

TERMS OF REFERENCE
DETAILED ENGINEERING DESIGN, COST ESTIMATE AND CONSTRUCTION SUPERVISION
FOR DEVELOPMENT CENTERS IN 6 PROVINCES AND EMPLOYMENT RESOURCE CENTER IN
ULAANBAATAR CITY SERVICES OF DESIGN FIRM – C1

A. SUMMARY

1. Mongolia has received a Loan (loan no. 3605) from the Asian Development Bank (ADB) to implement the Ensuring Inclusiveness and Service Delivery to Persons with Disabilities Project (the Project), and intends to apply a portion of the proceeds of this Loan to eligible payments to establish “Development Center” for children and adults with disabilities in 6 provinces¹ and “Employment Resource Center” for persons with disabilities (PWDs) in Ulaanbaatar city.

2. The Ministry of Labor and Social Protection (MLSP) of Mongolia will engage an international firm (the Consultant) to prepare the detailed engineering design and supervise construction works of Employment Resource Center in Ulaanbaatar city and Development Centers in six provinces from September 2019 for 21 months. MLSP will select the firm under quality and cost based selection with quality and cost ratio of 90 to 10 using simplified technical proposal procedure following ADB’s Guidelines on the Use of Consultants. The design service will be engaged under a full lump sum consultancy contract while the construction supervision under a time-based contract. The provisions of ADB’s Anticorruption Policy will be included in all invitation documents and contracts for consultants.

B. BACKGROUND INFORMATION

3. Development Centers in six provinces will deliver a range of center-based services such as mobile social welfare service, habilitation and rehabilitation, independent living services, advice and support for accessing social welfare benefits, access to assistive technology, home-based care and out-reach services as well as to develop the opportunities for socialization and learning. One design will be used as a model to be replicated in six provinces. Due to the differences in 6 provinces, the cadastral plan and infrastructural facilities, and the master plan of each center needs to be adjusted to the site.

4. The Employment Resource Center in Ulaanbaatar city will provide services to PWDs through variety of centers such as Job Mediation Center, Self-Independent Living Center, Assistive Technology through Business Incubator Center, Research and Information Center, Conference Center, Job Coaching and Case Management center. Moreover, there will be business oriented spaces for small and medium enterprises and accommodations for temporary placement of persons and children with disabilities from remote districts and provinces to be enrolled in training and services run by the center.

5. The Ministry of Labor and Social Protection (MLSP) provides Concept Designs² for Development Centers in provinces and Employment Resource Center in Ulaanbaatar. Relevant details of each building are shown in the Concept Designs. The designs of centers shall carefully reflect the universal design principals³ and local building codes, regulations and standards⁴, and will be built environmentally friendly and energy efficient way.

¹ Khovd, Dornod, Darkhan, Khuvsgul, Dundgovi and Arkhangai.

² See Appendix A for conceptual design for Development Centers in provinces and Appendix B for Employment Resource Center in Ulaanbaatar.

³ See Appendix C

⁴ See Appendix D

B. OBJECTIVES OF THE ASSIGNMENT

6. The main objectives of the assignment are to (1) produce complete Detailed Engineering Design and deliver construction documents including appropriate budget estimates for each center, (2) support MLSP in reviewing bidding documents, and (3) supervise construction works of both Provinces's Development Centers and Employment Resource Center buildings.

The consultancy service consists of 4 main phases:

- Phase 1. Preparing design development documents of province Development Center for approval by Land Relations, Construction and Urban Development Department (LRCUDD) of each province and Employment Resource Center for approval by Urban Planning Department of Municipality of Ulaanbaatar.
- Phase 2. Detailed Engineering Design and construction documents including budget estimates for each centers and get approval by State Expertise.
- Phase 3. Prepare the bidding documents for construction work and assist in the technical evaluation of the received bids for the construction works.
- Phase 4. Construction Supervision.

C. SCOPE OF SERVICES

7. The consultancy services will cover following tasks to be performed within two and half years, but not limited to:

Within the scope of Phase 1 and 2:

- To prepare the construction documents in accordance with national standards
- To carry out site survey and geotechnical survey
- To develop and finalize architectural design
- To develop the structural design
- To develop mechanical, electric and plumbing design
- To develop telecommunication and automation design
- To provide construction cost estimates
- To get approval on Detailed Design by State Expertises and other required permissions before bidding announcement for construction works

Within the scope of Phase 3:

- To prepare the bidding documents for construction work
- To assist in the technical evaluation of the received bids for the construction works.

Within the scope of Phase 4:

- To provide author's supervision and prepare monitoring reports on construction works of Development Centers in six provinces and Employment Resource Center in Ulaanbaatar

D. TEAM COMPOSITION & QUALIFICATION REQUIREMENTS FOR THE KEY EXPERTS

Qualification Criteria for the Consultant

8. The prospective consultants should meet the minimum qualification criteria specified in Table

1 and are required to submit the following documentation/information at the Expression of Interest stage:

- (1) Company registration certificates and special licenses.
- (2) Copies of Certificates of Project Completion and Acceptance or equivalent Certification from their previous related studies/design/contract.
- (3) Company profile
- (4) Any other document or information required as per Expression of Interest template.

TABLE 1: MINIMUM QUALIFICATION CRITERIA FOR CONSULTANT

Item	Requirement ("X" apply)
License	<p>If issued under framework of order no.89 dated 07 May 2013 of Minister of Construction and Urban Development:</p> <ul style="list-style-type: none"> ⊗ 1.2.1 – 1-10 story building architecture, landscaping, elevation, structure or ⊗ 1.2.2 – 1-16 story building architecture, landscaping, elevation, structure, permanent equipment planning ⊗ 1.2.4 – internal water, sewerage, heating, ventilation, air conditioning, external branch line ⊗ 1.2.5 – internal light, electricity, external branch line, internal communication, fire and other signaling, local area network, security systems, instrumentation and control ⊗ 1.2.6 – feasibility study, cost estimating <p>If issued under framework of order no.11 dated 19 January 2018 of Minister of Construction and Urban Development:</p> <ul style="list-style-type: none"> ⊗ 3T-3.1 or 3T-4.1 - Architecture, structure, internal organizational planning, design of building ⊗ 3T-6.1 or 3T-7.1 – internal water supply, sewerage system, external branch line, related facility technological design of building ⊗ 3T-6.2 or 3T-7.2 – internal heating supply, ventilation system, external branch line, related facility technological design of building ⊗ 3T-6.3 or 3T-7.3 – internal lighting, electrical supply system, external branch line, related facility technological design of building. Instrumentation and control, automation design of condominium, public and industrial building ⊗ 3T-6.4 or 3T-7.4 – internal radio communication, fire and other alarm system, information system design, security system, related facility technological design, computer local area network and external branch line of building ⊗ 3T-8.1 – external general plan, landscaping, topography design ⊗ 3T-11.1 or 3T-11.2 – cost estimating of building civil works
Active of license	Active
Similar experience	Experience in designing rehabilitation centers for the disabled using universal design principles will be an advantage.

Key experts input

9. The prospective firms are expected to engage an indicative total of 5 person-months of

international experts and 120 person-months of national experts, as summarized in Table 2.

TABLE 2: SUMMARY OF KEY EXPERT INDICATIVE PERSON-MONTH INPUTS

Detail Design			Construction Supervision		
Consultants	International person months	National person months	Consultants	International person months	National person months
Project Architect	2			1	
Civil Engineer with FIDIC experience	1			1	
Architect		4			7
CAD specialist		4			
Structural and Civil Engineer		14			3
Electrical engineer		8			3
HVAC engineer		8			3
Water Supply & Sanitation Engineer		8			3
Automation and Fire safety engineer		4			3
			Quantity Survey Engineer		12
			Site engineer		36
TOTAL	3	50		2	70

Qualification Criteria for the design team experts

10. The Consultant shall assemble a team of professionals with appropriate qualifications and expertise in similar projects, to satisfy the requirements of the scope of work both in terms of skills and time allocations. Short listed firms are required to submit the information as per Request for Proposals document, including CVs of Key Experts at Request for Proposal stage.

As a minimum the Consultant's core design team experts should have the qualifications and assignment specific experience as specified in Table 3.

TABLE 3: CONSULTANTS' QUALIFICATIONS AND TASKS OF DESIGN TEAM

Position	Tasks	Qualifications
Project Architect (x1 person) 3 months, international, intermittent	<ul style="list-style-type: none"> – Ensure implementation of the project within time and cost. – Maintain liaison with MLSP, Contractor as and when required. – Identification, assessment and finalization of the various project requirements and parameters on the basis of the required functions of universal design in consultation with the client. – Leading the planning and design team in design of the physical facilities. – Advising the project team in making appropriate assessment of information, data and forecasting demands of users, facilities, services and 	<ul style="list-style-type: none"> – Master's degree or higher in engineering and design, or related area. – Professional experience in preparation of social care, community based facilities, multi-purpose use space such as well as office building design and drawings community – Advanced knowledge of Universal Design Principles in Space Planning. – Experience in planning of

	<p>equipment in respect of architectural planning needs.</p> <ul style="list-style-type: none"> – Advising the architectural team in preparation of master plan on the basis of studies to be conducted on present and future space and master planning requirements. – Advising the architectural team in preparation of architectural designs including space planning keeping in view the equipment and future layouts and other requirements of the client to achieve an efficient interrelationship of functions. – Guiding the architectural team in interior decoration and design of furniture. – Guiding the project team in identifying special equipment in discussion with the client. – Guiding management of supervision especially to ensure attainment of architectural aspects. 	<p>architectural design, drawings of hospital building and rehabilitation center, access roads, and infrastructure.</p> <ul style="list-style-type: none"> – 5 years’ experience in project management. – A knowledge or experience in architectural drawing in Mongolia would be advantageous. – Proficiency in English language and effective communication and interpersonal communications skills are mandatory.
<p>Civil Engineer with FIDIC experience</p> <p>2 months, international, intermittent</p>	<ul style="list-style-type: none"> – Carefully assess geotechnical, including seismic and geological, conditions for each civil works location. – Undertake structural calculations and analysis and produce economic and efficient buildable designs. – Liaise with the project architects, other engineering disciplines, sub-consultants and clients as required. – Undertake site visits as required. – Carry out detailed structural design and preparation work for the foundation. – Undertake quality assurance checking of drawings and calculations produced by self and that of other team members as directed by Team Leader. – Ensure coordination of the works of structural design engineers for timely completion of the structural design. – Review the drawings and ensure that all the drawings are reviewed and checked by Team Leader prior to external issue. – Produce structural design briefs, documents, reports and material specifications as required for civil construction. – Supervise all civil works. – Assist the Quantity Site Engineer during the design, construction and post-construction phases. – Monitor post-construction activities as and when required. – Review the Contractor’s construction work plan and methodologies and propose changes if needed; 	<ul style="list-style-type: none"> – Graduate degree in Structural or Civil Engineering; – Be a licensed Structural Engineer or Civil Engineering; – Professional experience in engineering design and construction supervision, particularly in preparation of structural drawings, structural calculations according to Mongolian and international standards and legislation, quality assurance and quality control, building and site layout surveys, on site material testing, concrete mix design, planning and scheduling, safety engineering, and cost engineering and budgeting; – Excellent time management and organizational skills with the ability to self-manage billable hours and ability to undertake own work with a high degree of efficiency and accuracy; – Advanced knowledge of Structural Engineering Analysis & Design software packages (preferably SAP 2000) as well as CAD and general office software packages; – Excellent knowledge of International Building Codes and

	<ul style="list-style-type: none"> – Review and suggest a proposal on the works implementation plan by estimating the works quantity, materials on site, equipment and workforce; – Review and submit recommendations to the Team Leader on the (i) Contractor’s work quality; (ii) organization; (iii) potential risks; (iv) risk mitigation measures; and (v) labor health and safety; – Review the Contractor’s weekly, monthly and quarterly performance reports and make recommendation; and – Complete the engineering tasks as required by the Team Leader during the assignment. 	<p>Design Standards, and FIDIC contract standards;</p> <ul style="list-style-type: none"> – Excellent leadership skills with the ability to manage teams with a strong results-orientation; – Excellent written and spoken English communication skills; and – Previous work experience in engineering design teams and on construction supervision duties
<p>Architect (x2 persons)</p> <p>11 months, national, intermittent</p>	<ul style="list-style-type: none"> – Perform duties assigned by International Project Architect. – Undertake architectural, schematic and concept design for assigned projects, with the ability to undertake design details (windows, doors etc) including preliminary design calculations, preliminary sketches/drawings, preliminary specifications and other required design information. – Liaise with engineers and other disciplines to ensure coherent and correct, as well as aesthetically pleasing design. – Make amendments to the design as required. – Undertake detailed design work on projects as required, and fully check and ensure designs are properly validated as per the approved design process. – Undertake site visits as required. – Undertake quality assurance checking of drawings and calculations produced by self and that of other team members as directed by International Project Architect. – Ensure that all drawings are reviewed and checked by International Project Architect to external issue. – Produce architectural design briefs, documents, reports and specifications as required. – Produce architectural drawings utilizing Revit and/or AutoCAD as appropriate for the project. 	<ul style="list-style-type: none"> – Degree qualified in Architecture. – Minimum of 5 Years Post Graduate Experience – Previous experience working within an architectural design company. – Intermediate time management and organizational skills with the ability to self-manage billable hours and ability to undertake own work with a high degree of efficiency and accuracy. – Advanced knowledge of AutoCAD or Revit. – Intermediate knowledge of International Building Codes and Design Standards. – Proficiency in English language and effective communication and interpersonal communications skills are mandatory. – Previous experience within design teams and on Author’s Supervision duties. – Intermediate knowledge of Universal Design Principles and local Building Codes and Regulations of Disabled People’s Space Planning.
<p>Computer Aided Design Specialist (x2 persons)</p> <p>4 months, national, intermittent</p>	<ul style="list-style-type: none"> – Assist the Project Architect and Architect in the planning and designing facilities. – Assess space planning for different facilities and assist in maximizing space utilization. – Prepare architectural presentations using the CAD and oversee CAD production – Assist in the preparation of design and production of drawings 	<ul style="list-style-type: none"> – Qualified degree in architecture or engineering – Professional experience in architectural presentations using the CAD and in the preparation of design of drawings.

	<ul style="list-style-type: none"> – Provide inspection during construction as necessary to assist the Team Leader in conducting quality audit and administration of QA plan 	
<p>Structural and Civil Engineer (x4 persons)</p> <p>17 months, national, intermittent</p>	<ul style="list-style-type: none"> – Perform duties assigned by International Civil Engineer – Careful consideration of seismic and geological conditions for each location. – Undertake structural calculations and analysis and produce economic and efficient buildable designs. – Liaise with the project architects, other engineering disciplines, sub-consultants and clients are required. – Undertake site visits as required. – Carry out detailed structural design and preparation work for foundation. – Undertake quality assurance checking of drawings and calculations produced by self and that of other team members as directed by Team Leader. – Coordination of the works of structural design engineers for timely completion of the structural design. – Ensure that all drawings are reviewed and checked by Team Leader prior to external issue. – Produce structural design briefs, documents, reports and material specifications as required for civil construction. – Supervise all civil construction works. – Assist Quantity Site Engineer during the design, construction and post construction phases. – Monitor post construction activities as and when required. 	<ul style="list-style-type: none"> - Graduate degree qualified in Structural or Civil Engineering - Be a licensed Structural Engineer or Civil Engineering. - Professional experience in engineering design and construction supervision, particularly in preparation of structural drawings, structural calculations according to Mongolian and international standards and legislation, quality assurance and quality control, building and site layout surveys, on site material testing, concrete mix design, planning and scheduling, safety engineering, and cost engineering and budgeting. –Intermediate time management and organizational skills with the ability to self-manage billable hours and ability to undertake own work with a high degree of efficiency and accuracy. –Advanced knowledge of Structural Engineering Analysis & Design software packages (preferably SAP 2000) as well as CAD and general office software packages. –Intermediate knowledge of International Building Codes and Design Standards. –Intermediate leadership skills with the ability to manage teams with a strong results-orientation. –Intermediate written and spoken communication skills with a minimum basic understanding of English. –Previous experience within design teams and on Author’s Supervision duties
<p>Electrical Engineer (x4 persons)</p>	<ul style="list-style-type: none"> – Ensure all duties are undertaken within the required timeframe. – Assist the investigation teams during design services. 	<ul style="list-style-type: none"> –Graduate Degree in Electrical Engineering. –Be a licensed Electrical Engineer or be eligible to become a

<p>8 months, national, intermittent</p>	<ul style="list-style-type: none"> - Undertake planning and detail designs of internal and external electrical works including area lighting and emergency power supply system. - Prepare concept, basic and detail design of electrical drawings in Auto CAD or Revit, ensuring that the design are undertaken in accordance with local codes and international standards. - Liaise with the project architects, other engineering disciplines, sub-consultants and clients as required. - Undertake site visits as required. - Produce design specifications, design reports and to finalize all designs calculations as required. - Supervise preparation of bill of quantities, cost estimates and specifications for electrical works. - Review shop drawings and material submission from contractor/construction manager. - Liaise with contractors and undertake site inspection duties as required. - Ensure quality control, cost control, measurement of works, testing of materials, Verification of measurement of records, certification of bills, monitoring of progress and recommending appropriate actions, supervising finalization of as-built drawings. - Ensure that all drawings are reviewed and checked before submission to approval of Expertise and Fire Safety. 	<p>licensed Electrical Engineer.</p> <ul style="list-style-type: none"> - Professional experience working within an Engineering consulting environment such that electrical engineering for building, building automation, process electrification and automation, programming and instrumentation design. - Experience in finding power source alternatives for saving electricity, emergency power supplies, fire- detection systems, lighting, telephone and paging systems, elevator control etc. - Minimum of 5 Years Post Graduate Experience - Intermediate time management and organizational skills with the ability to self-manage billable hours and ability to undertake own work with a high degree of efficiency and accuracy. - Advanced knowledge of design software in relation to MEP design including AutoCAD and MS office software such as Excel, Word, PowerPoint, MS Project - Site inspection or supervision experience on building construction projects. - Intermediate knowledge of International Building Codes and Design standards. - Intermediate written and spoken communication skills with a minimum basic understanding of English. - Previous experience within design teams and on Author's Supervision duties.
<p>Heating, Ventilating, Air Conditioning Engineer (x4 persons)</p> <p>8 months, national, intermittent</p>	<ul style="list-style-type: none"> - Ensure all duties are undertaken within the required timeframe. - Prepare concept, basic and detail design of HVAC drawings. - Undertake all necessary design calculations and analysis along with schematic diagrams and select appropriate equipment size. - Undertake quality assurance checking of drawings and calculations produced by self and that of other team members. 	<ul style="list-style-type: none"> - Graduate degree in HVAC. - Experience in design of HVAC, clean rooms and air handling, air filtration. - Minimum of 5 Years Post Graduate Experience - Intermediate time management and organizational skills with the ability to self-manage billable hours and ability to undertake

	<ul style="list-style-type: none"> – Undertake site visits as required. – Undertake design of air-conditioning and mechanical ventilation system. – Review shop drawings and material submission from contractor/construction manager. – Liaise with contractors and undertake inspection of all mechanical works at site and attend to any revision of design, if required, during supervision. – Assist in preparation of equipment and material quantity for cost estimates. – Ensure that all drawings are reviewed and checked before submission to approval of Expertise and Fire Safety. 	<ul style="list-style-type: none"> own work with a high degree of efficiency and accuracy. –Advanced knowledge of design software in relation to MEP design including AutoCAD and MS office software such as Excel, Word, PowerPoint, MS Project –Site inspection or supervision experience on building construction projects. –Intermediate knowledge of International Building Codes and Design standards. –Intermediate written and spoken communication skills with a minimum basic understanding of English. –Previous experience within design teams and on Author’s Supervision duties.
<p>Water Supply & Sanitation Engineer (x4 persons)</p> <p>8 months, national, intermittent</p>	<ul style="list-style-type: none"> – Prepare designs, documentation, cost estimates and phasing of work in respect of water supply, plumbing, sanitary and drainage systems – Provide inspection of the works during construction – Assist the Team Leader and Site Engineer in the efficient implementation of the project – Assist HVAC and Building Services Expert – Assess requirements for elevators, air-conditioning and ventilation, water supply and fire fighting works, determine baselines and design parameters – Undertake design of lifts, air-conditioning and mechanical ventilation system, water supply and fire detection/fighting system – Supervise preparation of mechanical design drawings – Undertake supervision of all mechanical works at site and attend to any revision of design, if required, during supervision 	<ul style="list-style-type: none"> – Graduate degree in Plumbing systems – Extensive experience in hospital and rehabilitation center sanitary systems including clean water, sewage systems, sanitary drainage and water treatment systems. – Minimum of 5 Years Post Graduate Experience – Intermediate time management and organizational skills with the ability to self-manage billable hours and ability to undertake own work with a high degree of efficiency and accuracy. – Advanced knowledge of design software in relation to MEP design including AutoCAD and MS office software such as Excel, Word, PowerPoint, MS Project – Site inspection or supervision experience on building construction projects. – Intermediate knowledge of International Building Codes and Design standards. – Intermediate written and spoken communication skills with a minimum basic understanding of English.

		<ul style="list-style-type: none"> – Previous experience within design teams and on Author’s Supervision duties.
<p>Automation and fire safety Engineer (x 2 persons)</p> <p>4 months, national, intermittent</p>	<ul style="list-style-type: none"> – Ensure all duties are undertaken within the required timeframe. – Prepare concept, basic and detail design of automation and fire fighting systems. – Undertake all necessary design calculations and analysis along with schematic diagrams and select appropriate equipment size. – Undertake quality assurance checking of drawings and calculations produced by self and that of other team members. – Undertake site visits as required. – Review shop drawings and material submission from contractor/construction manager. – Liaise with contractors and undertake inspection of all mechanical works at site and attend to any revision of design, if required, during supervision. – Assist in preparation of equipment and material quantity for cost estimates. – Ensure that all drawings are reviewed and checked before submission to approval of Expertise and Fire Safety. 	<ul style="list-style-type: none"> – Years of Experience: Minimum of 5 Years Post Graduate Experience – Intermediate time management and organizational skills with the ability to self-manage billable hours and ability to undertake own work with a high degree of efficiency and accuracy. – Advanced knowledge of design software in relation to MEP design including AutoCAD and MS office software such as Excel, Word, PowerPoint, MS Project – Site inspection or supervision experience on building construction projects. – Intermediate knowledge of International Building Codes and Design standards. – Intermediate written and spoken communication skills with a minimum basic understanding of English. – Previous experience within design teams and on Author’s Supervision duties.

Qualification Criteria for the supervision team experts

11. The supervision team will be composed of highly qualified and experienced experts, who can carry out all the construction supervision duties as a fully competent and independent unit. The proposal should identify communication protocols that will ensure through coordination of the teams, so that all team members are at all times fully aware of the remedies to common problems, and so

that the full experience of all team members can be applied to the project.

As a minimum the Consultant’s core supervision team experts should have the qualifications and assignment specific experience as specified in Table 4.

TABLE 4: CONSULTANTS’ QUALIFICATIONS AND TASKS OF SUPERVISION TEAM

Position	Tasks	Qualifications
<p>Quantity Survey Engineer</p> <p>12 months, national, intermittent</p>	<ul style="list-style-type: none"> – Guiding the design and construction supervision team – Advising the project team in making appropriate assessment of field data and forecasting demands of users, facilities, services and equipment in respect of survey and soil investigations – Overseeing and supervising all activities of the project including pre-construction activities, survey, soil investigations, supervision of construction including management and monitoring – Guiding, supervising and coordinating activities of other project team members – Guiding management of supervision specially to ensure attainment of all civil works – Overseeing progress monitoring, cost and quality control – Monitoring of post construction work – Supervising all activities of the project including survey, soil investigation and construction work – Initiate testing of materials and works at site or at suitable laboratories – Interpret drawing, specifications, conditions of contract to the contractors/suppliers – Verify records of measurements of works done – Scrutinize & certify contractor’s/supplier’s bills for payment – Check and certify as-built drawings – Supervise progress of works and recommend appropriate actions and will prepare weekly and monthly progress report 	<ul style="list-style-type: none"> – Master’s degree or higher in engineering and design, or related area – Professional experience supervising all activities of the project including pre-construction activities, survey, soil investigations, specially to ensure attainment of all civil works, monitoring of post construction work. – Experience in testing of materials and works at site or at suitable laboratories. – Knowledge in interpretation of drawing, specifications, conditions of contract to the contractors/suppliers.
<p>Site Engineer (x7 persons)</p> <p>36 months, national, intermittent</p>	<ul style="list-style-type: none"> – Review and comment on drawing specifications and any other documents that may be required for the project. – Review and inspect the contractor capability in term of personal, equipment and other conditions with regard to the contract/bid conditions and legal requirements – Where applicable provide suggestions or observations in respect to the element of the works. 	<ul style="list-style-type: none"> – Degree qualified in Engineering or equivalent work experience (supervisor level). – 5+ years of experience in construction/site environment including main contractor works. – Intermediate time management skills with the ability to work under pressure and to tight timeframes on occasion. – Basic written and verbal communication

	<ul style="list-style-type: none"> – Assist with the development of the inspection process for the C&S/Finishing works at site. – Record accurate inspections carried out in line with the site documents. – Advise line manager and record where applicable any works not carried out in accordance with the drawings and specifications, – Check the work done by the contractor. – Assist with the H&S at site and advise line manager of any infringements. – Assist where required in the development of the commissioning procedures that are required for the project. – Review and comment in respect to As Built Drawings, and operations manuals. – Provide support for the functional area of the project within which they are allocated, or for the project team as a whole, as required by the structure of the project team. – Monitor and advise line manager of all of the works within their specific area of concern. – Any other duties that may be assigned as part of the construction works. 	<ul style="list-style-type: none"> skills, with the ability to collate materials into a template report. – Basic working knowledge of software such as MS Word, Excel and AutoCAD. – Team player and able to adapt to changes within the construction process. – Fluency in written and spoken English is preferred.
<p>Electrical Engineer</p> <p>3 months, national, intermittent</p>	<ul style="list-style-type: none"> – Liaise with contractors and undertake site inspection duties as required. – Ensure quality control, cost control, measurement of works, testing of materials, – Verification of measurement of records, certification of bills, monitoring of progress and recommending appropriate actions, supervising finalization of as-built drawings. 	<ul style="list-style-type: none"> – Graduate Degree in Electrical Engineering. – Be a licensed Electrical Engineer or be eligible to become a licensed Electrical Engineer. – Professional experience working within an Engineering consulting environment such that electrical engineering for building, building automation, process electrification and automation, programming and instrumentation design. – Experience in finding power source alternatives for saving electricity, emergency power supplies, fire-detection systems, lighting, telephone and paging systems, elevator control etc. – Years of Experience: Minimum of 5 Years Post Graduate Experience – Intermediate time management and organizational skills with the ability to self-manage billable hours and ability to undertake own work with a high degree of efficiency and accuracy. – Advanced knowledge of design software in relation to MEP design including

		<p>AutoCAD and MS office software such as Excel, Word, PowerPoint, MS Project</p> <ul style="list-style-type: none"> – Site inspection or supervision experience on building construction projects. – Intermediate knowledge of International Building Codes and Design standards. – Intermediate written and spoken communication skills with a minimum basic understanding of English. – Previous experience within design teams and on Author’s Supervision duties.
<p>Heating, Ventilating, Air Conditioning engineer</p> <p>3 months, national, intermittent</p>	<ul style="list-style-type: none"> – Ensure all duties are undertaken within the required timeframe. – Undertake quality assurance checking of drawings and calculations produced by self and that of other team members. – Undertake site visits as required. – Review shop drawings and material submission from contractor/construction manager. – Liaise with contractors and undertake inspection of all mechanical works at site and attend to any revision of design, if required, during supervision. 	<ul style="list-style-type: none"> – Graduate degree in HVAC. – Experience in design of HVAC, clean rooms and air handling, air filtration. – Years of Experience: Minimum of 5 Years Post Graduate Experience – Intermediate time management and organizational skills with the ability to self-manage billable hours and ability to undertake own work with a high degree of efficiency and accuracy. – Site inspection or supervision experience on building construction projects. – Intermediate knowledge of International Building Codes and Design standards. – Intermediate written and spoken communication skills with a minimum basic understanding of English.
<p>Water Supply & Sanitation Engineer</p> <p>3 months, national, intermittent</p>	<ul style="list-style-type: none"> – Provide inspection of the works during construction – Assist the Team Leader and Site Engineer in the efficient implementation of the project – Assist HVAC and Building Services Expert – Undertake supervision of all mechanical works at site and attend to any revision of design, if required, during supervision 	<ul style="list-style-type: none"> – Graduate degree in Plumbing systems – Extensive experience in hospital and rehabilitation centre sanitary systems including clean water, sewage systems, sanitary drainage and water treatment systems. – Years of Experience: Minimum of 5 Years Post Graduate Experience – Intermediate time management and organizational skills with the ability to self-manage billable hours and ability to undertake own work with a high degree of efficiency and accuracy. – Site inspection or supervision experience on building construction projects. – Intermediate knowledge of International Building Codes and Design

		standards. – Intermediate written and spoken communication skills with a minimum basic understanding of English.
Automation and fire safety Engineer 3 months, national, intermittent	<ul style="list-style-type: none"> – Ensure all duties are undertaken within the required timeframe. – Undertake quality assurance checking of drawings and calculations produced by self and that of other team members. – Undertake site visits as required. – Review shop drawings and material submission from contractor/construction manager. – Liaise with contractors and undertake inspection of all mechanical works at site and attend to any revision of design, if required, during supervision. 	<ul style="list-style-type: none"> – .Years of Experience: Minimum of 5 Years Post Graduate Experience – Intermediate time management and organizational skills with the ability to self-manage billable hours and ability to undertake own work with a high degree of efficiency and accuracy. – Site inspection or supervision experience on building construction projects. – Intermediate knowledge of International Building Codes and Design standards. – Intermediate written and spoken communication skills with a minimum basic understanding of English.

E. EXPECTED DELIVERABLES, REPORTS, DOCUMENTS AND DRAWINGS

12. The deliverables are divided into two parts. The first part of deliverables will include the serious of construction documents and design drawings produced during Phase 1 to Phase 3.

Following Table 5 displays consulting companies deliverables of consulting service Phase 1 to Phase 3 and deadlines to be submitted.

TABLE 5 : DELIVERABLES AND DEADLINES

Deadline* = Days will be calculated as calendar days from the contract approval date.

Deliverables	Content	Deadline to submit*
Deliverable 1	Project Management	20
Deliverable 2	Site Survey and Geological report of 7 sites (Khovd, Dornod, Darkhan, Khuvsgul, Dundgovi, Arkhangai and Ulaanbaatar)	50
Deliverable 3	Construction Documents for Development Center in Khovd province	80
Deliverable 4	Construction Documents for Development Center in Dornod province	100
Deliverable 5	Construction Documents for Development Center in Darkhan province	120
Deliverable 6	Construction Documents for Development Center in Khuvsgul province	140

Deliverable 7	Construction Documents for Development Center in Dundgovi province	160
Deliverable 8	Construction Documents for Development Center in Arkhangai province	180
Deliverable 9	Construction Documents for Employment Resource Center in Ulaanbaatar city	180
Deliverable 10	Construction and Supervision contract administration	-

Compositions of Deliverables

13. The **Deliverable 1** and **Deliverable 2** should be prepared and delivered as tables shown below. These tables include:

1) Deliverable 1: Project Management

Project Management	Document Type/Scale	Phase 1: Design development	Phase 2: Construction documents	Phase 3: Bidding documents
Program of Requirements	Document/Narrative Text	✓		
Project Initiation Document	Document/Narrative Text	✓		
Project Organization Structure	Diagram/Schematic	✓		
Communication Strategy	Document/Narrative Text	✓		
Issues Log & Risk Register	MS Excel Table	✓	Revision/Record	
Design Deviations & Derogations List	MS Excel Table	✓	Revision/Record	
Program Timetable	MS Project Table	✓		
Responsibility Matrix	MS Excel Table	✓		
Interface Agreements	Narrative Text	✓		
Project Communication Portal	SharePoint Web-site	✓		
Licensing & Contracting Issues	Government Approvals & Certification	✓		
Commissioning procedures	Document/Narrative Text	✓		

2) Deliverable 2: Site Survey and geological report

Site Survey	Document Type/Scale	Phase 1: Design development	Phase 2: Construction documents	Phase 3: Bidding documents
Geotechnical soil survey including drainage, water	Narrative Text, Diagrams/Table	To be done before detailed design begins	Record	✓

courses				
Site hazardous material/substances investigation	Narrative Text, Diagrams/Table		Record	✓
Topography map and analysis of city utility services available to site	Narrative Text, Diagrams/Table CAD version	To be done before detailed design begins	Revision	✓
Master Plan	Document Type/Scale	Phase 1: Design development	Phase 2: Construction documents	Phase 3: Bidding documents
Master Plan	Detailed Drawing	1:500	Revision	✓
Access road/ Pedestrian path/ Parking design	Detailed Drawing	1:500	Revision	✓
Grading/cartogram	Detailed Drawing		1:500	✓
Landscape design	Detailed Drawing	1:100/200	Revision	✓
Distance Plan	Detailed Drawing		1:300/500	
Urban planning & Integration	Narrative Text, Diagrams/Table	✓	Revision	✓

14. **Each of the Deliverables from 3 to 9** which are Construction Documents should be prepared and delivered as tables shown below. These tables include:

3) Architectural Design

The Architectural Design comprises all documents for approvals and permits from the appropriate local authorities. Following drawing list is minimum requirements, but is not limited to the following documents;

Architectural Design	Document Type/Scale	Design development	Construction documents (scale)	Bidding documents
Building engineering physics report	Narrative Text, Diagrams/Table	✓	Revision	✓
Design Description and technical data	Narrative Text, Diagrams/T able	✓	Revision	
Layouts of basement, ground and upper floor levels	Detailed drawing	1:50/100	Revision	✓
Section/ Cross section	Detailed drawing	1:50/100	Revision	✓
Elevations	Detailed drawing	1:50/100	Revision	✓
Reflected ceiling plan	Detailed drawing	1:50/100	Revision	✓
Furniture Plans	Detailed drawing		1:50/100	✓
Entrance and canopy details	Detailed drawing		1:10/25	✓
Facade details	Detailed drawing		1:10/25	✓
Ramp details	Detailed drawing		1:10/25	✓
Toilet Plans/ Section/ Elevations	Detailed drawing		1:25/50	✓
Floor finish plan	Detailed drawing		1:25/50	✓
Floor details				✓

Roof finish details	Detailed drawing		1:10/25	✓
Door and window schedules	Detailed drawing		1:10/25	✓
Door head, jamb and sill	Detailed drawing		1:10/25	✓
Door handle details	Detailed drawing		1:10/25	✓
Handrail details	Detailed drawing		1:10/25	✓
Tactile Paving details	Detailed drawing		1:10/25	✓
Universally accessible equipment details	Detailed drawing		1:10/25	✓
Architectural Specifications	Narrative Text, Diagrams/Table	✓		✓
Bill of Quantities	MS Excel Table	✓		✓

4) Structural Design

The structural Design comprises all documents for approvals and permits from the appropriate local authorities. This comprises, but is not limited to the following documents;

Structural Design	Document Type/Scale	Design development	Construction documents (scale)	Bidding documents
Drawing list, explanation note	Narrative Text, Diagrams/Table	✓		✓
Foundation settling drawing	Detailed drawing		1:100	✓
Foundation layout	Detailed drawing		1:50/100	✓
Foundation section, details, quantity estimation	Detailed drawing		1:10/20/25/50	✓
Plan of trenches in foundation, section and details	Detailed drawing		1:20/25/50/100	✓
Layout, section, reinforcement, quantity estimation of 1st floor slab, outside ramp	Detailed drawing		1:20/25/50/100	✓
Internal ramp, plan, section, detail and quantity estimation	Detailed drawing		1:10/20/25/50	✓
RC frame layout and quantity estimation	Detailed drawing		1:20/25/50/100	✓
RC column reinforcement plan, section, detail, quantity	Detailed drawing		1:10/20/25/50	✓
RC beam reinforcement plan, section, detail, quantity	Detailed drawing		1:10/20/25/50	✓
RC slab layout,	Detailed drawing		1:20/25/50/100	✓

reinforcement, section and quantity estimation				
Masonry wall mesh and fixing layout, details and quantity estimation	Detailed drawing		1:20/25/50/100	✓
RC lintel layout, section, quantity estimation	Detailed drawing		1:20/25/50/100	✓
Steel frame layout, section, details and quantity estimation	Detailed drawing		1:20/25/50/100	✓

NOTE: *The seismic and soil condition differ to each site. Additional drawings are required for structural designs.

5) Interior Design

Interior Design	Document Type/Scale	Design development	Construction documents (scale)	Bidding documents
Interior Design Colours, Finishes, Materials & Specifications	Narrative Text, Diagrams/Table		Revision	✓
Reception counters/desk and fixed cabinetry	Drawing/Schematic	1:50/100 /1:5	Revision	✓
Interior Design Bill of Quantities	MS Excel Table	✓	Revision	✓
Interior Design Sample Boards	Colour, Finishes & Material Samples	✓	Revision	✓
Special Sanitary Equipment	Colour, Finishes & Material Samples	✓	Revision	✓
Children Sanitary Equipment	Colour, Finishes & Material Samples	✓	Revision	✓

6) Heating, Ventilation and Air-conditioning design

Heating, Ventilation and Air-conditioning design	Document Type/Scale	Design development	Construction documents (scale)	Bidding documents
Room Environmental Design Calculations	Narrative Text, Diagrams/T able	✓	✓	✓
HVAC System Schematics	Drawing/Schematic	1:100/200	1:50/100	✓
HVAC Control System Schematics	Drawing/Schematic	1:100/200	1:50/100	✓
HVAC Duct Riser Diagrams	Drawing/Schematic	1:100/200	1:50/100	✓
Specialist Air Handling & Ventilation Systems	Drawing/Schematic	1:100/200	1:50/100	✓
Main Ducts/ Pipe	Drawing/Schematic	1:100/200	1:50/100	✓

Routing Schematics & Sleeved Penetration Drawings				
Schedules of Equipment	Narrative Text, Diagrams/Table	✓	✓	✓
Mechanical Systems Specifications	Narrative Text, Diagrams/Table	✓	✓	✓
Mechanical Systems Bill of Quantities	MS Excel Table	✓	✓	✓

7) External Mechanical, Electrical and Plumbing engineering work

Mechanical Design	Document Type/Scale	Design development	Construction documents (scale)	Bidding documents
Permission for connection to Power grid	Narrative Text, Diagrams/Table		1:50/100	✓
Permission for connection to Sewage grid	Narrative Text, Diagrams/Table		1:50/100	✓
Permission for connection to Water grid	Narrative Text, Diagrams/Table		1:50/100	✓
Permission for connection to Heating grid	Narrative Text, Diagrams/Table		1:50/100	✓
External electrical design and details	Detailed drawing		1:50/100	✓ ✓
External water supply and sewage system, connection details	Detailed drawing		1:50/100	✓
External heating design	Detailed drawing		1:50/100	✓
External telecommunication design and details	Detailed drawing		1:50/100	✓
Technical specification for MEP works	Narrative Text, Diagrams/Table			✓
Bill of quantities	Narrative Text, Diagrams/Table			✓ ✓
Estimating for External MEP Construction work	Narrative Text, Diagrams/Table			✓

NOTE: *The grading of the building differs to each site. The connectivity of external MEP differs to the distance of the sources. Additional and design adjustments are required.

Electrical Design

Electrical Design	Document Type/Scale	Design development	Construction documents (scale)	Bidding documents
-------------------	---------------------	--------------------	--------------------------------	-------------------

Room to Room Electrical Service Requirements	Narrative Text, Diagrams/Table	✓	✓	✓
Main Electrical Power Distribution Systems 3W, LV & ELV	Drawing/Schematic	1:100/200	1:50/100	✓
Earthing Systems	Drawing/Schematic	1:100/200	1:50/100	✓
Essential Electrical Services	Drawing/Schematic	1:100/200	1:50/100	✓
Non-essential Electrical Services	Drawing/Schematic	1:100/200	1:50/100	✓
Emergency Power Supply Systems	Drawing/Schematic	1:100/200	1:50/100	✓
Distribution Board/Panel Layouts	Drawing/Schematic	1:100/200	1:50/100	✓
Motor Control Schematics	Drawing/Schematic	1:100/200	1:50/100	✓
Main Cable Ducts/Trays Routing Schematics & Sleeved Penetration Drawings	Drawing/Schematic	1:100/200	1:50/100	✓
Internal Lighting Systems & Layouts	Drawing/Schematic	1:100/200	1:50/100	✓
Catering & Laundry Systems Schematics	Drawing/Schematic	1:100/201	1:50/100	✓
Lightning Protection Systems	Drawing/Schematic	1:100/200	1:50/100	✓
Electrical Systems Specifications	Narrative Text, Diagrams/T able	✓	✓	✓
Electrical Systems Bill of Quantities	MS Excel Table	✓	✓	✓

Water Supply and Plumbing design

Water Supply and Plumbing design	Document Type/Scale	Design development	Construction documents (scale)	Bidding documents
Chilled Water Riser Diagrams	Drawing/Schematic	1:100/200	1:50/100	✓
Fire Strategy & Safety Systems Schematics	Drawing/Schematic	1:100/200	1:50/100	✓
Fire Service Dry Riser Diagram	Drawing/Schematic	1:100/200	1:50/100	✓
Internal Sewage Systems	Drawing/Schematic	1:100/200	1:50/100	✓
Internal Drainage System Schematics	Drawing/Schematic	1:100/200	1:50/100	✓
Hot & Cold Water Distribution System Schematic	Drawing/Schematic	1:100/200	1:50/100	✓
Treated Water Supply & Distribution System	Drawing/Schematic	1:100/200	1:50/100	✓

Schematics				
Plant Room Layouts	Drawing/Schematic	1:100/200	1:50/100	✓
Main Ducts/Pipe Routing Schematics & Sleeved Penetration Drawings	Drawing/Schematic	1:100/200	1:50/100	✓
Schedules of Equipment	Narrative Text, Diagrams/Table	✓	✓	✓
Specifications	Narrative Text, Diagrams/Table	✓	✓	✓
Bill of Quantities	MS Excel Table	✓	✓	✓

8) Internet and Telecommunication, Automation and Fire safety

Mechanical Design	Document Type/Scale	Design development	Construction documents (scale)	Bidding documents
IT and security	Narrative Text, Diagrams/ Table/ Schematic drawing	✓	✓	✓
BMS	Drawing/Schematic	1:100/200	1:50/100	✓
Fire Strategy & Safety Systems & Layouts	Drawing/Schematic	1:100/200	1:50/100	✓

15. The **Deliverable 10** should be prepared and delivered as table shown below:

9) Deliverable 10: Construction and Supervision contract administration

Construction contract administration	Document Type/Scale
Inception Report* (submission within 1 month after commencement)	Narrative Text, Diagrams/Table
Construction Inspection and Review	Narrative Text, Diagrams/Table
Quarterly Progress Report	Narrative Text, Diagrams/Table
Process Certificates for Payment	Certificates
Review of Shop Drawing Product Data/Sample	Narrative Text, Diagrams/Table
Change Orders	Change Orders
Substantial Performance Report and Certification	Narrative Text, Diagrams/Table
Client Consultation	Narrative Text, Diagrams/Table
Interior Construction Inspection	Narrative Text, Diagrams/Table
Full-time Project Representation	Narrative Text, Diagrams/Table
Administration of Separate Contracts	Narrative Text, Diagrams/Table
Structural Inspection/Reports	Narrative Text, Diagrams/Table
Mechanical Inspection/Reports	Narrative Text, Diagrams/Table
Electrical Inspection/Reports	Narrative Text, Diagrams/Table
Record Drawings	Recordings
Pre installation F&E Inspection	Narrative Text, Diagrams/Table
Civil Construction Inspection	Narrative Text, Diagrams/Table
Landscape Inspection	Narrative Text, Diagrams/Table
Detailed Cost Accounting	Narrative Text, Diagrams/Table
Commissioning procedures	Narrative Text, Diagrams/Table
Project Completion Report**	Narrative Text, Diagrams/Table

16. *Inception report will cover at a minimum an assessment of the project procurement status, implementation delays and recommended corrective actions (if any), the status of design

development for the installations nominated as Provisional Sum in the construction contract;

17. **Project completion report shall include a detailed description of all the work by items of technical and non-technical matters, As-built drawings, difficulties and delays encountered and reasons, and remedial actions taken, the overall progress of the Project.

Supplementary

Boiler house – if needed
Rainwater tank, pump and filter details

F. REPORTING REQUIREMENTS AND TIME SCHEDULE FOR DELIVERABLES

Format, frequency, and contents of reports;

18. All drawings prepared and submitted by the Consultant shall be to the standard size of A2; and one-half size reductions as may be required by the MLSP. The scale of all drawings is to be determined by mutual consent of the Ministry and the Consultant prior to the commencement of each project phase, at which time the Consultant shall also identify the number of drawings to be produced. All drawings information should be clear and legible. The consultant shall upon review and approval of the corrected working drawings, submit the drawings on DVD’s in the format approved by the MLSP. Final drawings (three copies) approved by State Expertise will be submitted to MLSP in English and Mongolian version.

Review and approvals

19. Scheduled review periods are required at the conclusion of each phase of the project. The Consultant shall respond in writing to the comments of the MLSP or any of the review agencies. The Consultant shall meet with these agencies, as necessary, to resolve any problems or concerns which may surface shall during the review. The Consultant shall have their own internal review system to review drawings prior to MLSP approval. The Consultant shall not proceed with project work and/or a subsequent phase of the work without the written authorization of the MLSP. The Consultant shall become familiar with local holidays and customs so that in setting submittal schedules, the project and MLSP can take full advantage of the time periods schedule for reviews and approvals.

Timeframe for the assignment

20. The assignments except supervision are expected to be performed in 7 months. The design work for each Development Centers for provinces and Employment Resource Center in Ulaanbaatar and shall be prepared at the same time/simultaneously.

Timeframe of assignment which are divided into 4 phases is shown in below Table 6.

- Phase 1 Design Development
- Phase 2 Construction Documents
- Phase 3 Bidding Process
- Phase 4 Construction contract administration and supervision

TABLE 6: TIMEFRAME OF CONSULTANCY SERVICE

Phase	Task	Start	End	Duration	Year 2019						Year 2020				Year 2021			
					month						quarter				quarter			
					7	8	9	10	11	12	1	2	3	4	1	2	3	4
1&2	Design Development and Construction Documents	01 Jul 2019	30 Nov 2019	6 months														
3	Bidding Process	Dec 01	30 Jan	2														

		2019	2020	months														
4	Construction contract administration and supervision																	

*The detailed planning of activities for the Consultant during Construction contract administration is to be proposed and agreed during the design phase.

G. CLIENT’S INPUT AND COUNTERPART PERSONNEL

Local Project Office and Logistics

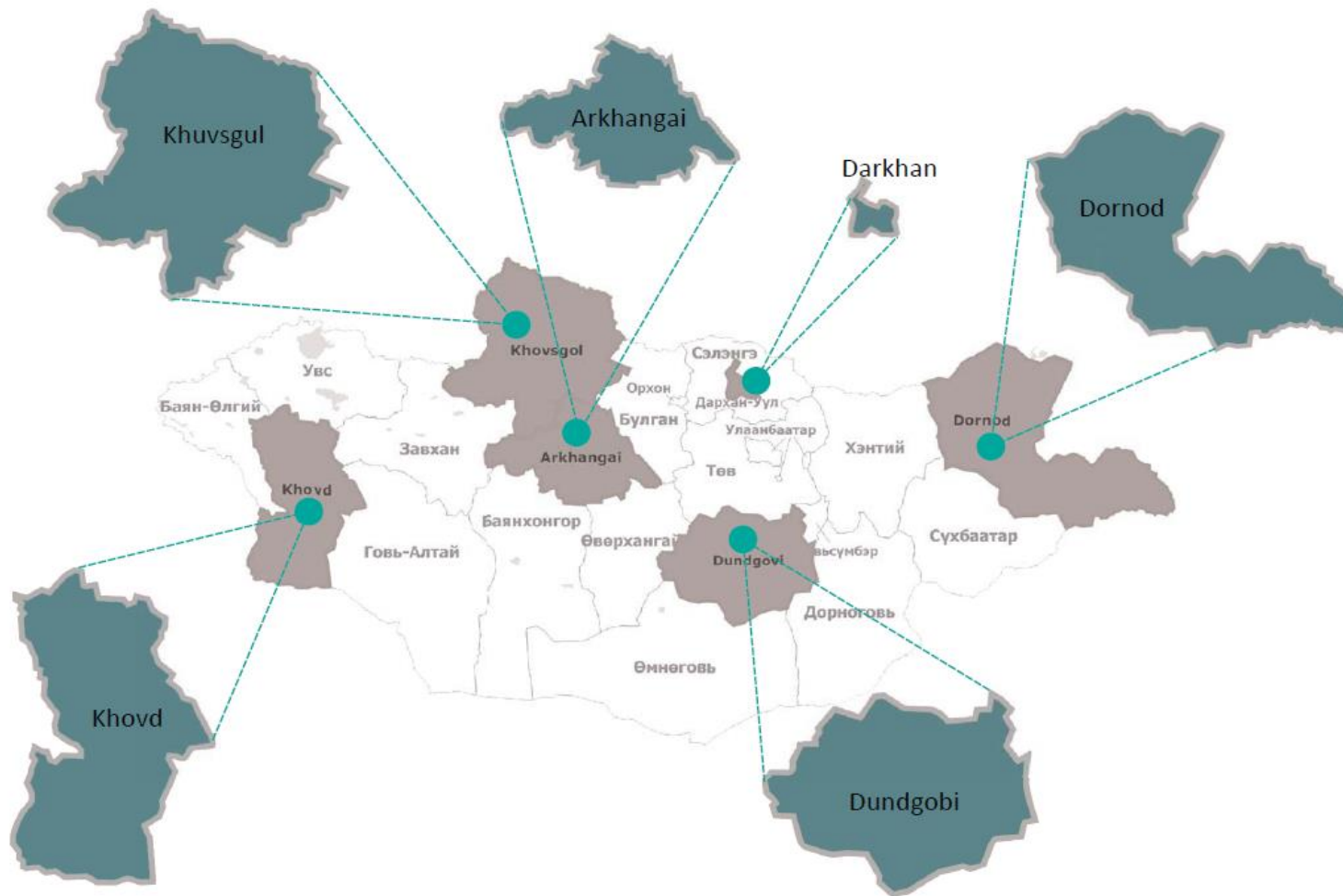
21. The Consultant is to bear the cost of their own Project office to each sites including six provinces and Ulaanbaatar city during the startup phase of the construction supervision period. The Consultant is to make allowances for the accommodation of the Construction Supervision team in each sites throughout the construction and defects liability periods.

Client will provide the following inputs, project data and reports to facilitate preparation of the deliverables:

1. Site master plan (1:500)
2. Conceptual Design
3. Any other data available with Ministry, if any.

APPENDIX A: PROVINCE DEVELOPMENT CENTER

Location diagram



Site locations



Dundgobi, 2800 sq.m



Dornod, 3000 sq.m



Darkhan, 5000 sq.m



Khovd, 2800 sq.m



Arkhangai, 3200 sq.m

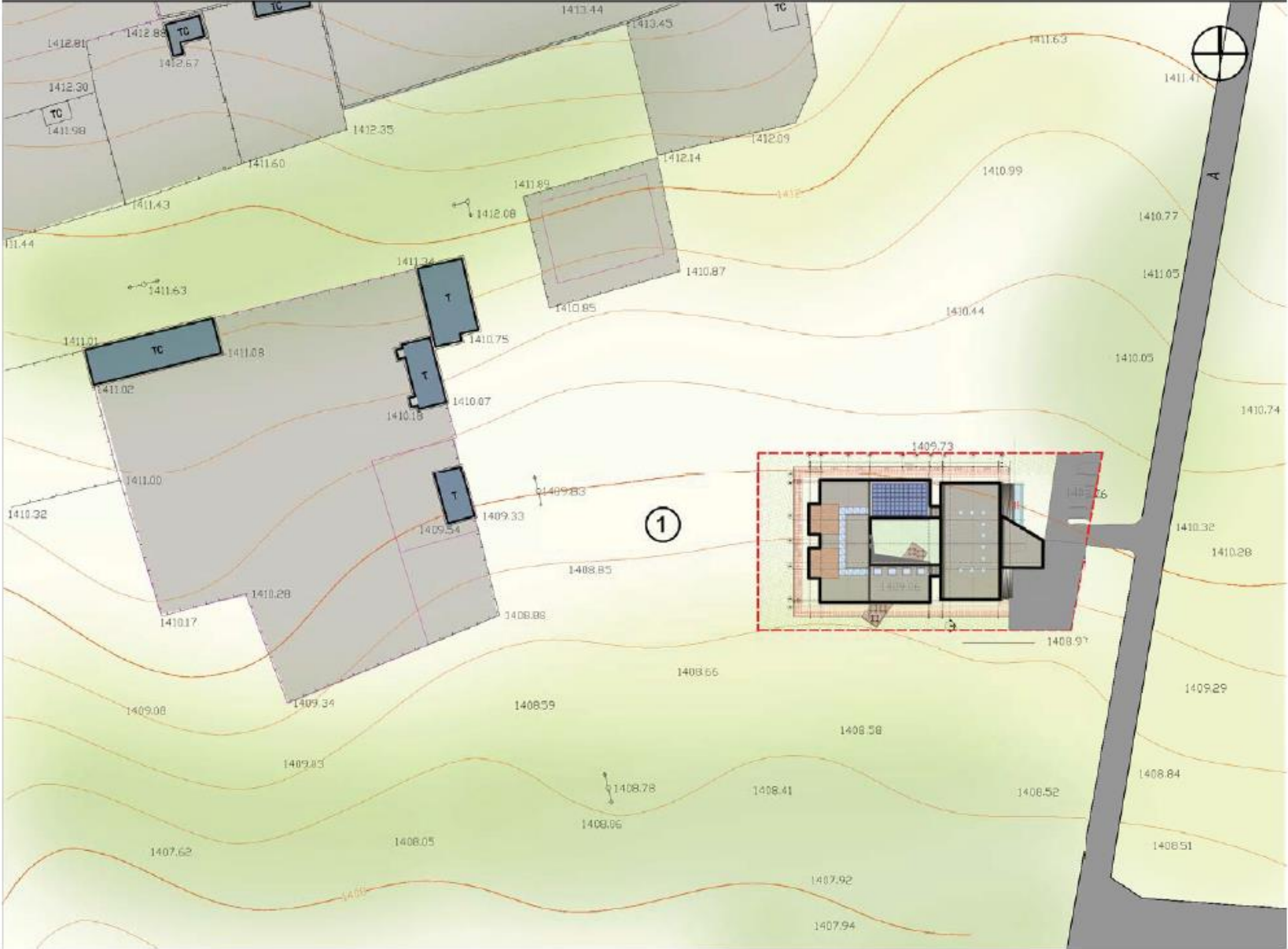


Khuvsgul, 4000 sq.m

Masterplan - Khovd



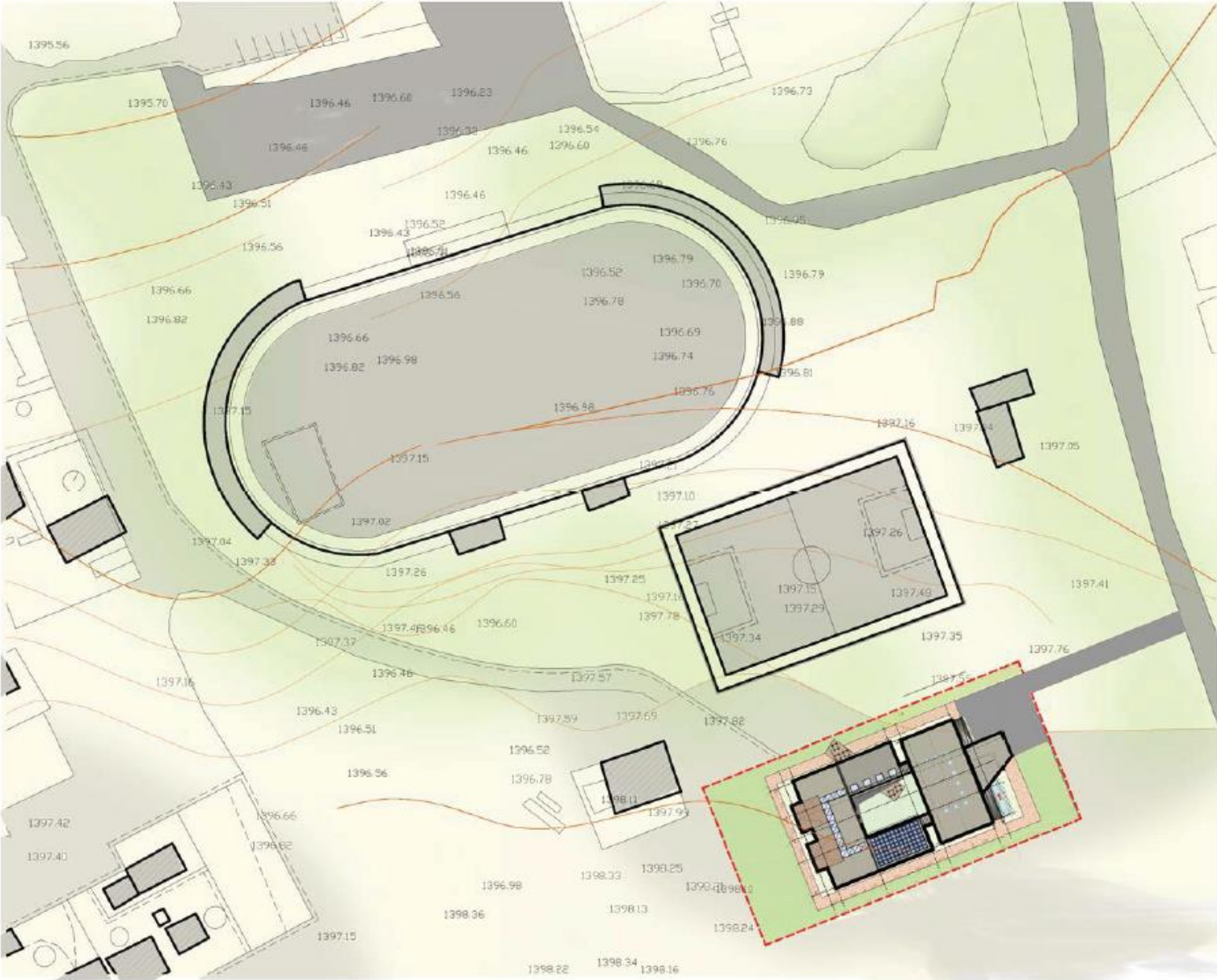
Masterplan - Dundgobi



Master plan - Dornod



Master plan - Arkhangai



Master plan - Khuvs gul

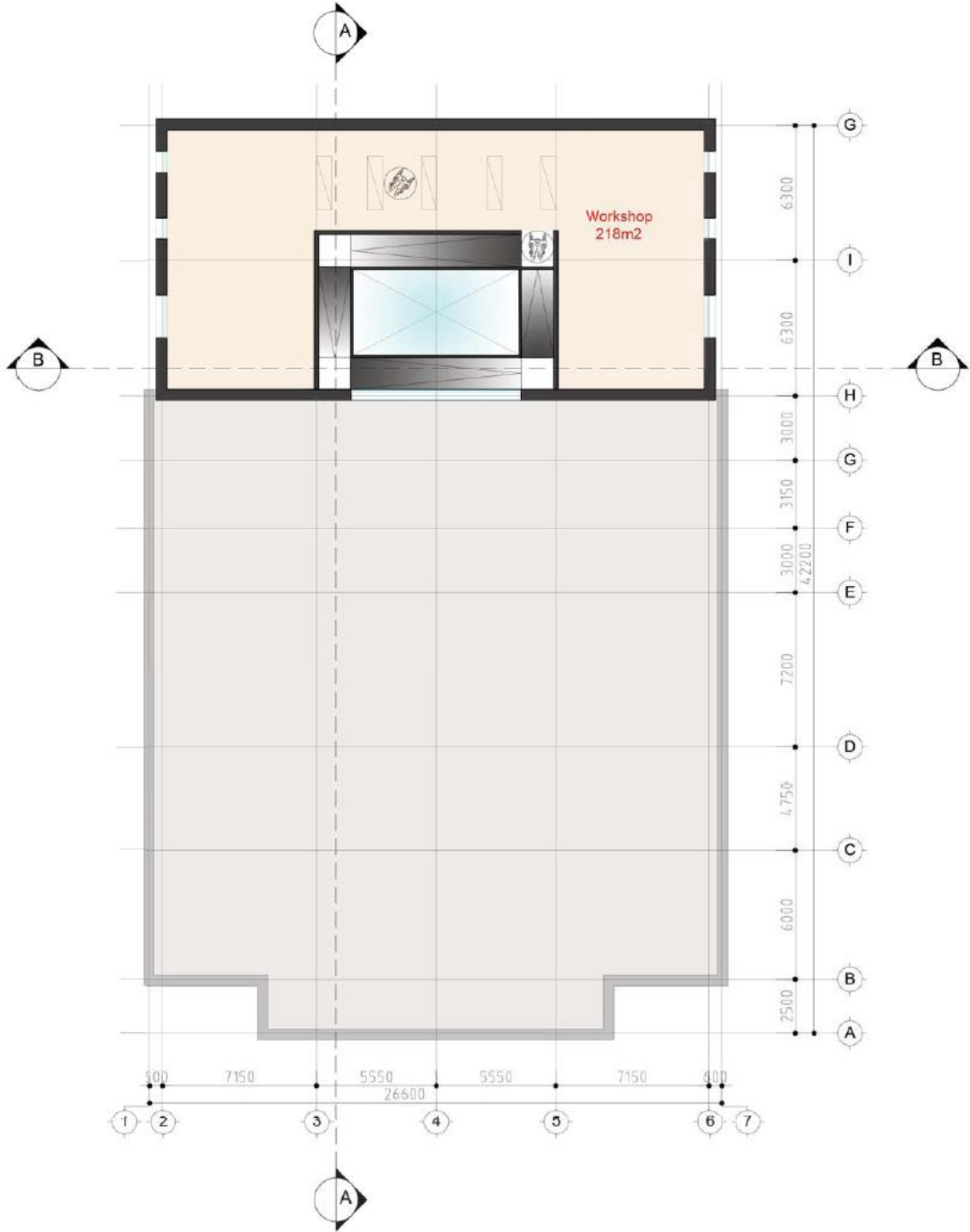


Master plan - Darkhan



Basement floor plan

FFL.-3.200
Area: 301 m²
Scale 1:250



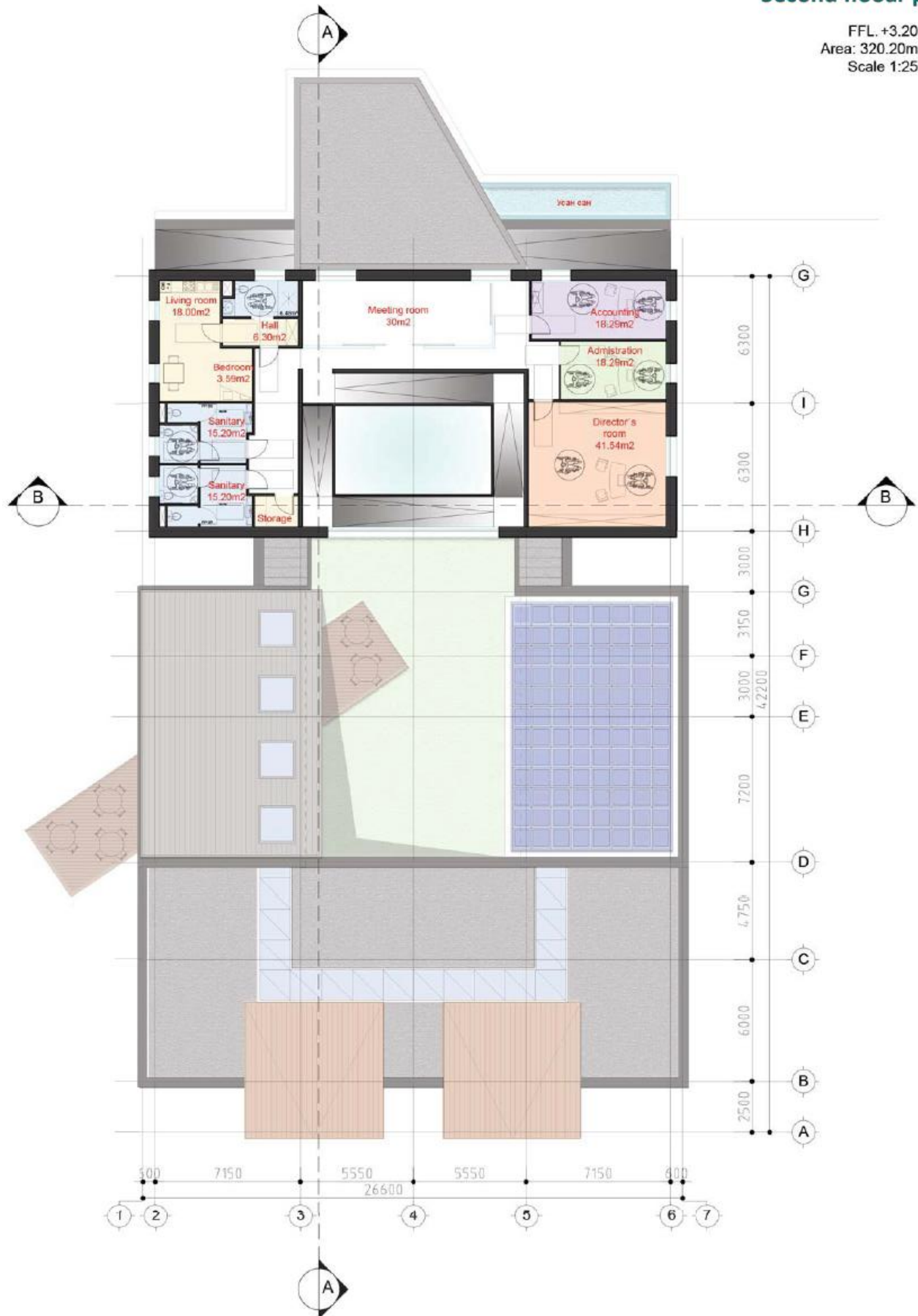
Ground floor plan

FFL ± 0.000
 Area: 855.30m²
 Scale 1:250

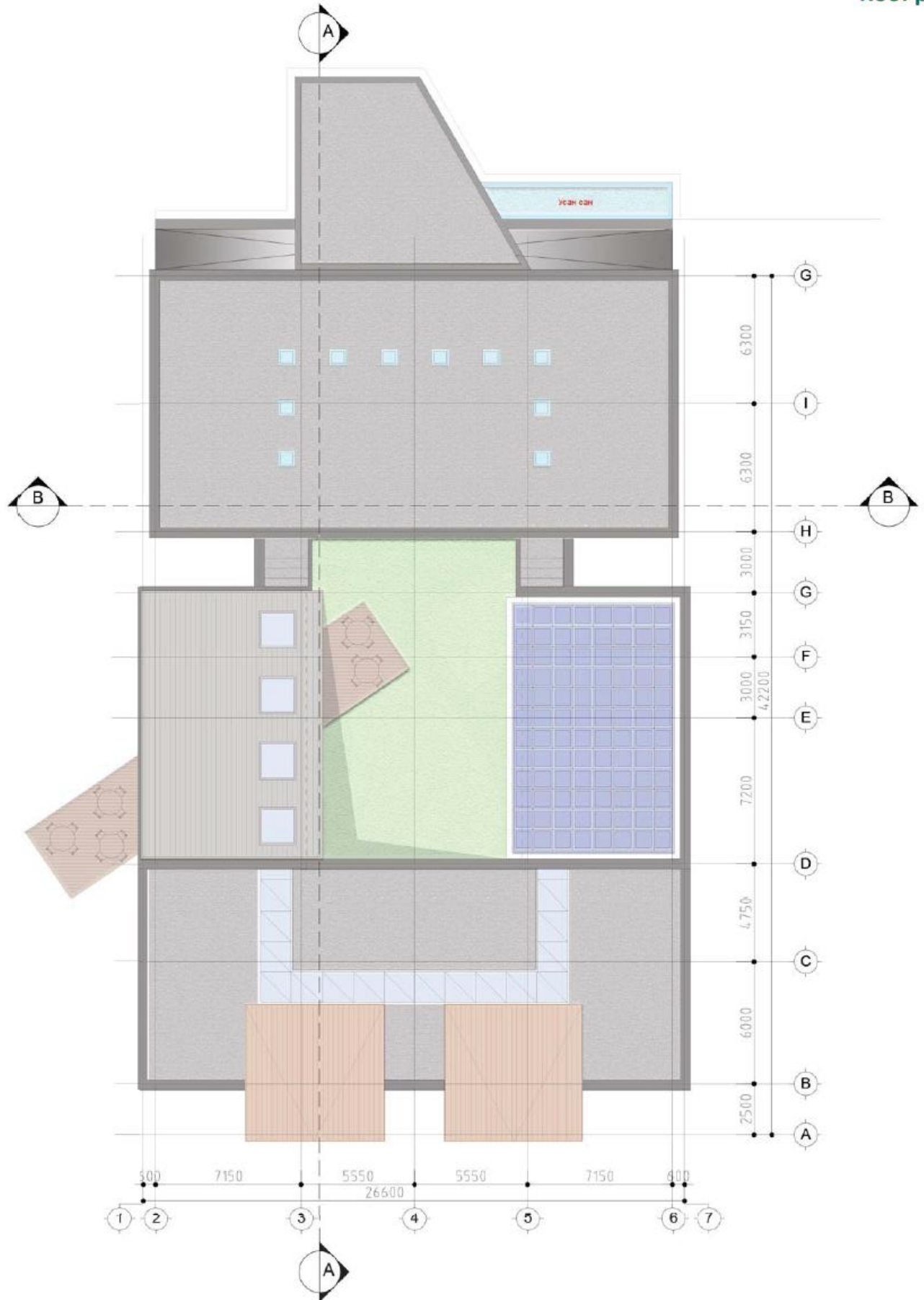


Second floor plan

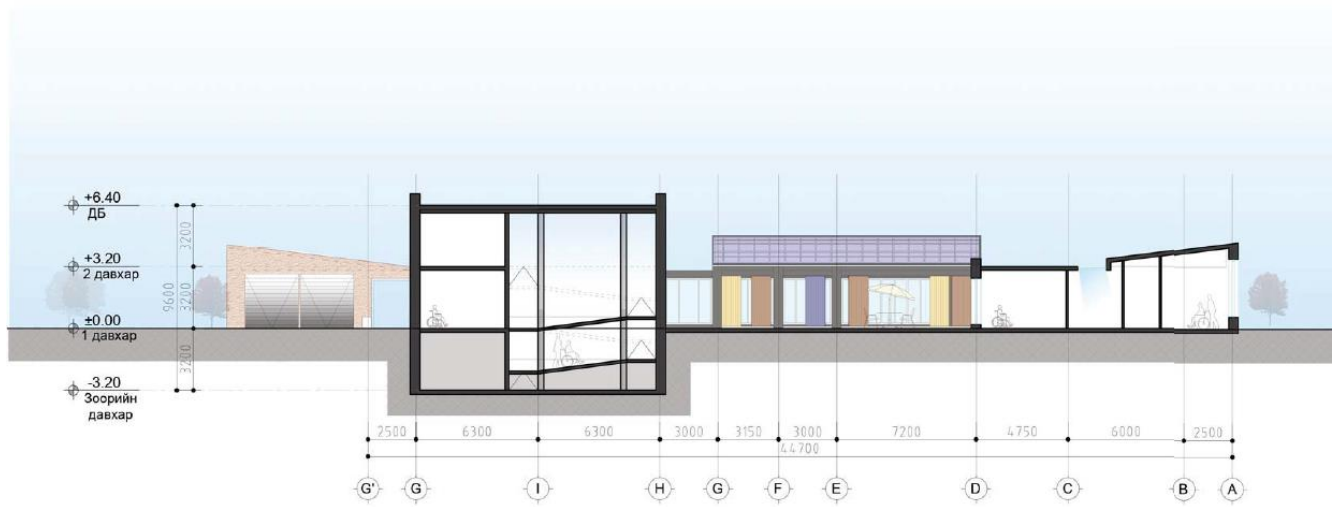
FFL. +3.200
 Area: 320.20m²
 Scale 1:250



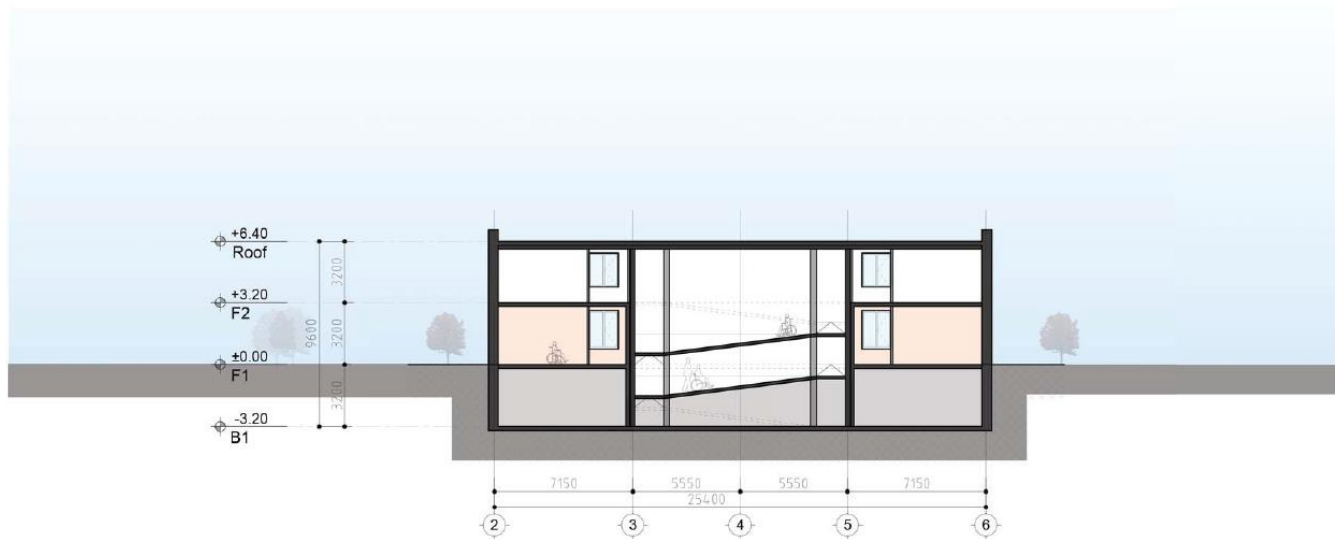
Roof plan



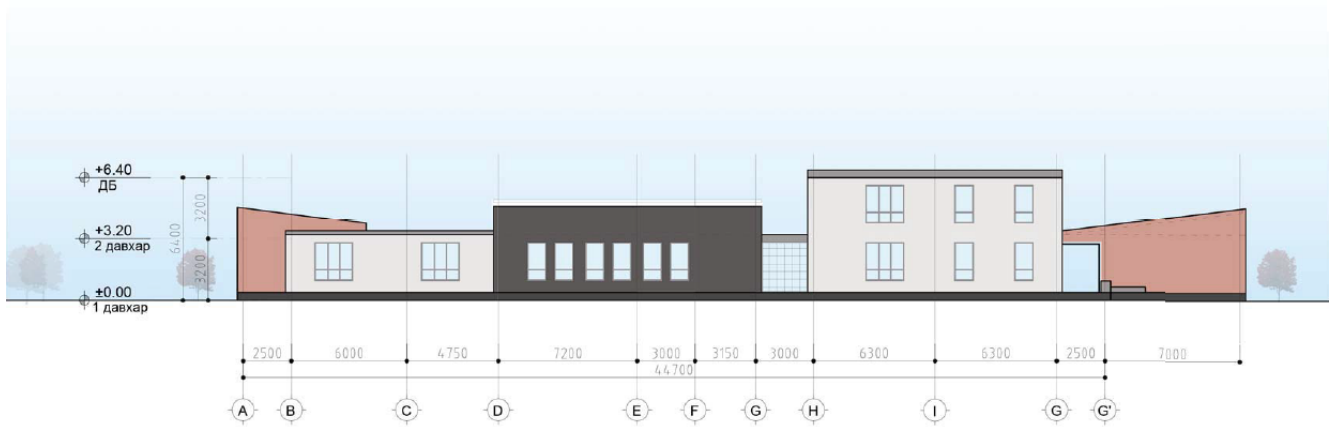
Section A-A



Section B-B



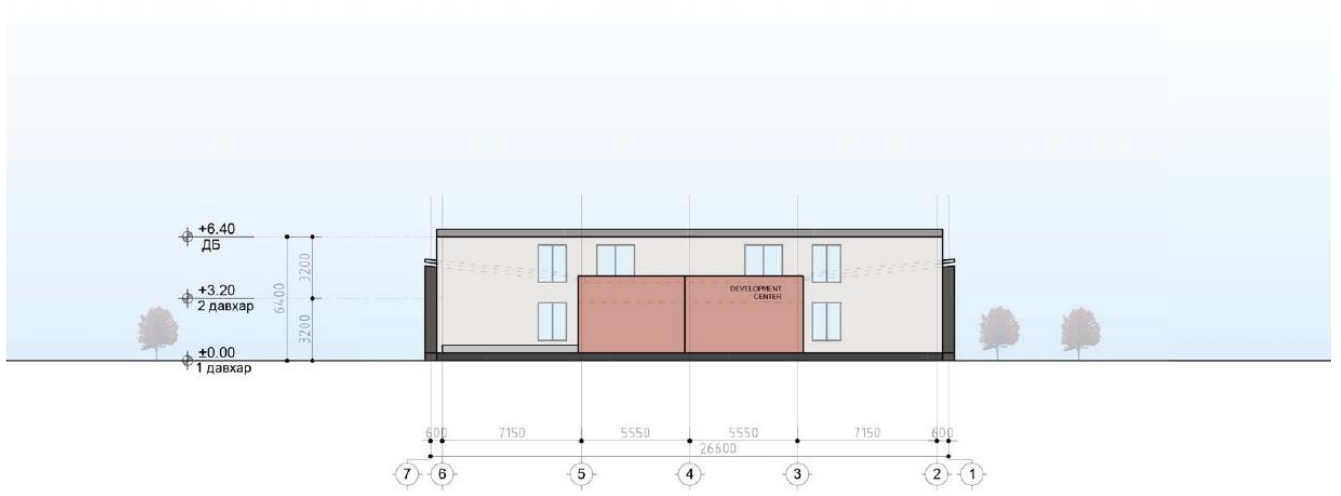
Elevation A-G'



Elevation G'-A



Evelation 7-1



Evelation 1-7



Bird-eye view



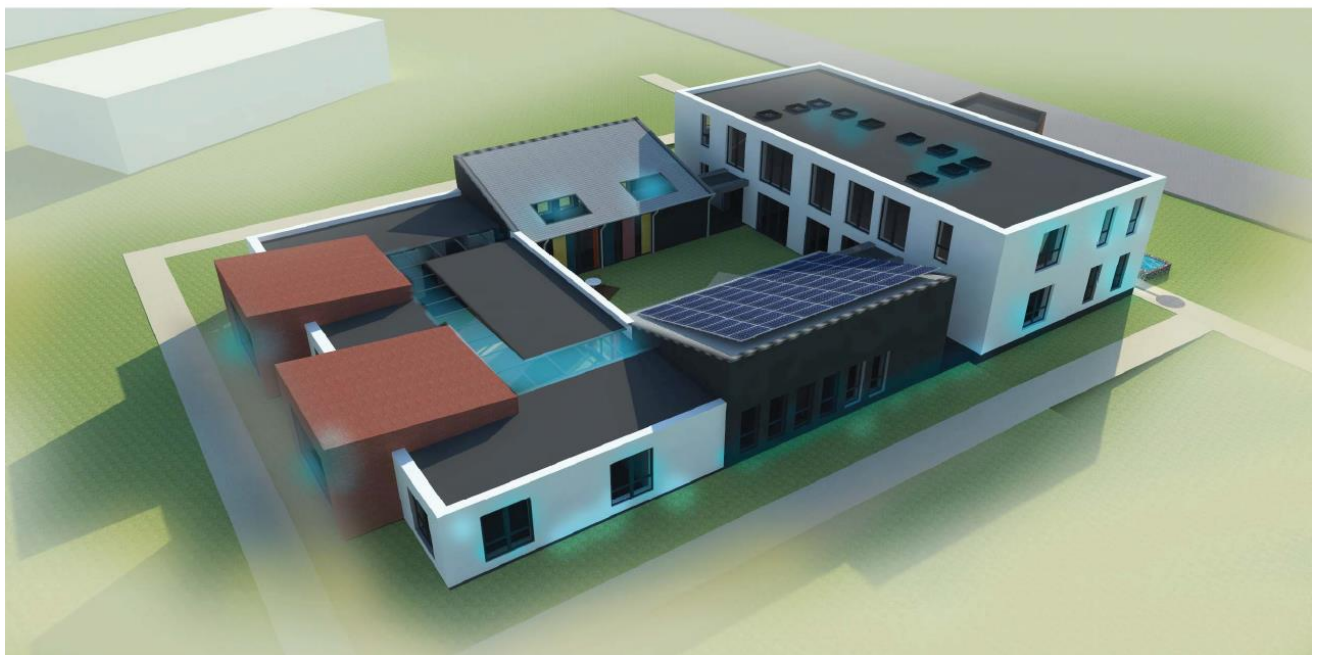
Bird-eye view



Bird-eye view



Bird-eye view



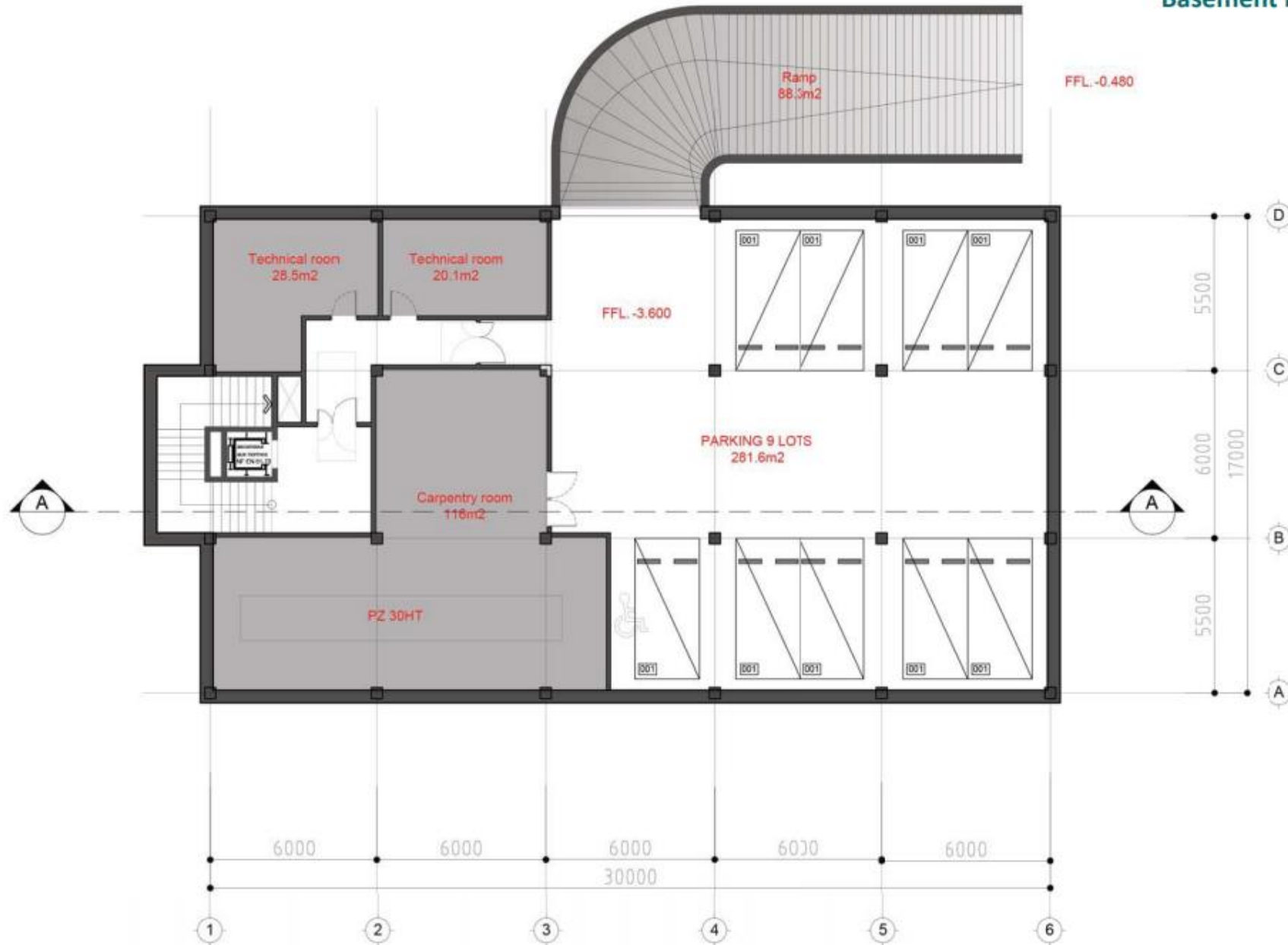
APPENDIX B: EMPLOYMENT RESOURCE CENTER IN ULAANBAATAR



Basement B1 floor plan

FFL. -3.600

Scale 1:200



Ground floor plan

FFL ±0.000

Scale 1:200



Second floor plan

FFL +3.600

Scale 1:200



3rd floor plan

FFL +7.200

Scale 1:200



4th floor plan

FFL +10.800

Scale 1:200



5th floor plan

FFL +14.400

Scale 1:200



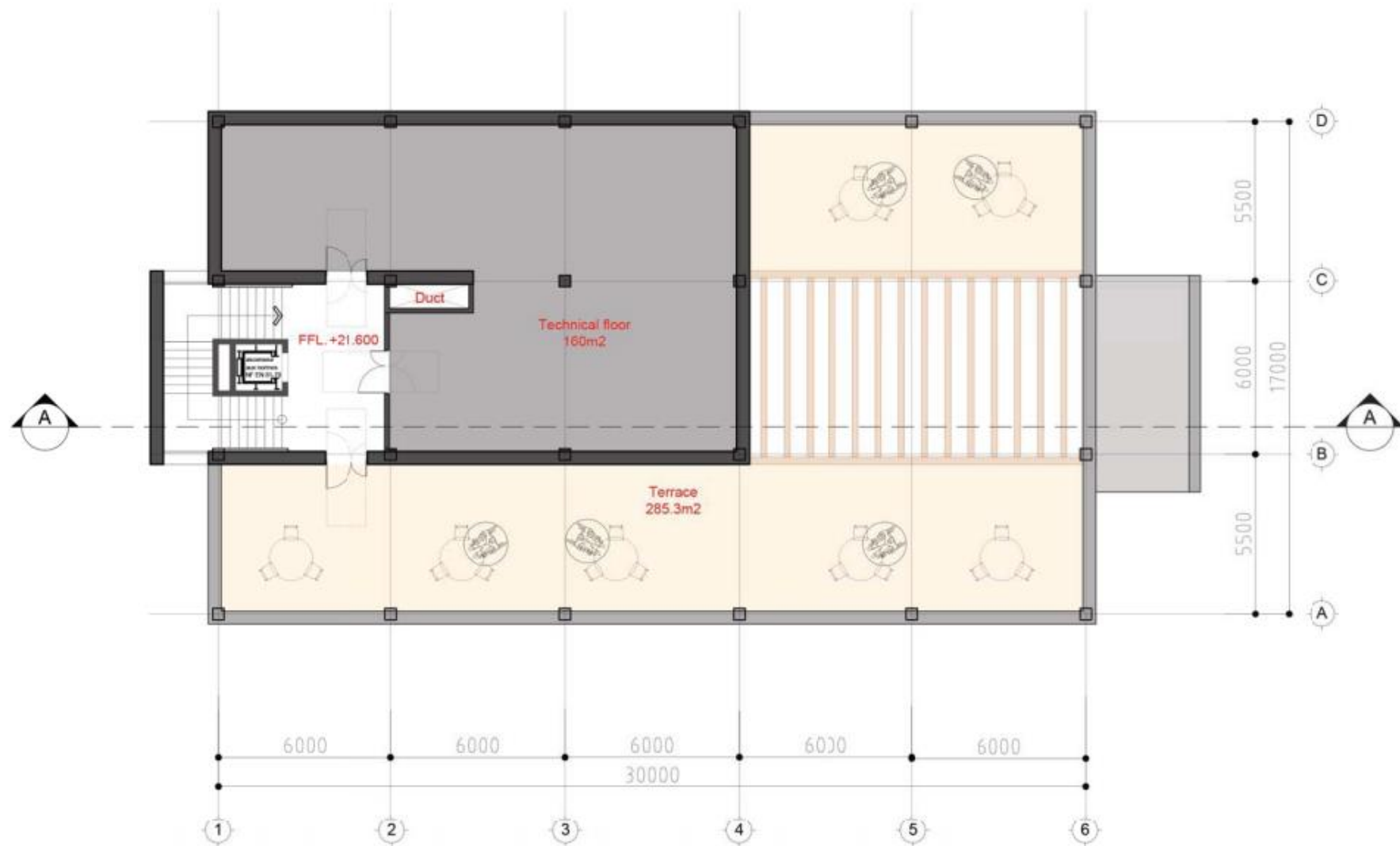
6th floor plan
FFL +18.000
Scale 1:200



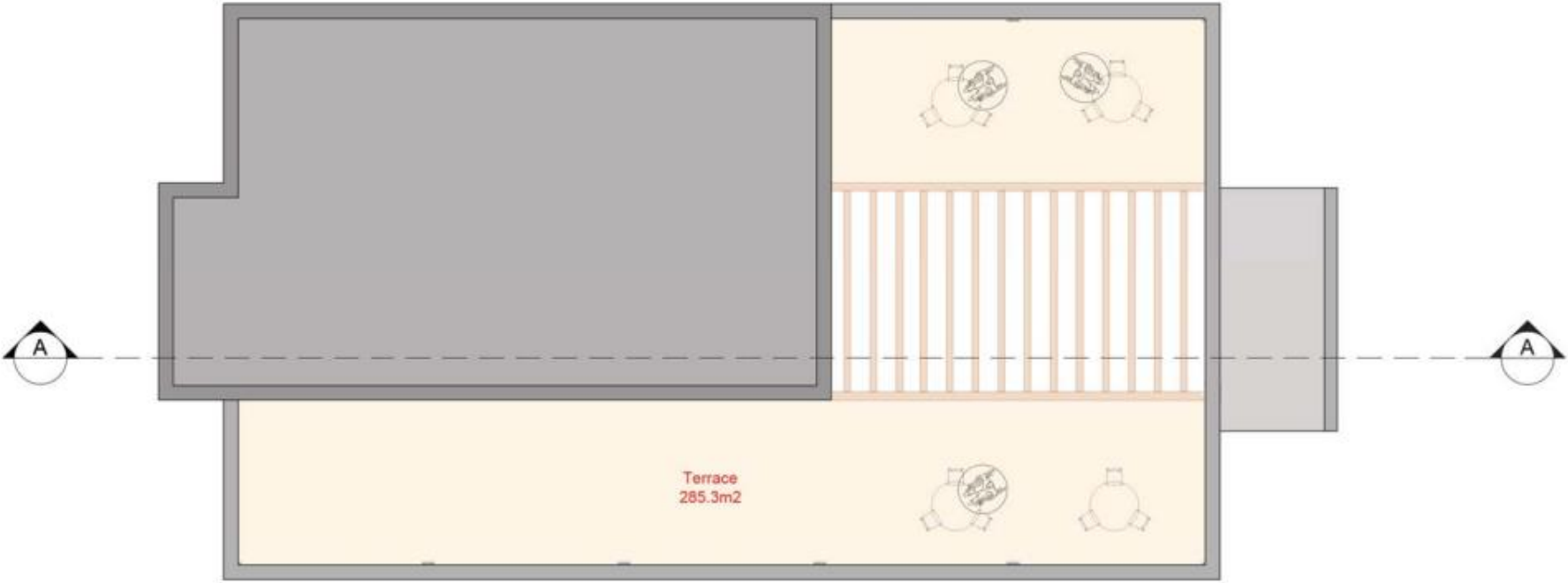
Technical floor plan

FFL +21.600

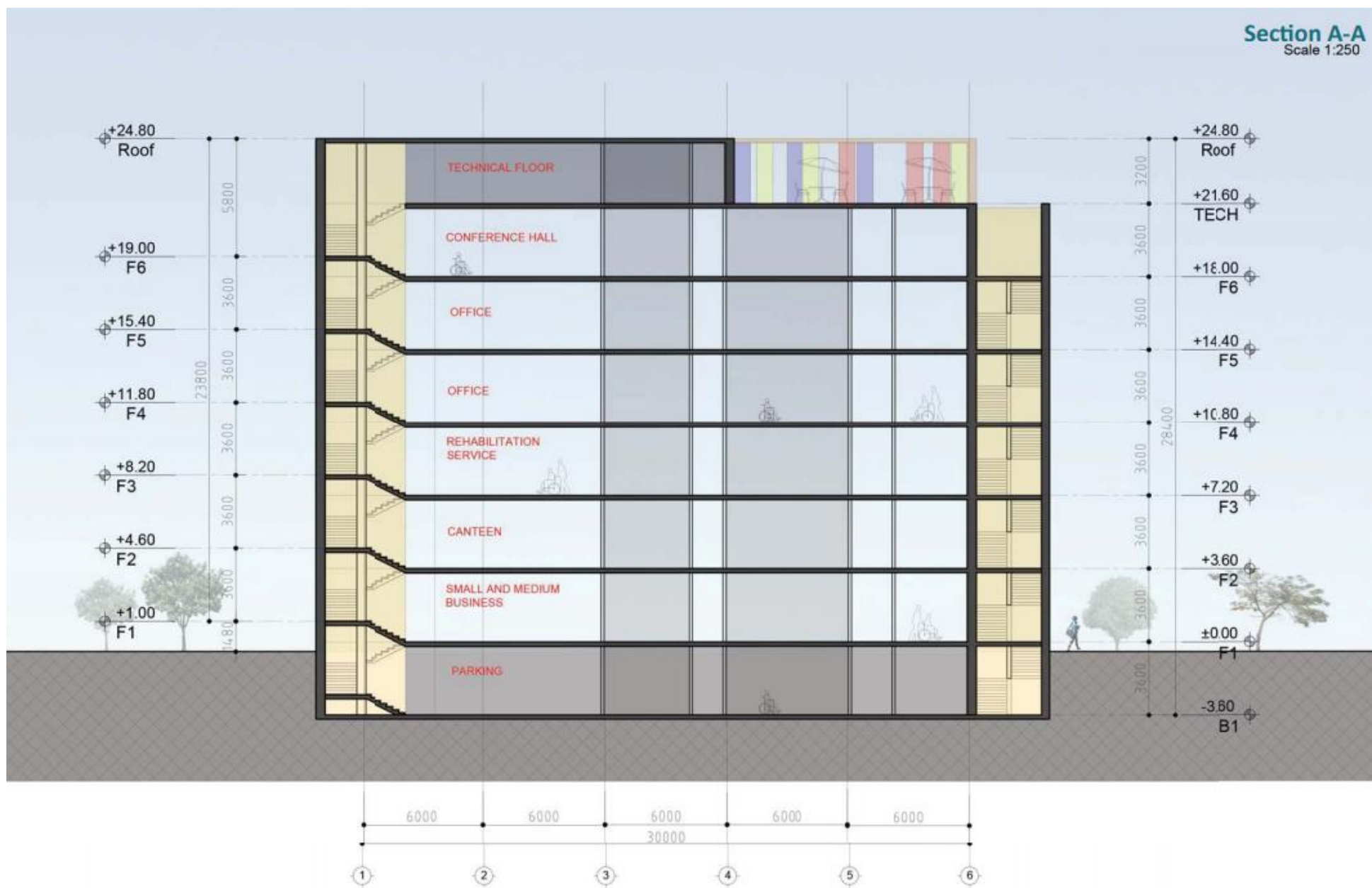
Scale 1:200



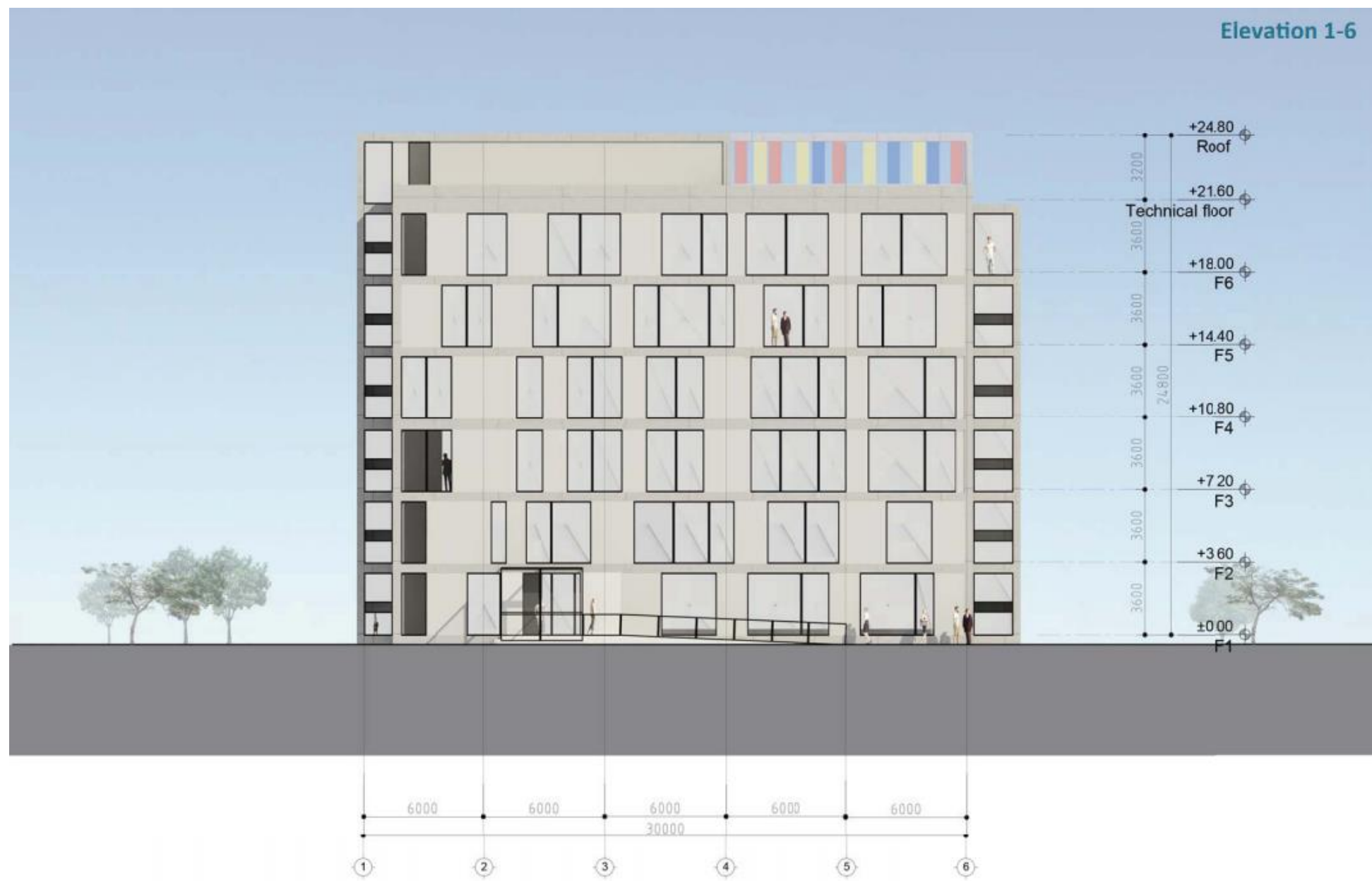
Roof plan
Scale 1:200



Section A-A
Scale 1:250



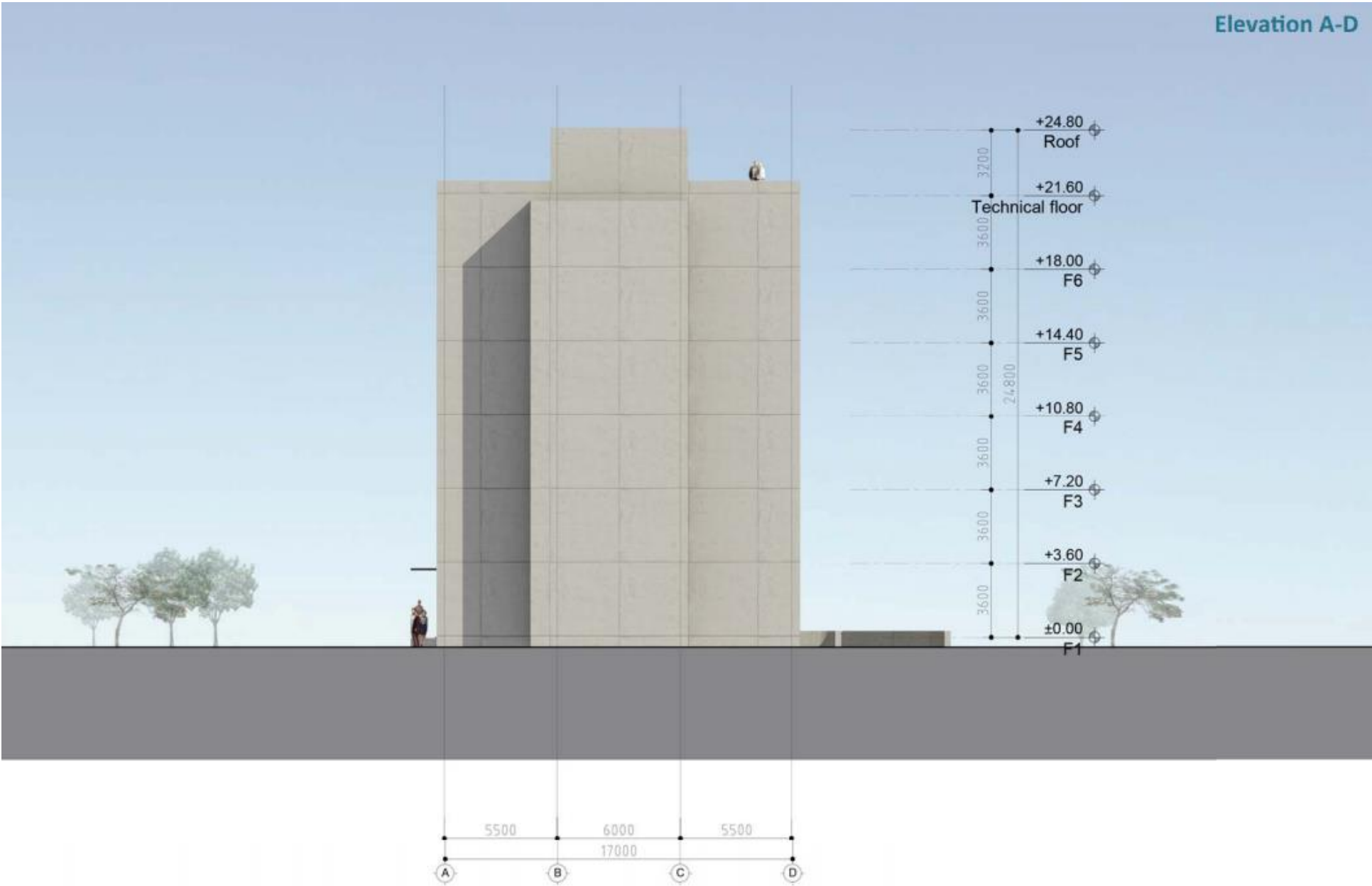
Elevation 1-6



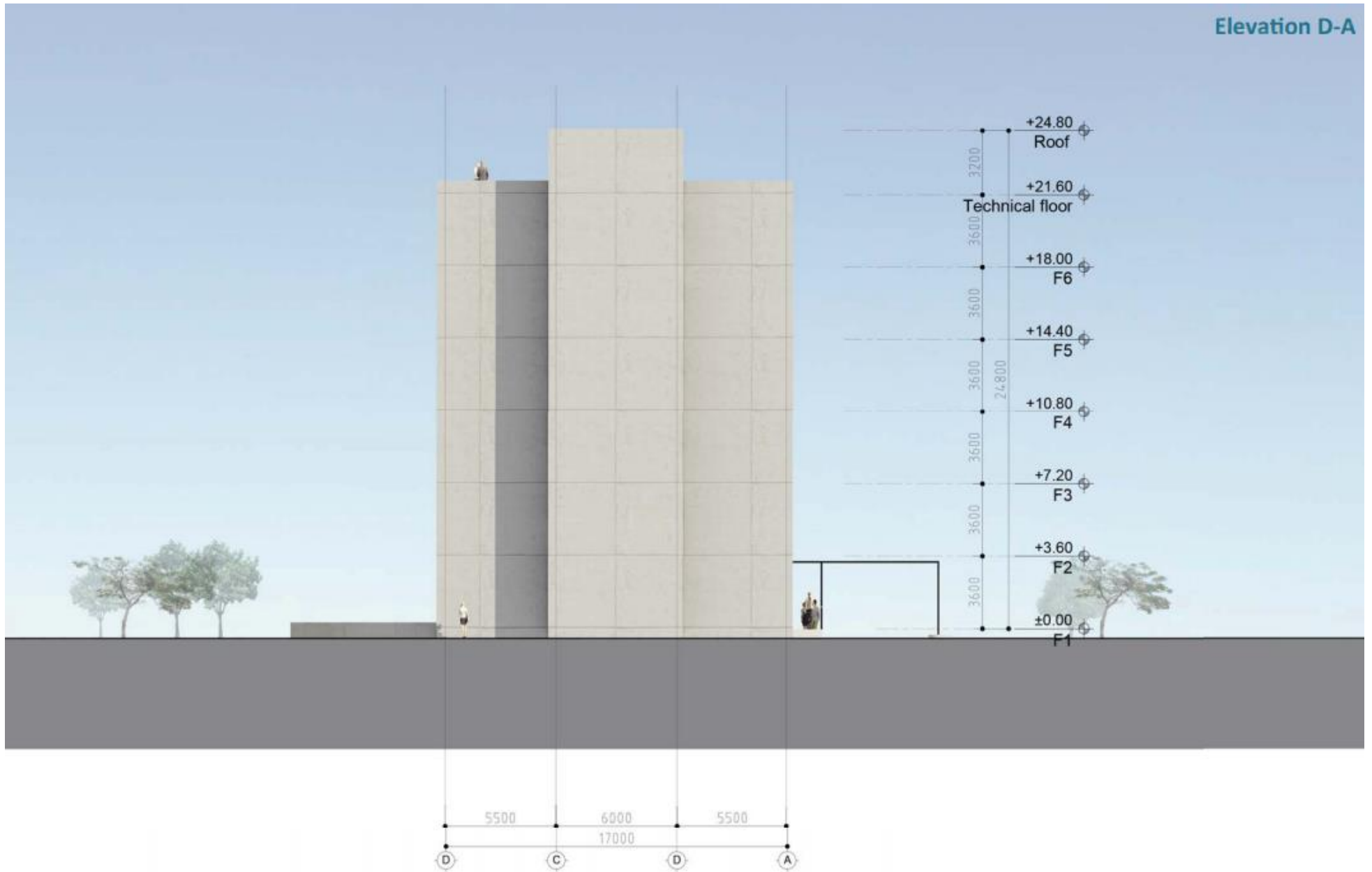
Elevation 6-1



Elevation A-D

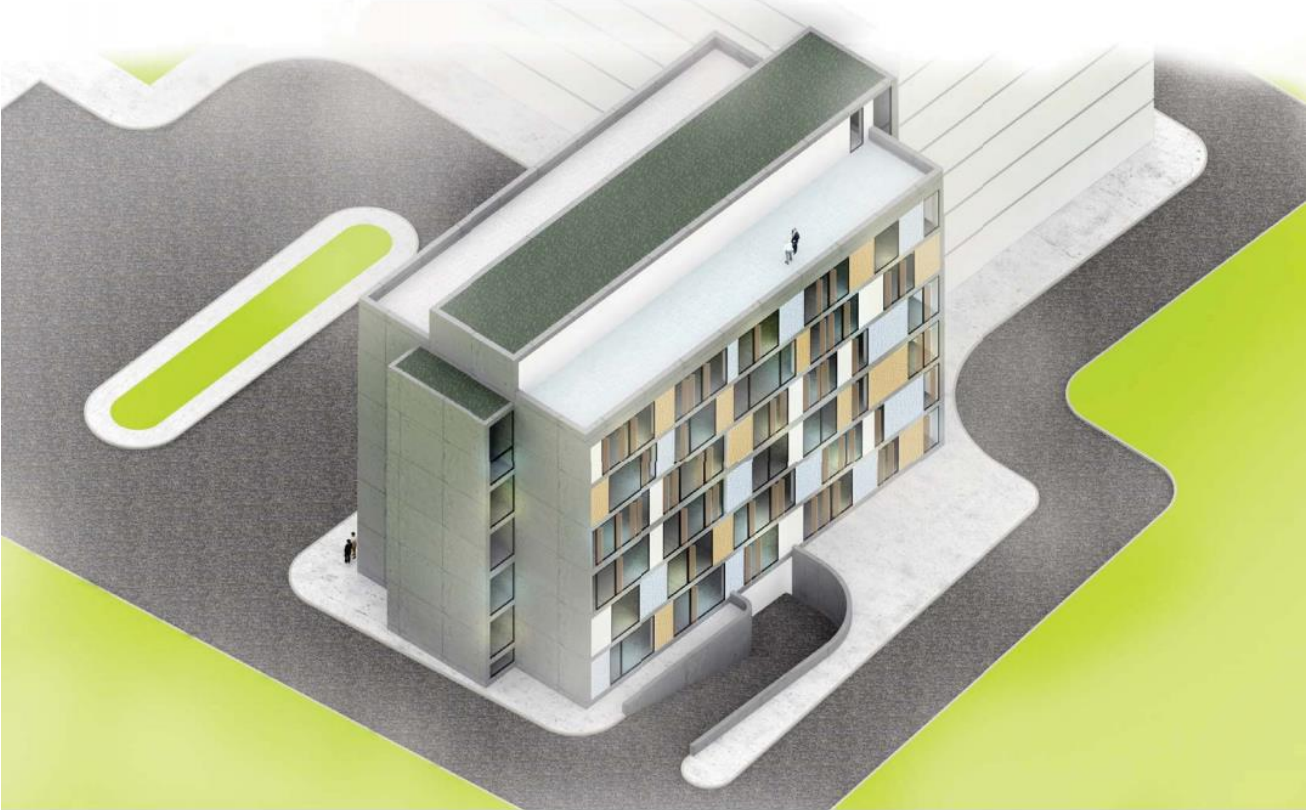


Elevation D-A

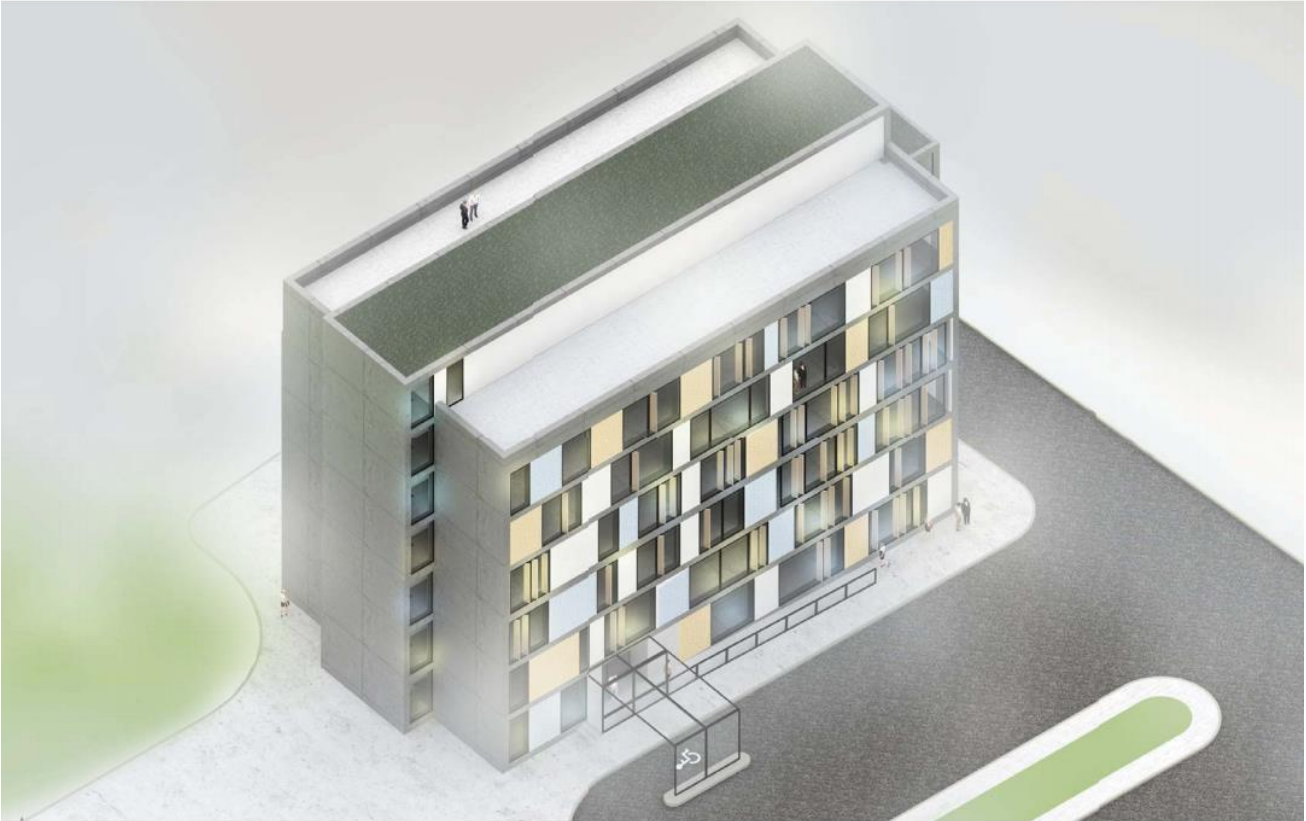




View



View



APPENDIX C: UNIVERSAL DESIGN PRINCIPLES

The following design consideration for each types of disability must be reflected on building design development and detail design stages. The Consultant must follow the Synthesis of the standards ISO/IEC Guide 71:2014

1) Sensory abilities and characteristics

- a) Multiple means of information presentation such as auditory or tactile to supplement or substitute for visual information;
- b) Appropriate size, contrast, form, luminance, lighting and viewing distance in relation to context of use;
- c) Avoidance of glare; redundant forms of coding to supplement or substitute for information conveyed with color coding, e.g. shape or texture coding;
- d) Appropriate physical construction and properties of fonts such as size, spacing, with or without serif, upright form or italics, and light, medium or bold appearance within a specific context of use;
- e) Visual information and controls placed in a prominent position, or a positioning that is flexible, adjustable or duplicated;
- f) Avoidance of flicker rates with flashing or blinking text, objects or video screens, especially those that can trigger visually induced seizures;
- g) Distinctive form to facilitate identification of a product/environment and/or parts of a product/environment (including orientation, e.g. top/bottom, front/back, entrance/exit);
- h) Colored markings that draw attention to steps and potentially dangerous places;
- i) Tactile indicators that draw attention to stairs, platform edges and pedestrian crossings;
- j) Traffic lights equipped with acoustic signals to indicate when pedestrians can cross streets safely;

2) Hearing consideration

- a) Multiple means of information presentation such as visual (text or pictures) or tactile to supplement or substitute for auditory information;
- b) Appropriate volume, pitch and frequency of spoken announcements, warnings and warning sounds in relation to context of use;
- c) Adjustable volume over a wide range and with multiple frequencies;
- d) Avoidance of sudden changes in volume of auditory signals;
- e) Constant signal-to-noise ratio between the level of an announcement and that of the background noise;
- f) Group assistive listening devices or communication systems such as induction loops, infrared or radio systems;
- g) Emergency announcements that are visual with text, and where appropriate, in sign language, as well as of an appropriate volume and pitch decrease risk for persons with hearing impairment;
- h) A good acoustic environment, that reduces background sounds and promotes sound that is important to be heard
- i) Accommodation for and compatibility with relevant assistive products, assistive technology and supports.

3) Touch functions

- a) Multiple means of information presentation such as visual or auditory information to supplement or substitute for tactile information or biometric controls;
- b) Multiple means of control such as eye and voice control, sensors and automatic or remote controls;
- c) Avoidance of sharp and uneven points/edges/surfaces;
- d) Avoidance of excessively hot or cold surfaces which can be touched (even inadvertently);
- e) Distinctive form to facilitate identification of a product and its parts, which in turn can facilitate use/handling/assembly.

4) Taste functions and smell functions

- a) Multiple means of information presentation to supplement or substitute for information gained by taste and smell functions;

- b) information in labelling on ingredients, use by and expiration dates;
- c) Visual and auditory signals to alert people to the presence of smoke or dangerous chemicals;
- d) Information or labelling to warn about strong smell or taste;
- e) Provision of minimal odors and taste, except where necessary (e.g. odors and taste are expected in foods).

1) Immunological system functions

- a) Avoidance of inclusion of allergens, sensitizing substances and chemicals known to cause hypersensitivities in products, foodstuffs and environments;
- b) Appropriate information and labelling of ingredients/contents (including allergens, sensitizing and chemical substances known to cause hypersensitivities) in accessible format, the provision of this information being mostly subject to national or international regulation and which can include
 - c) A list of ingredients,
 - d) A separate statement that declares any major allergens or sensitizing substances included, and warnings such as information regarding any change in composition of significance related to allergens and sensitizing substances;
 - e) Ventilation systems that filter out respiratory allergens;
 - f) Prevention of mold growth, e.g. by controlling level of indoor humidity, and following appropriate cleaning routines;
 - g) Avoidance of dust-collecting furnishings in public areas;
 - h) Availability of “allergy-free” areas such as smoke-free and allergy-free rooms in hotels, and animal-free areas in public transportation.

6) Physical abilities and characteristics

- a) Additional space in built environments;
- b) Space for clothing and personal protective equipment;
- c) Multiple size offerings and / or adjustability;
- d) Height clearance for tall persons;
- e) Width clearance for large persons;
- f) Step heights and reach distances for small persons;
- g) Space for assistive products, assistive technology, service animals and accompanying persons;
- h) Load capacities of system components appropriate for larger mass (weight) requirements;
- i) Systems with a clear line of sight to important components for seated or standing users;
- j) Systems with a comfortable reach to all components for seated or standing users;
- k) Grip sizes in systems components that accommodate variations in user sizes and shapes.

7) Movement: Functions of upper body structures and fine hand use abilities

- a) Manufacturing materials of lighter weight or lower density to reduce the weight of products;
- b) Products shaped to facilitate easy grasping, lifting and carrying with either or both hands;
- c) Manual controls that allow a comfortable grip, avoid the need for twisting of the wrist, and offer minimal resistance;
- d) Controls that avoid the need to manipulate multiple controls at the same time;
- e) Non-slippery surface that aids gripping and manipulating for people with limited dexterity;
- f) Textured surfaces, to increase friction, and facilitate the application of force;
- g) Design and spacing of controls that guard against inadvertent activation of a control other than the one intended;
- h) Containers that allow easy opening and closing with reasonably low attainable operating force;
- i) Simple and straightforward sequences for opening of packaging and assembling, installing or operating a product;
- j) Avoidance of simultaneous double movements, e.g. pushing and twisting;
- k) Alternative controls for accommodation of upper body movement impairments.

8) Movement: Functions of lower body structures

- a) Slip-resistant, threshold-free layout, e.g. in buildings and paved outdoor environments;
- b) Avoidance of sudden changes in surface level, obstacles, bumps or protrusions;
- c) Equipment, such as elevators and other lifting systems;

- d) Ramps with appropriate slopes and adequate space to allow for approach and manoeuvring, and use of wheelchairs, walking frames, or walking aids;
- e) Stairs with appropriate dimensions and banisters or hand grips alongside;
- f) Ample time for persons with mobility limitations to pass through automatic doors and to use pedestrian crossings.

9) Muscle power and muscle endurance

- a) Use of power grip (whole hand) which requires less effort than pinch grip (between thumb and index or middle finger);
- b) Appropriate handling characteristics (e.g. size and weight) for systems that involve lifting, holding, carrying or opening;
- c) Avoidance of long handling time and unnecessary repetition of operations;
- d) Avoidance of long service lines that cause people to stand unsupported for long periods of time;
- e) Alternative means of control in vehicles to accommodate lower body movement.

10) Voice and speech

- a) Alternative forms of communication such as via text, facial expressions, hand movements or signs, body postures, and other forms of body language;
- b) Augmentative and alternative communication based on symbols, aids, techniques, and/or strategies;
- c) Support for the use of assistive products such as speech synthesizers and communication amplifier and video communication;
- d) Provision of alternative means to interact with interactive voice systems and intercom systems, such as real-time text.

11) Cognitive abilities

- a) Information about time and place;
- b) Schedules, structures, signals to indicate start and termination of activities;
- c) An overview that informs the user what to expect before providing any details;
- d) Appropriate feedback/cues/reminders that hold the user's attention and give support through a process;
- e) Feedback that is adjustable to the needs and preferences of users;
- f) Environments and presentations that are stimulating but also avoid distractions;
- g) Systems and procedures that adapt to individual situations, abilities and preferences;
- h) Similar arrangement/layout and design of feedback and control logic on products of a similar type;
- i) Similar design of feedback and control logic on products of a similar type;
- j) Error-tolerant operating sequences;
- k) Flexible time period for assimilation of information and response;
- l) Simple and straightforward sequences for opening of packaging and assembling, installing or operating a product;
- m) Information provided in multiple formats, e.g. text is read out, diagrams are provided in addition to text;
- n) Information and instructions that are easy to understand in the language of the user;
- o) Explicit information on expectations placed on the user;
- p) Systems that can be used (as far as possible) without an instruction manual;
- q) Procedures that facilitate learning (learning by doing is generally easier than memorizing instructions, repetitions);
- r) Multiple means of information presentation (e.g. text is read out, widely recognized symbols);
- s) Emergency evacuation routes designed so that they are intuitive and easy to follow which clearly designate any alternative routes that accommodate for persons with disabilities;
- t) Accommodation for/compatibility with relevant supports and assistive products and assistive technology.

APPENDIX D: LOCAL BUILDING CODES, REGULATIONS AND STANDARDS

The Consultant should take into consideration of local building codes and regulation in terms of accessibility.

Norms on architectural design

1. BNbD: 30-01-04 /CCM 30-01-04/ *Norm and Regulation for Urban Resettlement planning and building construction, Decree No.130 by the Ministry of infrastructure, 2004*
2. BD 31-101-04 /31-104-04/ *Handbook for barrier-free construction planning for the handicapped, Decree No.17 by Director of Construction, Urban Development and Public Utilities Office, 2004*
3. BD 31-112-11 *Building regulations of space planning for the requirements of handicapped people, Decree No.256 by the Ministry of Construction, Urban Development and Transportation.*
4. *Other related norms and regulations*

Norms on structural design

1. BNbD: 2.01.07.90 Load and effect
2. BNbD: 22.01.01*2006 Building code of seismic regions
3. BNbD: 2.02.01.94 Ground and Foundation code for building design work
4. BNbD: 52.02.05 Cast in situ concrete and reinforced concrete
5. BNbD: 53.02.05 Steel Structure
6. BNbD: 2.03.02.90 Masonry and reinforced masonry structure
7. BNbD: 52.01.10 Concrete and reinforced concrete structure

Norms on electrical design

3. BD 43-101-03 The regulations of electrical installations
4. BD 43-101-03*12 The regulations of electrical installations
5. BD 43-103-08 The instruction for design of the lighting protection of building and facilities
6. BD 43-102-07 Design and installation of electrical equipment in residential and public buildings

Norms on fire safety and automation

1. BNbD 21-01-02 Fire safety of buildings and facilities
2. BNbD 21-02-02 Norm on fire safety for developing construction design drawings
3. BNbD 21-04-05 Automatic fire extinguisher and alarm equipment of buildings and facilities
4. BNbD 3.05.07-85 Automation systems for building

Norms on HVAC design

1. BNbD 41-01-11 Heating, ventilation and air conditioning
2. BNbD 43-03-07 Boiler equipment
3. BD 41-102-11 Design of independent heat supply sources
4. BNbD 23-01-09 Climate and geophysical parameters for construction
5. BNbD 23-02-09 Building thermal performance
6. BD 23-103-10 Designing thermal performance for building

Norms on Water supply, plumbing design

1. BNbD 3.05.04-90 Water supply, sewerage, outdoor pipelines and facilities
2. BNbD 3.05.01-88 Indoor plumbing system
3. BNbD 40-05-98 Indoor water supply and sewerage pipelines
4. BNbD 40-02-06 Water supply, outdoor pipelines and facilities

Mongolian National Standards;

1. MNS 6055:2009 – *Space planning for building and environment with the requirements of handicapped people, 2009*
2. MNS 6056:2009 – *Design manual for planning and designing accessibility for handicapped people, 2009*