TERMS OF REFERENCE
TVET FACILITIES UPGRADING: DETAILED ENGINEERING DESIGN, COST ESTIMATE AND CONSTRUCTION SUPERVISION SERVICES OF DESIGN FIRM 4 – CS52

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) Bayanchandmani Vocational Training and Production Center, Tuv aimag (Attachment No. 1)
   (2) Bulgan aimag Agricultural Vocational Training and Production Center (Attachment No. 2)
   (3) Zuunkharaa Polytechnic College, Selenge aimag (Attachment No. 3)
   (4) Khugjil Polytechnic College, Khovd aimag (Attachment No. 4)
   (5) Khuvsgul Vocational Training and Production Center (Attachment No. 5)
   (6) Khentii Vocational Training and Production Center (Attachment No.6)
   (7) Dornogobi Vocational Training and Production Center (Attachment No.7).

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 - ☒ 1.2.1 – 1-10 story building architecture, landscaping, elevation, structure **or** ☒ 1.2.2 - 1-16 story building architecture, landscaping, elevation, structure, permanent equipment planning

	☒ 1.2.4 – internal water, sewerage, heating, ventilation, air conditioning, external branch line ☒ 1.2.5 – internal light, electricity, external branch line, internal communication, fire and other signaling, local area network, security systems, instrumentation and control ☒ 1.2.6 – feasibility study, cost estimating If issued under framework of order no. 11 dated 19 January 2018 of Minister of Construction and Urban Development - ☒ 3T-3.1 or 3T-4.1 – Architecture, structure, internal organizational planning, design of building ☒ 3T-6.1 or 3T-7.1 – internal water supply, sewerage system, external branch line, related facility technological design of building ☒ 3T-6.2 or 3T-7.2 – internal heating supply, ventiliation system, external branch line, related facility technological design of building ☒ 3T-6.3 or 3T-7.3 – internal lighting, electrical supply system, external branch line, related facility technological design of building. Instrumentation and control, automation design of condominium, public and industrial building ☒ 3T-6.4 or 3T-7.4 – internal radio communication, fire and other alarm system, information system design, security system, related facility technological design, computer local area network and external branch line of building ☒ 3T-8.1 – external general plan, landscaping, topography design ☒ 3T-11.1 or 3T-11.2 – cost estimating of building civil works
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 63.7 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)	11.3
Architect	8.9
Structural Engineer	6.3
Heating, Ventilation and Air Conditioning Engineer	10.7
Electrical Engineer	7.9
Communication, Signaling, Information Engineer	4.6
Water and Sewerage Engineer	10.0
Cost Estimator	4.0
Total	**63.7**

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)	- 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	- 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	- 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	- 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	- 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	- 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	- 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	- 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.

Attachment no. 1

SCOPE OF SERVICES / DELIVERABLES
BAYANCHANDMANI 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, the Design in English) Hard Copy – 3 copies	- 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).	25
Deliverable 2 (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 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.	55
Deliverable 3 (Mongolian and English) Hard copy – 3	- 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).	85
Activity (Mongolian and English)	Assistance in preparing responses to requests for clarifications received from bidders.	
Construction Supervision: Architect, Structural Engineer, HVAC Engineer, Electrical Engineer, Communication Engineer, Water and Sewerage Engineer (6 persons); 6 engineers visit the site for three times (total 18 visits), the stages are: inception, foundation, 1st floor, hidden works, tests, preliminary commissioning, final commissioning.		
Deliverable 4 (Mongolian) Hard copy – 1	Construction supervision plan and quality check tools. Permission to commence the Works.	
Deliverable 5 (Mongolian)Hard	Construction supervision (both author and on behalf of client) to ensure that the construction works are carried out as specified in the	40% of civil works

copy – 1	works contract and document all critical elements throughout the construction.	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 Acceptance Certificate is issued
Deliverable 7 (Mongolian) – Hard copy 1	Defect Notice during warranty period	

Bayanchandmani Vocational Training and Production Center shall be hosting Assessment and Certification Center for Agricultural occupations. Occupations covered are:

1. Greenhouse Farmer
2. Vegetable Farmer
3. Wool & Cashmere Processing Technology Worker
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 - Master Plan of Bayanchandmani VTPC. The entire school complex was built in 1969. The project civil work activities will cover 4 existing buildings and facilities; and new construction works will be for one building and one facility.

1. A part of existing building shall be rehabilitated (Position 3a at Figure 1). It is a one/two story building with 18m x 90m size. Function: auto repar. The project investment will cover two rooms/halls #117 and 118 on the 1st floor (Figure 2). Refer to table below for tentative scope of rehabilitation works.

Table 1. Tentative scope of civil works

#	Shop Name	Min floor space m2	Required Rehabilitation Works
	Auto Mechanic Workshops		
1	Shop #118: Auto repair shop	540	The indoor electrical system shall be renewed for new equipment layout. Separate ventilation will be provided for some equipment.
2	Shop #117: Paint Mixing area, Paint Booth, Body Repair, Dry Sanding area, Car Wash area	108	To be provided: Water supply and sewage for car wash. Dedicated ventilation for paint booth and sanding area. Indoor rehabilitation works: construction of a new mezzanine floor, rehabilitation of indoor heating and electrical systems, painting of walls and ceiling, new thermo insulated door, etc. Separate locker for men and women.
	General Requirements		
3	Each shops' electrical wiring shall be installed in accordance with new equipment layout.		
4	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.
5	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.

2. A part of existing building shall be rehabilitated (Position 7a at Figure 1). The entire building is the one story building with 18m x 48 x 5.6m (h). Currently, only 18m x 12m part of building was used as a garage and remaining area used as storage. The building has connections to power, heating, water and sewage lines, but only garage heating is in working condition.
   The project shall use the area of 18m x 24m for allocation of required shops, labs and related facilities (Position 1 at Figure 3). Refer to below for tentative scope of rehabilitation works.

   - There shall be following shops and facilities: Storage for raw materials 15m2, Grading and Cleaning room 20m2, Washing, drying, hair separation, dyeing, re-orientation process shop 100m2, Yarning, knitting, linking process room 100m2, Storage for final products 15m2, Storage for equipment, tools, kits, etc. 15m2, Classroom 50m2, Teachers' office 10m2, Separate locker for men and women, separate restrooms for men and women.
   - The indoor electrical system shall be in line with the equipment layout; electrical wiring 220/380V.
   - General ventilation of the building, dedicated ventilation for some equipment will be provided.
   - The heating system of entire building will be re-calculated and renewed.
   - External heating, water and sewage, power and communication lines to be designed.
   - 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.

3. A new building shall be built (Position 14a at Figure 1). The building location will be in the school farm area with 8800m2 land, the farm is 200m far from the school area. The building will be multifunctional for serving the Greenhouse Farmer and Vegetable Farmer training needs. Refer to table below for spacing requirements to the new building.

Table 3. Preliminary Spacing Requirements for New Building

#	Shop Name	Min Floor Space m2	Requirements
	Multifunctional Building for Greenhouse Farmer and Vegetable Farmer (approximately 550m2)		
1	Classroom for Greenhouse and Vegetable Farmer	100	Includes area for 30 students (55m2) with internet, teachers (15m2), area for soil analyses (10m2) and seeding (20m2)
2	ACC room	60	Internet
3	Processing and packaging line for vegetables	120	Location shall be on the 1st floor; Shall have a separate space for washing and sorting; Shall have a separate storage spaces for raw materials and final products
4	Teachers' office	20	Internet
5	Storage for disinfecting and chemical materials	10	Location shall be on the 1st floor, shall have a separate access to outside
6	Storage for soil and fertilizer	14	Location shall be on the 1st floor, shall have a separate access to outside
7	Storage for tools and equipment	14	Location shall be on the 1st floor
8	Separate lockers for men and women		Location shall be on the 1st floor
9	Separate restrooms for		Location shall be on the 1st floor

	men and women		Shall have a shower
10	Watchman room	25	Location shall be on the 1st floor near the main entrance
	General works		
11	To be provided with all services such as, but not limited to: water, sewerage, heating, ventilation, electrical 220/380V, telecommunications including internet, CCTV, fire detection and alarm system. A new sewage treatment facility may be built for this building or this building be connected to the main sewage line of the school which is about 100 meters away.		

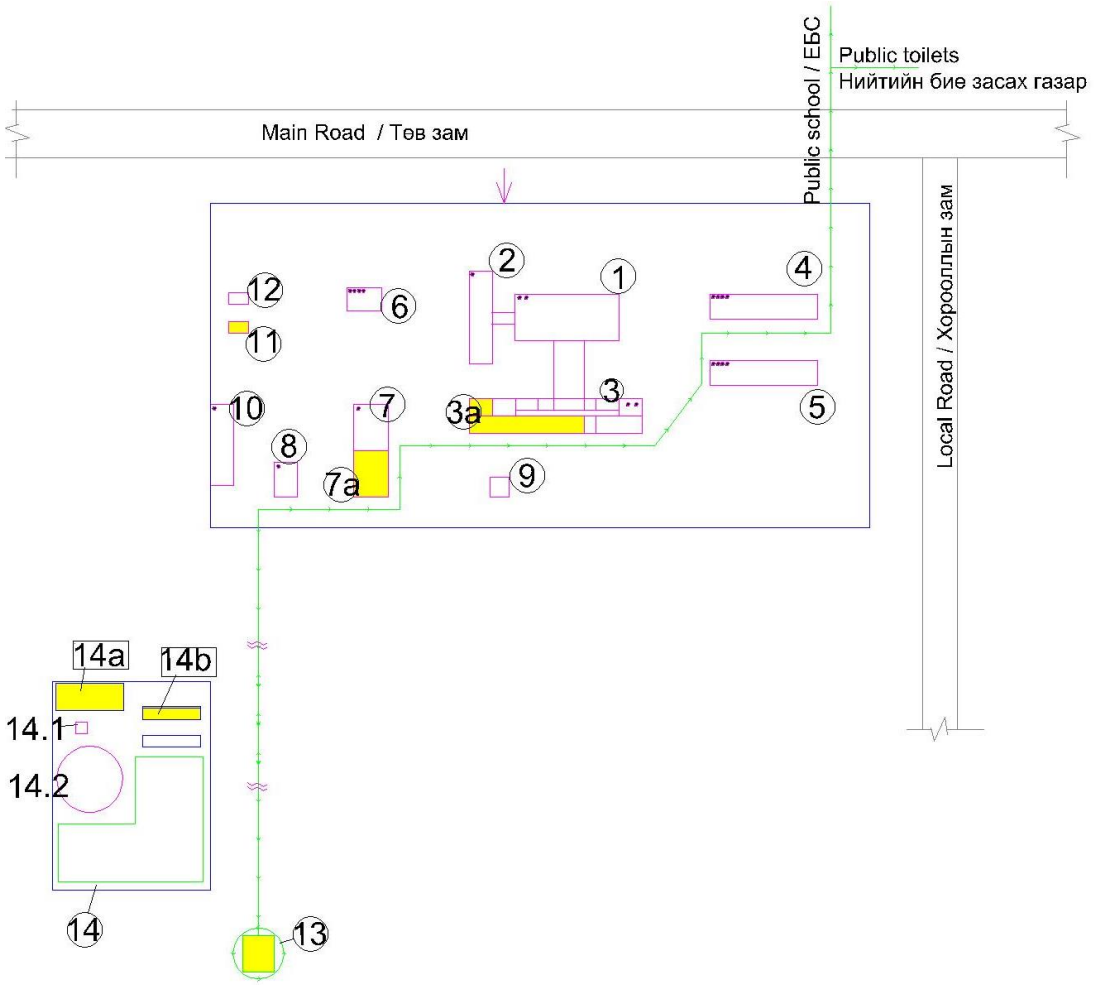
4. A new facility will be built (Position 14b at Figure 1) – A winter solar greenhouse with 6m x 30m (Pic 1.5) with a tambour with 6m x 3m shall be located in the school farm area:
   - The correct location and main structural parameters shall be calculated with regards of site specific geographical data.
   - Shall be a single-slope, energy-efficient solar greenhouse.
   - The rolling up and down of insulation blanket and ventilation vents are all automatic.
   - 1 ton water storage.
   - The design company shall design at this winter greenhouse all the measures to save heating costs during coldest winter times such as installation of wind turbine, solar panel, heat pump.
   - To be provided all services such as, but not limited to: water, heating, ventilation, electrical 220/380V.
   - Tambour shall have heating.
   - Tambour 6m x 3 m about.
   - The nearest heating line to this area is located inside of the water well building in Position 14.1 at Figure1. The new multifunctional building and the new greenhouse shall be heated from this heating line. The design company shall calculate the total amount of heating load supply for water well building (Position 14.1 at Figure 1), new multifunctional building (Position 14a at Figure 1) and winter solar greenhouse (Position 14b at Figure1) against existing heating line capacity; and if necessary shall do its' expansion.

5. An existing facility shall be rehabilitated (Position 11 at Figure 1). It is a vegetable storage facility which was built in 1969 and still in use for keeping food supplies at controlled environment /Pic 1.1/. Vegetable storage facility capacity – 60tn;
   - Improvement of current ventilation.
   - Rehabilitation of floor and roof elements.
   - Replacement of door with thermo insulated one.
   - Shall have an adequate heating device.
   - Shall have a tambour for reducing of heat loss.
   - Electrical 220/380V and lighting.

6. An existing facility shall be rehabilitated (Position 13 on Figure 1). It is a sewage treatment facility which was built in 1969 and serves all buildings of VTPC and one local public school (Pic 1.2-1.4). The current facility capacity is approximately 130m3. Following rehabilitation works shall be required:
   - Re-building of protective shield above the sewage treatment basin,
   - Re-building of discharging pipes (picture 1.3),
   - Re-building of a final sand filtration facility (picture 1.3),
   - All works shall be defined by the design company sewage engineer.

7. Landscaping
   - Landscaping works will be done around the new multifunctional building in a farm area /Position 14A at Figure 1/.

FIGURE 1. MASTER PLAN
ЗУРАГ 1. ЕРӨНХИЙ ТӨЛӨВЛӨГӨӨ



NOTE:	**ТАЙЛБАР:**
1. Administration	1. Захиргааны барилга
2. Classroom building	2. Хичээлийн байр
3. **Project Intervention** – Repair – Auto mechanic 3a – Auto repair – to be repaired	3. **Төслийн хөрөнгө оруулалт** – Засвар – Авто машины засварчин 3а – Авто засвар – засварлах хэсэг
4. Dormitory #1	4. Оюутны дотуур байр №1
5. Dormitory #2	5. Оюутны дотуур байр №2
6. Apartment for school staff	6. Багш, ажилчдын байр
7. **Project Intervention** – Repair – Wool & cashmere technology worker workshop 7a – to become shop for wool and cashmere, to be repiared	7. **Төслийн хөрөнгө оруулалт** – Засвар – Ноос, ноолуур боловсруулалтын технологийн ажилтны дадлагын байр 7а – ноос ноолуурын дадлагын газар болгож засварлана
8. Garage	8. Жижиг гараж
9. Power station	9. Цахилгааны дэд өртөө
10. Heating station	10. Уурын зуух
11. **Project Intervention** – Repair – Vegetable storage	11. **Төслийн хөрөнгө оруулалт** – Засвар – Зоорь
12. Vegetable storage /remains/	12. Зоорь /нурсан балгас/
13. **Project Intervention** – Repair – Sewage treatment facility	13. **Төслийн хөрөнгө оруулалт** – Засвар – Цэвэрлэх байгууламж
14. Farm area	

14.1 Water supply facility with two deep water wells 14.2 Underground water reservoir **14a Project Intervention** – New – Greenhouse and vegetable farmer's educational building **14b Project Intervention** – New – Winter solar greenhouse	14. Фермерийн ангийн талбай 14.1 Усан хангамжийн барилга, 2ш гүний худагтай 14.2 Газар доорх усан сан **14a Төслийн хөрөнгө оруулалт** – Шинэ –Хүлэмжийн аж ахуй ба Хүнсний ногооны фермерийн ангийн барилга **14b Төслийн хөрөнгө оруулалт** – Шинэ –Өвлийн нарлаг хүлэмж

FIGURE 2. WORKSHOP
ЗУРАГ 2. ДАДЛАГЫН БАЙР

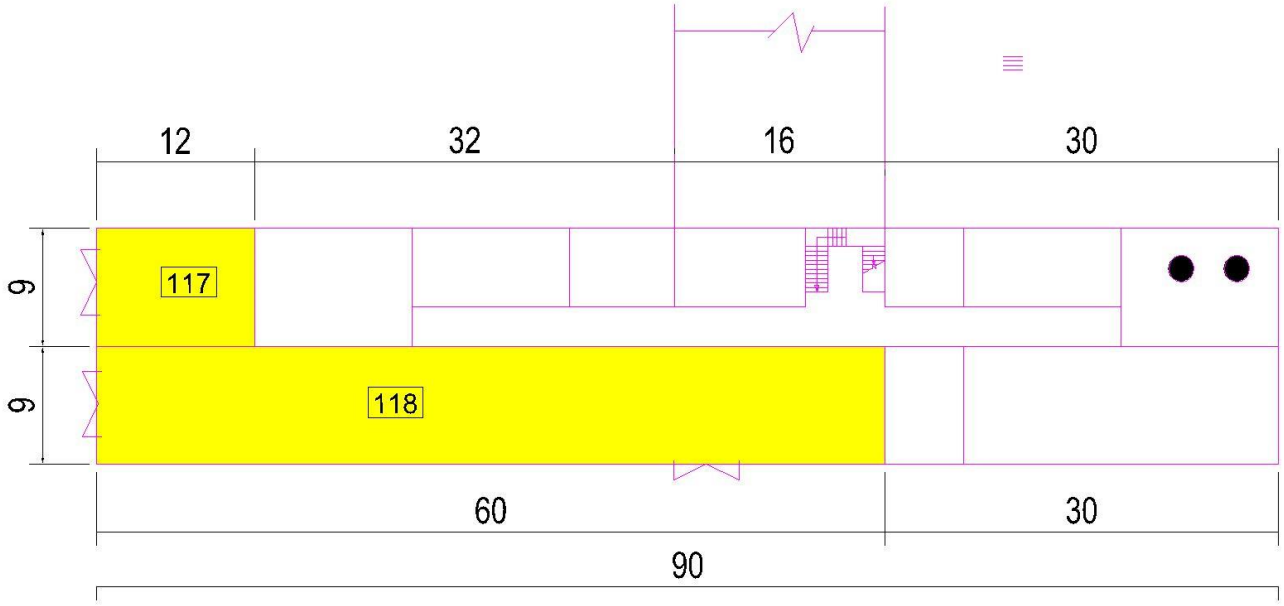
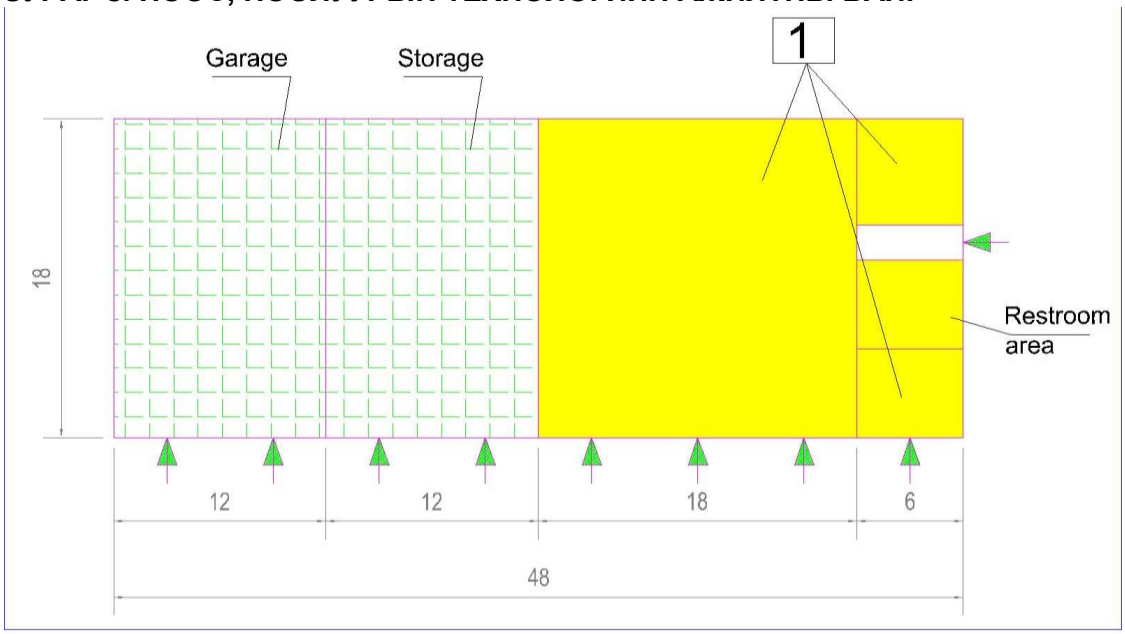


FIGURE 3. WOOL & CASHMERE TECHNOLOGY WORKER SHOPS
ЗУРАГ 3. НООС, НООЛУУРЫН ТЕХНОЛОГИЙН АЖИЛТНЫ БАЙР



PICTURE 1
ЗУРАГ 1

Pic 1.1 Vegetable storage / Зоорь

Pic 1.2 Protective shield above the sewage pit / Цэвэрлэх байгууламж дээрх хамгаалалт 2018.04.16

Pic 1.3 Sewage facility, a protective shield was damaged by strong wind, so it was demolished / Цэвэрлэх байгууламжийн дээрх хамгаалалт салхинаар нурсан тул буулгасан 2018.06.03

Pic 1.4 Temporary protective fencing around the sewage pit / Цэвэрлэх байгууламжийн түр хашлага 2018.06.16

Pic 1.5 Winter solar greenhouse / Өвлийн нарлаг хүлэмж

Attachment no. 2

SCOPE OF SERVICES / DELIVERABLES
BULGAN 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, the Design in English) Hard Copy – 3 copies	- Measurement drawings for project buildings and utility lines. Topo mapping for winter solar greenhouse and the related engineering lines, 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	- 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.	90
Deliverable 3 (Mongolian and English) Hard copy – 3	- 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: 3 engineers visit the site 3 times for 3 days for each visit (total 9 visits, 27 days), and the stages are: the stages are: 30% of civil works achieved, 70% of civil works achieved, hidden works, tests, preliminary commissioning, 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.	70% of civil works achieved
Deliverable 6	Construction supervision (both author and on behalf of client) to	Final

(Mongolian)Hard copy – 1	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.	Acceptance Certificate is issued
Deliverable 7 (Mongolian) – Hard copy 1	Defect Notice during warranty period.	

DETAILED SCOPE OF SERVICES

Bulgan Agricultural Vocational and Training Production Center shall receive the project investment for following occupations:

1. Veterinary technician
2. Farmer, greenhouse
3. Farmer, vegetable

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.

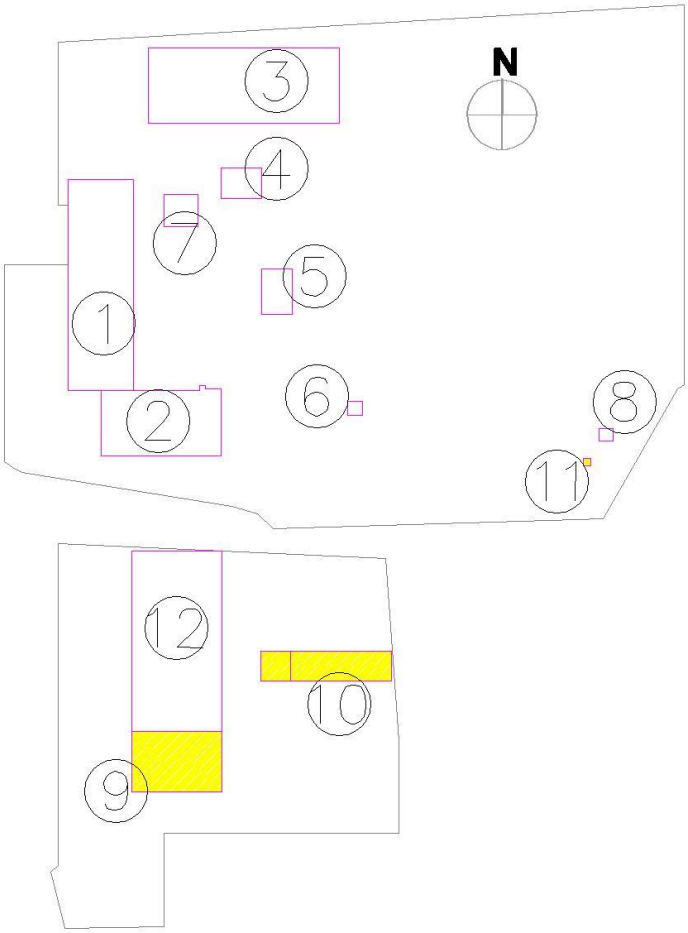
Figure 1 - Master Plan of Bulgan aimag Agricultural VTPC. The school complex is located in Rashaant 4th bag of aimag center; it has own water well and heating boilers; and sewage tank. The biggest challenge facing the school is the lack of classrooms or adequate space. The whole academic and training activities are functioning in the two-story building with 12m x 42m size, although the school cannot use bigger size two buildings due to shortage of funding, one is a two-story building with 12m x 18m and other is a garage 18m x 37m. The project is aiming to rehabilitate the two-story 12m x 18m size building.

1. A new facility will be built (Position 10 at Figure 1). – A winter solar greenhouse with 7m or 6m x 20m, will be located in the school area. The design firm shall use the full detailed engineering drawings of the winter solar greenhouse of Bayanchandmani VTPC prepared by them. The external heating, power supply and water supply drawings shall be made; a tambour size might be changed from tambour size of Bayanchandmani VTPC.

2. An existing building shall be rehabilitated (Position 9 at Figure 1, Figure 2 and Pic 2.1). It is a two-story building with brick walls and flat roof; the building size is 12m x 18m. The building shall allocate the Veterinary technician labs and classrooms, greenhouse and vegetable farmers' classrooms.
    - The classroom and laboratory layout – see Figure 2
    - Veterinary examination and Veterinary laboratory rooms shall have water supply and sewage.
    - The sewage from the Veterinary examination and Veterinary laboratory rooms shall have mechanical pre-treatment system before reaching the central sewage line.
    - Separate restrooms for men and women.
    - Shower on the 1st floor.
    - 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.
    - Telecommunications including internet, fire detection and alarm system, CCTV, intruder signaling etc.
    - External heating, water and sewage, power and communication lines to be designed.
    - Sewage tank with 50tn capacity shall be rehabilitated.

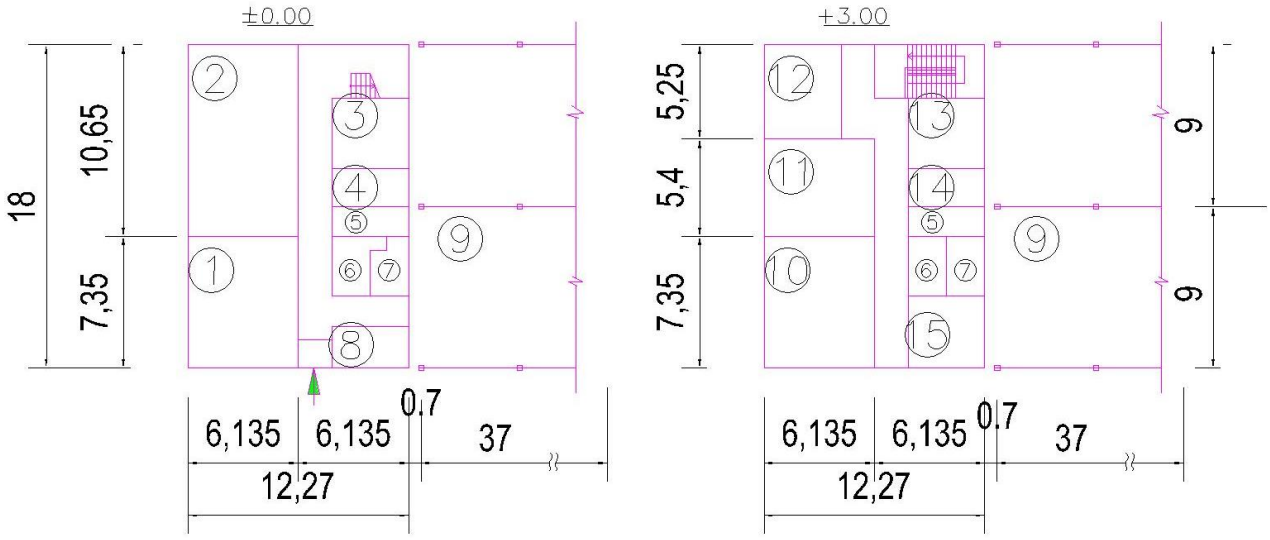
3. A new facility shall be built (Position 11 at Figure 1). – An incineration area – it shall be a concrete slab on the ground with 1.5m x 1.5m size which will be used as a basement for portable incineration iron box with approximately 0.125m3 (to make a fire for destroying of veterinary waste).

FIGURE 1. MASTER PLAN
ЗУРАГ 1. ЕРӨНХИЙ ТӨЛӨВЛӨГӨӨ



NOTE:	**ТАЙЛБАР:**
1. Classroom building, canteen	1. Хичээлийн байр, гал тогоо
2. Dormitory	2. Дотуур байр
3. Sport hall	3. Спорт заал
4. Dairy processing workshop	4. Сүү, сүү бүтээгдэхүүний дадлагын байр
5. Heating boiler	5. Халаалтын зуух
6. Deep water well building	6. Гүний худгын барилга
7. Sewage tank	7. Бохирын цооног
8. Trash point	8. Хогийн цэг
9. **Project Intervention** – Repair – Veterinary technician, Farmer greenhouse and vegetable	9. **Төслийн хөрөнгө оруулалт** – Засвар – Малын бага эмч, Хүлэмж болон хүнсний ногооны фермерийн анги
10. **Project Intervention** – New – Winter solar greenhouse with tambour	10. **Төслийн хөрөнгө оруулалт** – Шинэ – Өвлийн нарлаг хүлэмж
11. **Project Intervention** – New – Incineration area	11. **Төслийн хөрөнгө оруулалт** – Засвар – Хог хаягдал, халдваргүйжүүлэлтийн хэсэг
12. Garage /needs repairing/	12. Гараж /засвар шаардлагатай/

FIGURE 2. WORKSHOP 1st and 2nd FLOOR LAYOUT
ЗУРАГ 2. ДАДЛАГЫН БАЙР 1 БА 2 ДАВХРЫН БАЙГУУЛАЛТ



NOTE:
1. Veterinary examination room /40.4m2/
2. Veterinary laboratory /58.0m2/
3. Storage for laboratory tools and kits /14.9m2/
4. Storage for veterinary examination tools /8.4m2/
5. Restroom area
6. Restroom area
7. Restroom area
8. Preparation room /8.7m2/
9. Garage /not used, needs a rehabilitation/
10. Veterinary technician classroom /40.4m2/
11. Greenhouse farmer classroom /29.6m2/
12. Vegetable farmer classroom /21.0m2/
13. Storage for Vegetable farmer /14.9m2/
14. Storage for Greenhouse farmer /7.5m2/
15. Teachers office /17.7m2/

ТАЙЛБАР:
1. Малын бага эмчийн үзлэгийн өрөө /40.4м2/
2. Малын бага эмчийн лаборатори /58.0м2/
3. Лабораторийн агуулах /14.9м2/
4. Үзлэгийн өрөөний агуулах /8.4м2/
5. Ариун цэврийн өрөө
6. Ариун цэврийн өрөө
7. Ариун цэврийн өрөө
8. Малын бага эмчийн бэлтгэлийн өрөө /8.7м2/
9. Гараж /ашиглалтгүй, засах шаардлагатай/
10. Малын бага эмчийн онолын анги /40.4м2/
11. Хүлэмжийн фермерийн онолын анги /29.6м2/
12. Хүнсний ногооны фермерийн онолын анги /21.0м2/
13. Хүнсний ногооны фермерийн ангийн агуулах /14.9м2/
14. Хүлэмжийн фермерийн ангийн агуулах /7.5м2/
15. Багшийн өрөө /17.7м2/

PICTURE 2.1
ЗУРАГ 2.1

Pic 2.1 Workshop for rehabilitation / Засвар хийх дадлагын байр

Attachment no. 3

SCOPE OF SERVICES / DELIVERABLES
ZUUNKHARAA POLYTECHNIC COLLEGE, SELENGE AIMAG

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	- 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).	90
Deliverable 2 (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.	120
Deliverable 3 (Mongolian and English) Hard copy – 3	- 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).	150
Activity (Mongolian and English)	Assistance in preparing responses to requests for clarifications received from bidders.	
Construction Supervision: 5 engineers visit the site for 2 times for 1 day for each visit (total 10 visits, 10 days), and the stages are: 40% of civil works achieved, hidden work, preliminary commissioning, 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.	40% of civil works achieved
Deliverable 6 (Mongolian)Hard	Construction supervision (both author and on behalf of client) to ensure that the construction works are carried out as specified in	Final Acceptance

copy – 1	the works contract and document all critical elements throughout the construction. Assistance in accepting the Works through the Acceptance Commission.	Certificate is issued
Deliverable 7 (Mongolian) – Hard copy 1	Defect Notice during warranty period	

DETAILED SCOPE OF SERVICES

Zuunkharaa Polytechnic College, Selenge aimag shall receive the project investment for following occupations:

1. Farmer, greenhouse
2. Farmer, vegetable

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 Zuunkharaa PC. The project investment will refer to three (3) separate facilities: the main school building, classroom building A (Position 2 at Figure 1), Girls' dormitory area (Position 4 at Figure 1) and Agro park area with 1600m2 land (2.6 km far from a school).

The classroom building A and girls dormitory are connected to the soum central power grid, heating and water supply systems; but their waste water system is connected to school's sewage tank, from which waste is pumped and transported to the soum sewage treatment facility.

The agro park building is connected to the central power grid and water supply is from own water well; there is a small sewage tank.

1. A part of existing building shall be rehabilitated (Position 2a at Figure 1). It is a three story building with 23m x 46m size. A classroom for two occupations (Greenhouse farmer and Vegetable farmer) and a restroom are located on the 3rd floor.
   Classroom (72m2):
   - Includes area for 30 students (52m2), area for soil analyses (10m2) and seeding (10m2).
   - The shop's electrical wiring shall be installed in accordance with new equipment layout 220/380V.
   - Ventilation.

   Restroom area (36m2):
   - Separate for men and women;
   - New tile, partition walls, doors, windows, painting of walls and ceiling, etc.

2. A new facility will be built (Position 4a at Figure 1 and Pic 1.5 at Page 13). – A winter solar greenhouse with a tambour (7m or 6m x 20m) shall be located in the school area, near the girls dormitory. The design firm shall use the full detailed engineering drawings of the winter solar greenhouse of Bulgan VTPC prepared by them. The external heating, power supply and water supply drawings shall be made.

3. A new facility shall be built (Position 9 at Figure 2) – A vegetable storage facility shall be built in the school agro park area.
   Vegetable storage facility:
   - Capacity – 60tn.
   - The location shall be précised during design development.
   - Shall have proper ventilation and electrical lighting.
   - Shall have an adequate heating device (220/380).

Tambour:

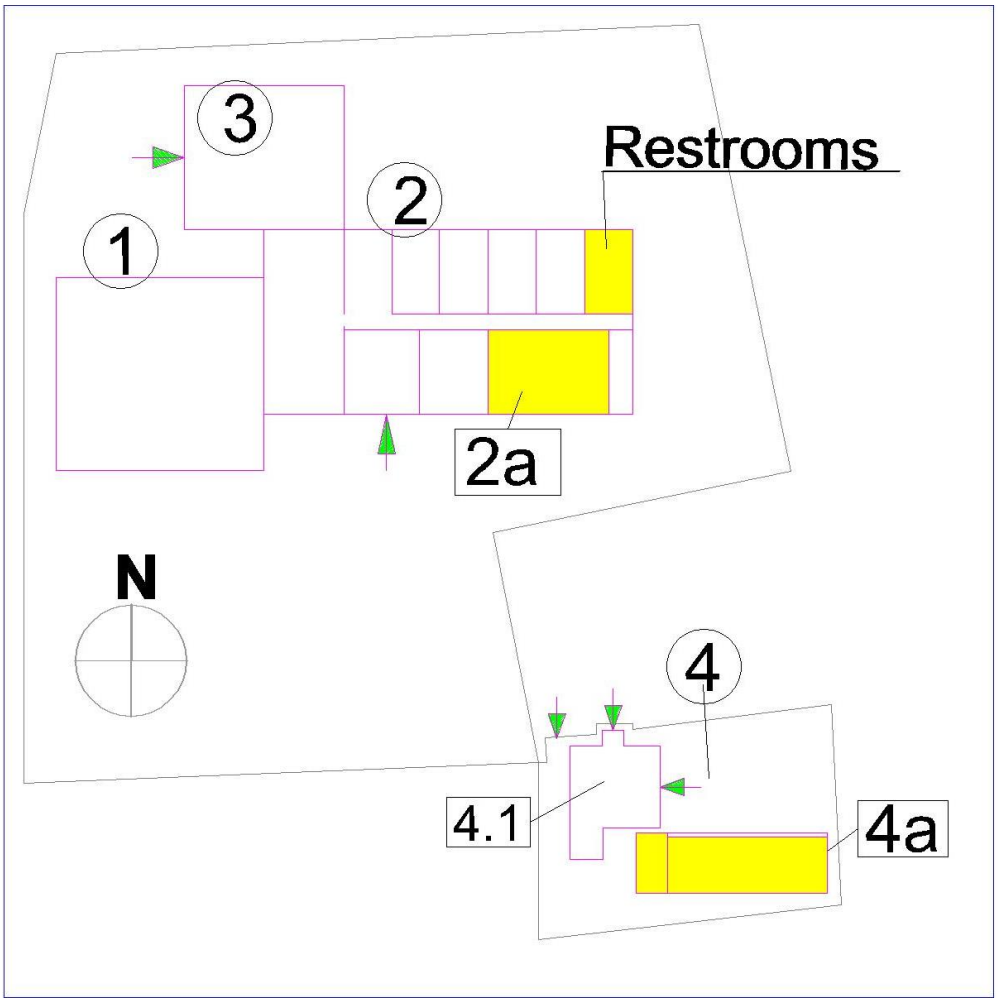
- Shall have function of a wind lock

4. Existing facilities shall be rehabilitated (Position 1, 2, 3, 4, 5, 6, 8, 10 on Figure 2). All these facilities are located in the school Agricultural park area. Refer to table below for tentative scope of rehabilitation works.

Table 3. Tentative scope of civil works

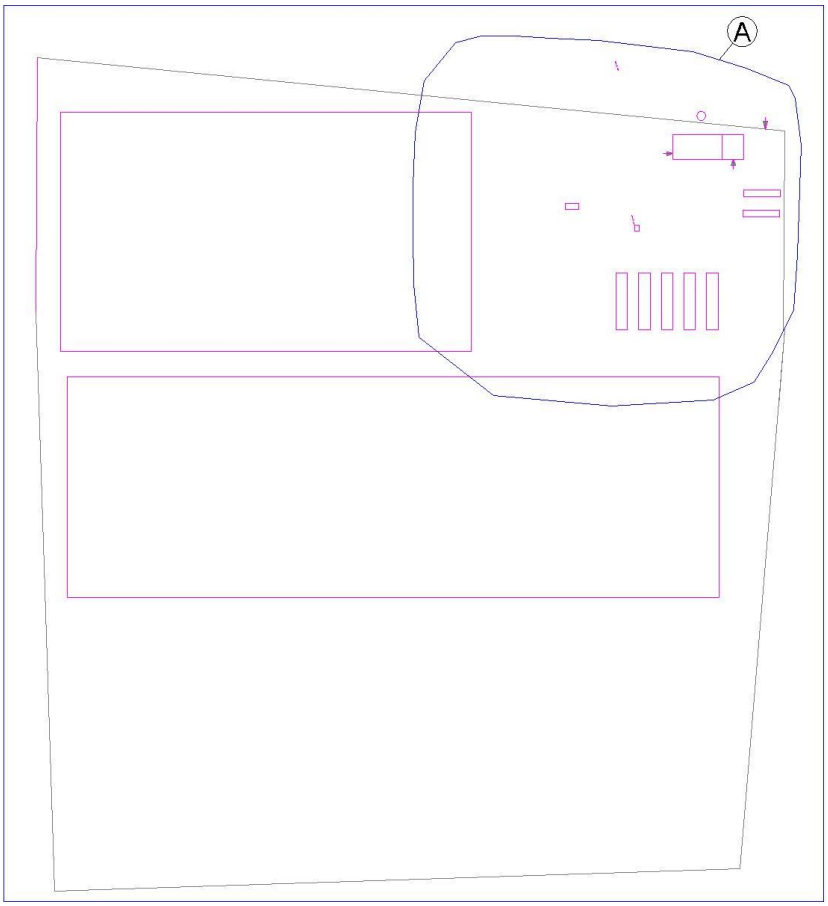
#	Shop Name	Space Req m2	Required Civil Works
	Greenhouse farmer and Vegetable farmer training area /Agricultural park/		
1	Multifunctional building, two story building (Position 1)	169*2	- Roof joint area shall be rehabilitated - Separate restrooms for women and men shall be restored
2	Garage (Position 2)	169	
3	Water well (Position 3)	12	- The water well building shall be repaired, including: installation of a water collector and its heating, new door and windows.
4	Sewage tank (Position 4)		- The tank shall be rehabilitated. It can be septic one, if related regulations and construction codes allow.
5	Power supply cables (Position 5)	160m	- The existing overhead power line between the grid to this area is dilapidated. Make this cabling underground (160m). - Install main power distribution box in the multifunctional building. - The power distribution box for watering of greenhouse and field shall be built (70m); and from that box electrical cables to 5 greenhouses and 2 vegetable fields shall be installed (700m). - An electrical lighting box shall be installed near the multifunctional building for lighting of building entry, parking and storage containers area (200m).
6	Parking area, walkway (Position 10)	300m2 600m	- A concrete apron with kerb and signage shall be built near the main gate. - A walkway with kerb and signage a from parking area to the multifunctional building, from this building to the greenhouses shall be built (600m length, 1.0m width).
7	Water reservoir /new/	30 ton	- Above ground location – shall be précised during design development. - Shall have appropriate foundation with proper elevation.

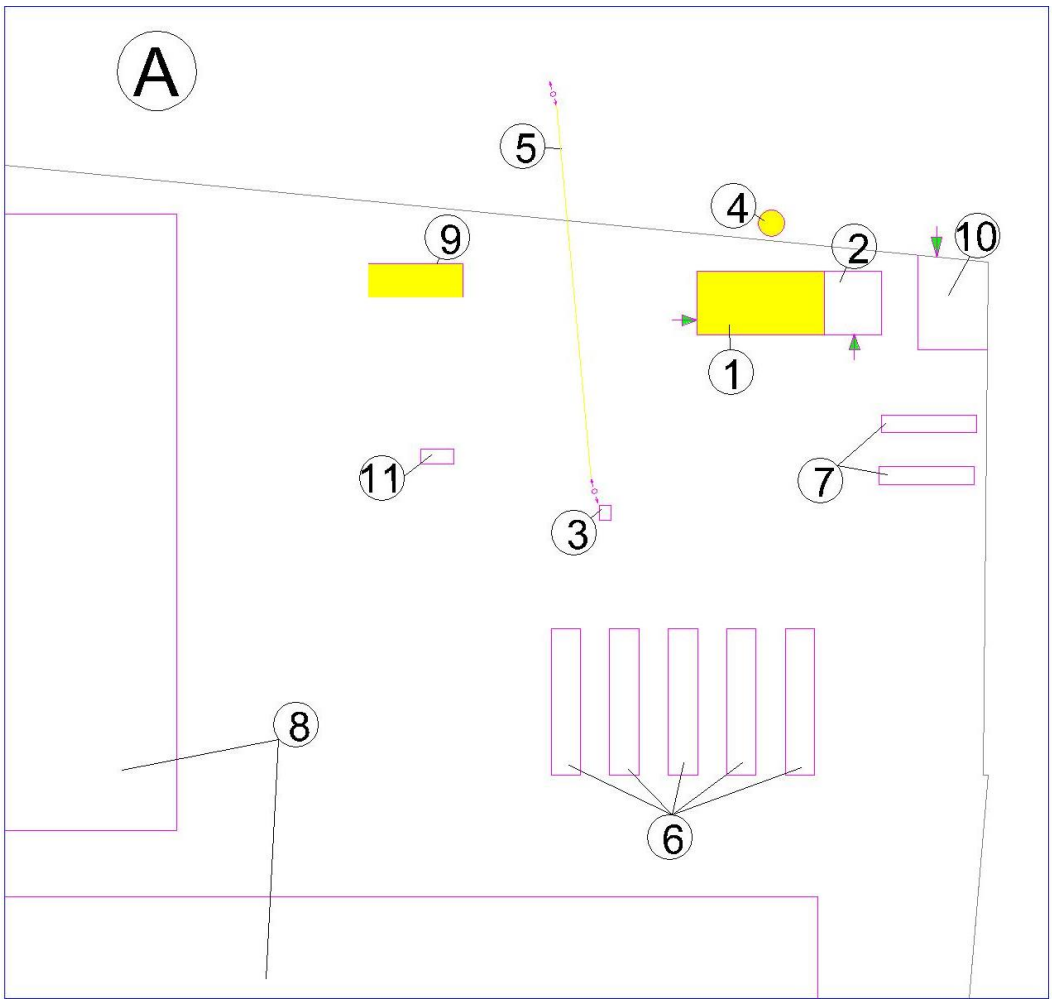
FIGURE 1. MASTER PLAN OF SCHOOL AREA
ЗУРАГ 1. СУРГУУЛИЙН ЕРӨНХИЙ ТӨЛӨВЛӨГӨӨ



NOTE:	**ТАЙЛБАР:**
1. Classroom building B	1. Хичээлийн Б байр
2. **Project Intervention** – Repair – Classroom building A	2. Төслийн хөрөнгө оруулалт – Засвар – Хичээлийн А байр
3. Dormitory (boys')	3. Хөвгүүдийн дотуур байр
4. Dormitory (girls') area	4. Охидын дотуур байрны хашаа
4.1 Dormitory (girls')	4.1 Охидын дотуур байр
4a. **Project Intervention** – New – Winter solar greenhouse	4a. **Төслийн хөрөнгө оруулалт** – Шинэ – Өвлийн нарлаг хүлэмж

FIGURE 2. MASTER PLAN OF AGRO PARK
ЗУРАГ 2. АГРОПАРКИЙН ЕРӨНХИЙ ТӨЛӨВЛӨГӨӨ





NOTE:	**ТАЙЛБАР:**
1. **Project Intervention** – Repair – Multifunctional building	1. **Төслийн хөрөнгө оруулалт – Засвар –** Сургалт, аж ахуйн барилга
2. Garage	2. Гараж
3. **Project Intervention** – Repair – Deep water well	3. **Төслийн хөрөнгө оруулалт – Засвар –** Гүний худаг
4. **Project Intervention** – Repair – Sewage tank	4. **Төслийн хөрөнгө оруулалт – Засвар –** Бохирын сорууллдаг цооног
5. **Project Intervention** – New – Power supply underground cable	5. **Төслийн хөрөнгө оруулалт – Шинэ –** Цахилгаан хангамжийн газар доорх кабель
6. Greenhouse	6. Хүлэмж
7. Warehouse (containers)	7. Агуулах – 2ш контейнер
8. Vegetable field	8. Ногоо тарих талбай
9. **Project Intervention** – New – Vegetable storage facility	9. **Төслийн хөрөнгө оруулалт – Шинэ –** Ногооны зоорь
10. **Project Intervention** – New – Parking area	10. **Төслийн хөрөнгө оруулалт – Шинэ –** Авто машины зогсоол
11. Water storage facility	11. Усан сан

Attachment no. 4

SCOPE OF SERVICES / DELIVERABLES
KHUGJIL POLYTECHNIC COLLEGE, KHOVD AIMAG

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	- Measurement drawings for project buildings and utility lines. Topo mapping (for new winter greenhouse and the related engineering lines), 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).	90
Deliverable 2 (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.	110
Deliverable 3 (Mongolian and English) Hard copy – 3	- 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).	130
Activity (Mongolian and English)	Assistance in preparing responses to requests for clarifications received from bidders.	
Construction Supervision: 2 engineers visit the site 2 times, 4 engineers visit the site once for 3 days for each visit (total 8 visits, 24 days), and the stages are: 40% 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.	40% of civil works achieved
Deliverable 6 (Mongolian)Hard	Construction supervision (both author and on behalf of client) to ensure that the construction works are carried out as specified in	Final Acceptance

copy – 1	the works contract and document all critical elements throughout the construction. Assistance in accepting the Works through the Acceptance Commission.	Certificate is issued
Deliverable 7 (Mongolian) – Hard copy 1	Defect Notice during warranty period	

DETAILED SCOPE OF SERVICES

Khugjil Polytechnic College, Khovd aimag shall receive the project investment for following occupations:

1. Farmer, greenhouse
2. Farmer, vegetable
3. Cashmere & wool production technology worker

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.

The college properties has locations in three separate sites of Khovd aimag center, but the project investment will related to the school building #3 area, where the Wool & Cashmere Processing Technology Worker shops and a winter solar greenhouse will be placed (Figure 1). All existing buildings are connected to the central power grid, heating and water supply, and sewage systems.

Also, the college has 5 agricultural parks in separate locations, but the project will deal with the only one farm near the airport, where a vegetable storage facility and the power supply line/facility shall be built (Figure 2).

1. A part of existing building shall be rehabilitated (Position 1a at Figure 1). It is a classroom building #3 with two stories. The 200m2 area on the 1st floor shall be allocated for the new occupation - Wool & Cashmere Processing Technology Worker. Minor finishing works, some water supply and sewage connection shall be introduced in 1 or 2 rooms, ventilation, electrical works 220/380V to match equipment locations, increase load bearing capacity of floor that shall be under new equipment. Propose solution on how to bring the new equipment inside as the doors and windows and corridor is narrow.

2. A new facility will be built (Position 6 at Figure 1 and Pic 1.5 of Attachment 1). A winter solar greenhouse /7m x 20m/ with tambour /6m x 6m/ shall be located in the school area; the design consultant based on more detailed technical data shall choose the exact location of one greenhouse from proposed two ones. The design firm shall use the full detailed engineering drawings of a winter solar greenhouse for Bulgan aimag VTPC or Zuunkharaa College prepared by them. The external heating, power supply and water supply drawings shall be made.

3. A new facility shall be built in the school agricultural park area (Figure 2) – It is a vegetable storage facility located in the agricultural park.

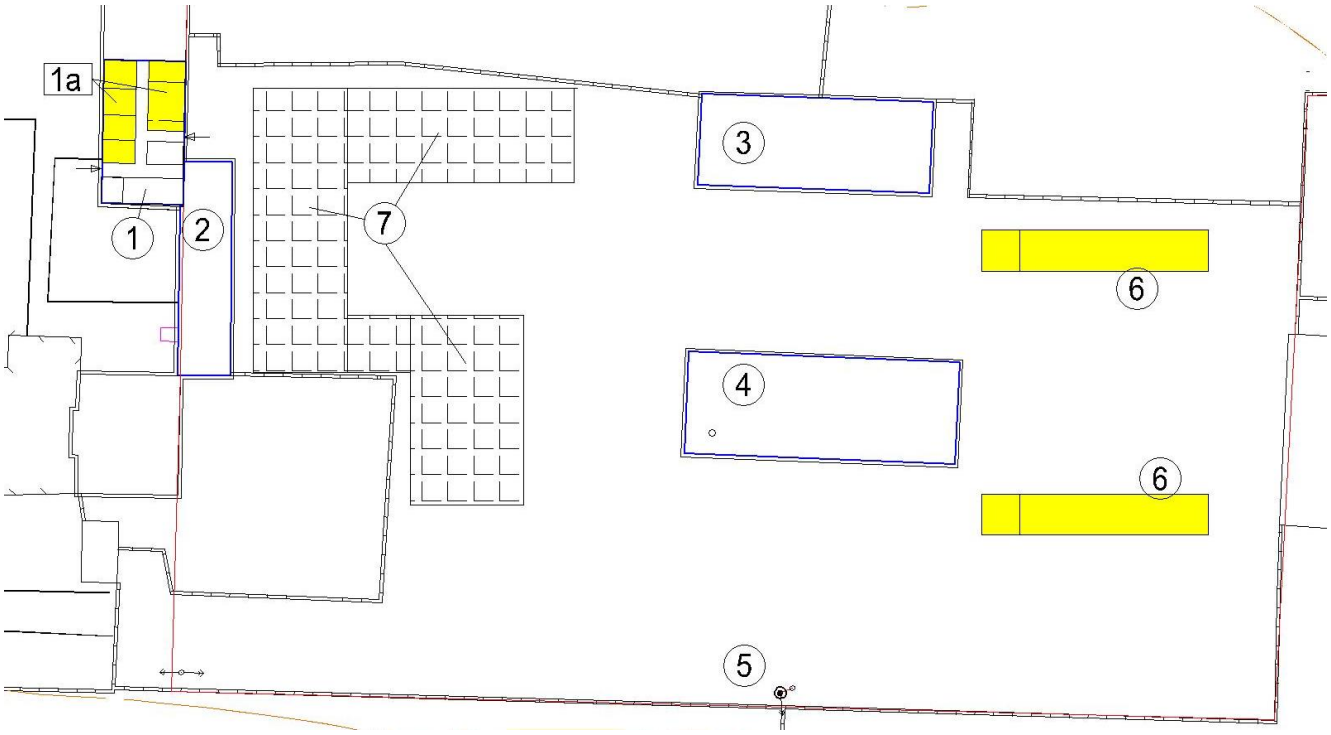
4. Some civil works shall be done at the agricultural park area.

Table 3. Tentative scope of civil works

#	Facility Name	Capacity	Required Rehabilitation Works
1	Power line, and transformer if necessary	About 100 meters	New power line shall be provided. Hook up location shall be defined by the local authority and design consultant Transformer if necessary

2	Two house type about 40 foot containers		Function: classroom, cloth changing room and storage, rest area, connected to electricity. Shall have lighting. Location shall be defined by the design consultant.
3	Water well		New water well shall be made. Water shall be pumped by electric pump. Shall have a building above the borehole, if necessary.
4	Water reservoir /new/	30 ton	Above ground location – shall be précised during design development; Shall have appropriate foundation with proper elevation.

FIGURE 1. MASTER PLAN of SCHOOL SITE #3
ЗУРАГ 1. ХИЧЭЭЛИЙН 3-Р БАЙРНЫ ЕРӨНХИЙ ТӨЛӨВЛӨГӨӨ



NOTE:

1. **Project Intervention** – Repair – Classroom building #3 – Wool & cashmere technology worker shops and labs
2. Cultural center /to be demolished/
3. Workshop
4. Workshop
5. Power sub – station
6. **Project Intervention** – New – A winter solar greenhouse with a tambour /a location shall be defined by the design consultant/.
7. New building /planned by others/

ТАЙЛБАР:

1. **Төслийн хөрөнгө оруулалт** – Засвар – Хичээлийн 2-р байр – Ноос, ноолуур боловсруулалтын технологийн ажилтны дадлагын байр
2. Соёлын төв /буулгахаар төлөвлөж байгаа/
3. Дадлагын байр
4. Дадлагын байр
5. Цахилгааны дэд өртөө
6. **Төслийн хөрөнгө оруулалт** – Шинэ – Өвлийн нарлаг хүлэмж, гонхын хамт /байршлыг зураг зөвлөх тодруулна/. Нэг ширхэг өвлийн хүлэмж байна.
7. Сургуулийн шинэ барилга /төлөвлөгдсөн, өөр хөрөнгө оруулалтаар шийдэгдэнэ/

FIGURE 2. AGROPARK LOCATION
ЗУРАГ 2. АГРОПАРКИЙН БАЙРШИЛ

Attachment no. 5

SCOPE OF SERVICES / DELIVERABLES
KHUVSGUL 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, the Design in English) Hard Copy – 3 copies	- Architectural Conceptual preliminary design of a new building. - 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).	40
Deliverable 2 (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 3 (Mongolian and English) Hard copy – 3	- 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).	110
Activity (Mongolian and English)	Assistance in preparing responses to requests for clarifications received from bidders.	
Construction Supervision: 6 engineers visit the site 3 times for 2 days for each visit (total 18 visits, 36 days), and the stages are: inception, hidden works, 40% of civil works achieved, preliminary commissioning, 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.	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 Acceptance Certificate is issued
Deliverable 7 (Mongolian) – Hard copy 1	Defect Notice during warranty period	

DETAILED SCOPE OF SERVICES

Khuvsgul Vocational and Training Production Center shall receive the project investment for following occupations:

1. Farmer, greenhouse
2. Farmer, vegetable
3. Forestry

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 Khuvsgul VTPC. The school complex is located in 6th bag of the aimag center. All buildings are connected to the central power grid and aimag heating supply. The school has own deep water well, only 2 buildings are connected to water.

A new building will be built and some rehabilitation works of sewage tank and dormitory restrooms shall be made in the school area. Also, the school owns the 15 hectare land 11km far from the school in Tunel soum. The land purpose is agricultural park for growing of vegetables.

1. A new building shall be built (Position 22 at Figure 1). The new building shall allocate the Forestry worker, vegetable and greenhouse farmer workshops, classrooms, laboratories and other supporting rooms.
    - It shall be one story building with a total area of 850m2 approximately.
    - There shall be three sections for each of occupations; each section shall have following shops and facilities: workshop 110m2, classroom 60m2, laboratory 15m2, cloth changing room for girls and boys separate each 15m2, tools storage 10m2.
    - 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.
    - Telecommunications including internet, fire detection and alarm system, CCTV, intruder signaling etc.
    - External power, heating, water supply, sewage and communication lines to be designed.
    - Existing sewage tank with approximate size of 80m3 is filled with dirt and earth. This tank shall be emptied and restored.

2. A new facility will be built (Position 23 at Figure 1). – A winter solar greenhouse with 6m x 30m with tambour 6m x 3m. The design firm shall use the full detailed engineering drawings of a winter solar greenhouse for Bayanchandmani VTPC, Tuv aimag prepared by them. The external heating, power supply and water supply drawings shall be made; a tambour size might be changed.

3. A part of existing facility shall be rehabilitated (Position 16a at Figure1 and Pic 1.1) – A vegetable storage facility has a timber structure and its capacity is 50tn.
    - Roof and some structure elements shall be rehabilitated.

- Doors shall be changed and thermo insulated.
- Shall have proper ventilation.
- Shall have adequate lighting and electrical wiring (220/380).
- Shall have an adequate heating device.
- Shall have fully functional wind lock area.

4. A part of existing building shall be rehabilitated (Position 2a at Figure 1 and Pic 1.2). It is a dormitory building with 3 stories; there are a canteen, medical room and 4 classrooms on the 1st floor, 2nd and 3rd for dormitory purpose.
    - Rehabilitate separate male and female restrooms in each of three floors, total 55m2.
    - Establish a shower and laundry room on the 1st floor, total 35m2.
    - The sewage tank restored under item 1 above shall be used for dormitory sanitation facilities.

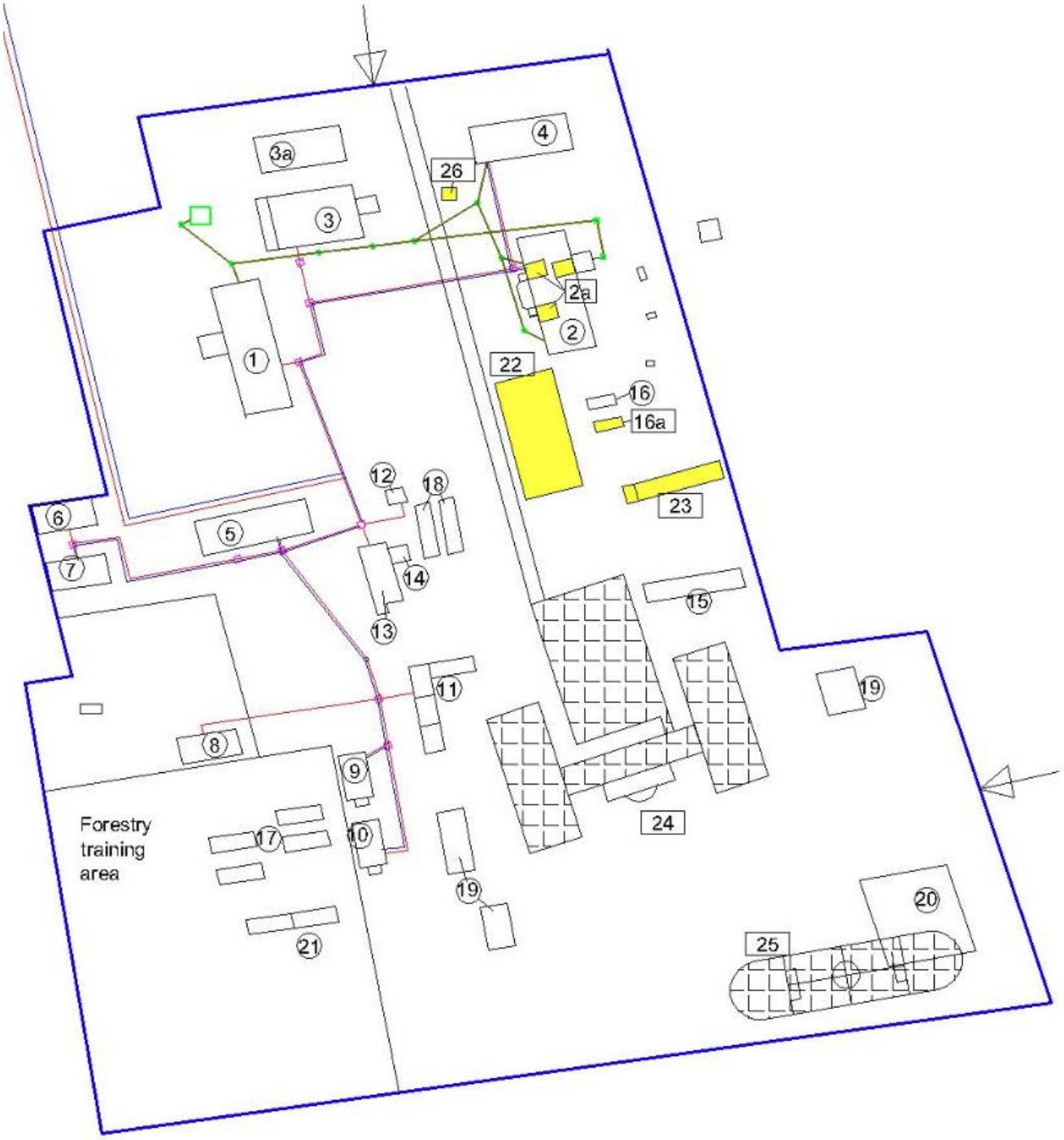
5. The entire school area /83000m2 land/ shall be covered by lighting and CCTV, which shall be controllable and monitorable at the dispatch center located in dormitory building under position 2 at Figure 1. The location and number of CCTV camera and lighting poles shall be decided by in consultation of design firm and school.

6. Some civil works shall be done at the agricultural park area as follows:

Table 3. Tentative scope of civil works

#	Facility Name	Capacity	Required Rehabilitation Works
1	Power line, and transformer if necessary	About 1 km	New power line shall be provided. Hook up location shall be defined by the local authority and design consultant Transformer if necessary
2	Two house type about 40 foot containers		Function: classroom, cloth changing room and storage, rest area, connected to electricity. Shall have lighting. Location shall be defined by the design consultant.
3	Water well		New water well shall be made. Water shall be pumped by electric pump. Shall have a building above the borehole, if necessary.
4	Water reservoir /new/	30 тон	Above ground location – shall be précised during design development; Shall have appropriate foundation with proper elevation.
5	Fence		Fence around the 15 hectare land

FIGURE 1. MASTER PLAN
ЗУРАГ 1. ЕРӨНХИЙ ТӨЛӨВЛӨГӨӨ



NOTE:	ТАЙЛБАР:
1. Classroom building #1	1. Хичээлийн 1-р байр
2. Dormitory	2. Дотуур байр
3. Sport hall, 3a Outdoor basketball court	3. Биеийн тамирын заал, 3а – Сагсны ил талбай
4. Workshop – Auto repair	4. Автын дадлагын байр
5. Canteen, cooking workshop	5. Цайны газар, нарийн боовны дадлагын байр
6. Classroom building #2	6. Хичээлийн 2-р байр
7. Workshop – Welding	7. Гагнуурын дадлагын байр
8. Workshop – Forest maintenance	8. Ойн арчилгааны дадлагын байр
9. Workshop – Masonry works	9. Өргийн дадлагын байр

10. Workshop – Interior finisher
11. Workshop – Carpentry, Handmade arts, Plumbing
12. Deep water well building
13. Heating boiler building /not used/
14. Heat supply station
15. Warehouse
16. Storage facility
    16a **Project Intervention** – Repair – Vegetable storage facility
17. Forestry class greenhouses for seeding
18. Greenhouses for vegetable and greenhouse farmer classes
19. Building remains
20. Vegetable growing field
21. A winter greenhouse remains
22. **Project Intervention** – New – A new building (workshops and classrooms) – for Forestry worker, Farmer, vegetable and Farmer, greenhouse occupations
23. **Project Intervention** – New – A winter solar greenhouse
24. Planned building (from state funding)
25. Planned sport facility (from state budget)
26. **Project Intervention** – existing sewage tank to be restored

10. Засал чимэглэлийн дадлагын байр
11. Мужаан, гар урлал, сантехникийн дадлагын байр
12. Гүний худгийн барилга
13. Халаалтын зуух /ашиглалтгүй/
14. Дулааны узелийн барилга
15. Агуулах
16. Зоорь
    16а **Төслийн хөрөнгө оруулалт** – Засвар – Ногооны зоорь
17. Ойн ангийн үрсэлгээний зуны хүлэмж
18. Хүнсний ногооны ангийн хүлэмж
19. Хуучирсан барилга
20. Ногооны талбай
21. Өвлийн хүлэмжний үлдэгдэл
22. **Төслийн хөрөнгө оруулалт** – Шинэ – Дадлага болон хичээлийн шинэ байр – Ойжуулагч, Хүнсний ногоо ба хүлэмжийн аж ахуйн фермерийн ангиуд
23. **Төслийн хөрөнгө оруулалт** – Шинэ – Өвлийн нарлаг хүлэмж
24. Улсын төсвөөр барихаар төлөвлөж буй барилга
25. Улсын төсвөөр барихаар төлөвлөж буй спортын байгууламж
26. Төслийн хөрөнгө оруулалт – одоо байгаа бохирын цооног - сэргээж ажилд оруулах

PICTURE 1
ЗУРАГ 1

Pic 1.1 Meat and vegetable storage facility / Мах ба ногооны зоорь

Pic 1.2 Dormitory / Дотуур байр

Attachment no. 6

SCOPE OF SERVICES / DELIVERABLES
KHENTII 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, the Design in English) Hard Copy – 3 copies	- 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).	90
Deliverable 2 (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.	110
Deliverable 3 (Mongolian and English) Hard copy – 3	- 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).	130
Activity (Mongolian and English)	Assistance in preparing responses to requests for clarifications received from bidders.	
Construction Supervision: 2 engineers visit the site 2 times 2 days for each visit including travel time (total 4 visits, 8 days), and the stages are: 40% of civil works achieved, preliminiary commissioning, 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.	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	Final Acceptance Certificate

	the construction. Assistance in accepting the Works through the Acceptance Commission.	is issued
Deliverable 7 (Mongolian) – Hard copy 1	Defect Notice during warranty period	

DETAILED SCOPE OF SERVICES

Khentii Agricultural Vocational and Training Production Center shall receive the project investment for following occupations:

1. Farmer, greenhouse
2. Farmer, vegetable
3. Forestry

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 the agro park area for vegetable plantation of Khentii aimag VTPC.

The school is located in the aimag center; the main building complex (4 wings: administration, classrooms, workshops, sports and artistic halls) was built in December 2013; others are dormitory, canteen, warehouses, greenhouses, garage and auto repair shop, etc. All buildings connected to the central power grid, local heating, water supply and sewage systems, but dormitory and canteen are connected to the pumped sewage tank. The project shall build a winter solar greenhouse in the school area, though the most of project investment will refer to the school farm area, which is located 6km far from the school. The farm has 3.5 hectare land with a water well, 20 ton water storage and a multifunctional building, which is connected to the power.

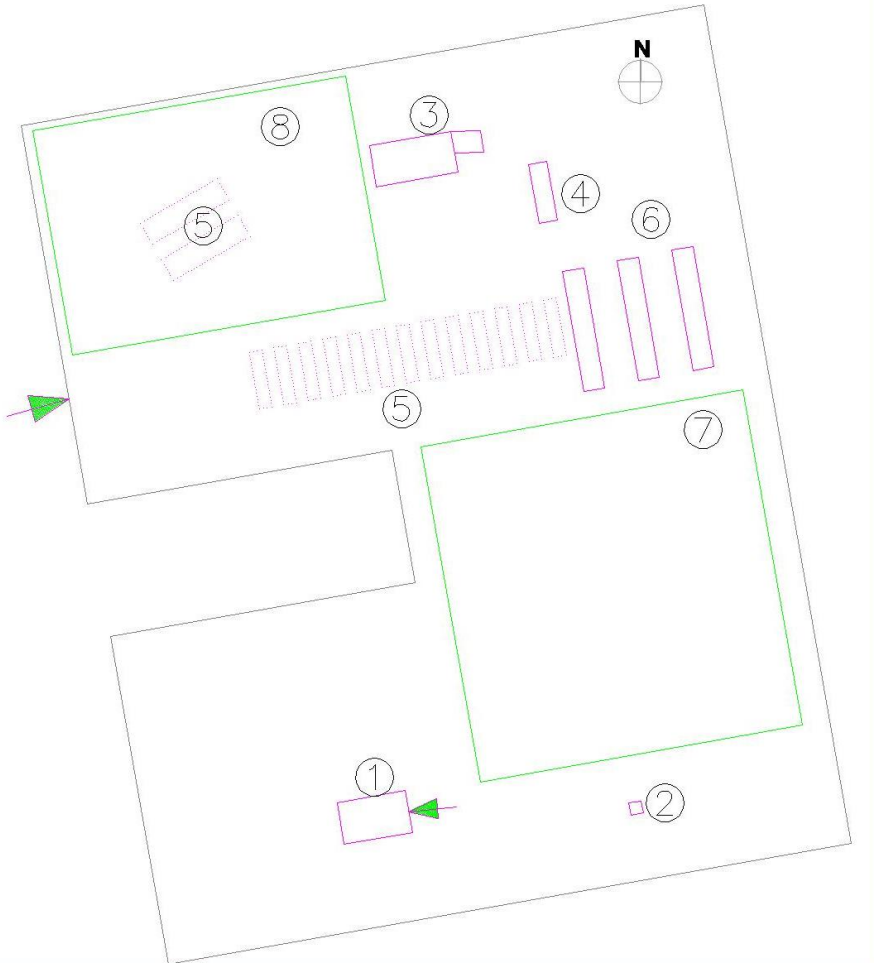
1. A new facility will be built – A winter solar greenhouse with 7m x 20m with tambour will be located in the school area, the final location shall be decided by the design firm with consultation of school. The design firm shall use the full detailed engineering drawings of a winter solar greenhouse for Zuunkharaa PC, Selenge aimag or Bulgan VTPC prepared by them. The external heating, power supply and water supply drawings shall be made; a tambour size might be changed.

2. Some facilities shall be rehabilitated (Figure 1). All these facilities are located in the school agro park area. Refer to table below for tentative scope of civil works.

Table 3. Tentative scope of civil works

#	Shop Name	Floor space m2	Required Rehabilitation Works
	Greenhouse farmer, Vegetable farmer, Forestry worker training area		
1	Multifunctional building (Position 1)	120	Roof repairing, some electrical works.
2	Water well (Position 2)	12	The water well building shall be rehabilitated, including: installation of a water collector and its heating, new door with thermo insulation.
3	The new fence for entire area of farm shall be built	650m	Shall have a gate for car and door.

FIGURE 1. MASTER PLAN OF AGRO PARK AREA FOR VEGETABLE PLANTATION
ЗУРАГ 1. ХҮНСНИЙ НОГООНЫ АГРОПАРКИЙН ЕРӨНХИЙ ТӨЛӨВЛӨГӨӨ



NOTE:	**ТАЙЛБАР:**
1. **Project Intervention** – Repair – Multifunctional building	1. **Төслийн хөрөнгө оруулалт** – Засвар – Сургалт, аж ахуйн барилга
2. **Project Intervention** – Repair – Water well	2. **Төслийн хөрөнгө оруулалт** – Засвар – Худгийн барилга
3. Cattle barn	3. Малын хашаа
4. Water reservoir	4. Усан сан
5. Greenhouse remains (to be removed by the school)	5. Хүлэмжний үлдэгдэл (Сургууль өөрөө буулгана)
6. **Project Intervention** – New – Greenhouse	6. **Төслийн хөрөнгө оруулалт –** Шинэ **–** Хүлэмж
7. **Project Intervention** – New – Vegetable field area	7. **Төслийн хөрөнгө оруулалт** – Шинэ **–** Ногооны талбай
8. **Project Intervention** – New – Forestry vegetation field	8. **Төслийн хөрөнгө оруулалт –** Шинэ – Мод үржүүлгийн талбай

Attachment no. 7

SCOPE OF SERVICES / DELIVERABLES
DORNOGOBI 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, the Design in English) Hard Copy – 3 copies	- Measurement drawings for project buildings and utility lines. Topo mapping, necessary power, heating, water supply calculations. - Assistance to the Client in obtaining permissions for the provision of power, water supply calculations, if it is necessary to obtain these permissions (at Consultant cost).	90
Deliverable 2 (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.	110
Deliverable 3 (Mongolian and English) Hard copy – 3	- Permission on the engineering lines for the provision of power, water supply, 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).	130
Activity (Mongolian and English)	Assistance in preparing responses to requests for clarifications received from bidders.	
Construction Supervision: 2 engineers visit the site 2 times 2 days for each visit including travel time (total 4 visits, 8 days), and the stages are: 40% of civil works achieved, preliminary commissioning, 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.	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	Final Acceptance Certificate is issued

	Acceptance Commission.	
Deliverable 7 (Mongolian) – Hard copy 1	Defect Notice during warranty period	

DETAILED SCOPE OF SERVICES

Dornogobi Agricultural Vocational and Training Production Center shall receive the project investment for following occupations:

1. Farmer, greenhouse
2. Interior Finisher
3. Auto mechanic

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.

The Dornogobi VTPC owns 2 hectare land which is about 14 km far from the school. The land purpose is agro park for growing of vegetables. The following works shall be carried out at this agro park area.

1. A new facility will be built. – A winter solar greenhouse with 6m x 30m with tambour 6m x 3m. The design firm shall use the full detailed engineering drawings of a winter solar greenhouse for Bayanchandmani VTPC, Tuv aimag prepared by them. The external power supply and water supply drawings shall be made; a tambour size might be changed.

2. Some other civil works shall be done at the agricultural park area as follows:

Table 1. Tentative scope of civil works

#	Facility Name	Capacity	Required Rehabilitation Works
1	Power line, and transformer if necessary	About 100 meters	New power line shall be provided. Hook up location shall be defined by the local authority and design consultant Transformer if necessary
2	Two house type about 40 foot containers		Function: classroom, cloth changing room and storage, rest area, connected to electricity. Shall have lighting. Location shall be defined by the design consultant.
3	Water well		New water well shall be made. Water shall be pumped by electric pump. Shall have a building above the borehole, if necessary.
4	Water reservoir /new/	30 ton	Above ground location – shall be précised during design development; Shall have appropriate foundation with proper elevation.
5	Fence	2 ha	Gate for car and door