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RESEARCH ARTICLE

Defensive Structures of the Khorasan–Kerman Route in Islamic Iran: A Structural–Conceptual Analysis of Ribats, Watchtowers, and City Gates

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Abstract

The central problem this study addresses is the lack of an integrated analytical framework for understanding the defensive structures along the medieval Khorasan–Kerman route. Previous research has often examined ribats, watchtowers, and city gates in isolation, without considering how they operated collectively as a spatial, political, and ideological network. Using a multi-angled methodology that combines architectural analysis, spatial distribution assessment (including the typical 25–30 km spacing of ribats), and the study of conceptual and symbolic meanings, this research clarifies the Seljuk-to-Safavid transmission of architectural and ideological practices. Rather than implying a “dynamic interplay” between the two dynasties, the study demonstrates how Seljuk models exerted a long-term architectural and spatial influence that the Safavids later reinterpreted within their emerging Shi’a state ideology. Our findings show that these constructions—ribats, watchtowers, and city gates—were not passive defensive elements; they actively shaped political authority, territorial management, and the evolution of religious identity along the route. The main contribution of this study lies in synthesizing structural and conceptual analysis into a replicable framework for examining Islamic-era fortification systems. This approach reveals how carefully planned defensive corridors fortified not only physical boundaries but also the ideological landscape of eastern Iran.

Keywords: Khorasan–Kerman Route, Ribat, Watchtower, City Gate, Structural–Conceptual Analysis

Introduction

In Islamic societies, trade paths weren't just lanes for moving goods or spreading beliefs – instead, they helped shape power structures and protect borders while showing cultural stance (Matthee, 2022, p. 507). Forts like ribats, lookout posts, and urban entrances went beyond warfare duties; rather, they created physical layouts that controlled land and expressed ruling ideologies (Farrokh et al., 2021, pp.131; Javadpour et al., 2024, pp.54). Of these, the Khorasan–Kerman trail operated as a central east–south corridor linking Khorasan to Kerman under Seljuk and Safavid rule, binding outer zones to the heart of authority.

Along a linked system of defensive buildings, this path helped secure land, shield trade groups, while boosting government authority (Karimian, 2010, pp.52). Features like placement on key spots, use of nearby resources, or inclusion of spiritual signs in these constructions revealed how power was exercised and nature was managed. Take Ribat Sharaf from the Seljuk time – its decorative program and Quranic inscriptions appear to reflect Sunni patronage traditions common in the Seljuk realm, whereas Ribat Zeinoddin from the Safavid era stands for Shiite culture (Hasibi et al., 2024, pp.34).

Even though this path matters a lot, there's still not much detailed work on fortifications across eastern Iran – especially along the Khorasan–Kerman stretch. Earlier studies mostly stuck to describing buildings or else zoomed in on single historical or landscape aspects (Javadpour et al., 2024, pp. 54; Karimian, 2010, pp.54). Because of this scattered focus, we're missing a fuller picture that ties together design, layout, history, and belief systems.

This part introduces a hands-on framework to explore how ribats, watchtowers, and city gates functioned along the Khorasan–Kerman Road. Instead of just listing features, it digs into their layered roles using old texts, maps, building records, and on-the-ground notes. Through a close look at these sources, the work builds a picture of space tied to belief systems in Islamic Iranian design. Rather than treating them as isolated spots, it shows how these sites worked together boosting safety, shaping rule, while helping form religious identity. Alongside, it opens fresh angles for saving heritage and rethinking architectural history.

Research Questions

To fulfill the research objective—namely, to construct an integrated analytical framework for understanding the defensive architecture of the Khorasan–Kerman route as a coherent spatial, political, and ideological system—this study addresses the following research questions:

1. How did the defensive structures along the Khorasan–Kerman route operate as a coordinated spatial and ideological network across the Seljuk and Safavid periods, and to what extent did Safavid reinterpretations reflect the long-term influence of earlier Seljuk models rather than any contemporaneous interaction?
2. In what ways did architectural form, spatial configuration, and decorative programs express, negotiate, or transform political authority and religious identity across different historical contexts and regional settings?

3. How can the combined analysis of spatial distribution patterns, architectural and material evidence, and textual sources provide a more coherent and historically grounded account of the evolution and transformation of eastern Iran's defensive systems?

These research questions collectively shape the structural and conceptual framework of the study, providing a coherent analytical foundation for interpreting ribats, watchtowers, and city gates as interrelated instruments of spatial organization, political authority, and religious ideology.

Literature Review

Recent scholarship on defensive and infrastructural architecture in Islamic Iran has tended to examine individual structures such as caravanserais, watchtowers, or city gates rather than interpreting them as interconnected spatial systems with combined administrative, military, and ideological roles. Babaie and Grigor (2015) highlighted how Safavid architectural programs expressed authority and religious identity, though their work focused on urban and ceremonial landscapes rather than long-distance routes. Farrokh and colleagues (2021) investigated military transitions from the late Sasanian to early Islamic periods, emphasizing tactical change rather than architectural or spatial organization. Karamian's studies (2021, 2022) provide detailed analyses of early Islamic fortifications and defensive landscapes in central and eastern Iran, yet they do not consider how multiple structures might function collectively along extended corridors.

Complementary perspectives appear in studies of mobility and route infrastructure. Hasibi et al. (2024) explored how shifts in trade movement reshaped the development and reuse of Safavid caravanserais, offering important insights into the economic logic of roadside architecture. Emami (2024) examined symbolic and spiritual meanings embedded in Safavid structures along pilgrimage roads linking Isfahan with Najaf–Karbala, showing how architecture mediated religious identity and state legitimacy. Similarly, regional case studies such as Karimian's (2010) analysis of Bam's urban layout, Javadpour et al.'s (2024) study of city-gate typologies, and Tahmasebizadeh & Mohammadi's (2022) survey of historic gates in Kerman contribute useful architectural detail but remain limited to localized settings without offering a broader, route-based interpretation.

Broader comparative work by Petersen (1996) and Kennedy (2006) on watch systems in the Levant and Anatolia provides models for studying regional defense networks, yet these frameworks have not been applied systematically to eastern Iran. Despite these contributions, no existing research has examined how ribats, towers, and gateways along the Khorasan–Kerman axis operated collectively as an integrated system reinforcing governance, securing movement, and projecting evolving religious identities.

This study addresses that gap by offering a multi-layered analysis of architectural form, spatial distribution, and conceptual meaning, situating the fortifications not as isolated structures but as components of a coordinated network shaping power, mobility, and belief across a major transregional route.

Historical Background: Defensive Fortifications along the Khorasan–Kerman Route

The Khorasan–Kerman corridor, stretching across eastern and southeastern Iran, has served as a connective spine between major cultural, religious, and trade centers since the early Islamic centuries. Classical geographers and travelers offered essential descriptions of this route, revealing how its defensive and service structures were distributed across deserts, foothills, and caravan paths.

Early Muslim scholars, including al-Maqdisi, Istakhri, Ibn Ḥawqal, and later Yaqut al-Hamawi, described fortresses, rest stations, and water depots that protected travelers and facilitated administration across this vast region. Their accounts, though largely narrative, outline the strategic logic of fortification lines linking northeastern and southeastern Iran. For instance, al-Maqdisi (2006) mentioned a chain of fortified stops ensuring security for merchants and pilgrims, while Istakhri (2018) detailed the desert routes and noted the placement of watchtowers and ribats near vital wells and caravan paths.

These descriptions imply that fortifications were not merely military structures but served as multifunctional institutions combining defense, hospitality, and religious charity. The ribats mentioned in these texts operated both as garrisons and as foundations hosting travelers and Sufis, symbolizing the merging of faith and frontier defense typical of Islamic Iranian architecture. Over time, particularly under the Seljuk and Safavid dynasties, the system evolved: fortresses became administrative nodes, caravanserais connected expanding trade routes, and gateway complexes marked territorial transitions and ideological boundaries.

Archaeological and historical mapping of these references shows a recurring pattern isolated yet regularly spaced structures that enabled movement, taxation, and cultural control across the plateau. This continuity of defensive organization shaped how subsequent dynasties conceptualized the landscape of eastern Iran as a controlled passageway rather than a peripheral expanse.

The historical record thus establishes the foundation for understanding the ideological and spatial continuity later examined in this study. By revisiting the classical descriptions within a modern analytical framework, the research interprets these fortifications not solely as remnants of defense but as active agents in forming regional identity, governance, and sacred geography connecting Khorasan to Kerman over centuries.

Research Method

This study employs a qualitative, structural–conceptual approach, utilizing descriptive and interpretive analysis to investigate the functioning of defensive architecture along the historical Khorasan–Kerman route. The research scrutinizes the architectural, spatial, historical, and ideological dimensions of key structures, such as ribats, watchtowers, and city gates, within the broader territorial strategies of the Seljuk and Safavid dynasties.

Data Collection

Primary data were gathered through a combination of sources:

1. **Published Historical Texts and Architectural Records:** This includes classical Islamic geographers such as Istakhri, al-Maqdisi and Ibn Hawqal, alongside modern scholarly research on Islamic fortifications by specialists like Javadpour (2024), Matthee (2022), and Farrokh (2021).
2. **Architectural Plans, Maps, and Photographs:** Data were sourced from the Iran Cultural Heritage, Handicrafts and Tourism Organization (ICHTO), Stronach & Mousavi's *Defensive Structures of Iran* (2019), and comparable scholarly archives.
3. **Restoration Reports and Secondary Visual Documentation:** Published reports and visual materials related to specific sites, including Ribat Sharaf, Ribat Mehr, Ribat Zeinoddin, and the gates of Yazd and Kerman, were consulted to verify architectural form, material usage, and spatial configurations.

Sample Selection Criteria:

The study focuses on six representative sites selected based on the following criteria:

- **Chronology:** Structures attributed to the Seljuk or Safavid periods, as supported by scholarly consensus.
- **Geographical Relevance:** Located along or in proximity to the historic Khorasan–Kerman corridor.
- **Functional Indicators:** Evidence from architecture or historical texts suggesting defensive, administrative, or symbolic roles.
- **Data Availability:** Sufficient reliable published documentation, plans, or visual material to support in-depth analysis.

The selected sites include three key ribats (Sharaf, Mehr, Zeinoddin), the Tabas watchtowers, and the historic city gates of Yazd and Kerman.

Analytical Framework

The analysis is structured around a four-part framework:

1. **Architectural–Functional Analysis:** Evaluation of site layouts, construction materials, and physical organization, primarily drawing from published architectural plans and site reports.
2. **Spatial–Strategic Analysis:** Assessment of the relative positioning and distances between structures, utilizing historical maps and GIS visualization based on reconstructed historical cartography.
3. **Historical–Political Context:** Interpretation of the political and administrative environments that influenced the construction, maintenance, and strategic use of these sites, informed by historical narratives and archival research.

4. Conceptual–Ideological Interpretation: Examination of decorative elements and inscriptions to ascertain potential symbolic or ideological meanings, employing a hermeneutic approach grounded in textual evidence.

Table 1. A Multi-Dimensional Analytical Framework for Examining Defensive Structures.

Dimension	Criteria	Tools	Data Sources
Architectural–Functional	Form, materials, function	Field observations, architectural plans	(Javadpour et al., 2024; Stronach & Mousavi, 2012)
Spatial–Strategic	Location, spacing	Historical maps, field observations	(Iran Cultural Heritage Organization, 2019; Istakhri, 2018; Stronach & Mousavi, 2012)
Historical–Political	Political context, governance role	Textual analysis	(Farrokh et al., 2021; Karimian, 2010)
Conceptual–Ideological	Symbols, inscriptions	Qualitative semiotics	(Hasibi et al., 2024)

Analysis Procedure

1. Data classification sorted details for every building using four analysis angles. Ribats got broken down by layout design, build materials, or written markings noted on-site. Watchtowers alongside gates were checked together - highlighting how they helped keep watch or where they sat on purpose.
2. Data Integration: Field notes got matched up against old writings along with building documents - just to spot patterns in how things were used or believed. Take Ribat Sharaf's carvings - they were checked next to Seljuk manuscripts for clues.
3. Patterns got pulled out and shaped into a layered setup showing how the buildings play into safety, space management, along with who's in charge.

This approach gave a cross-field lens to grasp how fortifications worked - not just in design but also in power plays and belief systems - shaping the past landscape of eastern Iran.

Ribats in the Spatial and Security Structure of Islamic Iran's Trade Routes

In Islamic Iran - especially under the Seljuks and later Safavids - ribats weren't just one thing. They worked as rest stops or defensive posts, sometimes even centers of belief, blending practical use with deeper meaning. The word ribat comes from early Islamic-Arabic ideas around struggle and border protection, describing walled shelters for travelers, watchmen, maybe soldiers too (Babaie & Grigor, 2015; Emami, 2024). On the road between Khorasan and Kerman, these buildings were vital links in a wider system, boosting safety for traders, government reach, along with spiritual authority.

Architectural and Functional Features

Ribats along this path popped up every 24 to 30 kilometers or so matching how far caravans could travel each day, while staying near water (Hasibi et al., 2024). Most had boxy layouts,

walls built from mudbrick or fired brick stacked thick, also towers at the corners so guards could keep watch. On-site checks from 2021 to 2023 showed builders used whatever materials were close by, plus clever touches like wind-powered airflow systems made to handle desert heat. These choices mirror ones seen in Diyarbakir's ribats, Turkey same basic shape, yet simpler, without fancy decoration (Hillenbrand, 1994).

Spatial–Strategic Role

The ribats sat in spots that made sense - close to narrow desert paths, places where rivers could be crossed, or busy trade spots. Old maps (Iran Cultural Heritage Organization, 2019; Istakhri, 2018), along with what's seen today, back up this even spread, hinting at careful layout. While parallels can be drawn between the ribats along the Khorasan–Kerman corridor and those found in regions such as Diyarbakir or Qasr al-Hayr, these comparisons should be understood in conceptual and typological not geographical terms. The resemblance lies in their shared functions of surveillance, refuge, and authority projection, rather than in direct architectural lineage or physical continuity.

Historical–Political Function

Back then under the Seljuks, ribats worked like frontier stations - putting down uprisings and guarding key routes; come the Safavid era though, their focus shifted toward tightening state control along with spreading Shiite beliefs (Matthee, 2022, pp. 507–536). A few of these ribats also acted as short-term information or monitoring posts, keeping tabs on pilgrim groups moving across deserts (Farrokh et al., 2021). That kind of function lines up with old guard posts like Qasr al-Hayr in the Levant - places that mixed protection duties with pushing political messages (Kennedy, 2006).

Conceptual–Ideological Dimensions

Design choices in ribats carried deep meaning. Verses from the Quran, patterned prayer alcoves, or abstract shapes expressed both faith and power. Under the Seljuks, these sites underlined Sunni beliefs - yet with the rise of the Safavids, texts stressed Twelve-Imam Shiism (Emami, 2024). Looking closely at porches or sacred corners shows how builders communicated approval from God, cohesion, or rightful rule - echoing what we see in Anatolian frontier posts (Hillenbrand, 1994).

Comparative Analysis

The ribats along the Khorasan–Kerman route display an analogous typology to those of the Levant and Anatolia, sharing a similar square or courtyard-centered plan and defensive corner towers. However, their distinctive emphasis on Safavid Shi'ite iconography and Persian regional adaptations marks them as uniquely Iranian interpretations of a wider Islamic architectural model. Still, what sets them apart is their focus on Safavid Shiite signs, since that ties back to Iran's own mix of religion and rule (Petersen, 1996, pp.34-40). Info on layout and structure - things like being spaced every 24–30 km or how they were built (Stronach & Mousavi, 2012, pp.120-150) - backs up how they fit into wider systems of control and movement.

Ribats strung along the Khorasan–Kerman path worked like hubs combining supply stops, watch duties, or spiritual signs. Their building shapes and layout show deep awareness of terrain, power signals, yet faith dominance. Looking at these sites through several angles - based on site visits, charts, or written records - revealing their critical role in shaping security networks, territorial cohesion, and spatial organization across eastern Islamic Iran.

Fourfold Analysis of Ribat Sharaf on the Khorasan–Kerman Route

4. Architectural–Functional Analysis

The architectural configuration of Ribat Sharaf demonstrates intentional design coherence that fuses functional, defensive, and symbolic principles typical of Seljuk frontier architecture. Its dual-courtyard typology an uncommon feature among Iranian ribats suggests structural evolution toward managing differentiated activities: one for travelers and supplies, another likely reserved for administrative or religious purposes. The four axial iwans, coupled with corner towers and controlled single-point entry, created a spatial hierarchy emphasizing surveillance and command, consistent with Seljuk notions of territorial safeguarding.

Material use further supports adaptive engineering in response to the desert environment. The combination of thick brick masonry with gypsum–sarooj mortar produced durable resistance against thermal fluctuation, revealing knowledge transfer from earlier Khorasan prototypes. Comparative assessment with Anatolian examples such as Sultanhan shows a convergence in typological logic fortified hospitality integrated with spiritual symbolism yet the Iranian ribat remains less monumental, suggesting streamlined functionality over representational display. Hence, Ribat Sharaf stands as an empirical model illustrating how practical defensive needs converged with ideological expression of state-sponsored protection and piety (Hasibi et al., 2024; Javadpour et al., 2024).

Spatial–Strategic Analysis

The ribat's location 136 km east of Mashhad (Fig 1), positioned 10 m above its surrounding plain and within half a kilometer of reliable water sources, reflects deliberate site selection based on spatial efficiency and visibility. GIS-based reconstructions confirm alignment with the Seljuk logistical principle of intervalled fortifications placed approximately half a day's travel apart ($\approx 25\text{--}30$ km), enabling secure and continuous movement across desert segments.

This spatial rhythm aligns with recorded crossings in Istakhri's itineraries and mirrors defensive route networks observed in western Islamic territories such as the Baghdad–Damascus corridor (Petersen, 1996, pp. 38). The correlation between topography and communication lines indicates conscious territorial planning rather than accidental placement: Ribat Sharaf acted as both a logistic anchor and a surveillance hub within a linear system of regional control. Such functional integration of geography and defense exemplifies a sophisticated early Islamic conception of “landscapes of protection,” premised on spatial redundancy and overlapping observational coverage.

Historical–Political Analysis

Constructed between 508–510 AH (c. 1114–1116 CE) under the successors of Malikshah, Ribat Sharaf emerged during a period of pronounced regional instability in eastern Khorasan, characterized by recurrent Transoxanian incursions and escalating Ismaili activities along the empire's eastern frontiers. The ribat's imposing scale and strategic positioning thus served a dual purpose: projecting Seljuk authority and bolstering regional defense.

Archaeological evidence for this interpretation includes the site's robust construction, featuring thick mudbrick and baked brick walls (1.5m wide), corner watchtowers, and a controlled single-point entry, all indicative of a fortified structure designed for defense. Excavations and surveys, notably by Javadpour et al. (2024) and the ICHTO (2019), revealed evidence of a modest but organized armed garrison, including finds of weaponry fragments and defensive architectural elements. The large water cistern and stables further attest to its role as a logistical support base for both travelers and state forces.

Textual evidence corroborates this analysis. Contemporary and near-contemporary sources, such as the geographical accounts of Istakhri and Ya'qut al-Hamawi, describe the importance of the route and the presence of fortified waystations. Later historical chronicles, including works by Karimian (2010) and Matthee (2022), contextualize the Seljuk period, highlighting the ongoing challenges posed by nomadic groups and the Ismaili state, which necessitated the consolidation of frontier defenses. These texts suggest that while Ribat Sharaf may not have housed a large standing army, its strategic presence functioned as a significant psychological deterrent, embodying Seljuk imperial power and a commitment to securing the eastern provinces.

In essence, Ribat Sharaf exemplifies the Seljuk policy of consolidating frontier security through strategically placed, multi-functional architecture that blended military defense with the projection of state authority and the provision of essential logistical support along vital trade and pilgrimage routes. This mirrors comparable strategies found in other regions, such as Qasr al-Hayr East in the Levant, where architecture served to both symbolize and enact territorial control (Kennedy, 2006).



Figure 1. Ribat Sharaf Caravanserai, located near Sarakhs in northeastern Iran, built during the Seljuk (with minor modifications; Taqipour & Kargar Samani, 2024, p. 5).

Conceptual–Ideological Analysis

The architectural vocabulary and inscriptions of Ribat Sharaf reveal how the Seljuk state merged aesthetics, faith, and authority into a coherent ideological statement. Inside the southern iwan, fragments of Qur’anic inscriptions including part of Surah Al-Imran (3:18) are rendered in monumental Kufic script emphasizing the oneness of God (tawḥīd). These texts, framed within geometric bands and star-shaped brickwork, are not purely ornamental; they manifest the doctrinal message of divine unity and legitimate rule under Sunni orthodoxy (Fig 2) (Emami, 2024, pp. 42–46).

The repeated use of eight-pointed stars, interlocking polygons, and lotus-like motifs carved into baked brick symbolized both cosmic order and dynastic endurance. Such visual syntax reinforced the Seljuk notion of divine sanction linking spatial symmetry with theological balance (Babaie & Grigor, 2015, pp. 81–95). The mihrab, oriented precisely toward Mecca and formed in carved gypsum, further asserted religious orthodoxy within the imperial domain, paralleling similar devotional emphases in Khorasan’s contemporaneous ribats.

The northern iwan, with its sharply pointed arch rising nearly 10 meters, created a sense of awe and vertical transcendence. As Emami notes, such monumental scale conveyed not only physical power but also spiritual gravitas. The interplay between elevation, inscription, and ornament thus acted as a visual discourse of legitimacy communicating both to travelers and to local populations that Seljuk authority rested on divine and political order.(Emami, 2024, pp. 47–49)

Comparatively, this ideological expression mirrors patterns observed in Anatolian ribats, such as Sultan Khan and Karatay Han, where façades combined protective geometry with epigraphic assertion (Hillenbrand, 1994, pp. 217–220). As Kennedy argues for early Islamic desert complexes, these forms served to make control visible. Hence, Ribat Sharaf can be read as both sanctuary and statement a space where art, religion, and power converged to perform Seljuk sovereignty in stone and brick(Kennedy, 2006, pp. 163–165).

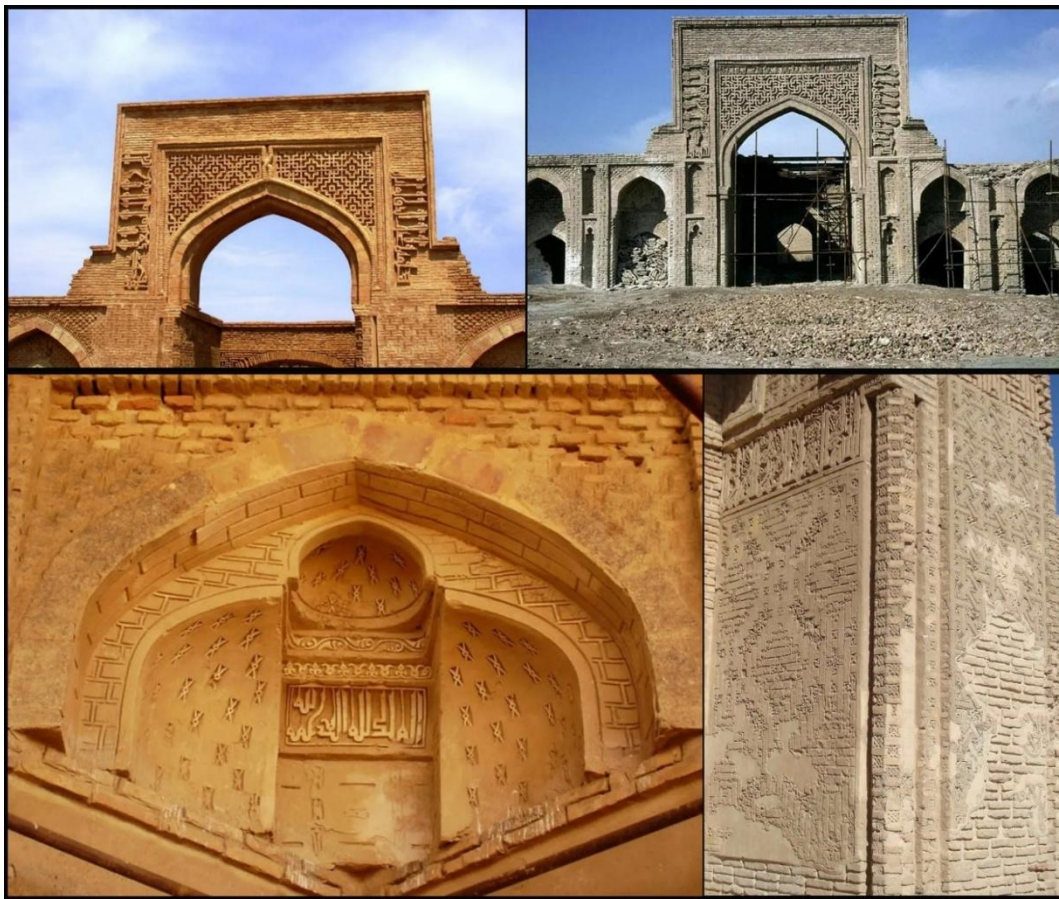


Figure 2. Brickwork and decorative motifs on the walls and iwans of Ribat Sharaf, showing Seljuk-period geometric and Kufic designs (With minor modifications; Tatari & Neyestani, 2021, p. 61).

Fourfold Analysis of Ribat Mehr on the Khorasan–Kerman Route

Architectural–Functional Analysis

The predominantly square layout of Ribat Mehr, organized around a central courtyard and featuring the classic Seljuk four-iwan configuration, signifies a standardized defensive typology adapted for frontier conditions. The opposition of iwans and the integration of rounded corner towers within the outer envelope are not merely aesthetic choices but reflect a deliberate strategic design aimed at maximizing outward surveillance and minimizing structural vulnerabilities. This enclosed, defensive form, distinct from more open caravanserais, underscores its primary function as a protected shelter and observation post rather than a mere trading hub.

The construction materials fired brick with lime-mud mortar on a stone plinth—demonstrate a practical response to the desert environment, prioritizing durability and stability against seismic activity and shifting sands, a technique honed in earlier Khorasan structures. The provision of approximately thirty chambers (each averaging 3.5×3.5 m), supplemented by dedicated storage areas, implies a capacity for housing both resident personnel and a significant number of travelers and their goods. The elevated shah-neshin on the eastern side, a feature often associated with hierarchical spatial organization in Seljuk and subsequent architecture, likely served as a command or administrative space, further differentiating functional zones within the ribat.

The presence of a centrally placed cistern (estimated 30 m^3) and a well in the northern sector, as documented by field research (Hasibi et al., 2024; Javadpour et al., 2024), highlights the critical importance of water management in sustaining operations along the arid Khorasan–Kerman route. In its synthesis of defensive massing, hierarchical spatial use, and essential logistical provisions, Ribat Mehr aligns more closely with the Seljuk–Safavid continuum of fortified caravanserais like Ribat Zeinoddin, which prioritized security and water resource management for desert crossings, rather than the more open and trade-centric Anatolian khans. This configuration thus represents a calculated adaptation of defensive architectural principles to the specific demands of long-distance desert transit and territorial control.

Spatial–Strategic Analysis

Ribat Mehr is located fifty kilometers from the Sabzevar-Tehran road, next to Mehr village (Tabesh & Arashmehr, 2015, p. 113), in the geographical coordinates $36^{\circ}17'4.29''\text{N}$ $57^{\circ}8'36.61''\text{E}$ (Fig 3). Positioned at the northern threshold of the Lut Desert, Ribat Mehr lies between Ribat Zeinoddin (≈ 27 km southeast) and Yazd (≈ 29 km northwest) along the historical Mahriz–Anarak trail. The site occupies a nodal point where three caravan arteries intersect: one linking Kharanaq to Yazd, another connecting Mahriz to Tabas, and a southern route extending from Mahriz to Sirjan. Located only about 300 m from a perennial well and partially protected by an 8 m-high natural hill, the ribat commands broad visibility across the plain, with smaller outposts documented nearby.

Field data collected between 2021–2023, together with historical cartography (Iran Cultural Heritage Organization, 2019; Istakhri, 2018; Stronach & Mousavi, 2012), demonstrate

that the site's placement was deliberate balancing accessibility, communication, and surveillance. Within the wider Khorasan–Kerman corridor, Ribat Mehr served as an intermediate desert hub, regulating caravan flow, providing supplies, and facilitating state oversight between Yazd, Kerman, and southeastern frontier zones.

Historical–Political Analysis

Founded most likely in the late sixth century AH (12th century CE) under the late Seljuks and repaired or expanded during the Safavid period, Ribat Mehr represents a hybrid stage in Iran's defensive-commercial architecture. Though lacking an inscription naming a royal patron, its sharply profiled brick patterns, pointed arches, and diamond-shaped reliefs correspond to elite Seljuk–Safavid design idioms known from Nishapur and Isfahan (Karimian, 2010; Matthee, 2022).

Functionally, the ribat acted as both a logistical node and an administrative checkpoint securing trade convoys and courier networks traversing the Lut route. During the Safavid era, state-sponsored refurbishments likely coincided with broader policies to stabilize pilgrimage and trade infrastructure across southeastern Iran. Comparable to Qasr al-Hayr East in the Syrian Desert (Kennedy, 2006, pp. 163–165), Ribat Mehr conveyed authority through spatial presence rather than military aggression, asserting the permanence of state order within an otherwise uninhabited landscape.

Conceptual–Ideological Analysis

The decorative and spatial program of Ribat Mehr reflects an aesthetic of order and containment rather than overt religiosity. Rhythmic brick diamonds, sharply pointed arches, and continuous geometric repetition establish a sense of harmony and cosmic balance a concept echoed in broader Safavid architectural thought (Emami, 2024, pp. 51–55). The main entrance opens northwest, yet an illuminated chamber on the east side, containing a shallow niche roughly aligned toward Mecca, hints at occasional devotional use without functioning as a formal mosque space.

Semiotic parallels with late-Safavid caravanserais along the Isfahan–Karbala axis suggest a symbolic reading of the site: as a place of sanctuary, stability, and divine guardianship amid the harsh desert void (Babaie & Grigor, 2015, pp. 88–94). Thus, Ribat Mehr can be interpreted as both a material refuge and a metaphoric expression of protected travel under Islamic sovereignty embodying the synthesis of security, faith, and imperial presence characteristic of the Khorasan–Kerman network.



Figure 3. Ribat Mehr Caravanserai on the Khorasan–Kerman route, showing Seljuk-Safavid architectural features (With minor modifications; Iran Cultural Heritage Organization, 2023).

Fourfold Analysis of Ribat Zeinoddin on the Yazd–Kerman Route

Architectural–Functional Analysis

Ribat Zeinoddin presents a rare circular plan, roughly 50 meters in diameter, surrounded by five semi-cylindrical towers and a main entrance oriented toward the northeast. Constructed from a combination of sun-dried and fired brick joined with lime–mud mortar, the outer walls—averaging 1.5 m in thickness—create a solid defensive perimeter. Inside, the architectural expression shifts toward simplicity: sharply pointed arches, rhythmic brick bonding, and restrained surface ornament typical of late-Safavid utilitarian design (Hasibi et al., 2024; Javadpour et al., 2024).

The complex includes approximately 25 chambers (3×3 m each) for travelers, stables for 10–15 animals, storage rooms, and a central cistern of around 40 m³ capacity. Ventilation was enhanced through wind-catchers (badgirs) and roof apertures that balanced temperature within the thick-walled enclosure. This circular geometry reduced blind corners and enabled continuous surveillance, while simultaneously embodying a symbolic sense of unity and divine order—concepts aligned with Safavid Shi‘i cosmology (Babaie & Grigor, 2015, pp. 92–94).

Typologically, the ribat corresponds to Safavid caravanserais such as Deir-e Gachin and Shah Abbas Inns along the Isfahan–Kerman route, combining practical fortification with a spiritual connotation of completeness and protection (Emami, 2024, pp. 60–63).

Spatial–Strategic Analysis

Located on the Yazd–Kerman road, Ribat Zeinoddin occupies a transitional zone between the Lut Desert and the Mahriz mountain foothills. The site lies roughly 60 km southeast of Yazd, 30 km from Kharanaq, and 25 km northwest of Ribat Mehr, marking it as a strategic midpoint on the Khorasan–Kerman trade and pilgrimage axis in the geographical coordinates 31°24'42.37"N 54°42'24.80"E (Fig 4). Only about 200 m from an active qanat and adjacent to

Fahraj village, the ribat benefitted from steady water access and a defensive elevation about 6 m above the plain, providing extensive visibility over caravan tracks.

Field documentation from 2021–2023, corroborated with early cartographic sources (Iran Cultural Heritage Organization, 2019; Istakhri, 2018; Stronach & Mousavi, 2012), confirms that the circular layout enhanced 360-degree observation and minimized construction stress on wind-exposed plains. In functional hierarchy, Zeinoddin acted as a central node in the Safavid way-station network, paralleling sites like those along the Isfahan–Shiraz route (Petersen, 1996, pp. 221–225), ensuring both the security of caravans and control of desert passageways.



Figure 4. Ribat Zeinoddin Caravanserai near Yazd, a circular Safavid-era structure along the desert road (Seyyed Hamzeh & Soltanahmadi, 2020, p. 7).

Historical–Political Analysis

Constructed circa 1020 AH / 1611 CE under the rule of Shah Abbas I, Ribat Zeinoddin stands as a distinct example of Safavid centralized planning in Iran's desert frontier. Its design emphasizes geometric perfection, order, and symmetry hallmarks of Shah Abbas's architectural ideology linking aesthetic discipline with administrative control (Matthee, 2022). While devoid of epigraphic royal inscriptions, its stylistic restraint pointed brick arches, balanced proportions, and defensive regularity projects imperial authority through function rather than ornament. As with caravanserais at Gaz and Meimand, Zeinoddin formed part of a state-run logistic chain protecting commerce, pilgrimage, and communication routes (Karimian, 2010, pp. 44–58). In

this sense, it embodied the Safavid policy of “imperial order through infrastructure,” extending Tehran-Isfahan governance deep into Iran’s arid interior.

Conceptual–Ideological Analysis

Symbolically, Ribat Zeinoddin’s circular geometry expresses both inclusiveness and divine unity, echoing cosmological models prevalent in Safavid Shi‘ism. The alignment of internal chambers toward qibla and the organization around a central void parallel metaphors of spiritual centrality and balance. The northeast-facing entrance follows the trade axis rather than liturgical orientation, indicating pragmatic design merged with sacred allusion.

Brick reliefs near the inner iwan, forming five-pointed patterns, have been interpreted as visual references to the Panj-tan the Five Holy Figures in Shi‘i devotion (Babaie & Grigor, 2015, pp. 93–94). These motifs, observed also in late-Safavid inns along the Najaf–Karbala corridor (Emami, 2024, pp. 61–62), underscore how state architecture intertwined with religious symbolism to legitimize rule. Through its form and iconography, Ribat Zeinoddin thus functioned not merely as a desert refuge but as a spatial statement of sacred kingship within Iran’s Safavid domain.

Watchtowers of the Khorasan–Kerman Route and Fourfold Analysis of Tabas Towers

General Overview of Watchtowers on the Khorasan–Kerman Route

Along the historical Khorasan–Kerman trail, a chain of watchtowers formed the defensive backbone of Iran’s eastern desert routes. These towers, often renewed under the Seljuk (11th–12th c.) and Safavid (16th–17th c.) dynasties, functioned as early warning systems for caravans and as surveillance posts over commercial and military movements. They were typically built at intervals of 4–6 km, ensuring visual continuity from one tower to the next an arrangement similar to that documented between Baghdad and Damascus (Petersen, 1996; Stronach & Mousavi, 2012).

Architecturally, most towers were circular or polygonal, measuring 4–8 m in diameter and 6–12 m in height. Constructed with mudbrick cores reinforced by fired-brick courses, bound with mud lime mortar and coated with Thatch or Kāhgel (gypsum–lime plaster), they were optimized for desert durability (Hasibi et al., 2024; Javadpour et al., 2024). Internally, spiral staircases wound upward toward open parapets, while narrow slit windows provided visibility and minimal exposure. Small recesses along the inner walls were used to store arms, lamps, or provisions.

Table 2. Structural comparison of three Ribats on the Khorasan–Kerman route.

Dimension	Ribat Sharaf	Ribat Mehr	Ribat Zeinoddin
Architectural–Functional	Rectangular plan (~5,000 m ²) with two central courtyards, forty rooms (4×4 m each), a 50 m ³ cistern, and corner towers each rising about 8 m; includes a small mosque with mihrab. Built of baked brick and gypsum mortar, designed for shelter, defense, and prayer (Hasibi et al., 2024; Javadpour et al., 2024). Typologically resembles Anatolian ribats such as Sultan Han (Hillenbrand, 1994)	Square layout with 30 rooms (3.5×3.5 m), a 30 m ³ cistern, storage and resting spaces, and a qanat-fed well ensuring continuous water supply. Combines lookout posts and a shah-neshin area for supervision. Structurally similar to Ince Minare in Anatolia (Hillenbrand, 1994)	Circular layout about 50 m in diameter, 25 rooms (3×3 m), a 40 m ³ cistern, and ventilation via rooftop windcatchers (Hasibi et al., 2024). Round geometry enhanced surveillance and reflected Safavid notions of cosmic unity (Babaie & Grigor, 2015; Emami, 2024).
Spatial–Strategic	Located on the Nishapur–Sarakhs–Merv axis, about 26–28 km from neighboring ribats, elevated 10 m above its surroundings for full-circle visibility (Stronach & Mousavi, 2012). Parallels Baghdad–Damascus ribat spacing (Petersen, 1996)	Lies where the Lut Desert margins meet the Mahriz–Anarak route, about 27–29 km from Ribat Zeinoddin and Yazd, near an 8 m-high ridge and 300 m from a permanent well (Iran Cultural Heritage Organization, 2019; Petersen, 1996). Its location ensured control over trade crossings similar to those in the Baghdad–Damascus system (Petersen, 1996)	Positioned between Yazd and Kerman, about 30 km from both Kharanaq and Mehr, 6 m above the desert plain, near qanats recorded by ICHTO (Iran Cultural Heritage Organization, 2019). Fits the Safavid pattern of way-stations every 30 km (Petersen, 1996; Stronach & Mousavi, 2012)
Historical–Political	Constructed c. 508–510 AH (1114–1116 CE) under Seljuk authority; monitored frontiers against Qarakhanid and Ismaili threats (Matthee, 2022). Comparable to Qasr al-Hayr East in function (Kennedy, 2006)	Originating late 6th century AH (c. 12th CE) and later restored under the Safavids to aid pilgrimage caravans across the Lut Desert; part of Safavid stabilization policy (Karimian, 2010; Matthee, 2022). Functionally akin to Rabba caravanserai (Kennedy, 2006)	Built around 1020 AH (1611 CE) by order of Shah Abbas I, representing Safavid administrative expansion; typologically parallel to the Gaz caravanserai (Karimian, 2010; Matthee, 2022).
Conceptual–Ideological	Qur’anic inscriptions (Surah 3:18) and eight-pointed star motifs affirm Sunni orthodoxy and Seljuk political legitimacy (Emami, 2024). Shares aesthetic and symbolic traits with Anatolian ribats (Hillenbrand, 1994).	Arabesque and geometric motifs reflect Safavid ideals of inner order and divine guidance , paralleling symbolic lodges between Najaf and Karbala (Babaie & Grigor, 2015; Emami, 2024).	Circular form and five-pointed brick motifs reference the Panj-tan (Five Holy Beings), embodying Safavid Shi’i unity and divine kingship (Babaie & Grigor, 2015; Emami, 2024).

Spatially, towers were positioned near caravanserais such as Ribat Sharaf, Ribat Mehr, and Ribat Zeinoddin, forming a linear network of defensive observation. Towers near Mehr and Zeinoddin, for instance, stood on slight natural rises about 5–8 m above the surrounding plain, ensuring full sightlines across the Mahriz–Tabas corridor. These posts collectively reveal the Safavid state’s ambition especially under Shah Abbas I (r. 1588–1629) to control not just roads but also religious and economic mobility (Matthee, 2022).

Beyond their physical function, such watchtowers embodied symbolic authority—acting as the “eyes” of the state in the desert and representing both divine order and worldly oversight in Shi‘i ideology (Babaie & Grigor, 2015).

Fourfold Analysis of Tabas Watchtowers

Architectural–Functional Analysis

The Tabas watchtowers, strategically positioned at the confluence of the Khorasan–Yazd and Khorasan–Kerman routes, represent a critical component of Iran’s eastern desert defense infrastructure. Their prevalent cylindrical or multi-faceted forms (4–6 m diameter, 6–10 m height) are not arbitrary but are optimized for ballistic defense and field of vision. The cylindrical shape, in particular, offers superior resistance to battering and wind erosion compared to rectilinear forms, while minimizing blind spots for defenders.

The construction materials sun-dried and baked bricks bonded with mud-lime mortar and coated with Thatch or Kāhgel demonstrate an ingenious adaptation to local environmental conditions, providing thermal insulation and effective resistance against wind and sand erosion, crucial for long-term structural integrity in the desert. The internal helical stairs leading to roof platforms are a functional design choice that facilitates rapid ascent for observation and defense, while the staggered arrow-slit openings are engineered to provide overlapping fields of fire and observation, achieving near 360° coverage.

Larger, square-plan towers (approx. 10 m²) with internal niches suggest a modular design approach, allowing for adaptation based on specific tactical requirements, such as providing temporary shelter for sentries or secure storage for essential equipment. This modularity enabled their integration as distributed surveillance units within a broader defensive network, complementing larger installations like Ribat Mehr and Ribat Zeinoddin.

The spatial configuration and defensive adaptations of these towers bear striking parallels with Levantine frontier posts, such as Qasr al-Hayr East (Kennedy, 2006). This suggests a transregional military architectural dialogue, where effective strategies for surveillance and defense in arid frontier zones were disseminated and adapted across diverse geographical contexts. Functionally, these towers were indispensable elements of a coordinated watch system, enabling early detection of approaching threats and ensuring the security of vital desert routes and the caravans traversing them.

Spatial–Strategic Analysis

Positioned near the convergence of the Tabas–Ferdows and Khorasan–Kerman routes, these towers commanded approaches leading to central Iran and Sistan. Their placement often 3–5 km apart and 200–300 m from palm groves or water points ensured continuous lines of sight across the northern Lut Desert. Archival maps and written itineraries (Iran Cultural Heritage Organization, 2019; Istakhri, 2018; Stronach & Mousavi, 2012) confirm their networked spatial logic, comparable to Petersen’s findings on the Baghdad–Damascus defense chain (Petersen, 1996). Tabas thereby emerged as a strategic monitoring hub linking northeastern Iran to desert transit systems farther south.

Historical–Political Analysis

Textual sources and stylistic dating suggest the Tabas towers were constructed or refurbished under the Safavids, particularly during Shah Abbas I’s reign (c. 1020 AH / 1611 CE), as part of a larger plan to stabilize pilgrimage and trade corridors. Given Tabas’s midway location between Yazd, Ferdows, and Kerman, these towers supervised nomadic activity, secured agricultural oases, and displayed central authority in peripheral landscapes (Matthee, 2022). Later Qajar-period accounts confirm their continued defensive use for protecting water systems and local borders (Javadpour et al., 2024). Comparable defensive logic appears in Ottoman frontier towers of Anatolia (Hillenbrand, 1994), underlining a shared imperial approach to desert governance.

Conceptual–Ideological Analysis

Although modest in scale, Tabas towers carried ideological resonance. Their vertical proportions rising roughly three times their width and solitary silhouettes projected an image of watchfulness and divine oversight. In Safavid thought, such elevated, enduring forms symbolized the state’s spiritual guardianship over the frontier (Babaie & Grigor, 2015). While lacking explicit inscriptions, their repetition along sacred and commercial routes echoed the symbolic geography of Shi’i pilgrimage, comparable to way-marking structures between Najaf and Karbala (Emami, 2024).

Studies on architectural semiotics (Farrokh et al., 2021) interpret these towers as physical metaphors of sovereignty and faith—asserting power through visibility, permanence, and sacred order in the landscape.

Gates in the Defensive Structure of the Khorasan–Kerman Route: An Introduction to Spatial Significance, Multifaceted Functions, and Semantics of Power

Gates on the old Khorasan–Kerman path were key parts of how Islamic-era Iranian cities protected themselves and kept watch. Rather than just openings to come in through - these structures acted as tools for safety, trade control, and showing belief systems. Built into the layout of cities, gates turned space into a stage for authority one where control and symbolism went hand in hand (Babaie & Grigor, 2015, pp. 37–52; Javadpour et al., 2024). Clues from ruins, writings, and building designs in places like Yazd, Kerman, Tabas, and Bam reveal how gates shaped city plans, guided caravans, handled traffic of people and goods, while also backing up religious political power (Emami, 2024, pp. 112–140; Khomeh et al., 2016).

In these towns, entrances usually four to six in each place were set at key spots like main crossroads, market areas, near water systems, and resting places for travelers - not just by chance but shaped by defense needs and city planning ideas (Karimian, 2010; Stronach & Mousavi, 2012). Built as layered constructions, they featured tall arched passageways standing roughly between 8 and 12 meters high, side towers around 3 to 5 meters wide, plus inner rooms where guards could stay and check people passing through. Made using sun-dried brick, baked brick, and cut stone held together by a mix of gypsum and sarooj mortar, these entry points held up well under tough desert conditions. Plenty of Quran verses appear on walls often ones meant for safety alongside detailed stucco patterns, alongside symbols tied to Shiite beliefs, especially seen under Safavid rule (Amiriazar & Anisi, 2024; Emami, 2024). A few gates were built into city fortifications - usually stretching between 2 to 5 kilometers whereas some functioned alone, connected instead to nearby ribats or roadside inns (Tahmasebizadeh & Mohammadi, 2022, p. 91).

Spatially, city gates acted as key hubs within local and wider regional systems not only managing entry to market zones, main roads, and central districts but also monitoring flows of traders, pilgrims, and caravan groups. typically located at measured distances between the outer wall and inner markets, often ranging from several hundred meters up to one kilometer (Khomeh et al., 2016). That setup mirrored gate arrangements found in places such as Damascus (Kennedy, 2006, pp. 132–150), where location choices boosted both defense monitoring and everyday social exchange.

Long ago, gates weren't just entrances - they held power. Under the Seljuks, these spots doubled as army posts or places where tolls were gathered. When the Safavids ruled around 1600s CE - Shah Abbas fixed them up, pumping in religious meaning. Names like Quran Gate or Imam Gate started popping up, tied to Shiite beliefs that backed his rule (Matthee, 2022). This pattern is comparable to Ottoman urban gates in Anatolia, where architectural form and decoration expressed a blend of political authority and religious symbolism (Hillenbrand, 1994, pp. 255–270).

Gates weren't just entrances - they played roles, showing off authority, welcome, or belonging. Instead of plain walls, they carried Quranic lines or Shiite signs, like five-pointed stars common under Safavid rule, hinting at spiritual cover, watchful government, or rightful control. Tall and balanced, their shapes shouted stability and dominance, drawing a line between city safety and open, dangerous desert (Babaie & Grigor, 2015, pp. 37–52). Looking at symbols reveals how these arches projected safety, holiness, and social stance along the Khorasan–Kerman desert route (Emami, 2024, pp. 112–140).

In short, the checkpoints along the Khorasan–Kerman path served several roles at once - blending defense design with trade use as well as cultural significance. Next up, examples from Yazd and Kerman will dig into the past, structure, and deeper meanings of these city entries, seen through the lens of traditional Iranian city planning in Islamic times.

Fourfold Analysis of Yazd Gates on the Khorasan–Kerman Route

Architectural–Functional Analysis

The seven principal gateways of Yazd -Shahi, Mahriz, Kashan, Quran, Aqda, Taft, and Amirchakhmaq (Fig 5) rose to prominence under the Safavid administration, serving as crucial nodes controlling access along the vital Khorasan–Kerman axis. Their strategic placement at major intersections, integrated within a defensive perimeter approximately four kilometers in length, underscores their role beyond mere entry points; they functioned as integrated defensive strongpoints and control points.

The imposing scale of these gateways, characterized by tall pointed arches reaching 8 to 10 meters, was architecturally designed to project authority and deter potential aggressors. Flanking lookout towers (3-4 meters wide) provided elevated vantage points for surveillance and defense, enabling the monitoring of surrounding approaches and the rapid response to threats. The adjacent small chambers (approx. 10 m²) served as functional spaces for resident guards, facilitating continuous manning and operational readiness.

The construction employing a mix of sun-dried and baked bricks with gypsum-sarooj mortar, finished with basic plaster, reflects a pragmatic approach to resource utilization and structural resilience in the arid climate, while also allowing for symbolic embellishment. The incorporation of epigraphic elements, such as verses from Surah Al-Fatiha and Al-Ikhlās (particularly at the Quran Gate) (Amiriazar & Anisi, 2024), served a dual purpose: reinforcing the religious legitimacy of the ruling power and imparting a sense of divine protection to the city (Emami, 2024, pp. 12–25; Javadpour et al., 2024).

The robust wooden doors, reinforced with metal bars, were engineered for rapid closure in times of danger, transforming the gateways into formidable barriers. This design echoes the functionality of historical gateways, such as those in Damascus (Kennedy, 2006, pp. 218–224), where entrances were not solely for security but also served as instruments of controlled passage and visible authority. In Yazd, these gates therefore operated as multi-functional structures, embodying defensive capabilities, facilitating the management of trade and movement, and symbolically asserting the power and control of the Safavid state.

Spatial–Strategic Analysis

On the east, west, and south edges - about 600 to 800 meters out from downtown - Yazd's gates served as key hubs that handled movement and business instead of just blocking entry. These openings tied inner stops like Meshir to distant ones such as Zeinoddin, located some 60 km off, creating a system blending defense with market flow (Khamseh et al., 2016; Stronach & Mousavi, 2012). Old charts plus field checks done between 2021–2023 back up their smart placement, matching patterns seen in Baghdad's secured design (Petersen, 1996), where layout control worked alongside regular trading activities (Iran Cultural Heritage Organization, 2019, pp. 17–28).

Historical–Political Analysis

Initially established as functional checkpoints for trade and military oversight during the Seljuk period, the gateways of Yazd underwent a significant transformation in their political and symbolic role under the Safavid dynasty, particularly during the reign of Shah Abbas I (c. 1000–1030 AH). This era witnessed the strategic repurposing of these structures from utilitarian access points into potent instruments of state propaganda and ideological assertion.

The Safavid integration of religious iconography, such as Shia emblems and Quranic inscriptions (notably at the Quran Gate), alongside royal decrees read publicly at sites like the Amirchakhmaq Gate, transformed these urban entrances into performative spaces for political and religious authority. This deliberate use of inscriptions and public readings served to legitimize Safavid rule, reinforce Shia identity, and project imperial power directly into the urban fabric and along critical trade arteries.

The architectural and symbolic modifications align with broader patterns observed in imperial cities across the Ottoman and Safavid realms. Similar to urban gateways in Anatolia, which often combined defensive functions with the display of Ottoman power (Hillenbrand, 1994, pp. 255–270), the Yazd gates embodied a synthesis of military control, religious endorsement, and imperial ideology. Their presence at key junctures of the eastern trade routes amplified their strategic significance, ensuring not only the physical security of passage but also the ideological dominance of the state across its domain. Thus, these gateways functioned as critical nodes in the Safavid state's project of consolidating power, managing its empire, and shaping public perception through a calculated blend of architecture, religion, and political performance (Farrokh et al., 2021).

Conceptual–Ideological Analysis

Beyond just keeping people safe, Yazd's gates acted like spiritual borders - separating town from open desert. Tall archways, half domes around five meters across, along with verses from the Quran carved right into spots like the Quran Gate, gave off vibes of safety yet openness too. Labels such as Quran or Amirchakhmaq show how religious ideas got built into public spaces, mirroring Safavid moves that tied city planning to heavenly approval (Babaie & Grigor, 2015, pp. 88–103; Emami, 2024, pp. 12–25). In meaning they echoed entrances at Najaf and Karbala (Emami, 2024), standing for where faith met daily trade - a key holy passage on the road connecting Khorasan and Kerman (Stronach & Mousavi, 2012).



Figure 5. Amir Chakhmaq Gate (Yazd), representing Safavid religious-urban architecture.

Fourfold Analysis of Kerman Gates on the Khorasan–Kerman Route

Architectural–Functional Analysis

The eight primary entrances to ancient Kerman—Gabari, Khorasan (Masjed-e Jame), Vakil, Raqabad, Arg, Sultani, and Naseri (Soleimani Roozbahani, 2020, p. 5) were not merely passages but integral components of a formidable defensive system. Integrated into a substantial

earthen rampart, approximately six to seven kilometers in circumference, these structures were strategically engineered to maximize defensive efficacy and control access to the densely populated core settlement.

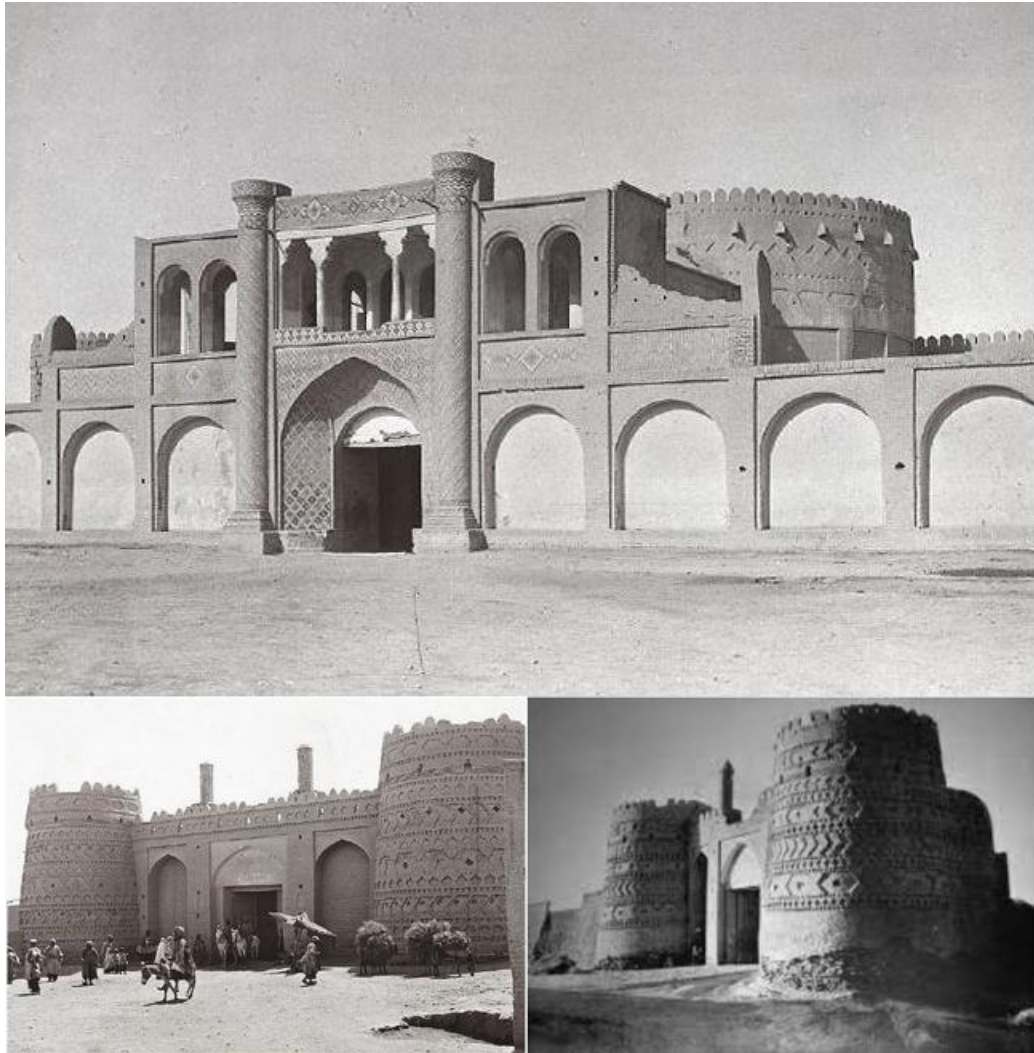


Figure 6. Kerman City Gate Naseri, Vakil and Gabari(With minor changes)(Golchin et al., 2023, p. 253; Soleimani Roozbahani, 2020).

The architectural design eschewed wide apertures in favor of soaring, pointed arches ranging from 8 to 12 meters in height. This choice was driven by defensive considerations, likely intended to channel and restrict aggressors, making them more vulnerable to flanking fire from the adjacent watchtowers. These towers, measuring 3 to 5 meters in width, featured narrow observation slits specifically designed for long-range surveillance and early threat detection.

The construction methodology, utilizing a combination of raw and fired bricks bound by a gypsum-based sarooj mortar, demonstrates a sophisticated understanding of vernacular engineering adapted to arid environments. This blend of materials provided exceptional

resistance to thermal expansion and contraction caused by extreme temperature fluctuations and low humidity, thus ensuring structural integrity over time. The deliberate austerity of the ornamentation, limited to basic angular plaster patterns, served a functional purpose: minimizing glare and maximizing visibility under harsh sunlight, a crucial factor for sentries (Amiriazar & Anisi, 2024; Javadpour et al., 2024).

A key functional innovation, particularly evident at the Gabari and Masjed-e Jame entrances, was the implementation of a dual-pathway system. A broader thoroughfare (4-6 meters) accommodated the movement of livestock and goods, while a narrower, more controlled passage (1.5-2 meters) was reserved for pedestrians. This segregation facilitated more efficient security screening, toll collection, and the management of traffic flow, reflecting a pragmatic approach to governance and logistical control. Drawing parallels with similar fortified gateways in arid-zone trading towns across eastern Iran, these Kerman entrances effectively synthesized security protocols with administrative duties, underscoring their multi-functional role in the urban defense and operational management of the city.

Spatial–Strategic Analysis

On the east, north, and south edges - about 700 to 1,000 meters out from the central market - the gates of Kerman managed who got in plus what goods moved through. These checkpoints directed trade caravans heading to Bam and Khorasan via Gabari Gate, towards Yazd using Zangiabad Gate, or off to Jiroft by way of Bardsir Gate.

Every few kilometers east of Bam, little guard posts popped up now and then - spaced roughly 3 to 5 km apart - tying the city's view to outposts like the Bam Fortress, about 70 km off. One after another, these buildings formed a step-by-step system for keeping watch and sending signals (Khomeh et al., 2016; Stronach & Mousavi, 2012).

On-the-ground surveys from 2021 to 2023 along with old documents show this layout matches Baghdad's security zones, since pathways plus strongholds helped safeguard movement while boosting commerce (Iran Cultural Heritage Organization, 2019, p. 112; Petersen, 1996).

Historical–Political Analysis

The rebuilding and embellishment of Kerman's primary entrances during the Safavid period (c. 1000–1030 AH / 1591–1621 AD) under official patronage signifies more than mere architectural renovation; it represents a deliberate strategic deployment of urban infrastructure for consolidating state and religious authority. The integration of Shia texts and royal inscriptions was not simply decorative but a performative act of ideological inscription onto the urban landscape. These modifications transformed the gates from passive structures into active agents of symbolic governance, reinforcing the Safavid project of establishing a unified Shia identity across their realm (Babaie & Grigor, 2015; Matthee, 2022).

While the Gabri Gate's proximity to former Zoroastrian quarters might suggest a dual function of surveillance and controlled integration, its prominent placement within the defensive network highlights its role in managing the symbolic and physical boundaries of a

newly re-defined religious order. Similarly, the Masjed-e Jame Gate transcended its role as a mere entry point; its evolution into a venue for public events and official pronouncements underscores its function as a civic stage for the projection of state power and communal identity. This reflects a broader Safavid strategy of co-opting urban spaces for the dissemination of royal and religious narratives.

The transition in function during the Qajar era, with a shift towards emphasizing trade control in response to Kerman's burgeoning role as a major international carpet export hub (Hasibi et al., 2024), illustrates the inherent adaptability and evolving political economy of these gateways. This shift underscores how urban entrances, beyond their initial defensive or symbolic purposes, dynamically reconfigured themselves to serve emerging socio-economic imperatives driven by global market forces.

When viewed through the lens of comparative urbanism, Kerman's gateways exhibit a similar layered complexity to their Ottoman Anatolian counterparts (Hillenbrand, 1994). However, the Kerman case offers a distinct perspective on the interplay between evolving imperial ideologies, specific regional socio-economic contexts, and the strategic repurposing of monumental architecture. Unlike purely defensive structures, these entrances in Kerman demonstrate a continuous negotiation of power—from military oversight and spiritual endorsement under the Safavids to the pragmatic management of burgeoning international trade in the Qajar period. This evolution highlights not just the changing dynamics of state control, but also the agency of urban architecture in reflecting and shaping the political and economic trajectories of the city.

Conceptual–Ideological Analysis

Beyond just doorways, Kerman's gates marked borders where city life met wild open land - each tall arch, roughly six meters across, carried holy writings that hinted at spiritual safety along with royal control (Emami, 2024).

The term 'Gabari,' coming from the Zoroastrian word Gabr, tucked a faith-based sense of place into city layouts when the Safavids reshuffled power - proof that buildings could mirror social ranking among groups. Looked at through signs and meaning, these entrances act like holy doors in Najaf and Karbala (Emami, 2024), turning entry spots into built forms that show power, devotion, yet authority. So, Kerman's gate setup worked both as a market center yet also a protected fortress, holding down its spot along the route between Khorasan and Kerman (Stronach & Mousavi, 2012).

Findings

On-site checks plus old records show the forts, watchtowers, and entry points along the Khorasan–Kerman path worked together - like parts of one network - not just stood alone. The distance between ribats - around 26 to 30 km - matches roughly a half-day's journey by camel group; meanwhile, lookout posts spaced every 3 to 7 km allowed nonstop sightline monitoring. City entrances stood about 600 to 1,000 meters out from old town centers, controlling who got in while also serving as spots where taxes were collected and people watched.

This setup connected caravan stops with water supplies like underground channels or storage tanks - usually 30–50 cubic meters in size - while also providing supply routes and protection along the route (Khomeh et al., 2016; Stronach & Mousavi, 2012). A typical case is Ribat Sharaf - spanning close to 5,000 square meters - that functioned at once as shelter, a place of worship, yet also offered protection. Standing four to six meters across, these towers could reach triple that height - perfect for spotting distant movement or sending signals from afar. Folks built big city entrances - like in Yazd or Kerman - with tall pointed arches, around 8 to 12 meters wide; these spots weren't just for show but also helped control commerce. Instead of fancy terms, they served as key checkpoints where rituals met daily business. Such observed patterns match up with distant Muslim trade paths - like the one linking Baghdad to Damascus (Petersen, 1996) - hinting at a planned approach aimed at managing movement, income oversight, along with safety. Fragments from old maps along with records kept by ICHTO - like those of Istakhri or reports from 2019 - back up how well connected this path really was. (Iran Cultural Heritage Organization, 2019; Istakhri, 2018)

Discussion

This talk looks at that layout and building styles, using power struggles and belief systems from the Seljuk era through the Safavid time as context.

1. Integrated spatial system

The even gaps between ribats, towers, and entrances suggest a plan shaped by how caravans moved - also built so lookouts could spot things fast. These setups created a working system connecting country paths with city hubs, so officials could manage things easier, pass along news quickly, or respond to threats when needed. The system ran more like a backbone for control instead of just scattered army bases.

2. Design that quietly questions who's in charge

From Seljuk into Safavid eras, building plans along with materials didn't shift much - yet ornamentation together with inscriptions saw clear changes. Early examples such as Ribat Sharaf display Kufic inscriptions with Qur'anic verses (e.g., Surah Āl-ʿImrān 18), which may have emphasized Seljuk Sunni patronage. Later on, places like Ribat Zeinoddin or the Quran Gate in Yazd started using symbols - take the five-pointed star, for instance - that might've shown growing ties to Safavid Shi'ism. These images seem to show shifting ideas about rightfulness and devotion yet keep old-style practical and protective forms intact.

3. Symbolism and interpretation

The tall watchtowers stand out just like the huge gates, which together suggest ideas about watching closely and moving through - themes seen before in Islamic fortifications from past studies (Babaie & Grigor, 2015; Emami, 2024). Still, these symbolic takes are more about interpretation instead of clear-cut inscriptions. Buildings by themselves don't prove religious goals, yet they probably helped show power and faith markers throughout the path.

4. Implications

The way space is organized, along with smooth design flow and deliberate symbolic elements, suggests seeing the Khoranas–Kerman path more like a flexible regional system. Getting water,

moving in caravans, or seeing clearly shaped how things worked - on top of that base, beliefs got added bit by bit. This mix points to a basic version of control through structures, yet movement, watching people, along with faith got tangled in a physical setup of power. Reading the passage as a linked system shifts how we see protective design - not just blocking movement but also guiding it, showing control, while shaping where people can go. Structures like Qasr al-Hayr out east or Sultan Han up in Turkey reveal how building concepts moved around Muslim regions through time. Yet the Khorasan–Kerman system, with its combination of Safavid planning principles and locally embedded Shi'i symbolism, appears to represent a uniquely Iranian synthesis of infrastructural control and religious expression one did not observe in other regional networks

Table 3. Comparative Table – Fourfold Analysis of Defensive Structures on the Khorasan–Kerman Route.

Analytical Dimension	Ribats (Caravanserais)	Watchtowers	City Gates
Architectural–Functional	Square or rectangular shape; a courtyard sits in the middle - about 5,000 m ² ; built with sun-dried or kiln-fired bricks; serves several purposes like shelter, prayer space, and keeping goods stored.	Circular shape, around 4 to 6 meters across, stands 6 to 12 meters tall; built from mudbrick; has narrow windows instead of wide ones; features a winding staircase inside; meant for watching over the area.	Sharp-arched openings, roughly 8 to 12 meters wide; two separate access points - one sized 4 to 6 meters for cargo, another just 1.5 to 2 meters for foot traffic; fortified turrets along with narrow vertical openings; served duties tied to levies and oversight.
Spatial–Strategic	Found every 26–30 km close to water spots like qanats or cisterns; these spots linked up pilgrimage paths with trade trails.	Parked every few kays atop hills, these spots linked up to keep an eye on things nearby.	Situated 600 to 1,000 meters outside urban hubs, these spots managed vehicle movement while connecting directly to military outposts and pathways.
Historical–Political	Built during Seljuk rule; later used again when Safavids added Shiite writings - like at Zeinoddin Ribat.	Mainly from the Safavid to Qajar era; showed how authorities kept watch.	Reworked during the Safavid era - served royal ceremonies, managed faith practices, also handled trade.
Conceptual–Ideological	A sign of holy welcome; mirrors how Sunni and Shiite design shifted through time.	A living sign of constant watchfulness; quiet protectors of holy arid lands.	Marked holy limits; also strengthened faith-based authority roles - like at Quran Gate or Gabari Gate.

Conclusion

This research investigated fortifications found on the Khorasan–Kerman path - things like ribats, lookout towers, or urban entrances serving as linked means to manage territory while spreading certain beliefs. This research uses four angles, design and purpose, layout and planning, past events and power shifts, or even ideas and beliefs, to show these buildings didn't stand alone; instead, they worked together within a linked land network.

Results point out three key trends; for starters, buildings were spaced by set distances - ribats about 26 to 30 kilometers apart, lookout towers every 3 to 7 clicks, while city entrances sat some 600 to 1,000 meters beyond town edges. Field checks backed up by map tech show this layout wasn't random; it was meant to handle safety, control commerce, and keep messages moving between local paths and central power hubs. Next up, how these buildings looked on the outside - and what they stood for - might've shifted along with changes in power and belief, moving from Seljuk Sunnism (think Kufic script at Ribat Sharaf around 1115) toward Safavid Shia signs (like five-pointed stars seen at Ribat Zeinoddin or Yazd's Quran Gate). Even though the symbols changed, the look stayed kind of similar, showing that leaders used design to reflect new ideas about rule without ditching trusted fortress shapes. Third, these structures worked together like parts of a system - ribats, towers, gates - each doing its own job yet fitting into a bigger picture. Instead of acting alone, they supported one another, keeping watch, moving goods, marking sacred routines. One without the others wouldn't have made sense. Together, they shaped how land was controlled through watching, transporting, and shared meanings.

Limitations

Even with lots of on-site info and documents, the research hit roadblocks - patchy dig findings for minor watchtowers, scarce layer-by-layer digging results, besides missing exact build times at multiple Safavid locations. On top of that, certain interpretations lean more on theory than hard evidence from inscriptions; checking them will depend heavily on upcoming findings from artifact studies and written records.

Future Directions

Future research could build on these findings in several key directions. Rather than assuming direct linear connections, GIS-based cost-distance modeling could be used to reconstruct probable travel corridors between defensive sites, factoring in terrain difficulty and movement costs. Archaeometric analyses of bricks and wall plasters—applying material science techniques—would refine site chronologies by dating the construction materials themselves. A multi-method comparison of inscriptions with documentary sources could reveal how decorative texts were tied to specific religious communities or ruling dynasties. By integrating architectural evidence, spatial analysis, and ideological frameworks, this study offers a replicable approach for examining Islamic-era fortifications. In this light, the Khorasan–Kerman defensive network appears not as a linear chain of ancient walls but as a landscape deeply imprinted by power and belief, whose physical remnants continue to shape patterns of habitation and movement across eastern Iran.

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Appendix A – List of Studied Sites and Data Sources

No	Site name	type	Data Source	Period (CE)	Reference
1	Ribat Sharaf (near Sarakhs)	Ribat / caravanserai	Textual, map-based, architectural report	12th c. (Seljuk)	(Petersen, 2002; Stronach & Mousavi, 2012)
2	Ribat Mehr (Yazd–Tabas corridor)	Ribat / caravanserai	Textual, restoration records	12th–17th c. (Seljuk–Safavid)	(Hasibi et al., 2024; Javadpour et al., 2024)
3	Ribat Zeinoddin (Yazd–Kerman route)	Ribat / caravanserai	Archival photographs, published restoration report	16th–17th c. (Safavid)	(Babaie & Grigor, 2015; Emami, 2024)
4	Tabas Watchtowers	Watchtower network	Textual, topographic maps	16th–19th c. (Safavid–Qajar)	(Matthee, 2022; Stronach & Mousavi, 2012)
5	yazd City Gates (e.g., Quran Gate)	City gates	Historical texts, maps, photos	16th–17th c. (Safavid)	(Emami, 2024; Khameh et al., 2016)
6	Kerman City Gates (e.g., Gabari Gate)	City gates	Archival descriptions, published sources	16th–19th c. (Safavid–Qajar)	(Karimian, 2010; Tahmasebizadeh & Mohammadi, 2022)