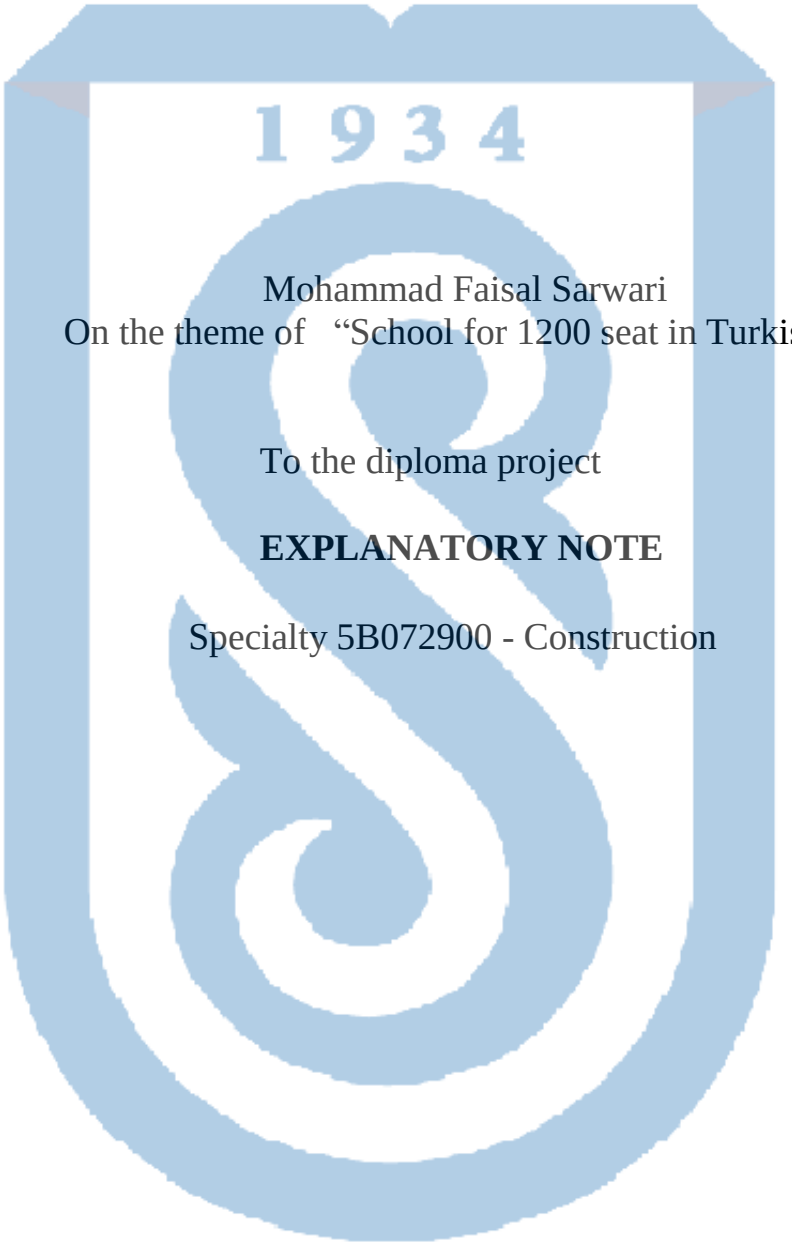
MINISTRY OF EDUCATION AND SCIENCE OF THE REPUBLIC OF KAZAKHSTAN
Kazakh National Research Technical University named after K.I. Satpayev

Institute of Architecture, Construction and Energy named after T. Basenov

Department of «Construction and Building Materials»



Mohammad Faisal Sarwari

On the theme of "School for 1200 seat in Turkistan"

To the diploma project

EXPLANATORY NOTE

Specialty 5B072900 - Construction

Almaty 2020

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ALLOWED TO PROTECT

Head of Department

_____K.Akmalayuli

«_25_»__05___2020 y.

EXPLANATORY NOTE

To the diploma project

On the theme of "School for 1200 seat in Turkistan "

Specialty 5B072500 – Civil Engineering

Prepared by M.Faisal Sarwari

Supervisor N.V. Kozyukova

«_25_»__05___2020 y.

Almaty 2020

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Department of «Construction and Building Materials»

I APPROVE

Head of the department

K.A. Akmalayuli

«25» 05 2020 y.

ASSIGNMENT

Complete a diploma project

Student __ Mohammad Faisal _____

Topic “School for 1200 seat in Turkistan”

№ _ - endorsed by the request.

Approved by the Order of the Rector of the University No. 762-b of January 27, 2020.

The deadline for completion is May 18, 2020.

Beginning entries of the certificate venture: construction locale – Turkistan.

Rundown of issues to be considered in the recognition venture:

1. Architectural and development division: qualities of the development region; three-dimensional arranging choices; structural and plan arrangements; external divider warm designing bookkeeping; building hardware of the structure;
2. Computational and valuable segment: count of burdens and making of the computation conspire, figuring of the board and its estimation of fortified solid components dependent on the outcomes and their motivation
3. Technology and association of development creation and work security: land assurance of the volume of underground and surface works; assurance of the quantity of solid trucks; surface strengthened cement of the structure development of innovative guide of structures establishment; object plan of development end-all strategy; Schedule. 4. Division of Construction Economics: neighborhood and article planning of assessments,

List of drawing materials (compulsory drawings must be indicated):

1. Facade of the structure, segments, joints, determinations, plans - 4 sheets;
2. Drawing, detail of the section - 2 sheets;
3. Calendar arrangement of development creation, general development plan, - 2 Sheets

11 slides of the presentation of work are provided.

Recommended basic literature: SP RK 2.04-01-2017 Construction Climatology, SN RK 2.04-04-2013 Construction Heat Engineering, SN RK 2.03-30-2017 Construction in Seismic Zones.

SCHEDULE

Preparation of thesis (project)

№	Sections	33%	66%	100%	Примечание
1	Predesign analysis Architectural and construction	18.02.2019г.-01.03.2019г.			
2	Settlement constructive		18.03.2019г. -29.03.2019г.		
3	Technology and organization of construction production and labor protection Economic			03.04.2020г.-19.04.2020г.	
4	Anti-plagiarism, norm control, pre-defense	18.05.2020y.-22.05.2020y.			
5	Defence	01.06.2020-05.06.2020y.			

Signatures

Consultants and the normative controller for the completed diploma work (project) with an indication of the sections of work (project) related to them

Name of sections	Consultants, I.O.F. (academic degree, rank)	date of signing	Signature
Architectural building	N.V. Kozyukova, master of technical science	25.05.2020	
Settlement and constructive	A.P.Turganbaev, master of technical science	25.05.2020	
Technology and organization of construction production	I.Z. Kashkinbaev, doctor of technical science	25.05.2020	
Economic section	N.V. Kozyukova, master of technical science	25.05.2020	
Norm controller	N.V. Kozyukova, master of technical science	25.05.2020	

Supervisor N.V. Kozyukova

The student accepted

The task M.Faisal Sarwari

Date «_____25_____» 05 2020

АННОТАЦИЯ

Тема работы: «Школа на 1200 мест в городе Туркестан»

Здание трехэтажное и подземное, обрамлено и выполнено в форме Н. В этом проекте в архитектурно-строительных, расчетно-инженерных и инженерных частях принимались инженерные решения. Определены общие технико экономические показатели проекта, а также приняты решения по охране окружающей среды.

АНДАТПА

Жұмыс барысы: «Түркістан қаласындағы 1200 орындық мектеп»

Ғимарат үш қабатты және жер асты еденнен тұрады, жиектелген және Н түрінде жасалынған. Бұл жобада сәулет-құрылыс, кенттік және инженерлік-техникалық бөліктерде инженерлік шешімдер қабылданды. Жобаның жалпы техникалық-экономикалық көрсеткіштері, сонымен қатар қоршаған ортаны қорғау бойынша қабылданған шешімдер анықталған.

ANNOTATION

Them of work: “School for 1200 seat in Turkistan City”

The building is three-storey and underground floor, framed and designed in an H form. In this project, in architectural and construction, settlement and engineering and engineering parts made engineering decisions. The general technical and economic indicators of the project are identified, and also accepted decisions on environmental protection.

CONTENT

INTRODUCTION

The school building with 1200 seats has an H-shaped configuration. Central the seventh block - connecting - school-wide, where the administrative premises, as well as classrooms. The main entrance is located in the seventh block. In the first and fifth blocks, at mark 0,000 and +3,300, there are primary classrooms. On the mark +6,600 secondary and high school classes are located. These blocks have a separate input group. In the second and sixth block are the main cabinet's schools, as well as a wardrobe, offices of the director, administration and teachers. Data blocks also have a separate input group.

In the eighth block there is a gym with dimensions in the axes of 13.2 x 25.2 m. The catering unit is located in the tenth block, and has its own entrance and boot. On the first floor of the ninth block there is a dining room, on the second library, on the third computer science classes.

The first, second, third, fourth, fifth, sixth, seventh, ninth blocks designed in three floors with a technical underground and ventilated attic space. The eighth and tenth block has one floor and a technical underground. Floor height from floor to floor 3.3m.

This planning solution allowed the most appropriate use the area of construction, and also eliminates the intersection of flows of high school and primary.

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1. Architectural part

Project "Construction of a school for 1200 places, located at: Turkistan city

1.1 Land characteristic:

- Site seismicity - 6 points
- Construction and climatic zone: IV-G;
- Estimated load of snow cover weight - 0.5 kPa
- Wind region III, standard load of wind pressure - 38 kg / m²
- Design temperature of outdoor air in winter period: -20 ° C;
- Humidity zone: dry;

1.2 Temperature conditions:

- Average annual temperature: 17.6 ° C;
- Absolute minimum: -20 ° C;
- Absolute maximum: -20 ° C;
- The climate of the region is continental, winters are short and summers are long and hot; For the conditional mark 0,000, the surface of the clean floor of the first floor is taken which corresponds to an absolute mark of 874.0 according to the general plan.

1.3. Constructive decisions

Ceilings - monolithic reinforced concrete flat thicknesses. 200mm External walls - wall panels "UTC-light wall" made of polystyrene concrete. 210 mm, on metal rolling fasteners.

Insulation of external walls (on columns and reinforced concrete walls) - hard mineral wool plates PTE-150 on a basalt basis, combustibility NG, a thickness of 80mm.

Internal partitions - wall panels "UTC-light wall" made of polystyrene concrete thickness 90 mm, on metal rolling fasteners.

The parapet is made of cast concrete.

The roof is flat ventilated.

Exterior finish of facades - building walls - steel panels of thicknesses. 0.7mm Polymer-cement facade plaster (tinted or with subsequent painting) according to reinforcing fiberglass mesh, basement, porch - granite.

Stained-glass windows - double glazed, metal-plastic, aluminum. IN energy-saving glazing is used for light-shielding constructions.

Windows - double glazed, metal-plastic. In light-guarding designs use energy-

saving glazing.

Doors - individual, dimensions in accordance with GOST6629-88, GOST24698-81.

Floors - ceramic tiles, porcelain stoneware, linoleum, carpet, boardwalks.

Technical risers (sewer, ventilation and for water supply)

To sew with plasterboard using sound insulation - min.vat P75 GOST 9573-96 - Thickness 50mm.

Floor communication of blocks is carried out by stairs (type L1) the design life indicator is 20 years.

Horizontal waterproofing of walls from soil moisture is made of cement a solution of composition 1.2 with sealing additives with a thickness of 20 mm per level. -0,200. Around buildings to make a blind area of fine-grained asphalt concrete with a thickness of 30 mm, 1.5 m wide on the crushed stone base.

Activities for the production of work in the winter are not provided for by the project.

1.4. Fire protection requirements

When developing a working draft, fire safety standards and SNiP requirements were taken into account RK 2.02-05-2009 "Fire safety of buildings and structures", Technical regulations from 01/16/2009 "General requirements for fire safety."

Fire safety and the necessary degree of fire resistance of the building provide fireproof supporting and enclosing structures adopted in the working draft and materials.

The dimensions of the door blocks adopted in the working draft and their quantity provide free evacuation of people in case of fire.

Evacuation of people from floors is carried out through staircases of type L1. To protect steel structures indoors, Phosphate is used. OFP-MM flame retardant coating: OFP-MM (GOST 23791-79) and OFP-MV (GOST) compositions 25665-83). The composition is applied to steel structures primed with iron minium according to GOST 8135-74 * or soil type GF according to GOST 12707-77 in accordance with the requirements of SNiP for the design of protection of steel structures against corrosion. Coating elements are painted with fire retardants to the limit of fire resistance not less than 30 minutes.

The lining of the outer surfaces of the outer walls is made of non-combustible materials. Walls and ceilings in the common corridors and stairwells are made of non-combustible materials. Floors in the lobby, stairwells and corridors are non-combustible materials.

1.5. Availability

The entrance to the school building is equipped with a ramp for disabled people.

On the The first, second and third floor is designed for disabled people.

Vertical communication is carried out by means of the passenger elevator "ALATAU" with cab dimensions 1300 x 2100 mm. The lift capacity is 1150 kg.

Table-1 Technical and economic indicators

Name	**unit**	Indicators										
	м²	Block 1	Block 2	Block3	Block4	Block5	Block6	Block7	Block8	Block9	Block 10	Total
total area		3179,2	3163,2	1207,0	1135,4	1478,6	1473,4	1391,7	978,4	913,5	631,2	15551,6
including above mark 0,000	м²	2444,2	2426,3	724,7	663,5	1155,2	1148,4	1348,6	340,4	830,1	309,2	11390,6
including below mark 0,000	м²	735,0	736,9	482,3	471,9	323,4	325,0	43,1	638,0	83,4	322,0	4161,0
Effective area	м²	3066,4	3050,4	1130,8	1059,2	1391	1383,4	1302,8	978,4	853,5	631,2	14847,1
Estimated Area	м²	1823,7	1830,6	592,7	583,7	907,2	912,1	714,3	340,4	756,7	234,2	8695,6
Construction volume building	м³	10149,7	10139,3	3675,0	3675,0	4529,2	4529,2	5677,5	4334,2	3832,1	1911,1	52452,3
including above mark 0,000	м³	8038,8	8028,4	2929,8	2929,8	3585,8	3585,8	4460,9	3307,7	2914,9	1051,1	40843,4
including below mark 0,000	м³	2110,9	2110,9	745,2	745,2	943,4	943,4	1216,6	1026,5	917,2	860,0	11619,3
Built-up area building	м²	886,4	885,7	319,2	319,2	406,1	404,0	584,8	407,6	367,9	396,6	4977,5

* The volume of ventilated sub-roofing is not included in the construction volume of the building (attic) space

* Ventilated area is not included in the total, usable and estimated area of the building subroofing (attic) space

1.6 Thermotechanical estimation of the outside mass of the structure

Discover the reasonableness of the arranged divider structure for the climatic states of Almaty. The wet mode in the room is the standard thing, climatic zone of development as far as moistness is dry.

Table -2 Thermotechanical characteristics of individual wall layers

Name	Δ (м)	ρ (кг/м^3)	λ (Вт/м·°С)	S (Вт/м·°С)
Waterproofing	0,02	1000	0,21	6,20
Insulation - mineral wool board	0,8	300	0,09	1,44
Ceramic brick	0,50	1600	0,64	8,48
Polymer-cement plaster	0,07	1800	0,76	9,6

• Coefficient n = 1 for an external wall;
• Standard external differential Δt_n = 4 ° C;
• Coefficient of heat transfer the inner surface of α_i= 8.7 W / (m 2 · ° C);
• Coefficient of heat transfer of the outer surface α_e = 23 W / (m 2 · ° C) 2. Determine the resistance of the intended wall design heat transfer R0:1

$$R0 = \frac{1}{\alpha i} + \frac{\delta 1}{\gamma 1} + \frac{\delta 2}{\gamma 2} + \frac{\delta 3}{\gamma 3} + \frac{\delta 4}{\gamma 4} + \frac{\delta 5}{\gamma 5} + \frac{1}{\alpha e} = \frac{1}{8.7} + \frac{0.02}{0.21} + \frac{0.08}{0.09} + \frac{0.50}{0.64} + \frac{0.07}{0.76} + \frac{1}{23} = 1.992\ m^2°C/Bm$$

We determine the characteristic of thermal inertia of the wall D:

$$D = \frac{\delta 1}{\gamma 1}.S1 + \frac{\delta 2}{\gamma 2}.S2 + \frac{\delta 3}{\gamma 3}.S3 + \frac{\delta 4}{\gamma 4}.S4$$
$$= \frac{0.02}{0.21}.6.20 + \frac{0.08}{0.09}.1.44 + \frac{0.50}{0.64}.8.48 + \frac{0.07}{0.76}.9.6 = 9.379$$

At D = 5.826> 5 the fence is of "great inertia".
Determine the required wall resistance to heat transfer R_0^{mp}:

$$R_0^{mp} = \frac{n(t_i - t_n)}{\alpha_i.\Delta t_n} = 1(20— (-20)/8.7 * 4 = 1.14 m^2°C/Bm$$

Check the suitability of the intended wall design. Check condition:

$$R_0^{mp} \geq R_0$$

$$R_0^{mp} = 1.14\, m^2°\text{C}/Bm < R_{0=}1.992 m^2°\text{C}/Bm$$

The intended wall design is suitable for climatic conditions. This area of Construction.

2. Structural part

2.1 The calculation of the column of the middle row

Decide the cross-sectional components of the solid segment on Ground floor and territory of working fittings the structure has three stories. Range L = 6.6 m, separating between segments = 6.6 m. Floor tallness is 3.2 meter. The heaviness of cement is B30, the coefficient of working state of cement. Three-level work extras, flat adornments AI level. The section is a fortified sewn casing.

Coating Load:

$$g^n = 5.8kn/m^2$$
$$g = 7.13kn/m^2$$
$$P_l^n = -;$$
$$P_{sh}^n = 0.7Kn/m^2;$$

The load from the floor:

$$g^n = 5.8kn/m^2$$
$$g = 6.51kn/m^2$$
$$P_l^n = 0.3Kn/m^2;$$
$$P_{sh}^n = 1.2Kn/m^2;$$

Decision

1. We write out from the tables the basic design characteristics of the materials:

For concrete of class B30

$$R_b = 11{,}5 \text{ MPa } = 1{,}15 \text{ кН/см}^2,$$
$$E_b = 24500 \text{ MPa } = 2450 \text{ кН/см}^2,$$

Taking into account the coefficient $\gamma_{b2} = 0.9$

$$R_b = 10{,}35 \text{ MPa } = 1{,}035 \text{ кН/см}^2,$$

For working fittings, class III

$$R_s = 365 \text{ MPa } = 36{,}5 \text{ кН/см}^2;$$
$$E_s = 200000 \text{ МПа } = 20000 \text{ кН/см2};$$
$$\begin{cases} \xi_R = 0.65 \\ A_{0R} = 0.451 \end{cases}$$

For concrete of class B30

For class AIIII fittings

2. We collect the load on the column, taking into account the coefficient of reliability $\gamma_n = 0.95$

The cargo area of the column is determined by the formula:

$$\omega = \left\{\frac{L}{2} + \frac{L}{2}\right\} * \left\{\frac{B}{2} + \frac{B}{2}\right\} = \left\{\frac{6.6}{2} + \frac{6.6}{2}\right\} * \left\{\frac{6.6}{2} + \frac{6.6}{2}\right\} = 43.56i'^2$$

Table 3 - Collection of loads on the column

Type of load	NLn (кН)	$N_{Sh}n$ (кН)	$\square_f$	N_L (кН)	N_{Sh} (кН)
Coating Load: (ω = 43,56м^2) I. Constant load 1. Normative 5,8×43,56 2. Estimated7,13×43,56 II. Temporary load (Snow load) long 1. Short-term 2. 0.7 × 43.56	252,64 8	30,5	1,4 1,4	310,58 -	42,7
Total coating load	252, 648	30 ,5		310 ,58	42, 7
Floor load (ω = 43,56ö м^2) I. Permanent Load. 1. Normative 5,8 × 43,56 × 3 2. Estimated 6.5 × 43.56 × 3 II. Temporary (Payload) 1.Long 0.3 × 43.56 × 3 2. Short-term 1.2 × 43.56 × 3	227 3,83 117, 612	47 0, 4	1,3 1,3	254 8,2 6 152 ,9	61 1,5
Total floor load	239 1,44 2	47 0, 4		270 1,1 6	61 1,5

3 Determine the working height and the distance to the cross section of the column.

$$h0 = h - a = 40 - 3 = 37см$$

Where a = 3cm.

3. Determine the estimated length of the column

$$L0 = 0.7H = 0.7H_f = 0.7 * 3.9 = 2.73 = 273ni$$

Where H is the distance between the sections fixed from the offset.

1. Determine the random eccentricity e:

$$e_a \begin{cases} \geq \frac{1}{600} H\ a_a = \frac{1}{600} * 273 = 0.455ni \\ \geq \frac{1}{30} h_{col} a_a = \frac{1}{30} * 50 = 1.66ni \\ \geq 1cm\ a_a = 1ni \end{cases}$$

h- Column section height

Of these three values, we finally take the highest e_a = 1.66cm

6. Determine the initial eccentricity e_0 :

Eo = ea=1,66см.

7. Determine the flexibility of the column λ:

$$\lambda = \frac{L0}{hcol} = \frac{273}{40} = 6.825$$

8. Determine the coefficient, taking into account the impact of additionalaction on the deflecting element:

$$\varphi_L = 1 + \beta \frac{N_L * e_a}{N * e_a} \leq 1 + \beta$$

$$\varphi_L = 1 + 1 \frac{2861{,}15\ 1.66}{3482{,}59\ 1.66} = 1.82 < 1 + 1 = 2$$

$$N = N_L + N_{sh} = 2861.15 + 621.44 = 3482.59eI$$

Where coefficient β = 1 for heavy concrete.

9. We determine the coefficient δe and δe min:

$$\delta_a = \frac{a_0}{h_{col}} \geq \delta_{min} = \frac{1.66}{40} = 0.04ni$$

$$\delta_{emin} = 0.5 - 0.01 * \frac{a_0}{h_{col}} - 0.01 * R_b = 0{,}5 - 0{,}01 * 0{,}04 - 0{,}01 * 10{,}35 = 0.39$$

Where Rb -is substituted in MPa.

Of the two values obtained, we finally take the largest, δemin = 0.39

10. Determine the moment of inertia of the cross section of the column:

$$I = \frac{b_{col} * h_{col}^3}{12} = \frac{40 * 40^3}{12} = 213333.3$$

11. Determine the ratio of elastic moduli:

$$\alpha = \frac{E_s}{E_b} = \frac{20000}{2450} = 8.16 \approx 8.1$$

12. We determine the critical force Ncr and check the condition N ≤ Ncr:

$$N_{cr} = \frac{6.4 * E_b}{L_0^2} * \left[\frac{I}{\varphi_l}\left(\frac{0.11}{0.1 * \delta_e} + 0.1\right) + 0.25 * \alpha * \mu * b_{col} * h_{col*(h_0 - a')^2}\right]$$

$$=> \frac{15680}{273^2} * \left[\frac{213333,3}{1,82}\left(\frac{0.11}{0.1 * 0.39} + 0.1\right) + 0.25 * 8.9 * 0.01 * 40 * 40_{*(37-3)^2}\right]$$

$$= 38579,67$$

Where μ = 0,01 is the reinforcement coefficient,

N = 3482.59 kN ≤ Ncr = 38579.67 kN

The conditions are met, the dimensions of the cross section of the column are sufficient.

13. Determine the coefficient of increase in eccentricity:

$$\eta = \frac{1}{1 - \frac{N}{N_{cr}}} > 1$$

$$\eta = \frac{1}{1 - \frac{3482,59}{38579,67}} = 1.09 > 1$$

The condition is met, the dimensions of the cross-section of the column are sufficient.

14. Determine the distance e:

$$e = e_0 * \eta + 0.5 * (h_{col} - a') = 1,66 * \ 1,09 + \ 0.5 * (40 - 3) = 20.3ni$$

15. Determine the cross-sectional area of the compressed, stretched, working fittings:

In our case, it is advisable to symmetric reinforced columns ($A_s = A'_s$):

a) Determine the relative height of the longitudinal force an:

$$\alpha_n = \frac{N}{R_b * b_{col} * h_0} = \frac{3482,59}{1.035 * 40 * \ 37} 2.27$$

b) Determineδ':

$$\delta' = \frac{a'}{h_0} = \frac{3}{37} = 0,08;$$

c) Determine the coefficient aml:

$$\alpha_{m1} = \frac{N * e}{R_0 * b_{col} * h_0^2} = \frac{3482,59 * \ 20,3}{1.035 * \ 40 * 37\text{^}2} = 1.2$$

d) We define as:

$$\alpha_s = \frac{\alpha_{m1} - \alpha_n * \left(1 - \frac{\alpha_n}{2}\right)}{1 - \delta'} = \frac{1.2 - 2.27\left(1 - \frac{2.27}{2}\right)}{1 - 0.08} = 2.16$$

d) Determine the relative height of the compressed section zoneξ:

$$\xi = \frac{\alpha_n * (1 - \xi_R)}{1 - \xi_R + 2 * \alpha_s} = \frac{2.27(1 - 0.65) + 2 * 2{,}16 * \ 0.65}{1 - 0.65 + 2 * 2.16} = 0.77$$

e) Determine the case of symmetrical reinforcement;

$$\xi = 0.77 > \xi_R = 0.65$$

This is the second case of symmetric amplification;

f) Determine the cross-sectional area of the working steel:

$$A_s = A'_s = \frac{R_b * b_{col} * h_0}{R_S} * \frac{\alpha_{m1} - \xi * \left(1 - \frac{\xi}{2}\right)}{1 - \delta'} = \frac{1.035 * 40 * 37}{36.5} * \frac{1{,}2 - 0.77 * \left(1 - \frac{0.77}{2}\right)}{1 - 0.08} = 6.2 ni^2$$

Accepted by assortment:

- Stretched working fittings - 2Ø20AIII A = 6.28
- Compressed working fittings - 2Ø2AIII A = 6.28

16. Check the percentage of reinforcement μ:

$$\mu = \frac{A_s + A_s}{b * h} * 100\% = \frac{6.28 + 6.28}{40 + 40} * 100\% = 1.57\%$$

μ% min ≤ μ% ≤ μmax

0.3% ≤ 1.57% ≤ 3%

17. We construct a column. We reinforce the column with knitted frames, Consisting of compressed working reinforcement Ø20AIII, extended working Reinforcement Ø20AIII and transverse reinforcement (clamps) Ø8AI, Set in increments of S = 15 cm. Column reinforcement in detail Shown in the drawing.

3 Technological part

3.1 Characterization of soil development conditions

III - category - Medium or heavy clay, loose, loamy dense. Construction waste in volume is about 10%

Table 4 - Characteristics of the soil

Names	unit of measurement	Numeric data	Note
Soil group		III	ENiR 2, Issue 1, pp. 6-12
Average soil density	kg/m^3	1900	ENiR 2, issue 1
Coefficient of initial loosening	%	24-30	ENiR 2, issue 1 p. 206
Residual Loosening Ratio	%	4-7	ENiR 2, issue 1 p. 206
Slope coefficient	%	0,5	"Technology of construction processes", p. 27

Soil is transported at a distance of: 6 km
Average winter temperature of external influence: -15˚C
The mark of the base of the foundation is set at -1.2 m
UGV: -4.00 m

3.2 Determination of the scope of work

When using working drawings of a building, the volume of work is calculated. On the basis of a complex technological process during the production of zero-cycle work, a list of work volumes is selected. Earth volumes of work are considered when designing earthworks, during the creation of PIC (construction organization projects) and PPR (work production projects).

1. The calculation of the volume of the pit

$$V_к = H/6 \cdot (a \cdot b + c \cdot d + (a+c) \cdot (b+d)), м3$$

Where A, b - the width and length of the pit on the bottom
C, d - width and length of the pit on top

$$V_к = 1.26 \cdot (80.2 \cdot 58 + 81 \cdot 58.6 + (80.2+81) \cdot (58+58.6)) = 7518 м3$$

2. Determination of backfill volume

$$V_{обр.з.} = V_к - V_ф - V_{подв} / 1 + К_{о.р.}, м3$$
$$V_{обр.з} = 7518 - 3428 / 1 + 0,04 = 3932 м3$$

Where Vф - volume of foundation elements

Ko.p. - the coefficient of residual loosening

3. Determination of the amount of excess soil

$$V_{изл.г} = V_к - V_{обр.з}, м3$$
$$V_{изл.г} = 7518 - 3932 = 3586 м$$

4. Determination of the volume of soil shortage

$$V_{н.г} = a \cdot b \cdot h_{нед}, м3$$
$$Н_{нед} = 0,1 \div 0,4 м$$
$$V_{н.г} = 930 м3$$

5. Determination of the cut-off area of the plant layer

$$F_{срез} = (10+c+10)(10+d+10), м2$$
$$F_{срез} = 101 * 78.6 = 7938 м2$$

6. The total volume of cuts of plant soil.

$$V = S * h_{рг} = 7938 * 0,2 = 1587,6 м3$$

7. Soil compaction area

$$F_{упл} = V_{о.з.} / h_y$$

Where hy - thickness of the sealing layer

$$F_{упл} = 3932 / 0,2 = 19660 м2$$

8. Foundation waterproofing area: S = 3828 m2

3.3 The selection of a set of machines for excavation

In construction, currently 4 methods of soil development are used: mechanical, hydro mechanical, explosive and combined. Backhoe excavators move along and across the pit, and can move in a zigzag fashion. Excavation is carried out with the help of an excavator equipped with a backhoe with soil loading into dump trucks or with partial dumping into a dump

Bulldozer selection

Initial data:

To do this, select the DZ-8 bulldozer based on the T-100 tractor.

We find the operational performance of the bulldozer:

$$Pa = \frac{60 * t * q * \alpha * k_b}{T_n + T_p + \frac{l_g}{V_g} + \frac{l_p}{V_p}} \quad (1)$$

Where T - The duration of the shift, h

q - Volume of soil in a dense state, m3

α - coefficient taking into account soil loss during displacement

α = 1-0.005lГ = 0.95

KV - coefficient of use of the machine in time (0.8)

TN - the duration of the set of soil, min (tab. 3.2)

TP - time spent on switching speeds (tab. 3.2)

lГ, lП - estimated distance of movement with cargo and empty, m

VГ, VP - accordingly, the speed of the bulldozer in the loaded state and Empty, m / min (tab. 3.2)

$$Pa = \frac{60*t*q*\alpha*k_b}{T_n+T_p+\frac{l_g}{V_g}+\frac{l_p}{V_p}} \quad (2)$$

Excavator selection

Excavation is carried out by an excavator equipped with a reverse

A shovel with unloading of soil in dump trucks and with partial dumping in a dump. We select 2 excavators with a direct shovel with a bucket with teeth with a bucket volume 1m3 and 1.25 m3 and perform a comparison.

Specifications are shown in Appendix B.

H1bp = 2.8 - the rate of time of the mechanism during operation will sweep (mash-hour). (ENiR2, issue 1).

H2вр = 3.5 - the rate of time of the mechanism when loading soil into vehicles. (ENIR 2, issue 1).

I. Komatsu PW 130-ES-6 Excavator

1. Set the cost of developing 1 m of soil in the pit for this type Excavator (tg)

$$C = \frac{1.08 * C_{mash.smen}}{P_{sm.vir}} = \frac{1.08 * 14400}{259} = 60Tg$$

Where 1, 08 - coefficient taking into account overhead costs

Smash.smen - the cost of an excavator machine shift

Psm.vyr. - shift excavator excavation, taking into account the development of soil into the dump and vehicles.

3. Interchangeable excavator excavation, taking into account the development of soil, will be swallowed, and with loading into vehicles

$$P_{cm.vir} = \frac{V_k}{\sum P_{mash.smen}} = \frac{7518}{29} = 259M^3/smen$$

4. The total number of machine tools of the excavator during operation will be piled and loaded onto transport

$$\sum P_{mash.smen} = \frac{V_{sample} * n^1_{vr} + V_{out} + n^2_{vr}}{8.2 * 100} = \frac{3932 \cdot 2.8 + 3586 * 3.5}{820} = 28.7 = 29$$

Where H1вр = 2.8 - the rate of time of the mechanism during operation will sweep (machine-hour). (ENiR 2, issue 1).

H2вр = 3.5 - the rate of time of the mechanism when loading soil into vehicles. (ENIR 2, issue 1).

5. Determination of capital specific investment for the development of 1 m3 of soil for each given type of excavator (tg / m3)

$$Kod = \frac{1{,}07 \cdot Cer}{Псм.vir \cdot tyear} = \frac{1{,}07 \cdot 109800}{259 \cdot 300} = 1.5\ тг/м3$$

6. Determination of reduced costs for the development of 1 m3 of soil for this type of excavator

Pd=S+En·Kod=60+0, 15·1.5=60.2 Tg/м3

En - the normative coefficient of efficiency of capital investments is 0.15

II. Hitachi 450-3 Excavator

1. Find the development price of 1 m of soil in the pit for this type of excavator (tg)

$$C = \frac{1{,}08 \cdot Cmash.smen}{Псм.vir} = \frac{1{,}08 \cdot 20000}{259} = 83.3\ тг$$

1, 08 - coefficient taking into account overhead costs

Smash.smen - the cost of an excavator machine shift

2. Interchangeable excavator excavation, taking into account the development of soil, will be swallowed, and with loading into vehicles

$$P_{cm.vir} = \frac{V_k}{\sum P_{mash.smen}} = \frac{7518}{29} = 259 M^3/smen$$

3. The total number of machine tools of the excavator during operation will be piled and loaded onto transport

$$\sum P_{mash.smen} = \frac{V_{sample} * n^1{}_{vr} + V_{out} + n^2{}_{vr}}{8.2 * 100} = \frac{3932 \cdot 2.8 + 3586 * 3.5}{820} = 28.7 = 29$$

Where H1вр = 2.8 - the rate of time of the mechanism during operation will sweep (machine-hour). (ENiR 2, issue 1).

H2вр = 3.5 - the rate of time of the mechanism when loading soil into vehicles. (ENI R 2, issue 1).

7. Determination of capital specific investment for the development of 1 m3 of soil for each given type of excavator (tg / m3)

$$Kod = \frac{1{,}07 \cdot Cer}{Псм.vir \cdot tyear} = \frac{1{,}07 \cdot 109800}{259 \cdot 300} = 1.5\ тг/м3$$

5. Determination of reduced costs for the development of 1 m3 of soil for this type of excavator

Pd=C+En·Kod=83.3+0, 15·1.5=83.3 Tg/м3

Where En - the normative coefficient of efficiency of capital investments is 0.15

As a result of comparing two excavators, the Komatsu PW 130-ES-6 excavator

has a low reduced cost compared to the Hitachi 450-3, so we choose the Komatsu PW 130-ES-6 excavator

3.4 Selection of special equipment

Determining the number of dump trucks

The export and transportation of the pound being developed by excavators will be performed by dump trucks. Depending on the transportation distance (3.0 km), we select a truck capacity of 10 tons, at Vk = 0.5 m. For a 10-ton truck capacity, we select a HOWO ZZ3161M4011 dump truck. Find the required number of HOWO ZZ3161M4011 dump trucks:

Find the volume of soil in a dense body in the bucket of an excavator:

$$Kod = \frac{Vков.* Кнап.}{Кпр + 1} = \frac{1.14 * 0,8}{1 + 0,26} = 0,72м3$$

Where Knap - bucket filling ratio (for an excavator with a backhoe) equal to 0.8);

KPR is the coefficient of initial loosening of the soil.

Find the mass of soil in the bucket of the excavator:

$$Q=Vgr*ɣ=0,72*1,9=1.3т$$

Where V - Bulk soil mass, t / m3.

Determine the number of soil buckets loaded into the dump truck body:

$$n = \frac{P}{Q} = \frac{10}{1.3} = 8$$

where P - Truck capacity, t.

Find the volume of soil in a dense body loaded into the body of a dump truck:

$$V=Vgr*n=0,72*8=5,76м3$$

Find the duration of one cycle of the truck:

$$Т_ц = t_n + \frac{60*L}{V} + t_р + t_m + \frac{60*L}{V} = 20.7 + \frac{60*4}{20} + 0,8 + 1,12 + \frac{60*4}{40} = 40.6min$$

Where tп - soil loading time, minutes;

$$Тр = \frac{V * Нвр * 60}{100} = \frac{5,76 * 6 * 60}{100} = 0,72м3$$

Where Нвр - the norm of machine time according to ENiR-2-1-11 for loading an excavator with 100 m3 of soil into vehicles;

L = 4 - distance of soil transportation, km;

Vg - average speed of a dump truck in a loaded state, km / h

Vп - the average speed of the dump truck in the empty state (35-45 km / h);

tP - unloading time, minutes = 0.8 min;

Tm is the time of auxiliary operations.

Determine the required number of dump trucks:

$$N = \frac{Tc}{Tn} = \frac{40.6}{20.7} = 1.9 = 2$$

3.5 Selection of soil compacting machines

Fake soil compaction is developed to increase stability, reduce rainfall, and increase the water tightness of an earth structure. We select the sealing method by rolling and for the length of the sealing strip more than 30 meters we select the roller with the RT56-SC remote control system.

Table 5 - Specifications for RT56-SC

Mark of car	RT56-SC
Characteristic	Remotely controlled
Mass, TN	1,391
Overall dimensions (DxSxV), mm	1855x560x1230
The thickness of the sealing layer, mm	300-400
The maximum condensed area, m2 / hour	668
Max speed, m / min	40

The choice of methods for transportation, supply, laying and compaction of concrete

Modern construction cannot be imagined without special equipment and machines, which should provide construction sites with the necessary materials, solutions, mixtures. One of them is a special technique - a concrete pump, which serves to supply freshly prepared concrete mortar. A concrete pump is a concrete pump mounted on a car chassis and is intended for supplying concrete mix to the place of its placement along the concrete conduit in both vertical and horizontal directions. Concrete pumps provide high-quality concrete laying, increase labor productivity and reduce construction time. In the modern market of concrete equipment, concrete pumps with distribution booms of 21, 24, 28, 37, 39, 42, 47 meters and above, which can rotate 360 degrees around the vertical axis, are now presented.

For the supply and laying of concrete in the construction, the automobile concrete pump 58152A is used.

Choice of mounting crane.

The choice of the type of crane to find a solution based on the size and configuration of the building to be lifted, the dimensions of the construction site, the sizes and weights of the structures to be mounted, layouts and their installation methods.

Required tower crane hook height

$$H_{mr}^{kr} = h_0 + h_a + h_z + h_s = 2206 + 0.4 + 0.5 + 2.025 = 25.525M$$

Where H_{mr}^{kr} - the distance from the parking level of the crane to the bottom of the hook with a minimum tight pulley block;

H0 - excess of the support of the mounted element over the parking level mounting crane;

Ha is the height of the element in the mounting position;

hz - the height margin required by the installation conditions for the factory structures to the place of installation or transfer through previously mounted construction (0.5m);

hs - Sling height in working position from the top of the mounted element to the crane hook.

Required boom reach

$$H_{cmp}^{mp} = 65M$$

We select the stationary tower crane Liebherr 245 EC-H12. This
The choice is due to the limited area of the construction site.
Liebherr 245 EC-H12 tower crane for mechanization
Construction works during the construction of residential, civil and
Industrial buildings and structures of increased number of storeys.
Economic indicators.
Prime cost mash-cm - 28.86tn
Crane operating time in a year - 3075 hours
Estimated inventory value - 42300tn
Cost of installation 1000 kg of structure

$$c_e = \frac{1.08\sum S_{mash-cm} + 1.51.08\sum Z_{sr}}{P_{N.cm}} = \frac{6\,,2295\,,186\,,2808\,,1}{86\,.8} = 4\,.42\ \text{тN/T}$$

Where 1, 08 and 1, 5-co-factors of overhead costs according to the operation of the machines and the wages of installers.

$\sum S_{mash-cm}$ - The cost of a crane machine for a given flow, TN.

$\sum Z_{sr}$ - The average wage of shift workers engaged in installation constructions

$P_{N.cm}$ - Regulatory shift operation of crane performance on installation of structures of this flow, t / cm

$$P_{N.cm} = \frac{P}{n_{mash.cm}} = \frac{14909}{78.26} = 190.5\ \text{T/cm}$$

Where P is the total mass of elements in the flow in question, t

$n_{mash.cm}$ - The number of crane machine-changes for mounting structures of this flow, mash shifts.

Specific capital investment.

$$k_{od} = \frac{C_{er} * t_{sm}}{P_{n.sm} * t_{year}} = \frac{42300 * 8.2}{190.5 * 3075} = 0.6\ \text{Tn/t}$$

$where\ C_{er}$ - Inventory-estimated cost of the crane, t

t_{sm} - The number of hours of operation of the crane per shift, tcm= 8.2h

t_{year} - The standard number of operating hours of the crane per year, h

Unit Rates

$$C_{etc.od} = C_e + E_n * K_{od} = 42.4$$

Where Ce- Cost of installation of 1 ton of structure (t / t)

En- Standard coefficient of economic efficiency of capital investments, En = 0.12

Kod- Specific capital investments, (tn / t)

Determination of the danger zone of the crane.

$$R_{0.z} = R_{max} + 0.5I_{max} + I_{wo}$$

Where Rmax is the boom reach;

lmax - maximum length of the mounted element;

lwo =0.4·Hzd;

Ro.z=65+0, 5·6, 0+0, 4·22, 6=27, 7 м;

The area of impact of the crane is equal to the maximum outreach of the crane: Rmax = 65m

3.6 The aboveground part. Scoping

Formwork:

Large-panel formwork:

Floor slabs:

S=L*B= 552*4+468*3+676*1+270*3+582*7+419*2+386*2=10782 м**2**

Small panel formwork:

Doorways:

S=0.49∗2.2∗2∗150=323.4м**2**

Window openings:

S=0.49∗1.3∗2∗175=222.95 м**2**

TOTAL: 546.35 m**2**

Support device, racks:

n=10*S/4=552/4*4+468/4*3+676/4*1+270/4*3+582/4*7+419/4*2+386/4*2=269

4 pc (Number of racks)

L=552/4*3.3*4+468/4*3.3*3+676/4*3.3*1+270/4*3.3*3+582/4*7*3.3+419/4*3.

3*2+386/4*3.3*2=8892.9 м

Beams device:

29*60+20*69+ (4*30+10*12) *3*5+6*18*2*9+ (4*30+10*12)*4=10084 pc

L=9264*3=28921 м.

TOTAL: 37813 m, 12778 pc

Reinforcing work.

Installation of reinforcing meshes of the framework of floors and coatings.

Size 1 grid 6 m2. Plates are reinforced above and below.

n=552/6*2*4+468/6*2*3+676/6*2*1+270/6*2*3+582/6*2*7+419/6*2*2+386/ 6*2*2=4210 pc.

Installation of reinforcing bars.

$$p = \frac{m}{v} \rightarrow \text{m} = \text{p} * \text{V}$$

m=2.4*(552*4+468*3+676+270*3+582*7+419*2+386*2)*0, 22=6100 т.

(Mass of concrete)

марм. =244 т.

First, we determine the mass of concrete, 3-5% is reinforcing bars.

Concrete works.

Laying concrete mix in coatings and floors:

V = (552*4+468*3+676+270*3+582*7+419*2+386*2)*0, 22=2366м3

Formwork:

Formwork dismantling:

Large-panel formwork 10782 m2

Small-panel formwork 546.35 m**2**

TOTAL: 11328 m**2**

Dismantling racks and beams:

L = 37813m

The definition of complexity and costing labor

Kner = Nmax / nav <1.5, Kner = 36 / 25.21 = 1.42 <1.5 - the condition is satisfied; nmax = 36 people

Table 6 - Technical and economic indicators (TEP of the project)

Indicators	Units rev.	Qty
Duration	Days	430
Total labor input	Chel-dn / Mash-cm	10844

3.7 Safety and environmental protection

Things for the installation of floor slabs are implemented in compliance with the requirements of the joint venture of the Republic of Kazakhstan. "Labor protection and safety in construction".

It is not allowed to perform installation work at a height in open places at a wind speed of 16m / s or more, with sleet, thunder and fog, which excludes visibility within the boundaries of the work front. Accepting from the second floor must put portable

inventory fencing on the outline of the building and the opening.

When moving the slab, the installers must be located outside the line of the found slab on the opposite supply side. Plates must be placed without jerks, prohibiting strikes on other structures.

Installers must not walk along the ends of wall panels.

The installers receive the main mounted floor slab from the stairs. The preceding slabs are mounted from the inserted floor slabs.

An electrician welder performing work on welding units for fixing reinforced concrete structures is required to master the certification in accordance with the "Welder Certification Rules" approved by the State Technical Supervision of the Republic of Kazakhstan and have an electric welder certificate.

It is forbidden to place inflammable materials in a radius of 11 m from the place of electric welding.

It is forbidden to generate electric welding work in unprotected points during rain, thunderstorms or heavy snowfall, as well as at heights with a wind speed of 16 m / s or more.

Welders' workstations must be isolated from adjacent workstations and passages by fireproof screens (screens, shields) with a height of at least 1.7 m.

It is forbidden to combine welding work and laying a heat-insulating liner at one working point.

Boxes with the solution should be determined only at the points of contact of the floor slabs to each other, i.e. over the panels of the inner walls.

When organizing works on the installation of structures, it is necessary to strictly monitor the implementation of complete labor protection measures, since these works, consisting in the movement of difficult and large-sized elements in space and associated with the dense location of the installers at high heights, can lead to severe safety failure industrial injuries. The installation work project provides for the unification of workplaces, methods and procedures for performing technological operations that ensure the safety of workers.

When completing the brigade, it should be borne in mind that workers who are at least 18 years old, possessing the qualification of an installer of at least the second category, experience in climbing the at least a year and undergoing medical examination are allowed to conduct independent installation works at a height of more than 4 m.

Installers who do not have the experience of climbing work shown are allowed to work at heights during the year only under the subordination of workers of larger ranks set by order of the head of the construction organization.

When combining work in multi-storey buildings, it is forbidden to allow people to be on the floors (tiers) over which installation is being carried out. For lifting and lowering, labor during the construction of buildings and structures with a height of more than 25 m, it is necessary to use lifts and or elevators. Stairs (brackets) for lifting workers to a height of more than 5 m are equipped with devices for fastening the safety

belt or metal arcs with vertical ties. The rise of labor on hinged stairs to a height of more than 10 m is skipped, provided that the rest areas are provided 10 m in height.

Placing the crane supply, assign a danger zone during the operation of the crane. Its dimensions are equal to the outreach of the crane jib plus 8 m with a hook lifting height of up to 25 m and plus 10 m with a hook lifting height within 25-105 m. The limits of a serious zone are marked with warning signs or enclosed. When designing a schedule, installation of works must take into account probable weather situations, since installation works are carried out with a wind strength of up to 6 points (installation of panels without openings - with a wind strength of up to 4 points) and interrupted during ice, thunderstorms and heavy snow and rain.

6. Economic part

Estimated cost of a construction project is the sum of all cash costs necessary for the construction of a project.

The estimated construction price is the basis for determining the amount of investment funds for construction, the formation of costs for construction products, serves as a guide for the procurement of contracting construction services by the customer and the conclusion of a contract agreement.

The estimated price for the construction of buildings and structures of the main and auxiliary directions is determined on the basis of aggregated estimated standards in 2001 prices, taking into account the correction factor (K1) in accordance with the construction area defined by the design assignment.

The estimated price is the basis for the size distribution of solid investments, financing the construction process.

In my thesis, the following types of budget documentation are shown:

- Local estimate - the primary document in the estimate, which is compiled on the basis of the volumes and costs of the projected building. The local estimate of the diploma project is given in the appendix.

-Vendome of volumes of labor

- A summary of the volume of construction and the cost of work, reflecting the cash costs for the sections of the estimated calculation. Given below.

- Resource estimates. Attached

Estimation was carried out using the program complex ABC-4

For the implementation of the investment project, it is proposed to use borrowed funds. But at the same time, according to the legislation of the Republic of Kazakhstan, 15% of the total amount of investments must be financed from personal funds.

CONCLUSION

As a result of the work done, a graduation project was implemented on the theme “Specialized boarding school for 1200 places in the city of Turkistan”

The architectural and construction share of the project reflected volumetric planning and constructive solutions, performed a heat engineering calculation of the exterior structures and building coatings.

The calculation part was the calculation of a monolithic reinforced concrete column and crossbar. The calculations were carried out both in the Etabs software package and in the manual calculation. The design of these elements was carried out selection according to the results of calculations of the reinforcement, and how much reinforcement is necessary for the structural strength

In the section of technology and organization of construction production, such works were performed as the calculation of the underground part of the building - earthworks and concrete, reinforcing, economically advantageous machine mechanisms were selected, labor costing was compiled, based on this a schedule was developed. The technological map is developed.

The section on safety and environmental considerations discusses the conditions and rules for conducting construction work, as well as ways to reduce the negative impact of work on the environment.

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Application A

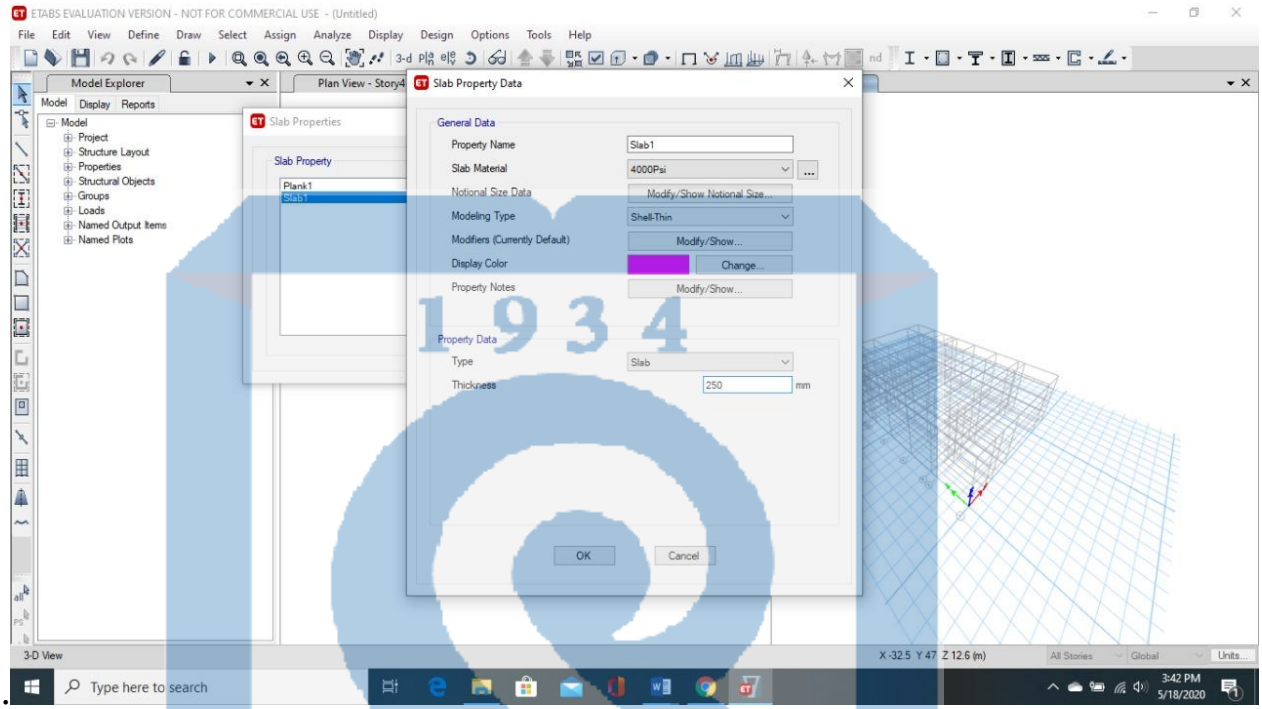


Figure A.1 - Slab property

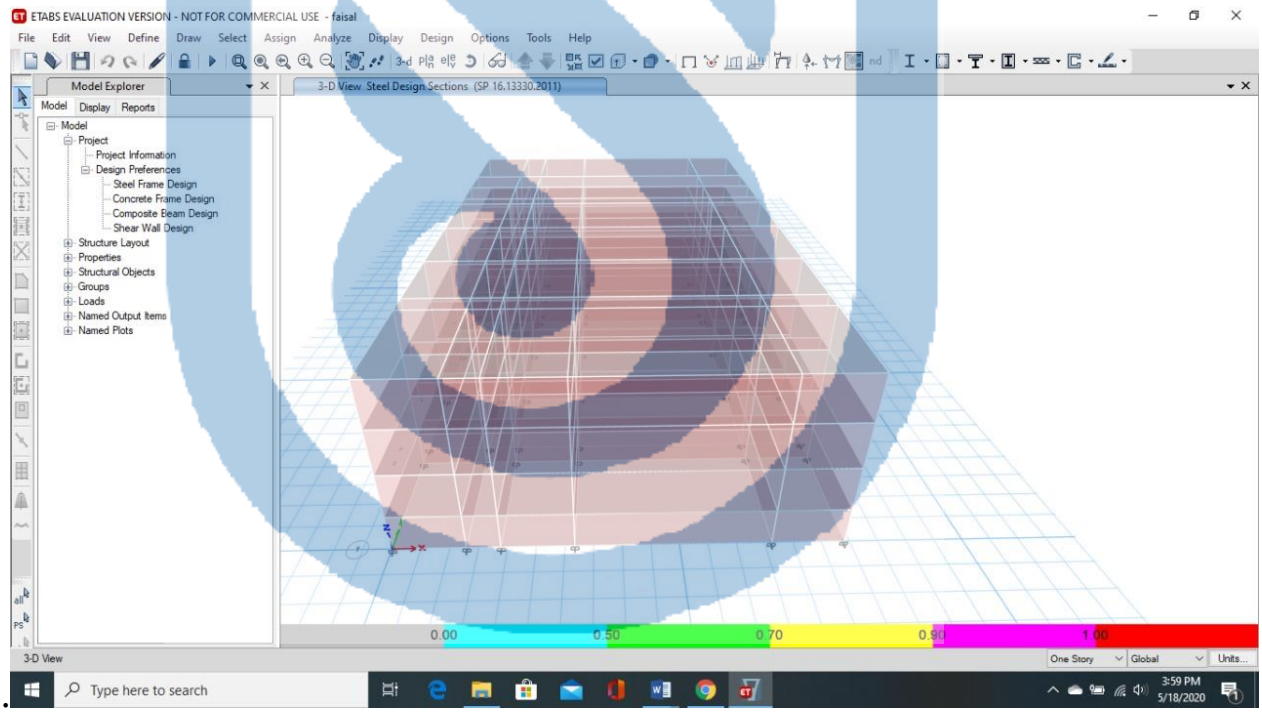


Figure A.2 - 3-D view steel design sections

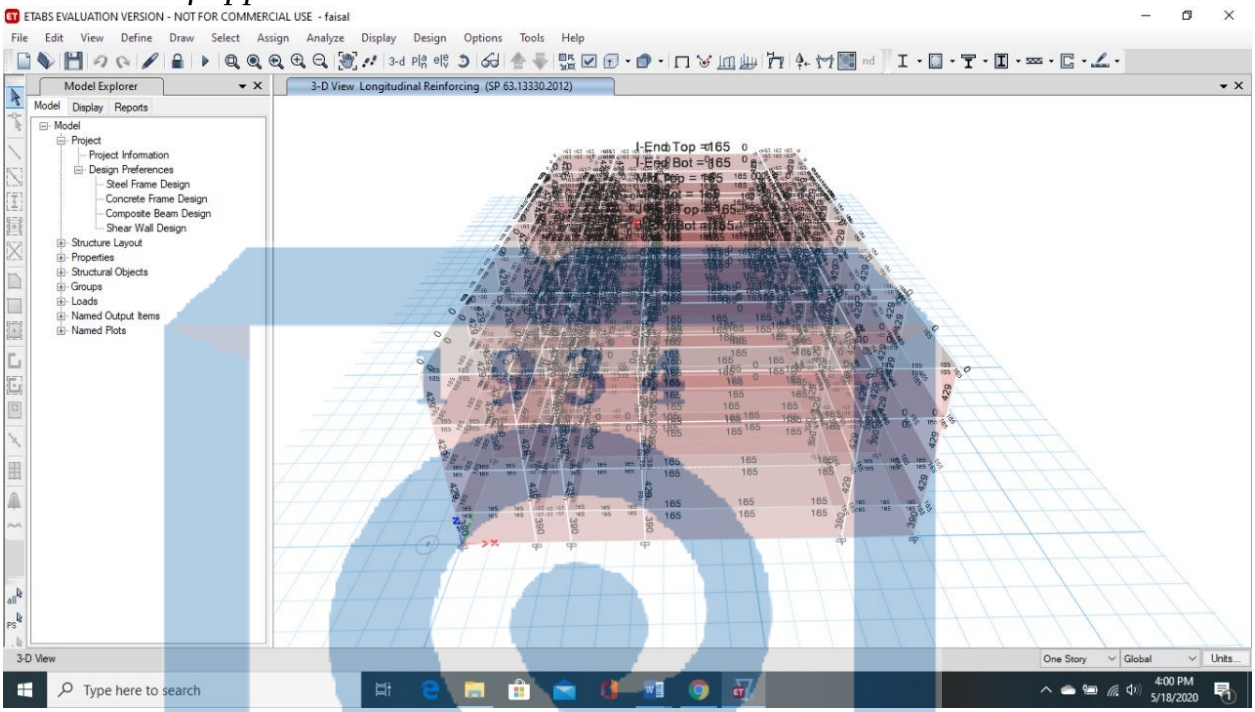


Figure A.3 - 3-D view longitudinal reinforcing.

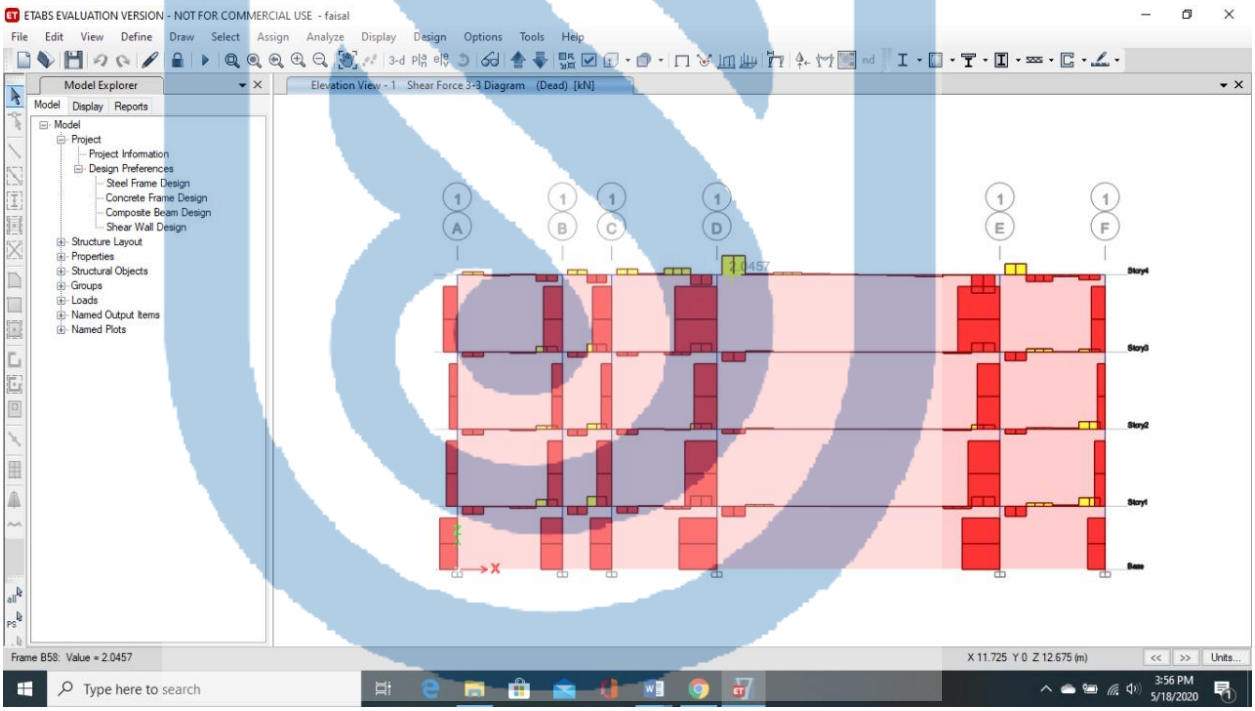


Figure A.4 - Elevation view.

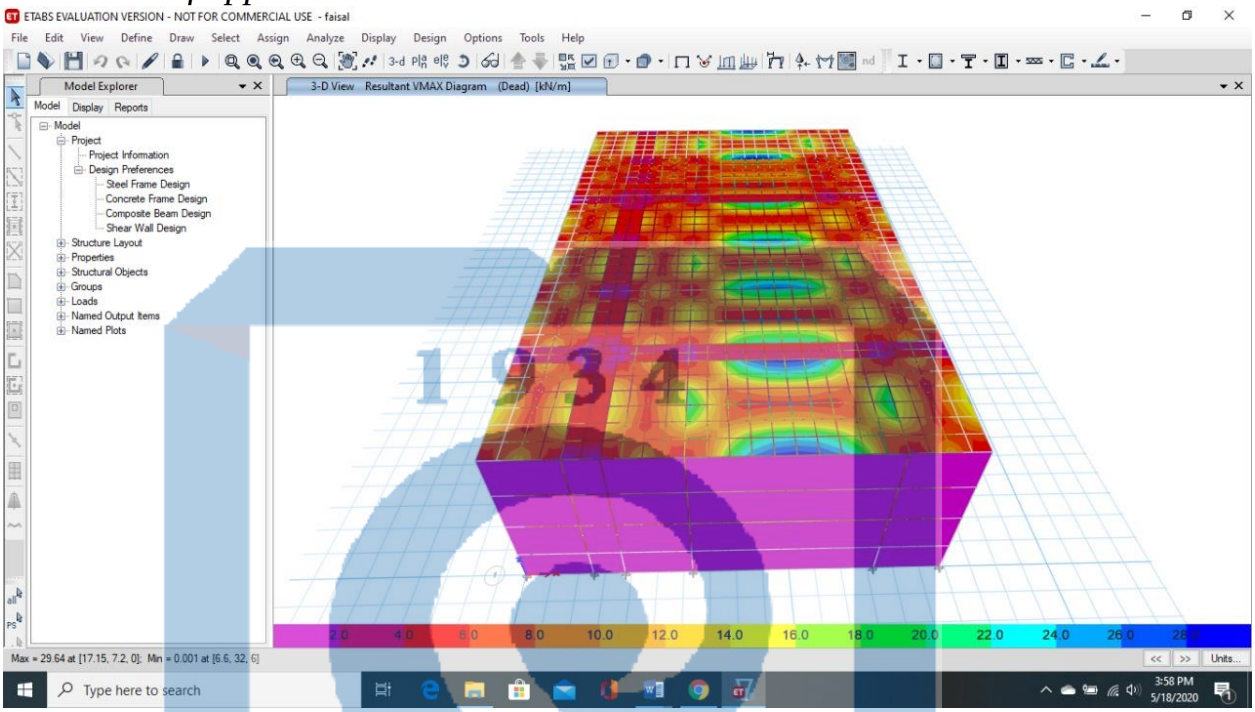


Figure A.5 - 3-D view Resultant VMAX diagram.

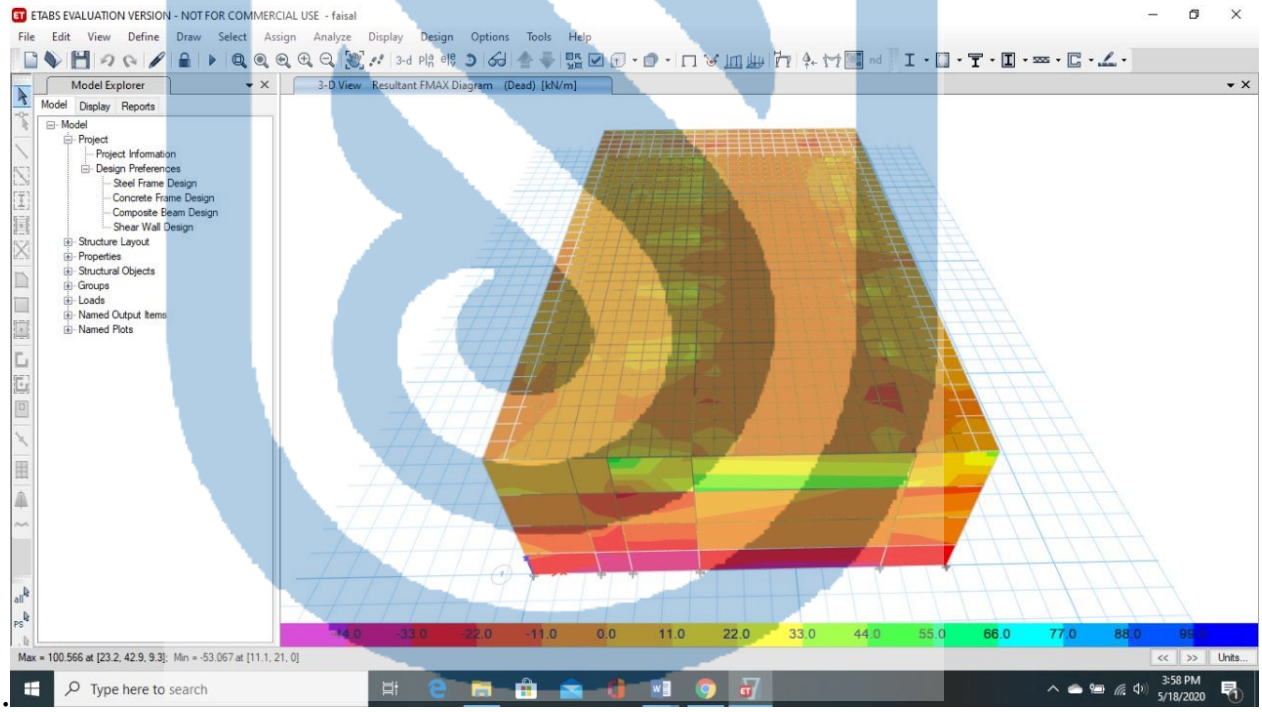


Figure A.6 - 3-D view Resultant FMAX diagram

Application B

Estimation

LOCAL ESTIMATION No. 1-1-1

(Local cost estimate)

Estimated Cost

Estimated Salary 544565712

Normative Labor Input 5500 ind.d

No. p / p	Norm code, resource code	Name of work and costs	unit of measurement	amount		Unit cost, tenge		Total cost, tenge			Overhead, tenge	Total cost with NR and SP, tenge
				per unit of measure	on the project	Total salary of construction workers	machine operation including salary drivers	Total salary of construction workers	machine operation including salary drivers	materials equipment, furniture, inventory	Estimated profit, tenge	
1	2	3	4	5		6	7	8	9	10	11	12
Excavation												
1	E11-010102-0302	Soils of 2 groups. Development with loading onto dump trucks with excavators with a bucket with a capacity of 1 m3	m3 of soil	2610		174.88	166.85	456434	435465	259	130407	633788
						7.94	61.46	20710	160411		46947	

2	E11-010102-0303	Soils 3 groups. Development with loading onto dump trucks with excavators with a bucket with a capacity of 1 m3	m3 of soil	1200	218.00	207.99	261598	249582	148	74739	363245
					9.89	76.61	11868	91937		26907	
3	E11-010102-0304	Soils 4 groups. Development with loading onto dump trucks with excavators with a bucket with a capacity of 1 m3	m3 of soil	719.3	286.77	273.63	206273	196819	107	58931	286420
					13.00	100.79	9347	72501		21216	
4	E11-010205-	Soils 4 groups. Manual		80.7					-		

	0704	development (revision) in trenches and pits with a depth of more than 3 m with a crane lifting if there are fastenings	m3 of soil		8475.46	2492.00	683970	201104		460123	1235620
					5983.46	1935.50	482865	156195		91527	
5	E11-010107-1804	The bottom and slopes of the recesses of the channels. Manual layout. Soil group 4	m2 planned oh surface	1675	318.53	-	533534	-	-	384145	991094

1	2	3	4	5	6	7	8	9	10	eleven	12
					318.53	-	533534	-		73414	
6	E11-010201-0502	Soil 3, 4 groups. Pneumatic ram seal	m3 compacted soil	151.5	182.07	82.09	27583	12437	-	15412	46435
					99.98	41.31	15146	6259		3440	
Securing the slopes of the pit with shotcrete 75 mm.											
7	E11-060301-0406 inch .	Installation of steel structures remaining in the concrete body	1t	3.6748	572263.22	21234.54	2102953	78033	1762705	267414	2559996
					71354.95	8611.69	262215	31646		189629	

8	S121-050301-3202	Hot-rolled reinforcing steel of a periodic profile of class A-III (A400) with a diameter of 14 to 32 mm ST RK 2591-2014	t	3.6748	192229.00	-	706403	-	706403	-	762915
					-	-	-	-		56512	
9	E11-290159-0102 including Sat. 29p.1.1	Shotcrete of a reinforced surface with a coating thickness of 30 mm	m2	675	4562.86	1336.09	3079932	901861	15371	2897745	6455891
					3204.00	698.69	2162700	471614		478214	
10	E11-290159-0103 Including Sat.29p.1.1 K = 4,5	Surface. Shotcrete. add, for every 10 mm, changes in the thickness of the shotcrete layer of a concrete or reinforced surface to the standards 1129-0159-0101, 1129-0159-0102	m2 surface	675	1354.48	880.05	914274	594033	210	799660	1851049
					474.12	602.86	320031	406933		137115	

11	S121-050308-0225	Single woven steel nets of galvanized wire, 2 mm in diameter, mesh side size 50 mm GOST 5336-80	m2	625	503.00	-	314375	-	314375	-	339525
					-	-	-	-		25150	
12	S121-020101-0601	Heavy concrete / GOST 7473-94 / class B15 / M-200 /	m3	50.6	12880.00	-	651728	-	651728	-	703866
					-	-	-	-		52138	
13	The commercial offer of NEOSTRIM LLP, ref. No. 61 dated 10/20/17.	MasterReobuild 1000K-Pla concrete mortar	l	354.2	449.82	-	159327	-	159327	-	172073
					-	-	-	-		12746	
14	The commercial offer of NEOSTRIM LLP, ref. No. 61 dated	MasterReock SA 167 - High-performance alkaline-free setting accelerator for fast application of				-		-		-	

	10/20/17.	durable spray-concrete	kg	1700.2	882.14		1499819		1499819		1619805
					-	-	-	-		119986	
Installation and dismantling of the pit fence (L-1500p.m.)											
15	E11-010205-0303	Development of soil manually under a concrete side (h-0,2m, b-0.2 m.), In soil of 3group	m3	6	2648.64	-	15892	-	-	11442	29521

1	2	3	4	5	6	7	8	9	10	eleven	12
					2648.64	-	15892	-		2187	
16	E11-010205-0502	Trenches, sinuses of foundation ditches and pits. Filling by hand. Soil group 2	m3 of soil		858.28	-	858	-	-	618	
				1	858.28	-	858	-		118	1594
17	E11-010205-1303	Manual loading of unconsolidated		6		-	4243	-	-	3055	7882

		soil from piles and dumps into vehicles, soil group 3	m3		707.16						
					707.16	-	4243	-		584	
18	S341-020102-1016	Transportation of construction materials by dump trucks outside quarries. Payload 15 t. Cargo class 1. Transportation distance 16 km	t		386.00	-	5095	-		-	
				13.2	-	-	-	-		408	5503
19	E11-010102-0602	Work on a dump 2-3 groups of soil	m3	6	19.67	16.50	118	99	1	43	174
					3.07	6.92	eighteen	42		thirteen	
20	E11-060101-0120	The device of reinforced concrete strip foundations with a width e on top of up to 1000 mm - a concrete	m3		21009.37	1964.65	252112	23576	177949	50535	326859
				12	4215.60	412.14	50587	4946		24212	

		side (h-0.5m, b-0.2m.)										
21	S121-050301-3001	Hot-rolled smooth reinforcing steel, class AI (A240), diameter from 6 to 12 mm, ST RK 2591-2014	t	0.032032	198308.00	-	6352	-	6352	-	6860
					-	-	-	-		508	
22	E11-090305-0401	Installation of fences	t	0.79508	110830.52	1495.78	88119	1189	6395	55831	155466
					101291.50	477.74	80535	380		11516	
23	S121-060801-0102	Separate structural elements of buildings and structures with a predominance of hot-rolled profiles, weight from 0.1 to 0.5 t	t	0.79508	415475.00	-	330336	-	330336	-	356763
					-	-	-	-		26427	
24	E11-460401-0102	Foundations are concrete. Disassembly	m3	12	17269.81	7585.64	207238	91028	-	135462	370115
					9684.17	3754.48	116210	45054		27416	

25	S341-310104-0501	Construction garbage. Loading	t	thirty	77.00	-	2310	-		-	2495
					-	-	-	-		185	
26	S341-020102-1027	Transportation of construction materials by dump trucks outside quarries. Payload 15 t. Cargo class 1. Transportation distance 27 km	t	thirty	586.00	-	17580	-		-	18986
					-	-	-	-		1406	
27	E11-010102-0302	Soils of 2 groups. Development with loading on cars - dump trucks with excavators with a bucket with a capacity of 1 m3, / low compressible soil /	m3 of soil	7.9	174.88	166.85	1382	1318	1	395	1918
					7.94	61.46	63	486		142	

1	2	3	4	5	6	7	8	9	10	eleven	12

28	S341-020102-1016	Transportation of construction materials by dump trucks outside quarries. Payload 15 t. Cargo class 1. Transportation distance 16 km	t	01/15	386.00	-	5794	-		-	6257
					-	-	-	-		464	
29	E11-010205-0502	Trenches, sinuses of foundation ditches and pits. Filling by hand. Soil group 2	m3 of soil	7.9	858.28	-	6780	-	-	4882	12595
					858.28	-	6780	-		933	
		Excavation pit excavation									
30	E11-010102-0304	Soils 4 groups. Development with loading onto dump trucks with excavators with a bucket with a capacity of 1 m3	m3 of soil	33.5	286.77	273.63	9607	9166	6	2745	13339
					13.00	100.79	435	3377		988	
31	E11-010205-0704	Soils 4 groups. Manual development (revision) in trenches and pits with a depth of more than 3 m with a crane lifting if there are fastenings	m3 of soil	3.1	8475.46	2492.00	26274	7725	-	17675	47465
					5983.46	1935.50	18549	600		3516	

								0			
32	E11-010107-1804	The bottom and slopes of the recesses of the channels. Manual layout. Soil group 4	m2 planned oh surface		318.53	-	17583	-	-	12660	32662
				55.2	318.53	-	17583	-		2419	
33	E11-010201-0502	Soil 3, 4 groups. Pneumatic ram seal	m3 compacted soil		182.07	82.09	503	227	-	281	
				2.76	99.98	41.31	276	114		63	
34	S341-020102-1016	Transportation of construction materials by dump trucks outside quarries. Payload 15 t. Cargo class 1. Transportation distance 16 km	t	01/15	386.00	-	5794	-		-	
					-	-	-	-		464	
35	E11-010102-0303	Soils of 2 groups. Development with loading onto dump trucks with excavators with a bucket with a capacity of 1 m3, / low compressible soil /	m3 of soil	1760	218.00	207.99	383677	366054	217	109618	532759
					9.89	76.61	17406	134840		39464	

36	S341-020102-1016	Transportation of construction materials by dump trucks outside quarries. Carrying capacity 15 t. Cargo class 1. Transportation distance 16 km	t	3344	386.00	-	1290784	-		-	1394047
					-	-	-	-		103263	
37	E11-010201-0502	Soil 3, 4 groups. Pneumatic ram seal	m 3 compacted soil	176	182.07	82.09	32044	14449	-	17904	53944
					99.98	41.31	17596	7271		3996	
38	E11-010201-0304	Priming. Compaction of self-propelled vibratory rollers 2.2 tons. First pass on one track with a layer thickness of 40 cm	m3 compacted soil	1584	42.49	42.49	67304	67304	-	20327	94641
					-	17.82	-	28232		7010	
1	2	3	4	5	6	7	8	9	10	eleven	12
39	E11-010201-0310 K = 6	Priming. Compaction of self-propelled vibration rollers 2.2 tons. For each subsequent pass along one track with a layer thickness of 40 cm	m3 compacted soil	1584	26.67	26.67	42245	42245	-	12665	59303
					-	11.10	-	17590		4393	
40	E11-010201-0601	The soil of embankments is compacted. Watering	m3 compacted soil	1760	81.37	68.92	143216	121295	5280	32419	189686
					9.4	16.13	16641	28386		14051	

					6						
41	E11-260101-1101	The surfaces are flat and curved. Insulation with mineral wool stitching mats and without fiberglass or metal mesh lining, mineral wool slabs on a synthetic binder grade M-125, semi-rigid slabs of glass staple fiber on a synthetic binder	m3 insulation		20017.46	1382.78	600524	41483	489	439872	1123627
				thirty	18618.40	674.22	558552	20227		83232	
42	S121-110401-0102	Foam polystyrene boards with flame retardant PSB-S-25 GOST 15588-86	m3		13371.00	-	401130	-	401130	-	433220
				thirty	-	-	-	-		32090	
TOTAL BASED ON: INCLUDING:			Tenge								544565712
- Salary of construction workers			Tenge				4740642				
- operating costs of wave n			Tenge					3456493			
- including salary machines comrade			Tenge					169443			

						8			
- Materials, products and designs	Tenge						6038608		
- Transportation of goods	Tenge				1327357				
- Overhead	Tenge							6017005	
- Estimated profit	Tenge							1726409	

Compiled by Mohammad Faisal

LOCAL ESTIMATION No. 1-1-2

(Local cost estimate)

Base:

Estimated Cost	761657880657
Estimated Salary	
Normative Labor Input	3430 ind.d

No. p / p	Code number resource code	Name of work and costs	Unit I am	amount		Unit cost, tenge		Total cost, tenge			Overhead, tenge	Total cost with NR and SP, tenge
				on the unit	on the project	Total the salary construct on workers	machine opera on including salary of drivers	Total the salary construct on workers	machine opera on including salary of drivers	materials equipment , furniture, inventory	Es mated profit, tenge	
1	2	3	4	5		6	7	8	9	10	eleven	12

1	E11-060101-0101	Concrete prepare on, B7.5, F100, W4, sulfate resistant. Device			17004.25	1087.29	820455	52462	707676	65412	956737
			m3	48.25	1250.10	239.68	60317	11564		70869	
2	E11-060101-0115	Reinforced concrete found on slabs flat, B25, F200, W4, sulfate-resistant. Device			20364.30	1667.29	7707888	631070	6327486	814850	9204557
			m3	378.5	1979.74	386.02	749332	146108		681819	
3	S121-050301-3601	Welded reinforcing steel bar of a periodic profile for reinforced concrete structures of class A500C with a diameter of 4 to 10 mm GOST R 52544-2006			198058.00	-	753	-	753	-	813
			t	0.0038	-	-	-	-		60	
4	S121-050301-3602	Welded reinforcing steel bar of a periodic profile for reinforced concrete structures of class A500C with a diameter of 12 to 40 mm	t	46.29	191925.00	-	8885955	-	8885955	-	9596831

		GOST R 52544-2006			-	-	-	-		710876	
5	E11 -060301-0408	Embedded parts weighing up to 20 kg / Zd1 /. install on	t	0.0176	235190.03	1266.03	4139	22	2877	1138	5699
					70470.00	560.82	1240	10		422	
	E11-080201-0703	Pit la cess metal (P1). install on	t ducts metal pro	0.0314	528410.75	8983.29	16592	282	14755	1543	
					49533.30	3291.78	1555	103		1451	19585
7	S121-050301-3001	Hot-rolled smooth reinforcing steel, class AI (A240), diameter from 6 to 12 mm, ST RK 25912014	t	0.041	198308.00	-	8293	-	8293	-	
					-	-	-	-		663	
				82							8957
8	S121-050301-3602	Welded reinforcing steel bar of a periodic profile for reinforced concrete structures of class A500C with a diameter of 12 to 40 mm GOST R 52544-2006	t	8.384	191925.00	-	1609187	-	1609187	-	
					-	-	-	-		128735	
				46							1737922

9	E11-060301-0407	Embedded parts weighing up to 4 kg / Ш1 /. install on	t	0.371	84	405290.03	1266.03	150703	471	60778	81592	250879
						240570.00	560.82	89454	209		18584	
10	E11-060501-0201	Columns of civil buildings in metal formwork, / heavy concrete class B30 /. Device				61634.81	27709.12	1959987	881150	598579	615461	
			m3	31.8		15102.45	6165.83	480258	196073		206036	2781484
11	S121-0503013001	Hot-rolled smooth reinforcing steel, class AI (A240), diameter from 6 to 12 mm, ST RK 2591-2014	t	1.47196		198308.00	-	291901	-	291901	-	315254
						-	-	-	-		23352	
12	S121-0503013601	Welded reinforcing steel bar of a periodic profile for reinforced concrete structures of class A500C with a	t	0.4388		198058.00	-	86908	-	86908	-	93860
						-	-	-	-		6953	

		diameter of 4 to 10 mm GOST R 52544-2006										
13	S121-0503013602	Welded reinforcing steel bar of a periodic profile for reinforced concrete structures of class A500C with a diameter of 12 to 40 mm GOST R 52544-2006	t	6.01988	191925.00	-	1155365	-	1155365	-	1247795
					-	-	-	-		92429	
14	E11-0603010407	Embedded parts weighing up to 4 kg / SK1 /. install on	t	0.1296	405290.03	1266.03	52526	164	21184	28438	87441
					240570.00	560.82	31178	73		6477	
15	E11-0605010201	Columns of civil buildings in metal formwork, / heavy concrete class B30 /. Device	m3	17.22	61634.81	27709.12	1061351	477151	324136	333278	1506200
					15102.45	6165.83	260064	106176		111570	

16	S121-0503013001	Hot-rolled smooth reinforcing steel, class AI (A240), diameter from 6 to 12 mm, ST RK 2591-2014	t	0.83902	198308.00	-	166384	-	166384	-	179695
					-	-	-	-		13311	
17	S121-0503013601	Hire welded reinforcing bars of a periodic profile for reinforced concrete structures of class A500C with a diameter of 4 to 10 mm GOST R 52544-2006	t	0.241	198058.00	-	47732	-	47732	-	51551

					-	-	-	-		3819	
18	S121-050301-3602	Welded reinforcing steel bar of a periodic profile for reinforced concrete structures of class A500C with a diameter of 12 to 40 mm GOST R 52544-2006	t	3.57176	191925.00	-	685510	-	685510	-	740351
					-	-	-	-		54841	
19	E11-060301-	Embedded parts weighing up to 4 kg / SK1 /. install on	t	0.0792	405290.03	1266.03	32099	100	12946	17379	53436

	0407				240570.00	560.82	19053	44		3958	
20	E11-060501-0201	Columns of civil buildings in metal formwork, / heavy concrete class B30 /. Device	m3	51	61634.81	27709.12	3143375	1413165	959985	987061	4460871
					15102.45	6165.83	770225	314457		330435	
21	S121-050301-3001	Hot-rolled smooth reinforcing steel, class AI (A240), diameter from 6 to 12 mm, ST RK 2591-2014	t	2.112	198308.00	-	418826	-	418826	-	452333
					-	-	-	-		33506	
22	S121-050301-3601	Welded reinforcing steel bar of a periodic profile for reinforced concrete structures of class A500C with a diameter of 4 to 10 mm GOST R 52544-2006	t	0.972	198058.00	-	192512	-	192512	-	207913
					-	-	-	-		15401	
23	S121-050301-3602	Welded reinforcing steel bar of a periodic profile for reinforced concrete structures of class A500C with a diameter of 12 to 40 mm GOST R 52544-2006	t	11.5937	191925.00	-	2225121	-	2225121	-	2403131
					-	-	-	-		178010	
24	E11-060301-0407	Embedded parts weighing up to 4 kg / SK1, N1 /. install on	t	0.21744	405290.03	1266.03	88126	275	35541	47713	146706
					240570.00	560.82	52310	122		10867	
25	E11-060501-	Columns of civil buildings in metal formwork / heavy concrete class B30	m3								

	0201	/. Device		10.2	61634.81	27709.12	628675	282633	191997	197412	892174
					15102.45	6165.83	154045	62891		66087	
26	S121-050301-3001	Hot-rolled smooth reinforcing steel, class AI (A240), diameter from 6 to 12 mm, ST RK 2591-2014	t	0.6538	198308.00	-	129654	-	129654	-	140026
		SP - 8%			-	-	-	-		10372	
27	S121-050301-3601	Welded reinforcing steel bar of a periodic profile for reinforced concrete structures of class A500C with a diameter of 4 to 10 mm GOST R 52544-2006	t	0.1944	198058.00	-	38502	-	38502	-	41583
					-	-	-	-		3080	
28	S121-050301-3602	Welded reinforcing steel bar of a periodic profile for reinforced concrete structures of class A500C with a diameter of 12 to 40 mm GOST R 52544-2006	t	3.14834	191925.00	-	604245	-	604245	-	652585
					-	-	-	-		48340	
29	E11-060301-0407	Embedded parts weighing up to 4 kg / SK1, N1 /. install on	t	0.31408	405290.03	1266.03	127293	398	51337	68918	211909
					240570.00	560.82	75558	176		15697	
30	E11-060501-0201	Columns of civil buildings in metal formwork / heavy concrete class B30 /. Device	m3	0.75	61634.81	27709.12	46226	20782	14117	14516	65601

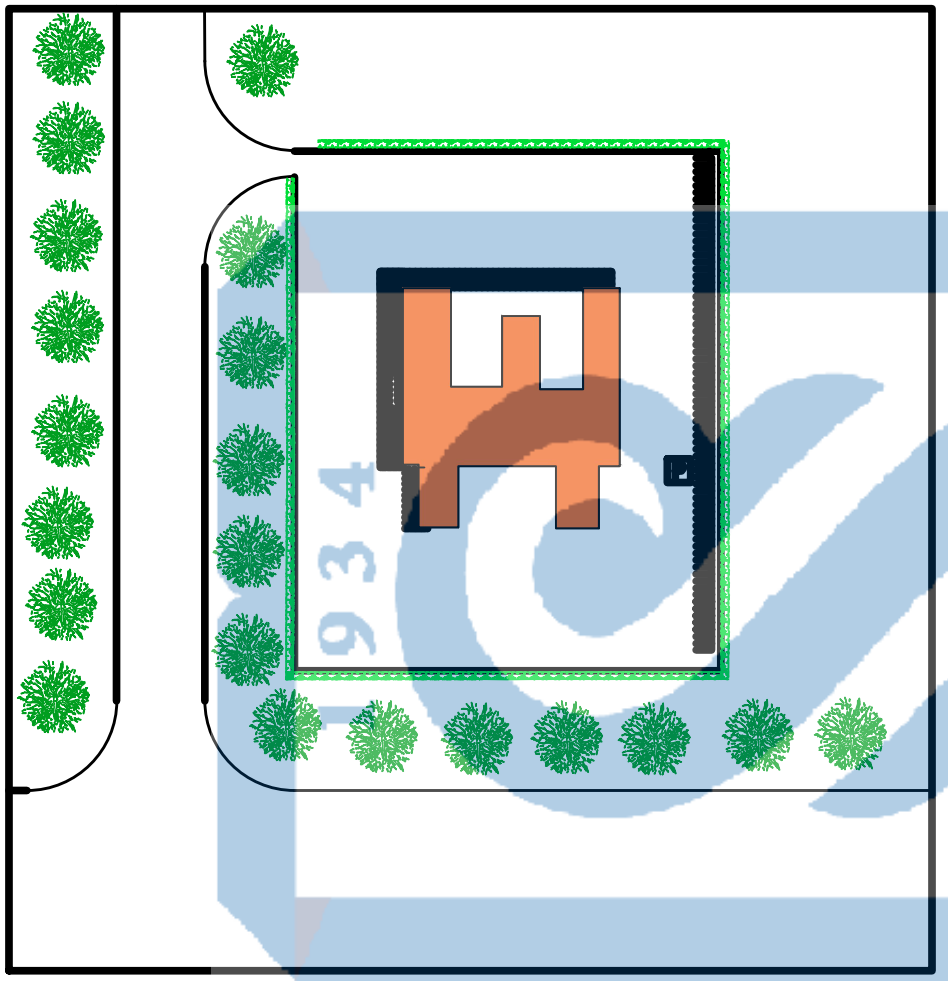
					15102.45	6165.83	11327	4624		4859	
31	S121-050301-3001	Hot-rolled smooth reinforcing steel, class AI (A240), diameter from 6 to 12 mm, ST RK 2591-2014	t	0.0265	198308.00	-	5255	-	5255	-	5676
					-	-	-	-		420	
32	S121-050301-3601	Welded reinforcing steel bar of a periodic profile for reinforced concrete structures of class A500C with a diameter of 4 to 10 mm GOST R 52544-2006	t	0.0108	198058.00	-	2139	-	2139	-	2310
					-	-	-	-		171	
33	S121-050301-3602	Welded reinforcing steel bar of a periodic profile for reinforced concrete structures of class A500C with a diameter of 12 to 40 mm GOST R 52544-2006	t	0.112	191925.00	-	21496	-	21496	-	23215
					-	-	-	-		1720	
34	E11-060301-0407	Embedded parts weighing up to 4 kg / SK1 /. install on	t	0.0036	405290.03	1266.03	1459	5	588	790	2429
					240570.00	560.82	866	2		180	
35	E11-060501-0201	Columns of civil buildings in metal formwork / heavy concrete class B30 /. Device	m3	0.62	61634.81	27709.12	38214	17180	11670	12000	54230
					15102.45	6165.83	9364	3823		4017	
36	S121-	Hot-rolled smooth reinforcing	t			-		-		-	

	050301-3001	steel, class AI (A240), diameter from 6 to 12 mm, ST RK 2591-2014		0.0234	198308.00		4640		4640		5012
					-	-	-	-		371	
37	S121-050301-3601	Welded reinforcing steel bar of a periodic profile for reinforced concrete structures of class A500C with a diameter of 4 to 10 mm GOST R 52544-2006	t	0.0108	198058.00	-	2139	-	2139	-	2310
					-	-	-	-		171	
38	S121-050301-3602	Welded reinforcing steel bar of a periodic profile for reinforced concrete structures of class A500C with a diameter of 12 to 40 mm GOST R 52544-2006	t	0.098	191925.00	-	18809	-	18809	-	20313
					-	-	-	-		1505	
39	E11-060301-0407	Embedded parts weighing up to 4 kg / SK1 /. install on	t	0.0036	405290.03	1266.03	1459	5	588	790	2429
					240570.00	560.82	866	2		180	
40	E11-060501-0201	Columns of civil buildings in metal formwork / heavy concrete class B30 /. Device	m3	11.1	61634.81	27709.12	684146	307571	208938	214831	970895
					15102.45	6165.83	167637	68441		71918	
41	S121-050301-3001	Hot-rolled smooth reinforcing steel, class AI (A240), diameter from 6 to 12 mm, ST RK 2591-2014	t	0.4556	198308.00	-	90349	-	90349	-	97577
					-	-	-	-		7228	

42	S121-050301-3601	Welded reinforcing steel bar of a periodic profile for reinforced concrete structures of class A500C with a diameter of 4 to 10 mm GOST R 52544-2006	t	0.216	198058.00	-	42781	-	42781	-	46203
					-	-	-	-		3422	
43	S121-050301-3602	Welded reinforcing steel bar of a periodic profile for reinforced concrete structures of class A500C with a diameter of 12 to 40 mm GOST R 52544-2006	t	2.6392	191925.00	-	506528	-	506528	-	547051
					-	-	-	-		40522	
44	E11-060301-0407	Embedded parts weighing up to 4 kg / SK1 /. Install on	t	0.072	405290.03	1266.03	29181	91	11769	15799	48578
					240570.00	560.82	17321	40		3598	
TOTAL BASED ON: INCLUDING:			Tenge								761657880657
- Salary of construct on workers			Tenge				2951970				
- Costs of opera ng machines			Tenge					4084976			
- including the salary of drivers			Tenge					914939			
- Materials, products and structures			Tenge						26797931		
- Overhead			Tenge							3518921	

- Es mated profit	Tenge							2988302	

General plan



exp

landscaping

paving stones

asphalt pavement

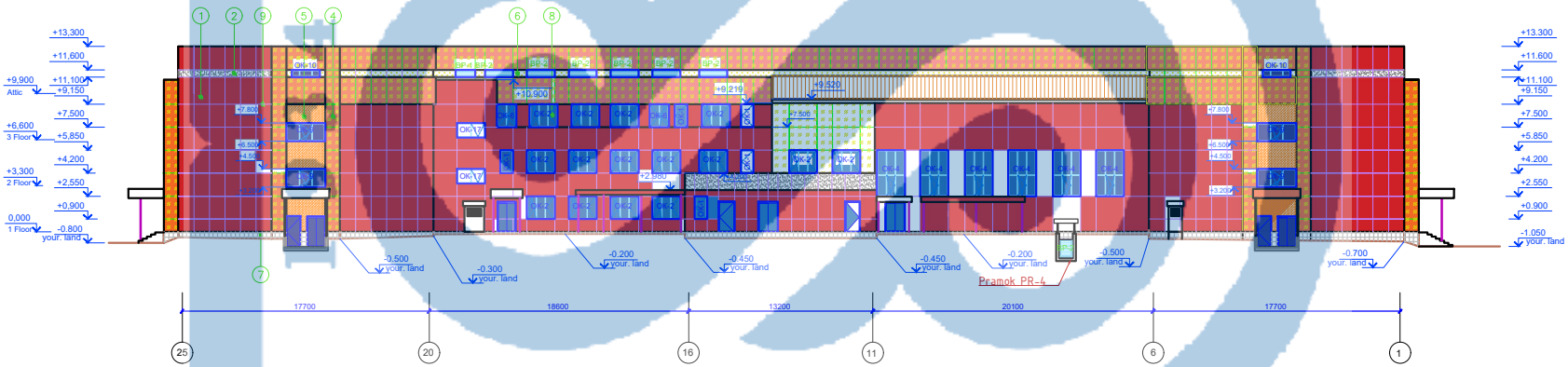
trees

plant railing

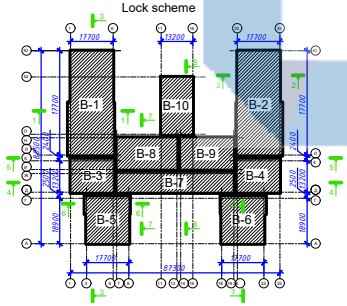
				Satbayev -5B072900 06/10/2020		
				School for 1200 seat in Turkistan		
name	Document №	Signature	date			
head of Dep	K.A.Akmalayuli					
superviser	Kozyukova.N.V			A rchitectural part	Level / Diploma	Sheet / 1 / Scale / 1:300
Consultant	Kozyukova.N.V					
controller	Kozyukova.N.V					
Prepared by	M.F aisal			General plan	Construction and building Department of Materials	

Facade in axates 1-25

Facade in axates 25-1



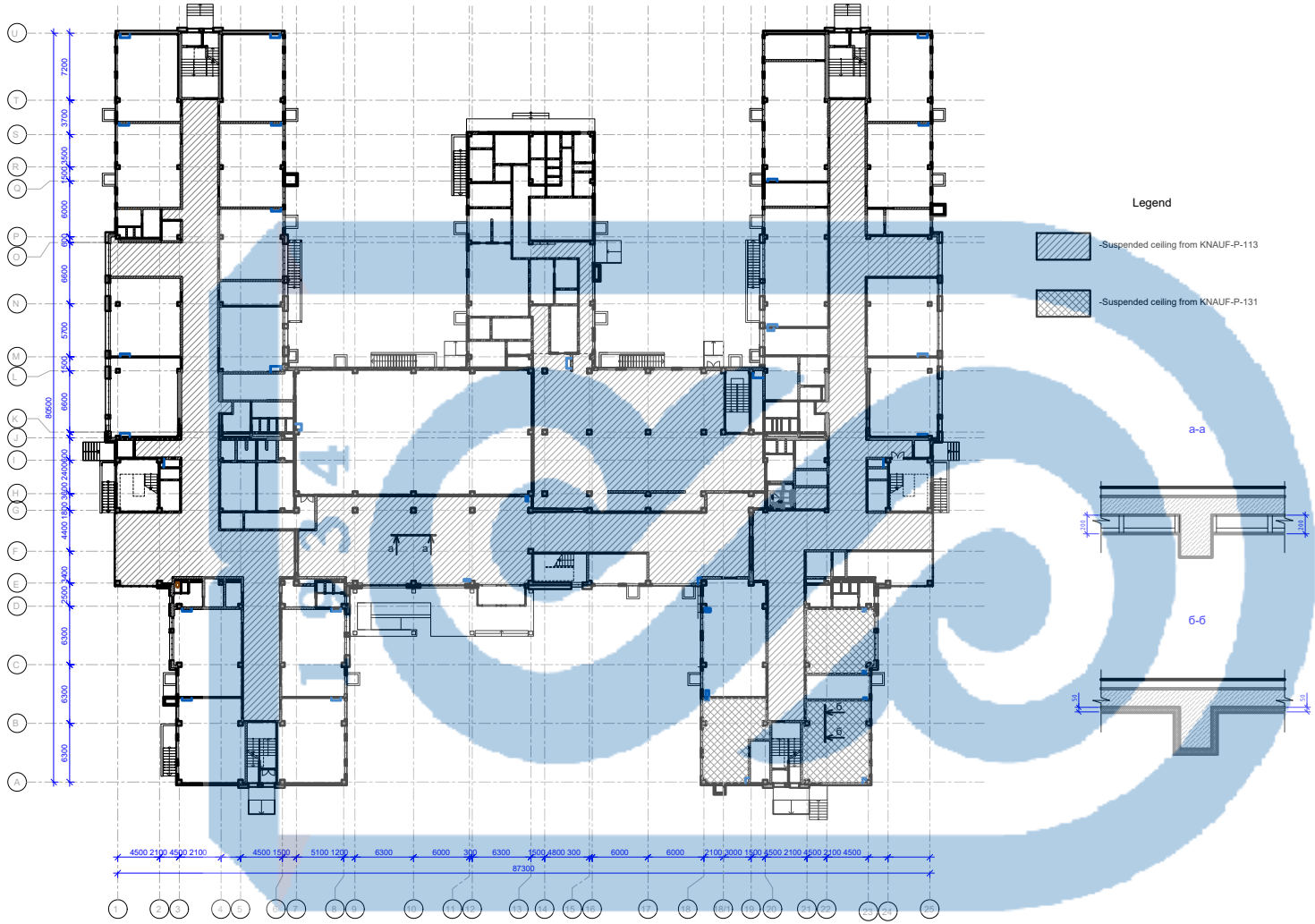
Lock scheme



				Satbayev -5B072900 06/10/2020
				School for 1200 seat in Turkistan
name	Document №	Signature	date	
head of Dep	K.A.Akmalayuli			
superviser	Kozyukova.N.V			A rchitectural part
Consultant	Kozyukova.N.V			
controller	Kozyukova.N.V			
Prepared by	M.F aisal			Fasad 1-10

Level	Sheet	Scale
Diploma	2	1:300

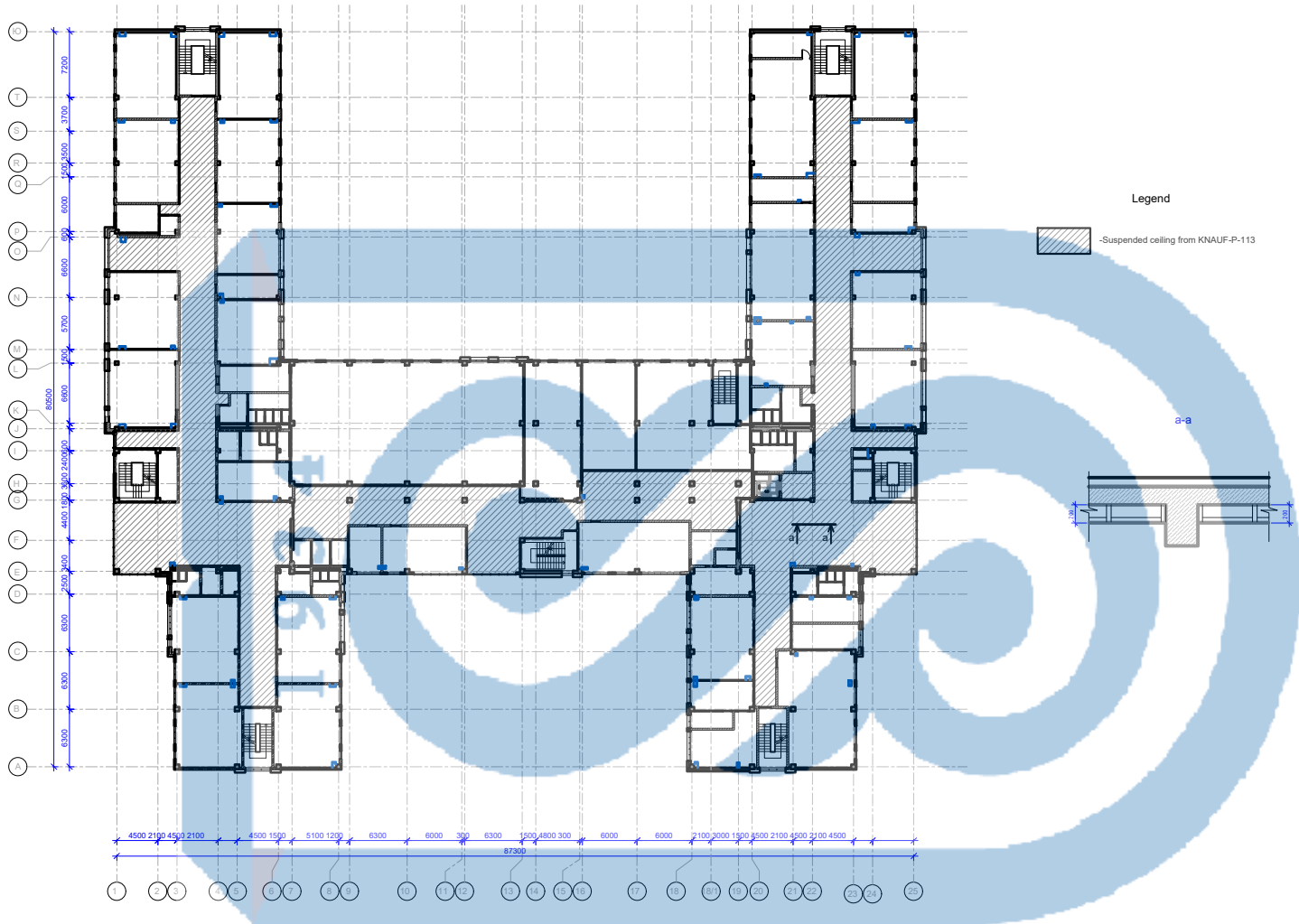
Construction and building Department of Materials



				Satbayev -5B072900 06/10/2020
				School for 1200 seat in Turkistan
name	Document №	Signature	date	
head of Dep	K.A.Akmalayuli			
superviser	Kozyukova.N.V			A rchitectural part
Consultant	Kozyukova.N.V			
controller	Kozyukova.N.V			
Prepared by	M.F aisal			Plan 0.000

Level	Sheet	Scale
Diploma	3	1:300

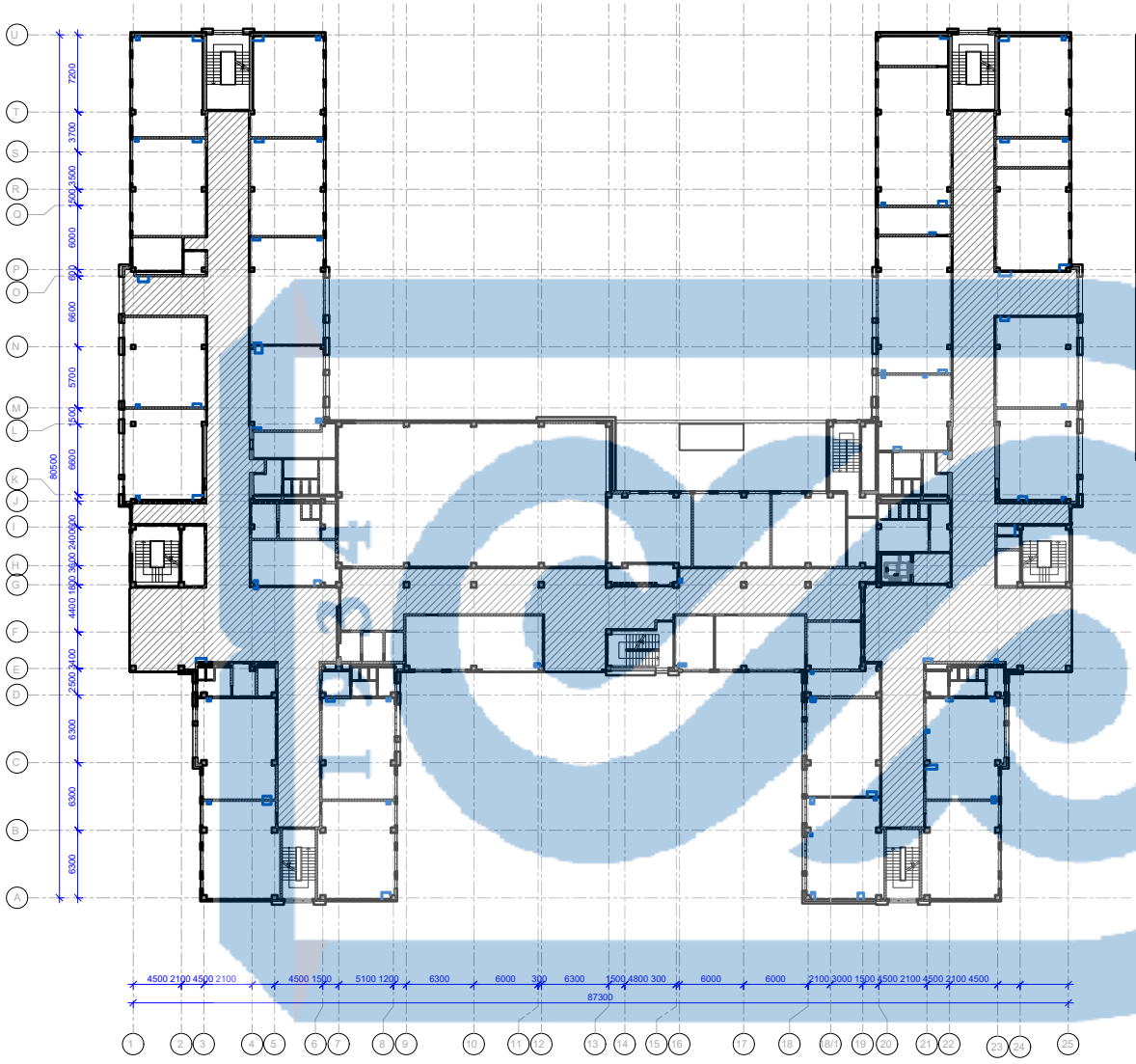
Construction and building
Department of Materials



				Satbayev -5B072900 06/10/2020
				School for 1200 seat in Turkistan
name	Document №	Signature	date	
head of Dep	K.A.Akmalayuli			
superviser	Kozyukova.N.V			A rchitectural part
Consultant	Kozyukova.N.V			
controller	Kozyukova.N.V			
Prepared by	M.F aisal			Plan 3.300

Level	Sheet	Scale
Diploma	4	1:300

Construction and building
Department of Materials



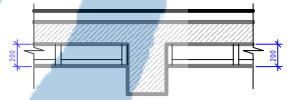
Material consumption specification

Brand	Symbol	Name		Kobl's pcs	Weight unit's kg	Note (commonly. m.) kg.
		Suspended ceiling from KNAUF-P-113				
1		KNAUF-GSP sheet-N2	м²	3727		
2		KNAUF-PP profile 60x27	м.п.	10808,3		
3		KNAUF-Profile OF THE N 28x27	м.п.	1871,0		
4		Profile extension cord 60x27	шт.	745,4		
5		Single-level connector 60/27	шт.	6335,9		
6		Suspension with clamp 60/27	шт.	2608,9		
7		Screw TN 25	шт.	85721		
8		Anchor element	шт.	609		
9		Dubel K 6/35	шт	3742		
10		Tape arming	м.п.	4472,4		
		Suspended ceiling from KNAUF-P-131				
1		KNAUF-GSP sheet-N2	м²	168		
2		Profile guide PN 50x40mm	м.п.	134,4		
3		Tape sealing 50x3,2 mm	м.п.	134,4		
4		Dubel anchor meth. to fasten the MON-profile	шт.	471		
5		Profile of the centenary PS 50x50	м.п.	352,8		
6		Screw LB	шт.	286		
7		Screw TN 25	шт.	3192		
8		Min Plate t=50mm, λ 100 kg/m³	м²	168		

Legend

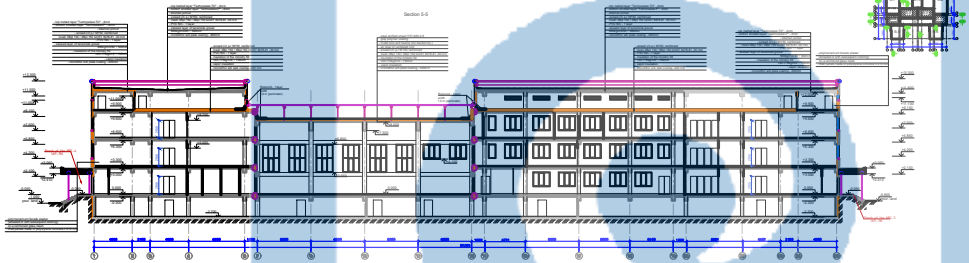
-Suspended ceiling from KNAUF-P-113

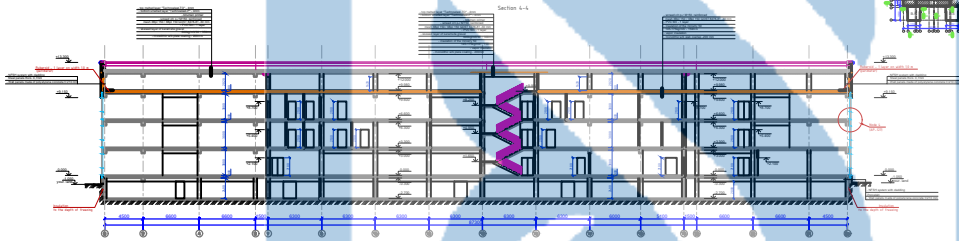
a-a



				Satbayev -5B072900 06/10/2020
				School for 1200 seat in Turkistan
name	Document №	Signature	date	
head of Dep	K.A.Akmalayuli			
superviser	Kozyukova.N.V			
Consultant	Kozyukova.N.V			
controller	Kozyukova.N.V			
Prepared by	M.Faisal			

	Level	Sheet	Scale
Architectural part	Diploma	5	1:300
plan 6.6000	Construction and building Department of Materials		





ChanNum.par.	List	Nedoc	Sign	date
Dean of kaf	K.A. Akmalayuli			
N. controller	Kozyukova N.V.			
Supervisor	Kozyukova N.V.			
Consultant	Kozyukova N.V.			
Created	M Faisal			

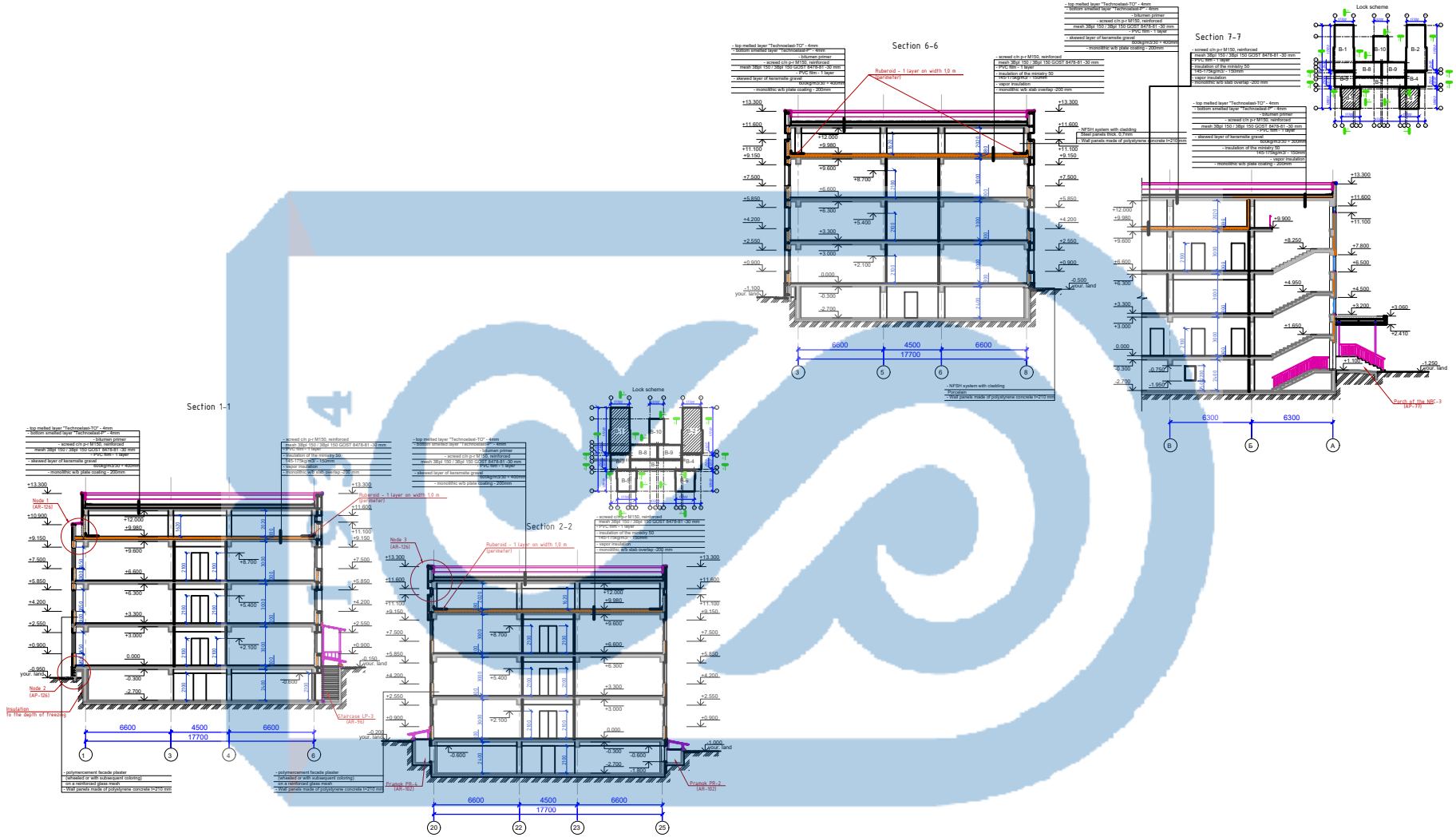
KAZNITU-5B072900-construction (TPGS)-16-1p

School for 1200 place in Turkistan City

Architectural part

stage	List	Scale
CW		1:300

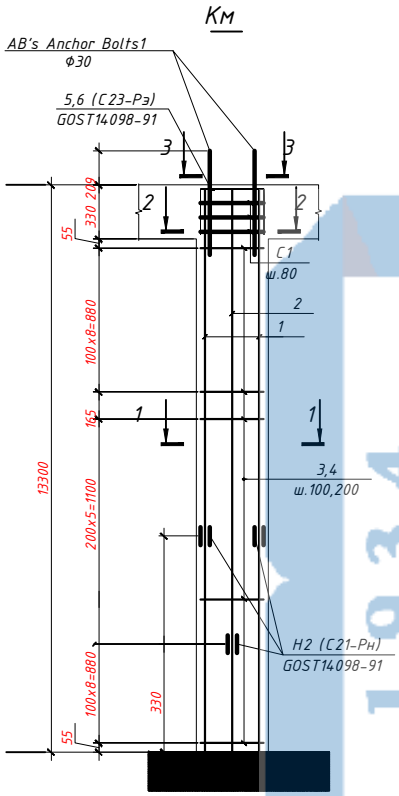
department of construction and construction materials

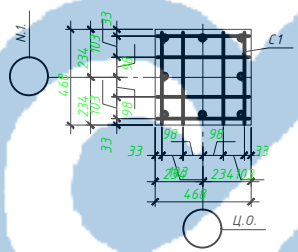


				Satbayev -5B072900 06/10/2020
				School for 1200 seat in Turkistan
name	Document №	Signature	date	
head of Dep	K.A.Akmalayuli			
superviser	Kozyukova.N.V			A rchitectural part
Consultant	Kozyukova.N.V			
controller	Kozyukova.N.V			
Prepared by	M.F aisal			Section 1,2 and 5,6

Level	Sheet	Scale
Diploma	7	1:300

Construction and building
Department of Materials



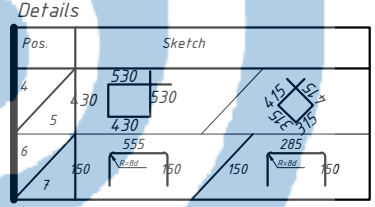


Specification of items on Km

Pos.	Symbol	Name	Kohl's	Weight, kg	Prime-it's a little
1		ф20А500С СТО АСЧМ 7-93 L=1925	4	4.75	19.0
2		ф20А500С -//-	4	6.23	24.92
3*		ф8АI ГОСТ 5781-82*	23	0.76	17.48
4*		ф8АI -//-	23	0.58	13.34
5*		ф16А500С СТО АСЧМ 7-93 L=855	2	1.35	2.7
6*		ф16А500С -//-	2	0.93	1.86
Н2	sheet 28	ф20А500С -//-	16	0.5	8.0
С1	-//-	Grid С1	3	3.0	9.0
Аб1					
		Materials:			
		нConcrete cl.IN THE253	0,79		
		Grid С1			3.0kg
7		ф10А500С СТО АСЧМ 7-93 L=480	10	0.3	3.0

Pos.with a sign (*) cm. details

Details



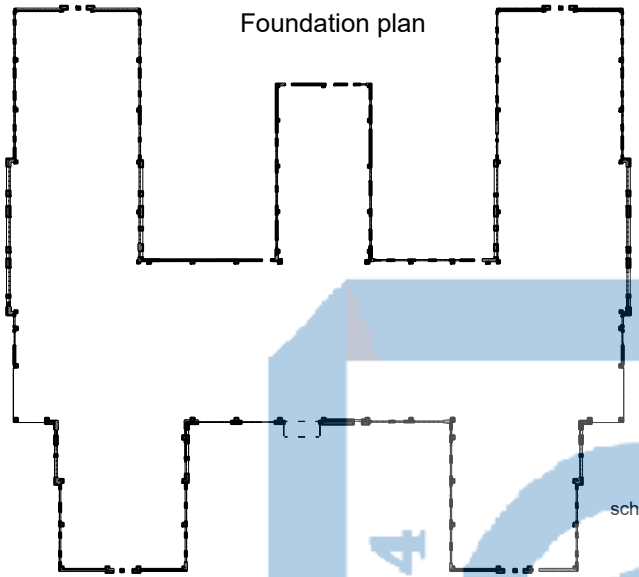
1.Concrete columns in the adjoining slab to lead after the installation of the working slab and indirect reinforcement rebar (WITH1).
2.The protective layer of concrete is taken along the outer edge of the vertical fitting column.
3.Sizes of clamps are given on the inner face of clamps.
4.Welding to lead electrodes E42And on GOST 9467-75.
5.The specification of the items and the expense statement became Km2

Expense billing became per item, kg

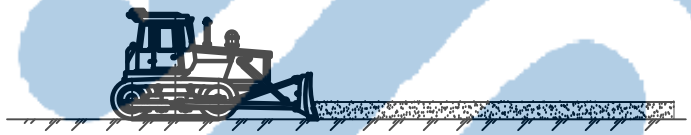
Item brand	Rebar products								
	Class armature								
	A500C						AI		Just
	СТО АСЧМ 7-93						ГОСТ 5781-82*		
	ф10	ф16	ф20	ф25	ф28	итого	ф8	total	
Column Km2	9.0	4.56	51.92	-	-	65.48	30.82	30.82	96.3

				Satbayev -5B072900 06/10/2020
				Scool for 1200 seat in Turkistan
name	Document №	Signature	date	
head of Dep	K.A.Akmalayuli			Level / Sheet / Scale
superviser	Kozyukova.N.V			Constructive part / Diploma / 8 / 1:300
Consultant	Kozyukova.N.V			
controller	Kozyukova.N.V			
Prepared by	M.F aisal			Column / Construction and building Department of Materials

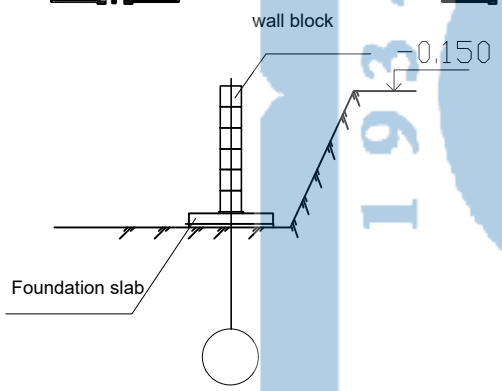
Foundation plan



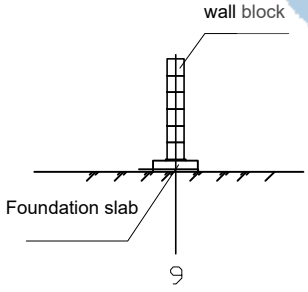
scheme of cutting the soil layer with a bulldozer



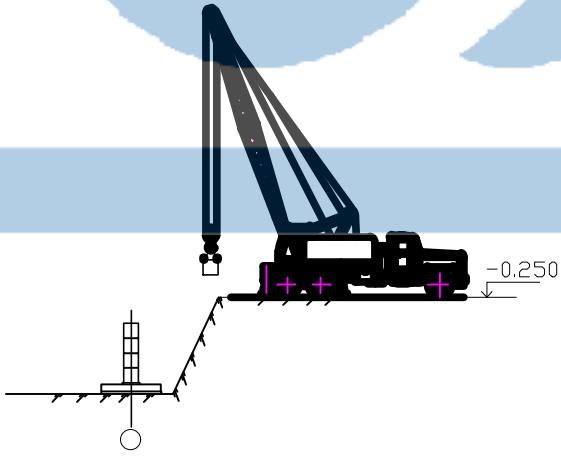
foundation block installation diagram



22



9



ТЭП

Name	Units. ism.	Calculated formula	Value
Construction area site	м2	-----	3877
Протяженность временных коммуникаций			
Water	m.p.	-----	32
TRANSMISSION	m.p.	-----	451
Temporary roads	м2	-----	766
Compact ratio plan	%	Ксм= [Sза /Sсп] x 100%	11
Compact ratio temporary buildings	%	Кпв= [Sвз /Sзд] x 100%	71

Экспликация временных зданий и сооружений

Номер по плану	Name	Units. ism.	Quantity	Area, м2	Brand
3	Watchbox	шт	1	2,25	-----
4	Office	шт	1	24,3	УТС-420-03
5	Locker room	шт	1	33	УТС-420-02
6	The washing	шт	1	26,35	УТС-420-02
7	Rooms for reception food	шт	1	24,3	УТС-420-03
8	Toilet	шт	1	18	УТС-420-04
----	Closed warehouses	----	-----	-----	на 1 эт. montair.rear
14	Canopy under gas slabs	шт	1	45	-----
15	Canopy under the sheet roofing steel	шт	1	45	-----
----	The Sub-Crane Path	м.п.	500	-----	2 link x 12,5м

name	Document №	Signature	date
head of Dep	K.A.Akmalayuli		
superviser	Kozyukova.N.V		
Consultant	Kozyukova.N.V		
controller	Kozyukova.N.V		
Prepared by	M.Faisal		

Satbayev -5B072900 06/10/2020

School for 1200 seat in Turkistan

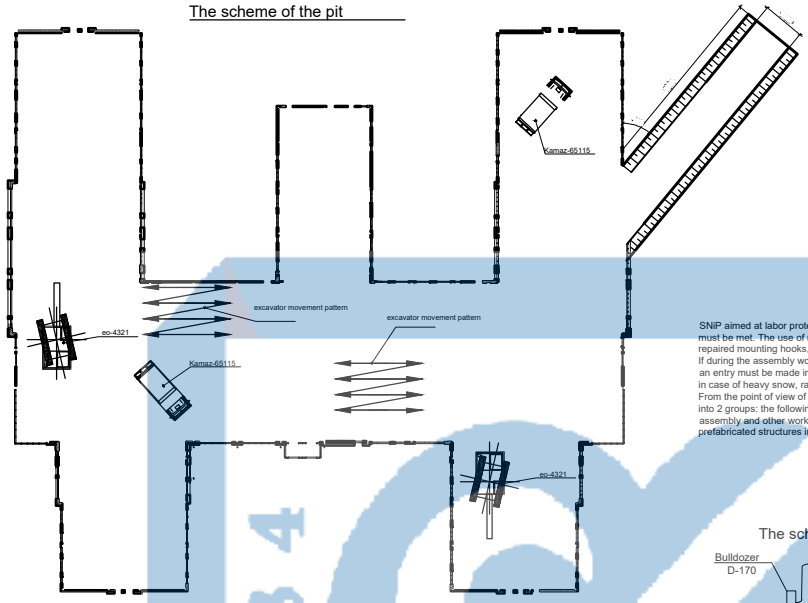
Technological part

Level	Sheet	Scale
Diploma	10	1:300

Technical map 2

Construction and building Department of Materials

The scheme of the pit



Technical and economic indicators

N	Name	measure.unit.	Num	Warning
1	Estimated cost of the building	thousand tenge	70671	
2	Construction volume of the building	m3	110840	
3	Production area of the building	m2	8681.5	
4	cost of 1m3 of building	tg	637	
5	the cost of 1m2 of the building	tg	12960	
6	duration of construction			
	according to the norm	day	310	
	according to the project	day	258	
7	payment for the first working day	tg	11499	
8	coefficient of heterogeneity		0.65	
9	Area of temporary warehouse	m2	260.4	

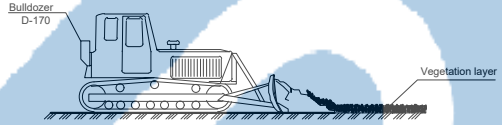
Safety Rules

SNiP aimed at labor protection in the production of assembly work 12. 04 - 2002 requirements must be met. The use of repaired loading devices and process equipment: a full number of repaired mounting hooks, fencing at the construction site and at the crane site.
If during the assembly work there is a situation that endangers the life or health of the worker, an entry must be made in accordance with the logbook. If the wind speed is 15 m / s or more, in case of heavy snow, rain, ice, prefabricated structures are not allowed to be assembled.
From the point of view of safety rules, the assembly of construction structures can be divided into 2 groups: the following works - preparation of the assembly site, loading, unloading, assembly and other works; The above work is the acceptance, installation and approval of prefabricated structures in accordance with the project.

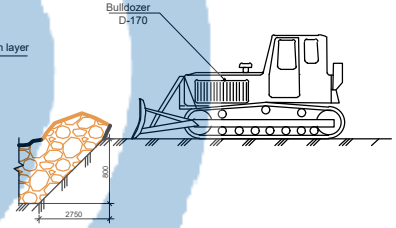
Composition of a set of machines

No	Name	Type, brand	Num
1	Excavator- backhoe, shovel capacity 0.8m3	EO-4321	1
2	Bulldozer	bulldozer	1
3	Pneumotechysteu	K-701	1
4	132, 75m self-propelled crawler crane	dek-251	4
5	Deep vibrator	IV-66	8
6	Surface vibrator	IV-29	4
7	Welding transformer	TS-500	2
8	Onboard transport 14 tons	Kamaz-514	2
9	Dump truck j.k. 15t.	KAMAZ- 6515	2
10	Auto concrete mixer, KAMAZ- 53213	KB-674a	1

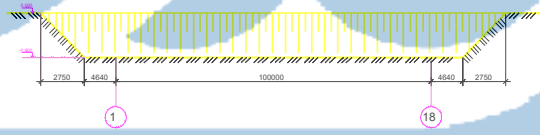
The scheme of cutting the vegetation layer with a bulldozer



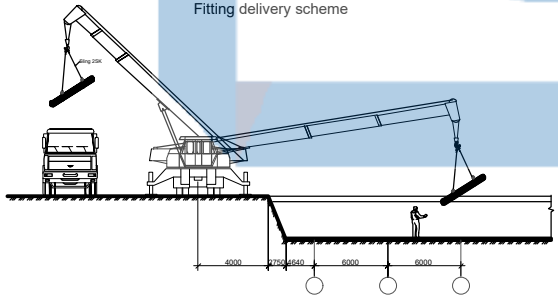
The scheme of backfilling with sand



Section 1-1

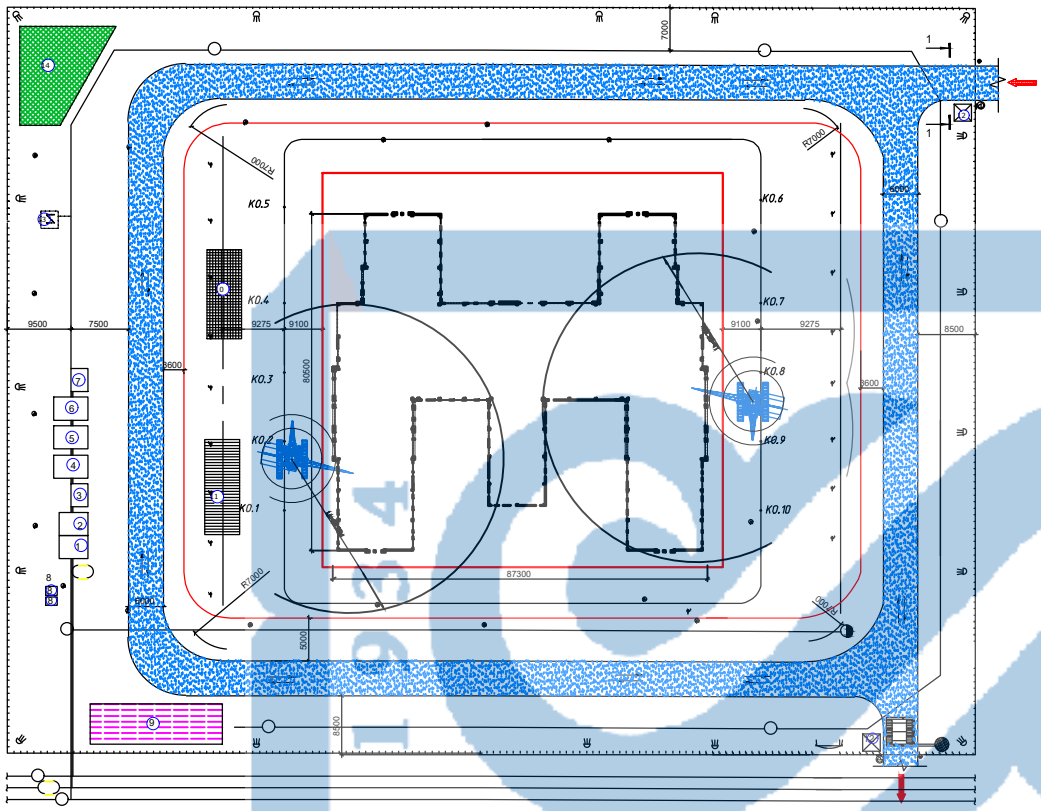


Fitting delivery scheme

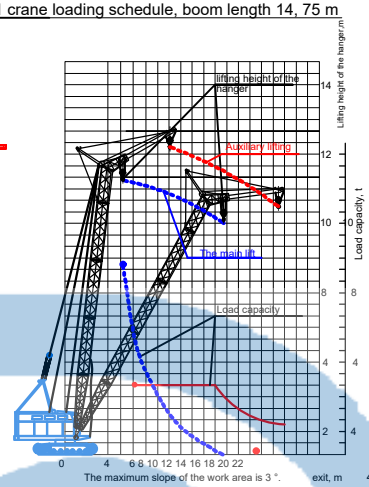


				Satbayev -5B072900 06/10/2020
				School for 1200 seat in Turkistan
name	Document №	Signature	date	
head of Dep	K.A.Akmalayuli			
superviser	Kozyukova.N.V			Technological part — Level: Diploma; Sheet: 9; Scale: 1:300
Consultant	Kozyukova.N.V			
controller	Kozyukova.N.V			
Prepared by	M.F aisal			Technical map 1 — Construction and building Department of Materials

General construction plan



DEC - 251 crane loading schedule, boom length 14, 75 m



Explanation for the construction master plan

1-The master plan of construction is planned for underground works. According to the plan, there is a storage warehouse, places, temporary roads, buildings and water, electricity.

2. Temporary roads at the construction site are gravel, 6 m wide and 12 m radius of rotation. Vehicles move in a circle on the construction site

3-Temporary lighting at the construction site is inventory, and there are luminaires at a distance of 30-40 m.

4-Workers, vehicles, cranes and machinery move freely on the construction site.

5-Danger zones are surrounded by red ribbons and notices.

6-Environmental hydrants inside and outside the site, Occupational Safety and Environmental Protection

Occupational safety and environmental protection

1-Before starting underground work on the construction site, it is necessary to mark and fence the areas that are dangerous for the safety of workers.

2- At the entrance to the construction site it is necessary to hang a poster with a plan of the temporary road, buildings, storage and parking at the construction site, the scheme of traffic.

3- Mechanisms and apparatus, devices, as well as all devices connected to the permanent electrical system, provided with a temporary electrical system, must be planned in accordance with electrical safety regulations.

4-The production site must be equipped in accordance with fire regulations.

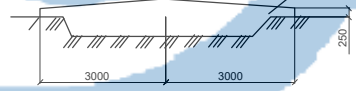
Tek

N	Names		number
1	Construction site area	M²	16424,25
2	Construction area	M²	3842,75
3	Area of temporary buildings	M²	151
4	Temporary roads	M	326
5	Temporary power line	M	588
6	Temporary fencing	M	672
7	Temporary water supply	M	60

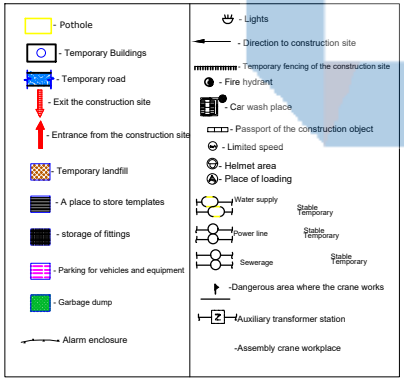
Section 1-1

Temporary path profile

Gravel mortar



Symbols



Explication of temporary building

	Names of building	of the day	Volume M²	Type of building
1	office of foremen	1	20	Collapsible
2	Dispatcher room	1	20	Collapsible
3	Bathroom	1	12	Collapsible
4	Medical center	1	24	Collapsible
5	Tool storage	1	12	Container
6	Kitchen	1	24	Container
7	tool - Place of equipment	1	12	Container
8	Restroom	2	3	plastics
9	location of vehicles and equipment	1	161	
10	Storage of fittings	1	93	
11	A place to store templates	1	99	
12	Gearbox	2	6	Collapsible
13	Auxiliary transformer	1	6	
14	Garbage dump	1	205	

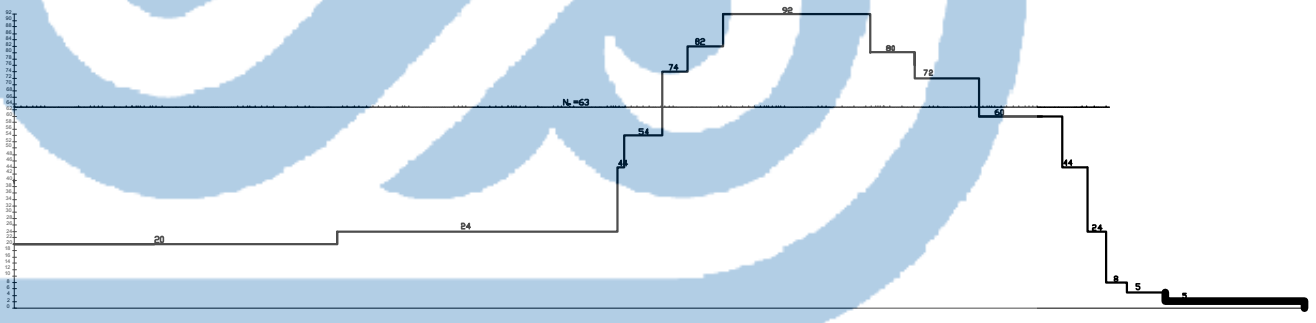
				Satbayev -5B072900 06/10/2020
				School for 1200 seat in Turkistan
name	Document №	Signature	date	
head of Dep	K.A.Akmalayuli			
superviser	Kozyukova.N.V			Technological part
Consultant	Kozyukova.N.V			Level: Diploma; Sheet: 11; Scale: 1:300
controller	Kozyukova.N.V			
Prepared by	M.F aisal			Master plan
				Construction and building Department of Materials

work schedule

№	Name of Works	Scope of Work		Labor cost in days	Cars required	Duration of execution	Number of shifts			Team composition
		unite ism	Count		Name of Works					
1	2	3	4	5	6	7	8	9	10	11
1	preparatory worl	%	5	963.95		45.84	44	1	20	20
2	excavator excavation	100m³	16.07	12.85		25.32	2	2	2	4
3	soil compaction	100m²	3723	25.97		64.72	4	2	4	8
4	installation of general foundations of columns ,foundation slabs,basement walls, concrete preparation	100m³	9.26	447.17		2962	20	2	8	16
5	installation of columns	1 m³	2.69	8.79		8.59	2	2	1	2
6	installation of floor panels	100m²	48	1447.8		228.4	40	2	12	24
7	basement wall waterproofing	100m²	2967	12.85		——	8	1	20	20
8	backfilling	100m³	0.863	31.14		8.938	3	2	2	4
9	Монтаж металлического каркаса основного здания	т	3739	6762		7539	9	2	5	10
10	installation of walls and partitions	100m²	0.68	848.16		1119	20	2	7	14
11	partition wall	100m²	0.19	3.42		——	2	2	1	2
12	installation of wall fences	100пт	0.05	2.12		0.31	2	2	1	2
13	installation of fire escape stairs	т	0.114	0.461		0.80	1	1	1	1
14	masonry of walls and partitions of brick, reinforcing ramp walls	1 m³	473.22	433.47		——	20	2	14	28
15	installation of slabs	100пт	0.114	0.461		0.056	2	2	2	4
16	roof of the main building	100m²	279.02	1029.01		2087	21	2	10	20
17	floors of the main building	100m²	9935	516.79		——	32	2	8	16
18	exterior decoration of the main building	100m²	2381	399.8		——	34	1	12	12
19	interior decoration of the main building, plastering	100m²	14654	6859.9		——	79	2	16	32
20	interior decoration of the main building; painting works	100m²	1314	754.71		——	30	2	10	20
21	roof ramp	100m²	0.35	86.35		——	6	2	5	10
22	insertion of window and floor blocks	100m²	1.55	21.39		——	6	1	4	4
23	ramp floors	100m²	3.17	164.09		——	9	2	10	20
24	ramp interior decoration; plastering work	100m²	7.59	3915.9		——	34	2	12	24
25	ramp interior decoration; painting work	100m²	6.32	477.64		——	29	2	12	24
26	sanitary works	%	5	744.78		38.63	47	1	16	16
27	electric installation work	%	8	210.48	——	48.13	60	1	20	20
28	weak-working	%	1	140.96	——	7.33	46	1	4	4
29	beautification	%	2	297.91	——	15.33	74	1	4	4
30	other unaccompanied work	%	20	2402.68	——	125.48				
30	Surrender	%	100	20.8	——	——	4	1	5	5

Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jun Feb Mar Apr May

Labor plot



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head of Dep	K.A.Akmalayuli			
superviser	Kozyukova.N.V			Technological part
Consultant	Kozyukova.N.V			
controller	Kozyukova.N.V			
Prepared by	M.F aisal			Work schedule

Level	Sheet	Scale
Diploma	12	1:300

Construction and building
Department of Materials

Протокол анализа Отчета подобия Научным руководителем

Заявляю, что я ознакомился(-ась) с Полным отчетом подобия, который был сгенерирован Системой выявления и предотвращения плагиата в отношении работы:

Автор: Саррари Мохамед Файсал

Название: School for 1200 places in Turkestan

Координатор:Надежда Козюкова

Коэффициент подобия 1:1,1

Коэффициент подобия 2:0

Замена букв:47

Интервалы:0

Микропробелы:0

Белые знаки: 0

После анализа Отчета подобия констатирую следующее:

☐ обнаруженные в работе заимствования являются добросовестными и не обладают признаками плагиата. В связи с чем, признаю работу самостоятельной и допускаю ее к защите;

☐ обнаруженные в работе заимствования не обладают признаками плагиата, но их чрезмерное количество вызывает сомнения в отношении ценности работы по существу и отсутствием самостоятельности ее автора. В связи с чем, работа должна быть вновь отредактирована с целью ограничения заимствований;

☐ обнаруженные в работе заимствования являются недобросовестными и обладают признаками плагиата, или в ней содержатся преднамеренные искажения текста, указывающие на попытки сокрытия недобросовестных заимствований. В связи с чем, не допускаю работу к защите.

Обоснование:

Обнаруженные в работе заимствования являются добросовестными и не обладают признаками плагиата. В связи с чем,признаю работу самлстоятельной и допускаю ее к защите.

…… ……

Дата *Подпись Научного руководителя*

Протокол анализа Отчета подобия

заведующего кафедрой / начальника структурного подразделения

Заведующий кафедрой / начальник структурного подразделения заявляет, что ознакомился(-ась) с Полным отчетом подобия, который был сгенерирован Системой выявления и предотвращения плагиата в отношении работы:

Автор: Саравари Мохамед Файсал

Название: School for 1200 places in Turkestan

Координатор: Надежда Козюкова

Коэффициент подобия 1:1,1

Коэффициент подобия 2:0

Замена букв:47

Интервалы:0

Микропробелы:0

Белые знаки:0

После анализа отчета подобия заведующий кафедрой / начальник структурного подразделения констатирует следующее:

☐ обнаруженные в работе заимствования являются добросовестными и не обладают признаками плагиата. В связи с чем, работа признается самостоятельной и допускается к защите;
☐ обнаруженные в работе заимствования не обладают признаками плагиата, но их чрезмерное количество вызывает сомнения в отношении ценности работы по существу и отсутствием самостоятельности ее автора. В связи с чем, работа должна быть вновь отредактирована с целью ограничения заимствований;
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Обоснование:

Обнаруженные в работе заимствования являются добросовестными и не обладают признаками плагиата. В связи с чем, работа признается самостоятельной и допускается к защите;

....

Дата

Подпись заведующего кафедрой / начальника структурного подразделения

Окончательное решение в отношении допуска к защите, включая обоснование:

Работа признается самостоятельной и допускается к защите.

Обнаруженные в работе заимствования являются добросовестными и не обладают признаками плагиата.

…… …… ……

Дата *Подпись заведующего кафедрой /*

начальника структурного подразделения

МИНИСТЕРСТВО ОБРАЗОВАНИЯ И НАУКИ РЕСПУБЛИКИ КАЗАХСТАН
СӘТБАЕВ УНИВЕРСИТЕТІ

RESPONSE

OF THE SUPERVISOR
for the graduation project

Sarwari Mohammad Faisal
5B072900-Civil Engineering

Topic: “School for 1200 places in Turkestan”

Graduation project of Sarwari Mohammad Faisal made in accordance with the requirements and includes all the necessary sections of the diploma project. In the Architectural part, facades, sections, floor plans and connection nodes of structures are presented. The thermotechnical calculation of the wall fencing was made.

In the constructive section, the calculation of the floor slab, frames on the LIRA CAD program is performed. In the technological part, technological maps for earthworks and stone works have been developed.

The economic part of the project is calculated according to the program of SMETA of the RK. All drawings are made in Autocad.

In general, the graduation project was performed at a good level, the student Sarwari Mohammad Faisal showed good knowledge both during training and during the implementation of the project. The work deserves a good grade.

Supervisor
Master of technical science, lecturer
_____ _____ Kozyukova N.V.
«25 » _____05_____ 2020г.