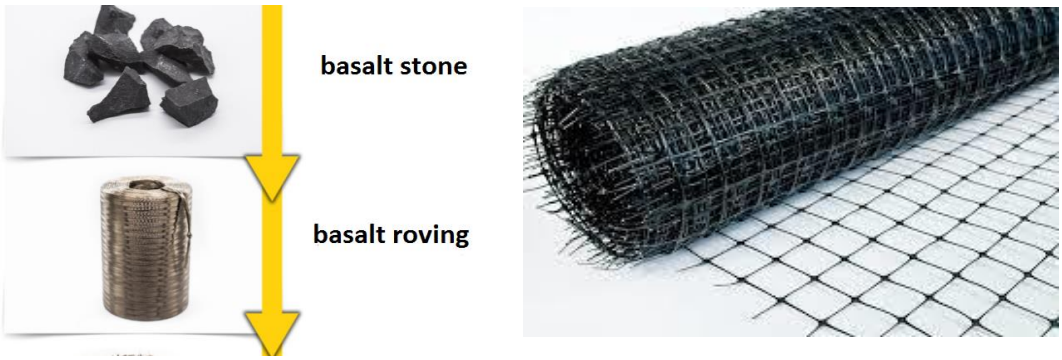
TECHNOLOGY OF APPLICATION OF GEOSYNTHETIC MATERIAL IN PRODUCTION AND CONSTRUCTION

Kurbanov Zavkiddinzhon Khamidulloevich
Jizzakh Polytechnic Institute, assistant
Rasulova Nargiza Botirkulovna
Jizzakh Polytechnic Institute, senior lecturer
Ortikulov Davron
Jizzakh Polytechnic Institute, student
E-mail: zavaclash@gmail.com
https://doi.org/10.5281/zenodo.7728460

Annotation. This article provides an opportunity to consider the use of geosynthetic materials (hereinafter referred to as GM) in accordance with design solutions in the construction, reconstruction and overhaul of roads, city streets, driveways, high-load areas, parking lots and other structures.
Key words and phrases: Basalt, geogrid, SBNP, geosynthetic material, basalt fibers.

Basalt is an igneous rock formed by the rapid cooling of lava that erupted onto the surface of the earth. Basalt is heavier than granite, but also stronger than it. Basalt melts at 1100–1200°C. There are variations of the rock, the melting point of which reaches 1450 degrees. Do not take a stone and strong chemicals. Basalt is resistant to all acids and alkalis.

From this material "MEGA INVEST INDUSTRIAL" the organization produces products for the construction industry. Basalt building mesh and reinforcement, which come to replace obsolete metal.



Pic. 1- *Basalt grid mining*

Applications in construction

- for reinforcing horizontal seams of masonry walls made of various materials in order to increase its bearing capacity under various types of its stress state (compression, tension in bending along a tied section, when shearing along a tied section) and solidity.
- for reinforcing the masonry of walls made of large-format ceramic stone with a voidage of more than 30% to prevent mortar from entering the joints of the masonry and to ensure the level of thermal conductivity of stone walls.
- as bonding elements in two-layer walls, with brick lining with the main inner layer of various wall materials (silicate and ceramic bricks, large-format stones, cellular concrete.
- for reinforcing the plaster layer of walls made of various stone materials in order to increase their solidity, seismic resistance and crack resistance.

- to reinforce brick walls and pillars by installing composite mesh bandages.
- to strengthen load-bearing, self-supporting and non-bearing (partitions) walls made of various stone materials.
- for reinforcing floor screeds from mortar and concrete mixtures in order to increase their strength and prevent the formation of shrinkage cracks.
-

Pic. 2-

Applications of GM in construction

The main purpose of the use of HM is to ensure the reliable functioning of the road or its individual elements in difficult conditions of construction and operation. The installation of additional layers of GM allows you to increase the operational reliability and service life of the structure or its individual elements, the quality of work, simplify the construction technology, reduce construction time, reduce the consumption of traditional building materials, the volume of earthworks, and the material consumption of the structure.

Geogrid: A flat geosynthetic material having regular, stable shape through cells larger than the largest cross-sectional dimension of the ribs, formed by extruding, gluing, thermally bonding, or interlacing the ribs, resisting tension (external loads) and acting as structural reinforcement.

Domestic and foreign experience in the use of geosynthetic materials shows their versatility (extensive field of application), cost-effectiveness (reducing construction and operation costs, saving building materials, reducing the time of work, increasing the time between repairs), and environmental friendliness. All decisions related to the use of geosynthetic materials must be based on design solutions developed taking into account the relevant documents.

Geogrids made of basalt fiber grade SBNP produced according to specifications are recommended to be used as reinforcing layers in the construction of roads, airfields, sites for various purposes and in other geotechnical structures.

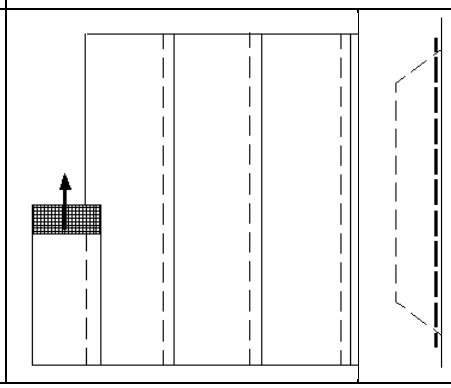
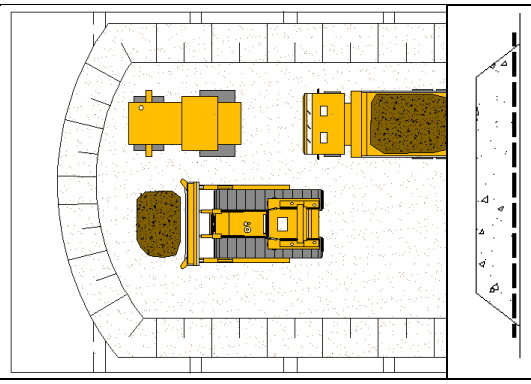
In cases of construction on weak foundations, in the presence of waterlogged cohesive soils, water-saturated sandy soils, it is recommended to use as a reinforcing element geogrids made of basalt fiber grade SBNP produced according to TU 24373711-001:2018 in combination with a separating layer of non-woven geosynthetic material.

When constructing geosynthetic layers from a geogrid, the following operations are additionally introduced into the applied technological maps:

- preparation of the base for laying the geogrid;
- transportation, distribution of geogrid rolls over the site, their laying;
- backfilling of the overlying layer onto the geogrid, its distribution and compaction.

Substrate preparation consists of profiling its surface and compacting it.

Shrubs, trees are cut down and cut down at the same level with the surface. In this case, uprooting of stumps may not be performed. In the presence of stumps, bumps, depressions, a leveling layer should be poured on the surface of the base of the embankment before laying the geogrid to eliminate irregularities. The size of the irregularities should not exceed 5 cm. If at the time of work on the site there are surface waters, then a leveling sand layer is poured. When laying layers of geogrids at the base of an embankment, arranged on soft soils, preparation may not be performed if there is no danger of damage to the geogrid [1, 2].

Types of work	1. Foundation preparation; 2. Geogrid laying;	3. Soil transportation; 4. Layer leveling; 5. Sealing layer
Direction flow	←	←
Technological subsequence		

Pic. 3- Preparation of earthworks using geogrids

Geogrid rolls are transported to the place of work immediately before laying and distributed along the length of the work site through a distance corresponding to the length of the web in the roll. If access to the construction site is difficult, special measures should be taken to organize temporary access roads for the period of construction. In a convenient place, close to the object of work, a working platform and a storage platform should be arranged, on which the geogrid is stored and prepared (if necessary) for laying [1, 2].

Before filling the soil, the quality of the laid material is checked by visual inspection and fixing the continuity, the size of the overlap, the quality of the joining of the canvases. Based on the results of the inspection, an act is drawn up for hidden work, which contains the results of the inspection, data on the supplier and the characteristics of the used geogrid, indicated in the passport for the batch or on the labels of the rolls, as well as data obtained when the geogrid was accepted by the contractor's laboratory [4, 5].

References:

1.СНиП 2.05.02-85. Автомобильные дороги. Нормы проектирования. М.-1986,52с.
2.ВСН 84-89. Изыскания, проектирование и строительство автомобильных дорог в районах распространения вечной мерзлоты.
3.ТУ 24373711-001:2018 Геосетки из базальтоволокна марки СБНП.

4.ГОСТ 25100-95. Грунты. Классификация.
5.ЧЕХОВСКИЙ, Ю. В., МАКАРОВ, В. С., ГАНИЕВ, А., ГОРЧАКОВ, Г. И., ЛИФАНОВ, И. И., & СПИРИДОНОВА, И. Н. (1982). Способ определения морозостойкости пористых тел.
6.Akramov, X. A., & Ganiyev, A. (2022). To Produce an Effective Composition of Vermiculite Plita and to Study the Coefficient of Thermal Conductivity. The Peerian Journal, 8, 29-37.
7.Ganiev, A., Tursunov, B., & Karshiev, E. (2022, June). Study of physical and mechanical properties of high strong concrete with chemical additives. In AIP Conference Proceedings (Vol. 2432, No. 1, p. 050046). AIP Publishing LLC.
8.Khakimov, O. M. (2022). Issiq-quruq iqlim sharoiti uchun asfaltbeton tarkibini tanlash. Science and Education, 3(2), 241-247.
9.Ганиев, А. Г., Ўгли, Т. Б., & Курбонов, З. Х. (2021). ИСПОЛЬЗОВАНИЕ СУПЕРПЛАТИФИКАТОРА JK-02 ДЛЯ УЛУЧШЕНИЯ ПРОЧНОСТНЫХ ХАРАКТЕРИСТИК БЕТОНА.
10.Парсаева, Н. Ж., & Искандарова, М. И. (2022). ИССЛЕДОВАНИЕ ВЛИЯНИЯ ОТХОДОВ ОБРАБОТКИ ПИРОКСЕНИТОВЫХ ПОРОД МЕСТОРОЖДЕНИЯ «КОЙ-ТАШ» НА ФИЗИКО-МЕХАНИЧЕСКИЕ СВОЙСТВА ПОРТЛАНДЦЕМЕНТА. Universum: химия и биология, (6-3 (96)), 28-33.
11.Бердиев, О. Б., Матниязов, Б. И., Парсаева, Н. Ж., & Бердиев, О. О. (2015). Напряженно-деформированное состояние пологих и подъемистых конических оболочек с учетом влияния краевого эффекта. Молодой ученый, (6), 123-126.
12.Бердиев, О. Б., Бозоров, И., & Парсаева, Н. Ж. (2016). К оценке напряженно-деформированного состояния конических оболочек. Молодой ученый, (7-2), 48-51.
13.Botirqulovna, R. N. (2022). KIMYOVIY QO ‘SHIMCHANING YENGIL BETONLARNING FEZIK-MEXANIK XOSSALARIGA TA’SIRINI O ‘RGANISH. TA'LIM VA RIVOJLANISH TAHLILI ONLAYN ILMIY JURNALI, 2(10), 54-56.
14.Rasulova, N., & Boboqulova, S. (2022). BETONNING SUV O ‘TKAZUVCHANLIGINI VA UNING MUSTAXKAMLIGINI YAXSHILASH USULLARI. Solution of social problems in management and economy, 1(4), 128-133.
15.Nurmamatouv, N. R. (2022). Bazalt armatura ishlab chiqarishdagi chiqindi asosida fibrabeton tarkibini tanlash va xossalarini o’rganish. Science and Education, 3(3), 146-152.
16.Nurmamatov, N. R., & Tilavov, E. N. O. G. L. (2022). Bazalt tolasi asosida fibrabeton optimal tarkibini tanlash va fizik mexanik xossalarini taxlili. Science and Education, 3(3), 153-160.
17.Istamov, Y., & O’roqboyev, O. B. (2022). YUQORI MUSTAHKAM BETONLAR OLISHDA KIMYOVIY VA MINERAL QO’SHIMCHALAR YORDAMIDA FIZIK-MEXANIK XOSSALLARINI TADQIQ ETISH. Journal of Integrated Education and Research, 1(1), 310-318.
18.Botirova, N., Abdikomilova, M., Botirov, B., & Abdullayev, M. (2022). DEVELOPMENT OF CONCRETE COMPOSITION WITH THE HELP OF CHEMICAL ADDITIVES OF HIGH STRENGTH HEAVY CONCRETE. Академические исследования в современной науке, 1(17), 99-106.
19.Botirova, N., Abdikomilova, M., & Botirov, B. (2022). SANOAT BINOLARINI LOYIHALASHNING UMUMIY ASOSLARI. Models and methods in modern science, 1(17), 75-81.
20.Xolmirzo o’g’li, T. L., & Farhod o’g’li, B. B. (2022). FIGHT AGAINST NOISE AND VIBRATION IN INDUSTRIAL BUILDINGS. American Journal of Research in Humanities and Social Sciences, 7, 79-83.

21.Nazirboyevich, A. R. (2022, September). SELECTION OF THE OPTIMAL COMPOSITION OF FIBER CONCRETE BASED ON BASALT FIBERS AND ANALYSIS OF PHYSICAL MECHANICAL PROPERTIES. In INTERNATIONAL SCIENTIFIC CONFERENCE" INNOVATIVE TRENDS IN SCIENCE, PRACTICE AND EDUCATION" (Vol. 1, No. 1, pp. 57-65).
22.Rasul, A. (2022). KO'PCHITILGAN VERMIKULITNING YENGIL BETONLARDA QO'LLANILISHI VA BETON KIRISHISHI. TA'LIM VA RIVOJLANISH TAHLILI ONLAYN ILMIY JURNALI, 2(10), 50-53.
23.Rasul, A., & Lazizjon, H. (2023, February). BETON TO 'LDIRUVCHILARINING G 'OVAKLIK XOSSASI HAMDA G 'OVAK TO 'LDIRUVCHILARNING HOZIRGI KUNDA QO'LLANILISHI. In " Conference on Universal Science Research 2023" (Vol. 1, No. 2, pp. 219-225).
24.Nazirbayevich, A. R., & Lazizjon, H. (2023). SANOAT CHIQINDI MAHSULOTLARI VA POLIMER XOM ASHYOLARDAN FOYDALANGAN HOLDA ZAMONAVIY QURILISH MATERIALLARI ISHLAB CHIQARISH ISTIQBOLLARI. Journal of Universal Science Research, 1(2), 432-441.
25.Boboqulova, S. R., & Zokirova, D. (2022). GRINDING METHODS AND THEIR APPLICATION. COMPARISON BETWEEN JAW CRUSHER AND CONE CRUSHER. Journal of Integrated Education and Research, 1(7), 39-42.
26.Jumanov, I., & Botirov, I. (2022). CHAQIQTOSH MASTIKALI ASFALTBETON QORISHMASINING FIZIK-MEXANIK XOSSALARINI ANIQLASH. Solution of social problems in management and economy, 1(6), 20-27.
27.Jumanov, I., & Botirov, I. (2022). CHAQIQTOSH-MASTIKALI ASFALTBETON QORISHMASI TARKIBIDAGI QO'SHIMCHALARNING SIQILISHGA BO'LGAN MUSTAHKAMLIGI. Science and innovation in the education system, 1(6), 49-55.
28.ўғли Жуманов, И. Б. (2022, September). ЧАҚИҚТОШ АСОСИДАГИ ЯНГИ ТАРКИБЛИ ЙЎЛ ҚУРИЛИШ АШЁЛАРИ. In INTERNATIONAL SCIENTIFIC CONFERENCE" INNOVATIVE TRENDS IN SCIENCE, PRACTICE AND EDUCATION" (Vol. 1, No. 1, pp. 164-171).
29.Азимов, Б. С. (2022, September). ИЗВЕСТКОВЫЙ СТРОИТЕЛЬНЫЙ РАСТВОР ДЛЯ ОТДЕЛКИ СТЕН ЗДАНИЙ ИЗ ГАЗОБЕТОНА. In INTERNATIONAL SCIENTIFIC CONFERENCE" INNOVATIVE TRENDS IN SCIENCE, PRACTICE AND EDUCATION" (Vol. 1, No. 1, pp. 73-79).
30.Yusuf, I., & Tursunov, B. A. (2022). SANOAT CHIQINDISI VA MINERAL QO'SHIMCHALAR ASOSIDA OLINGAN SEMENTLARNING FIZIK-MEXANIK XOSSALARINI O'RGANISH. Journal of Integrated Education and Research, 1(1), 324-329.
31.Махмудова, Н. А., & Турсунов, Б. А. (2019). ИСПОЛЬЗОВАНИЕ ОТХОДОВ ПРОМЫШЛЕННОСТИ ДЛЯ ПОЛУЧЕНИЯ ГИПСОВОГО ВЯЖУЩЕГО. In ПРОБЛЕМЫ ГЕОЛОГИИ И ОСВОЕНИЯ НЕДР (pp. 393-395).
32.Хакимов, О. М., Курбанов, З. Х., & Мухаммедов, Ф. (2021). Реализация возможностей получения легких наполнителей на основе меньше пластиковых почв в нашей республике. Science and Education, 2(5), 176-181.
33.Курбанов, З. Х. угли Холбоев, СО (2021). Микроарматурализация сухих строительных смесей волластонитом. Science and Education, 2(5), 410-416.
34.Парсаева, Н. Ж., Курбанов, З. Х., & Бобокулова, Ш. (2021). Исследование физико-механических свойств бетонных изделий используемые промышленные отходы. Science and Education, 2(5), 417-423.

35.Курбанов, З. Х., & Сулайманов, Ж. Ж. (2021). Подготовка зданий к отделке местными материалами из натурального камня. Science and Education, 2(5), 403-409.
36.Курбанов, З. Х., Мамиров, А. Х., & Махкамов, М. З. У. (2021). Улучшение процесса горения керамической плитки на заводе строительных материалов. Science and Education, 2(5), 395-402.
37.Khamidulloevich, K. Z., Begalievich, A. K., & Sanjarbek, K. (2021). TECHNOLOGY OF PRODUCTION OF EARTH WORKS WITH THE APPLICATION OF GEOGRAPHS. Oriental renaissance: Innovative, educational, natural and social sciences, 1(5), 267-271.
38.Курбанов, З. Х., Ганиев, А., & Усанова, Г. А. (2022). ИССЛЕДОВАНИЕ СОСТАВА СУХОЙ СТРОИТЕЛЬНОЙ СМЕСИ НА ОСНОВЕ МРАМОРНЫХ ОТХОДОВ. Oriental renaissance: Innovative, educational, natural and social sciences, 2(1), 299-304.
39.Парсаева, Н. Ж., Курбанов, З. Х., & Расулова, Н. Б. (2021). Технология производства земляных работ с применением геосеток. Science and Education, 2(12), 324-333.
40.Шоқосимов, И. К., & Курбанов, З. Х. (2021). ТЕХНОЛОГИЯ ПРОИЗВОДСТВА ЗЕМЛЯНЫХ РАБОТ С ПРИМЕНЕНИЕМ ГЕОСЕТОК.
41.Ганиев, А., Қурбонов, З. Ҳ., Усанова, Г. А., & Назаров, Ж. Ж. Ў. (2022). Тоғ-кон саноати чиқиндилари асосида олинадиган майда донали бетонлар. Science and Education, 3(3), 258-263.
42.Ганиев, А. угли Турсунов, БА, & Курбанов, ЗХ (2022). Особо легких бетонов полученных на основе сельского хозяйственных отходов. Science and Education, 3(4), 492-498.
43.Ganiev, A., Tursunov, B. A., & Kurbanov, Z. K. (2022). Prospects for the use of multiple vermiculitis. Science and Education, 3(4), 409-414.
44.Kurbanov, Z., & Parsaeva, N. (2022, June). Strong grinding based on local raw materials getting stones. In AIP Conference Proceedings (Vol. 2432, No. 1, p. 030104). AIP Publishing LLC.
45.Хакимов, О., & Қурбонов, З. (2022). ПЛАСТИКЛИГИ КАМ ТУПРОҚЛАР АСОСИДА ЕНГИЛ ТЎЛДИРУВЧИЛАР ОЛИШ ИМКОНИЯТЛАРИНИ ЎРГАНИШ. Solution of social problems in management and economy, 1(5), 58-64.
46.Курбанов, З., & Ортиккулов, Д. (2023). ВЫСОКОПРОЧНЫЙ ГИПСОВЫЙ ВЯЖУЩИЙ НА ОСНОВЕ СУЛЬФАТСОДЕРЖАЩЕГО ОТХОДА. Models and methods in modern science, 2(2), 5-12.
47.Khamidulloevich, K. Z., Botirkulovna, R. N., Narzullayeva, K., & Davron, O. (2023). Study of the Mechanical Properties of High Strength Concrete Obtained With the Help of Chemical Additives. AMERICAN JOURNAL OF SCIENCE AND LEARNING FOR DEVELOPMENT, 2(2), 64-68.
48.Сулаймонов, Ж. Ж., Рахимова, Н. Б., Курбанов, З. Х., & Турсунов, Б. А. (2021). РОЛЬ ИНТЕНСИФИКАТОРА ПОМОЛА ЦЕМЕНТНОГО КЛИНКЕРА.
49.Ганиев, А. Г., Сулаймонов, Ж. Ж., Курбанов, З. Х., Турсунов, Б. А., & Рахмонов, А. Р. (2021). МИКРОСКОПИЧЕСКИЕ ИССЛЕДОВАНИЯ ЖИДКОГО СТЕКЛА ДЛЯ ПОЛУЧЕНИЯ КИСЛОТОСТОЙКИХ КОМПОЗИЦИЙ.