



PN-ACD-731



# Environmental Policy and Technology Project

For the New Independent States  
of the former Soviet Union

Prepared for  
Bureau for Europe and the New Independent States  
**U.S. Agency for International Development**

By  
A USAID Project Consortium Led by CH2M HILL

PNACD-731

# Environmental Policy and Technology Project

Contract No CCN-0003-Q-00-3165

**UKRAINE**  
**Summary of the Results**  
**of the Demonstration Program**  
to Improve Lviv's Water Supply  
Through Upgrades to the Pasichna Pumping Facility

September 1997  
Delivery Order 9 - Task U2

Prepared for  
Regional Mission to Ukraine, Belarus & Moldova  
**U S Agency for International Development**

Prepared by  
Ukraine, Belarus & Moldova Regional Office  
**Environmental Policy and Technology Project**  
A USAID Project Consortium Led by CH2M HILL

## PREFACE

Under the 1992 Freedom Support Act, the United States Congress initiated a program to provide various forms of assistance to new independent states (NIS) of the former Soviet Union. Cooperative Agreements were signed between representatives of the U S government and each country in which assistance was to be undertaken. The U S Agency for International Development (USAID) was given the responsibility to coordinate all U S government assistance to the NIS under the Act.

Through competitive bidding, USAID awarded a multi-year contract to a team managed by CH2M HILL International Services Inc (CH2M HILL) to support implementation of an environmental assistance program to republics of the former Soviet Union. Under this contract, termed the Environmental Policy & Technology (EPT) Project, CH2M HILL is to assist USAID's missions in Moscow, Kyiv, and Almaty undertake a program to promote environmental improvements in the NIS. The USAID mission in Kyiv supports environmental, and other, assistance programs to Ukraine, Belarus, and Moldova. CH2M HILL established an office in Kyiv from which to perform services in these countries under the EPT Project.

This report was prepared as a contractually required deliverable under a contract between USAID and CH2M HILL. Although work on this report was conducted in cooperation with the assisted governments and USAID, the findings and recommendations are those of the CH2M HILL team. They do not necessarily represent official positions of the governments of the assisted countries nor of the United States of America.

The CH2M HILL team includes the following organizations:

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- Clark Atlanta University/HBCUMI Environmental Consortium
- Consortium for International Development
- Ecojuris
- Environmental Compliance, Inc
- Harvard Institute for International Development
- Hughes Technical Services Company
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## NOTIFICATIONS

### NOTE ON TRANSLITERATION

Ukrainian personal, institutional, and place names used in EPT documents are transliterated into English from Ukrainian (not Russian), according to the modified U S Library of Congress standard for Ukrainian-to-English transliteration that has been adopted by many Western organizations and publications, including the *Encyclopedia of Ukraine* (University of Toronto Press, 5 vols, 1984-1993) and O Subtelny's authoritative *Ukraine A History* (University of Toronto Press, 1988, 2nd edition 1994), as well as by the Ukrainian Commission on Legal Terminology (Resolution No 9 dated 19 April, 1996)

### NOTE ON COST ESTIMATES

The opinions of cost shown, and any resulting conclusions on project financial or economic feasibility or funding requirements, have been prepared for guidance in project evaluation and implementation from the information available at the time the opinion was prepared. The final costs of the project and resulting feasibility will depend on actual labor and material costs, competitive market conditions, actual site conditions, final project scope, implementation schedule, continuity of personnel and engineering, and other variable factors. As a result, the final project costs may vary from the opinions of cost presented herein.

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## ABBREVIATIONS, ACRONYMS & GLOSSARY

atm	atmosphere
CH2M HILL	CH2M HILL International Services, Inc (a U S -based international environmental engineering consulting firm under contract to USAID to implement a large component of the EPT Project)
DHF	District Heating Facility
DO	Delivery Order
EPT	Environmental Policy & Technology (Project) A USAID-funded program to provide environmental assistance to New Independent States of the former Soviet Union
h/d	hours a day
hrs	hours
kbv	karbovanets
kWh	Kilowatt hour
lcd	Liters per capita per day
LVK	Lviv Vodokanal
m <sup>3</sup> /d	Cubic meters per day
m <sup>3</sup> /h	Cubic meters per hour
NIS	New Independent States (of the former Soviet Union)
No	number
nos	numbers
p/d	per day
PS	Pump Station
STS	Step-down Transformer Station
TDH	Total Dynamic Head
US \$ or USD	United States dollar
USAID	U S Agency for International Development
vodokanal	A quasi-government agency responsible for municipal water supply and wastewater collection and treatment A U S analogue would be a water utility
WB	World Bank (International Bank for Reconstruction & Development)

## Section 1 INTRODUCTION

### 1.1 BACKGROUND

As part of a United States government bilateral assistance program, the U S Agency for International Development (USAID) is supporting environmental management in Ukraine Under direction from USAID, a consortium led by CH2M HILL International Services, Inc (CH2M HILL) is implementing part of USAID's Environmental Policy & Technology (EPT) Project by undertaking various tasks that have been agreed to by representatives of the governments of both countries

USAID authorized CH2M HILL to perform a series of tasks in Ukraine under Delivery Order (DO) 9 Under Task U2 (Urban Water Management Demonstration Lviv) of DO #9, CH2M HILL is to assist the local water utility, Lviv Vodokanal (LVK) strengthen its operations and improve service to its customers Part of Task U2 directed work to develop and implement demonstration program This subtask (3.3 Develop and implement a demonstration program) includes requirements that

*The alternatives recommended for demonstration shall be discussed with senior Vodokanal officials, appropriately adapted based on that reviewed with USAID/Kiyv prior to taking any action on implementation of the demonstration program*

*The Contractor shall develop, estimate the costs, design and implement the approved demonstration program, with the assistance of the Vodokanal, which will continue for a period of time agreed upon the Contractor, Vodokanal and USAID*

This report is in response to the USAID requirements The demonstration project described herein relates to improving operation of the LVK water distribution system Design of the demonstration project was carried out based on the proposal, developed by CH2M HILL<sup>1</sup> and approved by USAID

Funding for the equipment for this demonstration project came from Delivery Order #5, AIP 20

### 1.2 APPROACH

The staff of the EPT office in Lviv worked with the LVK and Lviv City administration to identify the areas of the city with "severely deficient" water service The Pasichna area was selected among them for the demonstration project because improvements of water delivery there would allow to improve the service level to a great number of residents within the

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<sup>1</sup> See report *Ukraine Proposal to Demonstrate an Improvement to Water Supply Operations in the City of Lviv* August 1996

budgets available to USAID and the municipality. Further, the demonstration would take advantage of utilizing partially completed infrastructure.

The Lviv City Administration and the USAID agreed to implement a joint project on improving water service to the Pasichna area in the shortest possible period of time. To do this, both parties agreed to fund a portion of the project. USAID funded the construction of a temporary pump station and the Lviv City Administration funded the completion of two 10,000 m<sup>3</sup> storage tanks and the balance of the site work at the Dovha pump station facility which will serve Pasichna.

The solution to improving the water service at Pasichna area was divided into two phases. Service would be improved in the short term (this demonstration project) by installing valves in existing water pipes to form the Pasichna water distribution subsystem, completing two unfinished storage tanks, and installing a temporary pump station. In the longer term, the temporary pump station would be repaired or replaced with a permanent facility and existing leaking water pipes would be replaced with those of better quality.

Work began on design in July, 1996 and the construction work was completed at the end of 1996, when the facility was transferred to the LVK. A dedication ceremony was held on site in January, 1997.

## Section 2 BACKGROUND

### 2.1 WATER SUPPLY PROBLEMS IN LVIV

Lviv currently has a population of about 800,000 people. Its present public water supply and distribution system was started about 100 years ago. Many parts of the Lviv Vodokanal service area receive water for only about 6 hours a day, and some receive water for even shorter periods. The water system infrastructure needs substantial replacement, in 1995, nearly 6,000 breaks occurred in the water conveyance and distribution network.

The city's drinking water source is groundwater pumped from a series of well fields outside the city perimeter. Water from these well fields is conveyed to the city in transmission pipelines (mains). These mains generally terminate at large pumping facilities at the city boundary, where additional pressure is added in order to distribute water within the city. Electricity used to pump water makes up about 70-80 percent of the total LVK operating expenditure, and this cost is rising as national government policies and regulations force an increase in energy prices.

Approximately 600 km of steel, cast-iron, and reinforced-concrete transmission lines convey water from wells to 10 large pump stations and associated reservoirs that encircle the city. Much of this piping is of inferior quality, with many leaks and frequent breaks. At the pump stations, water is chlorinated before being distributed to customers within the city.

Water engineers planned to establish a series of 'isolated' subsystems within this distribution system. By using a series of additional booster pumps, valves, and large tanks within the city, water from the large pump stations at the city perimeter would be delivered to customers by operating these subsystems in a manner that would optimize water supply against demand.

The distribution subsystems have not been completed. Instead, the system is generally operated as a single entity. The lack of subsystems increases the variations in pressure which adds to the frequent breaks in the distribution piping. Due to high leakage rates and lack of a surplus of supply, much of the population does not receive constant access to water. This situation has been exacerbated during the deteriorating economic situation in Ukraine following independence, as central government funding for capital improvements to the water system has become unavailable, and revenues to the LVK have fallen substantially short of that needed to operate and maintain the system. As a result, LVK is restricted to providing some 70 percent of its customers with water for six hours per day. In higher elevations, people are supplied with water for a shorter period. Only about 20 percent of residents receive water 24-hours per day.

Water tends to gravitate to lower elevations, so that customers on elevated terrain and upper portions of high-rise apartments suffer from poor water pressure and daily water shortages. Three areas of the city have been categorized as having 'severely deficient' water service, receiving water 0-3 hours per day.

To partly overcome this situation, it has been recommended that the distribution system be segregated into subsystems that are operated on a quasi-independent basis. This can be accomplished by redistributing the available water through installing tanks, booster pumps, gauges, and valves on a regular basis. Water delivered to higher areas can be stored in tanks, with valves preventing outflow to lower portions. Although city water engineers wanted to create the distribution subsystems, these were never established due to lack of funding.

The three parts of the city of Lviv with the most deficient water service were identified as

- Pasichna, with a population of about 35,000 people
- Varshavska, population about 40,000
- Zolota, population about 10,000

The distribution of land use in each area is as follows

Subsystem	Residential (%)	Industrial (%)	Institutional (%)	Open Space (%)
Pasichna	60	3	5	32
Varshavska	77	5	0	18
Zolota	52	16	13	19

There are approximately 33 km of 50-mm to 500-mm diameter water distribution pipes in these areas, with Pasichna having about 10 km, Varshavska about 16 km, and Zolota about 7 km.

LVK operates and maintains 10 large pump stations within the city distribution system. Two stations were associated with the Pasichna water distribution subsystem (Sykhiv III and Kryvchytsi), one for the Varshavska and one for the Zolota subsystem (respectively Zboisk and Yanivska pump stations). An additional pump station, adjacent to the Dovha tank had not been completed.

The part of the city where it was believed that the demonstration would be most-effective was Pasichna, because it might also indirectly improve water service to parts of adjacent areas Kryvchytsi and Sykhiv with a population of 75,000, which together would have the greatest number of beneficiaries. Further, the demonstration would take advantage of utilizing partially completed infrastructure.

## 2.2 WATER SUPPLY SITUATION IN THE PASICHNA AREA

### 2.2.1 Location

The Pasichna subsystem is situated in the Lychakivsky administrative district in eastern Lviv (Figure 2-1). The core water distribution alignment serving the residential area includes piping along Medova Pechera, Kytajska, Lysenytska, Maiorivka, Shafaryka, and Washington streets. Ground-level elevations vary from 320-380 m, and are generally higher than the rest

of Lviv. As a result, water pressure in the subsystem was low, creating difficulty in delivering water to local residents, most of whom live in typical high-rise (9-14 story) apartment buildings.

## **2.2.2 Water Supply, Pumping, and Storage**

Previous to this demonstration project two well fields, Bibrka and Hlynna-Navaria, provided water to the Sykhiv III pump station, which then distributed water to an area that includes Pasichna (population about 32,000). In addition, the Pluhiv well field provides water to the Kryvchytsi pump station, which then pumped water to the Kryvchytsi and Pasichna areas. Some 20 small booster pumps operated by LVK and housed in ten district heating plants located in the Pasichna area, were supposed to provide additional pressure to raise water to the high-rise apartments. Those booster pumps were frequently not turned on, in part because the heating plants used the limited available electricity to pump hot water, or because they were unserviceable.

Thus municipal water supply to the Pasichna area was supplied from the Sykhiv III and Kryvchytsi pump stations. Since Pasichna was at a higher elevation relative to these two pump stations, and the water distribution pipes were also connected to lower parts of the city, water tended to flow also to the lower portions of the system so little pressure was available for the multi-story apartment buildings within the Pasichna location.

As a part of a long term plan the City planned to fund improvements to water storage and pumping capability in the area that included Pasichna by constructing three large tanks (10,000 m<sup>3</sup> each), and a pump station at Dovha. This was part of a scheme to transfer additional water from an expanded Pluhiv well field into the city's distribution system. The Dovha pump station and tank complex was to have two main functions. One was to act as a booster station to transfer large quantities of water from an expanded Pluhiv well field to the southern section of Lviv. The second was to increase pressure of water in the local Pasichna area in order to provide better service to customers on the upper floors of high-rise apartment buildings, especially those without booster pumps. Construction of this complex commenced in 1989, but the Pluhiv well field was not expanded and construction at the Dovha site ceased in 1992. Before the construction of the temporary pump station LVK operated one completed 10,000 m<sup>3</sup> storage tank at Dovha, unfinished were the permanent pump station and the two other tanks.

## **2.2.3 Population and Water Consumption**

Pasichna area has a population of about 32,000 people. Out of this number 26,400 residents (83 percent) live in multi-story buildings (ranging from six to 14 floors) and 5,600 residents (17 percent) live in buildings which have one to five floors. Buildings having more than five floors are supplied with water through heating stations, and those having five and less floors receive water directly from the distribution system. Data on consumers at Pasichna are presented in Table 2-1.

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Table 2-1 Pasichna Subsystem Population Distribution and Projected Water Consumption		
Street Name and Building Number	Number of Residents	Projected Water Consumption (m <sup>3</sup> /d)*
Pasichna (#51-70)	1,342	539
Pasichna (#71-104)	6,024	1,948
Medova Pechera	6,072	1,521
Maiorivka	693	175
Tupikova	198	50
Sadivnycha-Sadova	1,198	302
Kashtanova	174	90
Sokolyna	362	88
Yaroshynskoi	1,685	498
Kytaiska	2,608	876
Lysenytska	3,807	1,056
Washington	2,648	91
Shafaryka	4,652	1,425
Pasiky Halytsky	403	120
<b>Total</b>	<b>31,866</b>	<b>9,606</b>

Note \*Projected Water Consumption is calculated based on norms for different categories of consumers, as specified in the document "Construction Norms and Regulations" (СНІП) 2 04 01-85 Appendix 3

As of November 1, 1996 the daily water supply to nine district heating stations, that served 24,300 residents (76 percent of the Pasichna population) area amounted to about 3,600 m<sup>3</sup>. The average water consumption was 149 lcd.



## Section 3 DEMONSTRATION PROJECT

### 3.1 APPROACH

The objective of the demonstration project is to segregate a portion of the city's water distribution system, the Pasichna area (population about 32,000), in order to demonstrate how creation and operation of a water distribution subsystem would improve water delivery in a part of the city that currently suffers from severe water deficiency. Development of the subsystem would be conducted through the completion of partially constructed tanks and installation of new energy-efficient pumps and a series of valves.

#### 3.1.1 Joint Venture

Acknowledging the seriousness of the water supply problem that the City of Lviv is facing, and the need to combine efforts for the purpose of resolving the water supply problems, the Lviv City Administration and the USAID agreed to implement a joint project on improving water service to the Pasichna area of the City of Lviv in the shortest possible period of time.

It was decided that water service to the 32,000 Pasichna residents would be improved in the short-term by completing the storage tanks and installing a temporary pump station, using modular equipment. Outside this immediate demonstration project USAID would assist in other work in Pasichna area including replacing or rehabilitating pipes, adding meters, and improving local booster stations. In the longer term the City of Lviv would replace the temporary pump station with a permanent station using the partially completed pump station building on the Dovha site.

#### 3.1.2 Lviv City Administration

City of Lviv Administration took responsibility for the following provisions:

- finance the overall construction work to complete unfinished construction including Dovha tanks #2 and #3, and the Dovha permanent pump house (install windows, doors, and seal the roof only)
- procure relevant materials and equipment
- install and test equipment (including that provided by USAID)
- operate and maintain the Dovha temporary pump station and Pasichna newly created subsystem

The City of Lviv Administration allocated 30 bln krb (170,000 USD) to perform this scope of work. The state enterprise contractor LvivSpetsComunBud performed all overall construction funded by the City.

### **3.1.3 USAID**

U S Agency for International Development, through the EPT project, took responsibility for the following provisions

- providing overall project management
- undertaking all engineering design in cooperation with the City of Lviv
- procuring and delivering pumps for the temporary pump station
- construction of the temporary pump station building
- purchasing of the high-voltage electrical power cable (1,400 m)

USAID allocated about 225,000 USD for the materials and equipment for the temporary pump station building, high-voltage power cable and step-down transformer, US manufactured pumps and a motor control center

### **3 1.4 SCHEDULE OF COOPERATION**

Both sides declared their commitment to successful accomplishment of the joint project on water service improvement for the Pasichna area in the shortest feasible term, and aimed for the following schedule of project implementation

- July 1996 EPT staff begins design and procurement
- August 1996 Mayor appoints task coordinator
- August 1996 City allocates necessary budget and authorizes completion of the two remaining Dovha tanks
- October 1996 City contractor completes two Dovha tanks, and installs high-voltage electrical power transmission cable to temporary pump plant site and gate valves to create distribution subsystem
- November 1996 EPT completes temporary pump station building with pumps installed

## **3 2 PROJECT**

### **3 2 1 Scope of Work**

To enhance water deliveries to customers in the Pasichna residential community, the following improvements were at the Dovha site and surrounding areas

- segregation of a portion of the overall Lviv distribution system by installing gate valves to establish the Pasichna water distribution subsystem

- construction of a temporary pump station
- completion of construction of the two remaining 10,000 m<sup>3</sup> water storage tanks
- bringing high-voltage electrical power to the site
- installation of connecting pipes and valves between the pump station, tanks, and water distribution mains

The above mentioned improvements created a distribution subsystem to reduce the volume of water moving out of the Pasichna area, increased water storage capacity in the area, and then increased pressure of the water in the subsystem (pressure zone), so that it could be more readily used by area customers. It demonstrated to LVK the concept of distribution subsystems to improve water service by being able to control pressure in specific portions and reduce the loss of water when it flows uncontrolled from higher into lower elevations.

The overall goal was to noticeably increase delivery of water to most consumers. However, as a temporary pump station, it was not intended to meet supply and storage requirements for fire-fighting needs.

### **3.2.2 Site General Layout**

Temporary pump station is located on a site referred to as Dovha in the south-eastern part of Lviv city, in a site bounded by Pasichna and Dovha Streets.

The Dovha site pump station occupies an area of 3.5 hectares. The temporary pump station building is situated to the west of the unfinished structure of the permanent pump station. The floor elevation of the temporary pump station is 378.55 m (by the Baltic system). The layout of the site and the adjacent area is shown at Figure 3-1.

### **3.2.3 Building and Equipment Specifications**

EPT-Lviv staff working with the LVK completed design documentation and obtained all necessary approvals for construction of the temporary pump station.

The general building specifications are summarized in Table 3-1.

### **3.2.4 Pumps**

Three pumps mounted on one skid are housed inside the temporary pump station building. All pumps are working and none is stand by. Each pump has the following characteristics:  $Q = 230 \text{ m}^3/\text{h}$ ,  $H = 30 \text{ m}$ ,  $N = 40 \text{ kW}$ . Pumps specification is shown in Figure 3-2. A drawing of the pump skid with pumps is shown in Figure 3-3.

Pumps are equipped with common suction and pressure headers. Each pump is equipped with a gate valve installed on the suction piping and a check and gate valve installed on the pressure piping.

The pump station gets water from two newly built 10,000 m<sup>3</sup> storage tanks. The discharge pipeline from the temporary pump station is connected to the two 500-mm pressure pipelines of the permanent pump station, which feeds the existing water distribution network in Pasichna street.

To provide water flow measurement an ultrasonic flow meter was installed in the maintenance hole on the pressure pipeline. The pump station is operated automatically without permanent operating staff in the building although the Dovha site (three tanks and the pump station) is continually manned.

### 3.3 PROGRESS

The temporary pump station project design was carried out by the EPT/Lviv office and the main drawings were prepared within a 30 days period. Drawings were prepared in two languages: in Ukrainian for the LVK and contractor and in English for USAID. Figure 3-4 shows the section view of the temporary pump station in Ukrainian from the set of drawings used by the contractor. Figure 3-5 shows the same drawing translated into English.

Considerable time was spent on getting approvals from all concerned engineering departments and municipal supervision organizations so as to allow the temporary pump station to operate. Twenty six approvals were needed, which took 60 days to accomplish.

A competitive bidding process was held for the general construction work of the pump station building and the contract was awarded to AGROBUD, a private contractor from the town Peremyshliany (small town 40 km from Lviv).

Figure 3-6 shows the work schedule of general construction at the Dovha temporary pump station.

The construction of the temporary pump station was started on October 4, 1996 and continued for 34 working days until November 20, 1996. The process of general construction work is shown at Figures 3-7 through 3-10. According to the agreement between the city administration and USAID, the City completed Tanks #2 and #3 as well as completing the roof and installing windows on the permanent pump station. Figures 3-11, 3-12 and 3-13, 3-14 show these structures before and after their completion.

Installation of the pumping equipment was started on November 19, 1996, and the work was carried out by EPT/Lviv staff assisted by LVK (Figure 3-15 and 3-16). Installation of pumps and electrical equipment, and equipment testing and adjustment was completed in 39 working days (Figure 3-17).

EPT/Lviv staff has tested and adjusted the installed equipment. The completed documentation was submitted to LVK for their use when they took over the temporary pump station (Figure 3-18)

Two weeks before the pump station was put into operation LVK set up a separate water supply zone. Valves on the distribution mains in Washyngtona and Pasichna streets (in three points) were closed which allowed to eliminate the influence of Kryvchytsi and Sykhiv III pump stations on the Pasichna water supply zone. There appear to be some minor interconnections between the Pasichna and the adjacent system but those do not affect the overall performance.

The temporary pump station was officially dedicated on January, 10 1997 during a ceremony attended by Gregory Huger, USAID Mission Director in Ukraine, Belarus and Moldova, Lea Swanson, Environmental Development Director in Ukraine, Moldova and Belarus, Volodymyr Kostenko, Minister of Ecology of Ukraine, and Vasil Kubida, the City Mayor (Figure 3-19). Those who attended the ceremony were invited to visit one of the households in the Pasichna area where they had an opportunity to talk to residents and see for themselves the improvement in water supply (Figure 3-20). The opening was widely covered in the mass media.

### **3 4 FUTURE WORK IN PASICHNA**

In discussions between USAID and the City of Lviv several things were discussed related to the improvement of water service in the Pasichna area. One hope was to complete the work on the existing unfinished pump station at the Dovha site. This was to be another joint venture to be funded in 1998. Unfortunately the financial condition of the municipal government did not permit it to participate in the completion of the physical structure of the old building. This would have involved an expenditure of about 400,000 to 500,000 USD on their part. USAID was to furnish new pumps or move the modular pumps from the temporary pump station to the completed building and assist with the electrical control and power system.

Instead, in a second phase of this work, USAID will do some additional minor work on the temporary pump station including the installation of a fourth pump that can be used as a standby or to furnish additional water during periods of heavy demand on the system. The funds that would have been spent on the permanent pump station are now available to accomplish a wider range of water service improvements in Pasichna.

These service improvements will include assisting the city in Pasichna by installing water meters at each connection to the main lines (about 330 meters in total), furnishing eight new booster pumps for four of the heating stations in the area, rehabilitating or replacing some of the distribution piping and reducing some of the hydraulic problems in the system. This work will be completed during 1997 and 1998.

**Table 3-1  
Temporary Pump Station Building Specifications**

Building	Designed for installation of pumping equipment, control equipment and connecting pipes The building is 2nd class reliability, one story, 6 by 12-m floor area with a clear height of 3 m
Foundation	Strip type foundation made of 400-mm thick blocks The trenches 1 60-m deep are excavated for the strip type foundation below the design floor elevation of 378 55 m with the consequent addition of a 25-cm layer of crushed rock Bottom edge of the foundation is 1 30-m below the floor level, 1 90-m at pipe service entrance The cement screed is arranged over the foundation blocks Waterproofing is by two layers of tar paper on bitumen mastic The inside building perimeter is filled in with sand and outside wall foundation pits are backfilled with soil
Equipment foundation	Cast-in-place concrete, 2 9 by 9 4-m linear dimensions by 0 65-m thick, B7 5 class concrete The movement joint is arranged along the foundation The equipment foundation is separated from the floor with thiokol mastic joints In the process of arranging the cast-in-place equipment foundation the soil has been excavated from the total floor area down to elevation of -1 m from the design floor elevation and a 35-cm thick crushed stone base has been laid Holes for service lines were provided for according to the pump skid drawing and additional foundation drawings
Walls	Brick, 380-mm thick, long walls are bearing, short walls are self-bearing The perimeter is paved outside with cement mortar extending 1 m from the wall
Ceiling Slabs	Precast hollow reinforced concrete slabs
Roof	Double sloped on wooden rafters covered with corrugated steel sheets, drainage by gutters and drain pipes
Floor	Small size paving slabs on cement screed and concrete base 150-mm thick When arranging the concrete floor base it was backfilled with compacted soil up to the elevation of -0 40 Then the 20-cm thick layer of crushed rock was spread over the whole floor area
Openings	Wooden window frames double glazed with coupled cross casement and metal screens The door made of two sections, no glazing The gate made of two sections, 2 5-m wide and 2 7-m high Louvered openings are 450 x 450-mm in the side walls
Finish work	Outside plastering (wall area above and below windows) 20-mm thick, light color Outside wall have tiles up to 450-mm from the sidewalk Windows, doors and roof are painted with the same paint of dark color Plastering on the inside was done with the lime and sand mortar Ceramic tiles inside, to 1 5-m above floor elevation, with the rest of the wall area and the ceiling covered with whitewash
Ventilation	Drought, plenum-exhaust through holes in face walls, which are closed with grid louvers, and also through two baffles on the roof Baffle holes on the ceiling are closed with circular grids The required air exchange factor is 10 Heating - not provided for
Plumbing	The floor drain is connected using low pressure PVC pipe, to an existing nearby sewer
Power supply	The temporary pump station is power supplied from the 160 kVA step-down transformer substation (STS) that was installed on the site A buried electric cable 1,400-m long was installed to power the STS A grounding grid of buried rods was made for the STS ground Pumps are powered through electrical cables connecting the STS to the switch board and the switch board to the pumps Standard and maintenance lighting is provided for by 220 and 12-V circuits

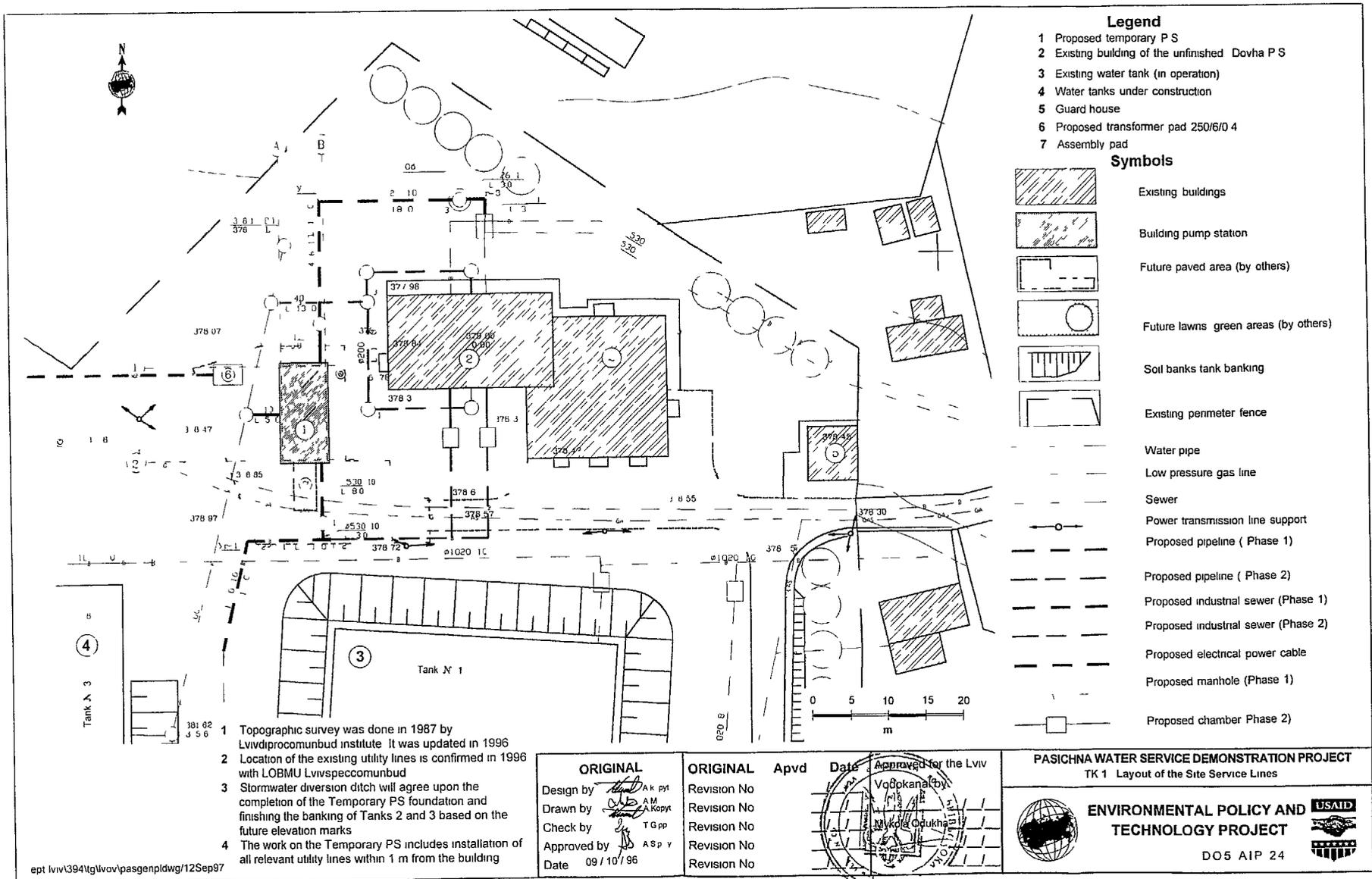


Figure 3 1 Layout of the Site Service Lines

BEST AVAILABLE COPY

### Characteristics PATTERSON PUMP 8 X 6 M

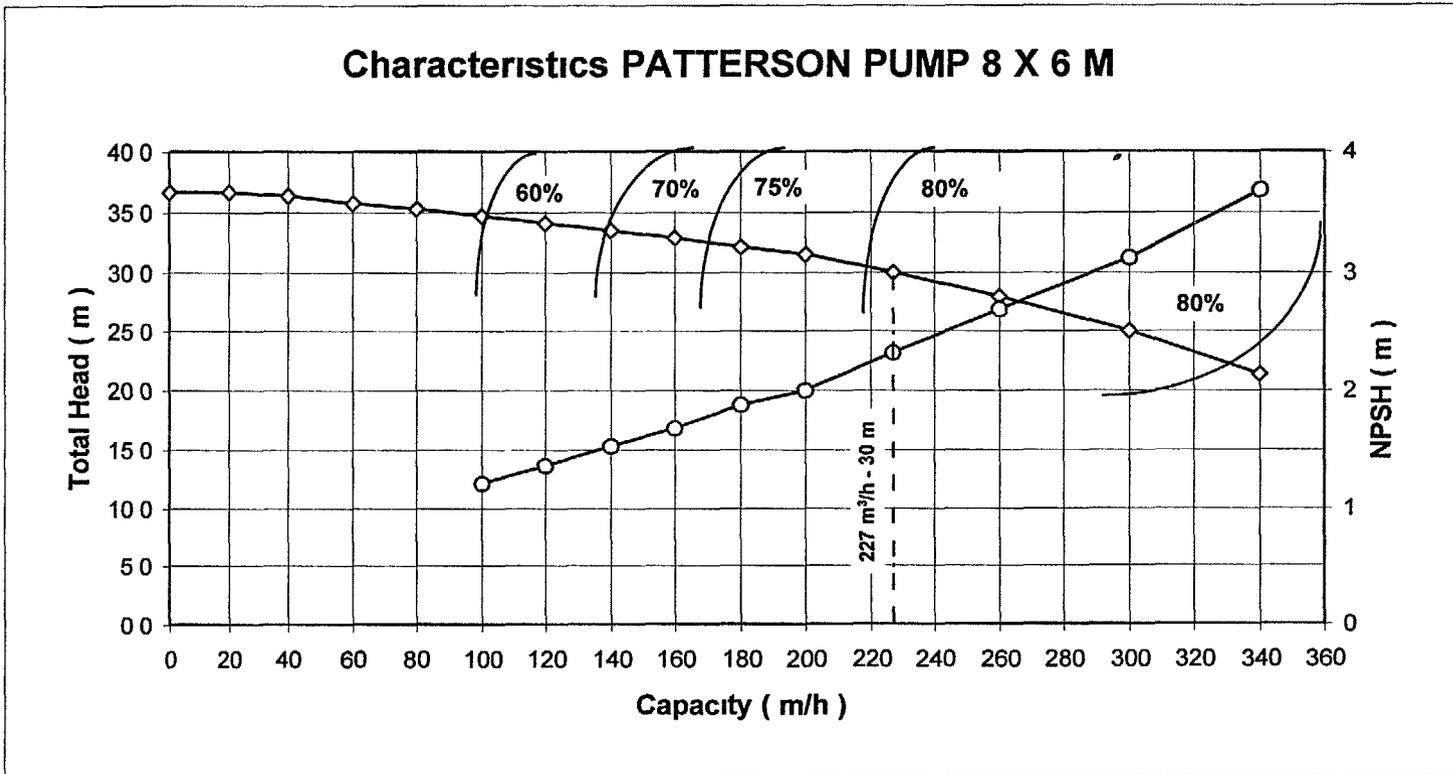
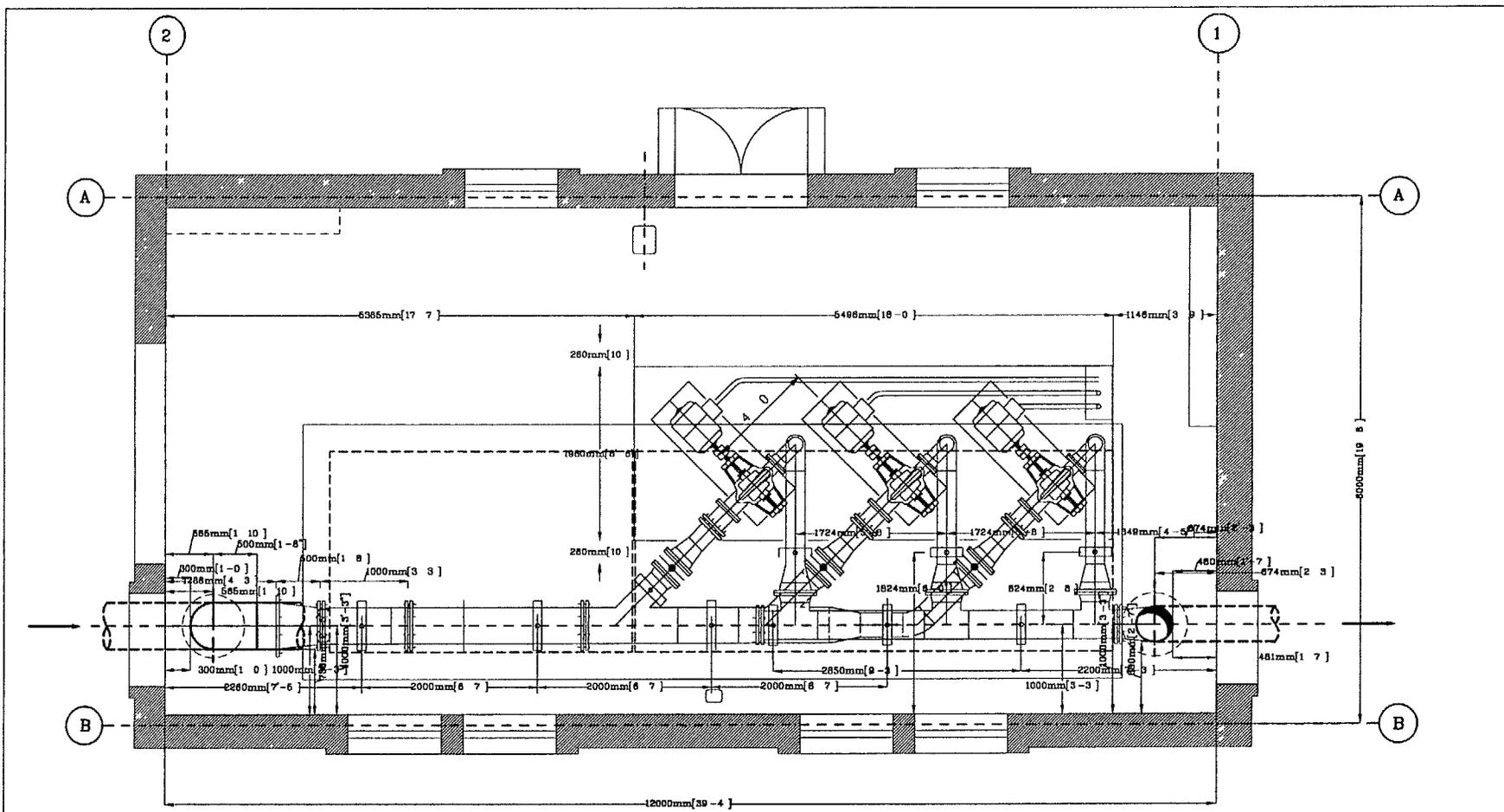


Figure 3-2  
Pump Characteristics at Dovha Pump Station



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**Figure 3-3  
Pump Skid**



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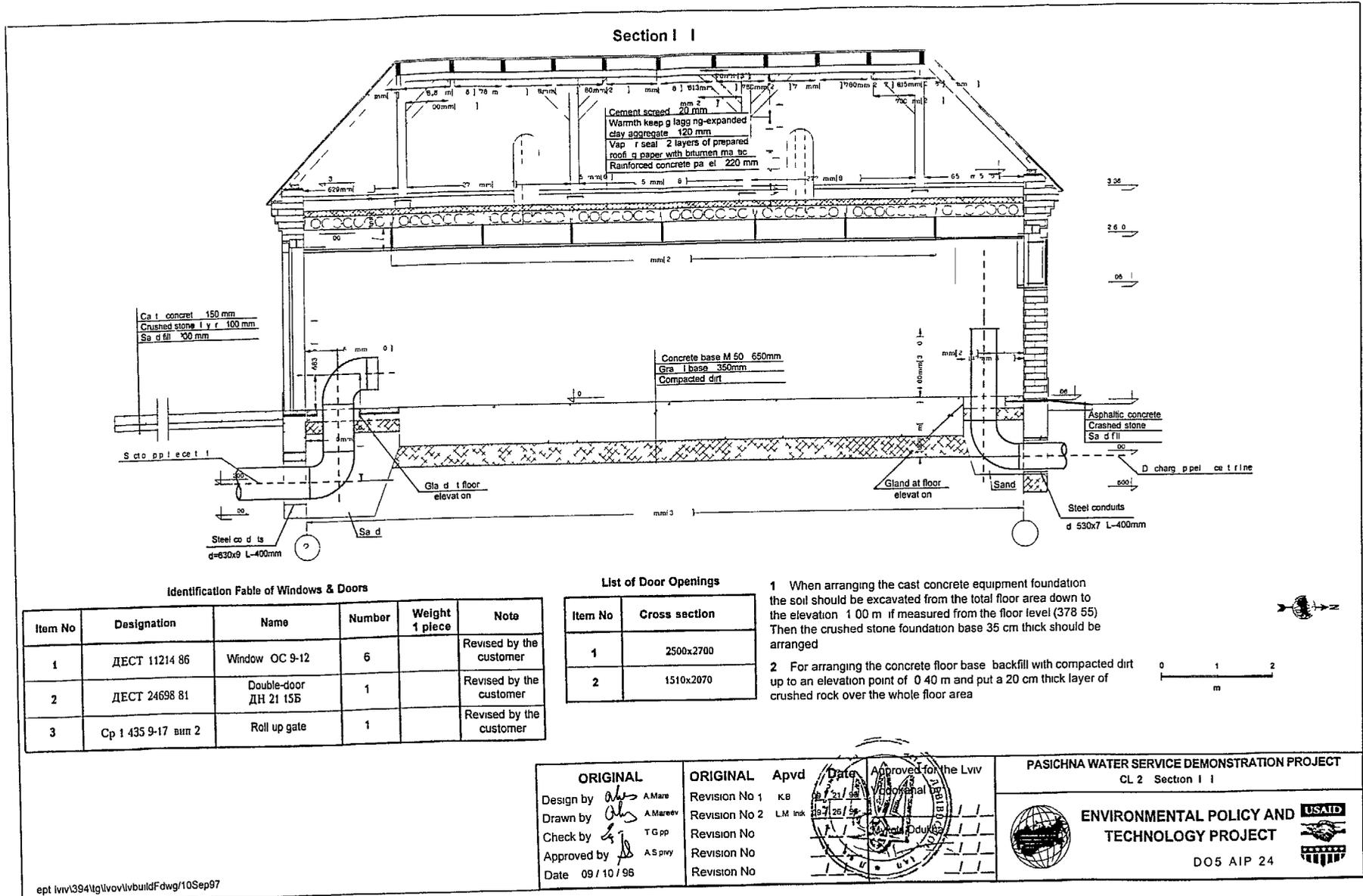


Figure 3 5 Section View of the Temporary Pump Station (in English)

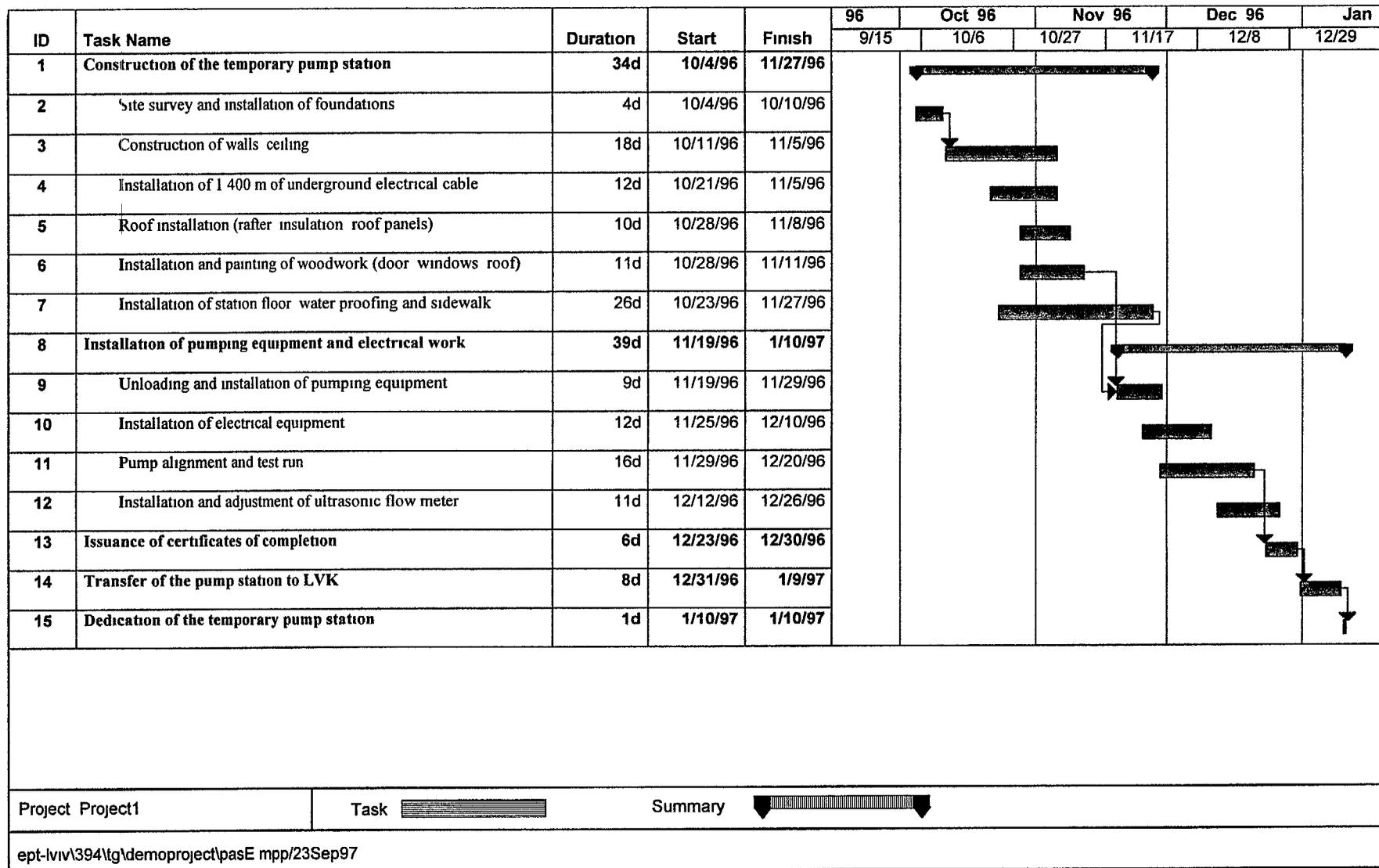


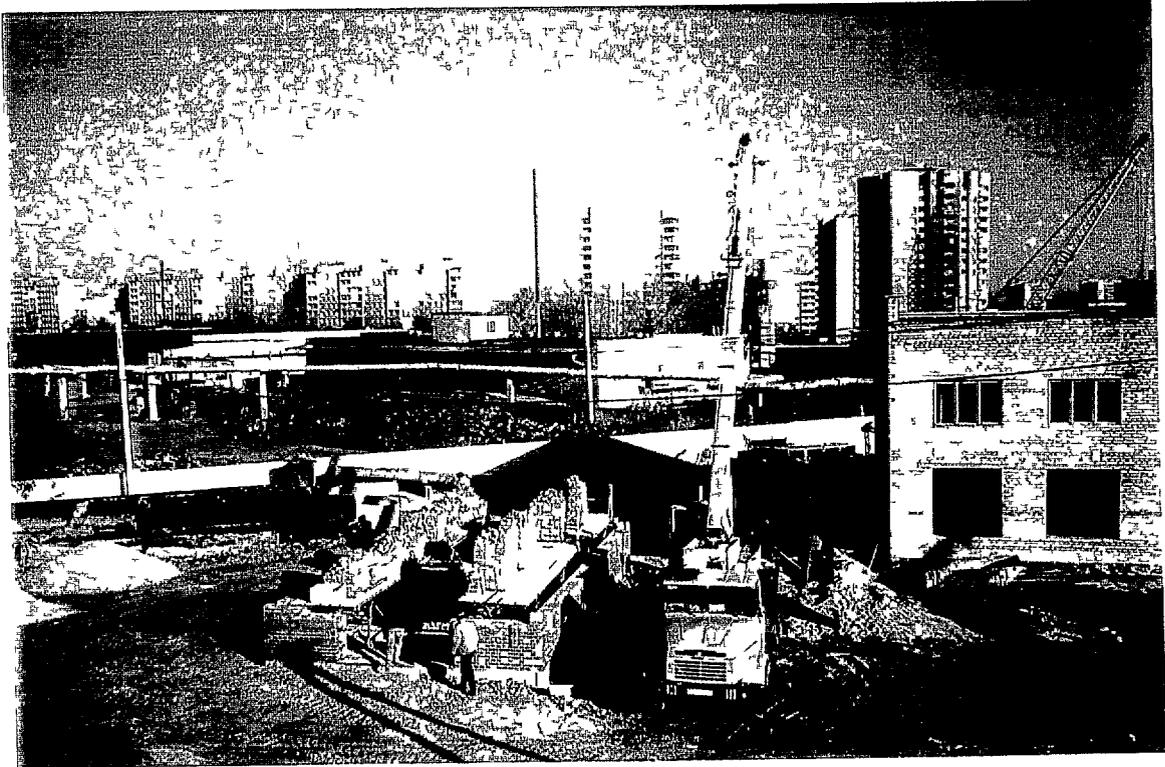
Figure 3-6 Schedule of Construction and Installation Works



Installation of the foundation blocks for the walls is completed. The two rectangular pits on the backside of foundation are to be filled with concrete to provide a base for the pumps. 9 Oct 96

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**Figure 3-7 Foundation Blocks in Place**



Work begins on the brick masonry walls. The walls are 380-mm thick to provide insulating capability. The apartments in the background will be supplied by water from the temporary pump station. The incomplete permanent station is to the right. 15 Oct 96

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**Figure 3-8 Masonry Brick Walls Begun**



The temporary pump station building is largely completed. Work is going on to complete the connecting piping and to complete other earthwork on the site. 2 Nov 96

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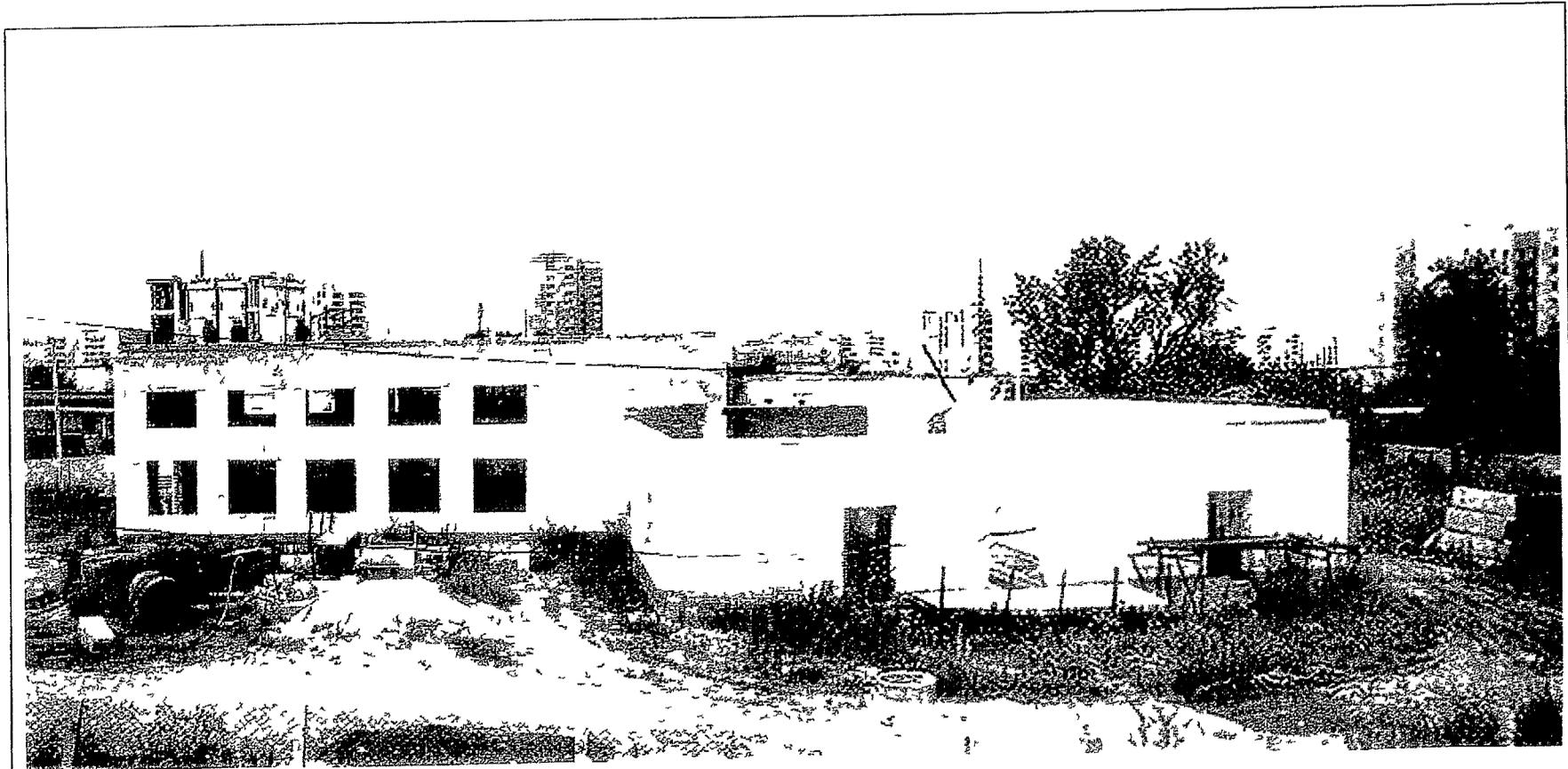
**Figure 3-9 Pump Station Building Completed**



The sea freight container with the modular pump skid is unloaded at the site. The pumps were manufactured in the USA and shipped by boat and truck via Germany and Poland to Lviv 19 Nov 96

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**Figure 3-10 Pumps Being Unloaded**

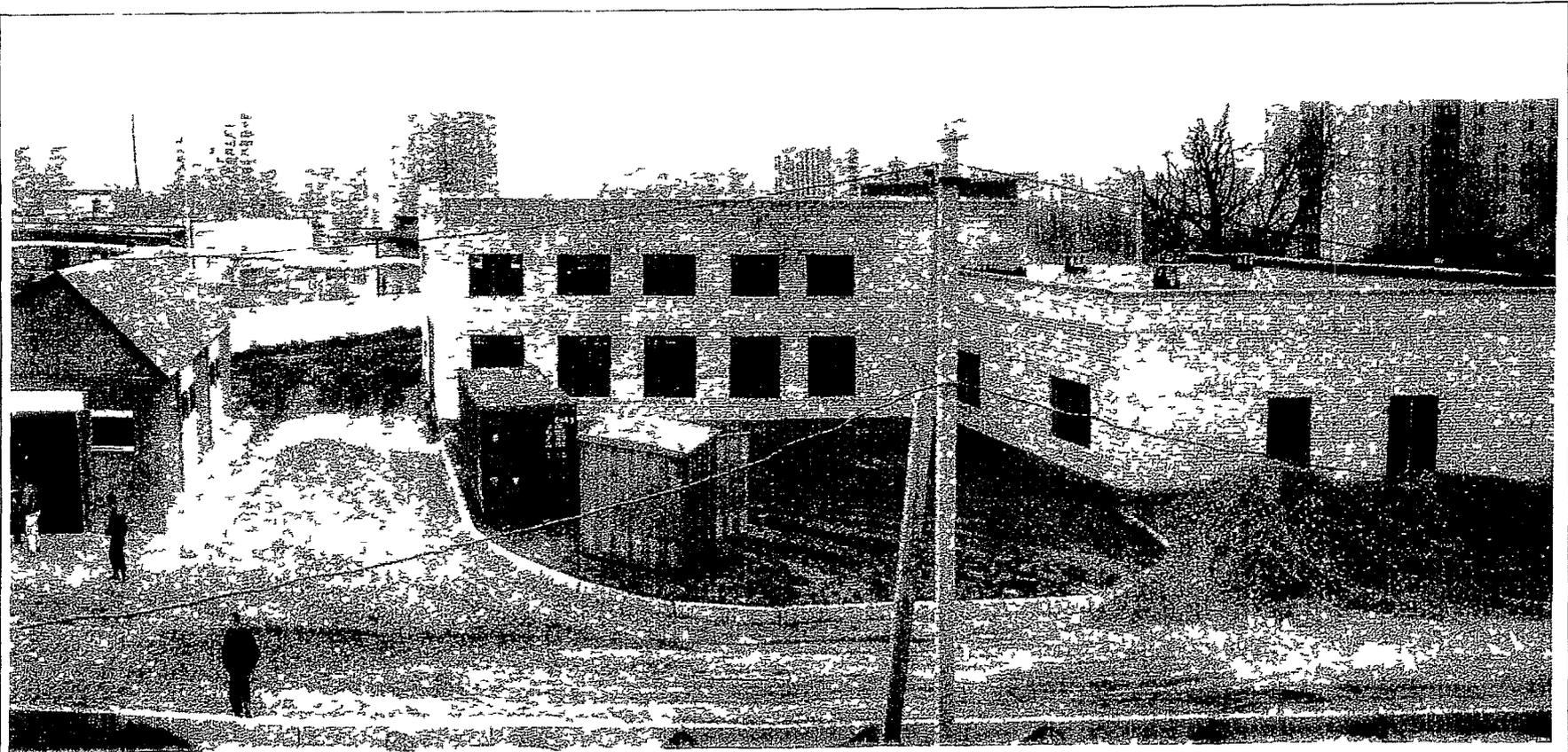


This unfinished pump station building at Dovha was abandoned in 1992. This facility was to be a major water transfer station to move water from an expanded Pluhiv well field (never completed) to southeast Lviv and to pressurize water for distribution in the Pasichna area. Aug. 96

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Figure 3-11 Abandoned Pump Station

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The roof was completed and windows and doors were added to the abandoned pump station at Dovha  
The new temporary pump station is to the left 20 Nov 97

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**Figure 3-12 Partially Finished Pump Station**

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One of the unfinished 10 000 m<sup>3</sup> storage tanks at the Dovha site  
Completion required the addition of wall and roof slabs water  
proofing connecting pipes and covering with earth Aug 96

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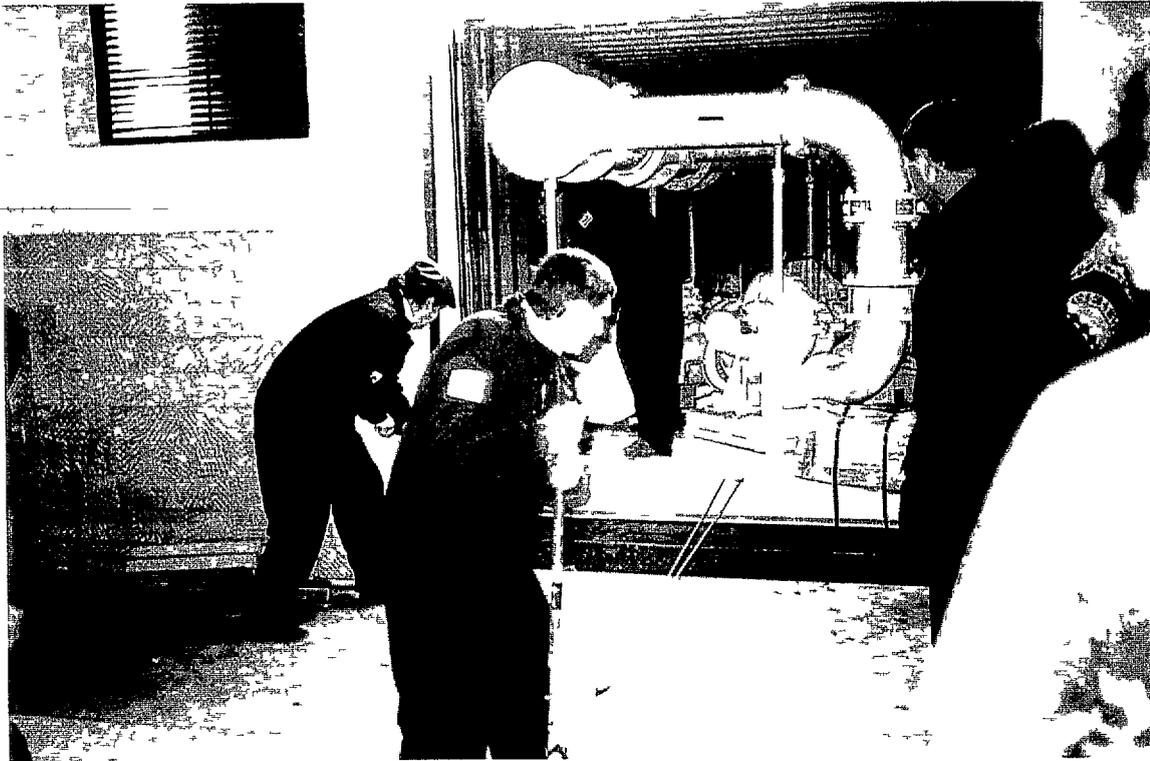
Figure 3-13 Unfinished 10,000m<sup>3</sup> Storage Tank



The finished 10 000 m<sup>3</sup> storage tank It is covered with earth to provide insulation and to enhance its structural strength to resist lateral forces 20 Nov 96

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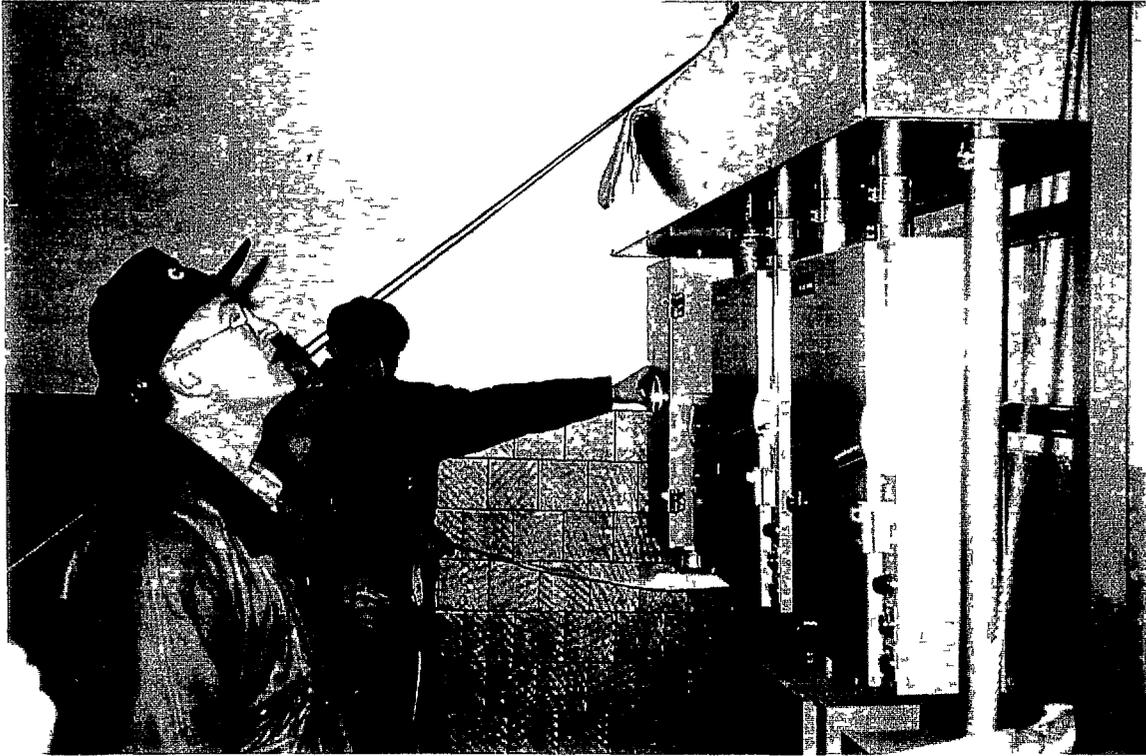
**Figure 3-14 Finished 10,000m<sup>3</sup> Storage Tank**



The modular pump skid being removed from the shipping container by EPT staff. A system of hand operated winches, jacks and rollers was used to move the 10 ton pump skid from the container to its proper place in the pump station. 19 Nov 96

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**Figure 3-15 Moving the Pump Skid**



The motor control center being installed on one wall of the pump station by EPT staff. This center is connected to the step down transformer located adjacent to the pump station. 19 Nov 96

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**Figure 3-16 Installation of Motor Control Center**



Installation of the buried 6 000 volt cable to the step down transformer located adjacent to the new pump station building The transformer converts the power to 380 volts to run the pumps  
20 Nov 96

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**Figure 3-17 Installation of Power Cable**



Final inspection of the pump station by municipal and other inspectors for conformance with electrical mechanical and structural codes and standards 29 Nov 96

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**Figure 3-18 Inspection of Pump Station**



Dedication ceremony for the pump station. Shown cutting the ribbon are Gregory Huger, USAID Mission Director in Kyiv, and Lviv Mayor Vasil Kubida. Also present was Volodymyr Kostenko, Ukrainian Minister of Ecology. 10 Jan. 97.

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**Figure 3-19 Dedication Ceremony**

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Mayor Kuibida and Director Huger talk to a resident of one of the high-rise apartments in Pasichna to learn how the new pump station has improved service in her apartment 10 Jan 97

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**Figure 3-20 Mayor Kuibida Talks to Apartment Residents**

## Section 4 RESULTS

The Pasichna Water Delivery Subsystem Demonstration Project was successfully completed. The following was achieved:

- 1 Directly improved water service to about 32,000 Lviv residents in the Pasichna area that had experienced severe water deficiencies
  - daily service were increased to 10 hours per day
  - the availability of water has allowed the daily average per capita consumption to increase from 149 lcd to 229 lcd (Table 4-1)
  - pressure at the inlets to the heating stations has increased from the range of 2 to 7 m to the range of 10 - 12 m (Figures 4-1 and 4-2)
- 2 Improved water service in adjacent areas that are still being served by the Sykhiv III and Kryvchytsi pump stations. The adjacent areas affected have a population of about 75,000 residents.
- 3 Improved the hydraulic mode of the Pasichna area distribution system which brought down the number of pipeline breakdowns from 135 in the first half of 1995 to 71 over the same period of 1997 (Table 4-2)
- 4 Created favorable conditions for energy saving in the future as a result of pump replacement at the Pasichna heating stations for better matched pumps (as planned for 1997) taking advantage of the stable system pressure created by the temporary pump station at Dovha.
- 5 Bolstered LVK management and staff by having them develop and implement, in a short period, a small yet meaningful project that provided a significant improvement in water deliveries to a segment of their customers that had some of the most deficient service, and so stimulated the utility to move ahead on its own with other improvements as funds permit.
- 6 Demonstrated to LVK, the City of Lviv administration, and other vodokanals, that instead of undertaking massive capital investments in new water source development, relatively minor improvements in water delivery infrastructure and system optimization, such as creation of distribution subsystems, can significantly improve water service.

The activities in the Pasichna area were given coverage by the local mass media. Appendix A presents some of the articles, both originals and translations into English.

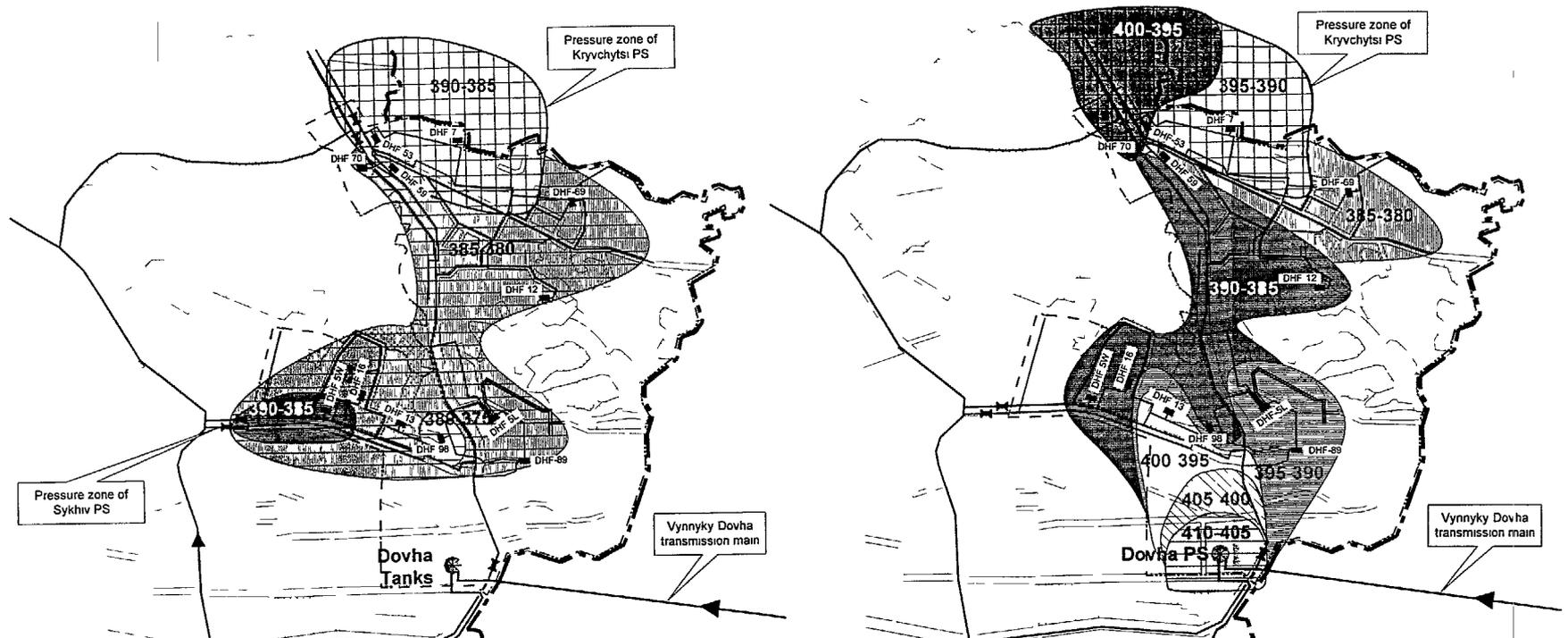
<b>Table 4-1</b>						
<b>Comparative Flow Measurement Results for District Heating Stations</b>						
<b>Name</b>	<b>Location (address)</b>	<b>Flow, m<sup>3</sup>/d</b>		<b>Number of Residents</b>	<b>Consumption led</b>	
		<b>1996</b>	<b>1997</b>		<b>1996</b>	<b>1997</b>
DHF-5W	Washingtona, 5a	70	109	221	317	493
DHF-16	Shafaryka, 16a	642	1,159	4,365	147	266
DHF-13	Washingtona, 13	512	702	2,416	212	290
DHF-98	Pasichna, 98(a)	289	453	1,785	162	254
	Pasichna, 98(b)	136	214	893	152	240
DHF-5L	Lysenytska, 5a	797	994	2,261	352	440
DHF-89	Pasichna, 89a	501	500	4,039	124	124
DHF-12	Kytaiska, 12a	341	790	4,352	78	181
DHF-59	Pasichna, 59	21	36	154	136	234
DHF-69	Medova Pechera, 69	295	593	3,790	78	156
	<b>Total</b>	<b>3,604</b>	<b>5,550</b>	<b>24,276</b>	<b>149</b>	<b>229</b>

<b>Table 4-2</b>		
<b>Breakdowns of Water Distribution System in Pasichna Residential Area</b>		
<b>Street Names</b>	<b>Number of Breakdowns</b>	
	<b>1st half 1995</b>	<b>1st half 1997</b>
Washington	5	15
Shafaryka	3	18
Lysenytska	13	5
Kytaiska	9	0
Medova Pechera	34	3
Maorivka	4	0
Pasiky Halytsky	3	0
Pasichna	59	26
Sadivnycha	1	1
Sadova	3	0
Sokolyna	1	0
Dovha	0	2
Tupikova	0	1
<b>Total</b>	<b>135</b>	<b>71</b>

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Pressure Data Based on Measuring of Pasichna Area Water Supply Network Performed in June-July 1996  
6 11 am

Pressure Data Based on Measuring of Pasichna Area Water Supply Network Performed in May June 1997  
6 11 am



**LEGEND**

	Pressure zone of Sykhiv PS
	Pressure zone of Dovha PS
	Pressure zone of Kryvchytsi PS
	Transmission main
	District heating facility (DHF)

**Figure 4 1**  
Network Diagram before and after (6 11am)

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**Appendix A**  
**SUMMARY OF NEWSPAPER ARTICLES COVERING THE OPENING**  
**OF THE DOVHA TEMPORARY PUMP STATION**

Vysoky Zamok, January 11-12, 1997

**WATER IN LVIV ALL DAY IT IS NOT A DREAM BUT REALITY (page A-3)**

Forty thousand of people living in the Pasichna area will have 10 hours of water supply daily as a result of completing of the first phase of the joint Ukrainian-American project for improvement of water supply pumping facilities and water tanks. By the beginning of the summer USAID promised to improve water service for 70,000 residents of the Pasichna area who will be getting water all day.

Moloda Halychyna, January 11, 1997

**PASICHNA WILL HAVE NO PROBLEMS WITH WATER (page A-4)**

Yesterday an opening ceremony was held at the Dovha pump station in the Pasichna area. Participants included Mr. Gregory Huger, USAID Mission Director in Ukraine, Belarus and Moldova, Yuri Kostenko, Minister of Ecology of Ukraine, Vasyl Kuibida, the City Mayor. USAID has allocated funds for the construction of the temporary pump station equipped with energy efficient pumps. The City funded the completion of two large water tanks. As a result water supply was improved for 40,000 residents of the Pasichna area. The project in Pasichna is a part of a wider US governmental assistance program to Lviv vodokanal. The purpose of the project is to improve water service of Lviv residents and to cut water production cost.

Moloda Halychyna, January 16, 1997

**COOPERATION BETWEEN USA AND LVIV SPRINGS FROM WATER (page A-5)**

The City Mayor Vasyl Kuibida can put on his record one more score - with the organizational and financial assistance of the Municipal Executive Committee 40,000 residents of the Pasichna area will be getting water almost 10 hours a day instead of 20 to 30 minutes as before. After the completion of all work this present to the city will cost the USAID 3 million dollars. Apart from sheer convenience to the residents this project will also bring a considerable economic effect. To the opinion of American partners the success of this project will allow our utilities to take financial loans in order to solve all the water supply problems in Lviv.

Den, January 14, 1997

**THE POSSIBILITY HAS APPEARED TO RECEIVE WATER ALL DAY (page A-6)**

The new pump station was opened in the Dovha street, which will allow 70,000 Lviv residents by the beginning of the summer to receive water all day. This is only the first phase of the project being implemented with the assistance of the US Agency for International Development. The project will improve water supply for residents of Mayorivka area. The successful implementation of this project will make it possible for Lviv to take a 15 to 20 million dollar loan from the World Bank. The Mayor Kuibida has refused to name the next area of Lviv where water supply will be improved having said that first of all we have to complete the work in Pasichna. According to Mayor's words it is extremely important to install meters in all 10,000 of buildings in Lviv.

Tyzhden, January 17-23, 1997

A SOUL IN LVIV CRAVES AN ALL DAY SHOWER (page A-7)

One million dollars was invested into the reconstruction of the pump station at Pasichna by the US Agency for International Development (USAID) This was announced by Gregory Huger, USAID Mission Director in Ukraine, Belarus and Moldova, during the opening of the joint American - Ukrainian project for water facilities improvement in Lviv

Ekspres, January 18-26, 1997

NOW THERE IS PLENTY OF WATER TO DRINK IN THE PASICHNA (page A-8)

Water supply in Lviv is without an exaggeration the most serious problem in the city This problem is especially acute in Pasichna area of Lviv From now on 40,000 of Pasichna residents will have 8 to 10 hour water service Pasichna will be the first step on the way of radical improvement of water supply in Lviv

# ВИСОКИЙ ЗАМОК

Виходить з 7 вересня 1991 року. СУБОТА - НЕДІЛЯ, 11-12 січня 1997 року. №4 Б. (820-821) Роздрібна ціна 3

Добрі новини

## Вода у Львові - цілодобово. Це не фантастика, а реальність

40 тисяч жителів вул. Пасічної у Львові матимуть воду у своїх квартирах по 10 годин на добу завдяки реалізації першої фази українсько-американського проєкту з поліпшення роботи водонасосних станцій та місткостей, в яких зберігається вода для нашого міста. А до початку літа мерія та агенція США з міжнародного розвитку (USAID), які фінансують цей проєкт вартістю 3 млн. доларів, обіцяють забезпечити водою 70 тисяч жителів мікрорайону Пасічної цілодобово.

Відтак вчора було запущено двигуни насосної станції Довга, що на вул. Пасічній, яка вважалася найгіршим мікрорайоном у Львові щодо забезпечення водою. Американці об'їждували станцію новими двигунами та іншим обладнанням, а місто профінансувало будівництво двох великих резервуарів (вирішено 300 тисяч гривень). У перспективі спільний українсько-американський проєкт передбачає реконструкцію свердловин, що забезпечують водою місто, заміну водопроводів, будівництво економних насосів для подачі води на верхні поверхи багатопверхових будинків.

Мерія буде встановлювати також водяні лічильники біля кожного будинку (їх у місті близько 10 тисяч), зазначив голова міської Ради Василь Куйбіда. А це своєю чергою стимулюватиме львів'ян економити воду, встановлювати лічильники у своїх квартирах, щоб платити за спожиту воду.

Директор місії USAID у Києві Грегорі Хьюгер заповнив, що нова технологія забезпечення водою дозволить зекономити енергетичні витрати на подачу води на 25 відсотків (зараз у собівартості води 75 відсотків припадає на електроенергію). Якщо така технологія приживеться в Україні, то це дозволить зекономити 4-5 відсотків електроенергії. До слова, Чорнобильська АЕС продукує на Україну 7-8 відсотків електроенергії. Окрім того, споживання води зменшиться у 2-3 рази.

Важливо також те, що зменшиться і кількість брудних стоків у водотоках. Підкреслив міністр охорони навколишнього природного середовища та ядерної безпеки України Юрій Костенко: «Отож є сенс брати кредити для впровадження таких нових технологій, які швидко себе окуплять. Тому дуже приємно, що реформа з водопостачання міст в Україні, яка реалізується вперше у Львові, розпочалася успішно».

Варто додати, що у Львові працює 16 водонасосних станцій, які аналогічні станції Довга. Поки їх модернізують - води стече чимало. І все ж відрадно, що перший крок зроблено.

Юрій БОРУЦЬКИЙ

## МІСТО

### НА ПАСІЧНІЙ З ВОДОЮ НЕ БУДЕ ПРОБЛЕМ

Учора на насосній станції «Довга» (район львівської вулиці Пасічної) відбулася церемонія присвячена початку реалізації проекту поліпшення водонасосних та водозберіжних ємкостей Львова

В урочистостях взяли участь Грегорі Хюгер - директор регіональної місії американського Агентства міжнародного розвитку в Україні Білорус Молдові, Юрій Костенко - міністр охорони навколишнього середовища та ядерної безпеки України, Василь Куїбіда - мер Львова та інші посадові особи

АМР виділило кошти на спорудження тимчасової насосної станції обладнаної енергоекономними агрегатами А за рахунок міського бюджету Львова встановлено два великі резервуари. Завдяки цьому вже покращено водопостачання для 40 тисяч мешканців прилеглої району. (Район Пасічної було обрано бо саме тут найгостріше відчувався дефіцит питної води в усьому Львові). До літа 1997 року планується запуснути додаткові насосні ємкості на станції «Довга» що дозволить нормально забезпечити водою вже 70 тисяч чоловік.

Проект вартістю 1 мільйон доларів США впроваджує в життя підрядчик АМР CH2M Хілл Інтернешнл Сервісіз Інк.

Здійснені роботи на вулиці Пасічній є частиною більш широкі американської урядової програми допомоги Львівському водоканалу вартістю 3 мільйони доларів США. Мета програми - поліпшення обслуговування мешканців та зменшення експлуатаційних витрат. Зважаючи на те що оплата за спожиту насосами електроенергію становить основну частину витрат водоканалу американська сторона надала кошти своєму підрядчикові для розробки техніко-економічного обґрунтування проектів поліпшення водопостачання в інших районах міста. Обов'язок CH2M Хілл підготувати і заявити щодо позик у міжнародних фінансових установах для кредитування цих проектів.

# Молода Галичина

зета виходить з 1 березня 1940 року

ЧЕТВЕР 16 січня 1997 року

№ 5 (7332)

Ціна 20 коп.

■ МІСТО

## ПАРОСТОК СПІВПРАЦІ МІЖ США ТА ЛЬВОВОМ ПРОРОСТАЄ З ВОДИ

Мер Львова Василь Куйбіда може записати до свого активу ще одне очко за організаційного та фінансового сприяння міськвиконкому 40 тисячам мешканців району вулиці Пасічної подаровано майже десятигодинний графік подачі води (замість 20-30 хвилинного). Цей подарунок лише Агентству з міжнародного розвитку (США) по завершенні усіх запланованих робіт обійдеться у 3 мільйони доларів. Але як мовиться ми не такі багаті щоб купувати дешеві речі. Бо всім відомо шлодобова подача води веде до менших втрат аніж пографікова.

Крім побутових вигод досягти яких вдалося завдяки американським підтримці цей проєкт обіцяє дати ще і значний економічний ефект. Може не всі знають що основну вартість нашої дорогої води (70-75 відсотків) становлять витрати на електроенергію. На сьогодні боєць Львів водоканалу за спожиту електроенергію вимірюється 15 мільйонами гривень тоді як уся область за цим же показником заборгувала 52 мільйони гривень.

Американські насоси як пови-

домив на церемонії пуску насосної станції Довга пан Грегорі Хюгер директор місії АМР в Україні Білорусі та Молдові дозволяють економити енерговитрати від 25 до 40 відсотків. На гроші американського ж уряду передбачається устаткувати будинки в районі вулиці Пасічної відпо-відними лічильниками. Мешканці наблизяться до реальної оплати за конкретне спожиті ресурси. Тому Львівводоканал змушений послідовно усувати втрати на водогоні. А вже тепер буде важко все списувати на рахунок неощадливих споживачів і тут також знадобляться американський досвід та технології використання труб з антикорозійним внутрішнім покриттям дасть змогу надовго забути про аварії та ризикі отруєнь. Більш того чиста труба це чиста вода.

Юри Костенко міністр охорони навколишнього природного середовища та ядерної безпеки України який теж був присутнім на церемонії пуску нової насосної станції основним позитивом американської українського водного проєкту вважає його екологічний аспект. За словами

міністра Львів поки що на одного мешканця витрачає вдвічі втричі води більше аніж у розвинутих країнах. Відповідно вдвічі втричі більше Львів скидає до річок забрудненої води. Реалізація запланованих заходів дозволить зменшити техногенний тиск на природу.

На думку американських партнерів адаліи результат цього проєкту відкриє перед нашими комунальниками можливість брати кредити для повного вирішення водної проблеми у місті Львівводоканал як стверджує його директор Володимир Сулипа для усунення водного дефіциту потребує 35 мільйонів доларів США. Саптовий банк може надати таку суму під 6-7 відсотків річних але при умові що уряд дасть гарантії а Львівводоканал збиратиме зі споживачів 80 відсотків вартості води та каналізаційних послуг. Тут здається з води випливає ще й політичний аспект. Бо ті 80 відсотків оплати стануть можливими лише коли споживачі матимуть гроші а гроші вони отримують тільки тоді як запрошують підприємства. А підприємства запрошують тільки тоді коли наша політична еліта знайде на те політичну волю і бажання.

Євген ГУЦЛА.



**Леонід Кучма: «Морський і річковий транспорт — це курка, що несе золоті яйця»**

...і хто ладен її зарізати, накладуть головою



**«Нехрещена людина не має ангела-хранителя»**

Свідчення християнським канонам і протоієрей Володимирського собору отець Стефан

Стр. 1

# ДЕНЬ

№ 3 (51)  
Вівторок 14 січня 1997 року  
ШОДІА-А ВСЕ КРАЇНЬСЬКА ГАЗЕТА

## Коротко / Львів

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### З'явилася перспектива отримувати воду цілодобово

На вулиці Довгий відкрито насосну станцію, що дозволить на початку літа 70 тисячам мешканців вулиці Пасечної цілодобово отримувати воду. Це лише перша фаза проекту, реалізованого за допомогою Агентства з міжнародного розвитку, який має забезпечити водою мешканців Майорівки. Сукупна вартість проекту становить 3 мільйони доларів США.

На церемонію відкриття спеціально прилетів міністр охорони навколишнього природного середовища та ядерної безпеки України Юрій Костенко. Таке зацікавлення пов'язане з тим, що для нашого міста водопостачання є вже кілька десяти років проблемою №1. Але при цьому Львів отримує води на 12% більше ніж, наприклад, такий же за розмірами польський Броцлав, у якому вода, на відміну від Львова, є цілодобово.

Проект також дозволить зекономити на електроенергії, оскільки витрати на неї становлять майже 80 відсотків собівартості води. За словами директора місії Агентства з міжнародного розвитку Грегора Хюгера, впровадження подібних станцій у 65 найбільших містах України дозволить заощадити 3-5% електроенергії (Чорнобильська АЕС виробляє 7-8% української електроенергії).

Успішне впровадження цього проекту дозволяє Львову отримати кредит від Світового банку (15-20 мільйонів доларів США) для покращення ефективності діяльності міського комунального підприємства «Водоканал».

Мер Львова Василь Куйбіда відмовився назвати, який район буде ошасливлено після Пасечної зауваживши, що треба спочатку довести до пуття Майорівку. За його словами, надзвичайно важливо встановити димильники в усіх десяти тисячах львівських будинків.

Олександр СИРЦОВ, «День»

## Душа у Львові прагне цілодобового душу

Один мільйон доларів інвестувало в реконструкцію водонасосної станції «Пасічна» Агентство США з міжнародного розвитку (АМР). Про це заявив директор місії АМР в Україні Грегори Г'югер під час відкриття першої черги спільного українсько-американського проекту поліпшення водонасосних і водозберігаючих місць міста.

Відтепер мешканці району вулиць Пасічна Батальна а це майже 30



тисяч осіб отримуватимуть воду щонайменше десять годин на добу. До кінця цього року повинні стати до ладу додаткові потужності, які вирішать проблему цілодобового водопостачання сімдесяти тисяч мешканців прилеглих до Пасічної житлових районів. Це коштуватиме американцям ще два мільйони доларів.

Свій внесок у спорудження насосної станції «Пасічна-Довга», яка качає воду із Золочівського району, зробив і Львівський міськвиконком. З міського бюджету на встановлення двох великих водорезервуарів витрачено 30 мільярдів карбованців.

Нововведення обіцяє вагоме (на 25—40 відсотків) зменшення енергозатрат у собівартості води. У випадку успішного завершення співпраці Львівської міської влади і АМР Львів може розраховувати ще на 15—20 мільйонів «водяних» доларів від Світового банку та інших фінансових інституцій.

● Олег СТЕЦИШИН

На фото Володимира САКВУКА — момент пуску водонасосної станції

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Щоденна програма екіпажів: УТ 1 УТ-2, Ірина, ІСТУ ГІТТ ТУР-1 ТУР-2, Нат ЛІТ, ТУ-4, Катерин.  
 10-міс (Різна черн. см.), 402-міс, 3-мі студія, КТБ, Волинська та Галицька вулиці, ПБ, ШУОР, З'їзда (Білозілля)  
 Газета експрес розповсюджується у чотирьох районах області заводу в м. Івано-Франківську та м. Киселів на територіях колишнього ПБ, ШУОР, З'їзда (Білозілля) у Львові 30 коп.

## НА ПАСІЧНІЙ ТЕПЕР МОЖНА НАПИТИСЯ ВОДИ ДОСХОЧУ

Водопостачання Львова без перебільшення можна назвати найбільшю проблемою міста. Особливо рідко вода бувала у домівках мешканців вулиці Пасічної. Відтепер 40 тисяч її жителів зможуть мати воду 8-10 годин на добу.

Це стало можливим завдяки відкриттю насосної станції Довга, яка є початком реалізації першої частини

проекту покращення водонасних та водозберігаючих ємкостей Львова. Проект сумарна вартість якого складає 3 млн. доларів здійснюється за підтримки американського уряду. Його перша фаза коштувала для американської сторони 1 млн. доларів, а для міста за встановлення двох водорезервуарів близько 150 тисяч доларів. До літа цього року

мають стати до ладу додаткові ємкості на насосній станції, що дозволить вирішити проблему водопостачання Пасічної та прилеглих вулиць з населенням 120 тисяч чоловік.

Будівництво наосних та водозберігаючих ємкостей на Довгій розпоча

лося кілька років тому, але воно не було завершено через фінансові проблеми. І тільки завдяки коштам Агентства США з міжнародного розвитку за шість місяців вдалося закінчити спорудження станції. Надалі буде зроблена реконструкція свердловин, заміна водопровідів, будівництво бустерних насосів для подачі води на верхні поверхи багатопверхових будинків підключення лічильників для контролю споживання води.

У відкритті насосної станції Довга взяли участь директор Мисії АМР США Грегорі Г'югер, мер Львова Василь Куйбіда, а пуск станції здійснив міністр охорони навколишнього природного середовища та ядерної безпеки України Юрій Костенко. Сьогодні Львів споживає



на 12 відсотків води більше польське місто Вроцлав. Хоч в останньому водолітово. Хочеться сподіватися, що насосна станція Пасічної стане початком справи кардинального посилення водопостачання Львова. Принаймні перший крок до цього вже зробив

**Богдан КУС**



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