

TERMS OF REFERENCE
TVET FACILITIES UPGRADING: DETAILED ENGINEERING DESIGN, COST ESTIMATE
AND CONSTRUCTION SUPERVISION SERVICES OF DESIGN FIRM 5 – CS53

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) Darkhan-Uul aimag Vocational Training and Production Center (Attachment No. 1)
 - (2) Darkhan-Uul aimag Darkhan-Urguu Polytechnic College (Attachment No. 2)
 - (3) Orkhon aimag Vocational Training and Production Center (Attachment No. 3)
 - (4) Dornod aimag 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 - <ul style="list-style-type: none"> <input checked="" type="checkbox"/> 1.2.1 – 1-10 story building architecture, landscaping, elevation, structure <li style="text-align: center;">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, external branch line <input checked="" type="checkbox"/> 1.2.5 – internal light, electricity, external branch line, internal communication, fire and other signaling, local area network, security

	<p>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 33.0 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)	5.8
Architect	4.0
Structural Engineer	2.9
Heating, Ventilation and Air Conditioning Engineer	5.2
Electrical Engineer	4.9
Communication, Signaling, Information Engineer	3.1
Water and Sewerage Engineer	5.1
Cost Estimator	2.0
Total	33.0

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)	<p>- At least 10 years of proven experience in management of construction design and construction supervision work by team of engineers.</p> <p>- Consulting Engineer or Consulting Architect.</p>

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. - 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.

* 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.

**DARKHAN-UUL VOCATIONAL TRAINING AND PRODUCTION CENTER
SCOPE OF SERVICES / DELIVERABLES**

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 except engineering calculations) Hard Copy – 4 copies + soft copy in native and PDF	- Detailed design that include the associated engineering calculations, detailed 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.	40
Deliverable 2 (Mongolian and English) Hard copy – 3	- 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).	70
Activity (Mongolian and English)	Assistance in preparing responses to requests for clarifications received from bidders.	
Construction Supervision during the construction period: 6 engineers visit the site 3 times for 2 days for each visit including travel time (total 18 visits, 36 days), the stages are: inception, hidden works, 50% of civil works achieved, final commissioning.		
Deliverable 3 (Mongolian) Hard copy – 1	Construction supervision plan and quality check tools. Permission to commence the Works.	
Deliverable 4 (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.	- 50% of civil works achieved
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. Assistance in accepting the Works through the Acceptance Commission.	Final Acceptanc e Certificate is issued
Deliverable 6 (Mongolian) – Hard copy 1	Defect Notice during warranty period	

Vocational Training and Production Center in Darkhan-Uul aimag will get the project investment for following construction sector occupations:

1. Interior Finisher
2. Energy-efficiency building structure assembler

3. Construction machinery operator

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.

TABLE 2: 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 Darkhan-Uul aimag VTPC. The entire complex was built in 1974; all buildings are connected to the centralized engineering utility suppliers. However, a flat roof of main classroom building and dormitory heating are in disrepair due to shortage of funding (Pic 1 and Pic 2);

1. A part of workshop building shall be rehabilitated (Position 2a at Figure 1). It is a one story building with 39m x 66m size; there are 10 shops, but only 4 shops with a total area of 756m² are related to the project investment shall be rehabilitated (Figure 2), namely Construction machinery operator #102, Interior Finisher #103, 104 and Energy-efficiency building structure assembler #105.
 - The indoor electrical system shall be renewed for new equipment layout;
 - Painting of walls and ceiling,
 - Changing of doors and windows,
 - Floor finishing;
 - Heating system shall be partially rehabilitated.
2. A part of classroom building shall be rehabilitated (Position 1a at Figure 1). It is multistory building with footprint of 1850m² (Figure 3). The project related space is 3 classrooms /414m²/ on 3rd floor for Construction machinery operator classroom #301, Interior finisher classroom #302, and Energy-efficiency building structure assembler classroom #308 and near restrooms /36m²/.
 - The indoor electrical system shall be renewed for new equipment layout;
 - Painting of walls and ceiling,
 - Changing of doors and windows;
 - Floor finishing;
 - Renovation of female and men restrooms;
 - Entire flat bituminous roof /1850m²/ shall be renovated (Pic 1).
3. A part of building shall be rehabilitated (Position 3 at Figure 1). It is 4 story dormitory building with footprint of 770m² (Figure 4). The dormitory is functioning by full capacity, which is 250 beds, but the temperature inside rooms is much lower than required, since internal heating system and windows are old, all of them from 1984 and external walls' thermo insulation might be insufficient (Pic 2).
 - Thermo technical calculation of entire building shall be done in accordance with the current codes, and necessary works shall be designed including following:
 - Internal heating system in 1-4 floors shall be renewed;
 - All windows shall be replaced by thermo efficient ones;
 - All external walls shall be thermo insulated if required.

FIGURE 1. MASTER PLAN
ЗУРАГ 1. ЕРӨНХИЙ ТӨЛӨВЛӨГӨӨ



NOTE:

1. **Project Intervention** – Repair – Classroom building
2. **Project Intervention** – Repair – Workshop
3. **Project Intervention** – Repair – Dormitory
4. Workshop
5. Power station
6. Facility for sewing dust removed from carpentry shop /not used/

ТАЙЛБАР:

1. **Төслийн хөрөнгө оруулалт** – Засварын ажил – Хичээлийн байр
2. **Төслийн хөрөнгө оруулалт** – Засварын ажил – Дадлагын байр
3. **Төслийн хөрөнгө оруулалт** – Засварын ажил – Дотуур байр
4. Дадлагын байр
5. Цахилгааны дэд өртөө
6. Мужааны ангийн үртэс цуглуулах байгууламж /ашиглалтгүй/

FIGURE 2. WORKSHOP
ЗУРАГ 2. ДАДЛАГЫН БАЙР

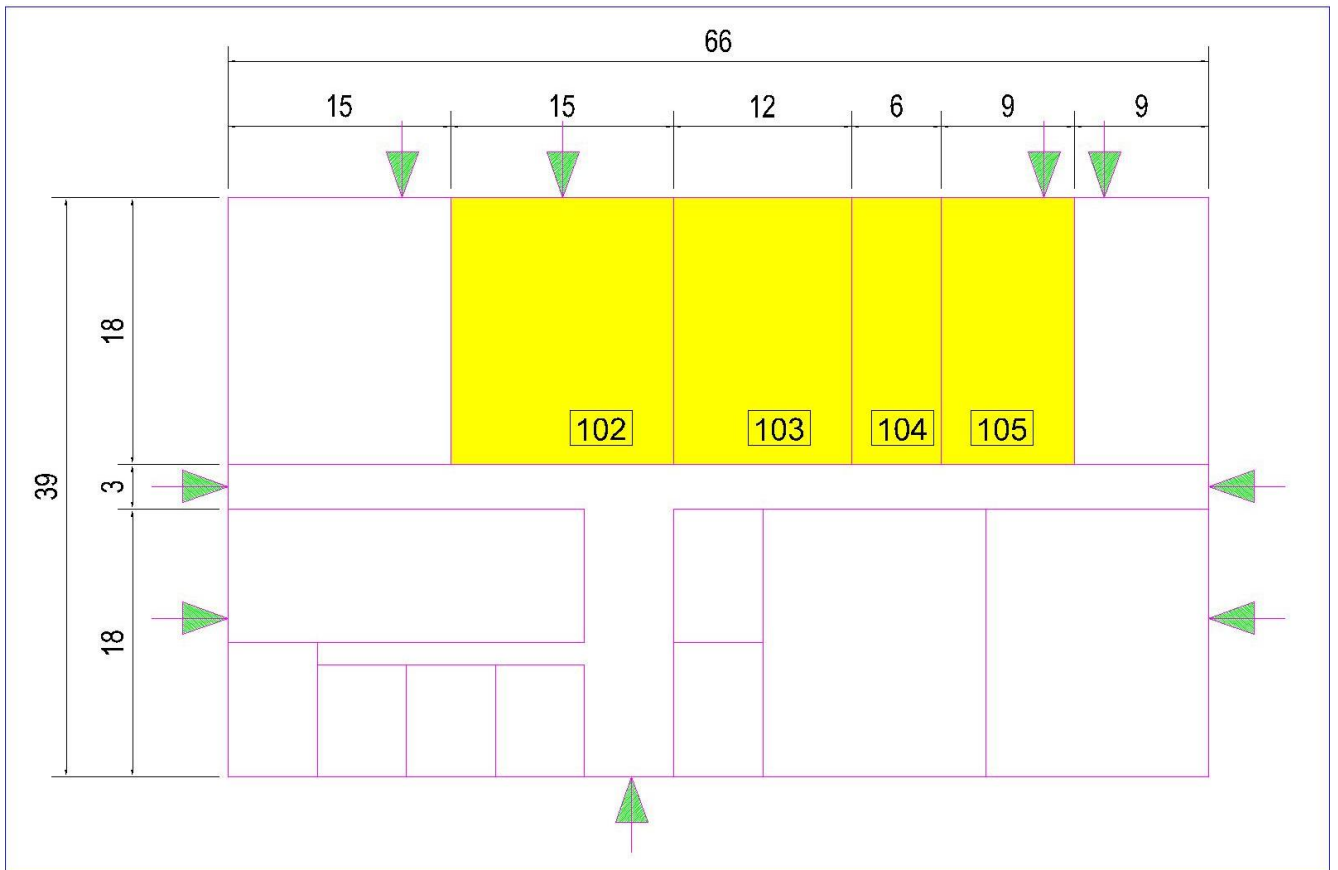


FIGURE 3. CLASSROOM BUILDING, 3RD FLOOR LAYOUT
ЗУРАГ 3. ХИЧЭЭЛИЙН БАЙР, 3-Р ДАВХРЫН БАЙГУУЛАЛТ

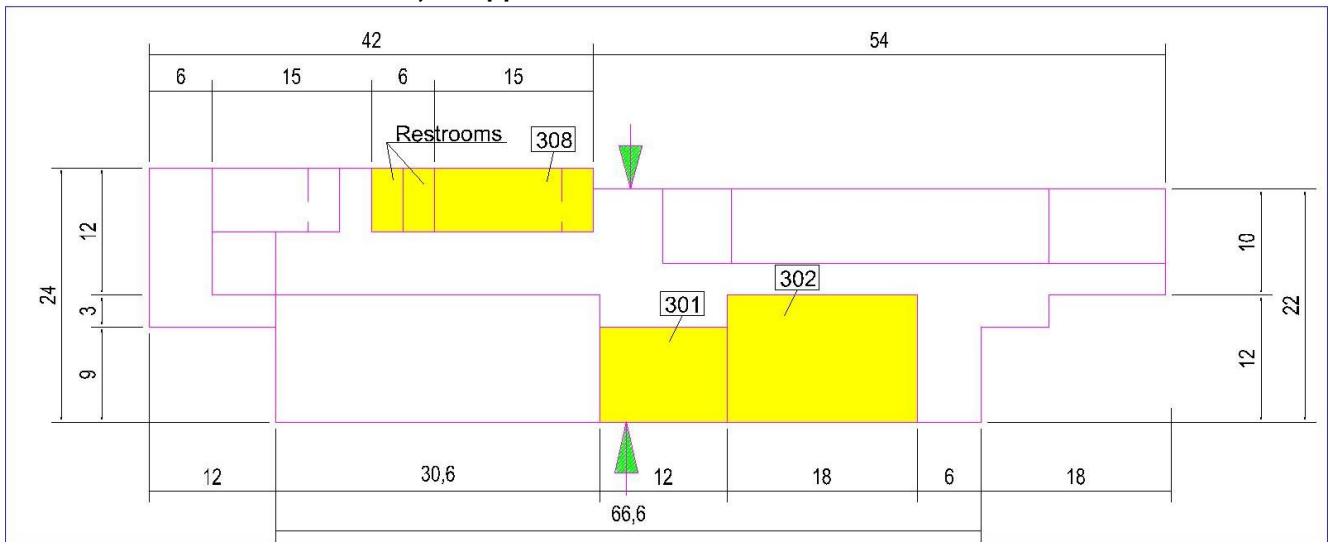
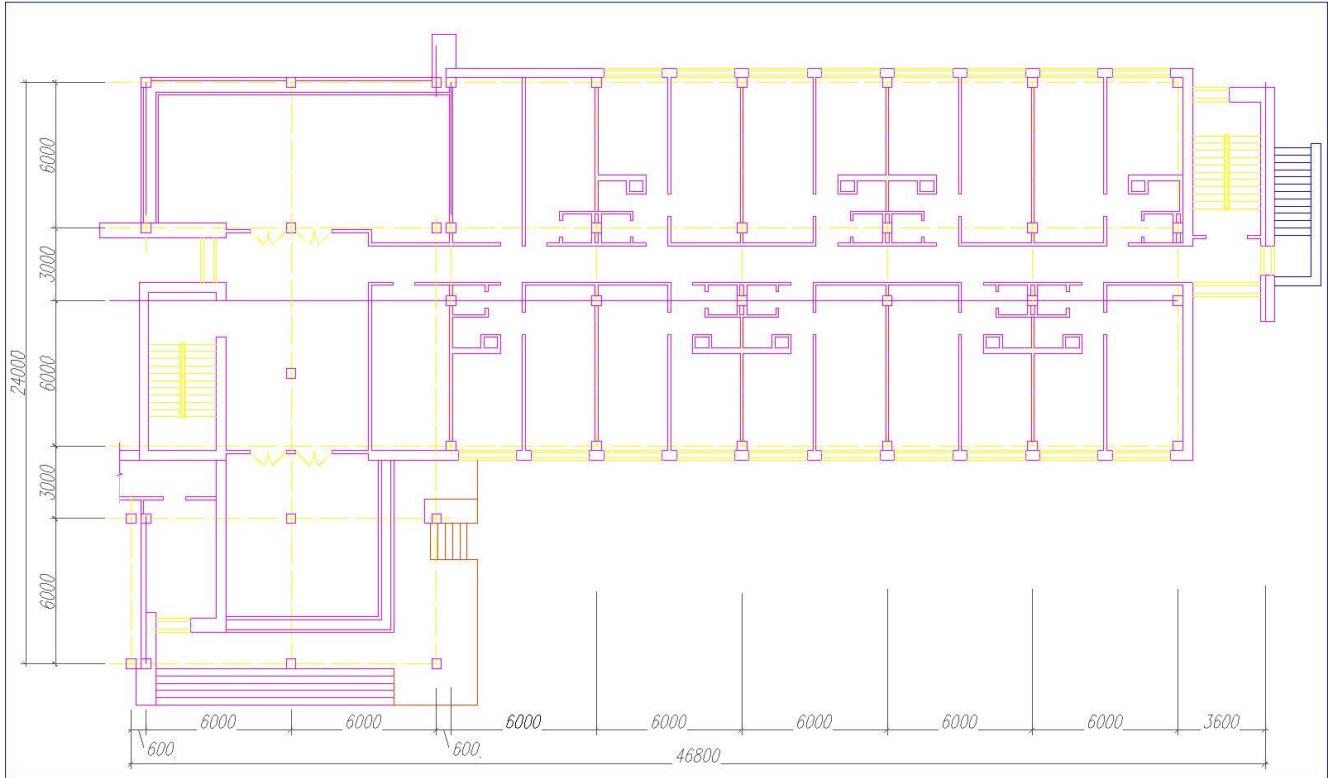


FIGURE 4. DORMITORY BUILDING, 2-4 FLOOR LAYOUT
ЗУРАГ 4. ДОТУУР БАЙР, 2-4-Р ДАВХРЫН БАЙГУУЛАЛТ



PICTURE 1. CLASSROOM BUILDING ROOF
ЗУРАГ 1. ХИЧЭЭЛИЙН БАЙРНЫ ДЭЭВЭР



Upper floor classroom ceiling
Дээд давхрын таазны хэсэг



Flat roof with bituminous layers
Хар цаастай хавтгай дээвэр

PICTURE 2. DORMITORY BUILDING
ЗУРАГ 2. ДОТУУР БАЙР



Facade (northern part) / Барилгын нүүр тал /хойд тал/



Heating pipes / халаалтын шугам



Heating device / Халаалтын хэрэгсэл

**DARKHAN-URGUU POLYTECHNIC COLLEGE
SCOPE OF SERVICES / DELIVERABLES**

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"> - 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). 	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 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). - Cost estimate. - Information for personnel requirements, construction equipment requirements, licensing requirements to be possessed by the contractor. Construction plan / schedule. 	80
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 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: 6 engineers visit the site 4 times for 2 days for each visit including travel time (total 24 visits, 48 days), the stages are: inception, hidden works, 50% of civil works achieved, final commissioning.		
Deliverable 4 (Mongolian)	Construction supervision plan and quality check tools. Permission to commence the Works.	

Hard copy – 1		
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.	- 50% of civil works achieved - preliminary commissioning
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 Acceptance Certificate is issued
Deliverable 7 (Mongolian) – Hard copy 1	Defect Notice during warranty period	

Darkhan-Urguu Polytechnic College will get the project investment for following road and transportation sector occupations:

1. Road and bridge construction worker
2. Road construction material laboratory technician
3. Heavy equipment operator

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.

TABLE 2: 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 – Site location of Darkhan-Urguu Polytechnic College with preliminary location of new building /highlighted by yellow/;

1. A new building to be constructed – Highlighted position at Figure 1 – location may change after discussion with the Project, the VTPC and view of the design company.
 - Building function: 1st floor for Road and bridge construction worker shops, 2nd floor for Road construction material laboratory technician and one room for Heavy equipment operator;
 - Dimensions: two story, approximate footprint 13m x 24m, 1st floor height is 3.3m, 2nd floor height is 2.7m;
 - 1st floor: Road and bridge construction worker training space shall have 3 separate training areas for water drainage facility construction, walkway and runway kerb construction, pavement construction, and also storage area for construction materials, equipment and tools;
 - 2nd floor: one room shall be dedicated for Heavy equipment operator and 3 laboratories (Soil test laboratory, Asphalt concrete test laboratory and Cement concrete test laboratory) for Road construction material laboratory technician;
 - The building location shall be finalized by the design consultant based on detailed engineering survey and utility supply conditions;
 - The main structures of building shall be steel frame with lightweight sandwich panels;
 - It is envisaged that about 20-30% of Road and bridge construction worker and Road construction material laboratory technician space shall accommodate locker room, teacher

space and some theoretical training area.

- Separate restrooms for women and men. Restroom accessible for people with disabilities.
- To be provided with all services such as, but not limited to: water, sewerage, heating, ventilation, electrical 220/380V, 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 the school main building.
- 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.)

Figure 1. Location of new building / Шинэ барилгын байршил



New building /
Шинэ барилга

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

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 except engineering calculations) Hard Copy – 4 copies + soft copy in native and PDF	- 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.	80
Deliverable 2 (Mongolian and English) Hard copy – 3	- 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: 4 engineers visit the site 3 times for 1 day for each visit including travel time (total 12 visits, 12 days), the stages are: inception, hidden works, 50% of civil works achieved, final commissioning.		
Deliverable 3 (Mongolian) Hard copy – 1	Construction supervision plan and quality check tools. Permission to commence the Works.	
Deliverable 4 (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.	- 50% of civil works achieved
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. Assistance in accepting the Works through the Acceptance Commission.	Final Acceptanc e Certificate is issued
Deliverable 6 (Mongolian) – Hard copy 1	Defect Notice during warranty period	

Vocational and Training Production Center of Orkhon aimag shall receive the project investment for following occupations:

1. Wool & cashmere processing technology worker

2. Drywall finisher
3. Auto mechanic

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.

TABLE 2: 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 Orkhon VTPC. The school complex consists of 10 buildings; all buildings were built in 1989, except a dormitory which is from 2017; all buildings has been connected to the municipal engineering systems, including power, heating, water supply and sewage.

The project shall do different scale rehabilitation works in following three buildings;

- Building # 2: one room for drywall finisher workshop;
- Building # 3: one garage space will be re-planned to make two separate workshops for Wool & cashmere processing technology worker and Auto mechanic.
- Building # 4: three classrooms for theoretical sessions of 3 occupations on the 1st floor; one room and hall space for RMC on the 3rd floor;

1. A part of workshop building shall be rehabilitated (Position 2a at Figure 1). The drywall finisher shop /230m2/ shall be allocated on 1st floor of workshop building (Figure 2, Pic 1.1 and Pic 1.2).
 - The indoor electrical system, including lighting, shall be renewed;
 - Painting of walls and ceiling, changing of doors, windows;
 - Floor finishing;
 - The ventilation systems shall be rehabilitated;
 - The wind lock tambour shall be built.
2. A part of building shall be rehabilitated (Position 3a at Figure 1). The auto mechanic and wool & cashmere technology worker shops with total area of 290m2 shall be allocated in garage (Figure 3, Pic 1.3 and Pic 1.4).

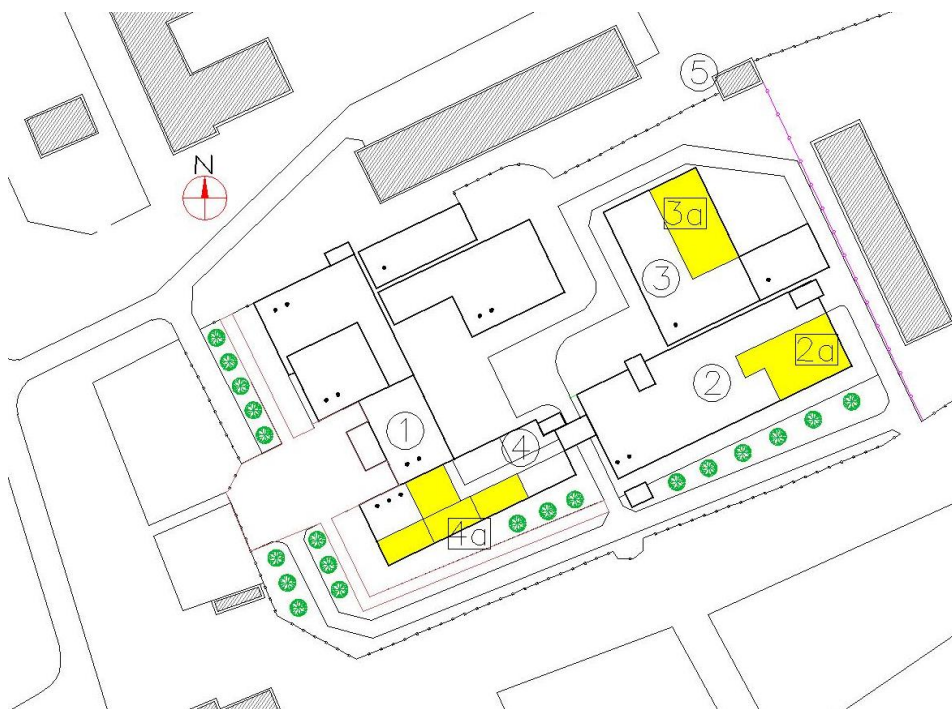
Table 1. Tentative scope of civil works

#	Shop Name	Min floor space m2	Required Rehabilitation Works
Wool & cashmere technology worker /220m2/			
1	Storage for raw materials	About 200	Location shall be on the 1 st floor, shall have a direct access to outside
2	Grading and Cleaning room		Location shall be close to the raw materials storage Shall have a proper ventilation
3	Washing, drying, hair separation, dyeing, re-orientation process shop		The shop shall have access to water and sewage, dedicated ventilation. The sewage from that shop shall have mechanical pre-treatment system before reaching the central sewage line. The electrical system shall be coordinated with equipment layout.
4	Yarning, knitting, linking process room		The electrical system shall be coordinated with equipment layout.
5	Storage for final products	20	
6	Storage for equipment, tools, kits, etc.		
Auto mechanic /70m2/			

7	Paint area	35	Shall have curtains as separation between paint and body repair areas; Paint area shall have dedicated ventilation; The existing tambour and doors shall be removed or converted for compressor room; The electrical system shall be coordinated with equipment layout.
8	Body repair area	35	Thermo insulated gates; Heat curtains gates; The electrical system shall be coordinated with equipment layout.
General requirements			
9	<ul style="list-style-type: none"> - The new partition wall shall be built to create separate space for auto mechanic /70m2/ and wool & cashmere technology worker training space /220m2/; - The internal heating system of entire building will be re-calculated and then renewed, including changing of windows and doors; - The external and internal water supply and sewage systems shall be provided to the 2 shops; - The two workshops to be provided with all services such as, but not limited to: water, sewerage, heating, ventilation, electrical 220/380V, telecommunications including internet, fire detection and alarm system etc. - Floor finishing; - Painting of walls and ceiling; - The ventilation systems shall be rehabilitated. 		

3. A part of classroom building shall be rehabilitated (Position 4a at Figure 1).
The classrooms #118, 120, 122 for theoretical sessions of drywall finisher, wool & cashmere processing technology worker and auto mechanic /1st floor, each classroom has 84m2/ shall be rehabilitated /Figure 3, Pic 1.5 and Pic 1.6/.
 - The indoor electrical system, including lighting, shall be renewed;
 - Painting of walls and ceiling;
 - Changing of doors, windows;
 - Floor finishing;
 - Hand washing corner with sanitation facilities shall be renewed.
4. The part of RMC space /3rd floor, total area is 180m2/ shall be rehabilitated /Figure 4, Pic 1.7 and Pic 1.8/;
 - Building of new partition PVC walls in the hall area to create an office room and corridor for RMC;
 - The indoor electrical system, including lighting, shall be renewed;
 - Painting of walls and ceiling,
 - Changing of doors, windows;
 - Floor finishing;
 - Hand washing corner with sanitation facilities shall be renewed.

FIGURE 1. MASTER PLAN
ЗУРАГ 1. ЕРӨНХИЙ ТӨЛӨВЛӨГӨӨ



NOTE:

1. Administration
2. **Project Intervention** – Repair – Drywall finisher
3. **Project Intervention** – Repair – Auto mechanic and Wool & cashmere technology worker
4. **Project Intervention** – Repair – Classrooms and RMC
5. Power station

ТАЙЛБАР:

1. Захиргааны барилга
2. **Төслийн хөрөнгө оруулалт – Засвар** – Хуурай хийц угсрагч
3. **Төслийн хөрөнгө оруулалт – Засвар** – Авто машины засварчин, Ноос, ноолуур боловсруулалтын технологийн ажилтны дадлагын байр
4. **Төслийн хөрөнгө оруулалт – Засвар** – төслийн 3 мэргэжлийн онолын ангиуд ба БАЗТ
5. Цахилгааны дэд өртөө

FIGURE 2. WORKSHOPS for WOOL & CASHMERE TECHNOLOGY WORKER
ЗУРАГ 2. НООС, НООЛУУРЫН ТЕХНОЛОГИЙН АЖИЛТНЫ ДАДЛАГЫН БАЙР

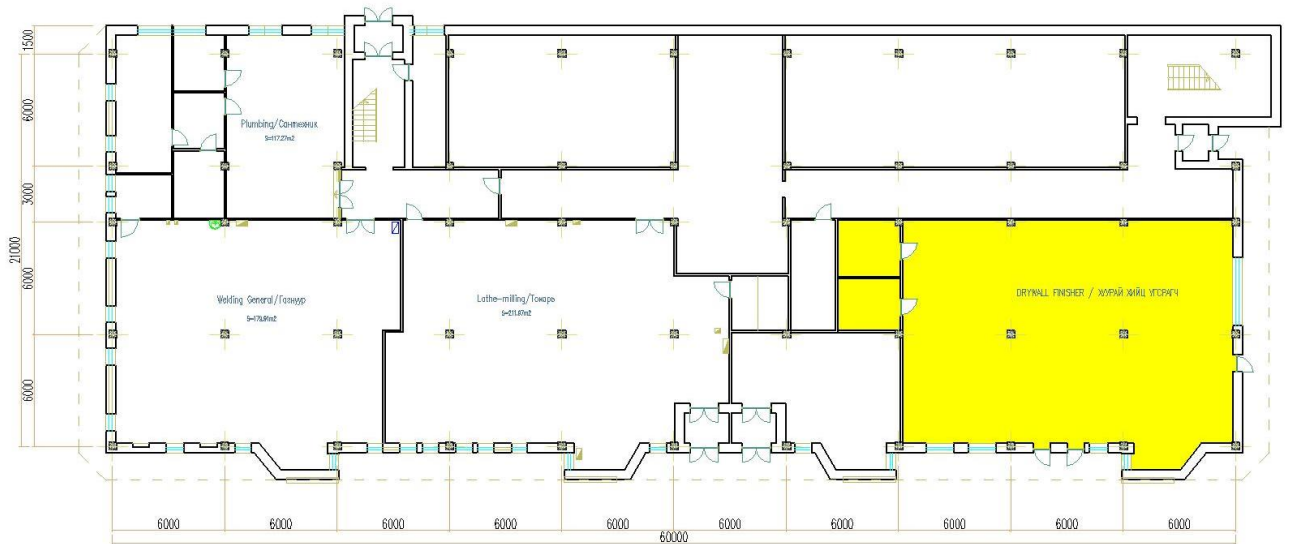


FIGURE 3. WORKSHOPS for AUTO MECHANIC AND WOOL & CASHMERE TECHNOLOGY WORKER
ЗУРАГ 3. АВТОМАШИНЫ ЗАСВАРЧИН БА НООС, НООЛУУРЫН ТЕХНОЛОГИЙН АЖИЛТНЫ ДАДЛАГЫН БАЙР



FIGURE 4. CLASSROOMS FOR DRYWALL FINISHER, AUTO MECHANIC AND WOOL & CASHMERE TECHNOLOGY WORKER
ЗУРАГ 4. ХУУРАЙ ХИЙЦ УГСРАГЧ, АВТОМАШИНЫ ЗАСВАРЧИН БА НООС, НООЛУУРЫН ТЕХНОЛОГИЙН АЖИЛТНЫ ОНОЛЫН АНГИ

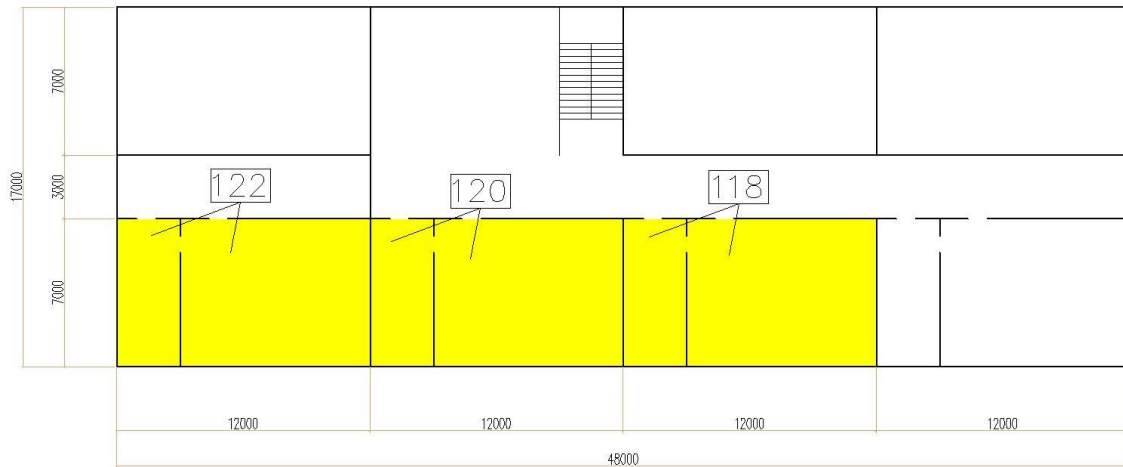
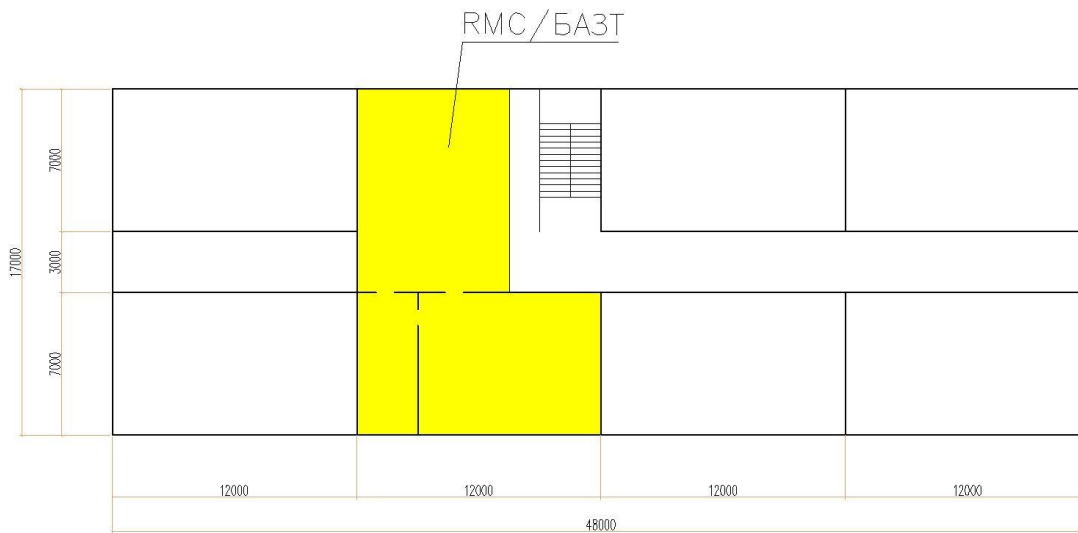


FIGURE 5. REGIONAL METHODOLOGICAL CENTER
ЗУРАГ 5. БҮСИЙН АРГА ЗҮЙН ТӨВ



PICTURE 1
ЗУРАГ 1



Pic 1.1 Drywall finisher workshop / Хуурай хийцийн дадлагын өрөө



Pic 1.2 Drywall finisher workshop / Хуурай хийцийн дадлагын өрөө



Pic 1.3 Garage / Гараж



Pic 1.4 Garage / Гараж



Pic 1.5 Classroom / Онолын хичээлийн анги



Pic 1.6 Hand washing place in classroom / Онолын ангийн гар угаах хэсэг



Рис 1.7 RMC Hall / БАЗТ Үүдний хэсэг



Рис 1.8 RMC Electrical receptacle /
БАЗТ Цахилгааны холболт

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

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 except engineering calculations) Hard Copy – 4 copies + soft copy in native and PDF	- 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.	70
Deliverable 2 (Mongolian and English) Hard copy – 3	- State Expertise Opinion (payment to the Construction Development Center is to be paid from the provisional sum).	100
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 2 days for each visit including travel time (total 8 visits, 16 days), the stages are: hidden works, 50% of civil works achieved, final commissioning.		
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. Assistance in accepting the Works through the Acceptance Commission.	Final Acceptanc e Certificate is issued
Deliverable 6 (Mongolian) – Hard copy 1	Defect Notice during warranty period	

Vocational Training and Production Center in Dornod aimag shall get the project investment for following construction sector occupations:

1. Construction electrician
2. Drywall finisher
3. Construction machinery operator

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.

TABLE 2: 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.

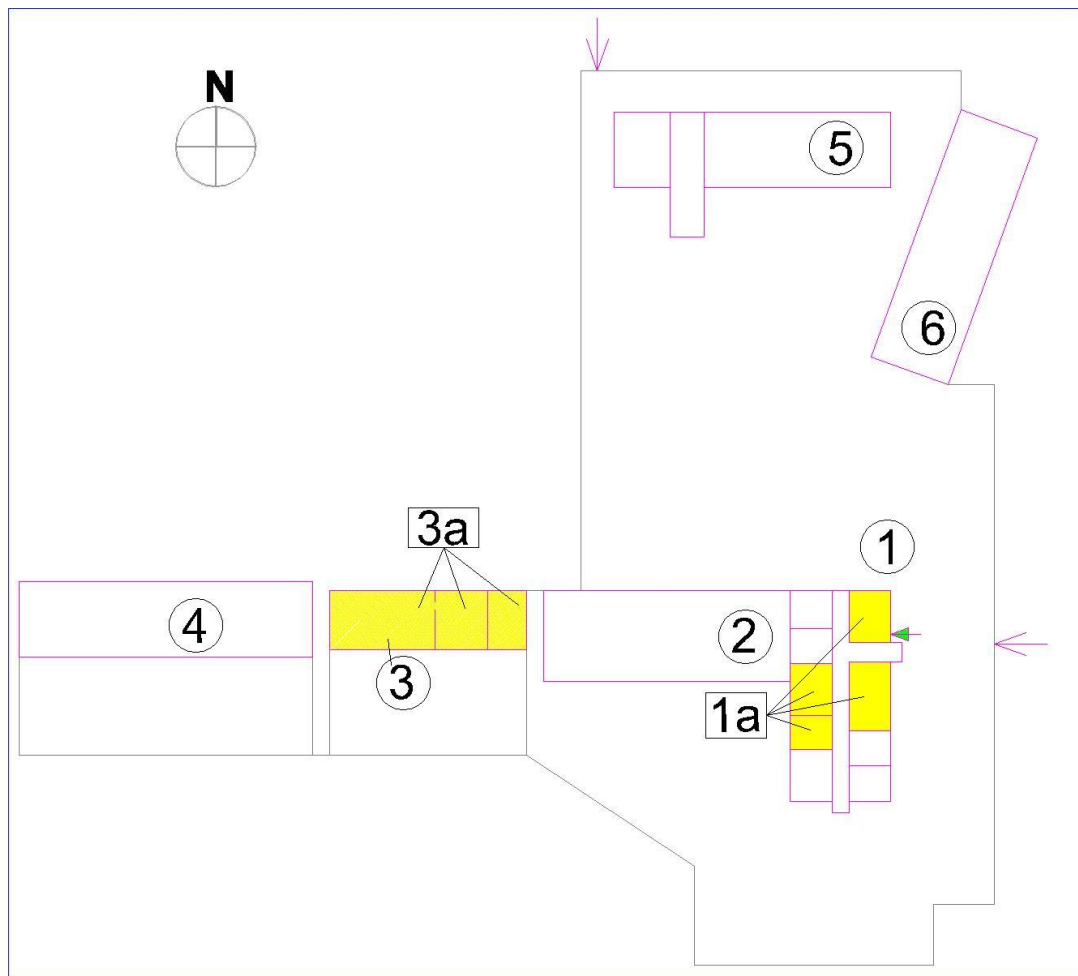
Figure 1 - Master Plan of Dornod aimag VTPC. The school consists of 6 buildings; the main building with adjacent gym, two separate buildings for construction occupations and auto repair workshop. All buildings are connected to the centralized engineering utility supplies.

The project invested occupation space shall be allocated in the school main building as well as construction workshop #2. The main building is a six story building with 17.4m x 36.6m size, it was built in 2016 /Pic 1.1/. The workshop #2 building is one story building with 10.2m x 34.2m size, it has a pitched roof with a timber truss; the building was built in 1969 /Pic 1.2 and Pic 1.3/.

1. A part of school main building might be rehabilitated (Position 1a at Figure 1). Since the building is relatively new, only minor rehabilitation works, mostly electrical, will be occurred here. Classrooms # 602, 606, 607 for Construction electrician / $81.6+40+61=182.6\text{m}^2$ / and classroom # 601 for Construction machinery operator / 60m^2 / shall be allocated on the 6th floor (Figure 2).
 - The indoor electrical system might be adjusted for new equipment layout;
 - Might be internet connection works.

2. A part of workshop building shall be rehabilitated (Position 3a at Figure 1). The drywall finisher shop with total area of 350m^2 shall be rehabilitated (Figure 3).
 - The indoor electrical system and lighting shall be renewed for new equipment layout.
 - Painting of walls and ceiling.
 - Changing of doors and windows.
 - Floor finishing.
 - The ventilation system.
 - The entire ceiling.
 - The internal heating.
 - Two external doors replaced.

FIGURE 1. MASTER PLAN
ЗУРАГ 1. ЕРӨНХИЙ ТӨЛӨВЛӨГӨӨ



NOTE:

1. **Project Intervention** – Repair – Classroom building
2. Gym
3. **Project Intervention** – Repair – Construction sector workshop #2
4. Construction sector workshop #1
5. Auto repair workshop
6. Dormitory – 3rd floor (1-2 floors are the social welfare department)

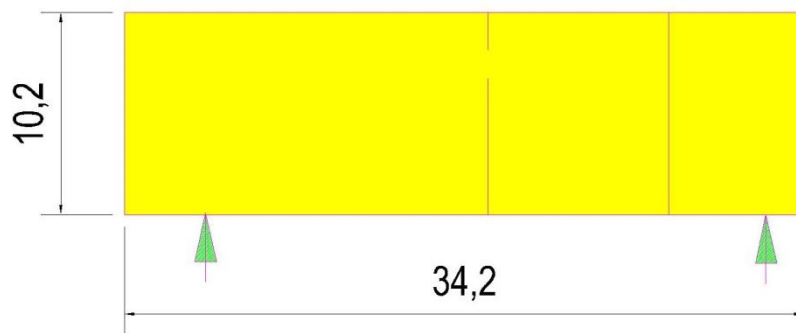
ТАЙЛБАР:

1. **Төслийн хөрөнгө оруулалт** – Засварын ажил – Хичээлийн байр
2. Биеийн тамирын заал
3. **Төслийн хөрөнгө оруулалт** – Засварын ажил – Барилгын мэргэжлийн дадлагын 2-р байр
4. Барилгын мэргэжлийн дадлагын 1-р байр
5. Авто засварын дадлагын байр
6. Дотуур байр – 3-р давхарт (1-2-р давхарт Халамж, үйлчилгээний төв)

FIGURE 2. CLASSROOM BUILDING, 3RD FLOOR LAYOUT
ЗУРАГ 2. ХИЧЭЭЛИЙН БАЙР, 3-Р ДАВХРЫН БАЙГУУЛАЛТ



FIGURE 3. WORKSHOP
ЗУРАГ 3. ДАДЛАГЫН БАЙР



PICTURE 1
ЗУРАГ 1



Pic 1.1 School main building / Хичээлийн төв байр



Pic 1.2 Construction sector workshop building No2 / Барилгын мэргэжлийн дадлагын 2-р байр



Pic 1.3 Workshop No2 inside / Дадлагын 2-р байрны дотор тал