HERITAGE FOR MYANMAR

Earthquake, Heritage and Conservation

28 March 2025

Assessment of Earthquake-Damaged Heritage

Assessment Date

April 2025 – April 2026

Prepared by HFM

17 April 2026

This book is intended to help the general public better understand systematic approaches to heritage conservation and to encourage a deeper appreciation of cultural heritage.

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Preserve Cultural Heritage – Protect it for Generations to Come

Earthquake-resilience heritage and a continuing manifestation of living belief

Introduction

Myanmar possesses a wealth of cultural heritage, ranging from the prehistoric era to the present day. This includes tangible and intangible assets inscribed on the World Heritage List and the Tentative List, national heritage sites, traditional religious beliefs, and living customs practiced in daily life. However, the majority of these cultural heritage sites face the daily risk of damage, deterioration, or loss due to their location along major seismic fault lines, the impacts of global climate change, increasing population density, and rapid economic development. There is an urgent need for not only the government departments responsible for heritage protection but also local civil society organizations to collaborate in conservation efforts, guided by accurate preservation knowledge.

Following the Mandalay earthquake of 28 March 2025, Heritage for Myanmar (HFM) has initiated this preliminary effort to foster a culture of public participation in heritage conservation. The objective is to enhance public understanding of heritage values, thereby encouraging citizens to take initiative in documentation and preservation while facilitating collaboration with relevant organizations in management efforts. By responsibly protecting the cultural heritage that has evolved through successive historical eras—from the primate regions of Myanmar through the Stone, Bronze, and Iron Ages—in accordance with existing laws, we ensure the sustainability of the nation's tangible and intangible heritage. It is through this collective cooperation that we can preserve these assets, in which every citizen takes pride, and successfully hand them down to future generations.

Heritage For Myanmar (HFM)

Following the catastrophic earthquake in Myanmar in March 2025, Heritage for Myanmar (HFM) spearheaded an initiative to rapidly catalog damaged cultural heritage sites. Just two weeks after the disaster, HFM launched the Heritage for Myanmar application to facilitate rapid impact assessments, and proceeded with data collection and field documentation. To facilitate an expedited assessment of the extensive damage caused by the earthquake, this application has been designed to mobilize a nationwide community-based heritage documentation and assessment initiative. It aims to engage a diverse range of stakeholders, including local residents, heritage enthusiasts, the monastic community, and conservation professionals. Engineered for optimal field utility, the application features offline functionality and a bilingual (English-Myanmar) interface. These features ensure that data collection is both efficient and accessible, requiring only a mobile device to systematically and rapidly gather critical information.

In addition to facilitating public participation in Post-Earthquake Rapid Damage Assessment, the HFM application is designed to support the analysis of collected data. This analysis serves as a critical resource for the conservation and restoration of earthquake-affected heritage and provides support for the formulation of comprehensive management plans.

Purpose

The data collected through this application is instrumental in addressing the following critical areas:

- Implementation of Emergency Response: Enables the rapid identification of structural damage and facilitates the execution of timely emergency response measures.
- Risk Assessment: Supports the evaluation of secondary risks and potential hazards to implement proactive preventive measures.
- Strategic Planning: Informs the establishment of priorities for heritage conservation and management.
- Recovery and Rehabilitation Management: Provides a framework for the systematic management of the reconstruction and recovery of damaged heritage sites.
- Collaboration and Coordination: Enhances rapid communication and operational synergy among all relevant institutional stakeholders.
- Information Dissemination: Ensures the real-time sharing of data with both domestic and international partners

Aim

The primary vision of Heritage for Myanmar (HFM) extends beyond seismic events to encompass the systematic documentation of priceless heritage impacted by all forms of natural disasters. We aim to establish a sustainable Data Management System that serves as a foundational resource for future conservation and rehabilitation initiatives. Furthermore, HFM is dedicated to fostering genuine public participation throughout the entire cycle of damage inventory, emergency response, restoration, and long-term strategic planning. By actively engaging the community, we strive to cultivate a profound sense of stewardship and a commitment to heritage preservation within future generations.

Objectives

- To facilitate the rapid and methodical recording of damages to heritage sites across Myanmar utilizing the HFM application.
- To ensure broad-based public participation in the damage assessment and cultural heritage conservation processes.
- To effectively support emergency response, risk assessment, and strategic planning for heritage conservation through the delivery of accurate, real-time data.
- To foster synergy between relevant authorities, technical experts, local communities, and international partners in the rehabilitation of damaged heritage.
- To ensure the enduring preservation of Myanmar's cultural heritage through the promotion of evidence-based conservation and best practices in management.

Table of Contents

Appendix

Heritage
FOR MYANMAR

1. Executive Summary

On March 28, 2025, a massive magnitude 7.7 earthquake struck along the Sagaing Fault near the city of Sagaing. This earthquake stands as the most powerful seismic event to occur in Myanmar in over a century. The United States Geological Survey (USGS) assigned it a Modified Mercalli Intensity (MMI) of X (Extreme). The event caused catastrophic destruction throughout the tropical regions of central Myanmar. The human and economic toll of the disaster was staggering. More than 5,300 people lost their lives. Over 11,400 people sustained injuries. Economic losses are estimated at approximately US$11 billion. More than 8,000 religious buildings across the country were damaged or destroyed.

From April 2025 to April 2026, Heritage for Myanmar (HFM) conducted damage assessments of 529 cultural heritage sites across Mandalay Region, Sagaing Region, Bago Region, and Shan State. The assessment process involved direct on-site documentation as well as the use of the HFM Application to analyze damage via photographs sourced from social media and the internet. Due to delays in data collection caused by various circumstances and the sheer scale of the disaster, the status of some sites may have changed by the time of this report's writing. Some locations documented in this report may have already been partially or completely demolished, renovated, or reconstructed. Consequently, the damage data presented here reflects only the conditions at the specific time each site was surveyed and may not fully represent the current, real-time situation.

Out of the 529 historical heritage sites surveyed, 38.5% suffered extreme damage or total structural collapse. The ancient city of Inwa was the hardest hit area. Brick-built stupas and temples were the primary types of structures affected by the earthquake. A key finding from field studies conducted by local and international experts in 2025 revealed that previous restoration efforts—specifically those using cement and reinforced concrete—actually exacerbated the damage caused by this earthquake. In contrast, traditional wooden monasteries sustained little to no structural damage. This serves as a vital lesson to be integrated into future conservation and reconstruction policies.

At the time of writing this paper, many of the damaged sites remain at risk due to a lack of systematic protection, incomplete documentation, and ongoing threats such as

aftershocks and increased rainfall. Furthermore, unauthorized restorations carried out without coordination with relevant heritage conservation departments pose a significant danger. Consequently, there are risks of further structural deterioration, the loss or theft of ancient artifacts, including enshrined relics, and irreversible damage caused by hasty reconstruction using Reinforced Concrete (RCC) without a long-term conservation perspective. This paper documents these ongoing threats, provides an assessment of the heritage sites affected by the earthquake, details the challenges encountered, and offers recommendations on priorities for future restoration and renovation efforts.

2. Background and Methodology

2.1 Seismic Event

The earthquake that occurred on March 28, 2025, had a magnitude of 7.7 and originated at a depth of approximately 10 kilometers. Striking at 12:50 PM MMT with its epicenter near Sagaing and Mandalay, the rupture moved along the Sagaing Fault, a major active strike-slip fault situated between the Indian and Eurasian plates. The quake was characterized as an incredibly fast and intense supershear rupture, with cracks propagating at speeds of up to 5.3 km/s. This significantly exceeds the standard shear wave velocity of roughly 3.5 km/s, resulting in much more violent ground shaking over greater distances. Within minutes of the initial quake, a powerful 6.7 magnitude aftershock followed. In areas near the fault, the peak ground acceleration reached over 100% of gravity (1G). At this level of intensity, the risk of structural collapse is extremely high, even for well-maintained historical buildings.

Since 1900, the Sagaing Fault has produced at least six earthquakes with a magnitude of 7.0 or higher, including notable events in 1912, 1956, 1988, and 1990. However, the 2025 earthquake surpassed all previous events in both magnitude and the scale of its impact. The primary reason for the large-scale loss of heritage during this earthquake is the geographic proximity of Myanmar's major ancient capitals — Mandalay, Inwa, Sagaing, Amarapura, and Pinya — to the Sagaing Fault.

According to official records, the death toll ranged from 5,352 to 5,456, with 11,404 people injured and 538 missing. Economic losses are estimated to reach approximately US$11 billion. The Mandalay Earthquake exacerbated the existing humanitarian crises in Myanmar. The collapse and destruction of homes forced thousands of people to relocate, creating challenges that overwhelmed the country's national emergency response capacity.

2.2 Damage to Heritage

The tropical dry zone of central Myanmar is home to one of the highest concentrations of historical religious architecture in Southeast Asia. This region encompasses ancient capitals, monastic complexes, stupas, and temples built across a vast timeline stretching

from the Bagan period to the Konbaung dynasty. The areas most severely impacted by the 2025 earthquake — Mandalay, Inwa, Sagaing, Amarapura, and Pinya — are former royal capitals. They house numerous sites on the World Heritage Tentative List, as well as structures of national importance for their cultural, historical, and religious value. Consequently, the loss of cultural heritage in these areas is not merely a local or national tragedy, but a significant loss of global importance.

2.3 Data Collection Methodology

Heritage for Myanmar (HFM) conducted this survey using the HFM Rapid Assessment Form to ensure that data on heritage sites damaged by the earthquake was collected systematically and made available for future researchers and interested members of the public. This form can be completed by downloading the HFM Application on Android mobile devices or by entering collected data into a web form available on the HFM website. The submitted data is then analyzed using KoboToolbox, a data management platform widely used for monitoring and evaluating humanitarian assistance. The heritage damage assessment was carried out from April 2025 to April 2026, utilizing a combination of the following two methods:

Direct Field Inspections: Surveyors traveled directly to the sites and, where building access was possible, used the HFM mobile app to record damage data. They were also able to compile GPS locations and comprehensive photographic documentation.

Data Collection from Social Media and Internet Sources: In areas where surveys were difficult due to security or transportation challenges, data was collected based on information submitted by the public via the HFM application, as well as photographs obtained from social media and the internet. The data gathered through this method can only reflect the state of damage at the time the photos or videos were taken and may not represent the full extent of the impact.

During the survey process, data collection was based on the 24 points outlined in the HFM Rapid Assessment Form (Appendix 1). Key data points collected included the building name, its GPS location, building type, damage scale (classified as No Damage, Minor, Moderate, Major, or Total Collapse), specific details on damaged structural components

and decorative elements, the potential for further collapse due to aftershocks or additional damage from other hazards, and whether any temporary protection measures or emergency safeguards were currently in place.

Readers should take note of the following two critical points. Firstly, as the survey period extended from April 2025 to April 2026, the damage conditions of the sites included in the data are not uniform. While some locations were surveyed shortly after the earthquake, others could not be assessed until several months later. Secondly, it should be noted that at the time of writing this report, some of the documented sites have undergone partial or total demolition and clearing, reconstruction, or drastic changes in the situation on the ground following the earthquake. Therefore, the damage conditions described in this record reflect only the status of each location at the specific time it was inspected and may not represent the current situation.

During the one-year survey period, HFM was able to document a total of 529 heritage buildings damaged by the earthquake. According to various news reports, thousands of heritage structures, including ancient buildings, were lost or damaged during the Mandalay Earthquake. It is estimated that the 529 sites recorded by HFM represent only about 10% of the actual volume of heritage loss and damage sustained on the ground.

3. Geographical Coverage

3.1 Regions and States Covered in the Data Collection

According to the records collected by HFM, the heritage sites damaged by the earthquake are located across four Regions and one State (Table 1). These include Mandalay, Sagaing, Bago, and Shan State (Map 1). Mandalay Region accounts for 88.4% of the recorded sites. This high percentage is due to several factors: the area's relative stability and ease of travel, the vast density of heritage sites located there, and its proximity to the Sagaing Fault, which resulted in the region bearing the most direct impact of the earthquake. These factors contributed to both the high level of damage and the high volume of data collection in this area.

Region/State	Sites Assessed	Total Percentage
Mandalay	467	88.4%
Sagaing	54	10.2%
Bago	5	0.9%
Shan State	3	0.5%
Total	**529**	**100%**

Table 1 – Number and Percentage of Damaged Heritage Sites by Region and State (Based on HFM Survey Data)

3.2 Major Affected Areas

The following areas sustained major damage during the Mandalay Earthquake (Appendix 2):

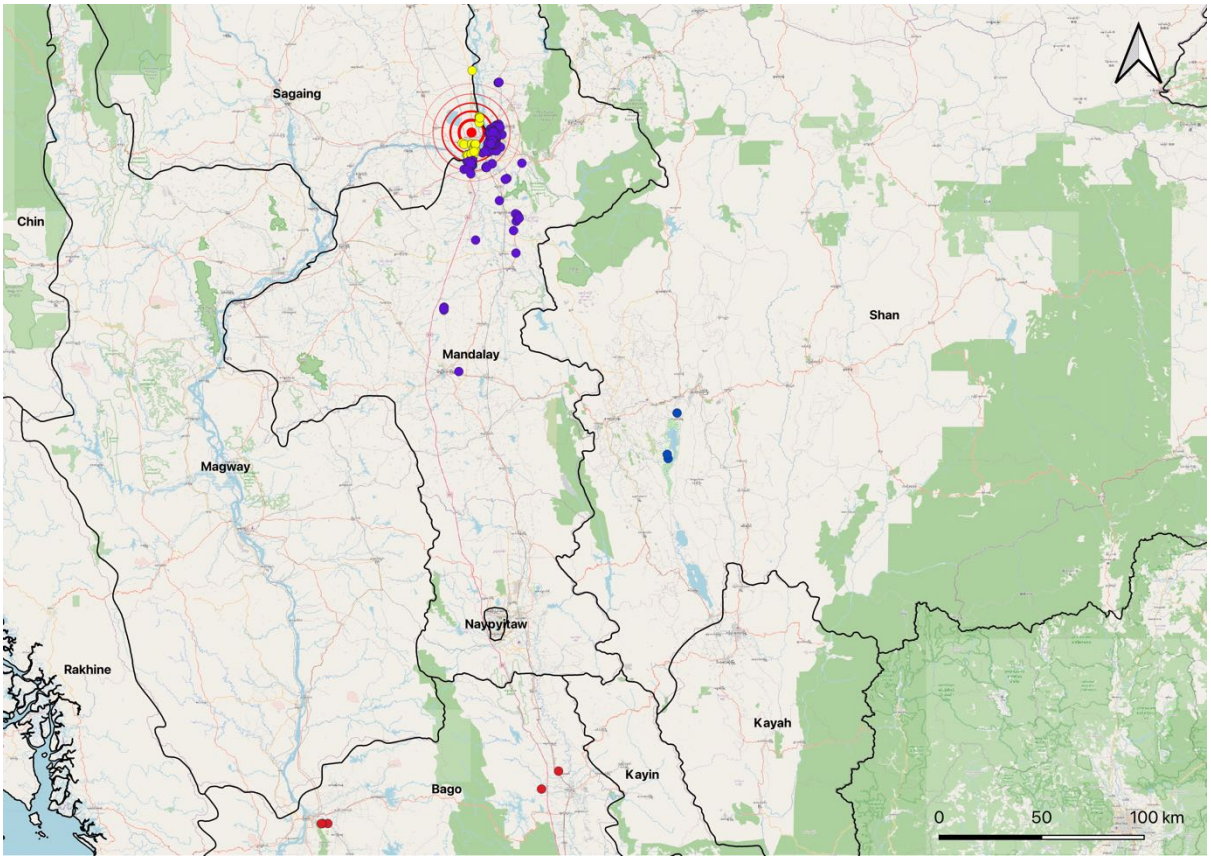
Mandalay City (Total: 250 sites): This area represents the largest portion of the survey. It includes national-level heritage sites such as the Mahamuni Temple, the Mandalay Palace Walls and the historic structures within them, Konbaung-era and colonial-period monasteries, and ancient stupas.

Inwa (Total: 180 sites): Located in Tada-U Township, Mandalay Region, the ancient city of Inwa was situated extremely close to the earthquake's epicenter. Inwa is part of the UNESCO World Heritage Tentative List for Upper Myanmar's ancient capitals and is one of the most severely damaged areas among those surveyed by HFM.

Ancient Cities and Surrounding Areas near Mandalay: Due to difficulties with field access and challenges in obtaining data from social media or the internet, only a limited number of heritage sites were documented in areas near Mandalay such as Amarapura, Madaya, Pinya, Myinsaing, Mekkhaya, and Kyaukse.

Sagaing City and Environs (Total: 54 sites): This includes religious sites across Sagaing City and the Sagaing Hills, as well as surrounding monasteries and stupas. It also features iconic cultural landmarks in the Mingun area, such as the Mingun Pahtodawgyi and Myatheindan Pagoda, along with heritage sites along the Ayeyarwady River.

Significant challenges remain in assessing prominent heritage sites within Sagaing Region—including Mingun, Shwebo, and Hanlin (the ancient Pyu city on the UNESCO World Heritage List) — due to ongoing instability and access limitations in those areas.



Map 1 – Map showing earthquake-damaged heritage sites according to regions and states in Myanmar

4. Monument Types and Structural Weaknesses

4.1 Monument Types

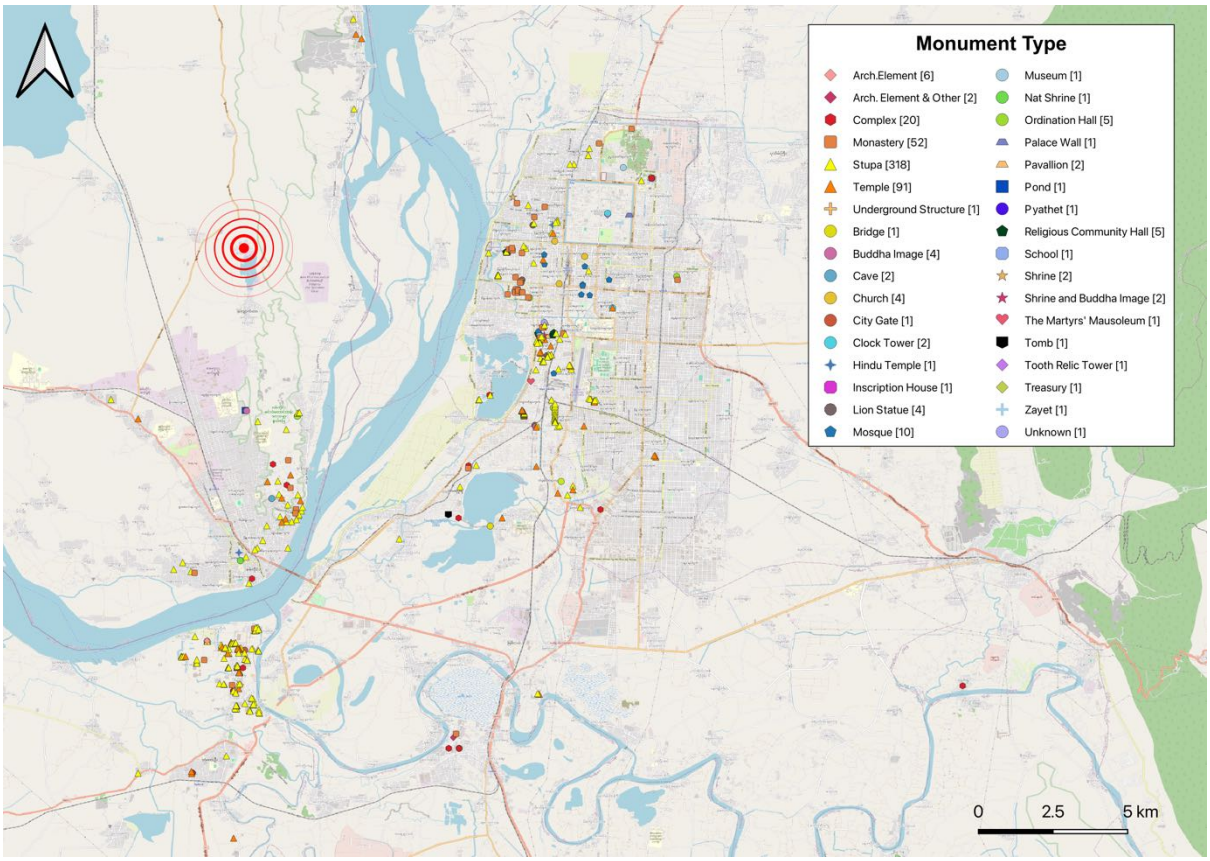
According to the survey, the monument type with the highest damage percentage (Table 2, Map 2) is stupas, accounting for 61.8% of the total. The structural design of most stupas—from the bell-shaped body up to the spire—lacks the resilience to withstand intense ground shaking. Consequently, the upper sections of these stupas frequently collapse during an earthquake. In addition to this structural vulnerability, the fact that the vast majority of historical structures in Myanmar are stupas contributes to this category having the highest rate of damage. Temples were the second most affected category, accounting for 18.7% of the damage.

Monument Type	Number	Total Percentage
Stupa	337	61.8%
Temple	102	18.7%
Monastery/Sima	54	9.9%
Other/ Mixed	70	12.8%
Archaeological Element	9	1.7%
Underground Structure	1	0.2%

Table 2 – Number and Percentage of Damage by Monument Type

In addition to the primary categories mentioned above, the survey also included various other structural types. This group encompasses bridges, Buddha images, caves, city gates, clock towers, Hindu temples, stone inscription sheds, lion statues, mosques, museums, spirit houses, ordination halls, palace walls, tiered roofs, ponds, religious assembly halls, monasteries, shrines, martyrs' mausoleum, tombs, tooth relic towers, gold treasuries, and rest houses.

Among these types, those constructed with masonry were similar to stupas and temples less resilient to lateral movement, resulting in cracking and collapse. In particular, tall and heavy structures such as city walls, gates, and clock towers suffered significant damage due to foundational instability and the impact of lateral forces during the tremors.



Map 2 – Map showing types of monuments damaged by the earthquake

4.2 Types of Materials

According to the survey of monument materials, 93.9% of the recorded structures were constructed of brick masonry. Monuments combining brick and timber accounted for 4.2%, while a small number of structures built exclusively of timber or other materials were also identified.

4.3 Typology and Seismic Resilience

In addition to the data collected by HFM, expert evaluations and assessments have shown that seismic vulnerability and resilience vary significantly depending on the monument typology (structural type).

Stupas: As the most damaged category, the primary failure point was the upper spires (Figure 1). Spires previously "restored" using reinforced concrete and heavy cement mortars suffered the most. When these heavy upper sections collapsed, they frequently crushed the original ancient bell-shaped body and the base below. It has been observed that stupas maintained with original brickwork and traditional lime mortar proved more

stable while monuments previously subjected to maintenance using incompatible replacement materials and bell-shaped domed structures on top of stepped terraces exhibited heightened vulnerability and sustained more extensive structural impact during the seismic event.

Figure 1 – Pahtotawgyi, Amarapura (17 July 2025)

Temples: Heavy brick structures with numerous load-bearing walls suffered severe structural failure (Figure 2). Previous conservation interventions—which involved the injection of reinforced concrete (RC) or the application of cement mortars into the original masonry fabric—have proven detrimental. During seismic excitation, these incompatible materials underwent brittle fracture and delamination, causing significant physical damage to the original historic masonry. While a natural earthquake might only cause partial damage to an ancient monument, the presence of inappropriate restorations led to total structural collapse in some cases.

Figure 2 – Upper part of Mahabodhi damaged by the earthquake (8 July 2025)

Brick and Timber Monasteries: Hybrid two-story monasteries constructed with load-bearing masonry exterior walls and internal timber framing (columns and beams) (Figure 3) exhibit higher seismic resilience compared to purely masonry structures. However, these buildings frequently sustain extensive out-of-plane failure in their two-story high masonry walls, a vulnerability primarily attributed to inadequate horizontal tying (diaphragm connectivity) between the timber floor systems and the masonry shell. When well-maintained, the internal timber skeleton allowed the building to sway with the seismic waves, reducing the overall force on the structure. However, due to the presence of earthquake-vulnerable structural elements—such as staircases, high-elevation entrance canopies, masonry walls with insufficient lateral bracing, and masonry wall corners—these buildings remain at a high risk of collapse during seismic events.

Timber Monasteries: Traditional timber monasteries constructed on stone plinths (Figure 4) sustained negligible structural damage, despite their proximity to the earthquake epicenter. This resilience is attributed to the traditional Myanmar

construction technique, in which timber columns are placed directly upon stone footings. This configuration allows the columns to move independently during seismic activity, while the inherent flexibility of the timber significantly dissipates seismic energy. Consequently, these structures exhibit high levels of earthquake resistance. This observation constitutes a critical lesson that should inform future heritage conservation and restoration policies.

Figure 3 – Sasana Vithudi Monastery, Mandalay (31 May 2025)

Modern Reinforced Concrete (RCC) Buildings: Damage was also observed in several reinforced concrete (RCC) structures, with the severity of impact being particularly pronounced in buildings exhibiting horizontal and vertical irregularities. Consequently, in seismically active regions, RCC buildings are not inherently safe unless designed and constructed in strict accordance with the stipulated engineering standards, specifically the *Myanmar National Building Code (MNBC) 2025.*

Furthermore, there is significant cause for concern regarding the extensive utilization of reinforced concrete in post-earthquake reconstruction without the adoption of

conservation measures, the systematic documentation of original damage, or adequate structural assessments. In certain sites of significant heritage value, it is observed that collapsed structures are being entirely demolished and replaced with RCC structures within only a few months of the earthquake. Also, the repair and/or maintenance of damaged buildings conducted using RCC components without a systematic comparative study between original and replacement materials can result in imbalances in stiffness, weak bonding between original and newly replaced components, and the further degradation of original brick and lime mortar due to the effects of cement mortar. Consequently, these factors may lead to more severe destruction when future earthquakes occur. Therefore, there is an urgent need for responsible authorities to supervise and regulate the reconstruction and maintenance activities currently being carried out using RCC.

Figure 4 – Ariyawuntha wooden monastery, Sagaing (31 August 2025)

Figure 5 – Myinwun Monastery, Mandalay (8 July 2025)

4.4 Management Authority

According to the data collected, 39% of the surveyed sites are registered as National Cultural Heritage sites, while 12.8% are under the management of pagoda trustees, monastic communities, or local organizations. Notably, 40.5% of the sites have no recorded management entity. Establishing clear management authority is critical for the post-seismic repair and reconstruction of these buildings because conservation and restoration of historic structures require coordination among multiple stakeholders, including managing authorities, donors, technical experts, and religious organizations.

Figure 5 – Yadanapon Pitaka Taik, Amarapura (15 July 2025)

5. Damage Assessment

5.1 Extent of Damage

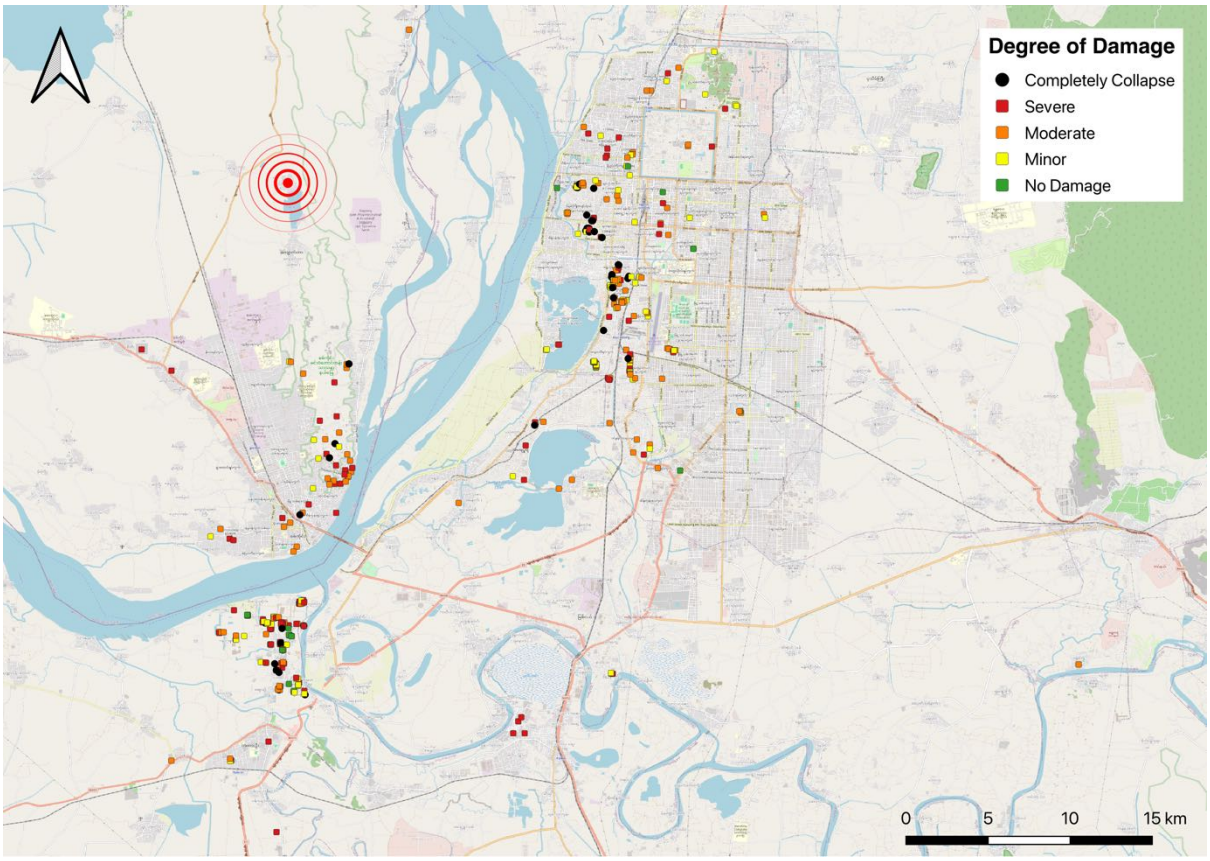
According to the data collected, the 529 surveyed structures have been categorized into five levels of damage (Table 3, Map 3). The data reveals that the scale of destruction inflicted upon cultural heritage during the earthquake is immense.

Damage Level	Site	Total %	Description
No Damage	39	7.2%	The structure remains intact.
Minor Damage	129	24.4%	Superficial cracks or slight damage
Moderate Damage	158	29.9%	Obvious structural damage
Severe Damage	151	28.5%	Compromised structural integrity
Completely Collapse	52	9.8%	The building has completely fallen.
Total	**529**	**100%**	

Table 3 – Classification of Building Damage Levels

Based on the survey data, the number of buildings with Major Damage combined with those that suffered Total Collapse reached a total of 203 (Figure 6-7), accounting for 38.4% of the overall results. Furthermore, 158 buildings (29.9%) sustained Moderate Damage (Figure 8). These figures together reveal that 68% of the heritage sites suffered significant structural impact, ranging from notable damage to total collapse. According to the survey data, only 39 buildings (7.2%) were found to have been unaffected by the earthquake.

The category of Completely Collapse includes not only buildings that fell during the earthquake itself but also those that were intentionally demolished afterward due to the damage they sustained. According to survey findings, there have been cases where well-known monasteries were completely razed and replaced with reinforced concrete (RCC) structures within just five months of the earthquake. These processes were carried out without adequate documentation, heritage impact assessments, or conservation supervision. Consequently, the actual number of heritage sites demolished in the aftermath of the earthquake may be higher than what is currently reflected in the HFM data.



Map 3 – Map showing the extent of damage

Figure 6 – Shwe Phone Shein mosque, Mandalay (8 July 2025)

Figure 7 – Gugyi Thone Lone (three temples), Pinya (18 July 2025)

Figure 8 – Ambika Vijay temple, Mandalay (9 July 2025)

Figure 9 – Sacred Heart church, Mandalay (9 July 2025)

Figure 10 – Tawagu Thein Zedi, Mandalay (31 May 2025)

5.2 Damage by Region

Mandalay Region recorded the highest number of damaged structures (Table 4). In Sagaing Region, which was closest to the earthquake's epicenter, a total of only 55 sites could be surveyed and documented. Additionally, only a small number of earthquake-affected structures were included in the data in Bago Region and Shan State.

Region/State	No Dmg.	Minor	Moderate	Severe	Collapsed
Mandalay Region	39	117	132	132	47
Sagaing Region	0	6	24	20	5
Bago Region	0	4	1	0	0
Shan State	0	2	1	0	0

Table 4 – Table Showing the Scale of Damage by Region and State

The number of records collected in Mandalay City is high, and the count of buildings that either completely collapsed or suffered severe damage (Table 5) is also significant. In the ancient city of Inwa, 183 sites were documented. Of these, 48.1% suffered either extreme damage or total collapse, making it the most severely affected area among all the cities surveyed.

City	Total	No Dmg.	Minor	Moderate	Severe	Collapsed
Mandalay	250	13	74	90	47	26
Inwa	175	26	37	29	69	14
Sagaing	49	0	6	22	18	4
Other Cities	55	0	12	17	18	8

Table 5 – Scale of Damage by Major Cities

5.3 Damage by Building Size

The original data collected by HFM did not include specific building dimensions. To determine the scale of each structure, the recorded GPS coordinates were plotted onto Google Earth Pro, and the size of each building was measured using the software's Measurement Tool. It should be noted that since measurements were conducted using Google Earth, there may be slight inaccuracies in the precision of the dimensions. Following the classification system used in Pierre Pichard's *Inventory of Monuments at Pagan*, the buildings were categorized into four sizes based on their maximum ground

plan length (the widest horizontal span of its ground footprint) rather than height or volume. The dimensions are Small (S) ≤ 12 meters, Medium (M) 12 – 25 meters, Large(L) 25 - 50 meters, and Very Large (VL) ≥ 50 meters.

Building size data was integrated after the initial survey to provide a deeper understanding of the nature of the damage. For instance, larger structures typically contain original ancient craftsmanship and possess high cultural value; however, they also present greater engineering complexities during conservation and reconstruction efforts. According to the data (Table 6), medium, large, and very large buildings sustained a significantly higher ratio of severe damage (43%–46%) compared to smaller structures (34.8%). This increased vulnerability is due to two primary factors: inertia force, and structural complexity, with their intricate architectural features—such as upper terraces, internal and external vaulted corridors, and attached porticos—making them more susceptible to collapse. Based on the HFM records, there are 16 "Very Large" (VL) buildings in total. Because these sites hold exceptional historical, artistic, and archaeological value, they have been designated as Priority Level 1 for restoration and conservation.

Size	Total	Severe	Moderate	Collapsed	% of Severe +
Small (S)	356	100	103	24	34.8%
Medium (M)	117	33	36	21	46.2%
Large (L)	39	10	13	7	43.6%
Very Large (VL)	16	7	6	0	43.8%

Table 6: Extent of Damage by Building Size

Figure 11 – Mingun Pahtotawgyi [VL], Mingun (14 April 2025)

Figure 12 – Layhtetgyi Monastery [L], Inwa (16 July 2025)

Figure 13 – Yawmingyi Monastery [L], Mandalay (12 April 2025)

Figure 14 – Wingaba pagoda [M], Inwa (6 April 2025)

Figure 15 – Aung Chan Tha Pagoda [S], Sagaing (20 April 2025)

5.4 Heritage Listed Sites

Most of the buildings recorded in the survey are listed as National Heritage Sites, while the remainder consist of other religious and public structures. Notably, Kuthodaw Pagoda, which is inscribed on the UNESCO Memory of the World, sustained minor damage. Furthermore, the ancient cities of Mandalay, Inwa, and Amarapura, along with the Konbaung-period monasteries, are currently on the UNESCO World Heritage Tentative List. Therefore, these significant factors should be taken into consideration when determining and assigning priority levels for conservation and restoration work.

5.5 Damage to Structural Components

Among the structures that did not suffer total collapse, the superstructures and finials of stupas (Figure 16) sustained the most significant impact, with 291 instances recorded (Table 7). Structural walls represent the second most affected component (Figure 17), with damage documented at 111 distinct locations. These findings are consistent with the mechanical behavior of unreinforced masonry buildings during seismic events,

specifically regarding lateral shear failure. This phenomenon occurs when the lateral forces exerted by the earthquake exceed the capacity of the masonry walls. Consequently, the primary structural elements, roofing systems, and upper architectural tiers (Figures 18–19) constitute the principal zones of vulnerability and damage within the affected built environment.

Structural Components	Number
Spire	291
Wall	105
Structural Component of Main Building	59
Roof	52
Door/Entrance	35
Window/Ventilation Opening	23
Floor	21
Outer Enclosure Wall	16
Passage to Main Hall	9

Table 7 – Number of Damaged Structural Components and Surviving Non-Collapsed Buildings

Figure 16 – Collapsed spire of Sandamuni Zedi, Amarapura (17 July 2025)

Figure 17 – Walls of Shwegugyi Monastery damaged by the earthquake, Amarapura (17 July 2025)

Figure 18 – Upper part of the entrance of Lawka Manisular pagoda damaged by the earthquake, Mandalay (1 April 2026)

Figure 19 – Roof and walls of Maha Bandoola Monastery damaged by the earthquake, Mandalay (8 July 2025)

6. Damage to Decorative and Archaeological Elements

In addition to the structural damage, the decorative elements and artifacts that represent cultural, religious, artistic, and historical values were also damaged during the earthquake (Figures 20-26). Buddha images, bronze statues, and devotional objects suffered the highest rate of damage and loss among decorative features, with 75 sites recorded (Table 8). Small heritage items—such as Buddha heads, bronze figurines, and fragments of murals—were discovered among the building debris. However, it has been observed that these items are often cleared away during debris removal without any systematic documentation.

Fragile and difficult to replace, murals (wall paintings) are in a highly precarious state due to direct earthquake damage or subsequent risks. According to the collected data, 15 sites have been recorded with such damage. Once the underlying brickwork or the plaster layer supporting these murals is destroyed, it is impossible to recover or repair them. Furthermore, the earthquake has also led to the discovery of hidden murals, revealed when outer walls collapsed or surface plaster layers peeled away. It is essential to document these newly exposed murals using photographic records and photogrammetry techniques to ensure their preservation.

Decorative Elements	Number	Remarks
Religious Images (Buddha Images, figurines)	75	Highest rate of damage
Other Decorative Elements	37	
Murals/Wall Paintings	15	Irreplaceable, new discoveries
Stucco	7	fragile
Glazed Plaques	2	550 Jatakas
Stone Sculpture	1	

Table 8 – Damage to Decorative Elements

Stucco carvings and ornamental decorations were recorded at 7 locations. However, due to the limitations of the survey process, the actual number of affected sites is likely significantly higher. Additionally, two temples decorated with glazed plaques (Jataka tiles) sustained damage. Among them, the glazed plaques at the Mingun Settawya Pagoda, which suffered a total collapse, require immediate emergency conservation. Other miscellaneous decorative elements accounted for 37 recorded instances.

There are also archaeological structures that have been newly unearthed due to the earthquake's impact, such as those at the Inwa Riverine Palace site. These newly exposed archaeological features must be reported to the relevant authorities immediately. Until professional archaeologists can conduct proper documentation and assessments, excavating or digging at the site, disturbing or damaging the structures, and moving or relocating any materials or artifacts should be prohibited. It is vital to realize that any such interference can lead to the irreversible loss of significant historical data from our past.

In certain locations, it has been observed that theft of small, easily transportable objects from collapsed heritage buildings is occurring. Due to the absence of a national-level database system to systematically record heritage artifacts emerging after the earthquake, it remains unknown exactly how many such items have surfaced. In some areas, although local residents have collected emerging heritage objects with the intention of securing them, the lack of formal documentation or reporting makes it extremely difficult to track the inventory of these items. Therefore, it is an urgent necessity to implement public education programs regarding the concepts of documenting and preserving heritage artifacts, as well as the relevant existing laws.

Figure 20 – Buddha image, Shwegugyi monastery, Amarapura (17 July 2025)

Figure 21 – Buddha image, Yadana Semi complex, Inwa (16 July 2025)

Figure 22- 550 glazed Jataka plaque, Aungzigon, Pinya (3 August 2025)

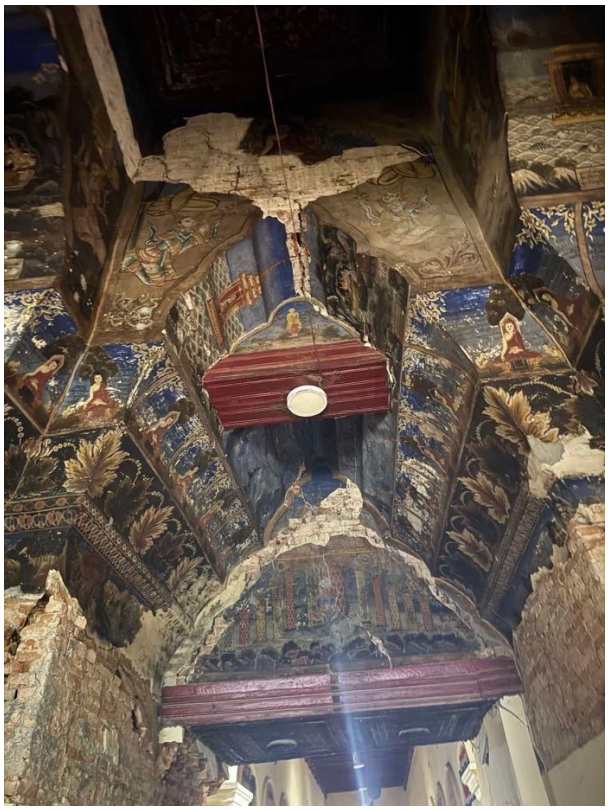


Figure 23 – Mural paintings, Mahamuni temple, Mandalay (5 August 2025)

Figure 24 – Manusiha figurine, Phayani, Mandalay (9 July 2025)

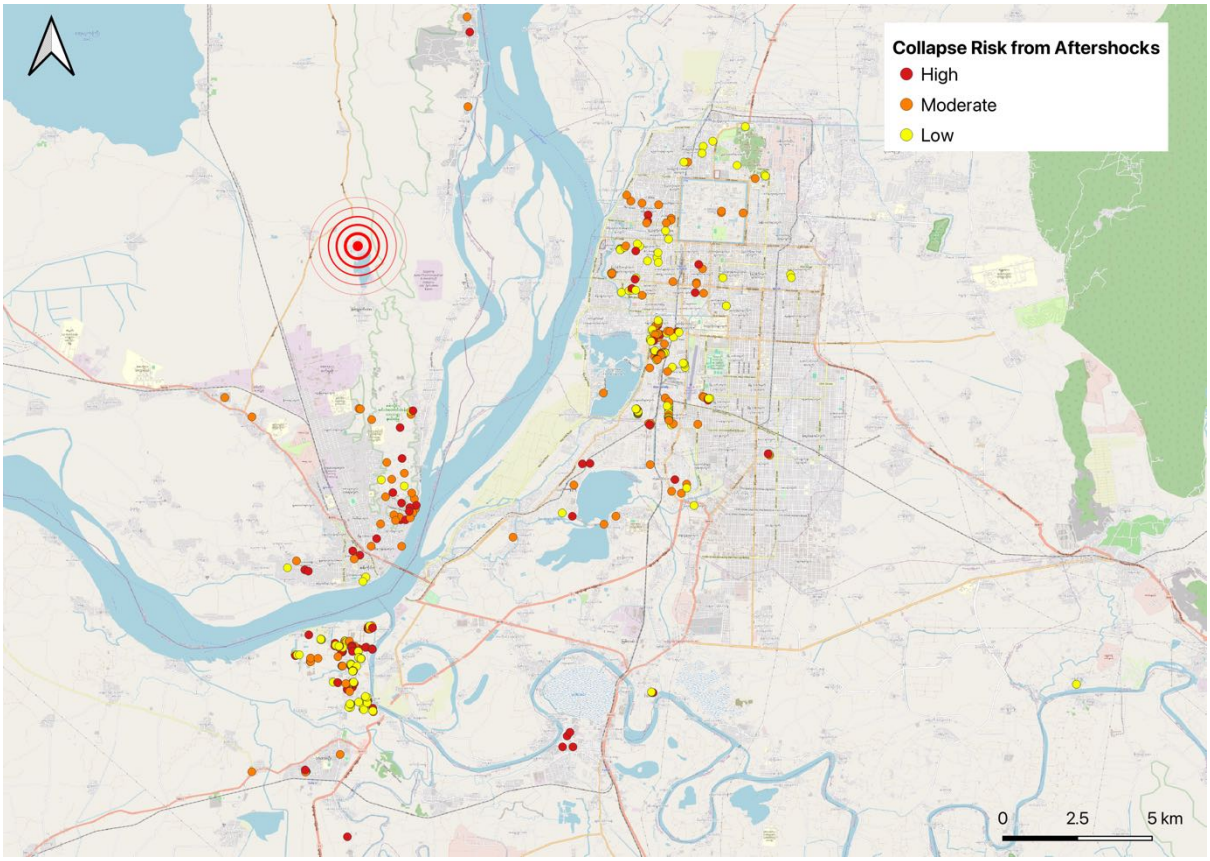
Figure 25 – Damage of glass mosaic, Shwe Yinye' pagoda, Amarapura (15 July 2025)

Figure 26 – Fragments of stucco, Yadana Semi complex, Inwa (16 July 2025)

7. Risk Assessment

7.1 Risk of Further Collapse Due to Aftershocks

Out of 529 buildings, 125 (23.6%) are in a high-risk condition, meaning they are highly vulnerable to further damage from aftershocks, while 169 (32%) face a medium risk (Table 9, Map 4). Consequently, a total of 55.6% of the sites are at risk of further damage or collapse. It is crucial to note that as minor aftershocks continue to occur along the Sagaing Fault, these already compromised buildings remain under an extremely high threat of additional structural failure.



Map 4 – Map showing risk of further collapse due to aftershocks

7.2 Risk of Damage from Rainfall

Precipitation represents a significant threat that exacerbates the deterioration of earthquake-damaged historical structures. According to the survey, 168 sites (31.8%) are at high risk of damage due to rainfall, while 183 sites (34.6%) are categorized as medium risk. This indicates that a total of 66.4% of the sites are vulnerable to accelerated decay caused by rain. Field assessments conducted by experts in August 2025—

approximately five months after the earthquake—revealed that the rainy season is causing the degradation of exposed brickwork. Water infiltration through cracks is damaging interior walls and mural paintings, while the proliferation of vegetation within collapsed sections is further compromising structural integrity. It was also observed that at some buildings, temporary tarpaulin covers had been displaced by wind and not replaced, leaving the damaged structures exposed to further risk. Furthermore, several significant heritage sites remain entirely without protective covering.

Hazards	High	Moderate	Low	High+Moderate%
Aftershocks	125	169	182	**55.6%**
Rainfall	168	183	125	**66.4%**
Looting	12	50	410	**12.3%**
Fire	2	7	470	**1.7%**
Flooding/Landslides	9	15	442	**4.4%**

Table 9: Extent of Secondary Risk

7.3 Risk of Looting and Theft

Among the damaged structures, 12 buildings (2.3%) are at high risk of heritage theft, while 50 sites (9.5%) face a medium risk. Interviews with local residents confirm that looting has already occurred in several locations. In areas lacking official caretakers, portable artifacts such as Buddha heads, votive tablets, and reliquary objects have been found scattered among the debris. Without systematic collection and reporting, it is impossible to determine the exact number of items exposed or lost. To address this, an Emergency National Database is required to rapidly document and report portable heritage assets unearthed by natural disasters.

7.4 Risk of Fire and Flooding

Generally, the risk of fire across the surveyed areas is low, with only 2 sites identified as high-risk and 7 sites as medium-risk. Notably, a fire incident was recorded only at Mandalay University. Despite the low overall numbers, special attention must be paid to fire safety in wooden structures and buildings currently in use for religious purposes, where the risk of secondary fire outbreaks remains a concern. Regarding the risk of

flooding and landslides, 9 sites are categorized as high-risk, while 15 sites are at a medium-risk level.

8. Temporary Protective Measures

Of the 529 sites surveyed, only 39 (7.4%) were found to have any form of temporary protective measures in place at the time of data collection. The remaining 490 sites (92.6%) had no protective measures whatsoever. Among the sites that did have protections, the most common method was the use of tarpaulins as temporary roofing, seen at 21 locations. Additionally, 13 sites had installed barriers to prevent entry into damaged buildings, and 4 sites were found to have posted warning signs.

The existing protective measures at most sites (Figures 27-28) have been found to be largely ineffective. As previously noted, tarpaulin covers are frequently displaced by wind, failing to protect the underlying masonry from rainfall. This exposure allows rainwater to seep into the structures, endangering interior walls and delicate murals. Furthermore, the moisture encourages the growth of invasive plants within the debris, which poses a secondary threat to the structural integrity of the heritage assets. At sites where a risk of further collapse exists, the current use of physical barriers and warning signs is also insufficient to ensure public safety or prevent further damage.

Figure 27 – Pagoda no.233, Pinya (18 July 2025)

The extremely low rate of implementation for temporary protection measures may be attributed to the prioritization of resources toward humanitarian relief efforts, as well as a critical lack of emergency protection budgets and manpower dedicated to heritage sites. Furthermore, damaged structures located in close proximity to fault lines remain at high risk of total collapse due to aftershocks. It is imperative to recognize that with each passing rainy season, the structural resilience of these earthquake-affected heritage assets will continue to diminish.

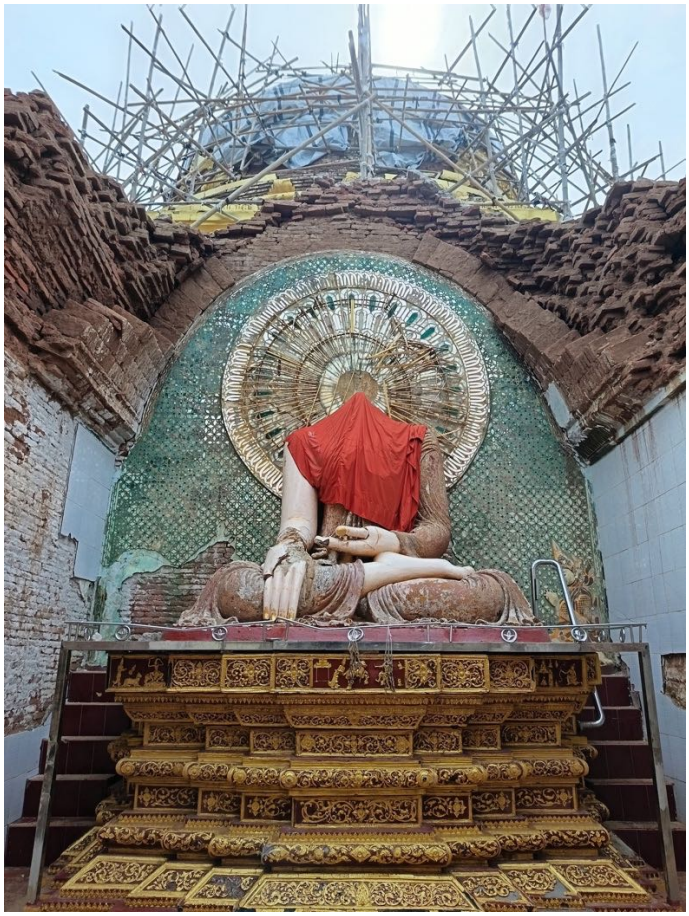


Figure 28 – Sandamuni and Buddha image, Amarapura (15 July 2025)

9. Priority Classification

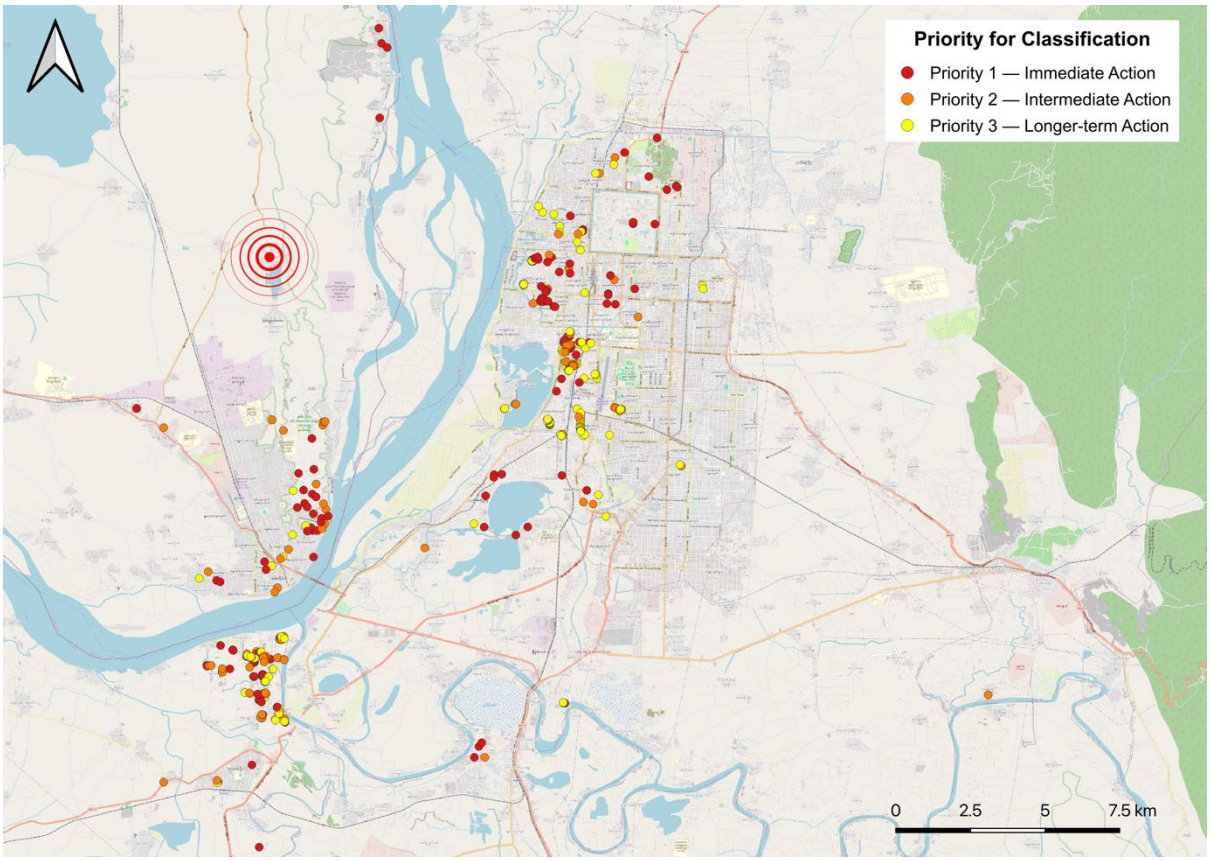
The 529 surveyed buildings have been categorized into Priority Levels 1, 2, or 3 based on cultural value, extent of damage, risk level, and structural size. Additionally, 42 sites where the core structure remained unaffected and do not yet require emergency intervention have been designated as Priority Level 0. These rankings follow the established HFM (Heritage First Model) priority standards, aimed at identifying which sites must be addressed first amid the vast number of earthquake-damaged heritage properties. Notably, buildings that are currently in active religious use have also been integrated into the high-priority lists for urgent repair and conservation.

Priority Level 1 comprises 158 buildings, accounting for nearly 30% of the total surveyed sites (Table 10, Map 5). This high-priority category includes all 16 of the "Very Large" buildings, 28 out of 39 "Large" buildings, and 61 "Medium" buildings that suffered severe damage or total collapse.

Priority Level	Site	Total %	Extent of Damage	Remarks
Priority 0 – No Immediate Action Required	42	7.9%	No Damage	Not damaged; monitoring required
Priority 1 – Urgent / Immediate Action Required	158	29.9%	Severe / Collapsed	Critically important; emergency conservation required
Priority 2 – Secondary Priority Action	152	28.7%	Moderate / Severe	Important; establish conservation plans
Priority 3 – Long-term Action	176	33.3%	Slight / Moderate	Slightly damaged; monitor and inspect
Total	**528***	**100%**		* There is 1 location for which a priority level has not yet been assigned.

Table 10 – Priority Classification for the Restoration and Conservation of Earthquake-Damaged Buildings

The buildings classified under Priority Level 1 are distributed across several key locations: 69 are in Mandalay, 45 in Inwa, 23 in Sagaing, and the remainder are situated in other townships within the Mandalay and Sagaing Regions. The Priority 1 list specifically includes 33 out of 52 buildings that suffered total collapse and 78 out of 151 buildings that were severely damaged.



Map 5 – Map showing priority for conservation

10. Case Study: Abayarama Shwegu Monastery

The *Abayarama Shwegu Monastery* in Mandalay represents one of the final masterworks of the traditional Burmese architect, Saya Hsaing. Its significance transcends its architectural merit, serving as a rare, high-level exemplar of traditional artistic crafts—most of which have been lost to contemporary practices. Currently, the monastery is undergoing systematic conservation, led by the descendants of the original donors in consultation with heritage preservation experts, who provide technical guidance and oversight. Consequently, this building is presented in this paper as a case study in exemplary conservation; its structural damage assessment records offer insights into the seismic vulnerabilities and resilience inherent to this building typology.

10.1 Structure

The monastery is a two-storey masonry structure with a rectangular plan, featuring longitudinal verandas at the front and rear, and integrated twin-flight brick staircases on the sides. Its primary structural system reflects the early colonial-era construction style, utilizing load-bearing masonry walls, internal timber flooring, and a composite roofing system of brick and mortar supported by a timber frame.

10.2 Earthquake Damage

The seismic event of March 28, 2025, resulted in the following structural damage to the building (Figures 29-30):

- Collapse of the rear veranda
- Structural cracking at the first-floor corners of the main building
- Cracking in the upper-level masonry of the staircase annex, coupled with outward structural drift
- Failure of staircase balustrade

10.3 Structural Analysis

The observed failure patterns correspond to the typical seismic responses of Unreinforced Masonry (URM) buildings under intense ground shaking (as detailed in Table 11). While the substantial thickness of the masonry walls and the rectangular plan configuration provided adequate in-plane seismic resistance, the primary causes of

failure were the insufficient connectivity between the timber floors and roofs and the structural walls. Furthermore, the lack of robust ring beams (wall plates) to provide lateral confinement contributed significantly to the severity of the damage.

Figure 29 – Damage of the rear veranda of Abayarama monastery

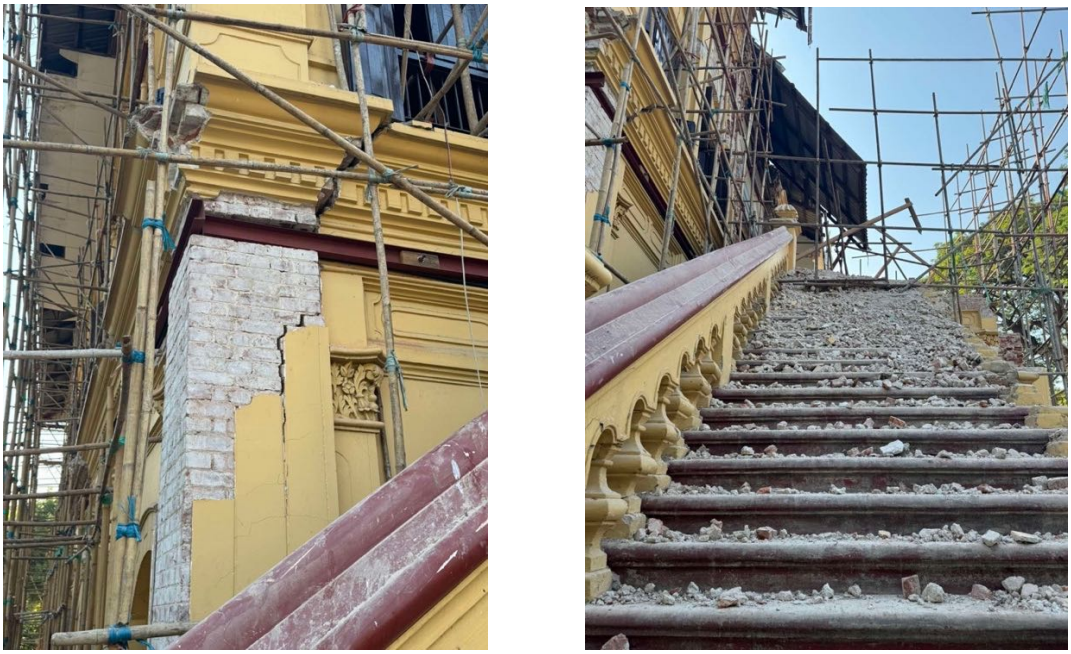


Figure 30 – Damage of corner (left) and staircase (right)

The engineering assessment identifies three primary structural vulnerabilities:

(a) **Shear Cracking at Wall-Opening Interfaces**: The building exhibits a concentration of seismic-induced shear cracks at the periphery of door and window openings, particularly in the lintel and jamb zones. This indicates an inability to effectively transfer and resist lateral seismic forces across these architectural discontinuities.

(b) **Inadequate Connectivity in Floor/Roof-to-Wall Anchorage**: There is a lack of robust mechanical anchorage between the floor/roof diaphragms and the masonry walls. This deficiency in structural connectivity creates a high risk of out-of-plane wall failure, as the masonry units are prone to displacing outward during seismic excitation.

(c) **Insufficient Load-Bearing Capacity and Lack of Structural Redundancy**: The total number of load-bearing masonry walls providing lateral support is insufficient for the building's mass. This lack of structural redundancy leads to an excessive concentration of seismic loads on the perimeter walls and cantilevered elements, such as the rear veranda, compromising the global stability of the structure.

10.4 Restoration Work

The installation of tie-rods and the structural restoration of the upper-floor staircase annex were successfully completed by the end of March 2026. Furthermore, the following conservation and rehabilitation works (Figure 31) have been implemented:

- Restoration of the collapsed rear veranda, adhering to authentic historical form and materials.
- Partial demolition and reconstruction of the upper-floor staircase annex: Dismantling the sections exhibiting cracking and outward leaning, followed by reconstruction to the original design specifications.
- Installation of structural tie-rods beneath the floor joists and ceiling rafters to stabilize the primary structure and mitigate seismic-induced drift.
- Repair of masonry cracks at the corners of the primary structure.
- Final cosmetic and structural refinements to ensure the authenticity.

Element/System	Location	Observed Damage	Severity	Immediate Action/Next Step
Rear portico (appendage)	Back side	Reported collapsed portico (mechanism unconfirmed due to lack of close-ups)	**Severe**	Cordon off area; temporary shoring; remove loose debris; detailed follow-up inspection/photos before reconstruction
URM exterior walls	Multiple elevations	Cracking with plaster/render delamination; stepped cracking at corners/returns; local masonry loss around openings/spandrels	**Moderate–High**	Restrict access near distressed wall lines; document crack widths and locations; plan for URM repair + OOP anchorage in retrofit
Openings / spandrels / lintel zones	Around doors/windows	Crack concentrations around openings and at spandrel bands (brittle distress)	**Moderate**	Map cracks; check lintel bearing and support; repair/strengthen spandrels as needed
Architectural features (cornice/parapet/ornaments)	Roofline & façade	Potentially loosened masonry/plaster at cornice/parapet; falling hazard risk	**Moderate**	Survey and secure/remove loose elements; install temporary restraint where required
Portico/front colonnade (visible areas)	Front elevation	Collapsed rear portico confirmed in summary photo sheet; failure mechanism and connections not confirmed (no close-ups).	**Light**	Inspect columns/beam seats; repair finishes after structural stabilization

Table 11 – Damage of the structural components of Abayarama monastery

Figure 31 – Renovation of Abayarama monastery

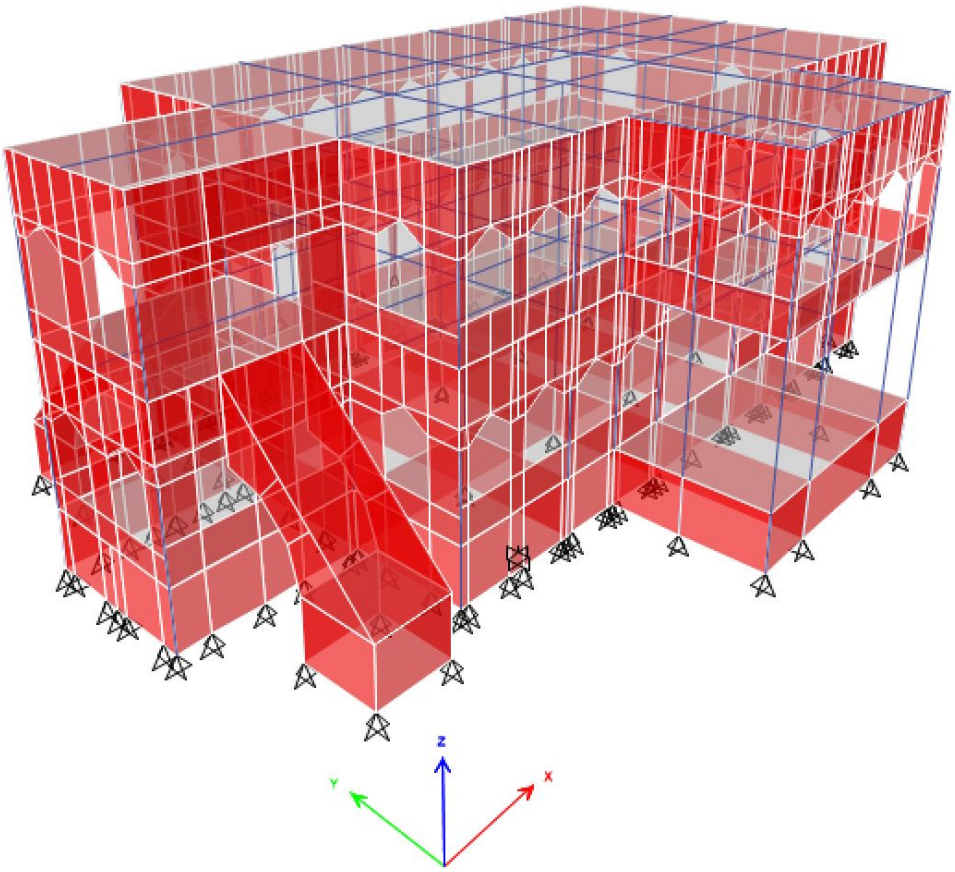


Figure 32 - 3D Analytical Model

Figures 29 and 30 summarize the ETABS-based demand screening for (a) URM in-plane shear demand and (b) out-of-plane wall demand. Green indicates demand within the adopted allowable limit; red indicates demand higher than the allowable limit and therefore requires retrofit attention.

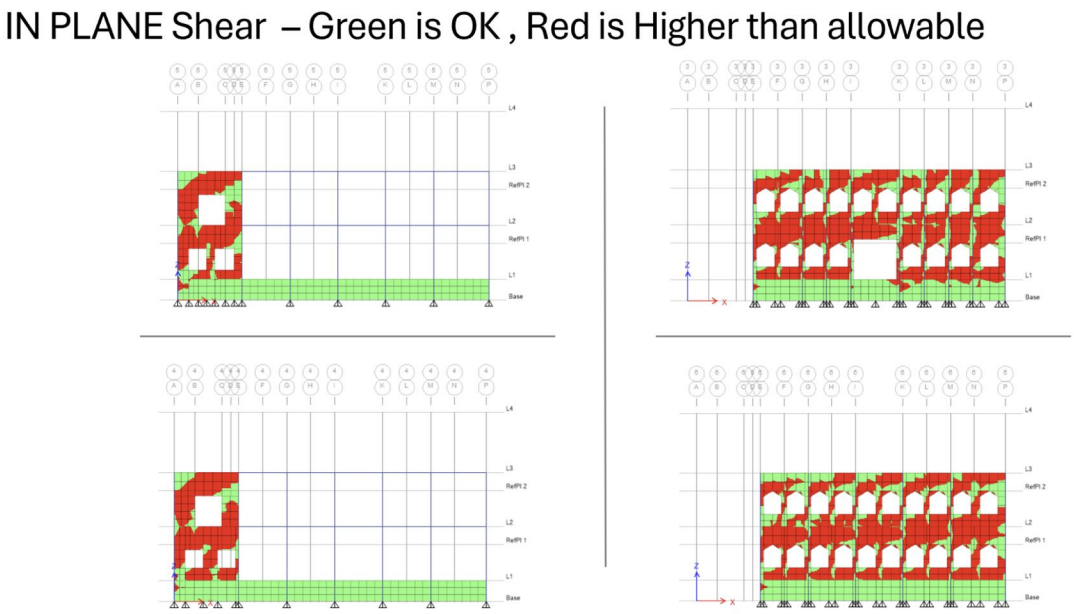


Figure 33 – Model showing damage caused by inward force impact on the surface of the load-bearing walls of the building

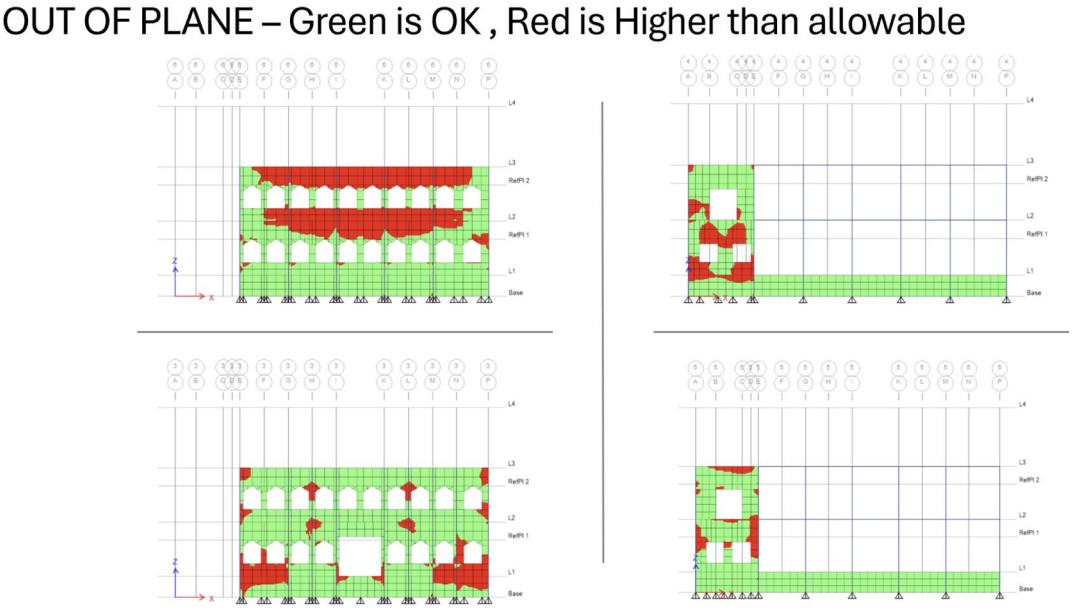


Figure 34 – Model showing damage caused by outward force impact on the exterior surface of the load-bearing walls of the building

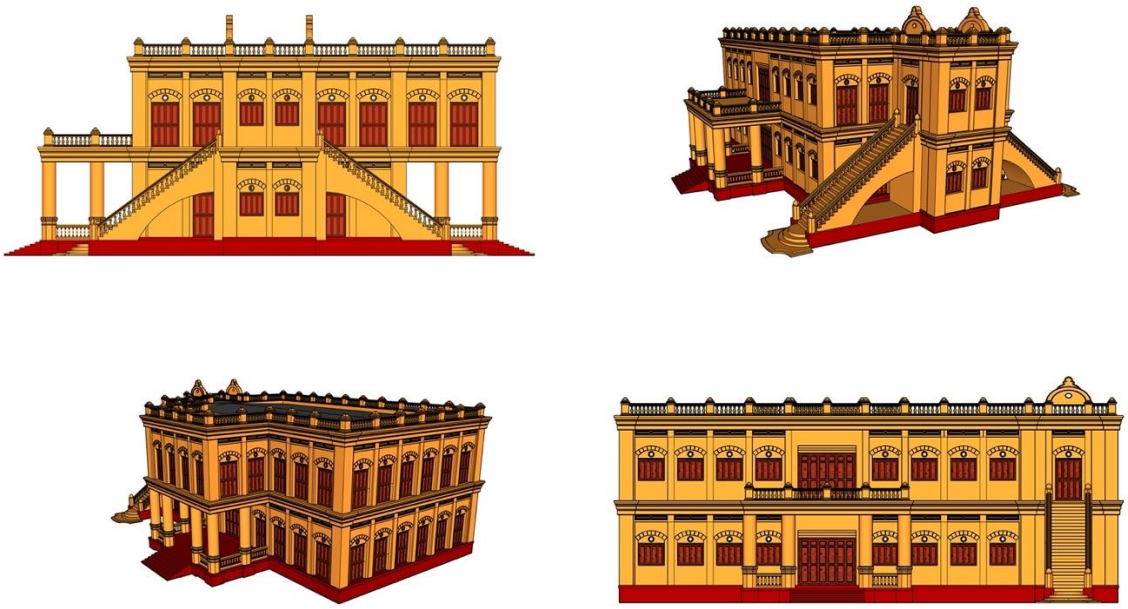


Figure 35 – Two-dimensional and three-dimensional drawings of the Abhayarama Monastery

The failure patterns observed at the Abayarama Shwegu Monastery are consistent with those documented across numerous sites in the HFM survey.

(a) The primary points of structural failure were the timber floors, verandas, staircases, and cornices, which were inadequately connected to the main unreinforced masonry (URM) structure despite its robust wall construction. This finding is directly applicable to the development of retrofitting and renovation strategies for buildings of a similar structural typology.

(b) To enhance the structural integrity of the floor-to-wall connections, restoration efforts should prioritize minimally invasive techniques. Furthermore, to ensure optimal seismic performance while minimizing impact on the original fabric, architectural elements such as stairwells and porches should be maintained or retrofitted as structurally independent units, isolated from the primary building mass.

Life Safety Structural Checklist for Building Type URM: Unreinforced Masonry Bearing Walls wil Flexible Diaphragms		STATUS			
REDUNDANCY	The number of lines of shear walls in each principal direction is greater than or equal to 2	C	NC	NA	U
SHEAR STRESS CHECK	The shear stress in the unreinforced masonry shear walls is less than 30 lb/in2 for clay units	C	NC	NA	U
WALL ANCHORAGE	Exterior concrete or masonry walls that are dependent on the diaphragm for lateral support are anchored for out-of-plane forces at each diaphragm level with steel anchors, reinforcing dowels, or straps that are developed into the diaphragm.	C	NC	NA	U
WOOD LEDGERS	The connection between the wall panels and the diaphragm does not induce cross-grain bending or tension in the wood ledgers	C	NC	NA	U
TRANSFER TO SHEAR WALLS:	Diaphragms are connected for transfer of seismic forces to the shear walls.	C	NC	NA	U
GIRDER–COLUMN CONNECTION:	There is a positive connection using plates, connection hardware, or straps between the girder and the column support	C	NC	NA	U
PROPORTIONS:	The height-to-thickness ratio of the shear walls is less than acceptable	C	NC	NA	U
MASONRY LAYUP:	Filled collar joints of multi-wythe masonry walls have negligible voids.	C	NC	NA	U
OPENINGS AT SHEAR WALLS	Diaphragm openings immediately adjacent to the shear walls are less than 25% of the wall length.	C	NC	NA	U
OPENINGS AT EXTERIOR MASONRY SHEAR WALLS:	Diaphragm openings immediately adjacent to exterior masonry shear walls are not greater than 8 ft long	C	NC	NA	U
CROSS TIES:	There are continuous cross ties between diaphragm chords.	C	NC	NA	U
STRAIGHT SHEATHING	All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered.	C	NC	NA	U
SPANS:	All wood diaphragms with spans greater than 24 ft consist of wood structural panels or diagonal sheathing.	C	NC	NA	U
DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS	All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and aspect ratios less than or equal to 4-to-1.	C	NC	NA	U
OTHER DIAPHRAGMS	The diaphragm does not consist of a system other than wood, metal deck, concrete, or horizontal bracing	C	NC	NA	U
STIFFNESS OF WALL ANCHORS	Anchors of concrete or masonry walls to wood structural elements are installed taut and are stiff enough to limit the relative movement between the wall and the diaphragm to no greater than 1/8 in. before engagement of the anchors	C	NC	NA	U
BEAM, GIRDER, AND TRUSS SUPPORTS:	Beams, girders, and trusses supported by unreinforced masonry walls or pilasters have independent secondary columns for support of vertical loads.	C	NC	NA	U

Figure 36 – Summary results of the Tier (1) assessment using the ASCE 41-17 Scheme

11. Key Findings

11.1 Loss of Heritage

The 2025 Mandalay Earthquake stands as one of the most severe in Myanmar's history. Since Mandalay and its surrounding areas hold the richest collection of Myanmar cultural craftsmanship since the Bagan era, the disaster damaged not only ancient architectural monuments but also living cultural heritage. The 529 damage records collected by the HFM are estimated to represent only about 10% of the officially reported damage list. An analysis of the data and key findings from this 10% sample, it is believed, can reveal vital insights into the structural strengths and vulnerabilities of the heritage lost in this major earthquake, which can be instrumental in establishing priority workflows for restoration tasks, systematics documentation and future disaster preparedness.

11.2 Inappropriate Past Conservations

In many areas where severe damage occurred, it was observed that the destruction was not caused by the earthquake alone, but was exacerbated by inappropriate replacement materials used during previous restoration projects. Unlike lime-based mortars, which possess self-healing properties that allow them to naturally fill and repair minor cracks over time, reinforced concrete (RC) incorporating cement lacks such restorative capabilities when structural damage occurs. Consequently, as cement-based reinforced concrete reaches the end of its lifecycle and begins to deteriorate, it often becomes irreparable, frequently leading to the subsequent degradation of the original structure itself. Furthermore, should the removal of reinforced concrete elements become necessary for any reason, it is exceedingly difficult to execute such a process without causing significant collateral damage to the historical building fabric. The past integration of cement-based mortars and reinforced concrete in the restoration of ancient buildings, has resulted in severe secondary damage during earthquakes, as the fracturing of concrete and the deformation and exposure of reinforcing bars have compromised original historical brickwork and structural components. This finding has a direct and critical bearing on current reconstruction and repair activities. The use of inappropriate replacement materials at this stage will inevitably lead to more catastrophic and intensified destruction when the next seismic event occurs.

11.3 Lesson from Wooden Structures

Despite being close to the earthquake epicenter, traditional wooden monasteries built on masonry plinths experienced almost no damage or only minor impacts during the earthquake. This fact is the primary lesson learned from the 2025 earthquake. Unlike masonry buildings, traditional wooden monasteries built by placing columns on stone base-pedestals are able to withstand earthquake forces well because they have the ability to move flexibly and naturally. When reconstruction work is required, instead of choosing to use reinforced concrete, serious consideration should be given to the use of traditional wooden construction methods where possible. This is because reinforced concrete can be more susceptible to earthquake hazards if the design used is incorrect.

11.4 Indiscriminate RCC Use and the Risk to Remaining Heritage

The rapid, extensive, and largely uncoordinated use of reinforced cement concrete (RCC) in post-earthquake reconstruction presents a critical challenge. It has been observed that several significant historical structures have been completely demolished and replaced with multi-story RCC buildings. In many instances, these reconstruction efforts are proceeding without systematic damage documentation, heritage impact assessments, or formal authorization. Consequently, some heritage assets have been irrevocably lost in the aftermath of the earthquake. Furthermore, conservation repairs utilizing flawed RCC designs are introducing new structural vulnerabilities into the original buildings. While natural disasters inherently pose a risk to heritage, undertaking reconstruction processes without adequate technical supervision and conservation measures risks the permanent disappearance of these cultural assets.

11.5 Documentation and Inventorying Requirements

In the aftermath of the earthquake, instances have been observed where demolition and site clearance are being conducted without systematic documentation, and recovered artifacts are not being properly recorded. Significant architectural components of collapsed historical structures are being discarded without thorough analysis, while heavy machinery, such as bulldozers, and other inappropriate equipment are being utilized for debris removal. Furthermore, in several locations, sub-surface archaeological evidence uncovered during excavation for restoration work has remained

undocumented. It must be emphasized that such undocumented demolition, clearance, and excavation activities result in the irretrievable loss of heritage—a loss that, once incurred, can never be recovered.

11.6 Human Resource Requirements

The magnitude of the 2025 Mandalay earthquake and the resulting extent of destruction have surpassed the emergency response capacities of relevant organizations, not only in terms of humanitarian aid but also in the critical tasks of emergency heritage documentation and structural assessment. Furthermore, there is a significant shortage of skilled personnel, compounded by regional logistical constraints that impede travel and accessibility. Local heritage enthusiasts, while committed, lack the technical experience and formal training required for emergency response, inventorying, and documentation, leaving them unprepared to participate effectively in heritage mitigation efforts. Additionally, there is a critical deficiency in the equipment and resources necessary for documentation and temporary stabilization. It is therefore recommended that local associations, universities, religious organizations, experts, and relevant authorities collaborate to launch an effective nationwide public awareness campaign. This initiative should leverage the lessons learned from this earthquake to ensure the systematic conservation of both damaged sites and remaining heritage assets for the benefit of the general public.

12. Recommendations

Based on the data collected by HFM and expert analyses, the following recommendations are presented to facilitate the conservation and restoration of heritage sites damaged by the earthquake. Although more than a year has passed since the Mandalay earthquake, and the window for immediate emergency response has lapsed, restoration work has yet to begin on the majority of affected buildings. Therefore, it is believed that the following recommendations and emergency response measures will help prevent further loss from subsequent risks, ensure public safety, and support the implementation of long-term conservation management plans.

12.1 Safety Level Classification

Earthquake-damaged heritage buildings should be categorized into four levels based on their safety and structural integrity using color-coded cards, and these classifications should be clearly displayed in prominent locations on the buildings as a warning.

Colour	Remarks
Red	Severe structural damage with high collapse risk: Entry should only be permitted after temporary stabilization measures have been implemented to provide support.
Yellow	Minor structural damage: Temporary stabilization plans must be carried out before entry or use is permitted.
Green	Minimal damage: Maintaining structural stability is not required.
Brown	Total building collapse: Entry by the general public should not be permitted until systematic documentation and debris clearance have been conducted.

12.2 Emergency Weather Protection

Emergency protective measures should be implemented for earthquake-damaged buildings to prevent further losses from weather-related impacts. To protect against hazards caused by rainfall, critical earthquake-affected structures should be covered and

protected with tarpaulins. In providing such protection, careful management is required to ensure proper water drainage and to prevent the covers from being blown away by the wind. Priority should be given to buildings containing wall paintings, glazed tiles, and stucco carvings that are at high risk of damage from rain, or those with ornamental decorations vulnerable to water damage. Buildings of high historical, archaeological, and artistic value that cannot yet undergo immediate conservation and repair must also be prioritized for protection. Furthermore, vegetation growing in the cracks or collapsed sections of earthquake-damaged buildings should be cleared using herbicides depending on the situation. These tasks are not one-off actions; rather, regular inspections and necessary repairs should be conducted as appropriate.

12.3 Security and Inventory of Heritage Items

An emergency assessment of the presence and security of heritage items should be conducted at all sites with a high or moderate risk of theft. Portable heritage items unearthed by the earthquake should be inventoried, photographed, and temporarily stored in a secure location or handed over to the relevant authorities. To ensure the safety of heritage items revealed by the earthquake and to enable legal action and repatriation efforts should they be stolen and sold on the international market, a central-level survey should be conducted, and information should be shared with relevant authorities, legal bodies, and international organizations specializing in cross-border crime prevention (e.g., INTERPOL). To facilitate community-based inventorying of heritage items, HFM has developed a heritage inventory form (Appendix 3) on the HFM Mobile Application and Website. This HFM application or web form can be used to record the inventory of heritage items revealed by the earthquake. It is crucial to conduct awareness activities for local heritage enthusiasts, religious figures, and trustee members on the systematic handling and documentation of these heritage items.

12.4 Documentation Prior to Any Intervention

Before any conservation, reconstruction, clearing, or demolition activities are undertaken at any earthquake-affected heritage site, the current state of damage should first be documented through photography and, if possible, 3D photogrammetry. The documentation team should include archaeologists, architects, and engineers. Newly

revealed or discovered archaeological structures or features should not be further excavated or altered for study purposes before notifying the relevant authorities. In inventorying and documenting earthquake-affected heritage, human resources can be utilized effectively and efficiently by providing training on systematic inventory methods to students from relevant university departments—such as archaeology, architecture, and engineering—in collaboration with respective local and international experts; furthermore, these human resources can be redeployed for future natural disasters. Additionally, the assessment forms used during the Bagan earthquake should be adapted to suit the heritage sites damaged in the Mandalay earthquake.

12.5 Heritage Impact Assessment (HIA)

Before undertaking activities such as debris clearance, structural stabilization, repair, or reconstruction, it is crucial to conduct a Heritage Impact Assessment (HIA) for each affected site. The objective of performing an HIA is to identify the specific values and significant features of the heritage site, to assess how proposed conservation workflows might impact those values, and to recommend mitigation measures to minimize potential negative effects. Therefore, the HIA process is vital when making decisions regarding the conservation and reconstruction of earthquake-damaged heritage to ensure that heritage values are preserved and further damage is prevented.

12.6 Systematic Debris Clearance

Debris clearance must be carried out systematically. Affected collapse sites should be divided using a grid system and cleared section by section, with debris categorized according to its heritage value. High-significance materials—such as original decorative bricks, stuccos, carved stones, fragments of statues, mural fragments, and glazed tile pieces—should be inventoried, preserved, and stored for future reuse. Medium-significance materials, including original plain stuccos, bricks, and stones without ornamentation, should only be removed and cleared after careful inspection and assessment. Low-significance debris, such as broken brick fragments and other materials, should only be disposed of in areas where they will not cover potential remaining underground archaeological artifacts. Every stage of the clearing process should be documented through photography, and if possible, photogrammetry and written records.

If the use of heavy machinery is required during clearance, it should be conducted in accordance with the guidelines derived from the HIA assessment to prevent further damage.

12.7 Detailed Assessment and Appropriate Conservation

Before carrying out reconstruction and repair work on severely damaged or completely collapsed sites, a detailed assessment and analysis of the building's structural integrity should be conducted. The purpose of performing this analysis is also to identify the causes of damage and seismic load paths. In areas with minor damage, when replacing bricks, pointing cracks, and waterproofing, traditional materials compatible with lime mortar should be used rather than modern cement. For moderate damage, conservation plans should be reviewed and approved by certified engineers with experience in heritage building restoration. In drafting and submitting such conservation plans, more than one possible model should be presented and evaluated before selecting the most appropriate conservation approach.

The widespread use of reinforced concrete construction systems in reconstruction projects should be halted immediately, replaced with appropriate materials, and strictly supervised from a technical perspective. In areas near fault lines where ground motion is high during earthquakes, the use of seismic base isolation technology (which reduces the impact of ground shaking on the structure) should be considered for highly significant heritage buildings. Furthermore, the reconstruction of sites that have completely collapsed should proceed according to the originally documented designs using appropriate materials, and existing components from the original structure should be preserved as much as possible without being removed during the rebuilding process.

12.8 Collaborative Planning with Stakeholders

A list of responsible conservation professionals and stakeholders for each earthquake-affected site should be systematically documented. Subsequently, a general recovery timeline should be established for these sites, incorporating phases for emergency structural stabilization, conservation and repair, and long-term rehabilitation. Based on experiences from similar events in other countries, the response phase requires at least

one year, while the execution of recovery works can span up to a decade. In drafting recovery guidelines and procedures for Myanmar's earthquake-affected heritage, the models should be based on international conservation standards while remaining compatible with the climate, building types, construction materials, and cultural characteristics of Central Myanmar. Once these guidelines have been developed, they should be disseminated through workshops, training programs, and practical demonstrations to participants at every relevant level to enhance their knowledge and understanding.

12.9 Training, Educational Programs, and International Cooperation

To address the issue of insufficient human resources for the long term, authorities and academic organizations should take the lead in providing training—with the support and assistance of international organizations and experts—on emergency disaster response for heritage, damage documentation, and protection against subsequent risks for students from relevant university departments. These human resources should then be utilized to expand documentation and conservation efforts at earthquake-affected heritage sites. This method has been found effective in resolving human resource shortages in other countries that have experienced natural disasters. To ensure the long-term sustainability of ancient heritage, plans should be implemented to produce specialized experts in necessary fields and to create heritage conservation job opportunities and projects for the trained students.

Furthermore, there should be increased cooperation with international cultural heritage conservation organizations such as UNESCO, ICOMOS, and ICCROM in drafting policy guidelines and procedures. In developing national-level recovery policies following the earthquake, the sector of heritage conservation and protection should be clearly integrated.

Finally, regarding the aforementioned policies, guidelines, processes, and information about earthquake-affected heritage, the rules and regulations for public compliance, as well as ways for the public to participate and assist, should be disseminated in a timely and appropriate manner.

13. Conclusion

The 2025 Mandalay earthquake caused unprecedented and historic damage to Myanmar's cultural heritage, on a scale not witnessed in a century. Among the 529 damaged structures documented by HFM are invaluable historical buildings, mural paintings featuring ancient craftsmanship, stucco works, reliefs, and various artifacts recovered from these sites. It is saddening to observe that, up to the time of this writing, debris at certain locations is being rapidly cleared without systematic documentation, alongside the implementation of inappropriate replacements and reconstruction efforts. Beyond the physical loss caused by the earthquake itself, the remaining heritage faces further degradation due to these insufficiently considered human actions. The 529 structures recorded by HFM likely represent only 10% or less of the total heritage sites actually affected by the earthquake. Consequently, collective efforts must be intensified to identify the full extent of the invaluable assets lost across all affected heritage sites and to understand the subsequent risks that continue to threaten them.

Due to its geographical location, Myanmar faces annual natural disasters, including cyclones, floods, landslides, and earthquakes; consequently, it possesses significant experience and valuable lessons regarding disaster response. The 2016 Chauk earthquake, which impacted the heritage sites of Ancient Bagan, provided considerable experience in disaster response and recovery management for cultural heritage. From the impacts of the Bagan earthquake, valuable expertise was gained through the Earthquake Response Coordination Committee—comprising relevant authorities, international organizations, and experienced local experts—particularly regarding survey methodologies, damage assessment protocols, conservation procedures, and strategies for community engagement and public awareness. In the restoration of heritage sites damaged by the recent Mandalay earthquake, the successful methodologies employed during the Bagan earthquake should be appropriately applied, adapted, and refined for more effective implementation.

In formulating future conservation and restoration decisions, actions must be guided by clear, precise, and definitive conservation policies. These guidelines should not be viewed

as restrictive prohibitions, but rather as essential frameworks that provide a systematic and technically sound approach to ensure the long-term sustainability of heritage assets.

(a) At this site, what is of primary importance to take into consideration and what has the seismic activity revealed?

Understand the value and significance before making any decisions.

Understanding the value prior to determining the treatment for each earthquake-affected site encompasses the construction materials used, the historical context of its creation, its cultural significance, and its artistic merit. By identifying the specific vulnerabilities—such as material composition, previous interventions, or structural systems—that led to damage or collapse, these findings should be applied to conservation efforts to ensure that past errors and weaknesses are not repeated.

(b) What is truly required and is there risk of further damage?

Interventions should be limited to what is strictly necessary.

Restoration efforts that exceed actual requirements pose the risk of introducing new problems to existing ones. The objective of conservation is to stabilize and preserve the remaining original fabric, not to replace it. Every conservation action should be undertaken with due care to ensure that the remaining original craftsmanship is not subjected to further degradation.

(c) Are materials and methods compatible, and are they reversible in the future?

Utilize harmonious and reversible methods.

The conservation materials and design motifs employed must be compatible with the original structural composition and aesthetic style. The use of flexible materials and techniques ensures that more advanced methodologies or tools can be utilized for improved interventions in the future.

(d) Can the repairs be maintained over time?

Design for maintainability and long-term durability.

Every intervention must be executed in a manner that allows both the original structure and the repaired sections to be maintained and restored in the years to come. Conservation is not a one-time event but rather a continuous, iterative process. It is

important to recognize that repairs which cannot be regularly inspected, mended, or maintained may devolve into perfunctory obligations rather than serving as heritage protection.

(e) What will happen in the next earthquake?

Consider future seismic events in every conservation and restoration effort.

It is essential to anticipate how currently restored sections will perform when a similar major earthquake recurs. As Myanmar is situated on active fault lines, future earthquakes are an absolute certainty, with only their timing remaining unknown. Therefore, it must be recognized that structural interventions—such as those creating incompatible stiffness, utilizing inappropriate materials, or resulting in poor bonding between original and replacement elements—may lead to outcomes far more catastrophic during future seismic activity than if no intervention had been undertaken at all.

(f) Has everything of value been documented and preserved?

Do not compromise original craftsmanship; document and preserve.

Original construction materials, including collapsed or displaced components, decorative fragments, stonework, and mural sections, possess irreplaceable historical and artistic value. No clearance activities should be conducted without the systematic categorization, documentation, and preservation of significant parts for future reuse or study. The unauthorized removal of portable heritage artifacts must be strictly prevented.

(g) What will be the state of these sites in 100 years?

Prioritize long-term planning over immediate rapid action.

Emergency stabilization represents only the initial phase. The decisions formulated and implemented in the months and years following this earthquake will determine the condition of Myanmar's heritage a century from now. Every heritage site requires a phased conservation plan that transitions from emergency protection to full recovery—one that adheres to international standards while being calibrated to suit Myanmar's climate, available materials, and cultural context.

In view of security concerns, resource constraints, the overextension of relevant personnel, and the ongoing challenges faced by the public in the aftermath of the

earthquake, adhering to these fundamental conservation principles and frameworks may present significant practical difficulties on the ground. However, rather than allowing these crises to justify a disregard for conservation frameworks, efforts should be made to overcome these challenges through the provision of clearer and more precise guidelines, the deployment of better-trained skilled staff and experts, strengthened coordination, public support, and the effective utilization of advanced international technologies.

A heritage structure that has been demolished and cleared can never be reconstructed in its original form. Likewise, heritage lost to rainfall, theft, or improper intervention is irretrievable. The principles outlined in this document do not claim to be exhaustive; indeed, more comprehensive methodologies and frameworks may exist. Nevertheless, it is recommended that every individual involved in the restoration and maintenance of Myanmar's damaged heritage sites—regardless of the cause of degradation—ask themselves several critical questions before commencing any work: Will the proposed actions provide better protection for the site? Has a profound understanding of the site been established? And are preparations sufficiently robust to respond to future contingencies more effectively than before?


Heritage
FOR MYANMAR


Mural Paintings in Mahamuni Temple
@ HERITAGE FOR MYANMAR

APPENDIX – 1

အချက်အလက်များဖြင့်ဖြည့်သွင်းခြင်းပုံစံ

👷 **Name of Surveyor**

📋 Rapid Assessment Form

🏯 **Monument Name/ Monument Group Name**

🔢 **Monument Number (if any)**

📍 Location

🗺️ **State/District**

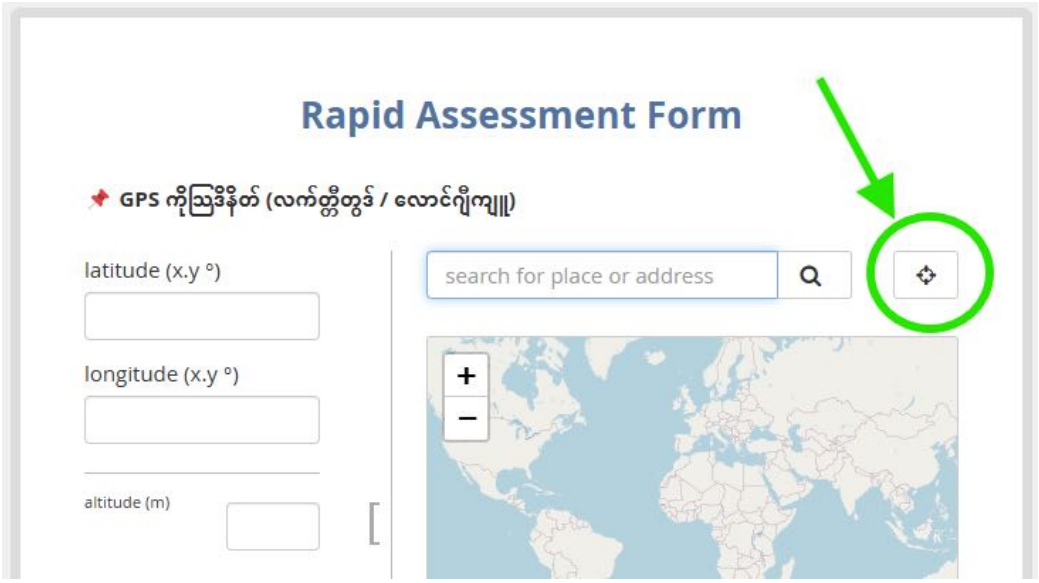
- ○ Chin State
- ○ Kachin State
- ○ Kayah State
- ○ Kayin State
- ○ Mon State
- ○ Rakhine State
- ○ Shan State
- ○ Ayeyarwady Region
- ○ Bago Region
- ○ Magway Region
- ○ Mandalay Region
- ○ Sagaing Region
- ○ Tanintharyi Region
- ○ Yangon Region
- ○ Naypyidaw Territory

🌆 **City**

🏘️ **Township**

🏡 Village

📌 GPS Coordinates (Lat/Long)



Press this ⊹ dot to know your location.

---

latitude (x.y °)

longitude (x.y °)

altitude (m)

accuracy (m)

🏛️ Monument Details

🏗️ Type of Monument

You can select more than one option.

- [ ] 🛕 Temple
- [ ] 🪷 Stupa
- [ ] 🏯 Monastery
- [ ] 🕳️ Underground Structure
- [ ] 🏰 Palace
- [ ] 🏺 Archaeological Element
- [ ] 🪨 Other (specify):

✏️ Type of Monument – Other

🏯 If this is a monument complex, how many monuments are there?

🏢 Storey of Monument

- (•) 1
- ( ) 2
- ( ) 3
- ( ) 4

👷 Management Authority

- ( ) 🏛️ National Heritage Listed
- ( ) 📄 Not Listed
- ( ) 🛡️ Pagoda Trustee / Monk / Local Community
- ( ) 🧩 Other (specify):

✍️ Management Authority – Other

⚠️ Safety Concerns (can do inspection inside)

- ( ) Yes
- ( ) No

🧱 Predominant Structural Material

- ○ 🧱 Brick
- ○ 🪨 Stone
- ○ 🟫 Wood
- ○ 🧱🟫 Brick & Wood
- ○ 🏗️ Steel Structure
- ○ 🔧 Other (specify):

🔧 Predominant Structural Material (specify):

⏳ Original Date or Period

🔄 Changes in Condition

📝 Changes in Condition

〰️ Displacement or Subsidence from Original Location (if known)

📷 Damaged Photographs of Monument

ℹ️ Photo Guidelines:

- Maximum file size: 5 MB
- Recommended resolution: 1280x960
- Stand at a consistent distance for uniformity.

Must Capture (4 Sides):

N, E, W, S – Each:
✓ Centered (perfect left-right symmetry)
✓ Same distance (e.g., 10m from base)

✓ Same height/angle (use tripod if possible)

Avoid:

✗ Tilted angles / portrait mode

Extras (if needed):

Close-ups of damage

Wide context shots

Tip: Mark shooting spots for consistency.

🧭 **Photo - North View**

Click here to upload file. (< 10MB)

🧭 **Photo - East View**

Click here to upload file. (< 10MB)

🧭 **Photo - South View**

Click here to upload file. (< 10MB)

🧭 **Photo - West View**

Click here to upload file. (< 10MB)

» 🏞️ Photo - Other Views

1

🖼️ **Photo - Other Views**

Click here to upload file. (< 10MB)

🧱 Damaged Condition

❗ **Damaged Condition**

- ◯ 🟩 No Damage
- ◯ 🟨 Minor
- ◯ 🟧 Moderate
- ◯ 🟥 Severe
- ◯ ⛔ Completely Collapse

🔧 **Damaged Elements (if not completely collapsed)**

You can select more than one option.

- ☐ 🛕 Spire
- ☐ 🏠 Roof
- ☐ 🧱 Walls
- ☐ 🟫 Floor
- ☐ 🪟 Windows/Ventilation Openings
- ☐ 🚪 Doors/Entrances
- ☐ 🚪 Outer Enclosure Wall
- ☐ 🏚️ Passage to Main Hall
- ☐ 🏗️🧩 Structural Components of the Main Building (specify):
- ☐ 🧩 Other (specify):

» ➕ Specify Other Damaged Element

1

* 🏗️ **Name of other Damage Element**

» 🏠 Specify Structural Components of the Main Building

1

* 🗒️ Name of Structural Components of the Main Building

🎨 Decorated Elements

🖌️ Decorated Elements

- ◯ 💢 Damaged
- ◯ ✅ Not Damaged

❌ Damaged Decorated Elements

You can select more than one option.

- ☐ 🖼️ Image
- ☐ 🟫 Stucco
- ☐ 🪞 Glazed Plaque
- ☐ 🎨 Mural
- ☐ 🗿 Stone Sculpture
- ☐ 🟫🪆 Wooden Sculpture
- ☐ 🧩 Other(s) (Specify):

🖼️ Damaged Decorated Element - Image

- ◯ 🟡 Minor
- ◯ 🟠 Moderate
- ◯ 🔴 Extensive
- ◯ ⛔ Complete

🏺 Damaged Decorated Element - Stucco

- ◯ 🟡 Minor
- ◯ 🟠 Moderate
- ◯ 🔴 Extensive
- ◯ ⛔ Complete

🪨 Damaged Decorated Element - Glazed Plaque

- ◯ 🟡 Minor
- ◯ 🟠 Moderate
- ◯ 🔴 Extensive
- ◯ ⛔ Complete

🖼️ Damaged Decorated Element - Mural

- ◯ 🟡 Minor
- ◯ 🟠 Moderate
- ◯ 🔴 Extensive
- ◯ ⛔ Complete

🪨 Damaged Decorated Element - Stone Sculpture

- ◯ 🟡 Minor
- ◯ 🟠 Moderate
- ◯ 🔴 Extensive
- ◯ ⛔ Complete

🪵 Damaged Decorated Element - Wooden Sculpture

- ◯ 🟡 Minor
- ◯ 🟠 Moderate
- ◯ 🔴 Extensive
- ◯ ⛔ Complete

» ➕ Damaged Decorated Element - Other(s) (Specify):

1

* ✏️ Damaged Decorated Element – Name

Next for Photo upload, Press the plus sign (+) to add other damages.

---

* 🧩 Damaged Decorated Element

- ◯ 🟡 Minor
- ◯ 🟠 Moderate
- ◯ 🔴 Extensive
- ◯ ⛔ Complete

🧾 Damaged Photography & History of Repair

📸 Damaged Photography of Decorated Elements (Please take details if possible)

- ◯ ✅ Yes
- ◯ ❌ No

ℹ️ Photo Guidelines:

- Maximum file size: 5 MB
- Recommended resolution: 2k
- Good lighting is important
- Capture entire damaged area
- Include ruler/scale if available

» 🔁 Damage Photos

1

✏️ Photo Description

After writing about the damaged content, you can upload a photo.

---

* 📷 Take photo of damage

Click here to upload file. (< 10MB)

🛠️ History of Repair (if known)

☢️ Risk Assessment

🧨 Risk of collapse due to aftershocks

- ◯ 📉 Low
- ◯ ➖ Moderate
- ◯ 📈 High

🔥 **Risk of fire hazard**

- ○ 📉 Low
- ○ ➖ Moderate
- ○ 📈 High

🌧️ **Risk of further damage due to rainfall**

- ○ 📉 Low
- ○ ➖ Moderate
- ○ 📈 High

🗝️ **Risk of valuable artifacts being looted**

- ○ 📉 Low
- ○ ➖ Moderate
- ○ 📈 High

🌊 **Risk of flooding or landslide**

- ○ 📉 Low
- ○ ➖ Moderate
- ○ 📈 High

🛡️ Temporary Protection

✅ **Temporary Protection**

- ○ ✅ Yes
- ○ ❌ No

🧰 **If present, type of protection**

You can select more than one option.

- ☐ ⛺ Shelter
- ☐ ⚠️ Danger warning sign
- ☐ 🚧 Barrier
- ☐ ❓ Other (specify)

» ➕ **Protection - Other**

1

* ✏️ Protection Type

📝 Remarks (if any)

🕰️ Photographs before damage

🕰️ Photographs before damage

- ◯ ✅ Yes
- ◯ ❌ No

» 🖼️ Photographs before damage – Upload Session

1

* 🖼️ Upload – Photographs before damage

Click here to upload file. (< 10MB)

📝 Photographs before damage – Description

Thank you so much for your contribution! 🙏

You have completed the Heritage Rapid Assessment survey.

Your assessment will serve as important documentation to help preserve Myanmar's cultural heritage for future generations.

If you have filled in all the information completely,
please press the "Submit" button to submit your responses. ✨

APPENDIX – 2

No.	Name	Mon. no.	Size	City	Lat.	Long.	Extent of Damage	Priority
1	Hel Yar Ywama		S	Inlay	20.493537	96.886357	Minor	3
2	Phaung Taw Oo		VL	Inlay	20.4743299	96.890205	Minor	1
3	Shwe Yan Pyay		M	Inlay	20.6847434	96.9318078	Moderate	2
4	-	193	S	Inwa	21.837848	95.978338	Severe	1
5	-	234	S	Inwa	21.838187	95.977683	Severe	1
6	-	602	S	Inwa	21.832769	95.978429	Completely Collapse	2
7	-	614	S	Inwa	21.832386	95.97851	Completely Collapse	2
8	-	158	S	Inwa	21.838964	95.979411	Severe	3
9	Aung Cha Thiri Man Aung	349	S	Inwa	21.845711	95.976042	Minor	3
10	Aung Chan Thar Ngwe Zedi		S	Inwa	21.848564	95.981407	No Damage	0
11	Aung Chan Thar Yan Shin		S	Inwa	21.858701	95.985017	Minor	3
12	Aung Sakkyar	31	S	Inwa	21.851755	95.976257	Minor	3
13	Aung Yadana Su Taung Pyae	166	S	Inwa	21.835727	95.983579	Minor	3
14	Aung Zedi	88 (a)	S	Inwa	21.848504	95.9816	No Damage	0
15	Aye Zedi	88 (b)	S	Inwa	21.848474	95.981659	No Damage	0
16	Ayoe Oe Zedi	519	S	Inwa	21.848195	95.982131	No Damage	0
17	Bagayar Monastery		L	Inwa	21.8482718	95.968209	Minor	1
18	Buddhist community hall (Dhamma Yone)	56 (a)	S	Inwa	21.857929	95.985054	Severe	2
19	Daw Gyan Complex	317	S	Inwa	21.85058	95.976128	Severe	1
20	Daw Gyan Complex	320	S	Inwa	21.850331	95.976123	Severe	1
21	Daw Gyan Complex	325	S	Inwa	21.850535	95.975972	Severe	1
22	Daw Gyan Complex	319	S	Inwa	21.850426	95.976053	Completely Collapse	1
23	Daw Gyan Complex	323	S	Inwa	21.850461	95.975876	Moderate	1
24	Daw Gyan Complex	324	S	Inwa	21.85054	95.975897	Severe	1
25	Daw Gyan Complex	318	S	Inwa	21.850471	95.976219	Severe	1
26	Daw Gyan Complex	322	S	Inwa	21.850371	95.97587	Severe	1
27	Gudaw Thit	6	M	Inwa	21.852009	95.979663	Severe	2

28	Hti Hlaing Shin	55	M	Inwa	21.85777	95.985033	Minor	3
29	Inwa Yadana complex		S	Inwa	21.848798	95.974669	Moderate	2
30	Khe Thin complex	114	S	Inwa	21.846303	95.979009	Severe	1
31	Khe Thin complex	113	S	Inwa	21.846194	95.97902	Completely Collapse	1
32	Khe Thin complex	108	S	Inwa	21.845955	95.978907	Severe	2
33	Khe Thin complex	119	S	Inwa	21.846388	95.979009	Minor	2
34	Khe Thin complex	123	S	Inwa	21.846159	95.978821	No Damage	0
35	Khe Thin complex	110	S	Inwa	21.846079	95.978934	Severe	1
36	Khe Thin complex	106	S	Inwa	21.845825	95.978762	Moderate	2
37	Khe Thin complex	116	S	Inwa	21.846273	95.97888	Severe	1
38	Khe Thin complex	111	S	Inwa	21.846144	95.978939	Minor	3
39	Khe Thin complex	118	S	Inwa	21.846373	95.978944	Severe	1
40	Khe Thin complex	115	S	Inwa	21.846318	95.978939	Minor	3
41	Khe Thin complex	117	S	Inwa	21.846383	95.978869	Severe	1
42	Khe Thin complex	121	S	Inwa	21.846452	95.978778	Severe	1
43	Khe Thin complex	107	S	Inwa	21.845885	95.978955	Moderate	2
44	Khe Thin complex	109	S	Inwa	21.846034	95.978928	Severe	1
45	Khe Thin complex	112	S	Inwa	21.846218	95.978944	Minor	3
46	Khe Thin complex	120	S	Inwa	21.846447	95.978816	Severe	1
47	Koe Su Tan complex	423	S	Inwa	21.848345	95.965823	Moderate	1
48	Koe Su Tan complex	426 (b)	S	Inwa	21.847214	95.965726	Severe	1
49	Koe Su Tan complex	425	S	Inwa	21.847727	95.965839	Severe	1
50	Koe Su Tan complex	427	S	Inwa	21.847189	95.965844	Minor	2
51	Koe Su Tan complex	424	S	Inwa	21.848345	95.965823	Moderate	2
52	Koe Su Tan complex (Myat Hteik Mo)	426	S	Inwa	21.847369	95.965823	Severe	1
53	Kyar Phaya		S	Inwa	21.851825	95.983617	Severe	2
54	Kyaung Lain Phaya	436	M	Inwa	21.84939	95.962185	Moderate	2
55	Lawka Dutha Man Aung	439	S	Inwa	21.849365	95.961494	Moderate	2

56	Lawka Hteik Oo		M	Inwa	21.837559	95.978472	Completely Collapse	1
57	Lawka Man Aung	556	M	Inwa	21.830976	95.986154	Completely Collapse	1
58	Lawka Tharaphu		L	Inwa	21.8558553	95.9652251	Severe	1
59	Lay Htet Gyi monastery		L	Inwa	21.8400977	95.9772297	Completely Collapse	1
60	Lay Myat Hnar	352	S	Inwa	21.84579	95.97616	Severe	1
61	Maha Lawka Chan Thar	620	S	Inwa	21.832625	95.978279	Severe	1
62	Maha Lawka Man Kin		S	Inwa	21.835687	95.984062	Minor	3
63	Man Aung Yadana	28	M	Inwa	21.853438	95.977008	Moderate	2
64	Melnu Monastery	64	VL	Inwa	21.858387	95.98447	Severe	1
65	Myitmo Taung	440	M	Inwa	21.84934	95.961075	Minor	3
66	Nga Man Aung Zedi	592	M	Inwa	21.833416	95.978875	Severe	1
67	Ngakywe Nadaung	441	S	Inwa	21.849146	95.960893	Severe	1
68	Ngwe Zin Chaung complex		S	Inwa	21.8457039	95.9807791	Minor	3
69	Pyatthet	233	S	Inwa	21.838192	95.978022	Severe	1
70	Pyi Lone Chan Thar	600	S	Inwa	21.832729	95.978268	Severe	2
71	Sandamuni	143	L	Inwa	21.840288	95.979186	Severe	1
72	Shwe Hinthar		S	Inwa	21.850535	95.981278	No Damage	0
73	Shwe Pauk Taw complex	139 (g)	S	Inwa	21.8441006	95.9796728	Severe	1
74	Shwe Pauk Taw complex	139 (h)	S	Inwa	21.844182	95.979728	Moderate	2
75	Shwe Pauk Taw complex	139 (e)	S	Inwa	21.844227	95.979577	No Damage	0
76	Shwe Pauk Taw complex	139 (b)	S	Inwa	21.844227	95.979459	No Damage	0
77	Shwe Pauk Taw complex	139 (a)	S	Inwa	21.844222	95.979475	No Damage	0
78	Shwe Pauk Taw Zedi	139	S	Inwa	21.844152	95.979577	Completely Collapse	2
79	Shwe Zedi	88	S	Inwa	21.848484	95.981423	No Damage	0
80	Shwezigon		L	Inwa	21.852288	95.973676	Severe	1
81	Su Htoo Pan	25	S	Inwa	21.853747	95.978279	Moderate	2
82	Su Taung Pyae Aung Theikdi Moekaung Shwe Zedi	143 (b)	S	Inwa	21.840542	95.979744	Moderate	2
83	Su Taung Pyae Mya Zedi		S	Inwa	21.8485898	95.9816046	No Damage	0

84	Su Taung Pyae Zedi	630	S	Inwa	21.83247	95.978177	Moderate	2
85	Teikma Khan Zedi	232	S	Inwa	21.838271	95.978016	Completely Collapse	2
86	Temple	69	S	Inwa	21.858377	95.985006	Severe	2
87	Temple	59	S	Inwa	21.858263	95.985757	Moderate	3
88	Temple	42 (b)	S	Inwa	21.852537	95.974004	Minor	3
89	Temple	17	S	Inwa	21.851929	95.979116	Severe	2
90	Temple	619	S	Inwa	21.83254	95.978279	Moderate	2
91	Temple	593	S	Inwa	21.833392	95.978724	Moderate	2
92	Temple	139 (c)	S	Inwa	21.844122	95.979465	No Damage	0
93	Temple		S	Inwa	21.851183	95.985816	No Damage	0
94	Temple	East of 509	S	Inwa	21.851352	95.985768	Minor	3
95	Temple	509	S	Inwa	21.851297	95.98573	No Damage	0
96	Temple	139 (f)	S	Inwa	21.844207	95.979722	Moderate	0
97	Temple	139 (d)	S	Inwa	21.844122	95.97947	No Damage	0
98	Temple	234	S	Inwa	21.838202	95.977689	Completely Collapse	1
99	Temple	149 (b)	S	Inwa	21.840189	95.979974	Severe	2
100	Thein (Sima)	57	S	Inwa	21.858029	95.985237	Severe	2
101	Thein Taw Gyi		S	Inwa	21.852089	95.974438	Completely Collapse	2
102	Thitsar Teik	26	M	Inwa	21.853662	95.977582	Severe	1
103	Thone Lu Hteik Oo Zedi	165	S	Inwa	21.835946	95.983579	Severe	1
104	Tittha Man Aung	546	S	Inwa	21.83366	95.984169	Minor	3
105	Tutha Man Aung	599	M	Inwa	21.83257	95.97866	Severe	1
106	U Ti Gate	79	M	Inwa	21.851422	95.981353	Severe	1
107	Wingaba	442	M	Inwa	21.849475	95.96078	Moderate	1
108	Yadana Semi complex	380	S	Inwa	21.854497	95.9691985	No Damage	0
109	Yadana Semi complex	371	S	Inwa	21.854384	95.969224	Severe	1
110	Yadana Semi complex	379	S	Inwa	21.854319	95.969149	No Damage	0
111	Yadana Semi complex	377	S	Inwa	21.854299	95.969149	No Damage	0

112	Yadana Semi complex	381	S	Inwa	21.8544866	95.9692709	No Damage	0
113	Yadana Semi complex	375	S	Inwa	21.8543585	95.9692071	Minor	2
114	Yadana Semi complex	374	S	Inwa	21.8543378	95.9692027	Minor	2
115	Yadana Semi complex	372	S	Inwa	21.854464	95.96916	Severe	1
116	Yadana Semi complex	373	M	Inwa	21.85427	95.969331	Severe	1
117	Yadana Semi complex	376	S	Inwa	21.8542772	95.9692155	No Damage	0
118	Yadana Semi complex	378	S	Inwa	21.854479	95.969122	No Damage	0
119	Yan Pyay Man Pyay	612	S	Inwa	21.832386	95.978725	Moderate	2
120	Yan Shin	51	S	Inwa	21.857715	95.984624	Severe	2
121	Zedi	56	S	Inwa	21.857819	95.985248	Minor	3
122	Zedi	54	S	Inwa	21.858019	95.984856	Moderate	3
123	Zedi		S	Inwa	21.858482	95.985258	Completely Collapse	3
124	Zedi	53	S	Inwa	21.857964	95.984781	Severe	2
125	Zedi	67	S	Inwa	21.858382	95.985264	Severe	2
126	Zedi	66	S	Inwa	21.858571	95.985258	Severe	2
127	Zedi		S	Inwa	21.858287	95.985864	Severe	2
128	Zedi	29 (b)	S	Inwa	21.853931	95.976895	Severe	2
129	Zedi	52	S	Inwa	21.85779	95.984845	Moderate	2
130	Zedi		S	Inwa	21.858835	95.98565	Severe	2
131	Zedi	58	S	Inwa	21.858128	95.985864	Severe	3
132	Zedi	29 (a)	S	Inwa	21.853826	95.976927	Severe	3
133	Zedi	29 (c)	S	Inwa	21.853911	95.976992	Minor	3
134	Zedi	35	S	Inwa	21.851959	95.974744	Moderate	2
135	Zedi	42 (a)	S	Inwa	21.853154	95.973768	Severe	2
136	Zedi	25 (b)	S	Inwa	21.853652	95.97822	Severe	3
137	Zedi	7	S	Inwa	21.851641	95.97969	Severe	3
138	Zedi	34	S	Inwa	21.851934	95.975017	Minor	3
139	Zedi	25 (a)	S	Inwa	21.853807	95.978403	Moderate	3

140	Zedi		S	Inwa	21.852248	95.980076	Moderate	2
141	Zedi	350	S	Inwa	21.845765	95.975919	Severe	2
142	Zedi	351	S	Inwa	21.845825	95.975962	Severe	2
143	Zedi	15	S	Inwa	21.851685	95.979084	Severe	2
144	Zedi	13	S	Inwa	21.851666	95.979373	Severe	2
145	Zedi	16	S	Inwa	21.851785	95.979094	Minor	3
146	Zedi	18	S	Inwa	21.852094	95.979137	Moderate	3
147	Zedi	19	S	Inwa	21.852323	95.979186	Severe	2
148	Zedi	11	S	Inwa	21.851621	95.979475	Severe	2
149	Zedi	18	S	Inwa	21.8505009	95.9793887	Completely Collapse	2
150	Zedi		S	Inwa	21.851885	95.983933	Moderate	3
151	Zedi	131	S	Inwa	21.844506	95.979765	Severe	2
152	Zedi	615	S	Inwa	21.832406	95.978381	Minor	3
153	Zedi	622	S	Inwa	21.832565	95.978504	Minor	3
154	Zedi	613	S	Inwa	21.832396	95.978617	Moderate	2
155	Zedi	597	M	Inwa	21.833287	95.978676	Minor	3
156	Zedi	601	S	Inwa	21.832779	95.978354	Minor	3
157	Zedi	603	S	Inwa	21.832769	95.978515	Severe	2
158	Zedi	594	S	Inwa	21.833531	95.97858	Moderate	2
159	Zedi	231	S	Inwa	21.838441	95.978129	Severe	2
160	Zedi	36	S	Inwa	21.852183	95.975232	Severe	2
161	Zedi	37	S	Inwa	21.852208	95.975028	Minor	3
162	Zedi	230	S	Inwa	21.838769	95.977936	Moderate	2
163	Zedi	596	S	Inwa	21.831818	95.982807	No Damage	0
164	Zedi	570	S	Inwa	21.831823	95.982892	No Damage	0
165	Zedi		S	Inwa	21.832117	95.985966	Severe	2
166	Zedi		S	Inwa	21.833865	95.984116	Severe	2
167	Zedi	543	S	Inwa	21.834507	95.984405	Severe	2

168	Zedi	568	S	Inwa	21.832082	95.982882	No Damage	0
169	Zedi	571	S	Inwa	21.831654	95.983064	Minor	3
170	Zedi	553	S	Inwa	21.831265	95.985972	Minor	3
171	Zedi		S	Inwa	21.833889	95.98418	Minor	3
172	Zedi	249	S	Inwa	21.840333	95.974733	Minor	3
173	Zedi	257	S	Inwa	21.840562	95.973161	Minor	3
174	Zedi		S	Inwa	21.840442	95.974556	Severe	2
175	Zedi	248	S	Inwa	21.8341301	95.9813993	No Damage	0
176	Zedi	139 (j)	S	Inwa	21.844242	95.979717	Minor	3
177	Zedi	139 (i)	S	Inwa	21.844162	95.979728	No Damage	0
178	Zedi	518	S	Inwa	21.8482195	95.9821443	Minor	3
179	Zedi		S	Inwa	21.8482108	95.9822702	Minor	3
180	Zedi		S	Inwa	21.8512702	95.9857954	Completely Collapse	1
181	Zedi		S	Inwa	21.851203	95.985816	Severe	2
182	Zedi	50 (a)	S	Inwa	21.857805	95.984378	Severe	3
183	Zina Man Aung	566	M	Inwa	21.831947	95.983027	Minor	3
184	Myin Thi Kone		S	Kyaukse	21.528168	96.175566	Severe	2
185	Pyat Thet Gyi		S	Kyaukse	21.57101	96.187781	Minor	2
186	Myo Shae Monastery		M	Madaya	22.212244	96.104118	Moderate	1
187	Phayani Su Taung Pyae		M	Madaya	22.213475	96.106086	Completely Collapse	1
188	Shin Pin Nan Taung		M	Madaya	22.2133382	96.1073775	Completely Collapse	1
189	Tagon Lay Myat Hnar		S	Madaya	22.214126	96.108334	Moderate	2
190	A Tu La Zedi		M	Mandalay	21.9288283	96.0818868	Minor	3
191	Abaya Narhta Zedi		S	Mandalay	21.9296488	96.0819089	Minor	3
192	Abayamuni Zedi		S	Mandalay	21.9259981	96.0819143	Moderate	3
193	Abidhama New Paday Tha monastery		M	Mandalay	21.967598	96.0688701	Completely Collapse	1
194	Ambika Vijay Temple		M	Mandalay	21.989167	96.081111	Moderate	2
195	Ananda		L	Mandalay	21.9499969	96.0805222	Moderate	1

196	Anauk Hti Lin Taik		M	Mandalay	21.9800809	96.0712056	Completely Collapse	1
197	Anauk Khinma Kan monastery		L	Mandalay	21.981725	96.06799	Moderate	1
198	Arga Mana New Paday Tha monastery		M	Mandalay	21.96833	96.0692415	Completely Collapse	1
199	Aung Nan Yeik Thar monastery		M	Mandalay	21.970523	96.0708676	Completely Collapse	1
200	Ayiek Ma Htwet Zedi		M	Mandalay	22.008864	96.088065	Moderate	2
201	Baung Taw Kya		M	Mandalay	21.990069	96.082649	Moderate	1
202	Bawdi Ta Htaung Gu Phaya		S	Mandalay	21.9435456	96.0869763	Severe	3
203	Buddhist community hall		S	Mandalay	21.9535372	96.0812575	Completely Collapse	3
204	Chan Thar Thet Shay		M	Mandalay	21.989943	96.08209	Minor	3
205	Chan Thar Thukha Nibbanna Zedi		S	Mandalay	21.9292196	96.0818949	Moderate	3
206	Clock tower		S	Mandalay	21.9929773	96.0990011	Moderate	1
207	Dhamma New Padaytha monastery		S	Mandalay	21.9672563	96.0690226	Minor	1
208	Dhamma Razika		S	Mandalay	21.9254015	96.081925	Minor	3
209	Dipel Yin monastery		L	Mandalay	21.9950393	96.0785988	Severe	1
210	Eain Daw Yar		L	Mandalay	21.9816122	96.0725083	Moderate	1
211	Group of pagodas (west of Phayagyi)		S	Mandalay	21.951548	96.0768741	Severe	3
212	Groups of Zedi (near Tha Htay monastery)		S	Mandalay	21.9514855	96.0767105	Severe	2
213	Htupar Yone Phaya 1		S	Mandalay	21.973016	96.0635221	Minor	3
214	Htupar Yone Phaya 2		S	Mandalay	21.9728639	96.063506	Moderate	3
215	Htupar Yone Su Taung Pyae		M	Mandalay	21.932637	96.057333	Minor	3
216	Inn Kharu Su Taung Pyae		M	Mandalay	21.9139799	96.114593	Moderate	2
217	Jamail Majid mosque		M	Mandalay	21.9713917	96.0994674	Minor	1
218	Kan Dhamma Riz Zedi		S	Mandalay	21.9241708	96.0833875	Moderate	3
219	Kan Tek Min Su Taung Pyae Gu Phaya		S	Mandalay	21.9238262	96.0827518	Minor	3
220	Kan Ywar mosque		M	Mandalay	21.941078	96.081508	Severe	1
221	Khone Taw Min		S	Mandalay	21.986525	96.081294	No Damage	0
222	Koe Taung Pyae		S	Mandalay	21.9437916	96.0868271	Moderate	3
223	Kuthi Nar Yone		M	Mandalay	21.9540954	96.082269	Minor	3

224	Kuthodaw		VL	Mandalay	22.0043391	96.1132405	Minor	1
225	Kyauk Taw Gyi		VL	Mandalay	21.8942632	96.0647773	Moderate	1
226	Kywel Sel Kan Mogok meditation centre Zedi 1		M	Mandalay	21.9284881	96.0819069	Moderate	0
227	Kywel Sel Kan Mogok meditation centre Zedi 2		M	Mandalay	21.9270154	96.081869	Severe	2
228	Kywel Sel Kan Mogok meditation centre Zedi 3		S	Mandalay	21.9263501	96.0816987	Severe	3
229	Kywel Sel Kan Mogok meditation centre Zedi 4		S	Mandalay	21.9255573	96.0819371	Minor	3
230	Lak Pan mosque		M	Mandalay	21.9663972	96.0931769	Moderate	1
231	Lawka Hman Kin Su Taung Pyae Aung Daw Mu Zedi		S	Mandalay	21.942495	96.083053	Moderate	3
232	Lawka Hman Kin Zedi 1		S	Mandalay	22.0116962	96.0927015	Severe	3
233	Lawka Hman Kin Zedi 2		S	Mandalay	22.0116962	96.0927015	Minor	3
234	Lawka Marazein		M	Mandalay	22.0139494	96.0930699	Severe	2
235	Lay Myet Hnar		M	Mandalay	21.90231	96.082835	Moderate	2
236	Lay Myet Hnar		S	Mandalay	22.008838	96.0867953	Moderate	3
237	Lion at the gate of Nyaungyan Pali university		S	Mandalay	21.9242575	96.0753697	Severe	3
238	Lion figure (22nd street)		S	Mandalay	21.9891348	96.0747337	Severe	2
239	Lion figure (38th street)		S	Mandalay	21.9714019	96.0712498	Severe	2
240	Lion figure in U Pwar Zedi		S	Mandalay	21.9468983	96.0793136	Moderate	2
241	Magada Kyaung		M	Mandalay	21.9673742	96.0699755	Severe	1
242	Maha Bandoola monastery		L	Mandalay	21.9526451	96.0770786	Severe	1
243	Maha Bandoola monastery		S	Mandalay	21.9523291	96.076974	Severe	2
244	Maha Lawka Htut Khaung		M	Mandalay	21.9034103	96.0877203	Minor	0
245	Maha Min Htin monastery		L	Mandalay	21.9539928	96.0846474	Minor	1
246	Maha Theindaw Oo		S	Mandalay	21.9300957	96.0818992	Moderate	3
247	Maha Thetkya Thiha		VL	Mandalay	21.9768716	96.075025	Moderate	1
248	Maha Waiyan Bonthar Pinma Teik		M	Mandalay	21.9709241	96.0709622	Severe	1
249	Maha Wizita Yarma Sima		L	Mandalay	21.9299499	96.081343	Completely Collapse	2
250	Maha Zawtika Oak Kyaung		M	Mandalay	21.980951	96.068177	Moderate	1
251	Mahabodhi clock tower		S	Mandalay	21.962311	96.100561	No Damage	0

252	Mahabodhi Zedi		M	Mandalay	21.962311	96.100561	Minor	2
253	Mahalawka Marazein (or) Kuthodaw		VL	Mandalay	22.0047036	96.1129066	Minor	1
254	Mahamuni		VL	Mandalay	21.9520276	96.0786263	Moderate	1
255	Mandalay palace wall		VL	Mandalay	21.992377	96.106006	Severe	1
256	Marawizaya Zedi		S	Mandalay	21.9259981	96.0819143	Minor	3
257	Mel Taw Gyi Zedi		S	Mandalay	21.928159	96.071801	No Damage	0
258	Middle monastery (in Myin Wun Min Gyi monastery)		L	Mandalay	21.955953	96.077748	Moderate	1
259	Monastery south of Magada Kyaung		M	Mandalay	21.9672358	96.0698823	Completely Collapse	1
260	Mula Aung Chan Thar Su Taung Pyae		S	Mandalay	21.9237061	96.0758673	Severe	3
261	Mya Kon Taung		S	Mandalay	21.9438059	96.0865699	Minor	3
262	Mya Thiendan monastery		S	Mandalay	21.9806066	96.066667	No Damage	0
263	Mya Yadana		S	Mandalay	21.942404	96.0872056	Minor	3
264	Myat Nyi Naung Teik Oo		S	Mandalay	21.9522035	96.0834261	Minor	3
265	Myay Soon Wun Su Taung Pyae		M	Mandalay	21.942254	96.075749	Severe	1
266	Myin Wun Mingyi monastery		M	Mandalay	21.955979	96.07833	Severe	1
267	Nagayon		M	Mandalay	21.90436	96.0511524	Severe	1
268	Nagayon image		S	Mandalay	21.9238703	96.0756752	Severe	3
269	Nanmadaw Ma Myat Lay Gu Phaya		S	Mandalay	21.9258634	96.0819633	Severe	2
270	Naung Daw Gyi		M	Mandalay	21.9464278	96.0797967	Minor	3
271	Ngar Zu Teik Buddhist community hall		M	Mandalay	21.9803445	96.0661262	Completely Collapse	1
272	Ngwe Zedi		S	Mandalay	21.92812	96.07196	Minor	3
273	Niruddi New Padatha monastery		M	Mandalay	21.9682833	96.0698517	Completely Collapse	1
274	Padamya monastery		M	Mandalay	21.9722206	96.0691443	Completely Collapse	1
275	Padamya Nyi Naung Zedi 1		S	Mandalay	21.932522	96.0807656	Moderate	3
276	Padamya Nyi Naung Zedi 2		S	Mandalay	21.932522	96.0807657	Moderate	3
277	Padamya Zedi		S	Mandalay	21.904652	96.087708	Moderate	3
278	Pahtotawgyi		VL	Mandalay	21.9113368	96.0563847	Moderate	1
279	Pali monastery		L	Mandalay	21.9679637	96.069957	Severe	1

280	Pali university monastery		M	Mandalay	21.9705298	96.0706054	Completely Collapse	1
281	Pariyatti New Padatha monastery		M	Mandalay	21.9683303	96.069617	Completely Collapse	1
282	Passage to shrine		M	Mandalay	21.9530733	96.0791382	Severe	1
283	Phaung Taw Oo Zedi		M	Mandalay	21.9512467	96.0761647	Severe	2
284	Phayani		L	Mandalay	21.990671	96.082687	Moderate	1
285	Rest House		S	Mandalay	21.950843	96.0767319	Completely Collapse	2
286	Ruined monastery in the compound of Lel Pyin Taung monastery		S	Mandalay	21.9962253	96.0696093	Severe	3
287	Sacred Heart Church		L	Mandalay	21.983918	96.081843	Minor	3
288	Saint Francis Church		L	Mandalay	21.9789756	96.0915498	No Damage	0
289	Sakkyar Anauk mosque		M	Mandalay	21.9666077	96.0904561	Severe	1
290	Sakkyar Myauk mosque		M	Mandalay	21.9698399	96.0908923	Moderate	1
291	Sakkyar Pawdawmu Gu Phaya		S	Mandalay	21.9327434	96.0935957	Severe	2
292	Sakkyar Taung mosque		M	Mandalay	21.9694475	96.0908712	Severe	1
293	Sakkyar Win Minlay Aung Zay		S	Mandalay	21.9327748	96.0933087	Moderate	2
294	Sakkyar Win Su Taung Pyae		M	Mandalay	21.9329953	96.0928986	Moderate	2
295	Sandamuni		VL	Mandalay	22.003523	96.109922	Severe	1
296	Sasana 2500 (Buddhist community hall)		L	Mandalay	21.953945	96.076468	Completely Collapse	1
297	Sasana 2500 (treasury)		M	Mandalay	21.953806	96.076856	No Damage	0
298	Sasana New Padaytha monastery		L	Mandalay	21.9677964	96.0693572	Completely Collapse	1
299	Sasana Wudhi monastery		M	Mandalay	21.981322	96.0670354	Completely Collapse	1
300	Sasana Zawti monastery		M	Mandalay	21.9917624	96.0752138	Severe	3
301	School		M	Mandalay	21.9530633	96.0771608	Minor	2
302	School		S	Mandalay	21.9667075	96.0665617	Minor	2
303	School		S	Mandalay	21.9714163	96.1216475	Minor	3
304	Shay Oo Myayar Kywel Zedi		S	Mandalay	21.896992	96.096664	No Damage	0
305	Shin Arahan Than Khaung Yan Sima		L	Mandalay	21.906105	96.08391	Moderate	1
306	Shin Bomel Su Taung Pyae		S	Mandalay	21.977916	96.07811	Moderate	2
307	Shwe Bon Zedi		S	Mandalay	21.9433858	96.0870169	Moderate	3

308	Shwe Bone Thar Myat Swar Phaya		S	Mandalay	21.9981628	96.0682893	Moderate	3
309	Shwe Kon Char Oak Gu		M	Mandalay	21.9242663	96.0760577	Moderate	2
310	Shwe Ku Gyi monastery		L	Mandalay	21.9103467	96.0538034	Completely Collapse	1
311	Shwe Kyi Myin		M	Mandalay	21.986632	96.080863	Minor	3
312	Shwe Kyin Kyun Kyaung Taw Gyi		L	Mandalay	Mandalay	96.1067208	Minor	1
313	Shwe Myit Mo Sulamani		S	Mandalay			Minor	3
314	Shwe Phone Shein mosque		L	Mandalay	21.954686	96.076564	Completely Collapse	1
315	Shwe Sankar		L	Mandalay	21.9109607	96.0758811	Moderate	1
316	Shwe Saryan		M	Mandalay	21.8398767	96.2140429	Moderate	2
317	Shwe Theindaw		M	Mandalay	21.9725514	96.0634496	Moderate	2
318	Shwe Zedi		S	Mandalay	21.928247	96.071941	Moderate	3
319	Shwegugyi		VL	Mandalay	21.9112056	96.0539043	Severe	1
320	Sima ?		M	Mandalay	21.965588	96.073662	Completely Collapse	1
321	Sima in Warkhin Kone pagoda's compound		S	Mandalay	21.9724799	96.1213502	Moderate	3
322	Sin Min Wut Shwe Theindaw Zedi		S	Mandalay	21.897701	96.090088	Moderate	3
323	Sin Myar Shin Adeik Htan Aung Zedi		M	Mandalay	21.901676	96.08597	Severe	2
324	St. Joseph Church		L	Mandalay	21.9701483	96.0832594	Minor	3
325	Su Taung Pyae Chan Thar Ya		S	Mandalay	21.9459706	96.0772375	Moderate	3
326	Su Taung Pyae Ma Shi Takhana		S	Mandalay	21.9322486	96.0946162	Moderate	3
327	Su Taung Pyae Mya Zedi		S	Mandalay	21.9252647	96.0819596	Moderate	3
328	Su Taung Pyae Naga Yone		S	Mandalay	21.9513256	96.076858	Minor	3
329	Su Taung Pyae Yan Aung Myin		M	Mandalay	21.9533886	96.0784254	Moderate	2
330	Suvanna Rathi		M	Mandalay	21.9743175	96.0928346	Moderate	2
331	Tant Kyi Taung monastery		S	Mandalay			Moderate	3
332	Tapel mosque		M	Mandalay	21.9757185	96.0916048	Severe	1
333	Taung Ba Lu mosque		M	Mandalay	21.9763931	96.0785196	Moderate	1
334	Taung Min Gyi		L	Mandalay	21.8942383	96.0506582	Severe	1
335	Taung Sin Kyone mosque		M	Mandalay	21.9795467	96.0784308	Minor	1

336	Taung Su Pyae		S	Mandalay	21.9728757	96.0632575	Minor	3
337	Tawagu		S	Mandalay			Minor	3
338	Tawagu Thein Zedi		S	Mandalay	21.980143	96.060405	No Damage	0
339	Teik Oo Zedi		S	Mandalay	21.956744	96.078535	Severe	2
340	Teik Oo Zedi		S	Mandalay	21.9537701	96.0852644	Moderate	3
341	Temple		S	Mandalay	21.9320461	96.094628	Moderate	2
342	Temple		S	Mandalay	21.945086	96.077965	Severe	2
343	Temple		S	Mandalay	21.945086	96.077965	Severe	2
344	Temple		S	Mandalay	21.927984	96.071815	Moderate	3
345	Temple		S	Mandalay	21.928497	96.071768	Moderate	3
346	Temple		S	Mandalay	21.928361	96.071928	Minor	3
347	Temple (in Inn Kharu Su Taung Pyae's compound)		S	Mandalay	21.914443	96.1140998	Moderate	3
348	Temple 1 (in Thardaw Ya's compound)		S	Mandalay	21.9478179	96.0773961	Moderate	3
349	Temple 2 (in Thardaw Ya's compound)		S	Mandalay	21.9478714	96.0770267	Completely Collapse	2
250	Tha Htay monastery		M	Mandalay	21.981285	96.067687	Moderate	1
351	Thardaw Ya		S	Mandalay	21.9477093	96.0772345	Moderate	3
352	Tharyar Shwegu Su Taung Pyae		M	Mandalay	21.932518	96.057165	Minor	3
353	The Martyrs' Mausoleum		S	Mandalay	21.9382384	96.0740999	Completely Collapse	1
354	Thiri Waipula Monastery		M	Mandalay	21.9657231	96.0732759	Severe	1
355	Tilawka Zedi		S	Mandalay	21.927714	96.0818654	Minor	3
356	Tooth relic tower		S	Mandalay	21.9924926	96.098951	Moderate	1
357	Treasury		M	Mandalay	21.955959	96.077837	Severe	1
358	U Bein wooden bridge		VL	Mandalay	21.8916325	96.0609354	Moderate	1
359	U Khandi museum		S	Mandalay	22.007765	96.1040445	Minor	1
360	U Pu Htee Buddhist community hall		S	Mandalay	21.9541601	96.0815489	Completely Collapse	1
361	U Pwar Zedi		L	Mandalay	21.946931	96.0801548	Moderate	2
362	U Taye Zedi		M	Mandalay	21.9508841	96.0762032	Minor	3
363	Udumbhara Zedi		S	Mandalay	21.8953101	96.0473582	Minor	3

364	Unknown structure		S	Mandalay	21.9576021	96.0784351	Completely Collapse	3
365	Unknown structure (Phayagyi market's Buddhist community hall's compound)		S	Mandalay	21.9574659	96.0786031	Completely Collapse	2
366	Vesali Gu Phaya		S	Mandalay	21.924038	96.0913154	Moderate	3
367	War Khel Ma monastery		M	Mandalay	21.9802879	96.0664923	Completely Collapse	1
368	Wi Thoketar Yone Pitaka Teik		M	Mandalay	21.9673885	96.0711875	Minor	1
369	Yadana Gu		S	Mandalay	21.8874541	96.0314248	Moderate	2
370	Yawmingyi monastery		L	Mandalay	22.0155953	96.0961756	Moderate	1
371	Yay Lel Kuthina Yone		M	Mandalay	21.934099	96.060714	Moderate	2
372	Yintaw Zedi		S	Mandalay	21.927615	96.071813	Minor	3
373	Zedi		S	Mandalay	21.9525966	96.0773546	Moderate	2
374	Zedi		S	Mandalay	21.9525036	96.0773559	Moderate	2
375	Zedi		S	Mandalay	21.9524286	96.0773636	Minor	3
376	Zedi		S	Mandalay	21.9472062	96.0807291	Moderate	3
377	Zedi		S	Mandalay	21.9471129	96.0807361	Minor	3
378	Zedi		S	Mandalay	21.9467559	96.0797498	Minor	3
379	Zedi		S	Mandalay	21.9466299	96.0797635	Moderate	2
380	Zedi		S	Mandalay	21.9469686	96.0797602	Moderate	2
381	Zedi		S	Mandalay	21.9470339	96.0797511	Minor	3
382	Zedi		S	Mandalay	21.9470945	96.0797615	No Damage	0
383	Zedi		S	Mandalay	21.9471524	96.0797689	Minor	3
384	Zedi		S	Mandalay	21.9472028	96.0797695	Minor	3
385	Zedi		S	Mandalay	21.9472727	96.0797749	Minor	3
386	Zedi		S	Mandalay	21.9510361	96.0768258	Moderate	2
387	Zedi		S	Mandalay	21.950977	96.0769918	Severe	2
388	Zedi		S	Mandalay	21.934038	96.060938	Severe	2
389	Zedi		S	Mandalay	21.944869	96.077937	Minor	3
390	Zedi		S	Mandalay	21.94479	96.077931	Minor	3
391	Zedi		S	Mandalay	21.9449322	96.0782672	Moderate	3

392	Zedi		S	Mandalay	21.9282645	96.0718199	No Damage	0
393	Zedi		S	Mandalay	21.928269	96.071807	Moderate	3
394	Zedi		S	Mandalay	21.928404	96.071768	No Damage	0
395	Zedi		S	Mandalay	21.9285447	96.0718634	Minor	3
396	Zedi		S	Mandalay	21.928808	96.071444	Moderate	3
397	Zedi		S	Mandalay	21.928936	96.071432	Minor	3
398	Zedi		S	Mandalay	21.929008	96.071438	Moderate	3
399	Zedi		S	Mandalay	21.929004	96.071499	Moderate	3
400	Zedi		S	Mandalay	21.928984	96.071249	Minor	3
401	Zedi		S	Mandalay	21.928921	96.07105	Minor	3
402	Zedi		S	Mandalay	21.929072	96.071122	No Damage	0
403	Zedi		S	Mandalay	21.9291959	96.0712942	Minor	3
404	Zedi (in Inn Kharu Su Taung Pyae's compound)		S	Mandalay	21.9144775	96.1143835	No Damage	0
405	Zedi (near Phayani monastery in Sato village)		S	Mandalay	21.83721	96.076353	Severe	3
406	Zedi (near Phayani monastery in Sato village)		S	Mandalay	21.83739	96.076303	Minor	3
407	Zedi (northwest corner of Aindawyar Phaya)		M	Mandalay	21.9823715	96.0717231	Minor	2
408	Zedi (Shwe Pyi Teik Daung monastery)		S	Mandalay	21.9955677	96.0732408	Minor	3
409	Zedi 1 (A Kauk Min Wun monastery)		S	Mandalay	21.9803342	96.066162	Moderate	2
410	Zedi 1 (central Mogok Vipassana meditation centre)		S	Mandalay	21.9308733	96.0819592	Moderate	3
411	Zedi 1 (inside Phaung Taw Oo Zedi's compound)		S	Mandalay	21.9513263	96.0759011	Minor	3
412	Zedi 1 (west of Maha Myat Muni)		S	Mandalay	21.9530008	96.0776546	Moderate	2
413	Zedi 1 (west of Nga Zu Teik Mya Theindan monastery)		S	Mandalay	21.980818	96.0662881	Minor	3
414	Zedi 1 (west of U Pwar Zedi)		S	Mandalay	21.9465923	96.0794775	Moderate	2
415	Zedi 1 (Yintaw's compound)		S	Mandalay	21.927274	96.071887	Minor	3
416	Zedi 2 (A Kauk Min Wun monastery)		M	Mandalay	21.9803896	96.066501	Moderate	2
417	Zedi 2 (central Mogok Vipassana meditation centre)		S	Mandalay	21.9305165	96.0819455	Minor	3
418	Zedi 2 (inside Phaung Taw Oo Zedi's compound)		S	Mandalay	21.9515331	96.0759766	Minor	3
419	Zedi 2 (west of Maha Myat Muni)		S	Mandalay	21.9529962	96.0778015	Minor	3

420	Zedi 2 (west of Nga Zu Teik Mya Theindan monastery)		S	Mandalay	21.9807906	96.066438	Moderate	3
421	Zedi 2 (west of U Pwar Zedi)		S	Mandalay	21.9464147	96.079497	Moderate	2
422	Zedi 2 (Yintaw's compound)		M	Mandalay	21.92743	96.071872	Minor	3
423	Zedi 3 (central Mogok Vipassana meditation centre)		S	Mandalay	21.93123	96.0819455	Severe	3
424	Zedi 3 (west of Maha Myat Muni)		S	Mandalay	21.9529815	96.0775041	Moderate	2
425	Zedi 3 (west of Nga Zu Teik Mya Theindan monastery)		S	Mandalay	21.9806607	96.066393	Moderate	3
426	Zedi 3 (Yintaw's compound)		S	Mandalay	21.927618	96.0719927	Minor	3
427	Zedi 4 (west of Nga Zu Teik Mya Theindan monastery)		S	Mandalay	21.9805562	96.0664111	Moderate	3
428	Zedi 4 (Yintaw's compound)		S	Mandalay	21.927689	96.071999	Minor	3
429	Zedi 5 (west of Nga Zu Teik Mya Theindan monastery)		S	Mandalay	21.9807956	96.066162	Minor	3
430	Zedi 5 (Yintaw's compound)		S	Mandalay	21.927798	96.071782	Moderate	3
431	Zedi 6 (west of Nga Zu Teik Mya Theindan monastery)		S	Mandalay	21.9806908	96.066157	Minor	3
432	Zedi 7 (west of Nga Zu Teik Mya Theindan monastery)		S	Mandalay	21.9805858	96.0661503	Moderate	3
433	Zedi 8 (west of Nga Zu Teik Mya Theindan monastery)		S	Mandalay	21.9804645	96.0661473	Minor	3
434	Zee Pin monastery		M	Mandalay	21.9673425	96.0713819	Completely Collapse	1
345	Zeid in Shinpin Own Inn monastery's compound		S	Mandalay	21.9319205	96.0946565	Minor	3
436	Zeid in Shinpin Own Inn monastery's compound		S	Mandalay	21.931788	96.0946665	Severe	2
437	Zeid in Shinpin Own Inn monastery's compound		S	Mandalay	21.9324206	96.0952687	Moderate	2
438	Zeid in Shinpin Own Inn monastery's compound		S	Mandalay	21.9323546	96.0948516	Minor	3
439	Zina Man Aung		S	Mandalay	21.9897446	96.0750734	Severe	3
440	Four zedi (in Hman monastery's compound)		S	Meikhtila	20.876576	95.922205	Moderate	3
441	Shwe Sati		M	Mekkhaya	21.7653939	96.1368387	Moderate	2
442	Shwe Yaung Taw		M	Mekkhaya	21.769225	96.144903	Moderate	1
443	Shwezigon		L	Mekkhaya	21.76512	96.138321	Minor	2
444	Mingun Pahtodawgyi		VL	Mingun	22.0509143	96.0174152	Severe	1
445	Mingun Tipitaka Dhara Lwan Zedi		M	Mingun	22.026793	96.016806	Moderate	1

446	Mya Thiendan Zedi		VL	Mingun	22.055852	96.016538	Moderate	1
447	Saktawyar		M	Mingun	22.049572	96.01922	Completely Collapse	1
448	Group of Zedi (in Kala Kyaung Ywar Oo monastery's compound)		S	Myin Zaing	21.59414	96.192933	Severe	2
449	Group of Zedis in Paw Taw Mu monastery		S	Myin Zaing	21.606218	96.184523	Moderate	2
450	Kyat Thahin Zedi		L	Myin Zaing	21.583862	96.193688	Moderate	2
451	Shin Pin Chan Thar		M	Myin Zaing	21.59322	96.197922	Minor	2
452	Shwe Umin		S	Myin Zaing	21.585466	96.201203	Minor	2
453	Zedi		S	Myin Zaing	21.585112	96.200795	Moderate	2
454	Zedi		S	Myin Zaing	21.59622	96.192448	Completely Collapse	3
455	Zedi (east of Kala Kyaung Ywar Oo monastery)		S	Myin Zaing	21.593592	96.194808	Completely Collapse	2
456	Zedi and Shrine (Bagan monastery's compound)		S	Myin Zaing	21.601239	96.192901	Moderate	3
457	Phayani		S	Myitnge	21.837156	96.076823	Severe	1
458	Su Taung Pyae Pyi Lone Chan Thar		S	Myittha	21.424233	96.1865228	Completely Collapse	1
459	Thort Shi Yar Zedi		S	Myittha	21.48428	95.999812	Completely Collapse	2
460	Aung Su Pan Sin		S	Paleik	21.824343	96.049878	Severe	1
461	Kyeik Kone monastery and Sima		M	Paleik	21.8196111	96.0508604	Severe	2
462	Kyiek Kone brick monastery			Paleik			Severe	
463	Maha Bodhi monastery		S	Paleik	21.819622	96.04748	Severe	1
464	Nagayon		M	Paleik	21.823138	96.048971	Severe	1
465	Baw Baw Gyi		L	Pyay	18.786149	95.285577	Minor	1
466	Lay Myat Hna		S	Pyay	18.786885	95.291285	Minor	1
467	Thone Pan Hla		M	Pyay	18.7868262	95.3163002	Moderate	2
468	Abaya Zedi		M	Sagaing	21.877584	95.958313	Minor	3
469	Anauk Nyi Ama Kaung Hmu		M	Sagaing	21.876912	95.963935	Severe	1
470	Ashay Nyi Ama Kaung Hmu		M	Sagaing	21.876484	95.965083	Severe	1
471	Aung Chan Thar		S	Sagaing	21.887007	95.987232	Severe	2
472	Aung Myay Lawka		L	Sagaing	21.873123	95.982758	Moderate	2
473	Aung Taw Mu Zedi		S	Sagaing	21.928381	95.998991	Moderate	2

474	Brick monastery (Patauk Chaung)		S	Sagaing	21.912944	95.995467	Severe	1
475	Buddha image of Taung Philar Dhamaku water tank		S	Sagaing	21.928953	95.981975	Moderate	2
476	Chan Thar Gyi		S	Sagaing	21.893727	95.998133	Moderate	2
477	Chin The Thone Zel		S	Sagaing	21.8930947	95.9949665	Severe	1
478	Ema Leimarel Shidbi Temple		S	Sagaing	21.8804251	95.9799529	Moderate	1
479	Htupar Yone		L	Sagaing	21.874577	95.983708	Moderate	2
480	Kaung Hmu Daw		VL	Sagaing	21.9326457	95.9380071	Severe	1
481	Khay May Thaka Nun monastery		S	Sagaing	21.897072	95.997983	Severe	1
482	Kyaik Lat Chaung		S	Sagaing	21.893966	95.994571	Moderate	1
483	Lawka Mhan Kin Gu		S	Sagaing	21.9060039	95.9887437	Minor	3
484	Lay Kyun Hteik Tin		M	Sagaing	21.898515	95.995295	Severe	1
485	Lay Kyun Man Aung		M	Sagaing	21.89535	95.998948	Moderate	2
486	Lay Kyun Myay monastery		S	Sagaing	21.8845556	95.9854444	Moderate	3
487	Lay Kyun Semi		M	Sagaing	21.897774	96.00008	Severe	1
488	Lone Taw Pyae		S	Sagaing	21.928396	95.999093	Completely Collapse	2
489	Maha Myat Su Pan		S	Sagaing	21.895051	95.998712	Moderate	2
490	Mee Pauk Gyi		S	Sagaing	21.892906	95.993358	Moderate	1
491	Padamya Zedi		S	Sagaing	21.9229384	95.9948228	Severe	1
492	Phaya Phyu		M	Sagaing	21.879794	95.961252	Moderate	2
493	Pyinnyar Thiha Sima		S	Sagaing	21.927192	95.99838	Moderate	2
494	Shin Marlel		S	Sagaing	21.926391	95.946817	Severe	2
495	Shin Phyu Shin Hla		M	Sagaing	21.908166	95.996212	Moderate	2
496	Shin Pin Nan Kaing		L	Sagaing	21.89311	95.996599	Severe	1
497	Shin Pin Nan Oo		M	Sagaing	21.891741	95.988504	Minor	3
498	Shin Saw Pu		M	Sagaing	21.894688	95.992817	Moderate	3
499	Shwe Bone Thar		S	Sagaing	21.896569	95.999737	Moderate	3
500	Shwe Phone Pwint Shwe Phone Myint		S	Sagaing	21.881641	95.981787	Moderate	3
501	Shwe Taung Oo Maw		M	Sagaing	21.884528	95.995333	Severe	1

502	Sin Bo Phaya		M	Sagaing	21.901775	95.998589	Moderate	2
503	Soon Oo Ponnya Shin		M	Sagaing	21.9018981	95.9924737	Severe	1
504	Sri Ram Temple		S	Sagaing	21.883005	95.979486	Severe	1
505	Taik Wargyi moanstery		M	Sagaing	21.895792	95.997789	Severe	1
506	Taung Philar		S	Sagaing	21.92553	95.985607	Moderate	2
507	Taung Philar Dhamaku water tank		M	Sagaing	21.929098	95.981497	Minor	3
508	Tilawkaguru		M	Sagaing	21.900551	95.990108	Minor	1
509	Umin Koe Zel		L	Sagaing	21.9049093	95.9949722	Completely Collapse	1
510	Umin Thone Zel		VL	Sagaing	21.9116538	95.9905043	Severe	1
511	Weikzardo		M	Sagaing	21.9007463	95.9933486	Completely Collapse	1
512	Yadanaya (Ngwe Than Kyar) Zedi		M	Sagaing	21.906205	95.992114	Moderate	1
513	Yoke Sone monastery		S	Sagaing	21.9040035	95.9961759	Minor	1
514	Zaytawin		S	Sagaing	21.8998684	95.9994284	Moderate	2
515	Zedi Hla		M	Sagaing	21.8839656	95.9846537	Completely Collapse	2
516	Zedi Hla Su Taung Pyae		S	Sagaing	21.928232	95.998412	Moderate	2
517	Tawya monastery (Shien Ma Kar)		S	Shwebo	22.268168	95.98425	Severe	3
518	Kaung Myat Chan Thar Shwe Gu Gyi		S	Sint Kaing	21.666831	96.110072	Completely Collapse	2
519	Maha Say O Pho		L	Tada-U	21.8171707	95.9754011	Severe	1
520	Maha Shwe Thar Hlaung (Paung Le Gyi)		L	Tada-U	21.811649	95.964401	Severe	1
521	Pyinhsa Malinda Yadana Maha Myazigon Zedi		L	Tada-U	21.811554	95.946774	Moderate	2
522	Temple (in Paung Le Gyi's compound)	318	S	Tada-U	21.8114477	95.9641672	Minor	3
523	Thitsar Shwegu		S	Tada-U	21.812152	95.964074	Moderate	2
524	Gugyi Thone Lone		M	Pinya	21.790529	95.977748	Severe	1
525	Nan Daw Oo Lawka Marazein		L	Taungoo	19.02897	96.383529	Minor	3
526	Zedi (in Mya Ninda's compound)		S	Taungoo	18.946268	96.304935	Minor	3
527	Lay Myat Hna Dak Taw		M	Wundwin	21.1610022	95.8537135	Moderate	3
528	Moe Kaung Zedi		M	Wundwin	21.1742236	95.8542963	Minor	3
529	Shwe Moke Htaw and monument around		M	Wundwin	21.168336	95.852034	Moderate	3

APPENDIX – 3

Artefact Inventory Form

Artefact Inventory Form

This form is for documenting artefacts discovered or exposed from the relic chambers of pagodas/temples or archaeological sites following the recent earthquake in Myanmar. Your contribution will help in creating an inventory for preservation and study. Thank you for your participation.

Location of Discovery

Name

e.g. Name of Pagoda/Temple/Museum

Region/State

- Ayeyarwady Region
- Bago Region
- Chin State
- Kachin State
- Kayah State
- Kayin State
- Magway Region
- Mandalay Region
- Mon State
- Naypyidaw Union Territory
- Rakhine State
- Sagaing Region
- Shan State
- Tanintharyi Region
- Yangon Region

City/Town

Township/Village

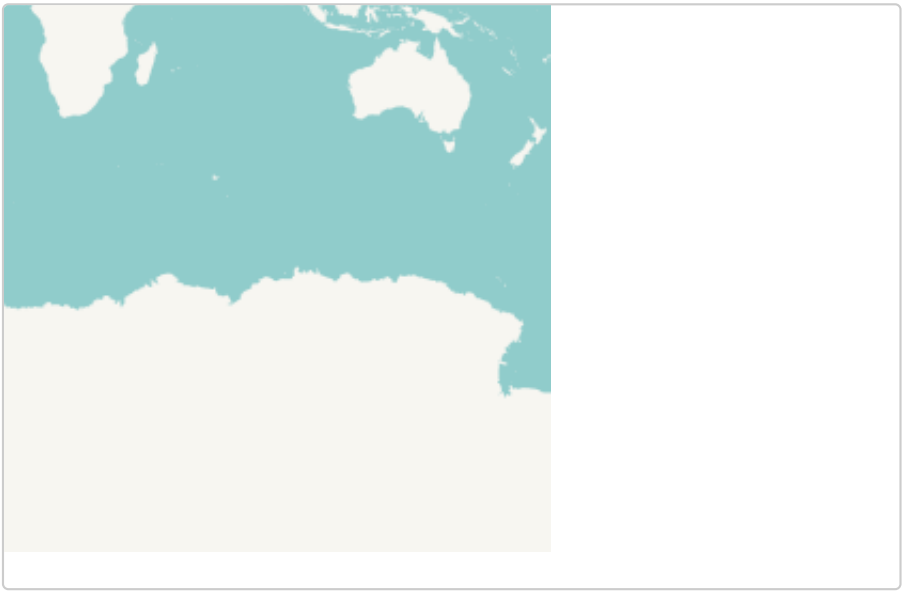
GPS Location (Lat/Long)

latitude (x.y °)

longitude (x.y °)

altitude (m)

accuracy (m)



Artefact Description

1

» Artefact Details

Object No.

Object Name/Type

Number of Objects
(multiples only if objects are same)

» Primary Material

Primary Material Type

Select all that apply, or choose the primary material

- [ ] Wood
- [ ] Metal
- [ ] Stone
- [ ] Ceramic/Earthenware
- [ ] Plaster/Stucco
- [ ] Composite
- [ ] Organic (Non-Wood)
- [ ] Other (specify)

Primary Material Type: Wood

- [ ] Teak
- [ ] Sandalwood
- [ ] Other (specify)

* **Other Wood (specify)**

_____

Primary Material Type: Metal

- [ ] Bronze
- [ ] Copper
- [ ] Gold
- [ ] Silver
- [ ] Iron
- [ ] Lead
- [ ] Alloy
- [ ] Other Metal (specify)

* **Other Metal (specify)**

_____

Primary Material Type: Stone

- [ ] Marble
- [ ] Sandstone
- [ ] Granite
- [ ] Jade
- [ ] Other Stone (specify)

* **Other Stone (specify)**

Primary Material Type: Ceramic/Earthenware

- [ ] Terracotta
- [ ] Glazed Ceramic
- [ ] Unglazed Earthenware
- [ ] Porcelain
- [ ] Other Ceramic (specify)

* **Other Ceramic (specify)**

Primary Material Type: Plaster/Stucco

- [ ] Lime Plaster
- [ ] Stucco
- [ ] Other Plaster (specify)

* **Other Plaster/Stucco (specify)**

Primary Material Type: Organic (Non-Wood)

- [ ] Bone
- [ ] Ivory
- [ ] Textile
- [ ] Lacquer
- [ ] Paper/Parchment
- [ ] Other Organic (specify)

* **Other Organic (specify)**

* **Other Primary Material (specify)**

» Secondary or Associated Material

Secondary Material Type

Select all that apply, or choose the secondary material. If there is no secondary material, you may leave this blank and click "Next."

- [ ] Wood
- [ ] Metal
- [ ] Stone
- [ ] Ceramic/Earthenware
- [ ] Plaster/Stucco
- [ ] Composite
- [ ] Organic (Non-Wood)
- [ ] Other (specify)

Secondary Material Type: Wood

- [ ] Teak
- [ ] Sandalwood
- [ ] Other (specify)

* **Other Wood (specify)**

Secondary Material Type: Metal

- [ ] Bronze
- [ ] Copper
- [ ] Gold
- [ ] Silver
- [ ] Iron
- [ ] Lead
- [ ] Alloy
- [ ] Other Metal (specify)

* **Other Metal (specify)**

Secondary Material Type: Stone

- [ ] Marble
- [ ] Sandstone
- [ ] Granite
- [ ] Jade
- [ ] Other Stone (specify)

* **Other Stone (specify)**

Secondary Material Type: Ceramic/Earthenware

- [ ] Terracotta
- [ ] Glazed Ceramic
- [ ] Unglazed Earthenware
- [ ] Porcelain
- [ ] Other Ceramic (specify)

* **Other Ceramic (specify)**

Secondary Material Type: Plaster/Stucco

- [ ] Lime Plaster
- [ ] Stucco
- [ ] Other Plaster (specify)

* **Other Plaster (specify)**

Secondary Material Type: Organic (Non-Wood)

- [ ] Bone
- [ ] Ivory
- [ ] Textile
- [ ] Lacquer
- [ ] Paper/Parchment
- [ ] Other Organic (specify)

* **Other Organic (specify)**

_____

* **Other Secondary Material (specify)**

_____

» Surface Treatment/Decoration

Surface Treatment/Decoration

Primary techniques observed (Select all that apply)

- [ ] Painted
- [ ] Carved/Sculpted
- [ ] Plastered
- [ ] Applied Decoration/Overlay
- [ ] Surface Finish
- [ ] Textile/Fibre Work
- [ ] Other (specify)

Metal Overlay / Appliqué

(e.g., thin metal sheets attached to a wooden or stone core)

- [ ] Gold Leaf / Gilding
- [ ] Silver Leaf
- [ ] Copper Sheet
- [ ] Bronze Sheet

Inlay / Encrustation

materials set into the surface

- [ ] Precious/Semi-precious stones (e.g., sapphire, ruby, jade)
- [ ] Glass/Mirrored glass
- [ ] Mother-of-pearl / Shell
- [ ] Wood inlay
- [ ] Metal inlay
- [ ] Lacquer inlay (e.g., with shell or glass)

Lacquer Work

- [ ] Black lacquer
- [ ] Red lacquer
- [ ] Gold lacquer (shwe zawa)
- [ ] Incised lacquer (yun)
- [ ] Metal inlay
- [ ] Thayo (molded lacquer relief)

Surface Finish

- [ ] Polished
- [ ] Burnished
- [ ] Glazed
- [ ] Engraved / Etched (lines cut into the surface)
- [ ] Stippled / Punched (creating a dotted texture)
- [ ] Matte / Unfinished

Textile / Fibre Work

- [ ] Woven
- [ ] Embroidered
- [ ] Dyed
- [ ] Applied fabric/textile (e.g., fabric covering a wooden object)

* **Other (specify)**

» Condition

Condition (Overall Completeness)

- ○ Complete
- ○ Nearly Complete
- ○ Fragmentary
- ○ Dismembered/Disarticulated

The artefact appears to be whole, with all its original parts present.

The artefact is largely intact, with only minor, non-structural losses.

The artefact is incomplete, existing only as a part or fragment of its original form.

For objects that were originally assembled but are now separated parts, e.g., a statue with a detached head.

» Date of Artefact

Date

e.g. 15th century, 1500, or 1564

» Photo (Please provide clear, well-lit photos from multiple angles with scale and object number.)

» » General Views

Front View

Click here to upload file. (< 10MB)

Back View

Click here to upload file. (< 10MB)

» » Specific/Detail Views

1

Specific/Detail Views

Click here to upload file. (< 10MB)

» Location of Object/Repository

Shelf/Room/Box

Additional Information

» Custodian Information

Name of Custodian/Contact Person

Custodian's Organization
(e.g., Temple, Museum, Local Authority, Community Group, etc.)

Custodian's Email
(Optional)

Custodian's Phone Number
(Optional)

» Voluntary Information

Date of Discovery/Collection

yyyy-mm-dd

Discovered/Collected By

e.g., Name of individual(s) or group

Circumstances of Discovery

e.g., during earthquake debris removal, deliberate excavation, chance find by community member, etc.

Notes/Remarks

Notes/Remarks

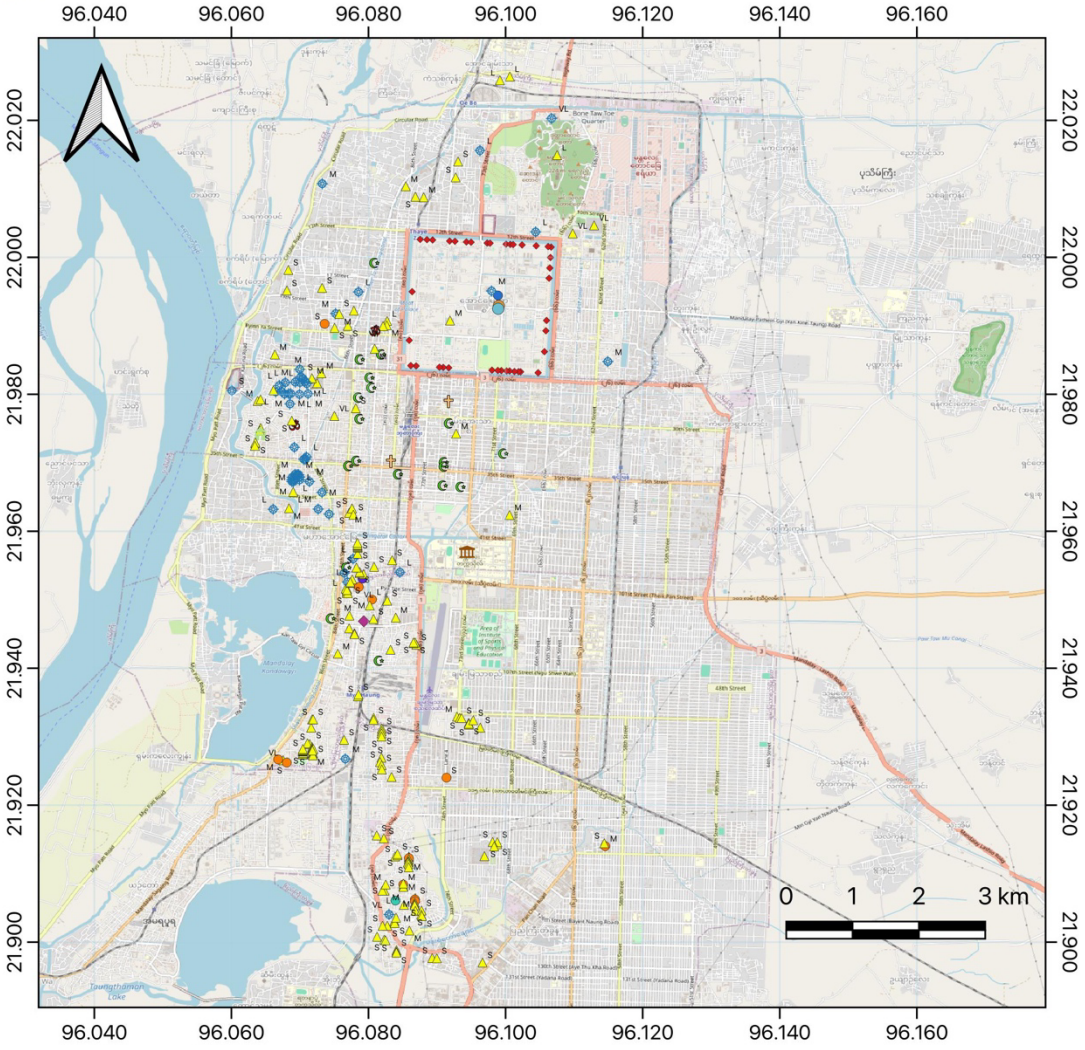
Any other relevant information not covered above

✅ Thank you for completing the Artefact Inventory Form.

APPENDIX – 4

Maps - Earthquake-Damaged Monuments from Satellite Imagery
May 2025

Earthquake-Damaged Religious and Ancient Monuments in Mandalay



Legend

- Church
- Clock Tower
- Community Hall
- Figure
- Hindu Temple
- Monastery
- Mosque
- Palace Wall
- Royal Factory
- Shrine
- Sima
- Stupa
- Temple
- Tooth Relic Tower
- University

Monument Size

S – Small (≤ 12 m)
M – Medium (> 12 m – ≤ 25 m)
L – Large (> 25 m – ≤ 50 m)
VL – Very Large (> 50 m)

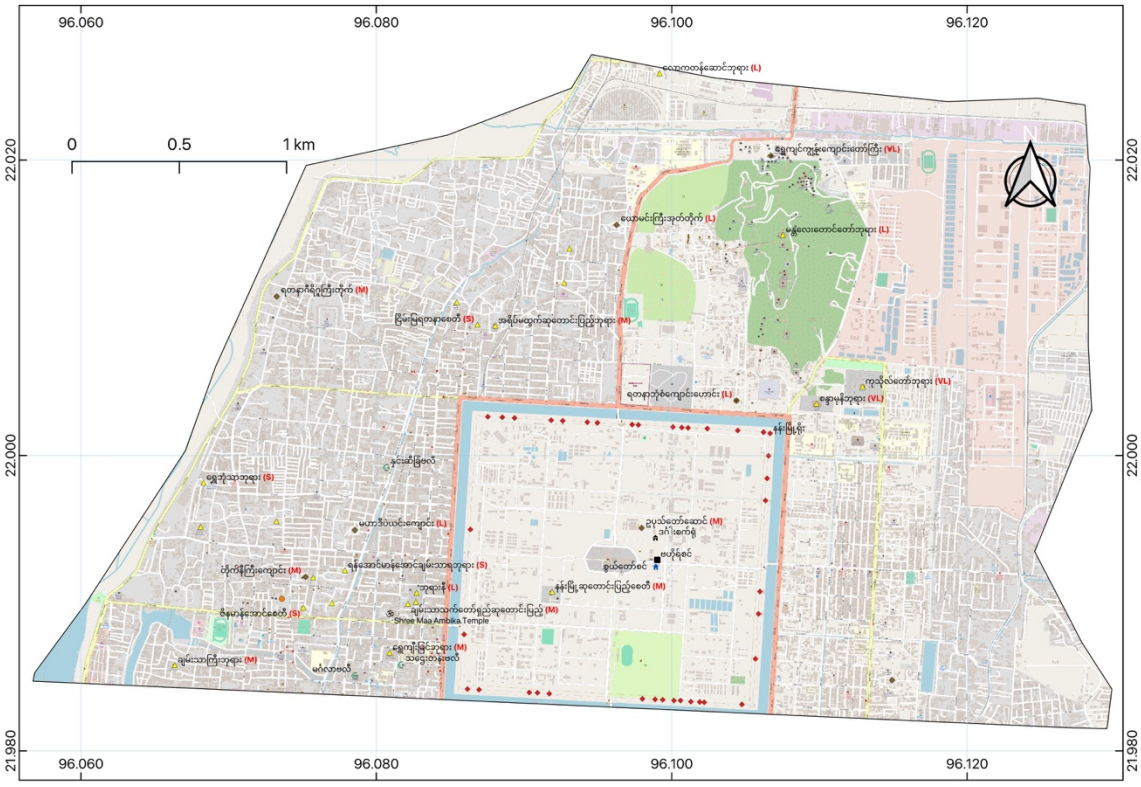
Size categories are based on the maximum dimension of the ground plan.

1:70000 Scale

Aung Myay Thazan Township

Mandalay Region

Map Showing Religious and Ancient Monuments Damaged after the 2025 Earthquake in Aung Myay Thazan Township, Mandalay



1:22,000 Scale

Legend

- Clock Tower
- Fortification
- Hindu Temple
- Monastery
- Mosque
- Palace Wall
- Royal Factory
- Stupa
- Temple
- Tooth Relic Tower

Monument Size

S	Small (≤ 12 m)
M	Medium (> 12 m – ≤ 25 m)
L	Large (> 25 m – ≤ 50 m)
VL	Very Large (> 50 m)

Size categories are based on the maximum dimension of the ground plan.

Earthquake Damaged Summary

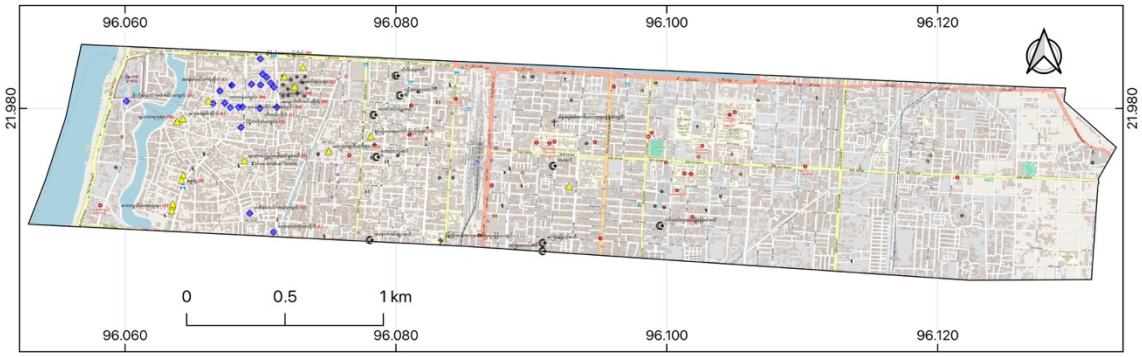
A total of 38 monuments were damaged:

- 1 Clock Tower
- 1 Palace Wall
- 1 Hindu Temple
- 8 Monasteries
- 3 Mosques
- 23 Pagodas
- 1 Tooth Relic Tower

Chan Aye Thazan Township

Mandalay Region

Map Showing Religious and Ancient Monuments Damaged after the 2025 Earthquake in Chan Aye Thazan Township, Mandalay



1:24,000 Scale

Legend

- Church
- Community Hall
- Hindu Temple
- Monastery
- Mosque
- Stupa

Monument Size

S	Small (≤ 12 m)
M	Medium (> 12 m – ≤ 25 m)
L	Large (> 25 m – ≤ 50 m)
VL	Very Large (> 50 m)

Size categories are based on the maximum dimension of the ground plan.

Earthquake Damaged Summary

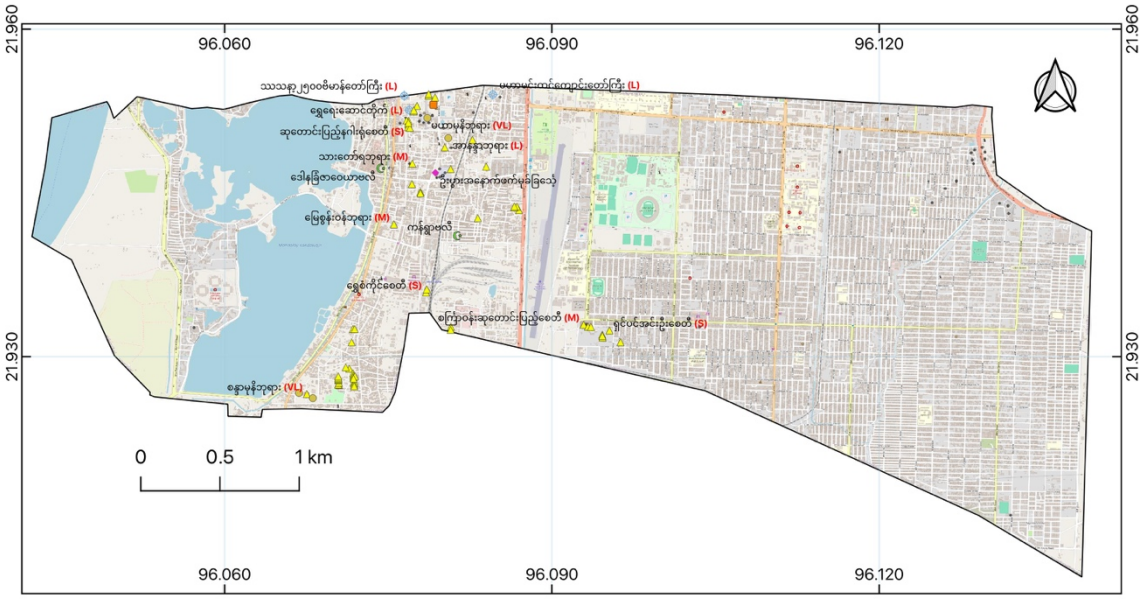
A total of 48 monuments were damaged:

- 2 Churches
- 1 Community Hall
- 1 Hindu Temple
- 20 Monasteries
- 8 Mosques
- 15 Pagodas

Chan Mya Thazi Township

Mandalay Region

Map Showing Religious and Ancient Monuments Damaged after the 2025 Earthquake in Chan Mya Thazi Township, Mandalay



1:35,000 Scale

Legend

- Figure
- Monastery
- Mosque
- Shrine
- Stupa
- Temple

Monument Size

S	Small (≤ 12 m)
M	Medium (> 12 m – ≤ 25 m)
L	Large (> 25 m – ≤ 50 m)
VL	Very Large (> 50 m)

Size categories are based on the maximum dimension of the ground plan.

Earthquake Damaged Summary

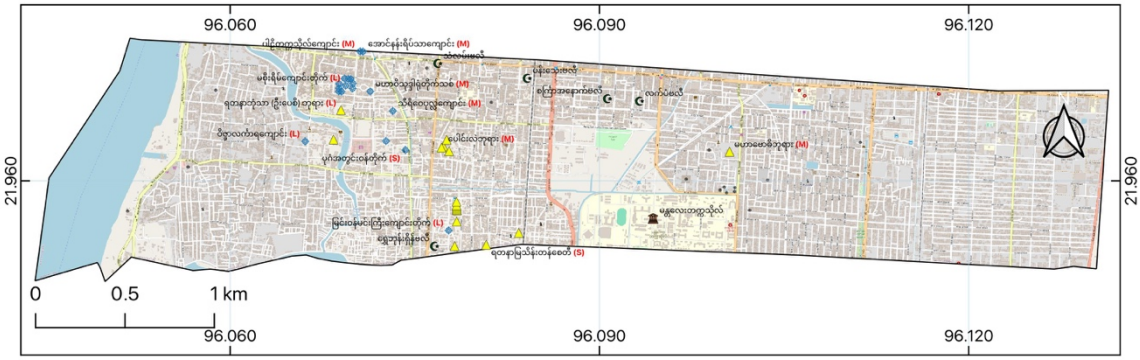
A total of 72 monuments were damaged:

- 1 Figure
- 3 Monasteries
- 2 Mosques
- 1 Shrine
- 65 Pagodas

Maha Aung Myay Township

Mandalay Region

Map Showing Religious and Ancient Monuments Damaged after the 2025 Earthquake in Maha Aung Myay Township, Mandalay



1:31,000 Scale

Legend

- Monastery
- Mosque
- Stupa
- University

Monument Size

S	Small (≤ 12 m)
M	Medium (> 12 m – ≤ 25 m)
L	Large (> 25 m – ≤ 50 m)
VL	Very Large (> 50 m)

Size categories are based on the maximum dimension of the ground plan.

Earthquake Damaged Summary

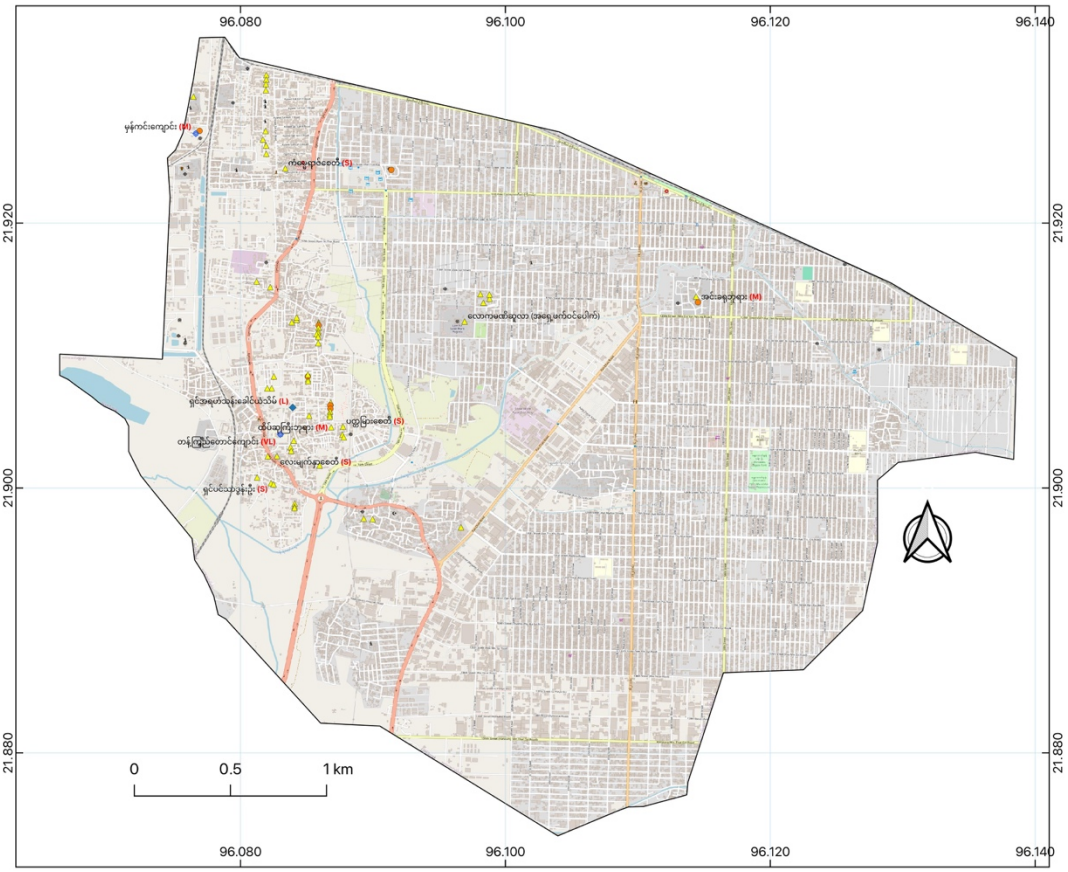
A total of 41 monuments were damaged:

- 18 Monasteries
- 17 Pagodas
- 5 Mosques
- 1 University

Pyi Gyi Tagon Township

Mandalay Region

Map Showing Religious and Ancient Monuments Damaged after the 2025 Earthquake in Pyi Gyi Tagon Township, Mandalay



1:23,000 Scale

Legend

- Monastery
- Sima
- Stupa
- Temple

Monument Size

S	Small (≤ 12 m)
M	Medium (> 12 m – ≤ 25 m)
L	Large (> 25 m – ≤ 50 m)
VL	Very Large (> 50 m)

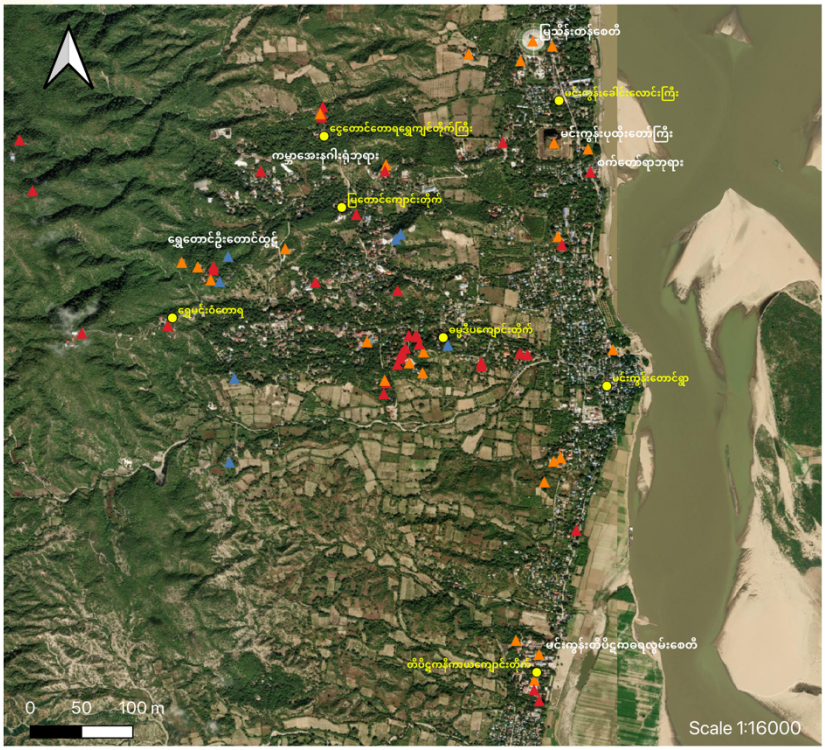
Size categories are based on the maximum dimension of the ground plan.

Earthquake Damaged Summary

A total of 69 monuments were damaged:

- 2 Monasteries
- 1 Sima
- 66 Pagodas

Earthquake Damage to Religious Buildings in Mingun
(Based on Satellite Imagery)



ထိခိုက်ပျက်စီးမှု

Satellite မြေပုံမှ လေ့လာမှုအရ ငလျင်အတွင်း မင်းကွန်းဒေသတွင် ဘုရား၊ စေတီပေါင်း ၈၀နီးပါးခန့် ထိခိုက်ပျက်စီး ဆုံးရှုံးခဲ့ပါသည်။

မင်းကွန်းပုထိုးတော်ကြီး ထိခိုက်ပျက်စီးမှု

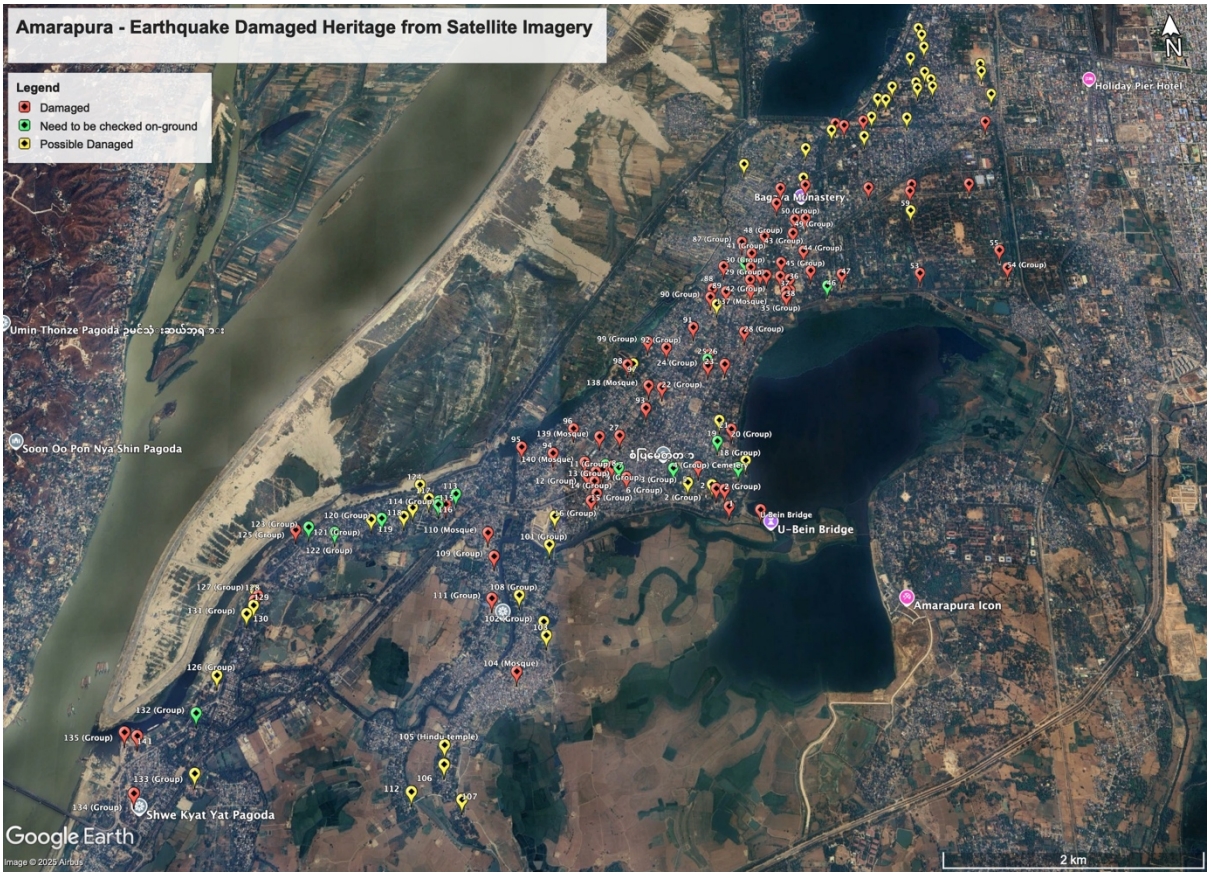
မင်းကွန်းတီပိုင်္ဂကဓရလွှမ်းစေတီ

Legend

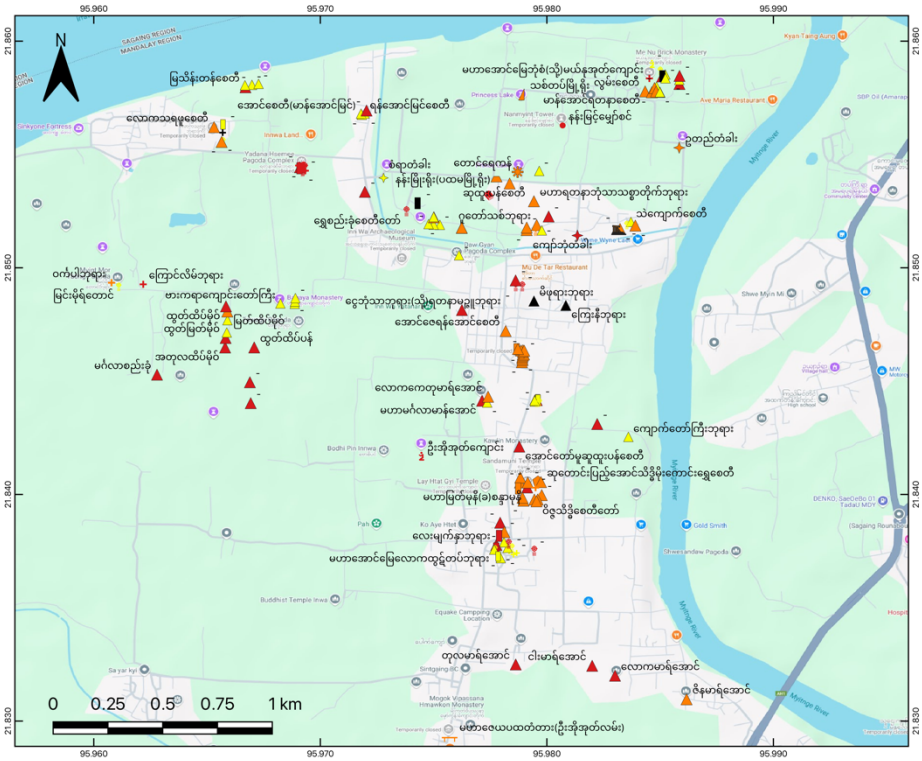
- Reference Landmarks

Damage Classification

- Collapse
- Damage
- Possible Damage



Map of Ancient Monuments in Ava (Innwa) Damaged by Earthquake



Heritage for Myanmar

Earthquake Damage Status

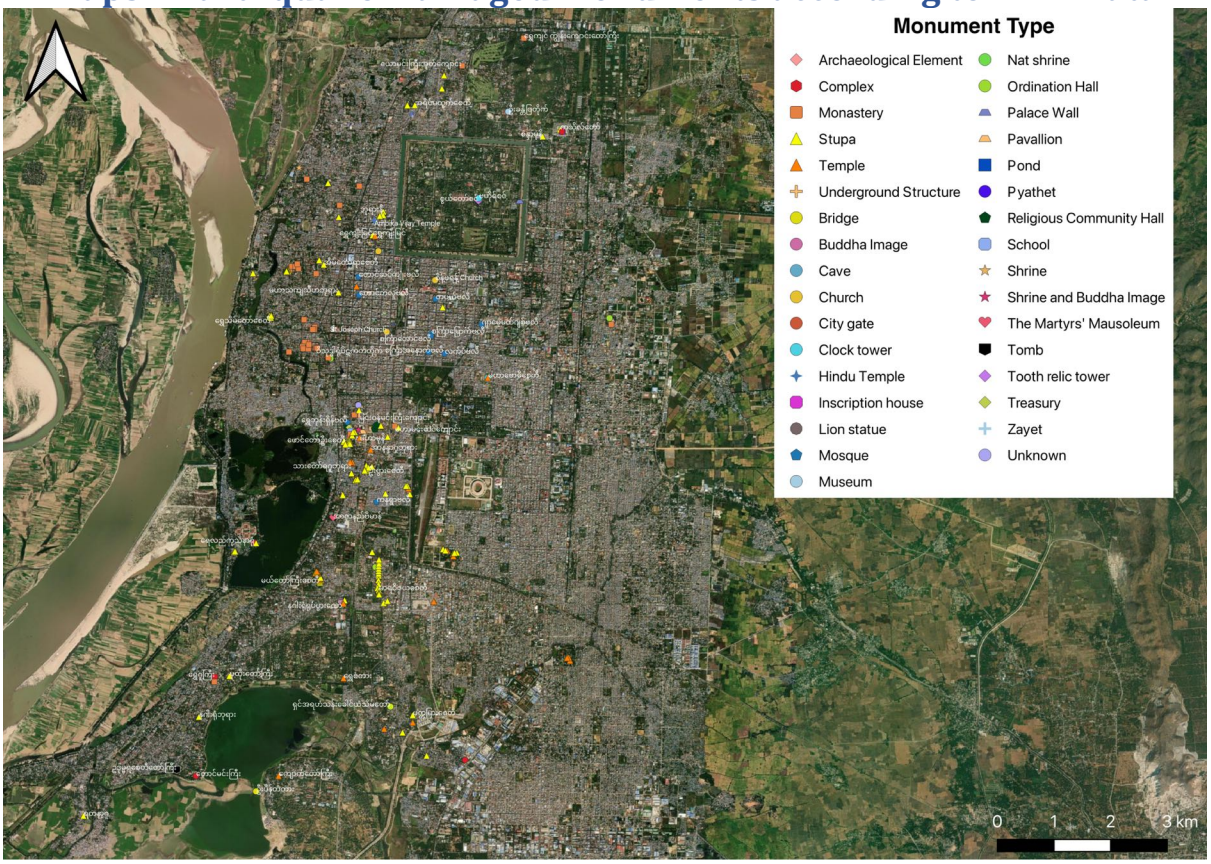
- Minor
- Moderate
- Severe
- Completely Collapse

Legend

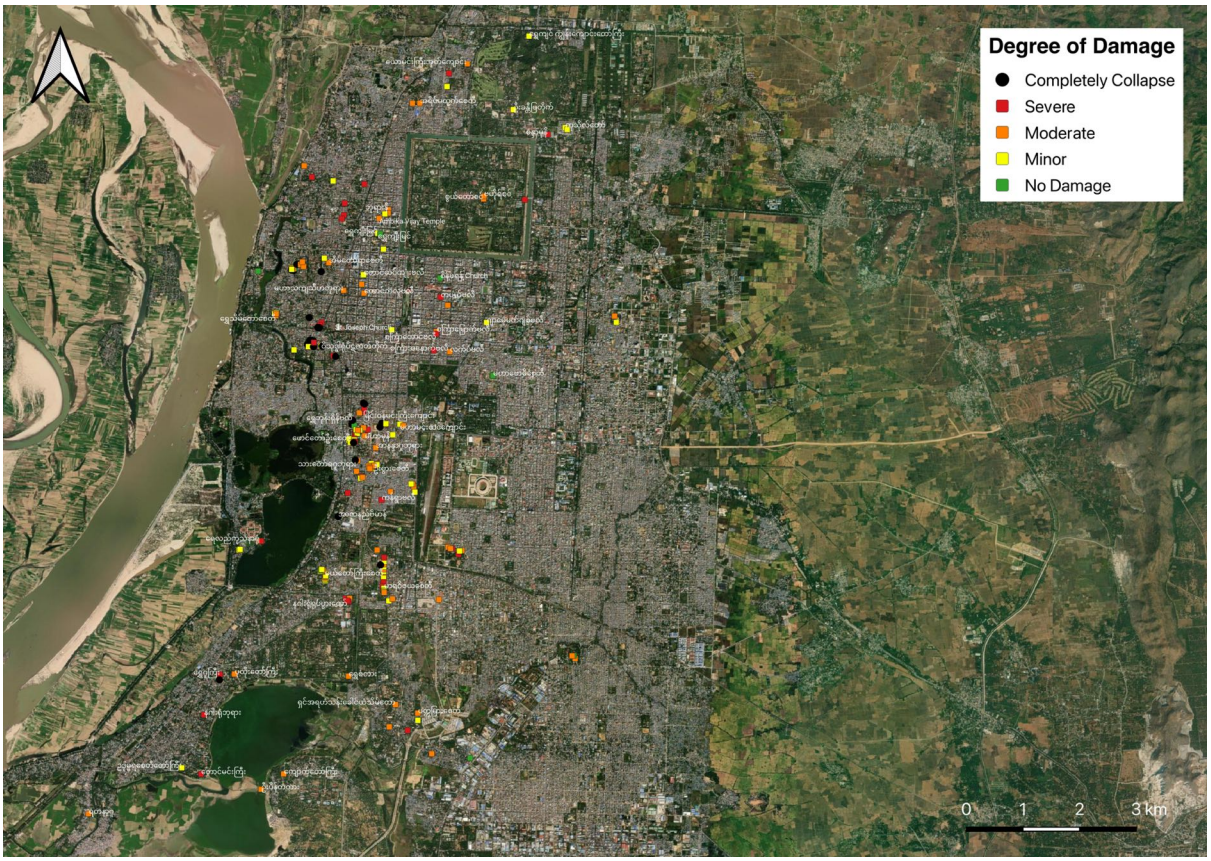
- Bridge
- City Gate
- City Wall
- Hollow Stupa
- Inscription House
- Monastery
- Pitakataik
- Pond
- Pyatthet
- Staircase
- Stupa
- Teak Wall
- Temple
- Watchtower

Scale 1:15,000

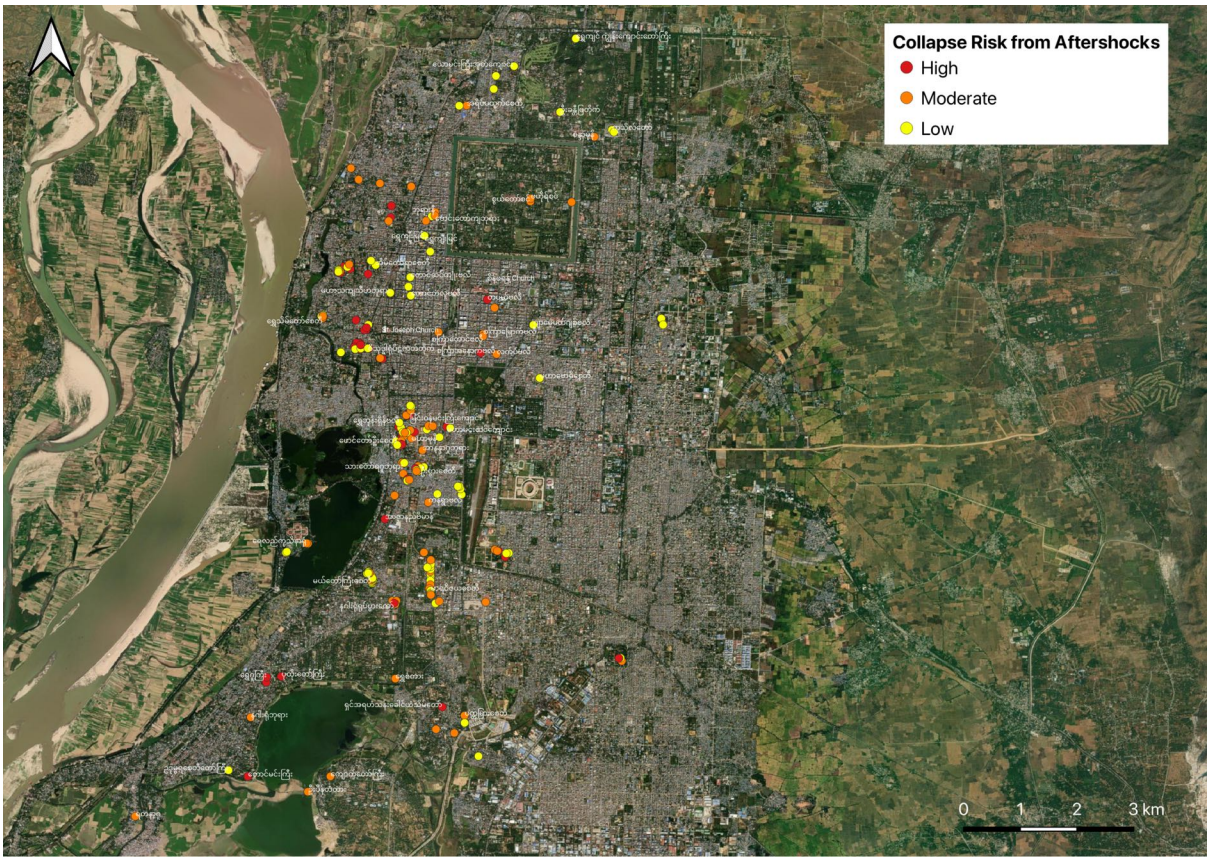
Maps – Earthquake-Damaged Monuments according to HFM Data



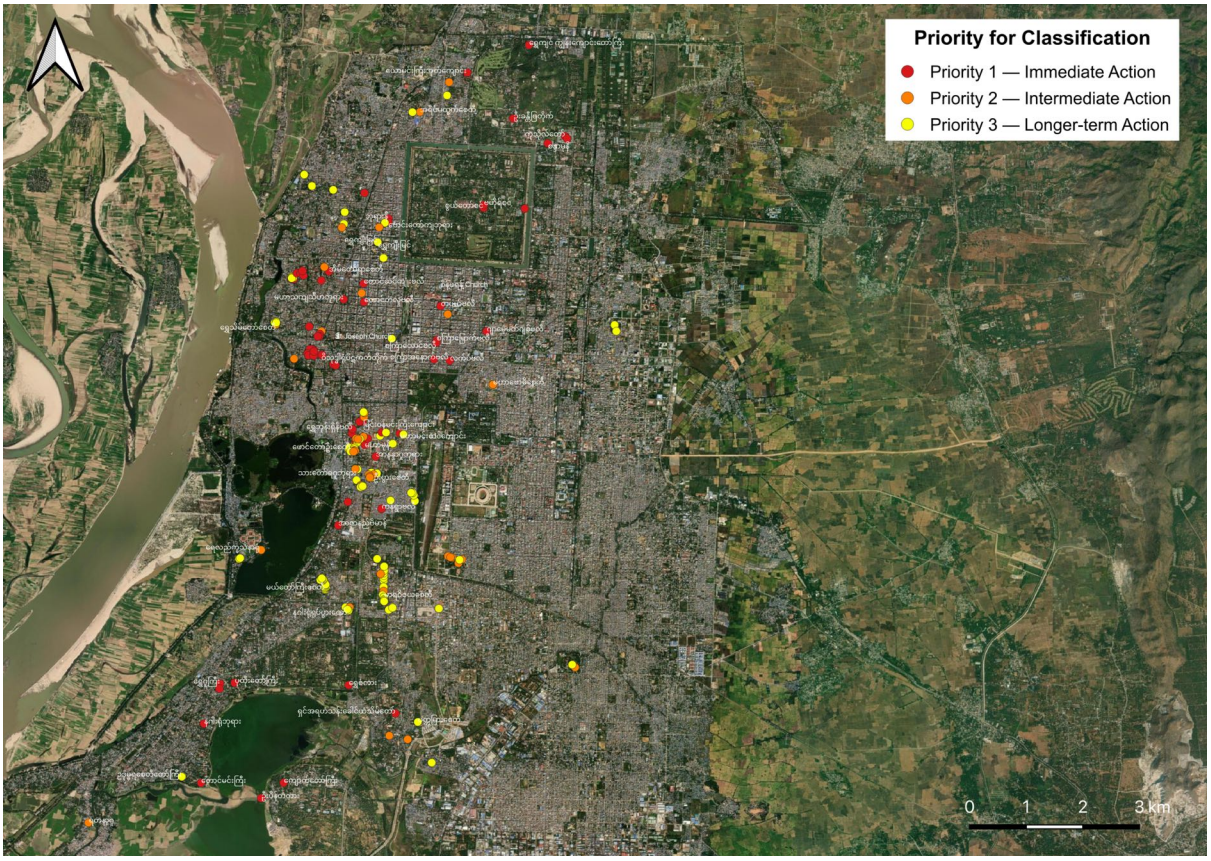
Map Showing Earthquake-Damaged Monument According to Type, Mandalay



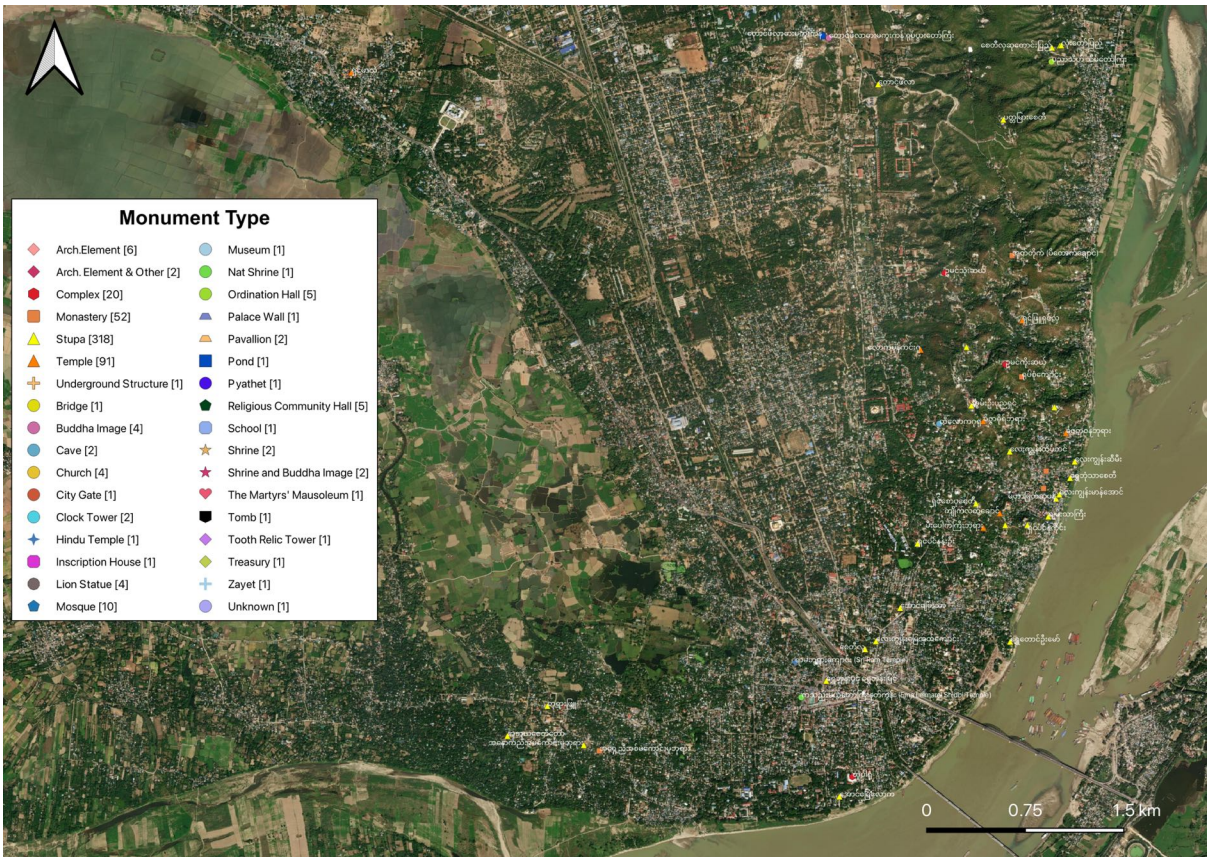
Map Showing the Extent of Damage, Mandalay



Map Showing the Risk of Further Collapse Due to Aftershocks, Mandalay

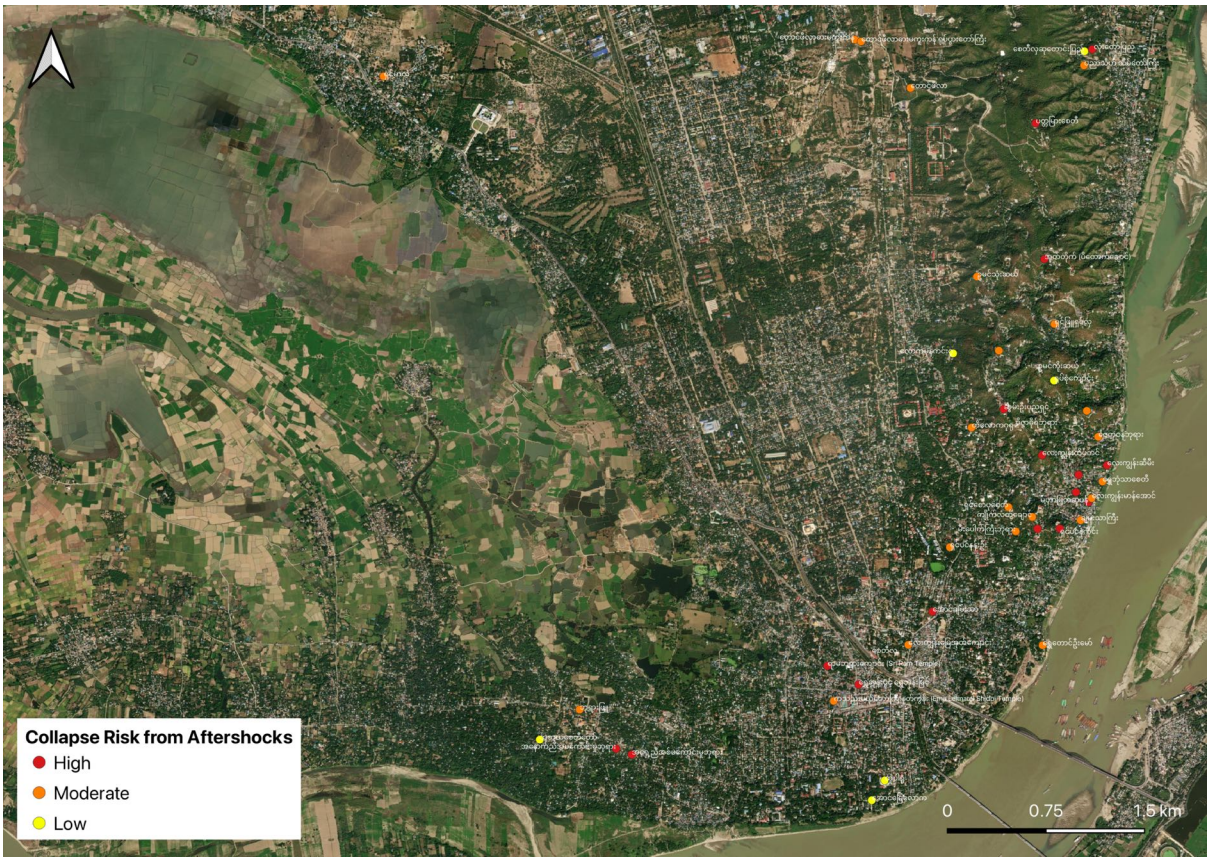


Map Showing Priority Level for Conservation, Mandalay

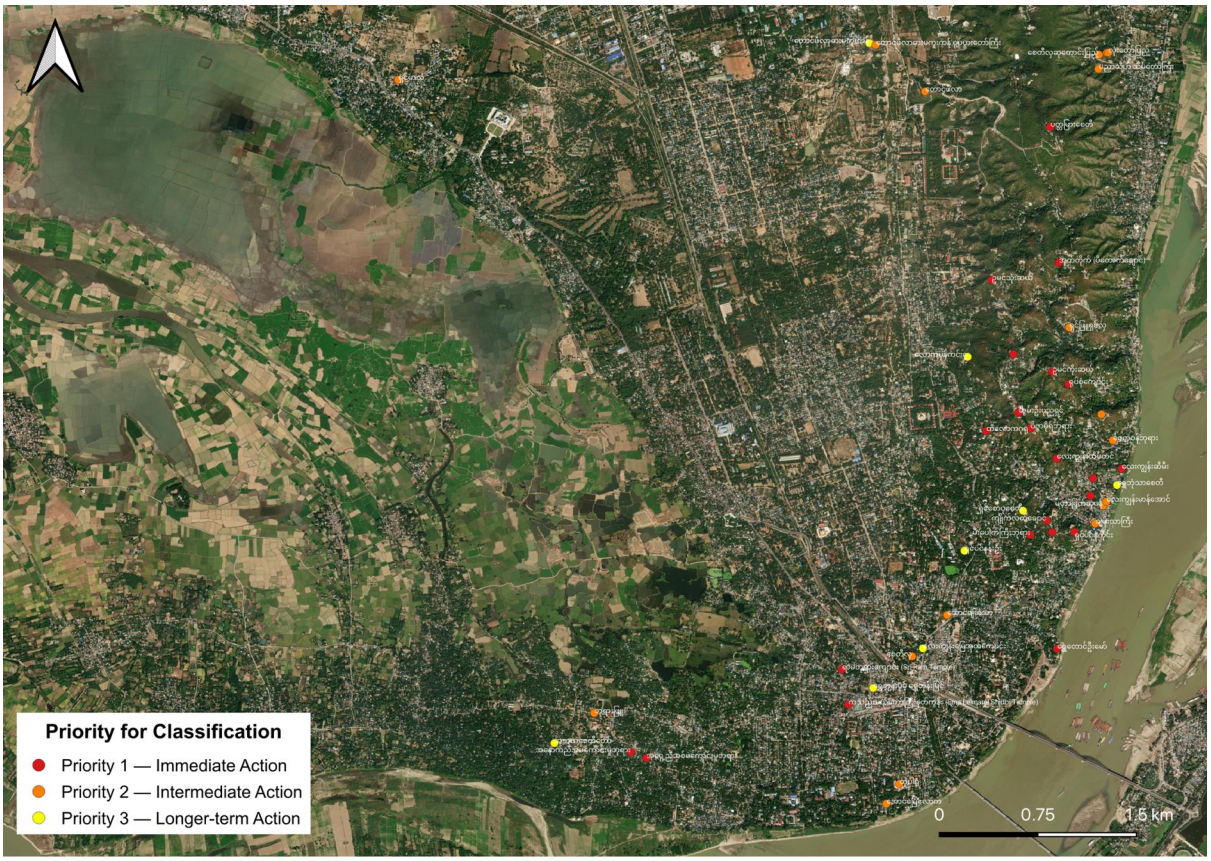


Map Showing Earthquake-Damaged Monument According to Type, Sagaing

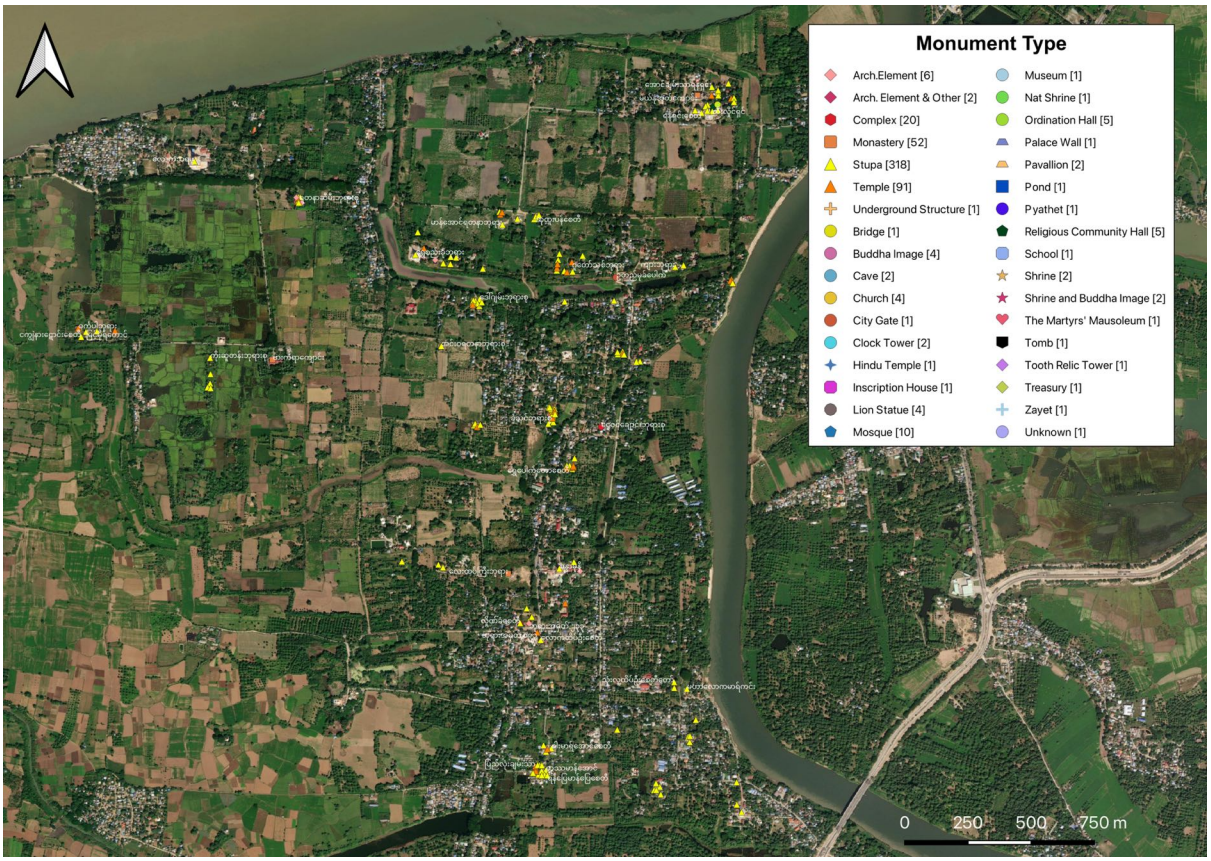
Map Showing the Extent of Damage, Sagaing



Map Showing the Risk of Further Collapse Due to Aftershocks, Sagaing

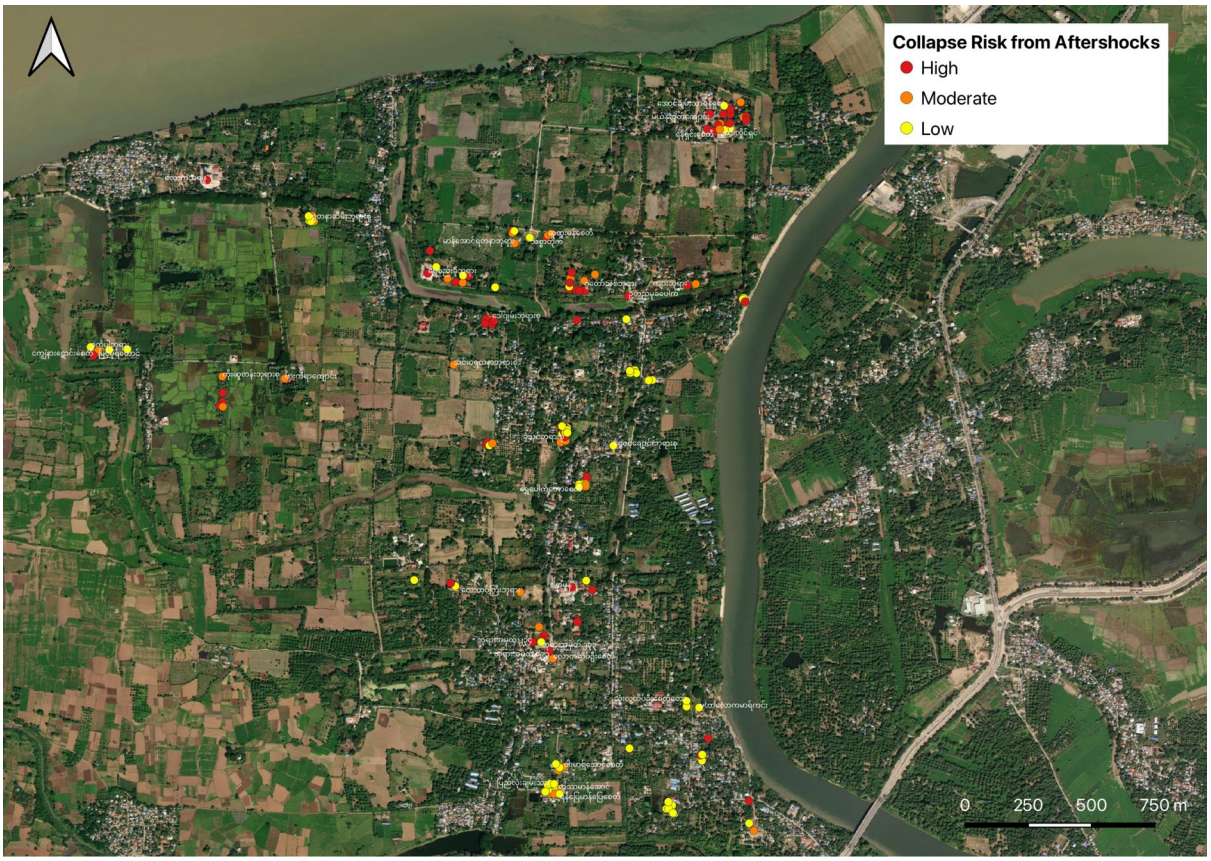


Map Showing Priority Level for Conservation, Sagaing

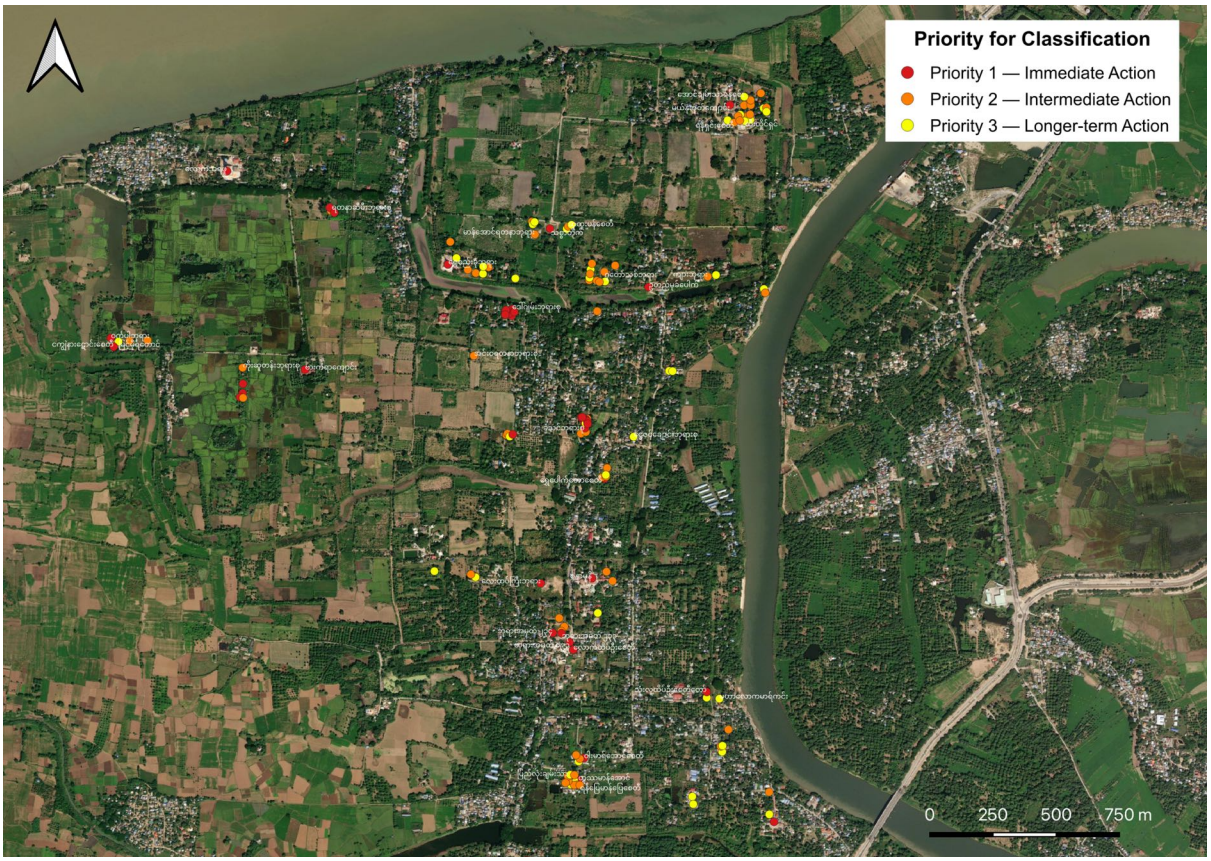


Map Showing Earthquake-Damaged Monument According to Type, Inwa

Map Showing the Extent of Damage, Inwa



Map Showing the Risk of Further Collapse Due to Aftershocks, Inwa



Map Showing Priority Level for Conservation, Inwa

APPENDIX – 5

Safety Protocols to Follow Before Conducting Rapid Heritage Damage Assessment

Please read all these guidelines carefully before documenting heritage damage. Your safety is the highest priority.

Do not enter potentially dangerous areas under any circumstances.

1. Preparations Before Assessment

- Wear a hard hat and boots. Bring a face mask, flashlight, phone, and water.
- Bring a fully charged cell phone and backup power bank.
- If available, bring GPS devices or install location-sharing smartphone applications.
- Work in teams of at least 2-3 people rather than conducting assessments alone.
- If you plan to survey damage, inform family, friends, or colleagues about your intended location(s) before leaving home.
- Keep a list of emergency phone numbers for volunteers, emergency response personnel in your phone or notebook.
- Reread safety information before entering data into the application.

2. Safety Procedures Before Assessment

(a) Safety Assessment

- Do not enter any building that appears unsafe.
- Do not conduct inspections if you observe:
    - Damaged or leaning walls
    - Leaning or collapsing roofs, ceilings
    - Collapsed pillars and beams
    - Damaged electrical wires, gas or water pipelines
    - Flooding or landslides
- Check for loose parts that might fall before entering any building.
- Always check for and be alert to dangerous insects and poisonous animals (scorpions, snakes, etc.).
- Always be aware of cracked areas or damaged structural components and barriers.
- If there is gas leakage, fire hazard, or other concerns, notify local authorities and do not enter.

(b) Initial Structural Assessment

- Before entering a building, inspect the main structural components from the outside.
- Understand hazard warning signs. For example, red tape barrier = high danger, no entry.
- Always be aware that the building you are inspecting could collapse at any time due to aftershocks.

(c) Establishing Access Routes

- Plan safe routes for entering and exiting the building in advance.
- If working with a team, designate emergency exits and meeting points in advance.

- When entering a building for inspection, set a time limit (15 minutes) and keep track of time.

3. Safety Procedures During Inspection

(a) Inspection Methods

- Begin assessment from the least dangerous area. Work from minimal to maximum risk areas.
- Always check the stability of floors or building structures before taking full steps.
- Do not stand under damaged components.
- Inspect only one room at a time, with no more than two people entering at once.

(b) Communication Guidelines

- Maintain communication between team members every 5 minutes during inspection, either by voice or phone.
- If someone you are communicating with does not respond, immediately declare a security emergency.

(c) Emergency Response

- If dust appears in the air, put on a face mask and leave the area immediately.
- If you hear sounds from the building or feel additional vibrations, exit immediately.
- Be vigilant for damaged electrical wires, gas or water pipelines.
- Keep track of time whenever entering for inspection, not exceeding 15 minutes.

4. Heritage Considerations

(a) Preventing Further Damage

- Carefully inspect fragile sculptures and surfaces, taking care not to scratch or damage them with other objects.
- Take care not to damage mural paintings. Do not collect fragments of damaged mural paintings, stucco, etc.
- Document additional damage that may occur due to flooding or moisture after rainfall.

(b) Protecting Moveable Objects

- When possible, note the location of moveable objects for emergency rescue purposes.
- Do not move valuable objects such as Buddha statues, sculptures, stone inscriptions, and other artifacts without notifying the relevant authorities.
- For security reasons, do not disclose or post on social media the location of valuable heritage objects that could be stolen by criminals. Immediately inform and properly hand them over to the relevant authorities such as ward, village, or religious organizations.

(c) Other Considerations

- If the heritage site you are documenting is privately owned, request permission from the owner.
- Remove shoes when entering Buddhist monuments, except in circumstances where doing so would pose a safety risk.
- Do not disrespect religious buildings and objects.
- When necessary, inform monks, locals, and religious leaders in advance about your heritage damage assessment activities.
- Request permission to photograph or handle culturally significant symbols and objects when needed.

5. Health Protection

- It is important to take regular breaks and stay hydrated during documentation.
- Allow team members to rest if they show signs of stress or fatigue.
- Use hand sanitizer for personal hygiene. Thoroughly wash hands after completing documentation. Change clothes.
- If you experience symptoms such as inhaling bad odours, skin irritation, or eye irritation, seek medical attention promptly.