



Islamic Relief Worldwide

IR-W

South Region

Kandahar Area Office

Shelter Project

Water Supply Network (Household Connection) Powered by Solar System with RCC

Water Reservoir

Zarin Zai, Arghastan District, Kandahar Province, Afghanistan

Submission Date: 12/11/2023

|

District Arghastan, Village Zarinzay

Legend

-  Pipe from pump to Reservoir

Zarinzy Village

Location of Reservoir

location of pump

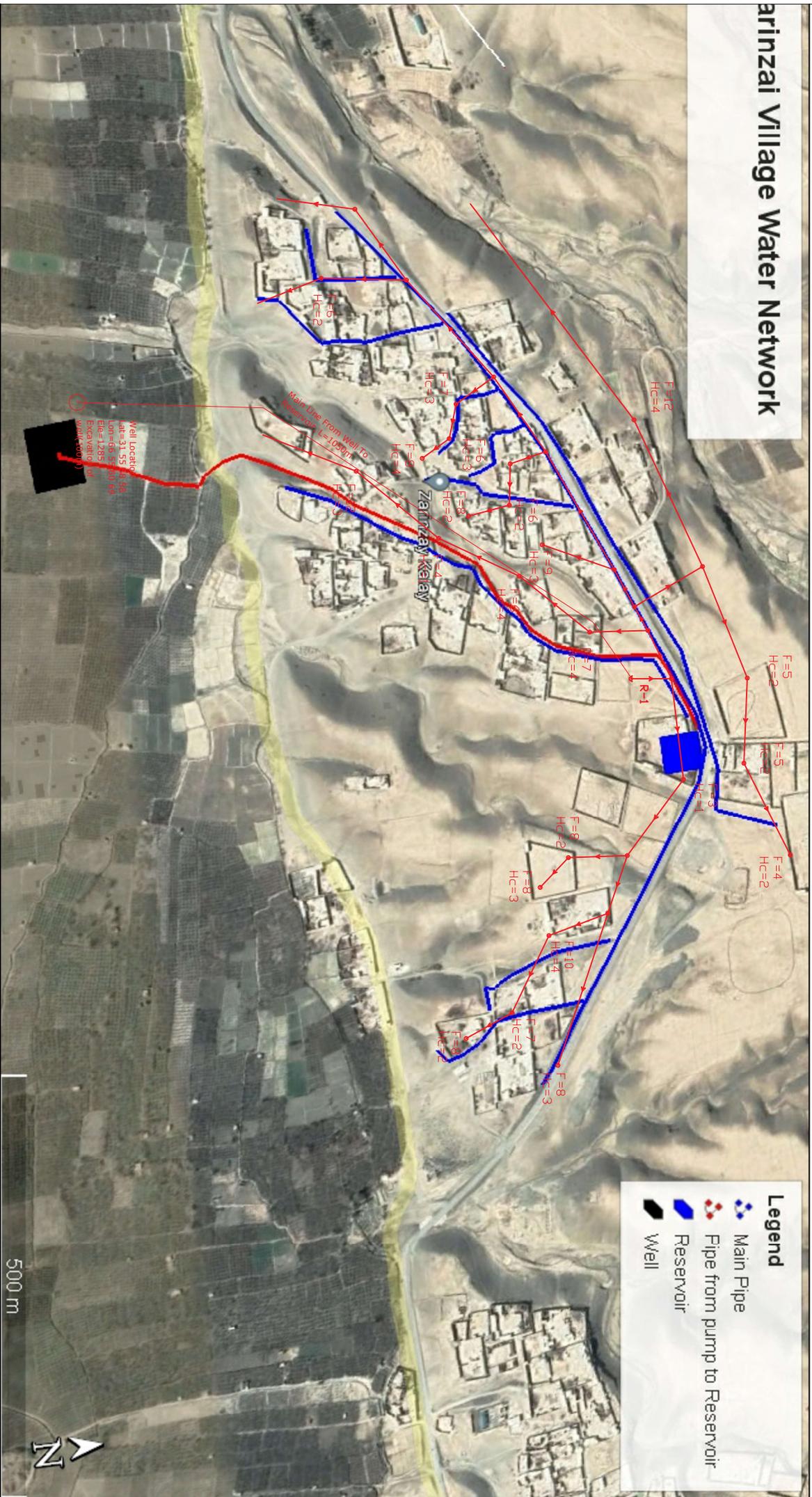
Google Earth

Image © 2023 CNES / Airbus

1000 ft

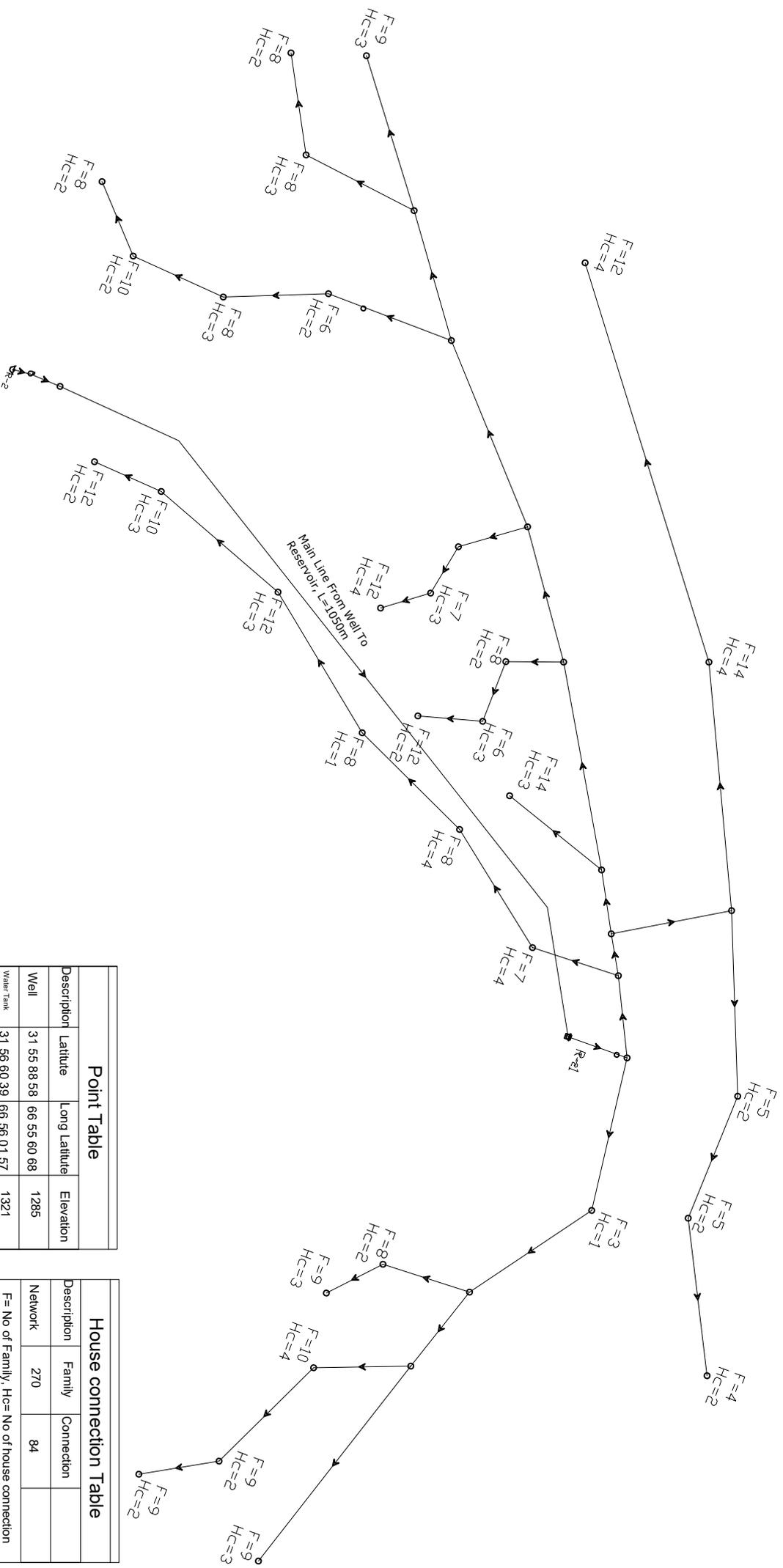


Arinzai Village Water Network



Survey: By	Eng. M. Moaine & M. Mehdi	Project	Shelter	Islamic Relief Worldwide		
Drawing: By	Eng. M. Mehdi	Section	Water Network	IR-W		
Design : By	Eng. M. Moaine	Date	16/10/2023	Unit	cm	
Checked: By	Eng. Dawod Shafag	Province	Kandahar	Scale	NO	
Approved: By		District	Arghastan	Sheet No	0	
		Village	Zarin Zai			

(House Connection survey)



Point Table			
Description	Latitude	Long Latitude	Elevation
Well	31 55 88 58	66 55 60 68	1285
Water Tank	31 56 60 39	66 56 01 57	1321

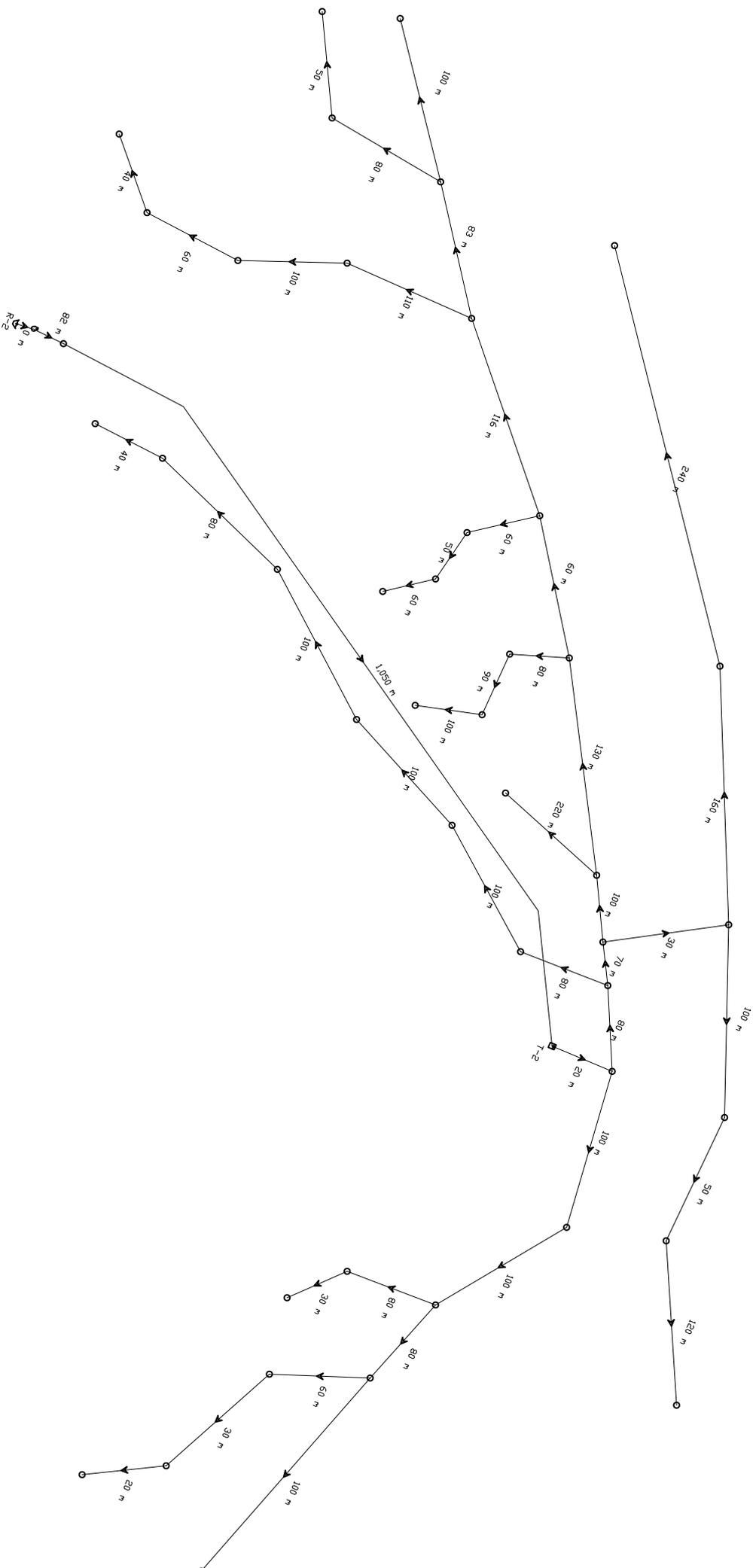
House connection Table			
Description	Family	Connection	
Network	270	84	

F= No of Family, Hc= No of house connection

Water Network Project (House Connection)

Survey: By		Eng. M. Moaine & M. Mehdi		Project		Shelter		Islamic Relief Worldwide			
Drawing: By		Eng. M. Mehdi		Section		Water Network		IR-W			
Design : By		Eng. M. Moaine		Date		16/10/2023		Unit		cm	
Checked: By		Eng. Dawod Shafiq		Province		Kandahar		Scale		NO	
Approved: By				District		Arghastan		Sheet No		0	
				Village		Zarin Zai					

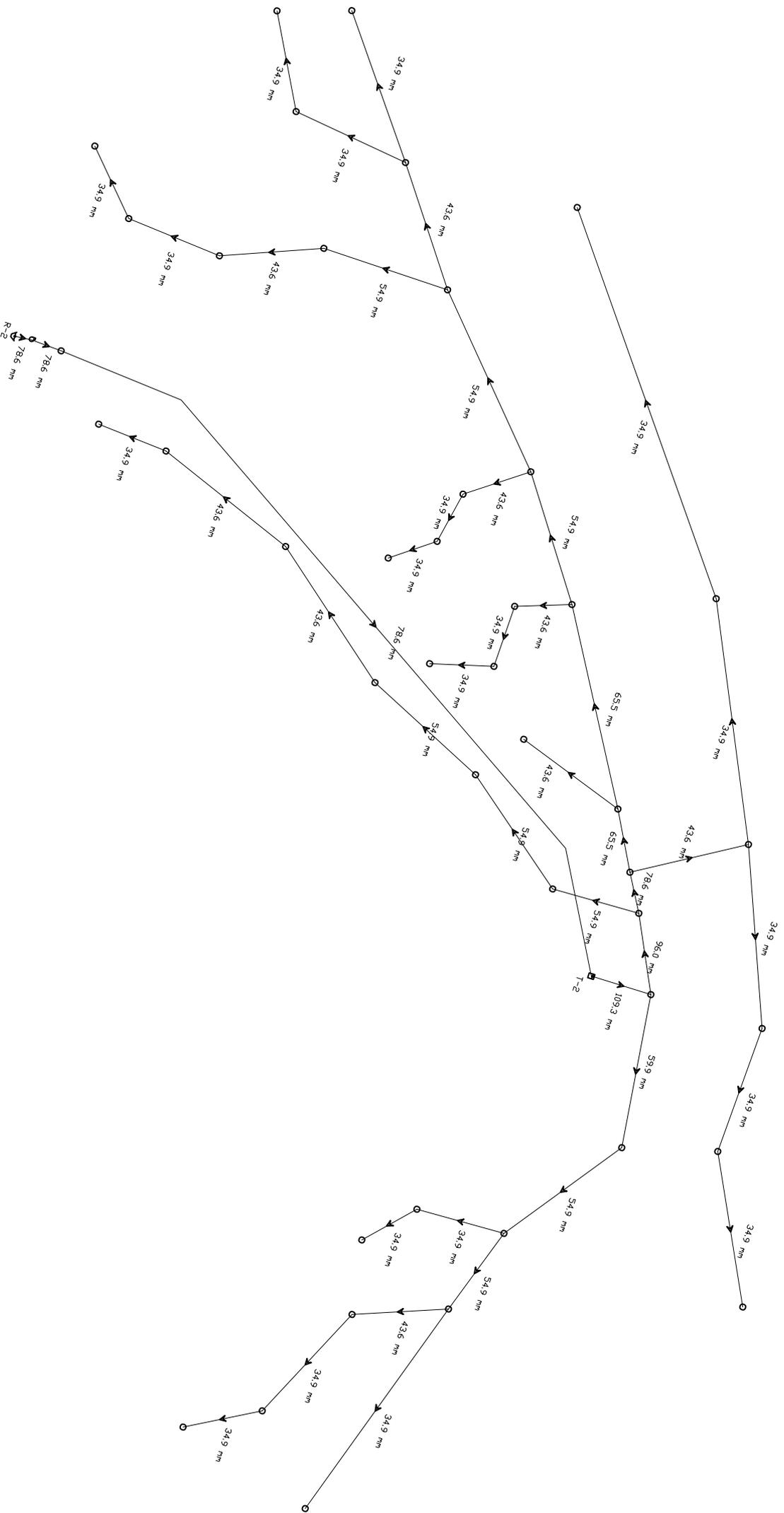
(Length)



Water Network Project (Length)

Survey: By	Eng.M.Moaine & M.Mehdi	Project	Shelher	Islamic Relief Worldwide	
Drawing: By	Eng.M.Mehdi	Section	Water Network	IR-W	
Design : By	Eng.M.Moaine	Date	16/10/2023	Unit	cm
Checked: By	Eng.Dawod Shafiq	Province	Kandahar	Scale	NO
Approved: By		District	Arghastan	Sheet No	0
		Village	Zarin Zai		

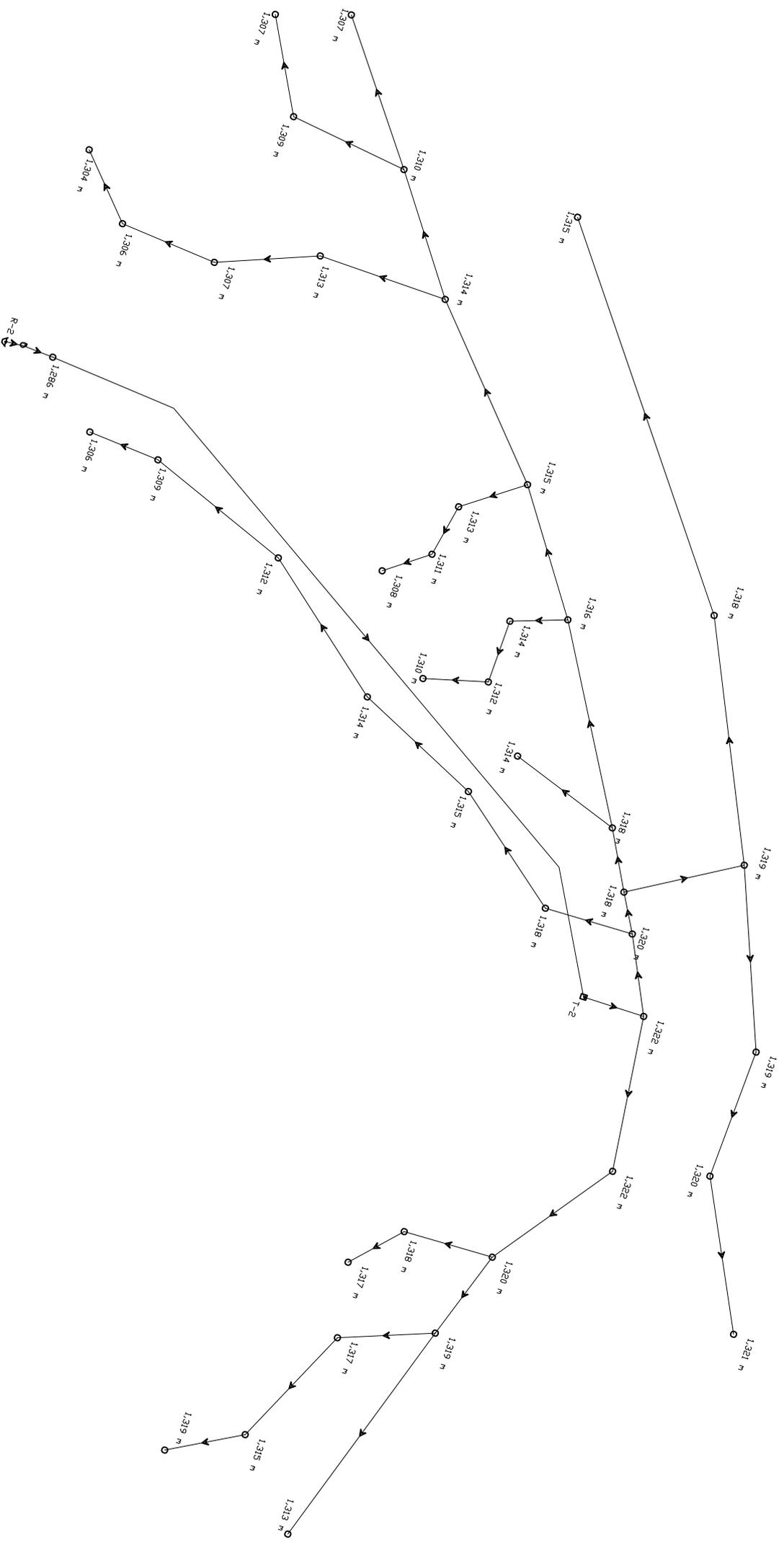
(Diameter)



Water Network Project (Diameter)

Survey: By	Eng.M.Moaine & M.Mehdi	Project	Shelher	Islamic Relief Worldwide	
Drawing: By	Eng.M.Mehdi	Section	Water Network	IR-W	
Design : By	Eng.M.Moaine	Date	16/10/2023	Unit	cm
Checked: By	Eng.Dawod Shafiq	Province	Kandahar	Scale	NO
Approved: By		District	Arghastan	Sheet No	0
		Village	Zarin Zai		

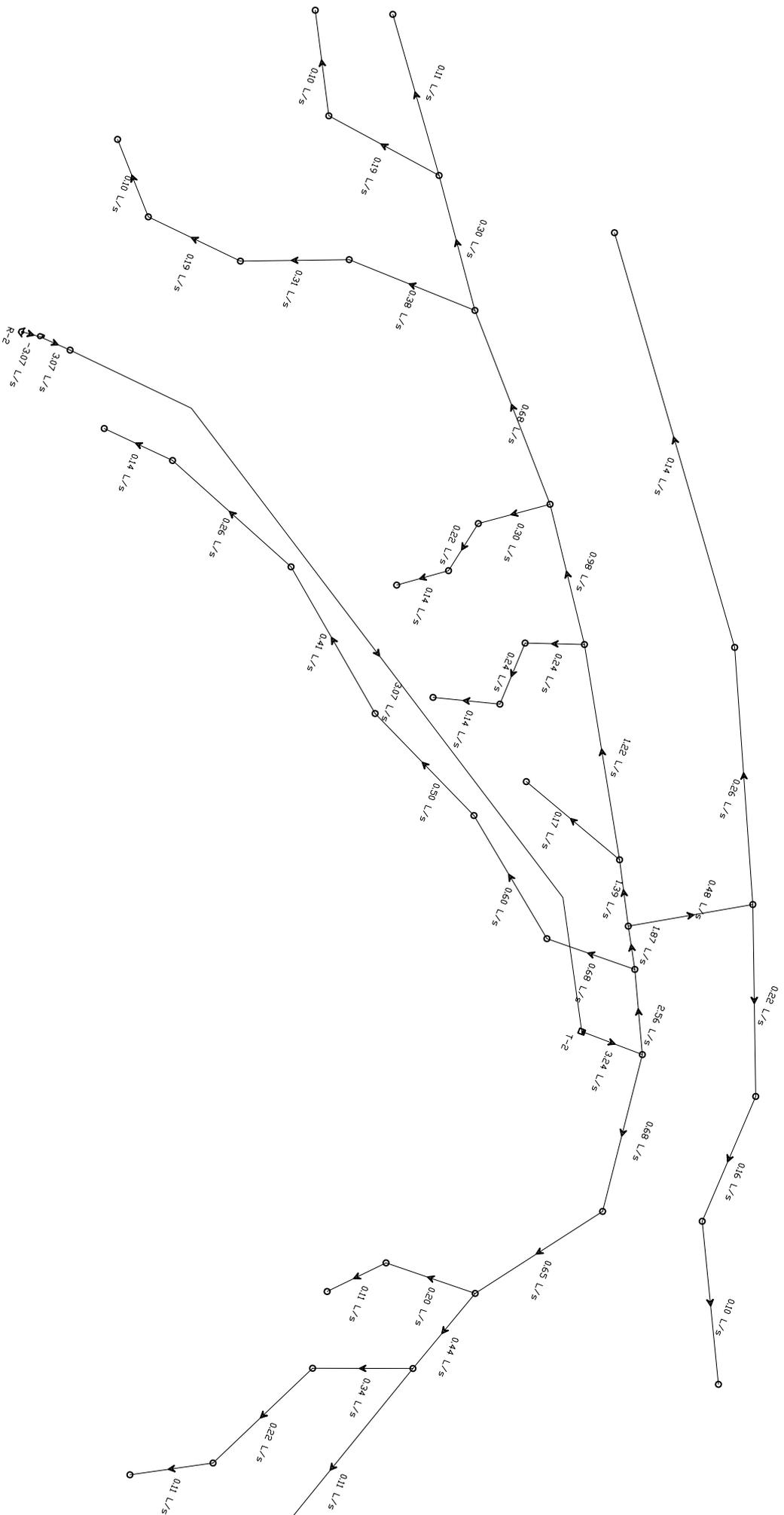
(Elevation)



Water Network Project (Elevation)

Survey: By	Eng.M.Moaine & M.Mehdi	Project	Shelher	Islamic Relief Worldwide	
Drawing: By	Eng.M.Mehdi	Section	Water Network	IR-W	
Design : By	Eng.M.Moaine	Date	16/10/2023	Unit	cm
Checked: By	Eng.Dawod Shafiq	Province	Kandahar	Scale	NO
Approved: By		District	Arghastan	Sheet No	0
		Village	Zarin Zai		

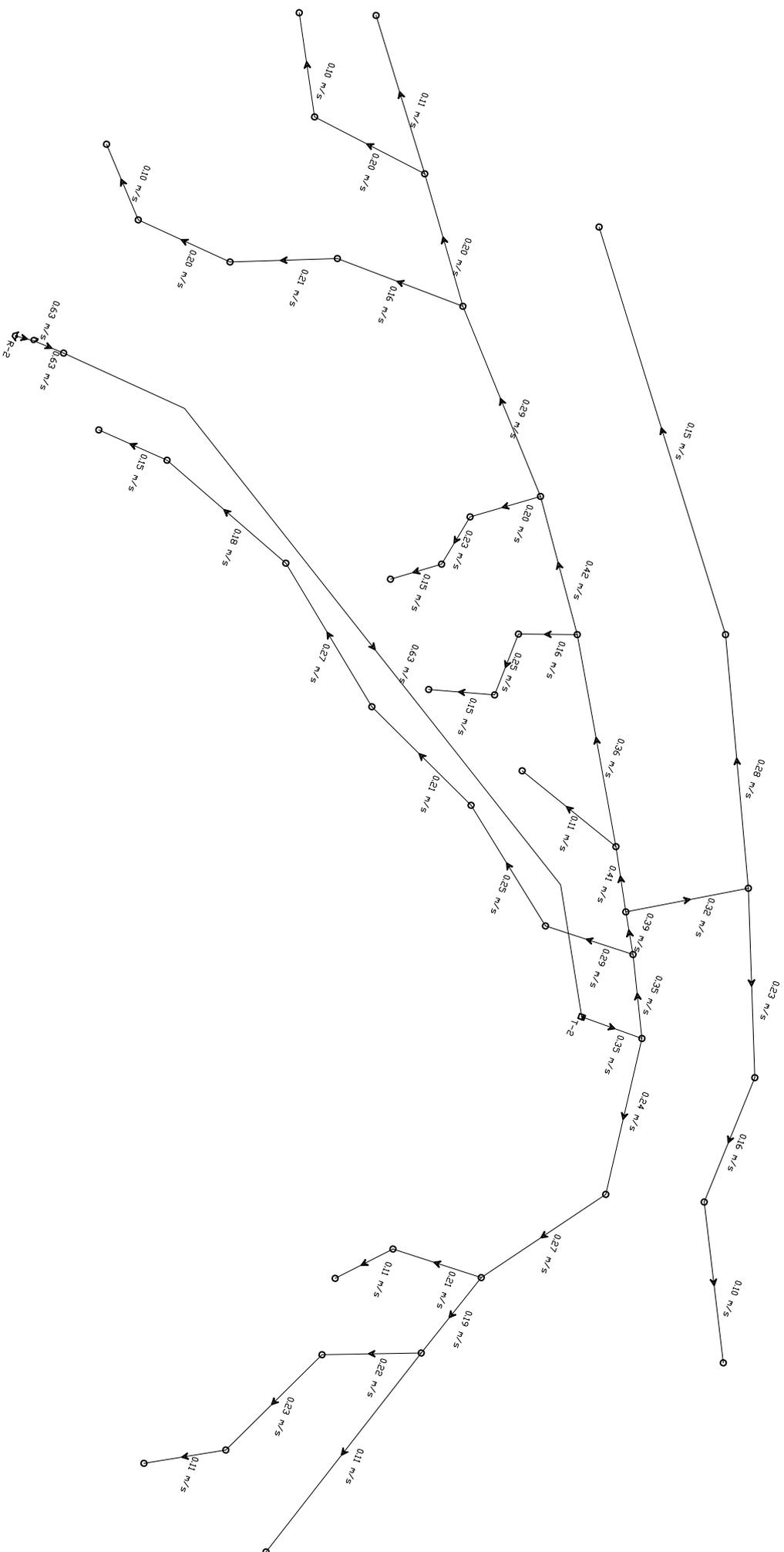
(Flow)



Water Network Project (Flow)

Survey: By	Eng.M.Moaine & M.Mehdi	Project	Shelter	Islamic Relief Worldwide	
Drawing: By	Eng.M.Mehdi	Section	Water Network	IR-W	
Design : By	Eng.M.Moaine	Date	16/10/2023	Unit	cm
Checked: By	Eng.Dawod Shafiq	Province	Kandahar	Scale	NO
Approved: By		District	Arghastan	Sheet No	0
		Village	Zarin Zai		

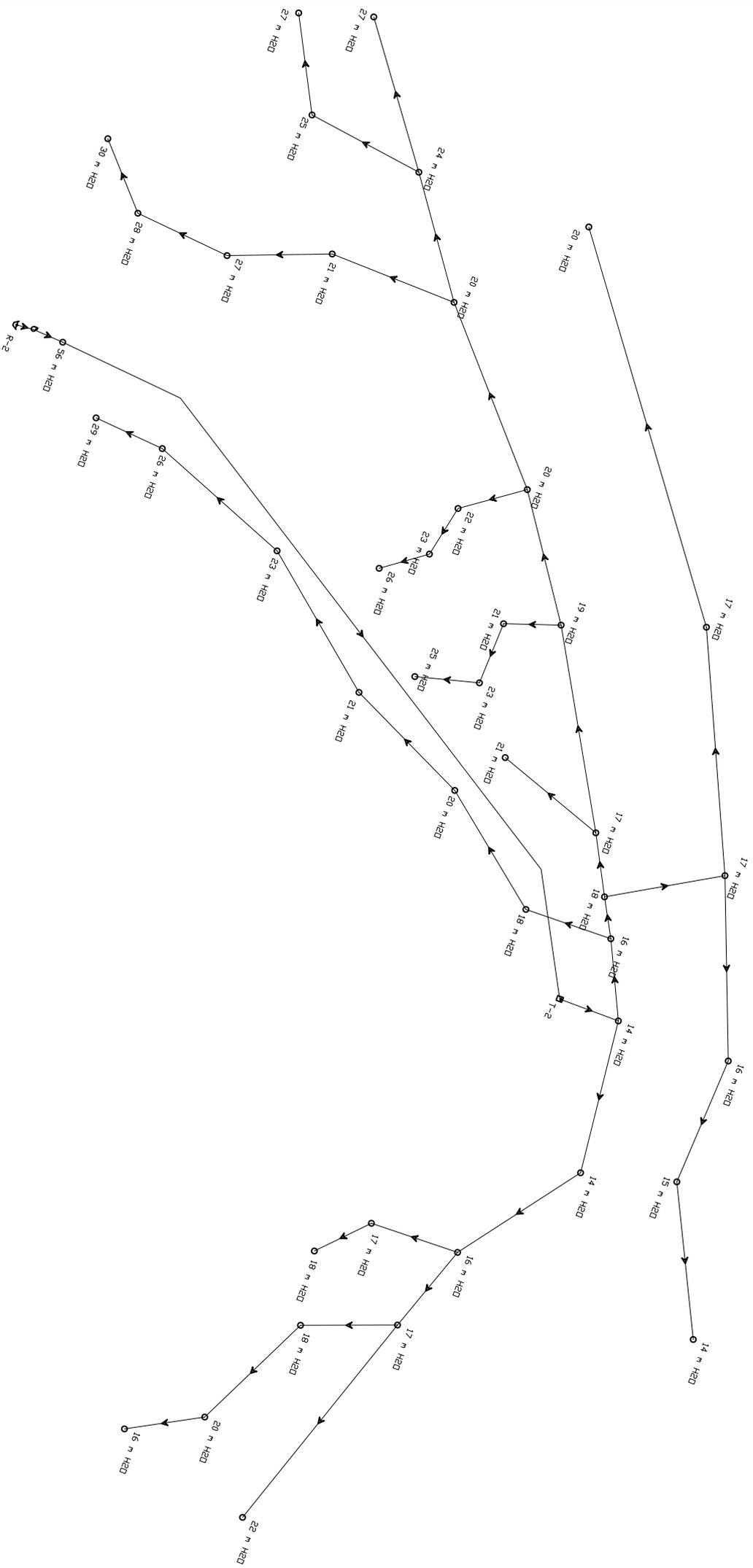
(Velocity)



Water Network Project (Velocity)

Survey: By	Eng.M.Moaine & M.Mehdi	Project	Shelher	Islamic Relief Worldwide	
Drawing: By	Eng.M.Mehdi	Section	Water Network	IR-W	
Design : By	Eng.M.Moaine	Date	16/10/2023	Unit	cm
Checked: By	Eng.Dawod Shajfaq	Province	Kandahar	Scale	NO
Approved: By		District	Arghastan	Sheet No	0
		Village	Zarin Zai		

(Pressure)

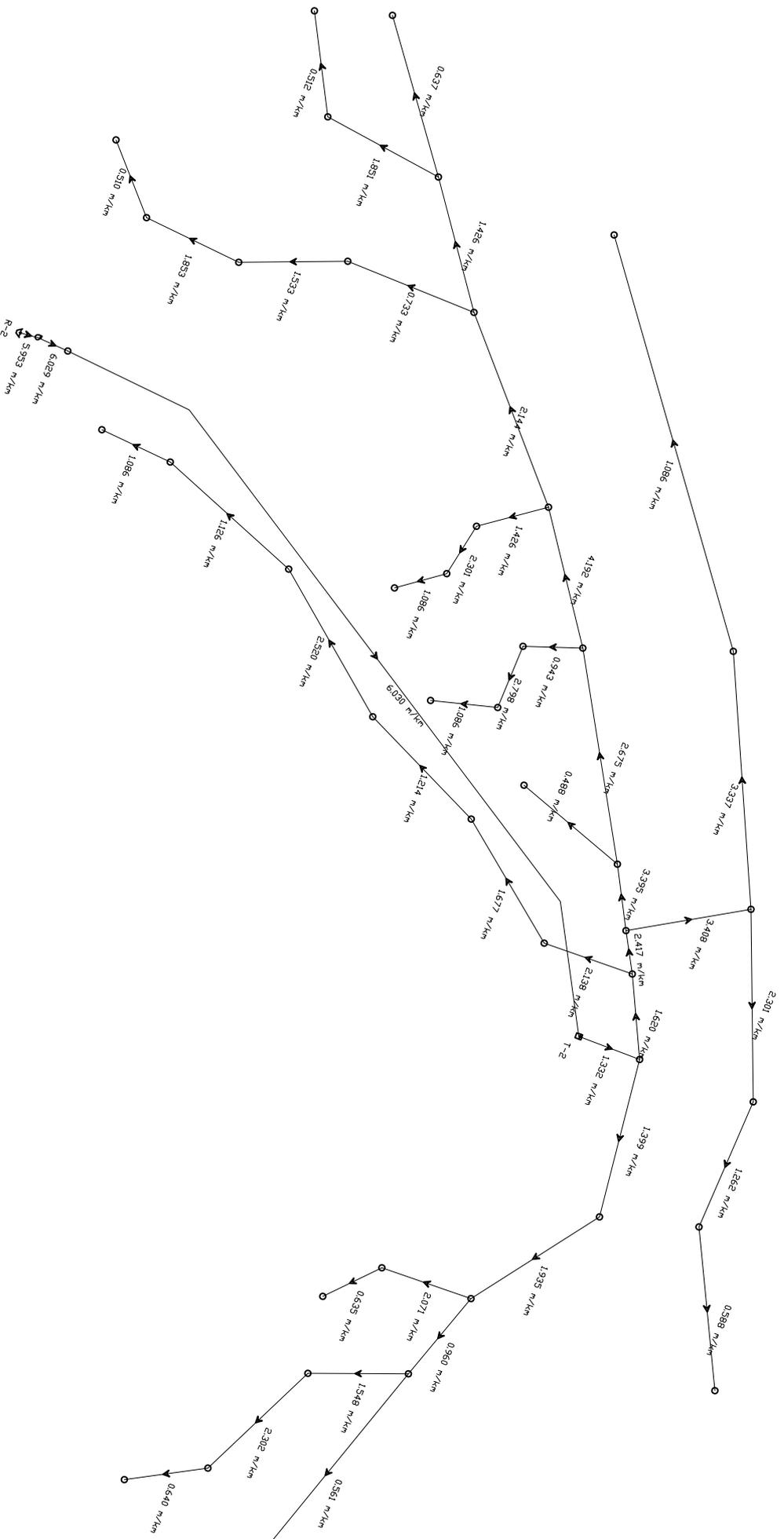


Water Network Project (Pressure)

Survey: By		Eng. M. Moaine & M. Mehdi		Project		Shelher		Islamic Relief Worldwide	
Drawing: By		Eng. M. Mehdi		Section		Water Network		IR-W	
Design : By		Eng. M. Moaine		Date		16/10/2023		Unit	
Checked: By		Eng. Dawod Shafiq		Province		Kandahar		Scale	
Approved: By				District		Arghastan		NO	
				Village		Zarin Zai		Sheet No	
								0	



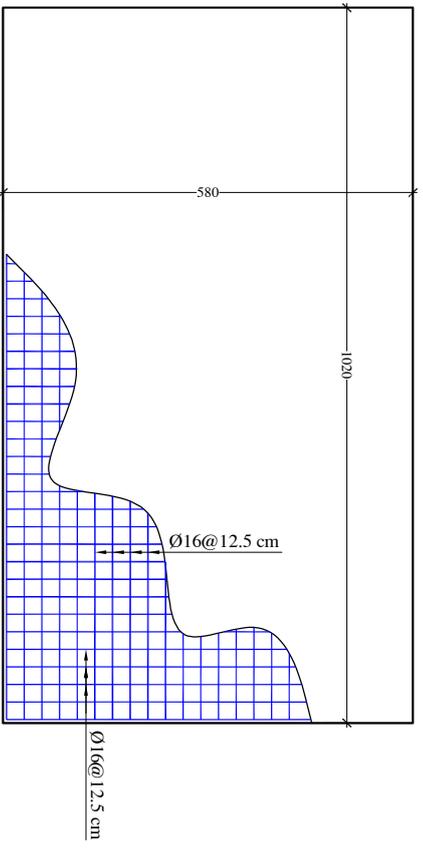
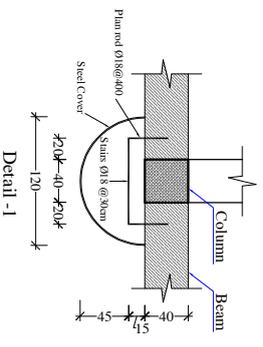
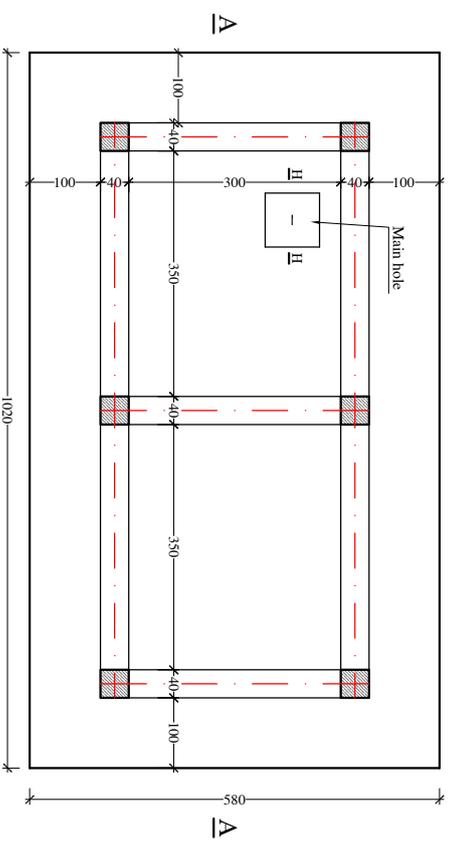
(Head loss)



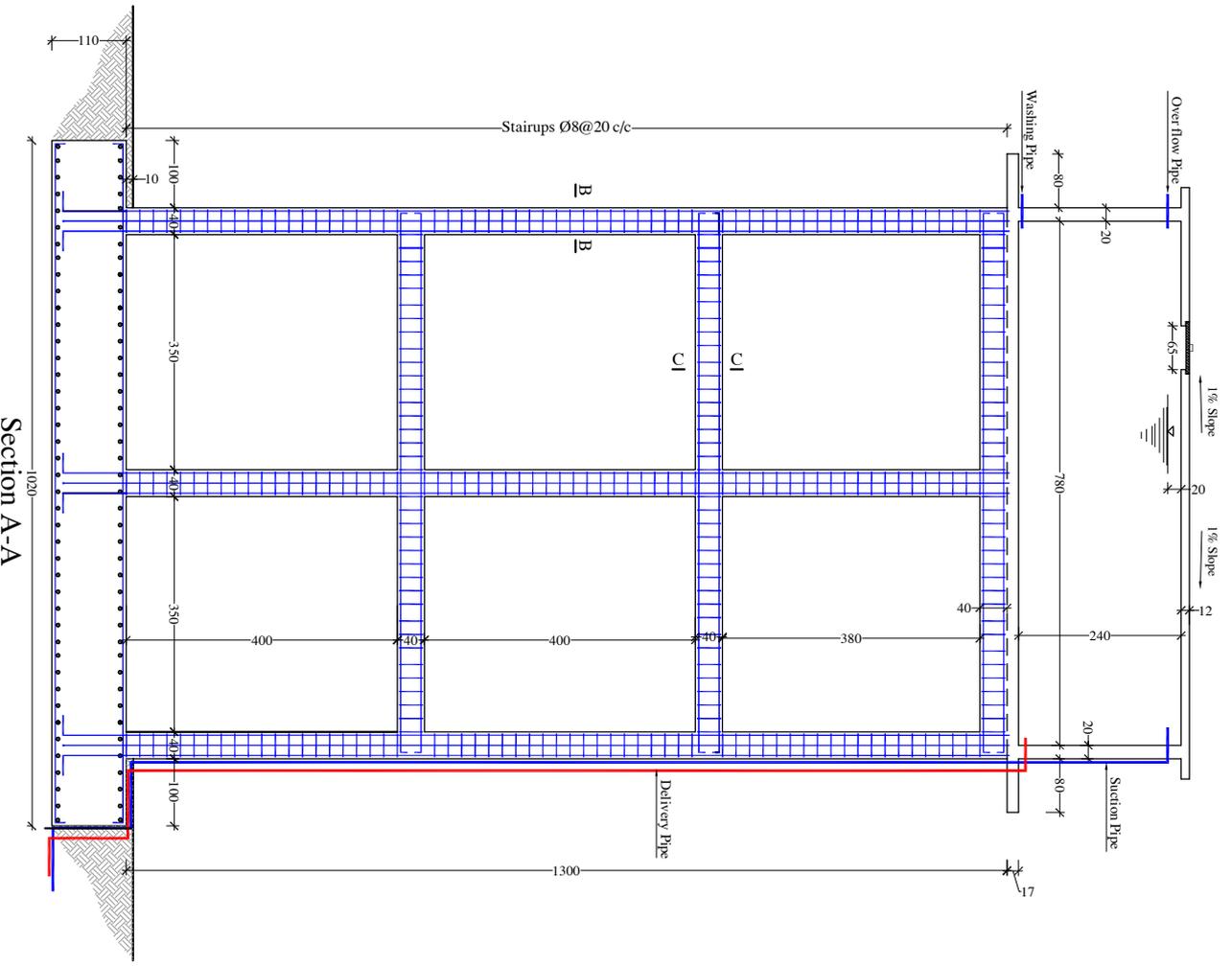
Water Network Project (Head Loss)

Survey: By		Eng. M. Moaine & M. Mehdi		Project		Sheler		Islamic Relief Worldwide			
Drawing: By		Eng. M. Mehdi		Section		Water Network		IR-W			
Design : By		Eng. M. Moaine		Date		16/10/2023		Unit		cm	
Checked: By		Eng. Dawod Shafiq		Province		Kandahar		Scale		NO	
Approved: By				District		Arghastan		Sheet No		0	
				Village		Zarin Zai					

Plan



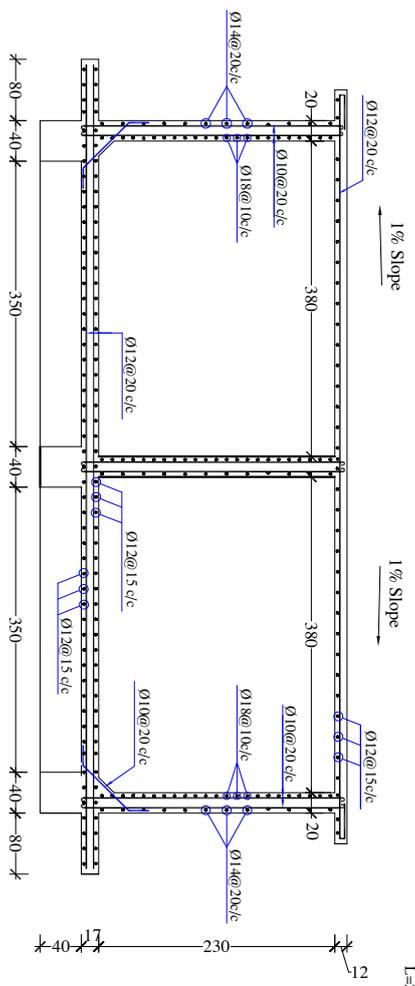
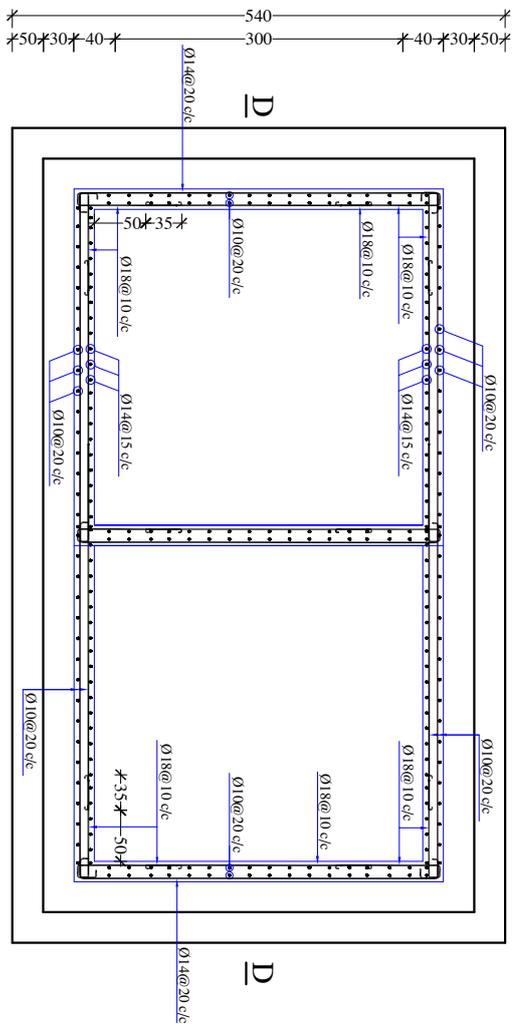
Reinforcement Plan of Footing



Section A-A

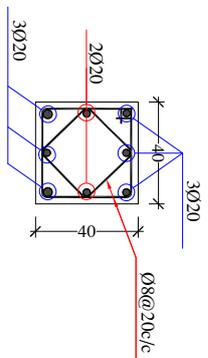


TS AFGHANISTAN Ministry of Rural Rehabilitation and Development WASTIP		SURVEYED BY Farah RMD	CHECKED BY Eng. Mahmood	SCALE 1:1	SHEET NO 2/3	PROVINCE Kandahar	PROJECT NAME Water Supply Project
DESIGNED BY Eng. Najibullah	REVIEWED BY Eng. Fazel Omer "Zahid"	DATE 17.08.2016	APPROVED BY Eng. Ghulam Qader	DRAWING NO.	DISTRICT Aghlshan	VILLAGE Zaini Zai	DRAWING TITLE 50 m ³ Elevated water reservoir
DRAWN BY Eng. Najibullah							

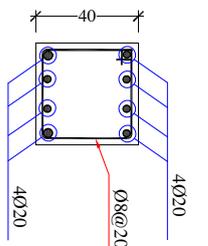


Reinforcement Plan of Water Tank

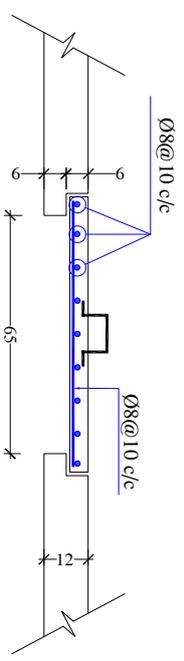
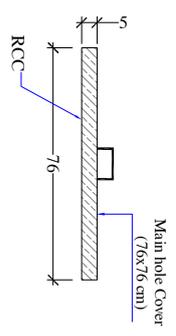
Corner Steel Bar Ø18 @ 10 c/c
L=250mm



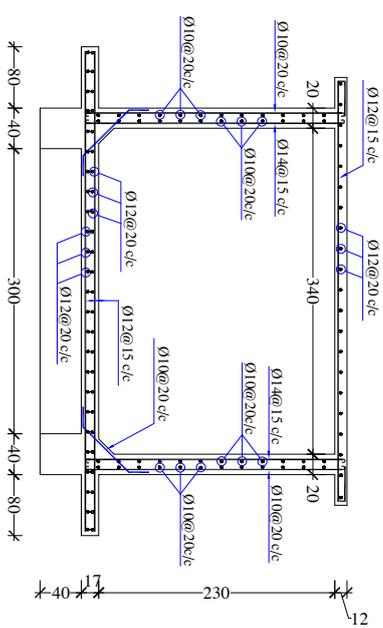
Section B-B



Section C-C



Section H-H

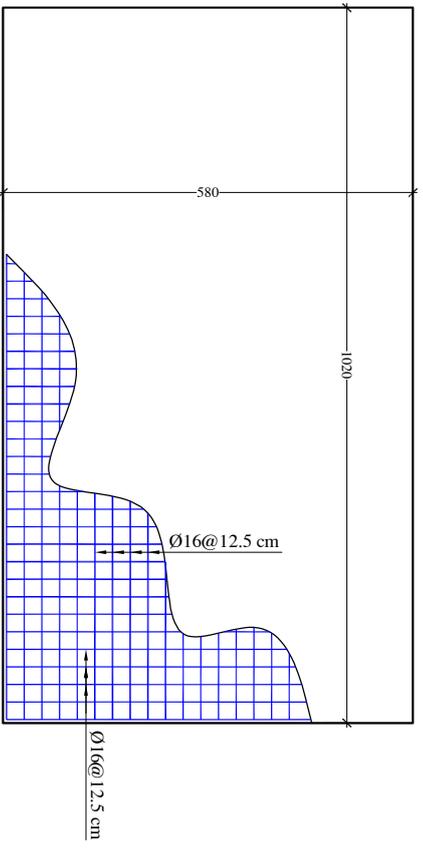
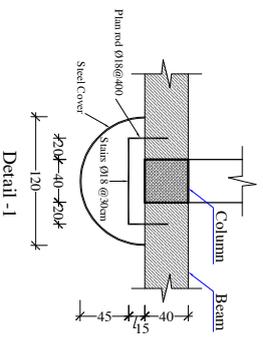
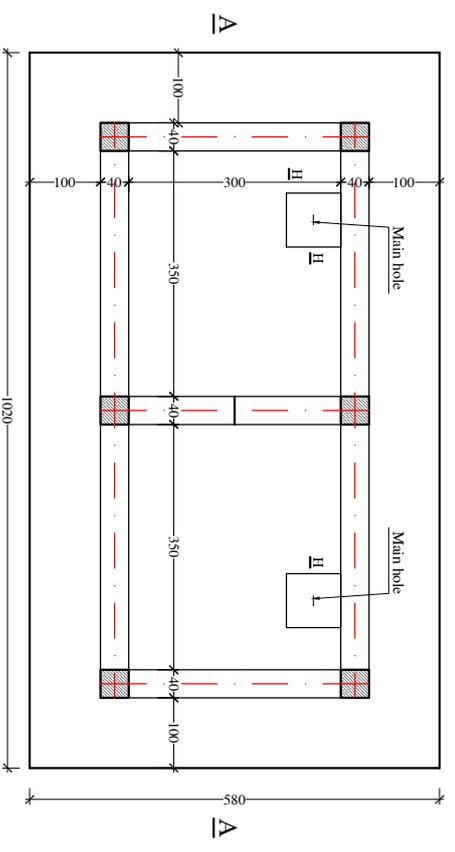


Section G-G

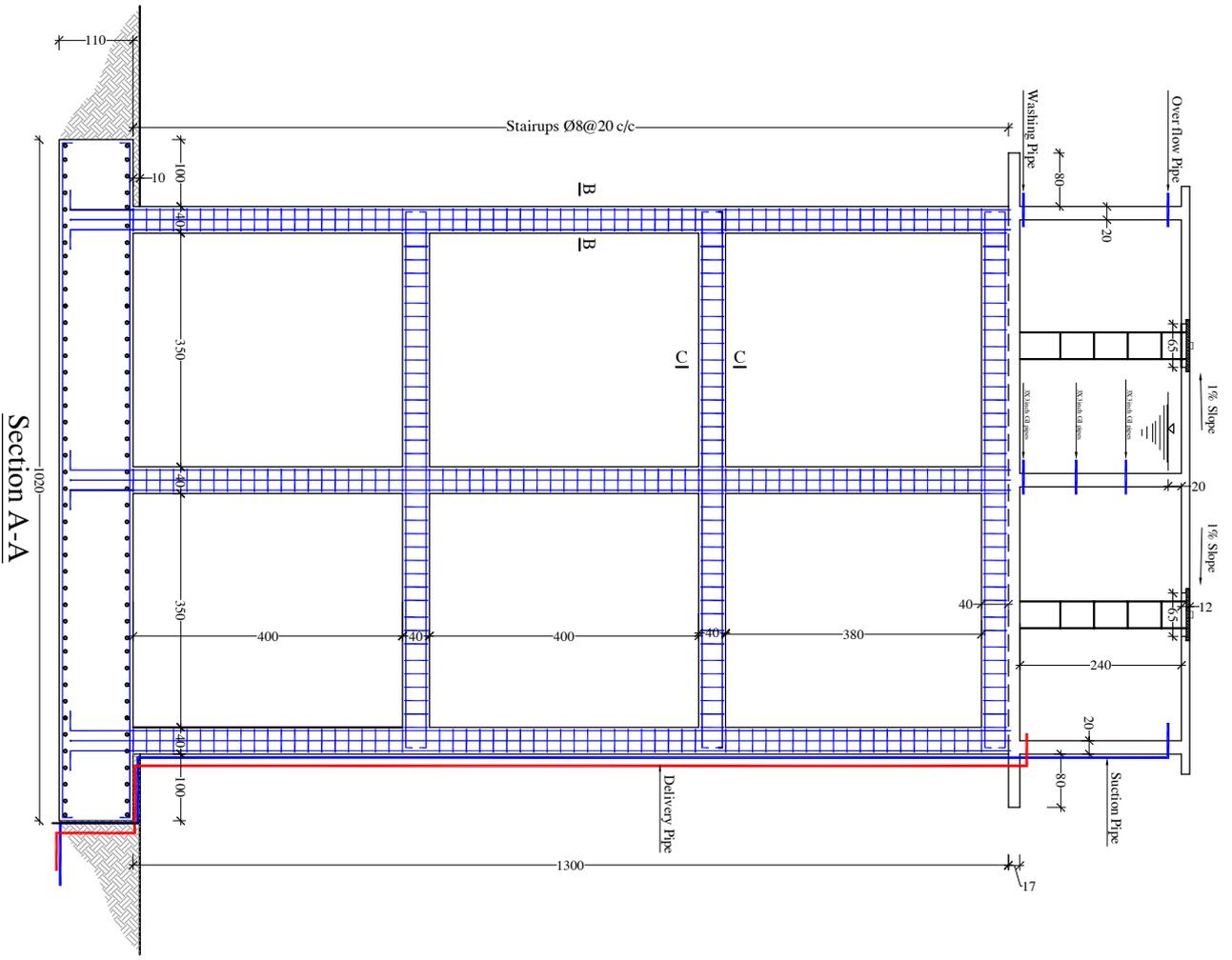


		TS AFGHANISTAN Ministry of Rural Rehabilitation and Development WATSIP	
SURVEYED BY	Farah RRD	CHECKED BY	Eng. Mahmood
DESIGNED BY	Egr. Najibullah	REVIEWED BY	Eng. Fazel Omer "Zahid"
DRAWN BY	Egr. Najibullah	APPROVED BY	Eng. Ghulam Qader
SCALE		DATE	17.08.2016
SHEET NO	3	PROVINCE	Kandahar
DISTRICT	Anglhasan	VILLAGE	Zam Zai
PROJECT NAME		Water Supply Project	
DRAWING TITLE		50 m ³ Elevated water reservoir	

Plan



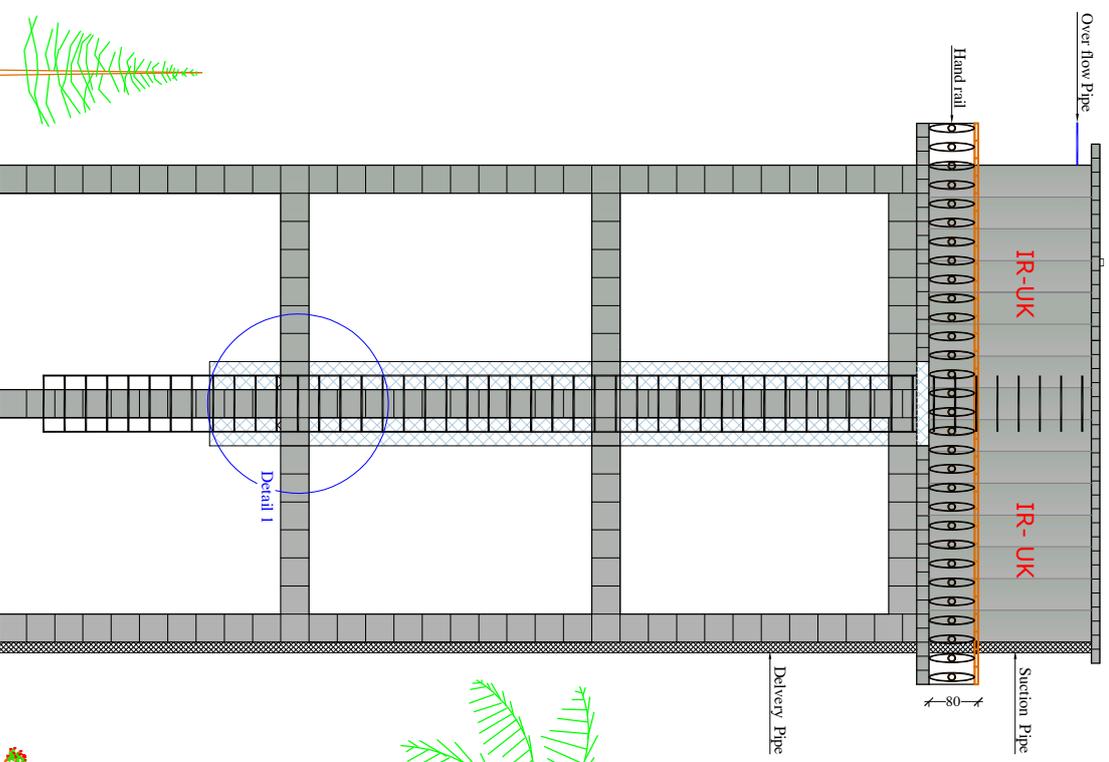
Reinforcement Plan of Footing



Section A-A



TS AFGHANISTAN Ministry of Rural Rehabilitation and Development WASTIP		SURVEYED BY Farah RMD	CHECKED BY Eng. Mahmood	SCALE 1:10	SHEET NO 2/3	PROVINCE Kandahar	PROJECT NAME Water Supply Project
DESIGNED BY Eng. Najibullah	REVIEWED BY Eng. Fazel Omer "Zahid"	DATE 17.08.2016	APPROVED BY Eng. Ghulam Qader	DRAWING NO.	DISTRICT Aghlshan	VILLAGE Zaini Zai	DRAWING TITLE 50 m ³ Elevated water reservoir
DRAWN BY Eng. Najibullah							



Elevation of Water Tank Tower

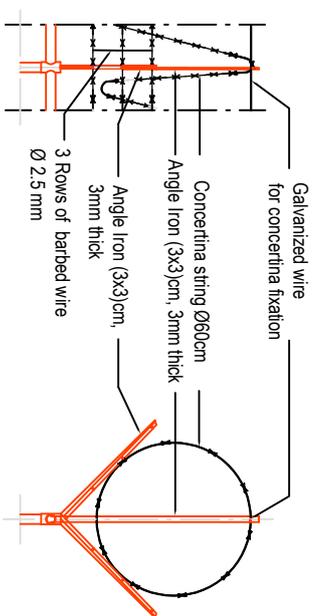
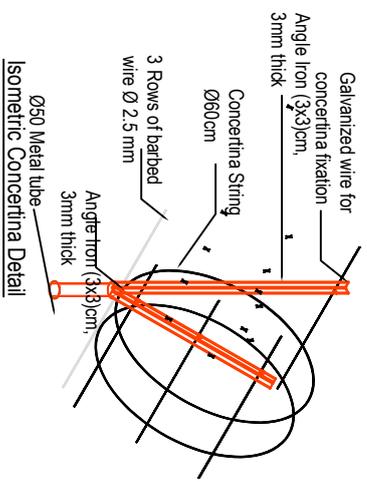
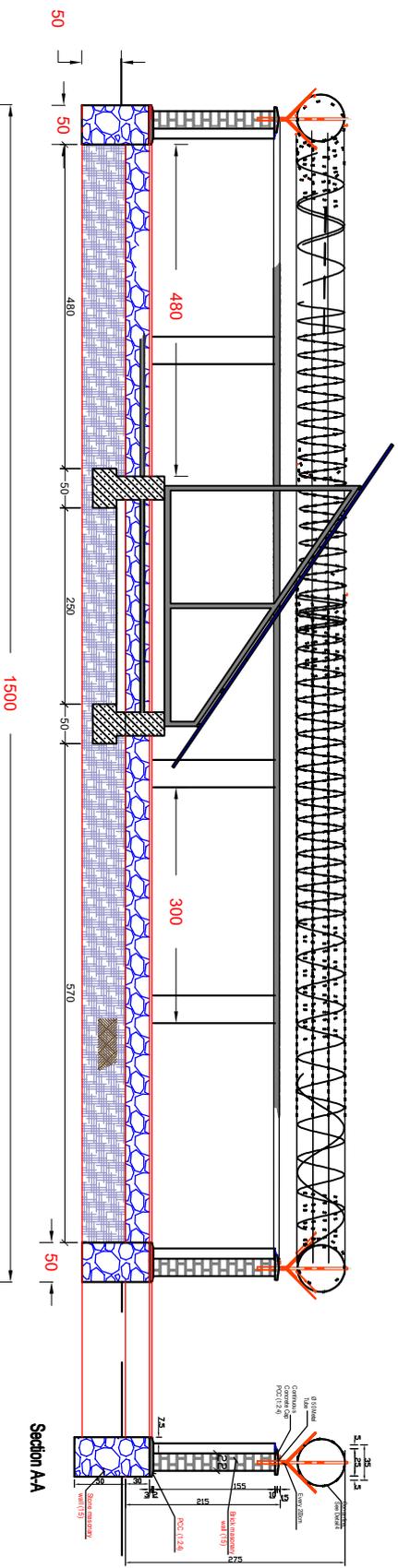
- Note:
1. All dimension are in cm
 2. Mark of concrete 200 kg/cm²
 3. Delivery and Suction pipe should be protected (Isolation)
 4. Assume bearing capacity is 2 kg/cm²



SURVEYED BY Farah RMD		CHECKED BY Eng. Mahmood		SCALE 		SHEET NO 1 / 3	
DESIGNED BY Eng. Najibullah		REVIEWED BY Eng. Fazel Omer "Zahid"		DATE 17.08.2016		PROVINCE Kandahar	
DRAWN BY Eng. Najibullah		APPROVED BY Eng. Ghulam Qader		DRAWING NO. 		DISTRICT Aghlshan	
						VILLAGE Zaini Zai	
						PROJECT NAME Water Supply Project	
						DRAWING TITLE 50 m ³ Elevated water reservoir	

Boundary Wall Section

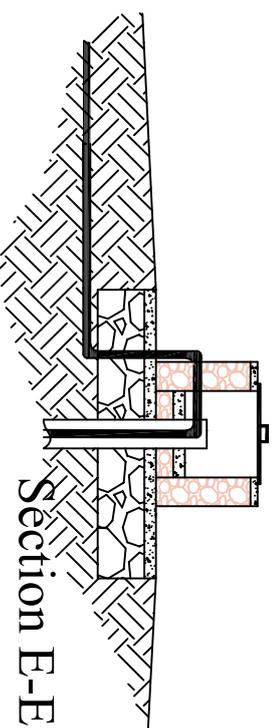
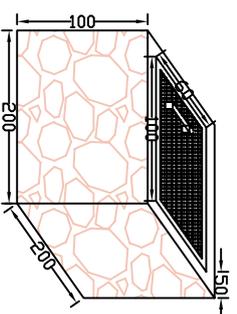
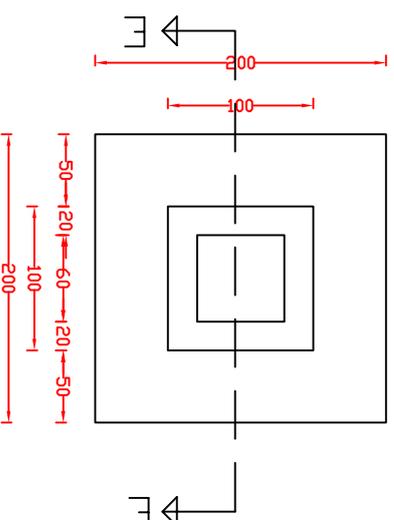
Section (B-B)



Water Network Project Boundary Wall Section

Survey: By	Eng. M. Moaine & M. Mehdi	Project	Shelter	Islamic Relief Worldwide	
Drawing: By	Eng. M. Mehdi	Section	Water Network	IR-W	
Design : By	Eng. M. Moaine	Date	16/10/2023	Unit	cm
Checked: By	Eng. Dawod Shafag	Province	Kandahar	Scale	NO
Approved: By		District	Arghastan	Sheet No	0
		Village	Zarin Zai		

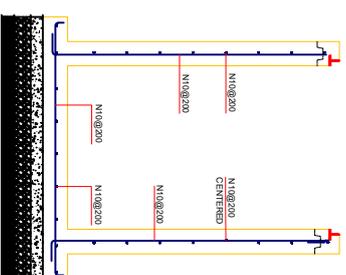
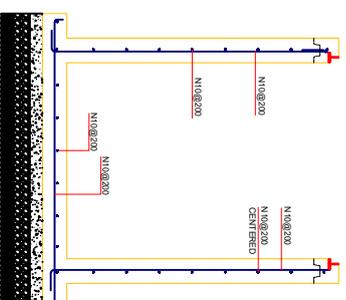
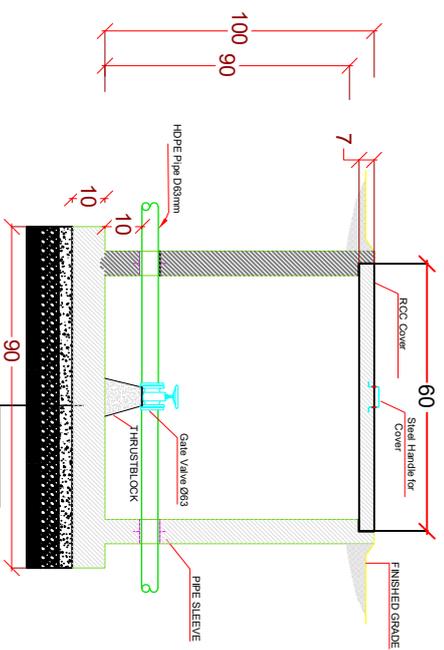
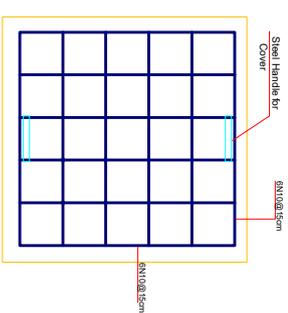
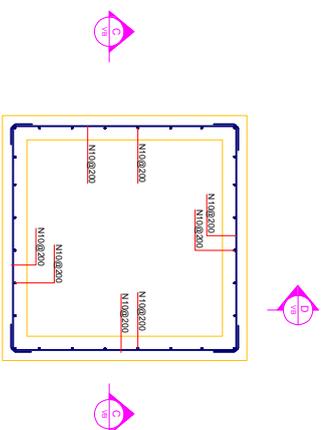
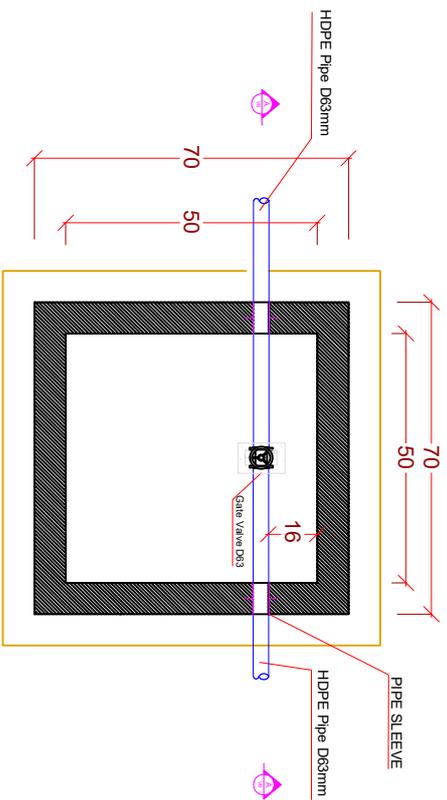
Plan of Well Apron protection



Water Network Project Plan of Well Apron

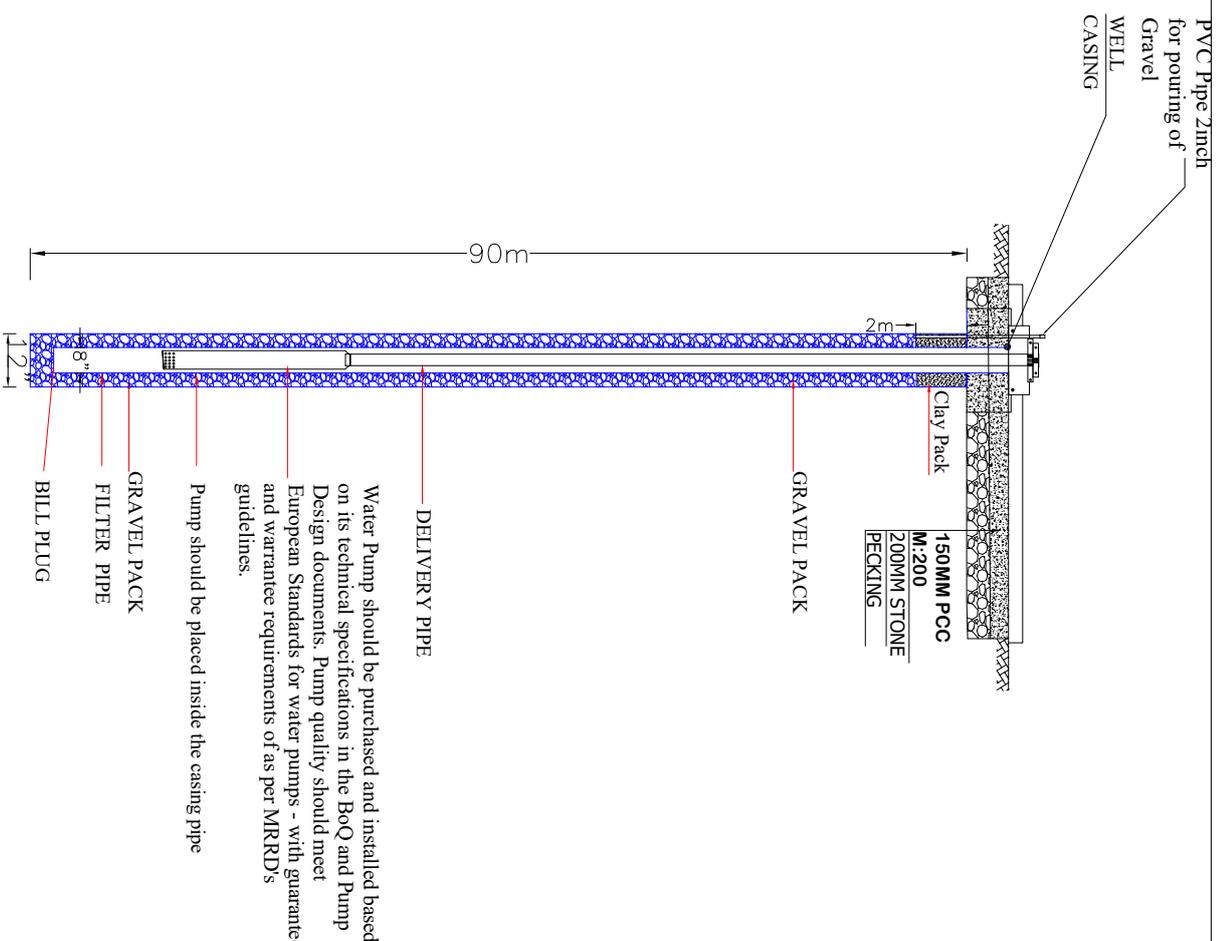
<i>Survey: By</i>	<i>Eng. M.Moaine & M.Mehdi</i>	<i>Project</i>	<i>Shelter</i>	<i>Islamic Relief Worldwide</i>	
<i>Drawing: By</i>	<i>Eng.M.Mehdi</i>	<i>Section</i>	<i>Water Network</i>	<i>IR-W</i>	
<i>Design : By</i>	<i>Eng.M.Moaine</i>	<i>Date</i>	<i>16/10/2023</i>	<i>Unit</i>	<i>cm</i>
<i>Checked: By</i>	<i>Eng.Dawod Shafag</i>	<i>Province</i>	<i>Kandahar</i>	<i>Scale</i>	<i>NO</i>
<i>Approved: By</i>		<i>District</i>	<i>Arghastan</i>	<i>Sheet No</i>	<i>0</i>
		<i>Village</i>	<i>Zarin Zaiy</i>		

Well Manhole



Water Network Project Well Manhole

Survey: By	Eng. M. Moaine & M. Mehdi	Project	Shelter	Islamic Relief Worldwide	
Drawing: By	Eng. M. Mehdi	Section	Water Network	IR-W	
Design : By	Eng. M. Moaine	Date	16/10/2023	Unit	cm
Checked: By	Eng. Dawod Shafag	Province	Kandahar	Scale	NO
Approved: By		District	Arghastan	Sheet No	0
		Village	Zarin Zaiy		



Notes

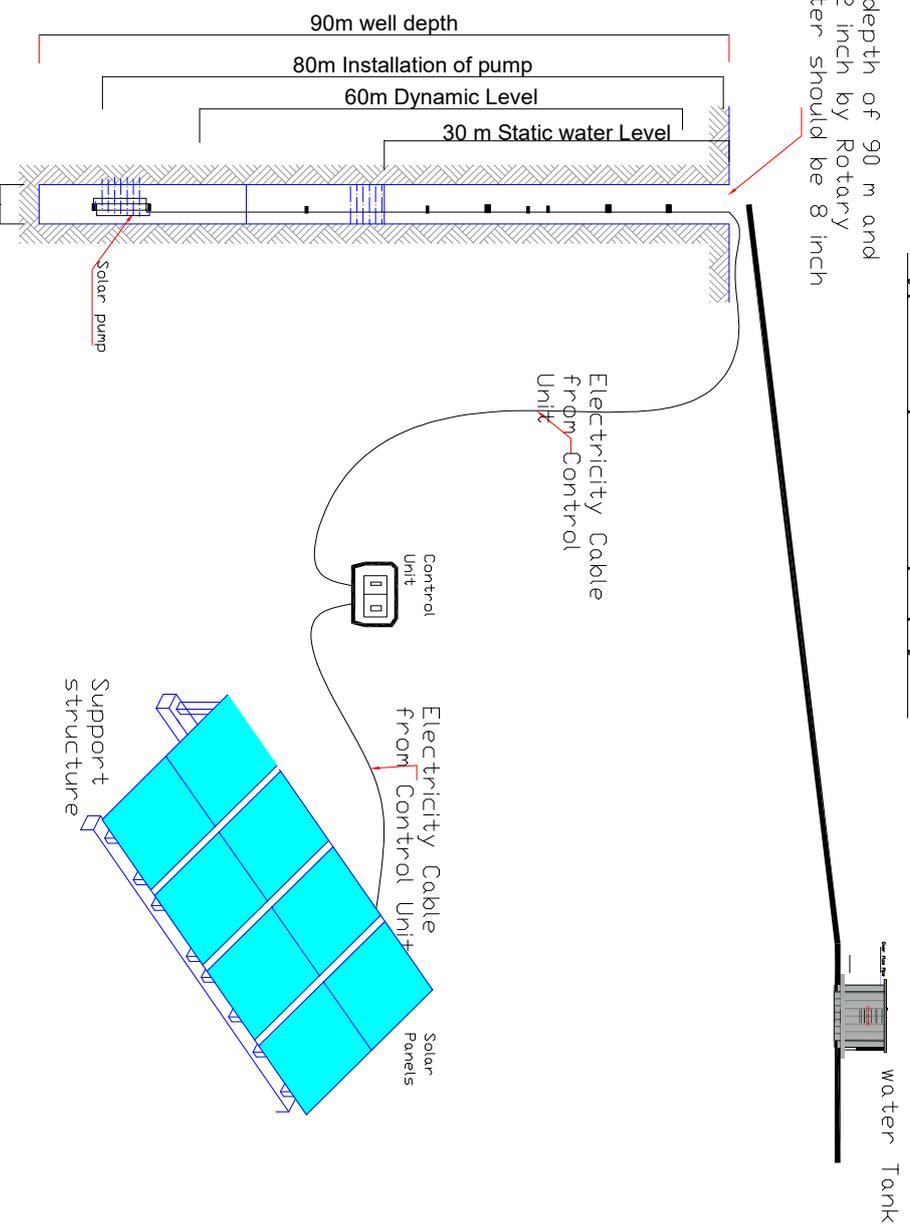
- 1-Well designed by WTSAN department.
- 2-The working pressure for pipes and valves will be 16 or 20 bar (290 PSI)
- 3- If the ground stratum are made of bed rocks it no need for installation of casing pipes. if the stratum are made of Loss soil it should be stabilized by installation casing pipes.
- 4-Each drilled strata depth should be noted and soil sample should be kept in a sample box separately .
- 5-Pump test for 8 hours.
- 6-the depth of filter pipe has considered based on the previous experience . the true depth will be determined after well practical drilling.

Water Network Project Well

Survey: By		Eng. M.Moaine & M.Mehdi		Project		Shelter		Islamic Relief Worldwide	
Drawing: By		Eng. M.Mehdi		Section		Water Network		IR-W	
Design : By		Eng. M.Moaine		Date		16/10/2023		Unit	
Checked: By		Eng. Dawod Shafag		Province		Kandahar		Scale	
Approved: By				District		Arghastan		NO	
		Village		Zarin Zaiy		Sheet No		0	
									

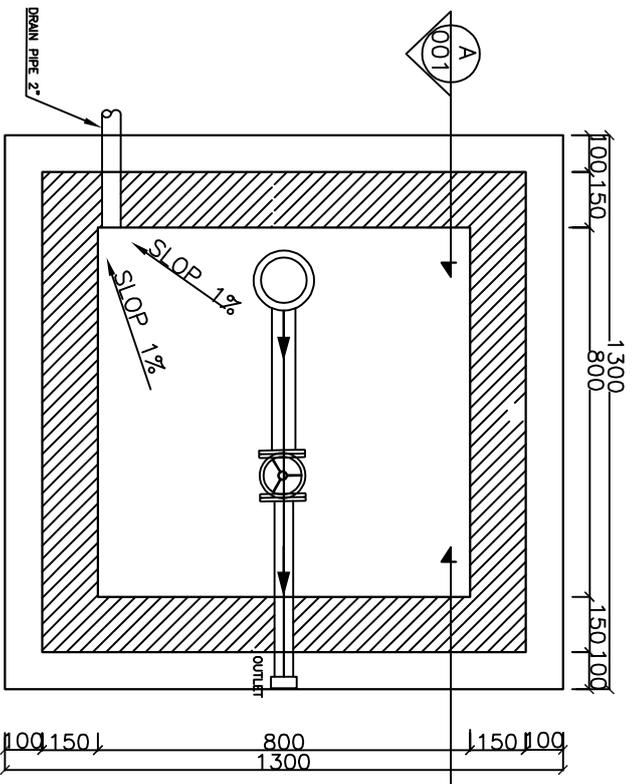
Typical Site plan of Solar pump system

New proposed well with the depth of 90 m and diameter of drilling will be 12 inch by Rotary machine , the casing and filter should be 8 inch Class D

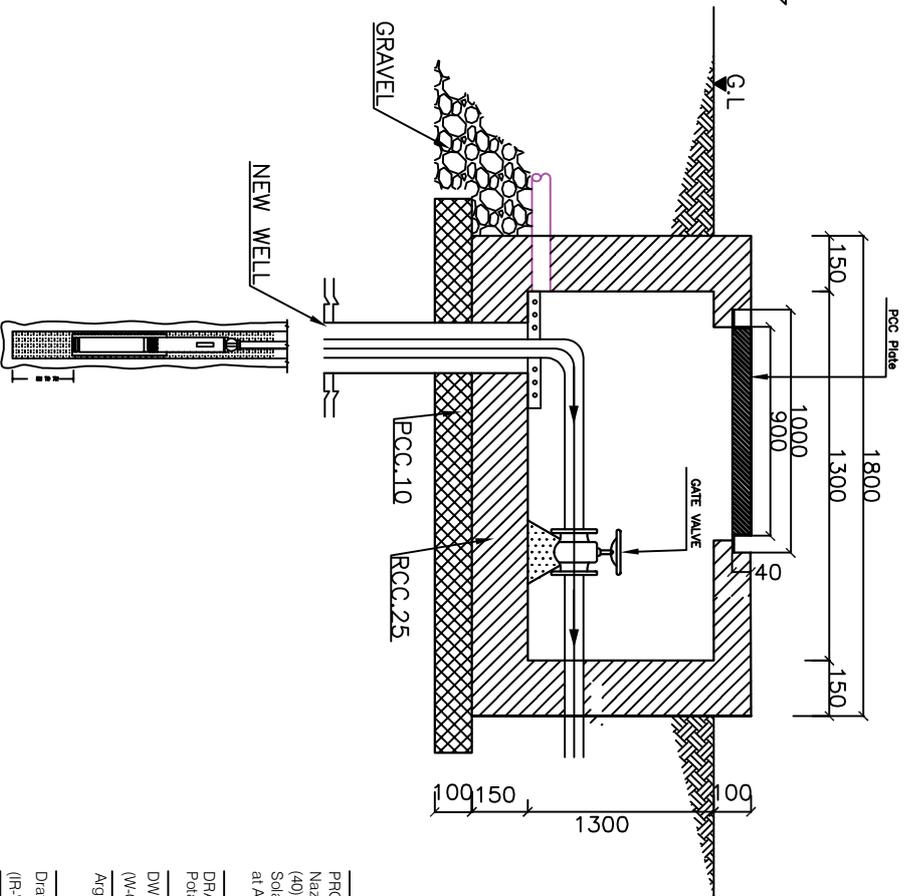


Water Network Project Well

<i>Survey: By</i>		<i>Eng. M.Moaine & M.Mehdi</i>		<i>Project</i>		<i>Shelter</i>		<i>Islamic Relief Worldwide</i>	
<i>Drawing: By</i>		<i>Eng.M.Mehdi</i>		<i>Section</i>		<i>Water Network</i>		<i>IR-W</i>	
<i>Design : By</i>		<i>Eng.M.Moaine</i>		<i>Date</i>		<i>16/10/2023</i>		<i>Unit</i>	
<i>Checked: By</i>		<i>Eng. Dawod Shafag</i>		<i>Province</i>		<i>Kandahar</i>		<i>cm</i>	
<i>Approved: By</i>				<i>District</i>		<i>Arghastan</i>		<i>Scale</i>	
				<i>Village</i>		<i>Zarin Zaiy</i>		<i>Sheet No</i>	
								<i>0</i>	
									



01 Well Chamber Plan
SCALE: NTS



02 WELL AND WELL CHAMBER SECTION A-A
SCALE: NTS

PROJECT NAME :Shaher
Nazad Khil PROJECT
(40)m Deep Well With Pump and
Solar System For Each House cantion
at Aghastan

DRAWING TITLE
Potable Water Well Plan and Section

DWG NUMBER
(W-01)

Aghastan District

Dra: Designed & Drawn By
(IR-W Area Team)

APPROVED BY INDEX

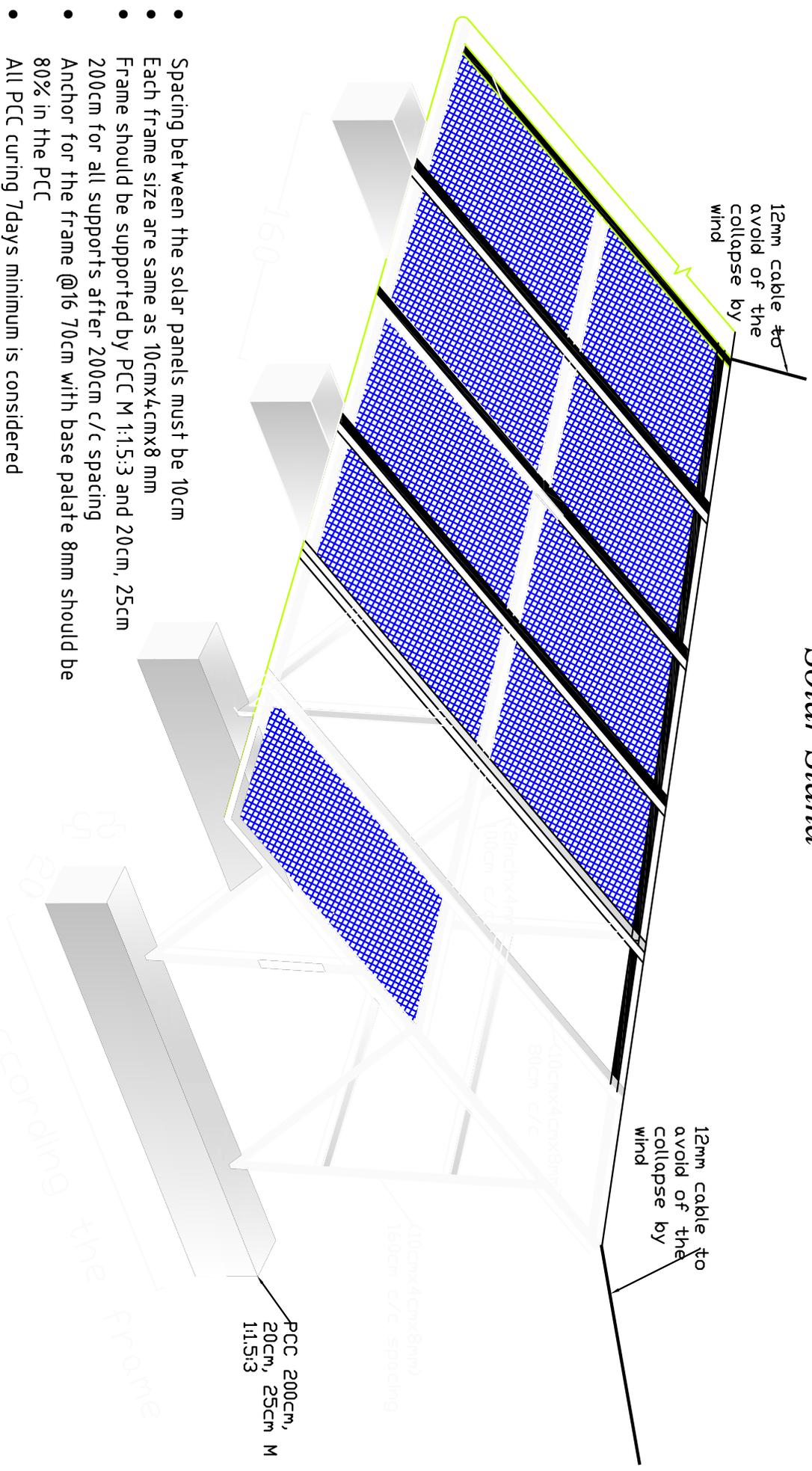
SCALE(NTS) DATE:04/2023

Remarks

Water Network Project Well

Survey: By	Eng. M.Moaine & M.Mehdi	Project	Shelter	Islamic Relief Worldwide	
Drawing: By	Eng. M.Mehdi	Section	Water Network	IR-W	
Design : By	Eng. M.Moaine	Date	16/10/2023	Unit	cm
Checked: By	Eng. Dawod Shafag	Province	Kandahar	Scale	NO
Approved: By		District	Arghastan	Sheet No	0
		Village	Zarin Zaiy		

Solar Stand



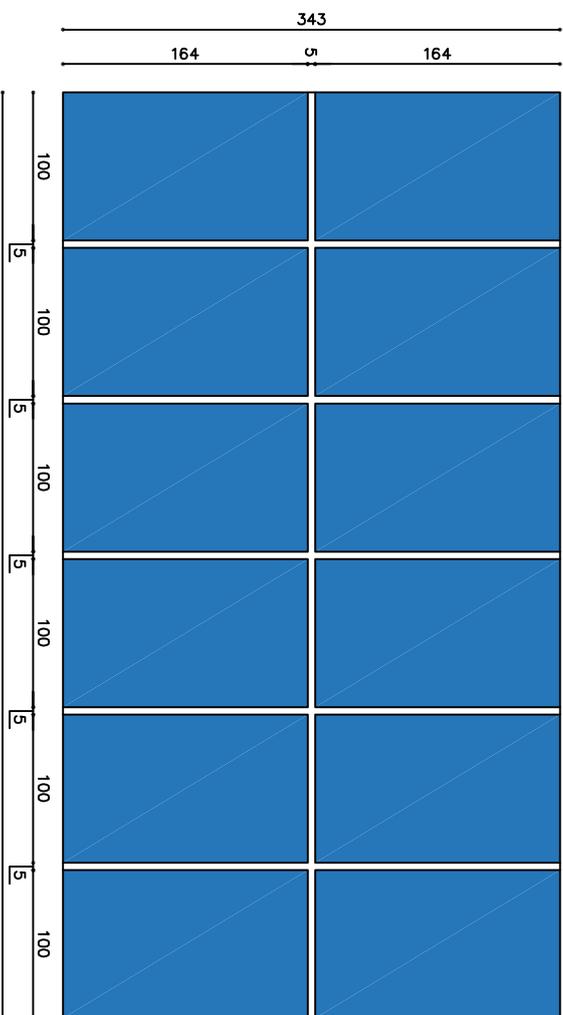
- Spacing between the solar panels must be 10cm
- Each frame size are same as 10cmx4cmx8 mm
- Frame should be supported by PCC M 1:1.5:3 and 20cm, 25cm 200cm for all supports after 200cm c/c spacing
- Anchor for the frame @16 70cm with base palatte 8mm should be 80% in the PCC
- All PCC curing 7days minimum is considered

Water Network Project Solar Stand

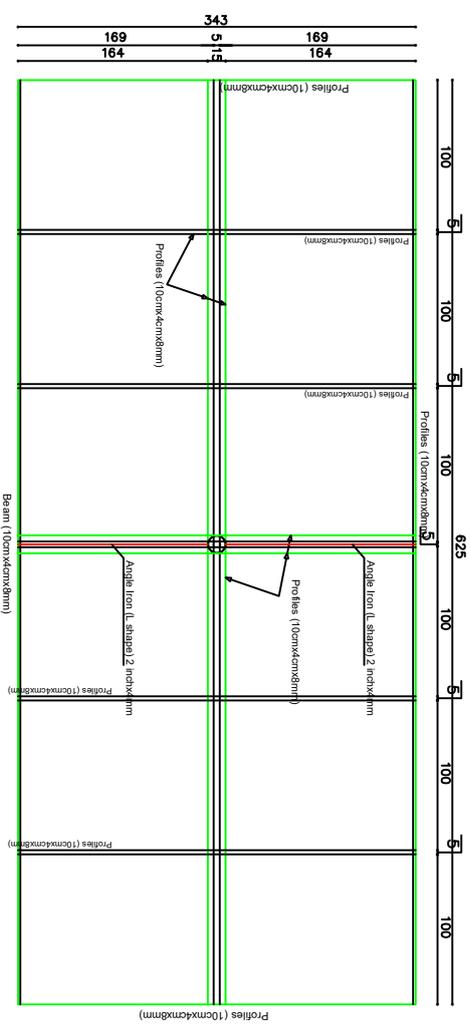
Survey: By	Eng. M. Moaine & M. Mehdi	Project	Shelter	Islamic Relief Worldwide		
Drawing: By	Eng. M. Mehdi	Section	Water Network	IR-W		
Design : By	Eng. M. Moaine	Date	16/10/2023	Unit	cm	
Checked: By	Eng. Dawod Shafag	Province	Kandahar	Scale	NO	
Approved: By		District	Arghastan	Sheet No	0	
		Village	Zarin Zaiy			

Typical Solar Panel Frame

plan of solar panels



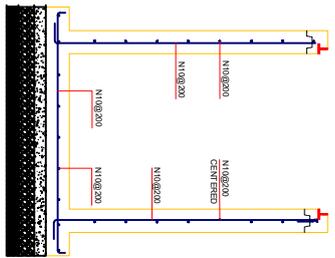
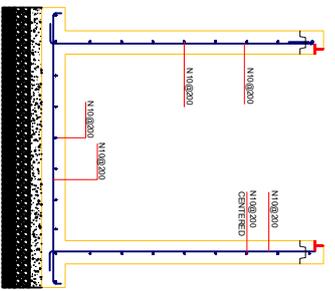
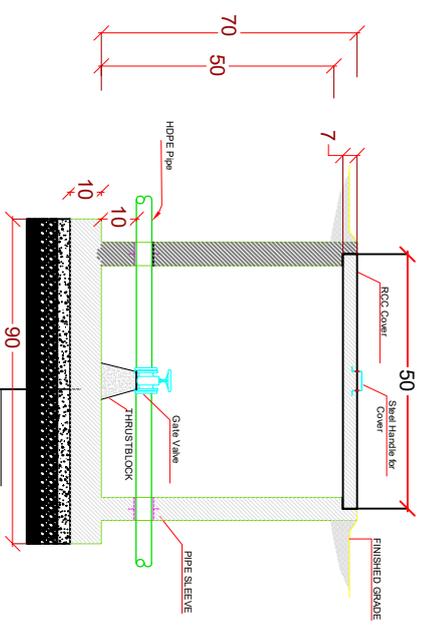
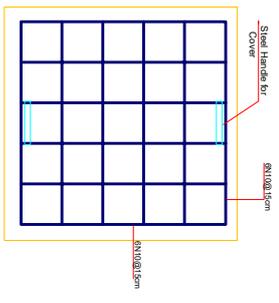
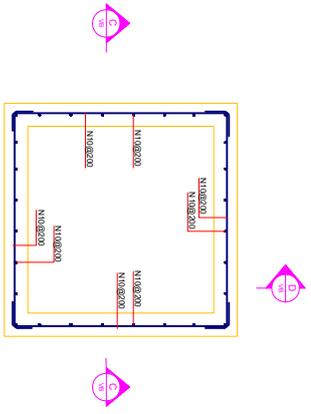
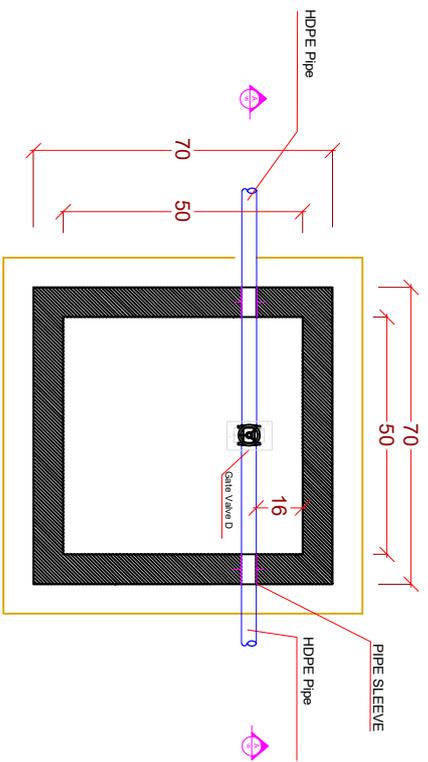
plan of solar panel's frame



Water Network Project Solar Panel Frame

Survey: By	Eng. M. Moaine & M. Mehdi	Project	Shelter	Islamic Relief Worldwide	
Drawing: By	Eng. M. Mehdi	Section	Water Network	IR-W	
Design : By	Eng. M. Moaine	Date	16/10/2023	Unit	cm
Checked: By	Eng. Dawod Shafag	Province	Kandahar	Scale	NO
Approved: By		District	Arghastan	Sheet No	0
		Village	Zarin Zaiy		

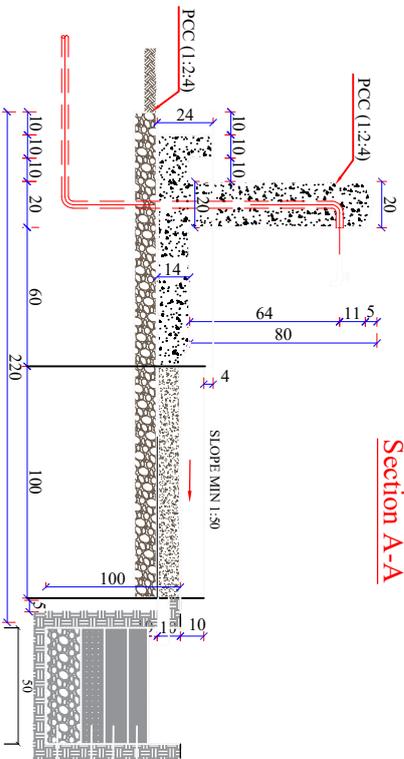
Gate Manhole



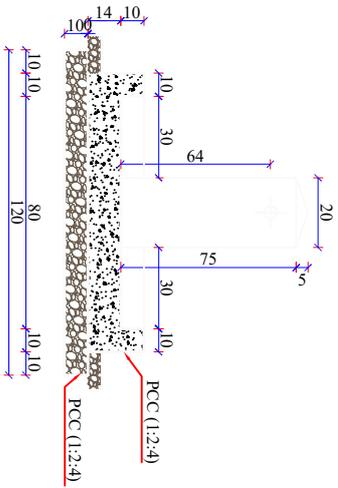
Water Network Project Manhole

Survey: By	Eng. M. Moaine & M. Mehdi	Project	Shelter	Islamic Relief Worldwide	
Drawing: By	Eng. M. Mehdi	Section	Water Network	IR-W	
Design : By	Eng. M. Moaine	Date	16/10/2023	Unit	cm
Checked: By	Eng. Dawod Shafag	Province	Kandahar	Scale	NO
Approved: By		District	Arghastan	Sheet No	0
		Village	Zarin Zaiy		

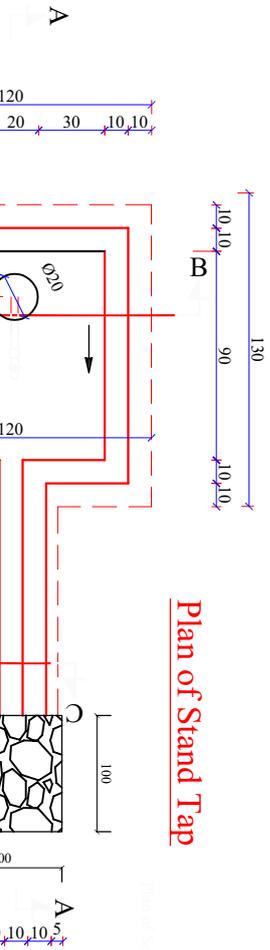
Plan of Stand Tap



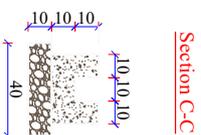
Section A-A



Section B-B



Plan of Stand Tap

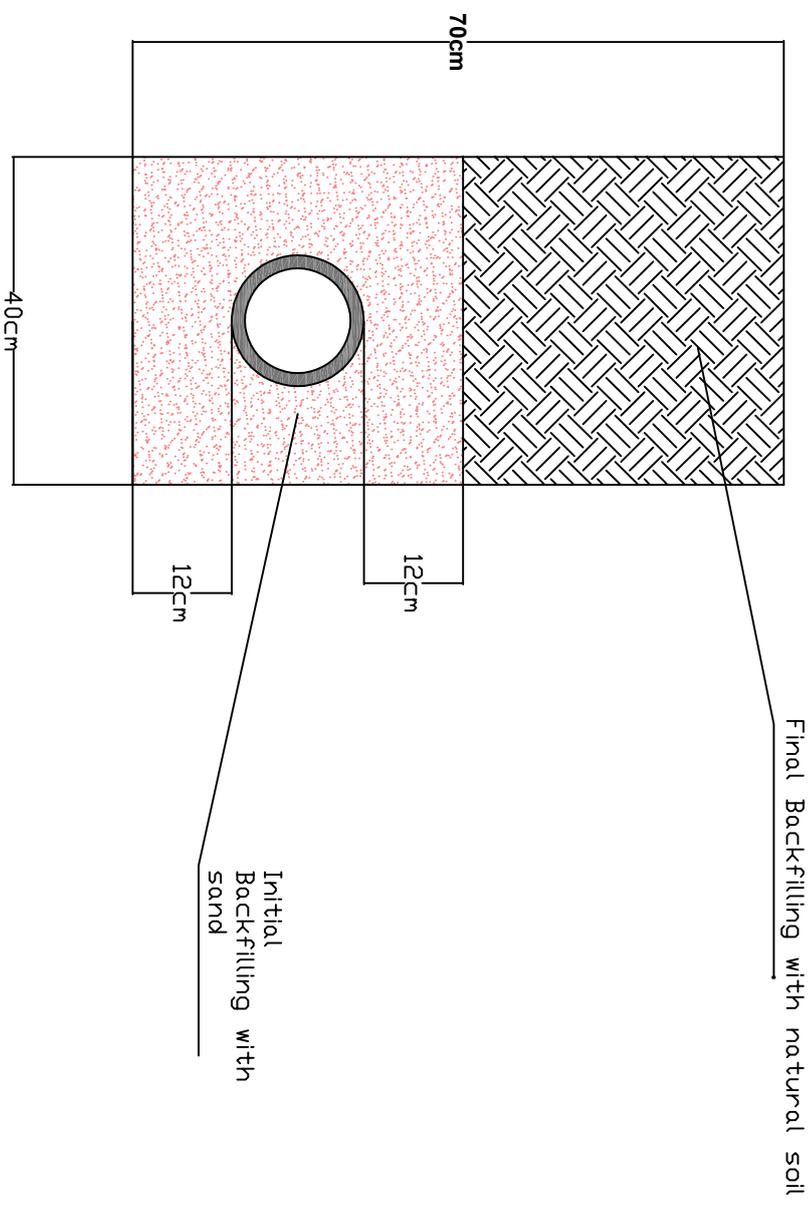


Section C-C

Water Network Project Plan of Stand Tap

Survey: By	Eng. M. Moaine & M. Mehdi	Project	Shelter	Islamic Relief Worldwide		
Drawing: By	Eng. M. Mehdi	Section	Water Network	IR-W		
Design : By	Eng. M. Moaine	Date	16/10/2023	Unit	cm	
Checked: By	Eng. Dawod Shafag	Province	Kandahar	Scale	NO	
Approved: By		District	Arghastan	Sheet No	0	
		Village	Zarin Zaiy			

Trench for Pipe



Section of trench for pipe laying

Water Network Project Trench

		<i>Islamic Relief Worldwide</i>			
Survey: By	Eng. M. Moaine & M. Mehdi	Project	Shelter		
Drawing: By	Eng. M. Mehdi	Section	Water Network		
Design : By	Eng. M. Moaine	Date	16/10/2023	Unit	cm
Checked: By	Eng. Dawod Shafag	Province	Kandahar	Scale	NO
Approved: By		District	Arghastan	Sheet No	0
		Village	Zarin Zaiy		





Islamic Relief Worldwide-Afghanistan
Kandahar Area Office
Shelter UK Project
Solar Pump Water Network Project

Zarin Zai Village

دسولر پمپ محاسبوی جدول

ارقام	تشریحات		شماره
1890	Population	نفوس	1
270	Family	دفا میلونو تعداد	2
2.2	Population growth/year	دنفوس کلنی زیاتوالی	3
15	Design period	د دیزاین زمان	4
2620	Design population	دیزاین نفوس	5
30	Daily Demand l/c/d	په روخ کی دمصرف نورم	6
78.6	Average daily Flow for design population m ³ /dy	د دیزاین شوی نفوس لپاره د متوسطی روخی جریان	7
1.3	Peak daily factor	د روخی اعظمی مصرف ضریب	8
102.2	Peak daily flow m ³ /dy	د هغه روخی لپاره به چی مصرف یی اعظمی وی	9
12.8	Peak hourly flow m ³ /h = (row9/8)	د هغه اوبو اعظمی مقدار چی سولر پمپ یی له څه څخه په ساعت کی پمپ کوی، د اعظمی ورخی دمصرف تقسیم به ۸ ساعته	10
80+37+2+1=130m	TDH=H _{ds} +H _{loss} +1m	د واثر پمپ لپاره ارتفاع، د څاه له دینامیک سطحی تر ذخیری ارتفاع جمعه د فشار ضایعات یو متر دخروج لپاره فشار په متر	11
120.0	TDH	مجموعی ارتفاع	
4.2	Hydraulic power of the pump (kW)	هایدرولیکی فشار Ph	12
1.25	η_p Pump efficiency (%). η_p	د پمپ موثریت ۷۵٪	13
5.2	Shaft power of the pump (kW)=75%Ph	د واثر پمپ د شافت قدرت ۷۵٪ Ph	14
1.24	Coefficient C= (1.1-1.2-1.5-2)	د موتور د موثریت ضریب 1.1-1.2-1.5-2	15
6.5	Power to the Motor (kW)	د واثر پمپ د موتور یانصب قدرت P _m	16
6.5	available	د تولید سندر	17
0.85	η (Inverter)= inverter efficiency 85% = 7.6	د انورتر موثریت ۸۵٪	18
0.80	η (factor) = efficiency factor is normally 80%	د سستم موثریت ۸۰٪	19
9.6	PV	دلمریزو تختو د بریښنا قدرت په کیلووات	20
9558.8		دلمریزو تختو د بریښنا قدرت په وات	21
19.1	20.0	دلمریزو تختو تعداد بریښنا قدرت په وات	22

دشبکی د دیزاین د ارقامو جدول

Zarin Zai		شمار
ارقام	تشریحات	
1890	Population	1 نفوس
270	Famil	2 د فامیلونو تعداد
2.2	Population growth/year	3 د نفوس کلنی زیاتوالی
15	Design period	4 د دیزاین زمان
2620	Design population	5 دیزاین نفوس
30	Daliy Demend l/c/d	6 په روځ کې دمصرف نورم
0.9	Everege daliy Flow for design population L/se	7 د دیزاین شوی نفوس لپاره د متوسطی روځی جریان
1.3	Peak daily factor	8 دروځنی اعظمی مصرف ضریب
1.2	Peak daliy flow l/sec	9 د هغه روځی لپاره اوبه چې مصرف یې اعظمی وی
2.5	Peak hourly factor	10 د په ساعت کې د اعظمی مصرف ضریب
3.0	Peak horly flow l/sec	11 د اعظمی مصرف په ساعت کې لیتر فی ثانیه (دشبکی د دیزاین جریان)
3.55	Well water yald= Pumped water l/sec- 12.8x1000/3600=3.55	12 د څاه ابدھی لیتر فی ثانیه، د واټر پمپ استخراج لیتر فی ثانیه
50	Volume of Reservoir 49% of(102m3)	13 د ذخیزی حجم د اعظمی روځی د مصرف (102 متر مکعب) ۴۹ فیصده په متر مکعب

Technical Specification for Zarin Zai Water Supply Pipe Scheme

1. Population: The village has 270 families.
2. The project includes the following tasks: - Drilling of tube well with Rotary machine 12" and 8" casing. - Construction of solar panels. - Construction of a 50 cubic meters RCC water Tank. - Construction of 8 valve boxes. - Excavation works, pipe laying, and extension from the Well to the reservoir and from the reservoir to the houses.
3. To regulate the daily water consumption balance, a 50 cubic meter capacity reinforced concrete (RCC) reservoir has been considered.
4. Source: The drinking water well is a rotary -type with a 12-inch diameter and a depth of 90 meters. The perceived static water level is 30 meters. Due to the lack of precise static water level data for the area, the well will be drilled according to specifications, followed by a pump test. Subsequent network actions and will depend on the test results. If the well yield is insufficient, **adjustments to the pump design and the number of solar panels may be necessary, or the project could be canceled.**
5. High Quality- Solar panels 500 to 540watt internationally certified- (meet European standards, and MRRD requirements). The vendor should guarantee PV-Panels 90% efficiency of its productivity for the first 10 years and 85 % efficiency of productivity for the subsequent 15 years.
6. Submersible pump with its Compatible inverter, control box and Fuse box as per BoQ and pump design sheet - Pump quality should meet European Standard for water pumps- with guaranty and warrantee requirements of as per MRRD's guideline).
7. The Site Plan includes the length and diameter of each pipe. Additionally, there is another table called "Pipe and Fittings Table" containing the diameter and length of the pipes.
8. All pipes used in this network are made of polyethylene and have a pressure rating of 10 bar, except for house connection pipes + Supplying main from well to Reservoir which are 16 bars.
9. The network is designed as a house-to-house connection. Each house will have a water meter installed. Therefore, a fabricated meter box and water meter with all necessary accessories are included in the project budget.
10. The total number of house connections in this project is 84.
11. All structures in this project, including the reservoir, brake pressures, collection box, and other structures in the network, as well as the pipe routes, should be accurately positioned according to the provided site plan and coordinates to avoid any future technical issues in the network.
12. The minimum depth of excavation for pipe installation should be 80 centimeters, with a width of 50 centimeters. The cross section is indicated in the relevant plan.

13. Steel bar should not be rusty all reinforced concrete should have a grade of 250, with a ratio of 1:1:2 (cement: coarse aggregate: fine aggregate).

15. All stone works should be done with a mortar ratio of 1:4 (cement: sand).

16. All non-reinforced concrete should have a grade of 60, with M250 for RCC tanks and 200 for other components.

17. All plastering works should have a ratio of 1:3 (cement: sand).

18. All water-resistant plastering works should have a ratio of 1:3 (cement: sand), with a minimum of 1 kilogram of water-resistant powder mixed per cement bag.

19. The reservoir should be plastered on all internal surfaces using water-resistant plastering powder.

20. The top of the reservoir should be covered with waterproofing (ISOGAM) material.

21. The pointing for the stonework should have a ratio of 1:3 (cement: sand).

22. The reservoir should have an entrance gate equipped with a lock to prevent water contamination.

23. The roof of the reservoir and all similar structures should have gutters to prevent rainwater or snow from damaging the buildings.

24. Handrails and vertical access ladders per OSHA recommendations, with adjustments for project site.

25. The water used for construction purposes should be clean and free from impurities.

26. Proper curing and watering of concrete should continue for a minimum of 28 days.

27- All construction materials must be of high quality. The vendor is required to provide samples for inspection and verification by the IRW/MRRD technical team. If any materials do not conform to the specifications in the BoQ and Design documents and are delivered without the technical team's inspection and verification, the vendor must replace them at no additional cost.

29- The workmanship for each aspect of this project must be of the highest quality, meeting the satisfaction and recommendations of the IRW technical team.

30-The vendor/contractor is responsible for all health and safety issues at the project site.

31- The vendor must implement all necessary environmental protection measures during the project. They must also safely dispose of all surplus construction materials in an environmentally responsible manner and ensure the project site is safe and visually acceptable upon completion.

32- Testing Requirements:

1. Concrete Mix Design: Based on selected aggregate properties, the contractor must define the M25 concrete mix design and submit the lab report to IRW before casting RCC elements.

2. Slump Test: To be conducted at the batching plant and at the site before pouring the concrete for each concrete mix.
3. Air Content Test: To be performed at the batching plant for every batch of concrete to ensure the mix design is consistent.
4. Cylinder Test: Three sets of cylinders (6 cylinders) to be cast for each concrete pour. One set to be tested at 7 days and the other set at 28 days for compressive strength.
5. Soil-bearing Capacity Test: To be conducted before foundation works to determine the bearing capacity of the soil and ensure it meets the project requirements.

Notes:

- All concrete testing results must meet the specified criteria as per IS 456:2000 or equivalent.
- Tests to be conducted by a certified laboratory and results to be submitted to the project engineer.
- Any deviation in test results must be immediately reported and rectification measures to be discussed and implemented as per engineer's instructions.

Work plan for the Water Supply (Zarin Zai) Pipe scheme project

ID-number: KDR-002 Water Network
 Province: Kandahar
 District: Aghastan
 Village:Zarin Zai
 Project purpose:Water Supply
 Date: 12 /11/2023

No.	Activities Description	Duration/days	First Month				Second Month				Third Month				Fourth Month			
			Week-1	Week-2	Week-3	Week-4	Week-1	Week-2	Week-3	Week-4	Week-1	Week-2	Week-3	Week-4	Week-1	Week-2	Week-3	Week-4
1	Mobilization of Materials to Site	7																
2	Drilling, of well	7																
3	Supply and installation of solar pump system	21																
4	Construction of boundary wall for solar panels	21																
5	Construction and Installation of 40 Cubic meter RCC Elevated Tank	35																
6	Excavation, Laying and Backfilling of distribution system	98																
7	Site Clearance and Hand over	112																
8	Reporting	112																





FIXED LADDER WITH WALK-THRU HANDRAILS:

Ladders are designed for applications where safe landing access is required. They are one-piece welded assemblies for use in applications less than 20' in vertical height.

CONSTRUCTION FEATURES:

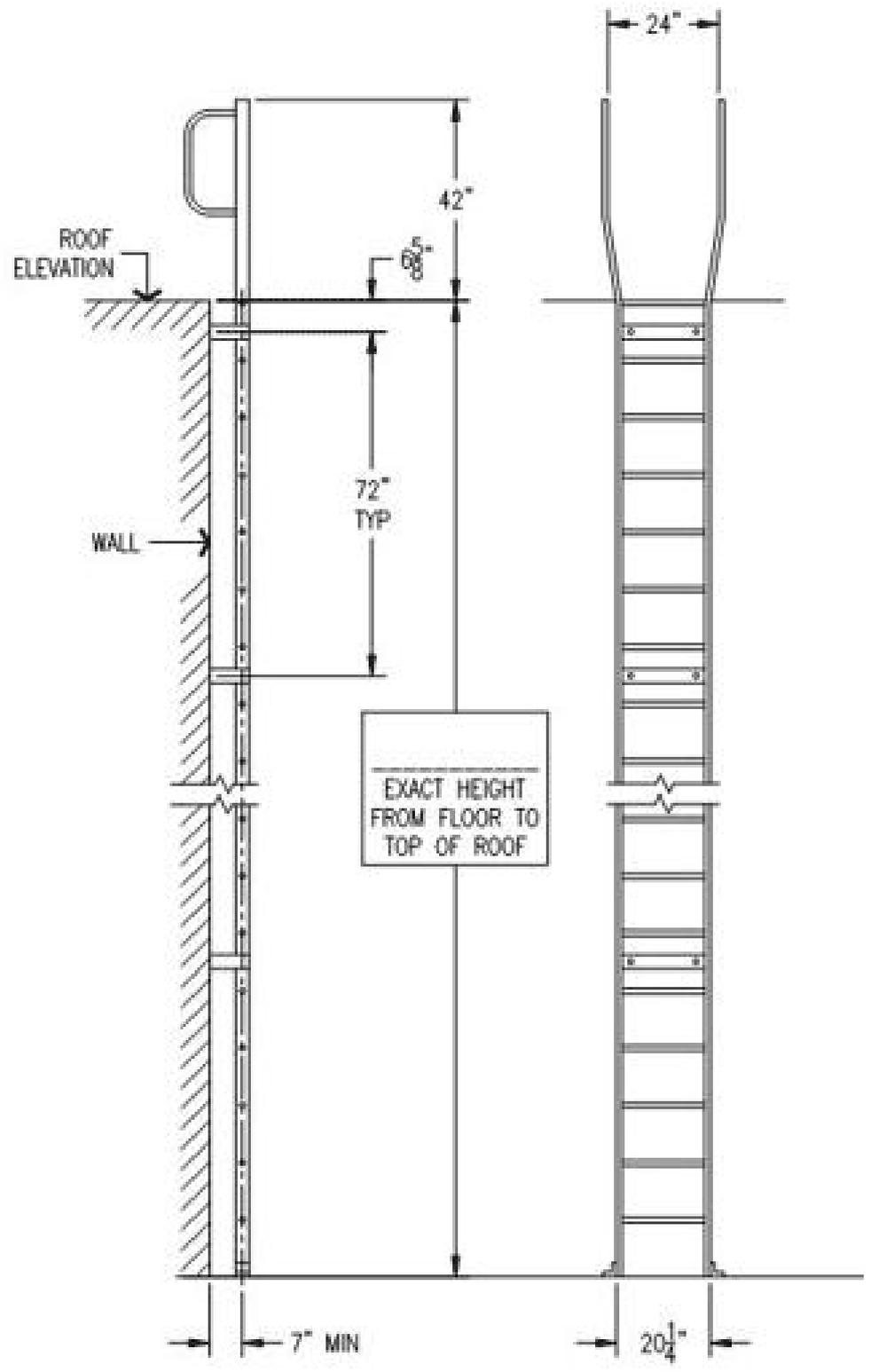
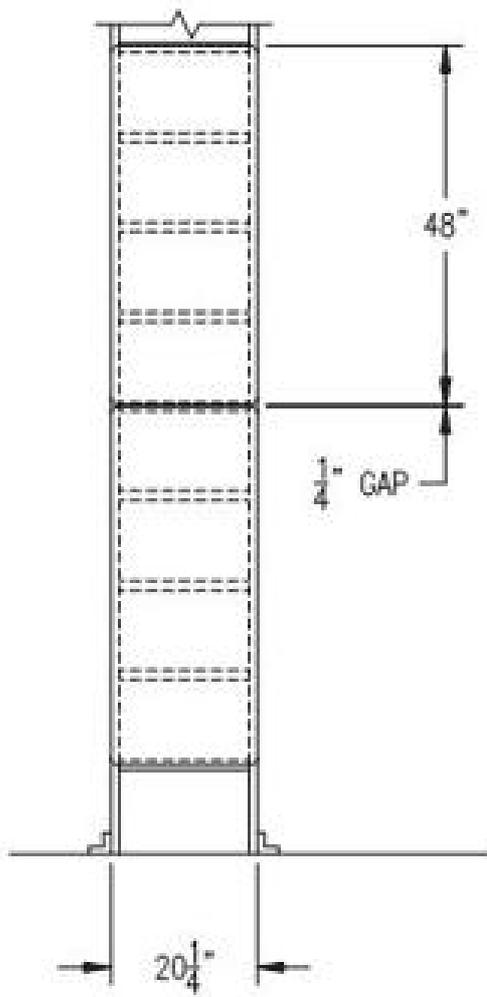
- Side members are $\frac{1}{4}$ "x2"x2" steel angle. $\frac{3}{4}$ " corrugated steel round climbing rungs on 12" centers. Stand-off mounting brackets are 7".
- Walk-thru handrails extend 42" above landing surface. Mounting brackets included.
- Welded one-piece, gray powder coat finish, yellow available.

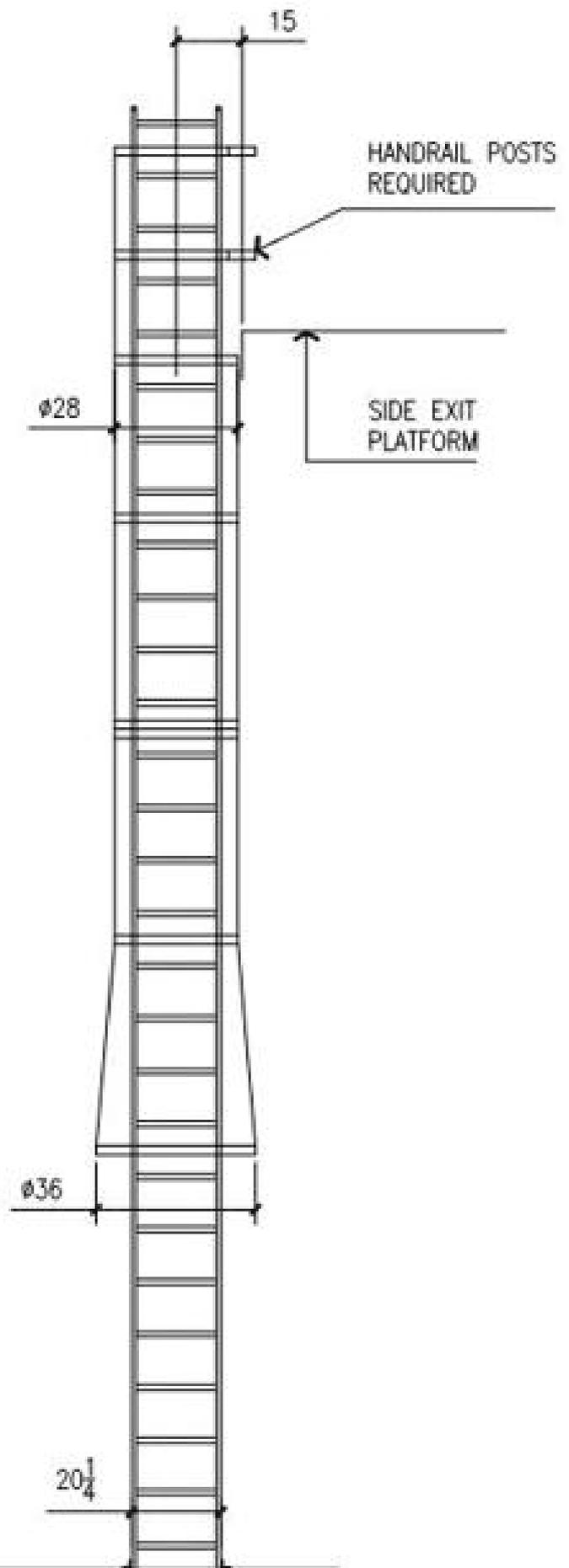
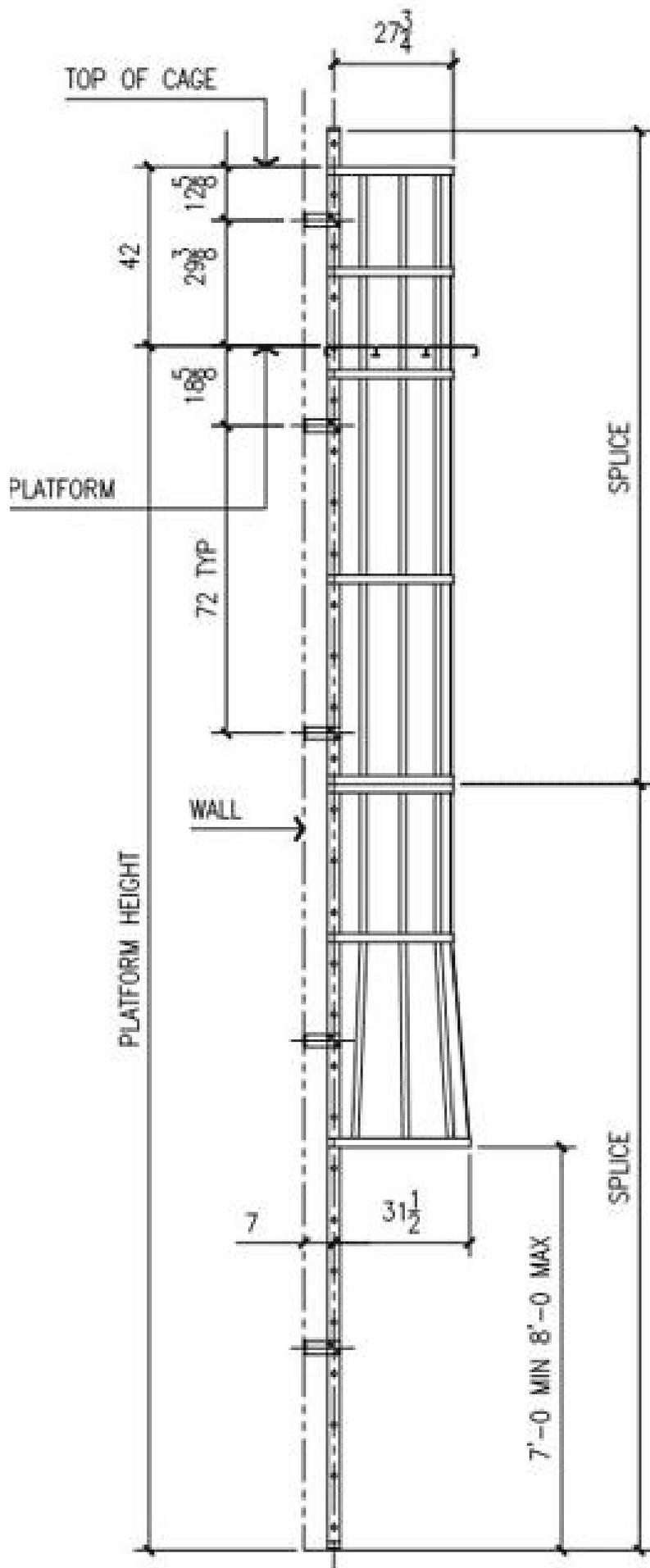
FIXED LADDER WITH WALK-THRU HANDRAILS AND SAFETY CAGES:

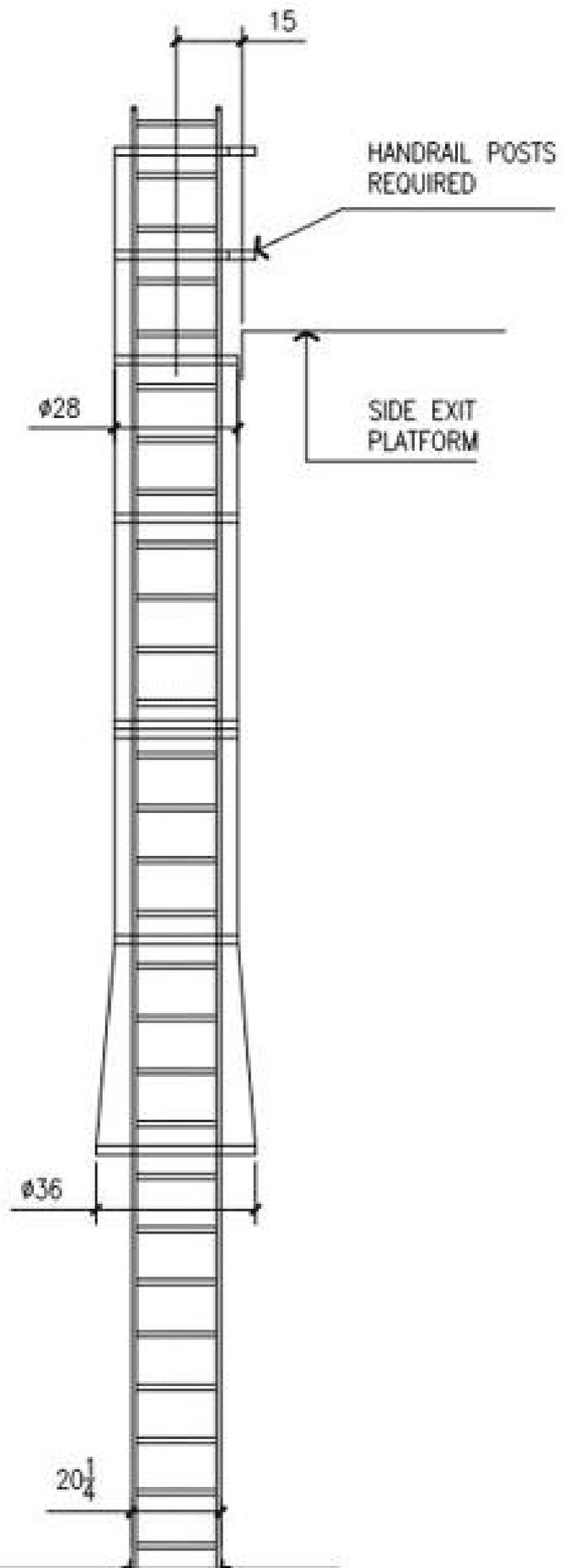
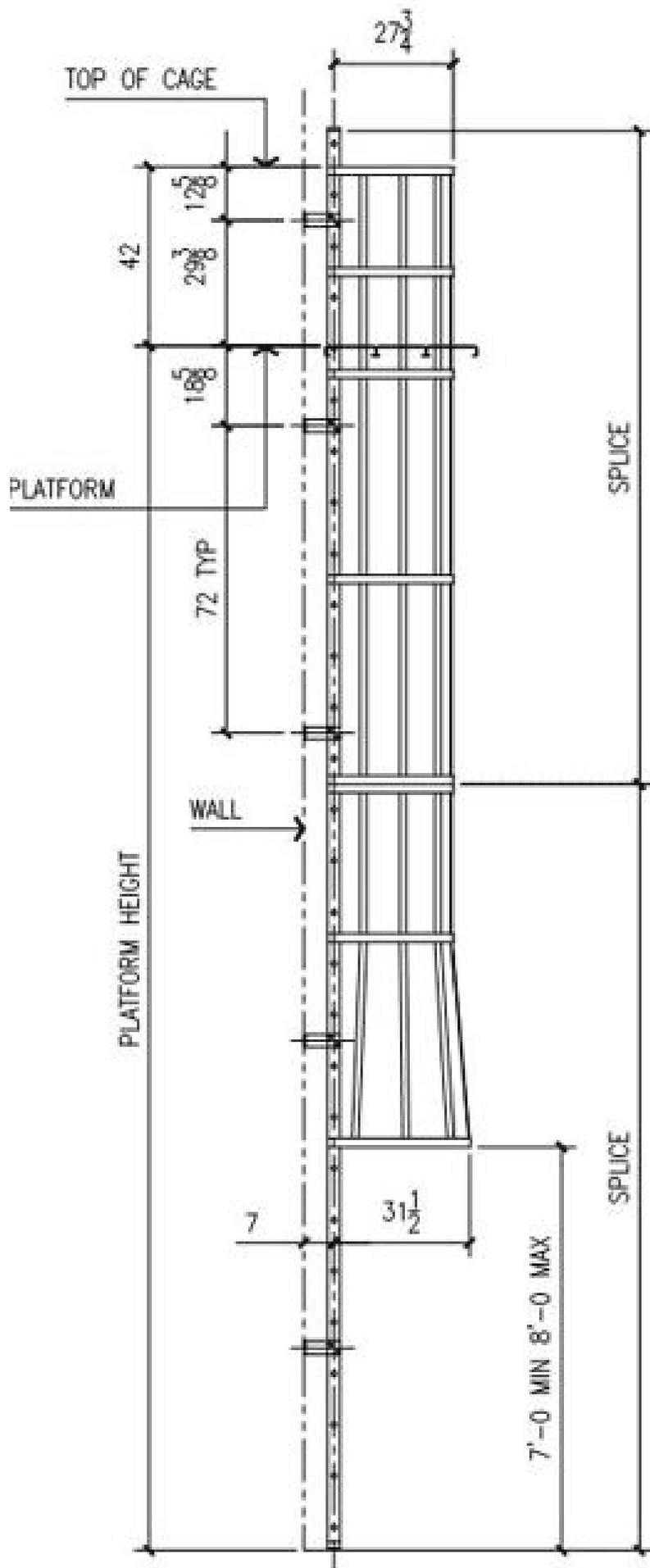
Designed for safe landing access and available from 10' to 29'. Cages and walk-thru handrails extend 42" above landing surface.

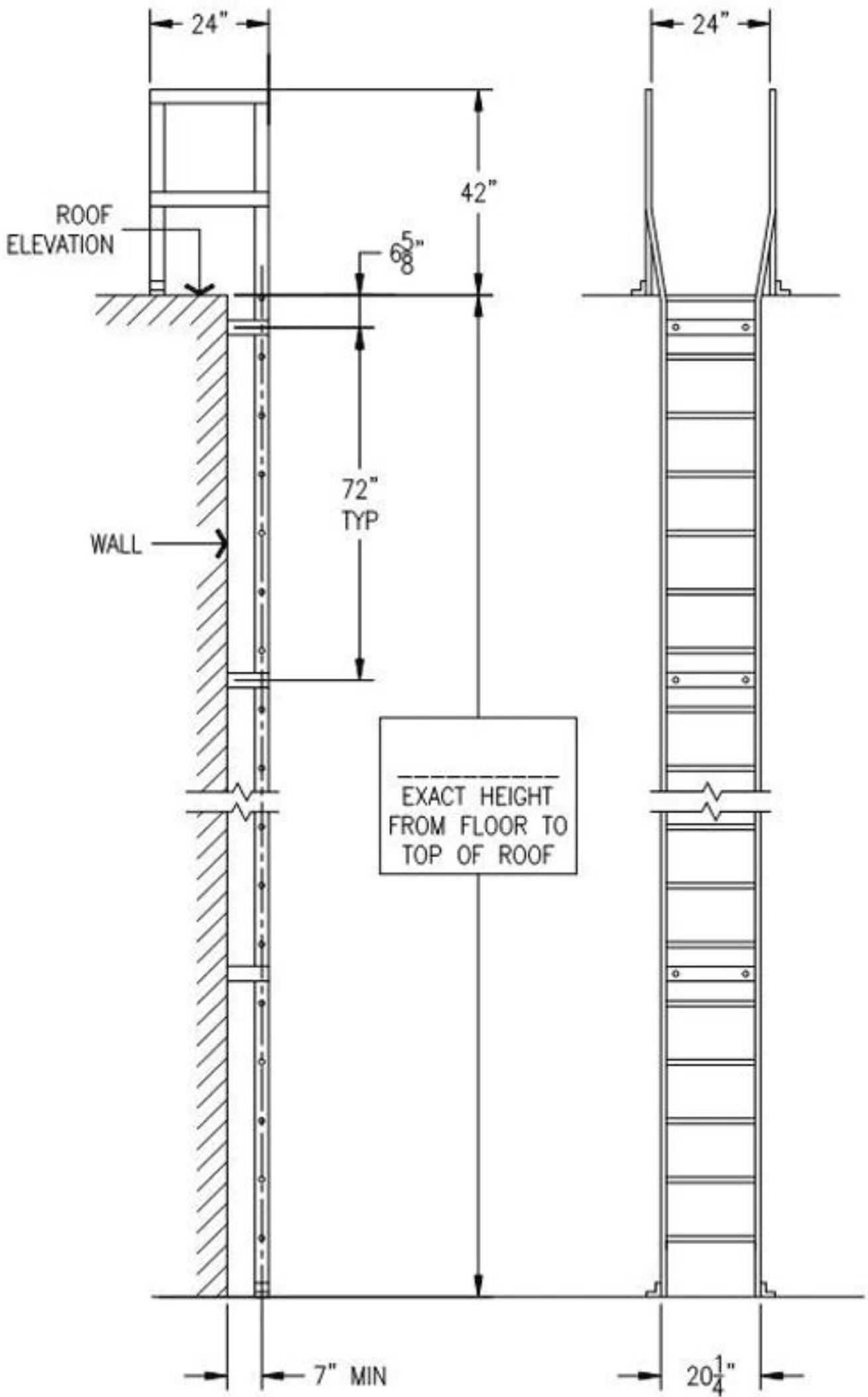
CAGE FEATURES:

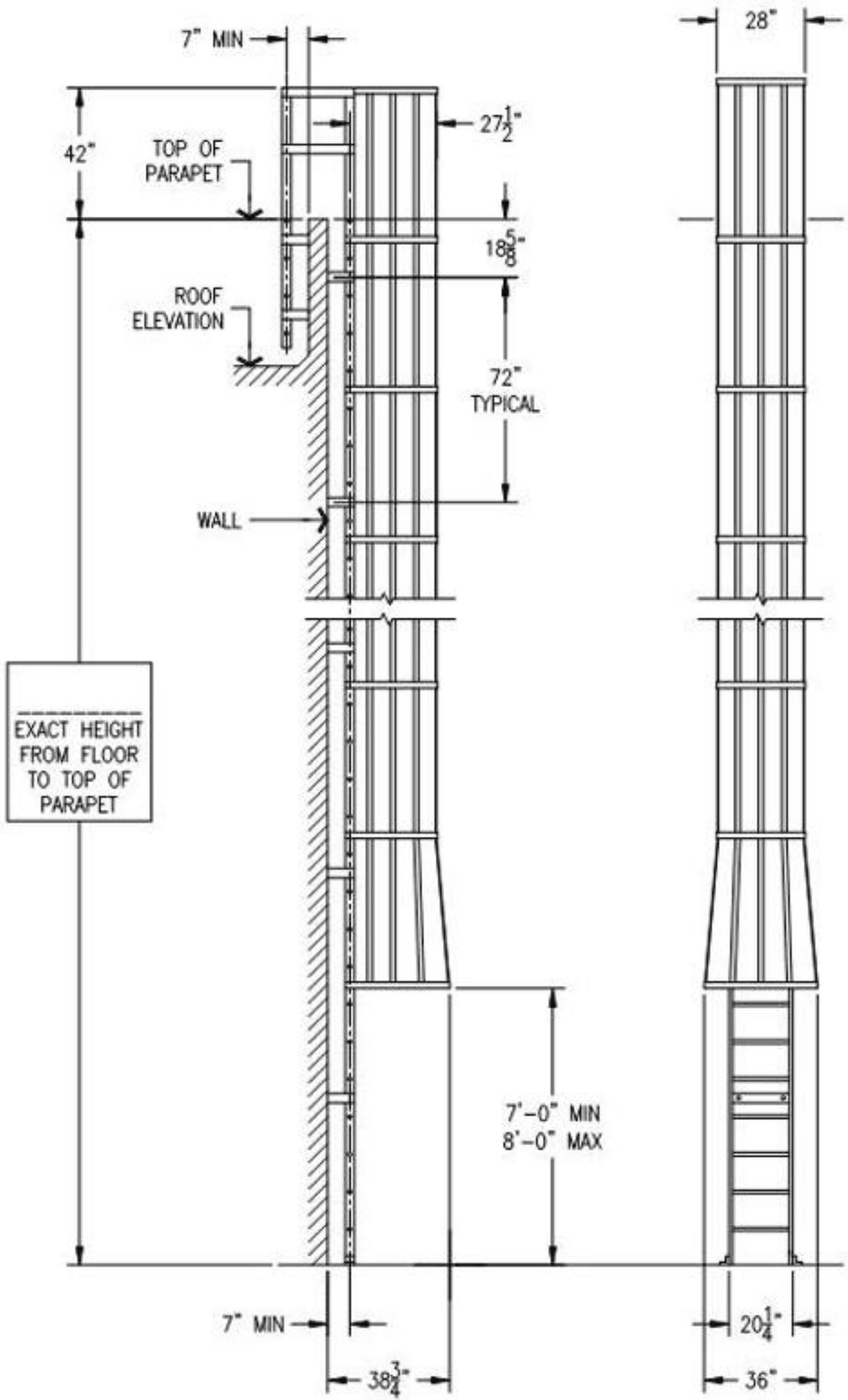
- Safety cages are designed to OSHA specifications with flared bottom opening for easy entry.
- Cage begins 7' from bottom of ladder.
- Gray powder coat finish, yellow available.











Submittal Data

PROJECT:	Islamic Relief Worldwide-Afghanistan Kandahar Area Office Shelter UK Project_Zarin Zai village	UNIT TAG:	QUANTITY:
REPRESENTATIVE:	IRA-UK	TYPE OF SERVICE:	
ENGINEER:	M. Moien	SUBMITTED BY:	DATE:
CONTRACTOR:		APPROVED BY:	DATE:
		ORDER NO.:	DATE:

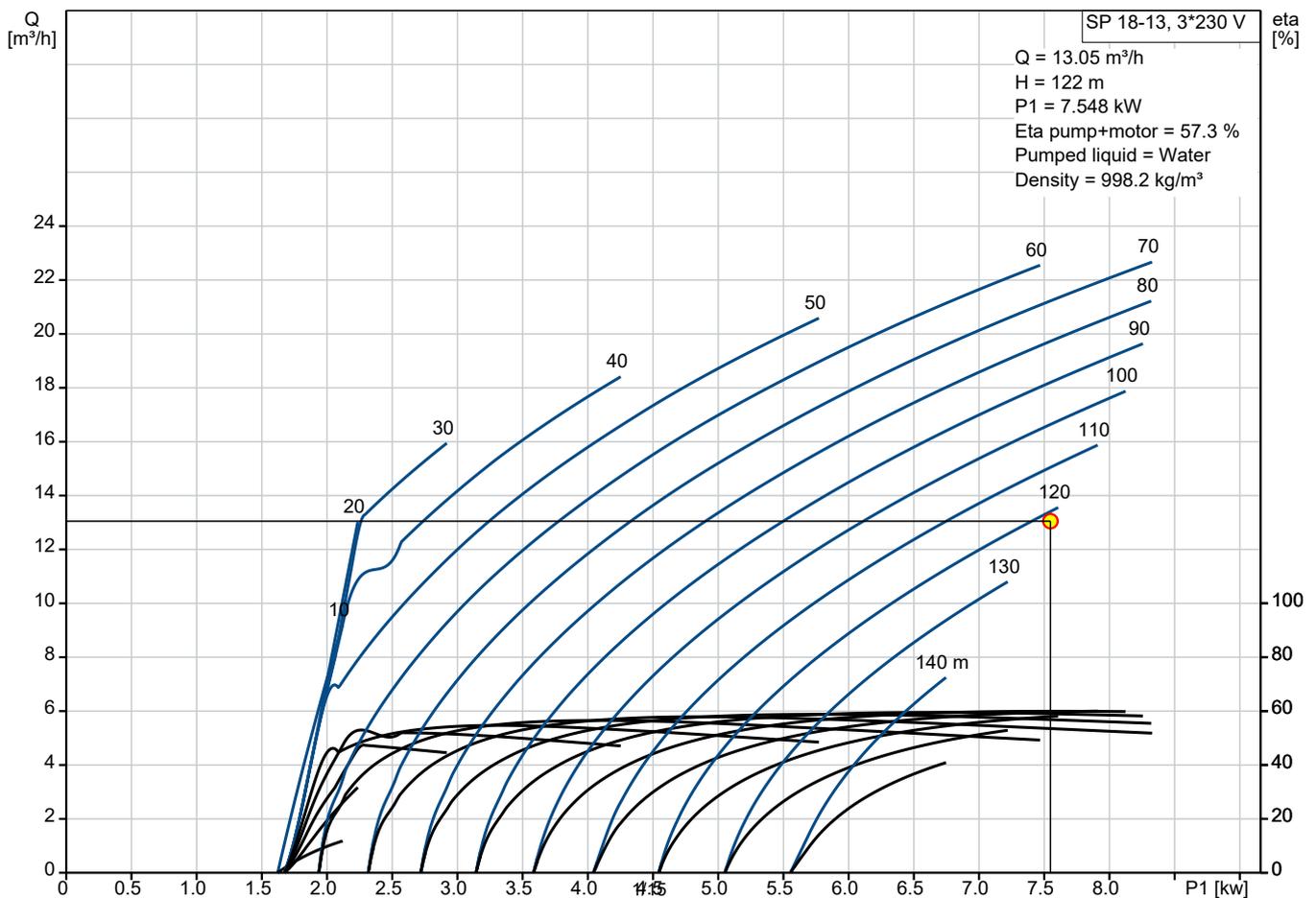


SP 18-13

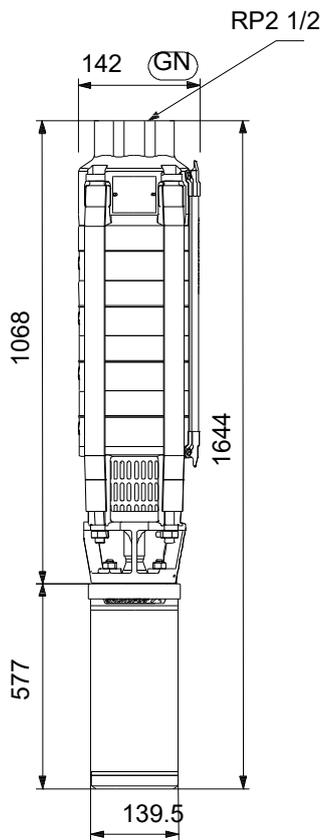
Grundfos SP are submersible borehole pumps, designed for pumping groundwater. Grundfos SP are all stainless-steel pumps, and they are available in 3 material grades. The pumps are suitable for boreholes in sizes ranging from 4" over 6" and 8" to 10". The motor sizes for the pumps are available in 0.37-250 kW.

Note! Product picture may differ from actual product

Conditions of Service	Pump Data	Motor Data
Liquid: Water	Liquid temperature range: -15 .. 40 °C Product number: On request	Rated power - P2: 7.5 kW Rated voltage: 220-230 V Mains frequency: 50 Hz Enclosure class: IP68 Insulation class: F Motor protection: NONE Thermal protection: EXT. Motor type: MS6000

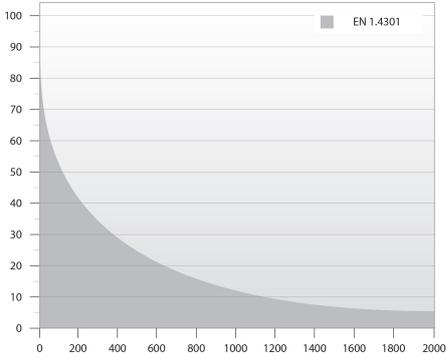
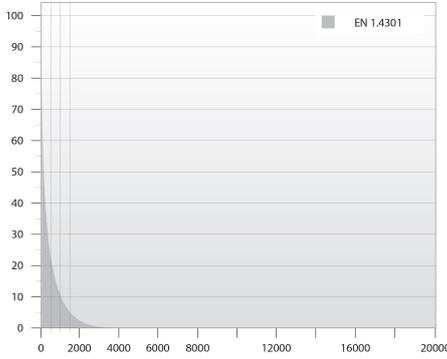


Submittal Data



Materials:

- Impeller: Stainless steel
- Impeller: AISI 304
- Impeller: EN 1.4301
- Motor: Stainless steel
- Motor: DIN W.-Nr. 1.4301
- Motor: AISI 304

Qty.	Description
1	<p data-bbox="204 450 304 479">SP 18-13</p> <div data-bbox="371 488 416 819" style="text-align: center;">  </div> <p data-bbox="592 795 1062 819" style="text-align: center;">Note! Product picture may differ from actual product</p> <p data-bbox="204 828 478 857">Product No.: On request</p> <p data-bbox="204 891 1417 965">Submersible borehole pump, suitable for pumping clean water. Can be installed vertically or horizontally. All steel components are made in stainless steel, EN 1.4301 (AISI 304), that ensures high corrosive resistance. This pump carries drinking water approval.</p> <p data-bbox="204 976 1401 1050">The pump is fitted with a 7.5 kW MS6000 motor with sand shield, mechanical shaft seal, water-lubricated journal bearings and a volume compensating diaphragm. The motor is a canned type submersible motor offering good mechanical stability and high efficiency.</p> <p data-bbox="204 1061 683 1090">The motor is for direct-on-line starting (DOL).</p> <p data-bbox="204 1122 512 1151">Further product details</p> <p data-bbox="204 1160 847 1189">The pump is suitable for applications similar to the following:</p> <ul data-bbox="240 1193 507 1335" style="list-style-type: none"> - raw-water supply - irrigation - groundwater lowering - pressure boosting - fountain applications. <p data-bbox="204 1339 284 1368">Pump</p> <p data-bbox="204 1373 1426 1447">All pump surfaces that are in contact with pumped liquids are made in stainless steel which makes them corrosion- and wear-resistant. The corrosion diagram below shows the capabilities of the pump and motor in relation to the temperature in Celsius (y-axis) and the concentration of chloride in ppm (x-axis).</p> <div data-bbox="204 1464 1107 1823" style="display: flex; justify-content: space-around;">   </div> <p data-bbox="204 1854 1394 1906">The suction interconnector is fitted with a strainer to prevent large particles from entering the pump. The suction interconnector is designed to comply with NEMA standards for motor mounting/dimensions.</p> <p data-bbox="204 1944 284 1973">Motor</p> <p data-bbox="204 1977 1453 2029">The stator is hermetically encapsulated in stainless steel and the windings are embedded in polymer compound. This results in high mechanical stability, optimum cooling and reduces the risk of short circuits in the windings.</p> <p data-bbox="204 2033 1453 2110">The shaft seal faces are ceramic/carbon. The material combination provides good dry-running resistance. Together with the shaft seal housing, the sand shield forms a labyrinth seal, which during normal operating conditions prevents penetration of sand particles into the shaft seal.</p>



Company name:

Created by:

Phone:

Date: 07/07/2024

Project:

Reference Number:

Client:

Client Number:

Contact:

Qty.	Description
1	<p>The motor can be fitted with a Pt100 or Pt1000 sensor that together with a control unit ensures that the maximum operating temperature conditions are not exceeded.</p> <p>Liquid: Pumped liquid: Water Liquid temperature range: -15 .. 40 °C</p> <p>Technical: Pump speed on which pump data are based: 2900 rpm Rated flow: 18 m³/h Rated head: 99 m Shaft seal for motor: CER/CARNBR Approvals: CE,EAC,UKCA,SEPRO,MOROCCO Approvals for drinking water: ACS,DM174 Curve tolerance: ISO9906:2012 3B Motor version: T40 Return valve: YES</p> <p>Materials: Pump: Stainless steel EN 1.4301 AISI 304 Impeller: Stainless steel EN 1.4301 AISI 304 Motor: Stainless steel DIN W.-Nr. 1.4301 AISI 304</p> <p>Installation: Maximum ambient pressure: 60 bar Maximum operating pressure: 60 bar Maximum outlet pressure: 14.4 bar Type of connection: Rp Size of connection: 2 1/2 inch Motor diameter: 6 inch Minimum borehole diameter: 145 mm</p> <p>Electrical data: Motor type: MS6000 Motor flange design: Grundfos Rated power - P2: 7.5 kW Power (P2) required by pump: 7.5 kW Mains frequency: 50 Hz Rated voltage: 3 x 220-230 V Rated current: 31.0 A Starting current: 500-530 % Cos phi - power factor: 0.82-0.79 Rated speed: 2870-2880 rpm Start. method: DOL Enclosure class (IEC 34-5): IP68 Insulation class (IEC 85): F Built-in temp. transmitter: N Length of cable: 5 m Power cable type: FLAT</p>



Company name:

Created by:

Phone:

Date: 07/07/2024

Project:

Reference Number:

Client:

Client Number:

Contact:

Qty.	Description
1	Motor No: 78104512 Windings: Enamelled Others: Minimum efficiency index, MEI ≥: 0.70 Net weight: 61.6 kg Gross weight: 91.3 kg Shipping volume: 0.232 m ³ Environmental approvals: WEEE



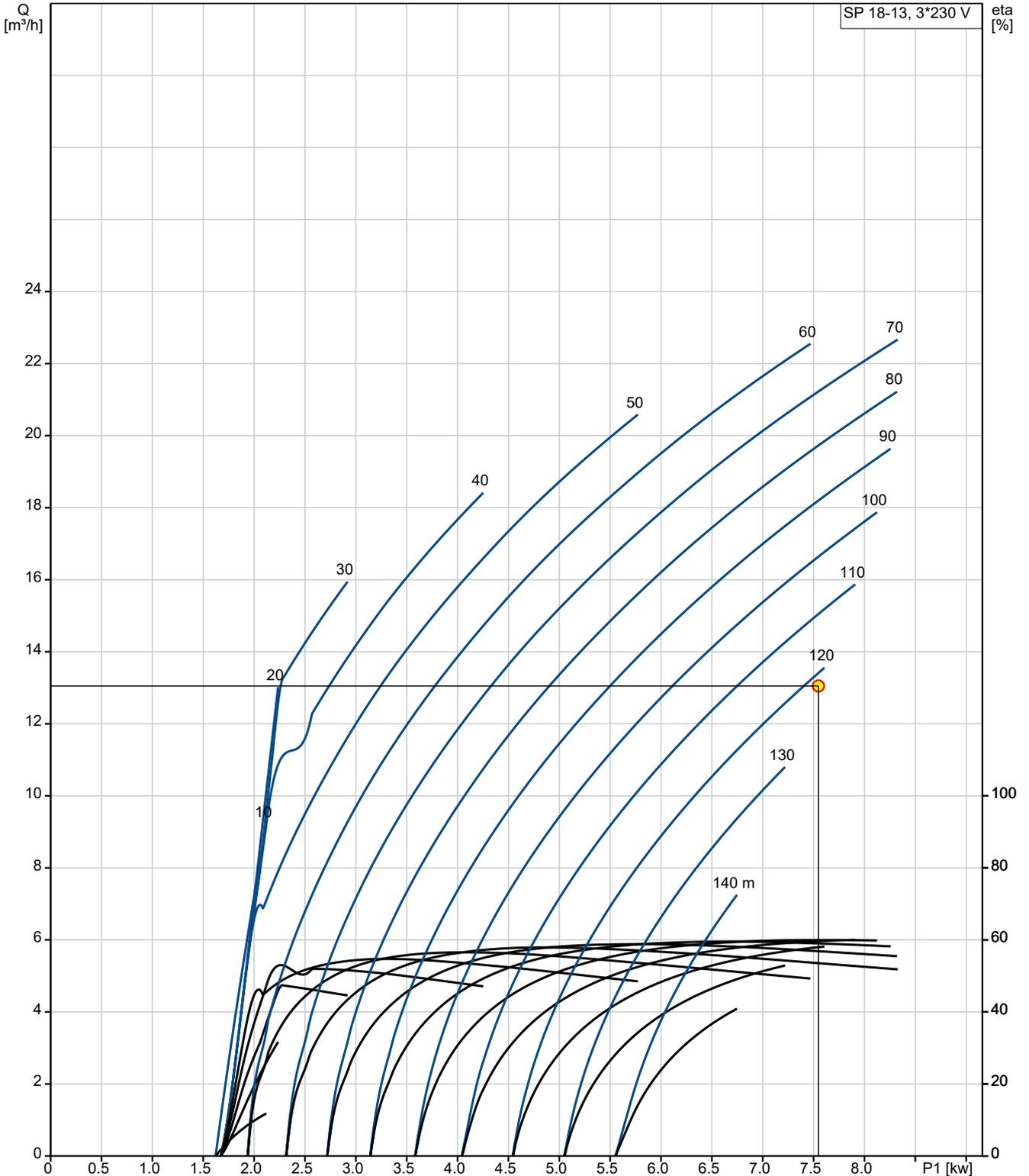
Company name:
Created by:
Phone:

Date: 07/07/2024

Project:
Reference Number:

Client:
Client Number:
Contact:

On request SP 18-13



Q = 13.05 m³/h
P1 = 7.548 kW
Pumped liquid = Water

H = 122 m
Eta pump+motor = 57.3 %
Density = 998.2 kg/m³

Project:

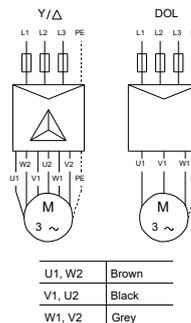
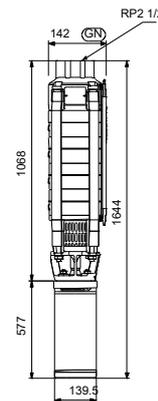
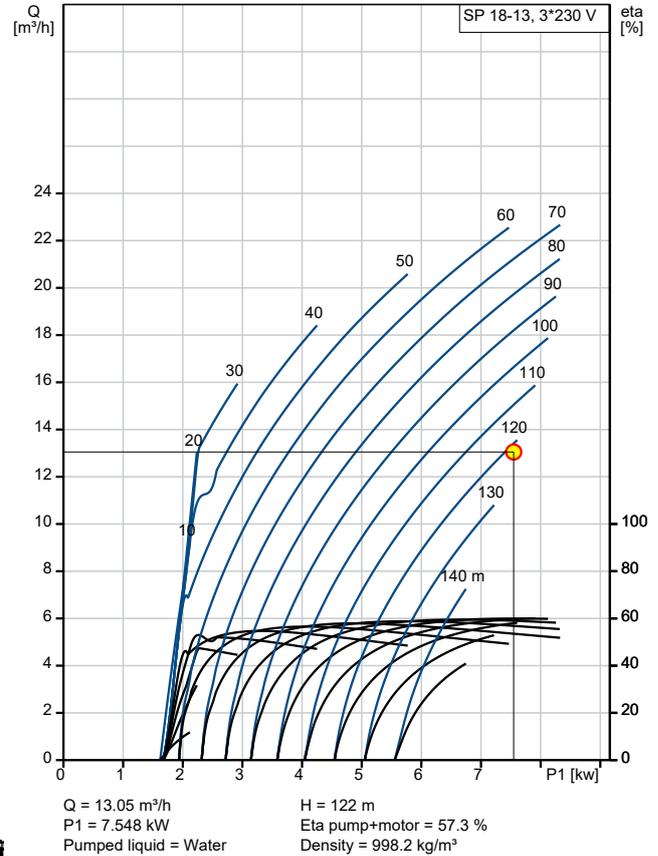
Reference Number:

Client:

Client Number:

Contact:

Description	Value
General information:	
Product name:	SP 18-13
Product No:	On request
EAN number:	On request
Technical:	
Pump speed on which pump data are based:	2900 rpm
Rated flow:	18 m ³ /h
Rated head:	99 m
Stages:	13
Number of reduced-diameter impellers:	NONE
Shaft seal for motor:	CER/CARNBR
Approvals:	CE, EAC, UKCA, SEPRO, MOR, OCCO
Approvals for drinking water:	ACS, DM174
Curve tolerance:	ISO9906:2012 3B
Model:	A
Motor version:	T40
Return valve:	YES
Materials:	
Pump:	Stainless steel
Pump:	EN 1.4301
Pump:	AISI 304
Impeller:	Stainless steel
Impeller:	EN 1.4301
Impeller:	AISI 304
Motor:	Stainless steel
Motor:	DIN W.-Nr. 1.4301
Motor:	AISI 304
Installation:	
Maximum ambient pressure:	60 bar
Maximum operating pressure:	60 bar
Maximum outlet pressure:	14.4 bar
Type of connection:	Rp
Size of connection:	2 1/2 inch
Motor diameter:	6 inch
Minimum borehole diameter:	145 mm
Liquid:	
Pumped liquid:	Water
Liquid temperature range:	-15 .. 40 °C
Electrical data:	
Motor type:	MS6000
Motor flange design:	Grundfos
Rated power - P2:	7.5 kW
Power (P2) required by pump:	7.5 kW
Mains frequency:	50 Hz
Rated voltage:	3 x 220-230 V
Rated current:	31.0 A
Starting current:	500-530 %
Cos phi - power factor:	0.82-0.79
Rated speed:	2870-2880 rpm
Start. method:	DOL
Enclosure class (IEC 34-5):	IP68
Insulation class (IEC 85):	F





Company name:

Created by:

Phone:

Date: 07/07/2024

Project:

Reference Number:

Client:

Client Number:

Contact:

Description	Value
Built-in motor protection:	NONE
Thermal protec:	EXT.
Built-in temp. transmitter:	N
Length of cable:	5 m
Power cable type:	FLAT
Motor No:	78104512
Cable number:	96164209
Windings:	Enamelled
Others:	
Minimum efficiency index, MEI ≥:	0.70
Net weight:	61.6 kg
Gross weight:	91.3 kg
Shipping volume:	0.232 m ³
Environmental approvals:	WEEE



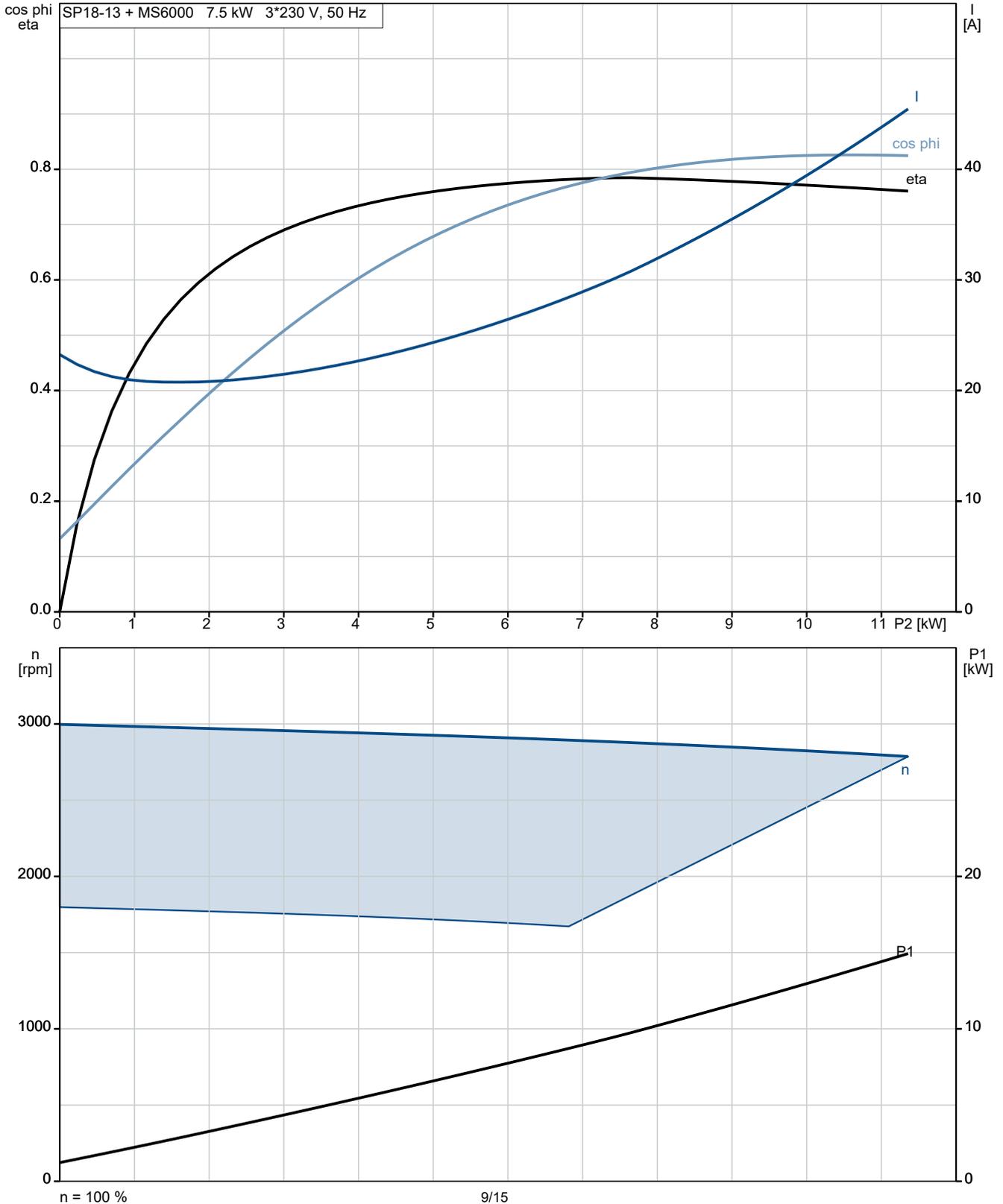
Company name:
Created by:
Phone:

Date: 07/07/2024

Project:
Reference Number:

Client:
Client Number:
Contact:

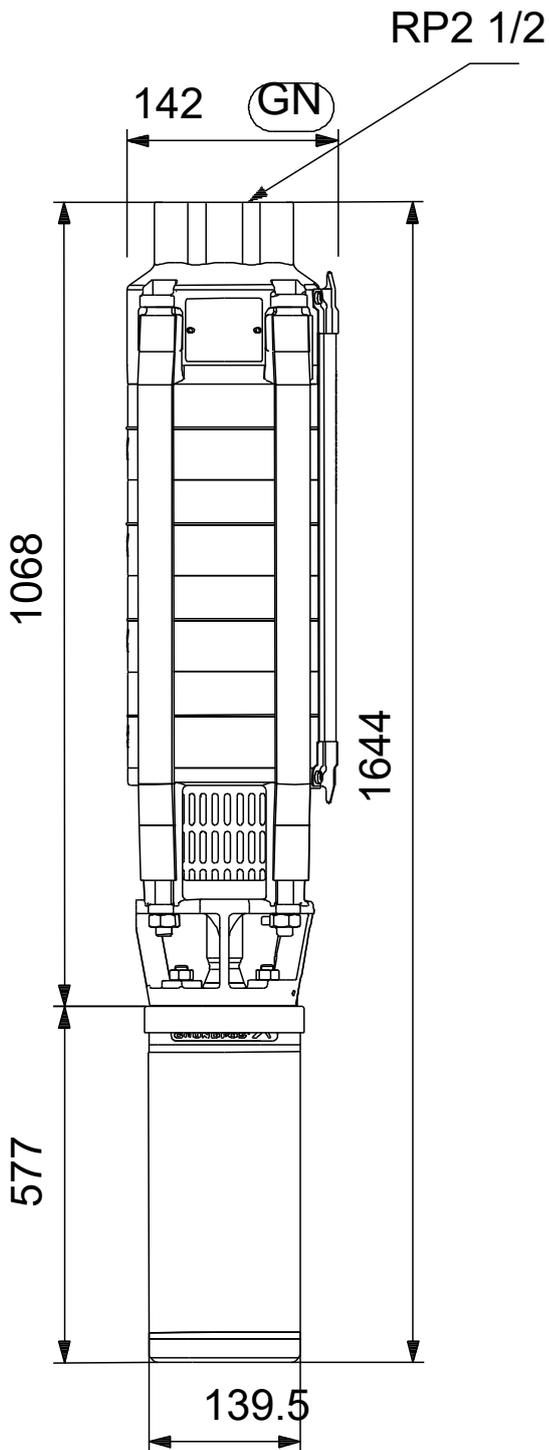
On request SP 18-13



n = 100 %

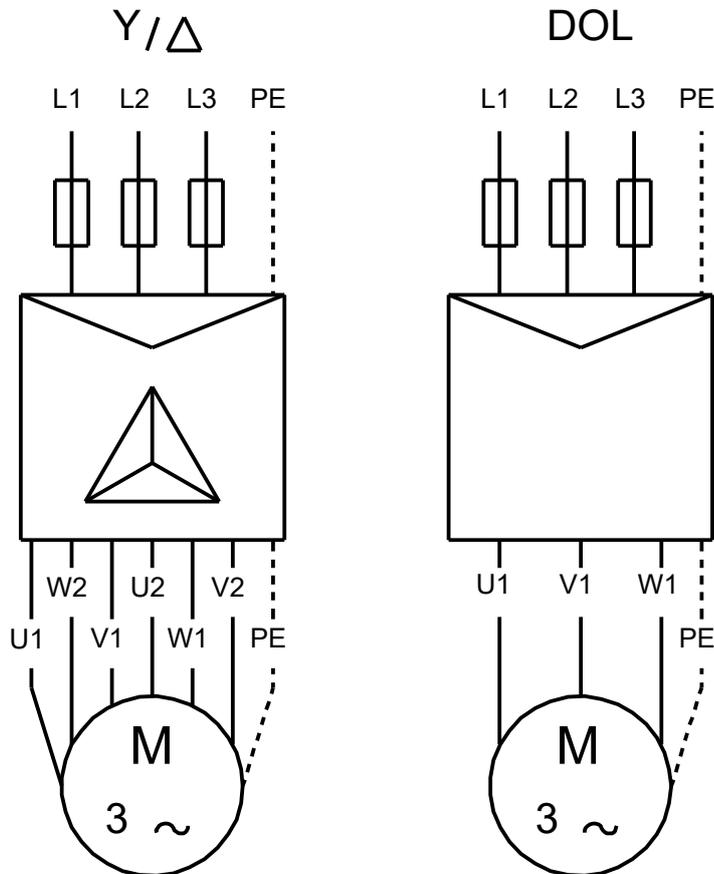
9/15

On request SP 18-13



Note! All units are in [mm] unless others are stated.
Disclaimer: This simplified dimensional drawing does not show all details.

On request SP 18-13



U1, W2	Brown
V1, U2	Black
W1, V2	Grey



Company name:

Created by:

Phone:

Date:

07/07/2024

Project:

Reference Number:

Client:

Client Number:

Contact:

On request SP 18-13

Input - summary

Water volume (max): 102 m³/day
Month for sizing: April
Static lift above ground: 40 m
Dynamic water level: 80 m
Sun tracking: No (fixed)
Location: Arghistan District, Kandahar, Afghanistan
Latitude: 31.5699 DD, Longitude: 66.5174 DD

Products

Pump: SP 18-13, 1 x On request
Solar module: 50 x GF 270

Sizing results - summary

Water production, Peak flow and Price

Total water production per year: 37200 m³
Avg. water production per day: 101.9 m³/day
Average water production per watt per day: 7.6 l/Wp/day

Typical performance at solar radiation 800 W/m²

Flow: 13.1 m³/h
Total head: 122.0 m

Solar module configuration:

Number of solar modules in series: 10, in parallel: 5
Solar array rated power: 13.5 kW
Solar array rated volts: 316 V
Sun tracking: No (fixed)
Tilt angle: 31 deg.

Cables and pipes:

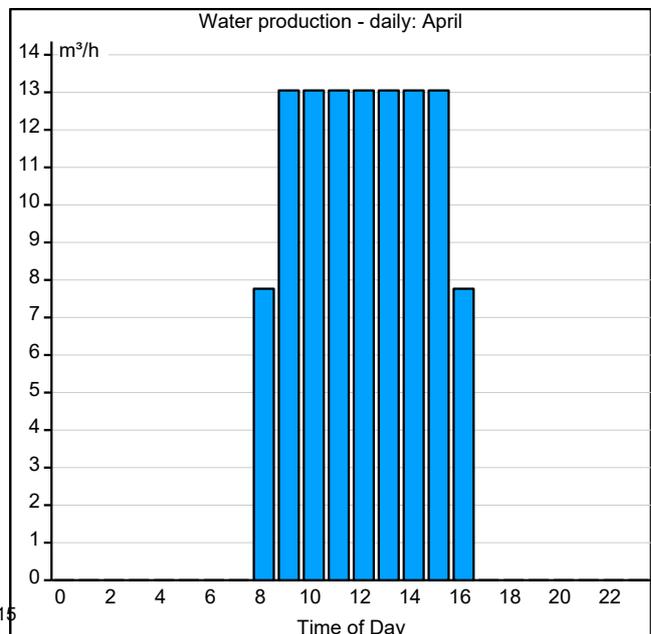
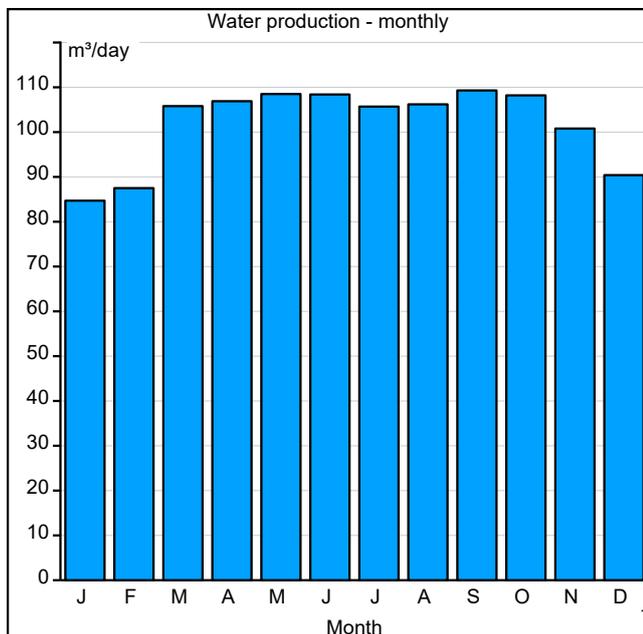
Pump cable length: 120 m
Pump cable size: 25 mm²
Total cable loss: 2.1 %

Material, riser pipe: PEH
Pipe length of riser pipe: 80 m
Friction losses: 1.979 m

System performance - monthly average

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Water production [m ³ /day]	84.7	87.5	105.8	106.9	108.5	108.4	105.7	106.2	109.3	108.2	100.8	90.4
Energy production Solar [kWh/day]	71.7	76.7	98.3	96.2	97.0	95.6	89.9	92.9	103.4	105.2	94.6	80.4
Radiation horizontal [kWh/m ² day]	3.6	4.5	6.7	7.8	8.9	9.3	8.6	8.1	7.7	6.4	4.8	3.9
Radiation tilt [kWh/m ² day]	5.5	6.0	7.8	7.9	8.1	8.1	7.7	7.8	8.6	8.5	7.4	6.5
Avg. Temp. [°C]	1.9	4.3	9.4	15.6	20.3	23.5	24.8	22.9	17.7	11.4	7.2	4.2

Data location: Latitude: 31 DD, Longitude: 67 DD





Company name:
Created by:
Phone:

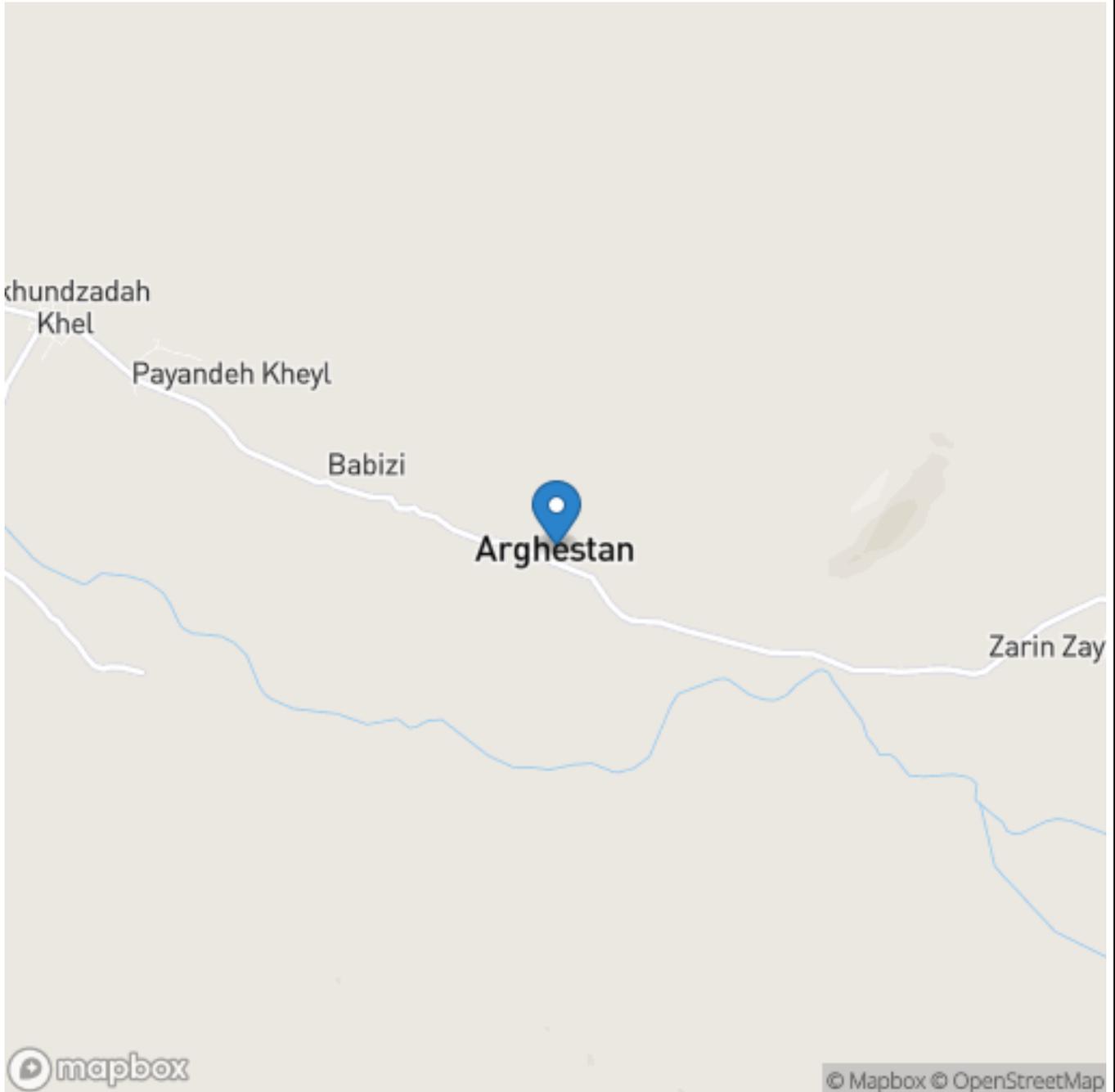
Date: 07/07/2024

Project:
Reference Number:

Client:
Client Number:
Contact:

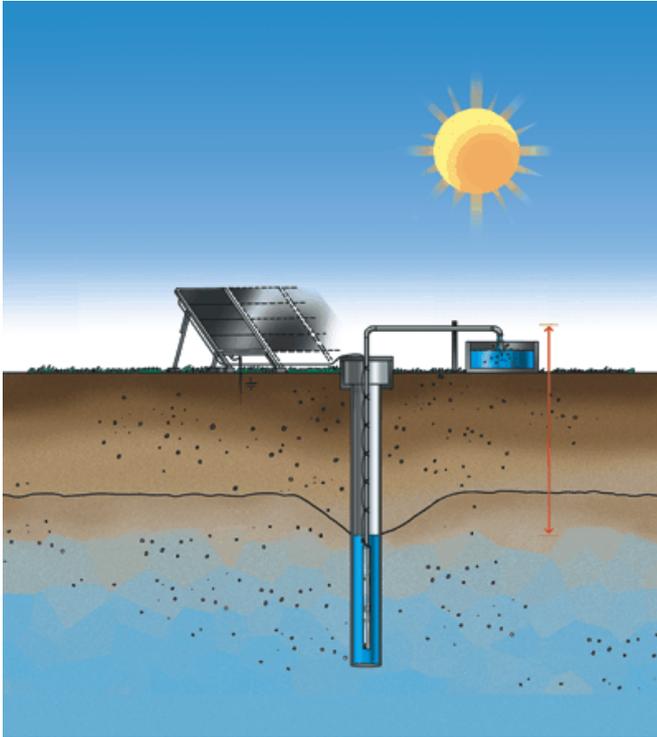
On request SP 18-13

Location Map



Location: Arghistan District, Kandahar, Afghanistan
Latitude: 31.5699 DD, Longitude: 66.5174 DD

Installation and Input



Sizing Results

Water production, Peak flow and Price

Total water production per year: 37200 m³
 Avg. water production per day: 101.9 m³/day
 Average water production per watt per day: 7.6 l/Wp/day

Solar module configuration:

Number of solar modules in series: 10, in parallel: 5
 Solar array rated power: 13.5 kW
 Solar array rated volts: 316 V
 Sun tracking: No (fixed)
 Tilt angle: 31 deg.

Typical performance at solar radiation 800 W/m²

Flow: 13.1 m³/h
 Total head: 122.0 m

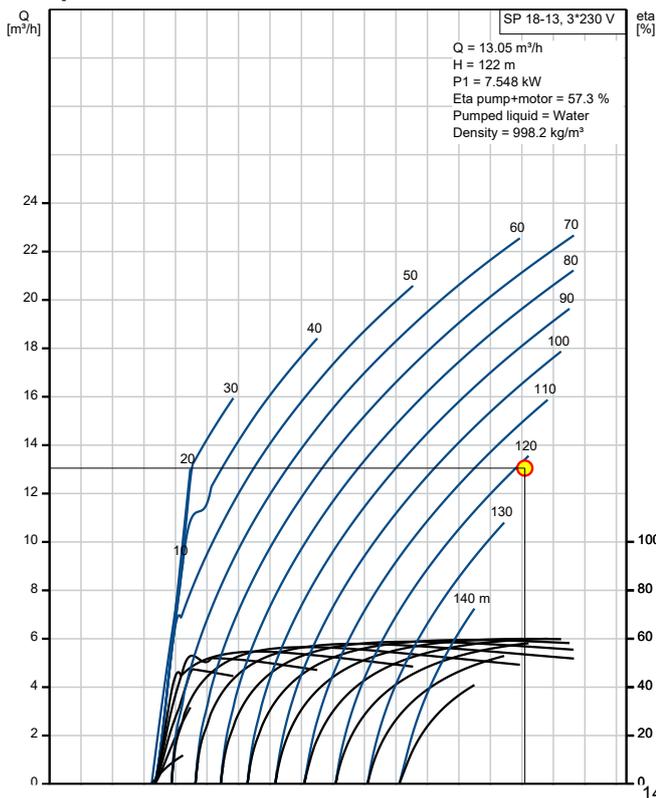
Cables and pipes:

Pump cable length: 120 m
 Pump cable size: 25 mm²
 Total cable loss: 2.1 %

Material, riser pipe: PEH
 Pipe length of riser pipe: 80 m
 Friction losses: 1.979 m

Location: Arghistan District, Kandahar, Afghanistan
 Latitude: 31.5699 DD, Longitude: 66.5174 DD

Pump Curve



Dimensional Drawing

