

Iaghluja, Marneul, Georgia

**Complex of Individual  
Houses**

General Part of the Project





RENDER





RENDER

Individual House (8X8m)



Individual House (8X10m)



Individual House (9X11m)



Individual House (10X13m)





Architectural Part

The project area is located in the Marneuli municipality in Kvemo Kartli administrative boundaries. It is located in the south-eastern part of Georgia. Its slope is oriented to the south. The total area of the territory is about 25 hectares. The allotted plot is roughly rectangular, with dimensions of 440 X 540 meters. Absolute index at the lower border of he plot is 413 meters above sea level, and at the upper border, it is 432 meters. The project area used to be a pasture of the laghluja territory. From the east, from the south and west it is bounded by the earth-roads and the northern part of the plot is crossed by the irrigation channel. The seismicity of the building site - 8 ball. Seismicity of the area - 8 scores. The design wind load is 30 kgf / m2 The design snow load is 50 kgf / m2 Statistically, the average temperature of the cold month in the winter months is -0.1 degrees Celsius, and the average temperature in summer is 30,3 degrees. Results of Engineering-Geological Survey: Dangerous geological processes are not observed in the allotted area and they are not expected in the future, it is in satisfactory engineering-geological conditions; The cover of the second layer is considered as a base of the foundation, namely the brown clay, semi-dense, with a rarely taped pebble. Parameters of the Ground: Conditional calculation impedance  $R_0 = 2.2 \text{ kgf/cm}^2$ ;  $p = 1.90 \text{ g / cm}^3$ ;  $E = 320 \text{ kgf / cm}^2$  Internal friction Coefficient  $\varphi^{\circ} = 20$ ; Specific traction  $c = 0.20 \text{ kgf / cm}^2$ . The project envisages construction of 4 types of individual residential houses. The sizes of the houses in the plan are as follows: 8.0X8.0 meters 8.0X10.0 meters 9.0X11.0 meters 10.0X13.0 meters The area of each land plot is approximately 2500 m2. The construction of 29 new houses is planned in total. Explanatory letters of the description of engineering infrastructure are presented in the relevant parts of the project.

Structural Design

All four types of house plan are simple rectangular shape. After removal of the foundation trench, it is necessary to conduct additional assessment of the geological situation in order to ensure the reaching of the calculation impedance of ground on the foundation basis  $2.2 \text{ kgf / cm}^2$  (220 kPa). The foundations are monolith strip footing, with a base of 50 cm width; while the width of the wall is 30 cm. Deepening of the foundation is 110 cm. As well as it will be the central, padded, with steps, the same deepening. After concreting of the foundation, one layer of hydro-insulating materials should be placed on the surfaces of the soil. The walls are reinforced (so called sandwich structure) three-layer masonry, specifically, the external; layer of perforated ceramic brick, middle layer of thermal insulation XPS tiles and internal layer of small wall block. The bearing structure of the building is the framed structure of reinforced concrete slabs consisting of walls with reinforced inserts (cores, belts) monolith reinforced concrete slab and a reinforced concrete belt binding at the ceiling level, in the construction of which the reinforced walls are included. The reinforced cores are concreted in parallel to the construction of reinforced bearing walls. The partitions are made from the reinforced small wall pumice blocks. The construction block quality must be no less than M-100 ( $100 \text{ kgf / cm}^2$ ), according to sand-cement mortar M-100 ( $100\text{kgf / cm}^2$ ). The building block quality should be at least M-200, and at least F-75 of frost resistance grade. The bearing structure of the house floor decks is a monolith reinforced concrete girdeless floor construction of 150 mm thickness. The roof will be built with painted metal slabs on a wooden structure. It is necessary that the elements of all the wooden structures of the building should be treated with antiseptic as well as fire proof solutions.

Water Supply System

The water supply of the residential house is provided through the water pipeline from the street. Supply of running watery is carried out under with the incoming water pipe placed under the roof slabs of the first floor. The water will pass through the mechanical filter. Quantity of water-service meter equipment is five. The water pipeline network will be constructed from polypropylene pipes and fittings. Cold and hot water pipes should be insulated with heat insulation. First of all, the two-meter pipe should be latched with insulation, then the mineral cotton insulation of 5 cm thickness should be fixed. The hot water supply of the building is carried out through the gas water heater.

Sewerage System

The sewerage network of the residential house is represented by a single pillar and a pipeline, through which the farm fecal waters flow into the sewerage manhole of the yard. The sewage pipes are provided under the roof slabs and will be fixed on the same slabs with bracing, a horizontal part of the pipe to be insulated with heat insulation (10 cm thick ). The sewerage network is built with 100 and 50 mm polypropylene pipes. For the purpose of ventilation of the network, the pillar of 0.2 m separates from the ceiling and stops transversely in the attic. The horizontal sections of the drainage network will be built by the following minimum slope: for 100-pipes -0,02; 50 pipes - 0,03.

Power Supply

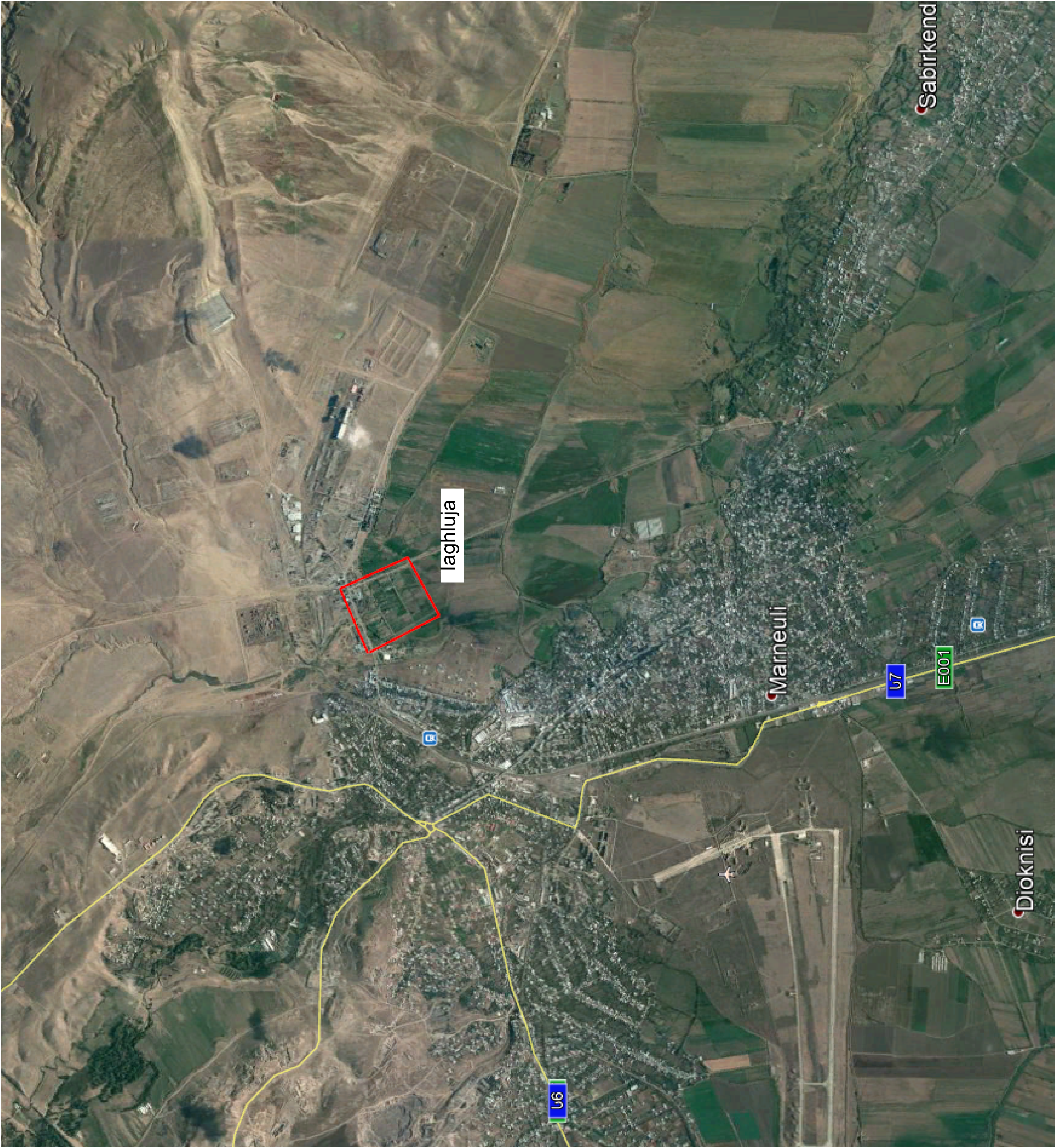
The electric part of the residential project is implemented on the basis of BCH-59-88 and RD34.20.185-94 of international and residential buildings and massive public construction electric designs, taking into consideration architectural-construction, technological, sanitary and other technical requirements. The voltage of the electric network is 220V, with the transformed matrix neutral. The residential house will be supplied with power from the power meter. The electricity to the power meter will be provided by the local energy distribution company. The power distribution switchboard will be installed behind the entrance door in the corridor. The switchboard should be at least of IP40 class of safety protection. Automatic breakers should comply with international standard IEC 947-2 (EN 60898), requirements with B or C-response with 6 KA short-circuit making and breaking capacity. Electrical wiring should be performed on copper PVC-type flat cord corresponding to the standard fire. The high-power supply is provided with a cable of 3X2,5 mm 2 crossing and lighting with a cable of 3X1,5 mm2 crossing, the wiring will be made under the plaster. In the rooms, the switches will be installed at the height of 90 cm from the floor and the plugs will be installed at the height of 30 cm from the floor. In the yard, near the distribution switchboard (at least 1 meter away from the foundation of the house) grounding circuit should be installed. The 3 electrodes of the grounding circuit must be 2-meter rods of the steel angle  $5 \times 50 \times 50$ . they must be buried on 0.5 m depth from the surface of the earth, 3 m from each other. The grounding electrodes are connected to each other with a 30X3 mm shield, by welding with electrodes. Connection to the networking circuit is made of a copper cable of  $1 \times 16 \text{ mm}^2$ .

General Requirements

All the finishing materials and works used in the project (doors, windows, floors, ceilings, walls, etc.) by the supplier and performer must be provided with at least 2 years warranty by the supplier and performer. Preparation of the site To prepare the site for the construction the following should be foreseen: All the equipment needed for construction should be supplied and maintained, (tools, cranes, scaffolds, etc.). Clearing roads and construction areas. Garbage removal and disposal shall be carried out regularly and / or according to the customer's order. The garbage should be fully removed from the construction site. The construction site should be provided with electrical energy, water and all necessary materials (cables, pipes, pumps, etc.). Land works The land works should be carried out precisely according to the the indicators and slopes that are included in the certified construction drawings. The bottom layer of the foundation should be prepared, rammed and then filled with a layer of gravel. Masonry Contractor shall provide all materials and equipment required for building of walls according to the drawings ,as well as he should present a sample of each type of block and brick and accept the consent from the customer to use this material. The blocks and bricks used should match the selected samples with density, dimensions and visuals. Blocks and bricks should comply with the requirements of the European standards. They should match the dimensions of the drawings, straight and undamaged sides and edges. They should be transported carefully and stored in a protected area to prevent damage. Damaged block and brick should be removed from the construction site and replaced with a new one. Blocks and bricks should be placed on cement-sand mortars, which should be prepared according to the standards. The quality of precision ( $\pm 2 \text{ cm}$ ) should be achieved when doing masonry work. Reinforced concrete works a. Supply of concrete b. Installation of reinforcement frames c. Arrangement of molds Contractor shall provide the customer with the information that the quality of the concrete and reinforcement used fully meets the specification requirements and the European standards. Wooden molds or molds from other material should ensure the full compliance of the reinforced concrete structures with the project line data. The contractor shall periodically provide concrete, reinforcement and other materials conformity certificates. Prior to the start of the construction, the contractor shall present the schedule of works.



Location of the Site on Orthophoto





Locations of Houses on Cadastral Plan of Land Plots





General Plan of the Territory

