MCP SERVER | NO CODE | CLOUD HOSTED

Concrete Volume Calculator MCP for AI Agents

Accurate Material Estimation for Concrete Foundations and Slabs

The Concrete Volume Calculator MCP precisely determines material requirements for construction projects. It calculates total concrete volume in cubic meters or cubic yards for foundations, slabs, columns, stairs, and curved paths. The connector also estimates the exact number of bags needed from various standard weights, factoring in waste to prevent costly over-ordering.

A+ Quality Score 100/100

concrete | volume | calculation | construction-tools | material-strongestimation

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vinkius.com/mcp/concrete-volume-calculator

SCAN TO VIEW

The connectivity layer between AI and the world's software.

Vinkius sits between AI and every application. All communication passes through Vinkius Cloud via the Model Context Protocol (MCP) — with governance, observability, and security at every layer.

Your AI Connections Run Through Vinkius Cloud

The world's largest managed MCP catalog

Vinkius is the connectivity layer where AI connects to the software your business already runs. We handle the hosting, the security, the credentials, the uptime — you get agents that actually do things.

We operate the world's largest managed MCP catalog. Major SaaS platforms, CRMs, databases, and cloud providers — running, monitored, production-ready. This MCP server is hosted and maintained by the Vinkius Cloud for AI Agents.

> *The agent doesn't manage credentials, doesn't manage uptime, doesn't manage security. Vinkius does.*
>
> — Architecture principle

Four Pillars of the Vinkius Runtime

01 — Security by design

Credentials stay encrypted at rest via AES-256. The AI agent never touches raw keys — they're injected into a sandboxed V8 isolate at runtime. Actions are logged, and connections have an emergency kill switch.

02 — Built on MCP Fusion

This MCP server was built with **MCP Fusion**, the open-source framework (Apache 2.0) that powers the entire Vinkius catalog. Schema-as-firewall strips undeclared fields, compiled PII redaction runs at zero overhead, and cryptographic lockfiles produce git-diffable audit trails.

03 — Deterministic observability

Eight immutable metrics per endpoint: request volume, p95 latency, error rate, active connections, cost attribution. A live payload feed logs every tool call with mutation detection.

04 — Autonomous operations

Servers are deployed, monitored, and patched autonomously. New capabilities and security patches ship weekly. Zero-downtime deployments ensure continuous availability across all managed MCP servers.

AES-256	Ed25519	24h TTL	V8 Isolate
Encryption at rest	PKI vault signatures	Ephemeral session keys	Sandboxed execution

One Token. Instant Access.

Every MCP server on Vinkius is accessed through a **Connection Token**. Tokens are generated in the cloud dashboard and produce a unique MCP endpoint URL. Paste this URL into any MCP-compatible client — no SDK required.

A single token can serve **multiple AI clients simultaneously**, or you can issue separate tokens per client for granular access control. Each token tracks its own request count, last activity timestamp, and can be individually enabled or revoked.

MCP ENDPOINT

```
https://edge.vinkius.com/{token}/mcp
```

Claude · Cursor · VS Code · Windsurf · Grok · Gemini

Security Is the Architecture

Security in Vinkius is not a feature — it's the foundation of the runtime. The gateway enforces multiple independent protection layers between AI agents and third-party APIs.

01 — Ed25519 PKI Vault

Every workspace has an Ed25519 Master Key. Session keys are generated ephemerally (24h TTL) and signed by the Master Key. Credentials never leave the vault boundary.

02 — V8 Isolate Sandboxing

Tool code runs inside isolated-vm V8 isolates with 64 MB memory caps and per-request timeouts. No filesystem access, no network access except through the SSRF-guarded fetch bridge.

03 — SSRF Guard

All outbound HTTP requests are DNS-resolved and validated before execution. Private IP ranges (10.x, 172.16-31.x, 192.168.x, AWS metadata 169.254.x) are blocked at the network layer.

04 — DLP & PII Redaction

A ResponseGuard pipeline intercepts every tool response. Configurable redaction patterns strip sensitive fields (emails, SSNs, card numbers) before data reaches the AI agent.

05 — Cryptographic Audit Trail

Every request is signed into a SHA-256 hash chain with Ed25519 signatures. Events form a tamper-proof, SIEM-exportable forensic record.

06 — Honeytoken Trap System

Phantom credentials are injected into isolated environments. If a honeytoken is used outside Vinkius infrastructure, the server is quarantined instantly.

Emergency Kill Switch

EU AI Act Art. 14(1) Compliant

The kill switch is an **emergency halt** mechanism — not a simple toggle. When triggered, it executes three actions atomically:

01 — Server deactivated

The MCP server is immediately taken offline across the entire cluster.

02 — All tokens revoked

Every connection token is invalidated. Total lockout — reconnection blocked until new tokens are issued.

03 — WebSocket connections killed

Active connections terminated via Redis pubsub broadcast. Propagates to every runtime node in the cluster.

Full Visibility. Zero Guesswork.

The Vinkius cloud dashboard includes a full MCP Governance suite — real-time analytics and security controls for production AI operations.

Control Plane

KPI dashboard with request volume, latency, success rate, token consumption, and AI-generated operational briefings.

Agent Activity

Which AI clients are connecting, how often, and what they're doing — real-time session tracking.

FinOps

Cost tracking per tool, payload compression savings, budget optimization signals, and consumption trends.

Tool Health

Slowest and most error-prone tools, with actionable root-cause insights and performance baselines.

Firewall & DLP

PII redaction activity, sensitive data protection counters, and security event timeline.

Incident Log

Error trends, failure rates, status-code breakdowns, and forensic audit trail access.

> Get started at **cloud.vinkius.com** — connect your AI agent in under 60 seconds.

Concrete Volume Calculator MCP

5 tools available
Cloud-hosted on Vinkius

Calculating materials for a new build is rarely straightforward; you're dealing with dozens of different shapes—slabs, footings, columns, stairs—and trying to keep accurate track of every cubic yard. This MCP solves that complexity by giving your AI client a single point of access for all concrete volume calculations. Instead of cross-referencing multiple formulas and doing manual math in spreadsheets, you simply ask for the total volume needed for any structure type. It not only gives you precise volumes in both metric and imperial units but also automatically breaks down how many bags (40lb, 60lb, 80lb, 25kg, 50kg) you need, even factoring in waste material. You'll find this entire suite of tools managed through the Vinkius catalog, connecting it directly into your existing workflow. This means when you're on site or at a desk, you just prompt your agent; it handles the geometry and the math.

Core Capabilities

01 — Calculate foundation volumes

Determine the exact concrete amount needed for rectangular or trapezoidal footings.

02 — Estimate floor slab volume

Get precise cubic measurements for flat, poured surface slabs and foundations.

03 — Measure vertical supports

Calculate concrete requirements specifically for round or square columns.

04 — Determine stair volume

Figure out the total material needed for a complete flight of steps.

05 — Measure curved paths

Calculate concrete volumes for arched or circular drives and walkways.

One Click on Vinkius — From Prompt to Execution

Available at **vinkius.com/mcp/concrete-volume-calculator** — connect your AI agent in three steps.

01 You describe the specific structural element, like a trapezoidal footing or a round column, and provide its dimensions (length, width, depth).

02 Your AI client sends those measurements to this MCP. The connector calculates the total volume in cubic meters and cubic yards.

03 The final output gives you the precise material requirement, plus an automated breakdown of how many bags are needed for various standard weights.

The bottom line is that your AI client handles all the geometry calculations, giving you a single, reliable material manifest instead of just raw volume numbers.

Built For

Anyone who needs to accurately estimate materials for concrete construction projects. This MCP is essential for site engineers, architects, and general contractors who are done guessing on job estimates.

Site Engineer

Uses the connector to quickly verify material orders against blueprints, ensuring columns or footings match calculated volumes before pouring concrete.

Architectural Designer

Calculates the total volume for complex elements like curved paths and stair flights during the initial design phase, providing accurate cost estimates to clients.

General Contractor Estimator

Runs multiple calculations—slabs, footings, columns—to generate a comprehensive material list needed for bid submissions and purchasing materials.

What Changes When You Connect

01 Stop guessing on material orders. Use the connector to get precise cubic yard or cubic meter totals for any structure, including curved paths.

02 Material efficiency is improved when you use `calculate_footing_volume` and `calculate_slab_volume`, ensuring your foundation estimate matches the blueprint exactly.

03 You save time by automating complex geometry. Need material for a column? Just run `calculate_column_volume` instead of manually calculating cross-sections.

04 The system automatically factors in waste, so you never order too little concrete—or worse, way too much.

05 It handles specialized structures like steps and arches. Use `calculate_stair_volume` or `calculate_curved_path_volume` for complex builds that confuse basic calculators.

Real-World Applications

Estimating the Foundation Spread

A contractor needs to estimate a new building's foundation. They ask their agent to run `calculate_footing_volume` with dimensions for both rectangular and trapezoidal footings, getting an immediate total volume and bag count for ordering.

Designing Complex Walkways

An architect needs to calculate the concrete needed for a winding driveway. They use `calculate_curved_path_volume`, which provides the exact cubic yardage, allowing them to finalize cost projections without site visits.

Slab and Column Check

A site engineer is checking plans for a new floor. They use `calculate_slab_volume` for the main area and then run `calculate_column_volume` for all vertical supports to ensure the total required material matches the budget.

Calculating Stair Material

A builder needs materials for a set of interior stairs. By using `calculate_stair_volume`, they get a precise, single number for the concrete needed, eliminating guesswork and manual calculations.

Patterns to Avoid

Using basic math tools

✗ AVOID

Trying to estimate a curved path or a trapezoidal footing by simply multiplying averages. This results in massive material waste and inaccurate bids.

✓ INSTEAD

Always use the specialized functions like `calculate_curved_path_volume` for arches, or `calculate_footing_volume` if the foundation isn't a simple rectangle.

Ignoring waste factor

✗ AVOID

Calculating volume perfectly but forgetting to add an allowance for spillage and uneven ground. This causes delays when materials run out mid-pour.

✓ INSTEAD

The connector automatically incorporates an optional waste factor into the final bag count, so you can order with confidence.

Mixing volume types

✗ AVOID

Using a slab calculator for columns or vice versa. The formulas are different, and combining them will give wildly inaccurate material estimates.

✓ INSTEAD

Stick to the specific tools: use `calculate_column_volume` only for vertical supports; reserve `calculate_slab_volume` for flat surfaces.

The Right Fit

Use this MCP if your job requires precise, reliable concrete volume calculations for diverse structural elements—from simple rectangular footings to complex curved paths. If you're dealing with any geometry beyond a basic cuboid (L x W x H), this is what you need. Don't use it if you only need to calculate the area of a flat surface without knowing its depth, or if your project involves entirely different materials like steel beams that aren't poured concrete.

Concrete Volume Calculator MCP for AI Agents: Estimating Foundation Needs

Today, estimating foundation needs means opening blueprints, finding the dimensions for footings and slabs, and then manually running multiple calculations. You're tracking rectangular sections, trapezoidal supports, and flat floor areas—a process that is slow, tedious, and prone to simple mathematical errors.

With this MCP, you just tell your AI client what needs pouring. It handles the geometry for everything from `calculate_slab_volume` to `calculate_footing_volume`. You get an immediate, comprehensive material list in both cubic yards and metric units—the final numbers are ready for ordering.

Concrete Volume Calculator MCP for AI Agents: Calculating Structural Elements

Before this connector, calculating the volume for complex elements like stair flights or curved driveways was a nightmare of specialized formulas. You had to switch between different sheets and different calculation methods just to get one total number.

Now, you treat every structural element—be it `calculate_stair_volume` or `calculate_curved_path_volume`—the same way: you ask your agent, and it gives you the accurate volume. It's a single source of truth for all site material estimates.

5 Concrete Volume Calculation Tools for Construction Estimates

Use these tools to calculate the volume of any structural element, including footings, columns, stairs, and curved paths. Get accurate material counts every time.

#	TOOL	DESCRIPTION
01	`calculate_column_volume`	Calculates the precise concrete amount required for vertical supports, whether they are round or square.
02	`calculate_curved_path_volume`	Determines the total volume needed for any arched or circular drive or walkway structure.
03	`calculate_footing_volume`	Calculates concrete requirements for foundational footings, accommodating both rectangular and trapezoidal shapes.
04	`calculate_slab_volume`	Determines the total volume needed for flat floor or foundation slabs of any size.
05	`calculate_stair_volume`	Calculates concrete requirements specifically for a complete flight of steps.

See It in Action

Real prompts you can use once this MCP is connected to your AI agent through Vinkius Cloud.

U I need to calculate the concrete needed for a curved driveway that is 10 feet wide, 20 feet long, and has a radius of 5 feet.

Concrete Volume Report

- **Total Volume:** 6.3 cubic yards (approx. $4.78 ext{ m}^3$).
- **Bag Breakdown (with waste factor):**

* $mathbf{40lb}$: 12 bags
* $mathbf{60lb}$: 8 bags
* $mathbf{80lb}$: 5 bags
* $mathbf{25kg}$: 7 bags
* $mathbf{50kg}$: 4 bags

U How much concrete for a slab that is 30m long, 10m wide, and 0.15m thick with a 10% waste factor?

Slab Calculation Results

- **Gross Volume:** $4.5 ext{ m}^3$
- **Required Volume (with waste):** $4.95 ext{ m}^3$ (approx. $0.65 ext{ yd}^3$).
- **Bag Count Estimate:**

* $mathbf{40lb}$: 18 bags
* $mathbf{60lb}$: 12 bags
* $mathbf{80lb}$: 9 bags

U I need materials for a square column that is 3 feet wide, 1 foot wide, and 5 feet high.

Column Volume Report

- **Volume:** $0.076 ext{ m}^3$ (approx. $0.10 ext{ yd}^3$).
- **Bag Breakdown:**

* $mathbf{40lb}$: 2 bags
* $mathbf{60lb}$: 1 bag
* $mathbf{80lb}$: 1 bag
* $mathbf{25kg}$: 1 bag
* $mathbf{50kg}$: 1 bag

Frequently Asked Questions

01 **Does the Concrete Volume Calculator handle different types of footings?**

Yes, it handles both rectangular and trapezoidal footings. You just need to input the specific top width, bottom width, and length for accurate material estimates.

02 **Can I use this MCP to calculate concrete for stairs or columns?**

Absolutely. The calculator has dedicated tools for both stair flights and vertical supports (columns), giving you precise measurements that general volume calculators miss.

03 **What if my project needs a waste factor included in the calculation?**

The connector includes an optional waste factor, so your final bag count estimate accounts for spillage or uneven ground. This prevents you from running short mid-pour.

04 **Does this MCP work with imperial units (feet/yards) and metric units (meters)?**

Yes, it works in both systems. You get the total volume reported accurately in cubic meters, cubic yards, and provides bag counts for common weights like 40lb and 25kg.

05 **How do I calculate a curved path using this Concrete Volume Calculator?**

You use the dedicated tool by providing the necessary radius, length, and width dimensions. The MCP handles the complex geometry to give you one accurate volume number for your driveway or walkway.

Go Live in 60 Seconds

Get your connection token from **cloud.vinkius.com**, then paste the endpoint URL into any MCP-compatible client.

YOUR MCP ENDPOINT

```
https://edge.vinkius.com/[TOKEN]/mcp
```

CLIENT	WHERE TO CONFIGURE
Claude AI	Profile → Customize → Connectors → "+" → Add custom connector → Paste endpoint
Cursor	Settings → Features → MCP Servers → "+ Add New MCP Server" → Type: SSE → Paste endpoint
VS Code	Ctrl/Cmd+Shift+P → "MCP: Add Server" → add `"concrete-volume-calculator": { "url": "…" }`
Windsurf	MCP Settings → `mcp_settings.json` → Add endpoint URL
ChatGPT	Settings → Tools & plugins → Add MCP server → Paste endpoint
Gemini	Extensions → Add MCP Server → Paste endpoint URL

ASK AN AI ABOUT THIS

Let your preferred AI explain this MCP server

- Ask ChatGPT
- Ask Claude
- Ask Perplexity
- Ask Gemini
- Ask Grok

READY TO CONNECT

Concrete Volume Calculator is live on Vinkius Cloud.

Get your connection token, paste it into your AI agent, and start building. No SDK. No deployment. Just results.

Start at cloud.vinkius.com →

vinkius.com · support@vinkius.com

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