

Straw Bale Building in Siberia
Report for Builders Without Borders

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December 2005

¹Many thanks to Sharon for editing; Catherine, Alyson, Cindy, Paul, Jeff, Igor, Valentina, Slava, Tatyana, Andrey, Tanya, Yelena, Lena, Ira, Irinas, Aleksander, Sasha, Pasha, Vanya, Yulya for a great experience.

Thanks to the American organization Builders Without Borders, Alyson Ewald and the local organisation Fund for 21st Century Altai, a pioneering project was achieved in summer 2005 that will serve as a show case of appropriate straw bale building technology in the Altai mountains, Siberia (see Fig. 1). The project continues a local tradition of building from renewable sources and takes advantage of the great energy saving potential of straw bales, a material with super insulating qualities, in a place with long and cold winters.



Figure 1: Altai mountains. View to the north from Kazakhstan.

Chapter 1

Akadem Gorodok

Thursday 4 August.

5:35 AM - Arrival at Tolmachevo airport in Novosibirsk. Igor Aleksandrovich Ogorodnikov, a short man in his fifties with a sparkle in his blue eyes, a shy smile, and white wild hair in the style of Albert Einstein, waited by the gate.

Igor, a physicist, lives with his wife Valentina and her 17 year old son Artyum in a 14 story block of flats in Akadem Gorodok "Academic Town" in the suburbs of Novosibirsk. It took us an hour in Igor's car to get from the airport to his apartment.

Academ Gorodok is a satellite city of Novosibirsk. Its population consists mainly of scientists and students. They come to Academ Gorodok from all over Russia to work and live at the scientific center.

There are a number of important Russian research institutes in Academ Gorodok. Due to the pleasant environment and quiet setting among forests, the town has lately become a popular suburban living place, especially for rich Russians who have moved there from the grey town of Novosibirsk. The stores and supermarkets are usually open 24 hours a day and they are filled with a wide range of imported goods.

Registration in the international hotel across the street from Igor's place was expensive. I paid 120,- USD ,a price that included one overnight stay in the hotel as a condition for the registration. Igor Aleksandrovich recommended such an arrangement to avoid the bureaucracy of registering with a municipal authority. That evening, before 17:00, registration was completed. Even though I had paid for one night in the hotel, I stayed the night at Igor's place. He offered me his hospitality for as long as I wanted.

Friday 5 August.

After breakfast Igor and Valentina drove me to their building site in the countryside. It is a future Ecovillage, five miles from Academ Gorodok. The property is divided into 60 parcels. Ecovillage is Igor and Valentina's vision. Talking to them, it becomes clear that they are not very happy with it.

In 1998, Igor's ecological building consultancy, ECODOM, founded a cooperative in order to buy land where they could start an Ecovillage. At that time the cooperative had two members. Igor and a friend. They decided to look for grants, so they could start to design, build, and sell experimental low-energy housing. They soon found out that instead of obtaining grants, it is easier to find people who are interested and capable of building their own homes.

By the year 2005, 54 parcels had been sold. There are 14 houses under construction. Many people came to live in the Ecovillage, but many people means many different opinions on how the Ecolovillage should look. That is the problem.

In this early stage, Igor decided on basic rules. The most important aspect of these was democracy. Decisions are made together. Citizens elect a management board of ten people, who organize meetings and prepare the issues for voting. Meetings take place weekly. "Attendance differs. In this phase, only people who are building are interested." Igor says.

The eco-aspect of the Ecovillage is provided by the following rules:

- Because the original land was sparsely covered by forest, inhabitants undertake the creation of "forest zones" on their properties.
- Ecovillage has a strict waste policy, which deals with waste in an ecologically appropriate way. This includes not only sewage and waste of houses, but construction waste as well.
- The building policy of the Ecovillage is the use of only ecological materials for construction.

Although some of the members of the cooperative see living in low energy houses as their main goal, most of the people, despite Igor's educational activities, still share the opinion that low-energy housing is either too expensive, or isn't worth the extra effort. Igor consults for free with them. The results are more or less well insulated houses with a proper orientation. Some of them have basic passive solar technology such as a winter garden.

After arriving in the Ecovillage, I joined the crew and helped build the reinforced concrete foundation for the Center for Ecological Education. This is Igor's most recent project, financed by his wife Valentina.

The Center of Ecological Education will be in the heart of the Ecovillage. According to the original urban plan, the building should have been the focal point of the whole village. It was meant to occupy the middle of a four parcel site with in park-like surroundings. The money should have been raised from government grants.

"What happened with the primary idea demonstrates the downfalls of our implemented democracy" Igor says. During one of the key meetings, the majority decided to cancel the project. "It was mostly older people, who argued that the Eco Center would only cost them more money." The decision was taken to divide the land into four parcels and sell it to other selfbuilders. The generated income was spent to improve the village infrastructure.

Igor married Valentina in 2002. She has been a businesswoman since the fall of an iron curtain in the early 1990's. Now she manages her own shop with garden products in her ex-hometown of Krasnojarsk 500 miles from Novosibirsk. After her marriage to Igor, she moved to Academ Gorodok. "I tried to start a fashion shop here a while ago, but it was awful. It felt like starting the same thing all over again." she says. She dropped the idea and invested her money into EKODOM. She bought one of the parcels and is financing the construction of The Center for Ecological Education herself.

She and Igor are going to work in the building when it's finished. There will be an office space, a large meeting room, an apartment for guests and a banya (Russian sauna) - of course.

Saturday 6 August.

After breakfast, two hired labourers from Tajikistan, Slava - Valentina's oldest son, Igor, and I continued on foundation work. Besides working manually on the building site, Igor acts as project manager and Slava manages the workers. He is a quiet, shy, 27 year old computer specialist by education, who has taken the opportunity to become Igor's disciple.

At lunchtime Igor and I returned to his apartment, where Igor led a discussion about the application of straw bale building technology in Siberia.

The meeting was attended by:

- Vladimir, an architect. He works in an architectural office that specializes in train station projects. At the moment he is finishing his PhD with a dissertation on standardized eco-house kits, which would be an inexpensive alternative to family housing in Russia. He is involved in Igor's building projects.
- Pavel, a programmer in the major Russian telecommunication company Telecom. He is a physicist by education and cooperates with Igor on interseasonal heating storage projects for residential housing.
- Andrey works for the company Novosibirskaya Energiya, which supplies the entire town of Novosibirsk with heat and electricity. Within the company, he is the director of The Center for Technology in a Residential Sector. Together with Igor they are working on another of Igor's project, on improving the homemade cellular concrete technology.
- Mikhail's wife and daughter.

They are all young people in their mid 30's. They are belonging to a group of people that plans to buy land neighboring the Ecovillage and build their family homes there. "They want to found an eco-community with their own rules. A little like hippies in the 1960's in America" Igor says. The chairman of the group is Mikhail, who was out of the town and couldn't come. His wife

and daughter attended instead. During our discussion, Mikhail's wife gradually became keen on straw bale building.

Meeting minutes:

- introduction by Igor
- straw bale talk by Kuba
- video and slide show
- discussion
- dinner
- talk about interseasonal heat storage experiment by Paul and Igor
- talk about the future of The Center for Ecological Education

Resume:

Until recently EKODOM focused on propagation of the idea of ecological building. It took Igor and his friends almost 15 years to make the term eco-house known to the Russian public. EKODOM was founded in 1987. Since then, they have published eight well-received publications on the subject of eco-building, and have organized more than 20 conferences. "There are students writing dissertations about eco-houses. Eco-houses are known to building professionals now, but when I approached someone in early 1990s with the idea, he looked at me as if I had fallen from the moon." Igor explains. "Now, its time to build."

Although EKODOM assisted in the planning and realisation of several houses in the region, the houses were not built fully according to Igor's idea of eco-houses. None of them could function as a true model.

In order to build the first examples of eco-houses, Igor, Vladimir, Pavel, Andrey and possibly a few other enthusiasts are going to establish a building company with its office in the building of The Center for Ecological Education.

To large extent, the Soviet centralized planning and construction system still remains. "If you ask an architect to design something quite simple, like a family house, he couldn't do it by himself." Igor complains. The technical universities in post-Soviet Russia still produce engineers and architects with narrow specialisations. The projects are usually divided into several parts : design, construction, plumbing and other aspects that are dealt with by specialists.

Igor's building company will offer a full service including the consultancy, design, planning and realisation. Igor says: "We are going to be the cheapest here. There is no other way to attract people to the idea of environmentally appropriate building. We are going to have plans for building permission ready for of the usual price asked by an architect." He hopes that the first examples will attract more people, starting a chain reaction.

The Eco Center is going to be an example in itself. It will have a unique interseasonal heat storage.

The winter in the region is cold and grey. The earth freezes 2 m deep and the temperature sometimes reaches under -40 degrees Celsius. When I spoke to

Igor's brother Vladimir, who bought one of the parcels in the Ecovillage and built a beautiful straw bale house on it, he said: "We have -25 degrees Celsius here for two weeks non stop. Then the temperature becomes even lower, -35 degrees Celsius. Its cold and people don't want to go out for few days. When there is -25 degrees Celsius outside again, people are on the streets smiling. They take off their hats, it's suddenly warm again! The human psychology works like that."

The biggest problem with the winters is that there is no sunlight, when the heat is the most needed. A passive solar approach doesn't work. People spend most of their money to keep warm. Igor believes that some sort of interseasonal heat storage could be a solution. He has been interested in the possibility of storing heat harvested in autumn (during relatively sunny weather) for winter use since the beginning of his involvement with ecoconstruction in the late 1980's. It is one of his greatest challenges.

Igor and Pavel did an experiment. They drilled a narrow hole, 7m deep, into the ground near the Eco Center's location. They inserted a copper pipe loop into it. They attached one end to a heater and started to pump the heat into the ground. The temperature of the water going in and coming out was carefully monitored. After the temperature of the ground 1m in diameter around the depth of the hole stabilized, they stopped heating and measured how long the earth managed to heat the water until it cooled again. They found out that after six hours the water temperature was still useful for heating a house.

This experiment initiated calculations. 10m³ of heated earth would be necessary in order to provide the 2 months of heat storage. The first two 40 m deep holes have already been drilled. There are going to be twelve of them. The trench, 2 m deep around the perimeter of the house, is going to be fitted with thermal insulation, to keep the ground under the house from freezing.

The Eco Center is going to be built out of prefabricated cellular concrete blocks. Igor and Andrey started the production of cellular concrete blocks in Igor's garage one year ago. There are large steel grid-like forms, coated with oil, laying on Igors garage floor. Pallets with cellular concrete blocks are stacked in front of the house that he built two years ago. It is the first straw bale house in Siberia (see Fig. 1.1).

The Ecovillage has two straw bale houses. The second one was built by Igor's brother Vladimir. When I asked Igor why he doesn't want to build the Eco Center out of straw bales, he said that straw is too "exotic". He thinks that people will relate to cellular concrete much better. However, the "garage" manufacture of concrete blocks is coming to an end. Their small scale production can't compete with the market and there isn't enough money for large scale production.

After the discussion, late in the evening, Igor called Barnaul. He spoke with Tatyana Artamonova from the organization "Fund for 21st Century Altai" about my journey to the Altai region. I'm expected to arrive in Barnaul by bus Monday afternoon.



Figure 1.1: Igor's straw bale house in Ecovillage and the cellular concrete blocks stacked in front of it. Note the garage protecting the north side of the house and the south facade with a solar air collector. Warmed air (by solar passive gain) should circulate around the superinsulated envelope of the house, in order to lower the exterior air temperature (there is a crawl space under the ground floor and the cavity between roofing from recycled plastic tiles and the roof insulation). This way, the house envelope faces continuous buffer space instead of exterior air. However, the design proved to be ineffective, due to very cold weather and lack of sunshine in the winter. The air collector is going to be used in a different way - as a trombe wall.



Figure 1.2: Poorly compacted straw bales behind the asbestos sheeting. Note the green wind barrier behind the sheeting and 50mm gap between the asbestos and bales.

Sunday 7 August.

In the morning, Igor, Slava and I went to the Ecovillage.

Igor and Vladimir had applied asbesto-cement sheets to the outside of their timber framed straw bale walls. There is a 50mm gap between the unplastered straw bales and the sheeting to allow air ventilation. It proved to be an inadequate solution.

Igor took down several sheets at the bottom of the eastern side of the house to see what the straw looked like after the winter. Just under the sheeting, there was a vapor permeable, wind proof membrane. Slava and Igor removed the membrane to find a layer of finely ground straw fiber under it. "It wasn't here before" Igor muttered. It looked homogenous, like the vertical surface of a panel, but after attempting to touch it, the whole layer poured down like snow, revealing poorly compacted straw bales behind (see Fig. 1.2). The shredded straw was the work of mice. It filled up the bottom of the cavity, chewed by mice snug in the warm winter refuge that this facade offered. The straw bales had holes in them. There were mice tracks.

Igor learned that earth plastering of the bales under the sheeting is unavoidable. Igor and Slava started to fill the holes with the loose straw. Valentina and I took earth from a pile near the house. We mixed it with sand and the straw shredded by mice and started to plaster.

After lunch, I went to interview Igor's brother Vladimir.

Although the interior of straw bale walls at Igor's house is plastered by 100mm of wonderfully executed earth plaster from local soil (it was done by Tajiks, workers experienced in earth construction), his brother's house doesn't have the bales plastered at all.

Insufficiently compressed straw bales are stacked on top of each other as infill of a timber frame construction. There is asbesto-cement sheeting on the outside,



Figure 1.3: Vladimir's straw bale house on the right. The garage creates buffer space and protects the house from western winds. Igor's house is on the left.

with a 50mm gap, and gypsum boarding on the inside. Vladimir tried to fill all the spaces between the straw bales and interior gypsum boarding with loose straw and old cardboard "So that it doesn't sound so hollow, when someone knocks on it" he explains. There are plenty of mice living in the walls. "That is why we have cats." he says, smiling. When I asked about the fire potential, he seemed sure that there is no danger of spontaneous combustion. The electrical wires are apart of a wall. "Somebody would have to come, break the facade and set the house on fire. When there is a fire, even concrete melts."

Vladimir is retired. He and his family moved to Novosibirsk several years ago from Kamchatka. His wife misses the extraordinary countryside of this eastern-most part of Russia. Although she has a great sense of humour, Vladimir's wife doesn't share her husband's eco-building optimism. Her main concern is the lack of ventilation in the house.

Vladimir has tried very hard to minimize the heat loss through the house's envelope by making the interior of the house airtight. He mounted triple glazed window panes straight on to the structural frame. There isn't an openable window in the whole house. The only ventilation is provided by the channels in the central brick partition. There are also air channels connected to the stove, providing heat distribution throughout the house.

Eco-building was introduced to Vladimir by Igor in the late 1980's while he was working as a secret police officer in Kamchatka. He became interested particularly because it offered a cheap alternative for living in a cold climate. From their retirement pension, Vladimir and his wife managed to save just enough money to buy land in the Ecovillage and to finance the building of their modest straw bale house. "If we weren't able to build this house ourselves, we would never be able to afford it." he says. It will be finished next summer.

Vladimir and his son have been working on the house since spring of 2004. One of the first jobs was making flooring for the ground floor. It is a concrete slab on straw bale insulation. Vladimir copied the technology from an American



Figure 1.4: View from the south. Vladimir's straw bale house, with a winter garden as a buffer zone on the left, Igor's house with the solar air collector on the right. Sauna in the middle.

book. Between a cold attic space and the second floor living area, there is a ceiling insulated by a 200mm layer of polystyrene. The roofing is made of corrugated metal.

While talking about the choice of materials, Vladimir starts to talk about the asbesto-cement facade: "At first I thought asbestos was a dangerous material. I had a lot of prejudice, but I went to see the manufacturer. I learned that there are only a few places in the world where the asbestos is mined: Ural, Baykal, Argentina and South Africa. The asbestos from Africa is radioactive, so the UN banned the import of asbestos from all those places. We can use it here, but we can't export it. Our asbestos is bad for you when you cut it. If you work with it, you need to put on a mask, otherwise it is a good and cheap product." (see Figs. 1.3, 1.4, 1.1)

The last evening at Igor's home, Igor and I spent in conversation about his extraordinary eco-house adventure. He said that the name EKODOM was suggested to him by the mayor of Akadem Gorodok. His name was Kaptyuk. From the beginning, EKODOM had a great supporter in this knowledgeable old man. He promised Igor that the academy would finance the "house laboratory", but unfortunately he died before the project's realization. His successor took the laboratory off the agenda.

Igor recalls one conversation he and Kaptyuk had about Russian ecological awareness, in 1995. "Eco-houses? Until 2005 - forget it." Kaptyuk said. "This man knew a lot about Russian nature and I was stupid. I didn't believe him." Igor laughs.

Chapter 2

Barnaul

Monday 8 August.

Early in the morning Igor took me to the bus station. I headed for the Altai mountains.

The Altai mountains, approximately 400 km south of Novosibirsk, form a unique natural area at the point where the borders of four countries meet: Russia, Mongolia, China and Kazakhstan. Mount Belukha on the Russian - Kazakh border reaches 4500 m high and is Altai's highest peak.

Natives of Altai still live in the mountains. They look Mongolian and are mostly herders migrating yearly, up in the summer and down the mountains in the winter. They are known for their shamanistic healing capabilities and for their Buddhist religion similar to Tibetan lamaism. There is a legend that during his travels, the Buddha came to Altai, and that these mountains are the location of the Buddhist paradise known as Shangri-la.

At 13:00, the bus from Novosibirsk arrived in Barnaul's main bus station. Barnaul is the capital of the Altai Republic in the Russian Federation. To get to the mountains from there, it is still a four hour drive to the south.

Lena, a young lawyer in her thirties, came to pick me up at the station at 13:30. A city bus took us to Kuznetsova street, not far from the city center. I was accommodated in a recently built block of flats.

After lunch, prepared by Lena, we went to her office. Lena works for the non governmental, non profit organization called The Fund for 21st Century Altai.

"In the 21st century, technology and nature are going to reach inseparable unity." says the organization's co-founder and its vice president, Andrey Ivanov, a professor at Altai State University.

"Altai was, historically, a home for many nations." Andrey explains "There is inhospitable land all around, stretching for hundreds of miles. When different nations migrated through here, they came to Altai to rest, to recover and settle." Andrey believes that Slavs, Turks, and others lived here, even Japanese.

The Fund for 21st Century Altai has an office on Matrasova street, in the part of the city where old, one-story wooden houses are lined up along the paved

road. Some of the houses are barely visible because they are hidden behind tall fences. A low, white wooden building houses the organization. There is a small library, serving as an entrance. I met Tatyana Artamonova there, behind her computer. She is the woman responsible for administrating the building of intended straw bale toolshed, the reason for my trip.

Tatyana is a tall, energetic woman in her forties. She speaks slowly and carefully. I was introduced to the problems they have encountered so far in organizing the building and materials. It was clear from our preliminary e-mail exchange that the project had a problem getting building permission.

Since 1993, the Soviet rules on individual housing have loosened up. That is why Igor and Vladimir Ogorodnikov, as individuals, had no difficulty getting permission to build their straw bale houses, even though straw isn't a certified material in Russian building regulation policy. However, the Fund for 21st Century Altai is an organization and therefore subject to different rules. These rules don't recognize straw bales as construction material unless the bales have been thoroughly tested by an authorised institution, which costs a lot of money and time.

There was no chance they would receive permission to build a straw bale house as a permanent building. In order to build an example, to test straw bale building technology in the Siberian climate, the Fund for 21st century Altai decided to build a toolshed.

The straw bale tool shed received a permit as a temporary structure. "If a building contractor, building on the property, wants to build a toolshed for their own use, they will get permission to do it without submitting the plans. That is what we did." Tatyana said. There are plans to build a log cabin on the Fund's property in the Altai mountains, where the straw bale building will also stand. The straw bale building will serve as a toolshed and a test at the same time .

I was sitting in the kitchen with Tatyana, Lena and Yelena Retchman, who is the office manager. There was warm, strong Russian tea with marmelade from homegrown raspberries on the table.

I learned that the Fund for 21st century Altai is urgently fighting a government decision to build a shortcut between China and Russia through the Altai Mountains. Recently, the Russian government, which generally promotes the superiority of economy above ecology, decided to build a highway and oil pipeline to China that would cut through the Altai mountain range.

In the name of "industrialization" of this area, a large hydropower station will flood the wild and precious valley of Altai's main river the Katun.

If nothing stops this shortsighted decision, the loss will be irreversible.

"I don't know." Tatyana answered worriedly when I asked if there is any chance to succeed in opposition against the Russian government. "We are becoming skeptical, but we need to live and the struggle for a good thing is a part of our lives. We have great hope."

The Altai mountains are sacred for nature lovers and indigenous peoples of the four countries, that share them. In order to establish international ecological cooperation, the coordination council Our Common Home Altai was set up

in 2003. Andrey, the vice president of the Fund leads some of the councils international projects.

Our Common Home Altai covers the Altai Republic of Russian Federation, the Altai region of Western Mongolia, Eastern Kazakhstan, and the territory of Northwest China.

Tuesday 9 August.

I was at Lermontova street at 10 am. I met Tatyana in front of the old building of the Institute of Architecture and Design of Altai State Technical University. Tatyana introduced me to Mikhail Shishin, a professor of philosophy and the deputy director of the Institute. In addition to his job at the University, he is a co-founder of the Fund for 21st Century Altai and its president.

Mikhail Shishin, a man in his fifties with a short beard, took me to a classroom. Large models of students' works were hanging on the walls. The prevailing color of the models was green. Most of them resembled urban studies of the countryside covered with forests, rivers and small buildings. Mikhail pointed at one of them. "This project took part in an international competition of students' graduation theses in Florence, Italy. This model, of an exemplary tourist resort in the Altai mountains, won first prize." The small cottages were integrated in the countryside, near the river. "The student proposed building all the lodges out of straw bales." Mikhail said that the students are thrilled by the idea of building with straw. "They generally find it fascinating. There are a number of student works like this, which explore straw bales as a sustainable alternative to the usual building construction." Mikhail showed me another few projects. They were general ideas. It was difficult to see if the students were aware of proper detailing.

The meeting was attended by:

- 5 fifth year students.
- Professors:
 - Mikhail Shishin
 - Lyudmila Fedorovna
 - Yelena Nazarenko
 - Vjatchaslav Andreyevitch
- Tatyana
- Nikolay Kuznyetsov, a builder and owner of two companies

Meeting minutes:

- Introduction by Mikhail Shishin
- Straw bale construction methodology by Kuba
- Discussion



Figure 2.1: From the left to the right: Lyudmila Fedorovna, Mikhail Shishin (the Fund's president), Yelena Nazarenko, Tatyana, students, Kuba.

After the friendly meeting (see Fig 2.1) Tatyana and I took public transportation and we were soon in the Fund's office.

Every summer, during the tourist season, the Fund for 21st Century Altai organizes a tourist camp called the Milky Way. The Fund has a 50 year lease on some land in the foothills of the Altai mountains, in the Chermal river valley. The valley is wide enough to allow for a district road and flat pasture, which is surrounded by steep rocks and forests. Until 2005, the camp consisted of tentlike, portable structures -even a wooden sauna was built and dismantled every year. In 2005, the Fund decided to build a log cabin on the property as a home for the Camp keeper and the straw bale tool shed. The Milky Way campsite will gradually become the Center for Ecological Technology and Alternative Energy.

Tatyana, whose function in the Fund is precisely: Alternative Energy Project Coordinator and Coordinator of Straw Bale Construction Projects, is also a journalist for the ecological TV programme Katun, which has a studio in the same building.

The original old wooden building of the Fund's office has two extensions. There are two small offices in one extension. The second extension is a small TV studio. There I found Pasha, Misha and Grisha, Katun's staff, all young, friendly boys. Grisha was keen to show me the equipment: digital TV cameras, a big hard disk, a computer and a large library of material. Katun broadcasts three hours a week regionally.

My eyes were captured by a postcard displayed behind the glass separating the recording room from the studio. The postcard showed a wonderfully executed drawing of a ram with curly cloud-like horns. It was a photograph of a 2 thousand year old tattoo of a mummy, an Altai princess (see Fig. 2.2).

In 1993, a unique burial mound of a woman and three years later a horseman, both of the Pazyryks tribe, related to the Scythians, were found in almost exactly the place where the oil pipeline and the highway are going to cut through,



Figure 2.2: The woman, called the Ice Princess, is elegantly tattooed with pictures of sacred, fantastic animals.

in the Ukok area in Altai. Both bodies are of about the same age and were well preserved in the ice of the permafrost.

Ukok was designated as a United Nations World Heritage Site in 1998. It is unfortunate that the Russian - Chinese border meets only at one point, because in order to make a shortcut from Beijing to Moscow, there is no way to go around. The pipe line and the highway would have to go through Ukok (see Fig. 2.3).

While walking out of the TV Katun studio, I had a glimpse inside the small Geography Information System Laboratory and saw Irina Mikhailidi for a moment. She was looking at me from behind of her large glasses, smiling broadly. Besides managing the GIS laboratory of the Fund, she is a GIS programmer at Altai State University.

"Most of the staff of the Fund for 21st Century Altai works simultaneously teaching in Altai State University. Otherwise we couldn't survive. We need to have multiple jobs." Tatyana told me.

Tatyana and Lena took me for an evening walk through the center of the city to the river bank. We stood on a concrete platform of an empty restaurant, looking at the wide river Ob. Russian young people, girls and boys, milled around, most of them with a can of beer in hand.

I was leaving the next day for the Altai mountains, to join Andrey and the others in building foundations for the straw bale tool shed in the Milky Way Camp site. Tatyana, Lena and I went by bus to Tatyana's small family orchard in the suburbs. She and her parents (like most Barnaul citizens, including Lena and her mother) work on their own garden out of town in their spare time. I was loaded with fresh vegetables for the camp's kitchen to take with me.

I was invited to sit down in a cosy room in the garden cottage. We had a glass of water and sat silently for a few minutes in keeping with Russian custom, performed always when someone leaves on a journey.



Figure 2.3: Ukok is a place of immense beauty. It is sacred to the native people of Altai.

Chapter 3

On the way to Milky Way

Wednesday 10 August.

There are lime kilns in one village on the road from Barnaul to the Altai mountains. The village is called "Izvyestkovyj" - or, Little Lime Village.

Ira, Irina Kalanchina from the Fund of 21st Century Altai, the director of Milky Way Camp and Nikolay Simonovich, the driver (officially: Driver 000, Milky Way), were driving me to the camp in a white LADA.

We were 30 km from the camp when we saw the signs saying "Lime" along the road. Nikolay Simonovich stopped the car and we walked to a garage filled up to the ceiling with small plastic bags of stones. Each 5 kg bag contained lumps of quick lime and was for sale for a little more than a dollar.

The man selling the quick lime was terribly burned all over his face. His ears were bleeding. I asked him where the kiln was.

He told me to go to the nearby forest, where, on a hill under the limestone quarry, there was a big crater-like hole with a pile of coal next to it. The crater was built out of bricks. It was ready to be filled up with limestone and coal again. There was a small door at the bottom to start a fire.

Ira bought a bag of quick lime. The quick lime has to be slaked and stored under water, ideally for a couple of months, before using it in construction. The longer the underwater storage, the better the quality of the lime.

We asked for slaked lime, but they didn't have it. The burned man said we should ask an old woman in the village. They usually store slaked lime - the lime putty- in a pit in the garden. They might have sold us some, but we had run out of time.

Chapter 4

Milky Way, Builder's diary

Later, Wednesday 10 August.

15:00 Arrival at the Milky Way Camp with the bag of quick lime.

Meeting with:

- Andrey Ivanov, the co-founder and the vice president of the Fund and his small daughter Anya
- Irina Fotyeva, the co-founder of the Fund, the chief editor of TV Katun
- Aleksander Nikolayevich, Makhlayev, the chief of the Camp, Ira's brother
- Sasha, Aleksander Moltchanov, a carpenter from Barnaul
- Yulia Artamonova, Tatyana's daughter, volunteer, a student at Altai State University
- Vanya, Ivan Yegorotchkin, volunteer, a student at Altai State University
- two local masons

Generally, the Russian women worked in the kitchen and the men worked on the building site.

18:00 Journey with the driver Nikolay Simonovich for local clay.

The soil in the Chermal river valley consists of sedimentary deposits and rocks. It doesn't have usable clay content for the earth plaster. There are two places near the Milky Way Camp site where the soil seems suitable for plaster. One of them, called Togolyok, 6 km from building site, was recommended by a villager as a place where the locals find material for the construction of their adobe stoves. Buckets of earth from both places were taken to the Camp and then the earth was mixed with sand and horse dung in different ratios to test

the suitability of local earth for plaster. Three samples were plastered on the wooden sauna wall.

Thursday 11 August.

Rain from the morning until 18:00

18:00 Working on foundations. Andrey and Vanya carried stones from around the building site. They laid them into fresh concrete made on site by two local masons in an electric mixer.

Massive corner posts and ladder-like timber framed posts were inserted into the concrete of the foundations. The wood that was meant to be buried in the concrete was covered with a thick layer of tar. The corner posts were large boards, 60 x 400 mm, of solid local wood (Siberian pine). They will be left exposed for future carving.

The working drawings of the straw bale toolshed were sent to Tatyana by Jeff Ruppert, a professional American straw bale builder, earlier in August (see Appendix 10 and 9). There were no corner posts of the kind used in the drawings, and the timber framed posts at the building site were 60mm wider than the ones in the drawings (see Fig. 4.2). Jeff designed the post frames to be as wide as the straw bales, so that they could be completely hidden under the plaster.

20:00 Sauna after dinner.

Friday 12 August.

9:00 Work on the foundation continued until the concrete reached the ground level.

Two local masons were making the formwork for the foundation.

The building site is sloping. The back of the toolshed will have barely 200mm of concrete foundation above the ground, while at the same level in the front the foundation will be almost 1m above the ground.

The formwork of reused timber boards was nailed to the corner posts and the timber framed posts.

String was attached to the inside of the formwork at the level of the intended top of the foundations.

14:30 The masons started to pour concrete into the forms.

16:00 The minibus from Barnaul arrived.

Meeting with:

- Alyson Ewald of the Center for Safe Energy, USA, the project's coordinator, translator and fund raiser. She worked closely with Tatyana, Builders Without Borders, donors and straw bale builders in order to bring professional expertise to this Siberian project.
- Paul Koppana of Skyhawk Construction, Crestone, a well known straw bale professional. His company specializes in building earth plastered straw bale houses in Colorado, USA.
- Jeff Rupert, P.E. of Odisea Design, Boulder, a well known straw bale professional. His company manages the design, engineering and construction of straw bale houses in Colorado, USA.
- Cindy Smith, a professional plasterer, specializing in earth plastering, from the USA.
- Tanya Komdrashova, a coworker of the Fund for 21st century Altai, the editor of Katun TV programmes.

Also arrived in the minibus;

- Tatyana with her dog Adara
- Yelena Retchman
- Irina Mikhailidi

18:00 The minibus went back to Barnaul,

taking:

- Andrey and his daughter Anya
- Irina, the chief editor of Katun

Paul and Jeff checked the site. The pouring of the foundation was stopped, due to the problem with the width of the framing (see the end of Thursday 11 August).

The local masons went home.

Saturday 13 August.

9:00 Two local masons mixed concrete, while Paul and Jeff poured it into the form.

After figuring out the detail of the foundation between the frame work and the straw bales, the frame was left as it was.

The ladder-like timber framed posts consist of two vertical posts (see Fig. 4.2). It was decided that the posts facing the exterior of the building will be buried in the straw bale wall and hidden behind the plaster, while the posts to the inside will stick out 60mm from the plaster into the interior. They will be visible and are going to be part of the shelving for tools. The straw bales will be flush with the exterior side of the foundation. There will be a drip edge, timber lath, mounted on the exterior side at the very top of the foundation. The drip edge will provide a natural ending of the exterior plaster above foundations.

Tatyana and Ira decided to narrow the large garage door opening that was designed to fit a car. They decided to have two windows in the front, instead of one. The intended straw bale toolshed was transformed into a cozy straw bale office.

Sasha, the carpenter, cut the corner boards that formed one side of the garage door with a power saw. He and Aleksander Nikolayevich made a 1200 mm wide door opening.

30 bags of cement arrived.

Cindy and Alyson were collecting stones.

Alyson heated the tar and painted the base of the freshly removed door frame.

Sasha, Aleksander Nikolayevich and Vanya continued working on the log cabin.

15:30 The masons mixing concrete for the foundation ran out of sand.

17:00 Planning meeting:

Topic: The First Straw Bale Building Seminar in Siberia, for Saturday, 20 August.

Meeting attended by:

- Tatyana
- Alyson
- Cindy
- Jeff
- Paul
- Kuba

Meeting minutes:

- the seminar's structure
- the topics
- the basic organization
- the place
- rehearsal and next meeting set for Friday, 19 August.

20:00 Sauna after dinner.

Sunday 14 August.

9:00 The sand was ordered for later that day.

Before the sand delivery, it was decided to use the trailer to transport the sand that was stored next to the log cabin construction site, 150m away. The trailer was filled with sand and pushed to the building site.

Alyson and Cindy were carrying sand, using "handy carriers" - a kind of Russian wheel barrel without a wheel.

Two local masons were mixing.

Jeff and Paul were pouring the concrete into the forms.

Sasha, Aleksander Nikolayevich and Vanya were continuing on the log cabin.

14:00 A few more trailers filled with sand were pushed and pulled from the log cabin to the building site.

The sky started clearing. The sun shone on the Chermal river valley.

Jeff, Paul and the two local masons continued working on the foundation.

Alyson and Cindy were economizing the use of concrete by inserting local stone carefully into the frame work.

At the top of the foundation, facing the exterior, wooden pegs were buried in the concrete, to provide a fixture for a future wooden drip edge at the bottom of the exterior plaster.

17:00 End of work.

18:20 Departure for a dinner party.

We were invited by Lyudmila Solvyeva to her house in Chermal village. She is the owner of a farm that provides organic food as well as tourist accommodation. She is the president and founder of a local organization called Protection of Tengri. The organization provides scientific research for the protection of historical and cultural monuments. We were offered a sauna, tea, fresh milk, cheese and vegetables.

Monday 15 August.

Meeting at the breakfast table:

Topic: Purchasing the straw bales

Meeting attended by:

- Tatyana
- Alyson
- Cindy
- Jeff

- Paul
- Kuba

Meeting minutes:

- Arrangements were made for the straw bales to be brought from Bijsk - 200 km from the Milky Way Camp site. Tatyana is going to confirm the exact date of delivery. It had been raining in the Bijsk area and the time of harvest was still unknown.
- It was decided that the straw bales production (baling) should be overseen by either Jeff or Paul.

9:00 1 trailer full of sand from near the log cabin was pushed and pulled to the building site in order to continue with the rest of foundation work. Roughly of the overall concrete volume still needed to be poured.

Two local masons mixed concrete.

Paul and Jeff poured concrete.

Alyson and Tatyana went to Chermal to register our passports with the local police.

The rest of us carried the sand in handy carriers.

12:00 The foundation was completed.

Two local masons were paid and went home.

Cindy, Paul and Jeff, were stripping down the part of the formwork.

The mixer was washed and the building site cleaned.

13:30 Lunch

After lunch, a trip to Chermal to visit a Church on a rock island.

Fishing in the Katun river.

In the meantime, the driver Nikolay Simonovich brought Andrey Ivanov (the Fund's vice president) from Barnaul.

Tuesday 16 August.

Meeting at the breakfast table:

Topic: Carpentry

Meeting attended by:

- Sasha, a carpenter
- Andrey Ivanov
- Tatyana
- Alyson

- Cindy
- Jeff
- Paul
- Kuba

Meeting minutes:

- Sasha showed us the windows that will be reused in the straw bale house.
- Sasha and Paul discussed the roof design. The decision was taken to use a simple "A" frame (the usual American way to construct a lightweight gable roof) built by Paul, Sasha and Jeff.
- Paul and Jeff discussed roof plate design.

9:00 Jeff cut and prepared wall plate boards out of 60 x 400 mm cedar wood.

Paul made a sifter to sift the sand for plaster out of cheap wire mesh.

The wire mesh was expected to last only few days due to its poor quality.

The rest took down the remaining foundation forms and leveled the floor with dug earth.

Tatyana called Bijsk and arranged the baling for tomorrow. Tatyana and Paul will go tomorrow for the bales.

14:00 Tatyana, Cindy and Alyson were driven by Nikolay Simonovich to get some samples of local soil for plastering.

The rest of us:

- straw bale business discussion
- swimming in the river

16:00 Organized trip along the Katun river. Visit of a place with stone carvings dating back thousands of years.

- Tatyana, Yulia and I were driven by Nikolay Simonovich to Togyok (see Wednesday 10 August), for more earth for the plaster samples. On our way back Tatyana searched for an excavator that could load the truck with soil, without success.

Cindy took down the old samples from Sauna wall (see Wednesday 10 August) and made new ones according to her own recipes. She used wheat paste to strengthen the plaster.

20:00 Meeting:

Topic: Money raising for the roofing material

Meeting attended by:

- Alyson
- Jeff
- Kuba

Meeting minutes:

- Conference call with Catherine Wanek, Administrative Coordinator of Builders Without Borders.
- Composition of a letter to be posted on GSBN (Global Straw Bale Network - an email discussion forum of professional straw bale builders) and elsewhere.

Wednesday 17 August.

8:00 Yulia and Vanya were driven by Nikolay Simonovich to Barnaul. Paul and Tatyana were dropped near Bijsk at the place of straw bale purchase.

9:00 Cleaning the building site.

Preparing the platform to stack the bales.

Preparing the foundations for straw bale wall rising:

- smoothing the surface
- cutting and cladding the bitumen sheets as a barrier against rising damp

14:00 Shopping trip to Chemal

20:00 Sauna

Thursday 18 August.

2:00 Paul and Tatyana arrived with the bales

Unloading the truck with a trailer filled up with straw bales (see Fig. 4.1).

Thanks to Paul's supervision and Tatyana's determination, the bales were O.K.. According to Paul, the bales could have been better if the straw was longer and baling was done very early in the morning, instead of in the afternoon. The morning straw has dew on it and is more flexible. It makes better quality bales

11:00 Straw bale wall raising.

Crew:

- Tatyana
- Paul



Figure 4.1: Tatyana, Cindy, Alyson's hands and the bales. The Kazakh nomads settled on the neighboring property.



Figure 4.2: From right to left: Jeff, Cindy, Pasha, Tatyana, Paul, Alyson, Tanya.

- Jeff
- Alyson
- Cindy
- Tanya
- Kuba
- a few curious volunteers who were passing by.

14:00 Straw bale wall raising continued.

Ira (the camp's director), her son Roman and Pasha (from Katun TV) arrived from Barnaul in a small truck with a load of old windows arrived.

Pasha joins the straw bale wall rising crew with a video camera.



Figure 4.3: The roof plate is a straight massive timber board laid flat on top of the walls. Note the plastic between the plate and the top of the straw bale walls.

17:00 The walls were up except the last, 7th row.

A storm was threatening. The walls were covered with rubber tent sheets.

Sergey, a volunteer, arrived by bus.

20:00 After a day of being unable to connect to his mobile phone network Jeff managed to send an SMS message to his company with a letter asking for the financial help.

Friday 19 August.

9:00 Unloading the roof material for the log cabin - ceramic tiles - received by the Fund as a payment from a local ceramic tile manufacturer for an advertisement on their TV program.

Sergey cleaned the building site.

Jeff and Paul cut posts at the height of the last row of straw bales. The roof plate will be placed on top of the posts.

The last row was placed by Alyson, Andrey, Cindy and Tanya.

Covering the bale walls:

- first with a strip of plastic
- then with the roof plate, a 60 x 400 mm cedar board.

The roof plate on the shorter sides (the building footprint is a rectangle) will overlap the roofplate on the longer sides, which means that on the shorter sides, the roof plate will be 60 mm higher. The 60 mm gap between the top of straw bale walls and the roof plate (on the shorter sides) was filled with off cuts of 60 x 400 mm cedar boards (see Fig. 4.3).

Tatyana decided the height of the window sill to be exactly 2 bales.

There will be gap of 150mm between the top of the window and roof plate. The gap was filled with flakes of straw bales.

14:00 A truck full of sand arrived.

Straightening the straw bale walls.

16:00 Meeting:

Topic: Tomorrow's Straw Bale Building Seminar

Meeting attended by:

- Tatyana
- Alyson
- Cindy
- Jeff
- Paul
- Kuba

Meeting minutes:

- Since the log cabin walls were finished in time (Sasha, Andrey Ivanov and Aleksander Nikolayevich were working on the building every day) the seminar will take place inside the log cabin.
- The speeches were briefly reviewed.
- There will not be a projector to show pictures. A flip chart will be provided.

Igor Ogorodnikov, Valentina, her son Slava, Slava's fiancée and Anatolij (a landscape designer from Kuzbas) arrived from Novosibirsk for tomorrow's seminar. They all eagerly joined the work.

Two trucks with soil from Togolyok arrived.

Paul and Jeff started the roof structure.

Igor, Slava and Andrey Ivanov continued to level the straw bale walls.

The rest took turns sifting the sand with Paul's sifter.

Tanya, Alyson, Valentina, Igor and Slava put a large sample of clay slip on a straw bale wall.

Under Cindy's supervision they prepared four different mixtures of earth, sand, straw, water and wheat paste for the next day's seminar.

19:00 Sauna

Saturday 20 August - First Straw Bale Building Seminar in Siberia.

9:00 Paul and Jeff prepared the roof so that Sasha the carpenter could continue the work

Cindy, Tanya and Alyson plastered four plaster samples of clay slip on straw bale wall.

Students from the Institute of Design and Architecture, with their professors Lyudmila Loktyonova and Yelena Nazarenko arrived from Barnaul. They will be staying and helping until the straw bale house is fully plastered.

Approximately 30 people arrived

11:00 Seminar was started by Andrey Ivanov, who introduced the Fund for 21st Century Altai and the building site.

According to Andrey: "This seminar is a big step in developing this unique region using sustainable resources."

Tatyana introduced the guests from abroad.

Talk by Paul and Jeff:

- the history of straw bale construction
- straw bale houses around the world
- advantages and disadvantages of straw bale building:
- structural aspects
- thermal insulation
- important details

Talk by Paul:

- experience of living in a straw bale house in Colorado.

Discussion

Tea break

14:00 Talk by Kuba:

- load bearing versus post and beam, construction methods
- moisture

Talk by Igor:

- building his own straw bale house in Novosibirsk (review of mistakes made)
- his straw bale learning experience in USA
- the organization EKODOM

Discussion

Tatyana ended the theoretical part of the day.

15:00 Lunch break

16:00 Tour of the straw bale house

Jeff explained the structural details

Talk by Cindy:

- plastering

Hands-on plastering lead by Cindy

Jeff, Paul and Kuba were interviewed by a local TV station and newspaper.

18:00 Meeting:

Topic: Evaluation of the seminar

Meeting attended by:

- Andrey
- Tatyana
- Igor
- Valentina
- Alyson
- Cindy
- Jeff
- Paul
- Kuba

Meeting minutes:

- The conference had a great response.
- Igor, who has organized many conferences, said this seminar was different because it was attended by people who actually want to build.
- Valentina thought that people appreciated Paul's input about living in his own straw bale house.
- Igor and Valentina thought there was not enough visual information, in the form of slides or large pictures. Valentina suggested that it would be especially useful to show the bathrooms and kitchens of straw houses.
- For next time:
 - Paul suggested that the seminar should be a yearly tradition. At the seminars, people who can offer something should meet people who need advice or services.

The money could potentially be raised with workshops.

-Tatyana saw a problem with getting people to this particular area. People need to travel far and to pay to get there. The next seminar could be nearer to Barnaul or Novosibirsk.

- The next conference should be for professional builders and people that have the right connections to facilitate the administrative process.

- Tatyana was skeptical, because the professionals tend to have fixed ideas.

- Paul agreed. The professionals are the greatest skeptics.

- How to proceed with Russian legislation to make straw bales a legal building material? Tatyana said that a detailed analysis of what is possible is needed. It is necessary to find connections in parliament. The Fund has a good connection in the parliamentary representative of Altai region. In order to proceed with the testing of straw bales, there must be specialist in the ministry, in Moscow.

- The financing could be done by funding and from grants. It would be worthwhile to contact the World Wide Fund or the Altai region representative in parliament.

19:00 Swimming in the Chermal river.

20:00 Banquet, toasts, vodka, singing.

Sunday 21 August.

9:00 Alyson, Cindy, Paul and Jeff - day off.

Sasha the carpenter, Roman, Aleksander Nikolayevich and Andrey continued on the timber roof construction of the straw bale house.

Tanya supervised the clay slipping of the rest of the house. The woman of the Fund, professors and students, were plastering the first layer.

Igor and Valentina went to spend few days in a nature resort near Ust Sema in the Altai mountains.



Figure 4.4: From left to right: Jeff, Paul, Yelena, Tatyana, Tanya, Sergey (volunteer), Alyson, Kuba, Anatolij (Igor's friend), Slava, Cindy, Igor, Andrey.

Chapter 5

On the way back

Later, Sunday 21 August.

Slava, his fiancée, Irina Mikhailidi and Anatolij agreed to take me to Novosibirsk, where my flight was scheduled to leave the next day. After fifteen minutes of driving, not far from the Milky Way Camp site, I asked them to stop in Askat.

Askat is a small village on the Katun river. In 1998, when my wife and I first visited this area, we were helping to build the foundations for a buddhist monastery here. Back then it was dangerous to bring a car into the village. To get there, the car had to be driven quickly over an old, narrow wooden bridge. The bridge was falling apart. If the car was too slow, it could have ended up stuck in one of the bridge's many holes.

Seven years later, we entered Askat by car through a new wide bridge made of steel and concrete (see Fig. 5.1). Slava stopped by the monastery. I hardly recognized the place. The village has grown. There were many new buildings. A young girl with a shaved head and bright eyes invited us in. She was from Novosibirsk and was looking after a small child while the rest of the buddhists attended the daily prayer. The place was stunning. The sun, the forest, the small brook, the green meadow, the flowers, the building, the girl holding a child, showing us an enclosure of roe deer, enhancing the peaceful vision of this mountain retreat (see Fig. 5.2).

"Come again" she said, smiling. She and the baby waved at us from behind the wooden fence.

Time is moving forward. People are constructing another bridge, another road, another building. More of the peace of the nature will be damaged by man. It is entirely upon each of us what the scale of the damage is going to be. The buddhists in Askat and environmentalists from the Fund of 21st Century Altai have made the choice to build causing as little harm as possible. To preserve nature means to preserve life.



Figure 5.1: 1998 on the right, the same place in 2005 on the left. The Katun river is a milky greenish colour.



Figure 5.2: Buddhist monastery in Askat.

Since there is now proof that it is possible to build low energy houses out of straw, what could justify the choice of building from anything else? There is nothing less damaging and as energy conserving as straw. Let's hope that the seed planted by Builders Without Borders in Siberia will flourish. It will be a slow process, but the Siberian soil is fertile. Igor Ogorodnikov and Valentina have decided to give straw bales another chance. Their Center for Ecological Education will have its second story built with earth plastered straw bales.

APPENDIX



Figure 3:

month	1	2	3	4	5	6	7	8	9	10	11	12	average per year
Tomsk	-9,4	-16,9	-9,9	0	8,7	15,4	18,3	15,1	9,3	0,8	-10,1	-17,3	-0,5
Novo - sibirsk	-18,8	-17,3	-10,1	1,5	10,3	16,7	19,0	15,8	10,1	1,9	-9,2	-16,5	0,2
Barnaul	-17,5	-16,1	-9,1	2,1	11,4	17,7	19,8	16,9	10,8	2,5	-7,9	-15,0	1,3

Figure 4: Monthly average temperature in degrees Celsius (EKODOM)

	average	the lowest	the highest
Tomsk	115	86	155
Novosibirsk	106	78	141
Barnaul	120	77	158

Figure 5: Number of days with average daily temperature above 0 degrees Celsius per year (EKODOM)

month	1	2	3	4	5	6	7	8	9	10	11	12	per year
Tomsk	52	96	163	223	256	292	309	242	172	79	42	32	1958
Novosibirsk	70	112	168	215	273	298	311	247	185	93	60	51	2083
Barnaul	66	102	156	203	260	290	292	253	186	106	61	50	2025

Figure 6: Number of hours of direct sun light (EKODOM)

month	1	2	3	4	5	6	7	8	9	10	11	12	per year
Tomsk	178	282	512	685	874	937	902	757	532	363	188	161	6371
Novosibirsk	126	223	453	652	820	880	859	720	503	312	178	89	5815
Barnaul	72	171	408	647	832	905	878	711	430	210	98	35	5397

Figure 7: Irradiance MJ/m² (EKODOM)

month	1	2	3	4	5	6	7	8	9	10	11	12	per year
Tomsk	34	23	28	31	51	67	77	76	49	55	58	42	591
Novosibirsk	19	14	15	24	36	58	72	66	44	38	32	24	442
Barnaul	26	25	26	37	56	66	75	64	48	58	50	38	569

Figure 8: Rainfall in mm (EKODOM)

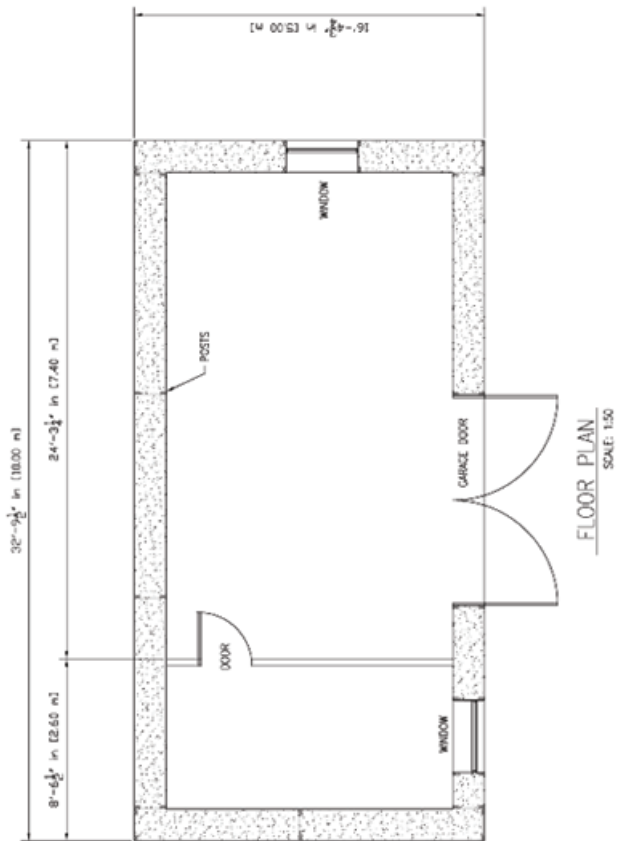


Figure 9: Original drawing of the straw bale toolshed in Milky Way camp site by Jeff Ruppert.

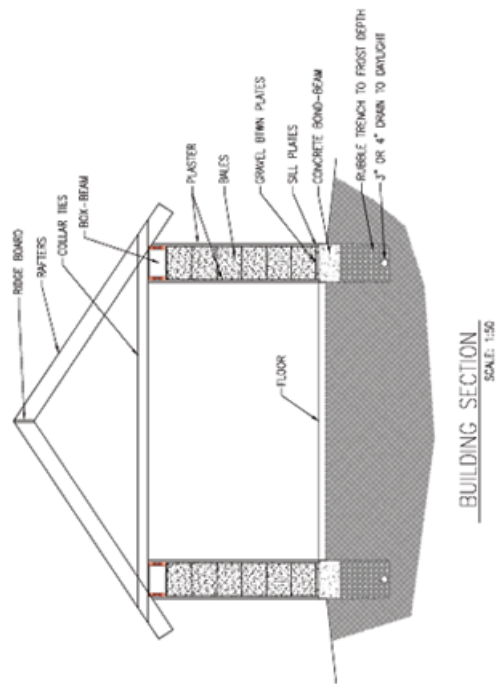


Figure 10: Original drawing of the straw bale toolshed in Milky Way camp site by Jeff Ruppert.



Figure 11: Window sill detail requires special care. Here it was covered in plastic and bitumen sheet prior to placement of wooden board. Note the drip edge on the right photograph - it was carved at the bottom of the window sill board. (photo by Jeff Ruppert)

NAME	PROFESSION	FROM
Yelena Semyanova	psychologist	Barnaul
Tatyana Veryaskina	Legislative Body for the Altai Region in Barnaul, Assistant of Deputy Director	Barnaul
Vadim Komarov	Chairman of Insurance Company	
Igor Ogorodnikov	EKODOM, Chairman of non governmental organization, Builder	Novosibirsk
Valentina Ogorodnikova	Businesswoman	Novosibirsk
Yelena Nazarenko	Institute of Architecture and Design, Deputy Director	Barnaul
Alena Bunkova	GTRK Gornyj Altai, Journalist	
Lyudmila Loktyonova	Institute of Architecture and Design, Technologist, Civil Engineer, Builder	Barnaul
Natalya Nakhayeva	Civil Engineer, Builder, Businesswoman	Barnaul
Lyudmila Solovyeva	Protection of Tengri, Chairman of regional educational organization, Doctor	Chemal
Yurij Toshpokov	Electrical Engineer	Gorno Altaisk
Sergey Belokon	Social-Ecological Union, Chairman of Department in Biysk	Biysk
Nikolay Nepomnyaschtschij	Teacher of Typography	Zonalnoye of Altai Region
Dmitrij Indjukov	Institute of Architecture and Design, Student	Barnaul
Irina Nikolenko	Institute of Architecture and Design, Student	Barnaul
Irina Galentzova	Institute of Architecture and Design, Student	Barnaul
Vital Gorodyilov	Institute of Architecture and Design, Student	Barnaul
Diana Shishin	Institute of Architecture and Design, Student	Barnaul
Viktor Fedyanin	Center for Alternative Energy, Engineer, Physicist	Barnaul
Vasilij Orlov	Agriculturalist	Gorno Altaisk
Anatolij Stepnov	Journalist	Novosibirsk
Irina Fedorova	Accountant	Barnaul

Figure 12: List of registered attendants of the First Straw Bale Building Seminar in Siberia 2005



Figure 13: After I left, "Cindy coordinated all of the volunteer labor to apply large quantities of cob and earth plaster to the walls, while Paul and Jeff put the recycled, corrugated, plastic roofing up." Jeff Ruppert (photo by Fund for 21st Century Altai)



Figure 14:



Figure 15: Alyson, Jeff (see Fig. 14) and Cindy (on the right) departed back to US on 29th of August; Paul (standing) left couple of days earlier; Sasha, the carpenter from Barnaul (squatting) stayed in order to finish the log cabin.



Figure 16: "I would like to close with a very heartfelt THANK YOU to COSBA (Colorado Straw Bale Association) and others who donated funds for their roof. We asked for 800 for the roofing materials. We received close to 3,000! The extra money will go towards renewable energy projects on the same project. The Russians were grateful beyond words! Thank you again everyone!" Jeff Ruppert.

ECODOM

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