EXECUTIVE SUMMARY & OVERALL RISK VERDICT

SITE UNDER ANALYSIS

Location hidden for privacy

Project: Commercial Development

Coordinates: Coordinates hidden for privacy

Generated: 14 Nov 2026, 10:31 am

Data: Open-Meteo ERA5 · USGS · Open-Elevation · OpenStreetMap/Nominatim | Standard: Bureau of Indian Standards (BIS)



ALGORITHMIC RISK ASSESSMENT:

Statistical probability from public datasets (Open-Meteo, USGS, Open-Elevation) - not field-verified measurements.

QUICK RISK INSIGHTS

FLOOD / HEAVY-RAIN RISK	SEISMIC ZONE	ELEVATION ASL
HIGH	Zone V	1443.6m
80mm+ rain in 9 of 10 years	IS 1893:2016 (regional approx.)	Slope: 15.1°
83 days over 80mm / 10 yrs	Very High Damage Risk	Terrain: Steep

OVERALL RISK VERDICT

High Risk Probability Detected - Significant Risk Indicators Found

Composite analysis of public datasets shows HIGH risk probability (76/100). Main drivers: Very High seismic hazard; High heavy-rain/flood indicator; Steep terrain (15.1°). On-site geotechnical investigation and specialist engineering input are essential before any commitment. Note: river flooding (Brahmaputra / Barak basins) is not captured by rainfall data - check State Disaster Management Authority flood-prone-area records.

KEY RISK INDICATOR TILES - PUBLIC-DATASET DERIVED

FLOOD / HEAVY RAIN	ELEVATION & SLOPE	SEISMIC RISK ZONE	SOIL & MOISTURE
HIGH RISK	1443.6m ASL	Zone V	Mountain / Rocky
83 days over 80mm / 10yr	Slope: 15.1°	IS 1893:2016 (regional approx.)	Rain-moisture index: 0.85
Annual avg: 4416mm	SRTM-based DEM	Very High Damage	High rainfall
ERA5 rain-day screen - not a flood model	Open-Elevation (SRTM)	BIS IS 1893 / USGS	Regional class + ERA5 rainfall

SAMPLE REPORT

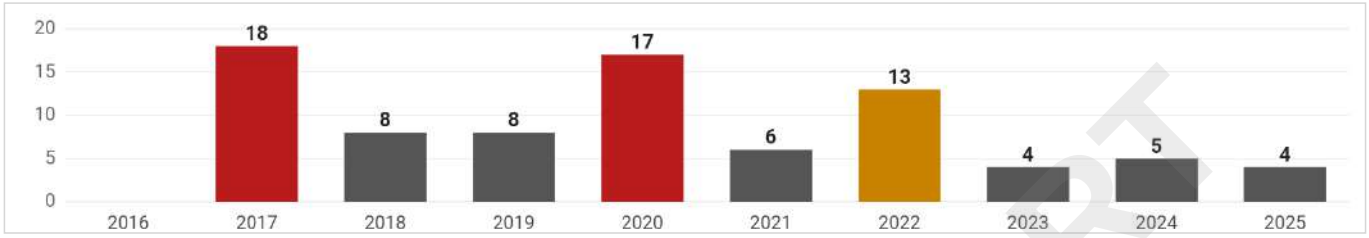
10-YEAR HISTORICAL ANALYSIS - PRECIPITATION & SEISMIC DATA

SITE: · PROJECT: COMMERCIAL · RISK: HIGH (76/100)

HEAVY-RAIN DAYS PER YEAR - 10-YEAR ARCHIVE (Open-Meteo ERA5)

Days per year with precipitation >80mm/day. A screening indicator on a ~25 km grid, not a flood model.

Total days over 80mm (10yr): 83 · Level: HIGH · Years affected: 9 of 10 · Avg annual precip: 4416mm



HEAVY-RAIN EVENT LOG - ERA5 ARCHIVE

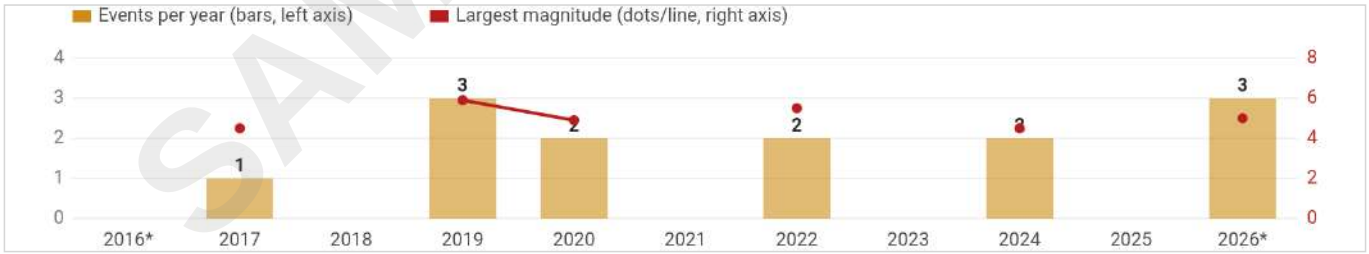
Year	Event Type	Description	Days	Severity	Source
2017	Major Heavy-Rain Season	18 days over 80 mm. Peak: 211.1 mm/day.	18 days	SEVERE	Open-Meteo ERA5
2020	Major Heavy-Rain Season	17 days over 80 mm. Peak: 182.8 mm/day.	17 days	SEVERE	Open-Meteo ERA5
2022	Major Heavy-Rain Season	13 days over 80 mm. Peak: 235.4 mm/day.	13 days	SEVERE	Open-Meteo ERA5
2019	Elevated Rainfall Event	8 days over 80 mm. Peak: 206.8 mm/day.	8 days	SEVERE	Open-Meteo ERA5
2018	Elevated Rainfall Event	8 days over 80 mm. Peak: 119.1 mm/day.	8 days	MODERATE	Open-Meteo ERA5

Showing the 5 years with the most heavy-rain days (9 of 10 years had at least one).

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

Magnitude 3.0+ · Source: USGS FDSNWS API · 13 events (all returned by USGS, not capped)

Total events: 13 · M4+: 13 · Max magnitude: M 5.9 · Zone: IS 1893 Zone V



* first and last year are partial years. USGS under-records small quakes (below about M4) in many regions.

LARGEST EARTHQUAKES - USGS CATALOGUE (5 OF 13 SHOWN)

Date	Mag	Depth	Location (USGS)	Dist	Level
2019-04-23	M 5.9	14km		47 km	MODERATE
2022-11-10	M 5.5	15km		61 km	MODERATE
2026-08-05	M 5.0	10km		62 km	MODERATE
2020-02-01	M 4.9	10km		88 km	LIGHT
2026-08-06	M 4.8	10km		68 km	LIGHT

Table lists individual events. The seismic level groups aftershocks with their mainshock, so it is not a simple event count.

SAMPLE REPORT

PREMIUM INTELLIGENCE MODULE · RAINFALL-BASED CLIMATE INDICATIONS

CLIMATE-BASED INDICATIONS - RAINFALL PROXY (ERA5 INTERPRETATION)

Indications inferred from 10-year rainfall patterns and (India only) a regional soil class. No land records or imagery are used.

Note: these are climate-based estimates, not measured from satellite images or land records.

Climate indication

Wet climate - dense vegetation likely

Very high annual rainfall (4416 mm) normally supports forest or dense vegetation. Not verified from imagery.

Confidence

MEDIUM

Heavy-rain history

Repeated heavy-rain seasons in the 10-year record

Many days over 80 mm were recorded; check local flood maps and drainage history on site.

Confidence

MEDIUM

Regional soil class

Mountain / Rocky

Indicative regional class from location only - not a soil test. A geotechnical investigation is required.

Confidence

LOW

SITE CONDITIONS, AIR QUALITY & REGULATORY FLAGS

HEAT STRESS

LOW

Avg max 19.6°C, peak 31.1°C. Manageable range - standard thermal design and IS 456:2000 cover depth apply.

COLD STRESS

LOW

Coldest recorded -1.8°C (avg min 11.6°C). No extreme-cold indicators in the 10-year record.

AIR QUALITY (INDICATIVE)

NOT ASSESSED

No air-quality sensor data used. For schools, hospitals or industrial projects obtain live readings from the local air-quality authority.

DATA AVAILABILITY 90%

All primary data sources responded. This shows data availability only, not accuracy; outputs remain statistical estimates.

REGULATORY & LEGAL FLAGS

! Seismic compliance advisory per IS 1893:2016 - earthquake-resistant construction strongly recommended

! High heavy-rain/flood indicator - Flood Zone NOC from DDMA strongly recommended before construction

! Steep terrain (slope 15.1°) - slope-stability / landslide assessment advisable before design

- North-East India: river flooding (Brahmaputra / Barak basins) is not captured by rainfall data - check State Disaster Management Authority flood-prone-area records and local flood history

SAMPLE REPORT

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 half vs recent half of the 10-year ERA5 archive. Differences between two 5-year averages are often within natural variability.

2016-2020

Avg Annual Rainfall: **4918mm/yr**

Days over 80mm per yr: **10.2 days/yr**

Earthquakes (M3+, same years): **6 events**

Max magnitude: **M 5.9**

2021-2025

Avg Annual Rainfall: **3915mm/yr**

Days over 80mm per yr: **6.4 days/yr**

Earthquakes (M3+, same years): **4 events**

Max magnitude: **M 5.5**

OBSERVED CHANGES BETWEEN PERIODS

Rainfall (period averages)

-1003mm (-20.4%)

Yearly totals here swing by about 24%, more than this gap - not a clear shift.

Days over 80mm

-3.8 days/yr

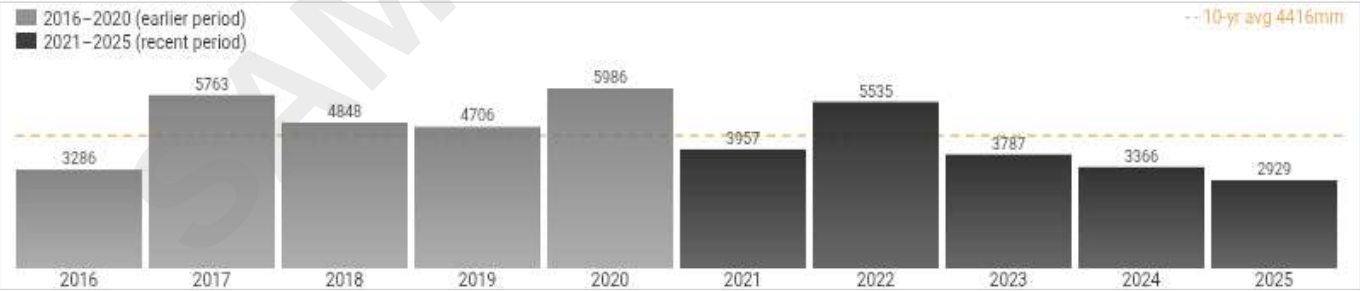
Fewer heavy-rain days recently, but a 10-year record is short and noisy - do not assume this will continue.

Earthquake counts

6 vs 4 events

Too few events to compare the periods meaningfully.

YEAR-BY-YEAR ANNUAL RAINFALL ARCHIVE (ERA5, mm per year)



CLIMATE CONTEXT & INTERPRETATION

Rainfall differs by 20.4% between the two halves of the archive; yearly totals at this site vary by about 24%, so this is within normal variability. Baseline design assumptions remain reasonable.

IMPORTANT CAVEAT: this comparison uses only the ~10-year ERA5 window available to this report. True multi-decade climate analysis (30+ years) needs longer records. These are indicative signals, not historical facts. For investment-grade decisions obtain local meteorological station data for 30+ years.

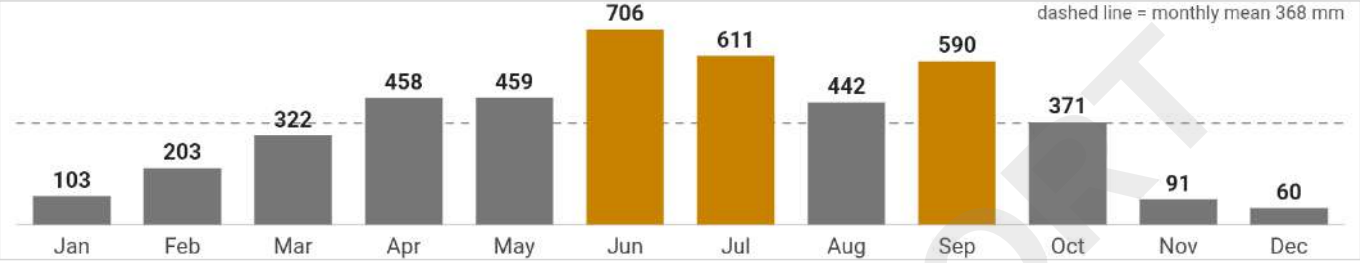
SAMPLE REPORT

PREMIUM INTELLIGENCE MODULE · SEASONAL MOISTURE PROFILE · HISTORICAL TREND PROJECTION

MONTHLY RAINFALL PROFILE - 10-YEAR AVERAGE (ERA5)

Average rainfall for each calendar month, from the same 10-year ERA5 archive. Shows the wet and dry seasons.

Highlighted months receive at least 50 mm and well above the monthly average - expect waterlogging/drainage demand then.



RAINFALL INTERPRETATION:

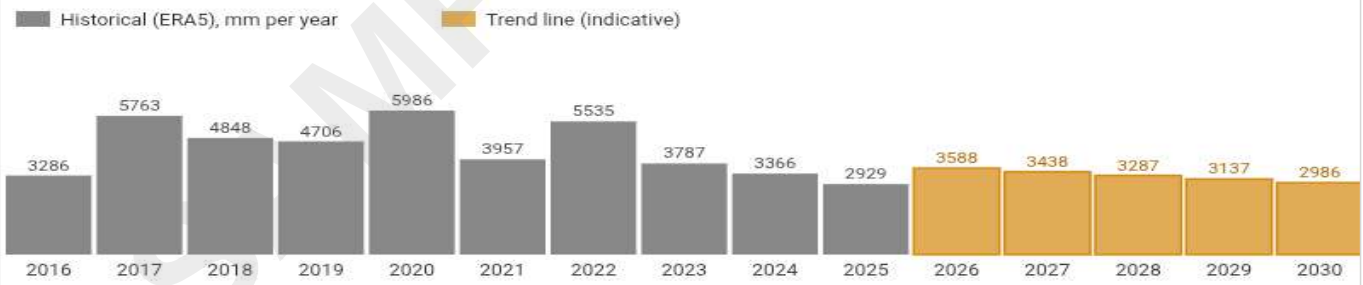
Annual rainfall: 4416 mm · Class: HIGH RAINFALL ZONE · Wettest 3 consecutive months: May-Jul (40% of annual rainfall).

Wet climate: groundwater and surface-water management need attention. A geotechnical investigation should confirm the foundation type; waterproof all below-grade elements.

5-YEAR RAINFALL TREND PROJECTION - ALGORITHMIC LINEAR REGRESSION

Straight-line fit on the 10-year Open-Meteo ERA5 archive. Not a meteorological forecast; year-to-year rainfall is highly variable, so reliability is low.

TREND DIRECTION: NO CLEAR TREND · Annual change: -151mm/yr · Rate: -3.4% per year · Fit R2: 0.17



INDICATIVE TREND-LINE VALUES - NOT A FORECAST (WEAK FIT, R2 0.17)

Year	Trend-line Rainfall	vs Previous	Trend	Reliability	Rainfall class
2026	**3588mm**	+659mm	NO CLEAR TREND	Low	**High rainfall**
2027	**3438mm**	-150mm	NO CLEAR TREND	Low	**High rainfall**
2028	**3287mm**	-151mm	NO CLEAR TREND	Low	**High rainfall**
2029	**3137mm**	-150mm	NO CLEAR TREND	Low	**High rainfall**
2030	**2986mm**	-151mm	NO CLEAR TREND	Low	**High rainfall**

SAMPLE REPORT

ENGINEERING RECOMMENDATIONS & CONSTRUCTION GUIDELINES

SITE: · PROJECT: COMMERCIAL · RISK SCORE: 76/100 · DATE: 14 November 2026

ENGINEERING RECOMMENDATIONS - COMMERCIAL PROJECT

1

Ground Floor & Drainage

High heavy-rain indicator (83 days over 80 mm in 10 years). Raise plinth/floor about 1.5-2.0 m above natural ground, add perimeter drainage and flood-proof openings; check the local flood map.

2

Critical Systems Placement

Electrical panels, server rooms and HVAC must be on an upper floor above the expected flood level - not at basement or ground level.

3

Structural Compliance

Design to IS 1893:2016 Zone V with ductile detailing per IS 13920; unreinforced masonry is not advised.

4

Legal & Insurance

Confirm flood-hazard status with District Disaster Management Authority (DDMA). Flood and earthquake insurance is strongly recommended. Disclose known risk to tenants in lease agreements.

SITE-SPECIFIC RISK WARNINGS BASED ON DATA ANALYSIS

! HIGH HEAVY-RAIN / FLOOD INDICATOR

83 days over 80mm in 10 years (9 years affected). Raise the plinth, provide flood barriers and consult a drainage engineer.

! SEISMIC ZONE V - MAXIMUM HAZARD

IS 1893 Zone V requires full earthquake-resistant design with ductile detailing per IS 13920. No column/beam shortcuts.

! STEEP TERRAIN - SLOPE STABILITY

Estimated slope 15.1 deg. A slope-stability / landslide assessment and retaining design are advisable before construction.

! VERY WET CLIMATE - FOUNDATION & DRAINAGE

Average rainfall 4416mm/yr. A geotechnical investigation including groundwater level is mandatory before foundation design.

SAMPLE REPORT

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TEMPERATURE EXTREMES & CLIMATE PROFILE (10-YEAR RECORD)

Average Daily Max

19.6°C

Annual average of daily maximum temperatures

Average Daily Min

11.6°C

Annual average of daily minimum temperatures

Recorded Maximum

31.1°C

Absolute hottest day in 10-year archive

Recorded Minimum

-1.8°C

Absolute coldest day in 10-year archive

Avg Wind Speed

5.4 km/h

10-year average of daily max wind speed

Peak Wind Speed

11.2 km/h

Highest recorded wind speed in 10-year archive

HEAT STRESS RISK

LOW - avg max 19.6°C, peak 31.1°C

Standard thermal design applies.

STEEL CORROSION RISK

MODERATE - Avg max 19.6°C, rain 4416mm/yr

Use the code-minimum concrete cover for the exposure class and protect structural steel with anti-corrosion primer.

PRE-CONSTRUCTION PROFESSIONAL CONSULTATION CHECKLIST

- [ ] Licensed Geotechnical Engineer - soil investigation and bearing capacity
- [ ] Structural Engineer - foundation and seismic design per IS 1893 / IS 13920
- [ ] District Land Records Office - title verification, encumbrance certificate
- [ ] Flood NOC / hazard status from District Disaster Management Authority (DDMA)
- [ ] Local municipality - building plan approval and setback confirmation
- [ ] Environmental clearance (EIA Notification 2006 applies if built-up area >= 20,000 sqm)
- [ ] Electrical & HVAC consultant - panel elevation above expected flood level
- [ ] Drainage engineer - stormwater management plan for the wet season

USER ACKNOWLEDGEMENT

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SAMPLE REPORT

DATA SOURCES USED IN THIS REPORT

Parameter	Provider	Dataset	Resolution / note
Weather & Rainfall	Open-Meteo (open-meteo.com)	ERA5 reanalysis archive, 10 yr	~25 km grid; smooths local extremes
Elevation & Slope	Open-Elevation (SRTM)	SRTM digital elevation model	~30-90 m; slope is coarse
Earthquake catalogue	USGS FDSNWS API	Events within 100 km, 10 yr	All events returned (not capped)
Seismic level	BIS IS 1893:2016 + USGS	Regional zone approximation	Confirm town-level zone
Address geocoding	OpenStreetMap / Nominatim	ODbL licence - (c) OpenStreetMap contri...	Place name accuracy varies
Moisture index	Open-Meteo ERA5 rainfall	Rainfall-derived proxy	Not satellite NDVI

TECHNICAL GLOSSARY

ERA5 Reanalysis

ECMWF/Copernicus 5th-generation global climate reanalysis (1940-present) combining model output with observations. Used here for rainfall, temperature and wind history. Grid cells are about 25 km wide, so very local storms are under-represented.

Heavy-rain day (over 80 mm)

A day with more than 80 mm of rainfall in ERA5. Used as a screening threshold, not an official class (IMD, for example, calls 64.5-115.5 mm "heavy" and 115.6-204.4 mm "very heavy"). Level rule: HIGH = 30 or more such days in 10 years; MEDIUM = 8 or more days, or such days in 4 or more years.

Seismic level

India: zone assigned from regional boundaries of the IS 1893 (Part 1):2016 map, raised if recent local seismicity is higher. It can differ by one zone at town level - confirm before design.

Rainfall-moisture index

Annual rainfall divided by 3000 (limited to 0.10-0.85). It is NOT satellite NDVI and does not measure vegetation or soil moisture; it is only a rough wetness indicator.

SRTM

Shuttle Radar Topography Mission elevation model. Slope is computed from five points about 280 m apart, so it describes broad terrain, not small local gradients.

Composite Risk Score

Weighted 0-100 index: heavy-rain/flood 40%, elevation 20%, terrain 10%, seismic level 15%, largest recent earthquake 10%, rainfall-moisture 5%. Safety floors apply: Very High seismic hazard or a HIGH flood indicator sets at least 55 (MEDIUM); High seismic hazard, steep terrain (15 deg+) or very low elevation sets at least 40; High seismic hazard with an M6+ event sets at least 65.

Trend projection

Straight-line fit on 10 years of annual rainfall. It is not a weather forecast; the R2 value shows how weak the fit usually is.

SAMPLE REPORT

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LIMITATION OF LIABILITY: This report uses publicly available data. If any data is found inaccurate, the developer (Thoiba Trader / Geo Prithvi Report) bears no responsibility, as all data is sourced from third-party public data services (Open-Meteo, USGS, Open-Elevation, OpenStreetMap).

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All risk scores are statistical probabilities derived from public climate, earthquake and elevation datasets - not ground-truth field measurements. For legal land due diligence, consult: (1) District Land Records Office, (2) a Licensed Geotechnical Engineer, (3) a Legal Advocate specialising in property law.