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COLD REGIONS RESEARCH AND ENGINEERING LAB HANOVER N H F/G 13/13  
NORTHERN GAS PIPELINE. RESIDENTIAL COMPLEX POLU (SEVERNYI GAZOP--ETC(U)  
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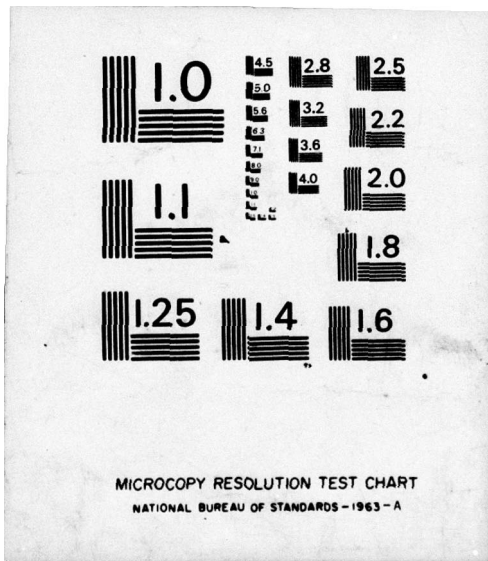
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Draft Translation 571

December 1976

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NORTHERN GAS PIPELINE.  
RESIDENTIAL COMPLEX POLU

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CORPS OF ENGINEERS, U.S. ARMY  
COLD REGIONS RESEARCH AND ENGINEERING LABORATORY  
HANOVER, NEW HAMPSHIRE

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| 19. KEY WORDS (Continue on reverse side if necessary and identify by block number)<br>RESIDENTIAL BUILDINGS<br>ARCTIC CLIMATE                                                                                                                                                                                                                                                                     |                                                                                                                                        | RESEARCH PROJECTS<br>DESIGN                 |
| 20. ABSTRACT (Continue on reverse side if necessary and identify by block number)<br>This is a report of the experimental dwelling complex "Polu ". The "Polu ." housing complex is a populated point in a single compact space whose spatial composition combines to a limited extent under a single light-transparent roof individual housing, public service institutions and a winter garden. |                                                                                                                                        |                                             |

DRAFT TRANSLATION 571

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FOREIGN TITLE: (SEVERNYI GAZOPROVOD. ZHILOI KOMPLEKS "POLU"?)

AUTHOR: None

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SOURCE: Leningrad, Series 123 of dwellings for climatic region (USSR)  
~~SNL~~ ~~Scrolled~~, 1971, 7p 1971.

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## NORTHERN GAS PIPELINE RESIDENTIAL COMPLEX POLUY

The project of the experimental dwelling complex "Poluy" is being developed by the LenZNIIEP Institute [Leningrad Zonal Scientific Research and Planning Institute for Standard and Experimental Design of Residential and Public Buildings] according to an assignment ratified by the Ministry of the Gas Industry and coordinated by Gosgrazhdanstroy in 1970.

The complex is intended to house operating personnel of a compressor station and the line section of a gas pipeline on the Nadym-Salekhard leg and also for temporary housing of gas pipeline builders. The total population of 480 persons was determined by calculation on the basis of total employment of work-capable population in public production, complex organization of public services and a developed family structure.

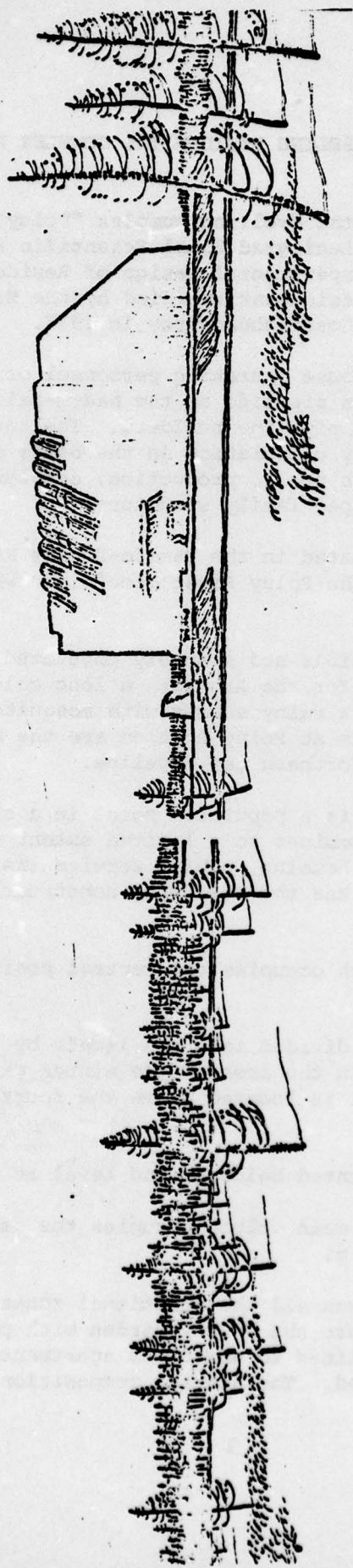
The construction site is located in the Yamalo-Nenets National Okrug and occupies the terrace above the Poluy River floodplain which empties into the Ob' River.

This is a difficultly accessible and sparsely populated region with severe climatic conditions typical for the Arctic: a long cold winter, strong winds, snowdrifts and a short rainy summer with mosquitos and midges. The living and working conditions at Poluy Station are the most difficult on the entire traverse of the Northern gas pipeline.

The "Poluy" housing complex is a populated point in a single compact space whose spatial composition combines to a limited extent under a single light-transparent roof individual housing, public service institutions and a winter garden. The complex has the following construction along the vertical:

1. The residential zone which occupies the central position between the +0.00 and +12.00 m marks.
2. The public zone which is divided into two levels by the residential zone. The lower level is located on the area of the winter garden at the -6.00 m marker while the upper level is located above the fourth residential floor at the +12.00 m marker.
3. The equipment zone is located below ground level at the -9.00 m marker.
4. The winter garden, whose main volume occupies the central span of the complex, has a height of 21 m.

Vertical communication between all the functional zones is accomplished through an open staircase into the winter garden with passenger elevators and shafts for engineering lines to which the apartments and the blocks of the public zone are connected. The spatial composition of the complex was



developed on the basis of two horizontal modular grids (6,000 x 6,000 and 1,200 x 1,200) and a single vertical module of 1,500 to which the height of the floors of all the functional zones (3.0, 4.5 and 6.0 m) correspond.

The residential zone occupies the fourth floor, located along the longitudinal sides of the complex, and has a sectional-terraced layout.

The residential zone contains 184 apartments for singles and families of three-six persons in the given ratio and also a small hotel.

The terraced structure of the residential zone provides the best communications of the apartments to the winter garden space. Unlike balconies, the extensive terraces adjacent to the apartments do not shade the lower-lying spaces and their vertical and horizontal projections create conditions for visual isolation of the rooms which emerge into the winter garden.

The nature of the apartment layout reflects the position of the residential zone on the boundary between the outside environment and the inside space of the winter garden. The bedrooms are located near the outside walls: closer to natural light and farther from possible noise in the garden. The common rooms, kitchens and terraces emerge into the garden.

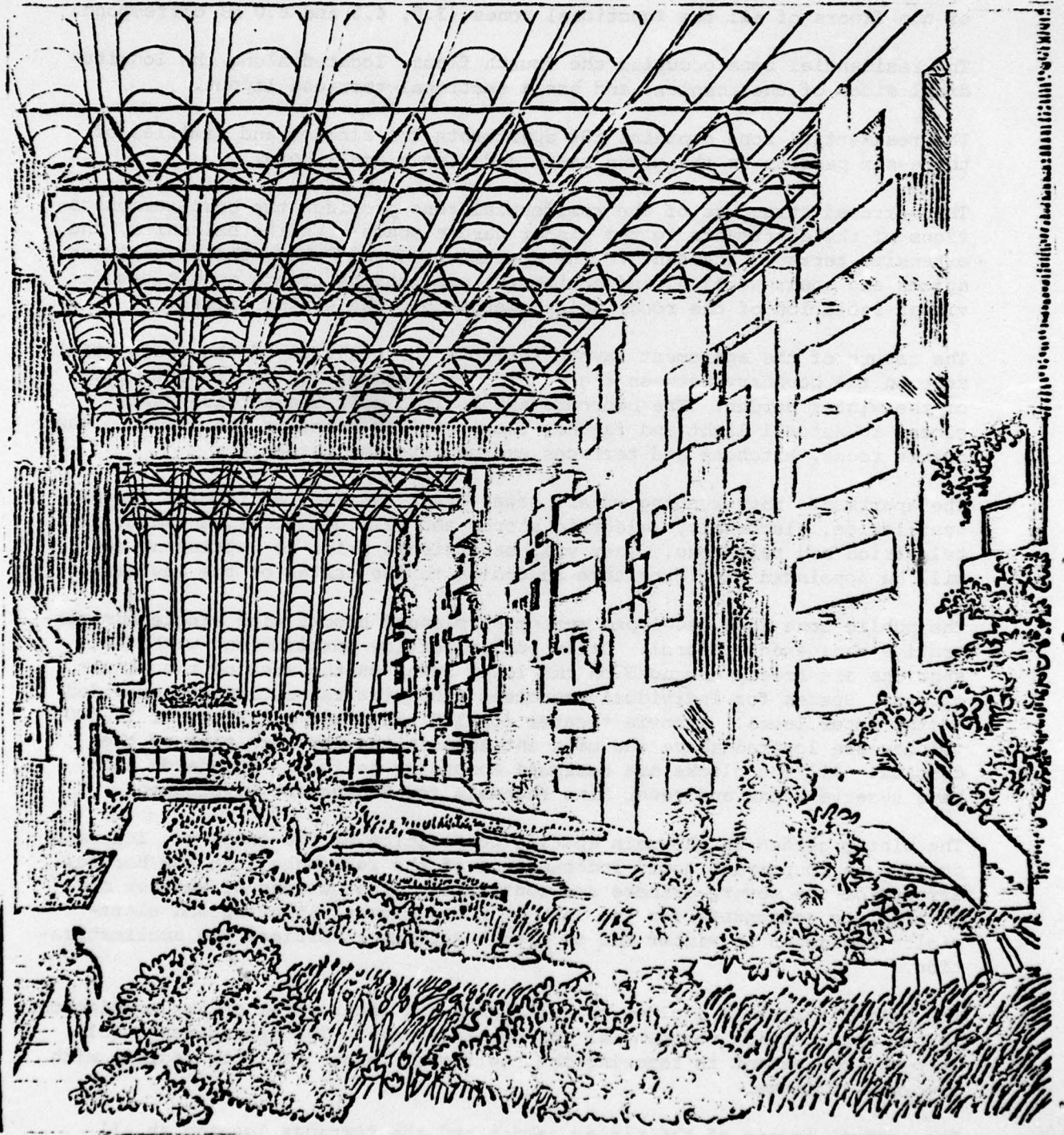
The apartments have running water, sewer drain systems, artificial forced ventilation, electricity (electric stoves and refrigerators), a radio, television and telephone. They will be finished prior to settlement and will be appointed with furniture according to the tastes of the residents.

The public zone is a developed system of planned blocks with single administrative-management control. Daily public service institutions with their sections are freely arranged on the lower level on the area of the winter garden. Spaces for individual exercises and quiet relaxation are provided on the upper level. A movie theater for 120 seats and a library of 10,000 volumes are located above the main entrance in the northern part of the complex. All the blocks are designed according to future standards and have reserve areas and sewer line channels for subsequent development.

The winter garden is the main spatial composition of the complex. Its main purpose is to provide total independence of the residents from the harmful effects of the severe climate and contrasting fluctuations of weather conditions, to compensate for the lack of heat, natural lighting and ultraviolet radiation in winter and to create optimum conditions for acclimatization.

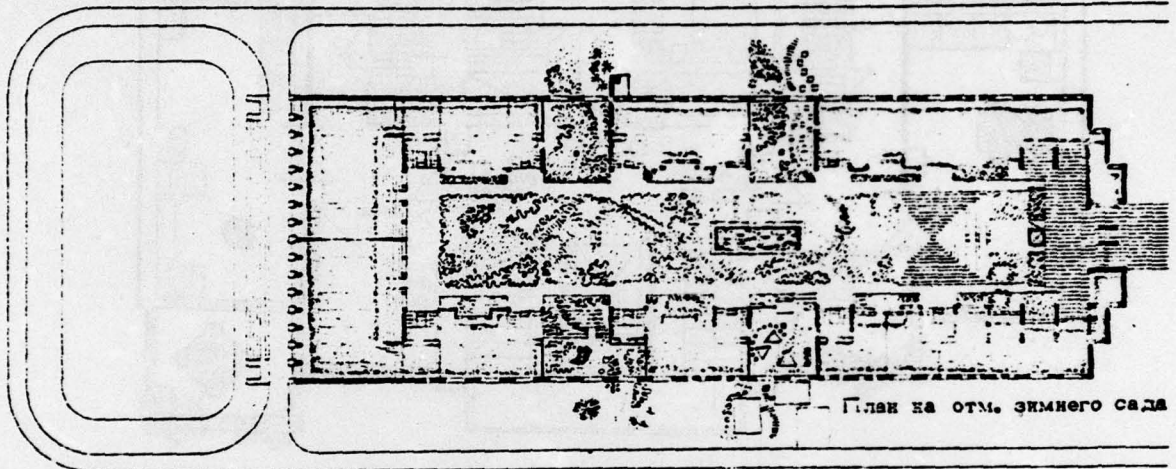
The winter garden is a place of relaxation and intercourse of the population in the open outside residential and public spaces. Its arrangement will help to some extent in removing the feeling of remoteness from regions with favorable climate.

The central square of the winter garden and the terraces located at all levels from the ground to the roof will be planted with trees and shrubs.



Planting of evergreens and trees according to a specially selection assortment, planting of lawns and flower beds, and installation of ponds and fountains and areas for games, solitary relaxation and walking are provided.

In summer the open spaces will connect the winter garden to the well-arranged area around the complex and the garden will serve mainly as a place of shelter in bad weather.



Layout at Winter Garden Marker

The controlled microclimate system will provide constant healthy temperature-humidity conditions with an air temperature of  $+16^{\circ}\text{C}$ , reduction of noise on weekdays and noise intensification on holidays, natural and artificial lighting and also ultraviolet irradiation. "Poluy" is a residential complex in a winter garden which will make the life of its residents pleasant and beautiful.

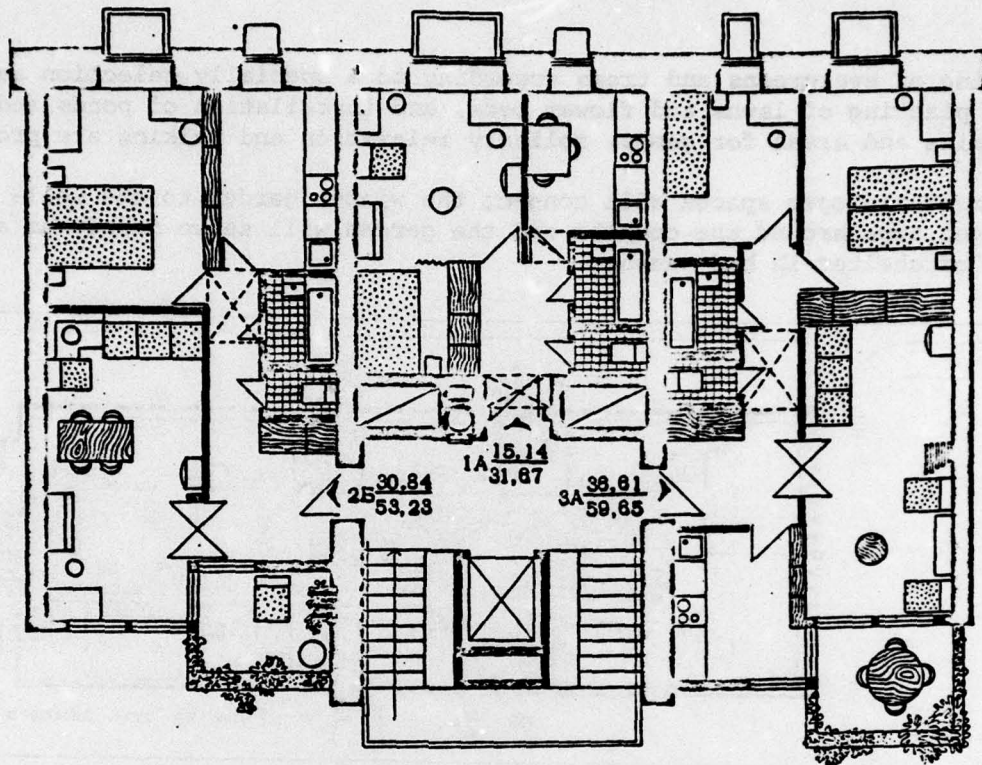
The project was ratified by the Ministry of the Gas Industry and was included in the experimental construction plan for 1972-1975. The purpose of the experiment is to develop optimum parameters under operational conditions of functional and engineering-technical solutions of the project and to determine their economic efficiency for introduction into mass construction at monoproduction enterprises of the Arctic regions of the USSR. The following will be checked during the experimental construction and operation:

the total spatial solution of the residential complex which combines housing, the public service system and a winter garden;

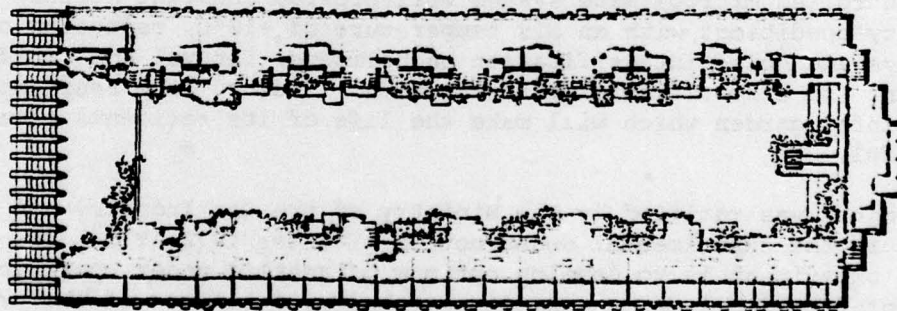
single social-service and functional organizations;

a winter garden and controlled microclimate system;

a light-transparent roof structure.

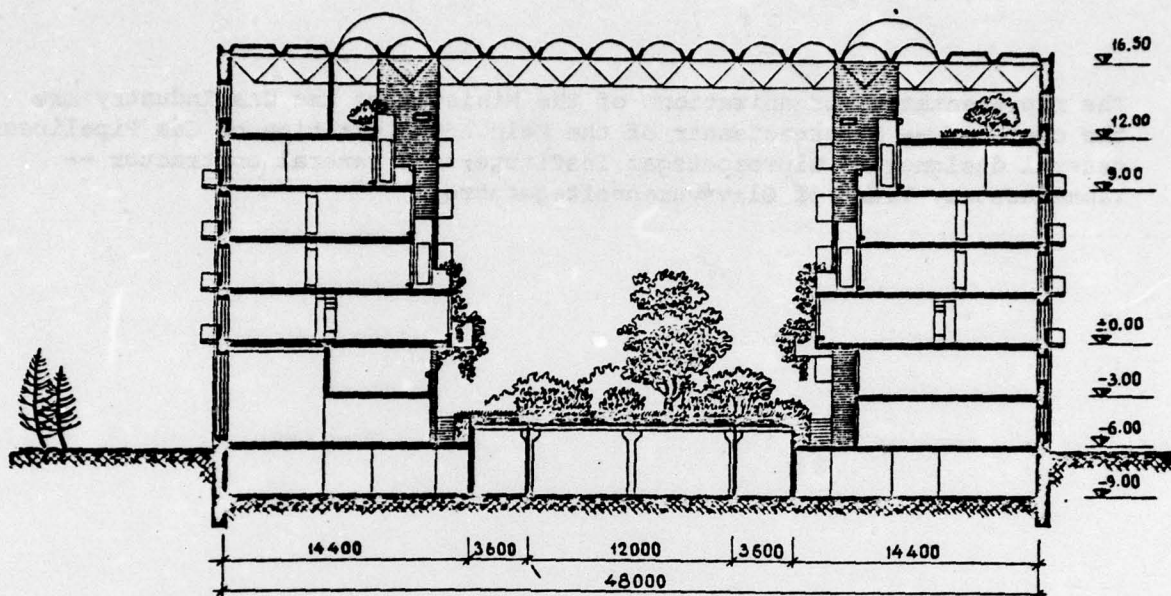


Residential Section

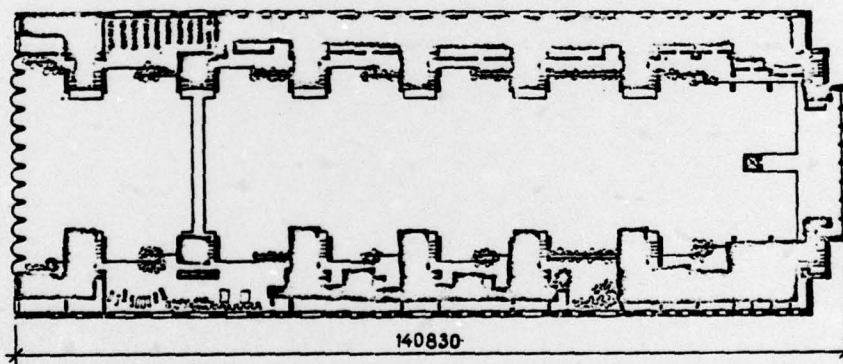


Layout at 9.00 m Marker

The high level of the housing standard and public service of the residential complex "Poluy," which corresponds to future residential construction development regulations in the USSR, creates material conditions for significant social transformations of everyday life which will be implemented in the final analysis in a further improvement of social labor productivity. And this will be the main socioeconomic result of the planned experiment which is of common importance rather than special, narrow regional importance in solution of the housing problem for the period of construction of the material and technical base of communism.



Transverse Section



Layout at 12.00 m Marker

Construction of the experimental residential complex "Poluy" on the Northern Gas Pipeline in 1972-1975 will be a specific embodiment of the decisions of the 24th Congress of the CPSU.

The main indices of the project are: population (persons) 480; number of apartments 184; utility area of residential zone (square meters) 8,201; working area of public zone (square meters) 5,161; area of winter garden (square meters) 6,431; utility area of complex (square meters) 22,229; construction volume (cubic meters) 165,328; heat consumption for heating (thousands of kcal/hr) 4,471.8; heat consumption for hot water (thousands of kcal/hr) 500; water consumption (liters/sec) 20.2; electric power output (kW) 1,070.

The representative organizations of the Ministry of the Gas Industry are the customer -- Severgaztsentr of the Main Administration of Gas Pipelines; general designer -- Giprospeftgaz Institute; and general contractor -- Yamalgazstroy Trust of Glavtyumenneftegazstroy.