

GAME DESIGN DOCUMENT

Spirefall

A Classic Tower Defense Game

Inspired by Element TD, Green TD, and Legion TD

Version 1.0

February 2026

Platforms: Web (itch.io) / Android

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1. Executive Summary

Spirefall is a classic tower defense game that blends the best mechanics from Warcraft III custom maps: the elemental rock-paper-scissors system of Element TD, the creative mazing freedom of Green TD, and the strategic unit-summoning economy of Legion TD. Players build towers on a grid to defend against waves of enemies, combining elements to unlock powerful hybrid towers while managing gold and income.

The game targets fans of classic TD games and strategy enthusiasts looking for deep, replayable gameplay. It will be released as a free-to-play web game on itch.io and as a mobile app on Android.

Attribute	Details
Title	Spirefall
Genre	Tower Defense / Strategy
Platforms	Web (HTML5 via itch.io), Android
Engine	Godot 4.x
Target Audience	TD fans, strategy gamers, ages 12+
Play Session	15–30 minutes per run
Monetization	Free with optional cosmetic DLC

2. Game Overview

2.1 Concept Statement

Build towers. Combine elements. Survive the fall. Spirefall challenges players to defend their base against 30+ waves of enemies by strategically placing towers on a grid, discovering powerful element combinations, and deciding between mazing for path control or stacking damage in key chokepoints.

2.2 Unique Selling Points

- Element Fusion System: Combine 6 base elements into 15 dual-element tower types and 6 triple-element legendary towers.
- Dynamic Mazing: Players shape the enemy path by placing towers, rewarding creative maze designs with longer enemy travel time.
- Legion Waves: Every 5th wave, players spend gold to summon attackers against an AI opponent (or another player), adding offensive strategy.
- Endless Replayability: Randomized element drafts and procedural wave compositions ensure no two games play the same.
- Cross-Platform: Seamless play on web browsers and Android with touch-friendly controls.

2.3 Player Fantasy

The player is an elemental commander, harnessing the forces of nature to build an impenetrable defense. The fantasy is about mastery — learning which element combinations counter which enemies, discovering optimal maze layouts, and achieving the satisfaction of a perfectly constructed defense that decimates waves effortlessly.

3. Core Gameplay Loop

The minute-to-minute gameplay follows a build-defend-upgrade cycle repeated across waves of increasing difficulty:

3.1 Phase 1: Build Phase (15–30 seconds)

- Players receive gold at the start of each wave.
- Place new towers on the grid, choosing from available elements.
- Upgrade or sell existing towers.
- Rearrange maze layout to optimize enemy pathing.
- Timer counts down; players can start the wave early for a bonus.

3.2 Phase 2: Combat Phase

- Enemies spawn and follow the dynamically calculated path through the player's maze.
- Towers automatically target and attack enemies within range.
- Players can activate tower abilities (if unlocked) with manual input.
- Enemies that reach the exit deal damage to the player's life total (starting at 20 lives).
- Gold is earned per kill, with bonuses for combos and no-leak waves.

3.3 Phase 3: Income Phase (every 5th wave)

- Players receive interest on banked gold (5% per 100 gold, capped at 25%).
- Legion summon option: spend gold to send mercenary units against the opponent (multiplayer) or AI base.
- Element draft: choose one new element to add to your available pool (if playing draft mode).

3.4 Win/Lose Conditions

Victory: Survive all 30 waves (Classic) or achieve the highest score in Endless mode.

Defeat: Lives reach 0. The game ends and a summary screen shows stats, score, and unlocks.

4. Game Modes

Mode	Description	Players	Priority
Classic	30 fixed waves with escalating difficulty. All 6 elements available from start. Fixed map layout.	1	MVP
Draft	Random element draft before game. Pick 3 of 6 elements; towers limited to chosen elements and their combos.	1	MVP
Endless	Waves scale infinitely. Leaderboard-based. Tests how far the player can survive.	1	Post-Launch
Versus	Two players build side-by-side. Send legion mercenaries to attack opponent. Last player standing wins.	2 (online)	Post-Launch
Co-op	Two players share a map. Coordinate element coverage and tower placement.	2 (online)	Post-Launch

5. Tower System





5.1 Tower Basics

Towers are the core units the player builds. Each tower occupies one grid cell and attacks enemies within its range. Towers can be placed, upgraded, or sold at any time during the build phase. During combat, towers can only be sold (at 75% refund value).

Property	Description
Grid Size	1x1 cell per tower
Placement	Any open cell that doesn't block the path completely
Selling	75% gold refund (build phase), 50% during combat
Upgrade Levels	3 tiers per tower type (Tier 1 → Tier 2 → Tier 3)
Targeting Modes	First, Last, Strongest, Weakest, Closest (player-selectable)

5.2 Base Element Towers (Tier 1)

Each of the 6 base elements provides a single-element tower with a unique attack style and role:

Element	Tower Name	Damage Type	Attack Style	Role
 Fire	Flame Spire	Fire (DoT)	Single target + burn	Sustained DPS
 Water	Tidal Obelisk	Water (Slow)	Single target + slow	Crowd Control
 Earth	Stone Bastion	Earth (Phys)	AoE ground pound	AoE Damage
 Wind	Gale Tower	Wind (Pierce)	Fast multi-shot	Fast Attack Speed
 Lightning	Thunder Pylon	Lightning (Chain)	Chain to 3 targets	Multi-Target
 Ice	Frost Sentinel	Ice (Freeze)	Single + freeze chance	Hard CC

5.3 Dual-Element Towers (Tier 2)

Combining two different base element towers adjacent to each other unlocks fusion. The player selects two qualifying towers and pays a fusion cost to merge them into a more powerful dual-element tower. There are 15 possible dual-element combinations:

Combination	Tower Name	Special Ability
Fire + Water	Steam Engine	Creates fog that reduces enemy accuracy; deals AoE burn
Fire + Earth	Magma Forge	Lava pool AoE that persists on the ground for 3 seconds

Fire + Wind	Inferno Vortex	Tornado of flame that pulls enemies into its center
Fire + Lightning	Plasma Cannon	Massive single-target burst damage with long cooldown
Fire + Ice	Thermal Shock	Rapid freeze/burn cycle; bonus damage to frozen enemies
Water + Earth	Mud Pit	Creates slowing terrain; enemies stuck take amplified damage
Water + Wind	Tsunami Shrine	Periodic wave that pushes enemies back along the path
Water + Lightning	Storm Beacon	Electrified rain AoE; chains to wet enemies
Water + Ice	Glacier Keep	Massive slow aura; chance to encase enemies in ice
Earth + Wind	Sandstorm Citadel	Reduces enemy vision/speed in a wide radius
Earth + Lightning	Seismic Coil	Stuns enemies periodically with ground tremors
Earth + Ice	Permafrost Pillar	Armored tower with thorns; damages melee-range enemies
Wind + Lightning	Tempest Spire	Fastest attack speed in game; hits 5 targets
Wind + Ice	Blizzard Tower	AoE slow + damage in a wide cone area
Lightning + Ice	Cryo-Volt Array	Freezes then shatters: frozen enemies take 3x chain damage

5.4 Triple-Element Legendary Towers (Tier 3)

The ultimate towers require three elements and a significant gold investment. Only 6 exist, each representing a trio of elements. These are game-changers that can anchor an entire defense:

Elements	Tower Name	Ultimate Ability
Fire + Water + Earth	Primordial Nexus	Erupts a geyser every 10s dealing massive AoE + slow
Fire + Wind + Lightning	Supercell Obelisk	Lightning storm in a huge AoE; scales with wave number
Water + Wind + Ice	Arctic Maelstrom	Permanent blizzard aura; 50% slow + freeze chance to all enemies in range
Earth + Lightning + Ice	Crystalline Monolith	Stun pulse every 8s; stunned enemies take 2x damage from all sources
Fire + Earth + Wind	Volcanic Tempest	Launches magma projectiles that create burning ground patches
Water + Earth + Lightning	Tectonic Dynamo	Earthquake that slows, damages, and disrupts enemy abilities

5.5 Tower Upgrade Path

Each base tower can be upgraded through three stages before fusion becomes available:

1. Base (Tier 1): Built for base cost. Standard stats.
2. Enhanced (Tier 1+): Costs 1.5x base. +40% damage, +10% range.
3. Superior (Tier 1++): Costs 2x base. +100% damage, +20% range, unlocks special effect.
4. Fusion (Tier 2): Merge two Superior towers of different elements. Pays fusion cost.
5. Legendary Fusion (Tier 3): Merge a Tier 2 tower with a Superior tower of the third element.

6. Element System

6.1 Elemental Damage Matrix

Elements interact in a rock-paper-scissors triangle system. Towers deal bonus or reduced damage based on the target's elemental affinity:

Attacker ↓ / Target →	Fire	Water	Earth	Wind	Lightning	Ice
Fire	1.0x	0.5x	1.5x	1.0x	1.0x	1.5x
Water	1.5x	1.0x	0.5x	1.0x	0.75x	1.0x
Earth	0.5x	1.5x	1.0x	0.75x	1.5x	1.0x
Wind	1.0x	1.0x	1.25x	1.0x	0.5x	1.5x
Lightning	1.0x	1.25x	0.5x	1.5x	1.0x	1.0x
Ice	0.5x	1.0x	1.0x	0.5x	1.0x	1.0x

Key: 1.5x = Super Effective, 1.25x = Effective, 1.0x = Neutral, 0.75x = Resisted, 0.5x = Weak

6.2 Element Draft (Draft Mode)

In Draft mode, players start with 1 random element and draft 2 more across the first 10 waves (1 pick at wave 5, 1 pick at wave 10). This limits available tower types and forces adaptation. The draft presents 3 random elements each pick; unchosen elements are discarded.

6.3 Element Synergy Bonuses

Having multiple towers of the same element on the field grants passive bonuses:

- 3 towers of same element: +10% damage for all towers of that element.
- 5 towers of same element: +20% damage and unlock element-specific aura effect.
- 8 towers of same element: +30% damage and enhanced aura (larger radius, stronger effect).

7. Enemy System

7.1 Enemy Types

Type	Behavior	Health	Speed	Appears
Normal	Standard unit, follows path	Medium	Medium	All waves
Fast	Low HP but moves quickly	Low	Fast	Wave 3+
Armored	High physical resistance	High	Slow	Wave 5+
Flying	Ignores maze, flies direct path	Medium	Medium	Wave 8+
Swarm	Spawns in large groups (x3 count)	Very Low	Fast	Wave 6+
Healer	Heals nearby enemies over time	Medium	Medium	Wave 10+
Boss	Massive HP, unique abilities	Very High	Slow	Every 10th wave
Split	Splits into 2 smaller units on death	High	Medium	Wave 12+
Stealth	Invisible until within tower range	Low	Fast	Wave 15+
Elemental	Immune to one element, weak to another	High	Medium	Wave 8+

7.2 Wave Composition

Each wave has a defined composition that scales in difficulty. Early waves introduce one enemy type; later waves mix multiple types. Wave composition follows this pattern:

- Waves 1–5: Single enemy types, tutorial-level. Introduces Normal, Fast, and Swarm.
- Waves 6–10: Mixed compositions. Introduces Armored, Flying, Elemental enemies. Boss at wave 10.
- Waves 11–20: Complex mixes with Healers, Split, and Stealth. Boss at wave 20 with adds.
- Waves 21–30: All types in heavy compositions. Final boss at wave 30 is multi-phase.

7.3 Boss Encounters

Wave	Boss Name	Element	Mechanic
10	Ember Titan	Fire	Leaves fire trail that damages nearby towers; immune to Fire
20	Glacial Wurm	Ice	Periodically freezes towers in range for 3s; spawns ice minions
30	Chaos Elemental	All	Cycles through elements every 10s; must match

			weakness or deal 0.25x damage
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7.4 Scaling Formula

Enemy stats scale with wave number to maintain challenge:

- Health = Base HP \times (1 + 0.15 \times wave_number)²
- Speed = Base Speed \times (1 + 0.02 \times wave_number), capped at 2x base
- Gold Reward = Base Gold \times (1 + 0.08 \times wave_number)
- Enemy Count = Base Count + floor(wave_number / 3)

8. Economy and Progression

8.1 Gold Economy

Source	Amount	Notes
Starting Gold	100	Enough for 3–4 base towers
Kill Bounty	1–10 per enemy	Scales with wave and enemy type
Wave Clear Bonus	10 + (wave × 3)	Bonus for clearing all enemies
No-Leak Bonus	+25% wave bonus	Extra gold if no enemies reach exit
Early Start Bonus	+10 per second saved	Reward for starting wave early
Interest	5% per 100 banked, max 25%	Paid every 5 waves
Tower Sell (Build)	75% of total invested	During build phase
Tower Sell (Combat)	50% of total invested	During combat phase

8.2 Tower Costs

Tier	Cost	Example
Base Tower (T1)	25–35 gold	Flame Spire: 30g
Enhanced (T1+)	40–55 gold	Enhanced Flame Spire: 45g
Superior (T1++)	60–80 gold	Superior Flame Spire: 60g
Dual Fusion (T2)	100–150 gold (fusion cost)	Steam Engine: 120g fusion + two T1++ towers
Legendary (T3)	250–400 gold (fusion cost)	Primordial Nexus: 300g fusion + T2 + T1+ + tower

8.3 Meta Progression (Between Runs)

Players earn experience points (XP) after each run based on waves survived, enemies killed, and gold earned. XP unlocks:

- New maps (unlocked at XP milestones).
- Cosmetic tower skins and effects.
- Challenge modifiers (e.g., half gold, double speed, element restrictions).
- Leaderboard entry for Endless mode.

9. Map Design

9.1 Grid System

All maps use a grid-based system. The default map is 20 columns by 15 rows. Each cell is either a path cell (where enemies walk), a buildable cell (where towers go), or an unbuildable cell (obstacles, decorations).

Property	Value
Grid Size (Default)	20 × 15 cells
Cell Size	64 × 64 pixels
Map Resolution	1280 × 960 pixels (playfield)
Spawn Points	1–2 per map (marked with portal)
Exit Points	1 per map (marked with crystal)

9.2 Mazing Rules

Players can place towers on buildable cells to create a maze. The pathfinding system dynamically recalculates the shortest path whenever a tower is placed or removed. Key rules:

1. The path must never be fully blocked. If placing a tower would eliminate all paths from spawn to exit, the placement is rejected with a visual warning.
2. Enemies always follow the shortest available path (A* pathfinding).
3. Diagonal movement is not allowed for enemies.
4. Flying enemies ignore the maze and move in a straight line from spawn to exit.
5. The maze resets between waves only if the player explicitly requests it.

9.3 Map Roster (MVP)

Map	Layout	Gimmick
Forest Clearing	Open field, full mazing freedom	Starting map; no gimmick, pure mazing
Mountain Pass	Pre-built walls create a partial maze	Less mazing space but natural chokepoints
River Delta	River splits map into 3 islands with bridges	Must defend all 3 paths; bridges are unbuildable
Volcanic Caldera	Circular map with center spawn	Enemies move outward; exit is the map border

10. User Interface

10.1 HUD Layout

The HUD is designed to be clean, unobtrusive, and touch-friendly for mobile:

- Top Bar: Wave counter ("Wave 7/30"), Lives (heart icons), Gold amount, Income timer.
- Bottom Panel: Tower build menu (scrollable row of tower icons grouped by element). Tap to select, tap grid to place.
- Right Panel (Desktop) / Popup (Mobile): Tower info panel when selecting a placed tower. Shows stats, upgrade button, sell button, targeting mode toggle.
- Minimap: Small overview in corner showing maze layout and enemy positions.
- Wave Preview: Before each wave, a small panel shows upcoming enemy types and their elements.

10.2 Controls

Action	Desktop	Mobile
Place Tower	Click build menu → Click grid	Tap tower icon → Tap grid cell
Select Tower	Click placed tower	Tap placed tower
Upgrade Tower	Click upgrade button / hotkey U	Tap upgrade in info panel
Sell Tower	Click sell button / hotkey S	Tap sell in info panel
Pan Camera	WASD / Middle mouse drag	Two-finger drag
Zoom	Scroll wheel	Pinch to zoom
Start Wave Early	Spacebar / click Start	Tap Start Wave button
Targeting Mode	Tab cycle / dropdown	Tap cycle button on info panel

10.3 Menus

- Main Menu: Play, Settings, Collection (tower skins), Leaderboards, Credits.
- Mode Select: Classic, Draft, Endless (with locked modes shown grayed with unlock requirement).
- Map Select: Grid of available maps with difficulty rating and preview thumbnail.
- Pause Menu: Resume, Restart, Settings, Quit to Menu.
- Game Over Screen: Stats summary (waves, kills, gold, time), XP earned, unlocks, Play Again / Menu buttons.

11. Audio Design

11.1 Music

- Main Menu: Ambient orchestral with elemental motifs. Calm and inviting.
- Build Phase: Light, strategic-feeling music. Muted instruments, focus on planning mood.
- Combat Phase: Escalating intensity tied to wave number. Percussion builds, tempo increases.
- Boss Waves: Unique boss theme with heavy drums and dramatic brass/strings.
- Victory: Triumphant fanfare with elemental harmonics.
- Defeat: Somber but not punishing. Encourages retry.

11.2 Sound Effects

- Each element has a distinct sound signature (fire = crackling, water = splashing, etc.).
- Tower placement: Satisfying "thunk" with element-specific accent.
- Tower upgrade: Ascending chime with magical sparkle effect.
- Enemy death: Quick pop with element-appropriate effect (sizzle for fire kill, shatter for ice).
- Wave start: Horn blast.
- Life lost: Warning alarm + heartbeat thud.
- Gold earned: Coin clink (soft for kills, louder for wave bonuses).

12. Technical Specifications

Specification	Details
Engine	Godot 4.x (GDScript primary, C# optional for performance-critical systems)
Rendering	2D top-down with isometric-style sprites (Godot 2D renderer)
Target Resolution	1280×720 minimum; scales to 1920×1080
Target FPS	60 FPS on mid-range devices
Pathfinding	A* via Godot's AStarGrid2D class; recalculated on tower place/remove
Web Export	HTML5 via Godot's Web export (WebAssembly + WebGL)
Android Export	Native APK/AAB via Godot's Android export template
Save System	JSON-based local save for progress, settings, and unlocks
Audio	OGG format for music, WAV for short SFX
Localization	English at launch; CSV-based translation system for future languages

12.1 Performance Targets

- Max simultaneous enemies on screen: 100
- Max towers on grid: 120 (20×15 grid minus path cells)
- Pathfinding recalculation: < 16ms (within one frame at 60 FPS)
- Memory budget: < 200MB RAM for web, < 300MB for Android
- APK size target: < 50MB

12.2 Architecture Overview

The game uses a component-based architecture in Godot with these key systems:

1. **GameManager:** Controls game state (build phase, combat phase, transitions), wave spawning, and win/loss conditions.
2. **GridManager:** Manages the 2D grid, handles tower placement validation, triggers pathfinding recalculation.
3. **PathfindingSystem:** Wraps AStarGrid2D. Exposes path queries for enemies and validates maze connectivity.
4. **TowerSystem:** Factory pattern for tower creation. Handles targeting, shooting, upgrading, and element fusion logic.
5. **EnemySystem:** Object pool for enemy spawning. Manages movement along path, health, status effects, and death.
6. **EconomyManager:** Tracks gold, income, interest, and handles all transactions.
7. **UIManager:** Manages all UI elements, tower selection, build menu, and HUD updates.
8. **AudioManager:** Handles music transitions and SFX playback with spatial audio for towers.

13. Development Roadmap

13.1 Phase 1: Prototype (Weeks 1–4)

Goal: Playable single-map TD with basic towers and enemies.

1. Grid system and tower placement with path validation.
2. A* pathfinding with dynamic recalculation.
3. 3 base element towers (Fire, Water, Earth) with basic stats.
4. 3 enemy types (Normal, Fast, Armored).
5. 10-wave test scenario.
6. Basic HUD (gold, lives, wave counter, build menu).
7. Placeholder art (colored shapes/sprites).

13.2 Phase 2: Core Systems (Weeks 5–8)

Goal: Complete element and tower systems.

- All 6 base element towers implemented.
- Dual-element fusion system (15 combinations).
- Triple-element legendary towers (6 towers).
- Full enemy roster (10 types).
- 30-wave Classic mode with scaling.
- Economy system (interest, bonuses, early-start reward).
- Tower upgrade path (3 tiers + fusion).

13.3 Phase 3: Content and Polish (Weeks 9–12)

Goal: Game-ready for itch.io launch.

- 4 maps with unique layouts and gimmicks.
- Draft mode implementation.
- Boss encounters (waves 10, 20, 30).
- Complete UI/UX pass with touch support.
- Art assets (tower sprites, enemy sprites, map tiles, VFX).
- Sound effects and music integration.
- Meta progression (XP, unlocks).
- Save/load system.

13.4 Phase 4: Platform Release (Weeks 13–16)

Goal: Published on itch.io and Android.

- Web export optimization and testing.
- Android build, touch controls refinement, performance testing on target devices.
- itch.io page setup (screenshots, description, tags).
- Google Play submission (if targeting Play Store).

- Bug fixing and balancing based on playtesting feedback.

13.5 Phase 5: Post-Launch (Ongoing)

- Endless mode with leaderboards.
- Versus and Co-op multiplayer (WebRTC or Godot multiplayer).
- Additional maps and tower skins.
- Community feedback integration and balance patches.
- Seasonal events and challenge modes.

14. Monetization

Spirefall is free-to-play with no pay-to-win mechanics. Revenue comes from optional cosmetics and supporter packs:

Item	Price (USD)	Description
Base Game	Free	Full Classic and Draft modes, all 4 maps, all towers
Cosmetic Tower Skins	\$0.99–\$2.99	Visual-only alternate tower designs per element
Map Theme Packs	\$1.99	Alternate visual themes for existing maps (e.g., Neon, Medieval)
Supporter Pack	\$4.99	Exclusive "Supporter" badge, unique tower skin set, early access to new content
Remove Ads (Android)	\$2.99	One-time purchase to remove optional reward ads

Note on Ads: If ads are included on Android, they are opt-in reward ads only (e.g., watch an ad for a small gold bonus between waves). No forced interstitials or banners during gameplay.

15. Appendix: Reference Data

15.1 Base Tower Stats

Tower	Cost	Damage	Attack Speed	Range	Special
Flame Spire	30g	15	1.0/s	4 cells	Burns for 5 dmg/s for 3s
Tidal Obelisk	30g	12	0.8/s	4 cells	Slows 30% for 2s
Stone Bastion	35g	20	0.6/s	3 cells	AoE 2-cell radius
Gale Tower	25g	8	2.0/s	5 cells	Hits 2 targets
Thunder Pylon	30g	14	0.9/s	4 cells	Chains to 3 targets at 60% dmg
Frost Sentinel	35g	10	0.7/s	3 cells	20% freeze chance for 1.5s

15.2 Enemy Base Stats

Enemy Type	Base HP	Speed	Gold Reward	Special
Normal	100	1.0x	3g	None
Fast	60	1.8x	2g	None
Armored	200	0.6x	5g	50% physical resist
Flying	80	1.2x	4g	Ignores maze
Swarm	30	1.4x	1g	Spawns in groups of 3x
Healer	120	0.8x	6g	Heals 10 HP/s to nearby allies
Boss (W10)	5000	0.5x	100g	Fire trail, fire immune
Split	150	1.0x	4g	Splits into 2 at 50% HP each
Stealth	50	1.5x	5g	Invisible until in tower range
Elemental	180	0.9x	6g	Immune to 1 element, 2x weak to another

End of Game Design Document

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