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CALCULATION OF THE ECONOMIC ROOF OF THE INTERNAL WATER SUPPLY NETWORK OF THE BUILDING

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ANNOTATION: *This article discusses the basics of economic assessment of the internal water supply network of a building. In the design of internal engineering networks, ensuring not only technical, but also economic efficiency is of great importance. The article analyzes the types of investment and operating costs for the water supply system, shows their calculation methods and economic efficiency through practical examples. At the same time, recommendations are given on reducing costs through the use of resource-saving equipment, the selection of modern pipeline materials, and monitoring water consumption. The results of this study are of practical importance for engineers, design organizations, and construction specialists.*

Key words: *Internal water supply, Water supply network, Building utilities, Economic efficiency, Cost calculation, Pipe sizing, Hydraulic calculation, Water consumption, Plumbing system design, Material cost estimation, Installation cost, Operation and maintenance cost, System optimization, Water flow rate, Pressure loss, Energy consumptionб Sustainable water systems.*

INTRODUCE

The internal water supply system of a building must be properly designed not only from a technical point of view, but also from an economic efficiency point of view. Economic calculations help to estimate the cost of the project, select the most efficient equipment and materials, and reduce long-term operating costs.

1. Basic expenses types

Internal water supply system for expenses **investment (one multiple) and operational (periodic)** to expenses is divided into :

Investment expenses :

- Pipes (PVC, polypropylene, metal)
- Fittings (valve , faucet , filters)
- Sanitary equipment (shower, toilet, sink)
- Schyotchiks , valves , welding equipment
- Design and installation workforce

Operational expenses :

- Water for payment (water) depending on consumption)
- Pump power (if applicable)
- Technical service to show and repair
- Losses and water waste control

2. Calculation methods

✓ *Water supply system calculate the investment value*

Csystem =∑ i = 1n(Cmaterial_i+Cassembly_i)C_{ system } = \sum_{ i =1}^{n} (C_{material_ i } + C_{ assembly _ i }) Csystem = i = 1 ∑ n (Cmaterial_i + Cassembly_i)

This on the ground :

- C_{ material_i } – material price for each element ;
- C_{ montage_i } – went to the installation expenses .

✓ *Promising water expense and t bill of payments (annual)*

Qyear=Qday · 365Q_{ year } = Q_{ day } \ cdot 365 Qyear = Qday · 365 Tsuv=Qyil · TnarxT_ { water } = Q_{ year } \ cdot T_{ price } Tsuv = Qyil · Tnarx

This on the ground :

- Q_{ daily } – daily water consumption (m^3);
- T_{ price } – 1 m^3 of water price (for example , 2000 soums);
- T_{ water } – annual water for payment .

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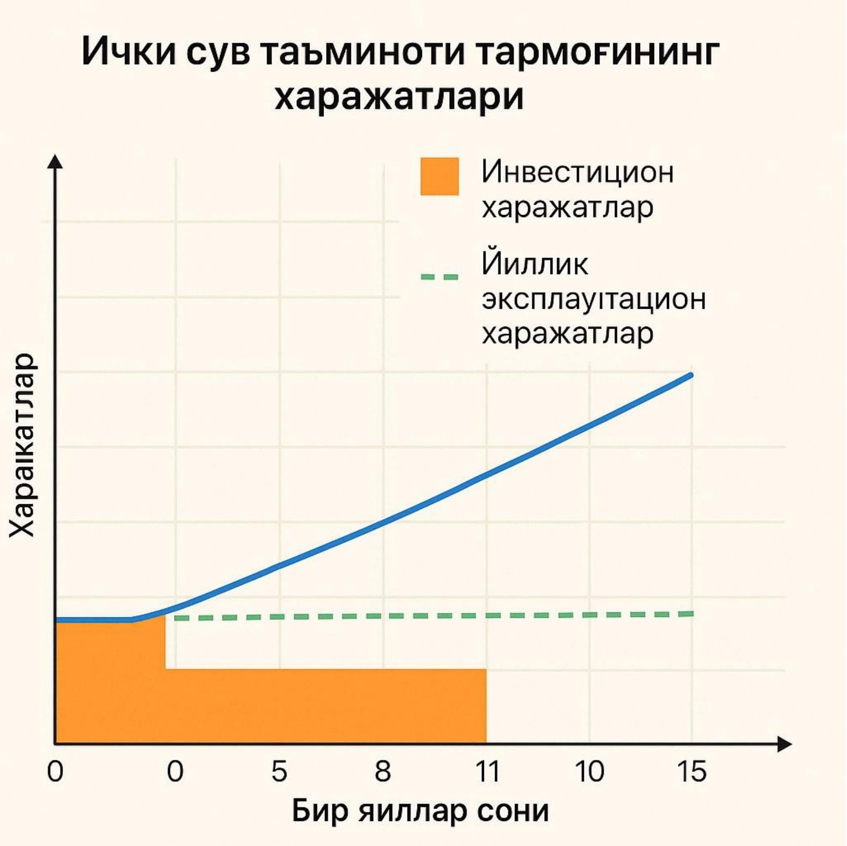
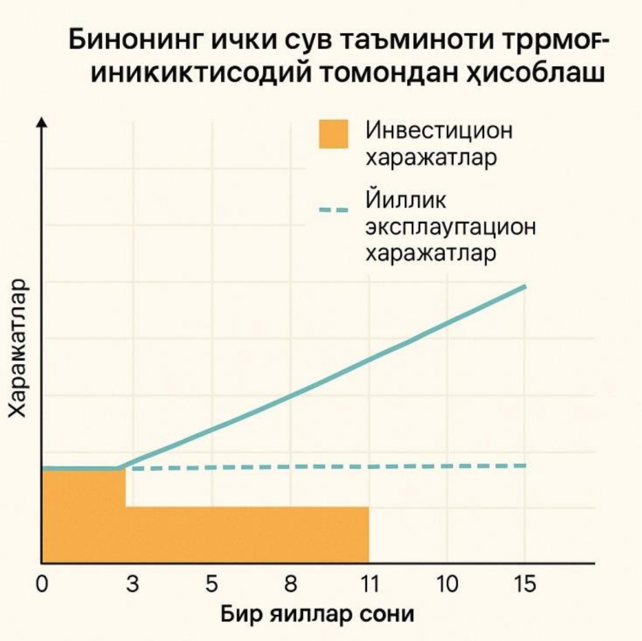
- 

3. A practical example (for example , a 5-story house for)

Information :

- 20 households in the house ;
- Each 150 l/day of water in the apartment expense ;
- 1 m³ of water price : 2000 sum ;
- 300 meters of pipe are needed , 1 meter costs 40,000 soums ;
- Installation work : 50,000 soum / meter



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1. In the building daily water consumption :

- average daily spending :

$$Q^{tot}_{o'r.kun} = (q^{tot}_{o'r.kun.1} \cdot U_1 + q^{tot}_{o'r.kun.2} \cdot U_2 + ... + q^{tot}_{o'r.kun.n} \cdot U_n + q^{tot}_{asf} \cdot F_{asf} + q^{tot}_{yash.may} \cdot F_{yash.may})/1000,$$

m ^{3}/day

$$Q^{tot}_{o'r.kun} = (250*113+12*5+250*5+56*90+8*10+0.5*6500 + 4.5*3500)/1000 = 65.70 m3/kun$$

$$Q^{h}_{o'r.kun} = (q^{h}_{o'r.kun.1} \cdot U_1 + q^{h}_{o'r.kun.2} \cdot U_2 + ... + q^{h}_{o'r.kun.n} \cdot U_n + q^{h}_{asf} \cdot F_{asf} + q^{h}_{yash.may} \cdot F_{yash.may})/1000,$$

$$Q^{h}_{o'r.kun} = (105*113+5*5+65*5+33*90+5*8)/1000 = 15.225$$ m ^{3} /day

$$Q^{c}_{o'r.kun} = (q^{c}_{o'r.kun.1} \cdot U_1 + q^{c}_{o'r.kun.2} \cdot U_2 + ... + q^{c}_{o'r.kun.n} \cdot U_n + q^{c}_{asf} \cdot F_{asf} + q^{c}_{yash.may} \cdot F_{yash.may})/1000,$$

$$Q^{c}_{o'r.kun} = (145*113+7*5+185*5+23*90+7*8+0.5*6500 + 4.5*3500)/1000 = 50.471$$

m ^{3}/day

– maximum daily spending :

$$Q^{tot}_{\max.kun} = (q^{tot}_{\max.kun.1} \cdot U_1 + q^{tot}_{\max.kun.2} \cdot U_2 + ... + q^{tot}_{\max.kun.n} \cdot U_n + q^{tot}_{asf} \cdot F_{asf} + q^{tot}_{yash.may} \cdot F_{yash.may})/1000,$$

m ^{3}/day

$$Q^{tot}_{\max.kun} = (300*113+16*5+250*5+60*90+16*8+0.5*6500 + 4.5*3500)/1000 = 71.758$$

$$Q^{h}_{\max.kun} = (q^{h}_{\max.kun.1} \cdot U_1 + q^{h}_{\max.kun.2} \cdot U_2 + ... + q^{h}_{\max.kun.n} \cdot U_n + q^{h}_{asf} \cdot F_{asf} + q^{h}_{yash.may} \cdot F_{yash.may})/1000,$$

m ^{3}/ day

$$Q^{h}_{\max.kun} = (120*113+7*5+65*5+35*90+7*8)/1000 = 17.126$$

$$Q^{c}_{\max.kun} = (q^{c}_{\max.kun.1} \cdot U_1 + q^{c}_{\max.kun.2} \cdot U_2 + ... + q^{c}_{\max.kun.n} \cdot U_n)/1000,$$

m ^{3}/ day

$$Q^{c}_{\max.kun} = (180*113+9*5+185*5+25*90+9*8+0.5*6500 + 4.5*3500)/1000 = 56.632$$

Equipment one at the time working The probability of leaving is P following expression through h is calculated as :

$$Pc = \frac{Q_{coam} \cdot U}{3600 \cdot q_0 \cdot N},$$

this on the ground Q $_{hours}$ – the most water spending done on the clock water amount in liters . It value from QMQ is obtained , table 2.

He is one kind qualitative water consumers general number ;

N – U quantity to consumers service to do sanitary technician equipment general amount .

One kind qualitative water consumption to do building and from the structures R value $\frac{U}{N}$ ratio value arithmetic in the plots change on account of did not receive in case acceptance to do It is possible to calculate H. simplification for the purpose of QMQ from Table 4 use recommendation is being done .

Sanitary technician to the equipment connectable pipes size QMQ from table 1 using designation The building is 60-70 m long . outside square , streets and to the flower beds water sprinkle for water sprinkle cranes installation condition . From the taps sprinkled water exit speed 0.9 ÷ 1.2 m/ sec It is between . The buildings internal in the water supply water leak speed , master in sections 1.5÷2.0 m/ sec on racks and to the utensils connection in the secret and 2.5 m/ sec until it was .

2. One to the device correct incoming people number per second probably :

- residence building for :

$$P^{tot}_{ahol.sek.1} = \frac{q^{tot}_{o'r.soat.1} \cdot U^{tot}_1}{3600 \cdot q^{tot}_{\max.sek.1} \cdot N^{tot}_1} = \frac{15{,}6 \cdot 113}{3600 \cdot 0{,}3 \cdot 60} = 0.027$$

$$P^{h}_{ahol.sek.1} = \frac{q^{h}_{o'r.soat.1} \cdot U^{h}_1}{3600 \cdot q^{h}_{\max.sek.1} \cdot N^{h}_1} = \frac{10 \cdot 113}{3600 \cdot 0{,}2 \cdot 45} = 0.035$$

$$P^{c}_{ahol.sek.1} = \frac{q^{c}_{o'r.soat.1} \cdot U^{c}_1}{3600 \cdot q^{c}_{\max.sek.1} \cdot N^{c}_1} = \frac{5{,}6 \cdot 113}{3600 \cdot 0{,}2 \cdot 60} = 0.015$$

- household service indicator objects for :

- Pharmacy :

$$P^{tot}_{dor.sek.2} = \frac{q^{tot}_{o'r.soat.2} \cdot U^{tot}_2}{3600 \cdot q^{tot}_{\max.sek.2} \cdot N^{tot}_2} = \frac{4 \cdot 5}{3600 \cdot 0{,}14 \cdot 3} = 0.013$$

$$P^{h}_{dor.sek.2} = \frac{q^{h}_{o'r.soat.2} \cdot U^{h}_2}{3600 \cdot q^{h}_{\max.sek.2} \cdot N^{h}_2} = \frac{2 \cdot 5}{3600 \cdot 0{,}1 \cdot 2} = 0.014$$

$$P^{c}_{ahol.sek.1} = \frac{q^{c}_{o'r.soat.1} \cdot U^{c}_1}{3600 \cdot q^{c}_{\max.sek.1} \cdot N^{c}_1} = \frac{2 \cdot 5}{3600 \cdot 0{,}1 \cdot 3} = 0.009$$

- Store :

$$P^{tot}_{do'k.sek.3} = \frac{q^{tot}_{o'r.soat.3} \cdot U^{tot}_3}{3600 \cdot q^{tot}_{\max.sek.3} \cdot N^{tot}_3} = \frac{37 \cdot 5}{3600 \cdot 0{,}3 \cdot 3} = 0.057$$

$$P^{h}_{do'k.sek.3} = \frac{q^{h}_{o'r.soat.3} \cdot U^{h}_{3}}{3600 \cdot q^{h}_{\max.sek.3} \cdot N^{h}_{3}} = \frac{9{,}6 \cdot 5}{3600 \cdot 0{,}2 \cdot 1} = 0.067$$

$$P^{c}_{do'k.sek.3} = \frac{q^{c}_{o'r.soat.3} \cdot U^{c}_{3}}{3600 \cdot q^{c}_{\max.sek.3} \cdot N^{c}_{3}} = \frac{27.4 \cdot 5}{3600 \cdot 0{,}2 \cdot 3} = 0.063$$

- Hairdresser :

$$P^{tot}_{sar.sek.4} = \frac{q^{tot}_{o'r.soat.4} \cdot U^{tot}_{4}}{3600 \cdot q^{tot}_{\max.sek.4} \cdot N^{tot}_{4}} = \frac{9 \cdot 90}{3600 \cdot 0{,}14 \cdot 15} = 0.107$$

$$P^{h}_{sar.sek.4} = \frac{q^{h}_{o'r.soat.4} \cdot U^{h}_{4}}{3600 \cdot q^{h}_{\max.sek.4} \cdot N^{h}_{4}} = \frac{4.7 \cdot 90}{3600 \cdot 0{,}1 \cdot 14} = 0.084$$

$$P^{c}_{sar.sek.4} = \frac{q^{c}_{o'r.soat.4} \cdot U^{c}_{4}}{3600 \cdot q^{c}_{\max.sek.4} \cdot N^{c}_{4}} = \frac{4.3 \cdot 90}{3600 \cdot 0{,}1 \cdot 15} = 0.072$$

- Administrative building :

$$P^{tot}_{ma'm.sek.5} = \frac{q^{tot}_{o'r.soat.5} \cdot U^{tot}_{5}}{3600 \cdot q^{tot}_{\max.sek.5} \cdot N^{tot}_{5}} = \frac{4 \cdot 8}{3600 \cdot 0{,}14 \cdot 2} = 0.032$$

$$P^{h}_{ma'm.sek.5} = \frac{q^{h}_{o'r.soat.5} \cdot U^{h}_{5}}{3600 \cdot q^{h}_{\max.sek.5} \cdot N^{h}_{5}} = \frac{2 \cdot 8}{3600 \cdot 0{,}1 \cdot 1} = 0.044$$

$$P^{c}_{ma'm.sek.5} = \frac{q^{c}_{o'r.soat.5} \cdot U^{c}_{5}}{3600 \cdot q^{c}_{\max.sek.5} \cdot N^{c}_{5}} = \frac{2 \cdot 8}{3600 \cdot 0{,}1 \cdot 2} = 0.022$$

– general probably :

$$P^{tot}_{sek.\Sigma} = \frac{P^{tot}_{sek.1} \cdot N_1 + P^{tot}_{sek.2} \cdot N_2 + P^{tot}_{sek.3} \cdot N_3 + ... + P^{tot}_{sek.n} \cdot N_n}{N_1 + N_2 + N_3 + ... + N_n} =$$

$$\frac{0.027 \cdot 60 + 0.013 \cdot 3 + 0.057 \cdot 3 + 0.107 \cdot 15 + 0.032 \cdot 2}{60 + 3 + 3 + 15 + 2} = 0.042$$

$$P^{h}_{sek.\Sigma}=\frac{P^{h}_{sek.1}\cdot N_1+P^{h}_{sek.2}\cdot N_2+P^{h}_{sek.3}\cdot N_3+......+P^{h}_{sek.n}\cdot N_n}{N_1+N_2+N_3+.....+N_n}=$$

$$\frac{0.035\cdot 45+0.014\cdot 2+0.067\cdot 1+0.084\cdot 14+0.044\cdot 1}{45+2+1+14+1}=0.046$$

$$P^{c}_{sek.\Sigma}=\frac{P^{c}_{sek.1}\cdot N_1+P^{c}_{sek.2}\cdot N_2+P^{c}_{sek.3}\cdot N_3+......+P^{c}_{sek.n}\cdot N_n}{N_1+N_2+N_3+.....+N_n}=$$

$$\frac{0.015\cdot 60+0.009\cdot 3+0.063\cdot 3+0.072\cdot 15+0.022\cdot 2}{60+3+3+15+2}=0.027$$

3. One to the device correct incoming people number hourly probably :

- residence building for :

$$P^{tot}_{ahol.soat.1}=\frac{3600\cdot q^{tot}_{\max.sek.1}\cdot P^{tot}_{sek.1}}{q^{tot}_{\max.soat.1}}=\frac{3600\cdot 0.3\cdot 0.027}{300}=0.087$$

$$P^{h}_{ahol.soat.1}=\frac{3600\cdot q^{h}_{\max.sek.1}\cdot P^{h}_{sek.1}}{q^{h}_{\max.soat.1}}=\frac{3600\cdot 0.2\cdot 0.035}{200}=0.111$$

$$P^{c}_{ahol.soat.1}=\frac{3600\cdot q^{c}_{\max.sek.1}\cdot P^{c}_{sek.1}}{q^{c}_{\max.soat.1}}=\frac{3600\cdot 0.2\cdot 0.015}{200}=0.025$$

- household service indicator objects for :

- Pharmacy :

$$P^{tot}_{dor.soat.1}=\frac{3600\cdot q^{tot}_{\max.sek.1}\cdot P^{tot}_{sek.1}}{q^{tot}_{\max.soat.1}}=\frac{3600\cdot 0.14\cdot 0.013}{80}=0.083$$

$$P^{h}_{dor.soat.1}=\frac{3600\cdot q^{h}_{\max.sek.1}\cdot P^{h}_{sek.1}}{q^{h}_{\max.soat.1}}=\frac{3600\cdot 0.1\cdot 0.014}{60}=0.083$$

$$P^{c}_{dor.soat.1}=\frac{3600\cdot q^{c}_{\max.sek.1}\cdot P^{c}_{sek.1}}{q^{c}_{\max.soat.1}}=\frac{3600\cdot 0.1\cdot 0.009}{60}=0.056$$

- Store :

$$P^{tot}_{do'k.soat.1}=\frac{3600\cdot q^{tot}_{\max.sek.1}\cdot P^{tot}_{sek.1}}{q^{tot}_{\max.soat.1}}=\frac{3600\cdot 0.3\cdot 0.057}{300}=0.206$$

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$$P^{h}_{do'k.soat.1}=\frac{3600\cdot q^{h}_{\max.sek.1}\cdot P^{h}_{sek.1}}{q^{h}_{\max.soat.1}}=\frac{3600\cdot 0.2\cdot 0.067}{200}=0.240$$

$$P^{c}_{do'k.soat.1}=\frac{3600\cdot q^{c}_{\max.sek.1}\cdot P^{c}_{sek.1}}{q^{c}_{\max.soat.1}}=\frac{3600\cdot 0.2\cdot 0.063}{200}=0.228$$

- Hairdresser :

$$P^{tot}_{sar.soat.1}=\frac{3600\cdot q^{tot}_{\max.sek.1}\cdot P^{tot}_{sek.1}}{q^{tot}_{\max.soat.1}}=\frac{3600\cdot 0.14\cdot 0.107}{60}=0.9$$

$$P^{h}_{sar.soat.1}=\frac{3600\cdot q^{h}_{\max.sek.1}\cdot P^{h}_{sek.1}}{q^{h}_{\max.soat.1}}=\frac{3600\cdot 0.1\cdot 0.084}{40}=0.755$$

$$P^{c}_{sar.soat.1}=\frac{3600\cdot q^{c}_{\max.sek.1}\cdot P^{c}_{sek.1}}{q^{c}_{\max.soat.1}}=\frac{3600\cdot 0.1\cdot 0.072}{40}=0.645$$

- Administrative building :

$$P^{tot}_{ma'm.soat.1}=\frac{3600\cdot q^{tot}_{\max.sek.1}\cdot P^{tot}_{sek.1}}{q^{tot}_{\max.soat.1}\cdot N^{tot}_{1}}=\frac{3600\cdot 0.14\cdot 0.032}{80}=0.2$$

$$P^{h}_{ma'm.soat.1}=\frac{3600\cdot q^{h}_{\max.sek.1}\cdot P^{h}_{sek.1}}{q^{h}_{\max.soat.1}}=\frac{3600\cdot 0.1\cdot 0.044}{60}=0.267$$

$$P^{c}_{ma'm.soat.1}=\frac{3600\cdot q^{c}_{\max.sek.1}\cdot P^{c}_{sek.1}}{q^{c}_{\max.soat.1}}=\frac{3600\cdot 0.1\cdot 0.022}{60}=0.133$$

– general probably :

$$P^{tot}_{soat.\Sigma}=\frac{P^{tot}_{soat.1}\cdot N_1+P^{tot}_{soat.2}\cdot N_2+P^{tot}_{soat.3}\cdot N_3+......+P^{tot}_{soat.n}\cdot N_n}{N_1+N_2+N_3+.....+N_n}=$$

$$\frac{0.087\cdot 60+0.083\cdot 3+0.206\cdot 3+0.9\cdot 15+0.2\cdot 2}{60+3+3+15+2}=0.241$$

$$P^{h}_{soat.\Sigma}=\frac{P^{h}_{soat.1}\cdot N_1+P^{h}_{soat.2}\cdot N_2+P^{h}_{soat.3}\cdot N_3+......+P^{h}_{soat.n}\cdot N_n}{N_1+N_2+N_3+.....+N_n}=$$

$$\frac{0.111\cdot 45+0.083\cdot 2+0.240\cdot 1+0.755\cdot 14+0.267\cdot 1}{45+2+1+14+1}=0.258$$

$$P^{c}_{soat.\Sigma}=\frac{P^{c}_{soat.1}\cdot N_1+P^{c}_{soat.2}\cdot N_2+P^{c}_{soat.3}\cdot N_3+......+P^{c}_{soat.n}\cdot N_n}{N_1+N_2+N_3+.....+N_n}=$$

$$\frac{0.047\cdot 60+0.056\cdot 3+0.228\cdot 3+0.645\cdot 15+0.133\cdot 2}{60+3+3+15+2}=0.164$$

4. Various objects there is of the building water consumption average indicator :

- per second :

$$q^{tot}_{sek.\Sigma}=\frac{q^{tot}_{\max.sek.1}P^{tot}_{sek.1}\cdot N_1+q^{tot}_{\max.sek.2}P^{tot}_{sek.2}\cdot N_2+q^{tot}_{\max.sek.3}P^{tot}_{sek.3}\cdot N_3+......+q^{tot}_{\max.sek.n}P^{tot}_{sek.n}\cdot N_n}{P^{tot}_{sek.1}N_1+P^{tot}_{sek.2}N_2+P^{tot}_{sek.3}N_3+.....+P^{tot}_{sek.n}N_n}$$

$$=\frac{0.3\cdot 0.024\cdot 60+0.14\cdot 0.013\cdot 3+0.3\cdot 0.057\cdot 3+0.14\cdot 0.107\cdot 15+0.14\cdot 0.032\cdot 2}{0.024\cdot 60+0.013\cdot 3+0.057\cdot 3+0.107\cdot 15+0.032\cdot 2}=0.234$$

$$q^{h}_{sek.\Sigma}=\frac{q^{h}_{\max.sek.1}P^{h}_{sek.1}\cdot N_1+q^{h}_{\max.sek.2}P^{h}_{sek.2}\cdot N_2+q^{h}_{\max.sek.3}P^{h}_{sek.3}\cdot N_3+......+q^{h}_{\max.sek.n}P^{h}_{sek.n}\cdot N_n}{P^{h}_{sek.1}N_1+P^{h}_{sek.2}N_2+P^{h}_{sek.3}N_3+.....+P^{h}_{sek.n}N_n}$$

$$=\frac{0.2\cdot 0.031\cdot 45+0.1\cdot 0.014\cdot 2+0.2\cdot 0.067\cdot 1+0.1\cdot 0.084\cdot 14+0.1\cdot 0.044\cdot 1}{0.031\cdot 45+0.014\cdot 2+0.067\cdot 1+0.084\cdot 14+0.044\cdot 1}=0.169$$

$$q^{c}_{sek.\Sigma}=\frac{q^{c}_{\max.sek.1}P^{c}_{sek.1}\cdot N_1+q^{c}_{\max.sek.2}P^{c}_{sek.2}\cdot N_2+q^{c}_{\max.sek.3}P^{c}_{sek.3}\cdot N_3+......+q^{c}_{\max.sek.n}P^{c}_{sek.n}\cdot N_n}{P^{c}_{sek.1}N_1+P^{c}_{sek.2}N_2+P^{c}_{sek.3}N_3+.....+P^{c}_{sek.n}N_n}$$

$$=\frac{0.2\cdot 0.013\cdot 60+0.1\cdot 0.009\cdot 3+0.2\cdot 0.063\cdot 3+0.1\cdot 0.072\cdot 15+0.1\cdot 0.022\cdot 2}{0.013\cdot 60+0.009\cdot 3+0.063\cdot 3+0.072\cdot 15+0.022\cdot 2}=0.165$$

- hourly :

$$q^{tot}_{soat.\Sigma}=\frac{q^{tot}_{\max.soat.1}P^{tot}_{soat.1}\cdot N_1+q^{tot}_{\max.soat.2}P^{tot}_{soat.2}\cdot N_2+q^{tot}_{\max.soat.3}P^{tot}_{soat.3}\cdot N_3+......+q^{tot}_{\max.soat.n}P^{tot}_{soat.n}\cdot N_n}{P^{tot}_{soat.1}N_1+P^{tot}_{soat.1}N_2+P^{tot}_{soat.3}N_3+.....+P^{tot}_{soat.n}N_n}$$

$$=\frac{300\cdot 0.087\cdot 60+80\cdot 0.083\cdot 3+300\cdot 0.206\cdot 3+60\cdot 0.900\cdot 15+80\cdot 0.200\cdot 2}{0.087\cdot 60+0.083\cdot 3+0.206\cdot 3+0.900\cdot 15+0.200\cdot 2}=11.421$$

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$$q^{h}_{soat.\Sigma}=\frac{q^{h}_{\max.soat.1}P^{h}_{soat.1}\cdot N_1+q^{h}_{\max.soat.2}P^{h}_{soat.2}\cdot N_2+q^{h}_{\max.soat.3}P^{h}_{soat.3}\cdot N_3+......+q^{h}_{\max.soat.n}P^{h}_{soat.n}\cdot N_n}{P^{h}_{soat.1}N_1+P^{h}_{soat.1}N_2+P^{h}_{soat.3}N_3+.....+P^{h}_{soat.n}N_n}$$

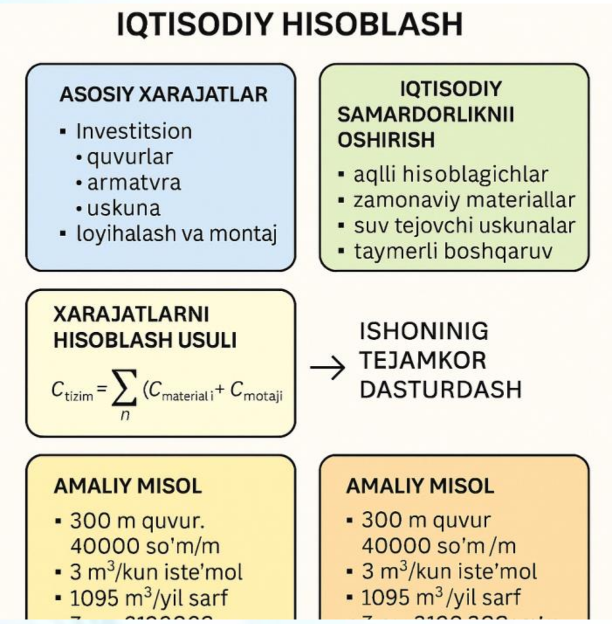
$$=\frac{200\cdot 0.111\cdot 45+60\cdot 0.083\cdot 2+200\cdot 0.240\cdot 1+40\cdot 0.755\cdot 14+60\cdot 0.267\cdot 1}{0.111\cdot 45+0.083\cdot 2+0.024\cdot 1+0.755\cdot 14+0.267\cdot 1}=6.331$$

$$q^{c}_{soat.\Sigma}=\frac{q^{c}_{\max.soat.1}P^{c}_{soat.1}\cdot N_1+q^{c}_{\max.soat.2}P^{c}_{soat.2}\cdot N_2+q^{c}_{\max.soat.3}P^{c}_{soat.3}\cdot N_3+......+q^{c}_{\max.soat.n}P^{c}_{soat.n}\cdot N_n}{P^{c}_{soat.1}N_1+P^{c}_{soat.1}N_2+P^{c}_{soat.3}N_3+.....+P^{c}_{soat.n}N_n}$$

$$=\frac{200\cdot 0.047\cdot 60+60\cdot 0.056\cdot 3+200\cdot 0.228\cdot 3+40\cdot 0.645\cdot 15+60\cdot 0.133\cdot 2}{0.047\cdot 60+0.056\cdot 3+0.228\cdot 3+0.645\cdot 15+0.133\cdot 2}=5.659$$

Calculation:

- **Daily general consumption** : 150 × 20 = 3000 l = 3 m³
- **Annual water consumption** : 3 × 365 = 1095 m³
- **Annual payment** : 1095 × 2000 **= 2,190,000 soums**
- **Pipe cost** : 300 × 40,000 **= 12,000,000 money**
- **Assembly work** : 300 × 50,000 **= 15,000,000 money**
- **Total Cost** : 27,000,000 sum + equipment and fittings (about 10 million) **= 37,000,000 sum**



4. Economic efficiency increase methods

Event	**Economic benefit**
Smart water meters	Reduces water loss

Event	Economic benefit
Modern materials (PE, PP-R pipes)	Repair expenses reduces
Water economical sanitary equipment	Annual water reduces consumption by 30-40%
Pump timer or with touch control	Electricity costs reduces

Conclusion

The building internal water supply system of economic calculation of construction costs planning , in operation efficiency increase and water rational use of resources possible gives . Every For a project , technical and economic aspects must be assessed together .

REFERENCES

1. Quvondiqov, Q. (2023). On the Issue of Efficiency in the Transportation of Oil Products by Main Pipeline. International Journal of Trend in Scientific Research and Development (IJTSRD).
2. Quvondiqov, Q. (2021). Suv ta'minoti, oqova suv, gidravlika va suv resurslarini muhofaza qilish sohalarida yangi yutuqlar. X МЕЖДУНАРОДНАЯ НАУЧНО-ПРАКТИЧЕСКАЯ КОНФЕРЕНСИЯ.
3. Quvondiqov, Q. (2022). Gidtrotransport tizimlaridagi adgeziyani dispers sistemalarni modifikaцyalash orqali kamaytirish. Scienceweb academic papers collection.
4. Quvondiqov, Q. (2023). Magistral va undan tarqalagn quvurlar tizimini gidravlik hisoblash. ELEKTRON HISOBLASH MASHINALARI UCHUN YARATILGAN DASTURNING RASMIY ROʻYXATDAN OʻTKAZILGANLIGI TOʻGʻRISIDAGI GUVOHNOMA OʻZBEKISTON RESPUBLIKASI ADLIYA VAZIRLIGI,№ DGU 24340, Talabnoma kelib tushgan sana: 03.04. 2023 Talabnoma raqami: DGU 2023 2692.
5. Quvondiqov, Q. (2018). TTYMI talabalar turar joyidagi suv ta’minoti tizimlarining muammolari. Scienceweb academic papers collection.
6. Quvondiqov, Q. (2022). Quduqning siljishga, agʻdarilishiga va suzib chiqishiga boʻlgan turgʻunligini hisoblash uchun dastur. Scienceweb academic papers collection.

7. Esanmurodov, S. (2023). On the Issue of Efficiency in the Transportation of Oil Products by Main Pipelines. International Journal of Trend in Scientific Research and Development (IJTSRD).

8. Quvondiqov, Q. (2021). Обоснование проведения реконструкции Бектемириских канализационных очистных сооружений г. Чирчика с целью повышения эффективности их работы. Scienceweb academic papers collection.

9. Бабаев, А. Р., & Умаров, У. В. (2023). МАҲАЛЛИЙ ХОМ АШЁЛАРДАН ТАЙЁРЛАНГАН ФИЛЬТРЛАРНИ ЮВИШ. Scientific Impulse, 1(10), 415-422.

10. Javokhir, O., Askar, B., Kuvonchbek, K., & Uchkun, U. (2023). Washing Filters Made From Local Raw Materials. Best Journal of Innovation in Science, Research and Development, 2(6), 281-288.

11. Quvondiqov, Q. (2023). MAHALLIY XOM ASHYOLARDAN TAYYORLANGAN FILTRLARNI YUVISH. Международный современный научно-практический журнал Научный импульс.

12. Quvondiqov, Q. (2023). Neft mahsulotlarini magistral quvurlar orqali tashishda nasos rejimi va nasos stansiyalarida elektr energiyasining xarajatlari. Замонавий архитектура, бинолар ва иншоотларнинг мустаҳкамлиги, ишончлилиги ва сейсмик хавфсизлик муаммолари.

13. Quvondiqov, Q. (2023). Neft va neft mahsulotlarini quvurlar orqali tashishda nasos va quvur liniyasining kombinasiyalashgan xususiyatlari. Замонавий архитектура, бинолар ва иншоотларнинг мустаҳкамлиги, ишончлилиги ва сейсмик хавфсизлик муаммолари.

14. Babayev, A. (2023). NEFT VA NEFT MAHSULOTLARINI MAGISTRAL QUVURLAR ORQALI TASHISHDA NASOS VA QUVUR LINIYASINING UMUMIY XARAKTERISTIKALARI. Замонавий архитектура, бинолар ва иншоотларнинг мустаҳкамлиги, ишончлилиги ва сейсмик хавфсизлик муаммолари.