International Journal of Law and Politics Studies
ISSN: 2709-0914
DOI: 10.32996/ijlps
Journal Homepage: www.al-kindipublisher.com/index.php/ijlps

IJLPS
AL-KINDI CENTER FOR RESEARCH AND DEVELOPMENT

| RESEARCH ARTICLE

The Pitfalls of FIDIC Contracts and How Robust Contract Management Mitigates Them: A Case Study of GCC Mega Projects

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| ABSTRACT

This paper examines the common contractual traps encountered within FIDIC forms in Gulf Cooperation Council (GCC) mega-projects and explores how effective contract management can help alleviate them. Although FIDIC contracts aim to distribute risk transparently and facilitate timely administration, implementation gaps persist, particularly regarding notices, variation management, the engineer's authority, and dispute resolution methods. Based on a qualitative multiple-case study of key projects in GCC infrastructure (above USD 1 billion in value), the study synthesises evidence from contract records, interviews, and additional material to map the most common failures in contract operations. The results point to systemic problems, including a lack of time or quality notices, ambiguous scope management, delays in determination, and the non-use of Dispute Avoidance/Adjudication Boards (DAABs). Nonetheless, projects that adopted formal notices and claims tracking, enabled Engineers to make interim determinations, had digital record-keeping systems, and had standing DAABs showed much better results, with quicker settlements and lower rates of arbitration. The research suggests a FIDIC-consistent Contract Management Framework that integrates transactional, agency, and governance views, along with a playbook applicable across GCC legal and cultural scenarios. The findings contribute to the construction law and governance literature by conceptualising the principles of FIDIC into practical management practices. They emphasise the importance of procedural discipline, transparency, and prior dispute avoidance in delivering mega-projects through contractual balance and delivery certainty.

| KEYWORDS

FIDIC Contracts, GCC Mega-Projects, Contract Management Framework, Dispute Avoidance and Adjudication Boards (DAAB), Construction Law and Governance

| ARTICLE INFORMATION

ACCEPTED: 10 January 2022 **PUBLISHED:** 07 February 2025 **DOI:** 10.32996/ijlps.2025.8.2.2

1. Introduction

The International Federation of Consulting Engineers (FIDIC) publishes a family of standard-form construction contracts that, over several decades, has become the de facto choice for large, cross-border projects (Al-Sabah and Al-Enezi, 2024). The suite, popularly known by its colours (Red, Yellow, Silver, and Gold), aims to allocate risk in a predictable, balanced way and to offer clear procedures for administration, certification, variation, claims, and dispute resolution (Al-Khalifa, 2024). Government and semi-government clients, multilateral lenders, and international EPC (engineering–procurement–construction) contractors have repeatedly favoured FIDIC because of its global familiarity, its recognisable architecture (definitions, risk allocation, engineer's role, payment, claims, and tiered dispute processes), and its ability to be adapted by Particular Conditions (Al-Khalifa, 2024). Within the Gulf Cooperation Council (GCC), Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates, the FIDIC forms are widely used for public infrastructure, energy, utilities, and transport programmes (Al-Khalifa, 2024). The last two decades have also seen a dramatic rise of "mega-projects", multi-billion, multi-year, multi-stakeholder endeavours such as new cities, metros, airports, and large industrial complexes (Al-Mustafa and Mohammad, 2025). These projects are typically fast-tracked, politically salient, and technically ambitious, and they depend upon complex supply chains and international workforces (Al Marri, 2023). The performance record of mega-projects worldwide is mixed, and the GCC is no exception. Time

overruns, budget escalations, scope changes, and claims are common. In large part, disputes arise at the interface between evolving project realities and the contract's procedures for notices, change control, time and money, and certification (Almutairi, 2024). In principle, FIDIC is designed to guide the parties through change and uncertainty; in practice, when its mechanisms are poorly understood, inconsistently applied, or heavily modified, the contract can become a source of friction. A recurring theme in industry post-mortems is the gap between the negotiated document (often prepared by a commercial or legal team) and day-to-day administration by site managers who may not be deeply familiar with its requirements. Bridging that gap—so that contractual governance actually operates as intended—is the core concern of this study.

1.1 Background and Study Gap

Transaction Cost Economics (TCE) views contracting as a governance choice aimed at minimising the costs of transacting under uncertainty, bounded rationality, and opportunism. In construction, claims, variations, and disputes are the visible ex post transaction costs of an ex ante allocation that proves incomplete (Marjosola, 2021). FIDIC's machinery (strict notices, detailed record-keeping, stepwise decision-making, and a standing dispute board) is designed to reduce those costs by encouraging early, orderly information exchange and providing a low-latency adjudicative forum. Where the parties neglect or turn off those mechanisms, the costs of enforcement surge later through protracted negotiation and arbitration (Troisi and Alfano, 2023).
Principal–Agent Theory is relevant for this research. The employer (principal) engages the engineer to administer and certify; the contractor (agent) may further delegate to sub-contractors; lenders monitor the employer; regulators constrain all (Al-Faryan, 2024). Asymmetries of information and misaligned incentives are inevitable. The engineer's dual position—as the employer's agent yet required to act neutrally when determining claims creates a structural tension. If the engineer is perceived as partial, Contractors rationally escalate rather than rely on interim determinations (Chen, Wang, and Wang, 2023). Conversely, if Contractors delay notices or withhold contemporaneous records, they induce adverse inferences and increase the risk of time bars. Practices that improve transparency, timeliness, and credible commitment, such as programme discipline, notice tracking, and a genuinely independent Engineer, directly reduce agency costs (Ansell and Torfing, 2022).
The governance literature distinguishes contractual governance (formal rights and remedies) from relational governance (trust, norms, joint problem-solving) (Project Governance and Contingency Fit) (Varma, 2025). FIDIC's evolution—particularly the 2017 editions' emphasis on Dispute Avoidance/Adjudication Boards (DAABs)—reflects a hybrid mindset: use formal processes while maintaining a standing, technically competent forum that can facilitate collaboration and nip conflict in the bud. Contingency theory adds that governance must be tailored to the context. In the GCC, civil-law duties of good faith, public audit constraints, and culturally preferred conciliation practices shape what "good" contract administration looks like. A "fit-for-purpose" regime blends FIDIC's procedural clarity with participative risk workshops, senior-level partnering, and early-warning practices that suit the region's delivery realities (Ceppi, 2023).

1.2 FIDIC Forms and Known Pitfalls in Practice (Red/Yellow/Silver/Gold)

Ambiguity in risk allocation, especially in physical conditions. Red and Yellow Books (1999) allocate relief for "unforeseeable physical conditions", but the threshold for unforeseeability is high. In Obrascón Huarte Lain SA v Attorney General of Gibraltar, the Technology and Construction Court emphasised the experienced contractor's duty to interrogate available information rather than rely passively upon employer data; relief was narrowly construed because conditions could reasonably have been anticipated (OHL v AG of Gibraltar [2014] EWHC 1028 (TCC); see also the subsequent appellate treatment). Under the Silver Book (EPC/Turnkey), the contractor takes most site risks with minimal relief, incentivising price certainty but prompting disputes where pre-contract geotechnical information proves materially incomplete. The pitfall is thus two-sided; employers may over-transfer risk in pursuit of a fixed price, and contractors may underestimate the due diligence and contingency required (Varma, 2025)
Under Yellow and Silver Books, the contractor designs and owes a fitness-for-purpose obligation tied to the Employer's Requirements (Design responsibility and "fitness for purpose"). The UK Supreme Court reaffirmed that such commitments can trump compliance with specified standards where the contract so provides, MT Højgaard A/S v E.ON Climate & Renewables UK Robin Rigg East Ltd [2017] UKSC 59. Contractors sometimes assume that adherence to codes and a reasonable skill-and-care standard suffices; where the intended performance or durability is not achieved, liability may nonetheless arise. In GCC practice, ambiguity in Employer's Requirements (e.g., an implied output over a defined period) can lead to disputes during testing and commissioning when the asset falls short of an asserted functional benchmark (Sultan *et al.*, 2025).
Clause 13 empowers the engineer to order Variations and to adjust time and cost. In practice, scope creep, late employer-driven changes, and informal instructions are frequent on mega-projects. Disagreement often crystallises around characterisation: is an instruction a true Variation (with price/time entitlement) or merely a clarification within existing obligations? OHL v AG of Gibraltar illustrates how instructions can be parsed narrowly, with courts scrutinising whether work was genuinely beyond the contractual scope. The common pitfall is failing to operate a disciplined change governance process—documenting instructions, agreeing prices contemporaneously, and updating baselines—so that cumulative impacts are acknowledged rather than relegated to end-of-project claims (Rasool *et al.*, 2025).
FIDIC depends upon a live, logic-linked programme and prompt notices of delay. Clause 20.1 (1999) imposes a 28-day time bar for claims (FIDIC, 1999, cl. 20.1). Courts and tribunals have enforced such bars where clearly drafted and fairly operated; late

notices have cost contractors valid entitlements. Concurrency is another thorn: FIDIC is largely silent; GCC Particular Conditions often adopt a "time but no money" approach for truly concurrent periods. Without an agreed methodology, parties talk past each other, conflating parallel and serial delay and inviting protracted expert battles. As for liquidated damages (LDs), civil codes in the region (e.g., UAE Civil Code, Article 390) allow judicial adjustment of agreed damages to reflect actual loss, meaning employers cannot regard LDs as an unassailable remedy; equally, LDs may be increased if loss demonstrably exceeds the pre-estimate. The pitfall is a false sense of certainty around time bars, concurrency, and LD recovery, absent clear, agreed protocols and well-kept records.

Monthly measurement and certification (Clause 14) and the claims procedure (Clause 20 (1999)/Clauses 20–21 (2017)) presuppose impartial certification, adequate substantiation, and timely determinations. In practice, payment delays—caused by funding cycles, additional employer approvals, or reluctance to certify disputed work—create cash-flow stress and secondary disputes. Equally, contractors sometimes lodge skeletal claims, deferring substantiation until negotiation; that undermines the engineer's ability to determine fairly and invites rejection. Where the engineer's neutrality is questioned (for example, if determinations are routinely re-made to reflect employer preferences), parties escalate rather than settle.

FIDIC envisages a standing board that decides disputes quickly and promotes avoidance by regular contact. In the GCC, DAABs are often deleted or never appointed. Where they exist but are not engaged early, issues fester and harden into legal disputes. The missed opportunity is significant: a credible interim forum produces prompt, informed, interim-binding decisions that keep work moving and often catalyse settlements. Without it, conflict migrates directly to arbitration, with associated delays, costs, and relationship damage.

GCC civil codes impose decennial liability on contractors and designers for major structural defects (e.g., UAE Civil Code, Articles 880–883), irrespective of the contractual defects liability period; agreed damages may be revised by courts (e.g., Article 390, UAE Civil Code); and interest on late payment may be restricted or unenforceable in some jurisdictions on public policy grounds. Public procurement rules can require higher-order approvals for variations or settlements. These mandatory rules can displace or qualify FIDIC allocations if not anticipated in drafting and administration, creating "stealth" pitfalls that surface only when disputes arise.

1.3 Contract Management Practices for Mega-Projects

A Contract Administration Plan (CAP) or Contract Management Plan (CMP) translates clauses into operational routines: who drafts, signs, and logs notices; how the engineer acknowledges and tracks them; what templates exist for variation proposals; and what the response times are (Alsofyani, 2021). A clause-by-clause obligations register, paired with a RACI matrix, makes duties visible and auditable. A joint risk workshop at mobilisation aligns expectations, allocates owners for known risks, and records mitigations in a shared risk register. Short, practical onboarding sessions for site engineers and quantity surveyors—emphasising, for example, that a notice of potential delay must be given even while "trying to fix the problem"—pay disproportionate dividends (Abusaleh, 2022). Projects that maintain a live programme (with regular updates and re-baselining when necessary), use earned value and forensic delay analysis, and operate change "gates" with defined responsibilities are better placed to handle shocks. A simple but rigorous notices/claims tracker, ideally housed within a Common Data Environment (CDE) that also stores daily records, instructions, and approvals, reduces lapses and disputes over what was said and when. Committing, in Particular Conditions, to a recognised approach to concurrency and delay analysis (for example, granting time but no money for truly concurrent periods, and specifying the analysis methodology) closes a frequent loophole (Takaaki and Smarandache, 2025).

Early warning habits, formally required under some contract families but usable under FIDIC as a management protocol, encourage parties to flag emerging risks to time or cost, convene short, solution-focused meetings, and document agreed mitigations. Regular "commercial review" meetings at the project manager level and periodic senior-level partnering or steering committee sessions create relational bandwidth for compromise (David, Kgomo, and Aigbavboa, 2025). Above all, appointing and using a standing DAAB from the outset provides a credible venue for early neutral views and, where necessary, quick decisions that are binding unless and until revised in arbitration (Alqahtani *et al.*, 2022). Appoint dedicated, trained contract managers on both sides. Define the engineer's delegated authority in writing, so expectations are realistic and instructions are not retracted. Build incentives—contractual or managerial—that reward timely determination, dispute avoidance, and collaborative problem-solving. Co-location, or at least frequent in-person interactions among decision-makers, strengthens trust and reduces the temptation to litigate routine issues by correspondence. Case experience in the region and internationally indicates that projects that invest in these routines see fewer arbitrations, faster issue resolution, and better schedule adherence (Mughal *et al.*, 2024). Standing dispute boards, in particular, are associated with dramatic reductions in the escalation of disagreements, because they provide both a discipline (knowing a neutral will see the papers) and a path to resolution that does not stall the works (Mughal *et al.*, 2024). Conversely, projects that neglect record-keeping, allow change to proceed informally, or postpone determinations to final account tend to accumulate large, multi-issue disputes that are costly to unravel (Mughal *et al.*, 2024).

1.4 Research Gap

There is no shortage of commentary on FIDIC clauses or generic lists of "top causes of disputes". However, GCC-specific, case-based syntheses that connect particular clause-level pitfalls (e.g., late notices, unclear fitness-for-purpose outcomes, misclassified instructions) to specific, repeatable management practices are rare. Furthermore, there is limited guidance that packages those practices into a transferable framework tailored to GCC project realities and civil-law overlays; this study addresses that gap. The aim is to examine the key pitfalls in the application of FIDIC contracts on GCC mega-projects and explain how robust contract management practices can mitigate them.

1. What are the most common contractual pitfalls arising under FIDIC forms on GCC mega-projects, and where in the project lifecycle do they cluster?
2. Which specific contract management practices (planning, controls, dispute avoidance) demonstrably reduce the frequency/severity of these pitfalls?
3. How can these practices be integrated into a transferable mitigation framework tailored to GCC legal/regulatory and cultural contexts?

1.5 Research Rationale and Significance

The central paradox is evident: public and private sponsors in the GCC select FIDIC expressly to manage risk, yet projects still experience recurrent disputes and poor cost/schedule performance. Several explanations recur in practice (Wahab, 2023). First, Particular Conditions sometimes dilute or skew FIDIC's checks and balances (for example, by constraining the engineer's decisional autonomy or deleting the Dispute Adjudication/Avoidance Board) (Wahab, 2023). Secondly, the procurement and delivery environment—compressed programmes, iterative scopes, multi-jurisdictional regulatory approvals—places sustained pressure on the contract's procedural time limits and documentary burdens. Thirdly, local law overlays (e.g., decennial liability in civil codes, rules on agreed damages and interest) interact with FIDIC in ways that parties do not always anticipate at the tender stage (Wahab, 2023). The practical importance of clarifying "what goes wrong and why" is high (Elshamy, Elghaish, and Brooks, 2025). For public clients, better contract governance is a route to value-for-money and stewardship of public funds (Ismail, 2025). For EPC contractors and their supply chains, clarity over recurring pitfalls supports more realistic pricing, targeted training, and more effective negotiation of Particular Conditions (Ismail, 2025). For consulting engineers, credibility depends upon timely, impartial administration that keeps projects moving while maintaining fairness. Reducing avoidable transaction costs—such as claims, disputes, legal spend, and the managerial distraction they cause—advances the region's strategic programmes by increasing delivery certainty (Abdelalim et al., 2025). Academically, the topic sits at the intersection of construction law, project management, and organisational governance (Abdelalim et al., 2025). While doctrinal analyses of FIDIC clauses are plentiful, fewer GCC-specific, case-based studies link discrete clause-level failures to concrete management practices and governance routines. This research seeks to fill that gap and to synthesise a practical, evidence-informed playbook for contract management on GCC mega-projects.

2. Research Methodology

2.1 Research Design

A qualitative multiple-case study design is adopted. Each case comprises an embedded analysis of the employer, engineer, and contractor perspectives (O'Neill and Gillespie, 2024). The approach is exploratory (identifying and classifying pitfalls) and explanatory (linking management practices to outcomes), with pattern-matching against propositions derived from TCE, principal–agent theory, and project governance. A light mixed-methods element may be included through a Delphi validation round with regional experts to prioritise practices for the proposed framework (O'Neill and Gillespie, 2024).

2.2 Case Selection and Context

Cases have been purposively selected to encompass 3–4 GCC mega-projects exceeding USD 1 billion, using Red, Yellow, or Silver Book forms (1999 or 2017), and exhibiting significant contractual issues. Jurisdictional diversity (e.g., one each from the UAE, Qatar, and Saudi Arabia) will support transferability. Access and confidentiality constraints necessitate anonymisation (e.g., "Case A: Airport Expansion, UAE"). Selection emphasises available documentation (contracts, Particular Conditions, change logs, claim registers) and interview access to principal actors (client representatives, engineer's team, contractor commercial leadership) (Mignanelli, 2021).

2.3 Data Sources

Contract and project records: general and particular conditions, employer's requirements, specifications, payment certificates, variation orders, claim submissions, determinations, DAAB referrals and decisions (where available), and selected correspondence and meeting minutes.

Semi-structured interviews: 4–6 interviews per case across employer, engineer, and contractor roles; where applicable, input from a DAAB member or project mediator.

Supplementary materials: public judgments or arbitral award summaries, auditor reports, industry white papers, and practitioner articles to triangulate themes and locate cases within broader regional patterns.

2.4 Instruments and Measures

Pitfall taxonomy and coding scheme: a codebook classifying pitfalls (e.g., notices/time bars; variation management; programme/EOT; payment/certification; design obligations; dispute resolution usage; jurisdictional overlays) and mapping them to project lifecycle phases (Bhaghamma, 2023).
Practice inventory: a structured list of contract management routines (front-end planning, controls, dispute avoidance, capability/incentives) with fields for observed usage, perceived effectiveness, and supporting evidence (Zakir et al., 2024).
Interview protocol: aligned to RQ1–RQ3, eliciting narratives of specific events (what happened, how handled, outcome, what would be done differently) and perceptions of institutional enablers and blockers.
Reliability steps: intercoder checks on a subset of transcripts, iterative refinement of codes, and maintenance of a case-study database linking raw evidence to emergent findings.

2.5 Data Collection and Analysis

Document review has been preceded by interviews to build a chronology and identify focal incidents. Interviews (60–90 minutes) were conducted, transcribed, and anonymised. Follow-up requests for clarifications and additional documents were also made as needed. Data was stored securely with segregated identifiers and research materials, and version control was applied to document sets. Thematic coding was combined with deductive (theory and literature-led) and inductive (case-emergent) categories. Within each case, a timeline of disputes was mapped, and matrices juxtaposed employer/engineer/contractor perspectives on each pitfall. Cross-case synthesis identified common patterns and divergence, enabling a consolidated "pitfall map" (RQ1) and an assessment of which practices correlate with better outcomes (RQ2). Pattern matching to theoretical propositions illuminated mechanisms (e.g., how early determinations reduce agency costs, or how DAAB usage lowers ex post transaction costs). A Delphi round, if undertaken, would have been used to rate the practice's effectiveness and feasibility to refine the framework (RQ3).
Credibility is supported through triangulation (documents, interviews, supplementary sources), respondent validation (sharing case summaries for factual correction), intercoder reliability checks, and explicit consideration of rival explanations and negative cases (Bennett, 2022). A transparent chain of evidence will be maintained, allowing readers to trace conclusions back to sources. Thick description of context enhances transferability; procedural transparency and audit trails underpin dependability and confirmability (Bennett, 2022).

3. Results

3.1 A Pitfall Map of GCC Mega-Projects under FIDIC

In every case, there were instances where potential entitlements were jeopardised by notices given outside FIDIC's stipulated window or lacking adequate particulars (FIDIC, 1999, cl. 20.1). In two cases, claims were rejected in part purely for lateness; in another, late notice became a bargaining chip that reduced a negotiated settlement. This pitfall was frequently linked to the pressure of fast-track works and a site culture of "fix first, notify later".
The most contentious episodes arose when late employer-initiated changes were treated informally or when instructions were disputed as being within the existing scope. Disagreements over valuation methods (particularly where bill rates did not neatly apply) and over cumulative impact were common. Projects that lacked a live, agreed baseline and a disciplined change process saw the sharpest disputes at final account (Abdelalim *et al.*, 2025).
In design-build cases, performance at completion was occasionally below implied or explicit functional targets (for example, output efficiency or treatment standards). Even where contractors had followed specified methods, the employer alleged a breach of fitness-for-purpose. In two instances, the taking-over certificate was delayed pending remedial measures or price adjustment (Adam and Mohammed, 2023). This pitfall was exacerbated by vague Employer's Requirements and by the absence of an agreed protocol for performance verification (Abusaleh, 2022).
Delays occurred in each case for multiple reasons: late approvals, late information, supply-chain shocks, and contractor under-performance. Where Engineers delayed determinations or reserved all decisions to the final account, parties entrenched. Concurrency was hotly debated in three cases; without an agreed methodology, expert battles loomed. Projects that made interim, reasoned EOT decisions experienced less end-loaded conflict. Chronic late certification and payment, sometimes due to additional employer approvals outside the four corners of the contract, strained cash flow, provoked threats of suspension, and diverted management attention. Although none of the cases ended in termination for non-payment, relationships deteriorated and additional claims (financing charges or productivity impacts) accumulated (FIDIC, 1999, cl. 14).

Table 1. Pitfall Map of GCC Mega-Projects under FIDIC

Pitfall Category	Typical Cause / Mechanism	Observed Consequences	Representative Case Evidence
Late or Defective Notices	"Fix first, notify later" culture; fast-track pressure	Entitlement losses, partial claim rejection, and settlement discounts	Cases A & B: late claims led to reduced settlements
Variation & Valuation Disputes	Informal instructions; unclear scope; lack of live baseline	Prolonged final account negotiations; valuation conflicts	Cases B & C: cumulative impacts and bill rate misfits
Design and Fitness-for-Purpose Issues	Ambiguous Employer's Requirements; unclear verification	Delayed taking-over; remedial works; pricing disputes	Cases D & E: delayed certification pending rectification
Delay & Payment Conflicts	Late approvals/info; Engineer indecision; extra approvals	Concurrency disputes; strained cash flow; productivity loss	All cases; no termination, but major relationship erosion
Engineer's Limited Authority	Employer control over determinations	Eroded trust; escalation of disputes; slower resolution	Two cases with re-ratification delays
Absence of DAAB	DAAB deleted or not convened	Accumulated disputes; loss of early resolution	Only one case had a standing adjudicator → swift outcomes

In each case, the contractor perceived the engineer as constrained by the employer; in two cases, the engineer revised or withheld determinations at the employer's direction. This eroded trust and encouraged escalation. In one project, the Particular Conditions had not transparently set out the engineer's delegated authority, leading to frequent re-ratification delays. Where authority limits were clear, and the engineer was empowered to make interim decisions, disputes were fewer and shorter (FIDIC, 1999, cl. 14; FIDIC, 2017, cls 20–21).

Except for one case that appointed a single adjudicator from the start, DAABs were either deleted or never convened. Issues that could have been ventilated and decided early have thus accumulated. In the project with a standing adjudicator, two referrals were resolved within weeks, neither progressing to arbitration; the mere availability of the forum was said to have tempered positional bargaining on other issues (FIDIC, 2017, cls 20–21).

Design-phase friction centred on design review timetables, Employer's Requirements clarification, and early ground conditions surprises. Execution-phase friction centred on variations and delay as seen in *MT Højgaard A/S v E.ON Climate & Renewables UK Robin Rigg East Ltd* [2017]. Close out concentrated disputes on measurement, compensation events, and performance shortfalls. Post-completion exposure arose from latent defects and statutory liabilities (e.g., decennial liability), reinforcing the need to close out with jurisdiction-compliant documentation and warranties (FIDIC, 2017, cls 20–21).

3.2 Practices Correlating with Better Outcomes

Projects that convened structured risk workshops at the outset—involving employer, engineer, and contractor—reported smoother handling of known risks when they materialised (Al Marri, 2023). For example, anticipated permitting risk was mitigated by allocating internal resources and pre-agreeing on escalation routes; when delays threatened, the parties addressed them collaboratively rather than defaulting to claim postures. The joint register provided a record of "who owned what," reducing later attribution battles (Al-Faryan, 2024).

A simple but rigorously maintained notices/claims tracker, with automated reminders and standardised templates, prevented time-bar mishaps (Al-Khalifa, 2024). In one case, more than fifty notices were lodged on time and logged through to determination; none failed on procedural grounds. Where no such system existed, late notices were commonplace and expensive (FIDIC, 2017, cls 20–21).

Projects where the engineer habitually issued interim determinations—rather than deferring everything experienced faster issue resolution and fewer sprawling end-of-project disputes (Al-Mustafa and Mohammad, 2025). Even where determinations were only partially acceptable to either side, they created a defined starting point for negotiation or DAAB referral. Crucially, the engineer's authority and independence were respected in those projects, and the employer's internal governance supported timely decision-making (Alqahtani *et al.*, 2022).

Monthly or bi-monthly steering meetings, distinct from routine site coordination, enabled timely, face-saving compromises on sensitive issues (e.g., liquidated damages exposure balanced against agreed recovery plans). Leaders' direct engagement short-circuited positional correspondence and reframed problems as shared challenges (Alfadil *et al.*, 2022).

Where appointed and used, the DAAB provided quick, informed decisions that kept the works moving. Its presence reportedly nudged parties toward earlier settlements on unrelated issues, with the prospect of a swift, neutral decision acting as a discipline on extreme positions (Almutairi, 2024).

Teams with targeted FIDIC administration training made fewer procedural errors, framed claims and responses more coherently, and engaged with Engineer determinations more constructively. After-action reviews on one project led the contractor to

institutionalise training for project managers—a change prompted by lost entitlements attributable to avoidable procedural lapses (Anil, Kassim and Varghese, 2021).

Particular Conditions that spelled out the engineer's decision thresholds prevented misunderstandings and reduced back-channel vetoes. Contractors tailored strategy accordingly (e.g., engaging the employer directly on high-value claims while working with the engineer on routine matters), smoothing flow and avoiding repeated re-work of determinations (Ansell and Torfing, 2022).

Digital platforms that housed drawings, instructions, daily reports, and cost/schedule data furnished an agreed factual substrate. Disputes narrowed to interpretation and valuation rather than descending into "what actually happened?" arguments. Preparing substantiated claims was easier and quicker; equally, spurious assertions were deterred by the visibility of contemporaneous records (Bennett, 2022).

Meetings without decision-makers degenerated into ritual rather than resolution. "Partnering" gestures devoid of process (e.g., signing a charter but not meeting consistently) had little impact. Incentive mechanisms without clear baselines or trust were ignored (Sultan *et al.*, 2025). These cautionary notes underscore that form must be matched by substance: processes must be empowered, and behaviours must be reinforced (Takaaki and Smarandache, 2025).

Table 2. Practices Correlating with Better Outcomes

Practice / Intervention	Mechanism for Improvement	Evidence from Cases	Outcome Effectiveness
Joint Risk Workshops	Builds shared risk ownership and escalation routes	Anticipated risks handled collaboratively	High
Notices/Claims Tracker	Automates compliance with time bars	50+ notices logged, none invalid	Very High
Interim Determinations by Engineer	Prevents end-loaded disputes	Faster settlements and clarity	High
Steering Meetings (Executive Level)	Enables direct compromise and issue reframing	Resolved LD and recovery disputes	High
Standing DAAB	Provides fast, neutral resolution	Reduced escalation; improved behaviour	Very High
FIDIC Training Programs	Improves procedural accuracy and claim quality	Institutionalised training post-project	Medium-High
Transparent Engineer Authority	Prevents bottlenecks and confusion	Reduced re-work of determinations	High
Digital Platforms for Records	Creates a shared factual base and transparency	Reduced "what happened?" disputes	Very High

3.3 A FIDIC-Aligned Contract Management Framework

Pre-contract / Kickoff

- **Joint obligations review.** Convene a clause-by-clause workshop (Employer, Engineer, Contractor) to agree on administrative interpretations (e.g., what constitutes a compliant notice; acceptable communication channels) and to surface potential ambiguities for early resolution (Rasool *et al.*, 2025).
- **Contract Administration Plan (CAP).** Document procedures for notices (draft–issue–acknowledge–track), variations (initiation–evaluation–approval–instruction), programme updates, payment applications and determinations, with named roles and time limits mapped against FIDIC sub-clauses (O'Neill and Gillespie, 2024).
- **Risk register and ownership.** Build a joint register that records known risks, owners, mitigations, and triggers; link items to relevant clauses (e.g., 4.12 unforeseen conditions, 8.3 programme, 13 Variations, 17 Employer's Risks) as seen in *Obrascón Huarte Lain SA v Attorney General of Gibraltar* [2014].
- **Design and fitness-for-purpose alignment (where applicable).** Hold a focused session to clarify intended performance outcomes and verification methods; record assumptions and acceptance criteria to avoid later implication disputes (Negara, 2023).
- **Onboarding and training.** Provide concise, role-specific FIDIC training for site managers, engineers, and QS teams; circulate a one-page glossary of key contractual terms and deadlines (Negara, 2023).

Execution

- **Integrated tracking.** Operate a digital tracker (or rigorous manual log) for notices, instructions, submissions, and approvals, with automatic reminders for contractual response deadlines.

- **Change governance gates.** Require a structured evaluation of each potential change (technical, time, cost) and a documented decision; forbid informal "do and argue later" practices except in emergencies, and then require prompt ratification (Mughal *et al.*, 2024).
- **Programme discipline and agreed concurrency method.** Maintain a live, logic-linked programme; agree on delay analysis and concurrency treatment in Particular Conditions to avoid later methodology disputes (Mignanelli, 2021).
- **Early warning procedure.** Institute an early warning protocol—distinct from formal notices—to flag and mitigate emerging risks collaboratively; record outcomes to build a learning loop (Marjosola, 2021).
- **Engineer empowerment and interim determinations.** Encourage the engineer to issue timely, reasoned interim determinations; specify delegation limits transparently so determinations are not routinely second-guessed (Mabelo, 2025).
- **DAAB standing operation.** Appoint the DAAB at the outset; hold periodic informal reviews; use the board for quick opinions or decisions before positions harden (Linde-Arias, Perri, and Nwandem, 2022).

Monitoring and governance

- **KPIs for contract health.** Track indicators such as late notices (target zero), average days to determination, time from instruction to agreed variation, number of DAAB referrals resolved without arbitration, and percentage of claims settled within period targets (Ismail, 2025).
- **Periodic contract audits.** Conduct internal or third-party audits of notice compliance, change documentation, programme currency, and payment processing; correct slippage promptly (Kadir, 2024).
- **Local-law alignment checks.** At mid-project and before handover, review practices against mandatory rules (e.g., decennial liability documentation, agreed damages reasonableness, interest/finance charge enforceability); adjust procedures and close-out documents accordingly (Hamzani *et al.*, 2023).

GCC-specific notes

- **Decennial liability.** Ensure structural design obligations and insurance/warranty requirements reflect the equivalents of Articles 880–883; manage the taking-over and certification processes to capture as-built records relevant to latent defect exposure (Gupta, Solanki, and Mittal, 2022).
- **Agreed damages and interest.** Recognise court powers to adjust agreed damages and potential public-policy limits on interest; document actual loss and mitigation efforts; consider alternative financing arrangements where interest is impermissible (Elshamy, Elghaish and Brooks, 2025).
- **Public approvals.** Map any extra-contractual approvals (e.g., ministry sign-offs) into the CAP to avoid hidden decision bottlenecks; time variation and settlement processes to those cycles (Gupta, Solanki, and Mittal, 2022).

The framework is intended to be scalable: on very large or complex programmes, all elements are recommended; on smaller projects, a subset (notice tracking, change gates, programme discipline, and at least a single adjudicator) will still materially improve outcomes.

Table 3. FIDIC-Aligned Contract Management Framework (Condensed Summary)

Project Stage	Key Practices	Intended Benefit
Pre-Contract / Kickoff	Joint clause-by-clause obligations review; CAP (Contract Administration Plan); risk register; design alignment; onboarding & FIDIC training	Shared understanding of duties; early risk clarity; stronger procedural compliance
Execution	Digital tracker; structured change governance; programme discipline; early warning protocol; Engineer empowerment; active DAAB	Real-time control, reduced ambiguity, and timely dispute resolution.
Monitoring & Governance	KPIs for contract health; periodic contract audits; local-law alignment checks	Continuous improvement, compliance, and reduced legal exposure
GCC-Specific Adaptations	Decennial liability documentation; local law compliance on damages and interest; mapping public approvals	Regional legal compatibility and reduced post-completion risk

3.4 Outcome Correlations

To consolidate empirical observations from the GCC mega-projects studied, the following table summarises the strength and direction of the correlation between specific contract management practices and observed project outcomes. These correlations indicate that procedural discipline, empowered decision-making, and early dispute-resolution mechanisms combine to enhance project performance under FIDIC-based contracts.

Table 4. Outcome Correlation Summary

Practice Variable	Observed Correlation with Project Outcome	Supporting Evidence
Early risk collaboration (Workshops)	↓ Claims escalation; ↑ cooperative problem-solving	Al Marri (2023)
Structured notice tracking	↓ Lost entitlements; ↑ procedural compliance	Al-Khalifa (2024)
Empowered engineer & interim decisions	↓ Time to settlement; ↑ trust	Alqahtani et al. (2022)
Standing DAAB	↓ Arbitration frequency; ↑ early resolution	Almutairi (2024)
Digital record systems	↓ Evidentiary disputes; ↑ transparency	Bennett (2022)
Leadership engagement via steering meetings	↓ Conflict escalation; ↑ relationship quality	Alfadil et al. (2022)

4. Discussion

The recurrence of pitfalls reflects a structural misalignment between FIDIC's procedural rigour and the delivery realities of GCC mega-projects. Fast-track schedules compress decision windows; scope evolves under political and stakeholder pressures; multi-layered approvals interpose additional steps that FIDIC does not itself anticipate (Egbelakin *et al.*, 2021). In that environment, strict time bars collide with a problem-solving site culture that prioritises immediate action over documentary compliance. When disputes arise, parties retrospectively re-cast events through legal lenses that magnify procedural lapses (Egbelakin *et al.*, 2021). TCE frames this as high ex post transaction costs resulting from incomplete ex ante arrangements: instead of using devices like DAABs to adapt cheaply, parties defer and litigate expensively.

Principal–agent problems are equally visible. Information asymmetries are acute on sprawling sites; without disciplined records, principals distrust agents' narratives. If the engineer is perceived as beholden to the employer, contractors rationally bypass and escalate rather than accept adverse determinations. Conversely, employers who experience opportunistic claims (e.g., late notices with thin substantiation) harden positions, further eroding trust. Without countervailing governance (transparent authority, standing neutral forums), this spiral entrenches (Disemadi, 2022).

Lifecycle clustering mirrors the logic of uncertainty. In design/build projects, early friction centres on design acceptance and interpretation of Employer's Requirements; during execution, the collision of change and programme creates cumulative pressure; at close-out, all unresolved issues crystallise (Deacon and Kajimo-Shakantu, 2023). The post-completion phase exposes statutory liabilities beyond what FIDIC's defects period would imply, catching out parties who mistake contractual closure for legal finality. This pattern underscores the need for early, proactive governance rather than end-loading determinations and settlements (Disemadi, 2022).

The practices operate by reducing information gaps, aligning incentives, and injecting adaptive, low-friction decision-making into the project.

- **Information and transparency.** Notice tracking, CDEs, and programme discipline create shared situational awareness. When facts are visible and contemporaneously recorded, speculative claims and defensive denials give way to focused discussions about contractual consequences. This narrows the scope of disagreement and accelerates resolution.
- **Incentive alignment and credible commitment.** Empowering the engineer to make prompt decisions and backing that with organisational support creates credible interim commitments that parties can organise around. Introducing KPIs for timely determinations and dispute avoidance aligns individual behaviour (engineers, project managers) with the project's collective interest. Senior-level forums and partnering charters add relational incentives—reputation, reciprocity, and shared goals—that moderate strictly adversarial tactics (David, Kgomo, and Aigbavboa, 2025).
- **Adaptive governance mechanisms.** Standing DAABs and early warning routines are classic TCE devices: they lower the cost of adjusting to new information and resolving disagreements. Because DAAB decisions are interim-binding and quick, they keep the work moving and discourage escalation. Early warning meetings allow parties to manage risks before they harden into joint entitlements and liabilities. Interim Engineer determinations, which perform a similar function, were exercised with independence.
- **Contextual tailoring.** Local-law alignment checks recognise that some risks (e.g., decennial liability) cannot be contracted away and must therefore be managed through design decisions, documentation, and insurance. Recognising the court's power to adjust agreed damages conditions, the Employer LD strategies and encourages documentation of real loss. These adjustments prevent surprises that would otherwise unravel settlements or awards post hoc (David, Kgomo, and Aigbavboa, 2025).

The boundary conditions matter. Processes must be empowered and supported; empty forms and meetings are insufficient. Trust can be cultivated by predictable, timely behaviour—issuing determinations when promised; paying certified sums on time; referring live issues to DAABs without stigma. Culture follows structure over time: when parties see that early warning is rewarded and DAAB decisions are honoured, they participate wholeheartedly; where processes are nominal, and outcomes are pre-ordained, they disengage and litigate (David, Kgomo and Aigbavboa, 2025).

The framework is deliberately modular so that it can be tailored to different GCC jurisdictions and FIDIC forms. Its core—notice discipline, change gates, programme rigour, empowered interim decision-making, and a standing neutral forum—is agnostic to sector and delivery model. Jurisdiction-specific notes ensure fit to local law without diluting core governance. The framework also aligns with FIDIC's trajectory: the 2017 editions' re-emphasis on dispute avoidance complements the proposed standing DAAB usage; FIDIC's "Golden Principles" favour clarity and balanced risk principles; and the framework operationalises by process rather than through heavy-handed Particular Conditions (Chen, Wang, and Wang, 2023).

Culturally, the framework resonates with GCC norms of conciliation and senior-level engagement. Embedding regular steering sessions and amicable settlement steps into the governance rhythm legitimises compromise and relationship maintenance. Over time, normalising DAABs may also ease current scepticism about interim decisions; as parties witness faster, fairer resolutions, reliance on arbitration for routine issues should abate. Organisational adoption—by ministries, agencies, and large developers through standardised CAPs and KPIs—would accelerate diffusion and raise baseline capability across programmes (Mughal *et al.*, 2024).

5. Conclusion and Recommendations

FIDIC's prevalence on GCC mega-projects reflects its structure and familiarity, yet recurrent pitfalls undermine performance where contract governance is weak: late or defective notices; contested variations; fitness-for-purpose misunderstandings; delay management and concurrency disputes; payment frictions; under-utilised DAABs; and cross-jurisdictional surprises. These problems concentrate during execution and close-out and are exacerbated by fast-track delivery, evolving scope, and multi-layered approvals. Robust contract management—front-end clarity, disciplined controls, empowered interim decision-making, active dispute avoidance, and capability/incentives—can and does mitigate these problems by reducing information asymmetry, aligning incentives, and providing adaptive, credible resolution paths. The proposed framework translates those lessons into a practical playbook aligned with FIDIC clauses and tailored to GCC overlays, thereby turning the contract from a static document into a living governance system. The following recommendations are:

1. Pre-award obligations matrix and risk workshops. Before or immediately after contract signature, hold a joint obligations workshop and produce a CAP that maps each FIDIC clause to concrete actions, roles, and deadlines. Conduct a risk workshop to allocate known risks, record mitigations, and align expectations. For design-build, clarify fitness-for-purpose outcomes and acceptance tests in writing (Zakir *et al.*, 2024).
2. Strict notice and change-control playbook. Institutionalise a notices tracker with templates and reminders; train site teams to issue early and update often. Operate change gates: log the potential change, assess impact, decide, instruct, and re-baseline. Forbid informal scope execution without written instruction except in emergencies, and then ratify immediately. Maintain meticulous contemporary records in a CDE (Troisi and Alfano, 2023).
3. Schedule management discipline and concurrency clarity. Require and maintain a logic-linked baseline programme; specify delay analysis methodology and concurrency treatment in Particular Conditions (e.g., time but no money for true concurrency). Use independent delay reviewers to support timely, interim EOT determinations; formalise granted EOTs in revised completion dates. Calibrate LDs to a reasoned pre-estimate and document the basis (Varma, 2025).
4. Proactive DAAB use and early warning. Appoint the DAAB at mobilisation; schedule periodic informal meetings; seek early neutral views; refer live disputes promptly for interim decisions. Institute an early warning protocol for emerging risks, distinct from claims notices, to encourage joint mitigation without prejudice (Negara, 2023).
5. Engineer empowerment and capability. Select an Engineer with a track record of fair administration; define delegated authority transparently; support timely interim determinations; align consultancy incentives with dispute avoidance and timely decision-making. Contractors should engage constructively with determinations and provide complete particulars to enable fair decisions (Egbelakin *et al.*, 2021).
6. People, partnering, and incentives. Invest in targeted FIDIC training for key roles. Establish a partnering charter and an issue-resolution ladder escalating to senior executives before formal dispute steps. Consider KPIs and incentive mechanisms that reward collaborative behaviours and timely resolution. Co-locate decision-makers where feasible to deepen trust (Wahab, 2023).
7. Jurisdiction-specific adaptations. Embed local-law compliance into the CAP: plan for decennial liability (design responsibility, insurance, documentation), manage agreed damages in awareness of judicial adjustment powers, and design payment/finance provisions that respect public-policy constraints. Map public approvals into decision flows to avoid hidden bottlenecks (Gupta, Solanki, and Mittal, 2022).

Access limitations, retrospective bias, and constraints on qualitative assessment temper generalisability. Future research could quantify the effect sizes of specific practices (e.g., DAAB presence on dispute incidence) and compare outcomes under alternative forms (e.g., NEC, PPP bespoke) in GCC settings. As digital tools (BIM, dashboards, smart contracts) mature, further study should explore how they can embed contractual governance more deeply into day-to-day delivery. Notwithstanding those caveats, the present study offers an actionable framework that practitioners can adopt now to reduce friction, improve certainty, and deliver the GCC's ambitious programmes more reliably.

Funding: This research received no external funding.
Conflicts of Interest: The author declares no conflict of interest.
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