

TERMS OF REFERENCE
TVET FACILITIES UPGRADING: DETAILED ENGINEERING DESIGN, COST ESTIMATE
AND CONSTRUCTION SUPERVISION SERVICES OF DESIGN FIRM 2 – CS03

A. BACKGROUND INFORMATION

1. Mongolia has received a Loan (loan no. 3243) from the Asian Development Bank (ADB) toward the cost of Skills for Employment Project, and intends to apply a portion of the proceeds of this Loan to eligible payments for these consulting services.
2. The project shall enhance capacity of the Technical and Vocational Education Training Providers to deliver training programs in certain occupations. This enhancement refers to training curriculum development, teacher capacity strengthening, building environment improvement and equipment provision.

B. OBJECTIVE

3. The main objective and scope of the assignment is to (1) prepare complete Detailed Engineering Design and (2) conduct Construction Supervision during the construction period.
4. For the architectural planning purposes of the practical training related building, facility, room or area, it is to be assumed that about 15 students would be involved in the practical trainings, subject to specific instruction(s) that may be issued by the Client for any given practical training related building, facility, room or area.
5. This Terms of Reference covers:
 - (1) Nalaikh Vocational Training and Production Center (Attachment No. 1)
 - (2) Bayankhongor Polytechnic College (Attachment No. 2)
 - (3) Zavkhan Polytechnic College (Attachment No. 3)
 - (4) Gobi-Altai Vocational Training and Production Center (Attachment No. 4).

C. CONSULTING SERVICE REQUIREMENTS

Minimum qualification criteria

6. Prospective firms should meet the minimum qualification criteria specified in Table 1 and are required to submit the following documentation/information at Expression of Interest stage:
 - (1) Company registration certificates, special license.
 - (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 – FIRM – MINIMUM QUALIFICATION CRITERIA

Item	Requirement (“x” apply)
License	If issued under framework of order no. 89 dated 07 May 2013 of Minister of Construction and Urban Development - <input checked="" type="checkbox"/> 1.2.1 – 1-10 story building architecture, landscaping, elevation, structure or <input checked="" type="checkbox"/> 1.2.2 - 1-16 story building architecture, landscaping, elevation, structure, permanent equipment planning <input checked="" type="checkbox"/> 1.2.4 – internal water, sewerage, heating, ventilation, air conditioning,

	<p>external branch line</p> <p><input checked="" type="checkbox"/> 1.2.5 – internal light, electricity, external branch line, internal communication, fire and other signaling, local area network, security systems, instrumentation and control</p> <p><input checked="" type="checkbox"/> 1.2.6 – feasibility study, cost estimating</p> <p>If issued under framework of order no. 11 dated 19 January 2018 of Minister of Construction and Urban Development -</p> <p><input checked="" type="checkbox"/> 3T-3.1 or 3T-4.1 – Architecture, structure, internal organizational planning, design of building</p> <p><input checked="" type="checkbox"/> 3T-6.1 or 3T-7.1 – internal water supply, sewerage system, external branch line, related facility technological design of building</p> <p><input checked="" type="checkbox"/> 3T-6.2 or 3T-7.2 – internal heating supply, ventilation system, external branch line, related facility technological design of building</p> <p><input checked="" type="checkbox"/> 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</p> <p><input checked="" type="checkbox"/> 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</p> <p><input checked="" type="checkbox"/> 3T-8.1 – external general plan, landscaping, topography design</p> <p><input checked="" type="checkbox"/> 3T-11.1 or 3T-11.2 – cost estimating of building civil works</p>
Similar experience	At least 1 similar contract completed during last 4 years.
Status of special license	Active

Indicative person-month inputs of key experts (intermittent)

7. Prospective firms are expected to engage an indicative total of 53.7 person-months of national experts, as summarized in Table 2.

TABLE 2 – SUMMARY OF KEY EXPERT REQUIREMENTS

Position	Person months
Team Leader (one of the engineers below, preferably Architect)	3.5
Architect	9.7
Structural Engineer	9.2
Heating, Ventilation and Air Conditioning Engineer	7.7
Electrical Engineer	5.9
Communication, Signaling, Information Engineer	5.9
Water and Sewerage Engineer	5.9
Cost Estimator	5.9
Total	53.7

8. 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. Key experts should have the qualifications and assignment specific experience as specified in Table 3.

TABLE 3 - KEY EXPERTS – REQUIRED QUALIFICATION AND EXPERIENCE

Position	Qualifications
Team Leader (one of the engineers below, preferably Architect)	<ul style="list-style-type: none"> - At least 10 years of proven experience in management of construction design and construction supervision work by team of engineers. - Consulting Engineer or Consulting Architect.
Architect	<ul style="list-style-type: none"> - At least Bachelor in architecture. - Certified Engineer. - At least 10 years of relevant experience in design of buildings. - At least 10 years of experience in construction supervision. - At least performed 1 similar design and supervision contract in the past 4 years. - Proficient in CAD or Revit technology and 3-dimensional conceptual skills.
Structural Engineer	<ul style="list-style-type: none"> - Civil Engineer in Structural Engineering. - Certified Engineer. - At least 8 years of relevant experience in the design, construction supervision. - Literacy in Structural Analysis Software and proficient in CAD or Revit technology.
Heating, Ventilation and Air Conditioning Engineer	<ul style="list-style-type: none"> - Mechanical Engineer in Heating Engineering. - Certified Engineer. - At least 8 years of relevant experience in the design, construction supervision of modern technology and design experience in heating and air-conditioning in green/passive technology buildings. - At least performed 1 similar design and supervision contract in the past 4 years. - Proficient in CAD or Revit technology.
Electrical Engineer	<ul style="list-style-type: none"> - Electrical Engineer. - Certified Engineer. - At least 8 years of relevant experience in the design, construction supervision. - Literacy in renewable energy design and regulations, experience in participation of green building designs*. - Literacy Building Management System (BMS)*. - At least performed 1 similar design and supervision contract in the past 4 years. - Proficient in CAD or Revit technology.
Communication, Signaling, Information Engineer	<ul style="list-style-type: none"> - Communications Engineer. - Certified Engineer. - At least 6 years of relevant experience in the design, construction supervision. - At least performed 1 similar design and supervision contract in the past 4 years. - Literacy in renewable energy design and regulations, experience in participation of green building designs*. - Literacy Building Management System (BMS)*. - Proficient in CAD or Revit technology.
Water and Sewerage Engineer	<ul style="list-style-type: none"> - Mechanical Engineer in Water supply and Sewerage Engineering. - Certified Engineer. - At least 6 years of relevant experience in the design, construction supervision. - At least performed 1 similar design and supervision contract in the past 4 years. - Proficient in CAD or Revit technology.
Cost Estimator	<ul style="list-style-type: none"> - Cost Estimator with at least 5 years of experience in cost estimating. - Engineer.

	<ul style="list-style-type: none"> - Certified Professional Cost Estimator. - Skills in reading building drawings and estimating building and material costs. - At least performed 2 similar cost estimate work in the past 3 years.
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* One of the engineers, Electrical or Communication, can satisfy this criterion.

D. GENERAL AND ENVIRONMENTAL REQUIREMENTS

9. All designs, surveys, calculations and other deliverables shall comply with the applicable national and international legislation, codes, norms, standards and procedures.

10. The Consultant shall have the sole responsibility for the adequacy, correctness and completeness, quality, reliability, and accuracy of all the deliverables produced by the Consultant.

11. All the design and engineering solutions shall be functional, easy to maintain, sustainable, safe, and responsive to gender, the age of students, and special needs.

12. The Consultant must consult with the Project Implementation Unit in the process of assuming the tasks.

13. The Consultant will be responsible for all transport, communication and logistic support required to effectively undertake the assignment, except where set out otherwise.

14. Environmental safeguards:

1. The consultant is supposed to include or reflect facilities, equipment and measures that aim to mitigate project impacts on environment and prevent from risks on human health and safety. These facilities, equipment and measures will be specified in the Environmental Management Plan which will be completed and provided to the Consultant during the design development process.
2. Environmental protection related costs specified in the Environmental Management Plan shall be considered and included within the construction costs.
3. Related domestic environmental laws, such as Law on Water, Law on Plants, Law on Prevention of Soil Erosion and Desertification, and other relevant laws, regulations and standards regarding environment, human health and safety and ADB's Safeguard Policy Requirements (SPS 2009) shall be taken into account when developing the design works.
4. The Client, through its Project Implementation Unit, retains all the rights to impose environmental protection related requirements on the project design during the development process and reject the design works if its requirements are not fulfilled to a satisfactory level.
5. The consultant is supposed to work closely with the environmental specialist of the Project Implementation Unit regarding information exchange such as location of construction site and facilities, scope of construction work, public consultation results and potential impact receptor survey.

E. CLIENT'S INPUT AND COUNTERPART PERSONNEL

15. Services, facilities and property to be made available to the Consultant by the Client: NONE

16. Professional and support counterpart personnel to be assigned by the Client to the Consultant's team: NONE

17. Client will provide the following inputs, project data and reports to facilitate preparation of the deliverables: any data available with the Ministry or the Center, if any.

**SCOPE OF SERVICES / DELIVERABLES
NALAIKH VOCATIONAL TRAINING AND PRODUCTION CENTER**

TABLE 1: SCOPE OF SERVICES AND DELIVERABLES

* Due = Elapsed time after Effective Date of Contract in calendar days

Description, Language, no. of copies	Key Content	Due*
The Detailed Engineering Design:		
Deliverable 1 (Mongolian) Hard copy – 3 copies	- Architectural Conceptual preliminary designs (at least 2 options as appropriate).	10
Deliverable 2 (Mongolian, the Design in English) Hard Copy – 3 copies	<ul style="list-style-type: none"> - Final Agreed Architectural Conceptual Design together with the geotechnical survey (for new building, new underground utilities), topo mapping (for new building, new underground utilities), all the power, heating, water supply, sewage, and communication supply calculations. - Assistance to the Client in obtaining permissions for the provision of power, heating, water supply, sewage and communication supply calculations, if it is necessary to obtain these permissions (at Consultant cost). - Permission and terms of reference for Planning and Architecture from Aimag Architect, if it is necessary to obtain this permission (at Consultant cost). - State Expertise Opinion on Geotechnical survey (payment for the Geotechnical survey is to be paid from the provisional sum, payment for this is expertise at Consultant cost). 	24
Deliverable 3 (Mongolian and English except engineering calculations) Hard Copy – 4 copies + soft copy in native and PDF	<ul style="list-style-type: none"> - Detailed design that include the associated engineering calculations, detailed architectural and engineering designs, all discipline drawings with notes, bill of quantities (that provides sufficient information on the quantities of Works to be performed to enable bids to be prepared efficiently and accurately), technical specifications (that present a clear statement of the required specifications, standards of the materials, plant, other supplies, and workmanships to be provided). - Cost estimate. - Information for personnel requirements, construction equipment requirements, licensing requirements to be possessed by the contractor. Construction plan / schedule. 	45
Deliverable 4 (Mongolian and English) Hard copy – 3	<ul style="list-style-type: none"> - Permission on the engineering lines for the provision of power, heating, water supply, sewage, heating and communication, if it is necessary to obtain these permissions (at Consultant cost). - Permission for Planning and Architecture from Aimag/Capital Architect, if it is necessary to obtain this permission (at Consultant cost). - Permission for Safety from the related Emergency Management Official / Agency (at Consultant cost). - State Expertise Opinion (payment to the Construction Development Center is to be paid from the provisional sum). 	75
Activity (Mongolian)	Assistance in preparing responses to requests for clarifications received from bidders.	

and English)		
Construction Supervision during the construction period:		
Architect, Structural Engineer, HVAC Engineer, Electrical Engineer, Communication Engineer, Water and Sewerage Engineer, Supervision Specialist (7 persons), 3 engineers visit the site 7 times, 5 engineers visit the site 5 times (total 46 visits), the stages are: inception, foundation, 1st floor, 2nd floor, 3rd floor, hidden works, tests, preliminary commissioning, final commissioning, 1 reserve trip.		
Deliverable 5 (Mongolian) Hard copy – 1	Construction supervision plan and quality check tools. Permission to commence the Works.	
Deliverable 6 (Mongolian) Hard copy – 1	Construction supervision (both author and on behalf of client) to ensure that the construction works are carried out as specified in the works contract and document all critical elements throughout the construction.	40% of civil works achieved
Deliverable 7 (Mongolian) Hard copy – 1	Construction supervision (both author and on behalf of client) to ensure that the construction works are carried out as specified in the works contract and document all critical elements throughout the construction. Assistance in accepting the Works through the Acceptance Commission.	Final Acceptance Certificate is issued
Deliverable 8 (Mongolian) – Hard copy 1	Defect Notice during warranty period	

Nalaikh Vocational Training and Production Center shall be hosting Assessment and Certification Center for Road Construction and Vehicle Repair occupations. Occupations covered are:

1. Road construction material laboratory technician
2. Road and bridge construction worker
3. Road construction machinery operator
4. Auto repair (mechanical and body repair)

TABLE 2: SCOPE OF CIVIL WORKS (CONCEPTUAL)

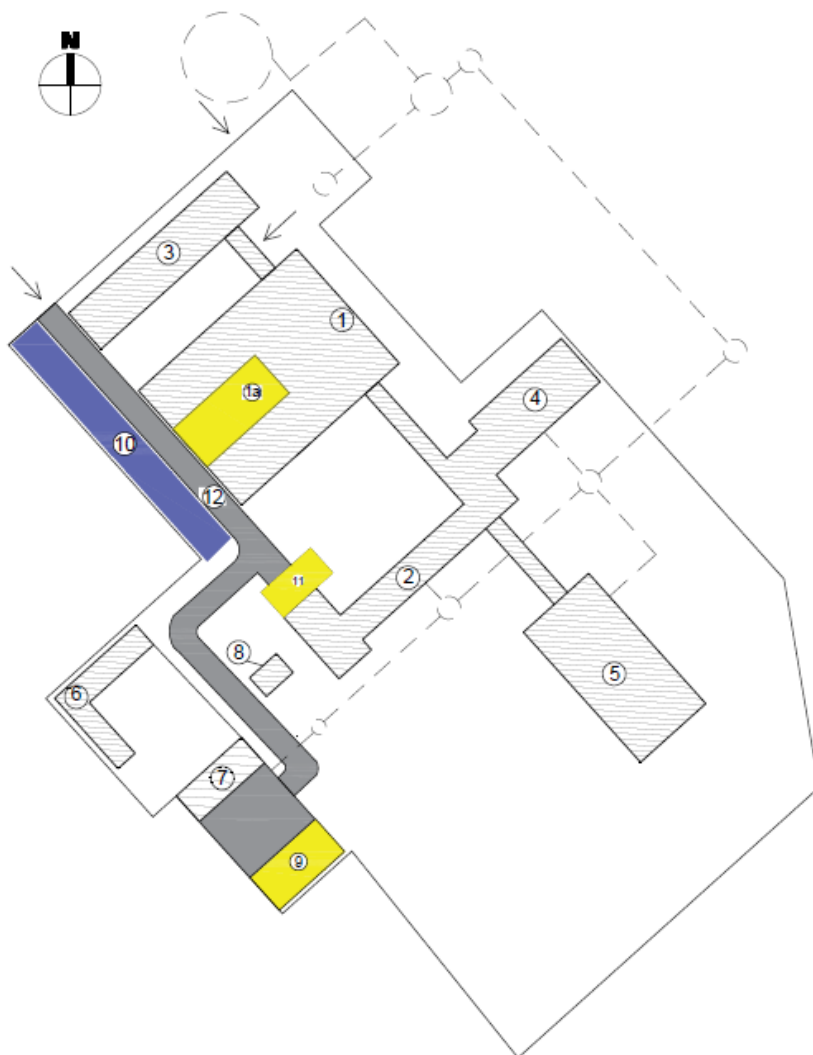
The below descriptions, dimensions, sketch drawings and functions are all preliminary and subject to check, revision if necessary and verification and validation by the Consultant.

Figure 1 shows Master Plan of Nalaikh VTPC.

1. A new building to be constructed – Figure 1 – Position 9
 - Figure 2 ... 7, for Details.
 - Building function: Auto repair (mechanical and body repair), Road construction material laboratory technician, Assessment center.
 - Dimensions 3 story, 1st floor 38m x 18m x 3m h, 2nd floor 38m x 8m x 3m h, 3d floor 38m x 18m x 3m h.
 - Draft Preliminary Conceptual Drawings are at Figure 3, 4, 5.
 - To be provided with **indoor lift**, capacity 800-1000 kg. The Consultant is to calculate the exact load and location based on the functions of the building.
 - To be provided with all services such as, but not limited to: water, sewerage, heating, ventilation, electrical 220/380V, building management system (BMS), telecommunications including internet, cable TV, public address system, fire detection and alarm system, CCTV, intruder signaling etc.
 - Fire Alarm Control Panel (FACP), public address system, CCTV, intruder signaling shall be controllable and monitorable at the dispatch center located in building under position 1

- at Figure 1.
- External heating, water and sewage, power and communication lines to be designed.
2. A new facility to be constructed – Figure 1 – Position 11
 - Building function: Garage.
 - Dimension 18m x 8m (approximate). Location to be confirmed by the Consultant, and if necessary the existing 35 kV overhead power line to be relocated or buried or both.
 - To be provided with all services such as, but not limited to: water, sewerage, heating, ventilation, electrical 220/380V, building management system (BMS), telecommunications including public address system, fire detection and alarm system, CCTV, intruder signaling etc.
 - Fire Alarm Control Panel (FACP), public address system, CCTV, intruder signaling shall be controllable and monitorable at the dispatch center located in building under position 1 at Figure 1.
 - External heating, water and sewage and power and communication lines to be designed.
 3. A new outdoor facility will be established - Position 10 on Figure 1
 - Dimension 75m x 15m.
 - Type: outdoor
 - Function: practicing range for road and bridge construction worker, practicing range for road construction machinery operator.
 - To be provided with electricity 220/380 V, water tank (3 ton), temporary water supply tapped at Building 1, Figure 1, public address system, street lightning and fence where necessary.
 - To re-locate the existing overhead power line with 2-3 wooden poles located now at this area.
 4. A part of the existing building shall be renovated.
 - Position 1A on Figure 1, Refer to Figure 8 and 9 for details.
 - Dimension 36m x 12m x 8m h
 - Function: road and bridge construction worker practice area
 - To be provided with services such as, but not limited to: water tank 1 ton (new), heating load to re-calculated, and the heating system to be rehabilitated accordingly, windows and doors replaced, repair of internal walls, floor, ventilation to be newly introduced, electrical 220/380V, telecommunications including public address system, fire detection and alarm system, CCTV.
 - To plan for double floor closed platform inside of this hall, 12m * 6m each floor (Figure 9, Position 1).
 - To plan storage for road and bridge construction worker tools, equipment and mechanisms
 5. Landscaping
 - Road: made of crushed stone or cobblestone, with kerbs on both sides, with signage, lighting, some green plant.

FIGURE 1. MASTER PLAN (without scale)
ЗУРАГ 1. ЕРӨНХИЙ ТӨЛӨВЛӨГӨӨ /масштабгүй/



NOTE:

1. Main workshop building
- 1A. **Project Intervention** –Repair - Road and bridge construction worker shop, 36м x 12м
2. Classes
3. Classes
4. Sport hall
5. Cultural center, library, canteen, dormitory
6. Warehouse
7. Practical training
8. Power sub-station
9. **Project Intervention** – New building - Auto Mechanic (Mechanical and Body Repair) Shop, 38м * 18м
10. **Project Intervention** - New – practicing outdoor range - Road and bridge construction worker, Road construction machinery operator, 75м * 15м
11. **Project Intervention** – New facility – Garage 18м * 8м
12. **Project Intervention** - New – Road and Landscaping

ТАЙЛБАР:

1. Хичээлийн төв байр
- 1A. **Төслийн хөрөнгө оруулалт** – Засварын ажил – автозам, гүүр барилгын ажилтны дадлагын газар, 36м x 12м
2. Хичээлийн байр
3. Хичээлийн байр
4. Спорт заал
5. Соёлын төв, номын сан, цайны газар, дотуур байр
6. Агуулах
7. Дадлагын байр
8. Цахилгааны дэд станц
9. **Төслийн хөрөнгө оруулалт** – шинэ барилга – Авто механик (агрегат ба кузов засвар) засвар 38м * 18м
10. **Төслийн хөрөнгө оруулалт** – шинэ гадаа ажлын талбай - автозам, гүүр барилгын ажилтан, Зам, барилгын машин механизмийн операторын дадлагын газар
11. **Төслийн хөрөнгө оруулалт** – шинэ байгууламж – гараж 18м * 8м
12. **Төслийн хөрөнгө оруулалт** – шинэ – зам болон тохижилт

FIGURE 2. PRELIMINARY DETAIL OF NEW BUILDING - AUTO MECHANIC (MECHANICAL AND BODY REPAIR) SHOP

1 st floor, height = 3.0m, 38m * 18m, 1 cell = 1m * 1m

ЗУРАГ 2. ШИНЭ БАРИЛГЫН УРЬДЧИЛСАН ЭСКИЗ – АВТО МЕХАНИК (АГРЕГАТ БА КУЗОВ ЗАСВАР) ЗАСВАР

1-р давхар, өндөр = 3.0m, 38m * 18m, 1 дөрвөлжин = 1m * 1m

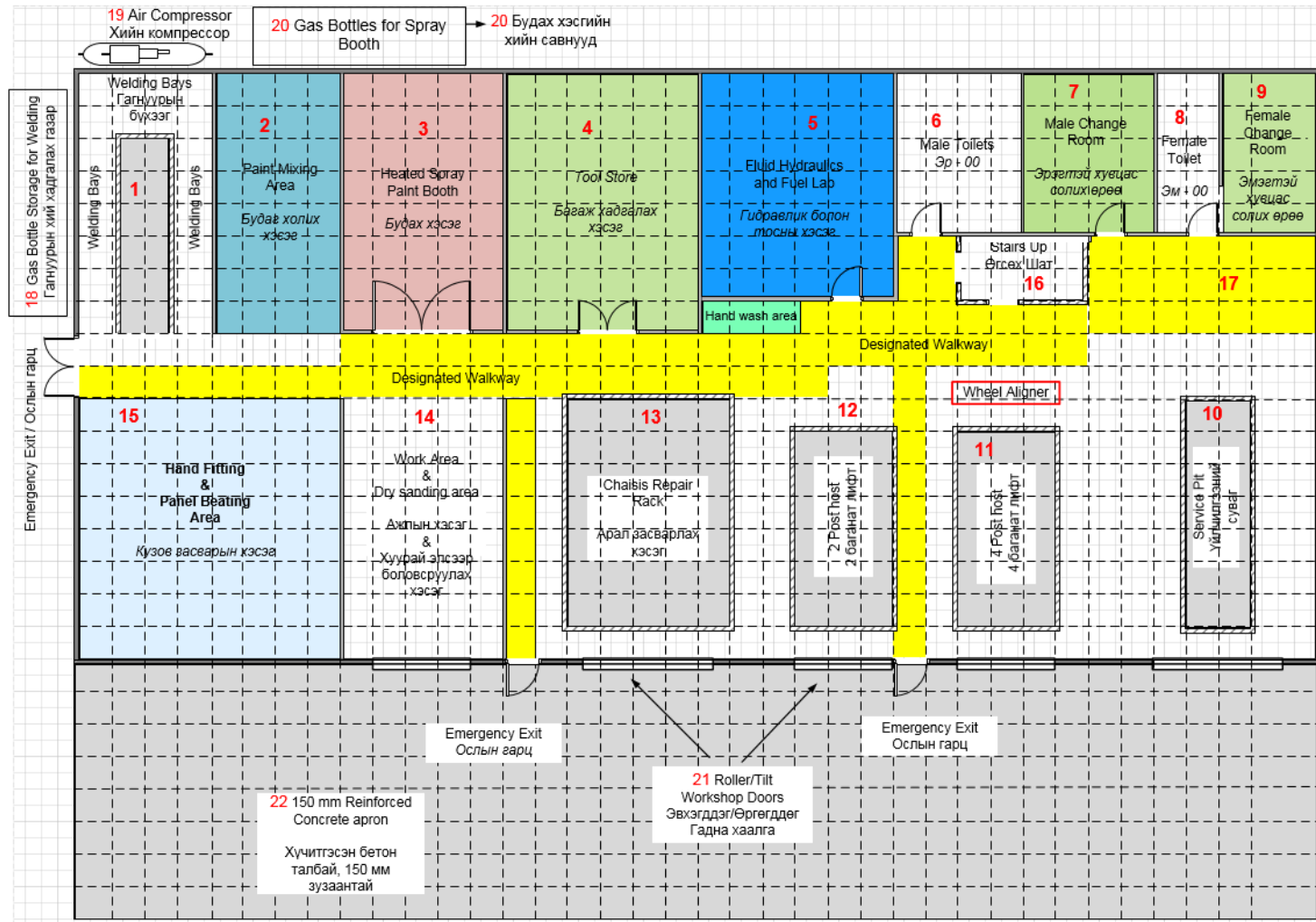


FIGURE 3. PRELIMINARY DETAIL OF NEW BUILDING - AUTO MECHANIC (MECHANICAL AND BODY REPAIR) SHOP

2nd floor, height = 3.0m half floor, 38m * 8m, 1 cell = 1m * 1m

ЗУРАГ 3. ШИНЭ БАРИЛГЫН УРЬДЧИЛСАН ЭСКИЗ – АВТО МЕХАНИК (АГРЕГАТ БА КУЗОВ ЗАСВАР) ЗАСВАР

2-р давхар, өндөр = 3.0м, 38м * 8м, 1 дөрвөлжин = 1м * 1м

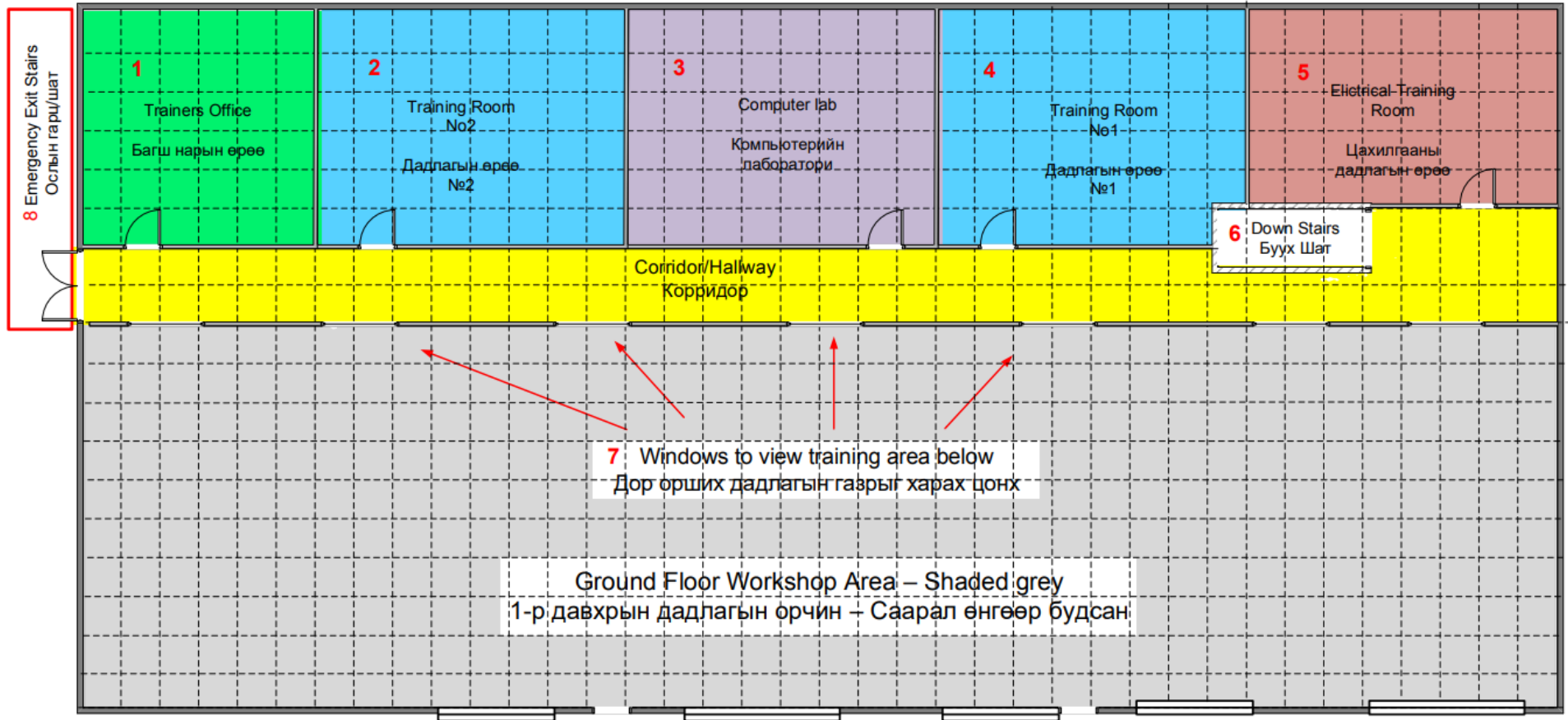


FIGURE 4. PRELIMINARY DETAIL OF NEW BUILDING - AUTO MECHANIC (MECHANICAL AND BODY REPAIR) SHOP

3d floor, height = 3.0m, floor, 38m * 18m, 1 cell = 1m * 1m

ЗУРАГ 4. ШИНЭ БАРИЛГЫН УРЬДЧИЛСАН ЭСКИЗ – АВТО МЕХАНИК (АГРЕГАТ БА КУЗОВ ЗАСВАР) ЗАСВАР

3-р давхар, өндөр = 3.0м, 38м * 18м, 1 дөрвөлжин = 1м * 1м

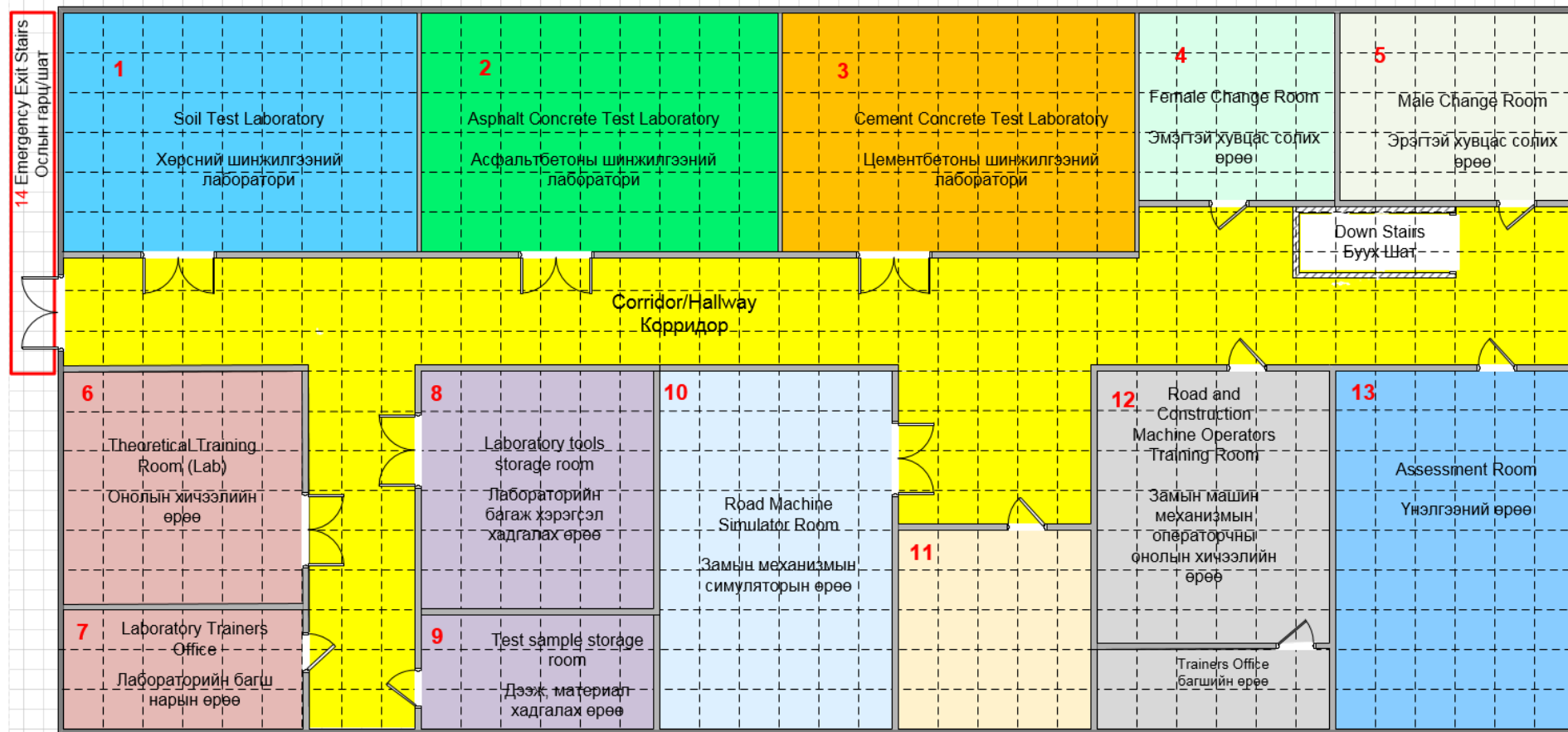


FIGURE 5. PRELIMINARY DETAIL OF SOIL TEST LABORATORY OF NEW BUILDING - AUTO MECHANIC (MECHANICAL AND BODY REPAIR)

SHOP, 3d floor, Room 1 – Soil Test Laboratory, 1 cell = 1m * 1m

ЗУРАГ 5. АВТО МЕХАНИК (АГРЕГАТ БА КУЗОВ ЗАСВАР) ЗАСВАРЫН ШИНЭ БАРИЛГАД БАЙРЛАХ ХӨРСНИЙ ШИНЖИЛГЭЭНИЙ

ЛАБОРАТОРИЙН УРЬДЧИЛСАН ЭСКИЗ – 3-р давхар, Өрөө № 1, 1 дөрвөлжин = 1m * 1m

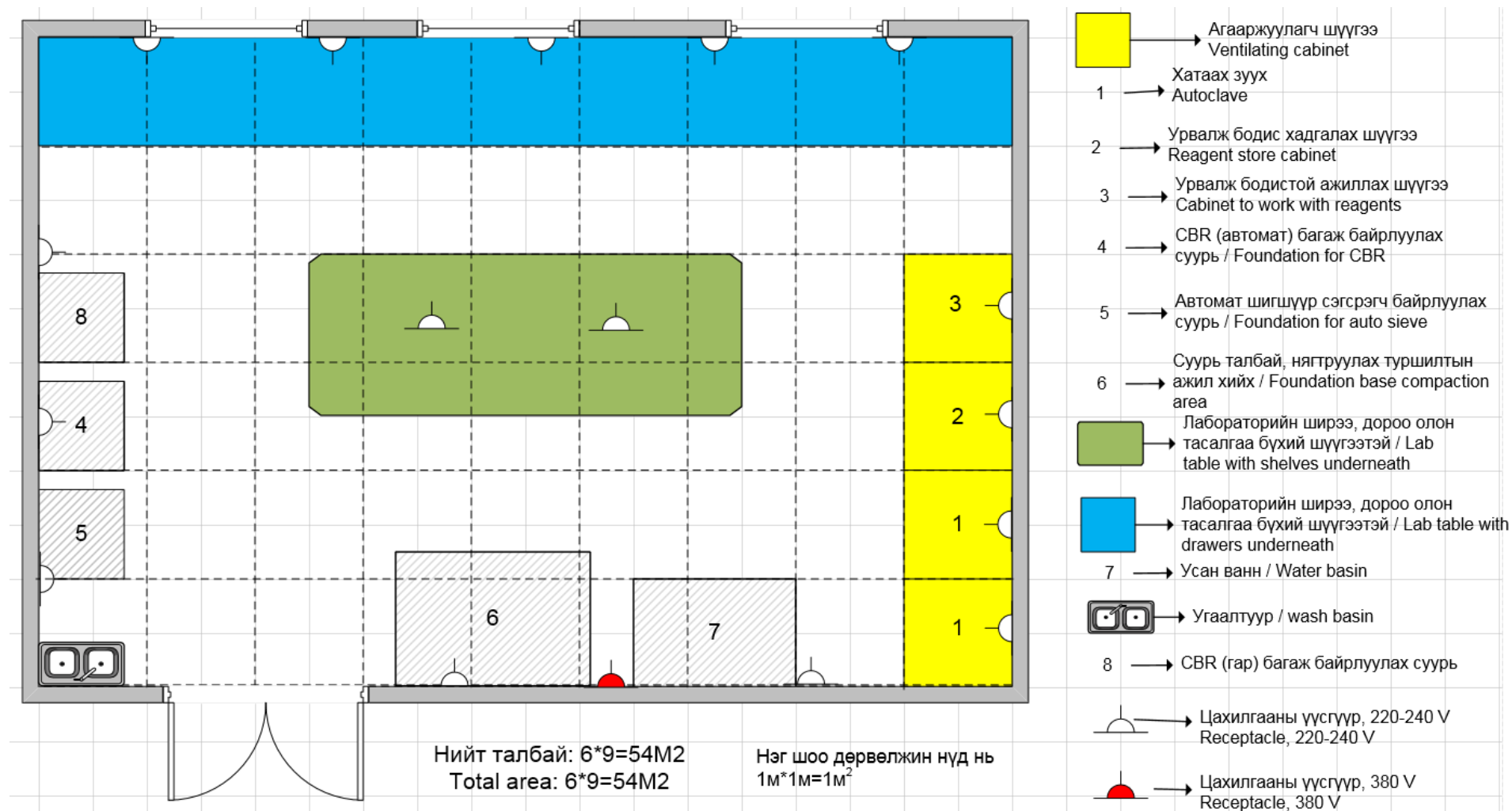


FIGURE 6. PRELIMINARY DETAIL OF ASPHALT CONCRETE TEST LABORATORY OF NEW BUILDING - AUTO MECHANIC (MECHANICAL AND BODY REPAIR) SHOP, 3d floor, Room 2 – Asphalt concrete test laboratory, 1 cell = 1m * 1m

ЗУРАГ 6. АВТО МЕХАНИК (АГРЕГАТ БА КУЗОВ ЗАСВАР) ЗАСВАРЫН ШИНЭ БАРИЛГАД БАЙРЛАХ АСФАЛЬТБЕТОНЫ ШИНЖИЛГЭЭНИЙ ЛАБОРАТОРИЙН УРЬДЧИЛСАН ЭСКИЗ – 3-р давхар, Өрөө № 2, 1 дөрвөлжин = 1м * 1м

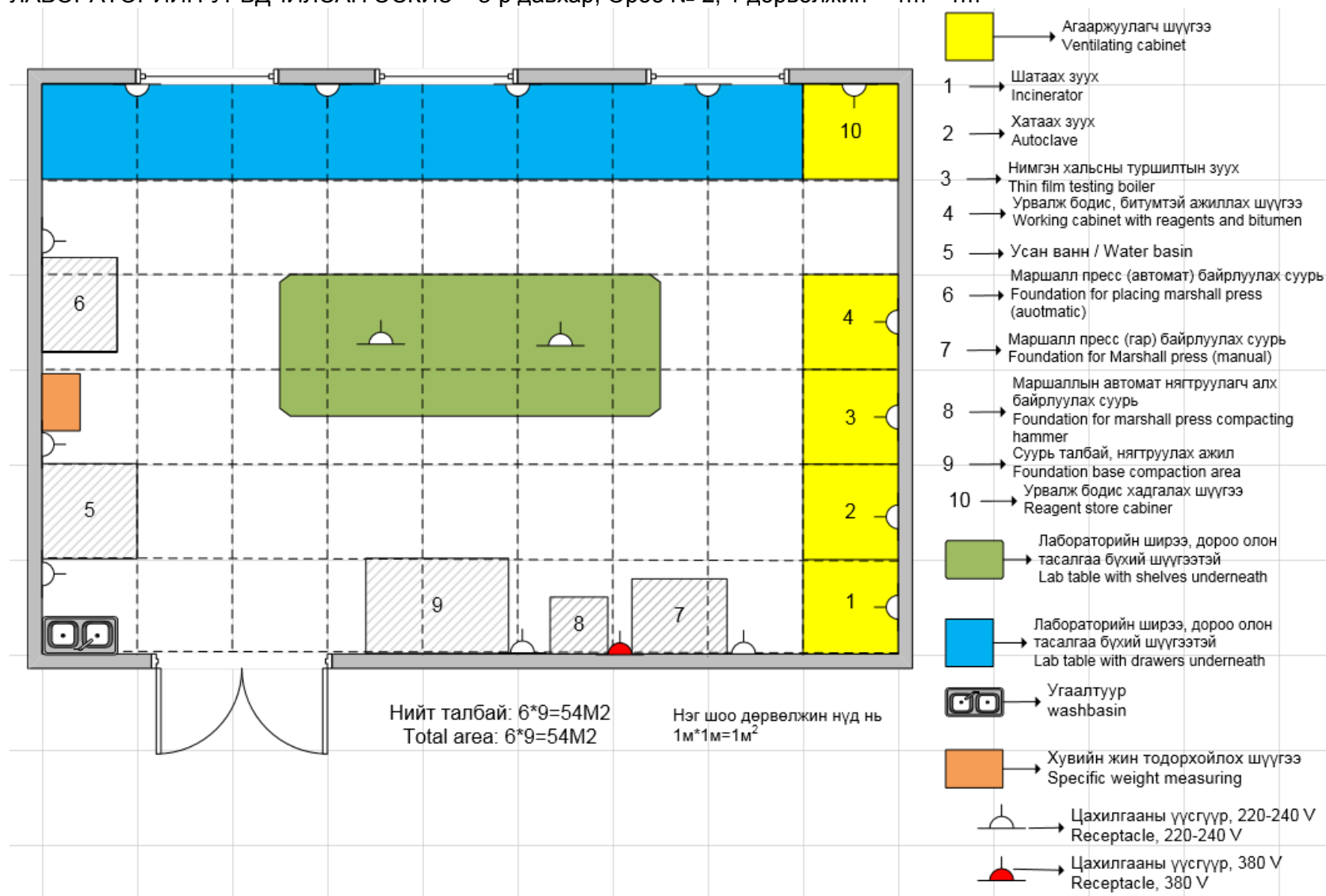


FIGURE 7. PRELIMINARY DETAIL OF CEMENT CONCRETE TEST LABORATORY OF NEW BUILDING - AUTO MECHANIC (MECHANICAL AND BODY REPAIR) SHOP, 3d floor, Room 3 – Cement Concrete Test Laboratory , 1 cell = 1m * 1m

ЗУРАГ 6. АВТО МЕХАНИК (АГРЕГАТ БА КУЗОВ ЗАСВАР) ЗАСВАРЫН ШИНЭ БАРИЛГАД БАЙРЛАХ ЦЕМЕНТБЕТОНЫ ШИНЖИЛГЭЭНИЙ ЛАБОРАТОРИЙН УРЬДЧИЛСАН ЭСКИЗ – 3-р давхар, Өрөө № 3, 1 дөрвөлжин = 1m * 1m

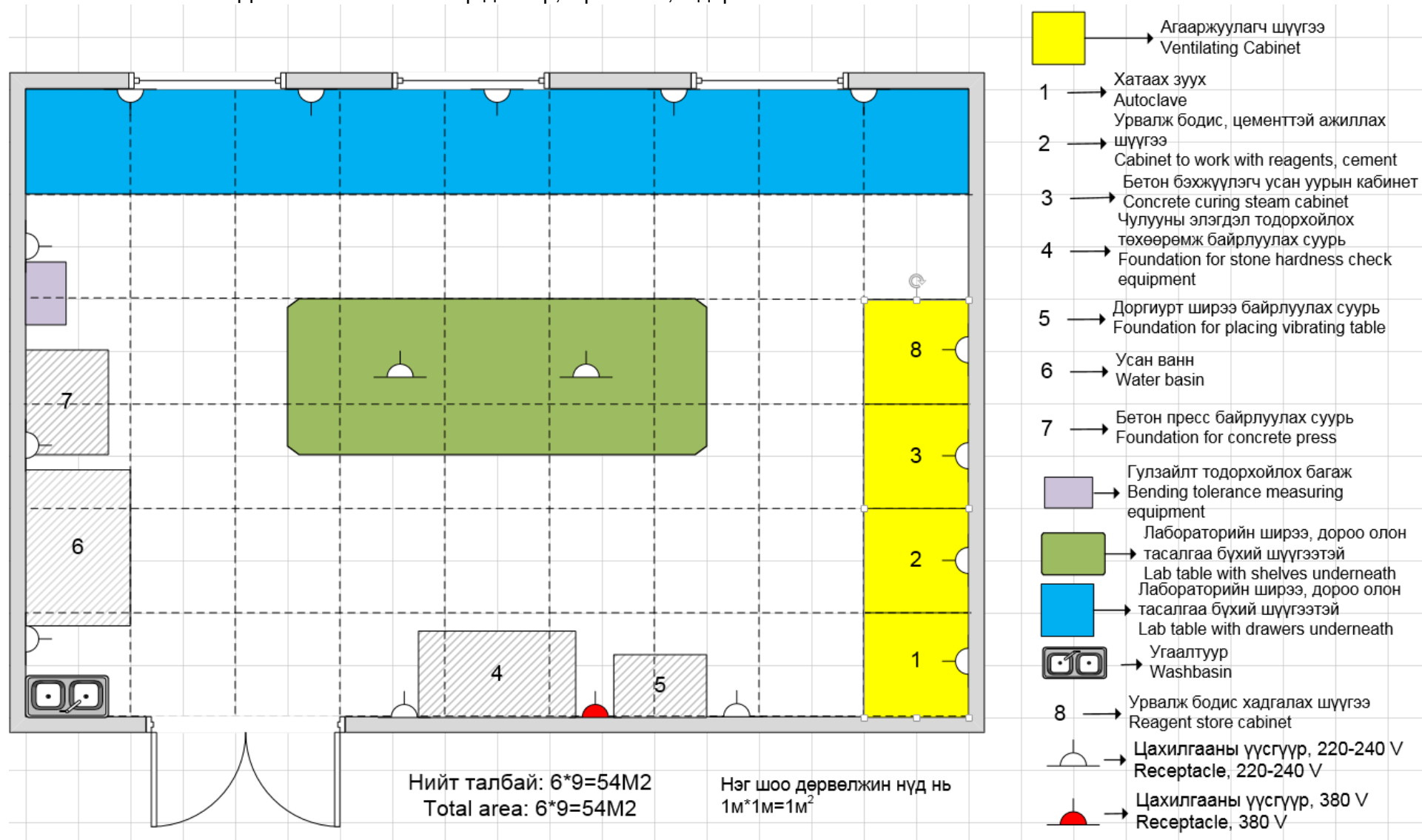


FIGURE 8. PRELIMINARY DETAIL – REPAIR WORKS - ROAD AND BRIDGE CONSTRUCTION WORKER SHOP, 36M X 12M (highlighted section, height about 9 meters, the dashed line circled area – to plan 2 story enclosure)

ЗУРАГ 8. УРЬДЧИЛСАН БАЙГУУЛАЛТ - ЗАСВАРЫН АЖИЛ – АВТОЗАМ, ГҮҮР БАРИЛГЫН АЖИЛТНЫ ДАДЛАГЫН ГАЗАР, 36М X 12М /будаг тэмдэглэсэн хэсэг, өндөр нь 9 метр орчим, тасалдсан зурсаар хүрээлсэн хэсэгт 2 давхар бүхий тавцантай өрөө төлөвлөнө/

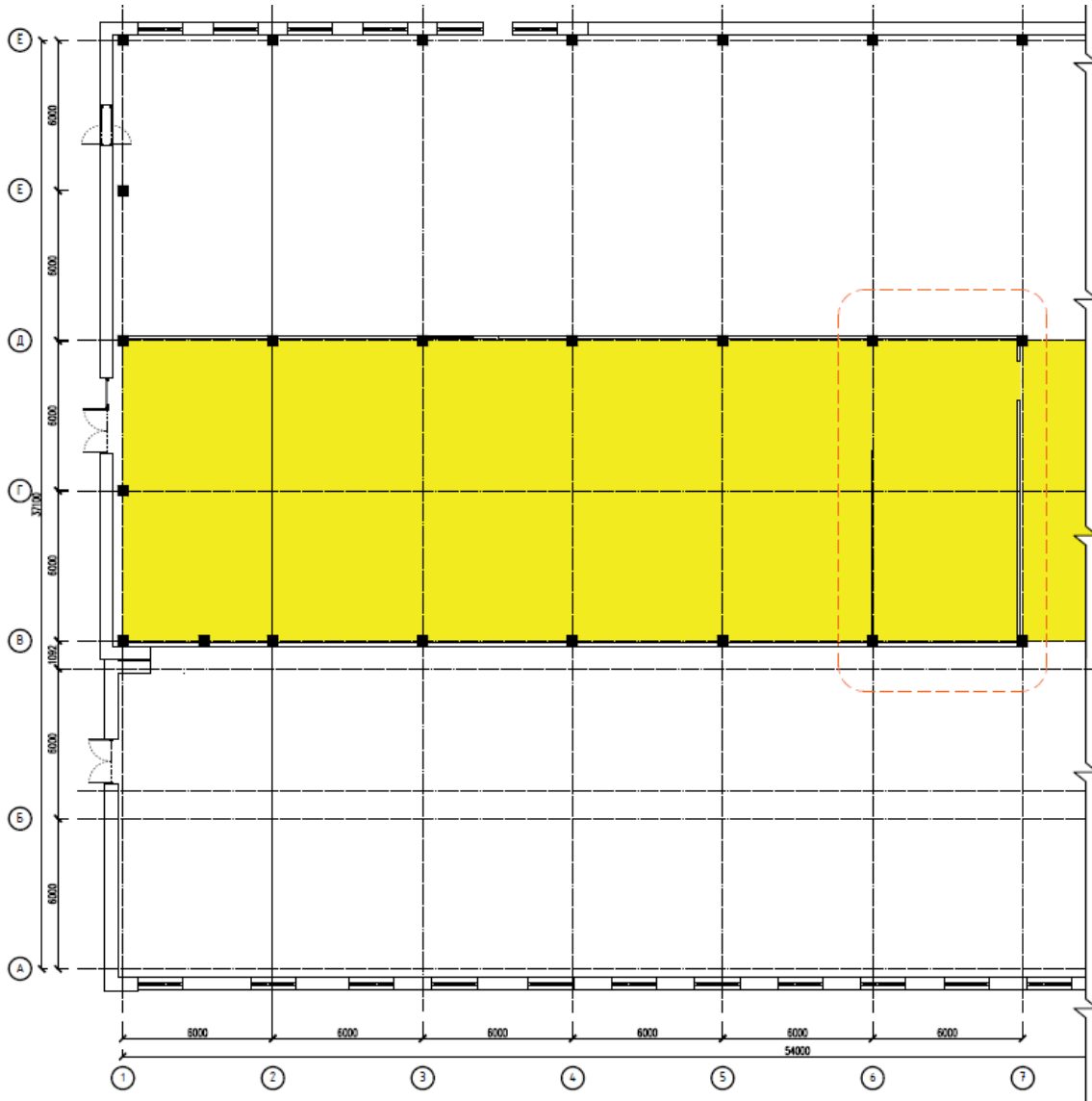
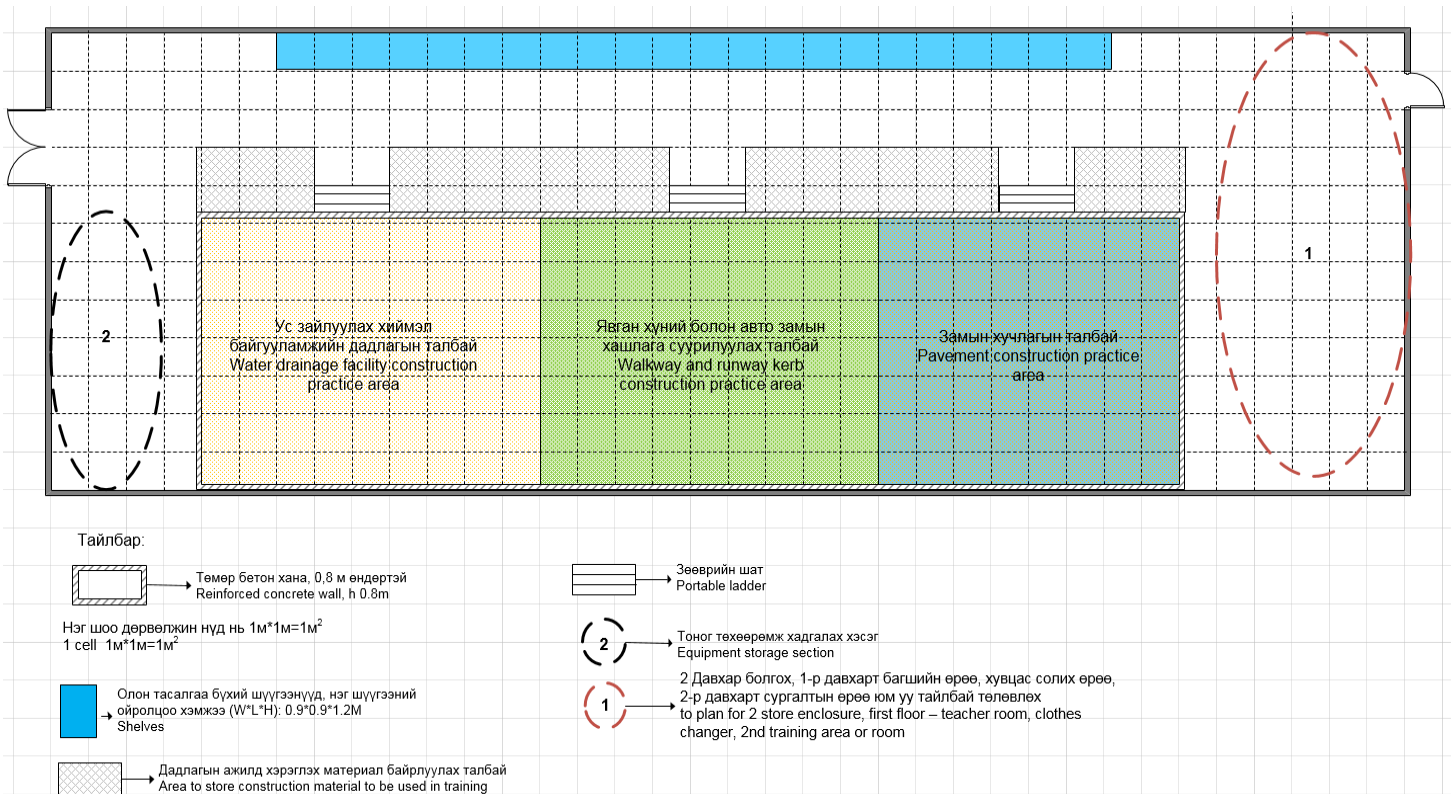


FIGURE 9. PRELIMINARY DETAIL – REPAIR WORKS - ROAD AND BRIDGE CONSTRUCTION WORKER SHOP, 36M X 12M (yellow highlighted section, height about 9 meters, the red dashed line circled area – to plan 2 story enclosure)

ЗУРАГ 9. УРЬДЧИЛСАН БАЙГУУЛАЛТ - ЗАСВАРЫН АЖИЛ – АВТОЗАМ, ГҮҮР БАРИЛГЫН АЖИЛТНЫ ДАДЛАГЫН ГАЗАР, 36М X 12М /шараар тэмдэглэсэн хэсэг, өндөр нь 9 метр орчим, улаан зурсаар хүрээлсэн хэсэгт 2 давхар бүхий тавцантай өрөө төлөвлөнө/



**SCOPE OF SERVICES / DELIVERABLES
BAYANKHONGOR POLYTECHNIC COLLEGE**

TABLE 1: SCOPE OF SERVICES AND DELIVERABLES

* Due = Elapsed time after Effective Date of Contract in calendar days

Description, Language, no. of copies	Key Content	Due*
The Detailed Engineering Design:		
Deliverable 1 (Mongolian) Hard copy – 3 copies	- Architectural Conceptual preliminary design.	30
Deliverable 2 (Mongolian, the Design in English) Hard Copy – 3 copies	<ul style="list-style-type: none"> - Final Agreed Architectural Conceptual Design together with the geotechnical survey (for new building, new underground utilities), topo mapping (for new building, new underground utilities), all the power, heating, water supply, sewage, and communication supply calculations. - Assistance to the Client in obtaining permissions for the provision of power, heating, water supply, sewage and communication supply calculations, if it is necessary to obtain these permissions (at Consultant cost). - Permission and terms of reference for Planning and Architecture from Aimag Architect, if it is necessary to obtain this permission (at Consultant cost). - State Expertise Opinion on Geotechnical survey (payment for the Geotechnical survey is to be paid from the provisional sum, payment for this expertise is at Consultant cost). 	65
Deliverable 3 (Mongolian and English except engineering calculations) Hard Copy – 4 copies + soft copy in native and PDF	<ul style="list-style-type: none"> - Detailed design that include the associated engineering calculations, detailed architectural and engineering designs, all discipline drawings with notes, bill of quantities (that provides sufficient information on the quantities of Works to be performed to enable bids to be prepared efficiently and accurately), technical specifications (that present a clear statement of the required specifications, standards of the materials, plant, other supplies, and workmanships to be provided). - Cost estimate. - Information for personnel requirements, construction equipment requirements, licensing requirements to be possessed by the contractor. Construction plan / schedule. 	80
Deliverable 4 (Mongolian and English) Hard copy – 3	<ul style="list-style-type: none"> - Permission on the engineering lines for the provision of power, heating, water supply, sewage, heating and communication, if it is necessary to obtain these permissions (at Consultant cost). - Permission for Planning and Architecture from Aimag/Capital Architect, if it is necessary to obtain this permission (at Consultant cost). - Permission for Safety from the related Emergency Management Official / Agency (at Consultant cost). - State Expertise Opinion (payment to the Construction Development Center is to be paid from the provisional sum). 	110
Activity (Mongolian and English)	- Assistance in preparing responses to requests for clarifications received from bidders.	
Construction Supervision during the construction period:		

5 engineers visit the site 2 times for 3 days for each visit (total 30 days) including the travel time, the stages are: inception, foundation, 1st floor, hidden works, tests, preliminary commissioning, final commissioning.		
Deliverable 5 (Mongolian) Hard copy – 1	Construction supervision plan and quality check tools. Permission to commence the Works.	
Deliverable 6 (Mongolian) Hard copy – 1	Construction supervision (both author and on behalf of client) to ensure that the construction works are carried out as specified in the works contract and document all critical elements throughout the construction.	40% of civil works achieved
Deliverable 7 (Mongolian) Hard copy – 1	Construction supervision (both author and on behalf of client) to ensure that the construction works are carried out as specified in the works contract and document all critical elements throughout the construction. Assistance in accepting the Works through the Acceptance Commission.	Final Acceptance Certificate is issued
Deliverable 8 (Mongolian) – Hard copy 1	Defect Notice during warranty period.	

DETAILED SCOPE OF SERVICES

Bayankhongor Polytechnic College shall have the project investment for following occupations:

1. Auto Mechanic (mechanical and body repair)
2. Interior/Exterior Finisher

TABLE 2: SCOPE OF CIVIL WORKS (CONCEPTUAL)

The below descriptions, dimensions, sketch drawings and functions are all preliminary and subject to check, revision if necessary and verification and validation by the Consultant.

Figure 1 - Master Plan of Bayankhongor PC. The college has 15 buildings and facilities built during 1965-2014, but main educational buildings (classroom building #1 and 2, dormitory, workshops) were built in 1960s. The college main buildings are connected to the central power grid, local heating and water supply and sewage systems.

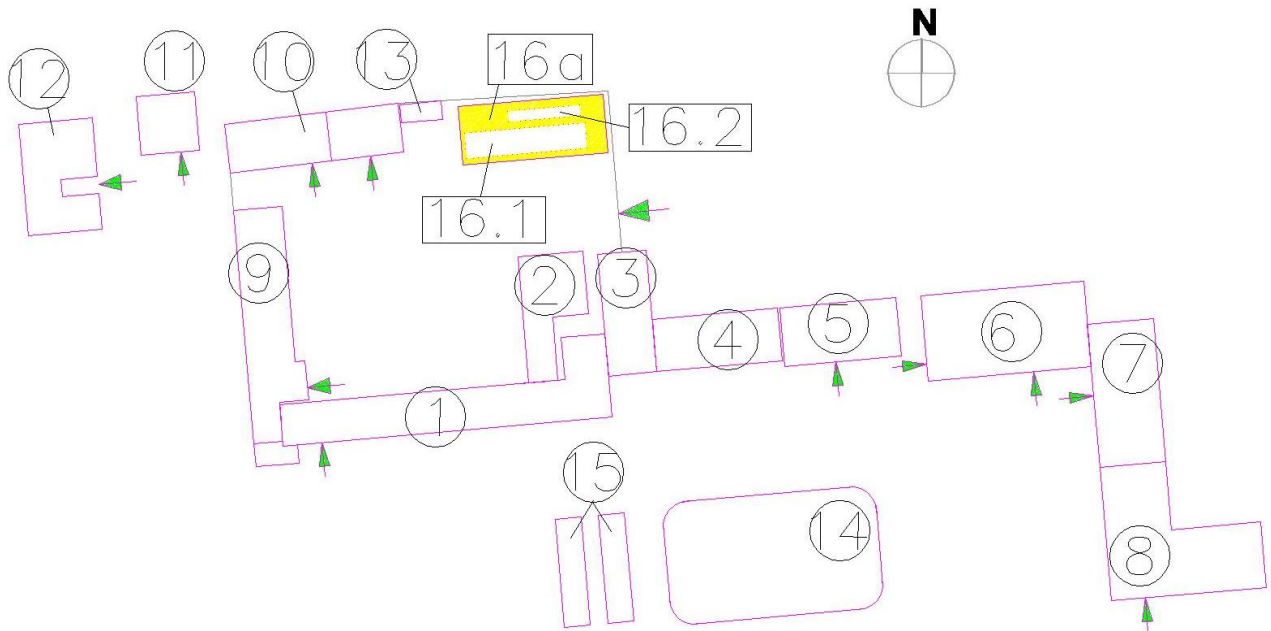
The Interior finisher workshop currently located in the building which was built in 2014, thus no civil works shall be done for this occupation.

Due to lack of space, remains of chicken farm and greenhouse (Photo 1.1, 1.2) shall be removed and on that area a new building shall be built for the Auto mechanic workshops and labs.

1. Auto Mechanic (mechanical and body repair): a new building to be built – Position 16a at Figure 1.
 - It is a one story building with partial 2nd floor. The 1st floor approx. size is about 13m x 24m x 6m height, 2nd partial floor approx. size is 6m x 24m.
 - The indoor electrical system shall be in line with the equipment layout; electrical wiring 220/380V; general ventilation, dedicated ventilation will be provided for some equipment; hand and parts washing and parts washing place shall be installed.
 - To be provided with services such as, but not limited to: ventilation, electrical 220/380V, telecommunications including internet, fire detection and alarm system, CCTV, intruder signaling etc.
 - Fire Alarm Control Panel (FACP), CCTV, intruder signaling shall be controllable and monitorable at the dispatch center located in building under position 1 at Figure 1.

- External heating, water and sewage, power and communication lines to be designed.
- Landscaping works will be done around the new building (concrete apron in front of new building, approx. size is 6m x 24m, street light.)
- Two existing facility remains shall be removed – Position 16.1 (Chicken farm) and 16.2 (Greenhouse) at Figure 1 (Photo 1.1, 1.2). The chicken farm building has masonry walls and pitched roof with timber truss, the building approx. size is 25m x 5m x 3.8m (height); the greenhouse remains' has a masonry wall with 0.4m width and some metal structure, overall size is 19m x 5.7m x 3.6 (height).

FIGURE 1. MASTER PLAN
ЗУРАГ 1. ЕРӨНХИЙ ТӨЛӨВЛӨГӨӨ



NOTE:

1. Classroom building #1
2. Library
3. Cultural center
4. Sport hall
5. Business development center
6. Food processing workshop
7. Classroom building #2
8. Dormitory
9. Workshop
10. Workshop, warehouse
11. Carrier guidance center
12. Workshop (Interior finisher)
13. Garage
14. Mini stadium
15. Greenhouse (2pcs)
- 16.1 **Project intervention:** Chicken farm remains (to be removed)
- 16.2 **Project intervention:** Greenhouse remains (to be removed)
- 16a **Project intervention** – New – Auto mechanic workshop

ТАЙЛБАР:

1. Хичээлийн 1-р байр
2. Номын сан
3. Урлаг заал
4. Спорт заал
5. Бизнес хөгжлийн төв
6. Хоолны дадлагын байр
7. Хичээлийн 2-р байр
8. Дотуур байр
9. Дадлагын байр
10. Дадлалгын байр, агуулах
11. Ажил мэргэжлийн чиг баримжаа олгох төв
12. Дадлагын байр (Барилгын засал чимэглэлчин)
13. Гараж
14. Бичил стадион
15. Хүлэмж (2ш)
- 16.1 **Төслийн хөрөнгө оруулалт:** Тахианы байрны үлдэгдэл (буулгах)
- 16.2 **Төслийн хөрөнгө оруулалт:** Хүлэмжийн үлдэгдэл (буулгах)
- 16a **Төслийн хөрөнгө оруулалт** – Шинэ – Автомашины засварчны дадлагын байр

Picture 1 CHICKEN FARM AND GREENHOUSE REMAINS (To be removed)
Зураг 1 ТАХИАНЫ БАЙР БА ХҮЛЭМЖИЙН ҮЛДЭГДЭЛ (Буулгах)



Chicken farm
remains/ Тахианы
байрны үлдэгдэл

Greenhouse remains/
Хүлэмжийн үлдэгдэл

Pic 1.1 Chicken farm remains/ Тахианы байрны үлдэгдэл



Pic 1.2 Greenhouse remains / Хүлэмжийн үлдэгдэл

**SCOPE OF SERVICES / DELIVERABLES
ZAVKHAN POLYTECHNIC COLLEGE**

TABLE 1: SCOPE OF SERVICES AND DELIVERABLES

* Due = Elapsed time after Effective Date of Contract in calendar days

Description, Language, no. of copies	Key Content	Due*
The Detailed Engineering Design:		
Deliverable 1 (Mongolian, the Design in English) Hard Copy – 3 copies	<ul style="list-style-type: none"> - Measurement drawings for project buildings and utility lines. Topo mapping, necessary power, heating, water supply, sewage, and communication supply calculations. - Assistance to the Client in obtaining permissions for the provision of power, heating, water supply, sewage and communication supply calculations, if it is necessary to obtain these permissions (at Consultant cost). 	50
Deliverable 2 (Mongolian and English except engineering calculations) Hard Copy – 4 copies + soft copy in native and PDF	<ul style="list-style-type: none"> - Detailed design that include the associated engineering calculations, detailed measurement and engineering designs, all discipline drawings with notes, bill of quantities (that provides sufficient information on the quantities of Works to be performed to enable bids to be prepared efficiently and accurately). - Cost estimate. - Information for personnel requirements, construction equipment requirements, licensing requirements to be possessed by the contractor. Construction plan / schedule. 	90
Deliverable 3 (Mongolian and English) Hard copy – 3	<ul style="list-style-type: none"> - Permission on the engineering lines for the provision of power, heating, water supply, sewage, heating and communication, if it is necessary to obtain these permissions (at Consultant cost). - Permission for Safety from the related Emergency Management Official / Agency (at Consultant cost). - State Expertise Opinion (payment to the Construction Development Center is to be paid from the provisional sum). 	120
Activity (Mongolian and English)	Assistance in preparing responses to requests for clarifications received from bidders.	
Construction Supervision during the construction period: 4 engineers visit the site 2 times for 3 days for each visit including travel time (total 24 days), the stages are: 40% of civil works achieved, final commissioning, total of 2 trips.		
Deliverable 4 (Mongolian) Hard copy – 1	Construction supervision plan and quality check tools. Permission to commence the Works.	
Deliverable 5 (Mongolian) Hard copy – 1	Construction supervision (both author and on behalf of client) to ensure that the construction works are carried out as specified in the works contract and document all critical elements throughout the construction.	40% of civil works achieved
Deliverable 6 (Mongolian) Hard copy – 1	Construction supervision (both author and on behalf of client) to ensure that the construction works are carried out as specified in the works contract and document all critical elements throughout the construction. Assistance in accepting the Works through the Acceptance Commission.	Final Acceptanc e Certificate is issued
Deliverable 7	Defect Notice during warranty period	

DETAILED SCOPE OF SERVICES

Zavkhan Polytechnic College shall have the project investment for following occupations:

1. Interior Finisher
2. Construction Electrician
3. Auto mechanic (mechanical and body repair)

SCOPE OF CIVIL WORKS (CONCEPTUAL)

The below descriptions, dimensions and functions are all preliminary and subject to check, revision if necessary and verification and validation by the Consultant.

Figure 1 - Master Plan of Zavkhan PC. The school compound has more than 20 buildings and facilities; the most of them were built in 60-ies, few of them in 1980-ies; all these buildings are connected to power supply and centralized heating system, some of the buildings are not connected to the sewage. These buildings without sewage are connected to the water, but without approved drawings. The project civil works will relate to those buildings and facilities without sewage.

The largest building (Position 1 and 3 at Figure 1) was built and put into operation in 2015. The power substation 2 x 400 kVA, power supply from this substation to the new building, heating, water supply and sewage external lines were built also for this building together with the construction of this new building. This building's sewage system, the substation shall be used for the project planned some civil works.

1. A part of the existing building with size 12m x 55m shall be rehabilitated (Position 8 at Figure 1). It is the one story building with 3 shops: plumbing, auto repair theoretical classroom and lathe-milling shops. The project investment will cover only two shops: Auto repair theoretical classroom with dimension of 10.4m x 10.5m x 3.55m height (Position 8.1 at Figure 1); and part of lathe-milling shop, total dimension – 10.4m x 14.6m x 3.55m height, of which project will use area of 10.4m x 3.25 to establish toilets and cloth changing room (Position 8.2 at Figure 1).
 - For the Auto repair theoretical classroom fully refurbish internal electrical system.
 - For lathe milling shop: design male and female toilet, and clothes changing area with new restroom facilities in the area of 10.4m x 3.25m; and design a new gate in place of existing window for the lathe-milling shop. This window is 1.9m x 1.6 m height, the walls are made of load bearing stone, height from floor level to the top of window is 2.4m.
 - External sewage and water supply to be designed.
2. A part of existing building shall be rehabilitated (Position 9 at Figure 1).
 - Building function: Auto body repair shop. This building dimension is 12m x 10m x 3.5m height. The existing by college made booth is located inside of this shop (see Pic 1.1) to be used for the car body paint purposes is made of low quality sandwich, size is 5.9m x 6.1m x 3.5m height, door size is 2.64m x 2.84 m height. The ceiling of the shop is made of laminated sheet with styrofoam sheets above (Pic 1.2).
 - Re-design the ceiling in a proper way.
 - Address the roof leakage.
 - Design new internal electrical system 220/380 V.
 - General ventilation and dedicated ventilation of equipment.
 - Insulate 1 external gate and install heat curtain.
 - Replace windows (1.85m x 1.5m - 2 pieces, 0.66m x 1.5m – 1 piece).
 - Concrete floor finishing. Verify load bearing capacity of the existing floor, and if load bearing capacity is adequate – make the floor flat and even and make finishing. If the load bearing

- capacity is not adequate – remove the existing floor completely and make new flooring.
 - Make the siding with proper finishing and insulation same as for the below Auto mechanical repair shop.
 - Design internal compressor pipe system.
3. A part of existing building shall be rehabilitated (Position 10 at Figure 1 and Photo 1.3).
 - Building function: Auto mechanical repair shop. This building dimension is 11.5m x 15.3m. Have 2 external gates, 1 gate is 1.8m x 2.15m, another gate is 3.1m x 3.1m. Inside teacher room separated with partition wall: 3.8m x 6m.
 - Design new internal electrical system 220/380V
 - External sewage and water supply to be designed, install hand wash and parts wash basins
 - Insulate 2 external gates and install heat curtain.
 - Replace 4 windows each 1.9m x 1.9m.
 - Remove existing 2 windows with 1.9m x 1.9m size each and fill in the openings.
 - Install partition wall in the teacher room to divide for clothes changing area and teacher area.
 - Install glass window in the teacher room towards the shop area, for teacher to observe students.
 - General ventilation and dedicated ventilation of equipment and cars.
 - Concrete floor finishing. Verify load bearing capacity of the existing floor, and if load bearing capacity is adequate – make the floor flat and even and make finishing. If the load bearing capacity is not adequate – remove the existing floor completely and make new flooring.
 - Design reinforcement measures for footprint of one pole of the existing 4 post car lifter (Pic 1.4).
 - Remove the existing broken external siding and make the siding with proper finishing and insulation same as for Auto body repair shop.
 - Install compressor cage for 2 compressors at the external wall to be used one for this shop and another one for Auto body repair shop. Design internal compressor pipe system.
 4. A part of the existing building shall be rehabilitated (Position 11 at Figure 1). The entire building is the one story building with 10.4m x 40m layout. Currently, 290m² area (70% from total) is used as the Interior finisher training space and remaining area used as Driver training class and for other purpose.
 - Room function: interior finisher.
 - Install ventilation electrical fan/motor at one side of the existing system (Pic 1.6).
 - Design the ventilation duct going to outside in a proper way to the outside through the roof.
 5. A part of existing building shall be rehabilitated (Position 4.1 at Figure 1 and Pic 1.5). It is a part of classroom building No 2 that serves for the Regional Methodological Center. The building was built in 1964 and the major issue to resolve is to improve the thermo efficiency and renewing internal electrical system.
 - Replace 29 windows in 12 rooms, 11 windows in corridors, total of 40 windows. Approximate size of one window is 1.4m x 1.9m height = 2.66m².
 - Install proper floor above the existing floor, in room # 2, 4, 5, 7, 8, 11.
 - Install insulation internally in walls in rooms # 2, 4, 5, 7, 8, 11 and make finishing for these insulated walls.
 - Replace the existing internal electrical system at RMC area (Position 4.1 at Figure 1).
 - Replace 5 doors. Design firm is to consult with RMC to determine doors of which rooms to be replaced.
 6. Sport hall to be refurbished (Position 5 at Figure 1). The entire building is 30m X 15m, height approximately 12m. The Sport hall is 24m x 15m (Pic 1.7 and 1.8).
 - Replace all large 12 windows (one window size 1.7m x 4.5m height), and two small windows (one window size 1.7m x 1.7m).
 - Install ventilation fan(s) through window(s).

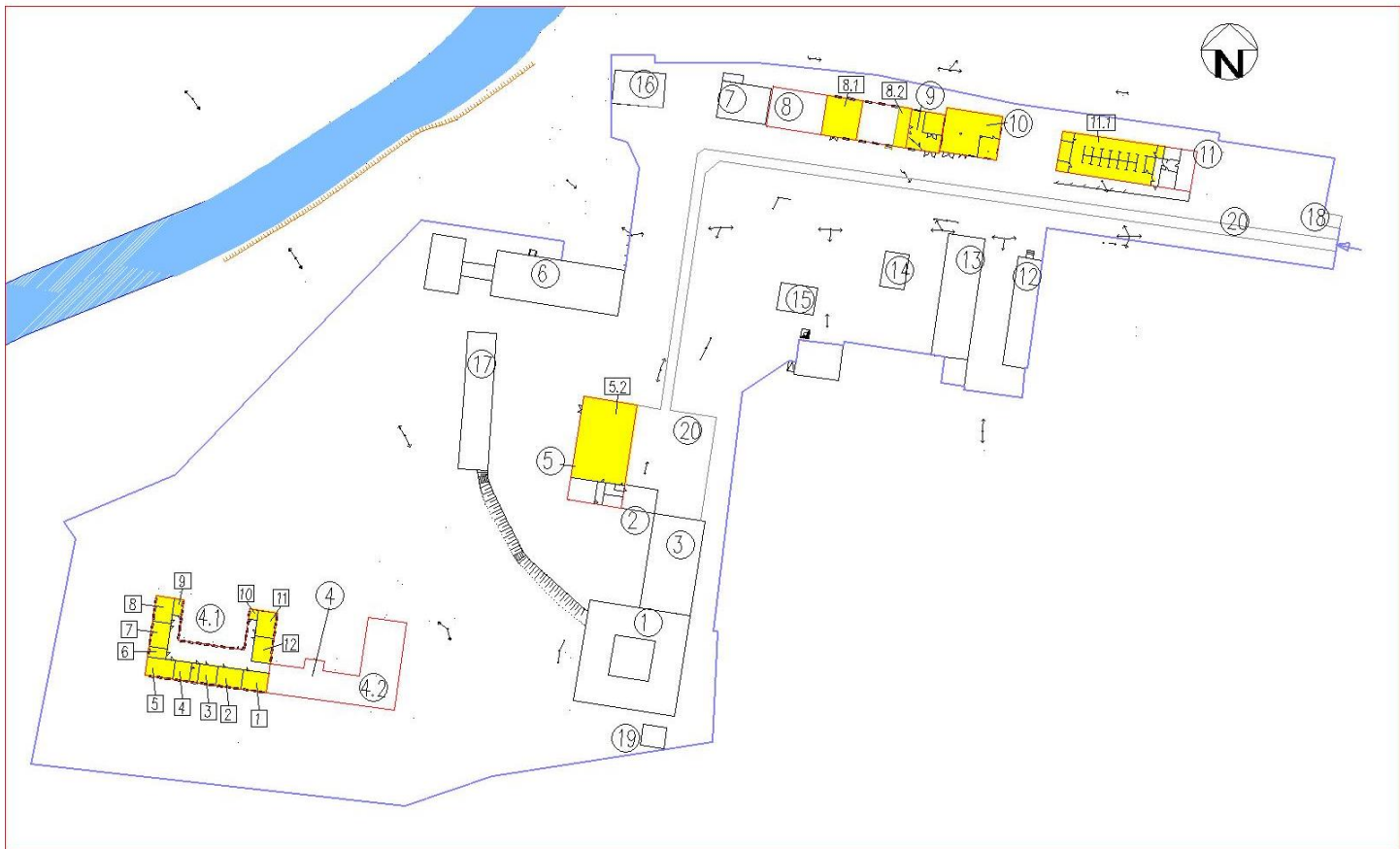
- Make heating load calculation and add heating devices if necessary.
- Replace existing floor, about 25%.
- Make lightning calculation and re-design the existing lighting if necessary. The ceiling existing lights are to be replaced in any scenario (existing 24 lights).
- Remove one existing door to outside and fill in opening.
- Insulate the external wall from outside of the entire building and make finishing, if necessary.

7. External electrical system

- Connect all the existing college buildings and college users that are currently connected to transformer substation outside of the college fence to the new substation 2 x 400 kVA inside of the college fence. Please refer to Position 19 at Figure 1.

8. Landscape works: construction of new auto road from the main gate of the college to the parking area (Position 20 at Figure 1). The parking area. Street light. For the new auto road, calculate the load bearing capacity of existing heating, water and sewage lines located under the new road and parking area, and design strengthening measures if necessary.

FIGURE 1. MASTER PLAN
ЗУРАГ 1. ЕРӨНХИЙ ТӨЛӨВЛӨГӨӨ



NOTE:

1. Classroom building #1
2. Passageway
3. Administration, library
4. Classroom building #2
 - 4.1 **Project Intervention – Repair – RMC**
 - 1 – Printing room – 41.7 sq m.
 - 2 – Methodologists’ room – 38.7 sq. m.

ТАЙЛБАР:

1. Хичээлийн 1-р байр
2. Хүзүүвч
3. ЗАА, номын сан
4. Хичээлийн 2-р байр
 - 4.1 **Төслийн хөрөнгө оруулалт – Засвар – БАЗТ**
 - 1 – Хэвлэх цех - 41.7 м2
 - 2 – Арга зүйч нарын оффис - 38.7
 - 3 – Амьдрах ухааны өрөө – 27.8

<p>3 – Soft skill training room – 27.8 sq. m. 4 – Methodologists room – large room 25.9 sq. m., small room – 13.1 sq. m, total 39.0 sq. m. 5 – Video conference room – 42.8 sq. m. 6 – Audio recording studio – 16.5 sq. m. 7 – Video recording studio – 41.2 sq. m. 8 – Multimedia laboratory – 12.5 sq. m. 9 – GIZ project room 10 – Individual consultation room – 6.3 sq. m. 11 – Group consultation room - 41.2 sq. m. 12 – Carrier counseling room - 41.2 sq. m.</p> <p>4.2 Workshops</p> <p>5. Sport hall 5.1 Project Intervention – Repair – Sport hall</p> <p>6. Dormitory</p> <p>7. Workshop – Welding</p> <p>8. Workshops – Plumbing, Auto repair theoretical classroom, Lathe milling shop 8.1 Project Intervention – Repair – Auto repair theoretical classroom 8.2 Project Intervention – Repair – restroom (Lathe milling shop)</p> <p>9. Project Intervention – Repair – Auto body repair shop</p> <p>10. Project Intervention – Repair – Auto mechanic repair shop</p> <p>11. Project Intervention – Repair – Interior finisher shop</p> <p>12. Workshop – Concrete, reinforcement shop, Masonry shop</p> <p>13. Workshop – Carpentry</p> <p>14. Teacher’s meeting room (not completed by GIZ)</p> <p>15. Shower building for students</p> <p>16. Garage</p> <p>17. Warehouse</p> <p>18. Guard point</p> <p>19. Project Intervention – Repair – Power sub-station</p> <p>20. Project Intervention – New – Auto road and parking area</p>	<p>4 – Арга зүйчийн өрөө – том өрөө 25.9 м2% жижиг өрөө - 13.1 м2, нийт 39.0 м2. 5 – Зайн хурлын өрөө – 42.8 м2 6 – Дуу бичлэгийн студи – 16.5 м2 7 – Дүрс бичлэгийн студи – 41.2 м2 8 – Мультимедиа лаборатори – 12.5 м2 9 – ГТХАОУБ төслийн өрөө – 12.5 м2 10 – Ганцаарчилсан зөвлөлгөө өгөх өрөө – 6.3 м2 11 – Бүлгээр зөвлөлгөө өгөх өрөө – 41.2 м2 12 – Ажил мэргэжлийн чиг баримжаа олгох сургалтын өрөө 41.2 м2</p> <p>4.2 Дадлагын байр</p> <p>5. Биеийн тамирын заалны барилга 5.1 Төслийн хөрөнгө оруулалт – Засвар – Биеийн тамирын заал</p> <p>6. Дотуур байр</p> <p>7. Дадлагын байр – Гагнуур</p> <p>8. Дадлагын байр – Сантехник, Авто засварын онолын анги, Токарийн анги 8.1 Төслийн хөрөнгө оруулалт – Засвар – Авто засварын онолын анги 8.2 Төслийн хөрөнгө оруулалт – Засвар – Токарийн ангийн хэсэгт шинээр Ариун цэврийн өрөө, Хувцас солих өрөө</p> <p>9. Төслийн хөрөнгө оруулалт – Засвар – Авто машины кузов засварын дадлагын байр</p> <p>10. Төслийн хөрөнгө оруулалт – Засвар – Авто машины засварын дадлагын байр</p> <p>11. Төслийн хөрөнгө оруулалт – Засвар – Барилгын засал чимэглэл</p> <p>12. Дадлагын байр – Бетон арматур, Өрөг</p> <p>13. Дадлагын байр – Мужаан</p> <p>14. Багш нарын уулзалтын өрөө (ГТХАОУБ – баригдаж дуусаагүй)</p> <p>15. Халуун усны байр</p> <p>16. Гараж</p> <p>17. Агуулах</p> <p>18. Манаачийн байр</p> <p>19. Төслийн хөрөнгө оруулалт – Засвар – Цахилгааны дэд өртөө</p> <p>20. Төслийн хөрөнгө оруулалт – Шинэ – Авто зам, авто зогсоол</p>
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PICTURE 1
ЗУРАГ 1



Pic 1.1 Paint booth / Будгийн камер



Pic 1.2 Ceiling with laminated sheet and Styrofoam sheets above



Pic 1.3 Auto body repair shop and Auto mechanical shop / Кузов засварын анги болон Авто засварын анги



Pic 1.4 The footprint of one pole of the existing 4 post car lifter / 4 тулгууртай авто өргөгчийн нэг тулгуурын доорх эвдэрсэн шал



Pic 1.5 Classroom building No2 – RMC /
Хичээлийн 2-р байр – БАЗТ-ийн барилга



Pic 1.6 Ventilation system Салхивчийн шугам
/одоо байгаа/



Pic 1.7 Sport hall building / Биеийн тамирын
заалны барилга



Pic 1.8 Sport Hall / Биеийн тамирын заал

SCOPE OF SERVICES / DELIVERABLES
GOBI-ALTAI VOCATIONAL TRAINING AND PRODUCTION CENTER

TABLE 1: SCOPE OF SERVICES AND DELIVERABLES

* Due = Elapsed time after Effective Date of Contract in calendar days

Description, Language, no. of copies	Key Content	Due*
The Detailed Engineering Design:		
Deliverable 1 (Mongolian and English) Hard Copy – 2 copies + Soft copy	- Bill of quantities (that provides sufficient information on the quantities of Works to be performed to enable bids to be prepared efficiently and accurately). - Cost estimate.	35
Deliverable 2 (Mongolian) Hard Copy – 2 copies	- State Expertise Opinion on cost estimate	75
Construction Supervision during the construction period: 2 engineers visit the site 1 time for 2 days including travel time (total 4 days), the stages are: 60% of civil works		
Deliverable 3 (Mongolian) Hard copy – 1	Construction supervision (both author and on behalf of client) to ensure that the construction works are carried out as specified in the works contract and document.	60% of civil works achieved

DETAILED SCOPE OF SERVICES

Gobi-Altai VTPC shall have the project investment for following occupations:

1. Interior Finisher
2. Construction Electrician

SCOPE OF CIVIL WORKS (CONCEPTUAL)

The below descriptions, dimensions and functions are all preliminary and subject to check, revision if necessary and verification and validation by the Consultant.

Figure 1 - Master Plan of Gobi-Altai VTPC. The school compound has 8 main buildings and several auxiliary facilities; the most of them were built in 1990-ies; all these buildings are connected to power supply and centralized heating system, some of the buildings are not connected to the sewage.

1. A part of the existing building shall be rehabilitated (Position 6.1 at Figure 1 and Pic 1.1, 1.2). It is one story workshop building with size 21m x 66m.
 - Room function: Interior finisher shop with dimension of 12m x 9m x 4m height and teacher room of 18m².
 - Address roof leakage.
 - Design new ventilation for removing excess moisture.
 - Replace windows.
 - Improve lights.
 - Install electrical sockets.
 - Replace existing timber floor with concrete one.
2. A part of existing building shall be rehabilitated (Position 7.1 at Figure 1 and Pic 1.3). It is one

story building with size 21m x 21.6m.

- Room function: Interior finisher shop with dimension of 6m x 8.8m x 4m height.
- Replace 2 windows. Size 0.9m x 0.8m height each.
- Replace door. Size 0.97m x 2.10m.
- Design a new ventilation for removing excess moisture.
- Improve lights.

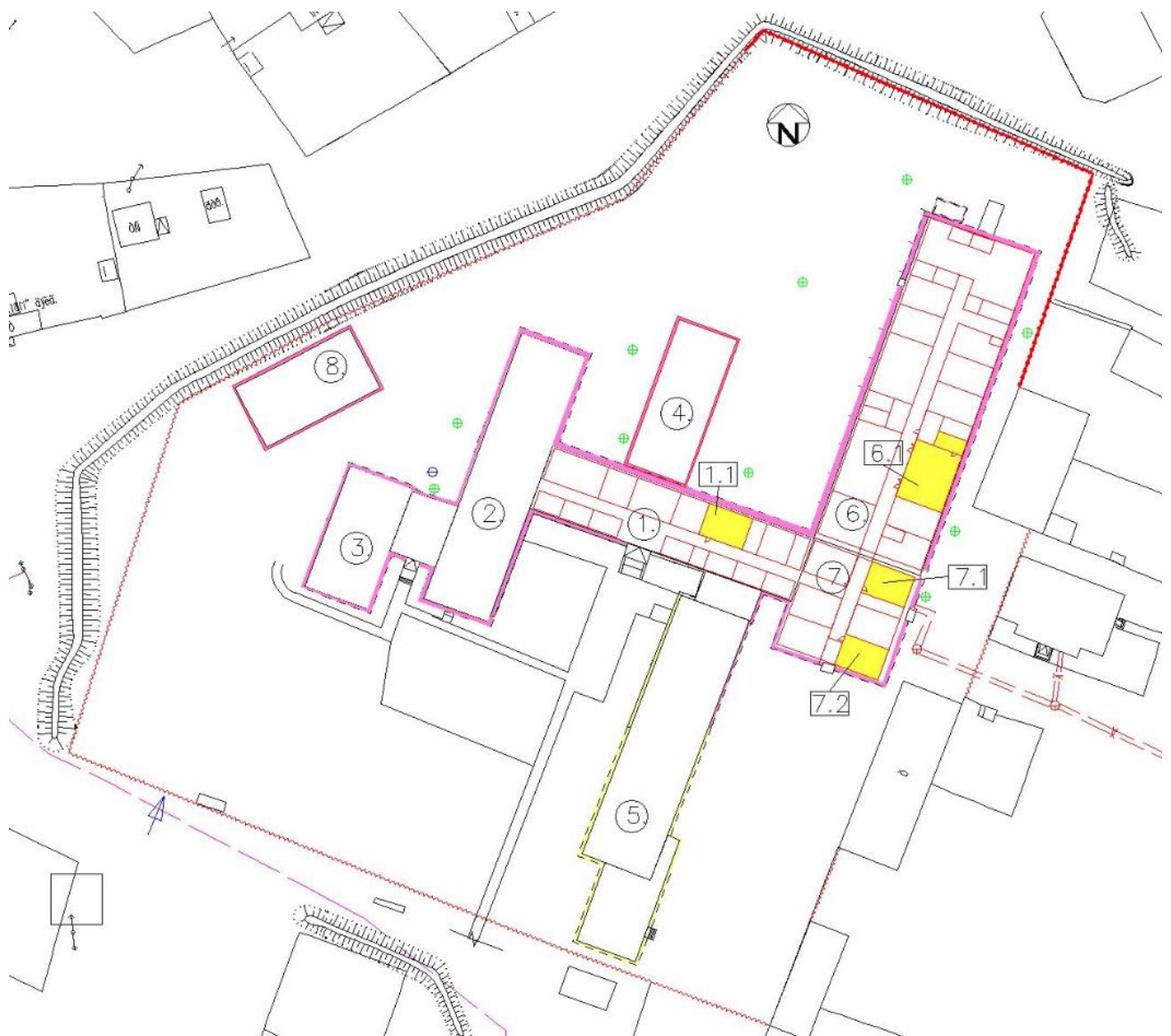
3. A part of existing building shall be rehabilitated (Position 1.1 at Figure 1). It is one story building with size 12m x 54m.

- Room function: Construction electrician shop is 6m x 9m.
- A bad odor is smelling in this room. Possible causes are leakage in the heating pipe channel and deterioration of soil near this channel in this room. Address this issue.

4. A part of existing building shall be rehabilitated (Position 7.2 at Figure 1 and Pic 1.4). It is one story building. Our shop is with size of 6.4m x 9m x about 3.3m height which will locate sewing shop.

- Replace 3 windows. Size of 1 window: 2.2m x 1.8m, 2 windows each 0.9m x 0.9m height.
- Replace door, size 0.95m x 2.3m.
- Improve floor (to make even, flat).
- Finishing of wall and ceiling.
- Improve lights and add electrical sockets and wiring.

FIGURE 1. MASTER PLAN
ЗУРАГ 1. ЕРӨНХИЙ ТӨЛӨВЛӨГӨӨ



NOTE:

1. **Project Intervention** – Repair – Administration, Classrooms
2. Classroom building
3. Sport hall
4. Cultural center
5. Dormitory
6. **Project Intervention** – Repair – Workshop
7. **Project Intervention** – Repair – Workshop
8. Workshop

ТАЙЛБАР:

1. **Төслийн хөрөнгө оруулалт** – Засвар – Захиргаа ба хичээлийн барилга
2. Хичээлийн байр
3. Биеийн тамирын заал
4. Соёлын төв
5. Оюутны дотуур байр
6. **Төслийн хөрөнгө оруулалт** – Засвар – Дадлагын байр
7. **Төслийн хөрөнгө оруулалт** – Засвар – Дадлагын байр
8. Дадлагын байр

PICTURE 1
ЗУРАГ 1



Pic 1.1 Interior finisher shop / Барилгын засал чимэглэлийн дадлагын байр



Pic 1.2 Interior finisher shop / Барилгын засал чимэглэлийн дадлагын байр



Pic 1.3 Interior finisher shop / Барилгын засал чимэглэлийн дадлагын байр



Pic 1.4 Interior finisher shop / Барилгын засал чимэглэлийн дадлагын байр