

FLEXIBLE AND ADAPTABLE :

**A strategy for future healthcare facility
toward disaster and emergency**

GUOKAI YAO

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ABSTRACT

With the increasingly diversified demand for healthcare and differentiated development of the medical system, more and more subdivided categories have emerged in the strategic planning of the healthcare system according to a variety of extreme environments and situations.

From the end of December 2019, the unprecedented outbreak and spread of the coronavirus pandemic exposes healthcare systems and healthcare workers to enormous risks and challenges. Although hospitals and healthcare systems have developed plans for disaster precaution and response, the implementation and deployment of these plans on such scale of the coronavirus pandemic have never been verified and tested.

The thesis investigates a preliminary survey of the categories of disasters and emergencies and then integrates relevant measures for preparedness and response in the face of disasters and emergencies.

Secondly, the thesis sequentially takes the pandemic as the object of an in-depth investigation and collects the demands summed up by health organizations and medical systems in the process of influenza spread. Afterward, the thesis studies and organizes the departments and functions of the healthcare facility.

Afterward, the thesis collects and organizes the departments and functions of the healthcare facility and rethinks the healthcare facilities based on the function and the new demands arising from the influenza preparedness and response process.

According to the new demands placed on healthcare facilities by the pandemic outbreak, the paper explores the potential and possibilities of adaptability and transportability in the strategic planning of healthcare facilities. Finally,

according to the specific situation of Milan in this influenza outbreak, an experimental healthcare facility system is proposed to solve the challenges and difficulties of dealing with disasters in the new era.

INTRODUCTION

The outbreak of coronavirus influenza has had a profound impact on the life and production of human society. As the impact of the coronavirus influenza continues to expand, the medical systems of various regions around the world have been affected in varying degrees. In addition, the coronavirus influenza puts forward new requirements for the existing medical system to respond to disasters and emergencies while bringing new challenges to the supply and transmission of social materials. With different levels of coronavirus influenza prevention policies, human beings have also suffered differentiated impacts on both the physiological and psychological levels. The strategic planning of the medical system and the establishment of healthcare facilities are worth rethinking about by every architect and student in the face of the current severe coronavirus influenza and the challenges that come with it.

Through this epidemic, we realize that an efficient medical system that can adapt to various environments and situations is significant to guarantee the operation of society and the life of citizens. At the same time, prefabricated and transportable buildings have developed different paths and methods around the world according to different situations and environments. In the field of healthcare facilities, prefabrication and transportability have gradually been accepted by medical systems in various regions as part of epidemic response and preparedness. Under this trend, research prefabrication and transportability provide possibilities and potential to address the demands placed on the healthcare system from the coronavirus influenza.

I

BACKGROUND
AND
NATIONALE

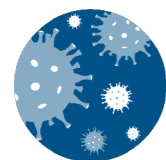
Disasters and Emergencies: Preparedness and Response

Overview

Disaster as an occurrence disrupting the normal conditions of existence causes a level of suffering that exceeds the capacity of adjustment of the affected community.

As a process of effectively preparing for and responding to disasters, disaster management and emergency management aims to reduce or avoid, potential losses from hazards, assure prompt and appropriate assistance to victims of disaster, and achieve rapid and effective recovery. Disaster management and emergency management can be divided into pre-disaster and post-disaster, as a cyclic process including response, recovery, reconstruction, mitigation, and preparedness.

Respectively preparedness and response play different roles at the beginning and end of disaster management and emergency management as key phases of the management cycle.



PANDEMIC



EARTHQUAKE



TSUNAMI



FLOOD



HURRICANE



THUNDERSTORM



AVALANCHE



WINTER
STORM



TORNADO



NUCLEAR
EXPLOSION



WILD FIRE



VOLCANO

Response

During and immediately after a disaster, disaster management focuses on providing support and interventions that can save human lives, safeguard physical and mental health, and prevent facilities, animals, and community property from further destruction. After an initial response, efforts shift toward supporting communities to rebuild emotionally, economically, and physically.

A range of activities implemented to address the immediate and short-term needs of the affected communities following disaster impacts include establishing temporary shelters to provide trained personnel with safe places to sleep, food, and emotional support, delivering meals and water, and distributing emergency supplies and essentials and providing emergency medical services.

Preparedness

Well-coordinated disaster responses require preparedness, which ensures fast, effective response efforts like the organized mobilization of personnel, funds, equipment, and supplies within a safe environment for effective relief, and limits duplicated efforts.

Disaster preparedness routinely can be divided into identifying organizational resources, assigning roles and responsibilities, developing policies and procedures, and organizing activities in order to improve disaster readiness. The planning of preparedness may include emergency shelter sites, evacuation routes, and emergency energy and water sources, which can address chain of command, training programs, communication procedures, emergency material distribution, and potential inventory needs.

Ms Paraskevi Michou. Directorate-General for European Civil Protection and Humanitarian Aid Operations. European Commission. (2020). Guidance Note: Disaster Preparedness

Ms Paraskevi Michou. Humanitarian Aid and Civil Protection European Commission. (2020). Disaster Preparedness: A Compendium of Experiences

International Federation of Red Cross and Red Crescent Societies. (2020). Introduction to Disaster Preparedness. Disaster Preparedness Training Programme

Pandemic Outbreak: Deficiencies and Challenges

Introduction

Pandemic such as influenza of high prevalence as an outbreak disaster of infectious disease that occurs over a wide geographical area generally affects a significant proportion of the world's population. Influenza pandemics are unpredictable but recurring events that always have severe consequences around the world. Since the 16th century, influenza pandemics have had outbreaks at intervals ranging between around 10 to 50 years apart, varying in severity and impact.

Since 2005, progress has been made in many areas of the preparedness and response plan. For example, constantly updated WHO guideline has been developed to attempt to block or delay pandemic influenza at its initial emergence. There is increased understanding of past pandemics, strengthened communications in response, deeper insight into influenza spread, and increasingly approaches to control.

Guidelines Review Committee. World Health Organization. (2009). Pandemic Influenza Preparedness And Response. WHO guidance document

Department of Communicable Disease. Surveillance and Response. Global Influenza Programme. WHO. (2005). EPIDEMIC ALERT & RESPONSE. WHO checklist for influenza pandemic preparedness planning

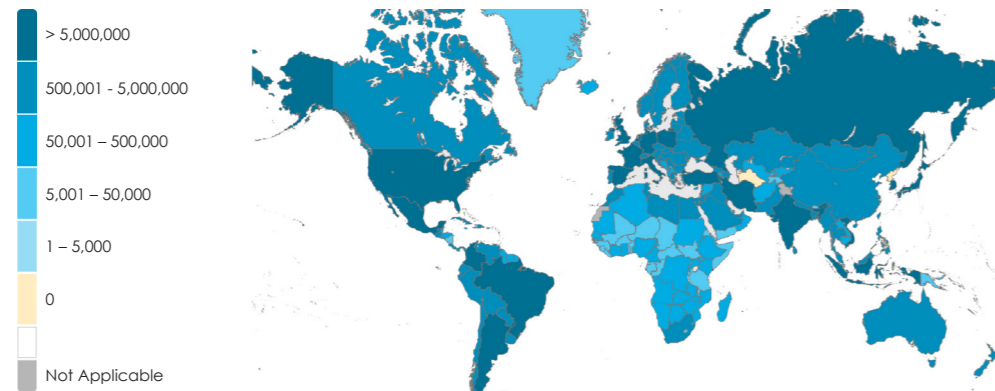


Figure 2. Cases - Total

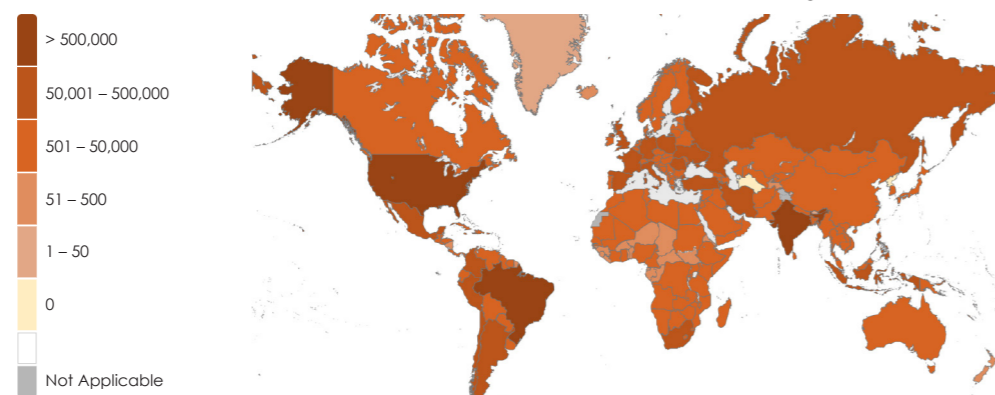


Figure 3. Deaths - Total

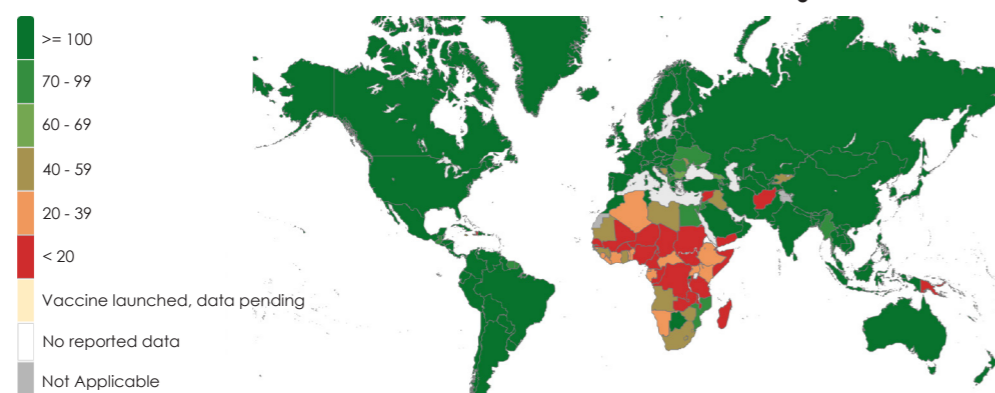


Figure 4. Vaccination - Total doses administered per 100 population

Geneva: World Health Organization (2020). WHO Coronavirus COVID-19 Dashboard

Coronavirus Outbreak

situation overview

Coronavirus disease an infectious disease caused by the SARS-CoV-2 virus has globally affected more than 171 million people worldwide and caused more than 486,761,597 confirmed cases of covid-19, including 6,142,735 deaths, reported to WHO until April 2022.

The coronavirus pandemic remains a serious global emergency since SARS-CoV-2 infection was first reported more than two years. By the end of 2021, the emergence and rapid spread of the Omicron Variant of Concern has accelerated the global spread of SARS CoV-2 at an intensity the world has never seen before. While coronavirus is now still affecting countries in very different ways, the pandemic is not over.

The coronavirus pandemic has captured the attention of researchers in many fields as a major health crisis, but we still lack a deep understanding of how the challenges are being addressed at different stages of the pandemic.

World Health Organization. (2021). Strategic Preparedness, Readiness and Response Plan to End the Global COVID-19 Emergency

World Health Organization. (2020). A guide to WHO's guidance on COVID-19

Strategic Health Operations. World Health Organization. (2022). WHO's response to COVID-19 2021 Annual Report

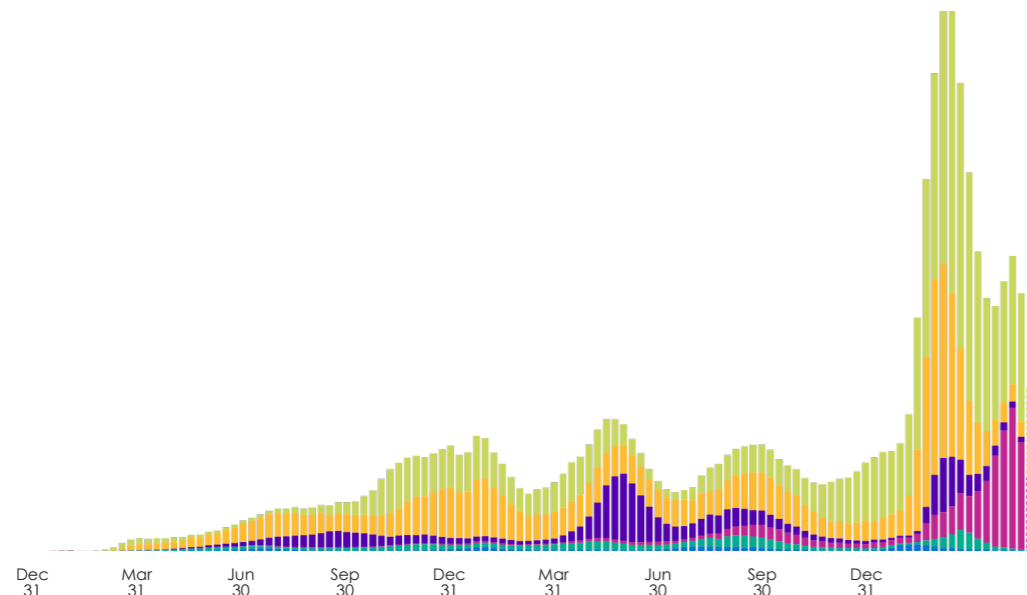


Figure 5. Weekly Confirmed Cases reported by WHO Region

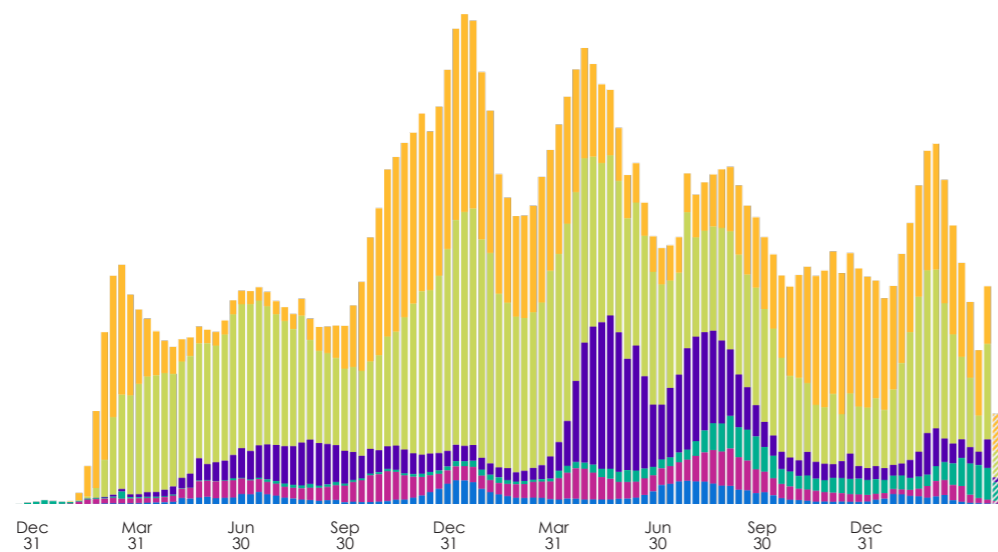


Figure 6. Weekly Confirmed Deaths reported by WHO Region

Geneva: World Health Organization (2020).
WHO Coronavirus COVID-19 Dashboard

Deficiencies and Impact

The coronavirus pandemic has led to a global health crisis with severe economic, social and psychological consequences.

The economic impact of the coronavirus pandemic involves an impending global recession due to lockdowns in non-essential industries and disruptions to production and supply chains.

The social consequences may be evident in many areas, such as the increase in domestic violence, the ineffectiveness of distance education, and increased food insecurity among poor households due to school closures.

The psychological consequences of coronavirus pandemic may last the longest and lead to a global mental health crisis. The coronavirus outbreak is producing more depressive symptoms, stress, anxiety, insomnia, denial, fear, and anger around the world. The economic, social, and psychological problems people are currently facing are a consequence of the deficiencies brought on by the pandemic.

Dominika Maison, Diana Jaworska, Dominika Adamczyk, Daria Affeltowicz. (2012). The challenges arising from the COVID-19 pandemic and the way people deal with them. A qualitative longitudinal study

Challenge and Objective

The precise timing and influence of the next influenza pandemics remain unknown and unpredicted, while pandemic preparedness remains incomplete and inadequate in most regions. Developing and sustaining the preparedness and response of a region is challenging.

The next Influenza pandemics could outbreak at any time everywhere, presenting challenges for each region such as implementing ad hoc mitigation measures to prevent the rapid spread of pandemic disease, coping with a possible large surge in demand responsible for medical facilities, solving the serious shortages of personnel and materials, relieving delayed and limited availability of medical supplies for the treatment, eliminating negative influence on social and economic activities of communities which could last a long time after the period of the influenza pandemic.

Our collective objective is to end the global public health emergency of coronavirus and prepare for the potential pandemic. To do that, we will need synthesis planning of preparedness and response.

Strategic Health Operations. World Health Organization. (2022). Strategic Preparedness, Readiness and Response Plan to END THE GLOBAL COVID-19 EMERGENCY IN 2022

II

STRATEGIC PLANNING
AND
DEPARTMENT MANAGEMENT

Circulation Management

Screening process of patient

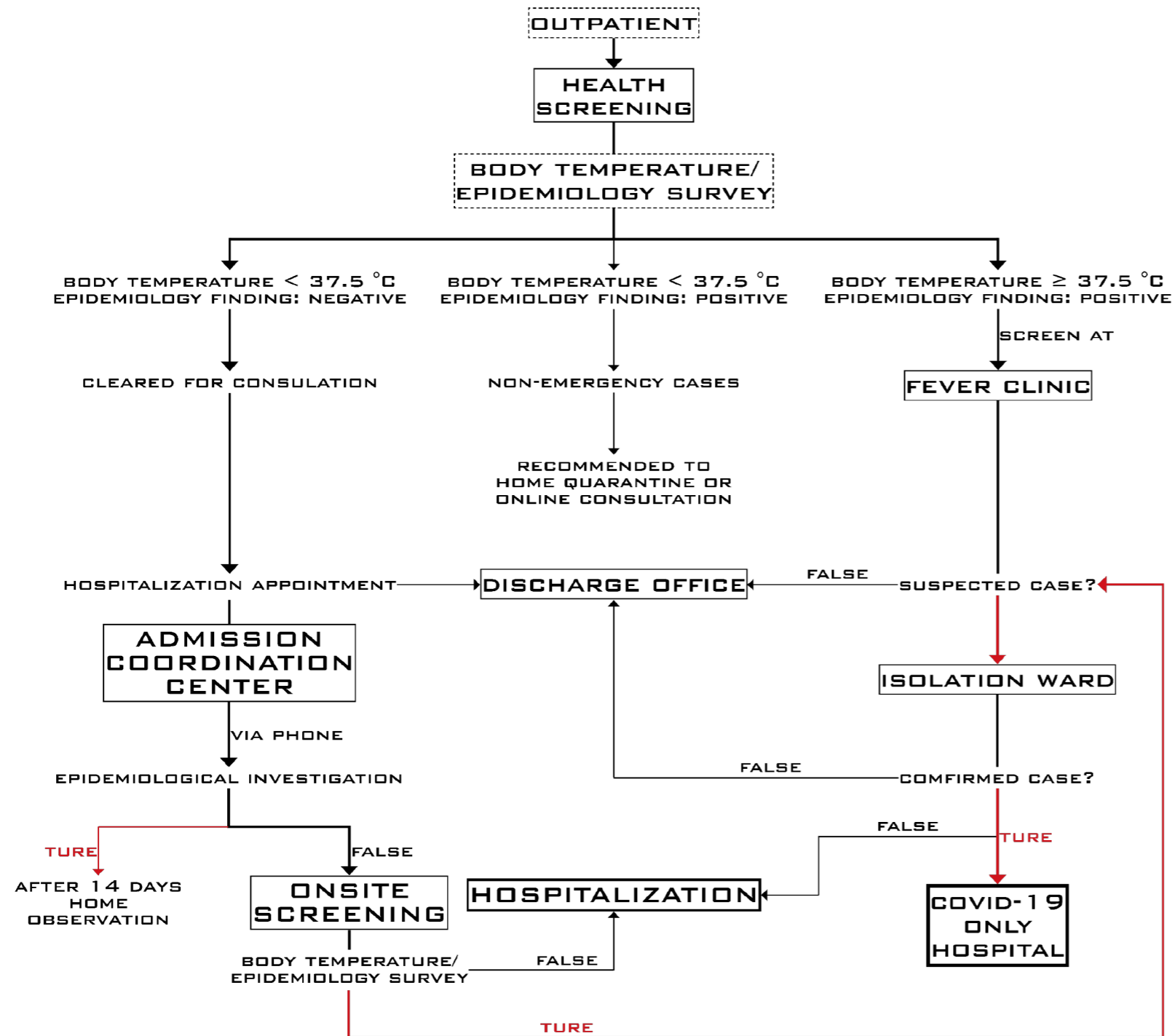
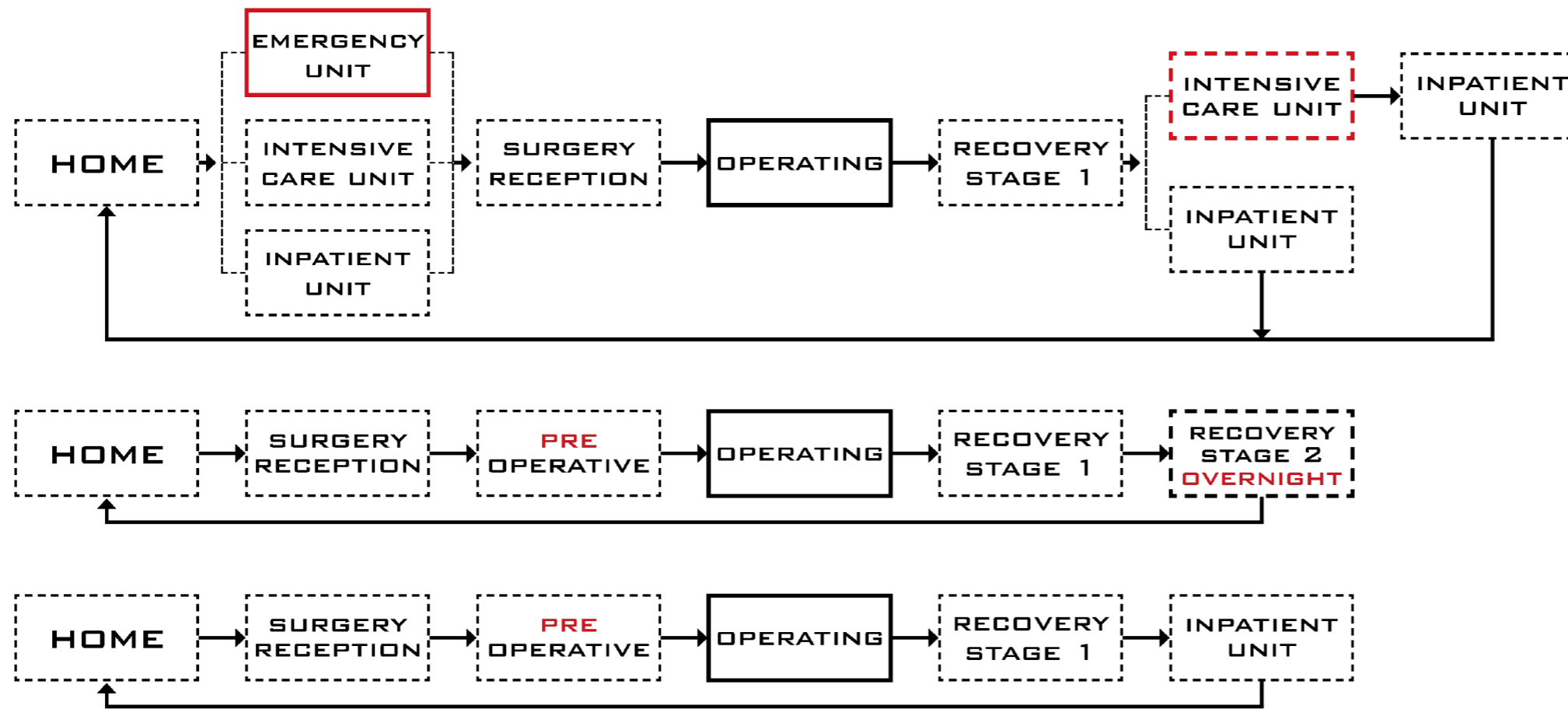


Figure 8. Screening process of patient

inpatient surgery process of patient

The process of the inpatient surgery can be divided into three different flows: no overnight stay in surgery, overnight stay in surgery on the day and overnight stay for several days.



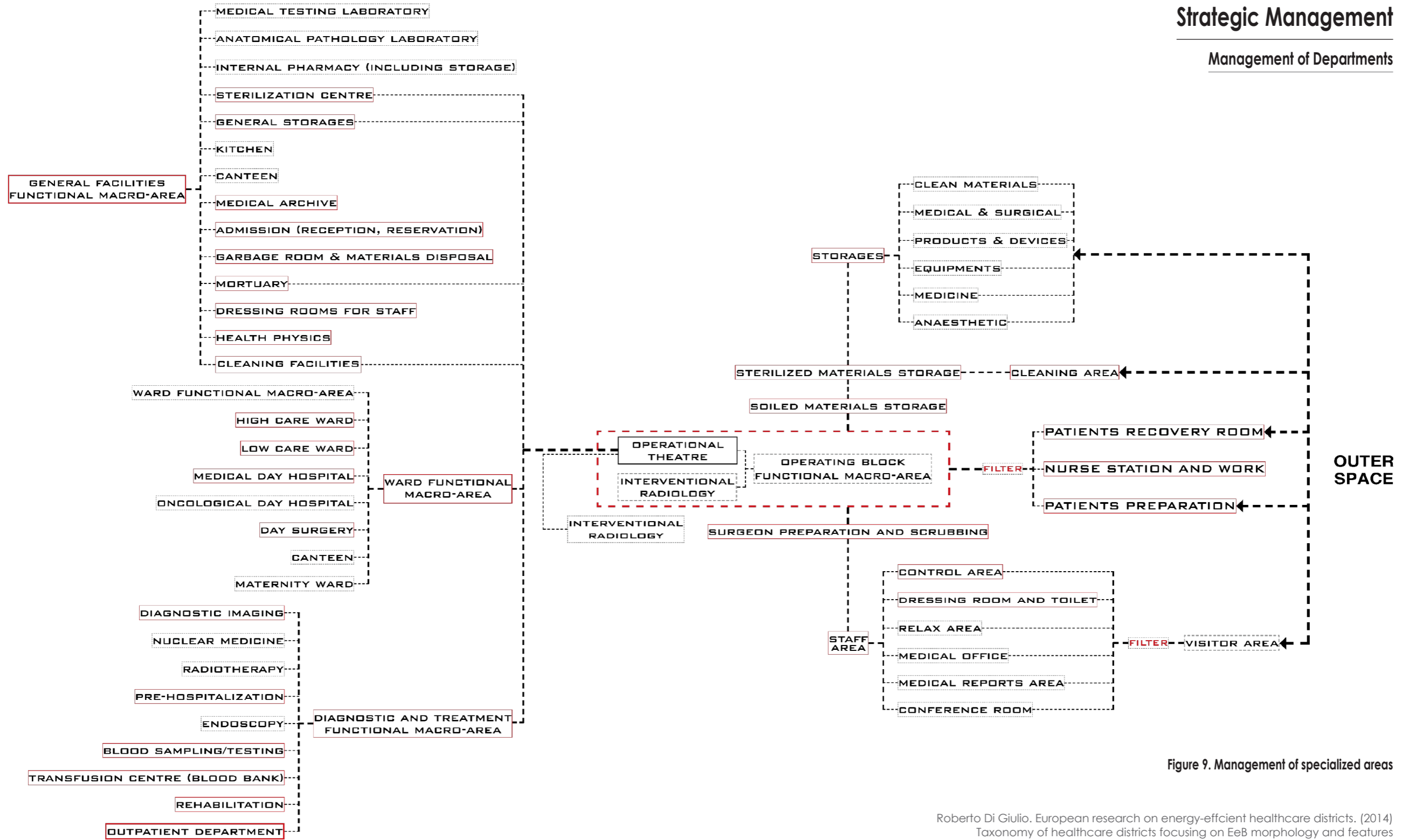


Figure 9. Management of specialized areas

Public Area

Main Entrance Zoning

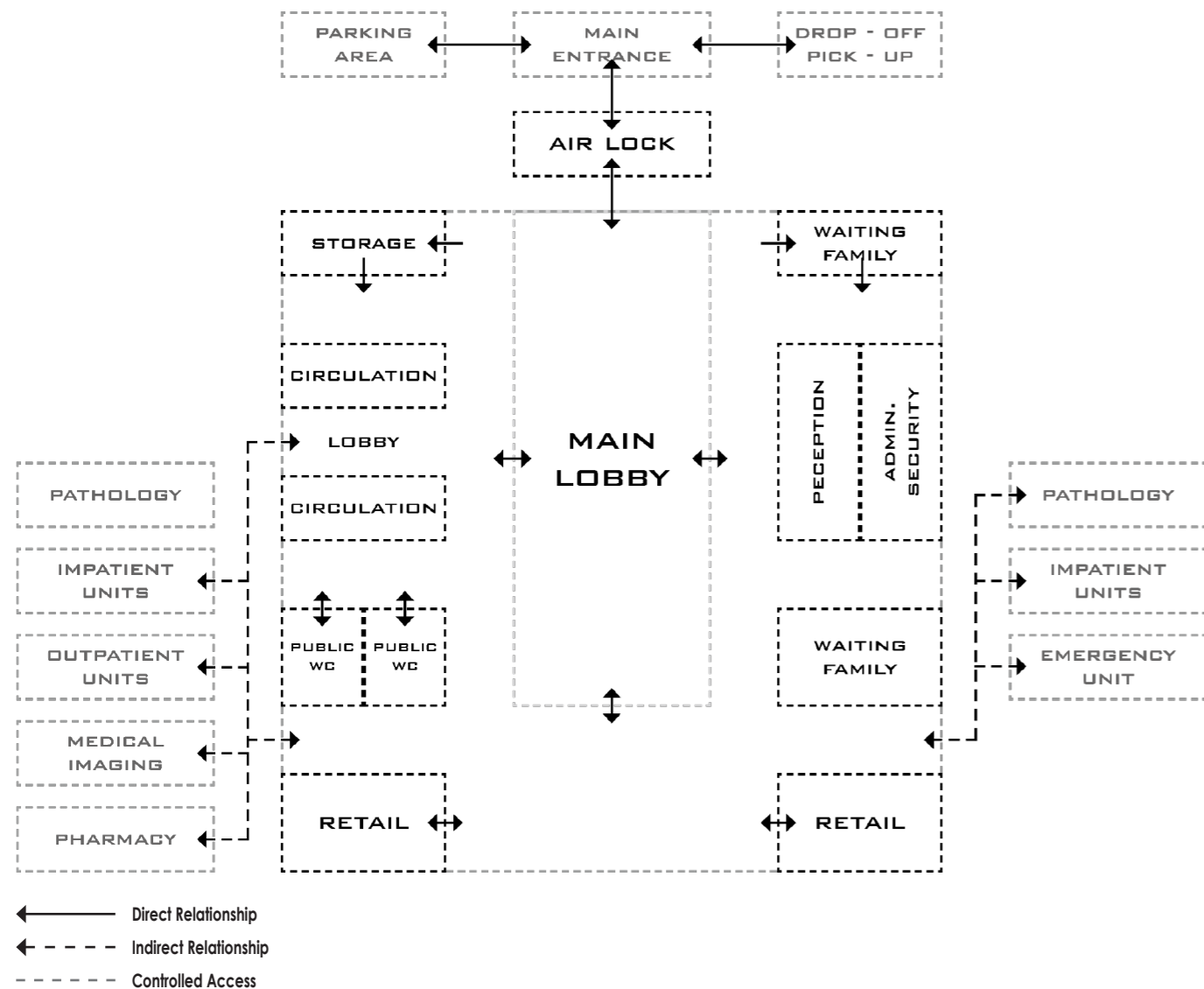


Figure 9. Main entrance zoning

Total Alliance Health Partners International. (2019).
International Health Facility GuidelinesVersion 4.2

The main entrance unit zoning as the buffer area that could effectively divert and guide both patients and visitors into different flows. There will be several corridors to divide different flows of people into different direction toward specific department. The corridors around the main lobby connect with different departments such as outpatient zoning, inpatient zoning, administration zoning, and diagnostic zoning. There will provide different circulation that some could let patients directly come to emergency unit zoning without passing through outpatient zoning.

The main entrance unit of hospital should provide the entrance to the hospital for visitors and patients. The entrance should preferably be close to the parking area and the transport area providing drop-off and pick-up to visitors and patients.

Airlock is required during influenza pandemic outbreak which should be set between the entrance and the main lobby that collect and organize the circulation of patients and visitors.

There could be the place in the lobby that patients and visitors can enquire information and guide them to specific department. After patients and visitors make sure the route according to the enquiry office, there should be the waiting room for both patients and visitor.

Retails closed to the main lobby that providing food and beverage is also required. Administration is recommended to be located on the side closed to the main corridors, which can effectively guarantee the security and order of the patients, visitors and hospital staffs at the main entrance zoning.

Total Alliance Health Partners International. (2019).
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Administration Area

Administration Unit Zoning

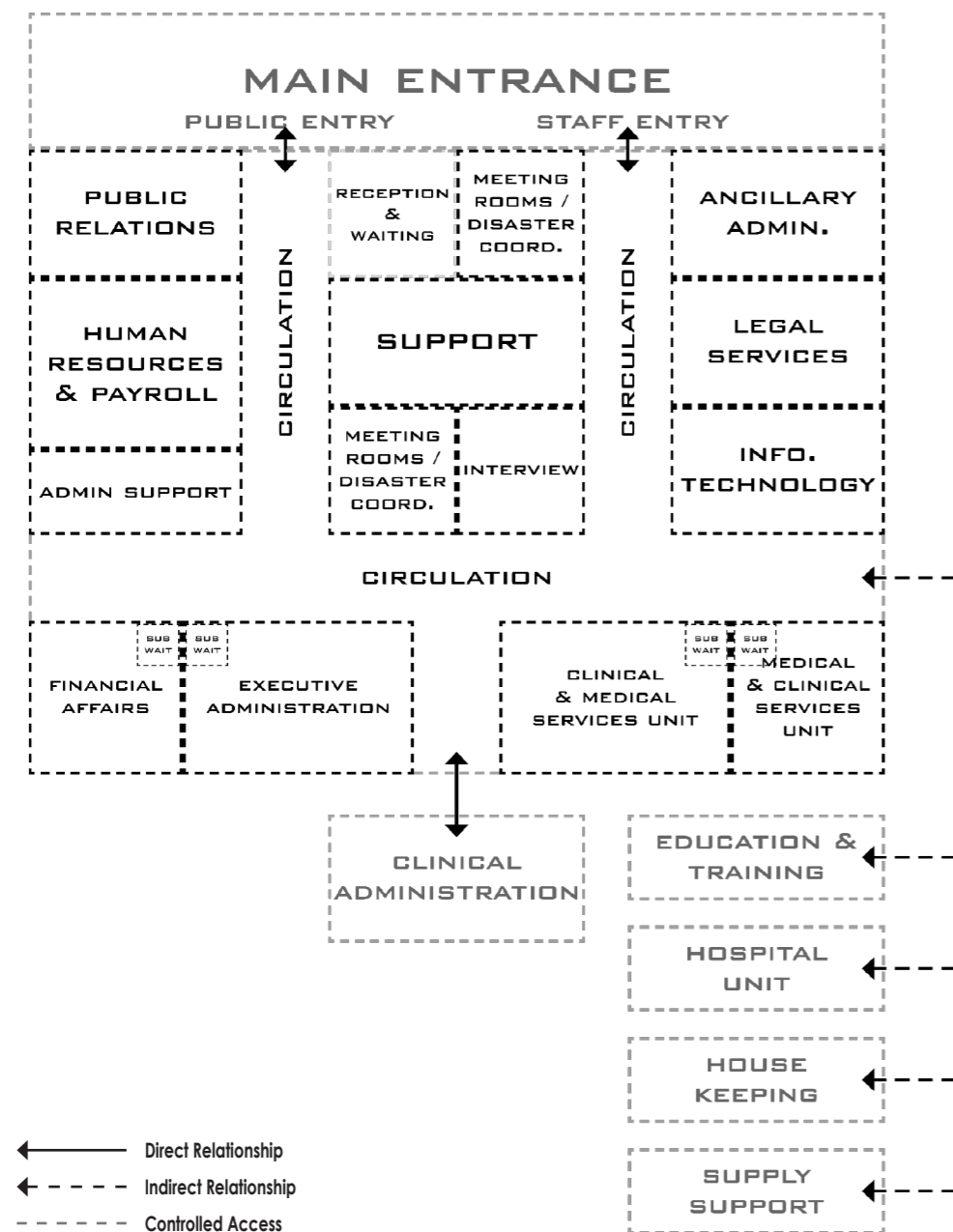


Figure 10. Administration unit zoning

Total Alliance Health Partners International. (2019).
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A range of support functions related to administration affairs should be prepared to corresponding spaces. For example, there is at least one support room to effectively collaborate with the interview room, while admin support room should be provided to the meeting rooms or disaster coordination room closed to the corridor for the public.

The administration unit zoning also have some indirect support and services relationship with other function zonings of department such as education training, housekeeping unit zoning and supply zoning.

The administration unit provides the staff area of offices, workspaces for hospital staffs and associated facilities for support the organization and management of patients and visitors.

According to European Commission code, the administration unit zoning should be located preferably on the ground floor or first floor and connected closely to the main entrance zoning, which can more effectively make the arrangement of the affairs and schedules for patients and visitors.

There are different entries provided to the staff and the public from the main entrance zoning. Patients and visitors will easily reach the reception and waiting area closed to interview room.

The corridor connected to another zoning of different department such as clinical administration should be located in the place that staffs and patients can easily get access to the function areas like executive administration and clinical services unit with sub waiting space.

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Admission Unit Zoning

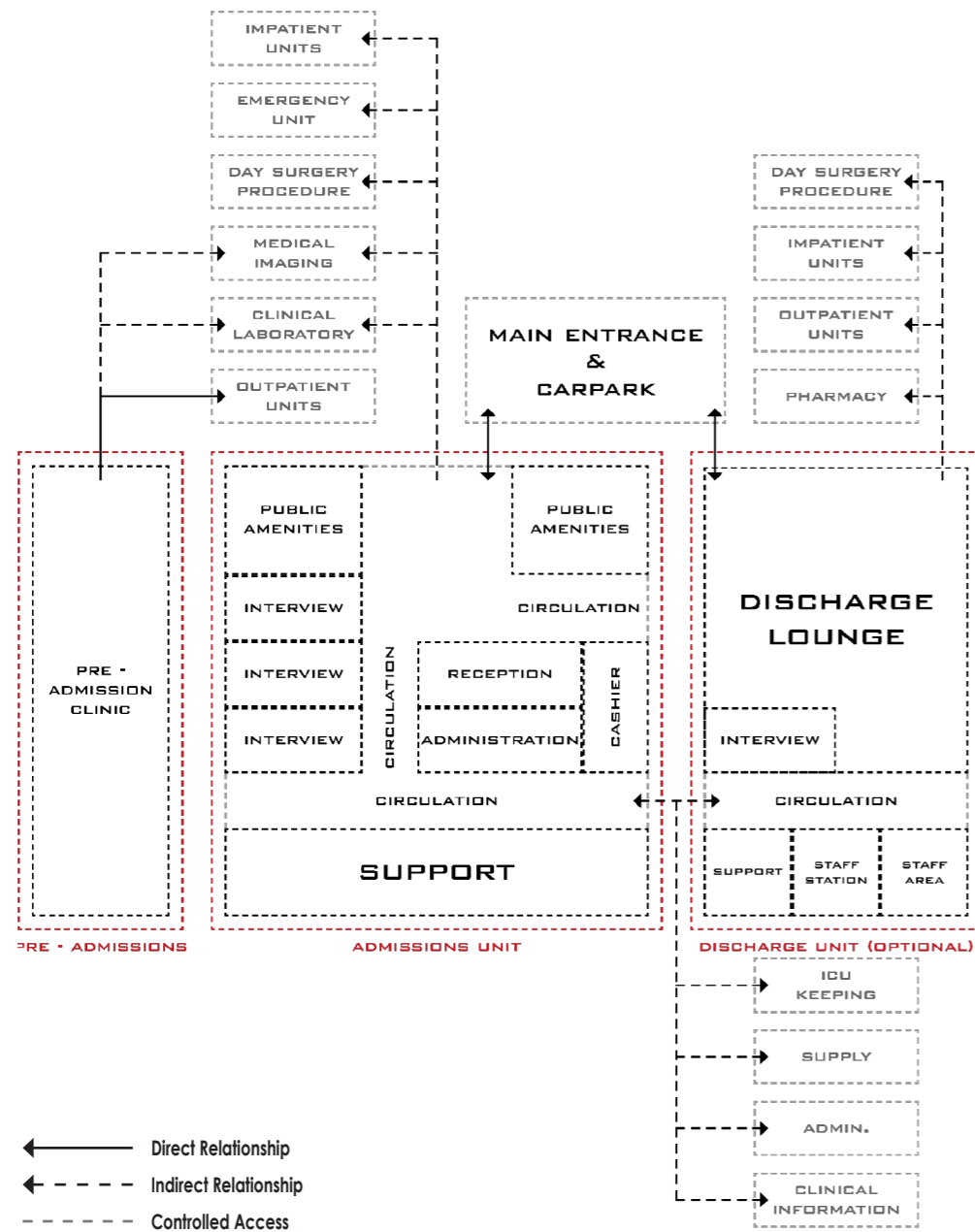


Figure 11. Administration unit zoning

Total Alliance Health Partners International. (2019).
International Health Facility Guidelines Version 4.2

The pre-admission clinic has direct support relationship with outpatient units while has indirect relationship with medical imaging and clinical laboratory. The admission unit zoning always has indirect services with day surgery, procedure unit, emergency unit, inpatient units, clinical laboratory and medical imaging. The discharge unit and admission unit both have indirect relationship with intensive care unit, supply unit, administration zoning and clinical information.

The admission unit zoning as the central administrative service that organizes and delivers information efficiently to support patients' admission from main entrance zoning and discharge from inpatient zoning. The process of a patient's admission to the healthcare facility could be through the administration unit zoning. Most of the patients who require admission into healthcare facility are admitted as either one day patient or several days patient according to the receipt of a request for admission from specific medical diagnosis by specialist.

The sequence of patients' admission is from the pre-admission area to admissions area through corridor. There are different corridors from main entrance zoning that connect to both admission unit and discharge unit.

The support area which collaborates with the staff areas in admission unit zoning like reception, staff station and cashier should be required both in the admission unit and discharge unit, while patient amenities should also cooperate with discharge lounge.

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Inpatient Department

Intensive Care Unit Zoning

The function of the intensive care unit zoning is to receive, arrange and stabilize patients who present a series of severe symptoms or urgent demand for first aid or maintenance. Meanwhile, patients could also be contained in intensive care unit if they present non-urgent condition but their physician recommend.

The intensive care unit zoning could also provide for the maintenance and management of disaster victims suffered from urgent injury collaborating with emergency unit zoning as part of modular unit within each department in the healthcare facility.

The intensive care unit zoning should be preferably close to emergency unit, operation unit and diagnostic unit, according to the consideration of collaborative work within the management and arrangement of patients.

For considering the experience and recovery of patients in the intensive care unit, the bed bay space should provide sufficient communication with outside like nature light and eye contact.

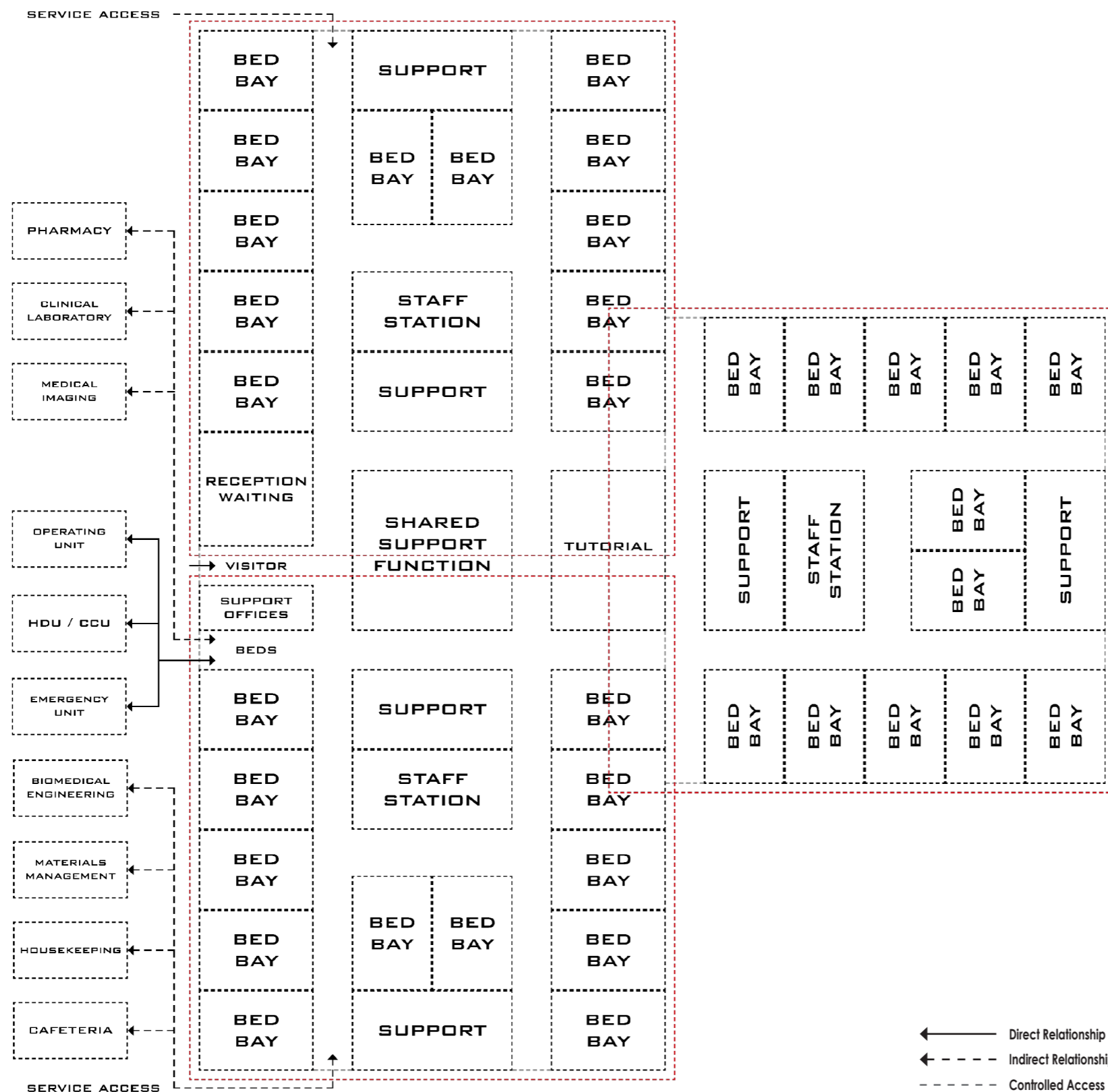


Figure 12. Intensive Care Unit Zoning

Inpatient Unit Zoning

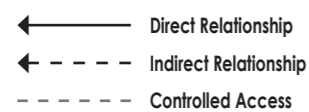
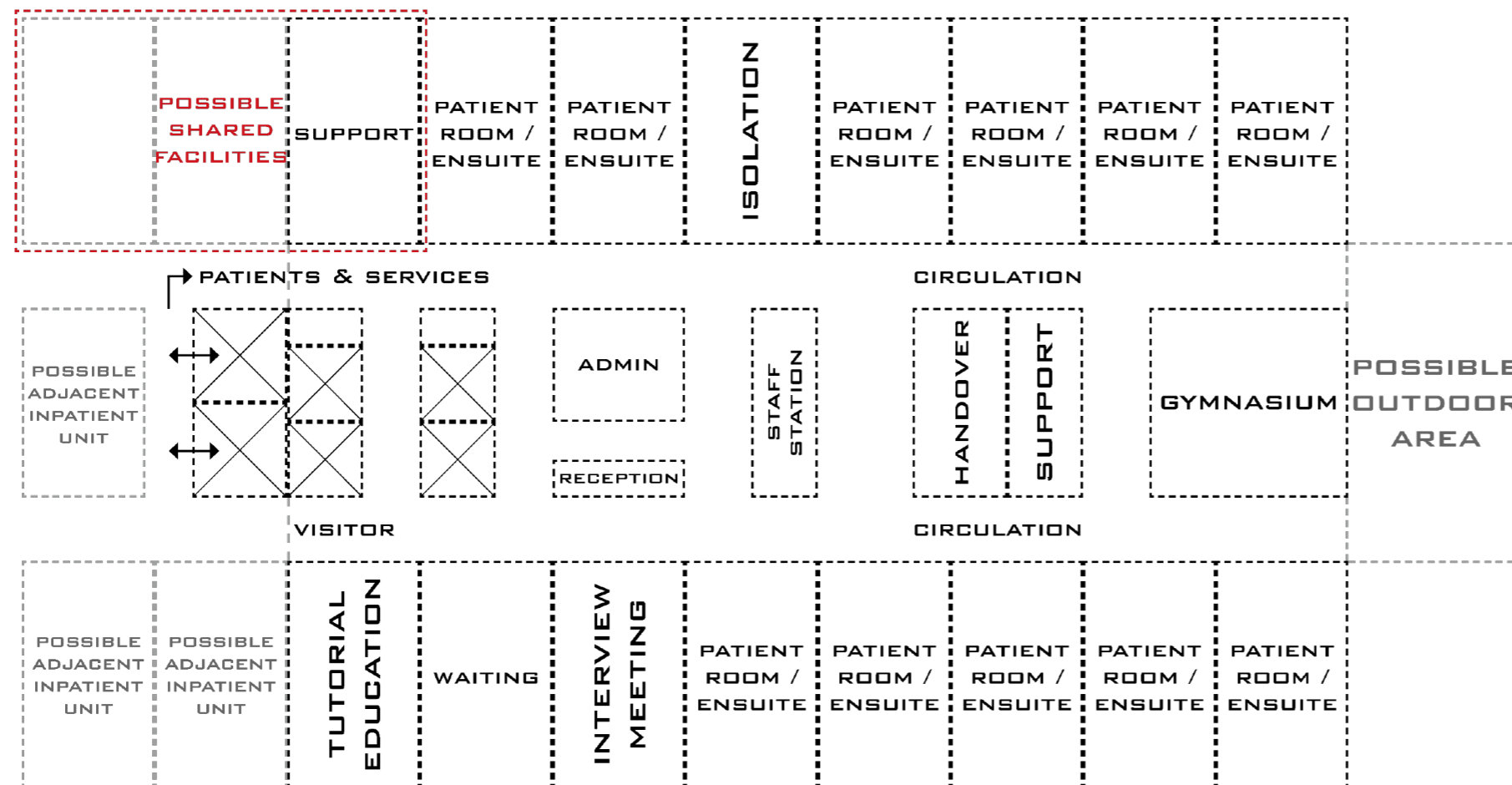


Figure 13. Inpatient Unit Zoning

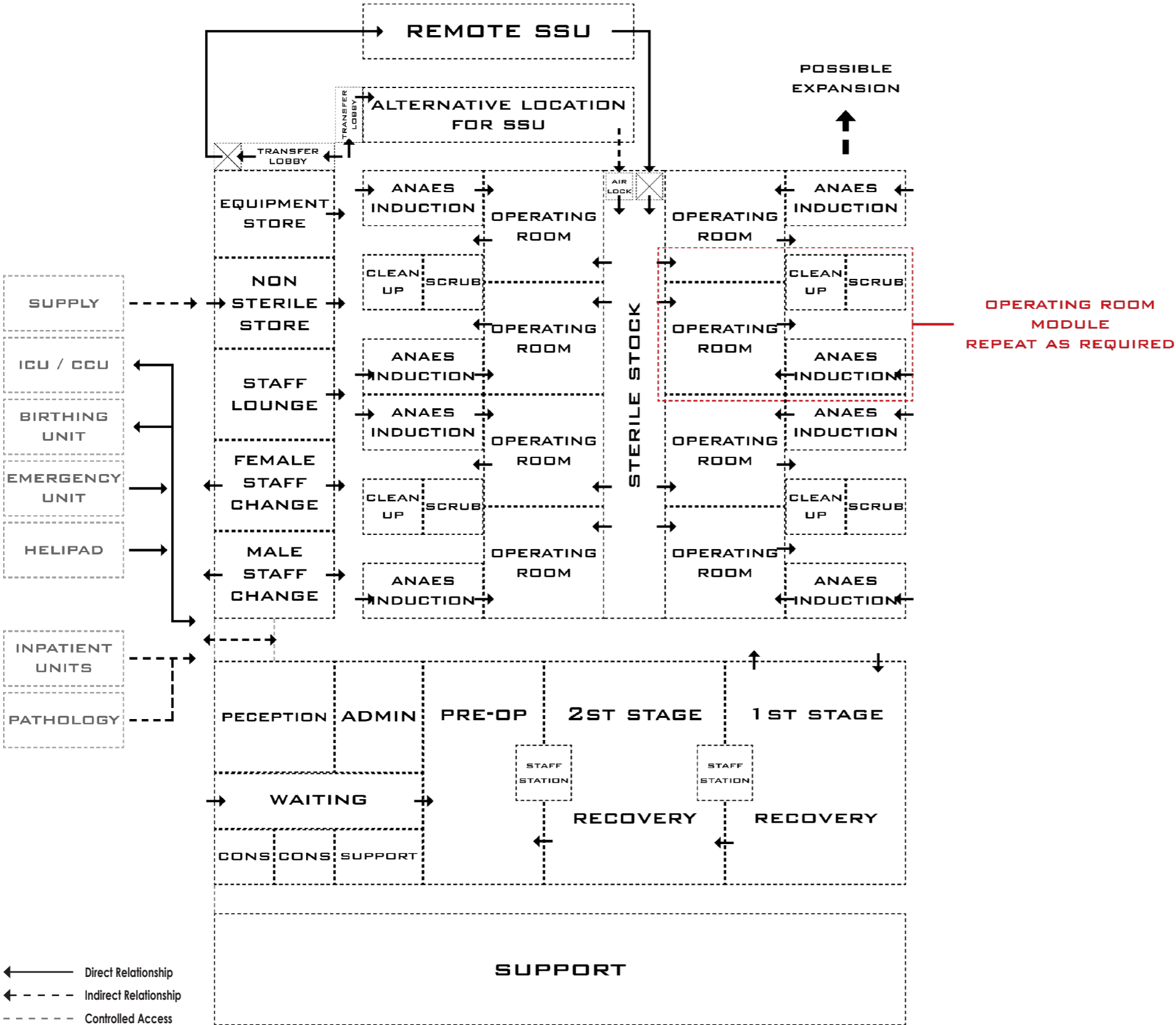
Total Alliance Health Partners International. (2019).
International Health Facility Guidelines Version 4.2

The inpatient unit zoning specially orientated to staffed and equipped service of a healthcare facility provides rehabilitation, support, treatment, and monitoring of the patients in a rigorously controlled multi-disciplined inpatient environment. The indoor ventilation in the patient unit along the east-west orientation should be guaranteed, while the ventilation of patient rooms/ensuites along the north-south direction should also be guaranteed on the premise of air cleaning according to the procedure for the influenza pandemic.

The inpatient units should be close to the emergency units and the reception hall in administration zoning as far as possible which considers they have a series of collaborative services with each other. According to the experience and practice, all doors of patient rooms/ensuites should be open inside to outside faced to the main corridors which can make staff more convenient to provide medical services and prevent safety accidents.

Operation Theatre

Operation Zoning



The operation zoning provides a sterile controlled environment for the operative care of patients undergoing surgical procedures under anesthesia as so as pre-operative care including post-procedure recovery and a series of preparation rooms and logistics space for the surgical staff supporting the surgical treatment.

The operation theatre zoning can be divided into the restricted area, half restricted area, and non-restricted area, which should be designed under the specifications that isolate the risk of infection. The minimum operating module consists of operating room, anaes induction, scrub for operative staffs and clean up room.

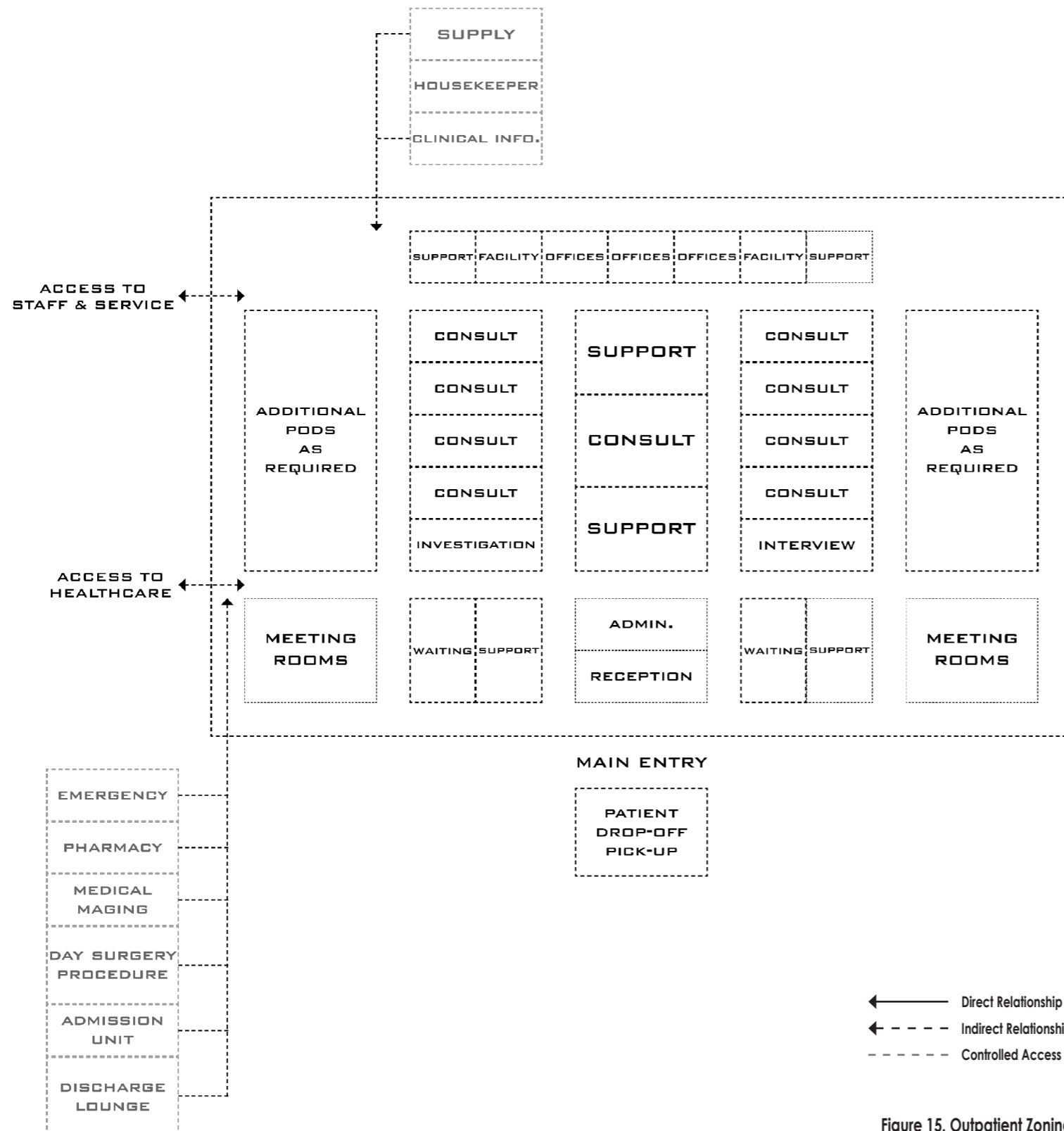
The short stay unit (SSU) providing targeted care for specific patients requiring brief hospitalization and dischargeable as soon as clinical conditions are resolved become a new option for current healthcare facilities. The SSU should pass through the transfer lobby with air lock for isolation and purification measures before connecting to the operation theatre zoning.

Total Alliance Health Partners International. (2019). International Health Facility Guidelines Version 4.2

Figure 14. Operation Zoning

Outpatient Department

Outpatient Zoning



The outpatient unit zoning as the ambulatory care unit dedicated to providing health care consults in the physician offices of hospital-based outpatient and ambulatory surgical centers of the operation theatre have consult rooms, staff facilities, investigation and meeting rooms for patients.

The outpatient unit zoning should be isolated from noises and bacterial contamination which guarantees a professionally controlled and staffed environment for patients and visitors. Especially according to the European Union code, the treatment room minimum area is 12 square meters, while the minimum width of corridor is 1.5 meters and the minimum area of examination room is 8 square meters.

There are at least three entrances in the outpatient zoning seperatively for patients and visitors, staff and services like supply zoning and housekeeping zoning, and other hospital units such as emergency units, day surgery, admissions unit, discharge lounge, and diagnostic zoning.

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Figure 15. Outpatient Zoning

Diagnostic Department

Radiology Zoning

The radiology zoning of diagnostic department as an independently discrete unit of the healthcare facility provides a series of diagnostic investigation such as diagnostic screening (fluoroscopy), magnetic resonance imaging (MRI), computed tomography (CT) or other interventional radiographic procedures, which depend on the hierarchy of the services provided and the strategic planning.

The radiology zoning is preferably located on the ground floor closed to the emergency unit zoning, the outpatient department and the main entrance zoning. In the radiology zoning, there should be at least three separate entrances and corresponding designed circulation for several departments: one for support departments like supply zoning and housekeeping zoning, the other for outpatient unit zoning and the main entrance zoning, the last for emergency unit zoning and inpatient unit zoning. There could be an another entrance for nuclear medicine and radiation oncology if it is necessary for considering potential demand while designing the strategic planning.

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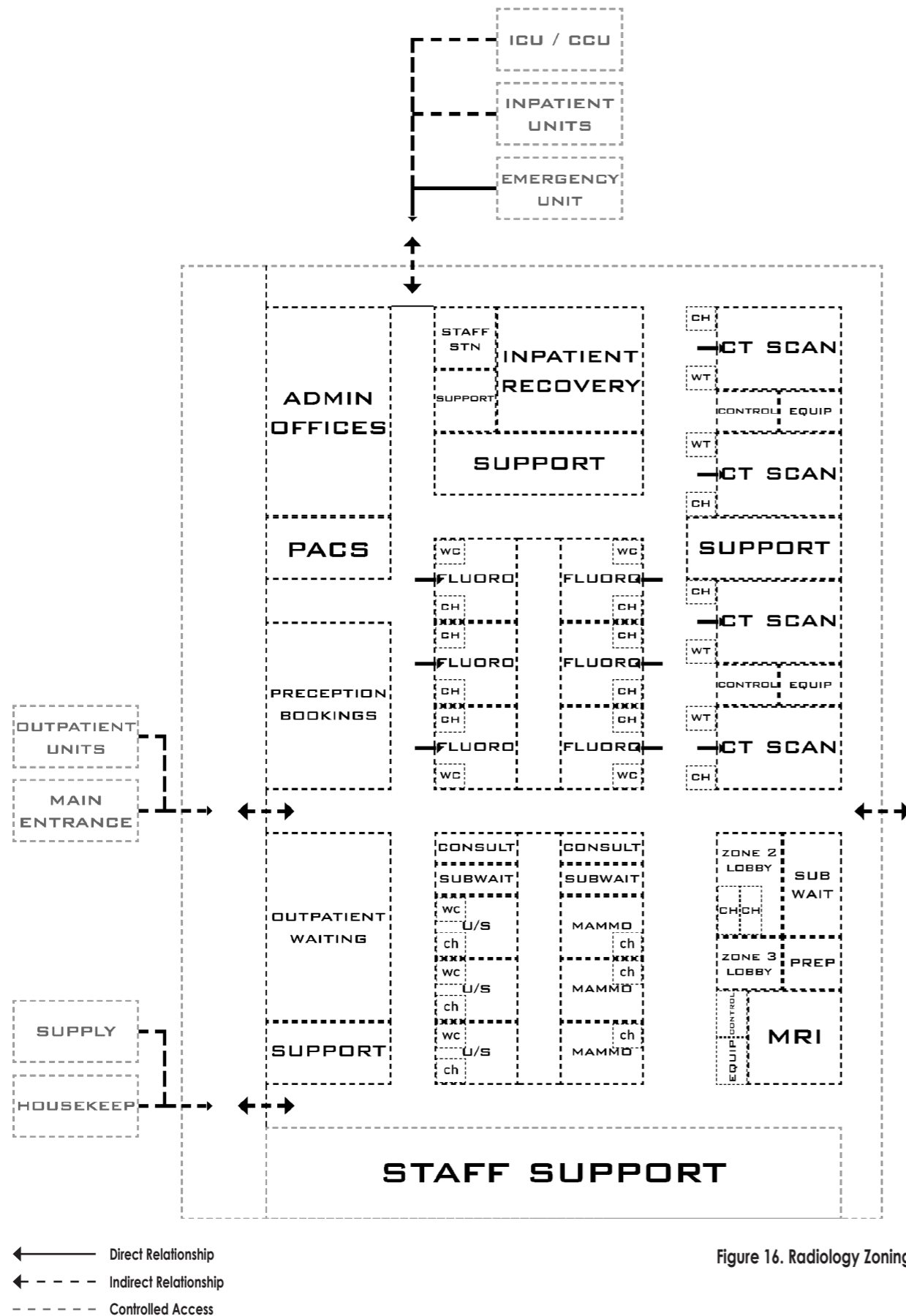


Figure 16. Radiology Zoning

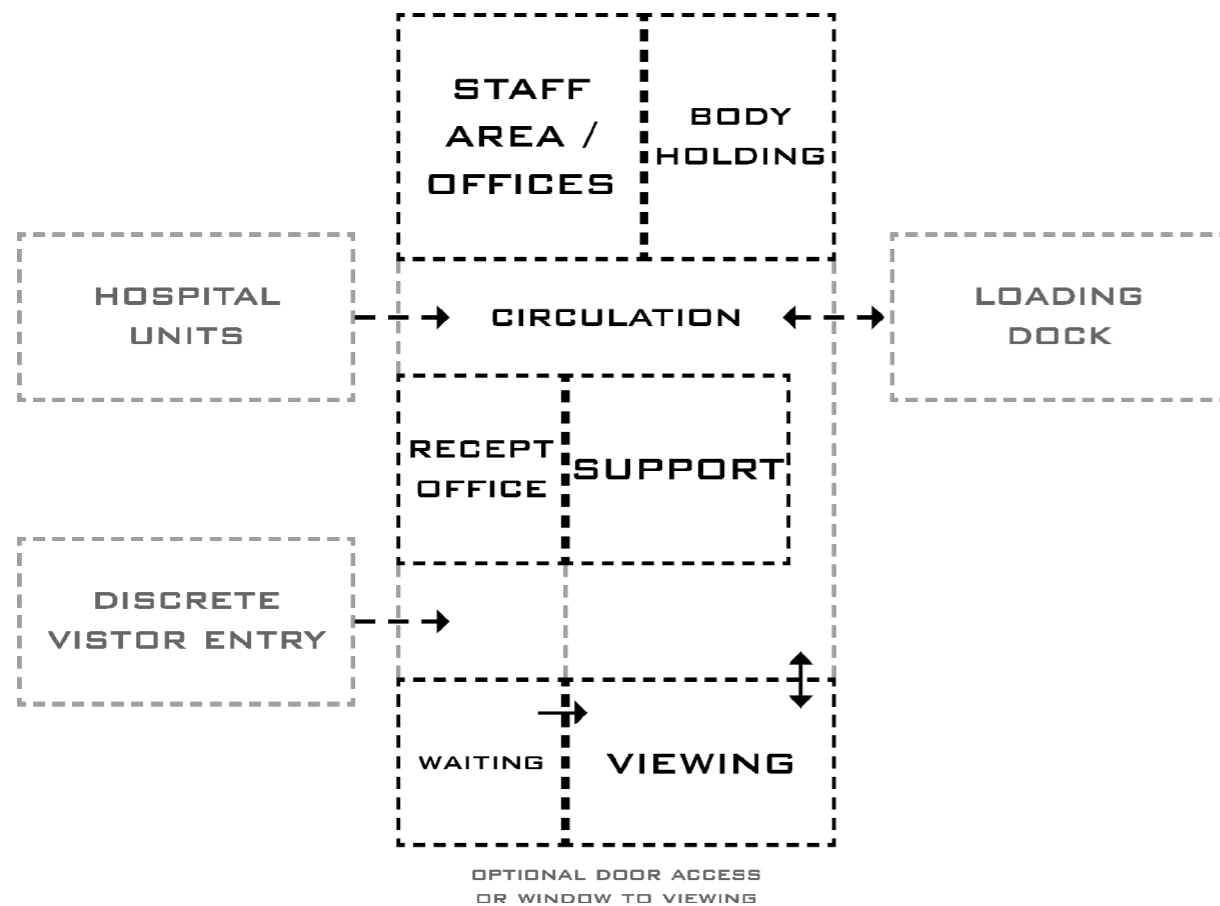


Figure 17. Mortuary Zoning

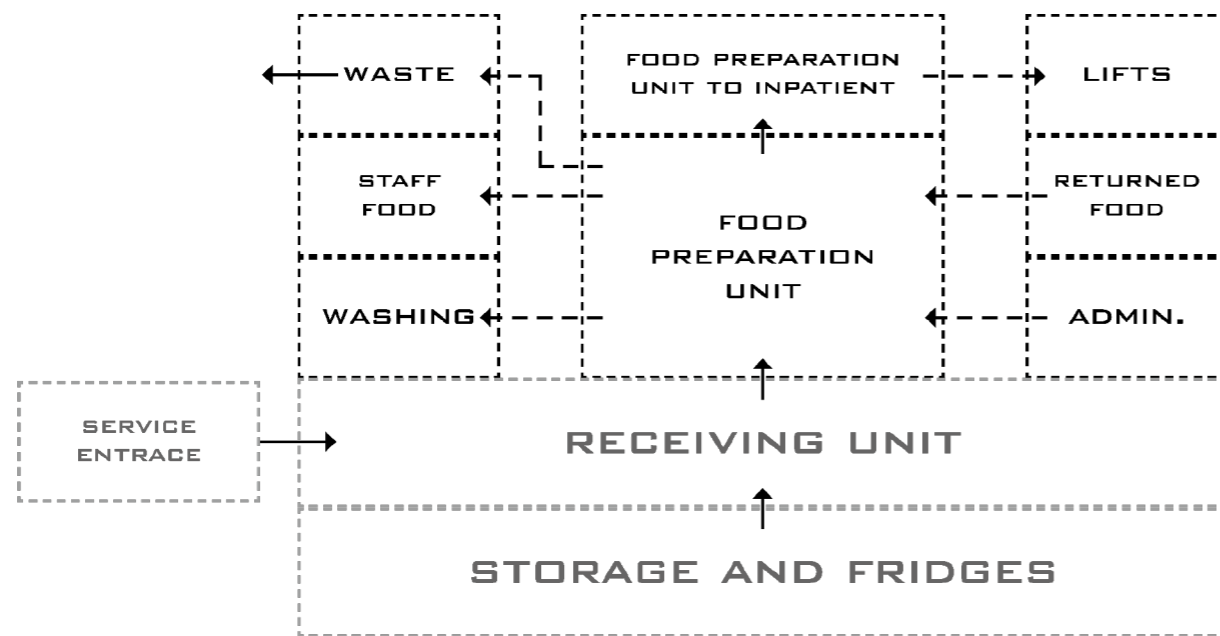


Figure 18. Food Services Zoning

Support Department

Mortuary Zoning

The mortuary zoning in the hospital provides the identification and censor of the bodies and the temporary preservation and storage of the bodies prior to transfer. The mortuary zoning should be located far from all of the entrances of the healthcare facility and preferably closed to the basement as required. The demands of relatives of the deceased, healthcare staff and the attendant authorized persons should be considered comprehensively in the strategic planning.

Food Services Zoning

The food services zoning is normally dedicated to spreading essential materials like foods to all patients and staff of the healthcare facility. The food services zoning is preferably located on the ground floor or in the basement as required which make the circulation of the food delivery convenient to reach various departments. It should be closed to staff entrance, vertical and horizontal circulation, and services entrance as far as possible. The natural sun light and ventilation is not necessary in the food services.

Maintenance Zoning

The maintenance zoning as the fundamental service of the hospital provides on-call repair service for the other departments that is always in-house and contracted. The maintenance zoning is preferably located in the separate zoning area of the healthcare facility, which prevents noises and pollution from the main departments of the hospital. The natural sun light and ventilation is required to guarantee the physical and mental health and work efficiency of staff.

Housekeeping Zoning

The housekeeping unit zoning that provides on-call contracted and in-house services is dedicated to guaranteeing the cleanliness of the functional facility in the hospital. Most of the department zoning should be required throughout the facility to maintain a cleaning and sanitary environment to guarantee the efficiency of the services and the health of all the patients and staff. The housekeeping should be closed to staff entrance and the staff circulation of support department.

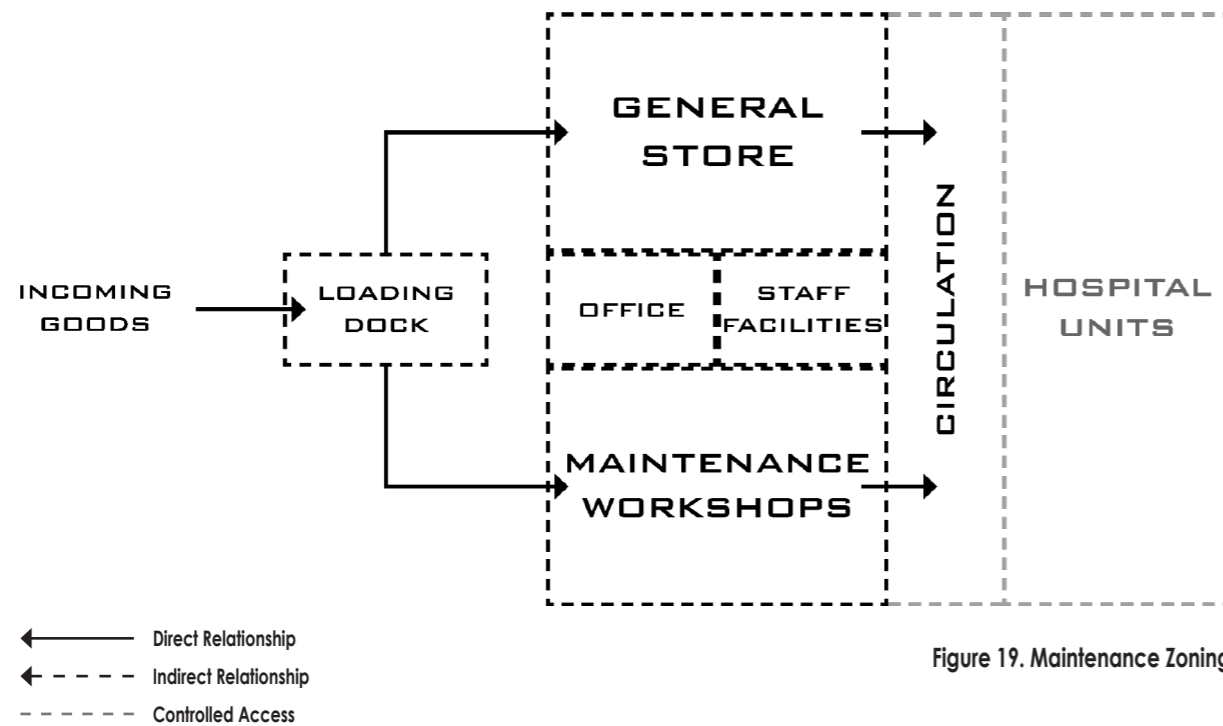


Figure 19. Maintenance Zoning

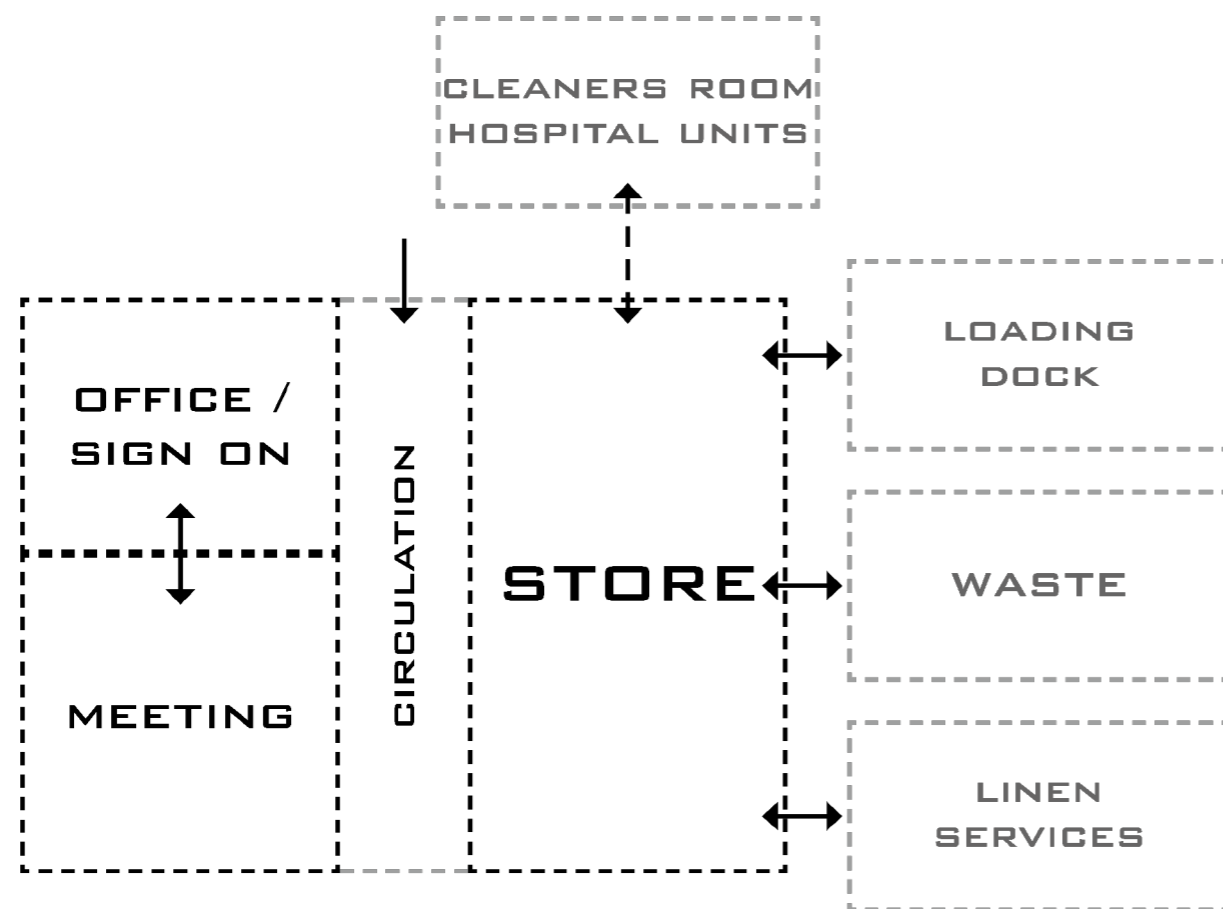


Figure 20. Housekeeping Zoning

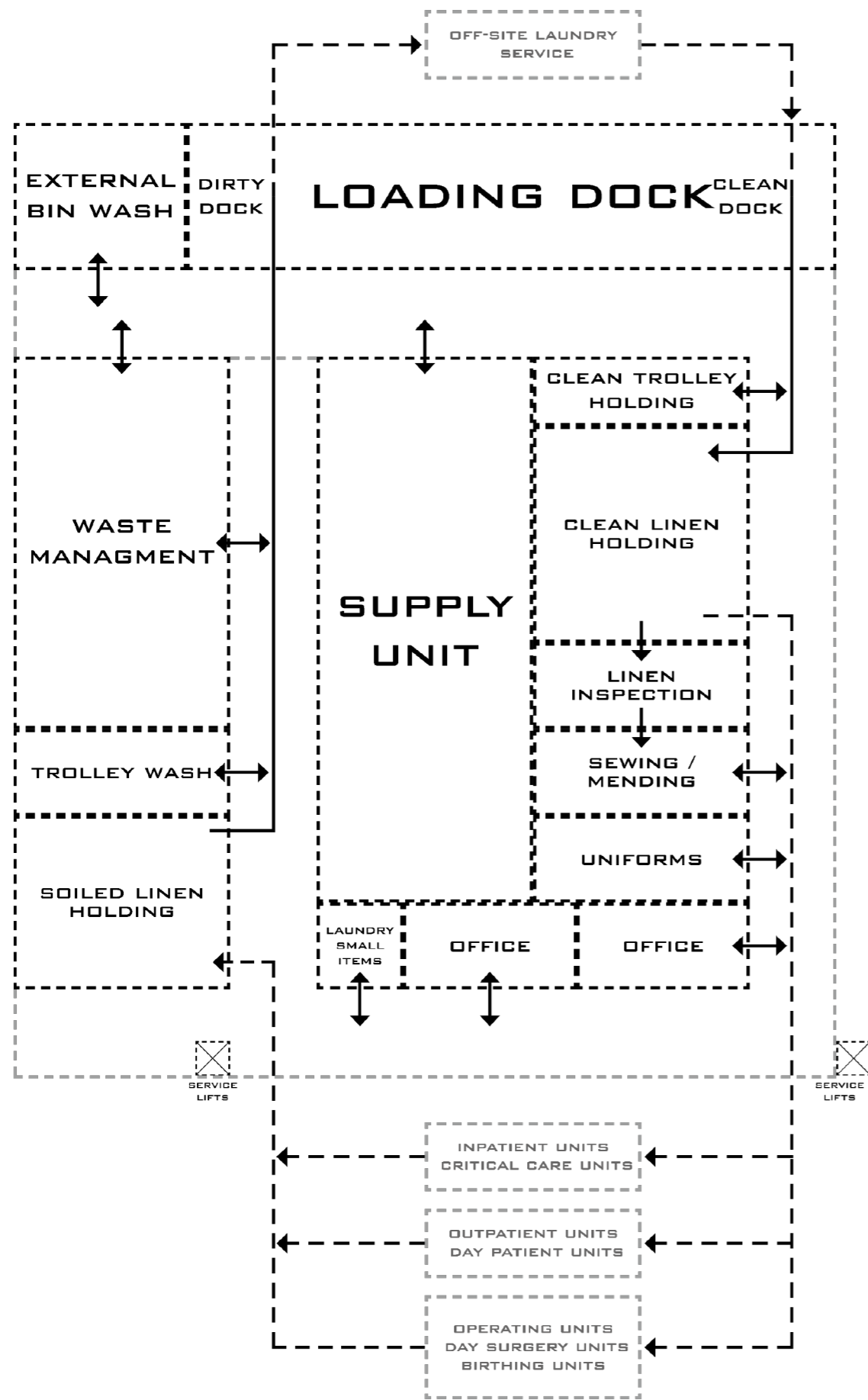


Figure 21. Linen Zoning

Linen Zoning

The linen zoning provides services for basic storage and handling of soiled and cleaned linen, which could reduce the risk of disease transmission to a low level according to the procedures and guidelines for precautions.

The long-sleeved fluid-resistant and disposable gloves of linen staff in linen zoning should be worn during the process of handling soiled linen in order to prevent skin and mucous membrane from blood and body substances, which should be removed and discarded into the clinical waste repository. Hand hygiene of linen staff should be performed each time following the handling of used linen.

There are no additional requirements for laundry management for patients with confirmed, probable, or suspected influenza infection. Laundry workers of the linen zoning should wear the personal protective equipment normally used as appropriate to the linen assignment being undertaken such as personal protective equipment such as gowns and gloves.

Supply Unit Zoning

The supply unit zoning provides not only the purchase and receipt of equipment but also the storage of bulk dry goods, consumables, drugs, intravenous fluids, flammable liquids, emergency stock for the functional facilities, surplus hospital equipment, and equipment awaiting repairs. It could deliver the regular restocking of the unit-based supplies to each functional units of healthcare facility. The supply unit zoning should be connected to other departments but preferably separated from the main area of hospital.

Waste Management Unit Zoning

The waste management unit as a designated area of the support department is staffed by the multidisciplinary management including collection, transport, processing, disposal, and monitoring of waste materials generated from the work of a series of departments. Waste material from healthcare facilities could be classified into infectious and pathological waste, sharp waste, pharmaceutical waste, radioactive waste, and general waste with infection risk.

Total Alliance Health Partners International. (2019).
International Health Facility Guidelines Version 4.2

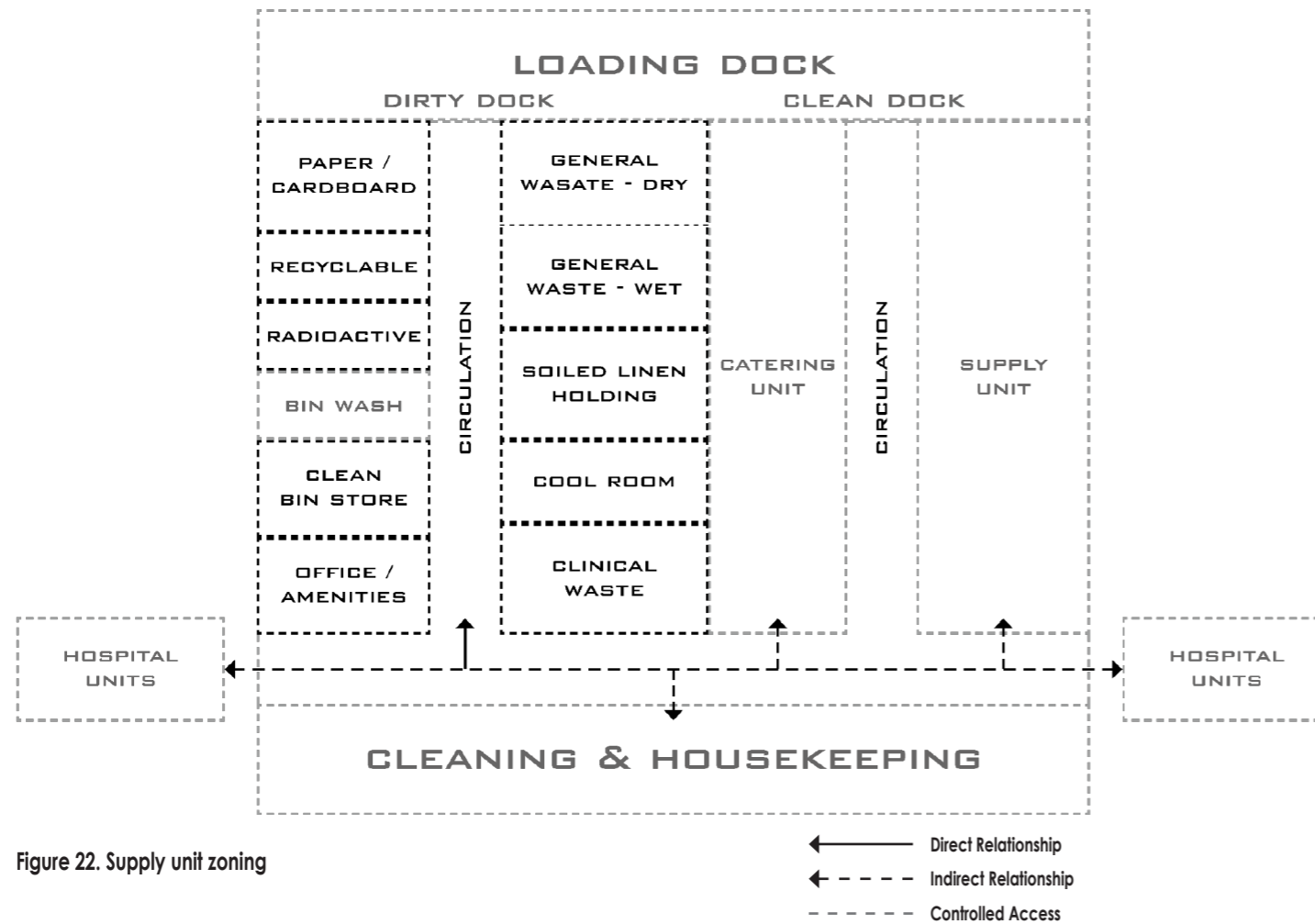


Figure 22. Supply unit zoning

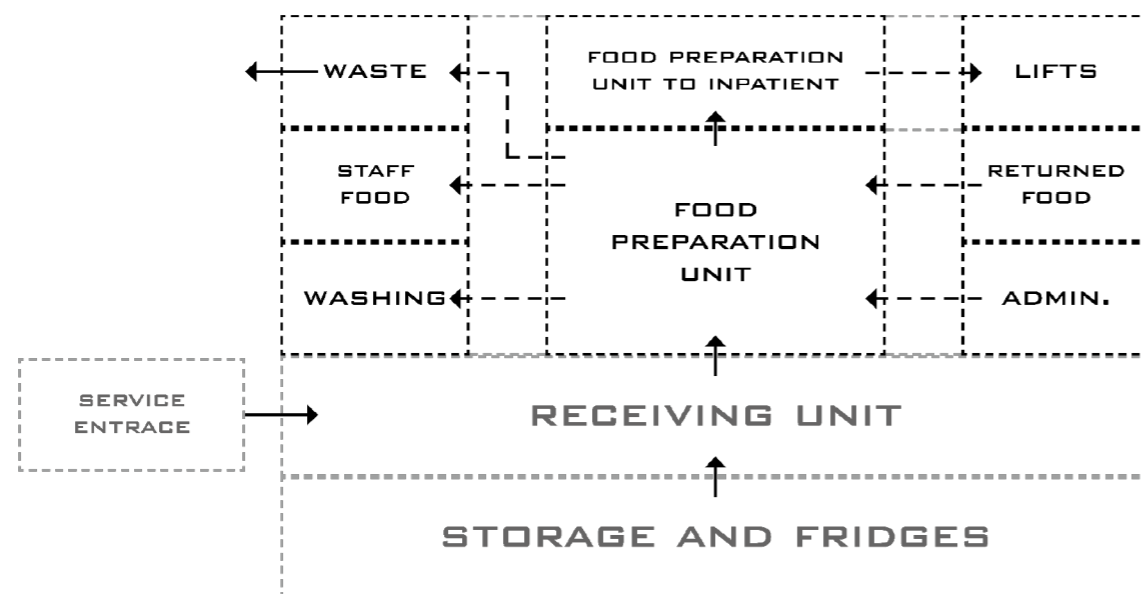


Figure 23. Waste management zoning

III

SYNTHESIS ANALYSIS
OF
APPLICATION ON SITE

Site Analysis: Accessibility Statistics

Overview

In this chapter, Milan would like to be used as a pilot area to explore the potential and suitable site for a fast-response pre fabric temporary healthcare system, according to the current situation in Milan and the travel accessibility of the citizens.

As one of the metropolises affected by the coronavirus influenza, the city of Milan, as a typical urbanization city, has research significance in the response and preparedness of the epidemic outbreak. In the outbreak and spread of the coronavirus influenza, the consequent difficulties and challenges faced by the city of Milan have also occurred in other regions in Europe.

Therefore, the thesis intends to take the city of Milan as the research object to discuss possible reasonable places for the fast-response healthcare system according to the distribution of public health resources in Milan and the appearance habits and travel radius of the people before the chapter on design specification.



Figure 24. Map of Milano, Italy

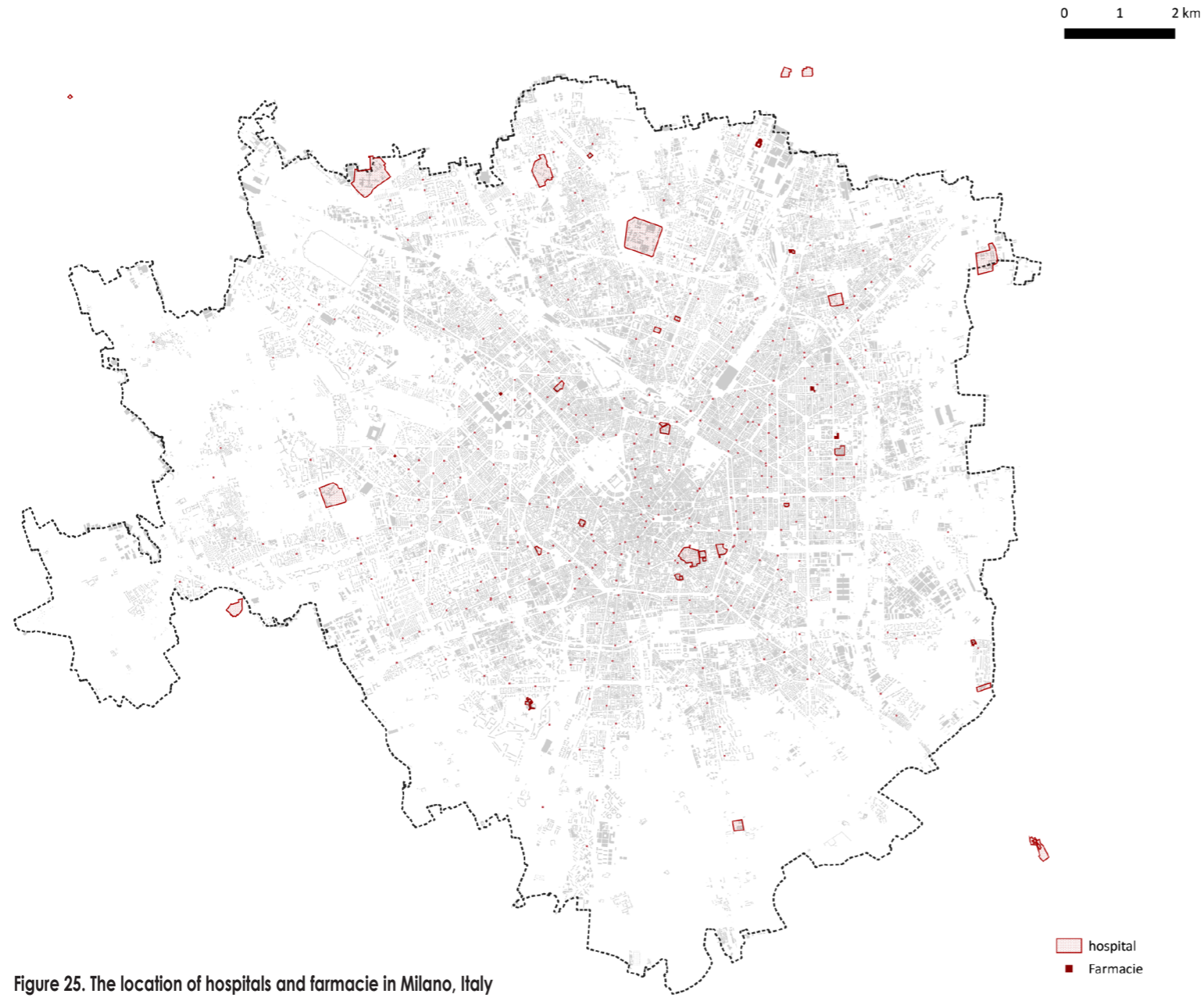


Figure 25. The location of hospitals and farmacie in Milano, Italy

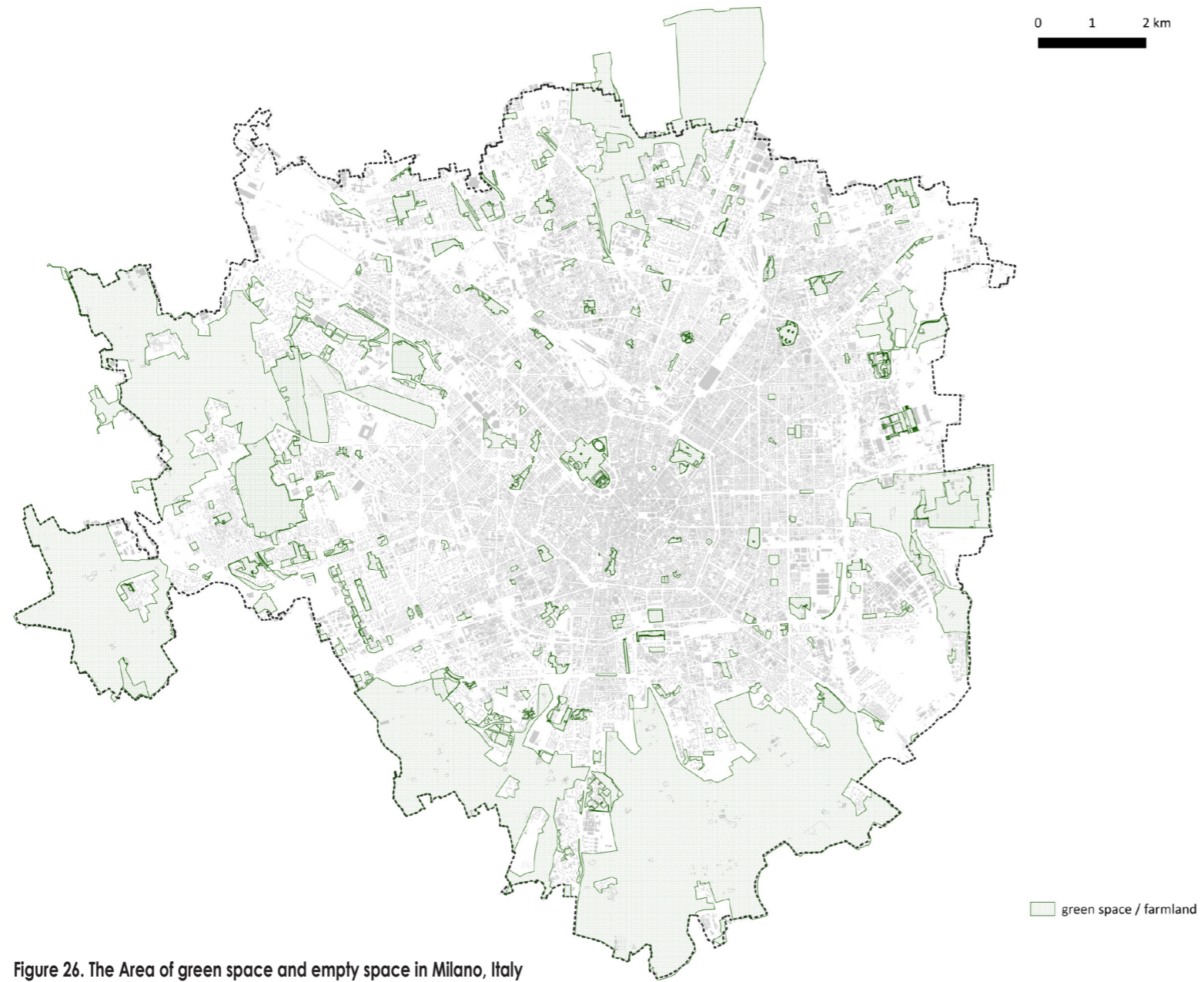


Figure 26. The Area of green space and empty space in Milano, Italy

0 1 2 km



Figure 27. Within 15 minutes of walking from each hospitals in Milano, Italy

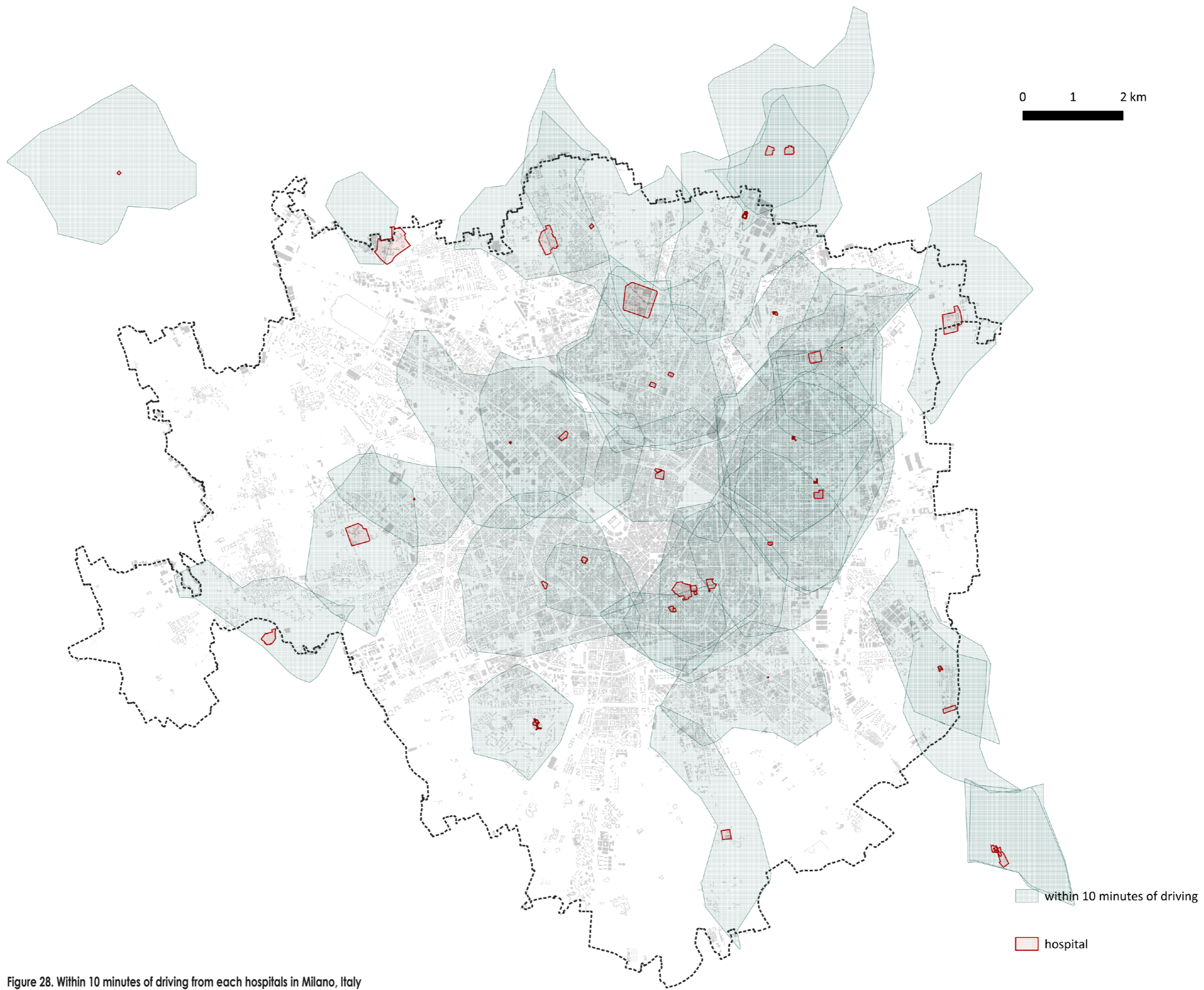


Figure 28. Within 10 minutes of driving from each hospitals in Milano, Italy

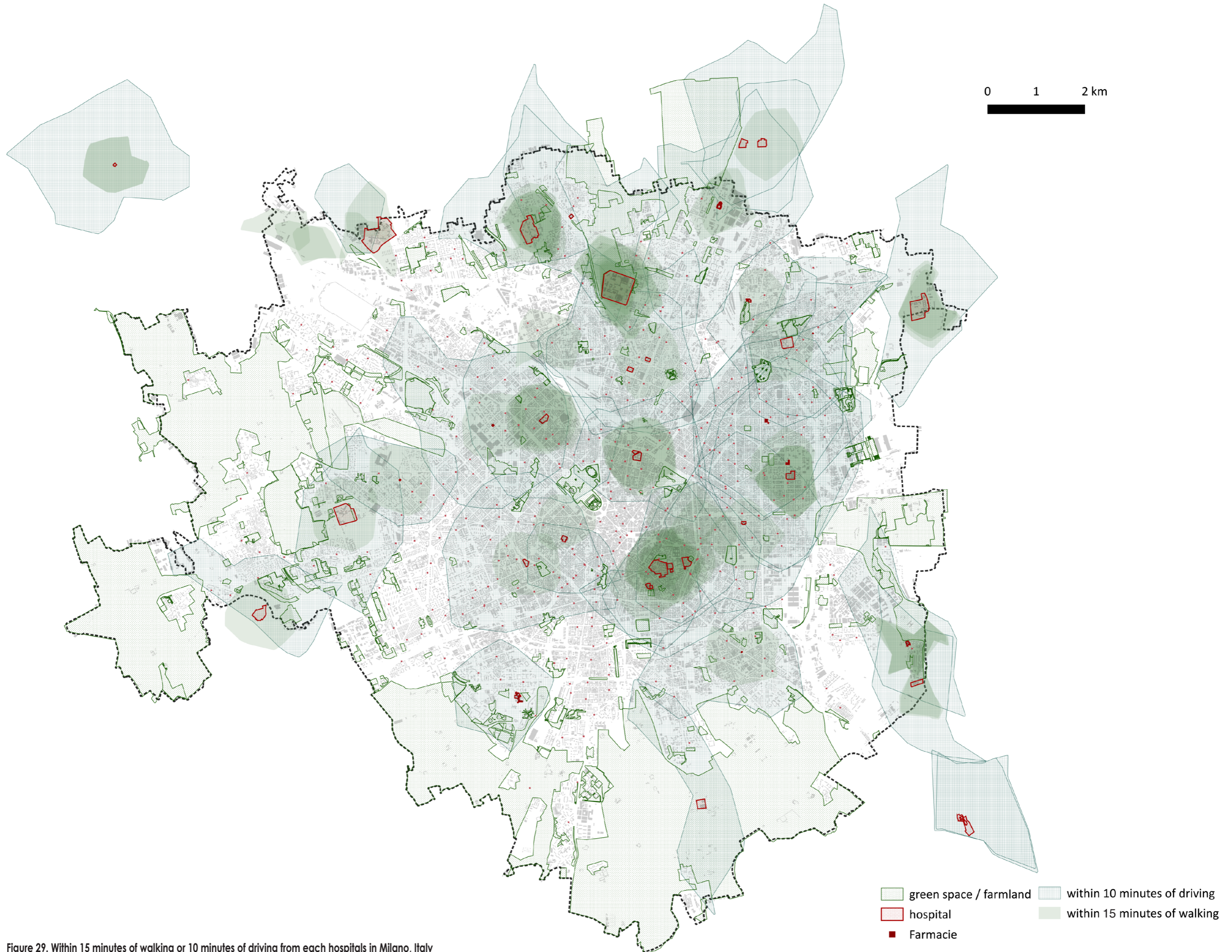


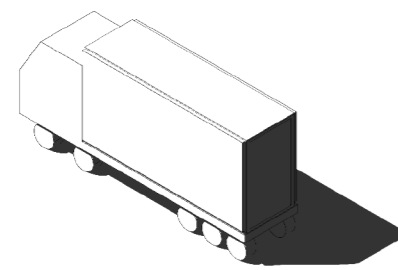
Figure 29. Within 15 minutes of walking or 10 minutes of driving from each hospitals in Milano, Italy

IV

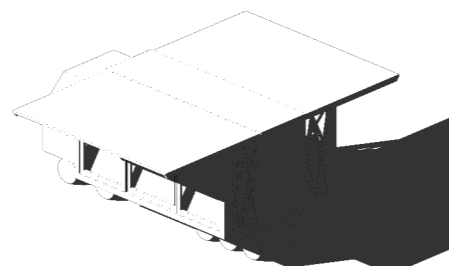
CASE STUDY
AND
DESIGN PRACTICE

Design Practice: Modular Unit and Combination

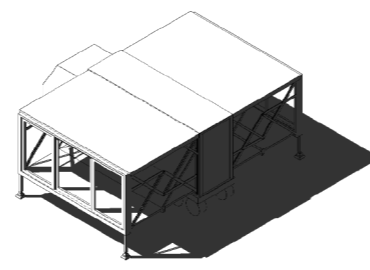
Process of Modular Unit Installation



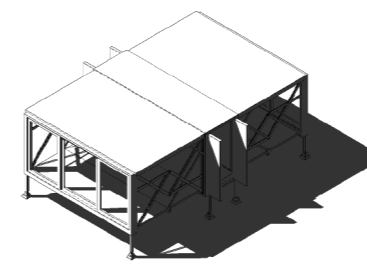
Step One
Modular Unit carried by Transportation
park at the planned location



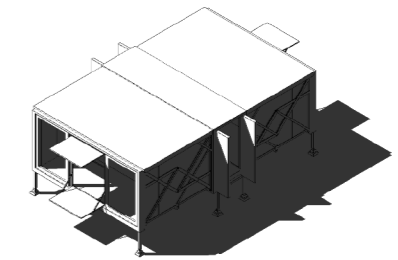
Step Two
Modular Unit carried by Transportation
open the panels on both sides



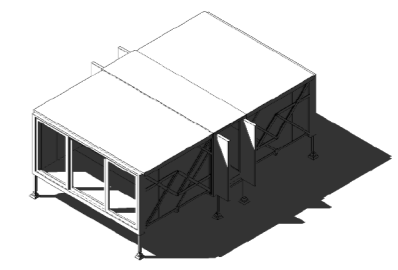
Step Three
Modular Unit carried by Transportation
put down the supported columns hidden in the panels



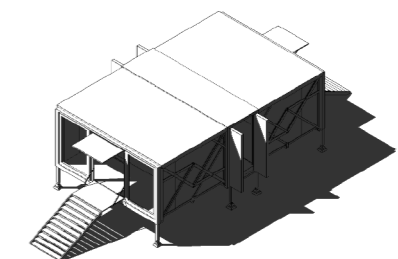
Step Four
Modular Unit supported by Columns on corners
put down the supported columns hidden in the central body



Final Step (availability to connect)
Modular Unit supported itself at the planned location
unfold the panels to connect to corridor/ another unit



Final Step (basic status)
Modular Unit supported itself at the planned location
unfold the panels to close sides with telescoping skeleton

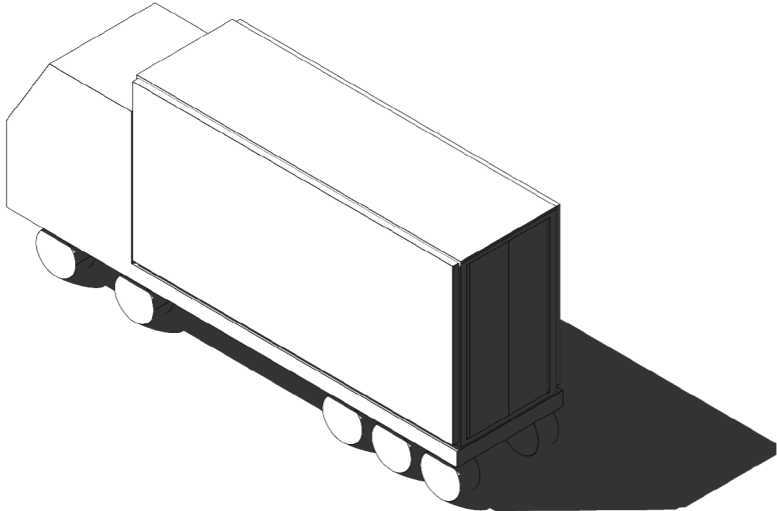


Final Step (availability to outdoor space)
Modular Unit supported itself at the planned location
put down the staircase to connect to outside

Figure 30. The process of Healthcare Modular Unit from Transport to Installation

Process of Modular Unit Installation

Step One: Modular Unit carried by Transportation park at the planned location



Step Two: Modular Unit carried by Transportation open the panels on both sides

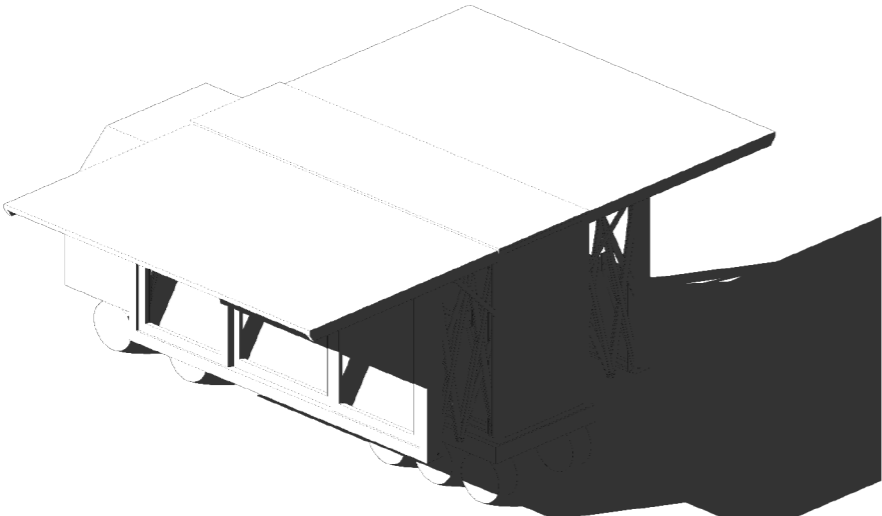
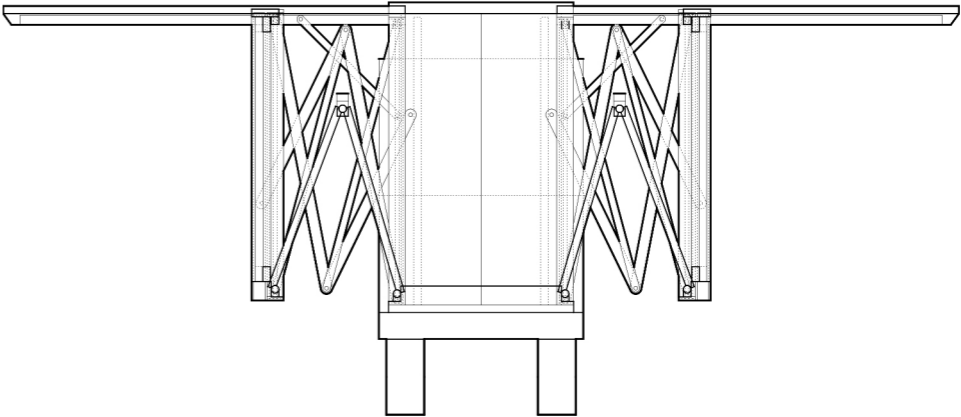
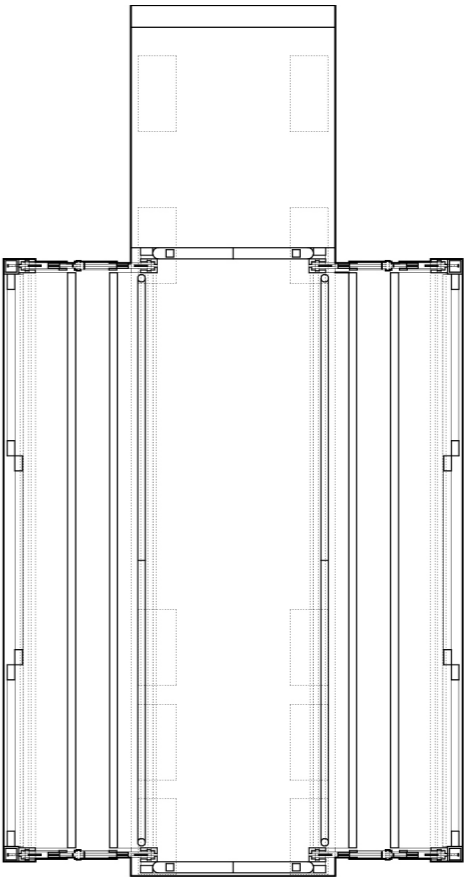


Figure 31. Axonometric view of the Modular Unit from Step One to Step Two



1 : 200

Figure 32. Plan and Section of the Modular Unit at Step Two

Process of Modular Unit Installation

Step Three: Modular Unit carried by Transportation put down the supported columns hidden in the panels

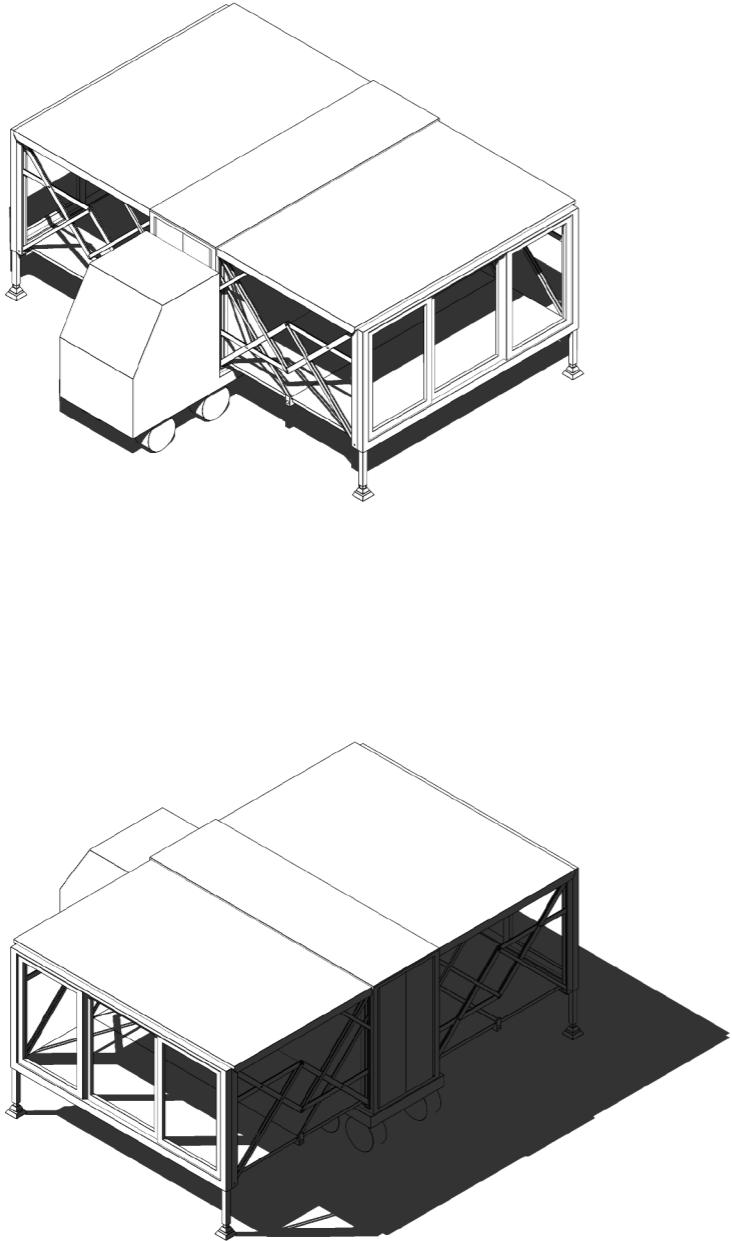
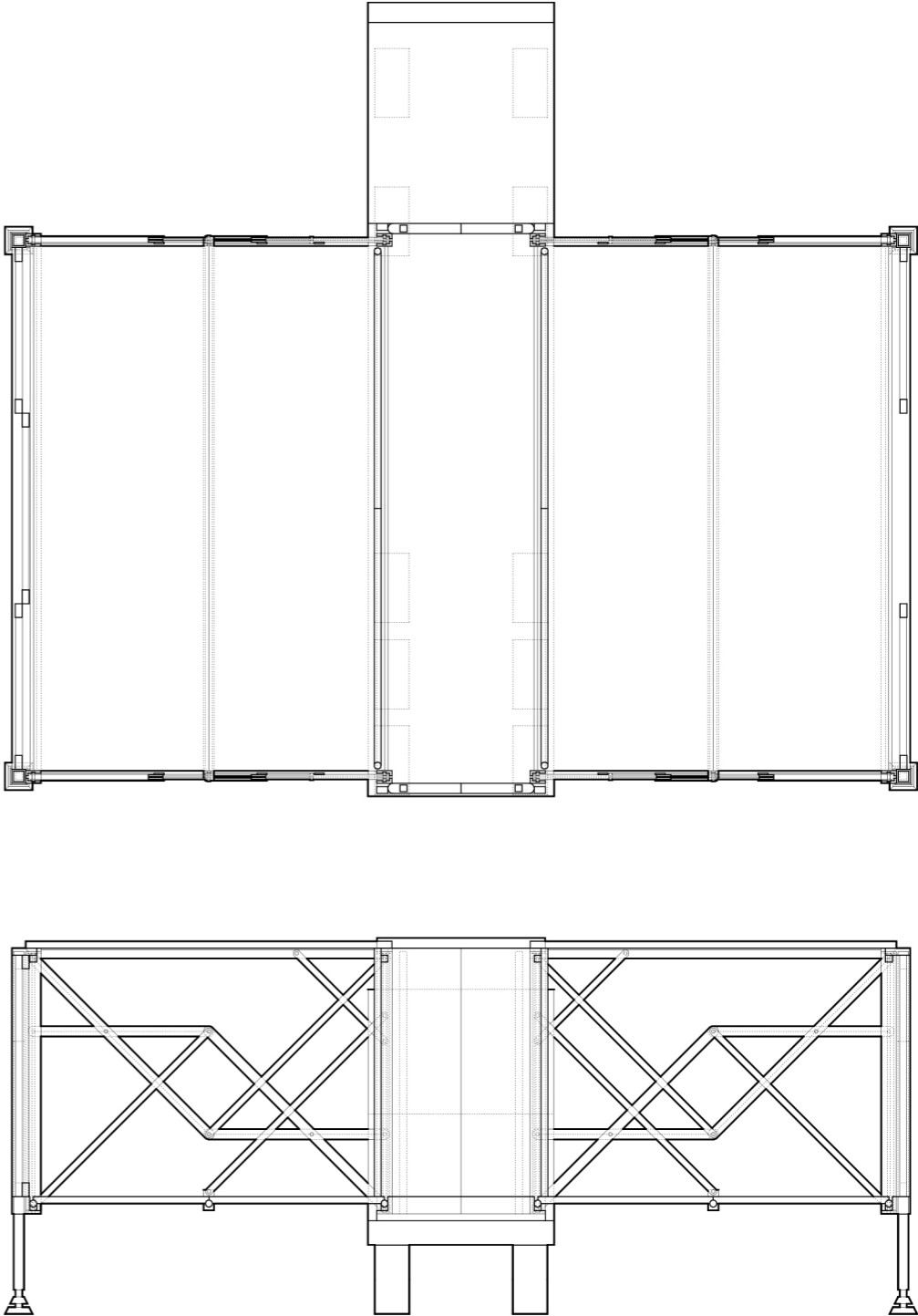


Figure 33. Axonometric view of the Modular Unit at Step Three



1 : 200

Figure 34. Plan and Section of the Modular Unit at Step Three

Process of Modular Unit Installation

Step Four: Modular Unit supported by Columns on comers put down the supported columns hidden in the central body

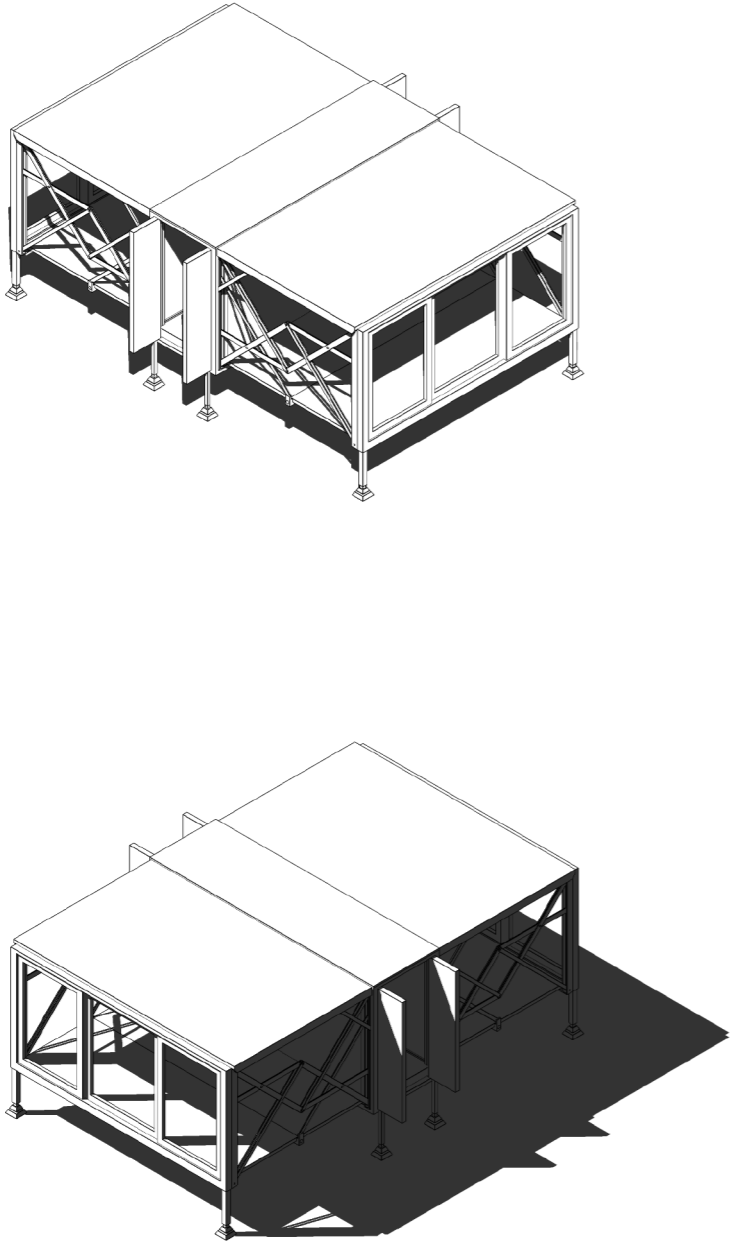


Figure 35. Axonometric view of the Modular Unit at Step Four

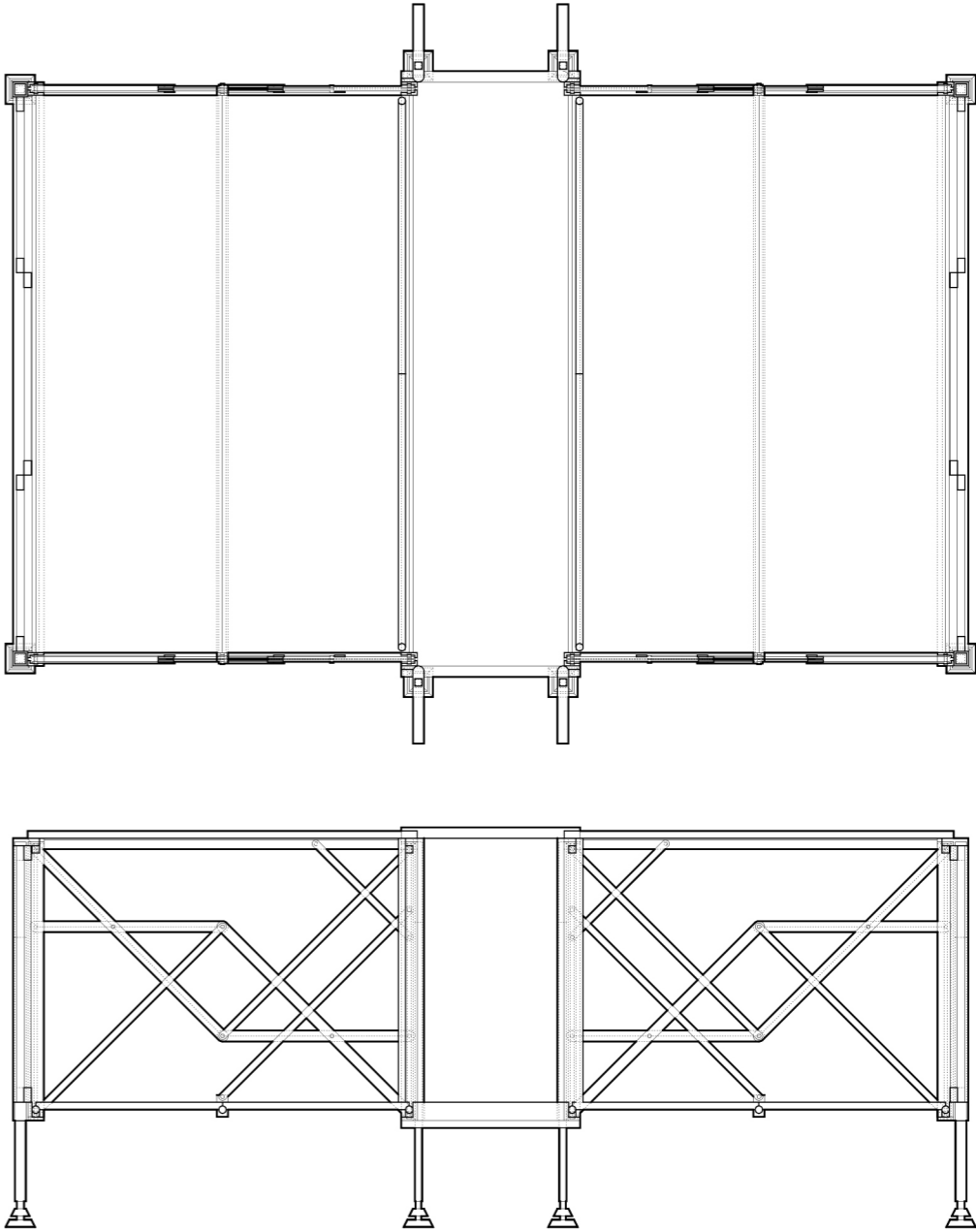


Figure 36. Plan and Section of the Modular Unit at Step Four

1 : 200

Process of Modular Unit Installation

Final Step: (basic status) Modular Unit supported itself at the planned location unfold the panels to close sides with telescoping skeleton

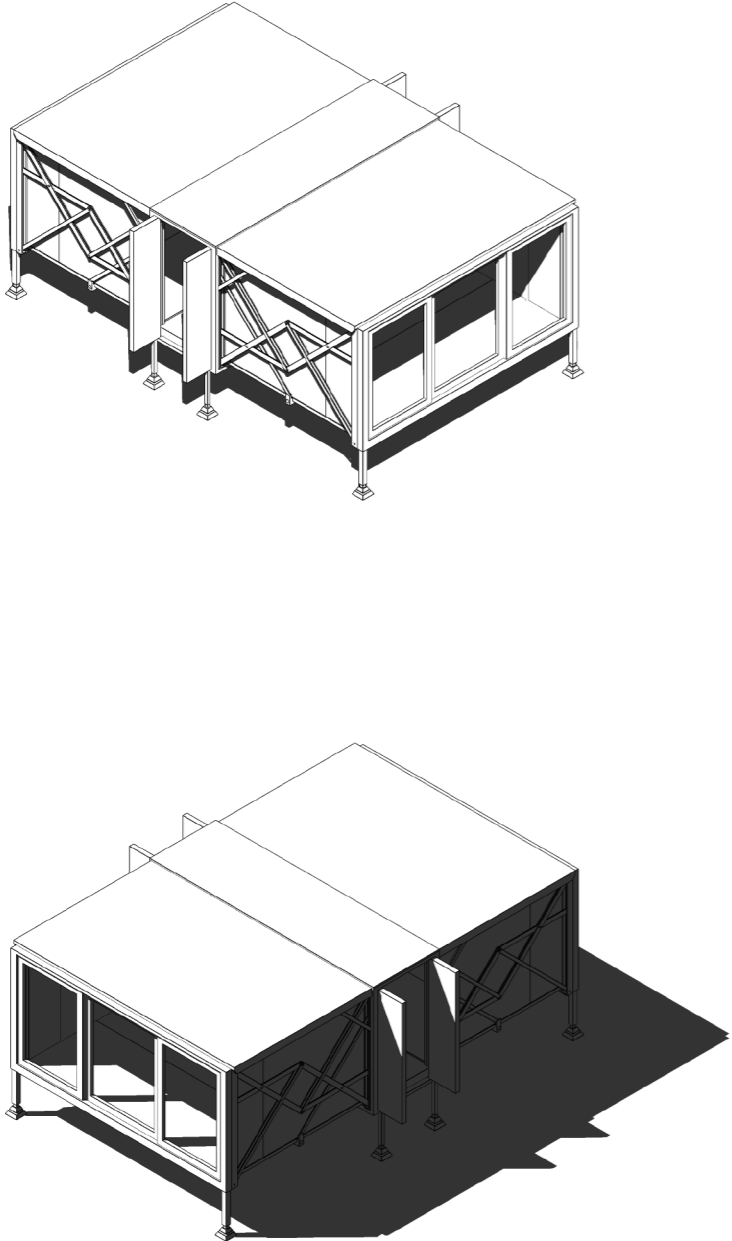
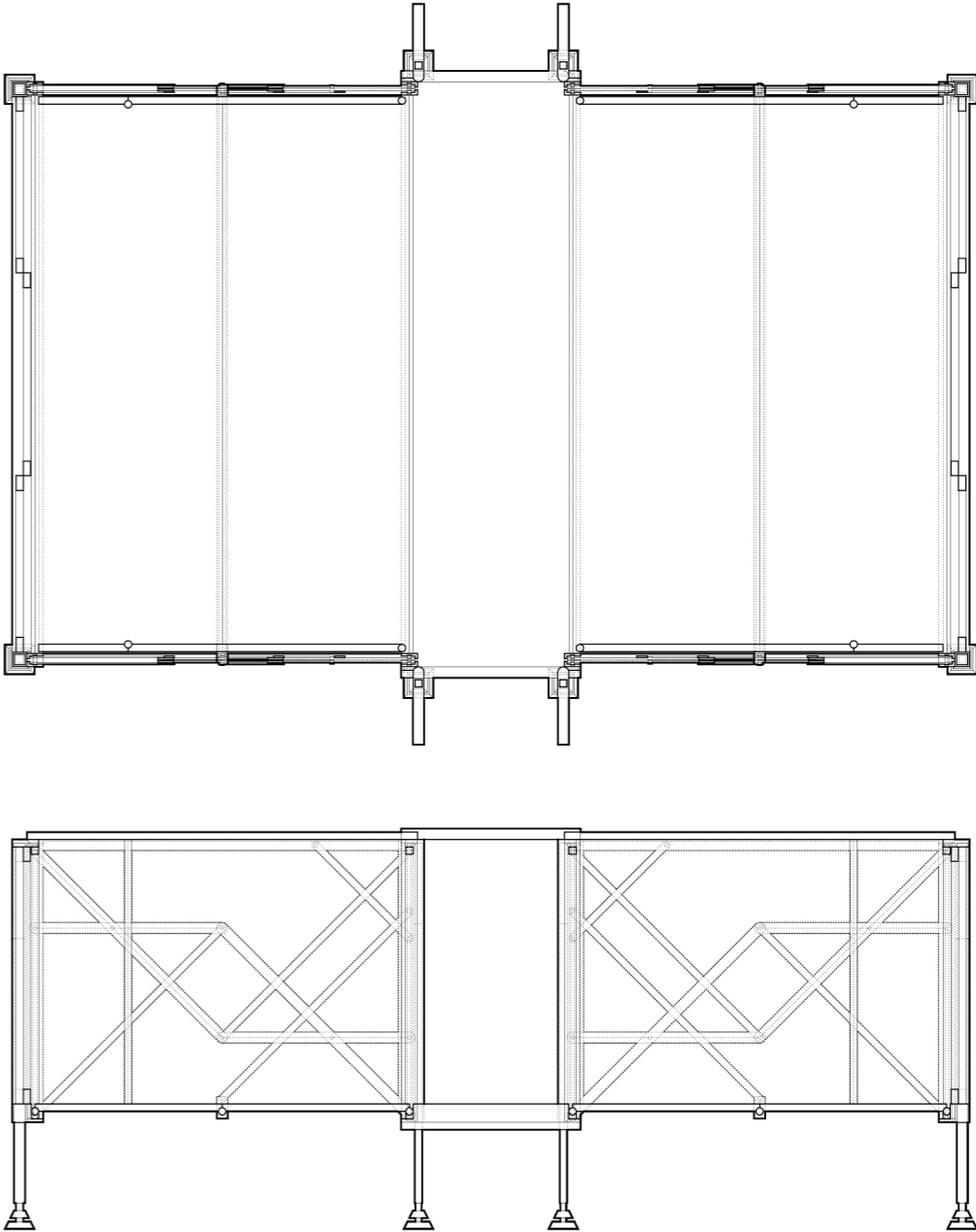


Figure 37. Axonometric view of the Modular Unit at Final Step (basic status)



1 : 200

Figure 38. Plan and Section of the Modular Unit at Final Step (basic status)

Process of Modular Unit Installation

Final Step: (availability to connect) Modular Unit supported itself at the planned location unfold the panels to connect to corridor/ another unit

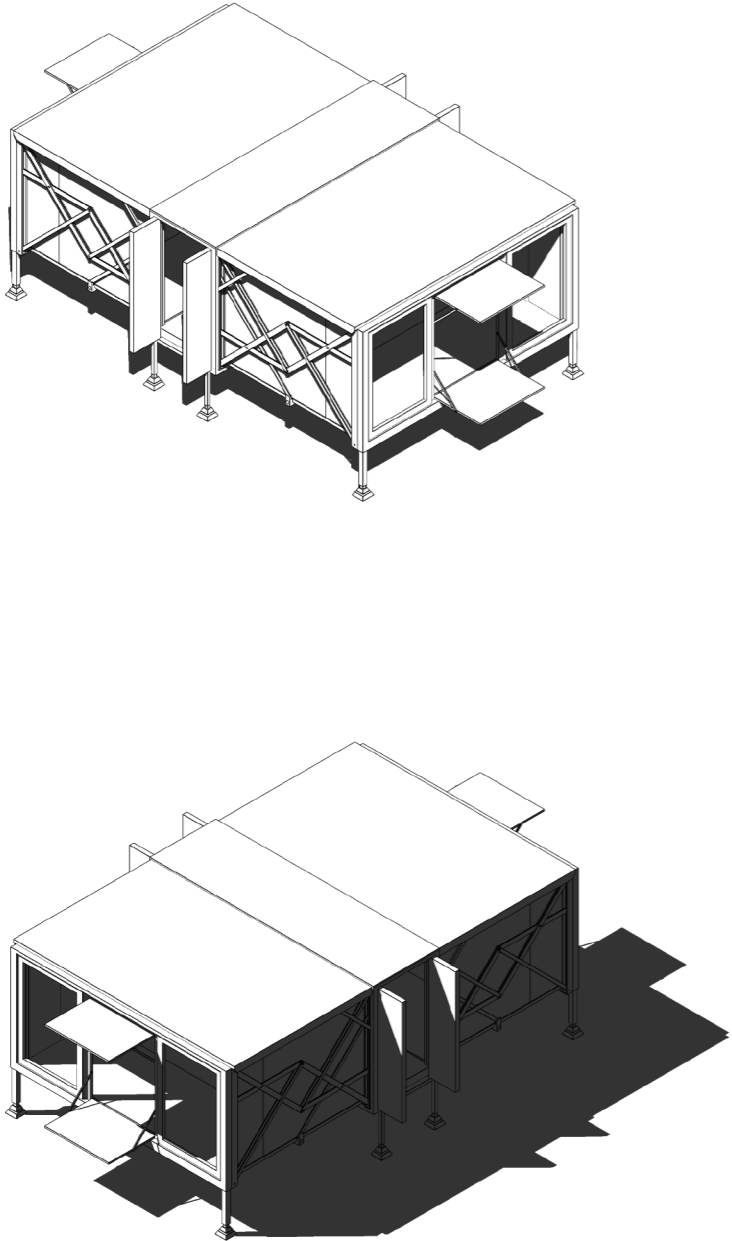
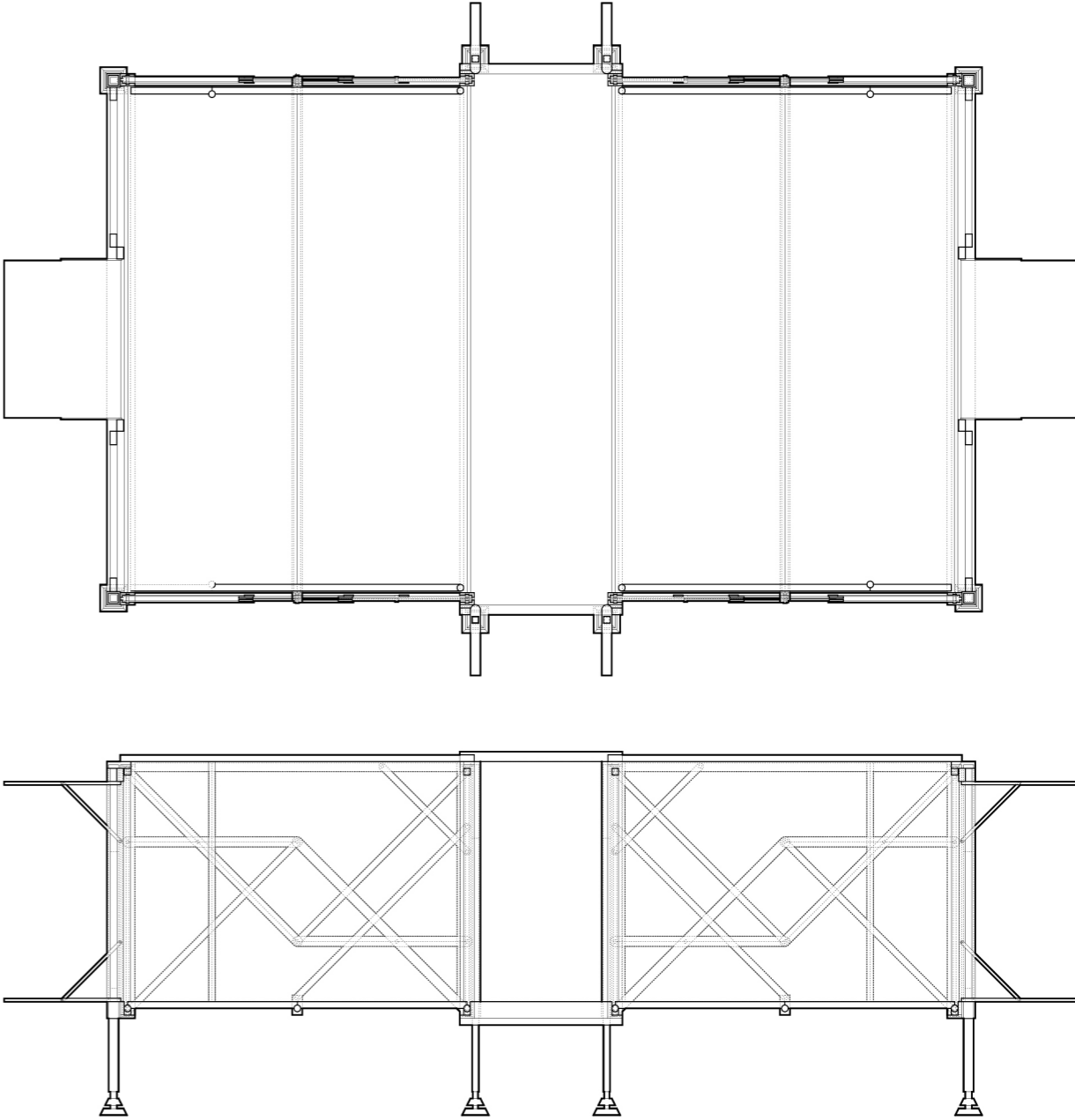


Figure 39. Axonometric view of the Modular Unit at Final Step (availability to connect)



1 : 200

Figure 40. Plan and Section of the Modular Unit at Final Step (availability to connect)

Process of Modular Unit Installation

Final Step: (availability to outdoor space) Modular Unit supported itself at the planned location put down the staircase to connect to outside

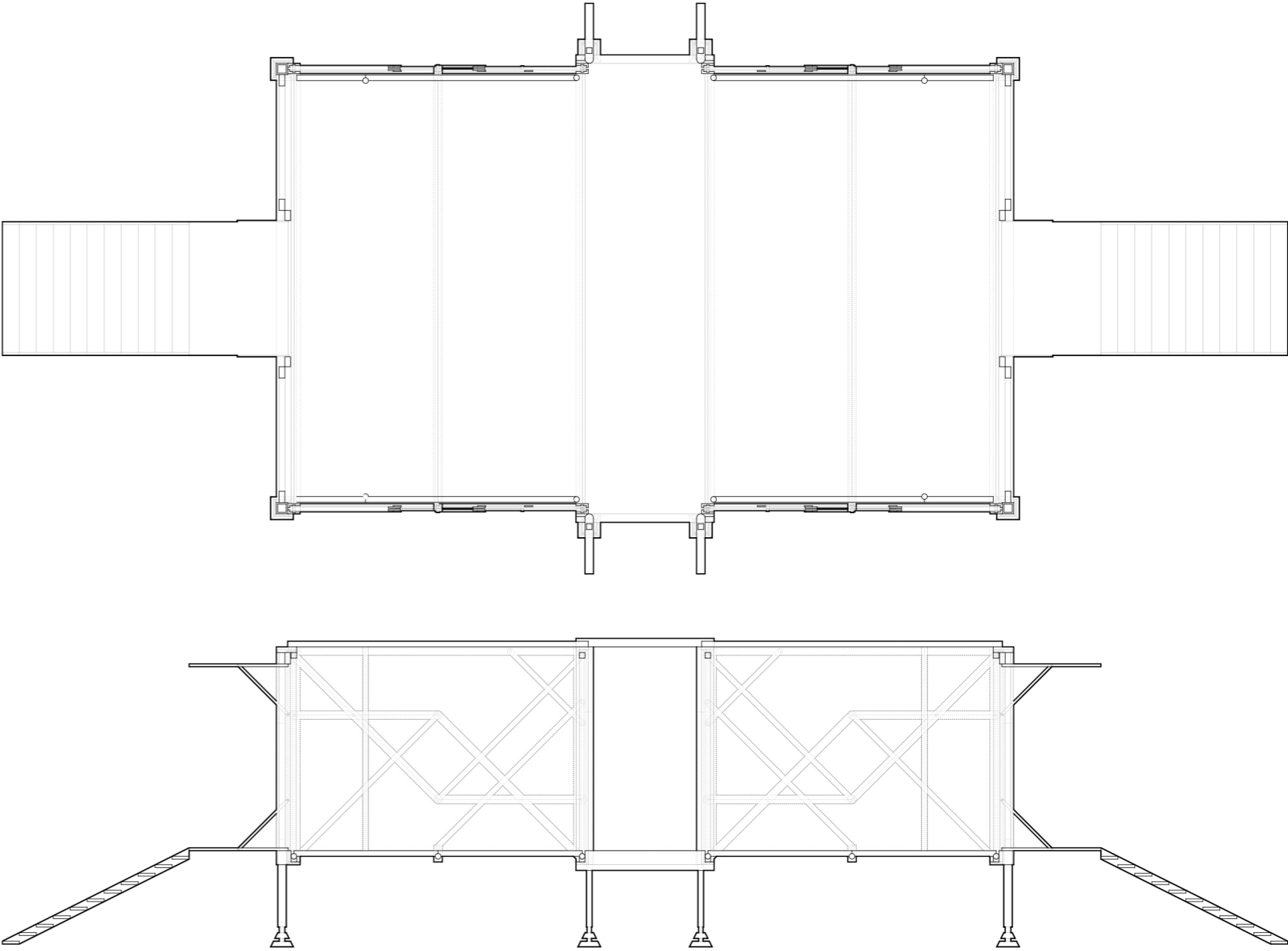
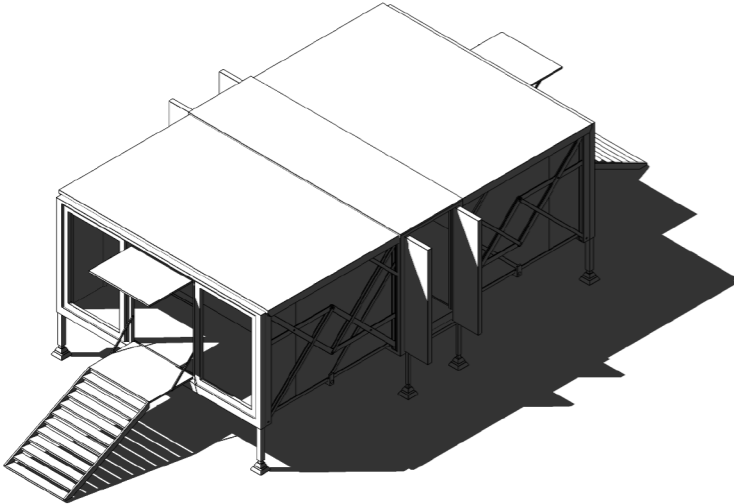
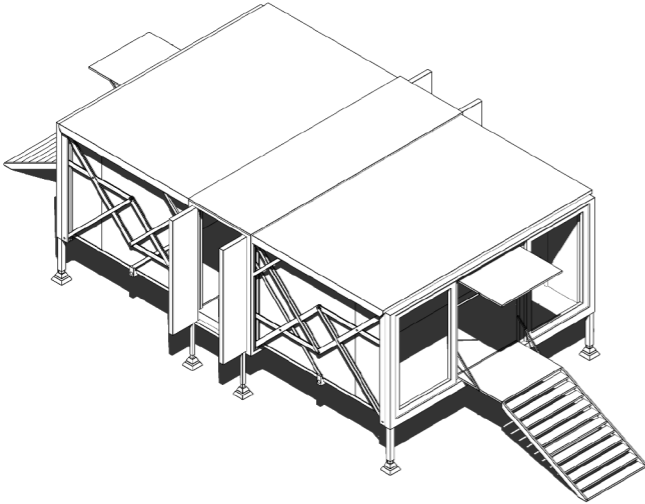
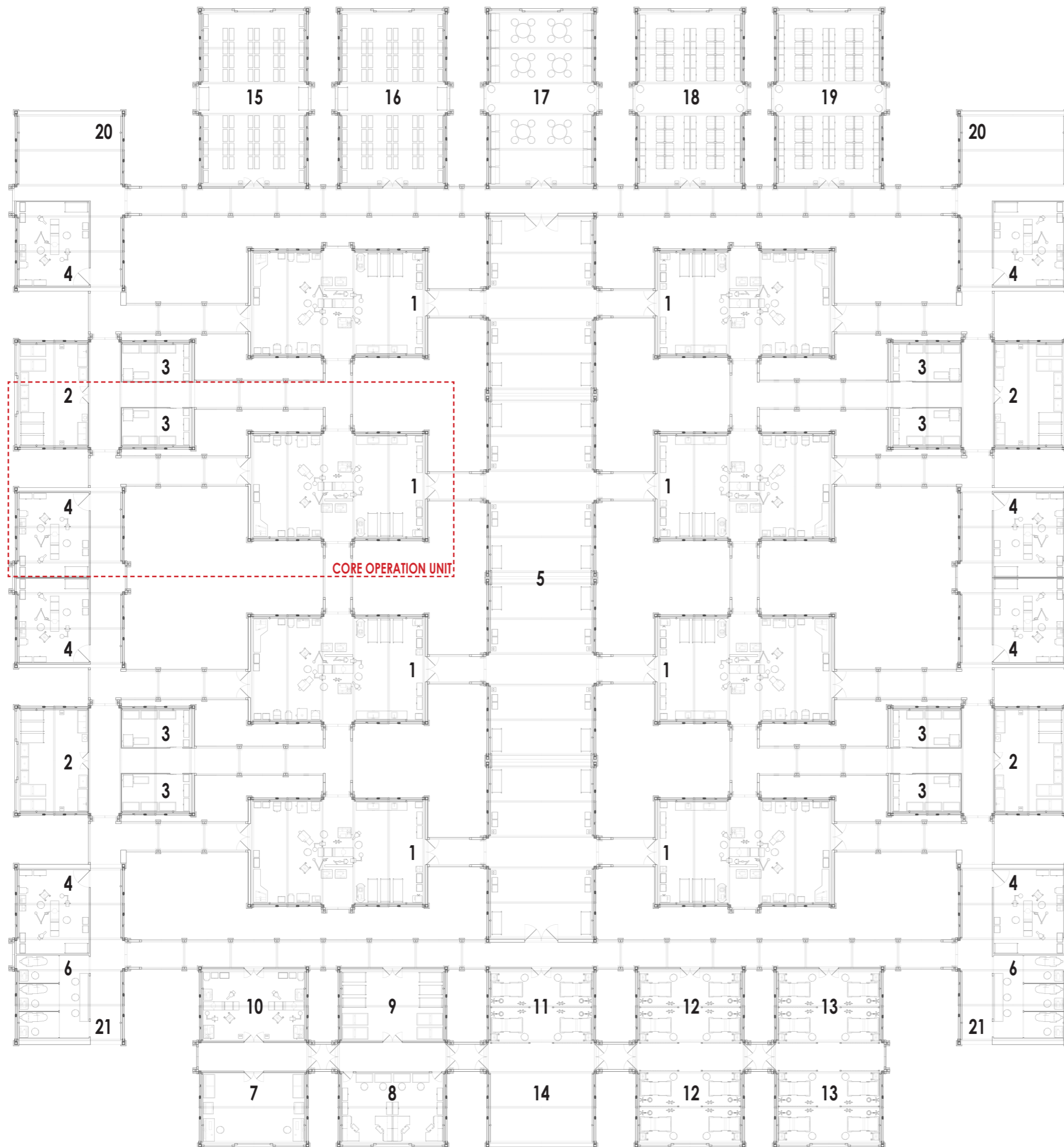


Figure 43. Axonometric view of the Modular Unit at Final Step (availability to outdoor space)

Figure 44. Plan and Section of the Modular Unit at Final Step (availability to outdoor space)



- 1. OPERATION ROOM
- 2. CLEAN-UP ROOM
- 3. SCRUB ROOM
- 4. ANAES INDUCTION ROOM
- 5. STERILE STOCK AREA
- 6. MICRO TRIAGE
- 7. WAITING ROOM
- 8. ADMINISTRATION
- 9. SUPPORT ROOM
- 10. PECEPTION ROOM
- 11. PRE-OPERATION
- 12. 2ND STAGE RECOVERY ROOM
- 13. 1ST STAGE RECOVERY ROOM
- 14. RESERVED AREA FOR CONNECTION
- 15. EQUIPMENT STORE
- 16. NON STERILE STORE
- 17. STAFF LOUNGE
- 18. FEMALE STAFF CHANGING ROOM
- 19. MALE STAFF CHANGING ROOM
- 20. ENTRY AND EXITFOR STAFF
- 21. ENTRY AND EXIT FOR PATIENTS

Figure 45. Ground plan of Operation Zoning 1:300

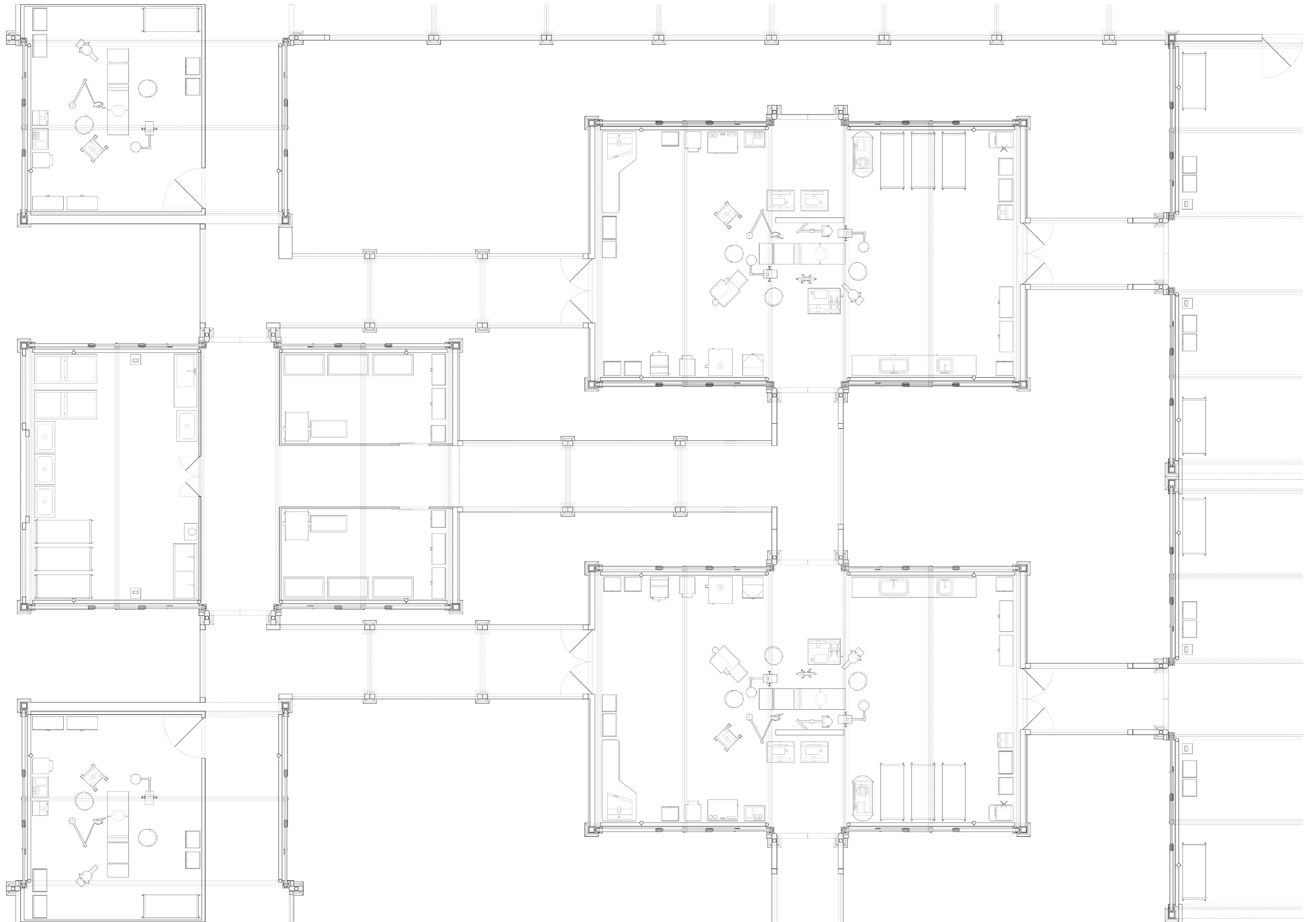


Figure 46. Ground plan of Core Operation Area 1:200

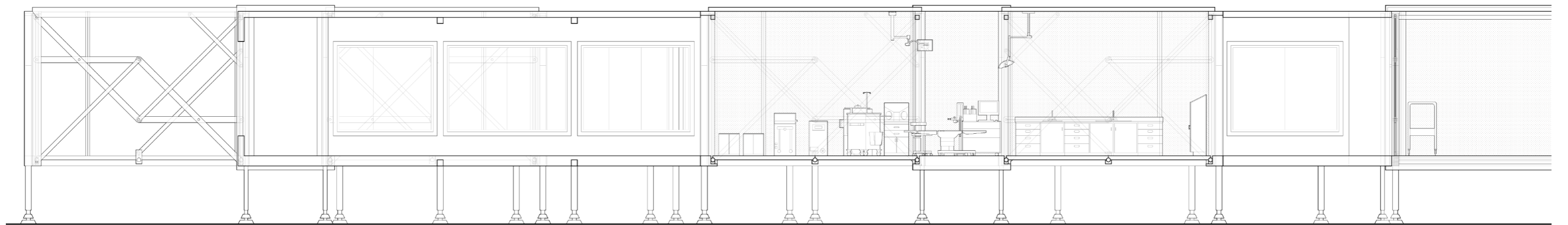
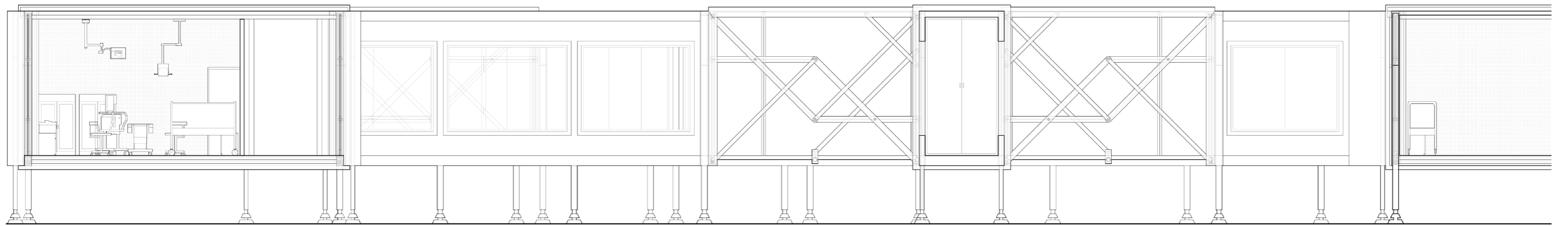


Figure 47. Sections of Core Operation Area 1:200

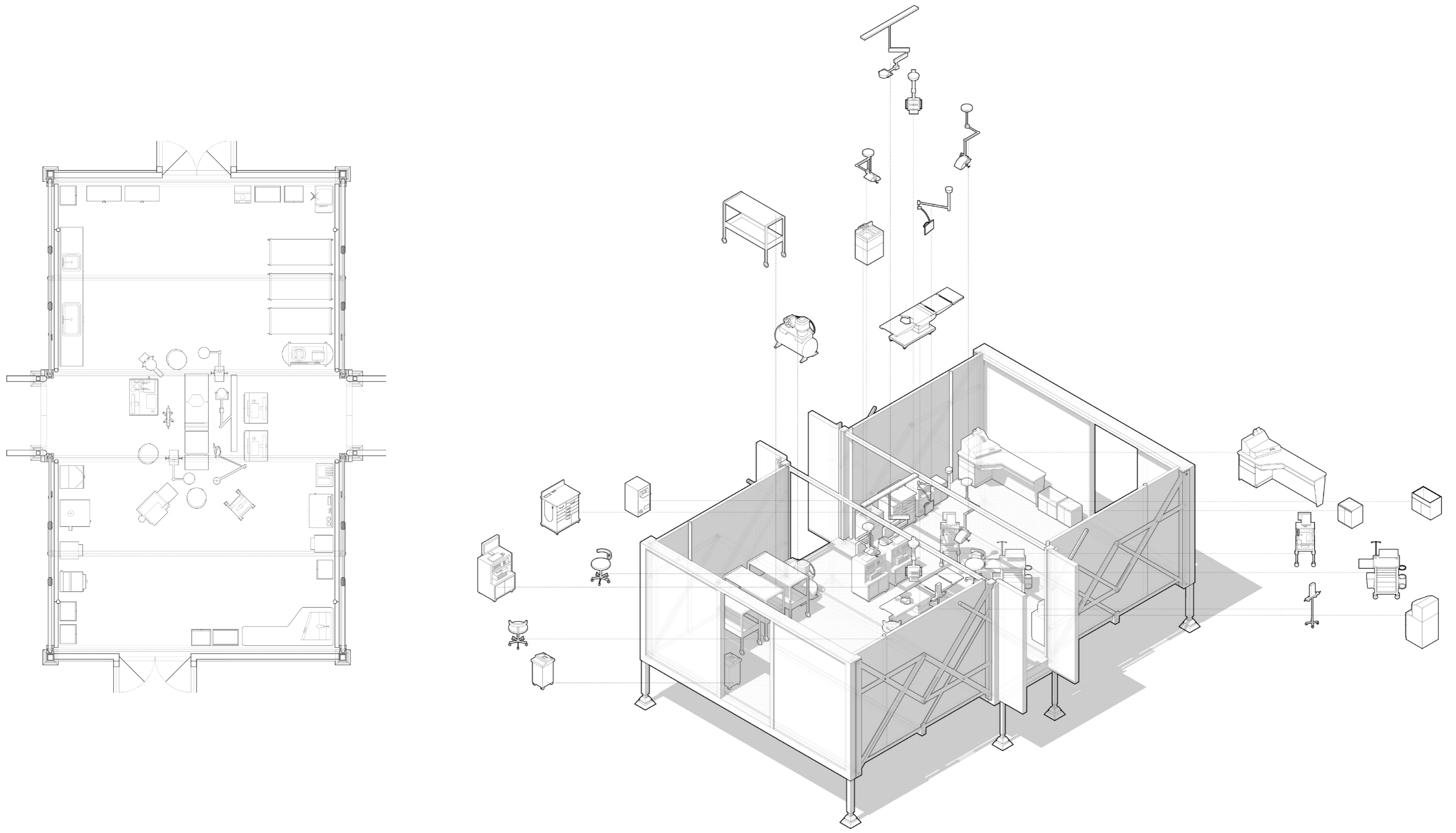


Figure 48. Axonometric View of Exploded Core Operation Area 1:200

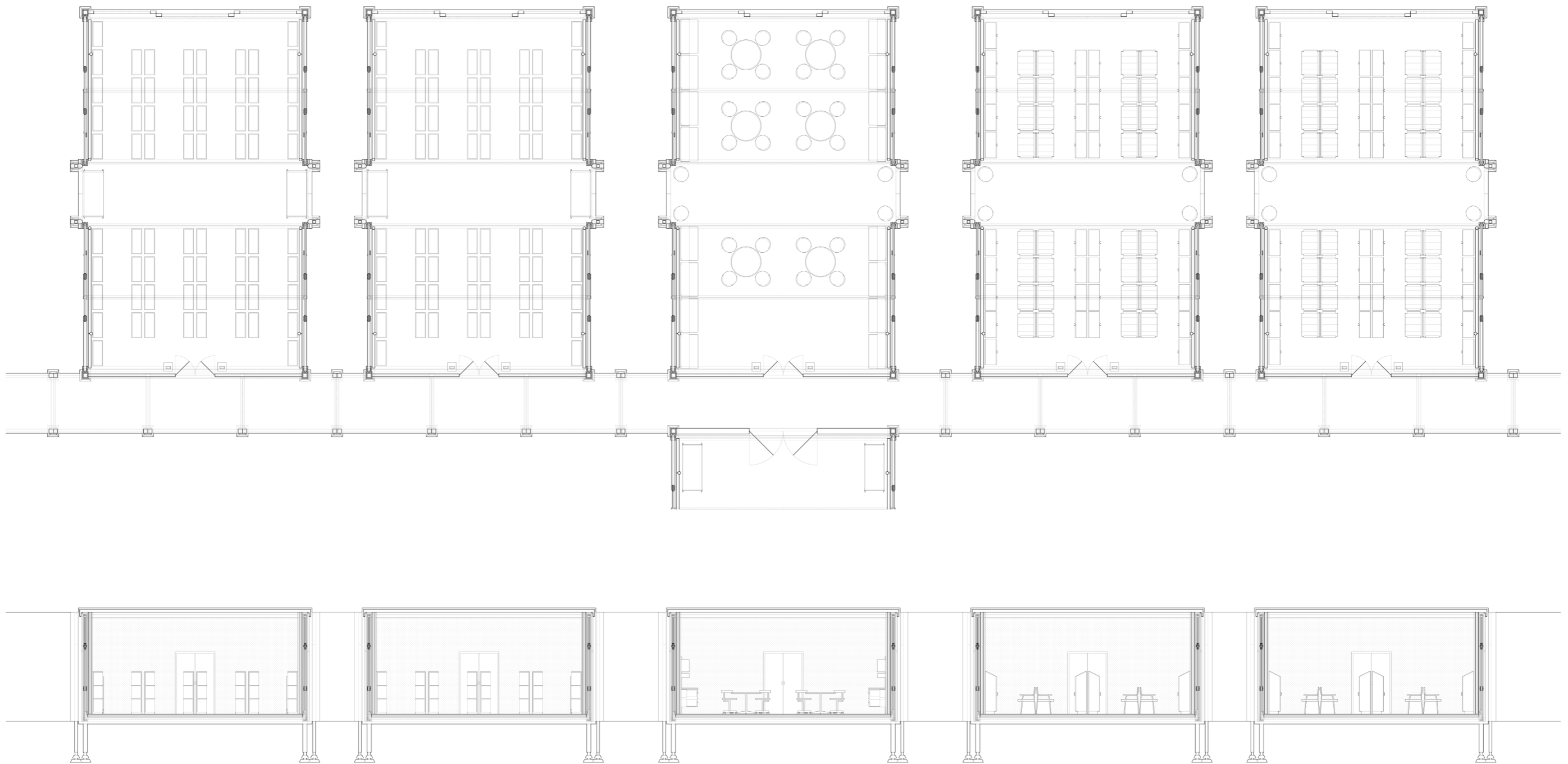


Figure 48. Ground plan and Section of Staff Area 1:200