Za-Eng Construction Digital Ecosystem Roadmap & Cost Plan

An AI-Powered Integrated Management Platform for the Construction Industry
Prepared by Za-Eng Consulting & Construction Engineers (Pty) Ltd

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Phase 0 – Brand, Setup & Infrastructure Foundation

(Runs Parallel with Phase 1)

Purpose:
Establish the digital, visual, and infrastructure foundation while Phase 1 development begins.

Specific Requirements:

- Logo, colour palette, typography, and brand manual

- Domain registration (.co.za / .ai), social-media setup

- Landing page with "Early Access" form

- Email hosting and routing

- AWS / Hetzner environment, CI/CD pipeline, Git repo

- Privacy & Terms pages

- Trademark / IP registration

AI Integration:
Brand-tone and SEO analysis; site-traffic insights.

Outcome:
Professional brand identity and deployment environment ready for MVP launch.

Phase 1 – AI-Powered Notice & Claim Assistant (MVP)

Purpose:
Digitise contractual notices and claims under JBCC, NEC, FIDIC & GCC.

Specific Requirements:

- Secure login, role-based access

- Project + contract upload (OCR + AI clause detection)

- Clause library with time-bars & mandatory fields

- AI-drafted notices, editable templates

- Evidence upload + claim-pack export (PDF/ZIP)

- Marketplace for legal & programme experts

B8 Heuwelsig Office Park, Centurion, Pretoria, 0130
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- Dashboard, reminders & audit trail

- Module subscription + payment gateway etc

- Doc sign + whatsapp integration

AI Integration:
RAG clause retrieval, NLP notice drafting, predictive deadline alerts.

Outcome:
Smart compliance engine reducing risk & admin.

Phase 2 – Integrations, Mobile App & Multi-Tenant Architecture

Purpose:
Transform MVP into a connected SaaS platform.

Specific Requirements:

- REST / GraphQL APIs (BuildSmart, Xero, Sage, Candy)

- React Native app (offline mode, GPS, voice, photo)

- Multi-tenant structure & OAuth2 security

- Analytics dashboards, push alerts

- CI/CD microservices + auto-scaling

AI Integration:
Predictive workflow routing and anomaly detection.

Outcome:
Enterprise-ready, mobile, real-time platform.

Phase 3 – Construction HR & Time Attendance

Purpose:
Automate workforce tracking and labour analytics.

Specific Requirements:

- WhatsApp / NFC / QR check-ins with GPS

- Leave management + approvals

- Live attendance dashboard + payroll export

- Certificate & medical expiry alerts

- Device sourcing & whitelabelling

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AI Integration:
Absence pattern analysis and productivity forecasting.

Sample:

https://www.agrigistics.co.za/

Outcome:
Accurate time management and labour compliance.

Phase 4 – Vehicle, Plant & Asset Tracking

Purpose:
IoT management of vehicles & equipment.

Specific Requirements:

- GPS / telematics API integration

- Live map dashboard, engine-hours, fuel use

- Geofencing alerts, hire-return reminders

- Maintenance scheduler + operator linking

- Device sourcing & licensing

AI Integration:
Predictive maintenance and utilisation optimisation.

Outcome:
Complete visibility and control of assets.

Phase 5 – Construction Accounting & ERP Suite

Purpose:
Unify financial and operational data.

Specific Requirements:

- Project budgets & cost tracking

- Subcontractor valuations & payment certificates

- Supplier & procurement workflows

- Expense capture & cash-flow forecasting

- Bank-feed integration & auto-reconciliation

- PO Creation , invoicing etc

- AI financial forecasting & variance alerts

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Sample:

Buildsmart

Outcome:
Real-time profitability and cash-flow insight.

Phase 6 – OHS Compliance & Site Safety Intelligence

Purpose:
Digitise all Occupational Health & Safety processes.

Specific Requirements:

- Permit-to-work workflow

- Inspection checklists (offline capable)

- Medical & training registry with expiry alerts

- PPE & signage inventory

- Incident logging & root-cause analysis

- Visitor & contractor induction records

- Safety dashboards & risk scores

AI Integration:
Hazard prediction, trend analysis, auto-alerts.

Outcome:
Paperless, proactive site-safety compliance.

Phase 7 – RFI Management System

Purpose:
Automate Requests for Information tracking.

Specific Requirements:

- RFI creation & auto-email distribution

- Online response panel & status update

- Master register with overdue flags

- Export PDF / Excel reports

AI Integration:
Auto-response drafting and delay prediction.

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Outcome:
Centralised communication and accountability.

Phase 8 – Automated Weekly & Monthly Reporting

Purpose:
Simplify progress and status reporting.

Specific Requirements:

- Guided wizard for inputs (images, weather, progress)

- Auto-fetch data from all modules

- AI narrative generation for summary reports

- PDF / Word exports + visual dashboards

AI Integration:
Insight generation & risk forecasting.

Outcome:
Professional client-ready reports in minutes.

Phase 9 – Predictive Procurement & ESG Intelligence (Future)

Purpose: Supplier marketplace with AI pricing and sustainability scoring.
Status: *Unbudgeted – Future Development.*

Phase 10 – Tender Management & Bid Automation (Future)

AI reads RFPs, drafts responses, builds bid trackers and risk scores.
Unbudgeted – Future Development.

Phase 11 – Materials & Inventory Management (Future)

Barcode / NFC stock tracking, reorder alerts, supplier comparisons.
Unbudgeted – Future Development.

Phase 12 – Quality Assurance & Snag Management (Future)

Mobile snag capture with photos, AI defect recognition and auto close-out.
Unbudgeted – Future Development.

Phase 13 – Document Control & Revision Tracker (Future)

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Centralised drawing repository, auto version control and change summaries.
Unbudgeted – Future Development.

Phase 14 – Community & Stakeholder Engagement (Future)

SMME tracking, community feedback logs and sentiment analytics.
Unbudgeted – Future Development.

Phase 15 – Client & Consultant Portal (Future)

External dashboard for clients to view project data and approve documents.
Unbudgeted – Future Development.

Phase 16 – Digital Handover & Facilities Management (Future)

QR-tagged assets, maintenance schedules and AI lifecycle forecasting.
Unbudgeted – Future Development.

Phase 17 – Insurance, Risk & Credit Module (Future)

Digital insurance tracking and AI credit scoring for subcontractors.
Unbudgeted – Future Development.

Phase 18 – Regulatory & Compliance Integration (Future)

Auto-submission to CIDB, SACPCMP, NHBRC and audit-ready compliance reports.
Unbudgeted – Future Development.