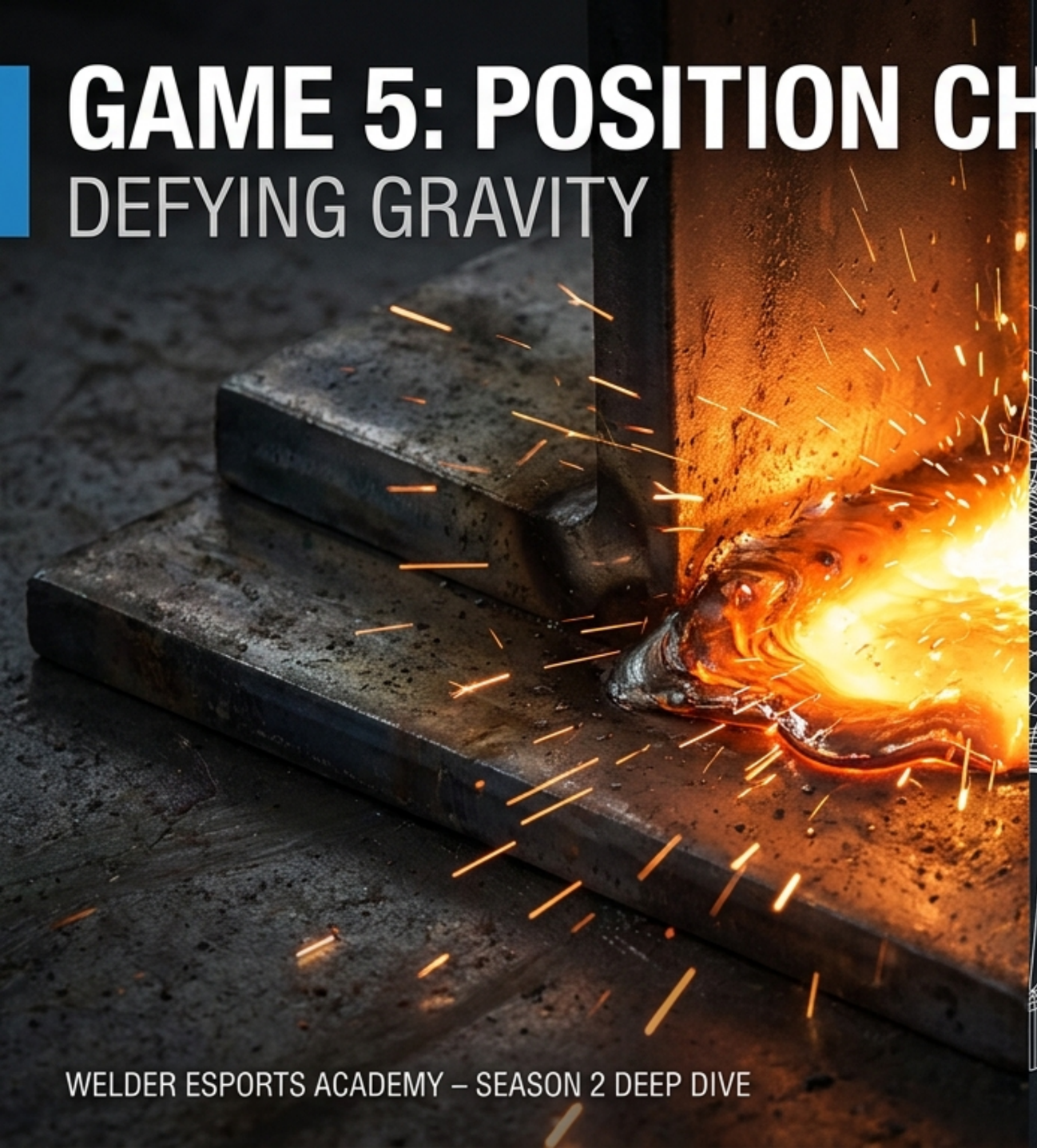
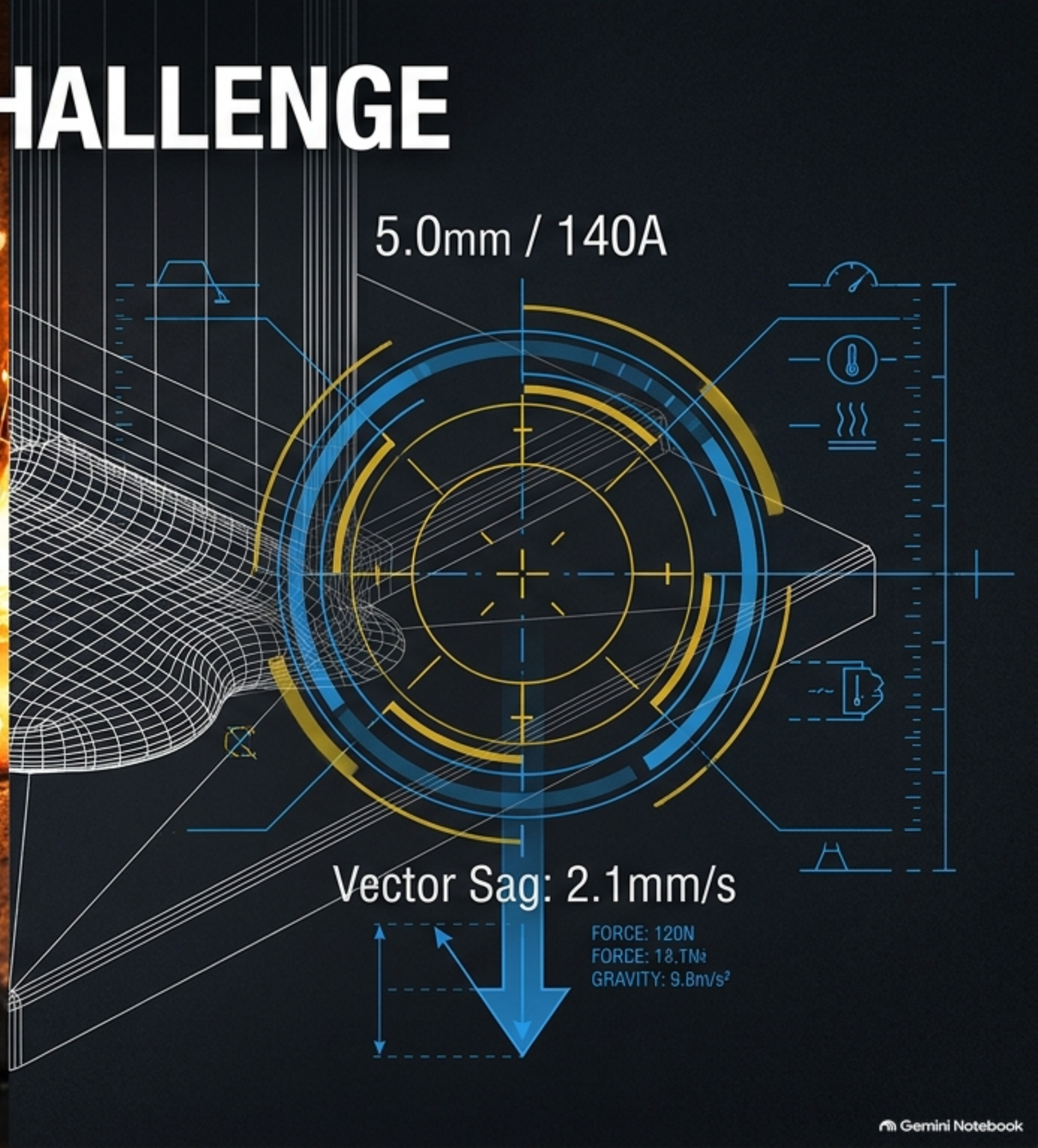
GAME 5: POSITION CHALLENGE

DEFYING GRAVITY





WELDER ESPORTS ACADEMY – SEASON 2 DEEP DIVE

Gemini Notebook

The Season 2 Leap into Spatial Complexity

Days 1-30



Season 1: Rookie

Safety, MIG Basics, 1G Flat

Gravity acts as an assist.

Game 5:
Transitioning from flat surfaces to multi-axis physical resistance.

Days 31-60



Season 2: Operator

Stick 6010/7018, TIG GTAW,
Blueprint AWS Symbols,
2G Horizontal / 3G Vertical Up

	Game	How to Play	Industry Link	Scoring
2	1 Position Challenge 2O/3G	Weld horizontal then vertical up with gravity sag compensation. Game Game adds gravity drag to joystick.	Positions	Bead profile, Undercut
4	3 Position Game	Weld horizontal fly drag to joystick.	Positions	Undercut
5	5 Position Challenge 2O/3G	Weld horizontal then vertical up with gravity sag compensation. Game Game adds gravity drag to joystick.	Positions 2G/3G	Bead profile, Undercut
6	6 Position Challenge 2O/3G	Weld horizontal then vertical up with gravity sag compensation. Game adds gravity drag to joystick.	Positions 2G/3G	Bead profile, Undercut

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The Physics of 2G and 3G Weld Positions

2G Horizontal

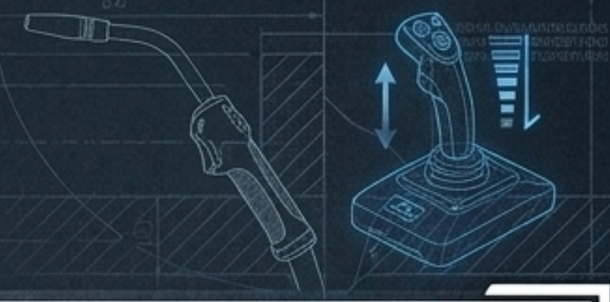


3G Vertical Up



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Translating Physical Resistance into Digital Haptics



	Physical Action	Enemy Force	Digital Counterpart
2G Horizontal	Transverse travel across a vertical plane.	Asymmetrical gravity sag on the lower toe.	Engine applies mild, asymmetrical downward haptic drag to the physical joystick, forcing constant upward angle correction.
3G Vertical Up	Defying gravity by building a molten shelf upward.	Total downward puddle collapse.	Requires variable travel speed. Joystick applies heavy, pulsing downward resistance if travel speed exceeds 5mm/s.

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Programming Weave Dwell Time for Puddle Control



To prevent undercut, the player must pause at the toes (dwell time) to allow filler metal to solidify, while moving quickly quickly across the center to prevent excess heat buildup.

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Gravity Compensation Through Haptic Feedback Feedback



Virtual Puddle Volume & Heat Input tracked by the engine.

Calculates downward gravity vector based on 2G/3G position and puddle mass.

Force-feedback motors in the physical joystick apply proportional downward physical drag.

Player applies upward physical force (Gravity Compensation) and adjusts travel speed.

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HUD Alignment and Telemetry Training



5mm Target
(+/- 0.5mm tolerance ring)

Speed Gauge:
Locked at optimal 5mm/s target

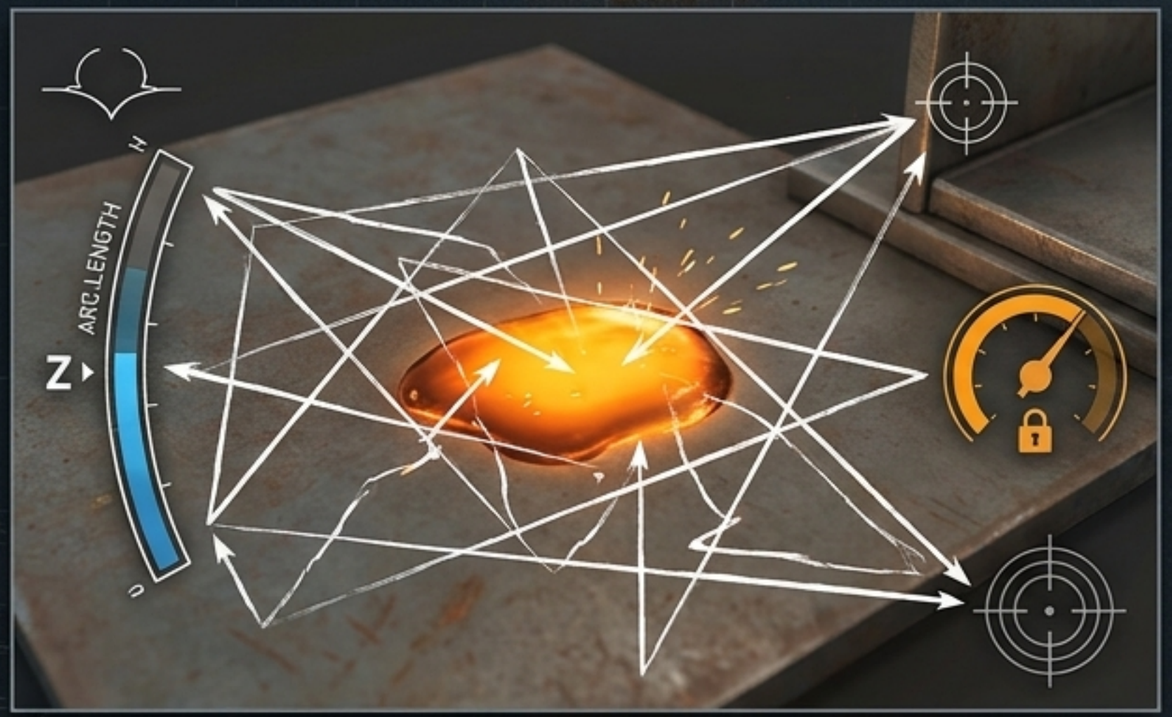
Arc Length Indicator:
Enforces strict 3mm weave depth

Sag Warning Cues:
Activate if gravity overcomes compensation

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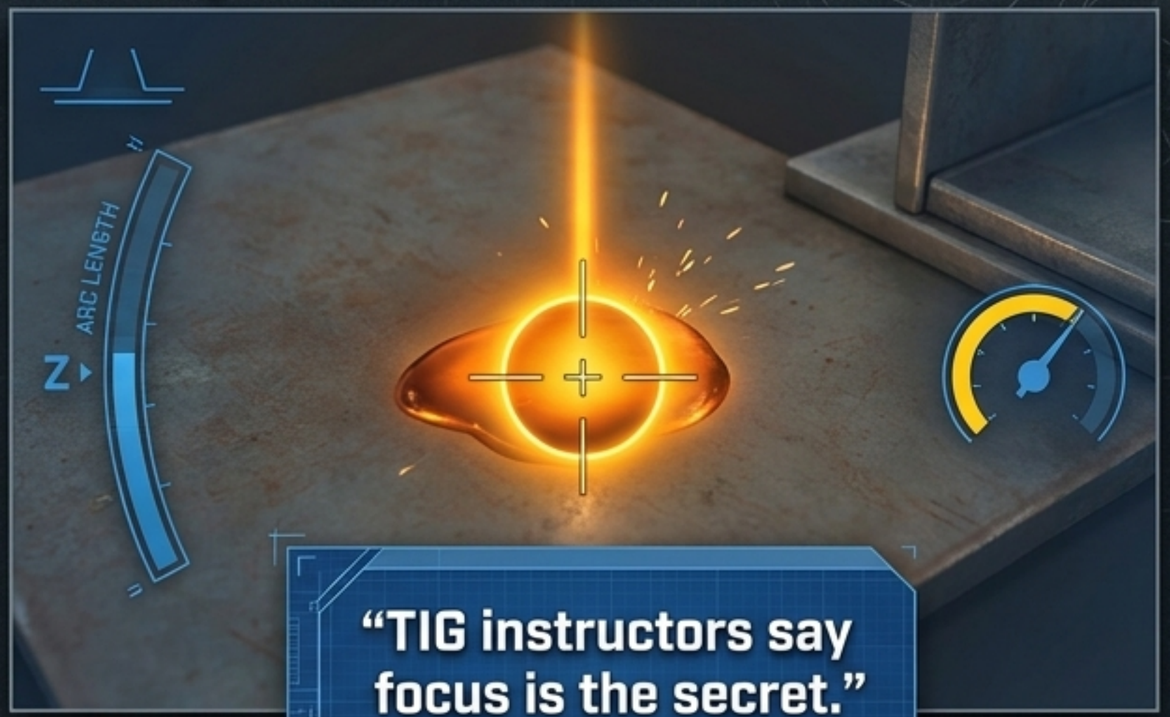
Managing Cognitive Load: The Focus Secret

The Novice



Erratically checking multiple telemetry points results in fatal puddle instability.

The Expert / HUD Trained



The HUD forces gamers to monitor complex spatial telemetry entirely through peripheral vision, keeping absolute primary focus locked on the 5mm puddle behavior—the exact cognitive state of a certified welder.

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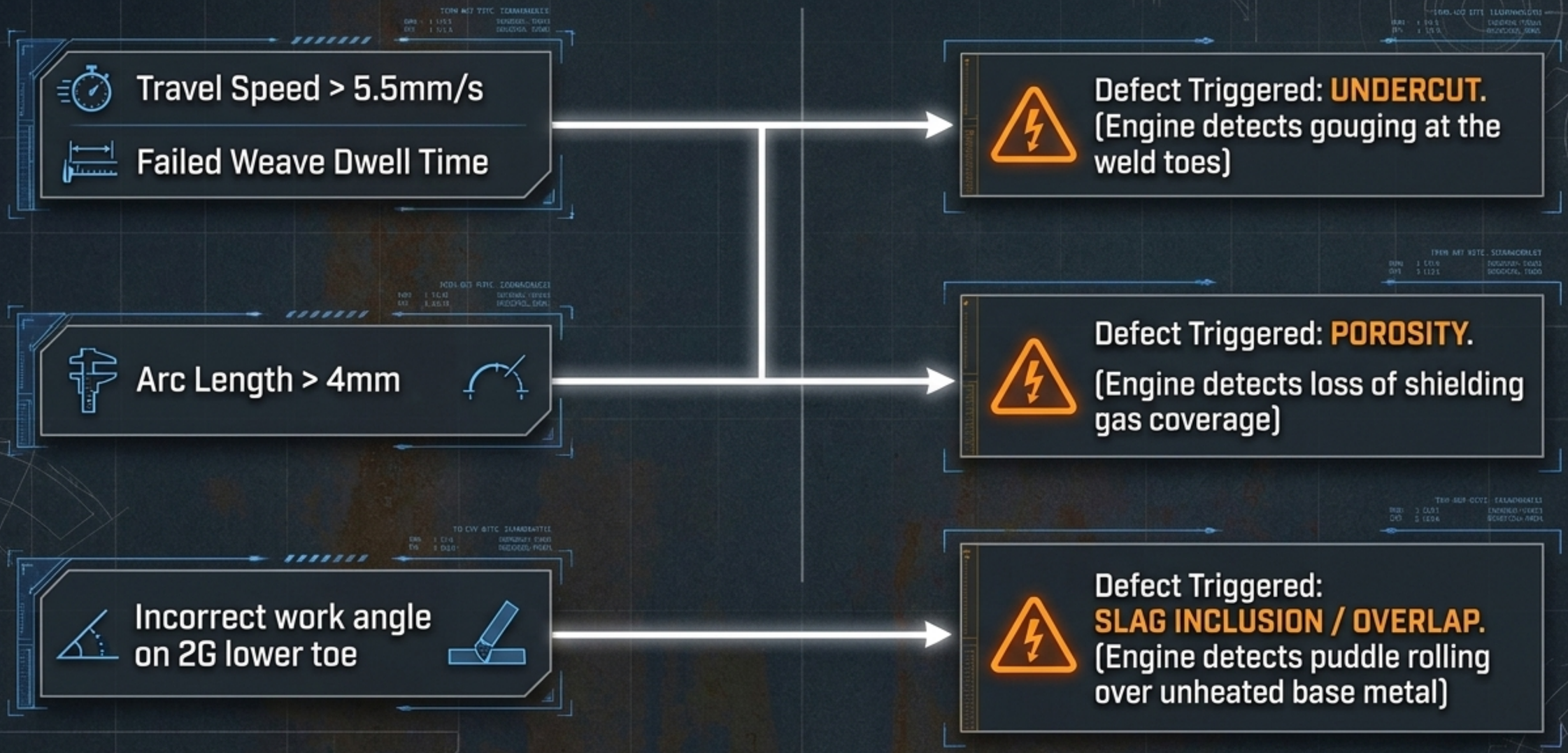
Encoding Industry Standards: AWS D1.1 Table 4.11



Game 5 is not scored arbitrarily; it strictly enforces the visual inspection criteria required for structural steel certification.

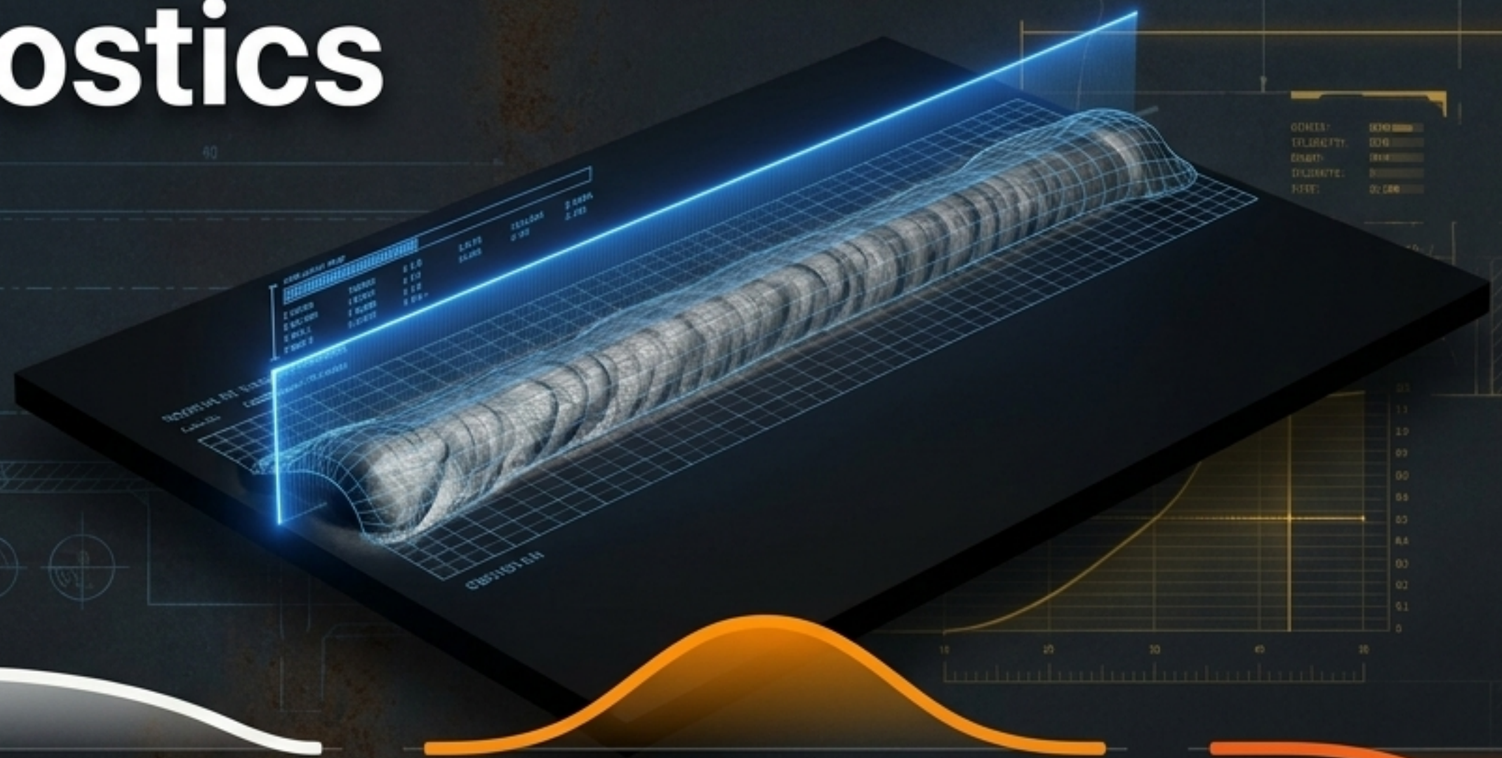
Gemini Notebook

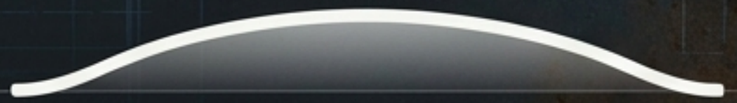
The Defect Detection Flowchart



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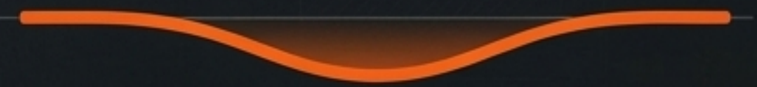
Bead Profile Evaluation Diagnostics





Optimal Profile:
Perfect fusion at the toes.

Excessive Convexity:
Filler buildup/slow travel speed (Violates Table 4.11).

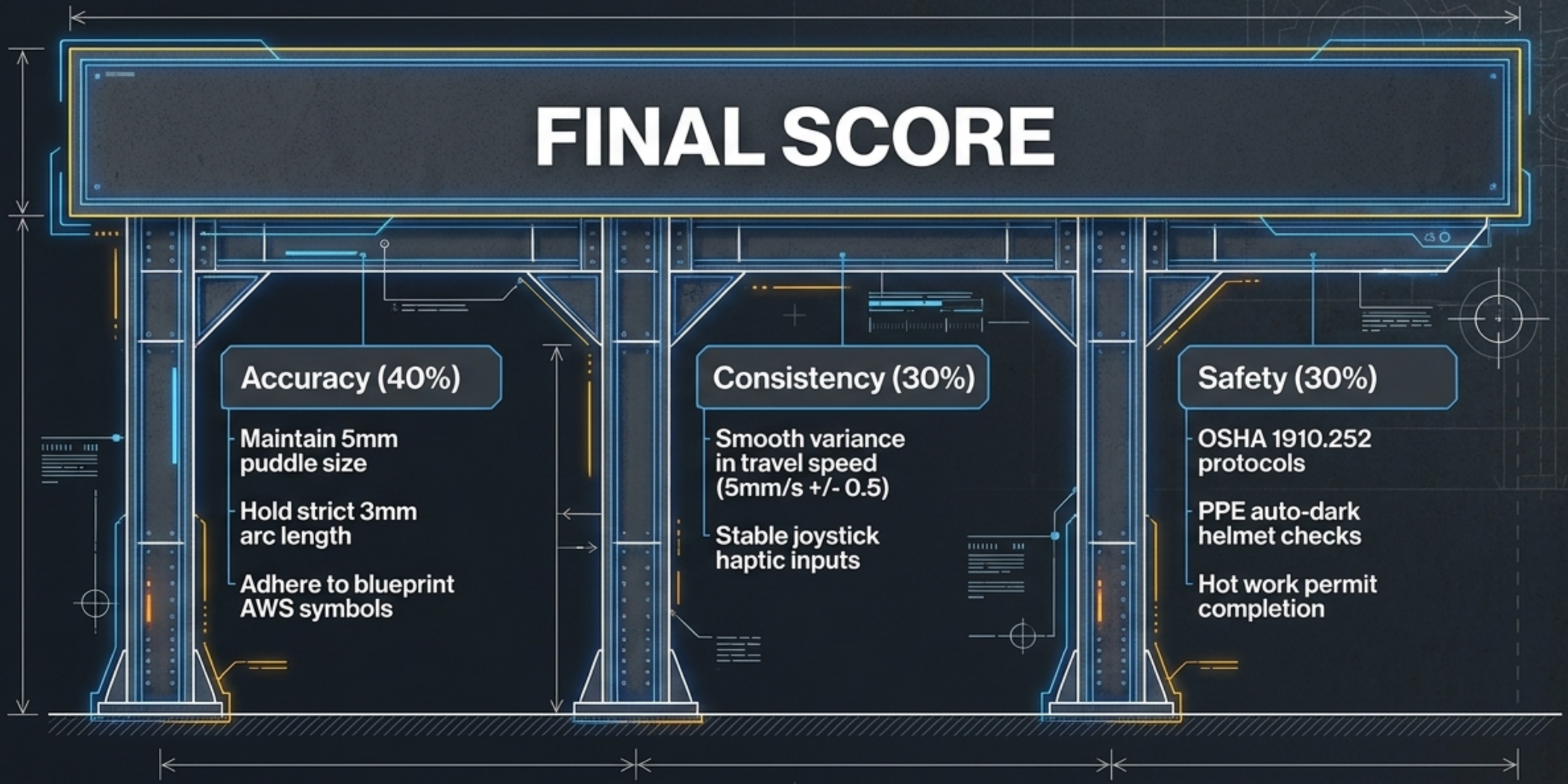


Concavity: Insufficient filler/fast travel speed.

The game engine casts a virtual 3D mesh over the player's completed pass, calculating precise convexity and concavity millimeter by millimeter.

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Deconstructing the Final Score Algorithm



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The XP Engine: Rewarding Precision, Punishing Defects



The math aggressively biases toward perfection. A single undercut or porosity defect drains 50 XP, ensuring that speed never supersedes structural safety.

Gemini Notebook

Esports Tier Mapping: From Novice to Operator

Platinum (10000XP) - Master Weld-Off, Zero Defects, AWS D1.1 3/8in qual ready, Remote Robotic job-ready.

Gold (5000XP) - 92% threshold. Ready for 4G/6G and Inspection Hunt 90%+.

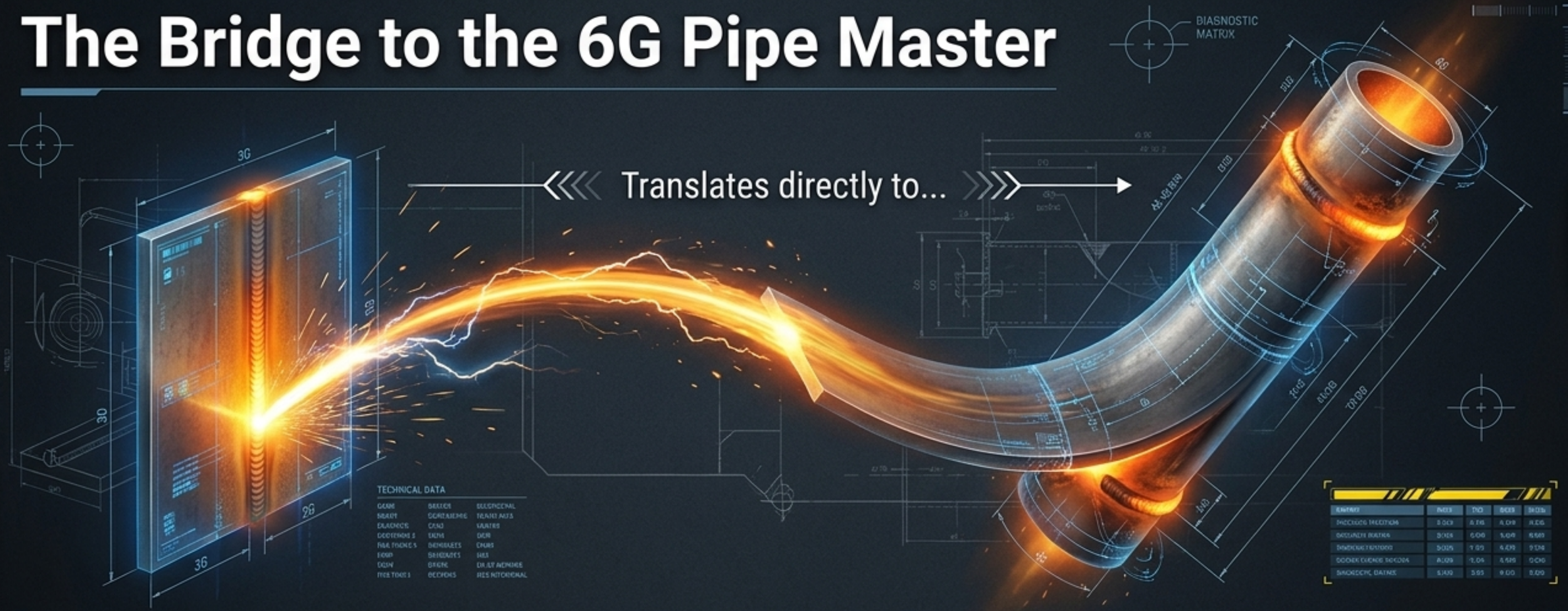
Silver (2000XP) - 85% score, 2G/3G proficient, Blueprint 80%+. The player has defeated gravity.

Bronze (500XP) - 70% threshold. Mastered 1G flat. Basic safety pass.

Game	How to Play	Industry Link	Scoring
0 Puddle Control	Weld pattern puddle diameter Down or Edmonton while moving Gauge. Measure if too big/small. Teaches heat input. Basic.	Mild Steel, T10 focus	Puddle size consistency 0-100
1 Bead Line	Run 150mm straight bead. Maintain travel speed and arc length. Score if straightness & speed consistency.	Travel speed	Straightness, Speed variance
2 Arc Length	Random 3mm or 6mm height. Score if held right. Like real life but vertical. Teaches voltage control.	Arc length	Length consistency, Arc stream
3 T10 Feet Pedal	Control heat with foot pedal joystick. Hold weld current steady 60-180A for puddle on thin steel. Dual task.	T10, Skill level	Amp stability, Puddle control
4 Blueprint Blitz	Fixed 4G/6G overhead (Edmonton) groove. Watch real pipe spool MultiTrack. Replicate, position, speed match.	Joint prep, WPS	Accuracy, Time
5 Position Challenge 2G/3G	Weld dedicated test vertical up with profile cap compression. Come with gloves and no gloves.	Positions 2G/3G	Bead profile, Undercut
6 Overhead Class	Inverted canopy, puddle wants to drip. Convert drip back there, keep weld.	4G overhead	Drip events, Consistency
6 Pipe	Pipe or ES Stainless, weld around with electrode from cold clock. Qualifies all positions per T10 OTT.	5G pipe	Root penetration, Fusion score
7 6G Pipe Master	Pipe at 45 Degrees, weld around with inferno from cold clock. Qualifies all positions per Tech Orb.	6G pipe	Root penetration, Fusion score
8 Inspection Hunt	Find defects in weld provided Tray. Identify slag inclusion, undercut, crater. 10 min per image.	Visual inspection	Defects found %
8 Multi-Pass Builder	5 pass groove run. 25 mm. Most place between space maximum. Protect temp limits.	Multi pass, Maintenance	Fusion Score, Interpass temp
10 Robot Remote Welding	Remote robotic setting with 100-400ms latency, partial fail, camera issue. Keep it clean & quick, CAMS for remote like, like T6ele remote ops.	Remote Ops, Safety	Control during OS, 5 step <0.5s
T1 Fabrication Pro	MTC weld blueprint all spell tasks, cut bit, work continue stations one cost. Manage tasks the march.	Substitution, Trip Planning	Build accuracy, Time started
T2 Master Weld-Off	Build 01 1 Side Toughed Thickness test coupon, 6G Gouge finished weld, per WPS. Timed qualification. Man in the Gold test simulation.	AWS CW Test	Visual pass, Bend simulation

Gemini Notebook

The Bridge to the 6G Pipe Master



Game 5 Masteries: Gravity Compensation, Weave Dwell Time, HUD Spatial Awareness.

Games 6 & 7: Overhead Chaos (Inverted puddles) & 6G Pipe Master (Continuous axis changes + mirror welding).

By successfully mapping AWS D1.1 standards and physical haptics to the 2G/3G digital environment, Game 5 builds the exact cognitive and muscular foundation required to qualify for elite, remote robotic welding operations.

Gemini Notebook