COMPREHENSIVE RISK MANAGEMENT PLAN FOR THE NATIONAL MUSEUM OF ANTHROPOLOGY

WORLD HERITAGE OFFICE INAH

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PRESENTATION

LUZ DE LOURDES HERBERT PESQUERA*

Two years of work, transcending the Covid pandemic, preceded the Comprehensive Risk Management Plan for the National Museum of Anthropology Complex (CMNA)–including the National Library of Anthropology and History and the Direction of Physical Anthropology–, a document that is now presented, prepared through a participatory process in which several professional experts in the world of museums were involved.

Responding to the initiative of the Legal Counsel of the Mexican Ministry of Foreign Affairs (within the Inter-Secretarial Commission on International Humanitarian Law), which invited the World Heritage Direction of the National Institute of Anthropology and History to collaborate in the inscription of the National Museum of Anthropology on the *List of Cultural Property under Enhanced Protection, in accordance with the Guidelines for the application of the Second Protocol (1999) to the Hague Convention (1954),* was the just "provocation" to generate this normative instrument on strategies for the protection of movable and immovable cultural heritage, which has been reflected upon and implemented in times of peace. With this, according to article 39, it will be guaranteed "that the cultural property is adequately protected against any type of negligence, such as deterioration or destruction...".

Funding from the Fund for the Protection of Cultural Property in the Event of Armed Conflict was essential for the development of the *Plan* and the availability of highly qualified personnel committed to the project.

It was not fortuitous to channel efforts to achieve an input of such scope and purpose since Mexico, according to the recent study *WorldRiskReport 2021*, published by the Ruhr University of Bochum, Germany, places Mexico in the 94th position out of 181 countries analyzed with high risk of disasters in the global context. The recurrence of catastrophic events is experienced on a daily basis in various parts of our country, with Mexico City being one of the most vulnerable in this regard.

* Director of World Heritage. National Institute of Anthropology and History.

The initiative of the World Heritage Direction, necessary to develop a methodology of analysis, evaluation, and planning of its own competencies to face contingencies in Mexican museums, was also designed to extrapolate the experience to other countries.

The National Museum of Anthropology Complex -unequalled in the Mexican Republic- houses collections of different nature or periodicity, which are cultural assets in force in the history, memory, and knowledge of the indigenous peoples and the past, so we must not allow their loss.

The *Comprehensive Risk Management Plan* that we are now submitting to UNESCO authorities and to the States Parties to the 1954 Convention for the Protection of Cultural Property in the Event of Armed Conflict (ratified by Mexico two years later), sets out and highlights a policy that positions the culture of preservation as essential, which is not limited to identifying the threats and vulnerability of the heritage, or systematizing the information gathered, but reaches the capacity to develop the respective protocols of action, in order to mitigate or respond in the event of a natural or anthropogenic disaster. This last phase is the most significant, which is reached after the analysis of the information and the definition of best practices, in order to minimize the impact on people and cultural property.

The structuring of information is another major contribution, making it a priority tool for decision making in all risk management tasks.

This exercise, which includes both the *Comprehensive Plan* and the future placement of the Blue Shield, entails the approach with international organizations such as the International Committee of the Blue Shield (ICBS) and the International Committee for Risk Preparedness (ICORP), thus strengthening awareness of the economic, social and cultural importance of the conservation of our heritage, of proactive or preventive monitoring, of training, education and dissemination programs, both for the armed forces and for civil society, as well as for the civil authorities involved, in one way or another, in the protection of the sites that hold and will bear this emblem.

With this Comprehensive Risk Management Plan for the National Museum of Anthropology Complex, prepared by INAH, Mexico's commitment to international best practices in the field of museum management is reaffirmed; with the promotion of new initiatives aimed at strengthening the awareness of authorities, societies and communities about the importance of protecting and preserving the integrity of museums; and of course, with UNESCO's cultural conventions and their proper implementation.

Likewise, this exercise is in line with the Decision adopted by UNESCO's Executive Board, during its 205th session in 2018, where it emphasized goals 1.5, 4.7, 8.2 and 11.4 of the 2030 Agenda for Sustainable Development Goals (UN), by virtue of the fact that they point directly to the basic functions of museums in society. A document that also pointedly warned about the absence, in the staff of many museums in the world, "of the technical knowledge to comply with international professional standards and basic protocols for risk prevention."

Finally, we endorse our commitment to the new definition of museum, approved during the work of the 26th General Conference of the International Council of Museums (ICOM), in the sense that the National Museum of Anthropology Complex is in permanent "service to society that researches, collects, conserves, interprets and exhibits the tangible and intangible heritage", promoting "diversity and sustainability, ethically and professionally".

We would like to thank the people who generously gave their time, opinions, and experience, giving meaning to the effort made.

THE CIDIH-MEXICO AND THE INSCRIPTION OF THE NATIONAL MUSEUM OF ANTHROPOLOGY ON THE LIST OF CULTURAL PROPERTY UNDER ENHANCED PROTECTION

ALEJANDRO CELORIO ALCÁNTARA*

Cultural heritage is the connecting thread between the past, present, and future of peoples, in addition to being a constituent element of our identity as individuals and as a nation. Its physical loss is accompanied by the disappearance of important information about the historical and material conditions that have brought us to the present day. Therefore, the protection of cultural heritage is a task of social concern that has a priority place in the agenda of the Federal Government of Mexico.

Historically, wars have involved the destruction and looting of monuments, museums, and places of worship. In the 20th century, the unrestricted violence of World War II forced the international community to outline a first scheme of special protection for cultural property in times of armed conflict. Thus was born the 1954 *Convention for the Protection of Cultural Property in the Event of Armed Conflict and its first additional protocol*.[1]

Later in the 1990s, the destruction of cultural property and massive looting in Afghanistan and Yugoslavia prompted the need to strengthen the 1954 scheme to reflect developments in international law and new experiences on the battlefield. Thus, the *Second Protocol to the 1954 Hague Convention for the Protection of Cultural Property in the Event of Armed Conflict* was adopted in 1999.[2] This treaty provides for the creation of an *International List of Cultural Property under Enhanced Protection*, which to date includes 17 properties located in 10 countries.[3]

* Legal Consultant. Ministry of Foreign Affairs. President in turn of the CIDIH-Mexico.

[1] Convention for the Protection of Cultural Property in the Event of Armed Conflict, adopted on May 14, 1954., UN Treaty Series vol. 249 (p. 215).

[2] Second protocol to the Convention for the Protection of Cultural Property in the Event of Armed Conflict, adopted on March 26, 1999, UN Treaty Series vol. 2253 (p.172).

[3] UNESCO, Cultural Property under Enhanced Protection (2019) https://unesdoc.unesco.org/ark:/48223/pf0000368300 (consulted on August 23, 2022).

Mexico is a party to the 1954 Convention and the 1999 Second Protocol. Therefore, our country is committed to take all necessary national measures to ensure compliance in times of peace and armed conflict. Within the Mexican Government, the task of implementing the above treaties corresponds to the Mexican Inter-Secretarial Commission on International Humanitarian Law (CIDIH-Mexico), made up of the Ministries of the Interior, Defense, the Navy and Foreign Affairs.

According to its creation agreement, the mandate of the CIDIH-Mexico includes disseminating and promoting international humanitarian law, as well as carrying out the necessary actions to comply with the commitments arising from the instruments in this area.[4] As a follow-up of previous actions for the protection of cultural heritage,[5] in 2019, the plenary session of the CIDIH-Mexico decided to submit to the National Institute of Anthropology and History (INAH) for consideration the registration of the National Museum of Anthropology (MNA) on the International List of Cultural Property under Enhanced Protection.

[4] Agreement by which the Inter-Ministerial Commission on International Humanitarian Law is created on a permanent basis, D.O.F. on August 19, 2009.

[5] En 2015, la CIDIH-México y el INAH trabajaron en la inscripción de 9 sitios arqueológicos en el Registro Internacional de Bienes Culturales bajo Protección Especial de la Convención de 1954: Monte Albán, Palenque, Teotihuacan, Chichén-Itzá, El Tajín, Uxmal, Paquimé, Xochicalco y Calakmul.

As shown in this plan, the MNA houses a priceless collection, in addition to being a building of great artistic and architectural merit. In its spacious halls, the Museum offers the public a journey through the cultures that inhabited the national territory. For the reasons detailed below, the MNA complex represents an asset of the greatest importance for humanity and a candidate for the enhanced protection regime.

It is important to mention that armed conflict as a means of dispute settlement transgresses the guiding principles of Mexican foreign policy, specifically with regard to the promotion of peace and respect for human rights. At the same time, the treaties on the subject contemplate preventive measures that also work for a wide variety of risks. Thus, the institutional architecture of the 1954 Convention and its protocols facilitated the provision of financial resources to strengthen risk management mechanisms within the MNA.

If the destruction of heritage impoverishes memory, protection actions vindicate its value and transcendence. The registration of the MNA in the list of properties under enhanced protection reflects the importance Mexico places on international law that protects the multiple dimensions of cultural heritage. Furthermore, this instance of cooperation with UNESCO also motivates us to continue broadening our perspective in the design of more and better mecha-

nisms for the safeguarding of our cultural heritage in Mexico and abroad. We hope that the MNA will continue for many years to come to preserve this common thread between what we were, what we are and what we aspire to be.

PREVENTIVE CONSERVATION AND RISK MANAGEMENT

ROSANA CALDERÓN MARTIN DEL CAMPO*

Preventive conservation in museums is not only limited to the control of environmental conditions, such as relative humidity, temperature, and lighting. Its field of action is transversal to all the work of a museum and/or space that safeguards cultural heritage, from the exhibition and storage systems of collections, their packaging and transportation, security actions, among others, as well as the generation of guidelines, guides, and procedures for the preservation of movable cultural property in safekeeping.

Preventive Conservation proposes a systematic working method to identify, evaluate, detect, and control the risks of deterioration of cultural property and/or collections. Its main objective is to reduce or minimize the risks that may affect them, thus avoiding their deterioration or loss. From a more comprehensive point of view, it seeks to attack the source of deterioration before it damages the cultural property, promoting the conservation of complete collections, avoiding the need for more invasive and costly interventions, once the cultural property shows deterioration that could compromise its stability and permanence in the future.

Preventive Conservation strategies contemplate aspects such as sustainability, that is, the application of continuous efforts over time, considering short, medium, and long term plans, as well as the optimization of technical, human and financial resources, and accessibility, understood as making cultural assets available to the society in general.

The lack of financial resources and specialized personnel in this area is a limitation present in cultural institutions worldwide; however, a preventive conservation policy should be promoted, whose strategies and criteria will always result in improving the preservation conditions of cultural property. In the *Comprehensive Risk Management Plan* presented here, particular emphasis has been placed on prevention measures.

The preventive nature of Preventive Conservation is shared with the lines of risk management, which is why, in the *Comprehensive Risk Management Plan for the National Museum of Anthropology Complex*, this confluence was sought.

* Restaurador Perito. Coordinadora del Proyecto. Dirección de Patrimonio Mundial

A Risk Management Plan should be prepared in accordance with the specific objectives of each institution, based on a thorough knowledge of the building that houses the collections, as its container and a first layer of protection, the specific characteristics of the cultural assets that make up the collections, as well as the internal and external risks to which they are exposed. All this, with a clear knowledge of the human, material, and financial resources available.

The protection of cultural property safeguarded in museums requires intense and extensive reflection exercises. Intense, because it must be a continuous exercise that requires constant updating, incorporating the daily practices of cleaning, handling, surveillance of cultural property, among others. Extensive, because it requires considering not only the physical space in which the cultural property is stored or exhibited, but also the packing, transfer, and loan practices, as well as the physical and administrative-legal environment in which they are inserted.

An extensive and in-depth analysis, such as the one required to prepare the *Comprehensive Risk Management Plan* presented here, included the participation of an interdisciplinary team of museum professionals and the determined participation of a working group from the National Museum of Anthropology Complex itself, with the necessary knowledge and experience to identify the threats and vulnerabilities to which the building, classified as an artistic monument under Mexican law, the collection it houses and which includes archaeological and historical monuments, and the people who visit and work in it, are exposed.

To initiate a risk analysis, such as the one included in this publication, it was necessary to compile and review existing information from international experts such as the ABC Method, formulated by Stefan Michalski of the Canadian Conservation Institute and José Luis Pedersoli of ICCROM, the ISO 3000 in its 2018 edition, among others. As well as national bodies such as the National Center for Disaster Prevention (CENAPRED), the Mexico City Risk Atlas and the Risk Atlas of the Mayoralty of Miguel Hidalgo, in addition to all internal institutional regulations.

With this *Comprehensive Risk Management Plan for the National Museum of Anthropology Complex*, we want to emphasize that we should not wait for a threat to occur before reacting, but that we must be adequately prepared, with sufficient anticipation to be able to face the risk situation, control it and minimize its effects, so that we can return to normality as soon as possible. This will allow the museum and its collections to fulfill their function, to connect the human being of today with the thoughts, achievements, desires and wishes of the human being of the past, in order to understand our present and outline a better future.

1
BACKGROUND

In December 2019, the Legal Counsel of the Mexican Ministry of Foreign Affairs requested the National Institute of Anthropology and History (INAH) to consider the nomination of the National Museum of Anthropology for the List of Cultural Property with Enhanced Protection of the Second Protocol (1999) of the Convention for the Protection of Cultural Property in the Event of Armed Conflict (1954). INAH considered that this registration would represent a milestone for Mexico in the protection of its cultural heritage.

The National Museum of Anthropology is the most important Mexican museum, both nationally and internationally. Its collections are made up of around 200,000 archaeological, historical, ethnographic, and artistic objects of the greatest importance for the Mexican people. Among them, it houses objects from the 11 archaeological zones declared World Heritage by UNESCO, in addition to those from the 9 archaeological zones included on the Special Protection List of the Second Protocol of the Hague Convention (1954).[1]

National Museum of Anthropology Complex

This building was made specifically to host the museum, so that, based on current Mexican legislation, the Mexican government determined in 2010 its protection as an artistic monument, given the excellent architectural design of its construction.[2]

[1] Archaeological Zone of Monte Albán, Prehispanic City of Palenque, Prehispanic City of Teotihuacan, Prehispanic City of Chichén-Itzá, Prehispanic City of El Tajín, Prehispanic City of Uxmal, Archaeological Zone of Paquimé, Archaeological Monuments Zone of Xochicalco and Ancient Mayan City of Calakmul, which have an exceptional universal value in terms of the 1972 Convention for the Protection of the World Cultural and Natural Heritage, in addition to the incalculable value for Mexico as archaeological monuments.

[2] Decree declaring the building known as the National Museum of Anthropology an Artistic Monument, *Diario Oficial de la Federación*, July 30th, 2010.

It was designed to house the National Library of Anthropology and History, one of the most important libraries in Mexico, with around 300,000 volumes, as well as a surprising collection of codices—most of them produced in the 16th century, some from the pre-Hispanic period and the rest from the period of contact between the Spanish conquerors and the original inhabitants of the territory now occupied by Mexico—, which is registered in UNESCO's Memory of the World Program.[3]

Also physically located in this building are three divisions of the National Coordination of Anthropology of INAH: the Direction of Physical Anthropology (responsible for the rescue, research, conservation, and dissemination of archaeological and historical human remains located in Mexico, from the most remote antiquity to the end of the nineteenth century), the Direction of Linguistics and, finally, the Direction of Ethnohistory.

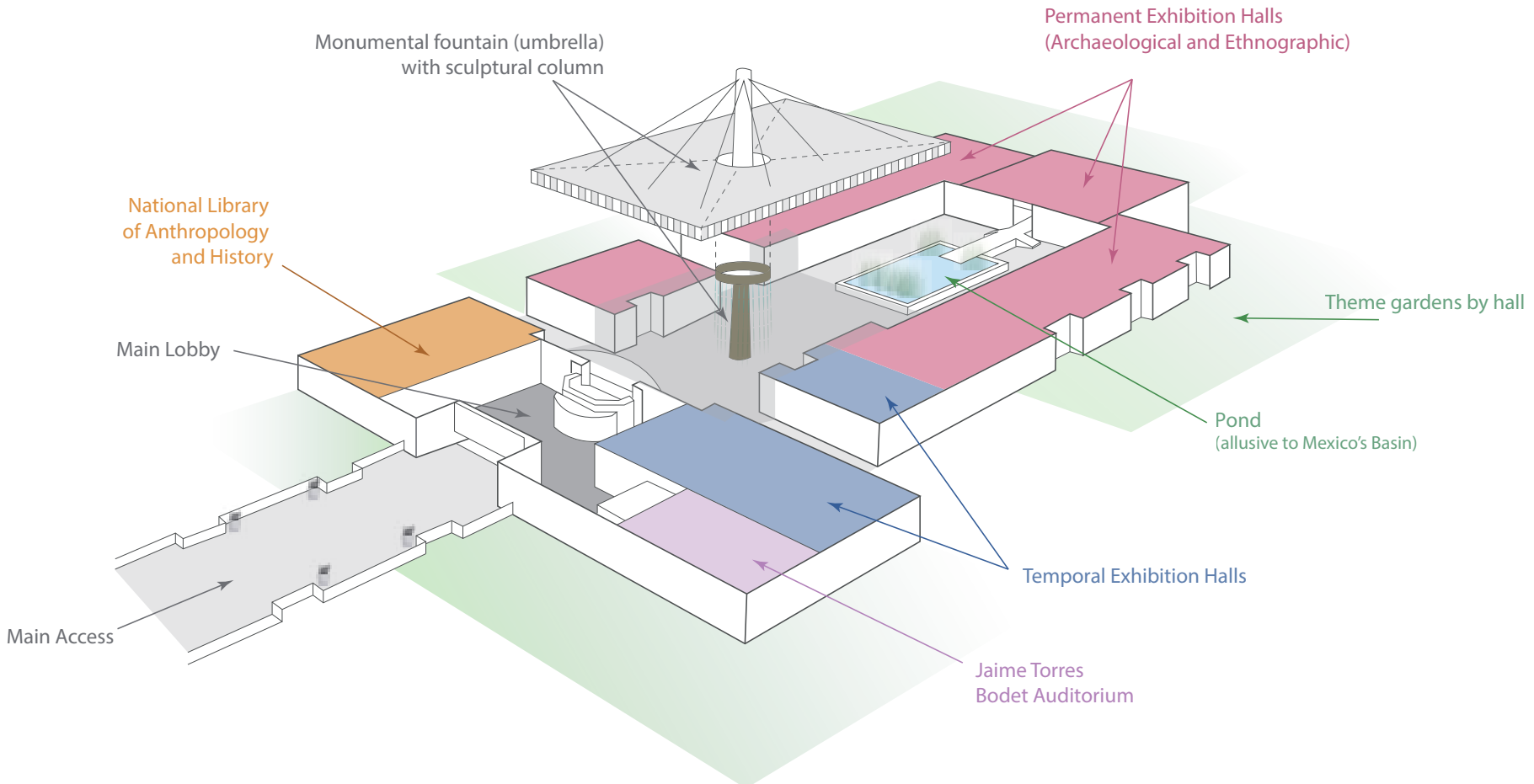
The fact that several areas with such varied collections and objectives—despite belonging to the same institution—coexist in the same architectural space has hindered the development and application of concerted lines of action for identification, response and/or recovery in case of risk.

Given that the architectural complex is commonly known by the same name of one of the instances it houses, for the purposes of clarity in the development of this analysis, we will differentiate them as follows:

- National Museum of Anthropology (MNA)
- National Library of Anthropology and History (BNAH)
- Direcion of Physical Anthropology (DAF)
- Direction of Linguistics (DL)
- Direction of Ethnohistory (DETH)
- National Museum of Anthropology Complex: the entire building and its associated areas (CMNA)*

[3] Mexican Codex Collection / United Nations Educational, Scientific and Cultural Organization <http://www.unesco.org/new/es/communication-and-information/memory-of-the-world/register/full-list-of-registered-heritage/registered-heritage-page-2/collection-of-mexican-codices/>.

* The acronyms correspond to its Spanish name. In the same will be done with all the acronyms belonging to institutions.



1. National Museum of Anthropology Complex. Martha Elena Ortiz, 2022.

Nomination to the List of Cultural Properties with Enhanced Protection

Prior to its nomination to the List of Cultural Property under Enhanced Protection, and given the importance that this complex represents in cultural terms for both nationals and foreigners, it was considered essential to develop a Risk Management Plan that would comprehensively address the National Museum of Anthropology Complex, so that its registration would be accompanied by formal protection actions, framed in the Guidelines for the Implementation of 1999 Second Protocol to the Hague Convention of 1954 for the Protection of Cultural Property in the Event of Armed Conflict (Numeral 27, regarding preparatory measures taken in times of peace for the safeguarding of cultural property, provided for in Art. 3 of the Convention and Art. 5 of the Second Protocol).

Based on this objective, support was requested from the Assistance Fund of the Second Protocol to the 1954 Hague Convention for the Protection of Cultural Property in the Event of Armed Conflict. At the 15th Session of the Convention Committee, it was decided to grant Mexico financial support for the development of the aforementioned Risk Management Plan.

With these funds, a Technical Team was conformed, coordinated by the Worl Heritage Office (DPM) of INAH and composed of the following specialists: Rosana Calderón Martin del Campo, Deputy Director of Special Projects and project coordinator; Alejandro Sabido Sánchez Juárez, responsible for the methodology and systematization of the project; Martha Elena Ortiz Sánchez, responsible for the identification and evaluation of risks, as well as the operational and physical characteristics of the CNMA; V. Augusto García Cortés, responsible for the analysis of the external context of the CMNA, and the risk analysis developed by national and international organizations. The project was divided into six stages:

1. Context analysis
2. Risk identification
3. Risk analysis
4. Risk assessment
5. Risk treatment
6. Evaluation, reporting, and publication

2 METHODOLOGY

Legal frame

In order to develop the methodology, the first step was to verify the legislation in force and the normative instruments hierarchized in three levels:

1. International legislation of a binding nature or whose regulations are relevant to the project,
2. legislation in force in Mexico at the federal and local levels,
3. regulations and protocols in force within the National Institute of Anthropology and History, the institution to which the CMNA belongs.

International Legislation[1]

- Universal Declaration of Human Rights (1948)
- Convention Concerning the Protection of the World Cultural and Natural Heritage (1972)
- Convention for the Protection of Cultural Property in the Event of Armed Conflict and Regulations for the Execution of the Convention (1954)
- Second Protocol to the 1954 Hague Convention for the Protection of Cultural Property in the Event of Armed Conflict (1999)

[1] Based on Art. 1 of the Political Constitution of the United Mexican States, international treaties that protect human rights acquire a recognition comparable to federal law: 'In the United Mexican States all persons shall enjoy the human rights recognized in this Constitution and in the international treaties to which the Mexican State is a party, as well as the guarantees for their protection, whose exercise may not be restricted or suspended, except in the cases and under the conditions established by this Constitution' (2021). The Supreme Court of Justice of the Nation in its Thesis (2007) on the interpretation of Art. 133 of the Political Constitution of the United Mexican States and international treaties established that 'international treaties are hierarchically located below the Federal Constitution and above general, federal, and local laws'.

- Sendai Framework for Disaster Risk Reduction 2015-2030 (2015)

Current federal legislation

- General Law of National Property (2013)
- Organic Law of the National Institute of Anthropology and History (1998)

Current local legislation

- Integral Risk Management and Civil Protection Law of Mexico City (2019)

Internal regulations

- Security Planning and Management Procedures Manual (2013)
- Protocols for the Conservation and Protection of the Cultural Heritage (2012)

Methodology for risk analysis and systematization of information

In order to determine the relevant methodology for the development of this project, we reviewed the contemporary literature on the subject, particularly that which is related to museum and heritage contexts; likewise, we took into account the references that are directly linked to the legislation in force or to the best practices compiled by UNESCO entities.

As a product of this review, it was proposed to adopt as a methodology framework the *Risk Management Guide for Museum Heritage* (2016), that addresses the ABC Method,[2] as well as its translation into Spanish, carried out by Ibermuseos (2017). Likewise, ISO 31000 in its 2018 edition, which was released to the general public in the context of the Covid-19 pandemic, was used as an auxiliary reference.

A general glossary was also adopted based on the references of ICCROM / UNESCO, *Managing Disaster Risks for World Heritage* (2010)—as the shared source that offers greater clarity—and UNDRO, *Natural Disasters and Vulnerability Analysis* (1979), as it contains the technical aspects related to risk identification that are well aligned with the ABC Method.

Once the criteria for hierarchizing the methodological references were adopted, a detailed review of the ABC Method proposed by Pedersoli, Antomarchi, and Michalski

[2] Edited by the Canadian Conservation Institute (CCI) and the International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM) (Pedersoli, Antomarchi y Michalski, 2017).

(2017) was carried out, and the following considerations were raised:

- The ABC Method proposes a valuation of cultural assets, to prioritize the attention and protection of these assets, calculating the 'loss of value'. Mexican legislation determines: "Assets subject to the public domain regime of the Federation—as is the case of Mexican archaeological, historical, and artistic monuments—are inalienable, imprescriptible and unseizable and shall not be subject to claims or definitive or provisional possession, or any other action by third parties',[3] so the concept of loss of value is not quite applicable to the nation's cultural property.[4]
- The location of the risks was included, based on an analysis of the architectural program of the complex, which includes the spaces occupied by the MNA, the BNAH and the DAF, as well as the common areas and spaces for shared services.
- The risk description criterion is maintained based on the structure of the ABC Method: identification of the threat, description of the effects and explanation of the impact.
- The time frame proposed by the ABC Method considers three frequency ranges:
  1. Rare events, occurring approximately 1 time every 100 years.
  2. Common events, which may occur several times in 100 years.
  3. Cumulative processes, which occur continuously or intermittently.

  In the case of the MNA, with 57 years of existence, the time frame of rare events is very wide, even contrasting the risks with historical records. It is important to consider that the Mexican political system generates changes in public policies every six years, due to the change of the head of the Executive of the Federal Government. Therefore, our time frame contemplated these periods and their multiples.
- The assignment of numerical value for the analysis of the different stages of diagnosis, identification, evaluation, and treatment in the ABC Method is based on a numerical scale of 1 to 5, which is im-

[3] National Property Law, Art. 12, *Diario Oficial de la Federación*, January 19, 2018.

[4] Federal Law on Archaeological, Artistic, and Historic Monuments and Zones, 1972. *Diario Oficial de la Federación*, January 19, 2018.

practical because it generates evaluations in fractions and complicates its interpretation.

- For the assignment of numerical value during the stages of diagnosis, identification, evaluation, and treatment, we considered pertinent to use a scale of 10 units, which yielded more precise and computable evaluations.
- During Phase 2, Risk Identification, we reviewed the concept of valuation of the collection proposed in the ABC Method, and instead of focusing its ponderation on the economic value, we considered pondering its significance in the whole, its possibility of providing information to researchers related to its study and its reception by the public—during the exhibitions—, among others.

Based on these proposals for modifications to the ABC Method, we developed a risk analysis model adjusted to the specific needs of the National Museum of Anthropology Complex and the Mexican legal framework.

We consider appropriate to divide the ABC components into subgroups and add a field with the appraisal for each component on a scale from 0 to 10:

1. Frequency
2. Level of impact: Collection / People / Property
3. Impact to the whole: Collection / People / Property

In addition, guide tables were proposed to estimate the impact on the proposed scale based on current technical references (Annex 1). The annexes are available on the USB memory stick that accompanies this publication.

Qualitative research

A collaborative approach was adopted for this project, so a direct dialogue was established between the Technical Team of the World Heritage Office of INAH and the members of the CNMA, the MNA, the BNAH, and the DAF. This was done both for the risk identification process and for the structuring of strategies for prevention, attention, and mitigation.

Phase 1 was developed with the purpose of getting a clear perception of the communication between the different instances that share the building, and a brief contextual analysis.

During phases 2, 3, and 4, interviews were carried out as a qualitative research method, and for phase 5, a

questionnaire open to all areas and specific in-depth interviews with key actors for particular processes were carried out.

The interviews conducted with middle managers—personnel with an institutionally recognized level of hierarchy and responsibility—of the MNA, BNAH, and DAF followed a semi-structured approach since the people interviewed have different specialties and specific responsibilities, which provided us with a very complete overview of the risk situations that each area perceives and has experienced.

This inquiry method allowed us to be flexible enough to ask specific questions to each of the interviewees so that they could share their experience. It also allowed us to build trusting relationships. The interviews were conducted through virtual meetings between July 13 and August 6, 2021, due to a rise in the number of SARS-CoV-2 infections in Mexico. Each meeting was held for an average of one hour and thirty minutes and there was great interest and willingness among the interviewees.

It is worth mentioning that most of them maintained an institutional position, they tried to speak with great reserve about the risk situations they have had to face. The trust generated by the interviewing team allowed us reassure them that the sensitive information they shared with us would be used solely and exclusively to identify risk situations and, subsequently, to be able to collectively seek strategies for their mitigation.

The interviewees were: Laura del Olmo Frese, deputy director of Archaeology of the MNA; Arturo Gómez Martínez, deputy director of Ethnography of the MNA; Rafael Balverde Preciado, deputy director of Museography of the MNA; Humberto Valentín González, head of the Department of Updating and Conservation of Museographic Elements of the MNA; Claudia Blas Rojas, head of the Conservation Laboratory of the MNA; Gilda Salgado Manzanares, head of Conservation of Modern and Contemporary Art Works; Laura Filloy Nadal, senior restorer; Jonathan Enoch Jiménez, head of the Collections Movement Department; Sergio Ángel Torres Rosales, head of the Information Technology Department; Jorge Arturo Ruvalcaba Salazar, head of the Cultural Promotion Department. From the National Library of Anthropology and History, the interviewees were: José Guadalupe Martínez, deputy director of the BNAH; Diana García Pozos, head of the Public Services Department; Xóchitl Cruz Pérez, restorer of the BNAH, and Carmen Lerma, researcher of the Direction of Physical Anthropology, responsible for human bone remains and mummies of this area, was interviewed.

Some of the interviewees were aware of the implementation of the Comprehensive Risk Management Plan for the MNA that the World Heritage Office was conducting with the support of a working group conformed of staff from the MNA, BNAH, and DAF; however, they were unaware of the scope and benefits of this exercise, so this was a good opportunity to inform them more exentesively about it. All those interviewed were enthusiastic and interested in the development of the process.

Once the risks had been identified and evaluated, a questionnaire was prepared so that workers in the different areas of the CNMA could share the processes have developed for the prevention, attention, and recovery of the various risks identified. This exercise was very useful to learn about the participation of CNMA personnel in the various existing brigades, and to learn about proposals for the prevention and investigation of the risks identified as having the greatest frequency or impact.

3
PHASE 1
CONTEXT IDENTIFICATION

The National Museum of Anthropology Complex is located in the Mayoralty (Alcaldía)[1] Miguel Hidalgo, which in additon is located in a strategic area in the west of Mexico City. It is bordered to the north by Azcapotzalco Mayoralty, to the east by Cuajimalpa Mayoralty and Cuauhtémoc Mayoralty, to the southeast by Benito Juárez Mayoralty, to the south by Álvaro Obregón Mayoralty, to the southwest by Cuajimalpa Mayoralty, and to the west by the State of Mexico.

It has free accessibility through all these borders and also allows connection to the municipalities[2] of the State of Mexico, this is relevant because it is one of the mayoralties that attracts more floating population due to labor needs (62% of the total labor force). Among its main primary arteries are Paseo de la Reforma, Constituyentes Avenues and Anillo Periférico.

In this district, primary economic activities are almost nonexistent; currently, tertiary activities, that is, those dedicated to services, prevail. There is still, to a lesser extent, industrial activity, since it disappeared with the process of deindustrialization that Mexico City experienced in the decades ot the eighties and nineties, caused by the migration of factories to other states in the center and north of the country.

Due to the activities of this tertiary branch, the mayoralty of Miguel Hidalgo has one of the largest participations in terms of employment in Mexico City, since it contributes 14% of it and generates the largest gross production in the city, as well as the gross value added of the census.

[1] Mexico City is divided into 16 *alcaldías*, which are administrative, territorial, and governmental units where the city's public policies are implemented and planned.

[2] Municipalities are also administrative and governmental entities that oversee a defined territory, as well as the population that inhabits it. The federative entities of the Mexican Republic are composed of municipalities for their better administration, except for Mexico City.

2. National Museum of Anthropology complex located between Paseo de la Reforma Avenue and Mahatma Gandhi Avenue, in the Miguel Hidalgo Mayoralty, Mexico City. Martha Elena Ortiz, 2022.

In 2009 alone, it contributed 22% of the capital's total GDP and 3% of the national total, exceeding entire states such as Morelos, Durango, Yucatán, and Quintana Roo, among others. Therefore, this mayoralty is considered in economic terms as the most important in Mexico City, given the resources it generates and its economic dynamics.

However, it has a lower population density than the other mayoralties of Mexico City, in addition to concentrating a large percentage of the green areas of Mexico City. Its vegetation consists of coniferous forests and grasslands; however, there are large areas of parks, mainly in the areas of Chapultepec Forest, the most important in the city,[3] where the National Museum of Anthropology Complex is located.

[3] Urban Park, considered the largest of its kind in the western hemisphere, with an area of 810 ha (Hueytletl Torres, Gutiérrez Salinas y Martínez Sánchez, 2004).

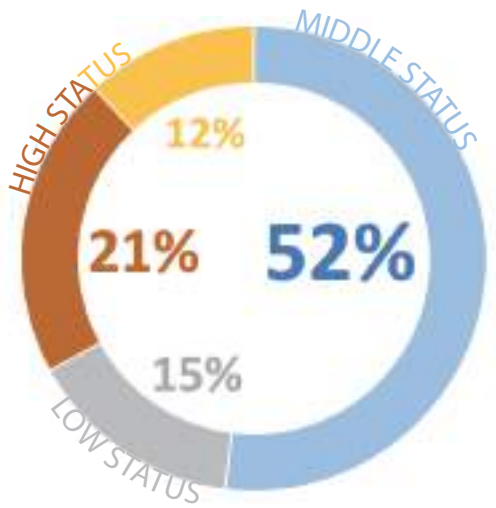
a. Socio-political, administrative, and service analysis of the Miguel Hidalgo Mayoralty and Chapultepec Forest

The marginalization and poverty analysis in the Mayoralty of Miguel Hidalgo is important to determine the degree of vulnerability of its population. Governmental agencies such as the National Population Council (CONAPO), the National Council for the Evaluation of Social Development Policy (CONEVAL), and the Ministry of Social Development (SEDESOL, currently the Welfare Ministry) indicate that it has a very low degree of marginalization[4] and poverty[5]. The Government of Mexico City mentions in its 2019 General Development Plan for Mexico City that 52% of the neighborhoods belonging to this municipality are middle class, 15% are low income, 21% are high income and 12% are very high socioeconomic level.

From 1970 onwards, the urban sprawl began to grow towards the north, such as the area of Lomas de Chapul-

[4] Marginalization, understood as exclusion (both social and/or spatial) and deprivation or difficulty in the normal satisfaction of basic and secondary needs, which is measured with different categories.

[5] Poverty is understood as the economic circumstance in which a person or group of people lack sufficient income to access minimum levels of health care, food, housing, clothing and education.



3. Socioeconomic level of the Mayoralty Miguel Hidalgo. Martha Elena Ortiz, 2022

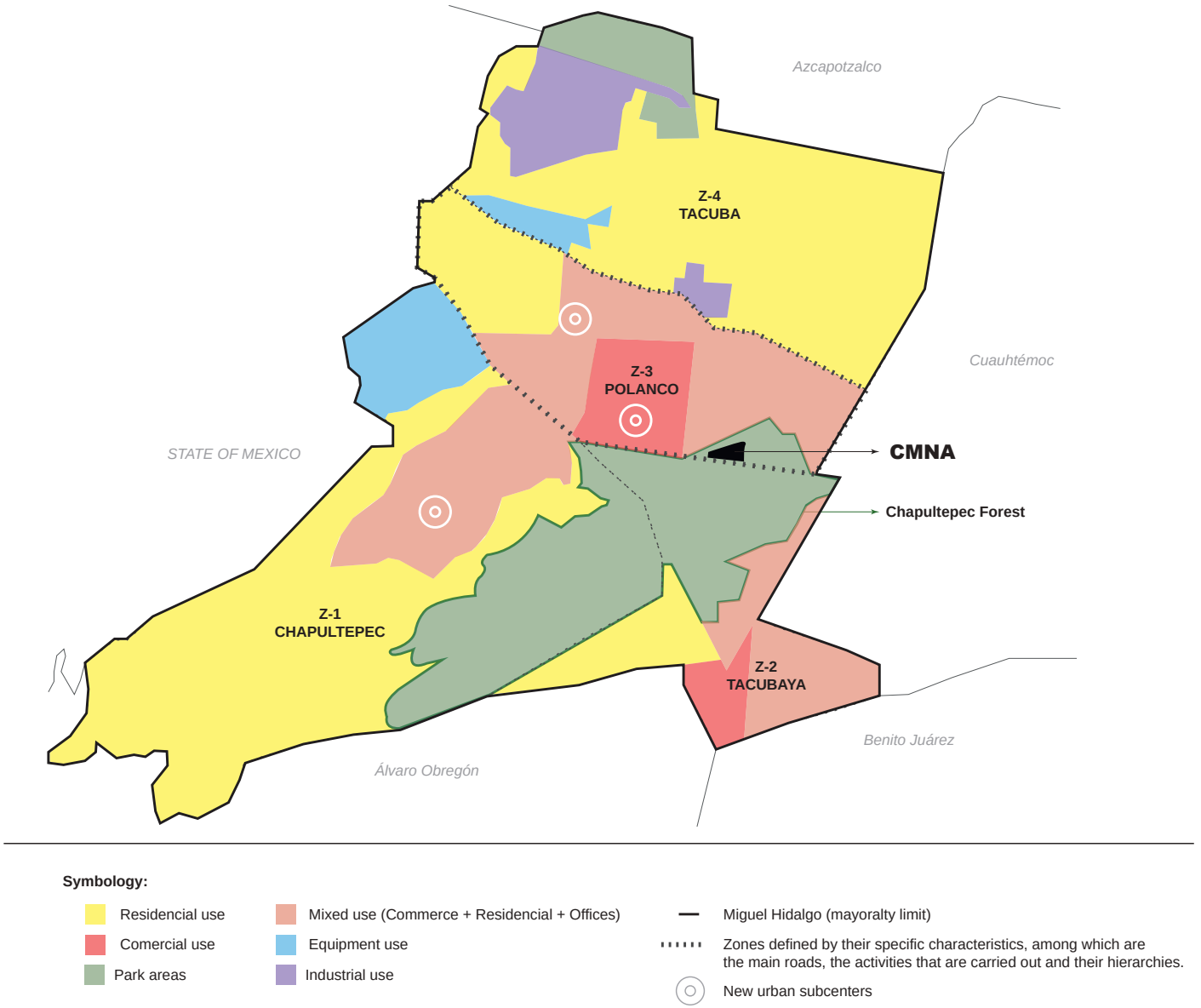
tepec, which in 1990 reached the limits of the Dolores Civil Cemetery. After 1990 and until 2010, the urbanization overflowed invading the whole area of Miguel Hidalgo and the State of Mexico, reaching Desierto de los Leones in Cuajimalpa.

The urban sub-centers of Polanco and Nueva Polanco, Bosque de las Lomas, and Plaza Carso, have begun to displace the current urban centers of Mexico City (CDMX) due to their high socioeconomic level, being characterized as areas of high concentration of services and equipment in the areas of culture, recreation, commerce and business, with not only regional but also national coverage.

The growth of urban centers in the district has led to the strengthening of an urban continuum, in which activities related to commerce and services require larger physical-territorial spaces to continue their growth, hence it is expected that the change from residential to administrative commercial land use will continue, causing the expulsion of the population to other areas of the Metropolitan Area of the Valley of Mexico.[6] This modification leads to a more intensive use of the city's roads, so special attention must be paid to their maintenance and mobility needs.

There is also significant retail trade in some neighborhoods such as the First Section of the Chapultepec Forest, Tacuba or Tacubaya, where there are independent retail distributors that sell products to the end

[6] Metropolitan area consisting of Mexico City, the capital of the Mexican Republic, and 60 surrounding municipalities. Based on the last census conducted by the National Institute of Statistics and Geography in 2020, this area had a population of approximately 22 million inhabitants. According to UN data in 2012, it is the seventh largest metropolitan area in the world and the second largest in Latin America, with 7,954 km^2. This area has the largest number of businesses and commercial activities in Mexico (INEGI, 2021).



4. Land use in the Mayoralty of Miguel Hidalgo. Martha Elena Ortiz, 2022, Source: Government of Mexico City, Integrated Mobility Analysis Service, Alcaldía Miguel Hidalgo., 2019

consumer. This should not be confused with informal economy.[7]

The mayoralty is of great importance because it is home to regional services such as the Chapultepec Forest in its three sections, for instance, the Hippodrome of the Americas, the Observatory of Mexico City, the National Conservatory of Music, the Ministry of Tourism, the Ministry of National Defense, the National Museums of Anthropology, and History, Chapultepec Castle, the Natural History, Rufino Tamayo, Contemporary Art, Modern Art and Children's Museums, the Escuela Normal Superior para Maestros, the University of the Valley of Mexico, the University Center for Design, Film and Television, the University of the National Army and Air Force, the National Polytechnic Institute (Casco de Santo Tomás), the Mocel Hospital, the Spanish Hospital, and the Mexican Red Cross, among others.

[7] In Mexico, the informal economy is the basis of income for a large part of the population, but its documentation and the magnitude of its figures are not accurate (Delegación Miguel Hidalgo, 2016, p. 160).

b. Morphological conformation and risks associated with the site

The Miguel Hidalgo Mayorarlty has an area of 1,181 hectares affected by subsidence ranging from 2 to 10 cm, in areas corresponding to the northeastern part of the district where the First Section of the Chapultepec Forest, the National Auditorium, and the National Museum of Anthropology are located, among others.

The extent of damage that can be caused by rainfall in the form of hail depends on its quantity and size. In urban areas, hail affects homes, buildings, and green areas. Occasionally, hail accumulates in such volume inside the drainage system that it obstructs the passage of water and generates flooding for several hours. This phenomenon occurs constantly in the mayoralty of Miguel Hidalgo, mainly between the months of May and September, and therefore significantly affects the CMNA.

Floods are one of the most common hazards in Miguel Hidalgo; although the concentration of water is slow, unfortunately the most damaging floods are sudden[8] and of short duration. Floods that occur in the area are mainly due to the confluence of water in low areas.

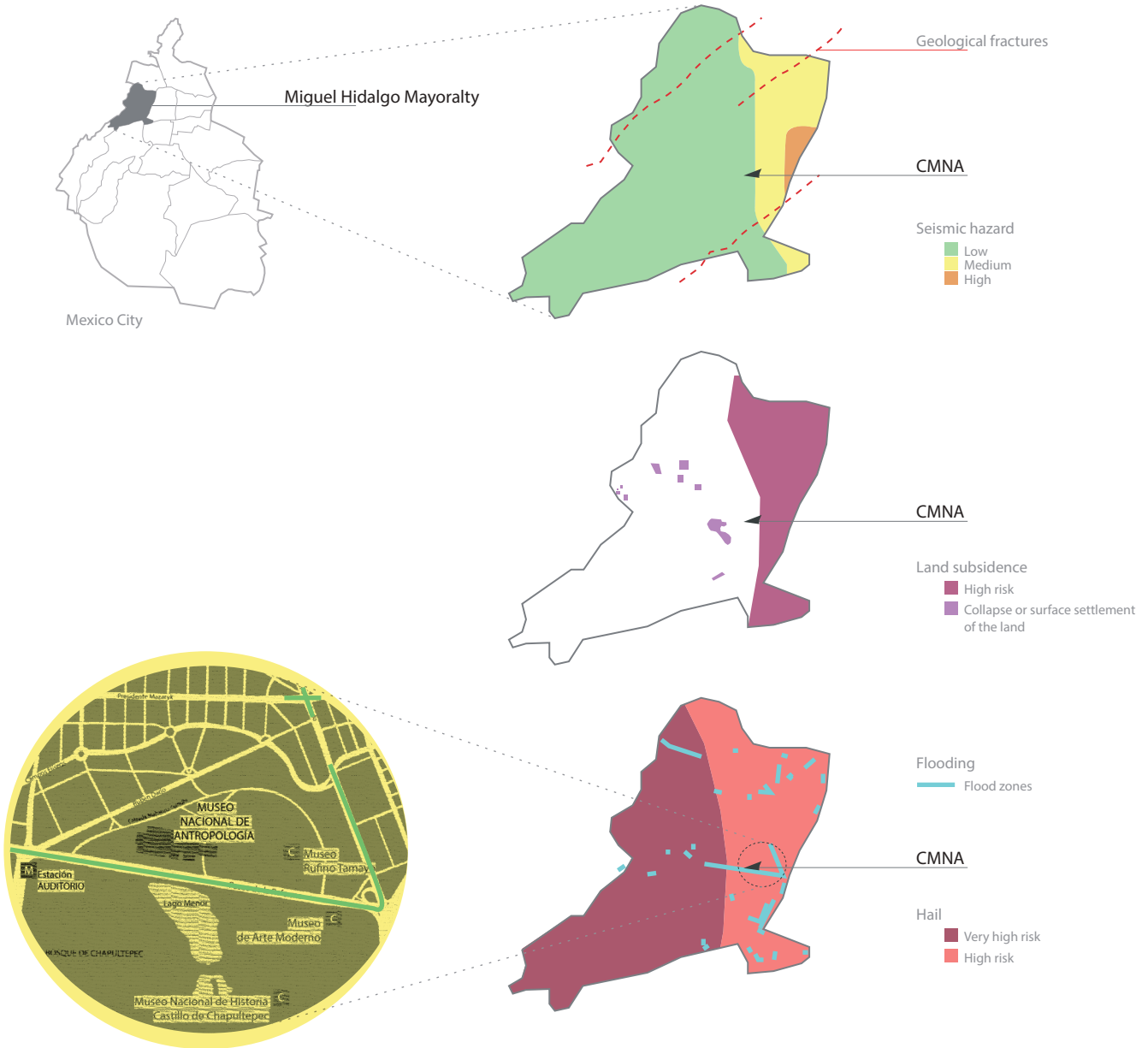
[8] Flash floods consist of a flood of water and with a load of debris that it encounters in its path.

The individual effects of flooding are generally very local, affecting a group of houses or a few streets, but the combined effect of several flooding points in the same event affect several neighborhoods in the mayoralty.

In Chapultepec Forest, Paseo de la Reforma Avenue, between Anillo Periférico and Circuito Interior, there are differential settlements, as well as invasion of tree roots and hydraulic insufficiency.

Although drainage service coverage in the Miguel Hidalgo mayoralty is 100%, there are puddles during the rainy season due to various causes, such as pipes that have exceeded their useful life and show continuous failures or insufficient drainage capacity because they were designed for a certain volume of population. Also, overexploitation of the aquifer has caused subsidence of the subsoil, resulting in the dislocation of some sections of the collectors and their counter-flow operation.

The CMNA is located in the vicinity of the Chapultepec Forest, so the climate is characterized by low temperatures and constant humidity. The presence of trees that exceed 10 meters in height represents a threat during the rainy season or thunderstorms due to the softening of the ground, and trees have fallen on several occasions.



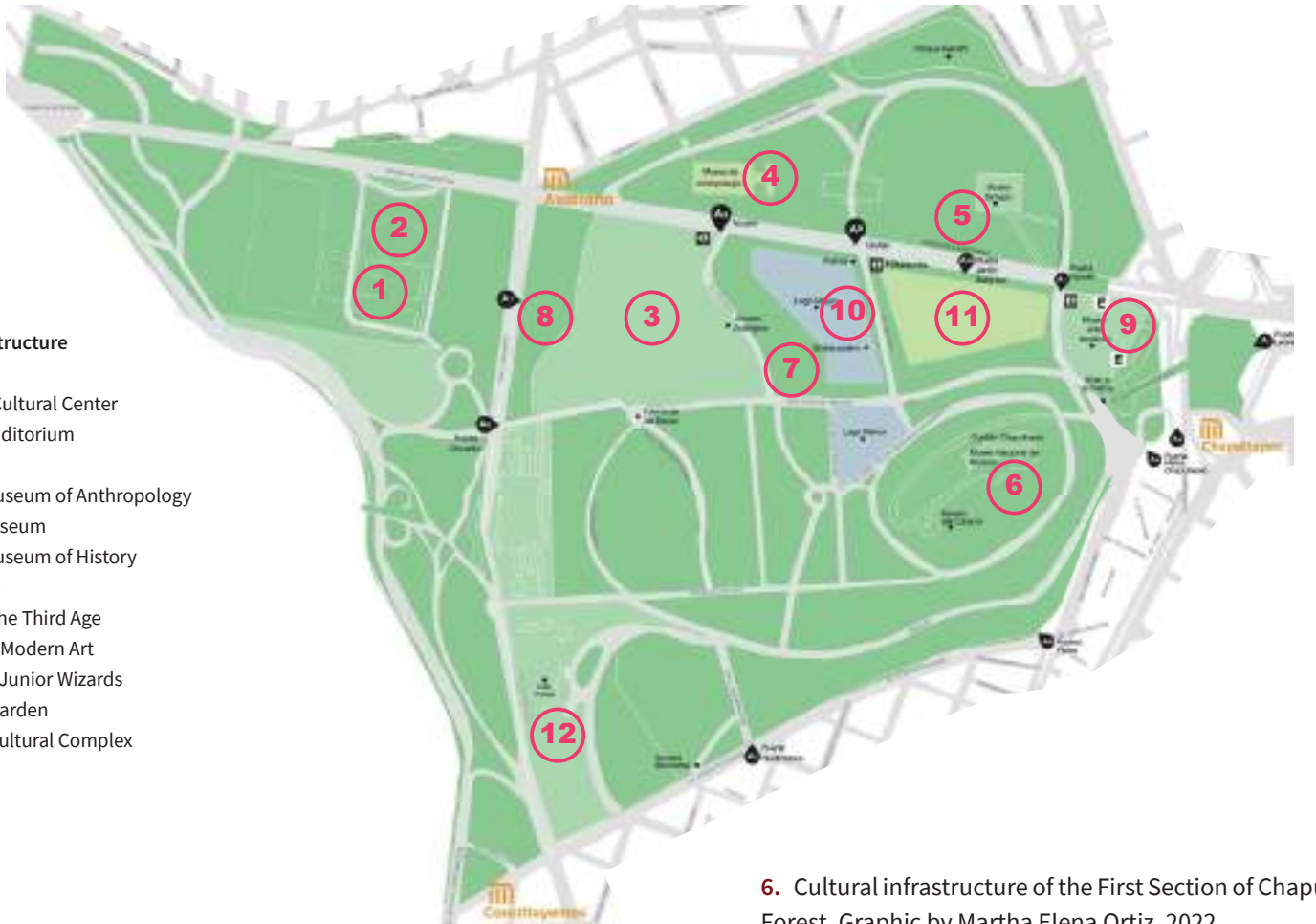
5. Morphological conformation and risks associated with the site. Martha Elena Ortiz, 2022. Source: Government of Mexico City, Integral Mobility Analysis Service, Alcaldía Miguel Hidalgo, 2019

c. Cultural Infraestructure

In the Chapultepec Forest, where the National Museum of Anthropology Complex is located, it is possible to find a wide range of cultural and recreational activities:

Cultural infrastructure
1st section

1. El Bosque Cultural Center
2. National Auditorium
3. Zoo
4. National Museum of Anthropology
5. Tamayo Museum
6. National Museum of History
7. Lake House
8. Garden of the Third Age
9. Museum of Modern Art
10. Senior and Junior Wizards
11. Botanical Garden
12. Los Pinos Cultural Complex



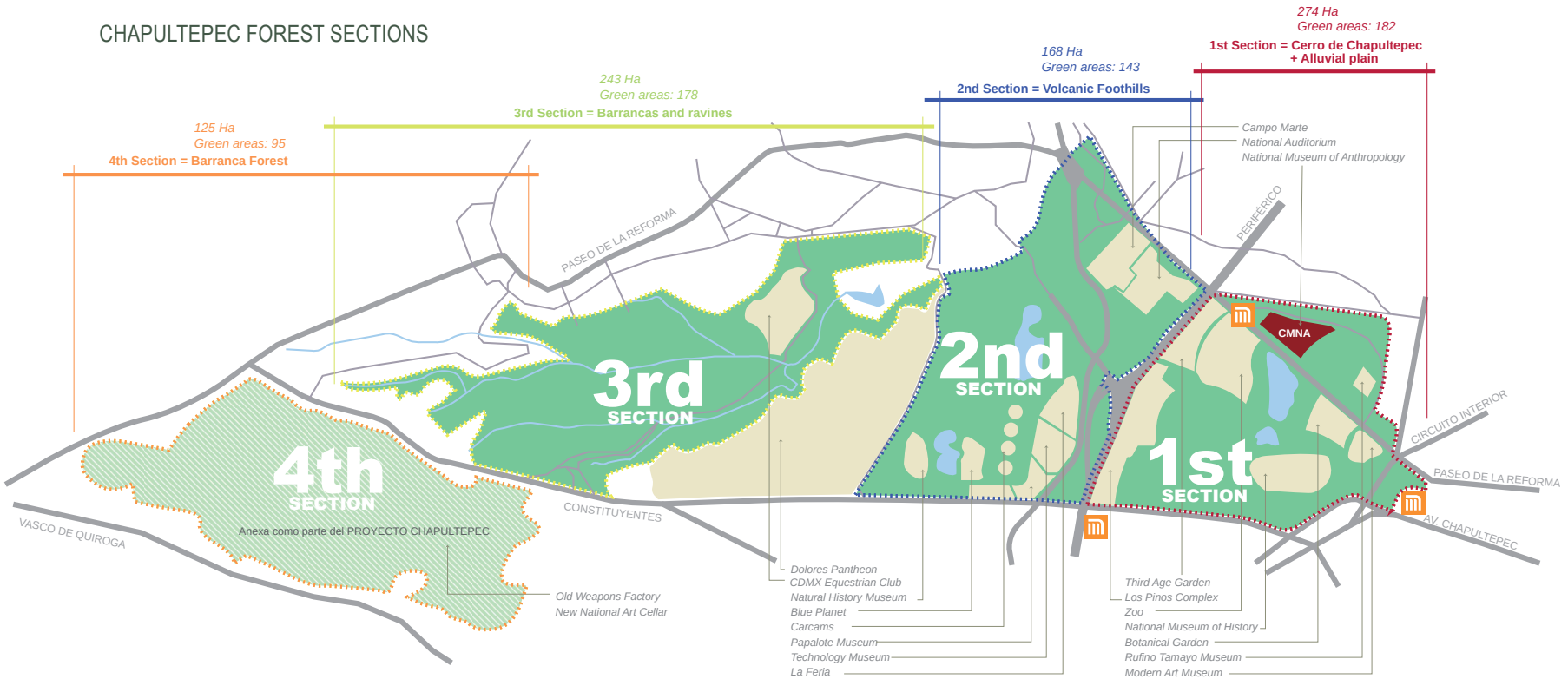
6. Cultural infrastructure of the First Section of Chapultepec Forest. Graphic by Martha Elena Ortiz, 2022

7. Visitor to temporary exhibition at the National Museum of Anthropology.

The wide range of services and tourist attractions in this area generates a high concentration of vehicles, and there are few parking spaces. It also generates a high volume of floating population, including national and international visitors, in addition to the inhabitants of Mexico City who are looking for recreational and leisure activities. On weekends the concentration of visitors in this area is very high. Paseo de la Reforma Avenue is a cultural, commercial, leisure, and recreational axis of great importance.

Chapultepec Project

The Master Plan initiated in 2020 was developed jointly by the Ministry of Culture, the Government of Mexico City, the Ministry of National Defense, and the Presidency of the Republic, with the support of numerous national and international experts in environmental restoration, urban infrastructure, history, archaeology, and other specialties. The Master Plan is conceived as a dynamic project with ecological and urban development plans that will be developed at the rythm that circumstances allow and adapting to changing realities.



8. Sections of the Chapultepec Forest, where the Chapultepec Project is being developed, and where the CMNA is located. Martha Elena Ortiz, 2022

The project seeks to establish the Chapultepec Forest[9] as a biocultural forest, in which both cultural heritage and biodiversity are protected. Its Master Plan seeks to set the basis for the restoration of the existing infrastructure and its rehabilitation from an environmental, architectural, urban, political, and cultural point of view.

The project is developed along three major lines: environmental, social, and cultural. It materializes in the territory the rights recognized by the Constitution of Mexico City such as the Right to the City, the Right to Culture, the Right to a Healthy Environment and the Right to the Preservation and Protection of Nature, thus presenting the possibility of increasing the environmental, social, and cultural services already offered by the Forest as a great green lung in the urban area.

This project integrates the recovery of the Los Pinos Complex[10] and its transformation into a cultural center open to the public, the recovery of the Third Section of the Chapultepec Forest, as well as the opening of its fourth section, on the land occupied by the Ministry of National Defense in the Santa Fe area, where the Military Camp Number 1 is located.

The main actions included in the project are focused on ecological restoration of gardens and parks, creation of cultural and ecological spaces, architectural restoration of historic centers, creation of pavilions, green islands, orchards, and environmental education spaces, construction of connectivity infrastructure, rehabilitation of public spaces, environmental rehabilitation, as well as the rehabilitation of the main avenues to improve mobility in the areas comprising the Chapultepec Forest in Mexico City.

d. Problems in the current context

The National Museum of Anthropology Complex attracts 13% of the annual visitors to Chapultepec Forest, which also implies that it is the most visited museum in Mexico City.

In front of the CMNA esplanade there are many street vendors (selling food, drinks, souvenirs, handicrafts, etc.) who take advantage of the continuous flow of visi-

[9] Chapultepec Forest is, as already mentioned, the largest urban park in the western hemisphere, with an area of 810 hectares. It is divided into four sections and houses some of Mexico City's most important tourist attractions.

[10] The Los Pinos Cultural Complex, formerly the Official Residence of Los Pinos, was the residence of the President of Mexico from 1934 until November 30, 2018 (Muñoz Altea y Escobosa Hass de Rangel, 1988).

tors who also stop to watch the Voladores de Papantla show.[11]

The main entrance to the CMNA is located after an esplanade, and not directly on Paseo de la Reforma Avenue. This gives the visitor a sense of privacy, while favoring the public space and connections with the other cultural and recreational offerings in the area.

The Tláloc monolith, located on the south corner of the CMNA, has become a landmark of this segment of the avenue, acting as a reference point and even the organizers of sports events—which are regularly held on weekends—often choose it as their goal. The CNMA parking lots become a facility that provides service not only to the complex itself, but also to the local area, as there are no other parking lots nearby.

The service accesses to the CNMA are located on Calzada Mahatma Gandhi, formerly known as Calle de la Milla. This secondary road is characterized for being a two-way street and is adjacent to a median strip with a green area that divides the residential area of Polanco—with high acquisitive power—, and functions as an urban barrier. This space and the road itself are sometimes occupied by school buses visiting the MNA or by vehicles linked to the organization of rallies or parades, due to its proximity to Reforma in the section where the Angel of Independence, Mexico City's iconic monument, is located.

The CNMA is surrounded by green areas, both inside and on the outside perimeter. The trees are more than 15 meters high and are approximately 60 years old; therefore, during the rainy season, it is common for the soil to soften and there is a risk of falling trees that could damage the urban area and the CNMA's architecture and property.

One of the advantages of the location of the CNMA is that there is no overhead electrical wiring that could increase the vulnerability of people and the building in the event of an earthquake. It is also worth mentioning that being within the perimeter of the Chapultepec Forest, the CNMA can benefit from projects such as the current Chapultepec Project, whose main objective is to protect both cultural heritage and biodiversity.

The CNMA is an architectural complex in which different areas of INAH are physically located, whose main activity is focused on the study, research, and exhibition of cultural heritage and manifestations of a material nature of Mexico's

[11] Cultural manifestation that has been performed since pre-Hispanic times, mainly on the west coast of Mexico. This practice was declared Intangible Cultural Heritage of Humanity by UNESCO in 2009. There is a space in front of the CMNA for the presentation of this cultural manifestation that is very appreciated by national and international visitors.

pre-Hispanic past, as well as of the ethnic groups that currently live in its territory.

The National Museum of Anthropology Complex of the National Institute of Anthropology and History was created with the clear intention of being located in a public enclave of great social affluence such as the Chapultepec Forest.

e. Collections

The collections housed in the CNMA are of the greatest relevance for Mexico's past, so we made a detailed analysis of how they are composed, in what areas they are located and what level of protection they have, so that in the risk analysis and assessment phases we would have a clear idea of the threats and their level of vulnerability.

Collections of the National Museum of Anthropology

In order to have a clear idea of how these collections are composed, we turned to the Subdirection of Cultural Heritage Inventories, which is part of the National Coordination of Museums and Exhibitions, the area in charge of keeping the inventory of cultural property under INAH's custody up to date.

The MNA collection is integrated of paleontological, archeological, historical, and contemporary artifacts. In accordance with Mexican legislation:

- *Paleontological assets* are, '… vestiges or fossil remains of organic beings that inhabited the national territory in past times and whose research, conservation, restoration, recovery, or use are of paleontological interest…' (Art. 28 bis) (Cámara de Diputados, 1972-2018).
- *Archaeological assets*. The collection is mainly composed of cultural property from the various archaeological sites in the country, mostly from scientific exploration projects; however, it also includes assets that have been handed over by private

National Museum of Anthropology

Property Declared an Artistic Monument of the Nation

Architecture and cultural assets associated to the building

Representative work of the modern architecture in Mexico.
Architect: Pedro Ramírez Vázquez

Year of construction: 1963-1964

ARCHITECTURAL ELEMENTS AND FINISHES:

Handcrafted parquet wood floors

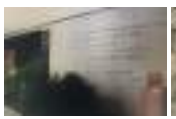
Bronze gargoyles

Ceilings for halls

- Ceilings of stamped sheet metal with pre-Hispanic motifs
- Modules of 60 x 60 contemplating the facilities of the time

St. Thomas and Carrara marble

- Some with bas-reliefs and engravings of pre-Hispanic literature



Replica of the Bonampak murals

- Building 17 m long and almost 5 m high
- Author: Rina Lazo
- Mayan fresco technique

Tzompantli Wall

- Sculptural wall by the artist Manuel Felguérez
- Created for the commemoration of the 50th anniversary of the museum.

Tláloc Fountain

- Monolithic sculpture of 21 tons
- Fountain with Venetian mosaic
- Foundation: slab of concrete of 50 cm thick

Central Courtyard Pond

- Architectural element that precedes the Mexica Hall.
- It is a representation of the Basin of Mexico where Mexico-Tenochtitlan was settled.
- There are representations of the four elements.
- Architect Pedro Ramírez Vázquez sought to create an obsidian mirror with black Venetian mosaic.

Snail or Wind Sun

- Bronze sculpture by artist Iker Larrauri

Aluminum louver

- *Homage to Uxmal* by Manuel Felguérez
- 12 micron anodized aluminum

Monumental Fountain (Umbrella)

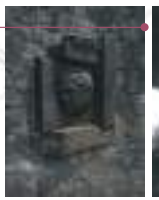
- Column covered in bronze with a relief made by the Chávez Morado brothers.
- Structure with a single support, radially arranged beams, reinforced concrete slab, and 80 tensors.
- Inverted truncated pyramid-shaped soffit made of anodized aluminum with a surface of 4,500 m² and a height of 17 meters.
- Its conservation process began in 2011 and concluded in 2018.

National Emblem - Main façade

- Work of the Chávez Morado brothers
- Sculpted on Carrara marble blocks

Fragment of the *Tira de la Peregrinación*

- Engraving on Carrara marble slabs



Bust of Architect Pedro Ramírez Vázquez

- Bronze sculpture

Orientation Hall Dioramas

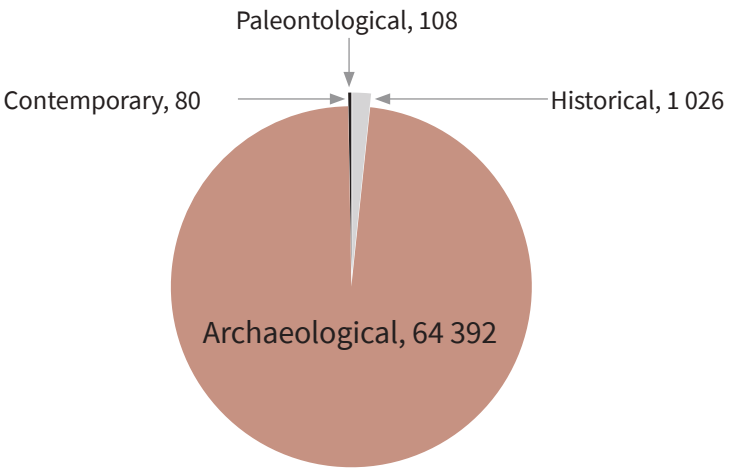
- Works created by plastic artists who collaborated in the museography of the MNA, such as Iker Larrauri

9. Property declared an Artistic Monument of the Nation, this graphic shows the movable objects associated with the property, except for the monolith of Tláloc at the main entrance of the cmna, with archaeological value, all other property with artistic value. Graph Martha Elena Ortiz, 2022.

owners or that had been confiscated and were illegally in the hands of private individuals.[12]

- *Historical assets*. Objects that evidence the first contact between Europeans and the original inhabitants of the territory identified as Mesoamerica, which corresponds to a great extent to the current territory of the Mexican Republic, as well as objects produced in that time and until the 19th century.[13]
- *Ethnographic assets*. Most of them are the result of field research, carried out by researchers with anthropological specialties. Many of the objects in this collection are no longer part of the daily life of the communities that produced them, either because the constituent materials no longer exist, the manufacturing techniques have been lost or fallen into disuse, or even the human groups that produced them no longer exist. Therefore, they are cultural artifacts of incalculable value to understand the current ethnic groups that still live in Mexican territory. They are objects that allow us to describe and analyze the customs, practices, beliefs, places, spaces, and ways of life of a society.
- *Contemporary assets*. Art objects, most of them made by contemporary Mexican artists specifically for the building and to support the museographic discourse of the National Museum of Anthropology.[14]

Distribution of collections by type of fund



[12] Art. 28 of the Federal Law on Archaeological, Artistic and Historic Monuments and Zones

[13] Art. 35 of the Federal Law on Monuments and Archaeological, Artistic and Historic Zones

[14] Art. 33 of the Federal Law on Archaeological, Artistic and Historic Monuments and Zones (Cámara de Diputados, 1972-2018).

Collections of the National Library of Anthropology and History

The collections of the BNAH are integrated as follows:

- Library. It has around 300 000 volumes:
  - 217 codices, from the 16th to the 19th century.
  - 8,000 historical maps.
  - About 64,000 images in diverse formats: daguerreotypes, albumen prints, black and white prints, modern prints, slides.
  - Modern collections, according to the acquisition practice of these collections.
  - Sound collection, which includes wire and all types of tapes, phonograms (78, 45 and 33 revolutions), as well as historical recordings and those from the Oral History Project.
  - Historical newspaper library, with a collection of 19th century newspapers from all over the country.
- Documentary archive, organized in three collections:
  - Institutional historical archives (3,000 boxes, located in a building outside the CMNA).
  - Historical archive of donations, rescues, and acquisitions (documents dating back to 1470). Collection with about 7 million physical documents.
  - Incorporated archive. Donations from INAH researchers. 64 archives.
- 13 million images in microfilm.

Physical Anthropology Direction's collections

Composed of:

- 22 thousand boxes with human bone remains.
- 8 thousand boxes with human bone remains from archaeological exploration projects, which are in temporary storage.
- 32 mummified human remains.
- 48 mummified human remains in temporary storage. This includes the mummified individuals, as well as their grave goods and associated objects.

f. Analysis of the architectural program of the National Museum of Anthropology Complex

For the analysis of the architectural program[15] of the National Museum of Anthropology Complex, we established a series of categories that would allow us to highlight the main characteristics of the building's spaces, as well as the activities that take place in them, their users, and the people responsible for their use and management. With this information, a table was created (Annex 2), whose generalities are presented below in order to have a comprehensive idea of the CMNA and its functioning.

Location

The site on which the National Museum of Anthropology Complex is located has an area of one hectare and includes both the building and its external areas.

By 'building' we understand all those areas inside the property, whether on the ground floor, upper floor, or basement, with a defined perimeter and a specific access.

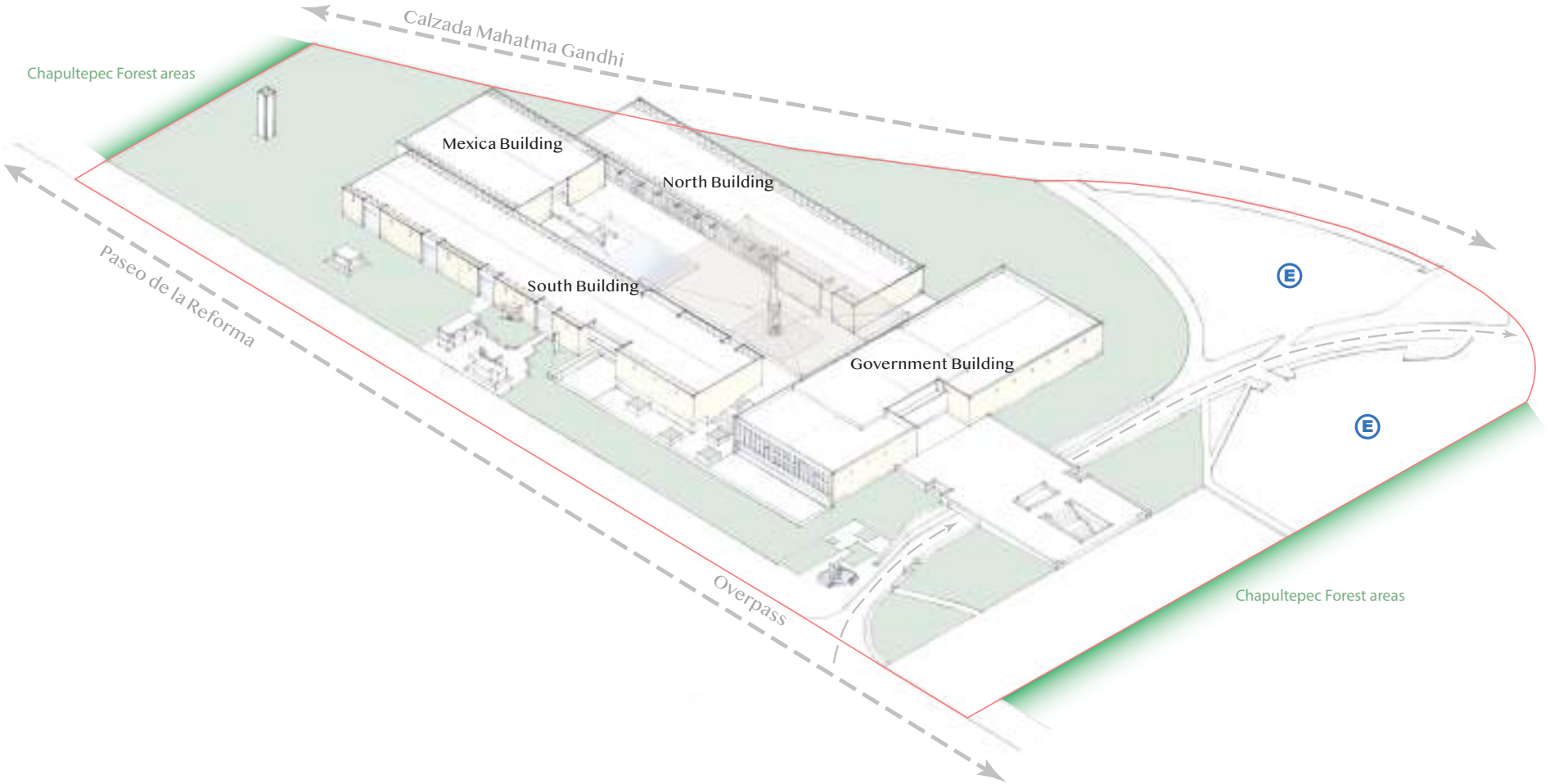
By 'external areas' we undestrand those located outside the building and distributed around its perimeter; whether they are outdoors or small volumes within the green areas surrounding the building.

It is important to consider that the CMNA is delimited on the outside by a perimeter fence, but the limits of the land exceed this line, and some spaces are in direct relation with the context, such as the parking lots, the overpass area, and the lockers for visitors, to mention a few examples.

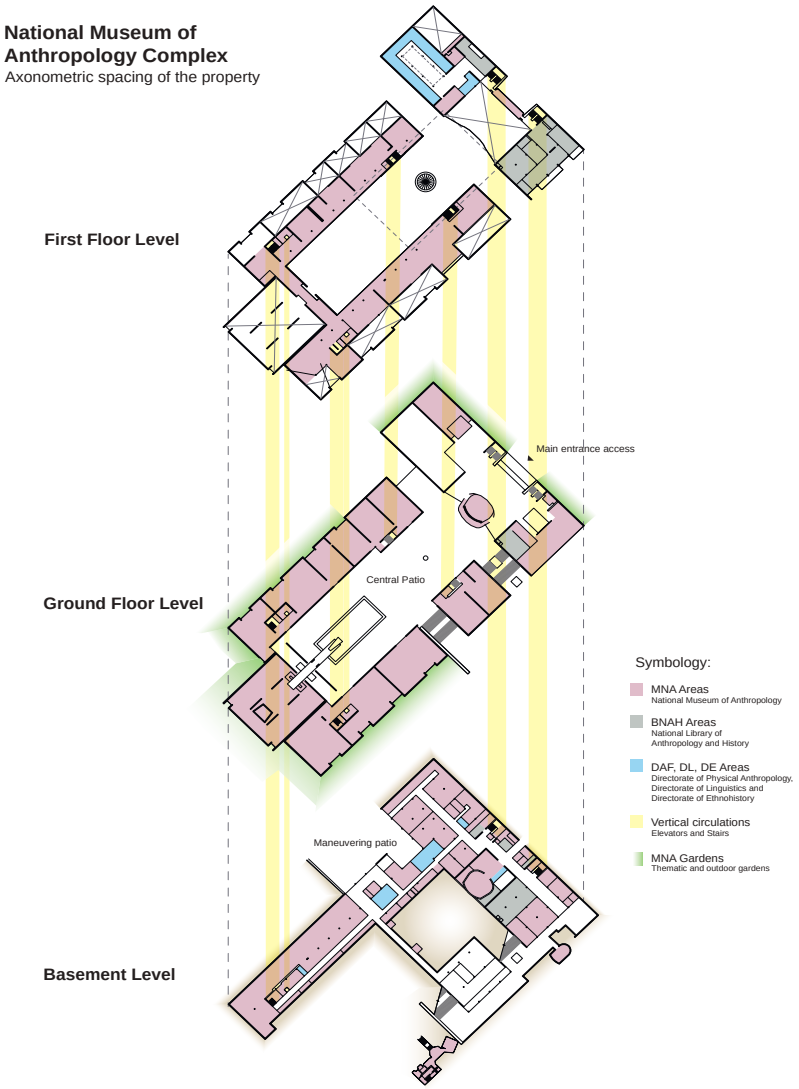
Level

In this category, three distinctions are made, each corresponding to its vertical location within the building. The ground floor of the building corresponds to the street level, the upper floor to the first level, and the basement to the level below street level. The basement is not an enclosed and humid space, since at this level there are several open spaces and courtyards that provide lighting and ventilation; however, its vulnerability to flooding is related to the operation of the pumping system that CMNA has.

[15] The architectural program refers to the study of spatial needs, with respect to the function, orientation, and dimensions of a building. This is reflected in the analysis of areas, the existing furniture and equipment or that will be distributed in the building, local and federal building regulations and standards, the functionality of the spaces, the circulations—vertical and horizontal—, mainly (Rodríguez, 2021).



11. National Museum of Anthropology Complex. General isometric plan with perimeter of the property and surrounding roads. Prepared by Óscar Ibarra and Martha Elena Ortiz, july, 2022



12. Axonometric drawing of the CMNA spaces. Building / Area. Martha Elena Ortiz,2022

Building / Area

The architectural layout of the CMNA consists of a grouping of volumes (buildings) around a central courtyard and the whole complex is surrounded by vegetation, which helps to integrate it with the Chapultepec Forest. In order to make reference to the more than 180 spaces that the CMNA has, their location has been indicated in the table (Annex 2) to identify the buildings and the zones in which they are located, in addition to the fact that each one of them corresponds to a cardinal point.

The CMNA is composed by the Government building, located to the east of the complex, which is the entrance to the CMNA; the north building, which houses the rooms known as Teotihuacan and Toltec; the Mexica building, which is located to the west and, as its name indicates, houses the Mexica room; and the south building, which houses the Mayan and Gulf Cultures rooms.

Considering the external areas, four other classifications called zones were established, which also refer to the cardinal points. The eastern zone corresponds to the area of the museum's access esplanade, the northern zone is adjacent to Calzada Mahatma Gandhi, and the southern zone runs parallel to Paseo de la Reforma Avenue.

Adscription

The National Museum of Anthropology is part of the National Institute of Anthropology and History and is physically located in the building designed by architect Pedro Ramírez Vázquez, which has been declared a monument of artistic value. As already mentioned in previous paragraphs, the National Museum of Anthropology shares the building with other INAH agencies such as the National Library of Anthropology and History and the departments of Physical Anthropology, Ethnohistory, and Linguistics of the National Coordination of Anthropology. In the architectural program table, we have considered the spaces assigned to these last dependencies.

Responsiblentities

Before describing the way in which each of the agencies that occupy the building are organized internally and how they carry out their activities, it is necessary to mention that the security of the entire building is the responsibility of the MNA's Security Subdirection, and the maintenance of the General Services Department is the responsibility of the Administrative Subdirection, and of the MNA. This particularity makes these two important functions fall only on the National Museum of Anthropology.

The National Museum of Anthropology is under the authority of the Direction of the Museum, which is supported by six subdirections: Technical Subdirection, Ethnography Subdirection, Museography Subdirection, Security and Heritage Safeguarding Subdirection, Archaeology Subdirection, and Administrative Subdirection. Due to the nature of the museum's activities, several areas develop their activities in the same space.

In addition to the structure of the MNA, there are other private organizations that support the museum, such as the Board of Trustees of the National Museum of Anthropology, or the concessions granted by INAH for the operation of spaces and services, such as the MNA restaurant, among others.

The National Library of Anthropology and History is under the responsibility of its Direction, which is supported by two subidrections and a department: Subdirection of Library, Subdirection of Documentation and Network of Libraries, and Department of Administrative Services.

Three additional areas that coexist in the building, the Direction of Physical Anthropology, the Direction of Ethnohistory, and the Direction of Linguistics, depend on the National Coordination of Anthropology, whose headquarters are in a building in another area of Mexico City; these dependencies occupy areas in the CMNA for reasons of space and, in the specific case of the DAF, because of the importance of the collection it holds.

Designated area

The following list shows the areas considered to be part of each direction and subdirection:

RESPONSIBLE AREAS OF THE CNMA	SUPPORT AREAS
Direction	• Website • Digitization • Historical Archives
Technical Subdirection	• Information Technology • Educational Services • Cultural Promotion • Conservation and Restoration Laboratory
Administrative Subdirection	• General Services • Financial Resources • Human Resources • Inventory • Warehouse • Liaison with labor union
Archaeology Subdirection	• Collections Movement
Ethnography Subdirection	• Ethnography Subdirection
Museography Subdirection	• Museum Maintenance Department
Security and Safety Subdirection	• Security and Safety Subdirection
National Library of Anthropology and History	• Library Subdirection • Documentation and Library Network Subdirection • Administrative Services Department
Physical Anthropology Direction	• Research areas • Human Remains Collections
Ethnohistory Direction	• Research areas • Library
Linguistics Direction	• Research areas • Library

Categories of use of spaces

- *Public*. Exhibition and recreation areas that are open to the public, any visitor has access and can visit them without restriction. These are areas of interest to visitors.
- *Services*. Spaces that complement the main functional activity of the CMNA, to which visitors have access, such as restrooms and checkrooms, consultation areas of the BNAH, among others.
- *Offices*. Administrative and research workspaces where the CMNA staff develops its activities, manages, and makes decisions. Some of these spaces receive suppliers or members of the public seeking specific attention, such as making a billing transaction or making a comment or suggestion about the MNA. This category includes the administrative and research areas of the Physical Anthropology, Ethnohistory, and Linguistics directions.
- *Workshops*. Technical and manual workspaces where CMNA personnel carry out their activities. Personnel using these spaces must be protected with safety equipment during their work.
- *Warehouses*. Areas where the different departments and offices of the CMNA store operating material.
- *Storage collection areas*. Spaces that house heritage assets, whether they are collections of the MNA, or consultation materials open to a specific public who come for research purposes, as is the case of the BNAH and the DAF. These spaces are under strict security control and only authorized personnel can handle the objects.
- *Restricted areas*. Spaces that contain and protect facilities that must remain closed for security reasons and to which only authorized personnel have access. These are spaces that are closed under lock and key or with a security system.

13. General floor plans of the National Museum of Anthropology Complex, in its three levels and the distribution of spaces by use and by responsible area. Martha Elena Ortiz, 2022

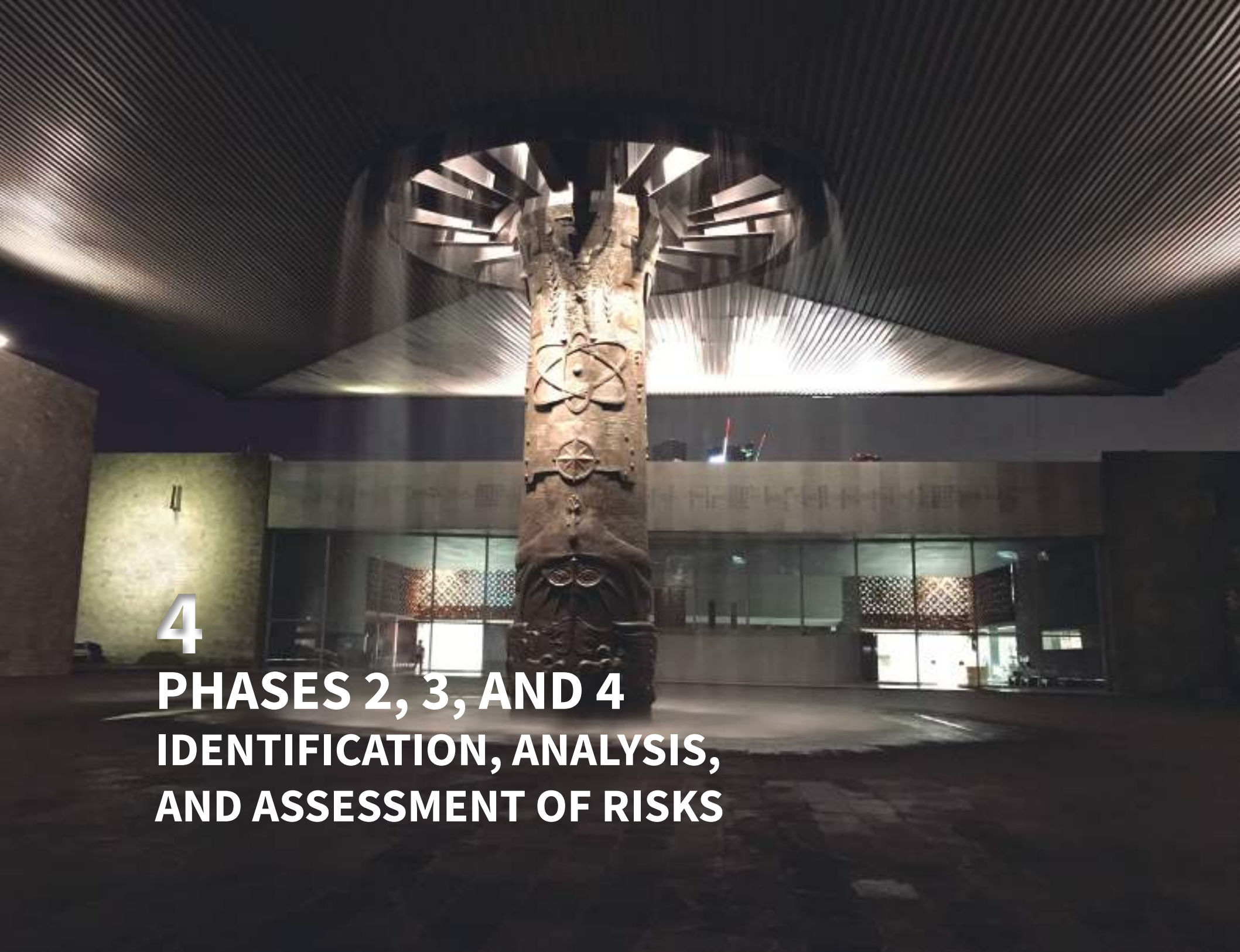
Users

The main users of the spaces were identified, and classified into primary and secondary users. It should be clarified that there are no unique users and there is always CNMA personnel who operate these spaces and make use of them. The following is the list of possible users that are found in the table:

Visitors

- School groups
- Researchers
- Visitors per event
- MNA Staff
- DAF, DIL, and DET personnel
- BNAH staff
- CNME staff[16]
- PMNA staff (MNA Board of Trustees including store staff)
- Maintenance (part of the General Services Department)
- Suppliers and external personnel

[16] National Coordination of Museums and Exhibitions. Normative area of the INAH Museum Network, in charge of the Temporary Exhibitions Hall.



4
PHASES 2, 3, AND 4
IDENTIFICATION, ANALYSIS, AND ASSESSMENT OF RISKS

For the risk analysis and evaluation phases, a tool called Risk Matrix was designed to concentrate in a disaggregated way the information gathered during phases 1 and 2, to clearly identify the risk components: threat, vulnerability, and elements at risk.

This tool made possible to integrate qualitative and quantitative components, so that the ponderations of the risk components would have a frame of reference, supported by arguments, that would be shared by both the members of the Technical Team of the INAH World Heritage Office and the working group of the National Museum of Anthropology Complex.

This matrix was integrated with the information obtained in the context analysis—in particular the information generated by the National Center for Disaster Prevention (CENAPRED)[1], the Risk Atlas of the Miguel Hidalgo Mayoraty[2], and the Atlas of Risks in Mexico City[3]—as well as qualitative information gathered during interviews with CMNA informants.

Based on the various consultations with the CMNA working group, adaptations and adjustments were made to the first matrix model. In particular, the vulnerability and elements at risk components were redesigned and a qualitative section was included to describe the causes, effects, and consequences of the threats analyzed to have as specific a description of the risks as possible, and thus have a road map for the subsequent phases in the preparation of the Comprehensive Risk Plan.

After a first version that followed directly the ABC Method—developed for museums by ICCROM and translated into Spanish by Ibermuseos, which we have already

[1] In <http://www.atlasnacionalderiesgos.gob.mx/> retrieved on August 4, 2021.

[2] In <https://www.miguelhidalgo.gob.mx/transparencia2019/uploads/archivos/atlasderiesgo2018.pdf> retrieved on August 4, 2021

[3] In <https://www.atlas.cdmx.gob.mx/principal/inicio> retrieved on August 4, 2021.

referred to—, the need arose to incorporate, in a more visible and hierarchical way, the description of vulnerabilities, as well as to have a complete section dedicated to the elements at risk, distributed according to the analysis of the architectural program of the building complex. Therefore, modifications were made, and the current structure was proposed: Threats / Vulnerabilities / Elements at Risk / Situated Risk / Ponderations.

Once the structure of the matrix was agreed upon, all possible threats reported by the different research centers and state entities dedicated to risk analysis mentioned above were considered, as well as those contained in the scientific literature—developed both by ICCROM, UNESCO, and by specialized researchers in risk analysis—and were analyzed with real possibilities of concurrence in consultation with the CMNA working group.

a. Threats

After verifying the potential threats reported by the employees of the CMNA during the interviews conducted, we decided to reorder the original groupings and eliminate some risks that had no probability of ocurrence.

Once this review was completed, we categorized the threats in such a way that they could be easily identified both in terms of their causes and effects, and thus obtain typologies that would allow us to carry out precise analyses based on the agents causing these threats.

The threats were divided into four main categories based on the agents or causes of each one: Nature, Anthropogenic, Operation of the CMNA, and Accidents.

a. Threats generated by the action of nature		
Geological	**Sanitary or biological**	**Hydro-meteorological**
– Earthquake – Volcanism – Landslide of slopes (horizontal) – Land subsidence (vertical)	– Environmental contamination – Epidemics – Presence of higher organisms (insects, rodents, marsupials, mammals)	– Snowfall – Hailstorms – Dust storms – Thunderstorms – Strong winds – Moisture from rising or capillary displacement

Anthropogenic / Human-generated threats			
Socio-organizational	**Intentional damage**	**Theft / illicit trafficking of cultural property**	**Military action**
– Rallies – Terrorism / sabotage	– Graffiti – Vandalism – intentional destruction of the property or collection – Arson – Improper behavior of visitors (aggression, influence drug use, alcohol, etc.) – Bomb threat – Presence of armed individuals – Unregistered entry / intrusion	– Theft with violence committed by outsiders – Theft with violence committed by internal staff of the CMNA – Non-violent theft committed by external persons – Non-violent theft committed by internal staff of the CMNA	– Domestic attack – International attack / invasion

Threats generated by the operation of the MNA Complex		
Environmental control / cumulative	**Dissociation**	**Everyday work at CNMA**
– Inadequate relative humidity and temperature – Inadequate levels of illumination and incidence of ultraviolet radiation – Environmental contaminants – Presence of microorganisms (fungi, bacteria, and viruses).	– Loss of paper records (inventories) – Obsolescence of software or collection inventory – Insurance payments (transfer of liability)	– Improper handling of collections – Major and minor maintenance work at the CMNA (improper use of facilities) – External and internal events – Management of concessioned spaces (restaurant, store, parking lot, employee cafeteria)
CMNA systems and equipment accidents	Personal accidents	Physicochemical accidents
– Failure of safety alert systems – Failure of safety communication systems and equipment – Failure of air conditioning system – Failure of sanitation/storm water systems – Failure or interruption of electricity, gas and/or water supplies	– Accidents involving visitors in and around CMNA – Accidents involving personnel in and around CMNA	– Accidental fire – Explosion – Toxic leaks or spills / radiation

b. Vulnerabilities

With respect to vulnerabilities, seven categories were established. Each one with the elements contrasted between those suggested by the literature and those that were reflected in the interviews.

For their quantitative ponderation, it was proposed to assign each one a value based on its presence/absence (binary) with values of one or zero. The following is a list of vulnerability components.

a. Surrounding elements

- Stationary gas tank
- Electric power poles
- Signs, canopies, and vegetation that may fall
- Pipelines
- Transportation accidents in the vicinity
- Merchants in the vicinity

- Architectural deterioration (cumulative)

- Structure of the building
- Roofs
- Slabs and mezzanines
- Walls and partitions [not museographic]
- Exterior doors and windows
- Interior windows and doors
- Building finishes
- Deterioration of escalators
- Vertical circulation

b. Deteriorations in facilities (cumulative)

- Electric
- Hydraulic
- Sanitary
- Air conditioning / relative humidity
- Voice and data
- Lighting

c. Deteriorations in safety systems (cumulative)

- Fire protection system
- Closed circuit television
- Motion / intrusion
- Fire and smoke detection
- Alarms
- Security intercom
- Hub / SITE
- Lightning protection

d. Deterioration in equipment and systems

- Research laboratory equipment
- Workshop equipment
- Restoration equipment

f. Deteriorations in furniture

- Furniture in storage areas
- Administrative furniture
- Museum furniture

g. Management problems

- Regulatory and/or legislative changes
- Lack of resources
- Mobility of personnel / loss of specific knowledge in key functions
- Lack of personnel

Since each of the vulnerabilities was assigned a value of one or zero depending on its presence or absence, a sum of elements was generated for each category and, in turn, a general aggregate in which each and every one of the vulnerabilities was contemplated.

This value was used to obtain an overall percentage, which was reflected in a special cell that was assigned a sort of traffic light based on the following scale: 0% to 33% green, 33% to 66% yellow, and 66% to 100% red.

c. Elements at risk

We consider 'elements at risk' the collections, the people, and the property. For this purpose, field was generated in which these were indicated in a general manner.

To determine the risk exposure of the elements mentioned above, fields were assigned to locate their presence in the CMNA according to the instances within it: National Museum of Anthropology, National Library of Anthropology and History, and Direction of Physical Anthropology. In addition, a field was included for common areas. Another field was included to specify in writing which are the areas of the CMNA where the elements exposed to threats are located, which would be useful for the outlining of the situated risk.

To ponder the elements at risk, it was decided to adopt a criterion that would make possible to measure the level of risk to which they may be exposed due to their location. Due to the complexity of this type of ponderation, the following evaluations were made.

CMNA Staff

Distribution of personnel by areas in the CMNA. The criterion was to consider the hours of greatest presence of personnel (9:00 to 20:00 hours), and their distribution in the spaces based on the proposed locations. Staff hired by INAH was considered, as well as those who belong to external companies and those who work in the concessioned spaces.

PERSONNEL WHO WORK 9:00 TO 20:00 HOURS IN THE CMNA

Areas	CMNA Staff	External suppliers	Concessions	Subtotal
Archaeological Collections	6	1		7
BNAH Collections	6	1		7
DAF Collections	4	1		5
Ethnography Collections	4	1		5
MNA Collections	4			4
Warehouses	3			3
Operational areas	2	25		27
Public areas	5	30		35
Vaults	2			2
Dining room, restaurant, and terrace			20	20
Parking lots			4	4
Facilities	2	5		7
Offices	85	10		95
Central courtyard	2	3		5
Archaeology Historical Archive	0	0	0	0
Archaeology Expo Halls	4	40		44
Ethnography Expo Halls	4	25		29
Temporary Expo Halls	8	2		10
Restrooms		10		10
Services to the public	30	3		33
Workshops	12	1		13
Store			5	5
Lobbies	10	10		20
	193	168	29	390

Visitors per area

In order to have an appropiate parameter for the distribution of the visiting public, an analysis of public flows to the MNA was made[4] based on the information generated by the museum itself and collected by the National Coordination of Institutional Information Development of the INAH.

We performed a public analysis, based on records from 2010 to 2021. Due to the SARS-COV-2 pandemic the years 2020 and 2021 were abnormal, so we decided to take the year 2019 as a reference, since it was the year with the highest flow of visitors, mainly considering the month of April in which 375 228 visitors were registered.

DISTRIBUTION OF VISITORS TO THE MNA DURING 2019

Month	Paid ticket	Disabled	Sunday entrance	Basic level students	Higher level students	Senior citizens	Total
Jan	75,095	91	139,259	34,513	2,622	3,602	255,182
Feb	54,486	83	230,360	30,311	4,316	3,290	322,846
Mar	51,140	93	206,593	27,630	3,539	3,177	292,172
Apr	47,774	92	266,179	53,989	3,396	3,798	375,228
May	34,541	62	138,308	27,762	2,999	2,977	206,649
Jun	32,672	66	76,568	27,860	2,355	2,994	142,515
Jul	39,144	62	90,263	34,818	3,316	2,401	170,004
Aug	40,339	58	105,102	33,122	2,525	2,589	183,735
Sep	33,568	73	152,471	44,118	2,401	2,961	235,592
Oct	42,677	121	247,151	70,669	3,734	3,772	368,124
Nov	57,024	112	199,251	75,232	2,919	3,588	338,126
Dec	39,255	85	103,154	48,649	2,594	2,645	196,382
Grand total	**547,715**	**998**	**1,954,659**	**508,673**	**36,716**	**37,794**	**3,086,555**

[4] The MNA visitor flow information was taken as a reference since there is no historical information from the BNAH or the DAF. It can be consulted in the portal: <https://www.estadisticas.inah.gob.mx/>.

In order to estimate the day with the highest flow of visitors during the year, the volume of visitors was taken into account based on a hypothesis of distribution by day of the week that reflects the usual visiting behavior for the National Museum of Anthropology: Tuesday 10%, Wednesday 10%, Thursday 10%, Friday 10%, Saturday 20%, and Sunday 40%.[5]

Based on the calculation of the busiest day at the MNA, we determined a spatial distribution from the flows recorded in a day and a simultaneous cut-off of the public was contemplated based on the recharge capacity in the spaces, based on a 2-hour visit in a 5-hour opening period.

Calculation basis for daily visit to the MNA								
Distribution	-	**10%**	**10%**	**10%**	**10%**	**20%**	**40%**	**100%**
Total monthly 375,228	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**	**Sunday**	**Total (days)**
Days per month	**5**	**5**	**4**	**4**	**4**	**4**	**4**	**30**
# days (*) distribution	-	50	40	40	40	80	160	
Distribution factor (%)	-	12	10	10	10	20	39	100
Distribution by total Monday, Tuesday, Wednesday, etc.		45 760	36 608	36 608	36 608	73 215	146 430	375 228
Average distribution per individual day (total by number of days)	0	9 152	9 152	9 152	9 152	18 304	36 608	

[5] This hypothesis is based on the historical distribution of visitors per week. With this information, the distribution of the monthly total was made with the days of the week of April 2019, and the day of highest visitor attendance was placed at 36 608.

SPATIAL DISTRIBUTION OF VISITORS TO THE MNA PER DAY*

The busiest day (Sunday) is taken and distributed according to the hypothesis	Percentage distribution in space	Total people 36,608	Recharge factor 2.25
Permanent Exhibition Halls Archaeology	50	18,304	8,135.02
Permanent Exhibition Halls Ethnography	30	10,982	4,881.01
Temporary Exhibition Hall	3	1,098	488.10
Parking lots	0.5	183	81.35
Central courtyard	3	1,098	488.10
Store	1	366	162.70
Public areas	3	1,098	488.10
Dining room, restaurant, and terrace	2	732	325.40
Public services	4	1,464	650.80
Restrooms	0.5	183	81.35
Lobbies	3	1,098	488.10
Totals	**100**	**36,608**	**16,270.05**

* Visitors to the BNAH and DAF are not included

In this way, a number of visitors was assigned to each of the foreseen locations.

A percentage distribution of the surface area of each of the locations considered—in this case for the entire CMNA—was made based on the analysis of the architectural program and of each of the premises in the proposed location categories.

DISTRIBUTION OF SPACES IN THE CMNA WITH CALCULATION OF SURFACE AREAS AND THEIR PERCENTAGE OF OCCUPANCY IN THE PROPERTY

Risk level	Distribution by elements at risk	Surface	Percentage
1	Offices	3,083.00	3.84
2	Restrooms	737.00	0.92
3	Services to the public	2,112.00	2.63
4	Warehouses	746.00	0.93
5	Operational areas	2,941.00	3.67
5	Facilities	1,781.00	2.22
5	Lobbies	2,300.00	2.87
6	Central courtyard	6,650.00	8.29
2	Public areas	25,677.00	32.01
6	Workshops	1,438.00	1.79
2	Parking lots	10,172.15	12.68
7	Store	140.00	0.17
7	Dining room, restaurant, and terrace	1,623.00	2.02
8	Vaults	46.00	0.06
9	Archaeological collections	1,365.00	1.70
9	Ethnographic collections	835.00	1.04
9	BNAH collections	700.00	0.87
9	DAF collections	205.00	0.26
9	INAH collections	563.00	0.70
9	MNA collections	55.00	0.07
10	Temporary Expo Hall	2,509.00	3.13
10	Ethnography Expo Halls	4,035.00	5.03
10	Archaeology Expo Halls	10,512.00	13.10
	Total	**80,225.15**	**100.00**

The cultural assets under the protection of the CMNA are a central part of the study, so we also calculated the distribution of these elements at risk, based on the information on the collections of the MNA contained in the Institutional Collection Control System of the National Institute of Anthropology and History, as well as the assets associated to the building and the artistic works made specifically for the MNA. The volumes of bibliographic material reported by the BNAH and the number of boxes with human bone remains and mummies reported by the DAF were also taken into account. This information was used to identify the collections in each of the locations mentioned in the previous point.

Following the model of protection levels proposed in the ABC Method generated by ICCROM and translated by Ibermuseos—which we have already mentioned—we consider, additionally, the proposal of a scale based on their location to register the level of risk for the collections.

Based on this consideration, we determined that the collections with the lowest level of risk are those that are on loan, since they are not located in the CMNA headquarters building. Following this logic and in descending order, the collections in the security vaults have a high level of protection. Next, we consider the collections in the cultural property storage rooms, the objects exhibited inside

SPATIAL DISTRIBUTION OF AT-RISK ELEMENTS: COLLECTIONS

Distribution by elements at risk [without external areas]	Collections	Associated assets	Artistic work	Total collections
Offices	33	3	6	-
Restrooms	-	-	-	-
Services to the public	-	-	-	-
Warehouses	-	-	-	-
Operational areas	-	-	-	-
Facilities	-	-	-	-
Lobbies	16	17	1	34
Central courtyard	-	3	-	3
Public areas	1	-	-	1
Workshops	-	3	-	3
Parking lots	-	-	-	-
Store	-	-	-	-
Dining room, restaurant, and terrace	-	-	-	-
Vaults	762	-	-	762
Archaeological collections	217	-	-	217
Ethnographic collections	50,865	-	-	50,865
BNAH collections	407,000	1	-	407,001
DAF Assets	31,323	-	-	31,323
INAH collections	30,080	-	-	30,080
MNA collections	30,000	-	-	30,000
Temporary Expo Hall	350	-	-	350
Ethnography Expo Halls	2,957	1	102	3,060
Archaeology Expo Halls	6,941	3	101	7,045
	560,545	**31**	**210**	**560,744**

showcases or hoods, those in rooms without direct protection, those located in circulation areas, those with missing information on their location, and those with administrative problems.

TABLE CHART OF LOCATION OF COLLECTIONS BASED ON INAH'S INSTITUTIONAL COLLECTION CONTROL SYSTEM

Location of collections based on INAH's Institutional Collection Control System	Number of collection objects
On loan	252
Vaults	757
Collection storage	55,599
Ethnographic Collection	26,409
BNAH, workshops, offices	33
Showcase or hood in exhibition	6,887
In halls without hood	3,544
In circulations	16
Without information	1,221
Special cases	1
Grand Total	**94,719**

With all the above described, a table chart was integrated in which the results were pondered, and a value was assigned to each element, according to its level of exposure/protection, in each of the locations already identified, as shown in the following.

The information obtained from this evaluation, concentrated in the table above, allowed us to give a ponderation to the elements at risk for each of the areas.

This ponderation allows us to qualitatively evaluate the level of protection/exposure of the cultural objects analyzed, considering that the general factor is obtained from the sum of each of the ponderations of the individual factors, in order to obtain an adequate representation of the level of risk/exposure, according to the protection value assigned to each of the spaces.

GENERAL PONDERATION OF ELEMENTS AT RISK DUE TO THEIR LOCATION

Ponderation of elements at risk	Distribution by elements at risk [without external areas]	Surface	% Surface	Collections	Artwork associated to the property	Artwork	Total collections	Level of protection	Visitors @ 2 hours	% Visitors	Staff on the day	% Staff	Area type Public 1 Private 2
1	Offices	3,083	4	33	3	6	-	6		-	95	24.36	2
2	Restrooms	737	1	-	-	-	-	5	81	1	10	2.56	1
3	Services to the public	2,112	3	-	-	-	-	5	651	4	33	8.46	1
4	Warehouses	746	1	-	-	-	-	6	-	-	3	0.77	2
5	Operational areas	2,941	4	-	-	-	-	5	-	-	27	6.92	2
5	Facilities	1,781	2	-	-	-	-	3	-	-	7	1.79	2
5	Lobbies	2,300	3	16	17	1	34	2	488	3	20	5.13	1
6	Central courtyard	6,650	8	-	3	-	3	3	488	3	5	1.28	1
2	Public areas	25,677	32	1	-	-	1	2	488	3	35	8.97	1
6	Workshops	1,438	2	-	3	-	3	4	-	-	13	3.33	2
2	Parking lots	10,172	13	-	-	-	-	1	81	1	4	1.03	1
7	Store	140	0	-	-	-	-	2	163	1	5	1.28	1
7	Dining room, restaurant, and terrace	1,623	2	-	-	-	-	2	325	2	20	5.13	1
8	Vaults	46	0	762			762	10	-	-	2	0.51	2
9	Archaeological collections	1,365	2	217			217	9	-	-	7	1.79	2
9	Ethnographic collections	835	1	50,865			50,865	9	-	-	5	1.28	2
9	BNAH collections	700	1	31,323			31,323	9	-		7	1.79	2
9	DAF collections	205	0	407,000	1		407,001	9		-	5	1.28	2
9	Arch. historical Archives	563	1	30,080			30,080	9	-	-	0	-	2
9	MNA collections	55	0	30,000			30,000	9	-	-	4	1.03	2
10	Temporary Expo Hall	2,509	3	350			350	8	488	3	10	2.56	1
10	Ethnography Expo Halls	4,035	5	2,957	1	102	3,060	7	4,881	30	29	7.44	1
10	Archaeology Expo Halls	10,512	13	6,941	3	101	7,045	7	8,135	50	44	11.28	1
		80,225	**100**	**560,545**	**31**	**210**	**560,744**		**16,270**	**100**	**390**	**100.00**	

FACTOR OF ELEMENTS AT RISK, BASED ON THE LEVEL OF PROTECTION/EXPOSURE IN WHICH THE CULTURAL PROPERTY MAY BE, ACCORDING TO ITS LOCATION IN THE CMNA

Space	Factor of elements at risk
Offices	[1]
Restrooms	[2]
Public areas	[2]
Parking lots	[2]
Services to the public	[3]
Material warehouses	[4]
Operational areas	[5]
Facilities	[5]
Lobbies	[5]
Central courtyard	[6]
Workshops	[6]
Store	[7]
Dining room, restaurant, and terrace	[7]
Archaeology vault	[8]
Codex vault	[8]
Archaeology collections	[9]
Ethnography collections	[9]
BNAH collections	[9]
DAF collections	[9]
Archaeology Technical Archive	[9]
MNA Historical Archive	[9]
Temporary Expo Hall	[10]
Ethnography Expo Halls	[10]
Archaeology Expo Halls	[10]

d. Risk assessment

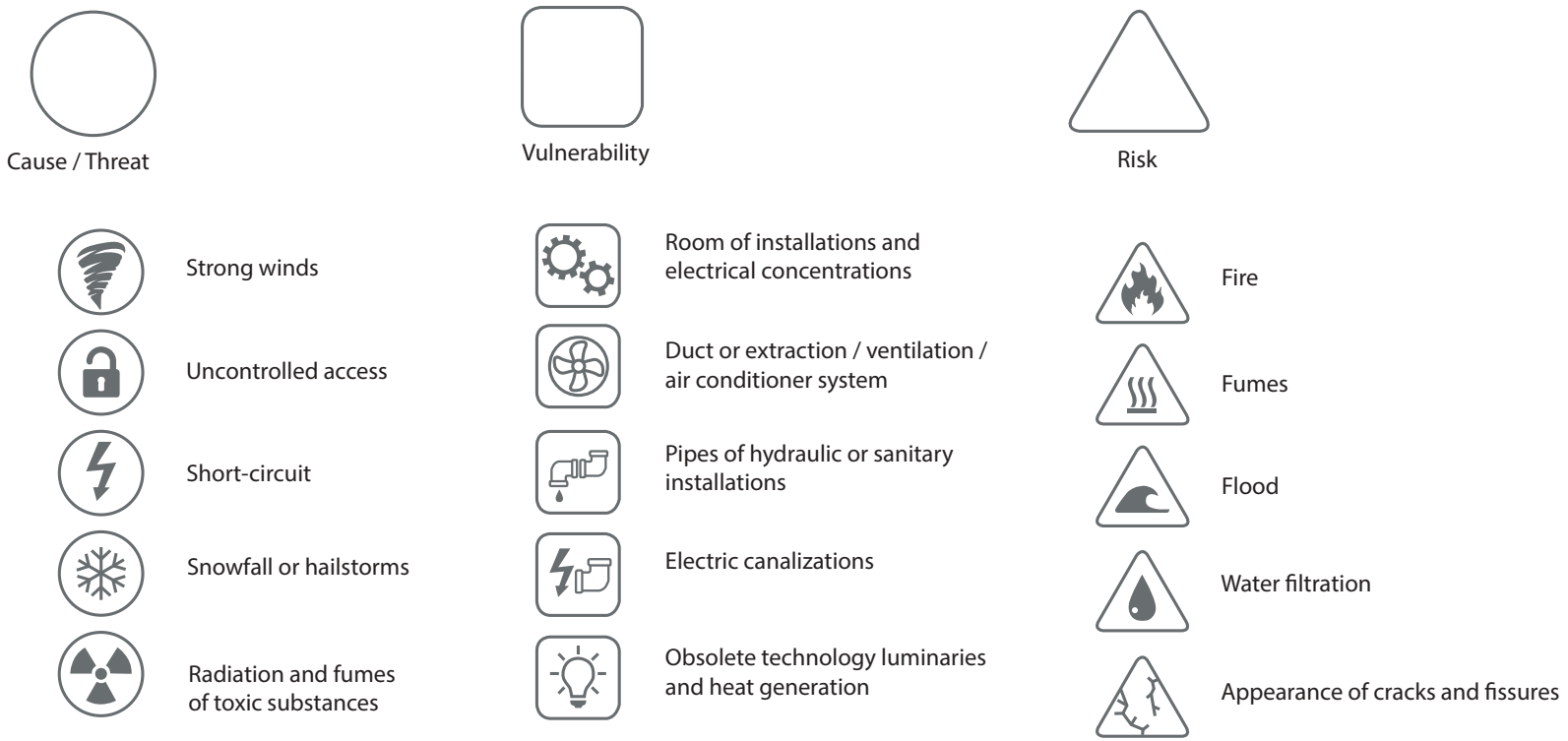
Based on what is proposed in the ABC Method for communicating risks, —'a useful way to communicate risks is by means of a summary sentence. A risk summary sentence is a short, coherent, clear, and meaningful text that refers to the future, identifies the threat or agent of deterioration, describes the expected adverse effect, and specifies the portion of the collection that is (most likely) to be affected—',[6] specific paragraphs were prepared for each of the threats. The aim was to clearly identify the agents of deterioration, the expected effects, and the elements at risk. This wording of situated risks makes it possible to approach, from synthetic statements, the result of the analysis of threats, vulnerabilities, and elements at risk.

This set of descriptive sentences makes it possible to delimit the risks and clearly locate the steps to be taken for their prevention and mitigation. At the same time, it contributes to the analysis of scenarios in which these damages may occur simultaneously, concatenated, or with an impact on other risks.

[6] Pedersoli, Antomarchi, and Michalski, 2017.

The wording of the risk analysis was discussed with the CMNA working group, in order to verify if there were any elements—agent, effect, or element—that had not been considered by the Technical Team of the World Heritage Office throughout this process, and to have, thus, a solid basis for the development of the following steps.

An analysis of the most representative spaces of the CNMA was carried out, mainly those that safeguard collections, elaborating statements accompanied by a graphic scheme that allows locating the sources of risk in the spaces, the causes, threats, and vulnerabilities.



Earthquake

Heavy rains

Land subsidence

Garden or landfills

Battery tank

Storage of volatile and flammable materials

Material accumulation

Preparation or presence of food

Low traffic, low frequented areas

Heavyweight on slab (Building structure or collection piece)

Maintenance or assembly works

Movement or transfer of pieces (collection)

Event / People agglomeration

Flammable materials (Wood)

Hidden structure of the building

Infestation / plague of insects

Infestation / plague of rodents

Presence of humidity

Temperature variation

Intrusion

Toxic spills

Damage to collection

Dust or pollulant deposit

Broken glass

Drp of scultoric pieces or architectonic finishes

Fall or tripping
Slope

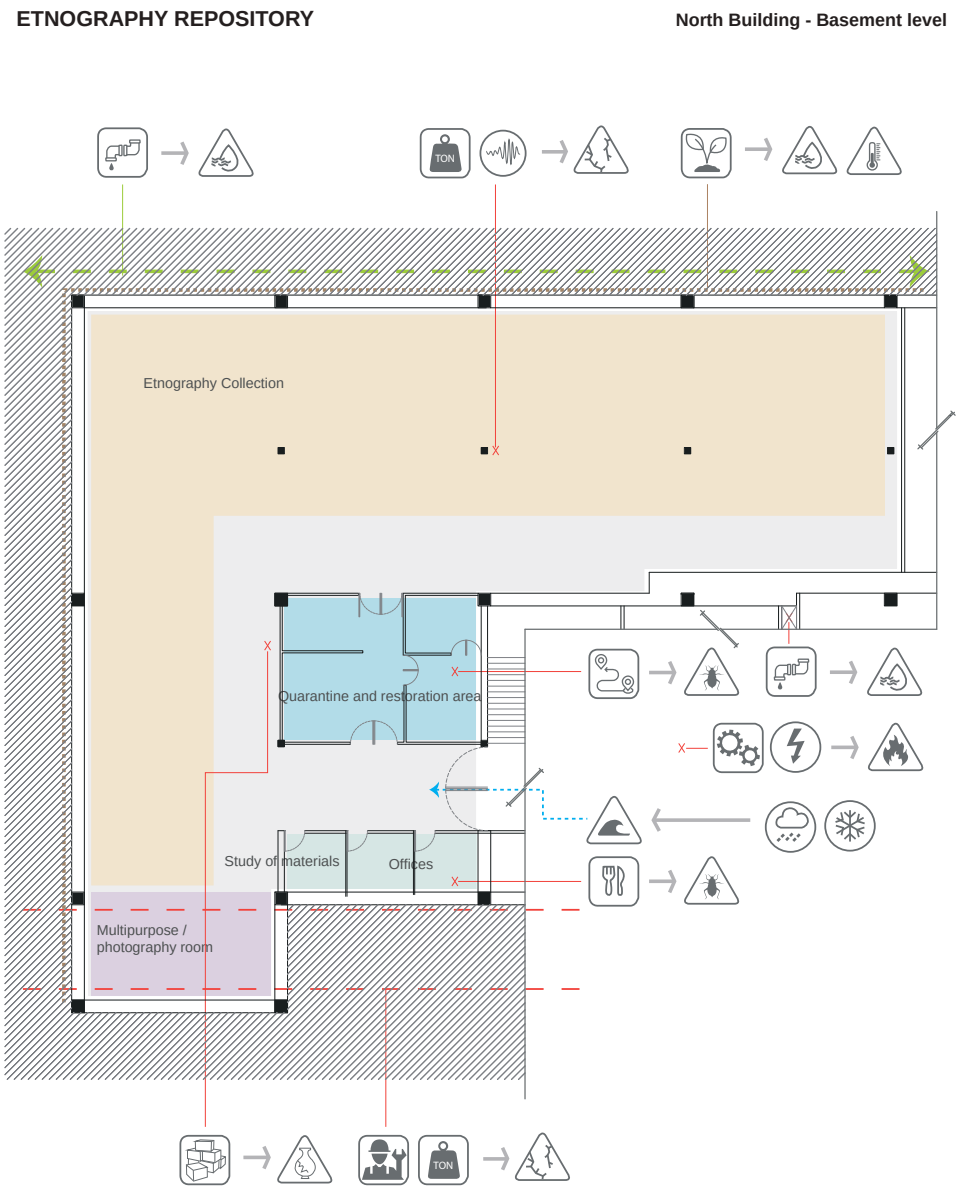
Graffiti

14. Icons that identify the causes/threats and vulnerabilities, that is, the risks identified in the spaces that house CMNA's collections

The multipurpose area that is normally used for the photographic recording of collection objects is located under a corridor that connects one of the accesses from a maneuvering yard to the central courtyard, the only point through which certain equipment, machinery, and structures used for the maintenance of the building or for the assembly of events can enter.

This situation means that the slab is subject to occasional live loads and the structure must be constantly monitored to detect the appearance of cracks in a timely manner so that they can be repaired.

With the writing of the risks based on the 45 identified threats, a condensing document was prepared as input for Phase 5, Risk Treatment: Reduction-Mitigation, Attention, and Recovery.



15. Graphic example and written description of risk, elaborated for each of the areas of the CMNA that house the collection

Risk assessment based on the ABC Method

As already mentioned, during Phases 1 and 2, the variables suggested in the ABC Method were reviewed. For this purpose, the Technical Team of the World Heritage Office generated specific table charts based on the technical documentation in force, in order to have a clear basis for establishing ponderations/valuations for the variables previously identified. This variable ponderation proposal was agreed upon with the CMNA working group.

The central element for this stage of the work was to have clearly defined terms for both the frequency of threats and the specific impacts, which allowed all those involved in this process—the Technical Team of the World Heritage Office, that has developed this work and the CMNA working group, which has been constantly consulted—to have shared references and thus avoid ponderations that were not based on arguments.

The analysis and evaluation of the identified variables is presented below:

Frequency

Defined as the possibility of occurrence of a certain threat over time.

To determine the frequency of each of the identified threats, we proposed a different time range than the one proposed in the ABC Method.

Based on the historical record of risks presented in the CMNA, we considered a temporal range that included from incidences that occur several times in a year, to those that occur every 150 or more years.

It is important to mention that the time range we determined was based on Mexico's governmental periods and that they have a notable influence in the changes of criteria and/or regulatory adjustments, so instead of basing the frequency factors on 5 years—of the ABC Method—, 3 and 6 years were considered, based on the periods of the public administration, and were assigned a ponderation/valuation from 1 to 10 was assigned to them as shown in the table chart below.

For the frequency ponderation, not only the ABC Method was considered, but also the proposal developed at the National School of Conservation, Restoration, and Museography: "Design of risk assessment tools for the conservation of cultural heritage", elaborated by D. Díaz Fuentes, in 2016.

FACTOR A - FREQUENCY. ABC METHOD

A Frecuency	#_F
Several times a year	10
Once a year	9
3 years	8
6 years	7
12 years	6
24 years	5
30 years	4
60 years	3
90 years	2
120 years	1
150 years or more	0

Specific impacts

We define specific impacts as the degree of damage caused by the effects of threats for each of the components analyzed: Collection / People / Property.

For the degree of possible damage caused by the effects of the threats, the ABC Method guide was taken into consideration, as well as the specific contributions of the restorer Rosana Calderón Martin del Campo and the contributions of the restorers specialized in each of the areas that are part of the National Museum of Anthropology Complex, Claudia Blas and the team of the Conservation Laboratory of the MNA, and Xóchitl Cruz of the BNAH.

For the degree of possible harm to persons, the Injury Severity Score and the compendium of risk scales proposed Cirujía Española journal were taken into consideration.

For the degree of possible damage to the building, the manuals developed by CENAPRED were used as a basis and were compiled and adapted by the restorer architect Marta Elena Ortiz, who is a memeber of the Technical Team of the World Heritage Office.

Based on the above, the ponderation/evaluation of the level of impact for each of the three elements presented in the CMNA—Collection, People and Property—was established in a scale from 10 to 0, in descending order, as can be seen in the table chart below. These criteria defined by the Technical Team of the World Heritage Office were discussed and agreed upon with the CMNA working group (Annex 1).

Impact to the totality

We interpret the impact on the totality as the percentage distribution of the effects of the threats on the 3 components analyzed: the collection, the people, and the property.

This ponderation of damage distribution in the totality of the components was defined and determined, in the first instance, by the members of the Technical Team of the World Heritage Office and, subsequently, commented and agreed upon with the CMNA working group.

In order to have an appropriate distribution of the impact on people, it was determined to represent the presence of the total number of visitors to the CMNA based on the calculations indicated in previous sections, on a base of 50% of the total number of personnel working at the CMNA, and of visitors the other complementary base of 50%. In this way, we consider that there is a more accurate representation of the number of people who are simultaneously inside the National Museum of Anthropology Complex at a given hour.

For the final ponderation, the methodology of percentage distribution was followed based on the sum of each of the components, which were compiled in a specific column, so that the quantitative ponderation (A+B+C)/3 was carried out taking into consideration the percentage distribution of each of the components. The criterion of disaggregating this information allows specific analyses for each of the components.

The results of the ponderation/evaluation based on the ABC factors are shown on the far right of the table chart in Annex 1 and, additionally, a traffic light was integrated to provide a quick reading of the impact of each of the risks identified and analyzed in Phases 2 and 3, with the following distribution:

- From 0 to 33%: green
- From 34 to 66%: yellow
- From 67% to 100%: red

e. Concentrator table chart

Since the Risk Matrix is extremely large and complex, in order to make a quick reading, we present the components of the concentrator table chart, which includes the following elements:

- *Causes*. Distributed under four headings: Natural / Anthropogenic / Operation / Accidents.
- *Threat types*. Divided according to the four previous headings:

Natural	Anthropogenic	Operation	Accidents
– Geological – Biological – Hydro-meteorological	– Socio-organizational – Intentional damage – Theft – Military Actions	– Environmental – Dissociation – Daily tasks	– In systems and equipment – To persons – Physicochemical

- *Specific threats*. Identified based on the various interviews conducted during Phase 2 and adjusted in consultations with the CMNA working group.
- *Vulnerability factor*. Determined in the exposure of the elements—collection, people, building—according to their location in the CNMA.
- *Risk ponderation*. Assessment made up of the sum of the identified threats and the vulnerability factor, expressed as a percentage.
- *Ponderation based on the ABC Method*. Already explained in previous points, based on Frequency + Impact level + Totality of elements at risk.

Finally, there is a global ponderation in which the results of the vulnerability analysis, elements at risk and the ABC Method are distributed as a percentage, resulting in the general risk assessment for the entire National Museum of Anthropology Complex. In addition, a column was included in which the situated risk is presented in the draft.

CONCENTRATOR TABLE CHART OF RESULTS WITH RISK PONDERATION

Threat	Cause	Type of threat	Vulnerability factor	Ponderation of elements at risk	ABC	Risk ponderation	Located risk
Geological risks	**Nature**	**Geological**	**3.65**	**4.50**	**2.78**	**3.64**	
Earthquake	Nature	Geological	7.95	10.00	6.67	8.21	Occurrence of fissures and cracks in structural and non-structural elements of the building, as well as in slabs and pavements. Detachment and fall of finishes, misalignment and fall of sculptural elements in façades. Misalignment of window and door frames and bursting of glass. Misalignment of building walls and of floor levels in construction joints. Falling ceilings, some of which weigh up to 30 kg. Misalignment of high-density storage furniture in collection storage areas. In an earthquake of a 7.5 magnitude or greater, there could be a partial collapse and irreversible damage to the structure of the entire complex. Movement and fall of objects exhibited in halls and stored in the storage areas, causing partial damage or loss.
Volcanism	Nature	Geological	2.56	2.71	2.44	2.57	Deposit of volcanic ash on roofs, parking lots, accesses, patios, and uncovered operating areas that can cause collapse of the rainwater drainage system. Failure to clean the ash on surfaces (finishes, glass, and sculptural elements) properly may cause damage due to abrasion. Leakage of ash into the exhibition rooms through the access doors to the gardens and central courtyard, which deposits on the display cases and collection objects without display cases, Affecting the health of personnel and visitors due to respiratory complications.

CONCENTRATOR TABLE CHART OF RESULTS WITH RISK PONDERATION (*continued*)

Threat	Cause	Type of threat	Vulnerability factor	Ponderation of elements at risk	ABC	Risk ponderation	Located risk
Landslide [horizontal]	Nature	Geological	1.28	0.90	0.44	0.88	Loss of trajectory and fracture in the piping of the hydraulic, sanitary, and pluvial installations, especially those that run below the finished floor level. Unleveling of the base of the Tlaloc fountain. Horizontal landslides will not have an immediate effect but will accumulate over time.
Land subsidence [vertical]	Nature	Geological	2.82	4.32	1.56	2.90	Collapse of the building structure, collision of buildings, loss of joint that potentiates damage in case of earthquakes. Loss of slope and fracture of hydraulic, sanitary, and pluvial installation pipes. Detachment of stone finishes from façades. Unleveling of the base of the Tlaloc fountain. Land subsidence can be differential and will not have an immediate effect but will accumulate over time.
Health risks / Biological risks	**Nature**	**Biological**	**3.33**	**5.57**	**4.22**	**4.38**	
Environmental contamination	Nature	Biological	2.31	4.26	4.67	3.74	Cumulative deterioration [abrasive and chemical changes] in the collection, replicas and architectural-artistic elements located outdoors, in the external areas of the building. Impact on the health of visitors and staff (respiratory and eye diseases).
Epidemics	Nature	Biological	1.54	3.94	3.33	2.94	Impact on the number of visitors to the museum and on the health of the staff, resulting in changes in the operation of the museum. Decrease in the number of specialized operative personnel in relation to the management of the collection and operation of the building's facilities.

CONCENTRATOR TABLE CHART OF RESULTS WITH RISK PONDERATION (*continued*)

Threat	Cause	Type of threat	Vulnerability factor	Ponderation of elements at risk	ABC	Risk ponderation	Located risk
Presence of higher organisms (insects, rodents, marsupials, cats)	Nature	Biological	6.15	8.52	4.67	6.45	Deterioration and destruction of constituent material in collection objects due to the presence of insects and rodents. Deterioration of the wiring of the electrical and voice and data installations, destruction of packaging (mainly cardboard boxes with collection), as well as contamination of material and spaces by excrement of rodents, cats, and opossums.
Hydro-meteorological risks	**Nature**	**Hydro-meteorological**	**3.52**	**5.72**	**4.16**	**4.47**	
Pluvial flooding	Nature	Hydro-meteorological	4.87	8.58	6.11	6.52	Short circuit and permanent damage to the electrical substation in case the water level exceeds the base of the equipment. Short circuit and damage to security equipment (monitoring) and elevators. Deterioration and destruction of constituent material in objects of the collection stored in storage areas, especially those on the lower shelves of high-density storage furniture. Deterioration and destruction of papers and books in offices (Physical Anthropology, Museography, Ethnography, and Archeology Offices). Deterioration of paint, finishes (walls and floors), and furniture (metal and wood) inside the building increased relative humidity conditions. Interruption of functions by the Complex's operational personnel to attend the event. Difficulty for the arrival and departure of visitors and Complex staff, both vehicular and pedestrian. Impact on the health of staff and visitors due to respiratory complications.

CONCENTRATOR TABLE CHART OF RESULTS WITH RISK PONDERATION (*continued*)

Threat	Cause	Type of threat	Vulnerability factor	Ponderation of elements at risk	ABC	Risk ponderation	Located risk
Snowfall	Nature	Hydro-meteorological	3.33	5.74	2.56	3.88	Collapse of the drainage capacity of roof collectors, perimeter gardens, and the overpass (under the access esplanade), which could lead to water filtration and flooding of spaces inside the buildings. Increase in the live loads of the roofs, putting the structural stability of these elements at risk. Damage to the vegetation in the thematic gardens of the halls and botanical gardens. Interruption of functions by the complex operational personnel to attend the event. Difficulty for the arrival and departure of visitors and museum personnel, both vehicular and pedestrian.
Hailstorms	Nature	Hydro-meteorological	4.10	6.52	5.56	5.39	Collapse of the drainage capacity of roof collectors, perimeter gardens, and overpasses (under the access esplanade), which can lead to water filtration and flooding of spaces inside the buildings. Increase in the live loads of the roofs, which puts the structural stability of these elements at risk. Damage to the vegetation in the thematic gardens of the halls and botanical gardens. Interruption of functions by the operating personnel of the Complex to attend the event. Difficulty for the arrival and departure of visitors and museum personnel, both vehicular and pedestrian.

CONCENTRATOR TABLE CHART OF RESULTS WITH RISK PONDERATION (*continued*)

Threat	Cause	Type of threat	Vulnerability factor	Ponderation of elements at risk	ABC	Risk ponderation	Located risk
Dust storms	Nature	Hydro-meteorological	2.31	3.68	2.67	2.88	Abrasion of sculptural elements and finishes on the building's façades, soil deposits in exterior common areas and, to a lesser extent, inside exhibition halls and offices with doors to the exterior. Possible contamination of drinking water tanks. Damage to botanical specimens in theme gardens. Abrasion of solar cells in exterior perimeter lighting. Obstruction of security cameras. Complications for the arrival and departure of visitors and workers, respiratory illnesses, and eye problems. Entry of dust into exhibition halls, which is deposited on exhibits without display cases and on display cases.
Thunderstorms	Nature	Hydro-meteorological	4.36	4.39	4.00	4.25	Electrical discharges in lightning rods or in installation booths that generate a short circuit and compromise the service and operation of the complex. Lack of illumination in exhibition spaces (Tomb of Pakal and burial in the Oaxaca Hall, mainly). Fall of trees and branches on restoration and/or electrical concentrations cabins located on the exterior perimeter of the building, fall and damage to replicas or collections located in exterior gardens.
Strong winds	Nature	Hydro-meteorological	3.33	3.87	4.00	3.73	Collapse of lightning rods, movement, misalignment, and deformation of sculptural elements of the complex (central patio lattice and ceiling of the monumental umbrella), misalignment of security cameras. Significant temperature changes that can generate respiratory illnesses in visitors when entering and leaving exhibition halls. Fall of trees on the perimeter that have softened or dried out.

CONCENTRATOR TABLE CHART OF RESULTS WITH RISK PONDERATION (*continued*)

Threat	Cause	Type of threat	Vulnerability factor	Ponderation of elements at risk	ABC	Risk ponderation	Located risk
Moisture due to capillary rise	Nature	Hydro-meteorological	2.31	7.29	4.22	4.61	Moisture in basement walls that may affect the conditions of the collection storage rooms in the basement and adjacent to garden soil fillings. Damages to the BNAH collection due to humidity conditions generated by rainwater deposited in drainage channels with obstructions or leaks due to lack of maintenance. Detachment of finishes (paint and stone finishes) on interior walls and façades.
Socio-organizational	Anthropogenic	Socio-organizational	4.36	4.02	4.78	4.39	
Rallies	Anthropogenic	Socio-organizational	3.08	0.58	3.89	2.52	Vandalism with graffiti on sculptural and architectural perimeter elements on Paseo de la Reforma Avenue (Tlaloc fountain curbstone and skull wall of M. Felguérez). This risk has diminished considerably since the transfer of the executive power from Los Pinos to Palacio National Palace.
Political meetings	Anthropogenic	Socio-organizational	2.56	1.48	4.67	2.90	Concentration of contingents and placement of banners and signs in the access esplanade to the complex and lobby. Vandalism with graffiti on sculptural and architectural perimeter elements on Paseo de la Reforma Ave. (Tláloc fountain curbstone, wall of skulls from M. Felguérez).
Terrorism / sabotage	Anthropogenic	Socio-organizational	7.44	10.00	5.78	7.74	Intentional damage to the property, with greater weight in public areas, facilities, accesses and symbolic pieces (Piedra del Sol, Coatlicue, Tláloc and the Monumental Umbrella).
Intentional damage	**Anthropogenic**	**Intentional damage**	**2.97**	**6.11**	**4.32**	**4.47**	

CONCENTRATOR TABLE CHART OF RESULTS WITH RISK PONDERATION (*continued*)

Threat	Cause	Type of threat	Vulnerability factor	Ponderation of elements at risk	ABC	Risk ponderation	Located risk
Graffiti	Anthropogenic	Intentional damage	3.08	3.68	4.11	3.62	Spray paint that causes damage to perimeter sculptural elements (wall of skulls by M. Felguérez), scraping of wooden elements in rooms (railings and handrails) and vegetation (magueyes in theme gardens), indelible marking with felt-tip pens on wooden railings, handrails, escalator and staircase rails, bathroom doors and other museographic elements.
Vandalism - Intentional destruction to the property/ collection	Anthropogenic	Intentional damage	4.36	10.00	5.44	6.60	Damage to restrooms, theft of hardware and scraping of walls, doors, glass, mirrors. Sticking of chewing gum on public surfaces, collection objects, museum furniture, and trees. Placing biological remains (nasal secretions) on objects without display cases. Damage to bibliographic material.
Arson	Anthropogenic	Intentional damage	6.67	10.00	5.11	7.26	Combustion, damage, or loss of collection, finishes and architectural elements of the property. Injury to personnel during fire or evacuation. The risk is present in the entire complex, but is greater in workshops, the BNAH, exhibition rooms, and ethnography storage rooms. It is considered that the impact would be minor due to the state of the firefighting system, which was updated in 2020.
Improper attitude of visitors (aggressions, drugs, alcohol)	Anthropogenic	Intentional damage	2.31	5.03	4.44	3.93	Damage to collection objects, architectural elements, window frames and finishes of the building in halls due to blows or falls caused by visitors. Minor to serious injuries to visitors and others.

CONCENTRATOR TABLE CHART OF RESULTS WITH RISK PONDERATION (*continued*)

Threat	Cause	Type of threat	Vulnerability factor	Ponderation of elements at risk	ABC	Risk ponderation	Located risk
Bomb threat	Anthropogenic	Intentional damage	1.54	5.23	3.22	3.33	Alteration in the behavior of personnel and visitors, panic attack, which may cause accidents and injuries at the time of evacuation. Uncertainty before the threat, implementation of the operation protocol after the threat.
Presence of armed individuals	Anthropogenic	Intentional damage	1.79	4.39	4.44	3.54	Increased possibility of accidents or injuries to visitors and staff, as well as possible damage to the collection.
Unregistered entry / Intrusion	Anthropogenic	Intentional damage	1.03	4.45	3.44	2.97	Administrative risk, with potential for theft and accidental or voluntary damage to the collection, property, visitors, and staff of the CMNA.
Theft	**Anthropogenic**	**Theft**	**4.10**	**7.84**	**4.14**	**5.36**	
Theft with violence External	Anthropogenic	Theft	3.85	8.58	3.78	5.40	Theft of cash and goods from visitors and staff, especially in the lockers, cloakroom, store, ATM, and restaurant areas. Theft of the collection (objects) located in the permanent and temporary exhibition halls, with those in the Ethnographic halls being more vulnerable due to their size and arrangement in the museography. The movement of valuables that takes place periodically in the museum is also a risk. According to articles 27 and 28 of the Federal Law on Archeological, Artistic, and Historic Monuments and Zones and article 6 of the General Law of National Assets, which establish the inalienable and imprescriptible nature of the collections safeguarded by the CMNA. Any theft of its collections makes them vulnerable to illicit trafficking, which places them under the protection contemplated in the Convention on the Means of Prohibiting and Preventing the Illicit Import, Export, and Transfer of Ownership of Cultural Property UNESCO 1970.

CONCENTRATOR TABLE CHART OF RESULTS WITH RISK PONDERATION (*continued*)

Threat	Cause	Type of threat	Vulnerability factor	Ponderation of elements at risk	ABC	Risk ponderation	Located risk
Theft with violence Internal	Anthropogenic	Theft	4.62	8.32	3.44	5.46	Theft of cash and personnel property, especially in the payroll area, lockers, store, ATM, and restaurant. There is a lower incidence of theft of collection objects. Artistic and Historic Monuments and Zones and article 6 of the General Law of National Assets, which establish the inalienable and imprescriptible nature of the collections safeguarded by the CMNA. Any theft of its collections makes them vulnerable to illicit trafficking, which places them under the protection contemplated in the Convention on the Means of Prohibiting and Preventing the Illicit Import, Export, and Transfer of Ownership of Cultural Property. UNESCO 1970.
Theft without violence External	Anthropogenic	Theft	3.59	4.45	5.00	4.35	Theft of cash and personal property of visitors and staff, especially in public areas and temporary and permanent exhibition halls. Theft of collection objects located in ethnographic halls due to their size and arrangement in the museography. Theft of equipment and work material by external service providers. Artistic and Historic Monuments and Zones and article 6 of the General Law of National Assets establish the inalienable and imprescriptible nature of the collections safeguarded by the CMNA. Any theft of its collections makes them vulnerable to illicit trafficking, which places them under the protection contemplated in the Convention on the Means of Prohibiting and Preventing the Illicit Import, Export, and Transfer of Ownership of Cultural Property. UNESCO 1970.

CONCENTRATOR TABLE CHART OF RESULTS WITH RISK PONDERATION (*continued*)

Threat	Cause	Type of threat	Vulnerability factor	Ponderation of elements at risk	ABC	Risk ponderation	Located risk
Theft without violence Internal	Anthropogenic	Theft	4.36	10.00	4.33	6.23	Theft of materials (cleaning supplies and stationery), expensive equipment and work tools (computer and construction), personal property, small collection objects from storage areas or during transfers to workshops or assembly movements of temporary exhibits. Artistic and Historic Monuments and Zones and article 6 of the General Law of National Assets establish the inalienable and imprescriptible nature of the collections safeguarded by the CMNA. Any theft of its collections makes them vulnerable to illicit trafficking, which places them under the protection contemplated in the Convention on the Means of Prohibiting and Preventing the Illicit Import, Export, and Transfer of Ownership of Cultural Property. UNESCO 1970.
Militar Action	**Anthropogenic**	**Military Action**	**7.56**	**10.00**	**5.28**	**7.61**	
Domestic attack	Anthropogenic	Military Action	7.44	10.00	4.89	7.44	In domestic attacks, the following scenarios are considered: social uprising, civil war, and military coup. In all cases, damage is estimated to the exterior of the building, permanent and temporary exhibition halls, BNAH, administrative spaces and collection storage areas, as well as to the installations, equipment and systems installed in the CNMA. Potential damage not only includes shrapnel, firearms and projectiles aimed at the building, collections, and people, but also secondary damage such as vandalism, theft, fire, changes in environmental conditions and potential accidents to people and equipment. Damage from an armed incursion can also jeopardize the structure of the building and trigger partial or total collapse of the CNMA.

CONCENTRATOR TABLE CHART OF RESULTS WITH RISK PONDERATION (*continued*)

Threat	Cause	Type of threat	Vulnerability factor	Ponderation of elements at risk	ABC	Risk ponderation	Located risk
Foreign attack	Anthropogenic	Militar Action	7.69	10.00	5.67	7.79	Foreign attack scenarios include military invasion or occupation by a country or coalition of nations. The effects caused by infantry, artillery, missiles, bombing, or the use of weapons of mass destruction are considered. In all cases, damage to the exterior of the building, permanent and temporary exhibition halls, BNAH, administrative spaces and collection storage areas, as well as to the installations, equipment and systems installed in the CNMA are estimated. Potential damage not only includes shrapnel, firearms and projectiles aimed at the building, collections, and people, but also secondary damage such as vandalism, theft, fire, changes in environmental conditions, and potential accidents to people and equipment. Damage from an armed incursion can also jeopardize the structure of the building and trigger partial or total collapse of the CNMA.
Environmental control / Cumulative	**Operational**	**Environmental**	**3.64**	**7.19**	**5.69**	**5.51**	
Inadequate RH and temperature	Operational	Environmental	3.85	6.45	5.89	5.40	Damage to the collection in storage areas and exhibition halls due to the increase and decrease in volume of pieces (especially those made of organic materials), detachment of finishes and pictorial layers on objects in the collection. Inadequate relative humidity (high) promotes the presence of microorganisms and fungi that can generate other risks.

CONCENTRATOR TABLE CHART OF RESULTS WITH RISK PONDERATION (*continued*)

Threat	Cause	Type of threat	Vulnerability factor	Ponderation of elements at risk	ABC	Risk ponderation	Located risk
Lighting and UV radiation	Operational	Environmental	3.08	6.45	5.33	4.95	Fading of dyes and pigments from collection objects in storage rooms and in exhibition halls. Fracture of chains and molecular bonds in organic materials in the collection.
Contaminants	Operational	Environmental	2.56	8.32	5.44	5.44	Abrasion, oxidation of metals, and changes in the nature of some of the materials of the objects in the collection, including those in storage rooms, exhibited in halls and movable property associated to the building (marble and anodized aluminum). The effects of contaminants may not manifest themselves immediately but will accumulate over time.
Presence of microorganisms [fungi, bacteria and viruses].	Operational	Environmental	4.62	7.94	5.67	6.07	Deterioration of constituent materials of collection objects due to the presence of microorganisms. Presence of fungi due to inadequate and insufficient extraction of vapors, debris and environmental control in workshops (lack of equipment). The presence of microorganisms can be caused and increased by humidity problems and personnel attitudes in workshops, offices and warehouses (storage and consumption of food). Distribution of fungal spores through ducts.
Dissociation	**Operational**	**Dissociation**	**3.68**	**7.63**	**6.07**	**5.79**	
Loss of paper records	Operational	Dissociation	1.28	6.45	4.56	4.10	Missing of historical records of inventory cards due to movement of furniture or change of personnel (researchers/curators). There is no updating and verification of records in the DAF. It is plausible that the risks arising from the loss of paper records are linked to other risks.

CONCENTRATOR TABLE CHART OF RESULTS WITH RISK PONDERATION (*continued*)

Threat	Cause	Type of threat	Vulnerability factor	Ponderation of elements at risk	ABC	Risk ponderation	Located risk
Collection inventory / software obsolescence	Operational	Dissociation	2.05	6.45	5.22	4.58	Dependence on annual payment for software and services needed to keep the inventory of the collection and bibliographic, newspaper, and documentary materials up to date. There is currently no single system (cataloguing criteria and categories) for all the complex's assets.
Insurance payments	Operational	Dissociation	7.69	10.00	8.44	8.71	Lack of protection of the property, collection, and people due to the annual uncertainty of having or not the resources to pay for insurance, since the insurance is contracted by INAH on an annual or biannual basis. The CMNA shares the insurance with all INAH properties and collections; it is not a private insurance managed by the CMNA itself. The experience that insurance companies have had with INAH (example: earthquake of 2017) has generated adjustments in the coverage, and this has caused that currently the insurance does not cover damages due to earthquakes or volcanism.
Daily Tasks	**Operational**	**Daily Tasks**	**6.54**	**6.16**	**5.22**	**5.97**	
Improper handling of collections	Operational	Daily Tasks	6.92	7.55	5.67	6.71	Damage to collection pieces and architectural elements (walls, doors, floors, ceilings, or installations) of the building due to the handling and transfer of pieces from the storage areas to the restoration laboratories, permanent halls, or temporary exhibition areas (temporary exhibition hall, A1, Media Luna, and second floor gallery). Injuries to museography, CNME and CNCPC personnel due to lack of experience or use of personal safety equipment. In the case of objects on loan, damage may be caused by the movement of the collection without notice to organizers and staff.

CONCENTRATOR TABLE CHART OF RESULTS WITH RISK PONDERATION (*continued*)

Threat	Cause	Type of threat	Vulnerability factor	Ponderation of elements at risk	ABC	Risk ponderation	Located risk
Major and minor maintenance works at the CMNA [misuse of facilities].	Operational	Daily Tasks	8.21	10.00	5.11	7.77	Damage to collection and architectural elements (including window and door frames and finishes of the building) due to incorrect handling of machinery, equipment, or inadequate protection of the work area. Injuries to operating workers during work at double heights, transfer of materials and heavy elements, or operation of heavy machinery or cutting elements. Possible generation of fires due to welding, short circuits, temperature increase in electrical transformers, use of flammable substances (paints and solvents). Partial interruption of service due to power cuts or damage to ducts and installations. Injuries to visitors and administrative employees due to work carried out during complex opening hours or without adequate delimitation and protection of the work area.
External and internal events	Operational	Daily tasks	6.15	4.77	5.11	5.35	Damage to architectural elements, finishes, and movable property associated with the building due to the transfer of equipment and furniture during museographic assemblies and disassemblies, from the maneuvering yards (loading and unloading) to public areas and lobbies. Possibility of electrical overload depending on the demand of the event. Increased possibility of pests (insects and rodents) due to food handling. Increased susceptibility to theft and accidents (systems and equipment).

CONCENTRATOR TABLE CHART OF RESULTS WITH RISK PONDERATION (*continued*)

Threat	Cause	Type of threat	Vulnerability factor	Ponderation of elements at risk	ABC	Risk ponderation	Located risk
Management of concessioned spaces (restaurant, store, parking lot, employee cafeteria)	Operational	Daily Tasks	4.87	2.32	5.00	4.06	Restaurant: pests (insects and rodents) caused by the handling and storage of food and waste, possible fires caused by gas handling, damage to the sanitary system caused by waste handling or lack of maintenance of grease traps, theft and accidents involving diners and employees. Store: theft of merchandise, staff and customer accidents due to uneven access, possible rodent breeding due to the sale of perishable food, possible short circuit. Parking lot: accidents and vehicle crashes, theft of vehicles or belongings from users taking advantage of the lack of lighting and surveillance, fights, possible fires, noncompliance with universal accessibility. Employee cafeteria (MNA archeology and ethnography, DAF): generation of pests (insects, rodents, and cats) due to the handling and storage of food and waste, possible generation of fires due to gas handling. The presence of pests can spread to other areas of the MNA when personnel bring their food to their workplaces (offices).
Accidents in CMNA's systems and equipment	**Accidents**	**Accidents in CMNA's systems and equipment**	**2.72**	**4.26**	**5.60**	**4.19**	
Failure of safety alert systems	Accidents	Accidents in CMNA's systems and equipment	3.33	4.58	5.67	4.53	Impact on the capacity and response time to threats and disasters.

CONCENTRATOR TABLE CHART OF RESULTS WITH RISK PONDERATION (*continued*)

Threat	Cause	Type of threat	Vulnerability factor	Ponderation of elements at risk	ABC	Risk ponderation	Located risk
Failure of safety communication systems and equipment	Accidents	Accidents in CMNA's systems and equipment	3.33	2.32	5.67	3.77	Impact on the capacity and response time to threats and disasters.
Failure of air - conditioning system	Accidents	Accidents in CMNA's systems and equipment	2.05	2.19	4.22	2.82	Damage to collections exhibited in the Temporary Exhibition Hall and A1 due to the impact on environmental conditions (temperature and humidity). Temperature rises and impact on the operation of the UPS in the Security HUB and Data Center due to the failure of mini splits. Failure in temperature control inside the auditoriums (Sahagún, Torres Bodet, and Tláloc). Condensation dripping in air-conditioned areas, affecting the collection in temporary exhibition rooms and users of the auditoriums during events.
Failure of sanitary / rainwater systems	Accidents	Accidents in CMNA's systems and equipment	2.05	6.45	6.11	4.87	Flooding of the basement with sewage and/or rainwater, affecting the ethnography and archaeology collection storage areas, codex vault, DAF collection and offices, ethnography, and archeology researchers' offices, and museography workshops. Wall leaks in permanent, temporary international and temporary A1 exhibition halls, BNAH collection, Fray Bernardino de Sahagún Auditorium, offices of the Ethnohistory and Linguistics Directions, due to the failure of the drainage through the gargoyles on the façades. In the slab of the DAF, important filtrations due to the obstruction of the grids of the pluvial drainage system. Partial or total interruption of sanitary units, impacting visitors and employees of the CMNA.

CONCENTRATOR TABLE CHART OF RESULTS WITH RISK PONDERATION (*continued*)

Threat	Cause	Type of threat	Vulnerability factor	Ponderation of elements at risk	ABC	Risk ponderation	Located risk
Failure or interruption of electricity, gas and/or water supplies	Accidents	Accidents in CMNA's systems and equipment	2.82	5.74	6.33	4.97	Partial interruption in the operation of the complex, affecting visitors and/or employees in their work. Shutdown of sanitary services in the event of water supply failures. In the event of a short circuit or gas leak, there is a risk of fire. Lack of treated water supply impacts the condition of plant species in the thematic and botanical gardens. Interruption of the power supply for a prolonged period or when the power generation system is out of order may affect the data backups in the Data Center and the security response capacity in the event of a disaster.
Accidents to people	**Accidents**	**Accidents to people**	**6.79**	**7.06**	**5.39**	**6.42**	
Accidents to visitors in the museum and its surroundings	Accidents	Accidents to people	6.15	4.13	5.11	5.13	Falls, trips, fainting, changes in blood pressure, dehydration of visitors due to lack of signage of slopes in rooms and public areas, lack of anti-slip strips on ramps and steps, location of museum furniture or visiting patterns (tours, malnutrition, heat stroke, altitude, and pollution of the CDMX). Most visitors are unaware of the existence of medical services.
Accidents to personnel in the museum and its vicinity	Accidents	Accidents to people	7.44	10.00	5.67	7.70	Minor to severe injuries to operating personnel in workshops, maintenance concentrations and gardening areas; also, injuries to personnel during assemblies in exhibition rooms, or movement (moving and packing) of collections. Injuries due to exposure to solvents and microorganisms in warehouses and laboratories. Among the personnel we have considered social servants, external researchers, suppliers, CNME personnel.

CONCENTRATOR TABLE CHART OF RESULTS WITH RISK PONDERATION (*continued*)

Threat	Cause	Type of threat	Vulnerability factor	Ponderation of elements at risk	ABC	Risk ponderation	Located risk
Chemical physical accident	**Accidents**	**Chemical physical accident**	**5.81**	**4.69**	**3.67**	**4.72**	
Accidental fire	Accidents	Chemical physical accident	7.18	10.00	3.33	6.84	Combustion, damage, and loss of equipment, furniture, and collection objects. The workshops, electrical concentrations, restaurant and cafeteria, the areas of the DAF, the BNAH and the Ethnohistory and Linguistics Directions are those most likely to be the origin of the fire, either because of the easily combustible material they house, the substances used (flammable), or the generation of sparks and temperature elevation.
Explosions	Accidents	Chemical physical accident	5.64	1.74	5.22	4.20	Combustion, damage and loss of equipment, furniture, and collection objects, depending on the place of origin of the explosion and its magnitude. Electrical concentrations, workshops, and gas tanks are the elements that generate the greatest risk.
Toxic leaks or spills / radiation	Accidents	Chemical physical accident	4.62	2.32	2.44	3.13	Corrosion of architectural finishes and/or collection objects due to spillage of toxic substances. Health problems caused in workers by the vapors generated. If the substances are flammable, there is a risk of being a point of origin of a fire or explosion.

f. Results

Based on the ponderations/valuations resulting from the above analysis, the most relevant risks that are faced/could be faced by the CMNA are as follows.

MOST IMPORTANT RISKS AFTER THE ANALYSIS

Threats	Risk ponderation %
Insurance payments	8.71
Earthquake	8.21
Foreign military attack	7.79
Major and minor maintenance work at CMNA [misuse of facilities]	7.77
Terrorism / sabotage	7.74
Staff accident in and around the CMNA	7.70
Domestic military attack	7.44
Arson	7.26
Accidental fire	6.84
Improper handling of collections	6.71
Vandalism - Intentional destruction to the building/collection	6.60
Presence of higher organisms (insects, rodents, marsupials, cats)	6.45
Rain flooding	6.28
Internal non-violent theft	6.23

5
PHASE 5
RISK PREVENTION, RESPONSE, AND RECOVERY STRATEGIES

The first step for Phase 5 was to develop a questionnaire to be distributed among the workers of the different areas of the CMNA, in order to know the actions that have been developed for the prevention of risks, the participation within the existing brigades, as well as to gather proposals to reduce the impact of risks before, during, and after the event.

Once the answers to the questionnaire were collected, they were systematized and a work route was planned that included the participatory writing of the various protocols by the Technical Team of the World Heritage Office and an active dialogue with the specialists in the different areas, in order to maintain fluid communication and carry out specific consultations, as well as successive reviews of the progress made.

Then, methodologies for the development of protocols and their organization, identification of agents, representation in text and graphics were analyzed in order to provide a clear tool for those who have to implement them.

Based on this analysis, a four-part methodology was proposed. First, the identification of the existing protocols or strategies of attention, as well as the forms of representation of the protocols that are in force in the INAH regulations. At this point, the MNA's civil protection plan was fundamental[1] and INAH's Protocols for the Conservation and Protection of Cultural Heritage,[2] as well as the Official Mexican Standards on occupational safety and health.

Secondly, charts were created with information for each of the risks. The work was based on the information gathered through the questionnaires provided by the various INAH experts and a careful identification of com-

[1] Internal working document.

[2] Available in: <https://www.normateca.inah.gob.mx/pdf/01472581144.PDF>.

ponents for risk prevention, attention, and recovery, developed by Martha Elena Ortiz Sánchez of the Technical Team World Heritage Office, based on the empirical information she obtained when she served as head of General Services of the MNA.

With the information contained in these charts, it was decided to make clusters of risks that would be familiar both in terms of the causal agents and the actions required before, during, and after the events.

With these new sets, 23 protocols were proposed: 10 individual protocols that present unique characteristics or that, because of their importance, should be addressed through a single protocol, and 13 protocols generated from the new clusters, as shown in the following table.

Individual protocols	1. Earthquake
	2. Volcanism
	3. Environmental contamination
	4. Epidemics
	5. Presence of higher organisms (insects, rodents, marsupials, cats, etc.)
	6. Pluvial flooding
	7. Electrical storms
	8. Moisture from capillary rise
	9. Bomb threat
	10. Insurance payments

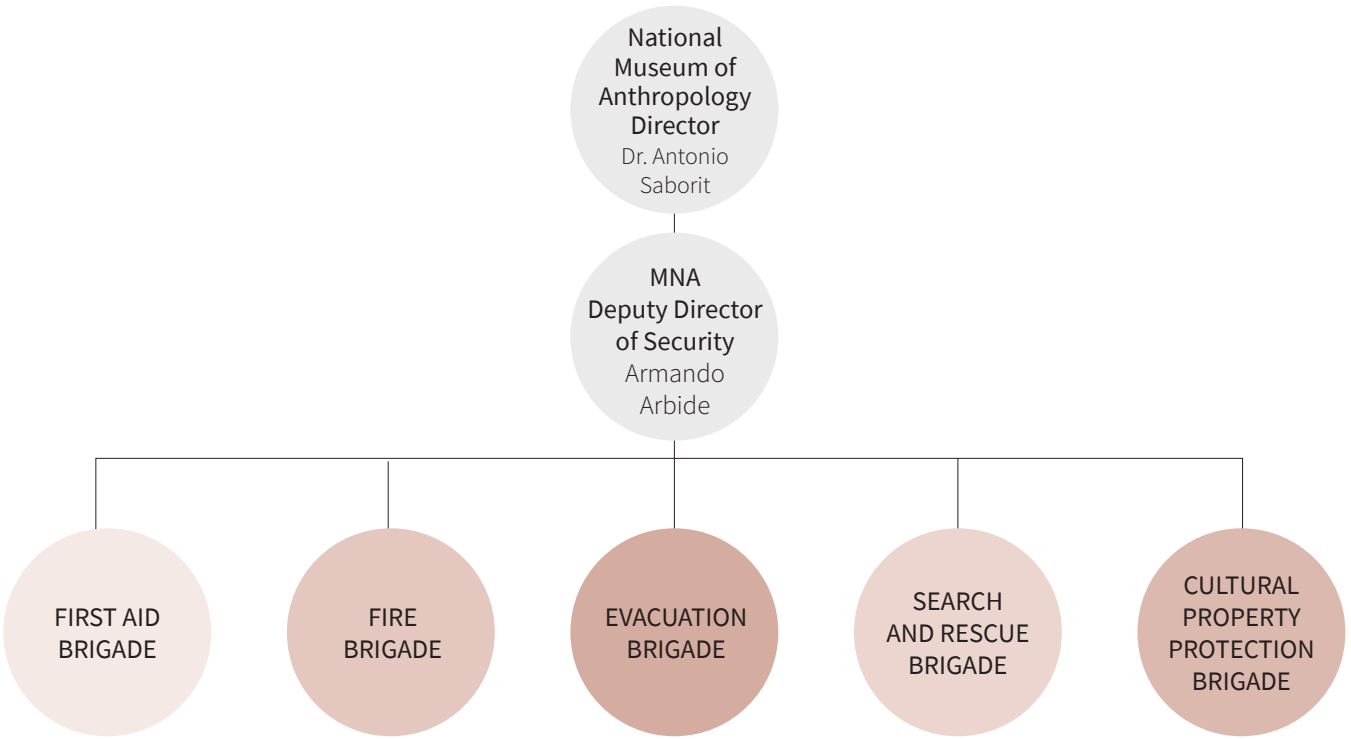
Anthropogenic Protocols	11. Military actions and terrorism	• Foreign attack
		• Domestic attack
		• Terrorism / sabotage
	12. Criminal acts	• Rallies
		• Political meetings
		• Graffiti
		• Vandalism - Intentional destruction of the property/collection
		• Improper behavior of visitors (aggressions, drug use, alcohol consumption)
		• Presence of armed individuals
		• Unregistered entry / intrusion
	13. Theft / Illicit trafficking	• Theft with violence External
		• Theft with violence Internal
		• Theft without violence External
		• Theft without violence Internal
Physical-chemical event protocols	14. Fire	• Arson
		• Accidental fire
	15. Explosions / leaks	• Explosion
		• Toxic leaks or spills/ radiation

Geological-meteorological protocols	16. Duststorms and high winds	• Dust storms
		• Strong winds
	17. Landslides	• Landslide [horizontal]
		• Land subsidence [vertical]
	18. Snow and hailstorms	• Snowfall
		• Hailstorms
Protocols derived from the operation of the CNMA	19. Cumulative risks	• Inadequate relative humidity and temperature
		• Illumination and UV radiation
		• Contaminants
		• Presence of microorganisms [fungi, bacteria, and viruses]
	20. Collection handling and maintenance	• Improper handling of collections
		• Major and minor maintenance work at the CMNA [misuse of facilities].
	21. Loss of paper records and software obsolescence.	• Loss of paper records
		• Obsolescence of collection inventory software
	22. Events and concessioned spaces	• External and internal events
		• Management of concessioned spaces (restaurant, store, parking lot, employee cafeteria)
Accident and breakdown protocols	23. Accidents and breakdowns	• Failure of safety communication, equipment, and systems
		• Failure of safety alert systems
		• Failure of air conditioning system
		• Failure of sanitation/ storm water systems
		• Failure or interruption of electricity, gas and/or water supplies
		• Visitor accidents at the CMNA and its surroundings
		• Staff accidents in the museum and its vicinity

This information was migrated to a software that allows mind mapping and project management, in order to visualize the loads of responsibility of the agents involved, the sequences of actions and the flows linked to decisions. It was also useful for detecting recurrent processes, categorizing types of action, and visualizing the universe of protocols to be developed in a single tool.

After the analysis of hierarchy, ordering ,and assignment of responsible parties, we experimented with different ways of representation based on flow charts, tables in

spreadsheets, long and synthetic texts, and it was decided to adopt an output based on tables created in a word processor that would include, in very specific cases, an introductory text, a table that would summarize the elements necessary to deal with the prevention, care, and reaction phases, and a sequence of 3 tables in which the prevention, care, and reaction processes were represented based on the following columns: category, action, type of action, and responsible parties. This last section was divided into 5 components: brigades, security, areas of the CMNA, authorities and, finally, visitors and external personnel. It is worth mentioning that the protocols for action during the event and during recovery take as their fundamental structure the risk response brigades already in place at the CMNA.



16. Civil Protection and Risk Attention Unit of the CMNA

Tables were also generated to concentrate the agents involved and the types of action. An example of the structure of the tables mentioned above and their use is shown below (Annex 3).

INTRODUCTORY SECTION OF EACH PROTOCOL

Threat Ponderation and Specific Risk						
Cause	**Type of threat**	**Threat**	**Vulnerability factor**	**Elements at risk**	**ABC**	**Risk ponderation**
Description[1]	Description	Description	Quantitative value	Quantitative value	Quantitative value	Quantitative value and color code
Located risk: Created during the identification, analysis, and evaluation phase						

Requirements to Cope Up with Risk	
Category	**Requirements**
Systems	Systems involved in the protocol
Equipment and materials	List of equipment and materials needed to deal with the risk
Property	Necessary modifications to the building
Operation	Action or management criteria
Training	Selection of existing training and identification of training to be included
Documents	Administrative controls, technical studies, identifications, regulatory documents, plans, and necessary signage

STRUCTURE OF THE TABLES FOR PREVENTION, CARE, AND RECOVERY ACTIONS

Preventive Actions / During The Event / Recovery								
Category	Action	Type	Responsibles					
		icon	**Brig**	**Securitye**	**CNMA**	**Aut**	**Ext**	

[1] The gray text indicates the information to be entered for each risk.

The content structure for the tables underwent multiple adjustments throughout the development of the contents, but thanks to the systematization and the use of the different programs employed, it was possible to arrange them as follows.

Preventive actions | **prevention strategies**

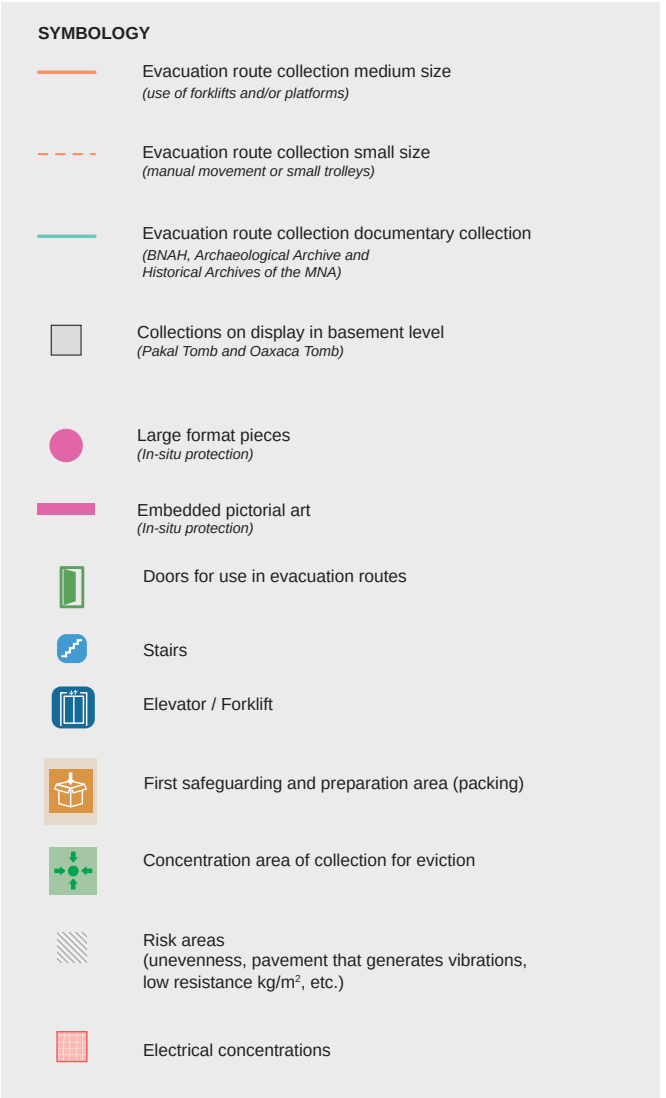
- Programmed actions
- General actions
- Specific actions by risk
- Systems
- Property
- Criteria for civil protection and cultural heritage protection actions
- Documents
- Training

Actions during the event | **attention strategies**

- Detection | Triggering | Initiation | Threat | Perception
- Alarms | Systems
- General Actions
- Assessment and Action Scenarios
- Containment
- Specific Protocols
- Actions related to facilities
- Initiation of general protocols: Return to normality, Recovery, Evacuation.

Post-event actions | **recovery strategies**

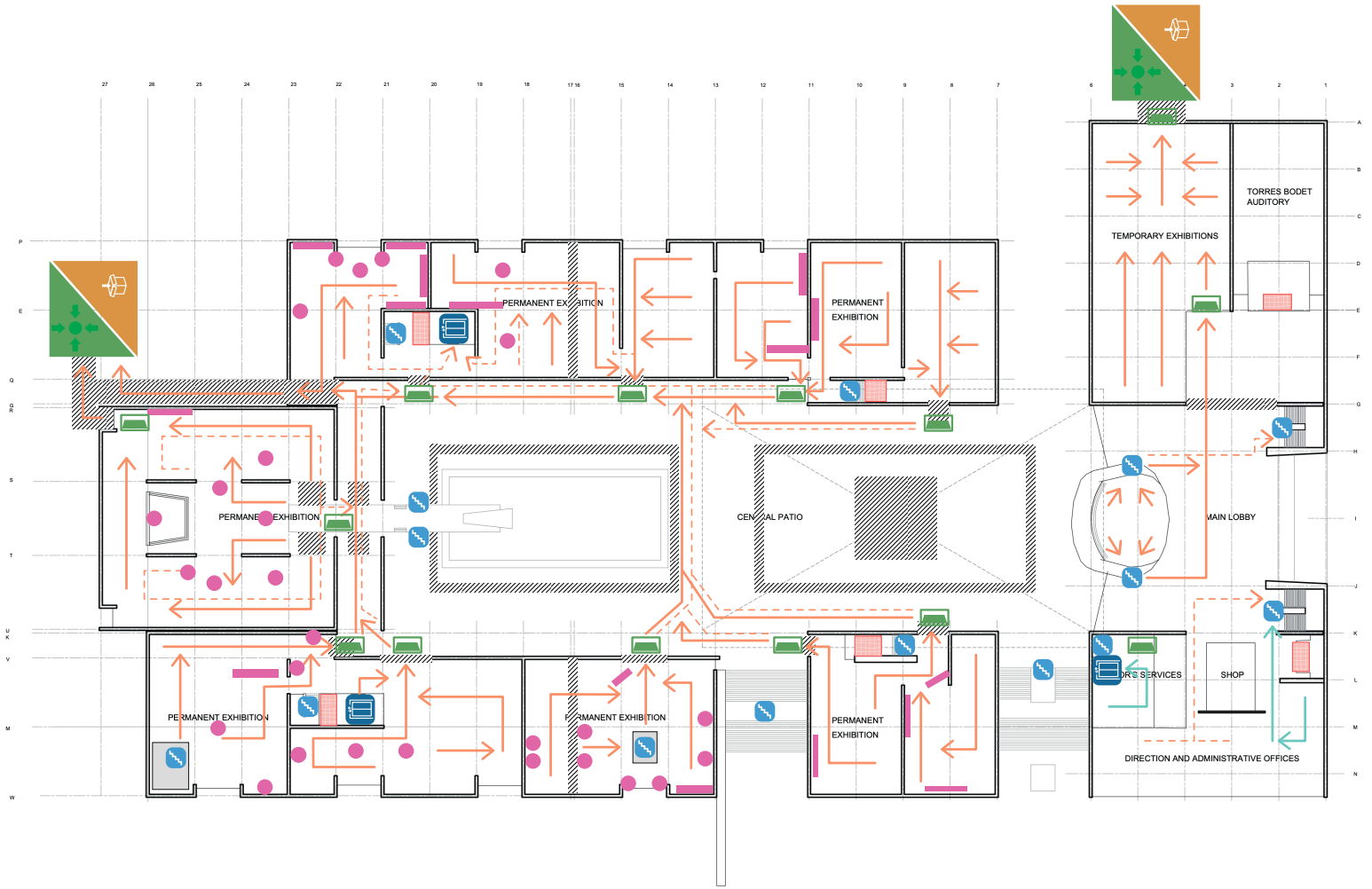
- Inspection
- Specific recovery actions
- Verification
- Reporting
- Evaluation



Symbology of the Collection Evacuation Plan in case of a Threat (next page)

Collection Evacuation Plan in Case of Threal

CMNA - Ground level



17. Collection evacuation protocol graphic. CMNA ground floor plan. Martha Elena Ortíz, 2022

In addition, processes were identified that were repeated throughout multiple risks, so it was decided to establish them as general protocols: Return to Normality, Recovery, Evacuation Protocol, and Evacuation of Cultural Property. Special mention should be made of the fire protocol and the attention to people with wounds or injuries since, in the analysis of concurrence of risks, they are frequently called for as a result of the occurrence of another initial risk.

Finally, due to the diversity and importance of the components necessary for preventive actions, a document was prepared that compiled all the actions identified in order to support the operation of the CMNA. Due to the length of the document, only the identified universe is listed here:

- *Documents*: 9 Administrative controls, 5 Technical studies, 10 Identifications, 9 Regulatory documents, 14 Drawings, 2 Signage projects, and 4 Operational coordination documents.
- *Systems*: Verification of 10 existing systems and the need to incorporate 2 additional systems.
- *Property*: 7 specific actions, identification of 4 essential components in the property, 2 additional measurement systems, 4 verifications in the property, and a new maintenance program.
- *Action criteria related to civil protection*: 4 guidelines for loading and moving collection objects, equipment, and materials, 5 principles applicable to all workers, 6 principles of order in the building, 3 recommendations to personnel, 4 principles for the safekeeping of collection objects, materials, and equipment, and 4 general security principles.
- *Training*: 4 risk-specific trainings, 7 related to collections, 1 to facilities, 1 to maintenance, and one additional related to the presence of organisms.
- *Materials and equipment:* Identificación de necesidades: 3 Environmental control equipment, 3 Packaging material, (14) Assembly equipment, 1 Security equipment, 9 Assembly materials, 3 Furniture, 1 Equipment protection, 6 Building protection, 10 Personal protection, 9 Medical equipment, 1 Reagents, 4 Collection safeguarding material, and 5 Sanitizing material.

The document also integrates recurrent, punctual and specific actions, as well as specific action criteria for the risks analyzed. Annex 5.

6 CONCLUSIONS

a. Participation

From the early stages of this project, the approach adopted by INAH's World Heritage Office was to assume a participatory scheme between a Technical Team made up of experts with direct knowledge of the National Museum of Anthropology and INAH, as well as staff with a certain level of authority working within the CMNA.

Developing a project of this nature only as an external consultancy, in a context in which the institutional culture, the administrative specificities, and the complex network of relationships in which the CMNA is inserted, was destined to a direct failure. On the other hand, the Security Subdirection of the National Museum of Anthropology had already developed a Civil Protection Plan, mandatory by law in Mexico, which covered in a timely and comprehensive manner many of the phenomena that needed to be addressed.

However, the extension of an integral risk management project, the mechanisms to involve the other administrative areas that reside in the same building, and the need to generate methodologies and tools that would allow the identification, analysis, and ponderation, as well as the systematization of prevention, attention, and recovery protocols, required the development of a task that exceeded, by far, the workload of the MNA's own Security Subdirection.

Those who work in a place not only have specific knowledge of the field and its problems, but also know the particular 'ways of doing'; they are steeped in the institutional culture and have a deep understanding of what is possible thanks to valuable practical, technical, and theoretical knowledge. However, workloads, proximity to their field of work, and daily dynamics sometimes inhibit them from proposing connections, solutions, and changes of perspective that allow them to imagine new solutions.

Involving an external Technical Team helped to take a distance from the phenomena and being able to propose an analysis with sufficient critical clarity to make visible what remains in the blind spot of those who are immersed in the daily work. However, the lack of familiarity can also produce proposals that are alien to the feasibility of prevention, care, and response within the capabilities and dynamics of an institution.

Therefore, a scheme proposed from the beginning as an open dialogue, with periodic reviews, continuous and transparent exchange of information, and the flexibility to make modifications, change the frameworks of the analysis, and correct not only specific elements, but also approaches to entire fields within the initial methodological proposals, proved to be a richer solution, closer to reality and with sufficient elements to be able to adapt over time.

b. Building on work already done

For the stages of context analysis and risk identification, as well as the proposals for prevention, attention and recovery, the work developed by institutes, research centers and public organizations in charge of disaster prevention, risk analysis and management, as well as those dedicated to civil protection, has been of invaluable value, not only for the extent and academic rigor of the studies carried out, but also for the vision of presenting disaggregated, verifiable and timely information, which has been indispensable for this Comprehensive Risk Management Plan.

It is also important to recognize and value the work that has been developed from the central instances of INAH, as well as the remarkable work done by the Security Subdirection of the National Museum of Anthropology and the dialogue with the other instances that share the building. One element that should be highlighted is the creation of a Cultural Heritage Brigade, implemented by the Security Subdirection, an exceptional component, since it does not exist in other museums of the INAH Network, and whose relevance could be analyzed for similar museums so that it can be developed to the point of becoming a good practice.

c. Analysis and systematization

Along with the participatory approach, another perspective that was central for us was the need to work based on systematized data. Being able to prioritize, order, and clarify the components on the basis of which the information is constructed was fundamental for the development of this Comprehensive Risk Management Plan.

Tracing the origin and sustaining the references from which the data were constructed allowed a clear analysis of this complexity not only for the World Heritage Office Technical Team, but also for a diverse community in terms of knowledge, practices, and specialties that converge in the CMNA.

The disaggregation of information and the possibility of migrating data between different platforms allowed us to make comparisons, correlations, causalities, detect recurring elements and, above all, to make the representation of this information as clear as possible for end users.

In the daily practice of the CMNA, we know that the elaboration of representations is a form of knowledge, since it demands an exercise of abstraction and, in turn, the translation to other formats, supports, and codes, which must seek clarity in the interpretation developed by the other. For this reason, the goal set by the World Heritage Office Technical Team is not the creation of a document, but the development of a useful and flexible tool that can be feasibly implemented in everyday reality and is appropriate to undergo adjustments over time.

d. Utility

The World Heritage Office Technical Team assumed that a Comprehensive Risk Management Plan should be measurable based on its concrete usefulness, on the appropriation that the personnel working at the CMNA can make of it, and on its capacity to adjust the daily management of a complex space that must continuously adapt to changing circumstances.

- The aim has been to make it easy to read and with terminology suitable for end users.
- The ponderations should be based on shared criteria.
- It was important to use a language around which specialists from the various academic disciplines participating in the CMNA could find meaning.
- The objective of making the processes transparent throughout the various stages was to maintain active dialogue, as well as to jointly build and adapt the methodology and work processes.
- The various components that made it possible to arrive at a final document also provide the capacity to continue deductive and inductive analyses to improve specific proposals and review the general principles of action.

e. Purpose

The analysis and development of comprehensive risk management plans are the result of an analysis of the circumstances, operating conditions, and management principles of a site. To place oneself in the scenario of destruction is also to reflect on what is to be preserved and what is the meaning of what is to be preserved.

In the last phase of the Comprehensive Risk Management Plan for the CMNA, dedicated to the writing the Action Protocols, we paid special attention to prevention measures, which in principle implies that the building and its facilities are in optimal conditions, that the staff is trained in the areas of risk attention, and even that they are integrated to the different brigades of Civil Protection and Risk Attention, already existing in the CMNA, with which they will have the capacity to respond in the necessary cases.

Examples of such actions are the proper maintenance of the various facilities, the constant review of architectural elements, temperature and relative humidity control in the exhibition halls and collection storage rooms, monitoring of people's behavior, updating of protocols and documents, etc. All these are basic and necessary actions to reduce the vulnerability of the building, the collections, and the people of the CMNA.

In the specific case of the National Museum of Anthropology Complex, what is being protected is not only the material components, but the possibility of fulfilling the essential tasks of a cultural entity: researching, preserving, and disseminating a heritage in which there are ways of seeing, feeling, thinking, and experiencing the world and, above all, what we can rely on to face the problems of the present, a model for the worlds we want to inhabit.

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7
ANNEXES

ANNEX 1: PONDERATION OF THE FREQUENCY AND LEVEL OF IMPACT ON EXPOSED ELEMENTS

A		B					
Frecuency[1]	**#_F**	**Impact level [Collection][2]**	**#_V_C**	**Impact level [people][3]**	**#_V_P**	**Impact level [Property][4]**	**#_V_I**
Several times a year	10	Total destruction	10	Death	10	Total loss / Total collapse of the property	10
Once per year	9	Total loss, with sufficient documentation for reconstruction. Susceptible to “virtual” reconstruction.	9	Incompatible with survival Critical “little chance even with adequate treatment”.	9	Partial collapse of the complex, appearance of cracks and fractures in the structure	9
3 years	8	Loss or vulnerability of more than 50% of the asset, with sufficient documentation to make a sufficient to make a reintegration	8	Critical "little chance even with proper treatment adequate"	8	Appearance of cracks and/or fractures without risk of collapse in structural elements.	8
6 years	7	Loss or vulnerability of less than 50% of the heritage object, with the possibility of restoration and reintegration.	7	Serious with vital risk	7	Appearance of cracks without damage to structural elements, total collapse of parts in coverings	7
12 years	6	Deterioration of more than 50% of the heritage object, with sufficient documentation for its restoration.	6	Serious but not life threatening	6	Appearance of cracks and partial collapse of coverings (flattened, soffits, stone coverings, tiles).	6
24 years	5	Deterioration of less than 50% of the heritage object, feasible to restore based on the evidence present in the object.	5	Serious	5	Damage to installations leading to loss of functionality of the network or system.	5

[1] Díaz Fuentes, 2016.
[2] Pedersoli, Antomarchi y Michalski, 2017.
[3] *Injury Severity* Score (ISS), en <https://www.mdcalc.com/injury-severity-score-iss>, recuperado el 04 de agosto de 2021.
[4] CENAPRED, 2016.

A		B					
Frecuency[1]	**#_F**	**Impact level [Collection][2]**	**#_V_C**	**Impact level [people][3]**	**#_V_P**	**Impact level [Property][4]**	**#_V_I**
30 years	4	Deterioration of more than 50% of the heritage property that does not jeopardize the stability of the object, and its conservation treatment is feasible without the need for restoration.	4	Moderate to serious	4	Damage to installations that allows for the continued operation of up to 50% of the network or system. Obstruction of the supply	4
60 years	3	Cumulative deterioration that is not reversible, that can risk the stability of the object, conservation treatments are applied to stop the deterioration. Extreme actions such as shelter away from light sources, freezing, etc.	3	Moderada	3	Minor damage to facilities that do not represent an interruption of service.	3
90 years	2	Reversible/controllable cumulative deterioration. Preventive conservation actions such as collection rotation, control of environmental conditions, removal of exhibits - replicas.	2	Minor	2	Partial damage or misalignment of architectural complements such as windows, doors, window frames and non-structural walls.	2
120 years	1	Displacement without affecting the heritage object	1	Superficial injury “Scratch”.	1	Reversible cumulative deterioration / Controllable through periodic preventive maintenance	1
150 years or more	0	No impact	0	No harm	0	No damage	0

#_F: Ponderation of the possibility or recurrence
#_V_C: Ponderation/assessment of impact on collections
#_V_P: Ponderation/assessment of impact on people
#_V_I: Ponderation/assessment of impact on the property

ANNEX 2: ARCHITECTURAL PROGRAM OF THE NATIONAL MUSEUM OF ANTHROPOLOGY COMPLEX

Space	Area (m^2)	Location	Level	Building / Zone	Adscription	Responsible	Designated Area	Category	Primary users	Secondary users
Lobby	1,355.00	Property	Ground floor	Government	MNA	Common areas and shared services		Public	Visitors	
Lockers	26.00	Property	Ground floor	Government	MNA	Administrative Sub.	Human Resources	Services	Visitors	
Orientation Room (includes spectator area and displays)	350.00	Property	Ground floor / Basement	Government	MNA	Technical Sub.	Cultural Promotion	Public	Visitors	School Groups
Media Luna (exhibition space and terrace)	340.00	Property	Ground floor	Government	MNA	Common areas and shared services		Public	Visitors	
Restrooms (Torres Bodet and lobby)	113.00	Property	Ground floor	Government	MNA	Administrative Sub.	General Services	Services	Visitors	MNA Staff
Financial Resources	33.00	Property	Ground floor	Government	MNA	Administrative Sub.	Financial Resources	Offices	MNA Staff	Suppliers
Cultural Tours	26.00	Property	Ground floor	Government	MNA	INAH	Site Operations	Offices	INAH Staff	Visitors
Copy room - Administration	4.00	Property	Ground floor	Government	MNA	Administrative Sub.		Offices	MNA Staff	
Historical Archives	55.00	Property	Ground floor	Government	MNA	Direction	Historical Archives	Collections	Researchers	
Cultural Promotion (offices and guide area)	100.00	Property	Ground floor	Government	MNA	Technical Sub.	Cultural Promotion	Offices	MNA Staff	Suppliers
Technical Subdirection	50.00	Property	Ground floor	Government	MNA	Technical Sub.		Offices	MNA Staff	
Administrative Subdirection	50.00	Property	Ground floor	Government	MNA	Administrative Sub.		Offices	MNA Staff	

Space	Area (m^2)	Location	Level	Building / Zone	Adscription	Responsible	Designated Area	Category	Primary users	Secondary users
Management (including Board Room)	235.00	Property	Ground floor	Government	MNA	Direction		Offices	MNA staff	
Web page	10.00	Property	Ground floor	Government	MNA	Direction	Website	Offices	MNA	
Digitalization	43.00	Property	Ground floor	Government	MNA	Direction	Digitization	Offices	MNA staff	
MNA Store	140.00	Property	Ground floor	Government	MNA	MNA Board of Trustees		Public	Visitors	
Board of Trustees	17.00	Property	Ground floor	Government	MNA	MNA Board of Trustees		Offices	PMNA staff	Suppliers
Cloak Room	45.00	Property	Ground floor	Government	MNA	Security and Safeguarding Sub.		Services	Visitors	
BNAH Collection (N. PB)	230.00	Property	Ground floor	Government	BNAH	BNAH	BNAH	Collections	Researchers	
Jaime Torres Bodet Auditorium Lobby	525.00	Property	Ground floor	Government	MNA	Common areas and shared services		Public	Visitors	Visitors per event
Jaime Torres Bodet Auditorium (includes stage areas and sound booth)	670.00	Property	Ground floor	Government	MNA	Technical Sub.	Cultural Promotion	Public	Visitors	Visitors per event
International Exhibition Hall	1,440.00	Property	Ground floor	Government	MNA	INAH	National Coordination of Museums and Exhibitions	Public	Visitors	
Electrical Concentration - Lobby	7.00	Property	Ground floor	Gobierno	MNA	Administrative Sub.	General Services	Restricted Area	Maintenance	

Space	Area (m^2)	Location	Level	Building / Zone	Adscription	Responsible	Designated Area	Category	Primary users	Secondary users
Central Courtyard (Pond and Umbrella)	6,650.00	Property	Ground floor	Central Patio	MNA	Common areas and shared services		Public	Visitors	
Hall A1	609.00	Property	Ground floor	North Building	MNA	Direction		Public	Visitors	
Electrical Concentration A1	34.00	Property	Ground floor	North Building	MNA	Administrative Sub.	General Services	Restricted Area	Maintenance	
American Settlement Hall	1,026.00	Property	Ground floor	North building	MNA	Archaeology Sub.		Public	Visitors	
Preclassic Hall - Central High Plateau	513.00	Property	Ground floor	North building	MNA	Archaeology Sub.		Public	Visitors	
Teotihuacan Hall	930.00	Property	Ground floor	North building	MNA	Archaeology Sub.		Public	Visitors	
Toltec Hall	650.00	Property	Ground floor	North building	MNA	Archaeology Sub.		Public	Visitors	
Restrooms (Toltecs)	65.00	Property	Ground floor	North building	MNA	Administrative Sub.	General Services	Services	Visitors	
Electrical Concentration - Toltecs	20.00	Property	Ground floor	North Building	MNA	Administrative Sub.	General Services	Restricted Area	Maintenance	
Mexica Hall (includes front hallway)	2,540.00	Property	Ground floor	Mexica Building	MNA	Archaeology Sub.		Public	Visitors	
Cultures of Oaxaca Hall (includes tomb)	940.00	Property	Ground floor	South Building	MNA	Archaeology Sub.		Public	Visitors	
Restrooms (Oaxaca)	65.00	Property	Ground floor	South Building	MNA	Administrative Sub.	General Services	Services	Visitors	
Gulf Cultures Hall	1,040.00	Property	Ground floor	South Building	MNA	Archaeology Sub.		Public	Visitors	
Oaxaca Electrical Concentration	18.00	Property	Ground floor	South Building	MNA	Administrative Sub.	General Services	Restricted Area	Maintenance	

Space	Area (m^2)	Location	Level	Building / Zone	Adscription	Responsible	Designated Area	Category	Primary users	Secondary users
Warehouse for cleaning materials (paper)	22.00	Property	Ground floor	South Building	MNA	Administrative Sub.	General Services	Restricted Area	Maintenance	
Mayan Hall (Includes Pakal's Tomb and projection area)	1,385.00	Property	Ground floor	South Building	MNA	Archaeology Sub.		Public	Visitors	
Northern Cultures Hall	543.00	Property	Ground floor	South Building	MNA	Archaeology Sub.		Public	Visitors	
Western Cultures Hall	595.00	Property	Ground floor	South Building	MNA	Archaeology Sub.		Public	Visitors	
North Electrical Concentration	42.00	Property	Ground floor	South Building	MNA	Administrative Sub.	General Services	Restricted area	Maintenance	
Nahua Hall	94.00	Property	Ground floor	South Building	MNA	Sub. Ethnography		Public	Visitors	
Nahua Electrical Concentration	28.00	Property	Ground floor	South Building	MNA	Administrative Sub.	General Services	Restricted Area	Maintenance	
Northeastern Mexico Hall	390.00	Property	Ground floor	South Building	MNA	Sub. Ethnography		Public	Visitors	
Maya Hall (Ethnography)	680.00	Property	Ground floor	South Building	MNA	Sub. Ethnography		Public	Visitors	
Totonacos and Huastecos Hall	385.00	Property	Ground floor	South Building	MNA	Ethnography Sub.		Public	Visitors	
Restrooms (Oaxaca ethnography)	55.00	Inmueble	Upper floor	South Building	MNA	Administrative Sub.	General Services	Services	Visitors	
Oaxaca Ethnography Electrical Concentration	18.00	Property	Upper floor	South Building	MNA	Administrative Sub.	General services	Restricted area	Maintenance	
Oaxaca Ethnography Hall	790.00	Property	Upper floor	South Building	MNA	Ethnography Sub.		Public	Visitors	
Mexica Terrace	367.00	Property	Upper floor	Mexica Building	MNA	Common areas and shared services		Public	Visitors	

Space	Area (m^2)	Location	Level	Building / Zone	Adscription	Responsible	Designated Area	Category	Primary users	Secondary users
Mexica Electrical Concentration	45.00	Property	Upper floor	North Building	MNA	Administrative Sub.	General services	Restricted Area	Maintenance	
Sierra de Puebla Hall	250.00	Property	Upper floor	North Building	MNA	Ethnography Sub.		Public	Visitors	
Electrical concentration Sierra de Puebla	20.00	Property	Upper floor	North Building	MNA	Administrative Sub.	General services	Restricted Area	Maintenance	
Restrooms (Sierra de Puebla)	55.00	Property	Upper floor	North Building	MNA	Administrative Sub.	General services	Services	Visitors	
Otopames Hall	256.00	Property	Upper floor	North Building	MNA	Ethnography Sub.		Public	Visitors	
Purépecha Hall	380.00	Property	Upper floor	North Building	MNA	Ethnography Sub.		Public	Visitors	
Cora-Huichol Hall	475.00	Property	Upper floor	North Building	MNA	Sub. Ethnography		Public	Visitors	
Introduction to Ethnography Hall	335.00	Property	Upper floor	North Building	MNA	Sub. Ethnography		Public	Visitors	
Electrical Concentration Introduction to Ethnography	10.00	Property	Upper floor	North Building	MNA	Administrative Sub.	General services	Restricted Area	Maintenance	
Library lobby	200.00	Property	Upper floor	Government	BNAH	BNAH		Public	Researchers	Visitors
Library counter	10.00	Property	Upper floor	Government	BNAH	BNAH		Services	Researchers	
General library services	35.00	Property	Upper floor	Government	BNAH	BNAH		Services	Researchers	
Library technical processes	18.00	Property	Upper floor	Government	BNAH	BNAH		Offices	BNAH Staff	
Library offices and cubicles	18.00	Property	Upper floor	Government	BNAH	BNAH		Offices	BNAH Staff	

Space	Area (m^2)	Location	Level	Building / Zone	Adscription	Responsible	Designated Area	Category	Primary users	Secondary users
BNAH management	70.00	Property	Upper floor	Government	BNAH	BNAH		Offices	BNAH Staff	
Library consultation area	60.00	Property	Upper floor	Government	BNAH	BNAH		Public	Researchers	
BNAH Collection (Upper floor)	60.00	Property	Upper floor	Government	BNAH	BNAH		Collections	Researchers	
Restrooms (Library)	45.00	Property	Upper floor	Government	BNAH	BNAH		Services	Researchers	BNAH Staff
General bibliographic archive - BNAH	60.00	Property	Upper floor	Government	BNAH	BNAH		Collections	Researchers	
Electrical concentration - Library	7.00	Property	Upper floor	Government	MNA	Administrative Sub.	General services	Restricted Area	Maintenance	
Second floor gallery	120.00	Property	Upper floor	Government	MNA	Common areas and shared services		Public	Visitors	
Historical Newspaper Library	30.00	Property	Upper floor	Government	BNAH	BNAH	BNAH	Collections	Researchers	
Microfilm - BNAH	10.00	Property	Upper floor	Government	BNAH	BNAH	BNAH	Collections	Researchers	
Restrooms (Linguistics)	80.00	Property	Upper floor	Government	MNA	Administrative Sub.	General services	Services	CNA Staff	Visitors per event
Fray Bernardino de Sahagún Auditorium (includes booth)	170.00	Property	Upper floor	Government	MNA	Technical Sub.	Cultural promotion	Public	Visitors	Visitors per event
Researchers' offices - Ethnohistory and Linguistics	673.00	Property	Upper floor	Government	DAF	DET / DLI		Offices	CNA Staff	
Physical Anthropology Offices	63.00	Property	Upper floor	Government	DAF	DAF		Offices	CNA Staff	

Space	Area (m^2)	Location	Level	Building / Zone	Adscription	Responsible	Designated Area	Category	Primary users	Secondary users
Linguistics courtyard (velaria)	452.00	Property	Upper floor	Government	MNA	Common areas and shared services		Public	CNA Staff	
Fray Bernardino de Sahagún Auditorium Lobby	220.00	Property	Upper floor	Government	MNA	Technical Sub.	Cultural promotion	Public	Visitors	Visitors per event
Restaurant (including warehouse, kitchen, and dining areas)	1,240.00	Property	Basement	South Building	MNA	Concession		Services	Visitors	MNA Staff
Educative Services Offices	150.00	Property	Basement	Government	MNA	Technical Sub.	Educative Services	Offices	MNA Staff	
Educative Services Workshops	527.00	Property	Basement	Government	MNA	Technical Sub.	Educative Services	Public	School groups	
Playroom	23.00	Property	Basement	Government	MNA	Technical Sub.	Educative Services	Public	School groups	
Educative Services materials warehouse	28.00	Property	Basement	Government	MNA	Technical Sub.	Educative Services	Warehouses	MNA Staff	
Educative Services cloakroom	10.00	Property	Basement	Government	MNA	Technical Sub.	Educative Services	Services	School groups	
Restrooms (Educative Services)	42.00	Property	Basement	Government	MNA	Technical Sub.	Educative Services	Services	School groups	MNA Staff
Tláloc Auditorium (including booth)	135.00	Property	Basement	Government	MNA	Technical Sub.	Educative Services	Public	School groups	Visitors per event
Electrical Concentration - Educative Services	30.00	Property	Basement	Government	MNA	Administrative Sub.	General Services	Restricted Area	Maintenance	
BNAH Collection (Basement)	340.00	Property	Basement	Government	BNAH	BNAH		Collections	Researchers	

Space	Area (m^2)	Location	Level	Building / Zone	Adscription	Responsible	Designated Area	Category	Primary users	Secondary users
Direction of the Board of Trustees of the MNA	24.00	Property	Basement	Government	MNA	MNA Board of Trustees		Workshops	PMNA Staff	
Warehouse of the MNA Board of Trustees	16.00	Property	Basement	Government	MNA	MNA Board of Trustees		Warehouses	PMNA Staff	
Computer warehouse	8.00	Property	Basement	Government	MNA	Technical Sub.	Informatics	Wasrehouses	MNA Staff	
Restoration of documents (Historical Archives)	85.00	Property	Basement	Government	MNA	Direction	Historical Archives	Workshops	MNA Staff	
Eternal Bodies (DAF mummies)	55.00	Property	Basement	Government	DAF	DAF		Collection	CNA Staff	
BNAH Storage Room	37.00	Property	Basement	Government	BNAH	Sub. Documentation BNAH		Collection	BNAH Staff	
Machine room - Orientation room	253.00	Property	Basement	Government	MNA	Technical Sub.	Cultural Promotion	Restricted Area	Maintenance	
Cleaning warehouse - BNAH	28.00	Property	Basement	Government	BNAH	Administrative Services BNAH		Warehouses	BNAH Staff	
Custodians	25.00	Property	Basement	Government	MNA	Administrative Sub.		Workshops	MNA Staff	
Archaeology Storage Room	20.00	Property	Basement	Government	MNA	Archaeology Sub.		Collections	MNA Staff	
Archive and Archaeology Technical Council	563.00	Property	Basement	Government	INAH	National Coordination of Archaeology		Collection		
Glass warehouse	125.00	Property	Basement	Government	MNA	Administrative Sub.	General Services	Warehouses	MNA Staff	

Space	Area (m^2)	Location	Level	Building / Zone	Adscription	Responsible	Designated Area	Category	Primary users	Secondary users
Data Center (includes air conditioning system rooms)	45.00	Property	Basement	Government	MNA	Technical Sub.	Informatics	Restricted area	MNA Staff	Maintenance
Audio and video warehouse	15.00	Property	Basement	Government	MNA	Administrative Sub.	General Services	Warehouses	MNA Staff	
Audio and video concentration	10.00	Property	Basement	Government	MNA	Administrative Sub.	General Services	Offices	MNA Staff	
Inventory warehouse 1	20.00	Property	Basement	Government	MNA	Administrative Sub.	Inventories	Warehouses	MNA Staff	
Photographic workshop (developing) - Museography	40.00	Property	Basement	Government	MNA	Museography Sub.		Workshops	MNA Staff	
Control desk	7.00	Property	Basement	Government	MNA	Security and Safety Sub.		Services	MNA Staff	Visitors / Suppliers
Informatics	57.00	Property	Basement	Government	MNA	Technical Sub.	Informatics	Offices	MNA Staff	
Union Local - Union (formerly D323)	60.00	Property	Basement	Government	MNA	Administrative Sub.	Sindicato de trabajadores	Offices	MNA Staff	
Human Resources	63.00	Property	Basement	Government	MNA	Administrative Sub.	Recursos Humanos	Offices	MNA Staff	
Movement of Collections	47.00	Property	Basement	Government	MNA	Archaeology Sub.	Movimiento de Colecciones	Offices	MNA Staff	
Archaeology Subdirectorate (includes researchers' offices and meeting room)	425.00	Property	Basement	Government	MNA	Archaeology Sub.		Offices	MNA Staff	
Archaeology Vault	16.00	Property	Basement	Government	MNA	Archaeology Sub.	Movement of Collections	Collections	MNA Staff	

Space	Area (m^2)	Location	Level	Building / Zone	Adscription	Responsible	Designated Area	Category	Primary users	Secondary users
Lithic and ceramoteca storage room	75.00	Property	Basement	Government	MNA	Technical Sub.	Archaeology	Collections	MNA Staff	
DAF Library	30.00	Property	Basement	Government	DAF	DAF		Collections	Researchers	
Carpentry workshop	367.00	Property	Basement	Government	MNA	Museography Sub.		Workshops	MNA Staff	
Museography workshop	195.00	Property	Basement	Government	MNA	Museography Sub.		Workshops	MNA Staff	
Graphic design workshop	143.00	Property	Basement	Government	MNA	Museography Sub.		Workshops	MNA Staff	
Subdirection of Museography (including secretarial area)	58.00	Property	Basement	Government	MNA	Museography Sub.		Offices	MNA Staff	
Museum maintenance workshop	108.00	Property	Basement	Government	MNA	Museography Sub.	Museographic maintenance	Workshops	MNA Staff	
Electricity workshop	40.00	Property	Basement	Government	MNA	Museography Sub.		Workshops	MNA staff	
Security warehouse 1	12.00	Property	Basement	Government	MNA	Security and Safety Sub.		Warehouses	MNA staff	
Restrooms (Museography)	50.00	Property	Basement	Government	MNA	Administrative Sub.	General Services	Services	MNA staff	
UPS Informatics - Museography	40.00	Property	Basement	Government	MNA	Technical Sub.	Informatics	Restricted area	MNA Staff	Maintenance
Physical Anthropology	214.00	Property	Basement	Government / North Building	DAF	DAF		Offices	CNA Staff	

Space	Area (m^2)	Location	Level	Building / Zone	Adscription	Responsible	Designated Area	Category	Primary users	Secondary users
Restrooms (Basement) - With showers and dressing rooms	115.00	Property	Basement	North Building	MNA	Administrative Sub.	General Services	Services	MNA Staff	DAF staff, all in general
Ethnography Subdirection (includes researchers' offices and meeting room)	245.00	Property	Basement	North Building	MNA	Ethnography Sub.		Offices	MNA Staff	
Photographic archive of Ethnography	12.00	Property	Basement	North Building	MNA	Ethnography Sub.		Offices	MNA Staff	
Medical office	16.00	Property	Basement	North Building	MNA	Administrative Sub.		Services	MNA Staff	Visitors
Stone storage room	45.00	Property	Basement	North Building	MNA	Archaeology Sub.	Collection Movement	Collections	MNA Staff	
Concentration of masonry	72.00	Property	Basement	North Building	MNA	Administrative Sub.	General Services	Workshops	MNA Staff	
Osteoteca (human bones collection)	175.00	Property	Basement	North Building	DAF	DAF		Collections	CNA Staff	
General services	85.00	Property	Basement	North Building	MNA	Administrative Sub.	General Services	Offices	MNA Staff	Suppliers
Janitorial concentration (includes locker area)	26.00	Property	Basement	North Building	MNA	Administrative Sub.	General Services	Offices	MNA Staff	
Employee dining room	103.00	Property	Basement	North Building	MNA	Administrative Sub.		Services	MNA Staff	
Auxiliary police locker room	26.00	Property	Basement	North Building	MNA	Security and Safety Sub.		Services	MNA Staff	

Space	Area (m^2)	Location	Level	Building / Zone	Adscription	Responsible	Designated Area	Category	Primary users	Secondary users
Concentration of scales	20.00	Property	Basement	North Building	MNA	Administrative Sub.	General Services	Restricted Area	Maintenance	
General Services Warehouse	25.00	Property	Basement	North Building	MNA	Administrative Sub.	General Services	Warehouses	MNA Staff	
Archeology Storage room	1,225.00	Property	Basement	North Building	MNA	Archeology Sub.	Collection Movement	Collections	MNA Staff	
Warehouse	130.00	Property	Basement	North Building	MNA	Administrative Sub.	Warehouse	Warehouses	MNA Staff	
Inventories	30.00	Property	Basement	North Building	MNA	Administrative Sub.	Inventories	Offices	MNA Staff	
Grenadiers	5.00	Property	Basement	North Building	MNA	Security and Safety Sub.		Offices	MNA Staff	
Fireman	5.00	Property	Basement	North Building	MNA	Security and Safety Sub.		Offices	MNA Staff	
Security	118.00	Property	Basement	North Building	MNA	Security and Safeguarding Sub.		Offices	MNA Staff	
Restrooms (Security)	25.00	Property	Basement	North Building	MNA	Security and Safeguarding Sub.		Services	MNA Staff	
Ethnography Storage room	835.00	Property	Basement	North Building	MNA	Ethnography Sub.		Collections	MNA Staff	
Access esplanade	3,800.00	External areas	Ground level	East zone	MNA	Security and Safeguarding Sub.		Public	Visitors	
Lockers for visitors	320.00	External areas	Basement	East zone	MNA	Administrative Sub.	Human Resources	Services	Visitors	
Front gardens	6,435.00	External areas	Ground level	East zone	MNA	Security and Safeguarding Sub.		Public		

Space	Area (m^2)	Location	Level	Building / Zone	Adscription	Responsible	Designated Area	Category	Primary users	Secondary users
Maneuvering yard - Mile 1	675.00	External areas	Ground level	North zone	MNA	Common areas and shared services		Restricted Area	CNME Staff	
Chillers Area - International Exhibitions	170.00	External areas	Ground level	North zone	MNA	INAH	National Coordination of Museums and Exhibitions	Restricted Area		
Turtle stand	1,500.00	External areas	Ground level	North zone	MNA	Common areas and shared services		Public	MNA Staff	
Restoration Laboratory (booths)	125.00	External areas	Ground level	North zone	MNA	Technical Sub.	Restoration	Workshops	MNA Staff	
Democratic Union	24.00	External areas	Ground level	North zone	MNA	Administrative Sub.	Workers Union	Offices	MNA Staff	
Electrical substation (including maintenance concentration)	775.00	External areas	Basement	North zone	MNA	Administrative Sub.	General Services	Restricted Area	Maintenance	
Paint, varnish, and plastics workshop	190.00	External areas	Basement	North zone	MNA	Museography Sub.		Workshops	MNA Staff	
Blacksmith shop	90.00	External areas	Basement	North zone	MNA	Museography Sub.		Workshops	MNA Staff	
INAH gardening concentration	75.00	External areas	Ground level	North zone	MNA	Administrative Sub.	General Services	Workshops	MNA Staff	
Organic waste deposit (exterior gardens)	40.00	External areas	Ground level	North zone	MNA	Administrative Sub.	General Services	Services	MNA Staff	
Maneuvering yard - Mile 2	940.00	External areas	Basement	North zone	MNA	Common areas and shared services		Services	MNA Staff	Suppliers

Space	Area (m^2)	Location	Level	Building / Zone	Adscription	Responsible	Designated Area	Category	Primary users	Secondary users
Inorganic waste deposit	30.00	External areas	Basement	North zone	MNA	Administrative Sub.	General Services	Services	MNA Staff	
Mile 2 booth (includes staff lunchroom)	36.00	External areas	Ground level	North zone	MNA	Security and Safety Sub.		Services	MNA Staff	Suppliers
Gardens of the North Building	2,530.00	External areas	Ground level	North zone	MNA	Archeology Sub.		Public	Visitors	
Ball Game Reproduction	780.00	External areas	Ground level	West zone	MNA	Archaeology Sub.		Public	Visitors	
Maneuvering yard - Mile 3	620.00	External areas	Ground level	West zone	MNA	Common areas and shared services		Services	MNA Staff	Suppliers
Cleaning materials warehouse (liquids)	40.00	External areas	Ground level	West zone	MNA	Administrative Sub.	General Services	Collections	MNA Staff	
Mexica Hall Garden	1,300.00	External areas	Ground level	West zone	MNA	Archaeology Sub.		Public	Visitors	
Concentration of external gardening	24.00	External areas	Ground level	West zone	MNA	Administrative Sub.	General Services	Collections	MNA Staff	
Restrooms (elevated tank)	27.00	External areas	Ground level	West zone	MNA	Administrative Sub.	General Services	Services	MNA Staff	Suppliers
Museography warehouse - Elevated tank	90.00	External areas	Ground level	West zone	MNA	Museography Sub.		Warehouses	MNA Staff	
Museography warehouse - Mile 3	50.00	External areas	Ground level	West zone	MNA	Museography Sub.		Warehouses	MNA Staff	
Inventory warehouse - Elevated tank	45.00	External areas	Ground level	West zone	MNA	Administrative Sub.	Inventories	Warehouses	MNA Staff	
Warehouse for cleaning materials (rigging)	45.00	External areas	Ground level	West zone	MNA	Administrative Sub.	General Services	Warehouses	MNA Staff	

Space	Area (m^2)	Location	Level	Building / Zone	Adscription	Responsible	Designated Area	Category	Primary users	Secondary users
Electrical concentration - Elevated tank	10.00	External areas	Ground level	West zone	MNA	Administrative Sub.	General Services	Restricted Area	Maintenance	
Hydraulic concentration	10.00	External areas	Ground level	West zone	MNA	Administrative Sub.	General Services	Restricted Area	Maintenance	
Debris type garbage warehouse	40.00	External areas	Ground level	West zone	MNA	Administrative Sub.	General Services	Services	MNA Staff	
Organic waste warehouse (interior gardens)	40.00	External areas	Ground level	West zone	MNA	Administrative Sub.	General Services	Services	MNA Staff	
Gardens in the South Building	3,630.00	External areas	Ground level	South zone	MNA	Archeology Sub.		Public	Visitors	
Botanical garden	2,275.00	External areas	Ground level	South zone	MNA	Administrative Sub.	General Services	Public	Visitors	
Terrace Restaurant	280.00	External areas	Basement	South zone	MNA	Concession		Services	Visitors	
Educative Services Theater	100.00	External areas	Basement	South zone	MNA	Technical Sub.	Educative Services	Public	School groups	
Educative Services Warehouse (theater)	8.00	External areas	Basement	South zone	MNA	Technical Sub.	Educative Services	Warehouses	MNA Staff	
Pink esplanade (merchants)	3,060.00	External areas	Ground level	East zone	MNA	Common areas and shared services		Public	Visitors	External merchants
Parking lot A	4,126.12	External areas	Ground level	East zone	MNA	Concession		Public	Visitors	MNA Staff
Parking lot B	6,046.03	External areas	Ground level	North zone	MNA	Concession		Public	Visitors	MNA Staff

General notes to consider when reading of the architectural program:

1. The restrooms area includes the plumbing ducts.
2. The garbage containers are only defined spaces, they do not constitute a building, they are all open air.
3. All areas of the CMNA are guarded by the Security and Safeguarding of the Cultural Heritage Subdirection, and the maintenance (cleaning, maintenance, and gardening services) is the responsibility of the General Services Department.
4. Some garden areas are being reconditioned, and we have sought to create a complementary script with the native flora of each corresponding archaeological region, of each hall. As for the botanical garden, its extension could grow to garden areas without a defined theme.
5. The gardens of the rooms may contain some replicas of archaeological objects and tombs linked to the cultures of the archaeological and ethnographic halls.
5. The assigned area field remains blank when the same direction or Subdirection oversees the space in question.

ANNEX 3. GUIDE TABLE WITH AGENTS LINKED TO RISK PROTOCOLS AND TABLE WITH TYPOLOGY OF ACTIONS

Brigades	Brig	Security	Seg	CMNA Areas	CNMA	Authorities	Aut	External	Ext
Fire Brigade	Inc	Auxiliary Police CDMX	P.A.	Security Subdirection	S_Seg	National Museum of Anthropology Direction	MNA	Visitors and third parties	Pub
Search and rescue brigade	Pat	Security personnel	Seg	Administrative Subdirection, BNAH, DAF and CNA administration.	S_Adm	National Library of Anthropology and History Direction	BNAH	Suppliers and service providers	P_Ps
Evacuation brigade	ByR	Resident Firefighter	B-R	Subdirection of Dissemination	S_Dif	Physical Anthropology Direction	DAF		
First aid brigade	Aux	Central Tacuba Firefighters	B -T	Subdirection of Archaeology	S_Arq	National Coordination of Anthropology	CN_A		
Patrimonial brigade	Eva	On-duty doctor	Med	Subdirection of Ethnography	S_Etn	National Coordination of Historical Monuments	CNMH		
		Special systems	Sist	Technical Subdirection: MNA, BNAH, DAF and CNA	S_Tec	National Coordination of Works and Projects	CNOP		
		Public Prosecutor's Office	MP.	Research: BNAH, DAF and CNA	Inv	National Coordination of Museums and Exhibitions	CNME		
		National Guard, Ministry of National Defense, Ministry of the Navy	GN SEDENA SEMAR	Museography	Mgraf	National Coordination of Legal Affairs	CNAJ		
				Restoration and Conservation: MNA, BNAH, DAF and CNA	Cons	National Coordination of Material Resources	CNRM		
				General Services	S Gen	General Direction of INAH	DG		
				Cleaning	Limp				
				Maintenance	Mant				
				Informatics Department	TecC				
				Collections: MNA, BNAH, DAF and CNAntropología	Colec				
				All CNMA staff	Todos				

ANNEX 4. ACTION PROTOCOLS. SYMBOLOGY

TYPE OF ACTION	ICONS
Document	
Action	
Acquisition of material / equipment	
Decision	
Affirmative	
Negative	
Alarm	
Communication	
Reception of communication	
Scheduled and recurrent action	
Action criteria	
Specific protocol	
Action executed by systems	

ANNEX 5. EXAMPLES OF PROTOCOLS FOR RISK MANAGEMENT

COMPREHENSIVE RISK MANAGEMENT PLAN FOR THE NATIONAL MUSEUM OF ANTHROPOLOGY COMPLEXA

A. Earthquake Protocol

When an earthquake is detected (with confirmation of the Mexico City Seismic Alert, a system that detects earthquakes of great magnitude—from 5 to 6 degrees or more—and emits an audible alert), the people who work and visit the CMNA must move to a place of lesser risk, marked by the meeting points—in accordance with the regulations of Civil Protection of Mexico—.

The Civil Protection and Cultural Heritage Attention Unit acts immediately, in accordance with the following:

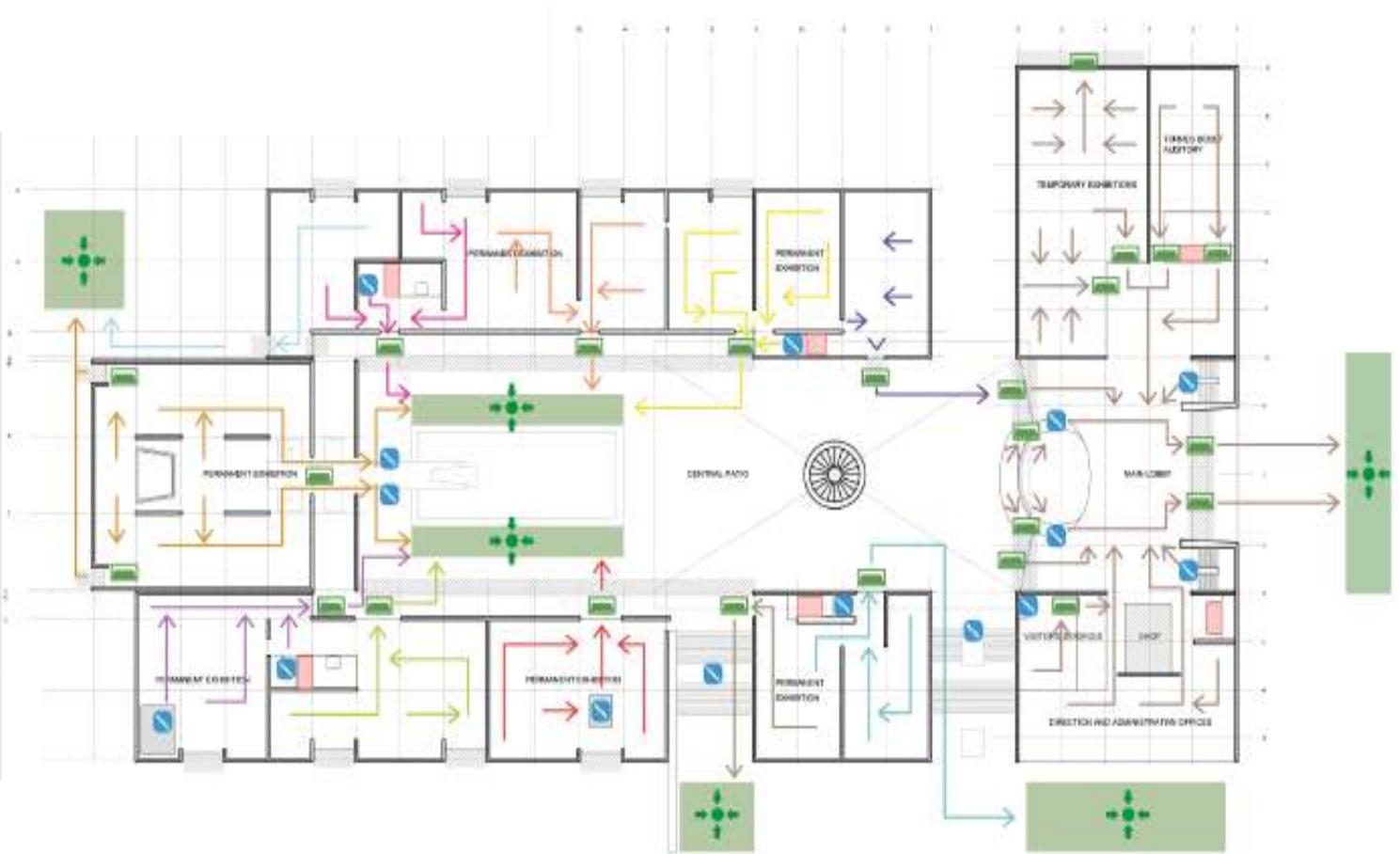
1. The evacuation brigade and the security personnel of the CMNA shall activate the evacuation alarm of the building.
2. The evacuation brigade and the security personnel of the CMNA must communicate the occurrence of an earthquake by the previously established means.
3. The evacuation brigade and the personnel working at the CMNA must invite all people inside the building to heed their instructions, remain calm, and promote their movement to the identified meeting points, using the evacuation routes marked for this purpose.
4. The fire brigade must extinguish any source of fire, such as interruption of gas services, disconnect the electrical power supply. Or do so as soon as possible, once the event is over.
5. Once the earthquake has ended, the evacuation brigade must verify the condition of the facilities, and in the event of finding anomalies, will not allow people to enter the building—except for the search and rescue brigade and the emergency services—, and must inform the General Services area of the CMNA and the National Coordination of Works and Projects of INAH so that together with the Civil Protection authorities they may determine if it is possible to access the building and under what conditions.
6. The search and rescue brigade, if the conditions of the building allow it, should enter to verify that no one is injured. If there is, the first aid brigade will be notified to act immediately to provide the primary care required. If possible, the emergency service of Mexico City, 911, should be called.
7. The cultural heritage protection brigade (composed of personnel from the Conservation Laboratory, Archaeology Subdirection, Ethnography Subdirection and Security Subdirection of the CMNA), once the earthquake is over and it is verified that it is possible to access the building, should conduct a tour of the CMNA in the spaces where the collection is stored and exhibited in order to record the conditions in which it is found. For example: broken glass in showcases and hoods, displacement, or damage to objects in the collection. A precise photographic and documentary record will be made to transfer them from the collection to the Conservation Laboratory for subsequent restoration, as well as to request payment of insurance.

EVACUATION PLAN

CMNA – Ground Floor

SYMBOLOGY

- Evacuation routes
- Emergency exits
- Stairs / Slopes
- Concentration area
- Safety zone
- Basement exhibits *(Pakal Tomb and Oaxaca Tomb)*
- High risk areas *(Possible detachment of finishes or sculptural elements)*
- Electrical Hazard Zones *(Possible short circuits)*



EVACUATION PLAN

CMNA – Upper Floor

SYMBOLOGY

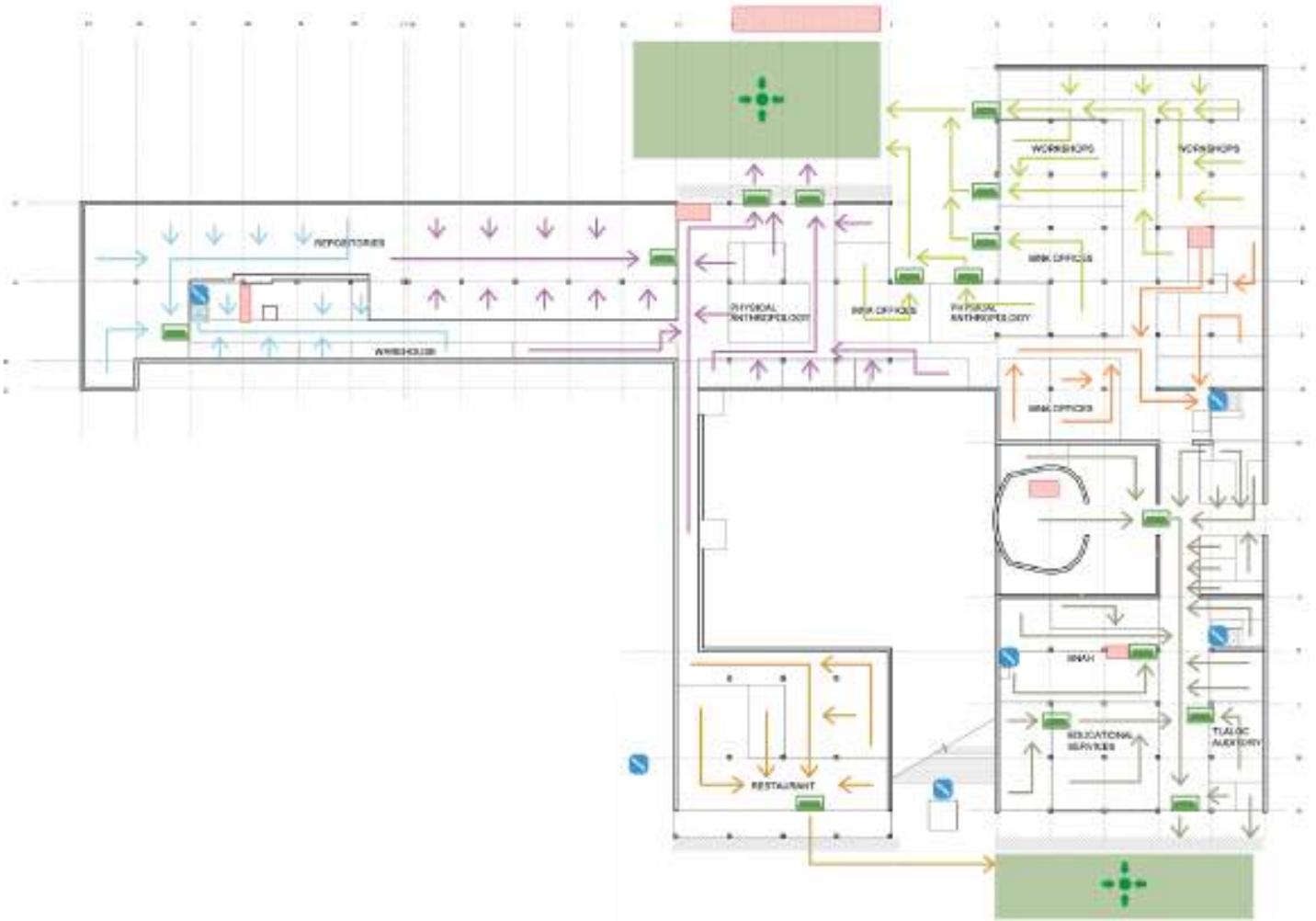
- Evacuation routes
- Emergency exits
- Stairs / Slopes
- Concentration area
- Safety zone
- Basement exhibits *(Pakal Tomb and Oaxaca Tomb)*
- High risk areas *(Possible detachment of finishes or sculptural elements)*
- Electrical Hazard Zones *(Possible short circuits)*

EVACUATION PLAN

CMNA – Basement Floor

SYMBOLOGY

- Evacuation routes
- Emergency exits
- Stairs / Slopes
- Concentration area
- Safety zone
- Basement exhibits *(Pakal Tomb and Oaxaca Tomb)*
- High risk areas *(Possible detachment of finishes or sculptural elements)*
- Electrical Hazard Zones *(Possible short circuits)*



B. Fire Protocol

1. The staff working in the CMNA, security personnel and/or brigade members shall immediately inform the security area of the CMNA, so that the resident firefighter in the CMNA, who belongs to the Fire Department Central Tacuba, can be informed.
2. The personnel working in the CMNA, brigade members, security personnel, and even a visitor, must activate the fire alarms installed in different points of the CMNA, immediately when they perceive the factors that indicate a fire: flames, smoke, sudden increase in temperature.
3. If the fire occurs in any area within the building, once the fire alarm is activated, or if the fire and smoke sensors perceive the factors that indicate a fire, the security personnel will activate the audible alarm.
4. Once the fire brigade and/or firefighter have assessed the origin and magnitude of the fire, if the latter allows, they will attempt to extinguish the fire with the help of the central fire and smoke control system and the nearest fire extinguishers.
5. The fire and smoke sensors of the National Library of Anthropology and History and/or the Ethnography Collection Storage (because they house a collection of highly flammable organic constituent material) will automatically dispense the extinguishing gas. (Novec 1230 Fire Protection Fluid. 3M[5]).
6. Simultaneously, the Tacuba Fire Department, already informed, will attend to evaluate the risk and/or act immediately according to the magnitude and location of the fire.
7. Once the magnitude of the fire has been evaluated, the firefighter on duty, the fire department and/or the fire brigade, will instruct the evacuation brigade to begin the process of evacuating the building.
8. Once the fire has been controlled, the evacuation brigade should check the condition of the facilities. If anomalies are found, the people still in the building must be evacuated and the General Services area and the National Coordination of Works and Projects must be informed in order to determine the necessary actions to be taken.
9. The cultural heritage protection brigade (integrated by personnel from the Conservation Laboratory, Archaeology Subdirectory, Ethnography Subdirectory and Security Subdirectory of the CMNA), once the fire has been extinguished, will verify, together with the General Services area, security personnel and auxiliary police of Mexico City, the condition of the cultural objects housed in the CMNA, as well as identify if there are broken showcases and/or hoods. A precise photographic and documentary record will be made in order to remove them from the collection to the Conservation Laboratory for their subsequent restoration, request insurance payments, and request the payment of the insurance premiums.

[5] Novec 1230 (C6F12O), 3M brand, environmentally friendly chemical compound. It is used to avoid the use of water for fire extinguishing, as in the case of cultural property and museums. Fluid that does not damage the ozone layer. Chemically, it is a systemic fluorinated ketone with the name ,1,1,2,2,2,4,5,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone and the structural formula CF3 CF2 C (= O) CF (CF3) 2.

FIRE ACTION PROTOCOL PLAN

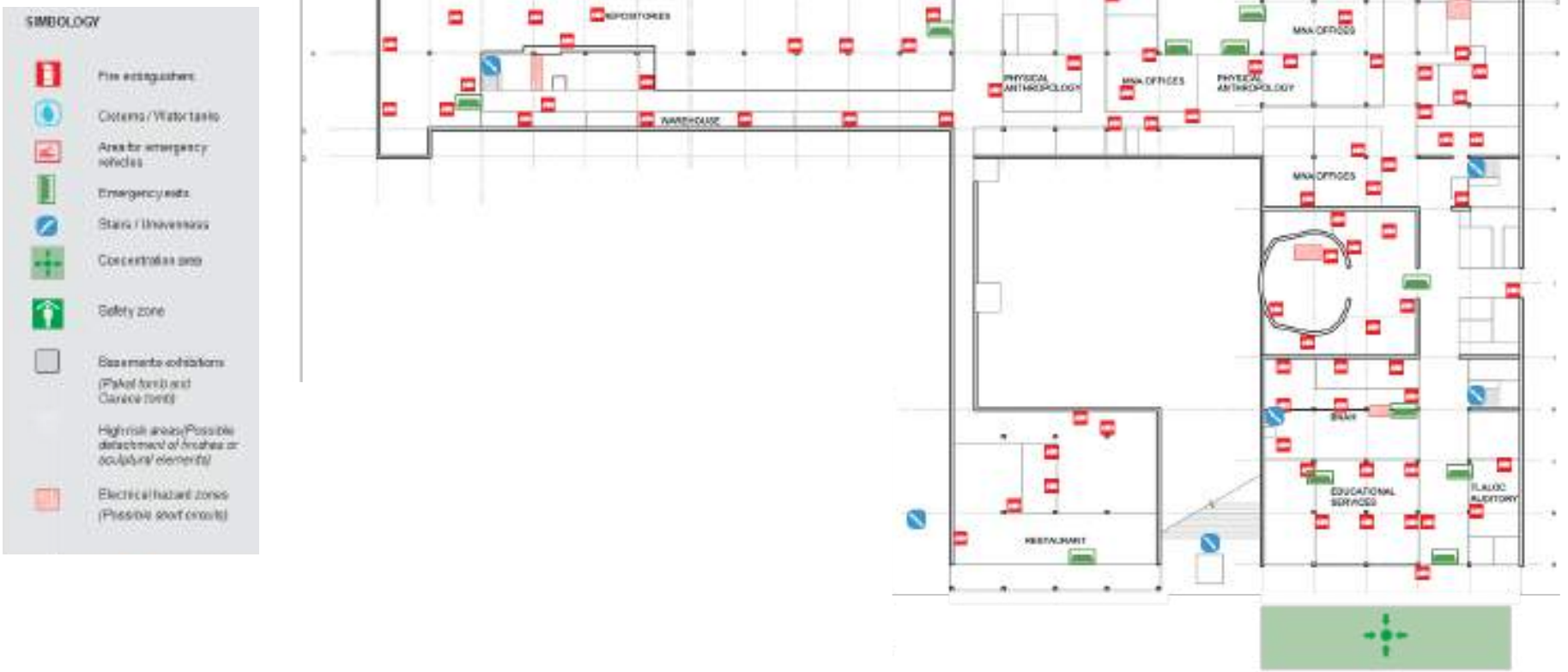
CMNA – Ground Floor

FIRE ACTION PROTOCOL PLAN

CMNA – Upper Floor

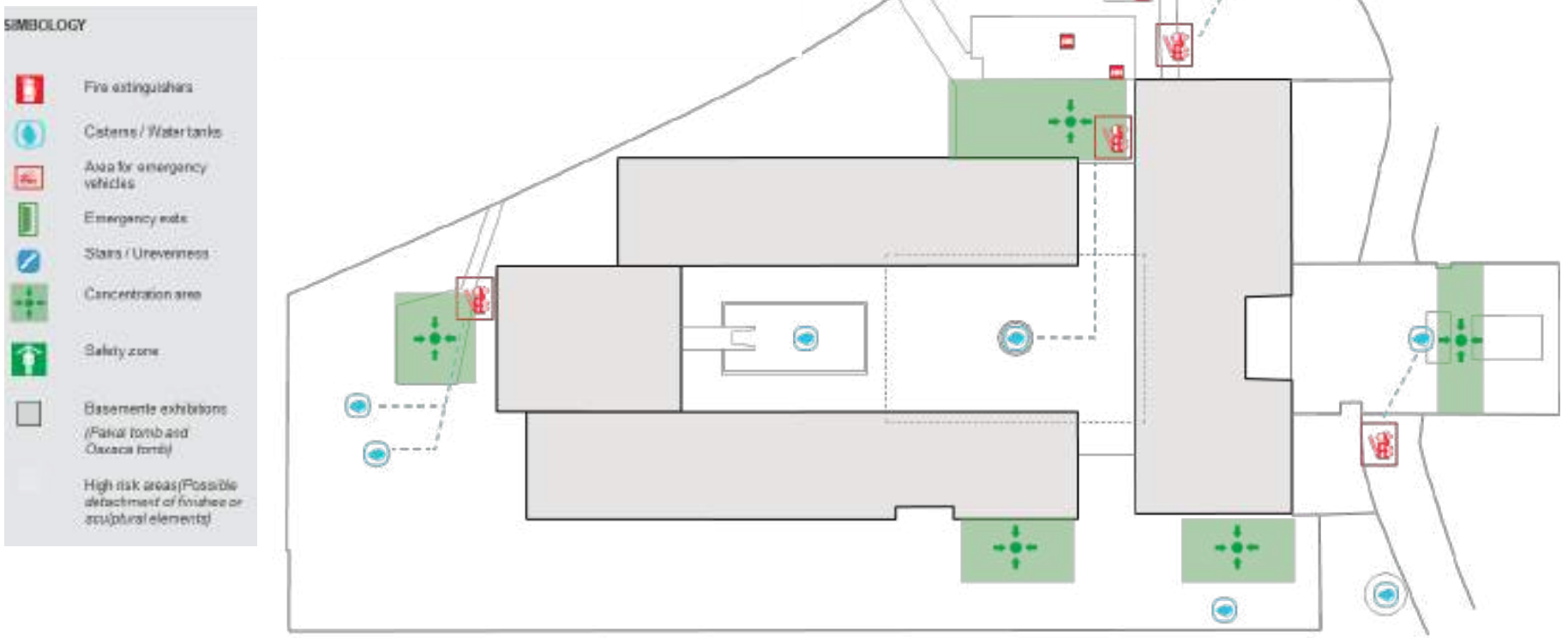
FIRE ACTION PROTOCOL PLAN

CMNA – Basament



FIRE ACTION PROTOCOL PLAN

CMNA – Exterior



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