2.0 PROJECT DESCRIPTION

2.1 Project Overview

2.1.1 The Project Proponent

ELZ A.S. was established as an SPV within the scope of a Public Private Partnership (PPP) agreement with the Ministry of Health (MoH) upon securing the Project Construction Works and the Provision of Products and Services bid tendered by MoH. The Project's initial agreement has been signed between MoH and ELZ A.Ş. on 04.06.2013. The agreement together with its annexes was amended and resigned on 26.08.2014. Under the terms of the agreement with MoH, ELZ A.Ş. will be responsible for the detailed design, construction, equipping, financing, operation and maintenance of the IHC for a 28-year project period. This period covers a 3 year construction period and a 25 year operation period. The provision of medical services will be under the responsibility of MoH. At the end of 28-year project period, the IHC will be transferred to MoH.

2.1.2 Background

The healthcare system in Turkey before 2003 was characterized as a fragmented provision and financing systems with inequalities in accessing healthcare by different subpopulations and dissatisfaction felt by both the providers and the purchasers of the healthcare system. Inequalities in accessing healthcare was the major challenge to be dealt with where only a minority of the population had access to timely and relatively high-quality healthcare services. This led to the need for strengthening the healthcare system in Turkey which, in turn, triggered the initiation of the Health Transformation Program (HTP) in 2003. The purpose of the program was to increase the quality and efficiency of the healthcare system and enhance access to healthcare facilities with the introduction of a number of reforms. The major reforms that have been undertaken are summarized below:

- All public health facilities were merged under MoH. This was the first step taken to consolidate the provision of public healthcare services under one authority. This merger resulted in opening up all public facilities to the entire population and was a first step towards equalizing access to healthcare.
- The financing of healthcare services has undergone a major restructuring. The social security funds which also cover social health insurance were transferred to the Social Security Institution and a new General Health Insurance Scheme (GHIS) was established in 2008 that included those previously covered under the transferred social security schemes as well as everyone joining the social health insurance system for the first time. In the run-up to the full implementation of the GHIS, the benefits provided by the (fragmented) pre-existing social health insurance schemes have been equalized and currently the whole population benefits from the same package.
- A pilot family practitioner scheme has been introduced and later extended to cover the whole population at the end of 2010.
- HTP aimed to increase the administrative and financial autonomy of hospitals. The major development in the hospital sector after 2003 focused on increasing the role of the private sector. Accordingly, a PPP Department under General Directorate of Health Investments of MoH was established for the planning of construction, renovation and management of health facilities in cooperation with the private sector.

Within the scope of HTP, MoH plans to develop 30 health campuses of different sizes and bed capacities within 22 provinces. The health campuses will serve 29 health regions in Turkey, which were determined based on the need for health services, geographical structure, patient flow, accessibility and socio-economic conditions. For each health region, usually a province is identified as the center of the health region and sub-provinces to be connected to the center province. Until now, 21 health facility projects have been initiated and are currently at different stages of planning and construction. Elazig IHC Project is one of these 21 projects and will serve the 4th health region that covers Elazig, Malatya, Tunceli and Bingol provinces. Among these four provinces, Elazig and Malatya have been identified as the centers of the 4th health region considering the population density, the ease of road transport, presence of health manpower, conditions and service delivery capacity of the existing health facilities.

As part of HTP, MoH has considered health campus planning based on four main reasons/needs:

- Effectiveness of health services across the country;
    - expanding the variety of treatment across the country and provide easy access
    - completing regional development in the field of health
    - improving the quality of service
    - providing cost-effective health services
- Needs of society;
    - sufficient number of beds and suitability of bed quality
    - Service of specialized team on surrounding area
    - application of new treatment technologies
    - development of new concepts for treatment services (such as outpatient surgery, day hospital)
- Patients;
    - shortening the length of hospitalization
    - reducing patient transfers
    - reducing hospital infections
    - enhancing the safety of the patients
    - increasing patient satisfaction
- Workers;
    - increasing the safety and satisfaction of employees
    - increasing workforce and service quality
    - improving health service performance

Health campuses are regarded as health complexes that incorporate various types of hospitals with specialized staff, research and development laboratories and centers, social and cultural facilities, hotel, logistic support units, high level of transport and parking facilities, accommodation and open space usage as a whole.

As mentioned above, Elazig IHC will be implemented as a PPP model. The relevant legislation on PPP model is discussed in *Chapter 3: Institutional and Regulatory Framework*. The PPP model is an investment and service model that is based on the long-term engagement between the government and private sector. The application of the PPP model in the health sector involves key elements including the use of financial resources of the private sector in public investments, integration of rapid decision-making and decision implementation skills of the private sector into the project process, sharing the risks between the government and private sector and shortening of

the construction period of the health campuses which may take up to 10 years if implemented by the public sector.

2.1.3 Need for the Project

Elazig province, situated in the Eastern Anatolia region, has a population of 568,753 (TUIK, 2014) and covers an area of 9,281 km^2. The province is located at a distance of 142 km to Bingol province, 135 km to Tunceli province, 98 km to Malatya province and 153 km to Diyarbakir province, which are the surrounding provinces. There is a high amount of daily population flux from the surrounding provinces to Elazig province. Due to its centralized location within the region, Elazig province provides health services to both people living in Elazig and people coming from the surrounding and further provinces.

There are currently 7 state hospitals (5 General Hospitals -1 in central district and 4 in other districts-, 1 Education and Research Hospital and 1 psychiatric hospital), 69 family health centers, 16 emergency stations, 1 oral and dental health clinic, 1 mother and child care and family planning center, 1 public health laboratory and 1 tuberculosis control dispensary in Elazig that are affiliated with MoH. The information on state hospitals, university hospitals and private hospitals in Elazig province is given in Table 2-1. Although the bed occupancy rates seem low, this is calculated taking into account the beds in the emergency and dialysis sections, in addition to the clinics. However, when the occupancy rates only in clinics are considered, it is observed that the occupancy rates exceed 100% in a great number of clinics within hospitals resulting in delays in patient treatments.

Table 2-1: Distribution of hospitals in Elazig province

Type of Hospital	Number of Hospitals	Number of Beds	Number of Personnel	Bed Occupancy Rate (%)	Average Stay in Hospital (days)
Hospitals affiliated with the Ministry of Health (State Hospitals)	7	1,523[a]	3,835[a]	62.2[a]	6.8[a]
University hospital(s)	1	910[b]	485[d*]	73.8[c]	6.2[c]
Private hospitals	4	382[b]	275[b*]	55.3[c]	1.7[c]
Other public hospital(s) (i.e., military hospital)	1	100[b]	n.a	n.a	n.a
Total or Average	**13**	**2,915**	**4,439[a]**	**63.7**	**4.9**

a: Information obtained from Elazig Provincial Health Directorate during ESIA stakeholder consultations December 2014 (the data covers the first 10 months of 2014)
b: http://www.elazig.gov.tr/ (March 2013)
c: Ministry of Health, Pre-feasibility Report for Elazig Integrated Health Campus, February 2010 (2008 data).
d: http://ftm.firat.edu.tr/
*: includes physicians and nurses only; n.a. information not available

The number of beds per 10,000 people in Elazig province is higher than the values for Turkey and the world average and close to the EU average, as shown in Table 2-2. However, it is important to note that the number of qualified beds (1, 2, 3 or 4 beds per room with a bathroom and shower) is only 211 out of 1523 beds in the state hospitals. In order to increase the number of qualified beds, it can be confirmed that there is a need for undertaking new health investments. The number of beds per 10,000 people in the 4th health region is 36 which will remain same after new investments in the 4th health region. As a result, the number of beds per 10,000 people in Tunceli will increase from 24 to 25, in Bingol from 25 to 27 and in Malatya from 30 to 35 while it will decrease in Elazig

from 52 to 44. The decrease in Elazig is related with the hospital planning in the province (as described in Section 2.2) that includes planned closure and/or relocation of existing hospitals, and also with the new investments in other provinces of the 4th health region. The new investment program will also result in modernization of the healthcare facilities.

Table 2-2: Comparison of hospital bed capacity per 10,000 people (2010 data)

World	European Union	Turkey (2011 data)	Elazig	4th Health Region (Elazig-Malatya-Bingol-Tunceli)
30	55.4	26	52*	36*

Source: MoH, Annual Health Statistics – 2011; *Ministry of Health, Inpatient Health Facility Planning Guide, 2011.

The state hospitals in Elazig province are listed in Table 2-3 with information on number of beds, total land area, closed area, closed area per bed and construction year. The buildings of the main three hospitals (Elazig Education and Research Hospital, Harput State Hospital and Elazig Psychiatric Hospitals) are old and also ward system dominates where rooms with three and above represent more than 50% of the total bed capacity.

Table 2-3: State hospitals in the Elazig province

Hospital Name	Number of Beds[a]	Total Hospital Land Area[a] (m^2)	Closed Area[a] (m^2)	Closed Area per Bed[a] (m^2)	Year of Construction[b]
Elazig Education and Research Hospital	605	82,284	43,561	72	1945-1980/ 1997-2005
Harput State Hospital	317	25,925	17,499	55,2	1968
Elazig Psychiatric Hospital	488	59,050	14,588	28,6	1925
Kovancilar State Hospital	54	6,223	6,634	123	1996
Maden State Hospital	12	1,018	1,025	67,9	2001
Palu State Hospital	15	4,616	2,032	202,1	1966
Karakocan State Hospital	32	17,743	2,929	92	1991
Elazig Oral and Dental Health Clinic	-	7,524[c]	2,520[c*]	-	2000

a: Elazig Provincial Health Director, personal communication, 2014
b: Ministry of Health, Pre-feasibility Report for Elazig Integrated Health Campus, February 2010 (2008 data).
c: http://elazig.adsm.saglik.gov.tr/(2013 data)
* Total closed area with the addition of 600 m^2 Dental Prosthesis Center in Kirklar neighborhood

Most of the hospitals are located in Elazig province center in parallel to the high population residing in the center and the status of Elazig province serving healthcare services to the other provinces in the region. These hospitals are unable to physically expand in these already condensed areas. All expansion works were already undertaken at the hospitals and there is no possibility for further expansion. These hospitals also do not have adequate parking and green areas. Due to the fact that the hospitals are old, they require reinforcement and repair. According to the pre-feasibility report prepared by MoH in 2010, the reinforcement and repair costs of Sarahatun Woman Maternity and Pediatrics Hospital whose administration was merged with the Elazig Education and Research Hospital in 2008, and the reinforcement and repair costs of Harput State Hospital exceeded more than 40% of their construction costs. For this reason, it is more feasible to undertake new investments instead of reinforcing and repairing the old buildings. It is also stated in the pre-

feasibility report that Elazig Psychiatric Hospital provides services with 13 independent buildings (the newest of these buildings is from 1951) which are physically not sufficient. The physical condition of AMATEM (the only center in the region providing service to people with substance dependency) that is located within the Elazig Psychiatric Hospital, is also not sufficient. In addition, independent buildings within the hospitals results in inefficient use of human resources as well as high-cost medical technologies. Appropriate areas are not present in the existing hospital buildings located in Elazig province center for supporting the changing and evolving technology of the medical devices and equipment. Moreover, service units such as operating theatre, intensive care, emergency, laboratory, imaging center, polyclinics do not meet the standards in terms of physical structure and equipment. Intensive care beds are only present in three state hospitals in Elazig. Considering the conditions stated above and increase in the need for health services with in parallel to the growing population of Elazig and nearby provinces, the existing hospitals cannot provide services of the required quality. In this context, Elazig IHC will contribute to health services with 1,038 bed capacity, rooms with one or two beds, and up-to-date technical infrastructure and overall modernize the healthcare facilities in Elazig.

Need for High Security Forensic Psychiatric Hospitals

Currently, there are no forensic psychiatric hospitals in Turkey. There are 8 psychiatric hospitals across Turkey (two of them are in Istanbul province, the others are in Manisa, Bolu, Samsun, Elazig, Adana and Trabzon provinces) that serve under the responsibility of MoH. Psychiatric services are also provided in some of the general hospitals, university hospitals and private hospitals. Altogether, the total bed capacity for psychiatric services is 7,356 (2010 data) including forensic, chronic, care and addiction treatments. The eight hospitals which are affiliated with MoH serve as regional hospitals that provide services for a number of provinces in a defined region. Local hospitals which are not able to provide the necessary service for the diagnosis, treatment and rehabilitation of psychiatric patients refer the patients to the regional psychiatric hospital responsible from their province.

With regard to forensic psychiatry (including high-security forensic psychiatry), beds are only present in five (Istanbul - Bakirkoy, Manisa, Elazig, Samsun and Adana Psychiatric Hospitals) of the eight psychiatric hospitals. Thus, this service is also provided on a regional basis as mentioned before. The total number of beds for forensic psychiatry in Turkey is 668 (551 for forensic and 117 for prisoner) which results in 0.9 beds per 100,000 people. The Turkish Criminal Law states the following in its article 32: “a person lacking ability to perceive the legal meaning and consequences of the offense, or having considerably lost the capacity to control his actions due to insanity may not be subject to any punishment. However, security precautions are imposed for such individuals” and its article 57: “The decision for imposition of security precautions is given by the court about a person suffering from mental illness at the time of commission of the offense. The insane people subject to security precautions under the court’s decision are sheltered and taken under protection for treatment purposes in high security health institutions”. At present, although 551 beds out of 668 beds do not have high-security properties, they are used for purposes as mentioned in Article 57 of the Turkish Criminal Law. Moreover, due to the insufficient capacity of the hospitals, appointments are given to later dates.

Based on the above information, MoH has worked together with experts from the World Health Organization and other specific experts to identify the required bed capacity of forensic psychiatry

in Turkey in order to meet the demand. According to the National Mental Health Action Plan (2011-2023) prepared by MoH, it is decided to establish high security forensic psychiatric hospitals in 16 provinces with a total bed capacity of 2000, and hospitals having prisoner psychiatry beds in 5 provinces with a total bed capacity of 350. Elazig IHC will contribute to this service with a 150 bed capacity High Security Forensic Psychiatric Hospital.

2.1.4 Level of Planning Detail

A preliminary design has been provided by MoH as part of the bidding process for Elazig IHC. The detailed design of the Elazig IHC is under the responsibility of ELZ A.S. according to the agreement signed with MoH. The design is currently being studied and has not yet been finalized. This ESIA study is based on the concept design dated December 2014 and the information on hospital design presented in this chapter are limited with the information made available to the ESIA team by ELZ A.S. Significant changes in the design are not expected to occur; however, if changes occur over time, these will be reviewed and assessed by ELZ A.S. and additional relevant mitigation measures may need to be identified and implemented as necessary if the impacts will differ from those identified in this ESIA Report.

2.2 Hospital Planning in Elazig Province

As explained in Section 2.1.3, there is a need for new health infrastructure investments in Elazig province and across Turkey. In order to provide necessary health services to patients, planning has been made by MoH for all of the identified health regions in Turkey, as indicated in the MoH-Inpatient Facility Planning Guide-Summary Book dated June 2011. According to this guide, the following plans were made for the Elazig province:

- Elazig Education and Research Hospital (605 beds), Elazig Psychiatric Hospital (488 beds) and Harput State Hospital (317 beds) to be moved to the Health campus,
- A new general hospital with 200 bed capacity to be constructed in the existing land of Elazig Education and Research Hospital,
- A 100-bed High Security Forensic Hospital to be constructed in Elazig province center.

According to the mentioned MoH planning guide, the distribution of bed capacity between hospitals affiliated with MoH, private hospitals and university hospitals will be 49%, 17% and 35%, respectively with the implementation of the above-mentioned plans. Apart from the above information, consultation was conducted with Elazig Provincial Directorate of Health as part of the ESIA consultation process in order to understand the current planning for the potential closure of existing hospitals. Based on this consultation, the following information was obtained:

- The planning at the provincial level is still ongoing for the existing hospitals. Although there are plans, these are not yet officially approved.
- There is a plan to move Elazig Education and Research Hospital and Elazig Psychiatric Hospital into the health campus. These hospitals are aware of this planning.
- There won't be a job loss and all the staff working in Elazig Education and Research Hospital and Elazig Psychiatric Hospital will continue working at the health campus.
- There is a plan to downsize Harput State Hospital and move it to the existing location of Elazig Education and Research Hospital,
- There is a plan to close AMATEM.

- There may be a need to open a psychiatric clinic after the Elazig Psychiatric Hospital is moved into the health campus. The most important contribution with these plans will be the increase in the ratio of qualified beds from 15% to almost 100%.

It can be concluded that there are plans in Elazig province to close and/or move some of the hospitals either in full or partly and/or to make alterations in the existing hospitals, however this is not only related to Elazig IHC Project but rather related to create a more efficient health service in Elazig province.

2.3 Project Alternatives

2.3.1 'No Project' Scenario

The 'no project' scenario considers the situation of not developing the Project. As a result, there will be no new investment for the healthcare system and no provision of health services with better quality. Given the demand of improved and modern healthcare facilities with sufficient bed capacities in the Elazig province, the Project needs to be implemented to meet the demand and satisfy the objectives of the healthcare planning across Turkey.

2.3.2 Project Site Alternatives

Different site locations were evaluated for Elazig IHC based on the information obtained during discussions with Elazig Provincial Health Director. The discussion was undertaken as part of the ESIA stakeholder engagement process. It was stated by the Provincial Health Director that all available alternative lands in Elazig were evaluated prior to deciding on the finally selected location. The alternative sites that were considered included the following locations and/or characteristics that limited their selection:

- A site with an area of 150 decares in Beyyurdu region (considered small for the health campus)
- A site in Yenimahalle region (request was not accepted as the area was included within the urban transformation program)
- Land has been requested from Firat University
- A site through which a high-voltage transmission line is passing (for this reason, this area was scoped out)
- A site with an area of 110 decares (considered small for the health campus)

As a result, it was decided to select the current site based on two major criteria which were as follows: (i) the land was large and present as one piece (ii) the land was under the ownership of Ministry of Finance (except an area of 250 m^2 – as explained in *Chapter 5: Land Use and Zoning*) and did not require expropriation. In addition, the selected site does not have difficulties in terms of access and infrastructure.

2.4 Project Components and Design

2.4.1 Overview

The Project comprises of the development of an integrated health campus with a total capacity of 1,038 beds consisting of two hospitals and one clinic. These are the 888-bed Main Hospital, 150-bed High Security Forensic Psychiatric Hospital and 60-unit Oral and Dental Clinic. In addition to the

hospitals, there will be a health support facilities, commercial area, technical unit building, a helipad and a trigeneration plant. The layout of the hospitals and other units are shown in Figure 2-1 and Figure 2-2. The illustrations of the hospitals are presented in Annex E-1.

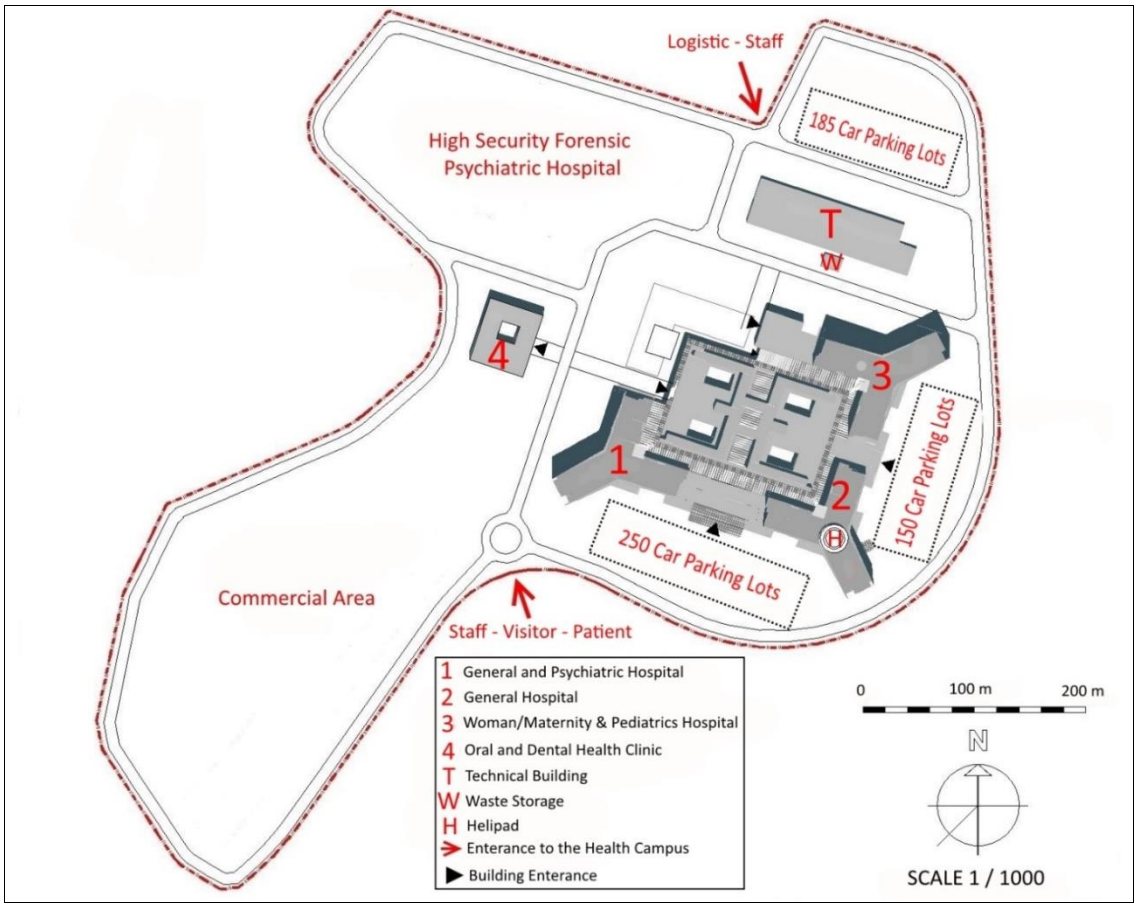

Figure 2-1: Layout of the hospitals and other units within IHC

Figure 2-2: Layout and 3D-view of hospitals

2.4.2 Main Hospital (MH)

MH will consist of three patient blocks surrounding a common core. The land for the fourth patient block around the common core is reserved for future expansion. The three tower blocks will include the following specific hospitals with a total of 888 bed capacity:

- 493-bed General Hospital
- 299-bed Women/Maternity & Pediatrics Hospital
- 96-bed Psychiatric Hospital

The distribution of bed capacities in the MH in different units are given in Table 2-4.

Table 2-4: Distribution of bed capacities in the MH

Hospital Unit	Number of Beds			Total Beds
	General Hospital	Women/Maternity & Pediatrics Hospital	Psychiatric Hospital	
Acute Care Unit	400	176	96	672
Intensive Care Unit (ICU)	52	39	-	91
Cardiovascular ICU	10	-	-	10
Newborn ICU	-	46	-	46
Trauma	13	-	-	13
Labor/Delivery/Recovery Room	-	14	-	14
Post Partium	-	16	-	16
Suit	8	8	-	16
Burn Unit	10	-	-	10
Total Beds	**493**	**299**	**96**	**888**

There will be a Diagnostic and Treatment Center within the MH that will include day surgery area, surgery suite, pre/post operation area, endoscopy unit, In-vitro fertilization unit, advanced pathology unit, genetic diseases center, radiation oncology and sterile processing department, radiology-nuclear medicine-iodine treatment department, emergency service, transfusion center, hemodialysis center, physiotherapy center and chemotherapy clinic.

The total construction area of the MH will be 233,405 m^2 (including closed car parking area and shelter area) with a hospital area of 156,905 m^2. A total of 2,664 cars will be able to park in the 76,500 m^2 closed car parking area. The shelter area will cover 1,020 m^2. In addition to the closed car parking areas inside the hospital buildings, there will be open car parking areas at three locations (as shown in Figure 2-1) with a total capacity of 535 cars.

The MH will have 9 floors, 2 entrance levels (higher and lower entrance) and 3 basement floors. A typical cross-section of the MH is shown in Figure 2-3. A sample floorplan and cross-sections of the MH are presented in Annex E-2.

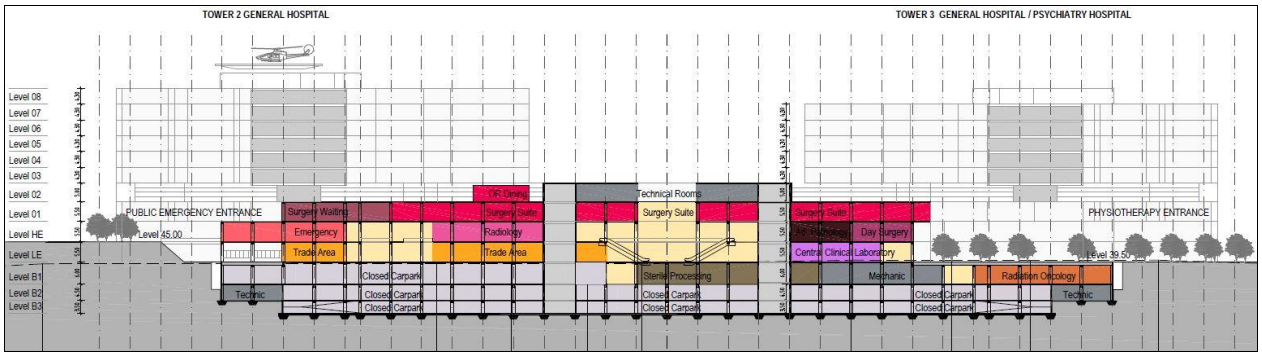

Figure 2-3: Cross sectional view of Tower 2: General Hospital and Tower 3: Psychiatric Hospital

2.4.3 High Security Forensic Psychiatric Hospital (FRH)

The High Security Forensic Psychiatric Hospital will have a capacity of 150 beds. The total construction area of the FRH will be 48,166 m^2 (including closed car parking area) with a hospital area of 34,666 m^2. A total of 450 cars will be able to park in the 13,500 m^2 closed car parking area inside the FRH.

There will be different inpatient sections within the FRH that includes clinics arranged according to gender and different security levels. The hospital includes shared clinics for inpatients and 110 beds of male – female and adolescent (for the rehabilitation and treatment of children between the age of 14 to 18, who are mostly drug substance dependents) ward service units in low – medium – high security levels, attached with forensic clinics and 40 beds forensic wards services.

The building program includes clinics for inpatients, patient wards in different security levels and their support units, administration and educational areas for staff. The clinics patient areas will include test rooms, EKG, EEG, a stat laboratory with blood draw and specimen collection, and an imaging centre with X-ray and USG rooms. Each security level service will contain 10 to 30 single beds' wards, intensive care units with restraint and seclusion rooms and shared day rooms named as multi-purpose room, sports, rehabilitation and therapy rooms integrated with an outdoor courtyard. Each security level service will have its own shared day rooms, open courtyards and gardens where the patients can run their daily activities, socialize, rehabilitate or deal with their hobbies.

The design of the FRH is currently at an early stage. The building will be a terraced three-storey structure with one basement to be used as car parking area. The building is located on a natural slope in a terraced structure where the natural slope is utilized as terraces which are used as patient courtyards. Light wells are provided through the building in order to get daylight and natural ventilation to the staff rooms and offices. Patient rooms are located in the periphery of the building to get maximum benefit from the sunlight. The conceptual layout of the FRH is presented in Annex E-3.

FRH will have three entrances: a main entrance from the west, through the clinics, a forensic entrance through the clinics and to the male / female wards for the patients on the basement floor; and a service entrance on the ground floor level in the east where the logistics are provided. While mechanical and electrical services will be provided through tunnels from the Technical Service Building of the entire campus, other services like kitchen, laundry, medicine, equipment and disposal services will be provided by trucks coming to the service yard.

Regarding the security of the FRH, ELZ A.S will not assume any responsibility with regard to already existing measures and practices applied for the forensic sections of the existing psychiatric hospitals pursuant to applicable legislation (as agreed by and between the Turkish Ministry of Justice, Turkish Ministry of Interior, and the Ministry of Health by triple protocol). In accordance with the triple protocol, the security of the FRH will be managed by the gendarme (branch of the Turkish armed forces).

MoH Sample Project Approach

MoH has prepared a study together with a team from Bakirkoy Psychiatric Hospital (located in Istanbul province), as a sample project for FRHs that are being planned to be constructed across Turkey. Information presented below has been collected from that study[1] and the conceptual design of the FRH within the scope of Elazig IHC considers the issues mentioned below.

Context of Planned Hospitals

The structure of the FRH is to be designed as a spreading structure rather than a rising structure that includes shared spaces such as administration, polyclinics and technical areas. The relation of the FRH with the surrounding environment is specially designed taking the security of the patients and the neighbors into account. The environments where FRHs are to be located are either hospital campuses or urban settings. In case of Elazig IHC, the FRH will be located within an integrated health campus, which serves to a holistic treatment oriented concept for the personnel and patient, and the patient's relatives as a result of being in contact with the other health units within the campus. Furthermore, it is highly important that FRH be located within the city for the transportation of patients and personnel, and avoidance of stigma, which is one of the most important elements of FRH planning. Due to being located in an urban setting, FRH within the Elazig IHC will also meet the above mentioned issues.

Bed Capacities in FRH

A feasible arrangement in FRH is not deemed possible when the bed capacity is below 80-90 due to different security levels and differentiation between women and men. When the bed capacities are in the range of 100-200, it becomes possible to share the rehabilitation, entrance, visitor and some personnel areas in a clinic, which in return increases the feasibility and provides economic benefits. In the hospital scale; the indoor sports hall, administration, electro-convulsive therapy center and policlinic become the shared areas of all clinics. The forensic clinics might not be able to benefit from these shared areas.

In general, the ratio of male patients to female patients is 7. Different ratios are tested among the security levels to determine the type, capacity and total number of clinics. An ideal clinic has 20 beds. The number of doctor, nurse and personnel in a clinic is approximately 14.

[1] Türk Adli Psikiyatri Hastaneleri (Yatan Hasta Klinikleri) Örnek Tasarımı Proje Özeti (Turkish Forensic Psychiatric Hospital (Inpatient Clinic) Exemplary Design Project Brief, Turkish Ministry of Health PPP Program

Area distribution

A 100 m^2 average total indoor area (including clinic and other indoor service areas) per patient is considered to be the norm in psychiatry. In clinics, this area may vary from 75 to 85 m^2. The important criterion is to provide a minimum of 20 m^2 open area per patient. The total open area can be considered as 100 m^2 per patient; however this depends on plot conditions. In this way, it comes to an average where indoor areas and open spaces are equal. An average of 400 m^2 yard area is considered for each clinic. The difference in the security levels does not require major changes in the total area that is needed. The program distribution in the total indoor area of a clinic includes approximately 30% rehabilitation; 20% treatment personnel; 20% patient bedroom; 3% administration; 15% entrance, visitors and security areas. The remaining 10-15% is allocated to service places. Each clinic has at least one private outdoor/yard area that are at an equivalent ratio with the rehabilitation areas.

Layout strategies in FRH

The layout strategies in the FRH are made according to three grades which include urgency, publicity and security. Urgency grade includes a special status. Areas requiring urgency (such as emergency room or quarantine) or areas requiring special furnishing (such as surgery room or isolation room) are within the scope of urgency grade. Publicity includes privacy, and common spaces as well as public spaces. There is privacy in a patient's bedroom, and the clinic yard has also privacy compared to an open public space. The security grade includes both disasters such as fire, and the security of patients, personnel and the public.

The forensic psychiatry units are healthcare facilities in which units are separated from each other. Moreover, forensic psychiatry units have an emergency character due to patient transfer and should be placed in the highest security area. On the other hand, low psychiatry clinics are in the same program with acute psychiatry clinics and they can share the common rehabilitation areas; so, while the security level decreases, the degree of publicity increases.

Generic Clinical Function

The patients' areas do not have any user other than the assigned treatment staff in a generic clinic. Patient bedroom areas are separated from the daily life and activity areas; however, they are all in visual integrity. Visitor areas are separated from the patient areas for security reasons; however, they are not completely separated from the clinic. Intensive care areas are under the permanent supervision of the nurses. All areas have connection with the clinical base.

The stay duration in the high security healthcare facilities are in the range of 6 months to 5 years. The facility becomes almost a home to the patients. The average stay in acute psychiatry clinics is 21 days; however, therapy is extended over a period of time. In order to prevent any external effects or interventions, and the possibility of the patient escaping or harming himself or attempting suicide, the patient circulation is to be kept separate from the personnel and visitor circulation. There are different footprints for patients, doctors and nurses, and personnel and visitors inside the FRH. For patients, footprints also differ according to the security level (high, medium and low), intensive care, prisoner and adolescent.

Personnel should be able to walk around during the day between the clinics without being exposed to outside weather conditions and the inner life of the other clinic. Services (cleaning, food, etc.) shall be provided in the same way and swiftly.

Intensive care areas are arranged for single person that have direct surveillance from personal observation and indirect surveillance with camera. It is a principle that all corridors are surrounded by windows to allow observation.

Security

There are different security measures in the FRH that include walls, fences, remote control steel doors, iron railings, closed circuit camera systems (CCTV), security buildings and security staff. Typical schematic representation of these security measures at different security levels in the FRH are presented in Annex E-4. In addition, the relationship between the security, vegetation, borders, privacy and socialization are schematically presented in Annex E-5.

Therapy Areas

Psychiatric treatment areas require indoor/outdoor areas where social activities can be arranged. Point corners are created in the patient corridors furnished as living space and in the daytime living spaces and the opportunities for socializing and resting are provided. Natural ventilation is provided in these places.

For cases when the illness is at peak; special care areas such as intensive care, isolation rooms, electro-convulsive therapy center are important areas that require special furnishing and also require natural and mechanical ventilation and sufficient lighting.

There are special places (such as painting, music, group therapy, dance, sports, sculpture, handwork, weaving, movie, TV corner, library, wood workshop, etc.) within the clinic for occupational therapy for congregate use. These areas may vary according to the size of the hospital.

Personal quality of life

The patient rooms are single suits with a bathroom and cover in average a total area of 20 m^2. It is a principle that each room has an outward opening window (opens to the garden) to get natural air and lighting. Specially designed furniture and non-breakable glass are used in the rooms to prevent people from harming themselves.

2.4.4 Oral and Dental Health Clinic

There will be an oral and dental health clinic (ODHC) within the IHC. The total area of the ODHC will be 10,734 m^2 including a closed cark parking area of 2,537 m^2 with a capacity of 76 cars. There will be 60 regular clinics within the ODHC each with an area of 20 m^2. There will also be one disabled clinic (60 m^2), three pedodontics clinics (60 m^2 each) and one separate clinic (50 m^2) dedicated to forensic hospital patients. In addition, ODHC will include operation rooms, observation rooms, dental prosthesis laboratory and X-ray area.

2.4.5 Commercial Areas

There will be a commercial area within Elazig IHC Campus which is planned to include health support facilities such as pharmacies, doctors' offices, day chemotherapy and a medical hotel. The planning of the commercial area is currently ongoing and the types of units to be located in the commercial area will be clarified as the design proceeds.

2.4.6 Technical Building

There will be a technical unit building, located north of the Main Hospital, to house a trigeneration system with a total rated thermal capacity of 5.5 MW that will consist of three gas engines using natural gas with total rated thermal capacities of 1.5 MW and 2x2 MW, respectively. In addition, there will be a boiler system inside the technical unit building to include three boilers each with a rated thermal capacity of 10 MW. The design of the technical building is currently ongoing.

2.4.7 Helipad

There will be one helipad located at the top of the MH making it directly connected with Accident & Emergency Department and Burn Unit by a vertical connection. The helipad will serve the ambulance helicopters which are directly under the service of MoH. As reported by ELZ A.Ş., an average of 1 cycle/day and on peak, 3 cycles/day are expected (depending on the severity and priority of the possible incident) for Elazig IHC helipad.

2.5 Design Standards of the Hospitals

The design of the hospitals will meet the following standards as a minimum:

- "Circular on the Minimum Technical Standards that should be met in Existing and New Health Facilities" issued by MoH, Department of Construction and Maintenance (last update: 30.10.2012)
- "Minimum Design Standards for Turkey's Health Facilities, Guidebook for the Year 2010", issued by MoH, Department of Construction and Maintenance
- "MoH, PPP Program, Elazig Health Campus, Technical Specifications" provided by MoH during the bidding process that includes technical specifications for the following:
    - Part 1: Technical Specifications for Architectural and Construction Works – provides technical specifications for the concept scheme design and for construction works
    - Part 2: Mechanical and Plumbing Technical Specifications
    - Part 3: Electrical Technical Specifications

Technical specifications provided by MoH (technical specifications hereafter) cover environmental, health and safety (EHS) based design criteria and infrastructure requirements as presented in Annex E-6.

2.5.1 Infrastructure

Plumbing system

As stated in the technical specifications during the bidding process, plumbing systems are requested to be designed in accordance with the Turkish Standards Institution (TSE) Standards as well as taking the requirements of local codes, standards and relevant authority requirements into consideration. Plumbing systems and equipment necessary for a complete and properly functioning hospital are expected to be installed including but not limited to the following:

- Domestic hot and cold water systems
- Drainage, sanitary waste and vent system
- Drainage - storm water systems
- Natural gas systems
- Fuel oil systems
- Medical gas and vacuum systems

Heating, Ventilating, and Air Conditioning (HVAC) System

As stated in the technical specifications, the HVAC system shall provide heating and cooling for every occupied space in the hospital and for all equipment and storage space that requires temperature and humidity control. The hospital HVAC systems are expected to operate at the extreme weather conditions and after catastrophic events such as earthquakes. The HVAC systems are requested to be designed in accordance with the following standards, as per the Technical Specifications:

- American Society of Heating and Air-Conditioning Engineers (ASHRAE) HVAC Design Manual for Hospitals and Clinics 2003 (the manual describes airborne infection control issues in healthcare facilities which are the only places where nosocomial infections can be acquired)
- TSE Standards

Systems and equipment necessary for a complete and properly functioning HVAC system in a hospital are expected to be installed including but not limited to the following:

- Central Energy Plant
- Plant Steam System
- Plant Chilled Water System
- Low Temperature Surgery Chilled Water System
- Hospital Steam Systems
- Hospital Hot Water Heating System
- Air Handling Units and Systems
- Fan Coil Systems
- Air Distribution Systems
- Building Management System
- Exhaust Systems
- Supplemental Cooling Systems
- Control Systems

Electrical systems

The electrical systems are requested to be designed in accordance with the applicable sections of the following standards, codes, regulations, and recommendations, as stated in the technical specifications:

- TSE
- National Fire Protection Association (NFPA)
- International Electro-technical Commission (IEC)
- Chartered Institution of Building Services Engineers (CIBSE)
- International Industry Association/Electronics Industry Association (TIA/EIA)
- Local authorities (Electricity, Telecommunication, Fire, etc.)

The electrical services will include the following systems as per the technical specifications:

- Normal power distribution
- Emergency power distribution
- Uninterruptable power supply system
- Isolated power system
- Grounding and earthing system
- Lightening protection system
- Electric heat trace/snow melt
- Indoor and outdoor lighting system
- Exit and emergency lighting system
- Automatic fire detection and alarm system
- Automatic voice evacuation and firefighting telephone system
- Security, closed circuit television system (CCTV) and access control system
- Master clock system
- Nurse call and code blue system
- Telemedicine system
- Public address system
- Telephone system
- Data communication system
- Audio-visual system

2.5.2 Fire Safety

Health facility operations are exposed to life and fire safety risks, as they are accessible to the public. Elazig IHC is being designed in accordance with the Turkish Regulation on the Fire Protection of the Buildings (Official Gazette Date/No: 19.12.2007/26735). The technical specifications have also covered requirements related to fire protection to be integrated into the design to include the following:

- Compartmentalization: The standards for fire compartmentalization between floors and between compartments will allow fire resistance for one hour (60 minutes). Sub-compartments and identified fire hazard rooms will allow fire resistance for half an hour (30 minutes).

- The fire separation shall be reviewed with local officials during the design process to verify compliance with local codes and regulations. The final compartmentalization shall represent the regional firefighting principals.
- Sealants: Intumescent sealants to be used for plugging smaller gaps around services to avoid penetrations in compartment walls and floors.
- Smoke Barriers: Proprietary mineral wool products like Rockwool to be used for maintaining fire separation between compartment floors and walls, and to avoid penetrations.

In addition to the above, Fire Suppression Systems shall be provided throughout the hospitals as required by national and local codes, and the Fire Alarm System shall be designed and installed in accordance with the requirements of NFPA72 and local codes, as per the technical specifications.

ELZ A.S. has assigned a fire consultancy company for the identification of necessary life and fire safety design criteria. As reported by ELZ A.S., the overall design, construction and operation of Elazig IHC will be based on Turkish Regulation on the Fire Protection of the Buildings, and Turkish and European (EN) standards. However, when local standards are not sufficiently detailed and are incomplete, internationally accepted life and fire standards (NFPA standards, IBC Codes and EN standards) will be applied. For this reason, mapping of Turkish requirements for life and fire safety will be conducted by ELZ A.S. in order to identify the insufficient areas and incorporate them into the design based on the international standards.

2.6 City Planning and Components near the Project Area

There is an existing zoning plan prepared by the Elazig Municipality which covers the Project area. The Project area is indicated as a “Health Facility Area” where the site selection was made considering different alternative sites as described in Section 2.3.2. The details related to the zoning plan are provided in *Chapter 5: Land Use and Zoning*.

When the existing conditions of Elazig province is reviewed, it can be seen that the infrastructure and transport systems require improvements, and there are signs that past urban planning resulted in urban sprawl. Elazig Municipality 2019 Strategic Plan covers these topics and indicated the following works as required to be undertaken:

- new routes needs to be opened to minimize transport problems as the technical standards of the existing road network is not sufficient
- revision of the zoning plans and implementation of urban transformation projects
- implementation of the urban sprawl prevention project which has already started in the province

The following information was also obtained from Director of Traffic Department and Director of Technical Works of Elazig Municipality during face-to-face meetings conducted as part of the ESIA stakeholder consultations related to transport systems and urban development:

- There is no transport master plan for Elazig province. Preliminary studies have started by the Elazig municipality that include discussions with traffic experts and university professors. Preliminary studies have started for metro transport system as well.

- A motorway to the north of the city (called as northern motorway) will be constructed. At present, design projects of this motorway is being undertaken.
- Mass transport (bus and minibus) is satisfactory in the city.
- The city is expanding towards west and the location of the hospital at the east of the city is considered to be a good balance.
- Elazig municipality is likely to become a metropolitan municipality after which the boundaries of the municipality will expand towards east (to the east of the health campus area towards Guneycayir village)

Based on the information above, it can be concluded that there are two major future development plans around Elazig IHC which include the urban development towards east and the northern motorway construction (to the north of the IHC). Elazig IHC Interim Traffic Report Study (2015) prepared by ELZ A.S. also mentions about the northern motorway and states that Elazig Municipality plans to extend the existing south motorway so as to cover the northern part of the city as well with the aim to develop a ring road system which is expected to facilitate access to Elazig IHC. Details about the road planning is presented in *Chapter 11: Traffic Impact*.

2.7 Construction Stage

2.7.1 Overview

The planning of the Project is still ongoing. Construction is estimated to start in the early fourth quarter of 2015 and take up to a maximum of 36 months. The tentative construction schedule is given in Table 2-5.

Table 2-5: Tentative construction schedule

	1st year				2nd year				3rd year			
Works to be undertaken	1st quarter	2nd quarter	3rd quarter	4th quarter	1st quarter	2nd quarter	3rd quarter	4th quarter	1st quarter	2nd quarter	3rd quarter	4th quarter
Contractual Processes		■	■	■								
Design Processes	■	■	■	■	■	■	■	■				
Mobilization	■	■	■									
Earth & Infrastructural Works		■	■	■	■	■						
Structural Works				■	■	■	■	■	■	■	■	■
External Site Works (Landscaping)											■	■
Mechanical & Electrical Works					■	■	■	■	■	■	■	■
Automation & Furnishing										■	■	■
Testing & Commissioning											■	■

The construction work timeframe is proposed to be up to 12 hours per day (between 07:00 and 19:00), and 7 days per week. The construction site facilities (including offices, camping area, cafeteria, resting areas, infirmary, workshop, material storage areas) will be located inside the

Project area. The types of construction site facilities are given in Table 2-6 and the layout of construction site facilities are illustrated in Figure 2-4.

All construction site facilities shall be constructed in accordance with the specifications and regulations of the Turkish and FI EHS standards. ELZ A.S. shall ensure that accommodation of workers and provision of basic services to workers are managed in line with the guidance note on worker's accommodation published by IFC and EBRD (Worker's Accommodation: Processes and Standards). The construction area has already been enclosed with fences. There are entrance and exit gates to control vehicles getting into the site. Maximum driving speed in the construction site will be set as 30 km/h. There will be no blasting activities during construction works. There will be no requirement for additional land other than the defined Project area.

Table 2-6: Types of construction buildings

Site Buildings	**Explanation**	**Quantity**	**Total Area (m^2)**
Management office	1 fabricated building for management office, 1 for administration and financing office + 3 rooms for H&S Specialist's office	3	1,144.87
Sub-Contractor Office	-	1	840
Infirmary	1 infirmary and 1 doctor's office	1	34.3
Workshop	2 fabricated building for project information + 1 training room + 1 meeting room	4	754
Storage Area	1 prefabricated building for kitchen storage area	1	426.3
Camping Buildings			
Engineer dorm	-	1	585
Technician dorm	-	1	585
Worker dorm (2-storey)	6 dormitory with a capacity of 1,920 people	6	6,912
Worker rest area	-	2	375
Engineer rest area	-	1	180
Cafeteria (with cooking area)	2 cafeteria with a capacity of 2742 people	2	829
Cafeteria (without cooking area)	1 cafeteria with a capacity of 492 people	1	479.6
Laundry	-	1	96
Total	**-**	**27**	**13,241.07**

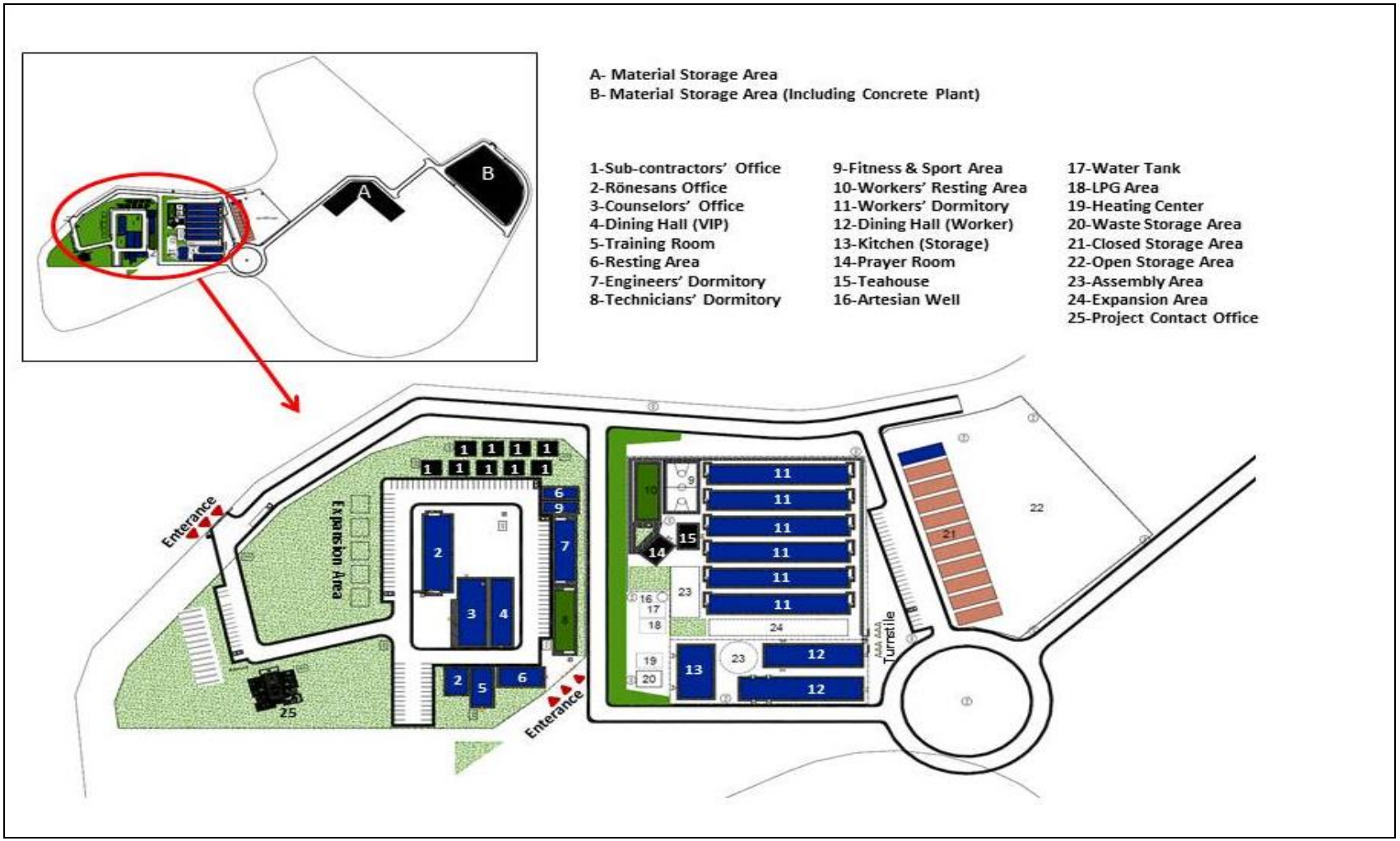

Figure 2-4: Layout of construction site facilities

2.7.2 Construction Equipment

The types and quantities of construction equipment with respect to various construction works are detailed in Table 2-7.

Table 2-7: Construction equipment deployment

Phase	Road			Non-Road		
	Equipment	**Number**	**Working Day**	**Equipment**	**Number**	**Working Day**
Earthworks	Truck	20	140	Excavator	8	90
				Bulldozer	1	20
				Grader	1	50
				Loader	4	140
				Backhoe	2	90
				Roller	1	50
				Water Truck	1	50
	Total	**20**	**140**	**Total**	**18**	-
Main Construction	Truck	20	150	Tower Crane	7	240
				Fixed Crane	1	240
				Crane (Mobile)	3	120
				Concrete Mixer	15	240
				Mobile Concrete Pump	3	240
				Backhoe	2	300
				Mobile Concrete Pump (for trimworks)	2	200
				Concrete Mixer (for trimworks)	15	180
				Crane (Mobile) (for trimworks)	10	240
				Concrete Vibrator	10	240
				Bobcat	2	140
				Forklift	1	120
				Telehandler	1	100
				Pick-Up	6	180
				Automobile	8	160
	Total	**20**	**150**	**Total**	**86**	-
Finishing	Asphalt Truck	20	30	Finisher	2	30
				Roller	5	30
	Total	**20**	**30**	**Total**	**7**	**-**

2.7.3 Construction materials/quantities

It is anticipated that approximately 200,000 m^3 C30/C37 type ready-mixed concrete, 400,000 tons of aggregate, 21,000 tons of iron and 3,800 m^2 steel carcasses will be needed for the Project which will be transported to the site via roads from local suppliers except concrete which will be supplied from the concrete plant to be installed during construction. As necessary, onsite temporary laydown areas for imported materials will be appropriately selected to avoid potential disturbance and run-off. Appropriate management practices for these materials will need to be adopted, as discussed in *Chapter 8: Material Resources and Waste Management*.

2.7.4 Excavated Soils to be Disposed

It is anticipated that approximately 830,000 m^3 of excavated soil will be generated in the Project area. 620,000 m^3 of excavated soil was initially planned to be transported to the off-site disposal area designated by the Elazig Municipality to ensure compliance with the Regulation on Control of Excavated Soil, Construction and Demolition Wastes (Official Gazette Date/No: 18.03.2004/25406). The location of the designated excavation waste disposal area by the Elazig Municipality is shown in Figure 2-5 below. As for the remaining 210,000 m^3 of excavated soil, it was reported by ELZ A.S. that one half of the soil is planned to be used in landscaping studies while the other half is planned to be used as filling material. As also reported by ELZ A.S., approximately 201,000 m^3 of soil (out of 830.000 m^3) has been excavated prior to the start of ESIA study. 127,000 m^3 of this excavated soil has been transferred to the excavation waste disposal area designated by the Elazig Municipality (as shown in Figure 2-5) while the remaining amount of 74,000 m^3 was stored temporarily within the Project area. Temporary excavation waste storage areas within the Project area are illustrated in Figure 2-6.

Figure 2-5: Excavated waste disposal area designated by Elazig municipality

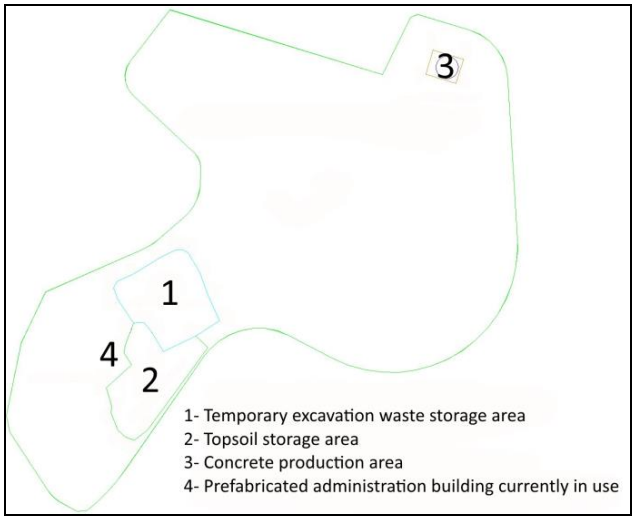

Figure 2-6: Excavated material storage areas within the Project area

During the ESIA process, formerly proposed waste storage area located at the outskirts of Meryem mountain (as shown in Figure 2-5) was closed and the new storage area (in Sarıçubuk Village) proposed by Elazig Municipality has a long distance to the Project site which is approximately 30 km. At the current stage, approximately 700,000 m^3 of material (including the 201.000 m^3 of material as explained above) has already been excavated and upon the request of the land owners, approximately 400,000 m^3 of the excavated soils was transported to the surrounding lands after protocols were signed with the landowners. This practice is also in line with article 26 of the Regulation on Control of Excavated Soil, Construction and Demolition Wastes which states that the excavated soil other than the topsoil should be first used as a filling material, for recreational purposes, as a cover soil in landfills and for similar purposes and should be stored for final disposal if reuse is not possible. In addition, 50,000m^3 of the excavation waste was transferred to the Çöteli Solid Waste Disposal area upon municipality's request to use as cover soil and 130,000 m^3 of the material (including 74.000 m^3 of excavated soil that was initially stored on site) was used as filling material on site.

2.7.5 Traffic and Access Management

Project area is located approximately 3 km north of the Diyarbakir-Elazig Motorway (D885). It is possible to access to the Project area through D885 road which is named as Cahit Dalokay Boulevard (D260) within the provincial administrative borders. There is also Mimar Sinan Street, which is a 23 m wide, 2x2 cross-sectioned, and center stripped road, till the roundabout where Mimar Sinan Street and Dogukent Street intersects. Another alternative from city center is to use Ulukent Street which passes from northern west of the Project area and Mustafa Temizer Street which is 2x2 cross-sectioned road connecting the Dogukent intersection to D260 motorway.

As reported, the excavated soil is currently being transferred to the designated disposal area using Cahit Dalokay Boulevard (D260) and Malatya-Elazig Motorway (D300). There will be no need to open a new road during construction.

2.7.6 Workforce

The total workforce that will be employed during the construction of the IHC is expected to be 500,000 person-days. The maximum workforce that is anticipated during the construction phase is 2,000 people. Workforce will be supplied locally to the extent possible including local sub-contractors. Appropriate pre-fabricated facilities will be provided to those employees who need on-site accommodation. Further details and conditions pertinent to management of project labor are provided in *Chapter 14: Labor and Working Conditions*.

2.8 Operation Stage

2.8.1 Responsibilities and Organizational Management

The management of the Elazig IHC will be shared between MoH and ELZ A.S. during the operation phase. MoH will be responsible for providing doctors and the support health personnel, and the general management of the clinical hospital activities will be undertaken by the administrative staff provided by MoH. MoH administrative staff will be responsible for the tasks excluding those under the responsibility of ELZ A.S. as described below. Staff other than the doctors and support health personnel will be provided by ELZ A.S.

ELZ A.S. will be responsible for the management of services classified as obligatory services (P1) and optional services (P2) as listed below:

- P1 - Obligatory services include building and land services, extraordinary maintenance and repair, management of common services, furniture services, ground and garden care, and other medical support services.
- P2 - Optional services include *non-medical services* including pest control, car parking, cleaning, implementation and operation of the hospital information management system, security, guidance and escort for patients/help desk/reception/carrying services, laundry, food and waste management; and *medical support services* including laboratory, imaging, sterilization and disinfection, and rehabilitation services.

2.8.2 Traffic and Access

It is estimated that approximately 12,000 people will visit the IHC daily during its operation. Currently, the transportation system for accessing the IHC site includes public buses and minibuses that operate continuously from the city center to the nearby Ulukent and Dogukent neighborhoods. In order to understand the existing baseline conditions in detail and future conditions, ELZ A.S. has assigned a traffic consultant to undertake a traffic assessment study which will also identify the necessary traffic arrangements inside the IHC site. The initial results of the traffic assessment study were received in February 2015 and the study is expected to be completed by no later than the date on which construction permit is obtained. The details on the present road network and traffic conditions are given in *Chapter 11: Traffic Impact*.

2.8.3 Emergency Preparedness and Response

An Emergency Preparedness and Response Plan (EPRP) will be prepared by ELZ A.S. prior to operation as part of the Environmental and Social Management System to be established for the IHC. The EPRP will cover issues related to occupational accidents, fire, fuel and chemical spills, natural disasters such as flooding and earthquakes. EPRP will consider FRH in detail for all types of accidents/disasters.

2.8.4 Security

Security arrangements for the IHC are described in the Technical Specifications. Accordingly, an electronic security system will be provided in the IHC and will consist of the following elements:

- CCTV
- Access Control System
- Intrusion Detection System
- Radio Frequency Identification System (RFID)

CCTV cameras will be located at the following locations:

- Exterior entrances
- Main entrance lobbies
- Elevator lobbies
- Car parks
- Loading docks
- Pharmacy

- Service corridors
- Material storage

The access control system will include proximity card readers, key pad or a combination of both at selected entrances to the building and to areas/rooms within the building. At doorways the system will include readers, sensors, and locks. All users of the facility will be issued an identification badge (ID) with photographs in order to facilitate entry. These badges in conjunction with the access control system components will be used to gain entry to restricted areas. Examples where card readers or other access control devices are used include entrances, loading docks, critical utility areas, plant rooms, storage areas, parking garages, elevator lobby call buttons, and telecommunication rooms.

The intrusion detection system will consist of wall or ceiling mounted passive infrared (PIR) sensors, security alarms, and break-glass sensors. PIR sensors will be provided in specific areas within the buildings including pharmacy areas, material storage, financial offices, and retail areas.

The RFID system uses wireless and semiconductor based technology as a means of identifying and tracking items. It requires a transponder tag, tag programming equipment and a tag reader. When an RFID tag passes within a range of a reader, the tag is detected and interrogated for its information contents. The RFID technology will be used for child abduction security system and physical asset tracking system.

The security system shall be designed to have a minimum of 20% spare capacity.

The security for the forensic patient room inside the MH will be under the responsibility of the Gendarme. As described previously in section 2.4.3, the security of the FRH will be managed by the Gendarme as well; however this issue will be discussed in more detail during the project development, as reported by ELZ A.S.

2.8.5 Hygiene Management

ELZ A.S. aims at increasing the quality of services provided to the patients in the fields and branches related to disinfection, cleaning and sterilization services through a comprehensive systems approach. A brief summary of the disinfection, cleaning and sterilization services to be undertaken within the Elazig Integrated Health Campus are provided below:

Disinfection Services

Hospital disinfection service necessitates special procedures for all the closed and open areas within the health campus. While the hospital disinfection process is underway, all the other routine works of the hospital will be carried out concurrently. Common use areas, critical areas, patient rooms and open areas will be disinfected according to separate procedures and schedules. The disinfection procedures and intervals will be determined for each area by a team with the contribution of contracting entity and infection committee. The relevant locations will be disinfected by the relevant personnel as per the foreseen frequencies and methods and then the process will be marked on charts. The responsible nurses and disinfection personnel working in these locations will regularly monitor these charts. Hospital disinfection should not create a threat in terms of patient and personnel health. Hospital disinfection will be made every 15 days in line with detailed planning so as to cover all the areas of the hospital. The disinfection services will also

be conducted at interim periods when needed. The waste areas will be included to the daily disinfection schedule. During disinfection services, the closed areas and open areas will be subject to day and night inspections once a week and once a month, respectively.

Cleaning Services

In healthcare settings, 24/7 continuous building occupancy leads to the requirement for cleaning while the building is occupied. It is important to use the least toxic cleaning products which are currently available and commonly accepted by healthcare institutions worldwide. Environmentally friendly and sustainable cleaning practices will be adopted as part of sustainable cleaning operations. The cleaning services department will work closely with the hospital inspection control committee to follow all new developments in this important area and to reflect all the concerns to the cleaning services program in a timely manner. The cleaning services will be arranged according to international accreditation rules and norms. The cleaning of joint areas of use, critical areas and patient rooms will be executed by trained personnel. There will be different cleaning standards for hospital in general, intensive car units, surgery rooms, clinics, polyclinics, emergency units and bathroom and toilets. The cleaning procedures and time intervals for each location to be cleaned will be determined jointly by the contracting entity and infection committee. At these intervals, the related locations will be cleaned as per the foreseen frequencies and methods by the relevant personnel and the process will be recorded on charts. The responsible nurses and cleaning chiefs working at these locations will regularly monitor these charts.

Sterilization Services

The sterilization process will include the collection of used items from clinical settings and their transport to a sterilizing services facility safely. This will require the ability to transport processed items to clinical settings and associated storage areas, while maintaining the sterility and integrity of items. The management program of sterilization services will cover the following core areas:

- monitor a safe workplace, follow the organization's occupational health and safety policies
- Communicate and work effectively in the workplace
- Organize personal work priorities and development
- Comply with Infection Control Policies and Procedures
- Collect and transport used items
- Clean and Dry used Items
- Prepare and pack Items for Sterilization
- Sterilize Loads
- Disinfect Items
- Control and Transport sterile stock
- Support Continuous Improvements Systems and Processes
- Commission Equipment and Validate Processes
- Manage and Maintain Reprocessing Services, Equipment and Facilities
- Manage Sterilization and Disinfection Processes

2.8.6 Patient Personal Data Protection

The Hospital Information and Management System (HIMS) and the patient data included within the system will be designed and developed in order to ensure access of the authorized users only, with their allocated user names and passwords or by using an alternative secure authentication system

in accordance with their authorities. All required customization/modification and adaptations will be provided on-time in accordance with MoH Requirements and also based on the changes in related regulation and legislations.

The unauthorized sub-contractor staff will not be able to see/have access to irrelevant HIMS modules and data. There will be at least 33 modules and the sub-contractors will only be authorized to have access to modules only related to their service fields.

The overall HIMS system will be protected by fire wall and antivirus software. The security of access and authorization levels will be established with MoH. All critical systems will be backed up minimum 30 minutes during the absence of emergency power. It is noted that the system will have at least one month local storage capacity. The HIMS provider will be responsible for the patient data security.

2.8.7 Operational Equipment

Medical equipment will be supplied from foreign and domestic suppliers.

2.8.8 Operational Employment

The workforce requirement during the operation phase is anticipated to be 3,169 in total with 1,631 health service personnel and 295 administrative personnel to be employed by MoH and 1,223 service employees and 20 administrative personnel to be employed by ELZ A.S. and its service providers.