



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

I

District Arghastan, Village Zarinzay

Legend

 Pipe from pump to Reservoir

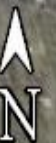
Zarinzy Village

Location of Reservoir

location of pump

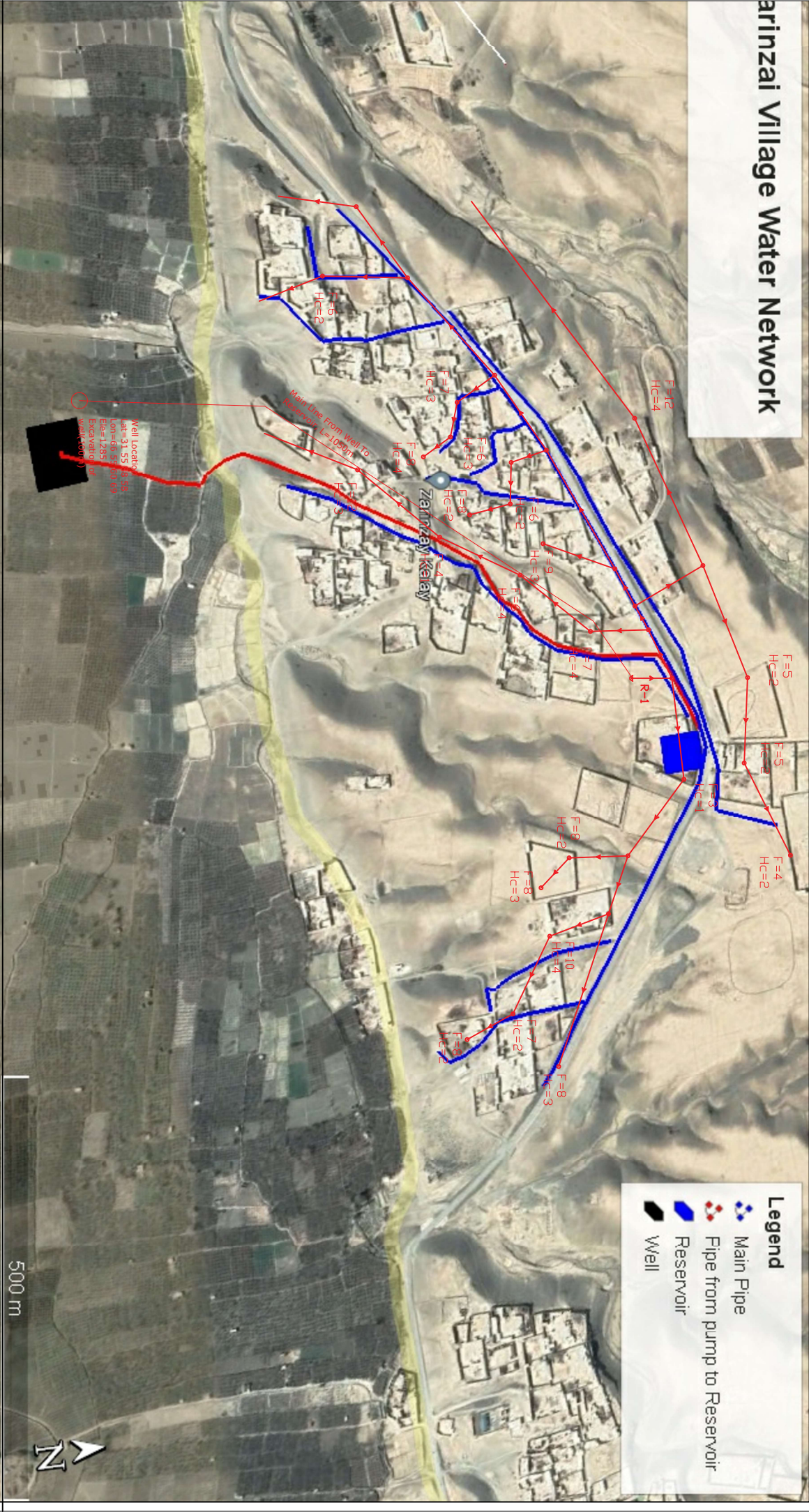
Google Earth


Image © 2023 CNES / Airbus



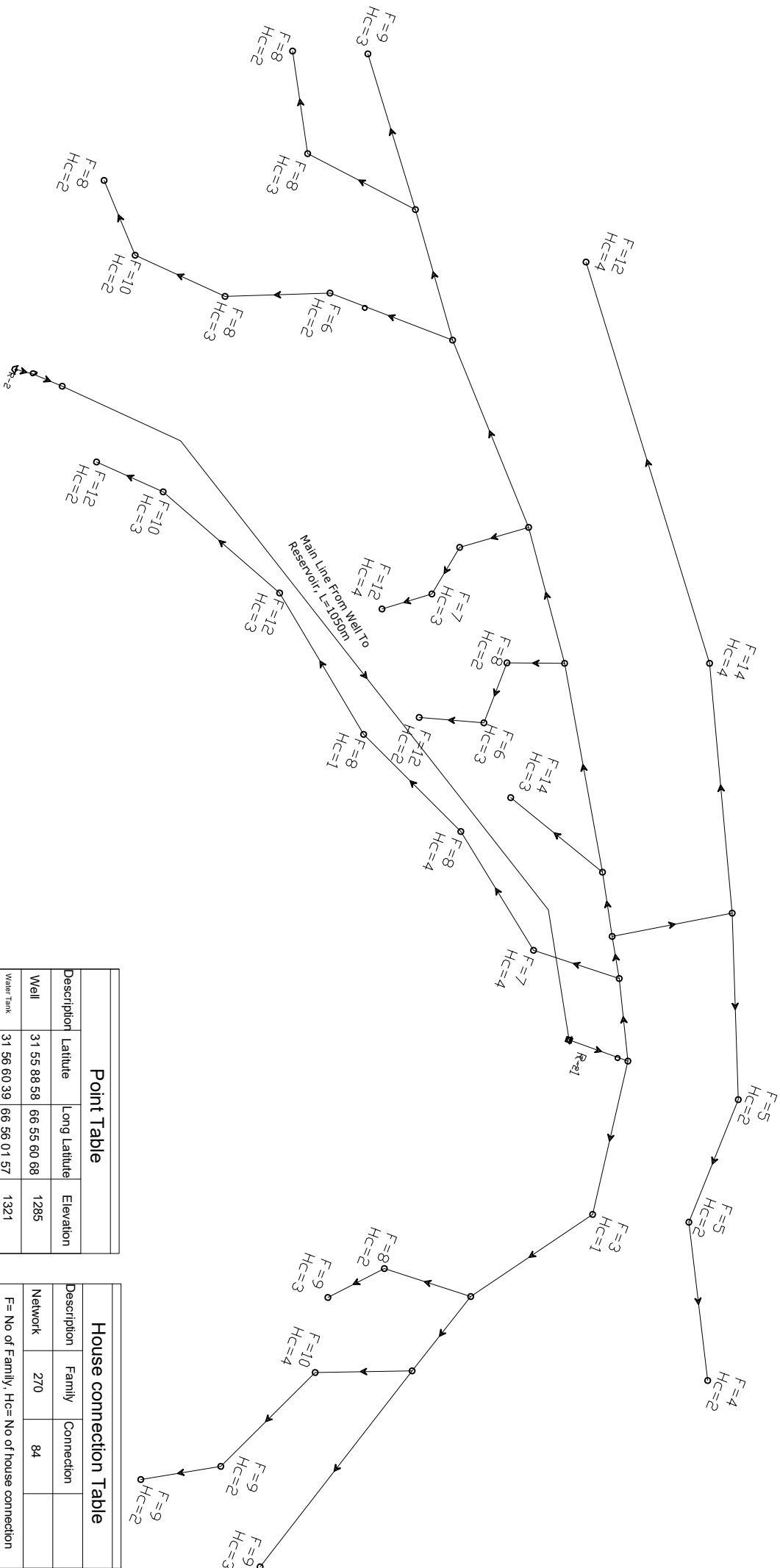
1000 ft

arinzai Village Water Network



Islamic Relief Worldwide						
IR-W						
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			
Checkd: By	Eng. Dawod Shafag	Province	Kandahar			
Approved: By		District	Arghastan			
		Village	Zarin Zai	Unit	cm	
				Scale	NO	
				Sheet No	0	


(House Connection survey)



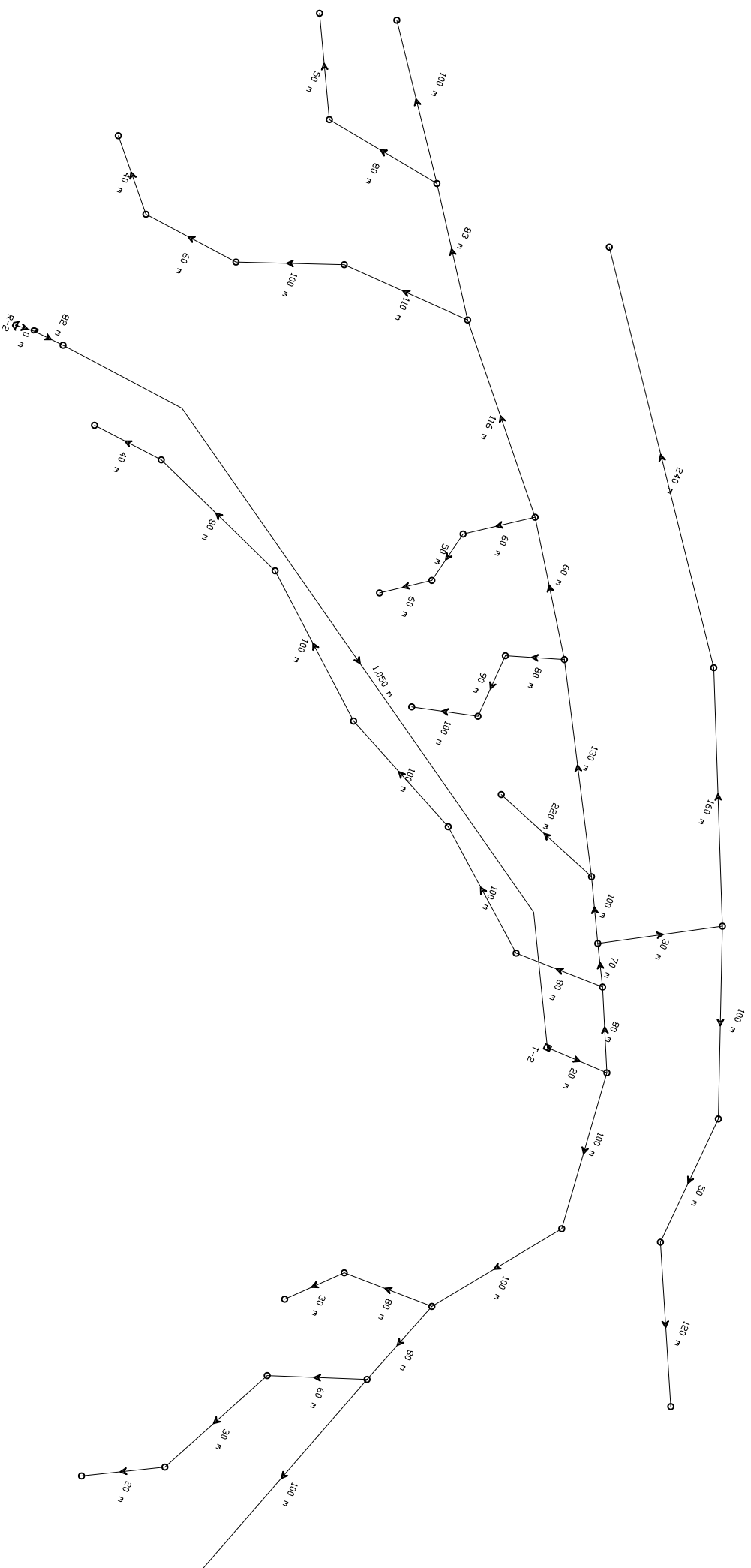
Point Table			
Description	Latitude	Long Latitude	Elevation
Well	31 55 88 58	66 55 60 68	1285
Water Tank	31 56 60 39	66 56 01 57	1321

House connection Table			
Description	Family	Connection	
Network	270	84	
F= No of Family, Hc= No of house connection			

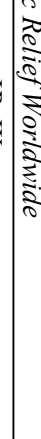
Water Network Project (House Connection)

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		

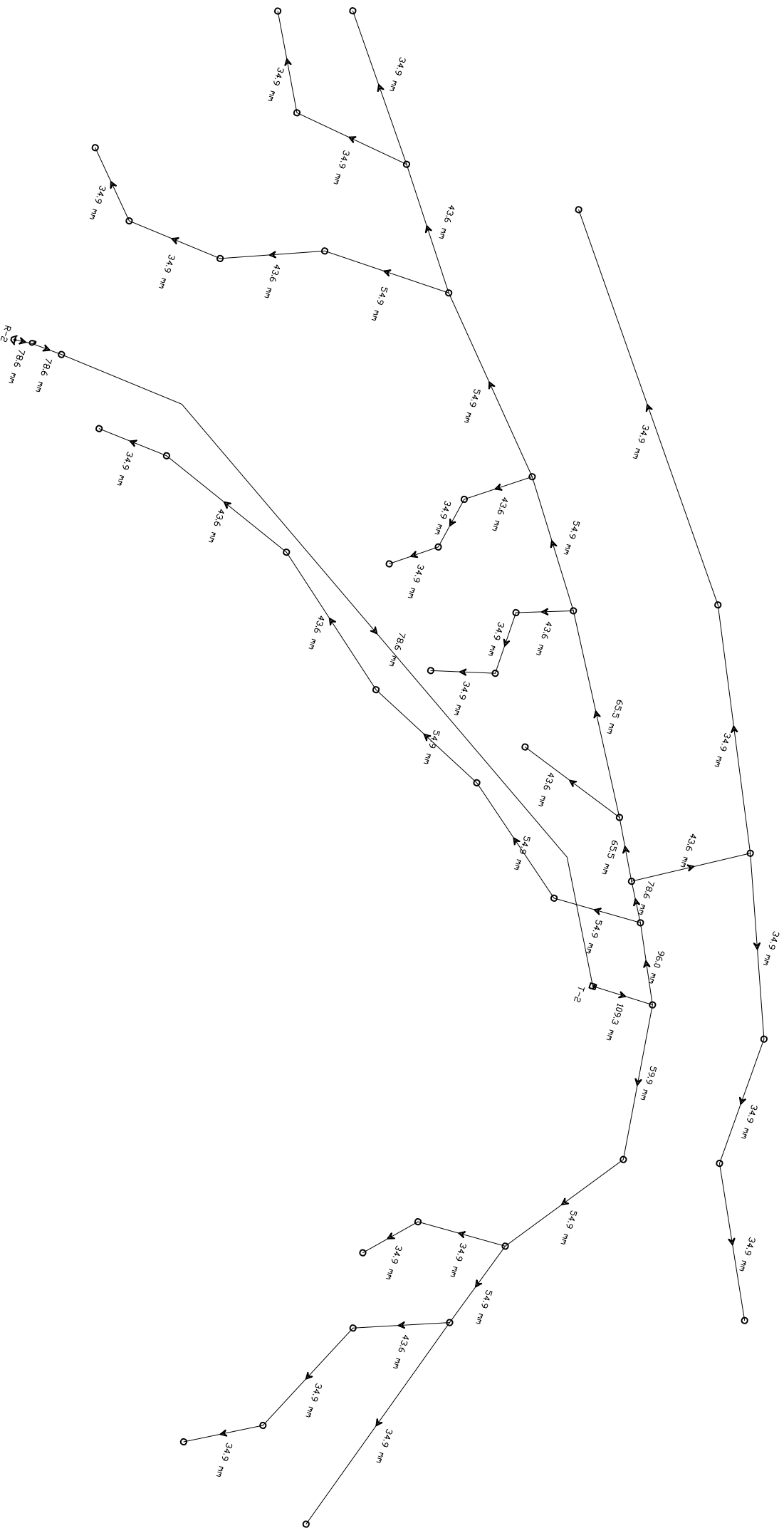
(Length)




Water Network Project (Length)

				Islamic Relief Worldwide		
				IR-W		
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 Shafiq	Province	Kandahar	Scale	NO	
Approved: By		District	Arghastan	Sheet No	0	
		Village	Zarin Zai			

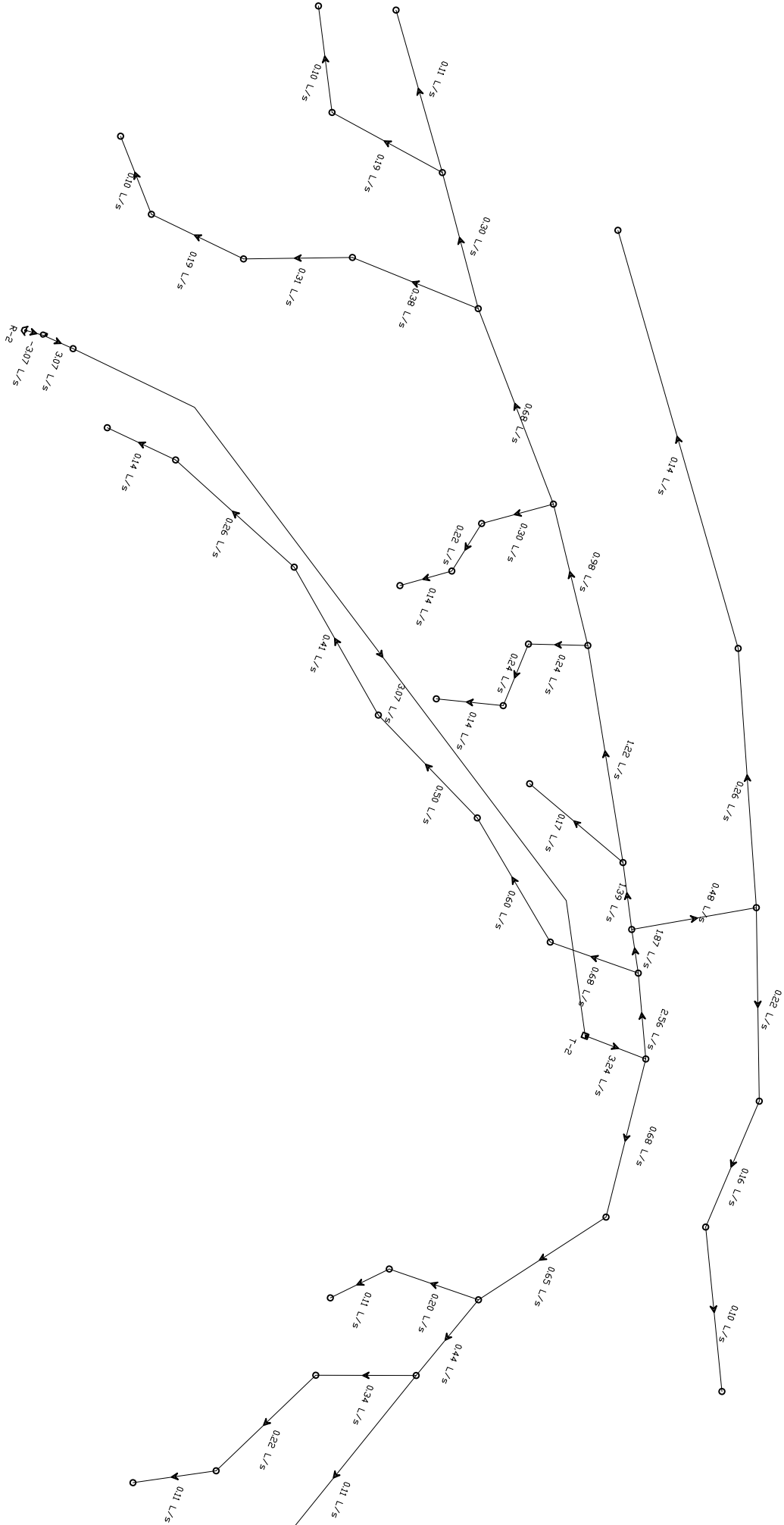
(Diameter)




Water Network Project (Diameter)

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

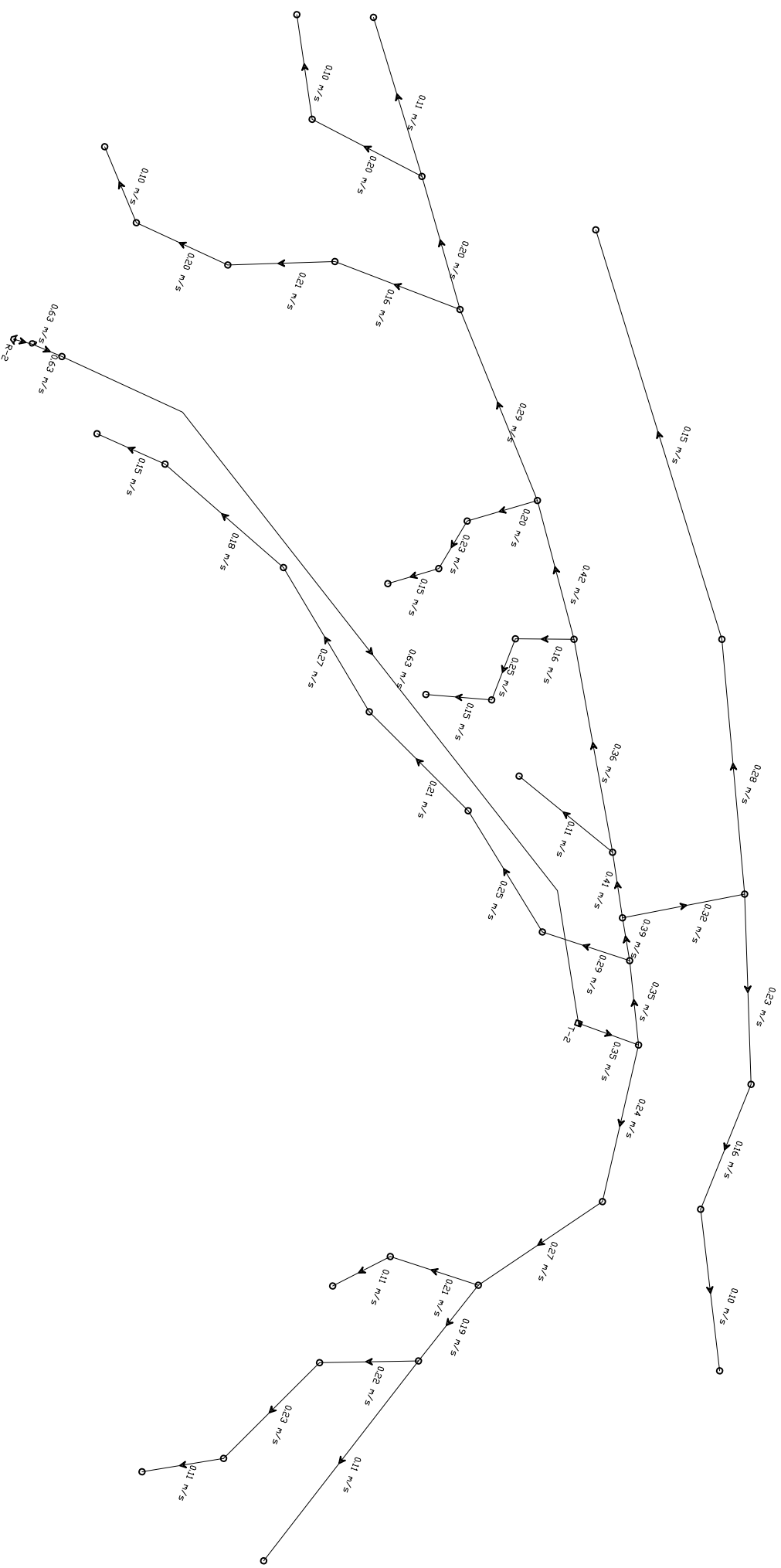
(Flow)



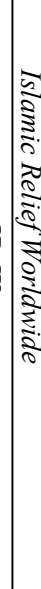
Water Network Project (Flow)

				Islamic Relief Worldwide		
Survey: By	Eng.M.Moaine & M.Mehdi	Project	Shelter	IR-W		
Drawing: By	Eng.M.Mehdi	Section	Water Network			
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			

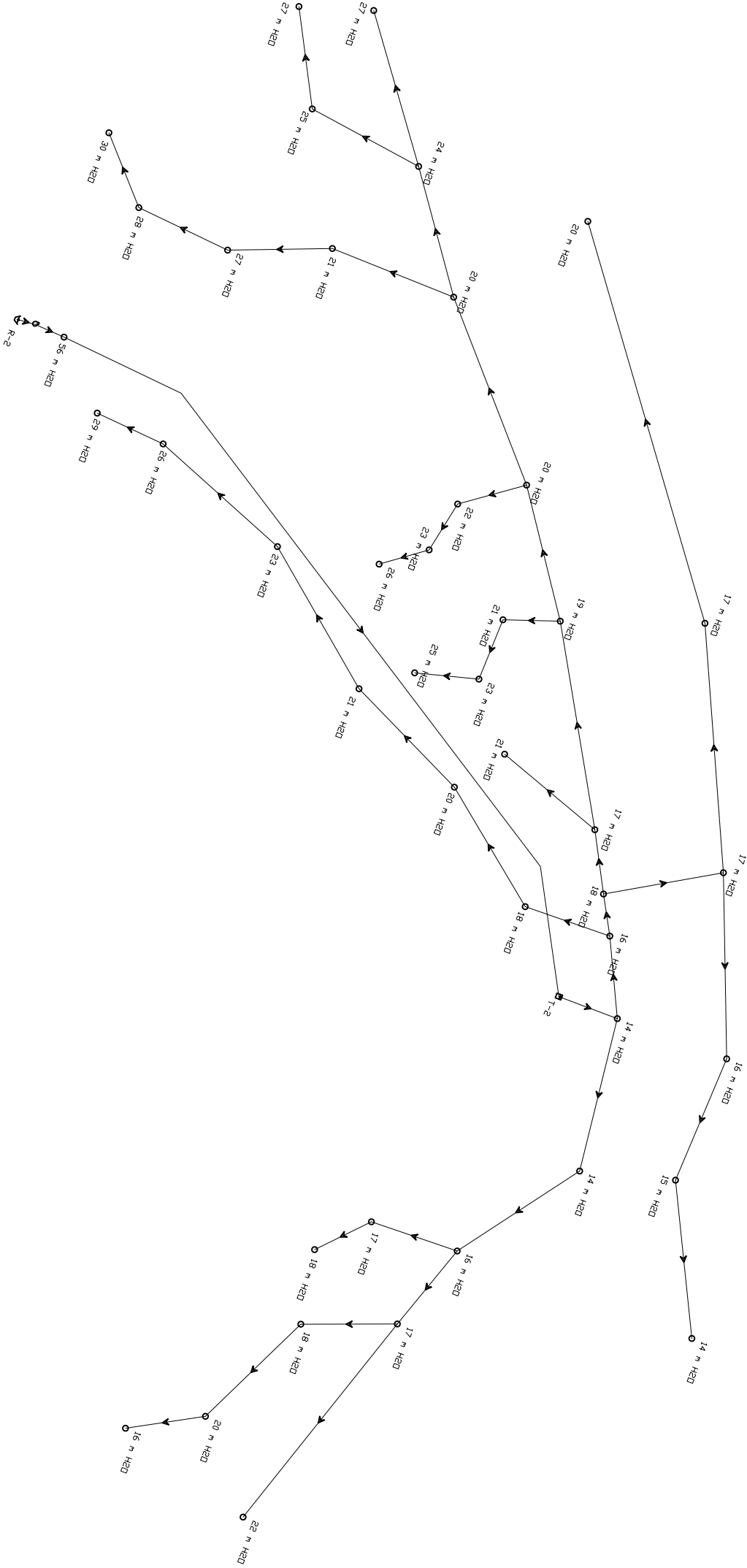
(Velocity)



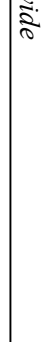
Water Network Project (Velocity)

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

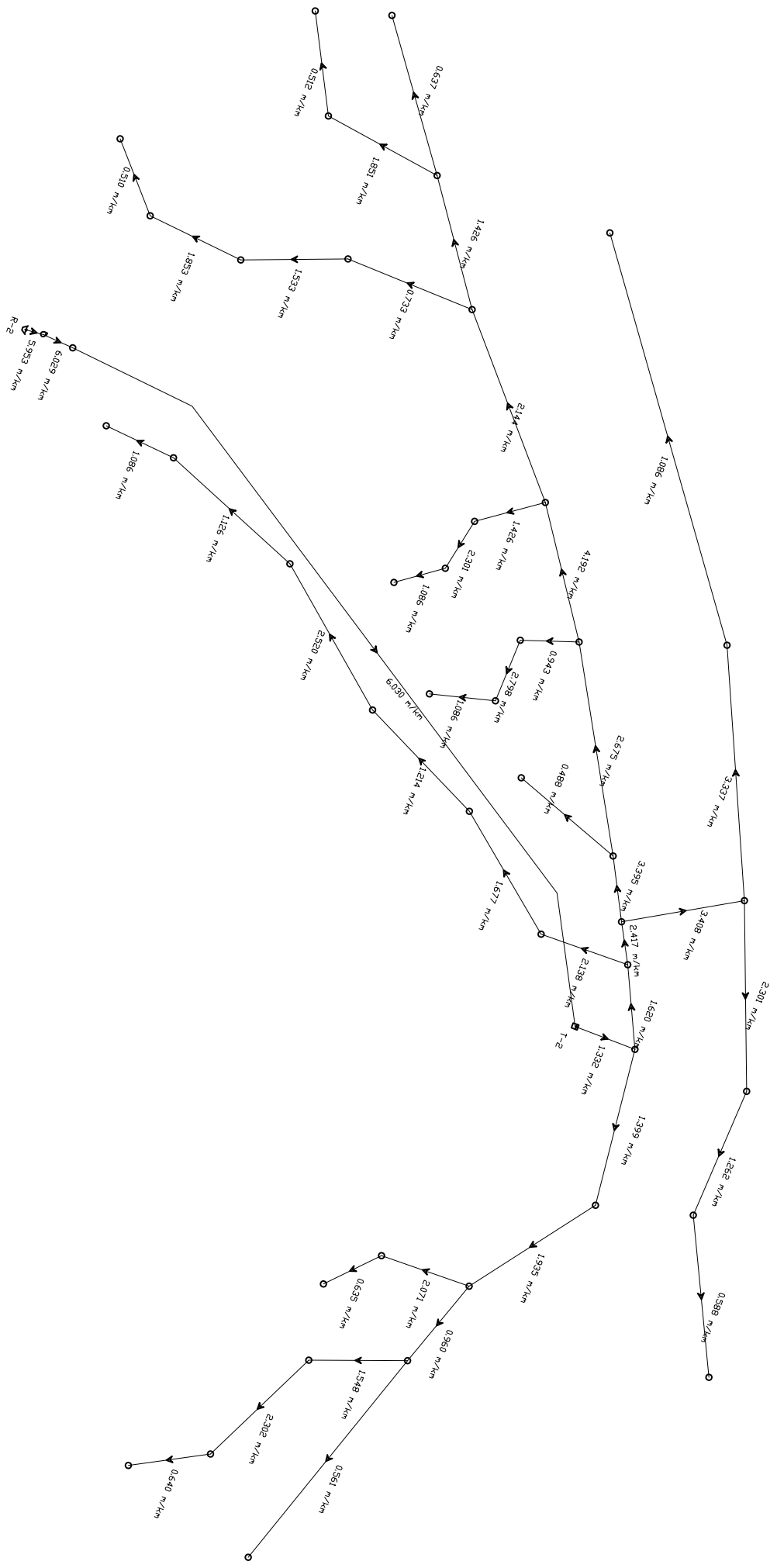
(Pressure)




Water Network Project (Pressure)

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 Shafaq	Province	Kandahar	Scale	NO	
Approved: By		District	Arghastan	Sheet No	0	
		Village	Zarin Zai			

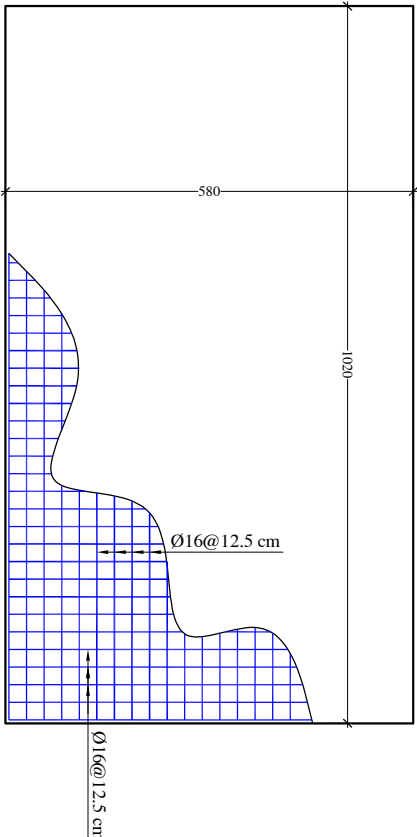
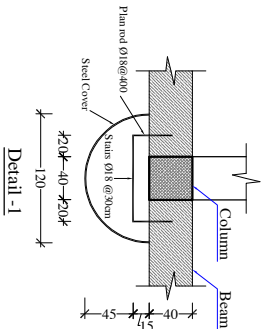
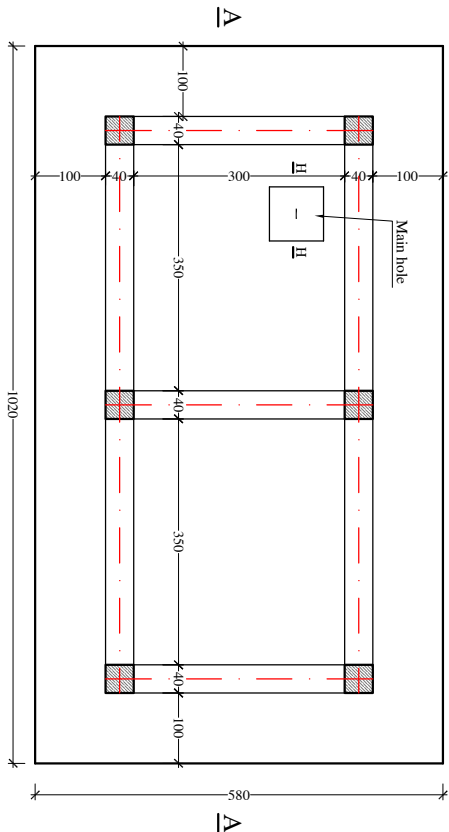
(Head loss)



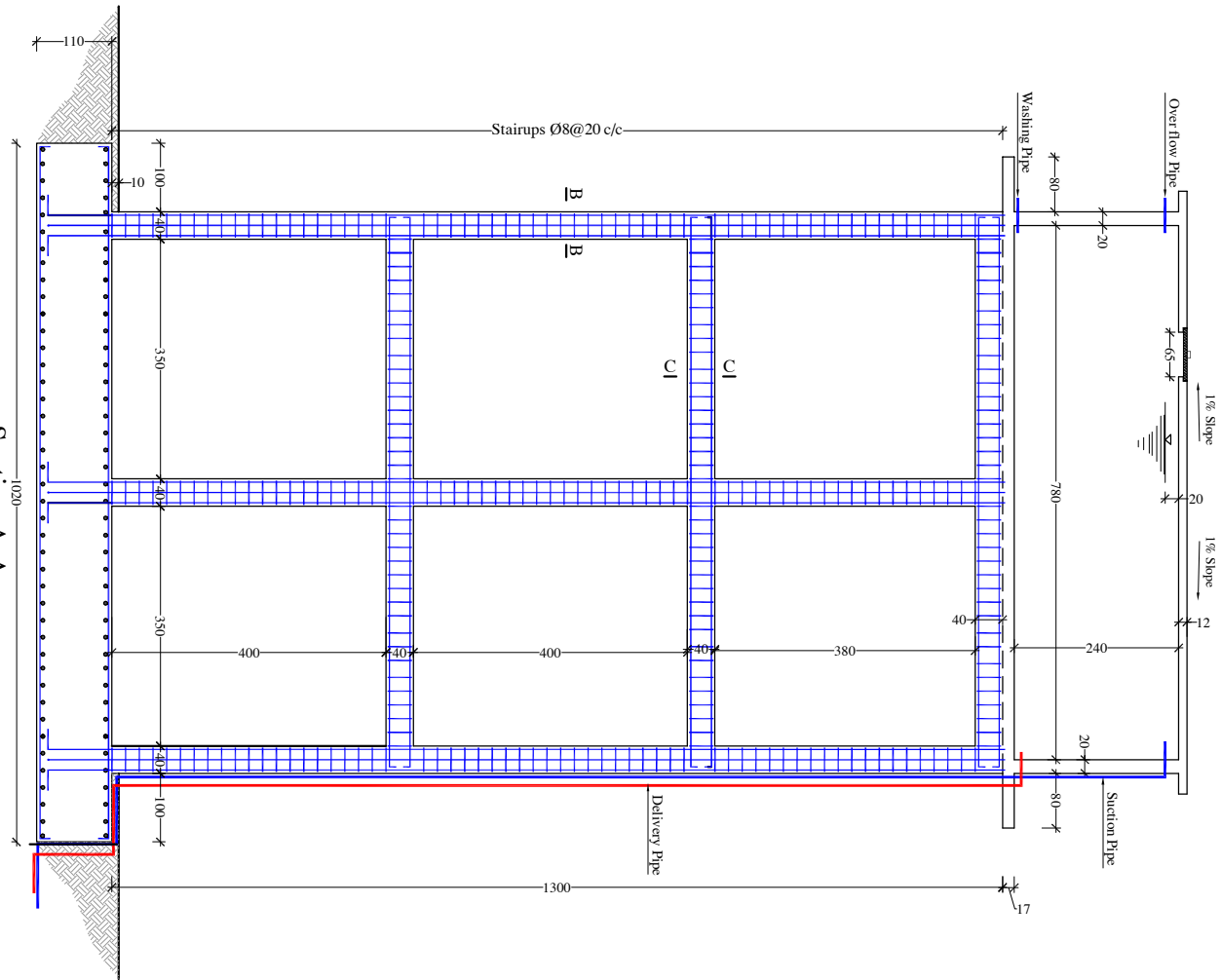
Water Network Project (Head Loss)

				Islamic Relief Worldwide		
Survey: By	Eng.M.Moaine & M.Mehdi	Project	Shelter			
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 Shajaaq	Province	Kandahar	Scale	NO	
Approved: By		District	Arghastan	Sheet No 0		
		Village	Zarin Zai			

Plan



Reinforcement Plan of Footing



Section A-A

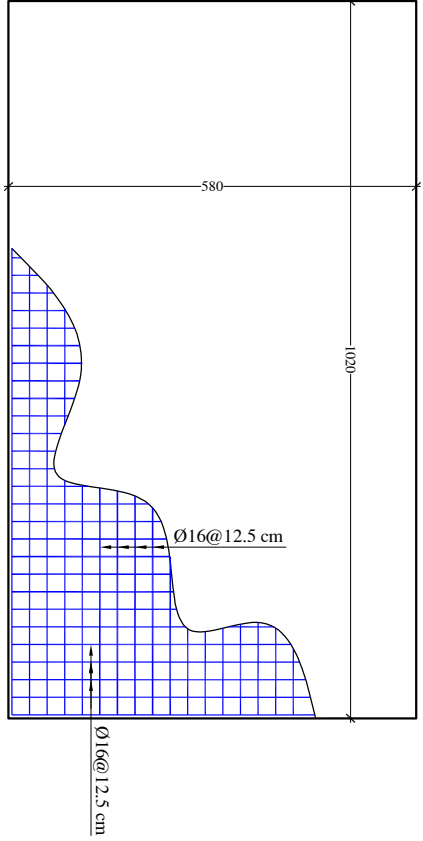
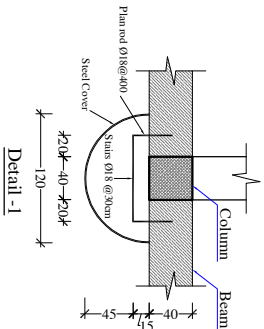
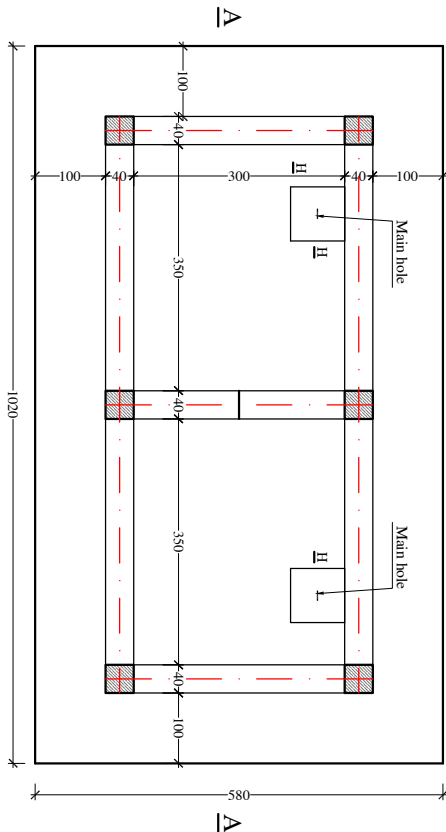


SURVEYED BY	Faah RRD	CHECKED BY	Eng. Mahmood	SCALE	<div><div>3</div><div>3</div></div>		PROVINCE	Kandahar	PROJECT NAME <i>Water Supply Project</i>
DESIGNED BY	Eng. Najibullah	REVIEWED BY	Eng. Fazel Omer "Zahid"	DATE	17.08.2016	DISTRICT	Arglasthan		
DRAWN BY	Eng. Najibullah	APPROVED BY	Eng. Ghulam Qader	DRAWING NO.		VILLAGE	Zarin Zai	DRAWING TITLE 50 m ³ Elevated water reservoir	

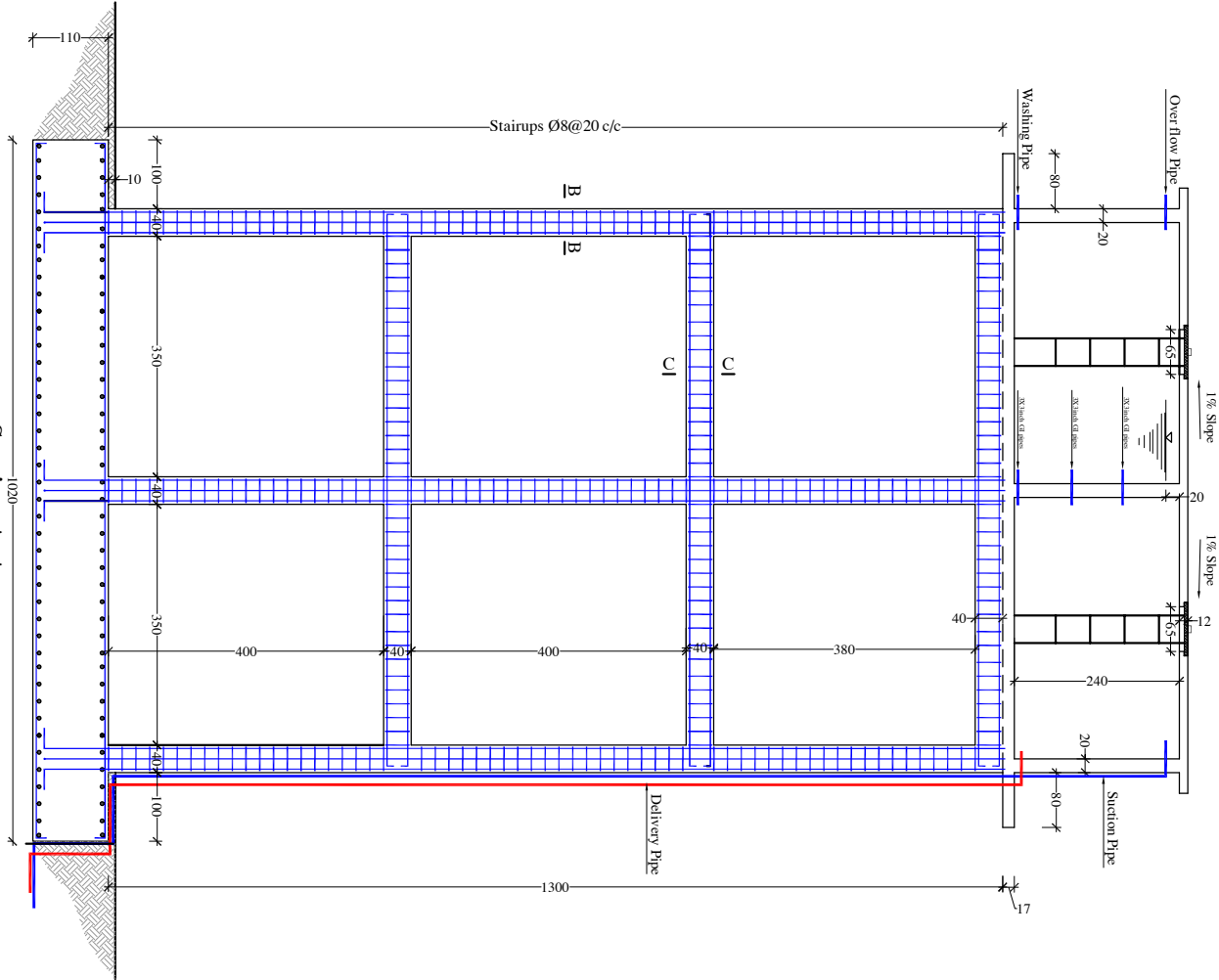
Corner Steel Bar $\phi 18 @ 10c/c$
L=250cm

Diagram illustrating the main hole cover (76x76 cm) and its reinforcement details. The cover is made of RCC (Reinforced Concrete) and is supported by a 6 cm thick base layer. The reinforcement consists of Ø8 bars at 10 cm center-to-center (c/c) spacing. The cover dimensions are 65 cm by 12 cm. The reinforcement is shown in both plan and cross-section views.

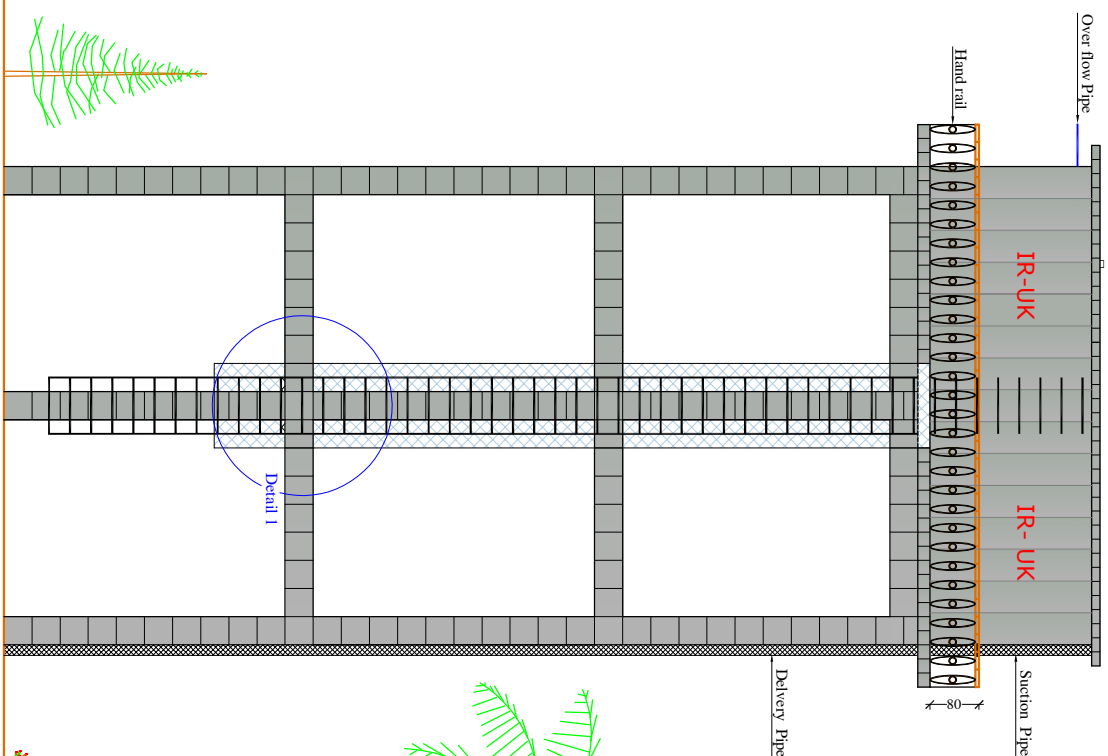
Plan



Reinforcement Plan of Footing




Section A-A

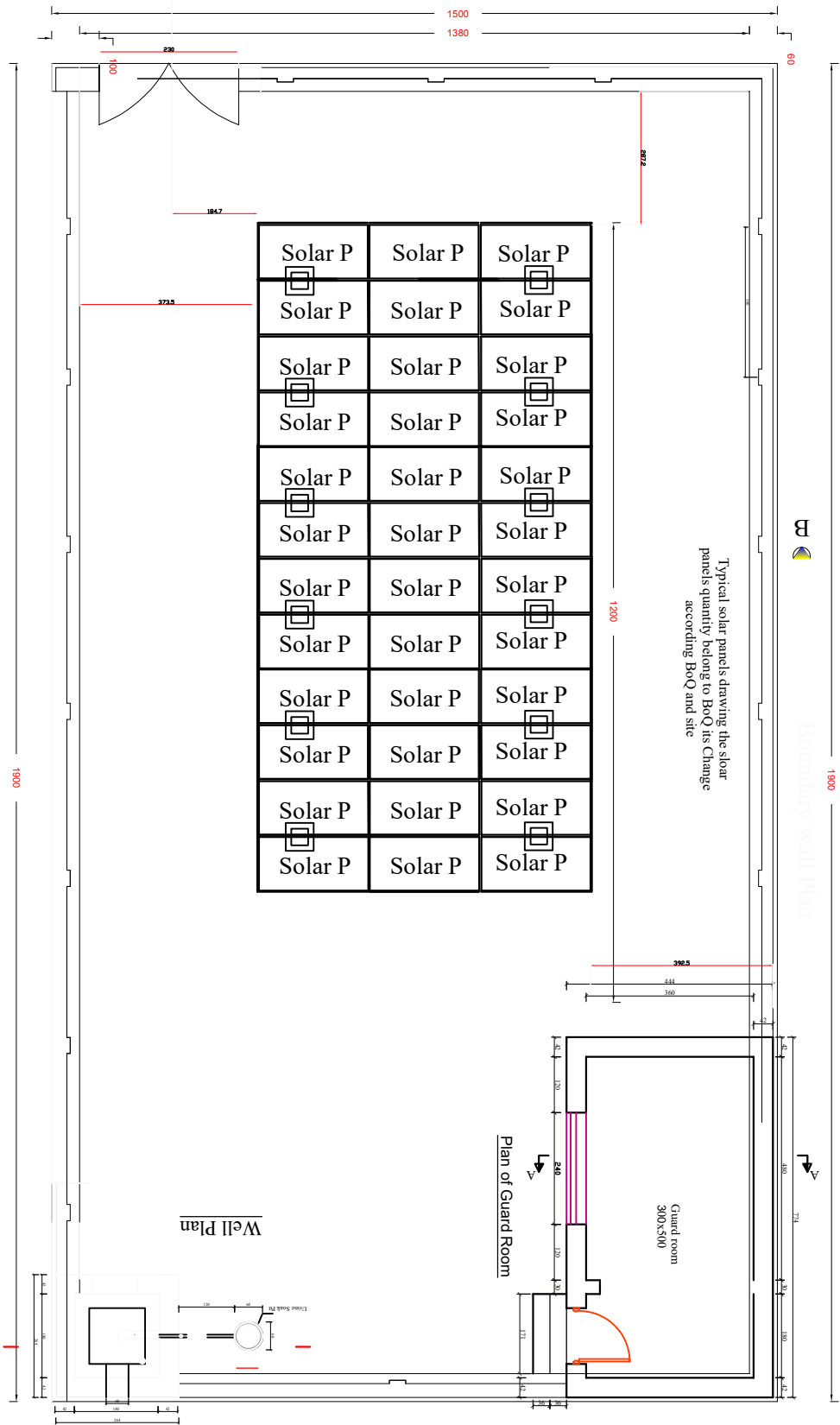


- Note:**
1. All dimension are in cm
 2. Mark of concrete 200 kg/cm²
 3. Delivery and Suction pipe should be protected (Isolation)
 4. Assume bearing capacity is 2 kg/cm²


Elevation of Water Tank Tower

 ITS AFGHANISTAN Ministry of Rural Rehabilitation and Development WatsIP				PROJECT NAME Water Supply Project	
SURVEYED BY	Farah RRD	CHECKED BY	Eng. Mahmood	SCALE	
DESIGNED BY	Eng. Najibullah	REVIEWED BY	Eng. Fazel Omer "Zahid"	DATE	17.08.2016
DRAWN BY	Eng. Najibullah	APPROVED BY	Eng. Ghulam Qader	DRAWING NO.	
SHEET NO.				PROVINCE	Kandahar
1/3				DISTRICT	Arglhasan
				VILLAGE	Zam Zai
				DRAWING TITLE 50 m3 Elevated water reservoir	

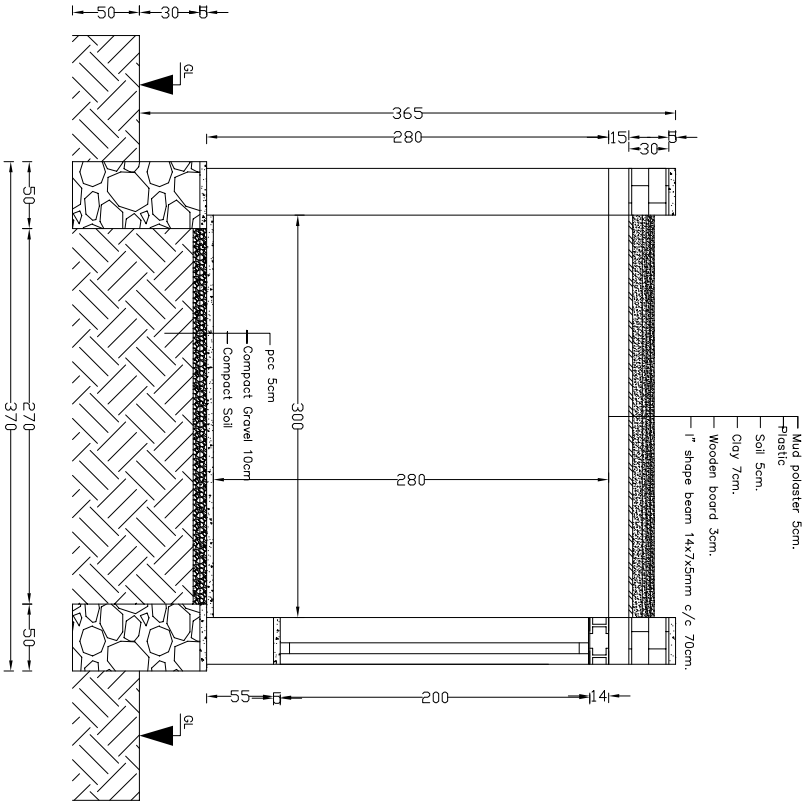
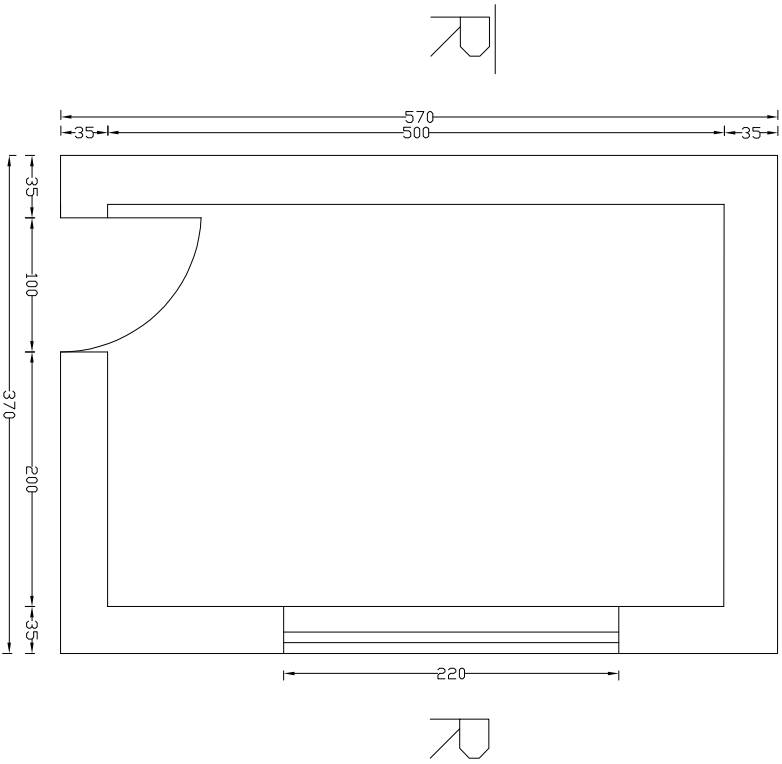
Boundary Wall




Water Network Project Boundary Wall for Solar Panels

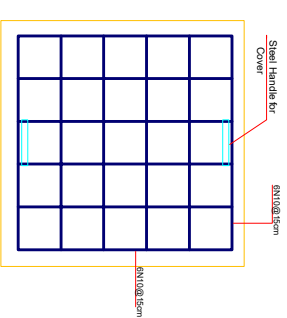
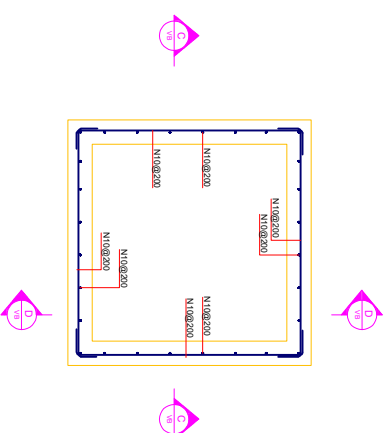
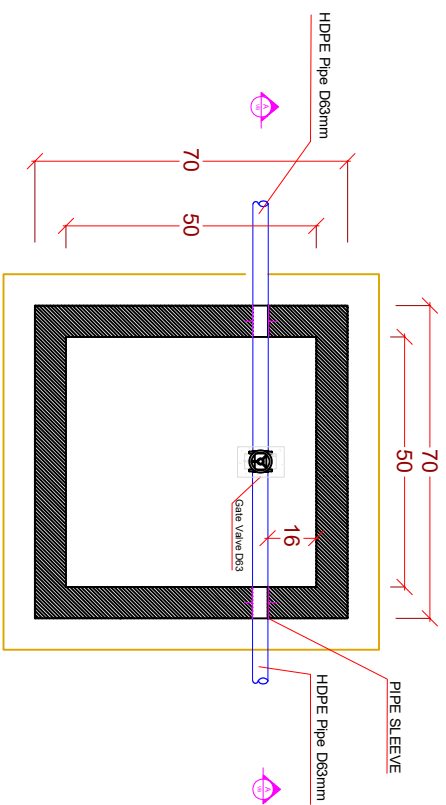
Survey: By	Eng. M. Moaine & M. Mehdi	Project	Shelter	Islamic Relief Worldwide		
Drawing: By	Eng. M. Mehdi	Section	Water Network	IR-W		
Design : By	Eng. M. Moaine	Date	16/10/2023	Unit	cm	
Checked: By	Eng. Dawod Shafag	Province	Kandahar	Scale	NO	
Approved: By		District	Arghastan	Sheet No	0	
		Village	Zarin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

Guard Room



Water Network Project Guard Room						
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			

Well Manhole

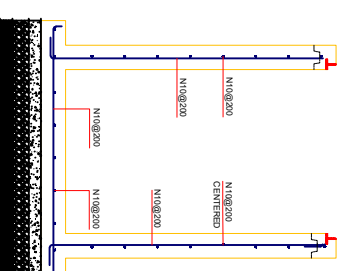
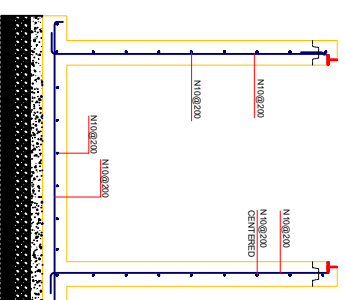
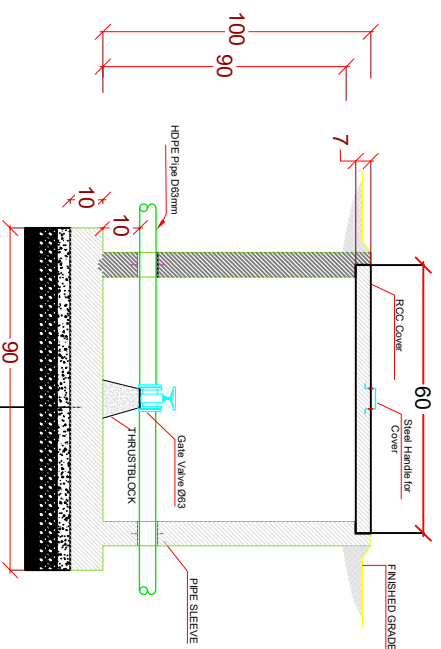


VALVE Box plan

SCALE N.T.S.

VB VB Reinforcement Plan
SCALE N.T.S

Cover of Manhole



SECTION A-A

SCALE N.T.S

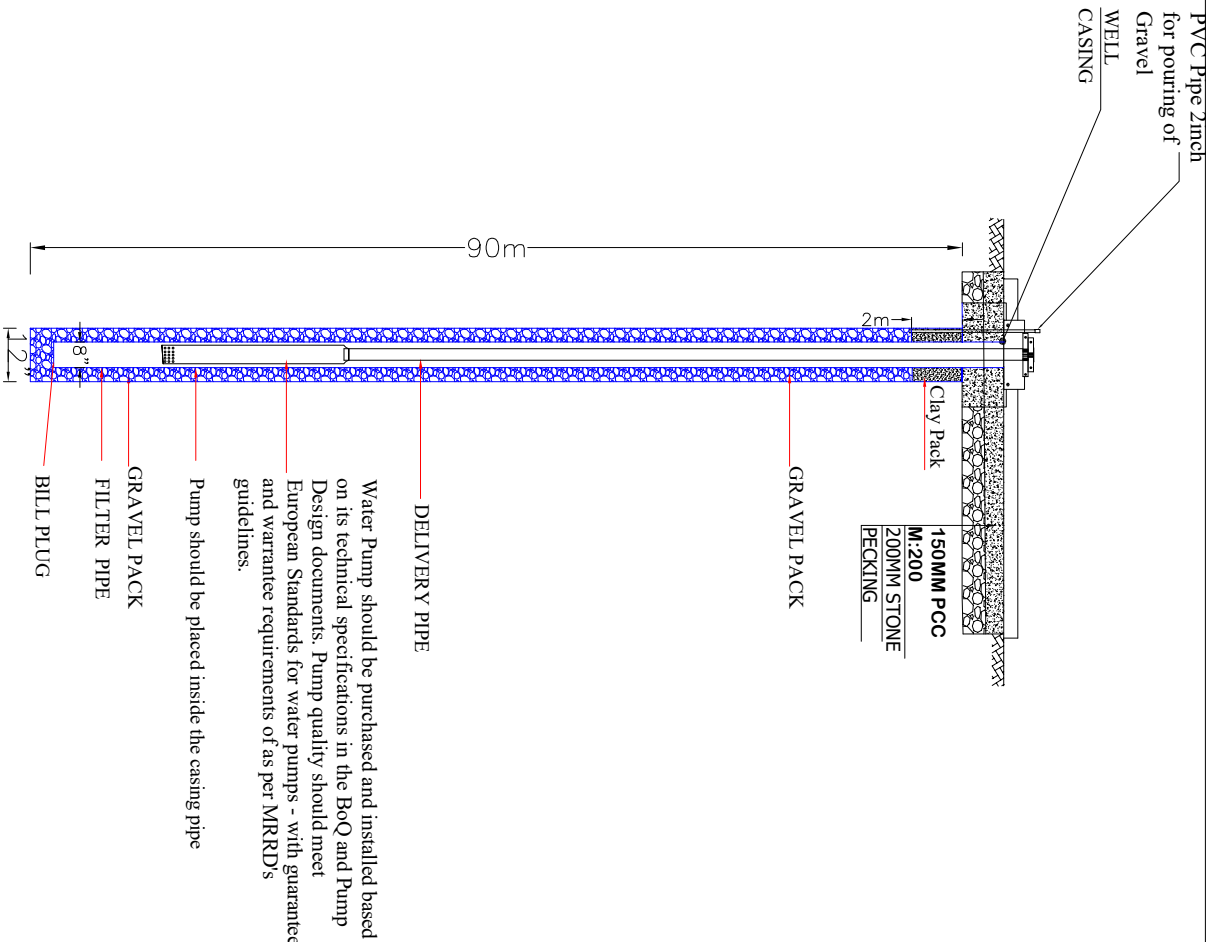
Section C-C

SCALE N.T.S.

Section D-D
SCALE N.T.S

Water Network Project Well Manhole


Islamic Relief Worldwide				
IR-W				
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	
Checked: By	Eng. Dawod Shafiq	Province	Kandahar	
Approved: By		District	Arghastan	
		Village	Zarin Zaiy	



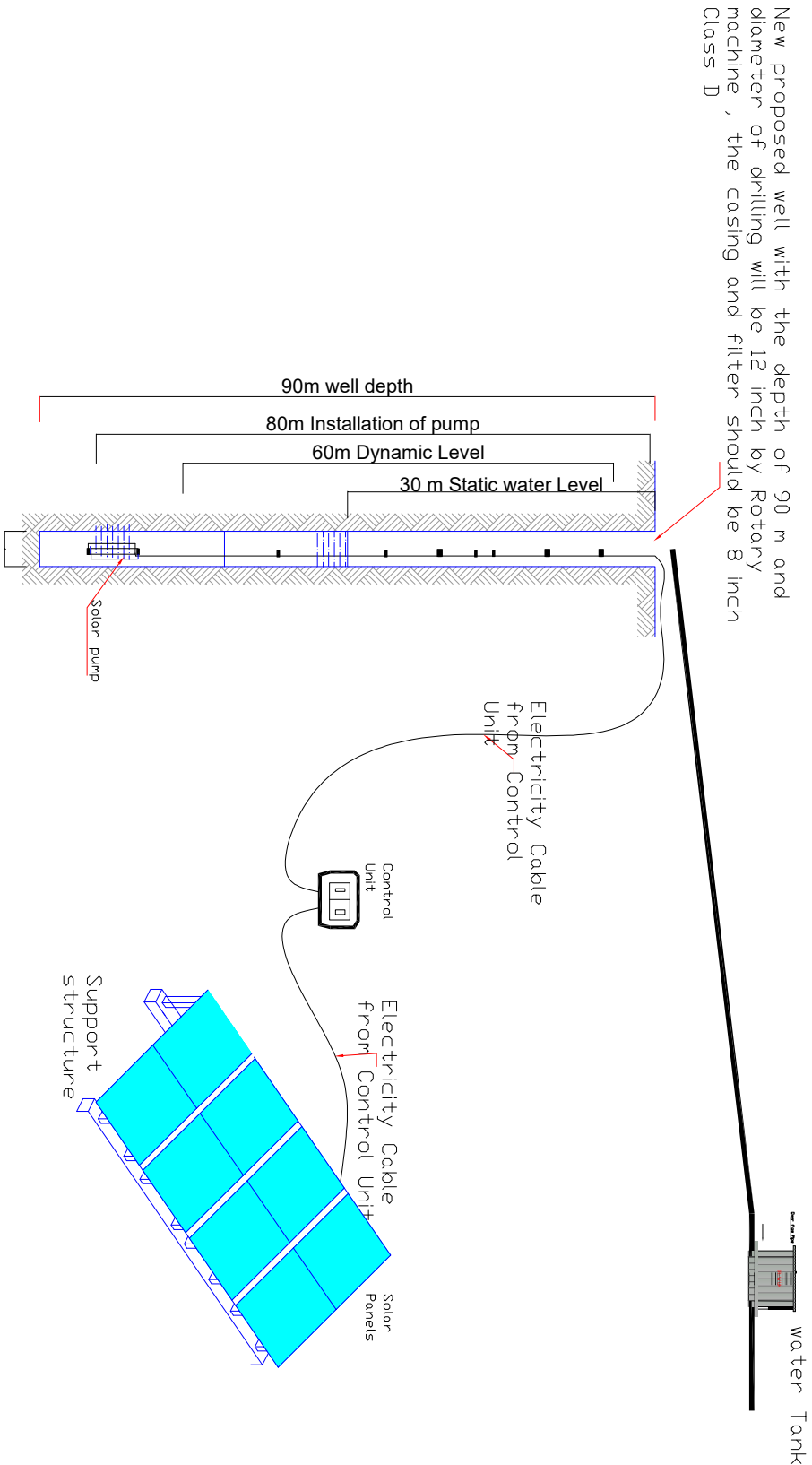
Notes

- 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

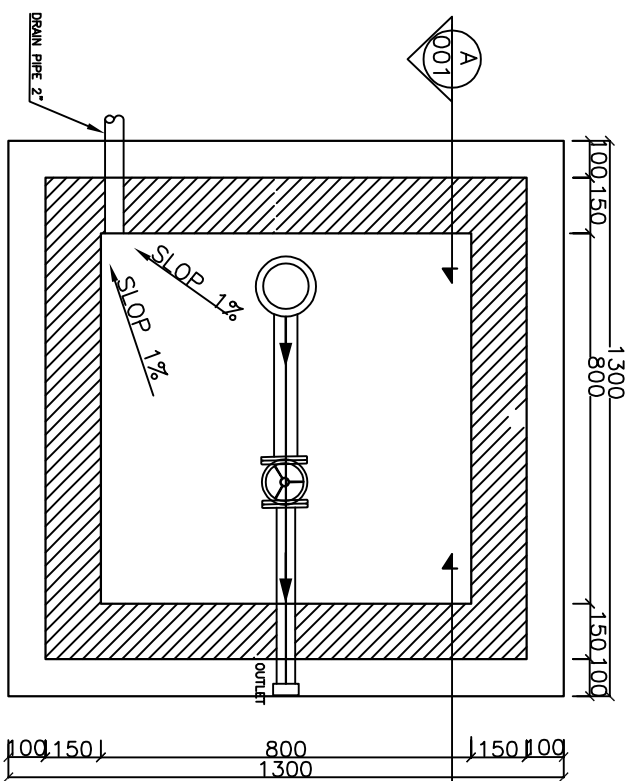
				Islamic Relief Worldwide			
				IR-W			
Survey: By	Eng.M.Moaine & M.Mehdi	Project	Shelter	<div><div></div><div>1,300</div><div>800</div><div>1,00150</div></div> <div></div>			
Drawing: By	Eng.M.Mehdi	Section	Water Network				
Design : By	Eng.M.Moaine	Date	16/10/2023				
Checked: By	Eng.Dawod Shafag	Province	Kandahar				
Approved: By		District	Arghastan				
		Village	Zarin Zaiy	Unit	cm		
				Scale	NO		
				Sheet No	0		

Typical Site plan of Solar pump system

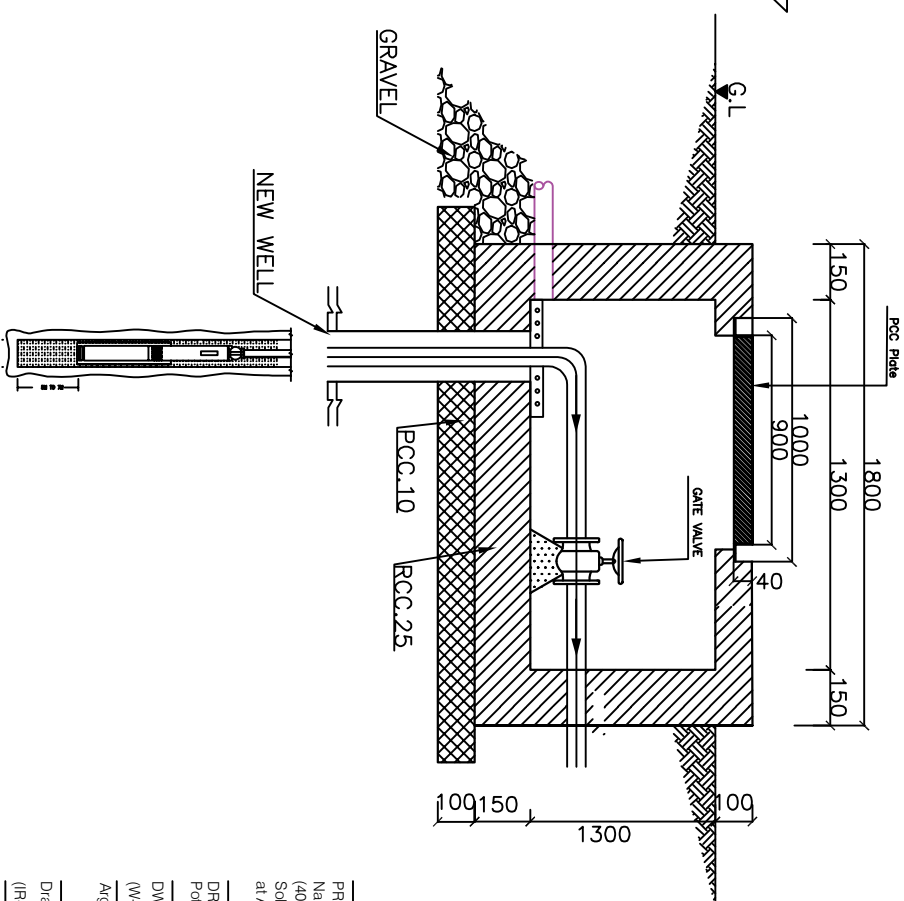


Water Network Project Well

		Islamic Relief Worldwide	
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
Checked: By	Eng.Dawod Shafaq	Province	Kandahar
Approved: By		District	Arghastan
		Village	Zarin Zaiy
		Unit	cm
		Scale	NO
		Sheet No	0



01 | Well Chamber Plan
SCALE: NTS



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

Remarks

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

DRAWING TITLE
Potable Water Well Plan and Section

DWG NUMBER
(W-01)

Aghastan District

Draht, Designed & Drawn By
(IR-W Area Team)

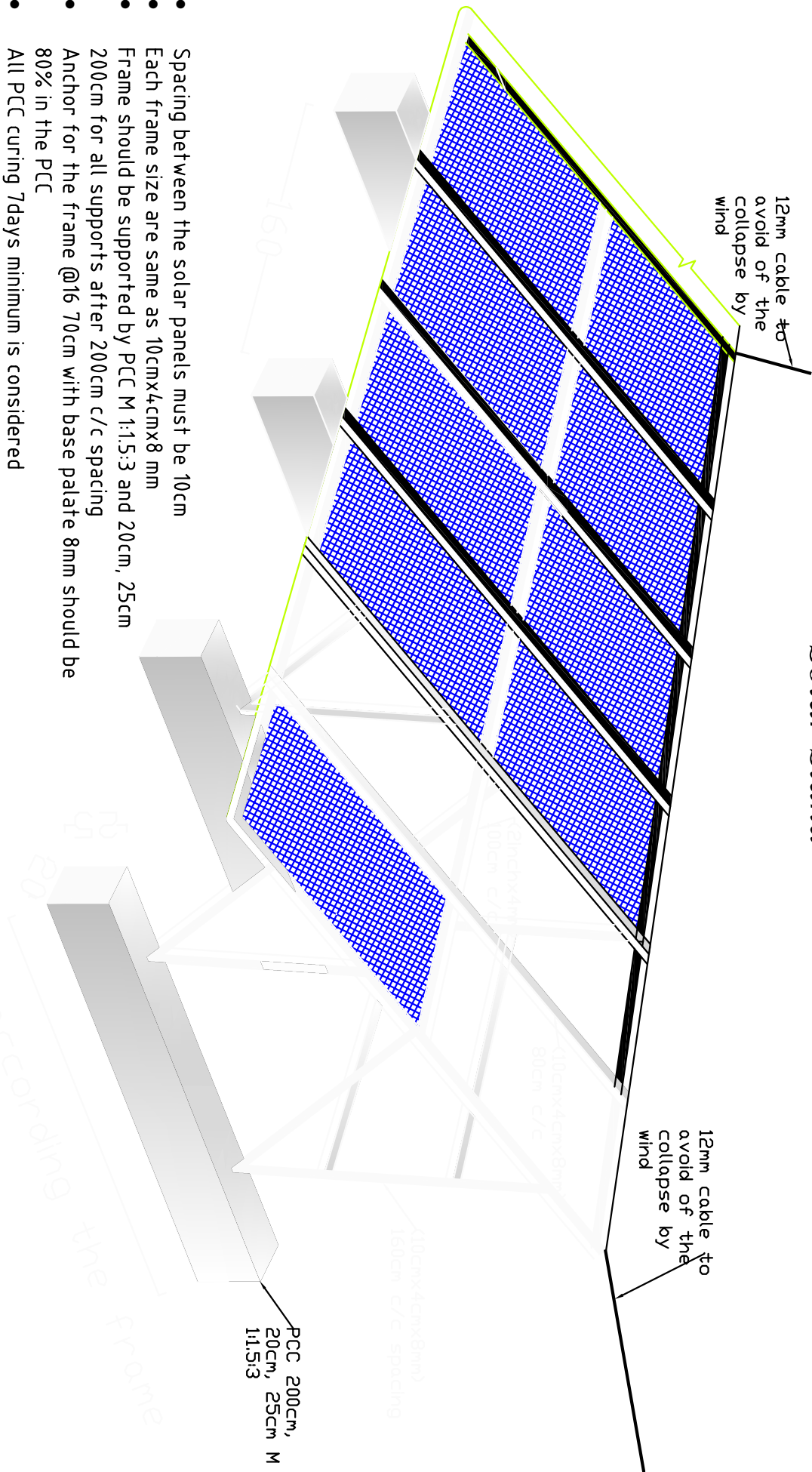
APPROVED BY INDEX

SCALE(NTS) DATE:Oct 2023


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 Shafaq	Province	Kandahar	Scale	NO
Approved: By		District	Arghastan	Sheet No	0
		Village	Zarin Zaiy		

Solar Stand

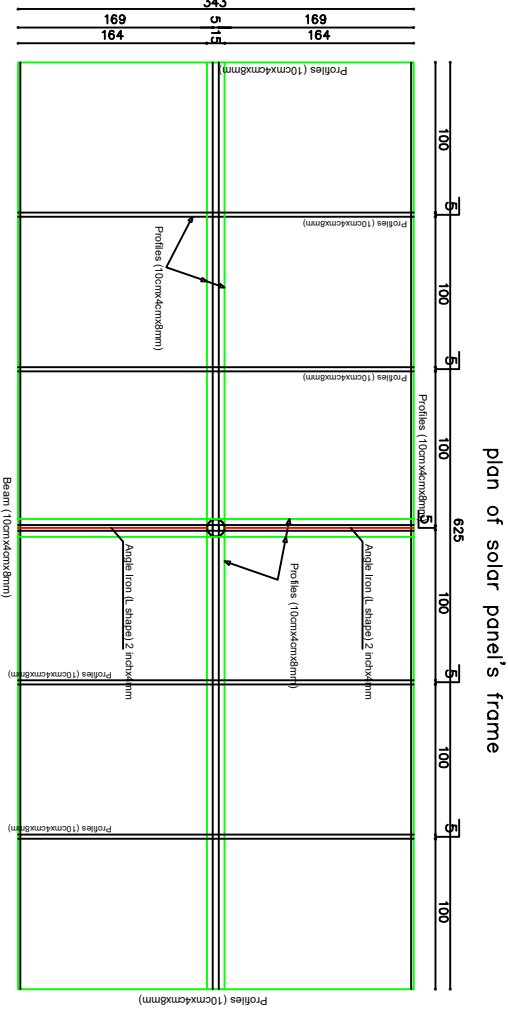
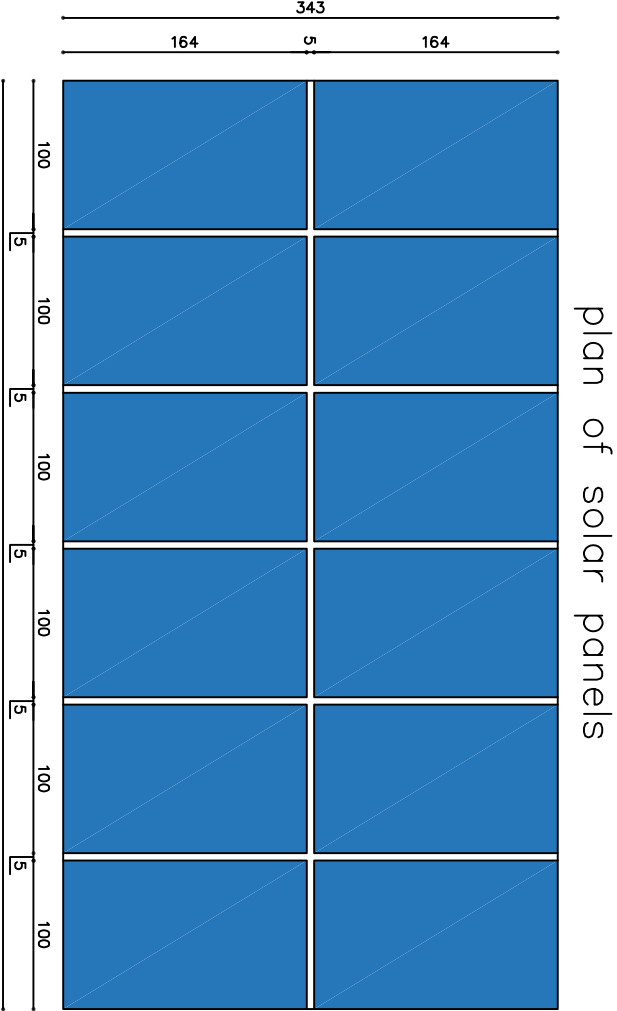



Water Network Project Solar Stand

Islamic Relief Worldwide						
IR-W						
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			
Checked: By	Eng. Dawod Shafag	Province	Kandahar			
Approved: By		District	Arghastan			
		Village	Zarin Zaiy			
		Unit	cm			
		Scale	NO			
		Sheet No	0			

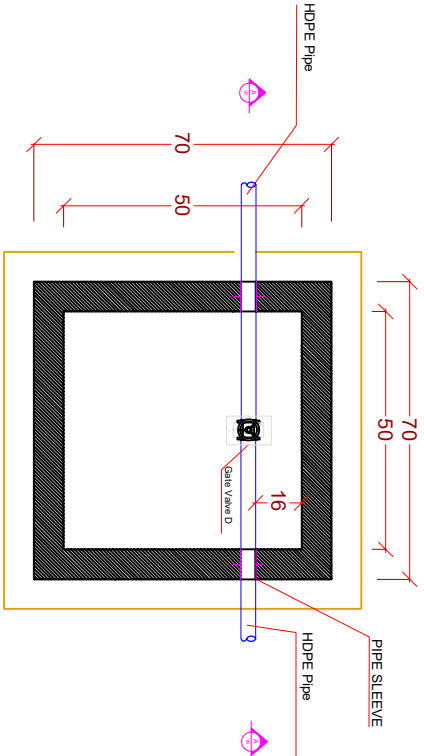


Typical Solar Panel Frame

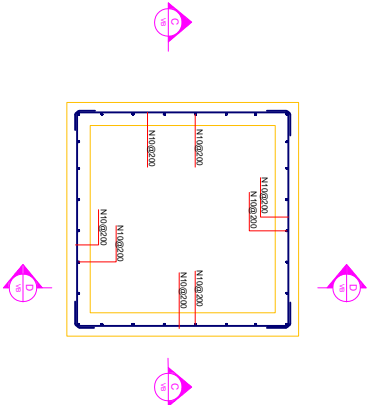


Water Network Project Solar Panel Frame						
Survey: By	Eng.M.Moaine & M.Mehdi	Project	Shelter	Islamic Relief Worldwide		
Drawing: By	Eng. M.Mehdi	Section	Water Network	IR-W		
Design : By	Eng.M.Moaine	Date	16/10/2023	Unit	cm	
Checked: By	Eng.Dawod Shafaq	Province	Kandahar	Scale	NO	
Approved: By		District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

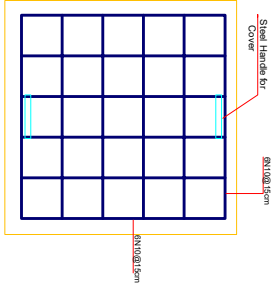
Gate Manhole



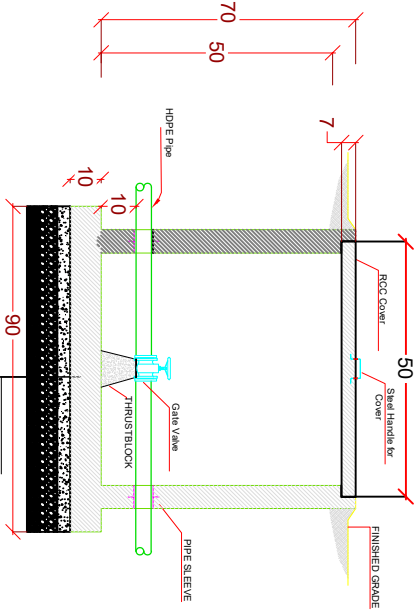
Valve Box Plan
SCALE N.T.S



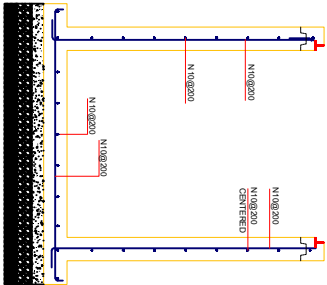
V/B Reinforcement Plan
SCALE N.T.S



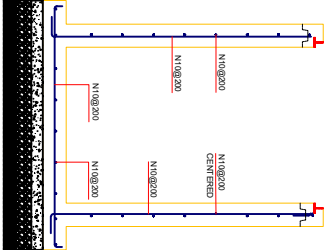
Cover of Manhole



SECTION A-A
SCALE N.T.S




Section C-C
SCALE N.T.S



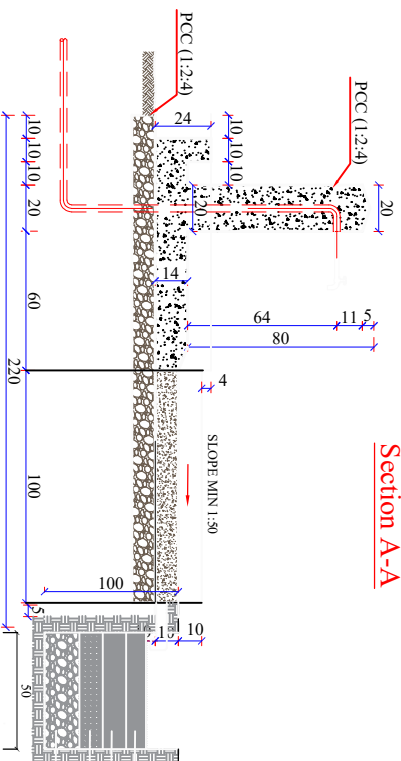
Section D-D
SCALE N.T.S

Water Network Project Manhole

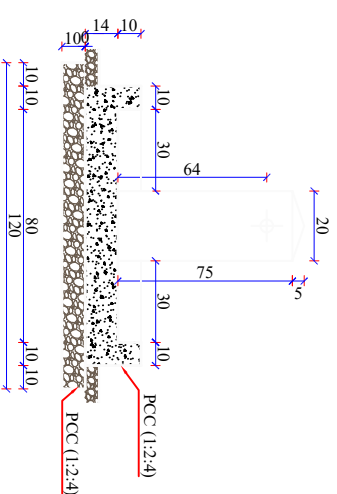
Survey: By	Eng. M. Moaine & M. Mehdi	Project	Shelter	Islamic Relief Worldwide	
Drawing: By	Eng. M. Mehdi	Section	Water Network	IR-W	
Design : By	Eng. M. Moaine	Date	16/10/2023	Unit	cm
Checked: By	Eng. Dawod Shafag	Province	Kandahar	Scale	NO
Approved: By		District	Arghastan	Sheet No	0
		Village	Zarin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

Plan of Stand Tap

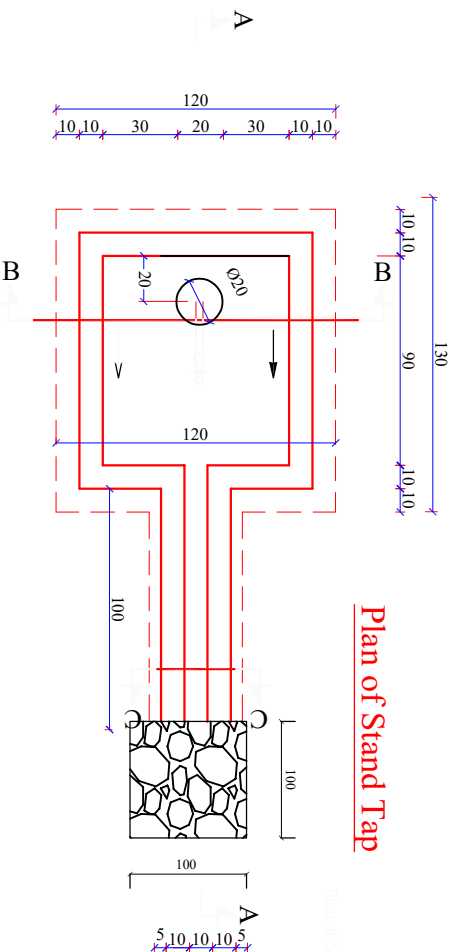
Section A-A



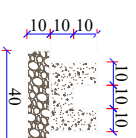
Section B-B




Plan of Stand Tap



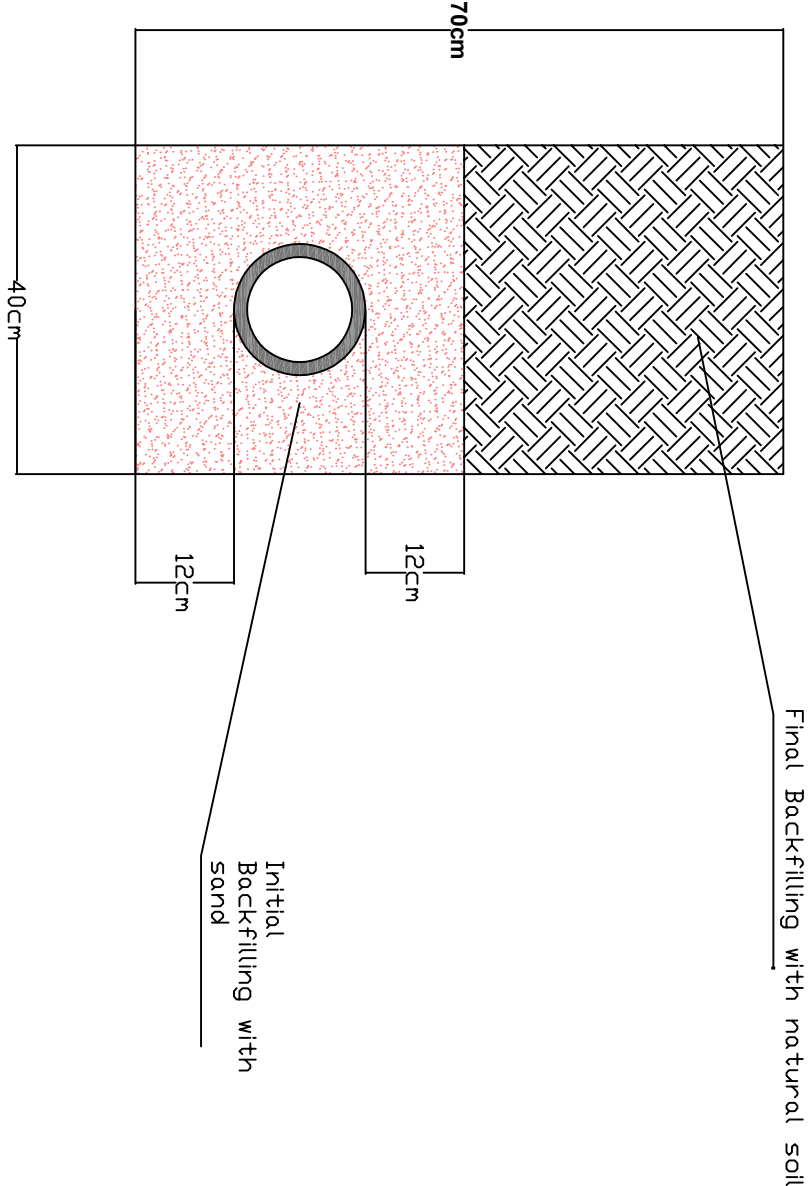
Section C-C




Water Network Project Plan of Stand Tap

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

Trench for Pipe



Section of trench for pipe laying

Water Network Project Trench						
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 Shafaq	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	1 نفوس
270	Family	2 دfamیلونو تعداد
2.2	Population growth/year	3 دنفوس کلنی زیاتوالی
15	Design period	4 د دیزاین زمان
2620	Design population	5 دیزاین نفوس
30	Daliy Demend l/c/d	6 په روځ کي دمصرف نورم
78.6	Everege daliy Flow for design population m3/dy	7 ددیزاین شوی نفوس لپاره د متوسطی روځی جریان
1.3	Peak daily factor	8 دروځنی اعظمی مصرف ضریب
102.2	Peak daliy flow m3/dy	9 د هغه روځی لپارابه چي مصرف یي اعظمی وی
12.8	Peak horliy flow m3/h= (row9/8)	10 د هغه اوبو اعظمی مقدار چي سولرپمپ یی له څاه څخه په ساعت کي پمپ کوی، د اعظمی ورځی دمصرف تقسیم به ۸ ساعته
80+37+2+1=130m	TDH=Hds+H loss+1m	11 د واټرپمپ لپاره ارتفاع، دڅاه له دینامیک سطحی تر ذخیری ارتفاع جمعه د فشار ضایعات یو متر دخروج لپاره فشار په متر
120.0	TDH	مجموعی ارتفاع
4.2	Hydraulic power of the pump (kW)	12 هایدرولیکی فشار Ph
1.25	η_p Pump efficiency (%).	13 دپمپ موثریت ۷۵ %
5.2	Shaft power of the pump (kW)=75%Ph	14 دواټرپمپ د شافت قدرت ۷۵ % Ph
1.24	Coefficient C= (1.1-1.2-1.5-2)	15 د موټور د موثریت ضریب 1.1-1.2-1.5-2
6.5	Power to the Motor (kW)	16 دواټرپمپ د موټور یانصب قدرت Pm
6.5	avalibal	17 دتولید ستندر
0.85	η (Inverter)= inverter efficiency85% = 7.6	18 د انورټر موثریت ۸۵ %
0.80	η (factor) = efficiency factor is normally 80%	19 د سستم موثریت ۸۰ %
9.6	PV	20 دلمریزو تختو د بریښنا قدرت په کیلووات
9558.8		21 دلمریزو تختو د بریښنا قدرت په واط
19.1	20.0	22 دلمریزو تختو تعداد بریښنا قدرت په واط

دشبکی د دیزاین د ارقامو جدول

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

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:

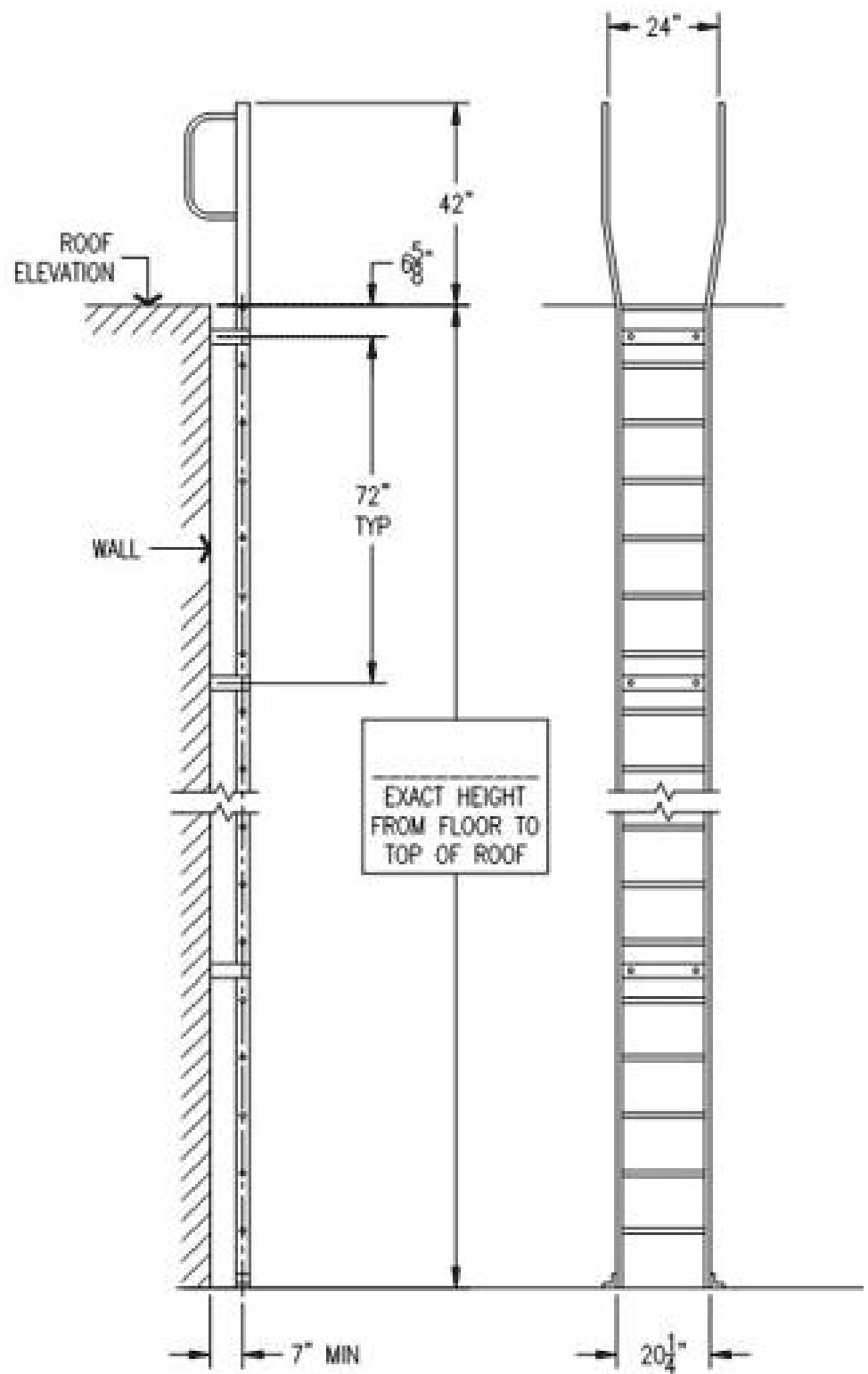
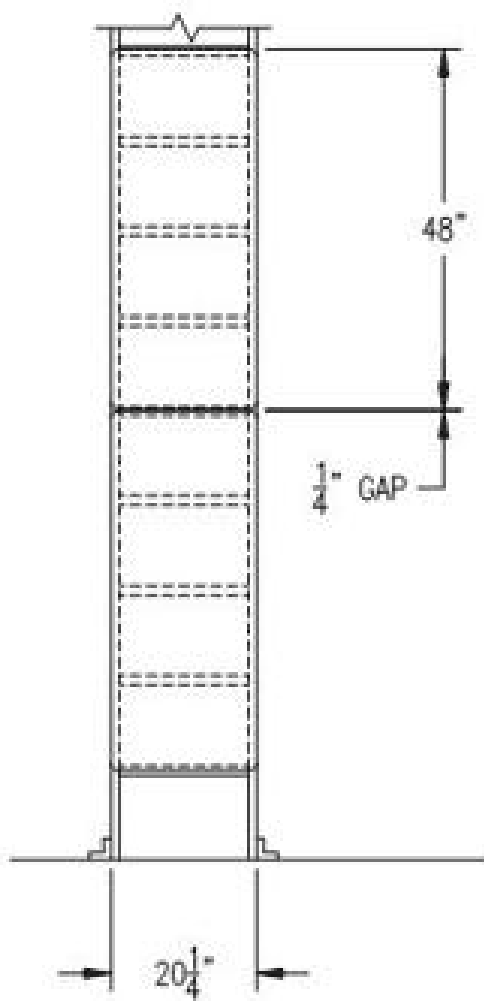
- Side members are $\frac{1}{4}$ "x2"x2" steel angle. $\frac{3}{4}$ " corrugated steel round climbing rungs on 12" centers. Stand-off mounting brackets are 7".
- Walk-thru handrails extend 42" above landing surface. Mounting brackets included.
- Welded one-piece, gray powder coat finish, yellow available.

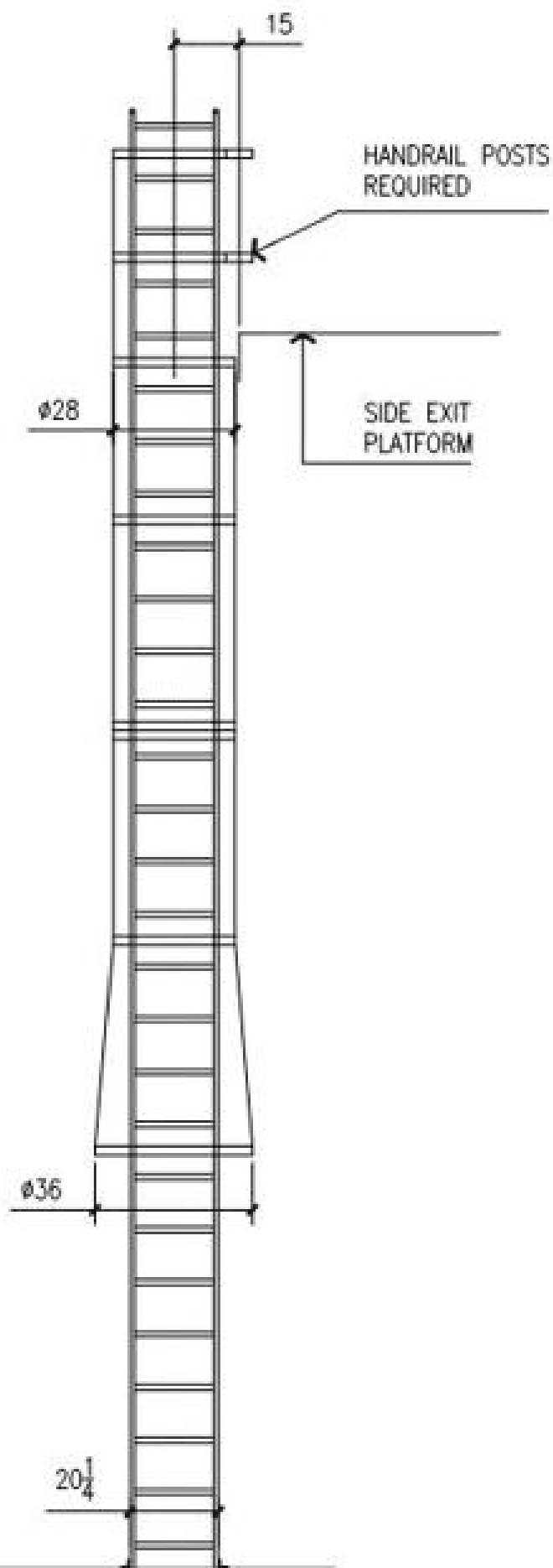
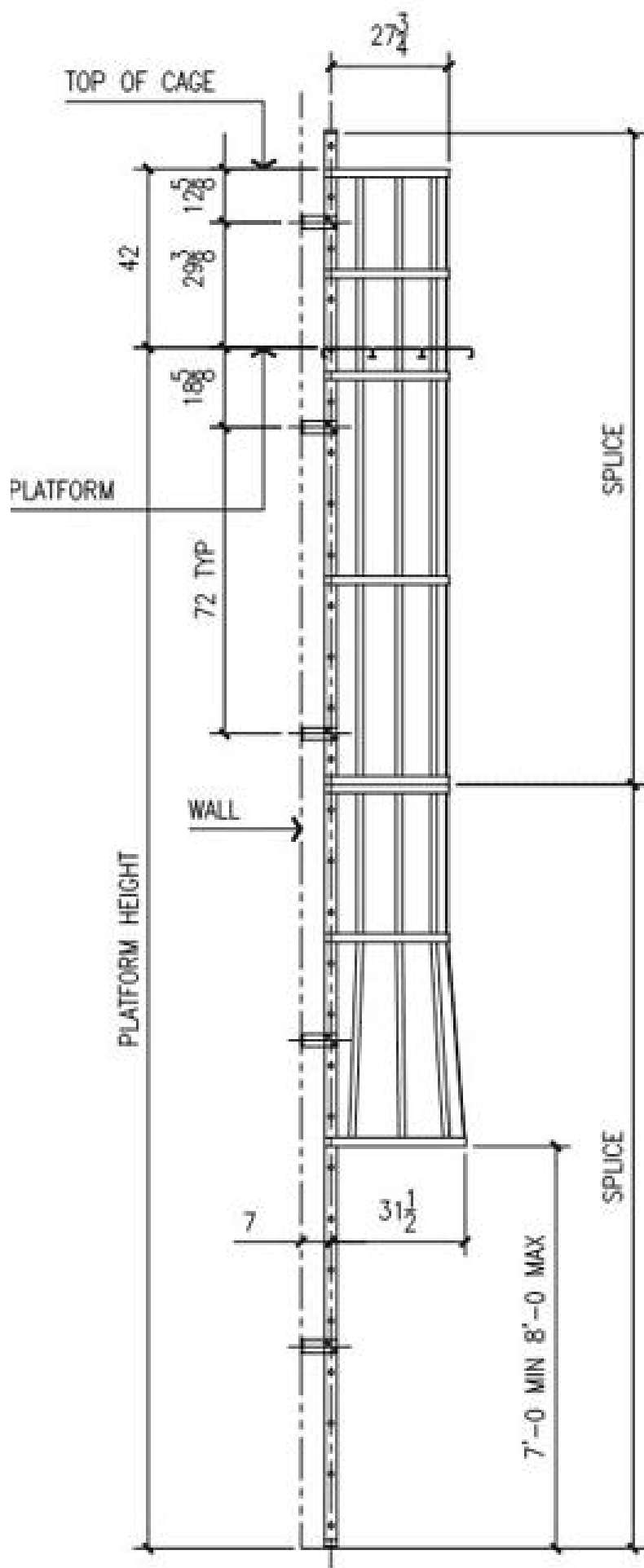
FIXED LADDER WITH WALK-THRU HANDRAILS AND SAFETY CAGES:

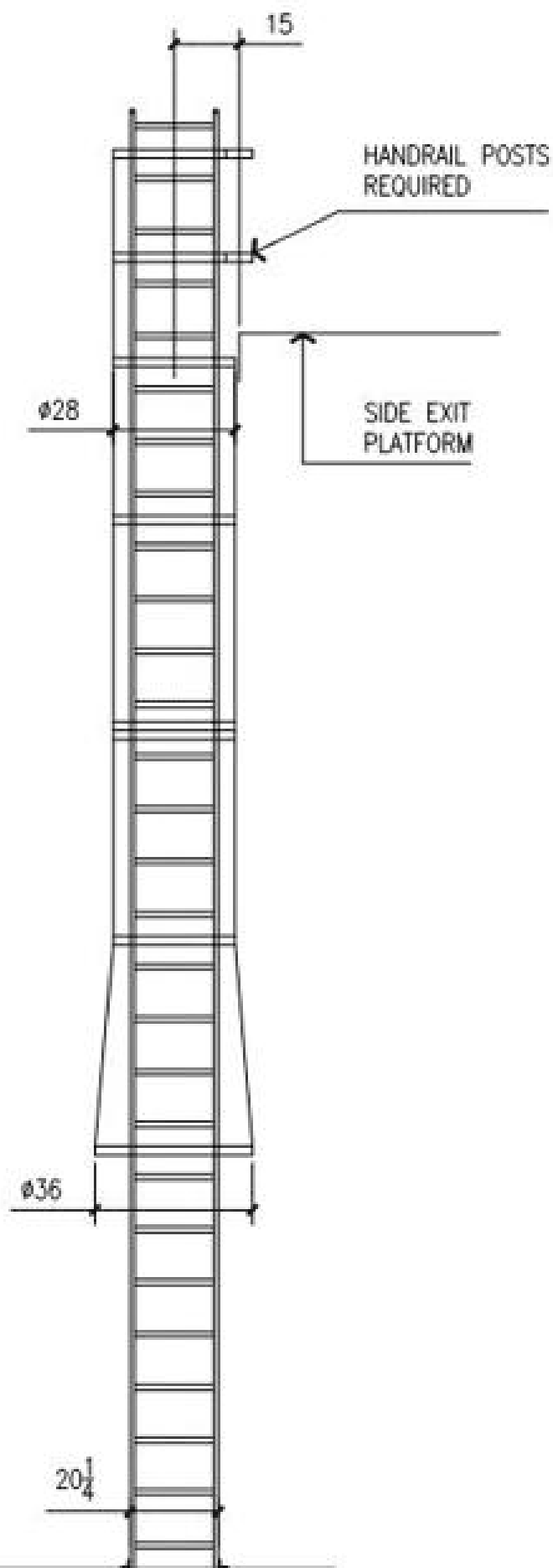
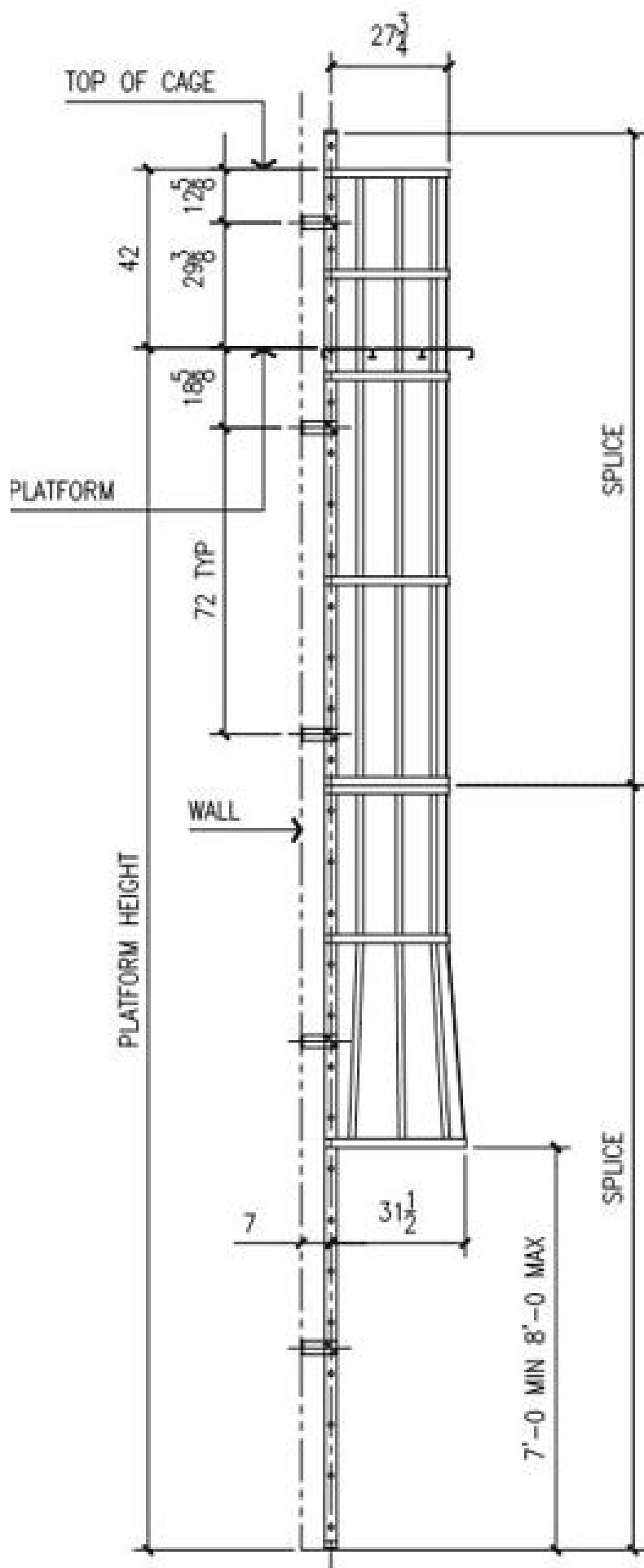
Designed for safe landing access and available from 10' to 29'. Cages and walk-thru handrails extend 42" above landing surface.

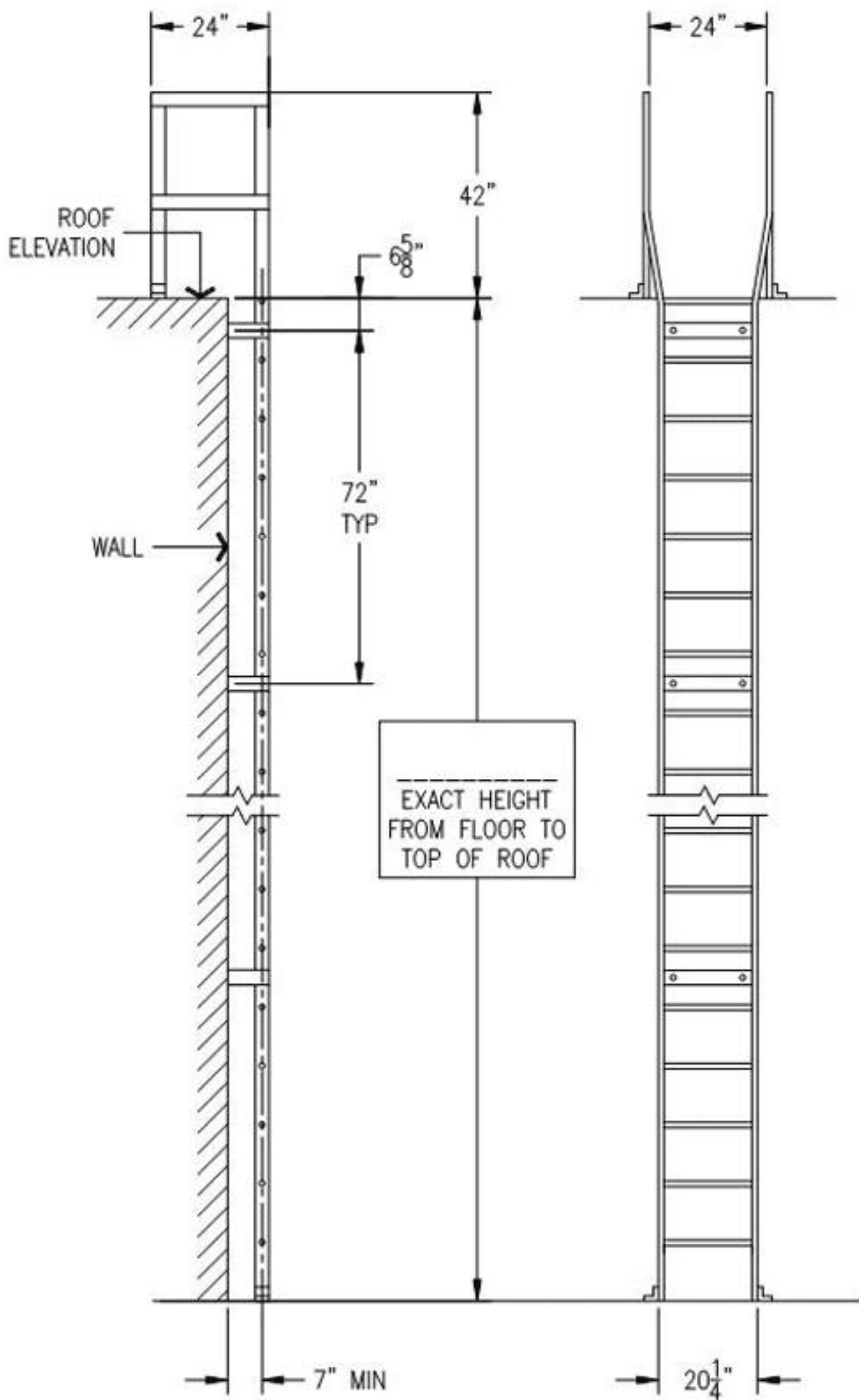
CAGE FEATURES:

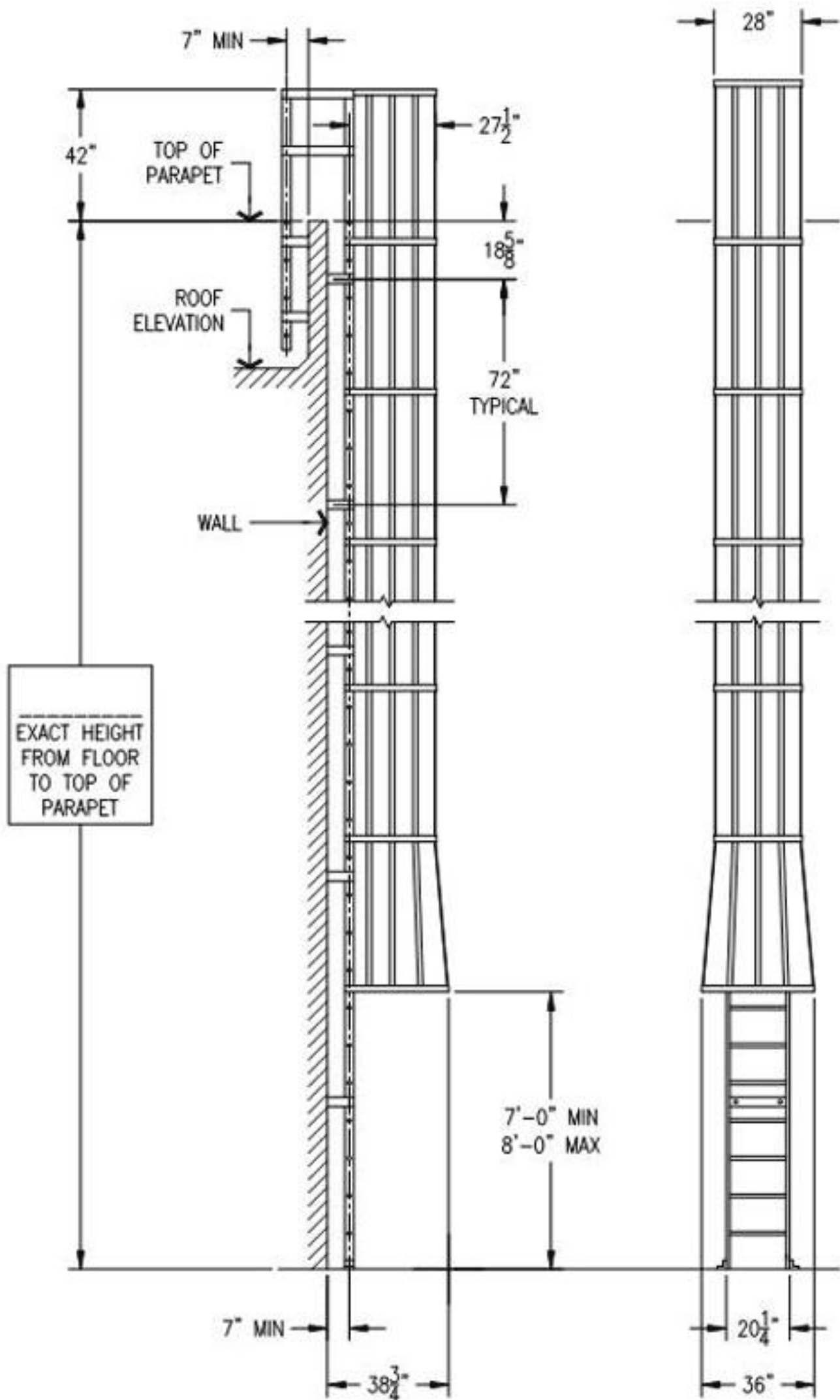
- Safety cages are designed to OSHA specifications with flared bottom opening for easy entry.
- Cage begins 7' from bottom of ladder.
- Gray powder coat finish, yellow available.











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:

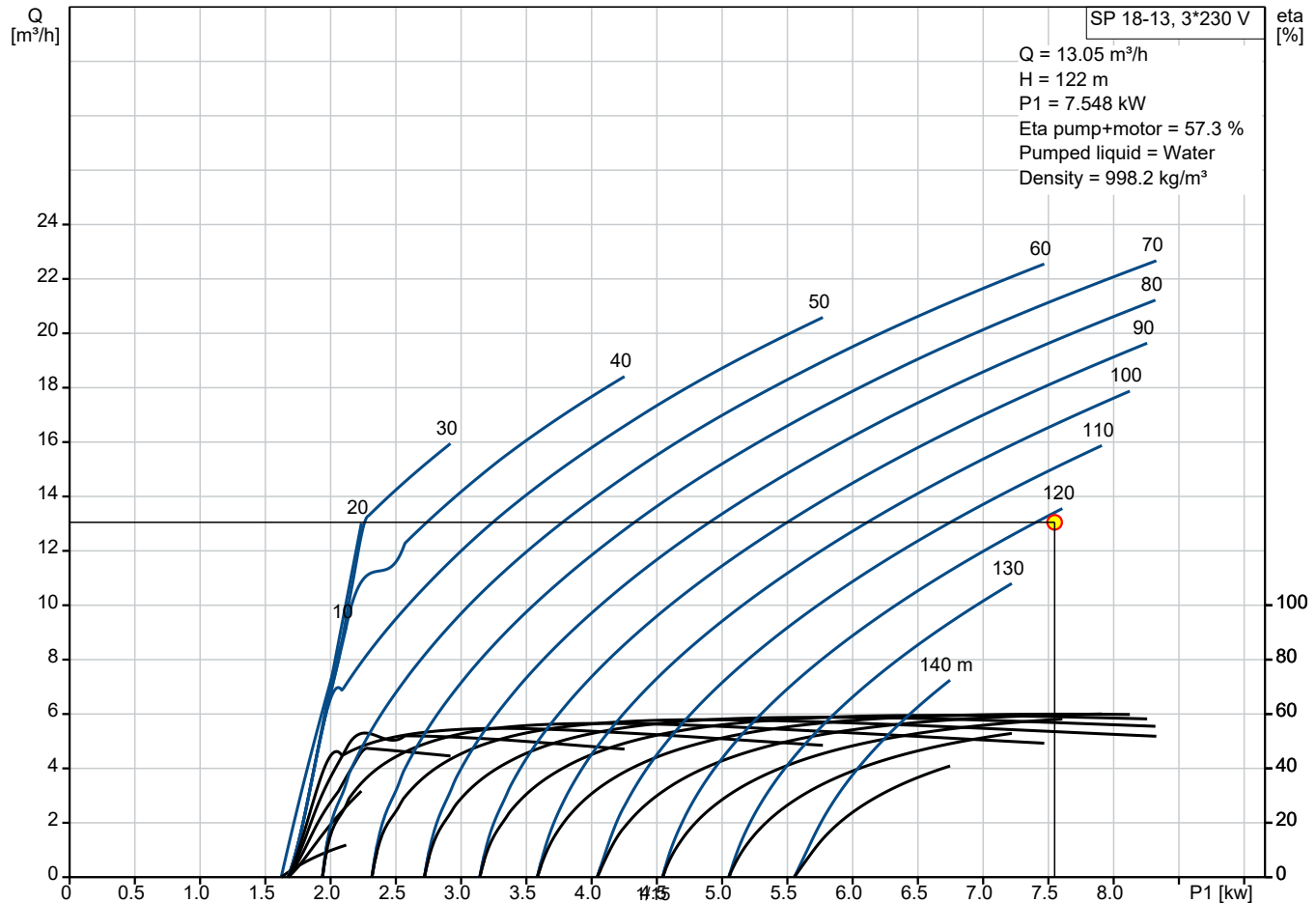


SP 18-13

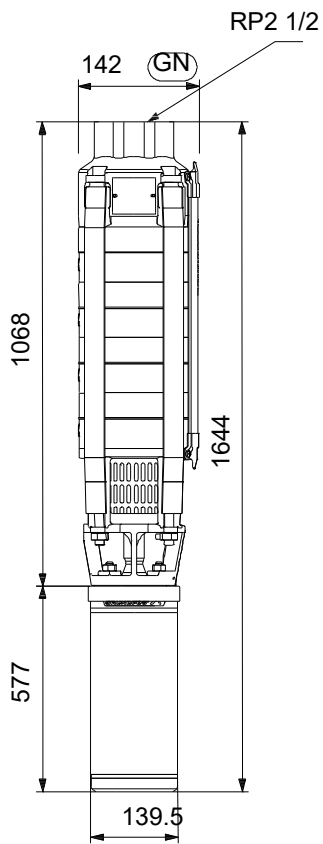
Grundfos SP are submersible borehole pumps, designed for pumping groundwater. Grundfos SP are all stainless-steel pumps, and they are available in 3 material grades. The pumps are suitable for boreholes in sizes ranging from 4" over 6" and 8" to 10". The motor sizes for the pumps are available in 0.37-250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


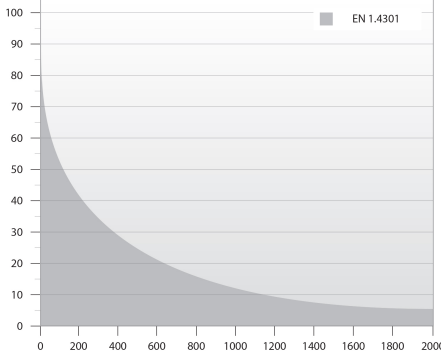
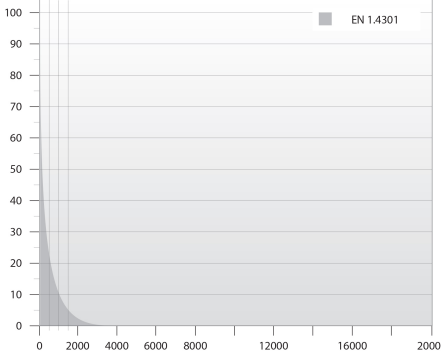
Project:

Reference Number:

Client:

Client Number:

Contact:

Qty.	Description
1	<p>SP 18-13</p>  <p>Note! Product picture may differ from actual product</p> <p>Product No.: On request</p> <p>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>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>The motor is for direct-on-line starting (DOL).</p> <p>Further product details</p> <p>The pump is suitable for applications similar to the following:</p> <ul style="list-style-type: none"> - raw-water supply - irrigation - groundwater lowering - pressure boosting - fountain applications. <p>Pump</p> <p>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 style="display: flex; justify-content: space-around;">   </div> <p>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>Motor</p> <p>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>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:

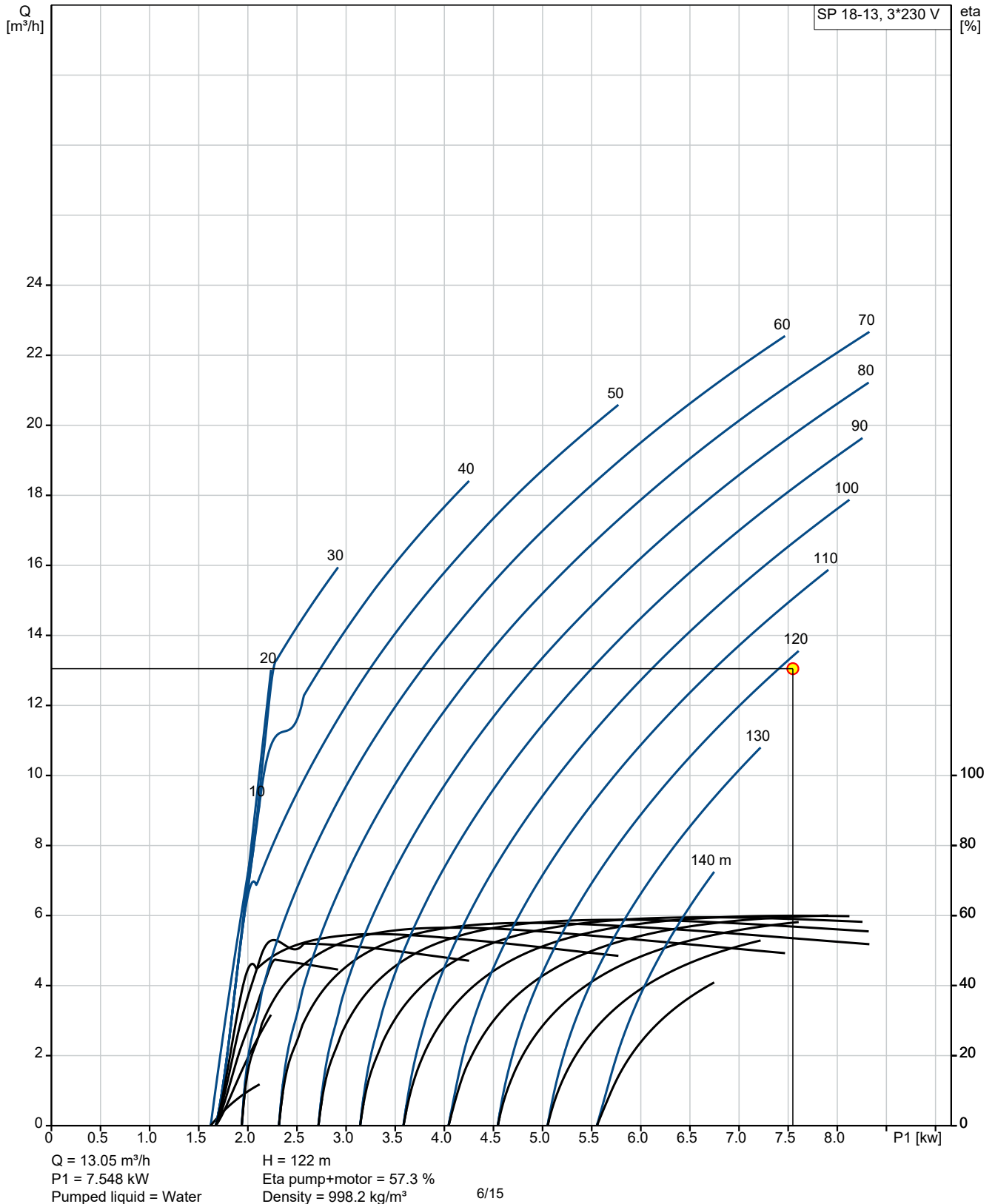
Client:

Client Number:

Contact:

Qty.	Description
1	<div><div>Motor No:78104512</div><div>Windings:Enamelled</div><div>Others:</div><div>Minimum efficiency index, MEI ≥:0.70</div><div>Net weight:61.6 kg</div><div>Gross weight:91.3 kg</div><div>Shipping volume:0.232 m³</div><div>Environmental approvals:WEEE</div></div>
5/15	

On request SP 18-13



Project:

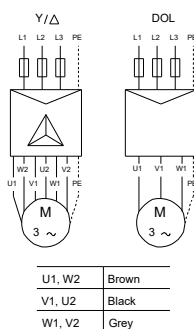
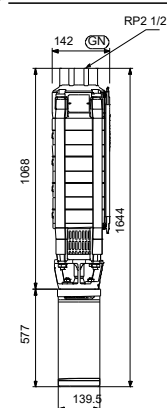
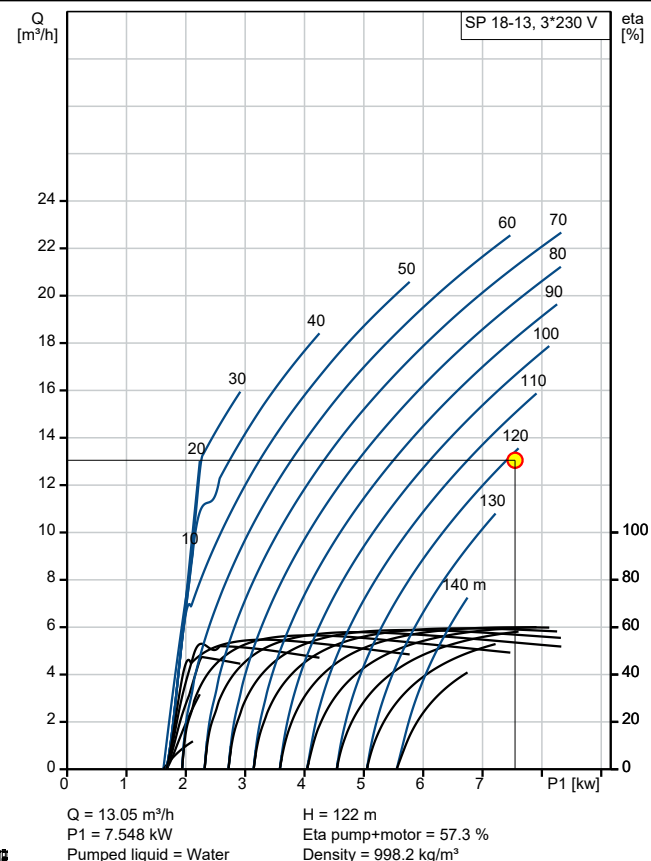
Reference Number:

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 m³/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:

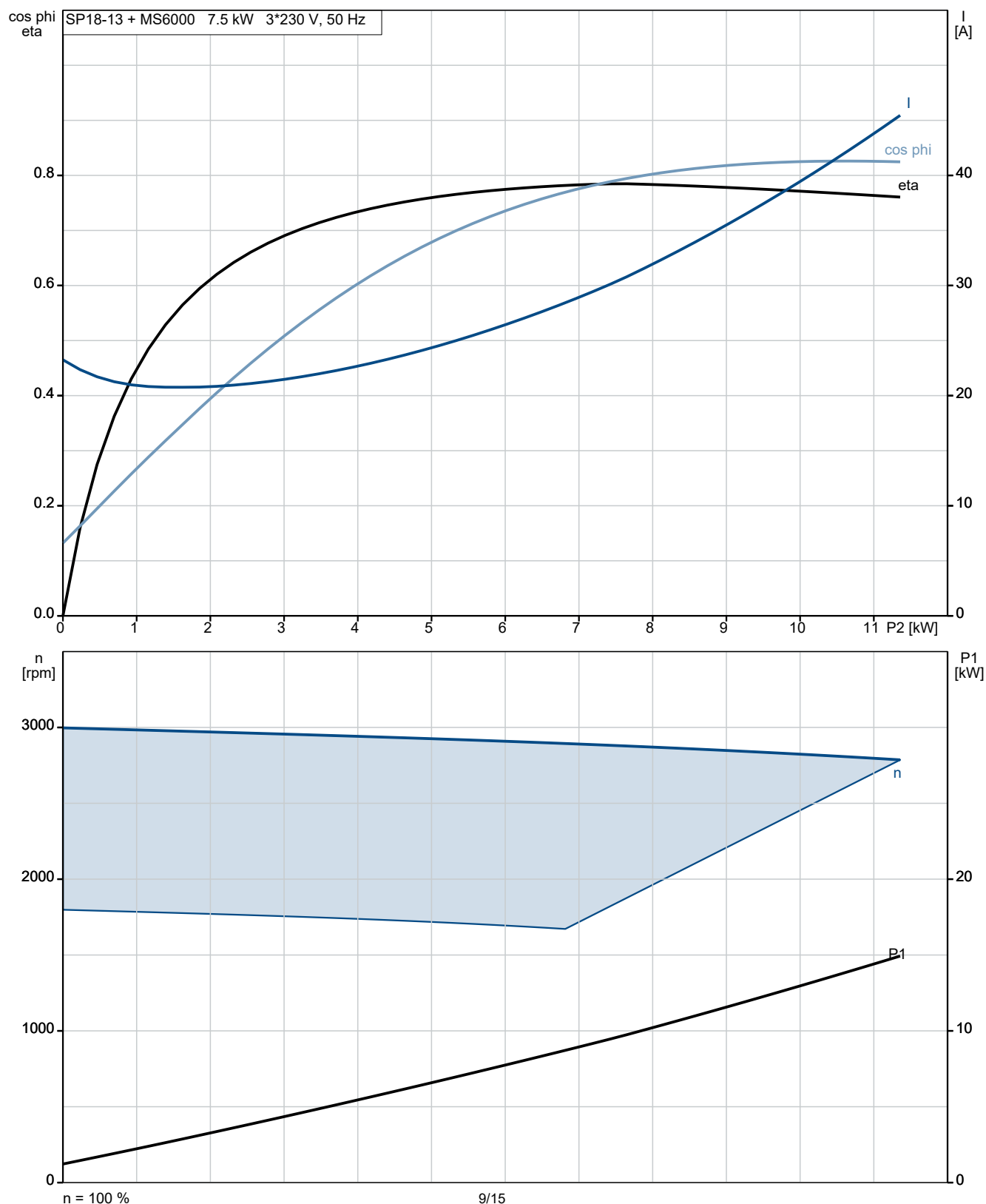
Client:

Client Number:

Contact:

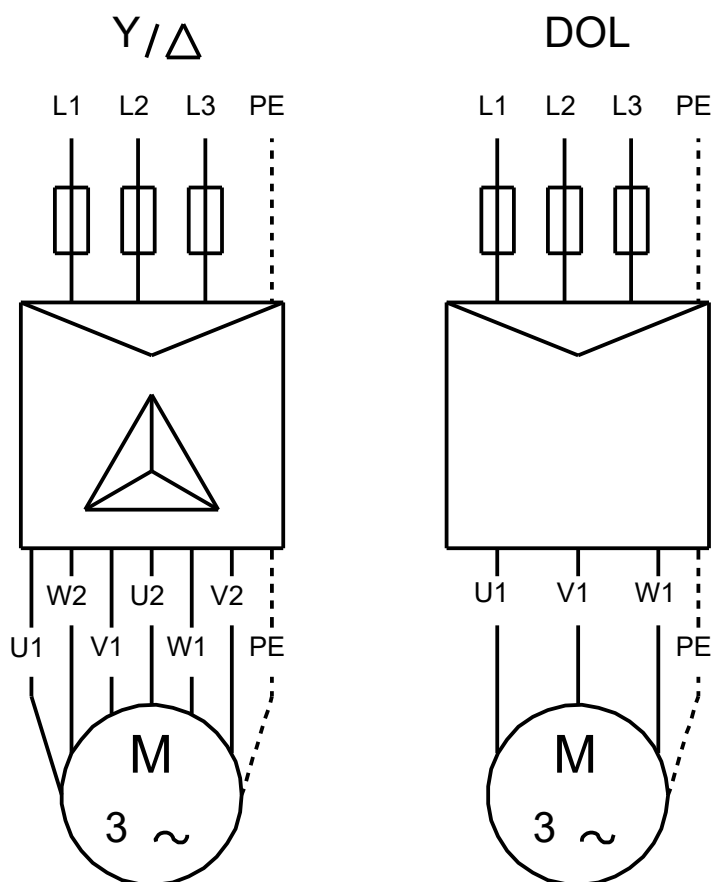
Description	Value
Built-in motor protection:	NONE
Thermal protec:	EXT.
Built-in temp. transmitter:	N
Length of cable:	5 m
Power cable type:	FLAT
Motor No:	78104512
Cable number:	96164209
Windings:	Enamelled
Others:	
Minimum efficiency index, MEI \geq :	0.70
Net weight:	61.6 kg
Gross weight:	91.3 kg
Shipping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

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

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

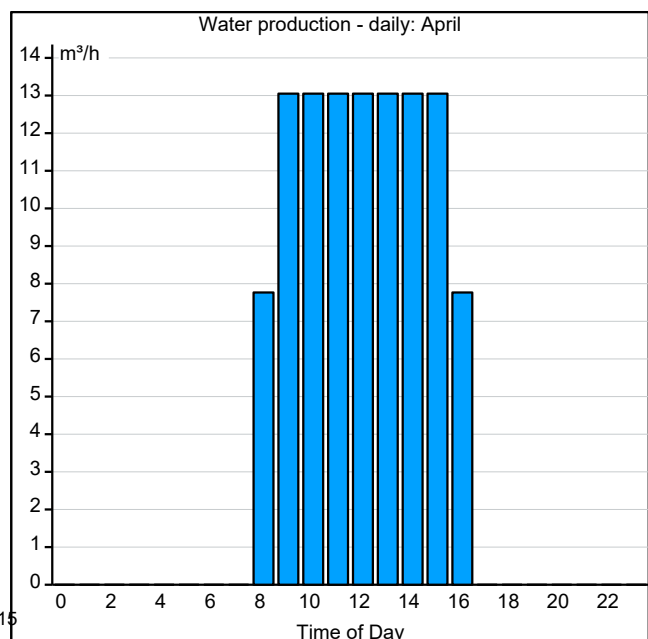
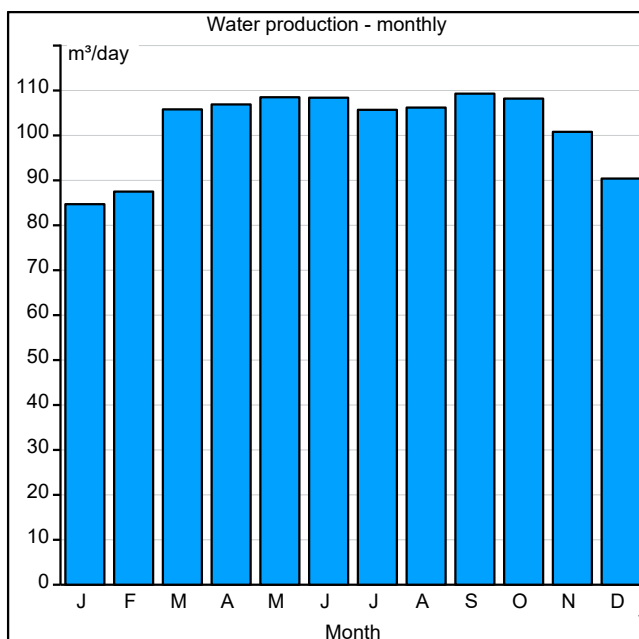
Pipe length of riser pipe: 80 m

Friction losses: 1.979 m

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:

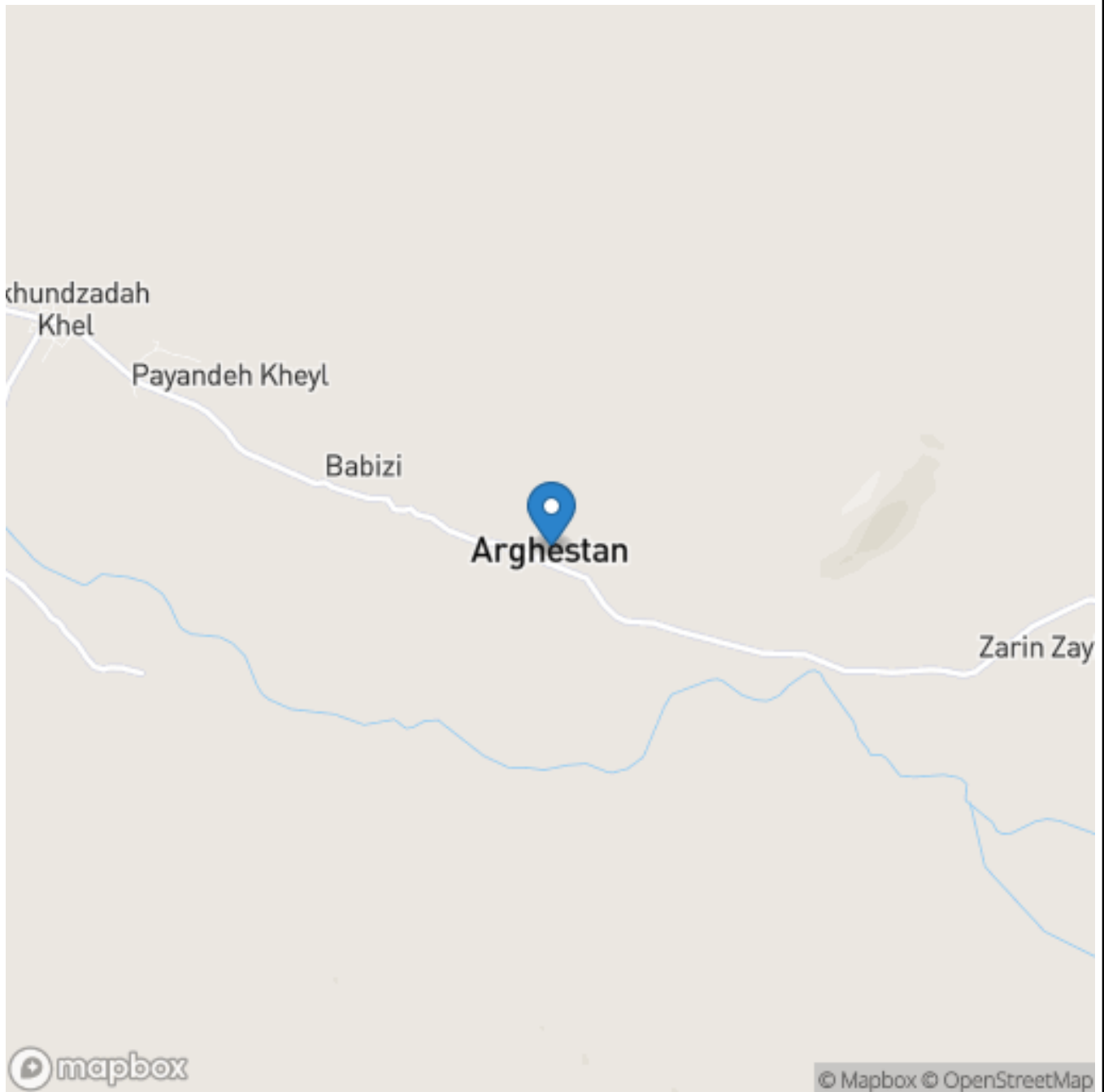
Client:

Client Number:

Contact:

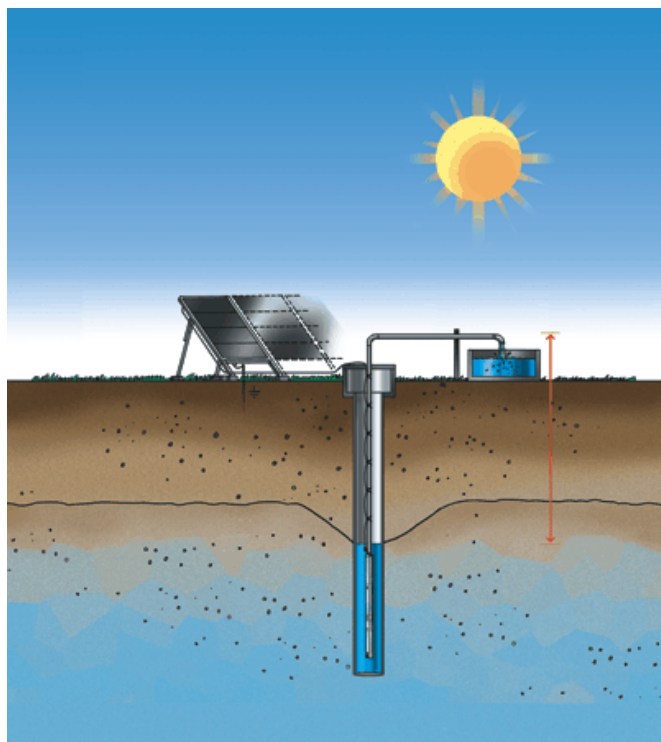
On request SP 18-13

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

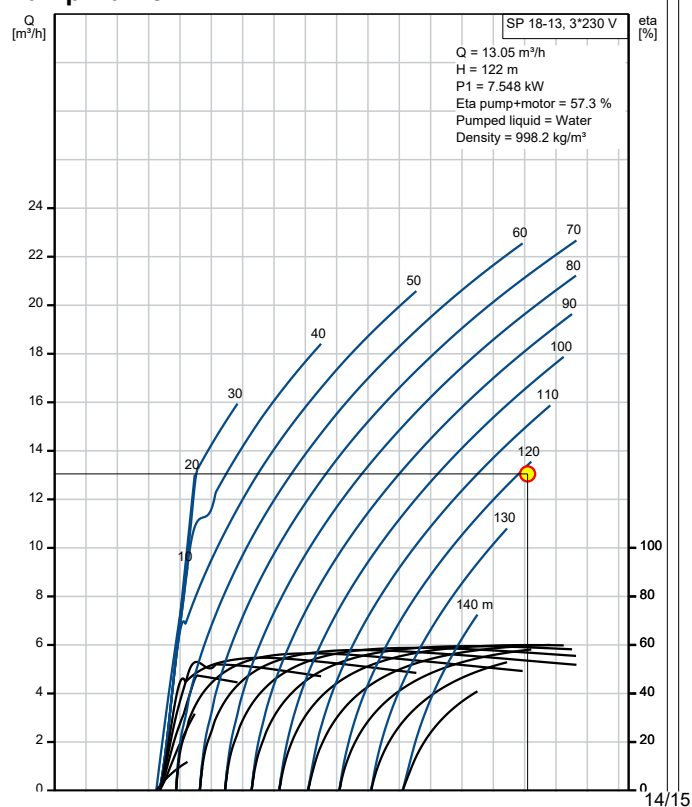
Pipe length of riser pipe: 80 m

Friction losses: 1.979 m

Location: Arghistan District, Kandahar, Afghanistan

Latitude: 31.5699 DD, Longitude: 66.5174 DD

Pump Curve



Dimensional Drawing

