

EXECUTIVE SUMMARY & OVERALL RISK VERDICT

SITE UNDER ANALYSIS

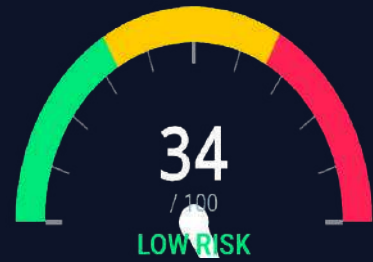
[Redacted Site Name]

Project: Commercial Development

Coordinates: [Redacted Coordinates]

Generated: 1/5/2026, 6:34:25 pm

Data: Open-Meteo ERA5 USGS Open-Elevation OpenStreetMap/Nominatim



ALGORITHMIC RISK ASSESSMENT:

Statistical probability from public satellite archives (NASA/ESA/USGS) not field-verified measurements.

QUICK RISK INSIGHTS

FLOOD RISK

LOW

Return period: >15 years  
4 extreme rain days / 10 yrs

SEISMIC ZONE

Zone III

IS 1893-2016 Classification  
Moderate Risk

ELEVATION ASL

215m

Slope: 0.36  
River: LOW proximity

OVERALL RISK VERDICT

Low Risk Probability Relatively Safer Location

Analysis indicates lower risk probability. Risk Score: 34/100. Standard construction with full local building code compliance recommended.

KEY RISK INDICATOR TILES SATELLITE-DERIVED DATA

FLOOD PROBABILITY

LOW RISK

ELEVATION & SLOPE

215m ASL

SEISMIC RISK ZONE

IS Zone III

SOIL & VEGETATION

Deep Alluvial

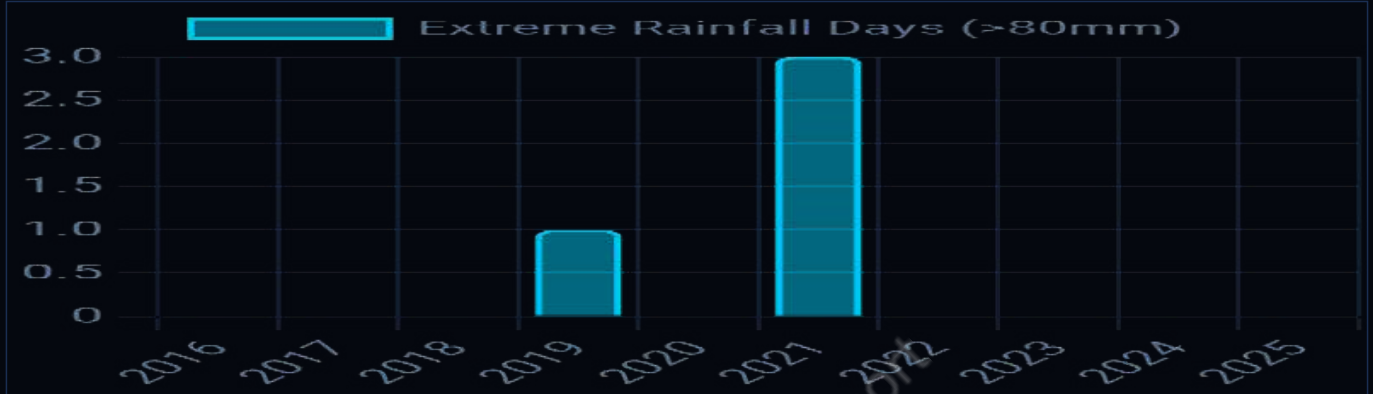
10-YEAR HISTORICAL ANALYSIS PRECIPITATION & SEISMIC DATA

PROJECT: COMMERCIAL RISK: LOW (34/100)

ANNUAL EXTREME RAINFALL DAYS 10-YEAR ARCHIVE (Open-Meteo ERA5)

Days per year with precipitation >80mm/day (severe flood threshold)

Total extreme days (10yr): 4 Risk: LOW Return period: >15 years Avg annual precip: 766mm



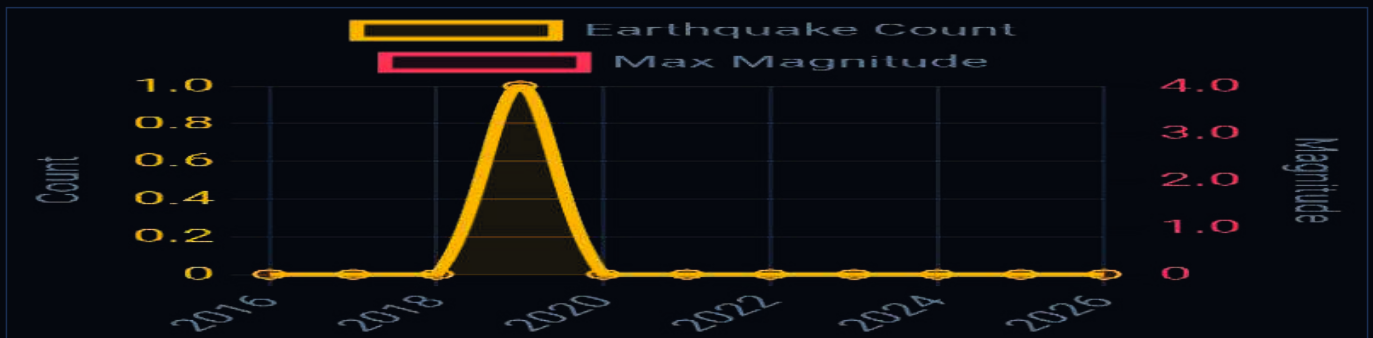
EXTREME PRECIPITATION EVENT LOG ERA5 ARCHIVE

Year	Event Type	Description	Days	Severity	Source
2025	No Major Flood Events	No significant extreme rainfall	days	NONE	Open-Meteo ERA5 Ar

SEISMIC ACTIVITY USGS DATA (LAST 10 YEARS, 100km RADIUS)

Magnitude 3 Source: USGS FDSNWS API

Total events: 1 Max magnitude: M 4.0 Zone: IS 1893-2016 Zone III



EARTHQUAKE EVENT LOG (USGS VERIFIED)

Date	Mag	Depth	Location (USGS)	Dist	Level
16/3/2019	M 4.0	10km	13 km W of Govindgarh, India		MODERATE

LAND USE HISTORY & PROXIMITY ANALYSIS

PREMIUM INTELLIGENCE MODULE SATELLITE-DERIVED LAND HISTORY NDVI & PRECIPITATION PROXY ANALYSIS

LAND USE HISTORY NDVI & PRECIPITATION PROXY (NASA ERA5 INTERPRETATION)

Historical land-use characteristics inferred from 10-year NDVI proxy, soil classification, and precipitation patterns.

Note: Direct satellite imagery requires ESA/NASA API subscription. These classifications are algorithmically derived from public data.

10+ yrs ago

Confidence: Medium

LAND USE: Dry Land / Sparse Vegetation

MEDIUM

Low NDVI suggests semi-arid, degraded, or already developed land

Recent (510 yrs)

Confidence: High

LAND USE: Stable / Developed Land

HIGH

Low flood history suggests stable land not prone to seasonal inundation

Geological

Confidence: High

LAND USE: River Deposit / Sedimentary Plain

HIGH

Alluvial soil confirms ancient riverbed or floodplain deposit — common in Indo-Gangetic belt

LAND CONDITION INDICATORS DERIVED FROM SATELLITE PROXIES

Vegetation Density (NDVI)

26%

Sparse vegetation — monitor soil erosion

Annual Water Stress

766mm/yr

Low rainfall — drought-resistant construction advised

Extreme Weather Days

4 days / 10yr

Low severe weather frequency — stable climatic conditions

Terrain Stability

0.36 slope

Near-flat terrain — excellent buildability but poor drainage

PROXIMITY ANALYSIS DISTANCE TO CRITICAL GEOGRAPHIC FEATURES

Distance estimates derived from elevation profile, seismic zone classification, and coordinate analysis.

DECADAL CLIMATE COMPARISON & LONG-TERM CHANGE ANALYSIS

PREMIUM INTELLIGENCE MODULE ERA5 ARCHIVE DECADAL SPLIT HISTORICAL TREND ANALYSIS

ARCHIVE PERIOD vs PERIOD COMPARISON (ERA5 Reanalysis)

Earlier archive half vs recent archive half. Open-Meteo ERA5 data. Longer historical span requires extended API subscription.

2016-2020

Avg Annual Rainfall:

**656mm/yr**

Seismic events:

**0 total**

Extreme Rain Days/yr:

**1 days/yr**

Max magnitude:

**N/A**

2021-2025

Avg Annual Rainfall:

**875mm/yr**

Seismic events:

**0 total**

Extreme Rain Days/yr:

**3 days/yr**

Max magnitude:

**N/A**

OBSERVED CHANGES BETWEEN PERIODS

Rainfall Change

**+219mm/yr**

Increasing trend (+219mm). Higher monsoon intensity may elevate flood exposure.

Extreme Rain Days

**+2.0 days/yr**

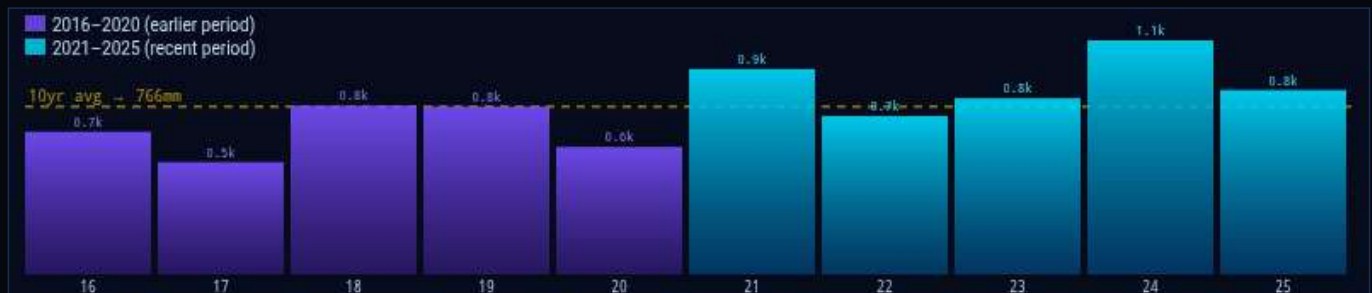
Stable extreme weather frequency. No escalation pattern detected.

Seismic Frequency

**0 vs 0 events**

Comparable seismic activity. Zone III structural code applies.

YEAR-BY-YEAR ANNUAL RAINFALL ARCHIVE (ERA5, All Available Years)



CLIMATE CONTEXT & INTERPRETATION

Annual rainfall has increased by approximately 219mm between the earlier and recent archive periods. While this may reflect natural inter-decadal variability, a sustained increase raises flood and waterlogging exposure.

IMPORTANT CAVEAT: ERA5 reanalysis data covers the available ~10-year archive window only. True multi-decade analysis (e.g. 1990–2025) requires extended ERA5 subscription data from Copernicus Climate Data Store. These findings are indicative trend signals, not absolute historical records.

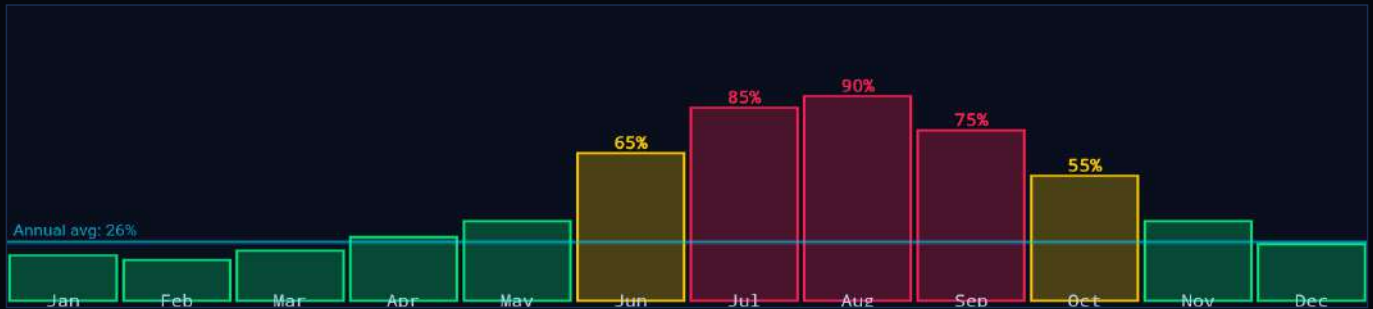
SOIL MOISTURE ANALYSIS & 5-YEAR TREND PROJECTION

PREMIUM INTELLIGENCE MODULE SEASONAL MOISTURE PROFILE HISTORICAL TREND PROJECTION

ESTIMATED SOIL MOISTURE 12-MONTH SEASONAL PROFILE

Monthly soil moisture estimated from regional precipitation patterns and NDVI proxy. Reflects seasonal wetness cycle.

Higher values during monsoon = waterlogging risk. Values >70% indicate saturation risk for foundations.



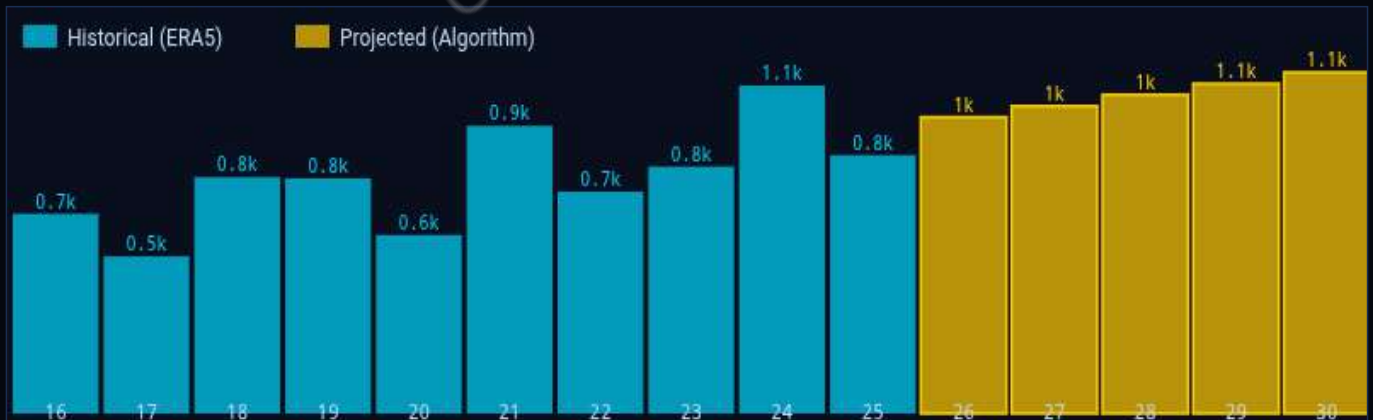
MOISTURE INTERPRETATION:

Annual moisture index 26% Classification: LOW MOISTURE ZONE

5-YEAR RAINFALL TREND PROJECTION ALGORITHMIC LINEAR REGRESSION

Historical Trend Projection using linear regression on 10-year Open-Meteo ERA5 archive. Not a meteorological forecast.

TREND DIRECTION: STABLE Annual change: +36mm/yr Rate: +5.6% per year



PROJECTED ANNUAL RAINFALL 5-YEAR OUTLOOK TABLE

Year	Projected Rainfall	vs Last Year	Trend	Confidence	Risk Implication
2026	966mm	+124mm	STABLE	High	Low risk
2027	1002mm	+36mm	STABLE	High	Low risk
2028	1039mm	+37mm	STABLE	Medium	Low risk

ENGINEERING RECOMMENDATIONS & CONSTRUCTION GUIDELINES

SITE: [REDACTED] PROJECT: COMMERCIAL RISK SCORE: 34/100 DATE: 1 May 2026

ENGINEERING RECOMMENDATIONS COMMERCIAL PROJECT

1

**Elevated Ground Floor**

Commercial floor area minimum 1.5m above natural ground level. Flood barrier-ready entrance design. Lobby and basement areas require waterproof tanking.

2

**Critical Systems Placement**

Electrical panels, server rooms, and HVAC systems must be on first floor or above — never at basement or ground level in flood-probability zones.

3

**Structural Compliance**

Zone-appropriate seismic detailing for all RCC structures. Regular structural health monitoring recommended for commercial assets in high-risk zones.

4

**Legal & Insurance**

Obtain Flood Zone NOC from local authority. Commercial property flood insurance mandatory. Disclose risk probability to tenants as part of lease agreements.

GeoLens Sample Report

**SITE-SPECIFIC RISK WARNINGS BASED ON DATA ANALYSIS****NO CRITICAL WARNINGS FOR THIS SITE**

Based on available satellite data, no extreme risk flags detected. Standard construction with local code compliance is recommended.

**PRE-CONSTRUCTION PROFESSIONAL CONSULTATION CHECKLIST**

- Licensed Geotechnical Engineer soil bearing capacity test
- Structural Engineer foundation design as per IS:1893 seismic zone
- District Land Records Office title verification, encumbrance certificate
- Flood NOC from District Disaster Management Authority (DDMA)
- Environmental clearance (if site >20,000 sqm or near water body)
- Local Municipality building plan approval and setback confirmation
- Electrical & HVAC consultant panel elevation above flood level
- Drainage engineer stormwater management plan for monsoon season

GeoLens Sample Report

VERIFIED DATA SOURCES, TECHNICAL GLOSSARY & LEGAL DISCLAIMER

VERIFIED DATA SOURCES USED IN THIS REPORT

Parameter	Provider & URL	Dataset	Accuracy
Weather & Flood	Open-Meteo (open-meteo.com)	ERA5 Reanalysis Archive 10yr	5% precipitation
Elevation & Terrain	Open-Elevation / NASA SRTM	30m DEM (USGS-distributed)	10m vertical
Earthquake Catalog	USGS FDSNWS API	Real-time verified catalog	M0.1 magnitude
Seismic Zone	BIS IS 1893-2016 / USGS	Bureau of Indian Standards	Zone 1 boundary
Address Geocoding	OpenStreetMap / Nominatim	CC-BY-SA license	<100m accuracy
Satellite Reference	NASA Landsat ESA Sentinel	Public domain archives	30m spatial res
NDVI Proxy	Open-Meteo ET0 + Precip	Vegetation-precipitation proxy	Statistical estimate

TECHNICAL GLOSSARY UNDERSTANDING YOUR REPORT

**ERA5 Reanalysis**

ECMWF/Copernicus 5th generation global climate reanalysis — combines model data with observations for 1940-present. Used for precipitation and temperature history.

**NDVI (Normalized Difference Vegetation Index)**

Satellite-derived measure of vegetation density (-1 to +1). Used as proxy for soil moisture, land use, and water stress/vegetation/wet soil.

**IS 1893:2016 Seismic Zone**

Bureau of Indian Standards classification of earthquake hazard in India. Zone II = Low, III = Moderate, IV = High, V = Very High (highest risk). Governs structural design requirements.

**SRTM (Shuttle Radar Topography Mission)**

NASA's global digital elevation model at 30m resolution. Used to determine site elevation above sea level and terrain slope for drainage and flood risk assessment.

**Extreme Rainfall Day**

A day with precipitation exceeding 80mm — India Meteorological Department (IMD) threshold for "Very Heavy Rainfall." More than 15 such days per year indicates high flood exposure.

**Return Period**

Statistical probability of a flood event recurring. A "1-in-10 year" event has 10% annual probability. Lower return period = more frequent severe floods.