environment References

Figure 26: Example of multilevel catwalks encircling a missile in a silo



Figure 27: Example of the scale of the missile silo

Perspective Shots

N/A

Area 4: Level 5

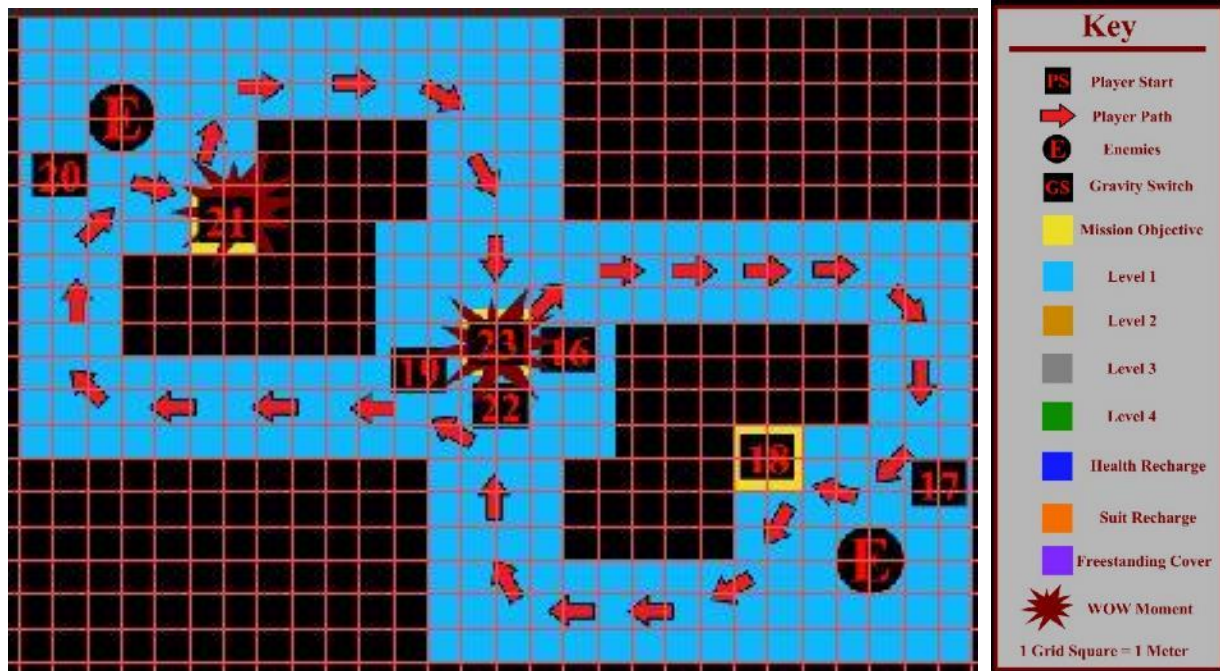


Figure 28: Level 1 Overview Map

Gameplay/Story

16. Freeman eliminates the enemies on the second level, both of whom have shotguns, before dropping down to the sublevel directly under the missile's engines.
17. Gordon makes his way around to the first manual release valve, eliminating the SMG Combine soldier stationed there.
18. Freeman turns the valve, again highlighted by a spinning red light, opening one side of the silo doors.
19. Gordon makes his way through the central room and down the corridor on the opposite side.
20. Gordon eliminates the enemy guarding the second manual release.
21. Freeman turns the valve opening the silo doors completely. With the doors open, the missile's engines engage, engulfing the corridors in fire as Gordon takes cover. (WOW Moment)
22. The flames die, Gordon moves to the central room where he switches gravity and falls up.
23. Gordon follows the missile's path all the way up through silo's doors in the ceiling, escaping the Black Mesa East. Freeman disengages his negative gravity switch, falls back down to the building's roof. He looks on, watching as the missile continues its fiery flight through the sky. The screen fades, and the level ends. (WOW Moment)

Text and Dialog

Objective Text

- N/A

Dialog

- N/A

*Visual References**Theme*

Missile Silo (Underground area)

Characters/Vehicles Introduced

N/A

Environment References

Figure 29: Example of the models and textures for the Underground passage beneath the missile silo



Figure 30: Example of the lighting inside the tunnels beneath the missile silo



Figure 31: Example of the mood and lighting in the tunnels beneath the missile silo

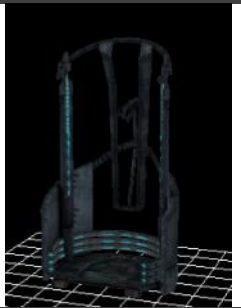
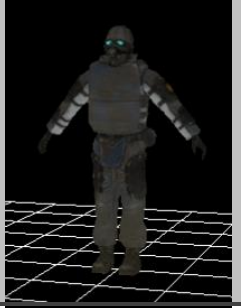

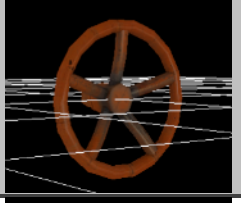
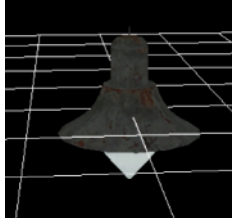




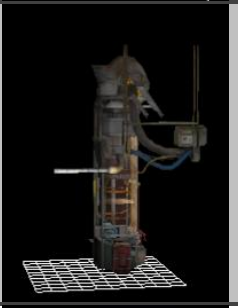

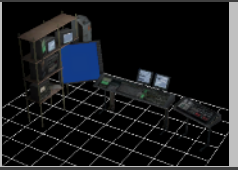

Figure 32:Example of fire shooting through the tunnels beneath the missile silo


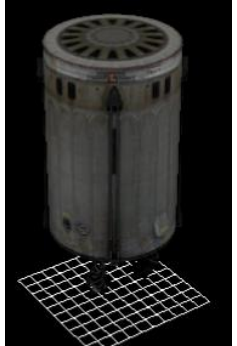
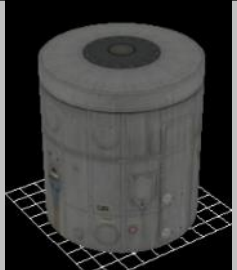

Perspective Shots

N/A


Critical Asset List

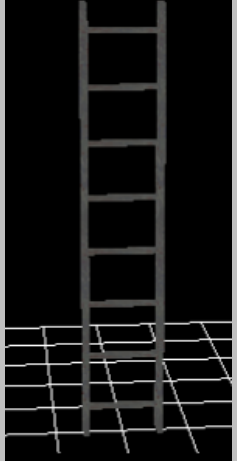

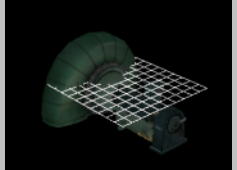

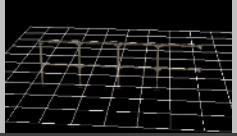
Asset Name	Type	Use	Exists?	Link/Pic
Combine_teleportplatform	Dynamic Prop	Repurposed suit upgrade machine	Y	
Combine Soldier	Entity	Enemies in the level	Y	
Kleiner	Entity	Lab Tech	Y	
Crank	Dynamic Mesh	Manual Silo Door Release	Y	
Lamp_bell_on	Static Mesh	Ceiling lights	Y	

Light_cagelight01_on	Dynamic Mesh	Emergency Lighting	Y	
Light_cagelight01_off	Dynamic Mesh	Emergency Light (off)	Y	
Crystalbulk	Dynamic Mesh	Experiment Room Clutter	Y	
Eyescanner	Dynamic Mesh	Lab equipment Clutter	Y	
Workspace002	Static Mesh	Observation Room Clutter	Y	
Rocket	Dynamic Mesh	Missile Nose Cone	Y	

Rocket_engine	Dynamic Mesh	Missile Engine	Y	
Rocket_stage1	Dynamic Mesh	Missile Stage 1	Y	
Rocket_stage2	Dynamic Mesh	Missile Stage 2	Y	
Rocket_stage3	Dynamic Mesh	Missile Stage 3	Y	

Additional Asset List

Asset Name	Type	Use	Exists?	Link/Pic
Crane_Controlbox	Static Mesh	Silo clutter	Y	

Metalladder001	Static Mesh	Catwalk Ladder	Y	
Powerbox	Static Mesh	Wall Clutter	Y	
Generator01	Static Mesh	Underground clutter	Y	
Combineinterface002	Static Mesh	Observation Room terminal	Y	
Handrail01_Long	Static Mesh	Catwalk railings	Y	

References

1. Figure 1: Half-Life 2 Logo -
http://fc04.deviantart.net/fs41/f/2009/016/0/7/half_life_2_logo_remix_by_gtafreak112.jpg
2. Figure 2: Experiment Room References
 - Top Left –
http://www.pcgameshardware.com/&menu=browser&mode=article&image_id=945816&article_id=701195&page=1
 - Top Right – http://img4.wikia.nocookie.net/_cb20100327220008/half-life/en/images/9/97/Bme_teleport.jpg
 - Lower Center –
http://www.pcgameshardware.com/&menu=browser&mode=article&image_id=945813&article_id=701195&page=1
3. Figure 3: Observation Room References
 - Top Left – https://casualaggro.files.wordpress.com/2013/08/2013-08-13_00005.jpg
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Appendix

Why is it fun?

Topsy-Turvy provides players with an opportunity to engage enemies in combat while rapidly switching between normal and negative gravity. This allows them to get a jump on their opponents, using unusual cover and experience FPS combat in an exceptional way.

What makes this sequence interesting/memorable?

Topsy-Turvy provides the player with the ability to reverse the pull of gravity. This unique mechanic challenges the player to think about combat and navigation in a radically different way.

How will you communicate to the player what they need to do?

The designer will use a variety of tools to communicate the level objectives to the player. This will include text, sound cues, spinning and different colored lighting, movement, enemy placement, and particle effects. The designer will utilize all of these tricks to steer the player to their next objective.

How can the player break it?

Allowing the player to alter gravity can lead to a variety of potential opportunity to use the mechanic to break the level. This would include:

- Clipping through walls
- Getting stuck on geometry
- Falling outside of the map
- If players stop the level while on the roof, the keys never unbind when the player restarts
- Could conceivable use unintended cover to attack the AI

However, with careful planning and design I believe these risks can be overcome.