



**Islamic Relief Worldwide**

**IR-W**

**South Region**

**Kandahar Area Office**

**Shelter Project**

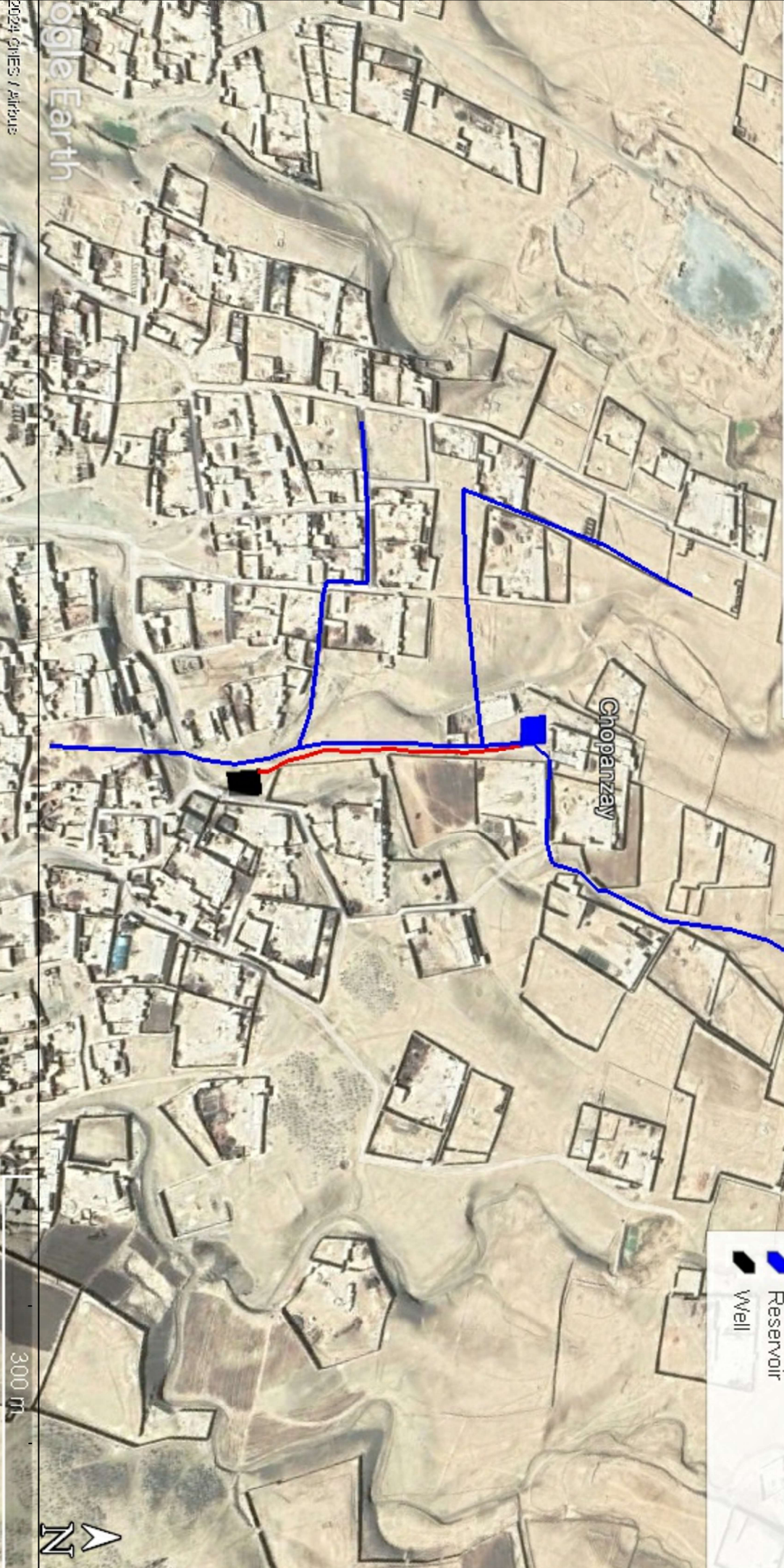
**Water Supply Powered by Solar System with RCC Water Reservoir**

**Khawghani, Arghastan District, Kandahar Province, Afghanistan**

**Submission Date: 12/11/2023**

|

Map Of Khawgani Village Water Network  
astan District



Legend

 Main Pipe

 Pipe from pump to Reservoir

 Reservoir

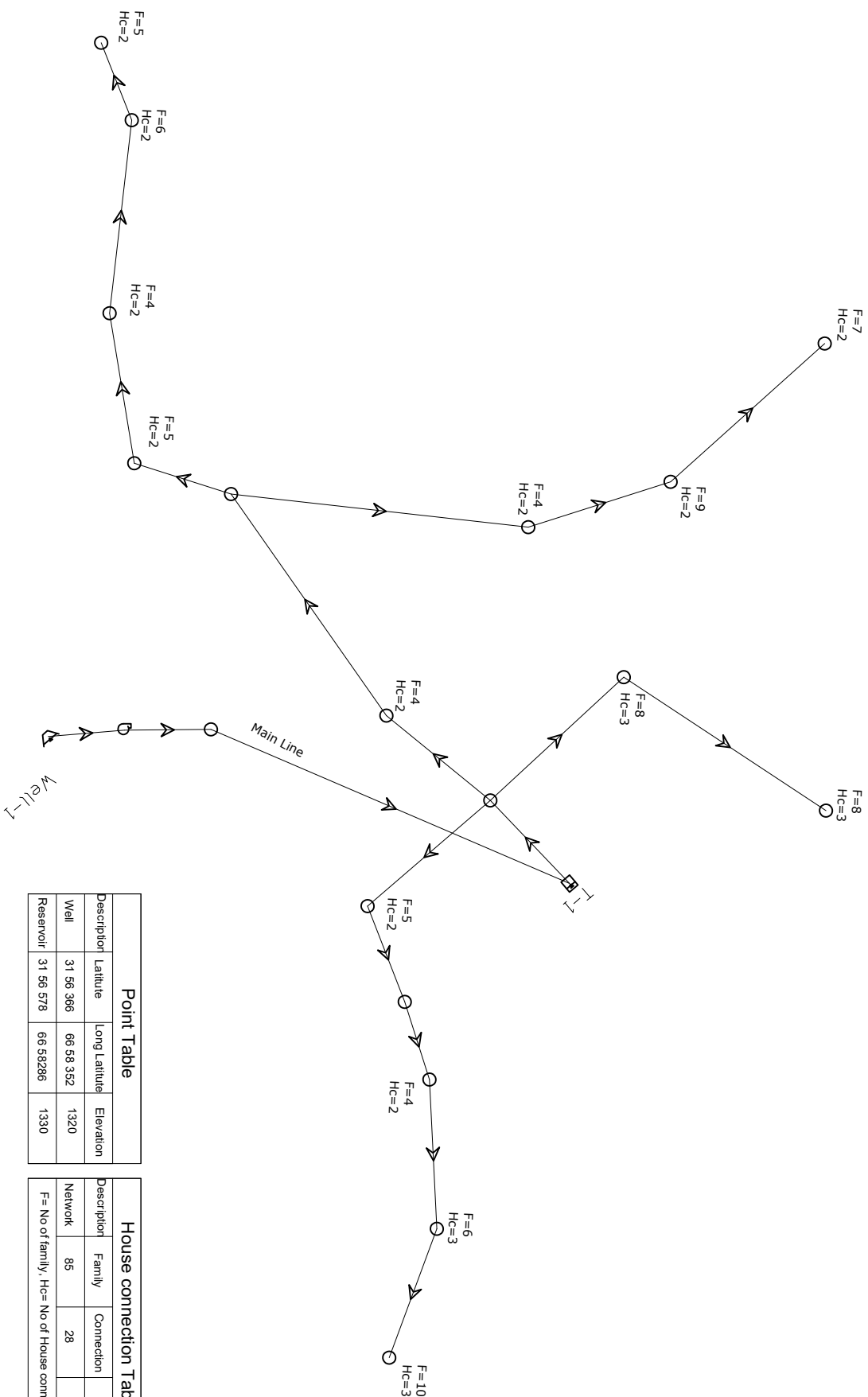
 Well

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 Shajdaq		Province		Kandahar		Scale	
Approved: By				District		Arghastan		Sheet No	
				Village		Khawgyani		cm	
								NO	
								0	






House connection survey

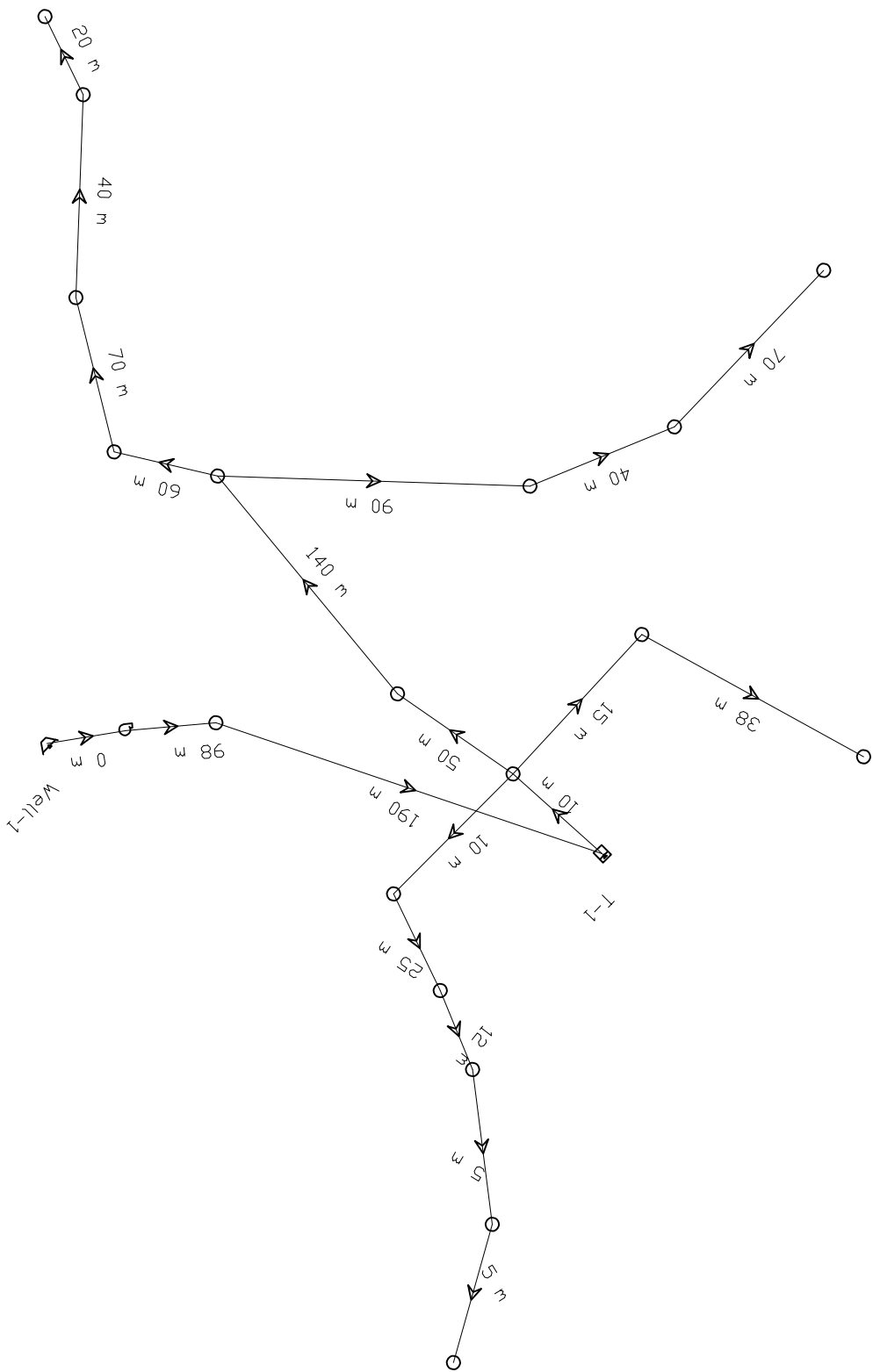


Point Table			House connection Table		
Description	Latitude	Long Latitude	Description	Family	Connection
Well	31 56 366	66 58 352	Network	85	28
Reservoir	31 56 578	66 58286	F= No of family, Hc= No of House connection		

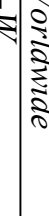
Water Network Project Survey Plan for Families and HHS Connection

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

Pipe Length

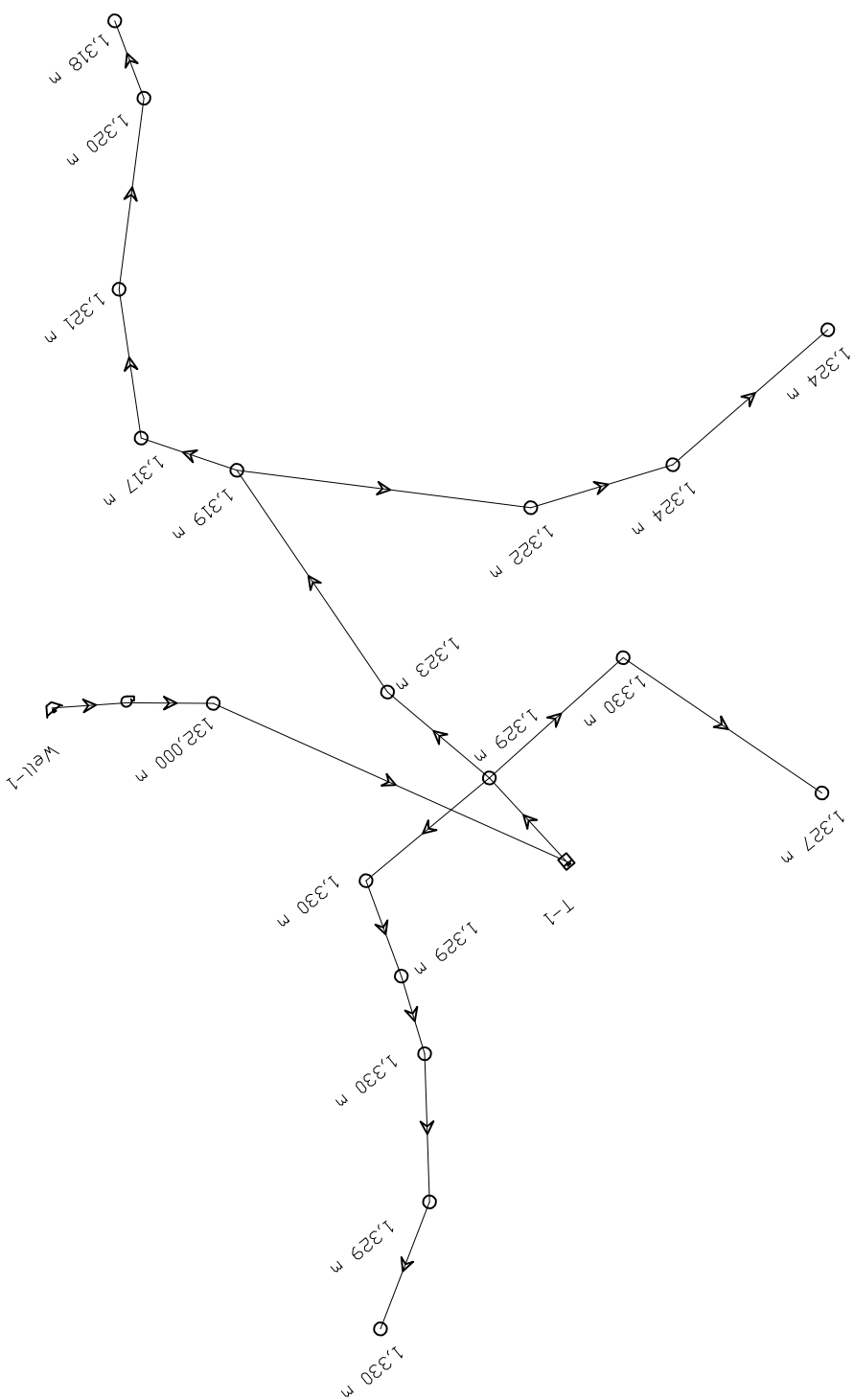


Water Network Project


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



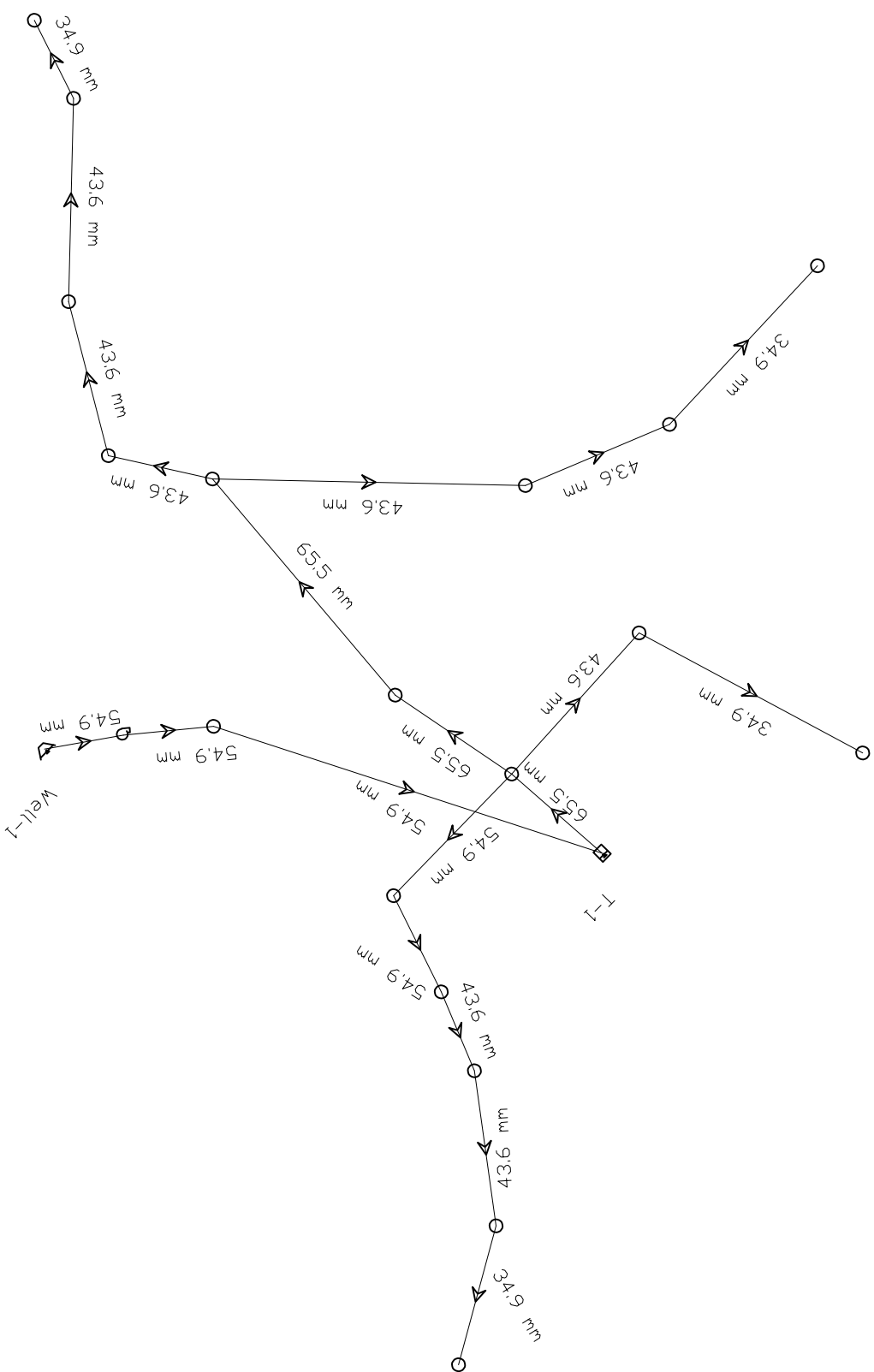
Elevation



Water Network Project

		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	Khawgyani
		Unit	cm
		Scale	NO
		Sheet No	0
			

Water Network Project (Pipe Diameter)

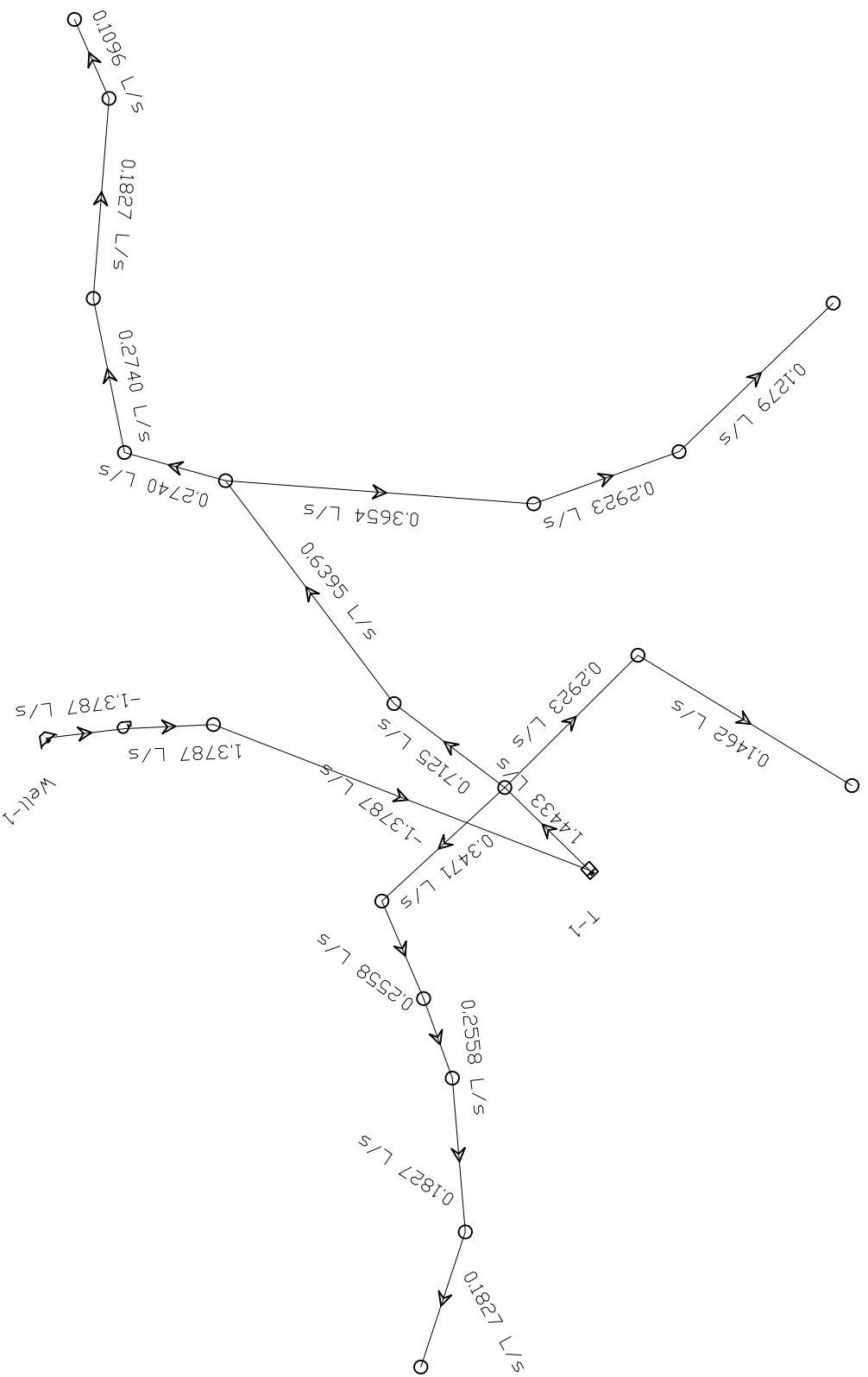


Water Network Project (Pipe Diameter)


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



## Flow

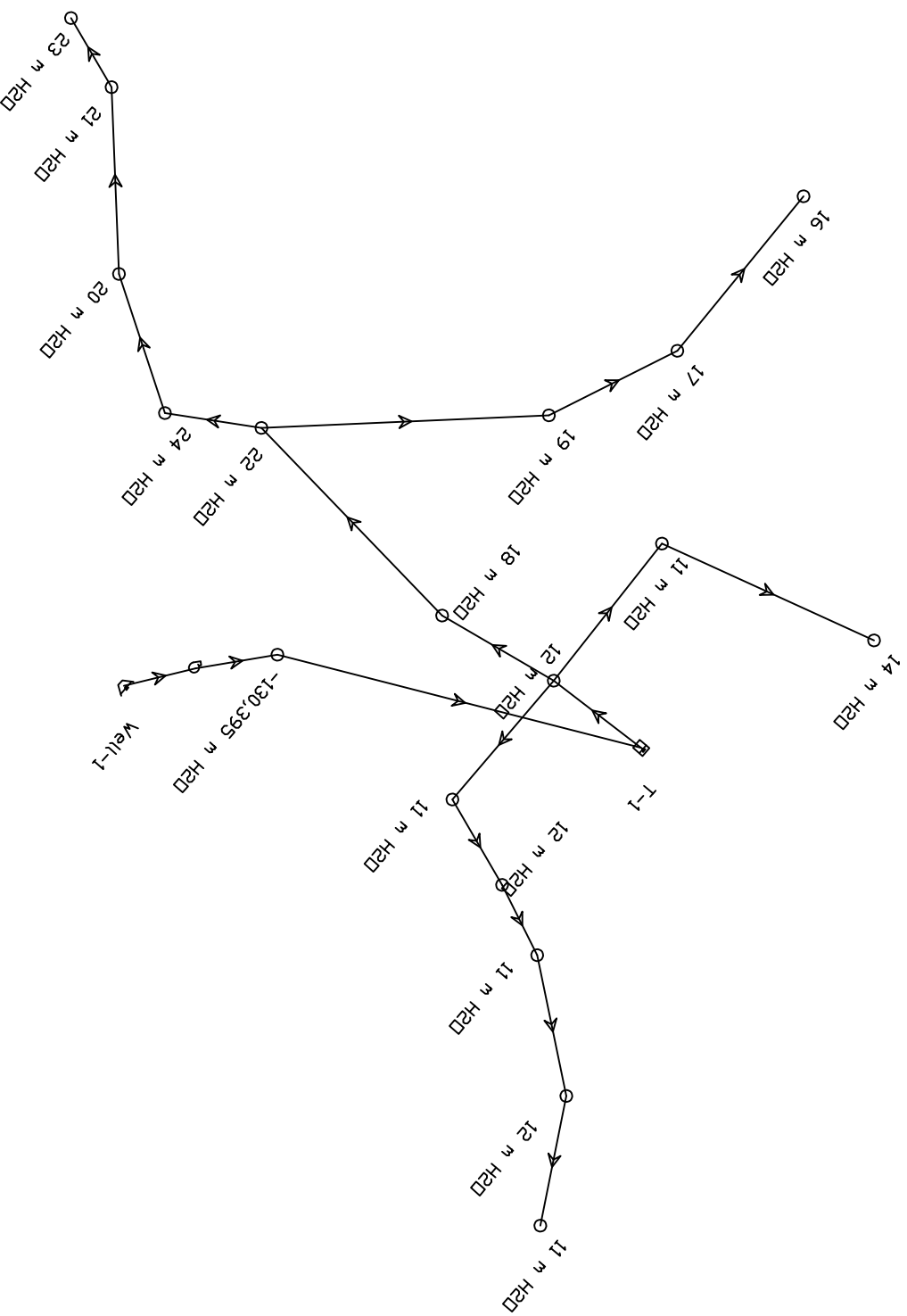


# Water Network Project Flow

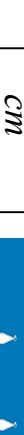
		<i>Islamic Relief Worldwide</i>	
<i>Survey: By</i>	<i>Eng.M.Moaine &amp; M.Mehdi</i>	<i>Project</i>	<i>Shelter</i>
<i>Drawing: By</i>	<i>Eng.M.Mehdi</i>	<i>Section</i>	<i>Water Network</i>
<i>Design : By</i>	<i>Eng.M.Moaine</i>	<i>Date</i>	<i>16/10/2023</i>
<i>Checked: By</i>	<i>Eng.Dawod Shafaq</i>	<i>Province</i>	<i>Kandahar</i>
<i>Approved: By</i>		<i>District</i>	<i>Arghastan</i>
		<i>Village</i>	<i>Khawgyani</i>
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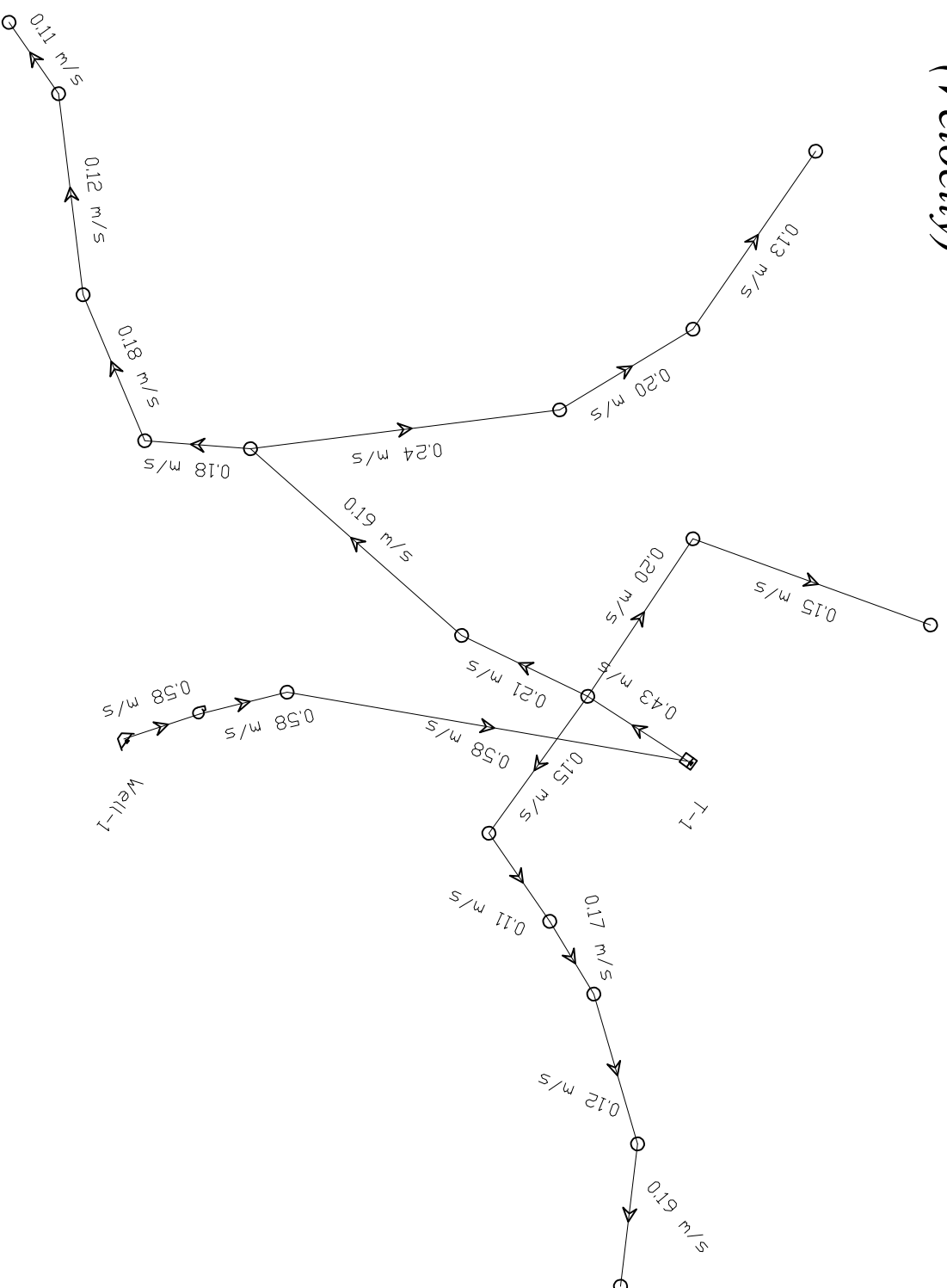
## Water Network Project (Pressure)



### Water Network Project (Pressure)

		<i>Islamic Relief Worldwide</i>	
<i>Survey: By</i>	<i>Eng.M.Moaine &amp; 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>Khawgyani</i>
		<i>IR-W</i>	
<i>Unit</i>	<i>cm</i>		
<i>Scale</i>	<i>NO</i>		
<i>Sheet No</i>	<i>0</i>		
			

(Velocity)

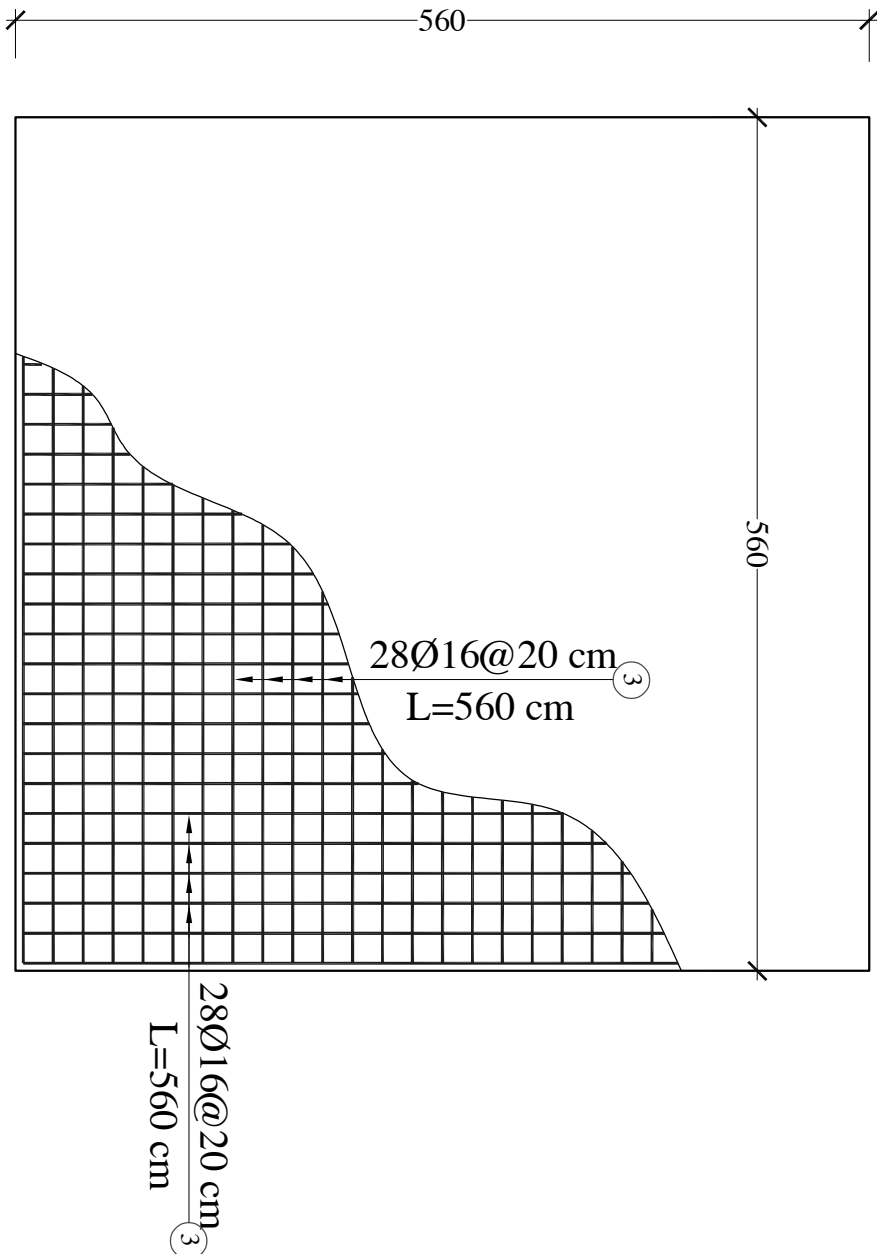
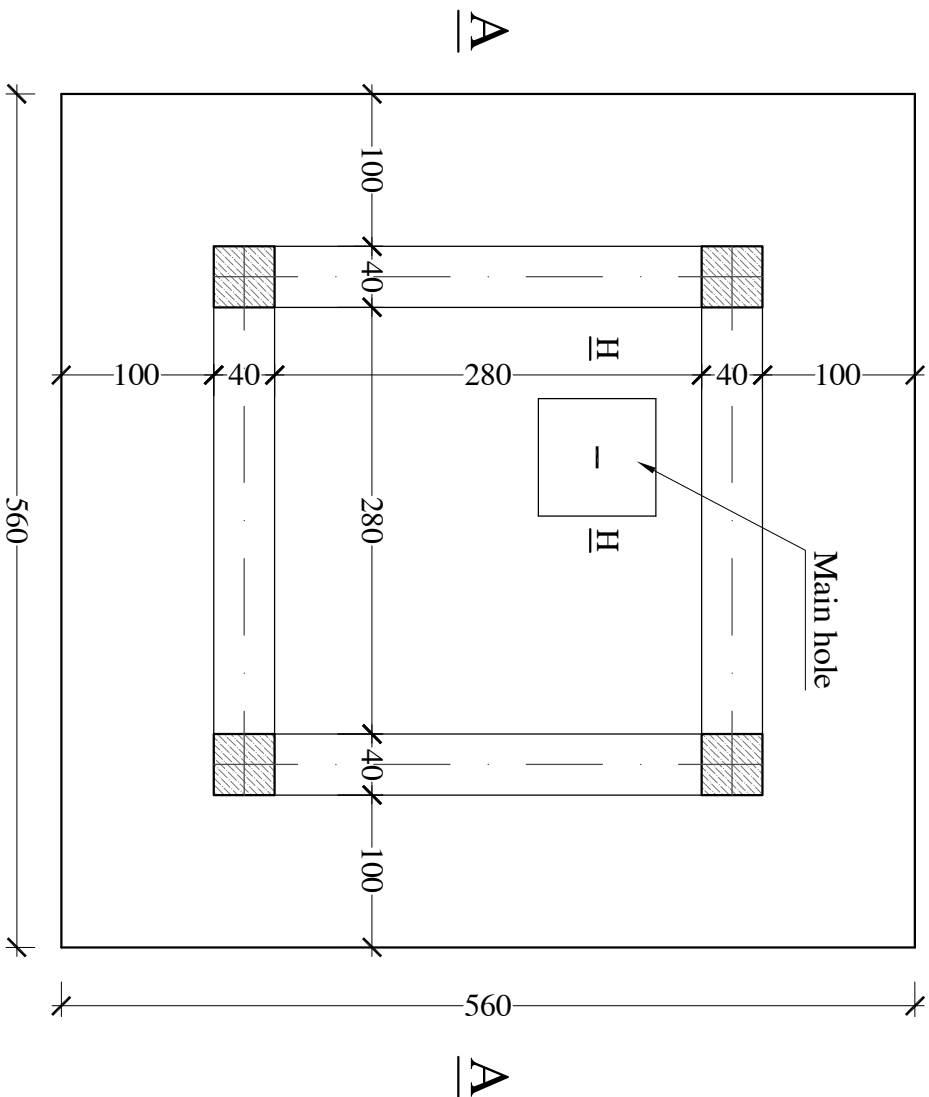


### Water Network Project (Velocity)

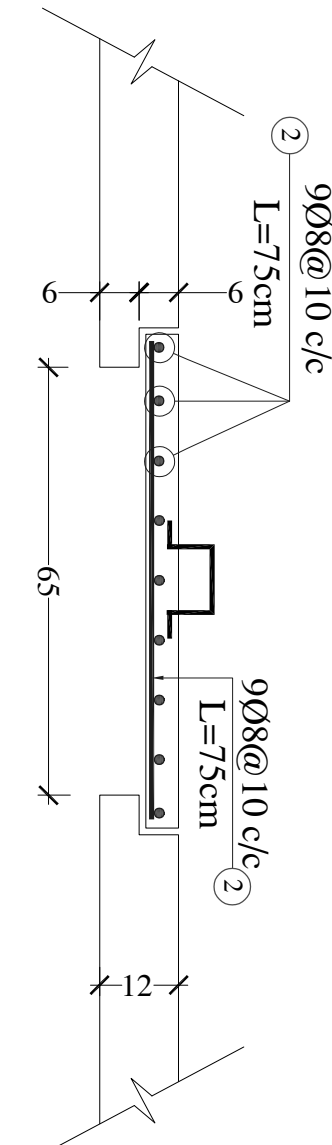
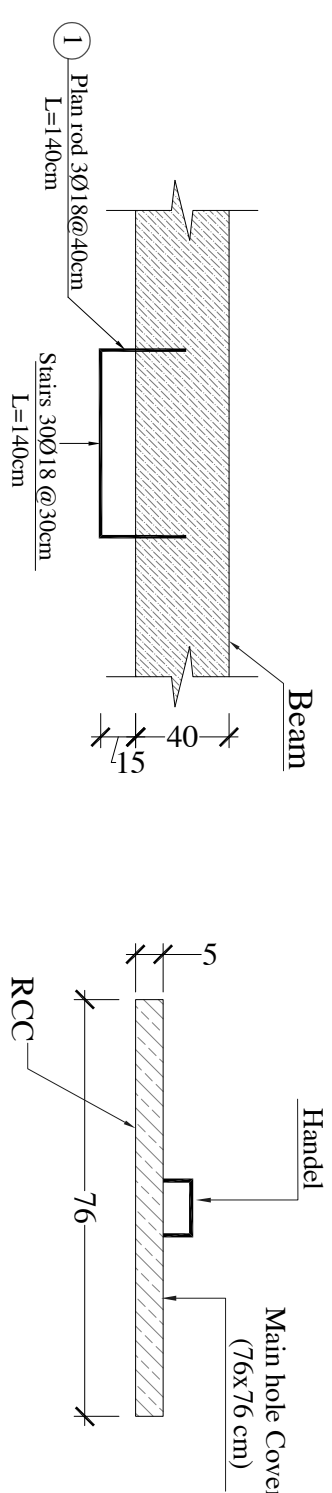
Islamic Relief Worldwide				
IR-W				
Survey: By	Eng.M.Moaine & M.Mehdi	Project	Shelter	
Drawing: By	Eng.M.Mehdi	Section	Water Network	
Design : By	Eng.M.Moaine	Date	16/10/2023	
Checked: By	Eng.Dawod Shafaq	Province	Kandahar	
Approved: By		District	Arghastan	
		Village	Khawgyani	
		Unit	cm	
		Scale	NO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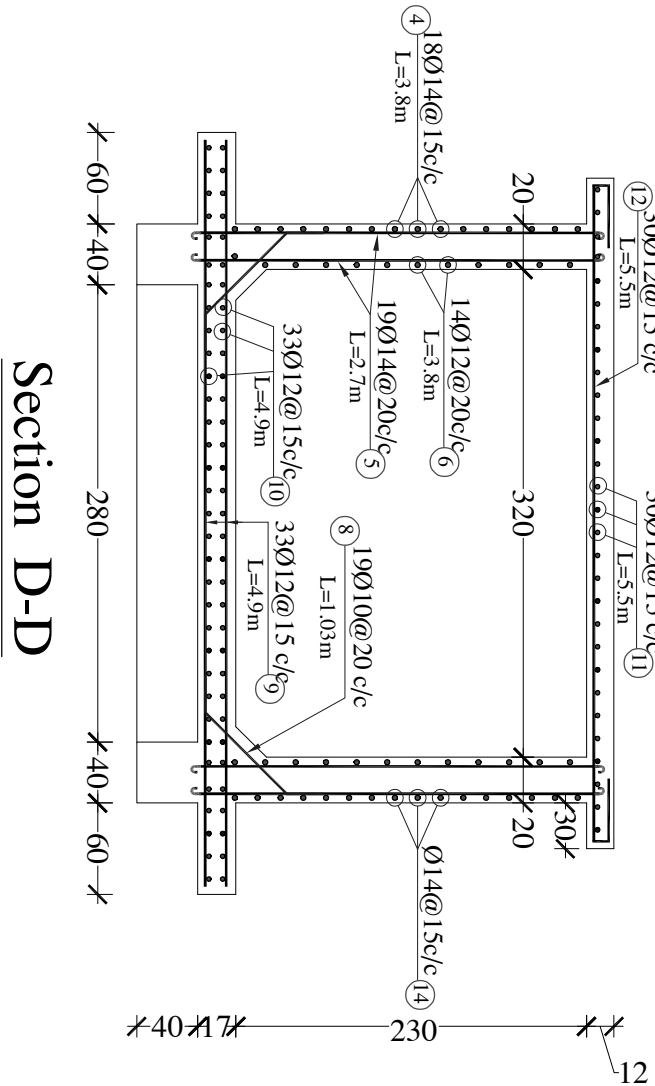
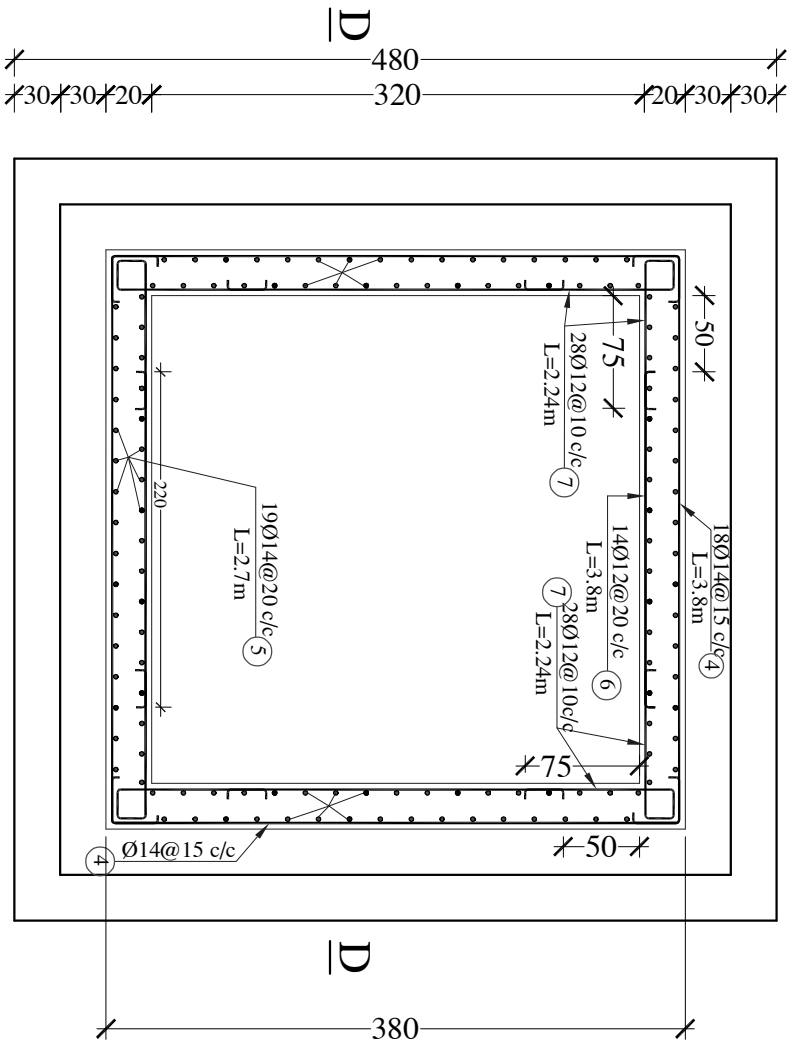


Plan



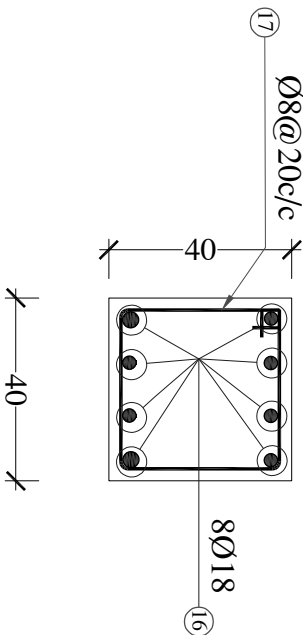
Section H-H

Detail -1

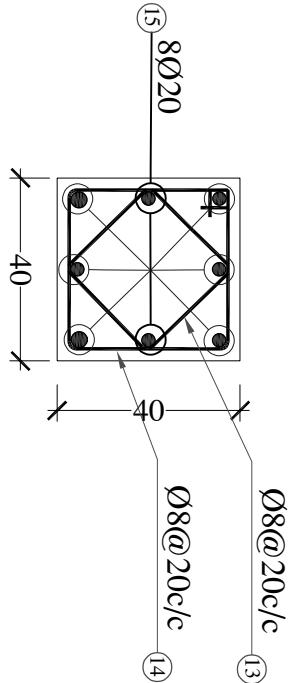


30\*30\*20 320 20\*30\*30 480

Reinforcement Plan of Water Tank

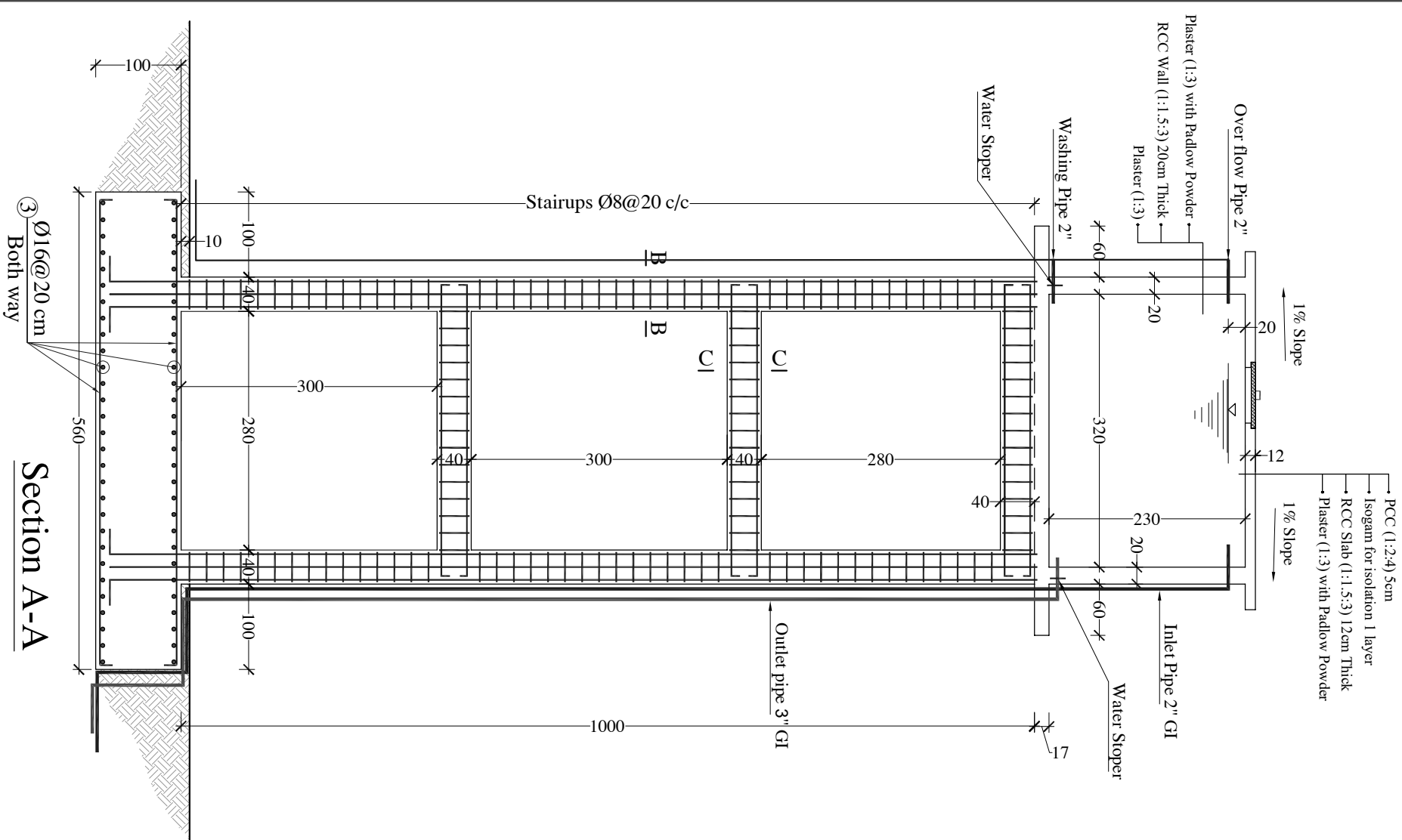


Section C-C



Section B-B

SURVEYED BY	ENG.S.RAUF	CHECKED BY	ENG.NAJIBULLAH "AHMADI"	SCALE		PROVINCE	Kandahar	PROJECT NAME :	20 Cubic meter RCC Water Tank
DESIGNED BY	ENG.SAYED RAUF	REVIEWED BY	ENG.FAZAL OMAR "ZAHID"	DATE	30/01/2021	DISTRICT	Arghastan	DRAWING TITLE	Plan and Reinforcement plan
DRAWN BY	ENG.SAYED RAUF	APPROVED BY	ENG.GHULAM QADER	DRAWING NO.		VILLAGE	Khawgyani		

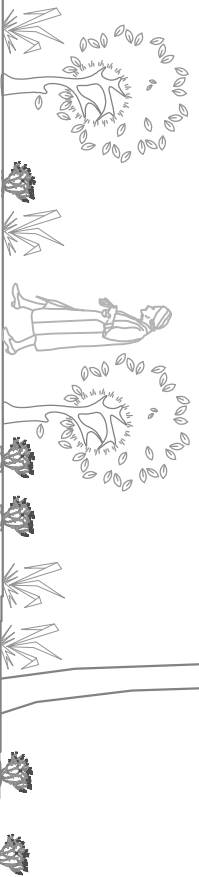
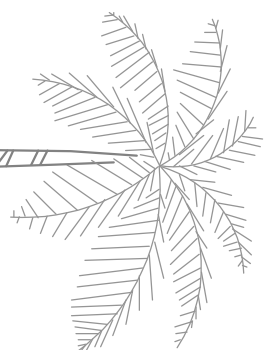
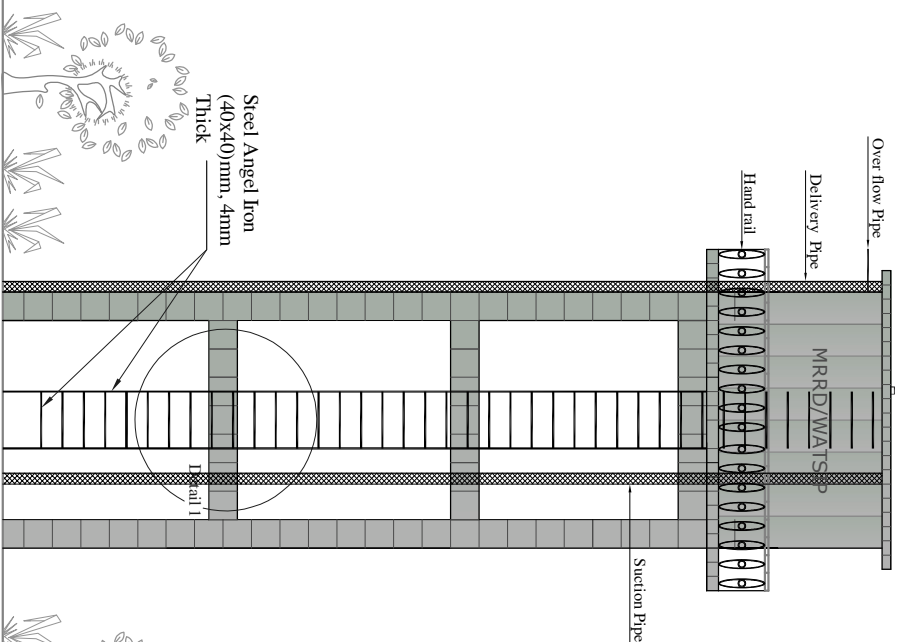
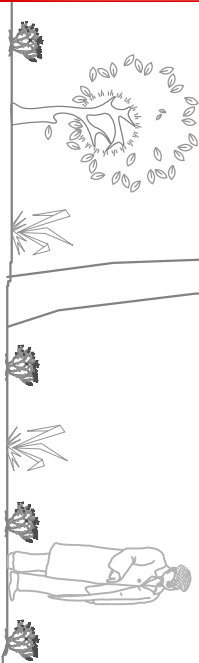
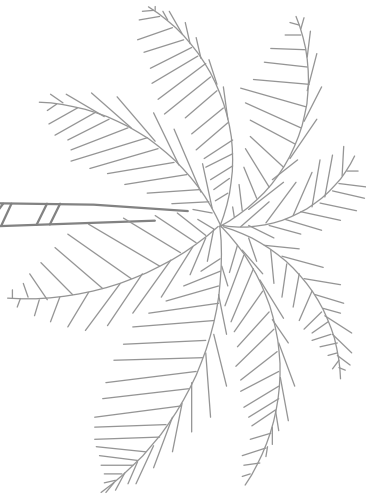


STEEL BAR SCHEDULE FOR 20 CUBIC METER RCC Elevation WATER Tank

Shape of bar	Bar No	Bar Dia (mm)	Number of Bar	Total Number	Length (m)	Total Leng (m)	Weight (kg/m)	Total weight (kg)	Total weight +5% (kg)
—	1	18	3	3	1.4	4.2	1.998	8.4	8.8
—	2	8	9x2	18	0.75	13.5	0.4	5.32	5.6
—	3	16	4x28	112	5.6	627.2	1.579	990.35	1040
—	4	14	4x18	72	3.8	273.6	1.2	328.32	350
—	5	14	8x19	152	2.75	418	1.2	502	530
—	6	12	4x14	56	3.8	212.8	0.888	190	200
—	7	14	4x28	112	2.24	250.9	1.2	301	316
—	8	10	4x19	76	1.03	78.3	0.6166	48.3	50.7
—	9	12	2x33	66	4.9	323.4	0.888	287.2	301.5
—	10	12	2x33	66	4.9	323.4	0.888	287.2	301.5
—	11	12	1x30	30	5.5	165	0.888	146.5	154
—	12	12	1x30	30	5.5	165	0.888	146.5	154
—	13	8	4x46	184	1.6	294.4	0.4	117.7	123.68
—	14	8	4x46	184	1.6	294.4	0.4	117.7	123.68
—	15	20	4x8	32	11.2	358.4	2.467	884.05	928.26
—	16	18	8x12	96	3.5	336	2.0	672	710
—	17	8	15x12	180	1.6	288	0.4	115.2	121


Bar Dia (mm)	Total Length (m)	Weight (kg/m)	Total weight (kg)	Total weight +5% (kg)
8	890.3	0.4	356.1	373.92
10	80	0.6166	50	55
12	1190	0.888	1056	1109
16	627	1.579	990	1040
18	340	1.998	680	714
20	359	2.467	884	930
14	943	1.2	1131	1188



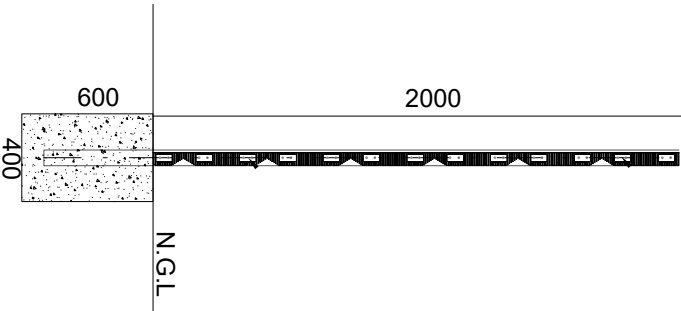


- Note:**
- 1. All dimension are in cm
  - 2. Mark of concrete 200 kg/cm<sup>2</sup>
  - 3. Delivery and Suction pipe should be protected (Isolation)
  - 4. Assume bearing capacity is 2 kg/cm<sup>2</sup>

Elevation of Water Tank Tower

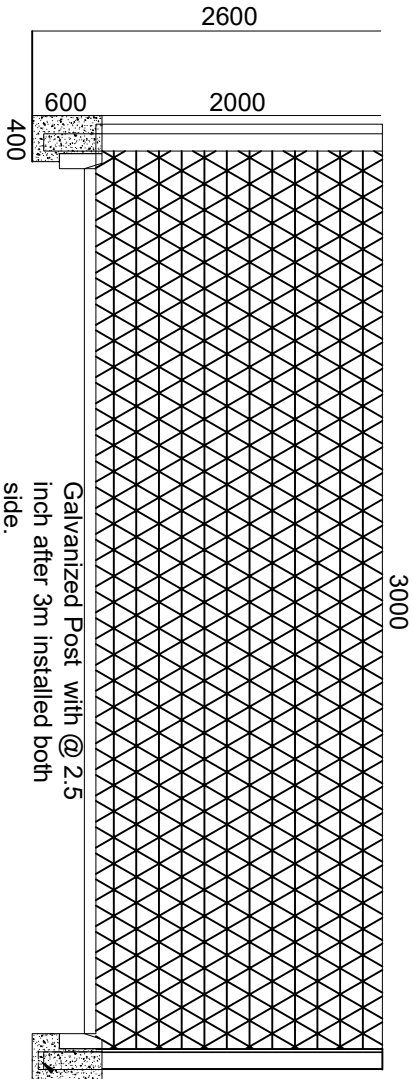
<div><div>ITS AFGHANISTAN Ministry of Rural Rehabilitation and Development <b>MRRD</b> <b>WATSIP</b></div></div>				SURVEYED BY	Eng.Sayed Rauf	CHECKED BY	Eng. Najibullah "Ahmad"	SCALE		SHEET NO. <div>1/4</div>	PROVINCE	Kandahar	PROJECT NAME : <b>Water Supply Project</b> DRAWING TITLE Elevation of RCC Tank	
				DESIGNED BY	Eng.Sayed Rauf	REVIEWED BY	Eng. Faraz Omar "Zahid"	DATE	30/01/2021		DISTRICT	Argistan		
				DRAWN BY	Eng.Sayed Rauf	APPROVED BY	Eng. Ghulam Qader	DRAWING NO.			VILLAGE	Khawayni		

Water Network Project (Typical Fence for solar stand)



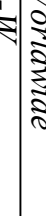
400x400x600mm 25 Mpa Concrete Foundation

Galvanized Post with @ 2.5 inch after 3m installed both side.

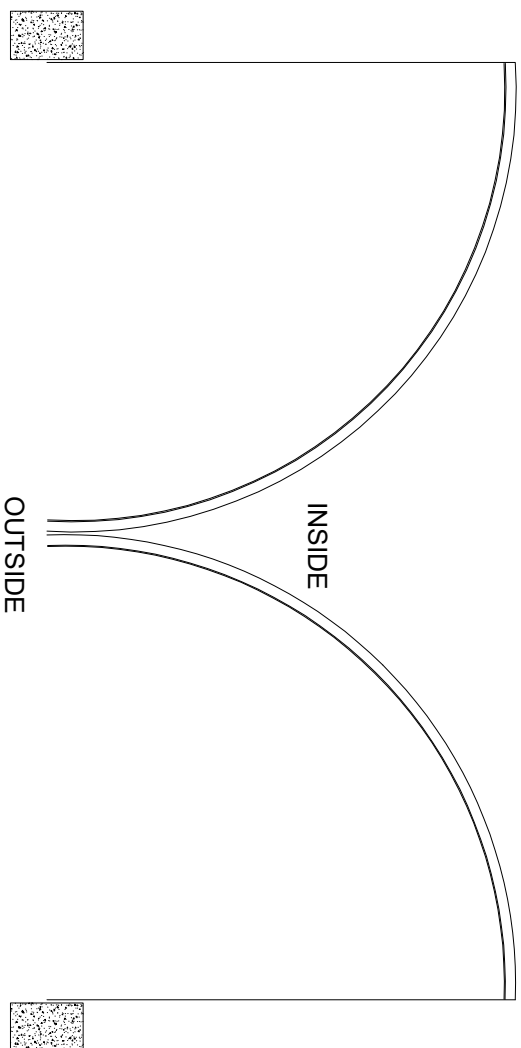
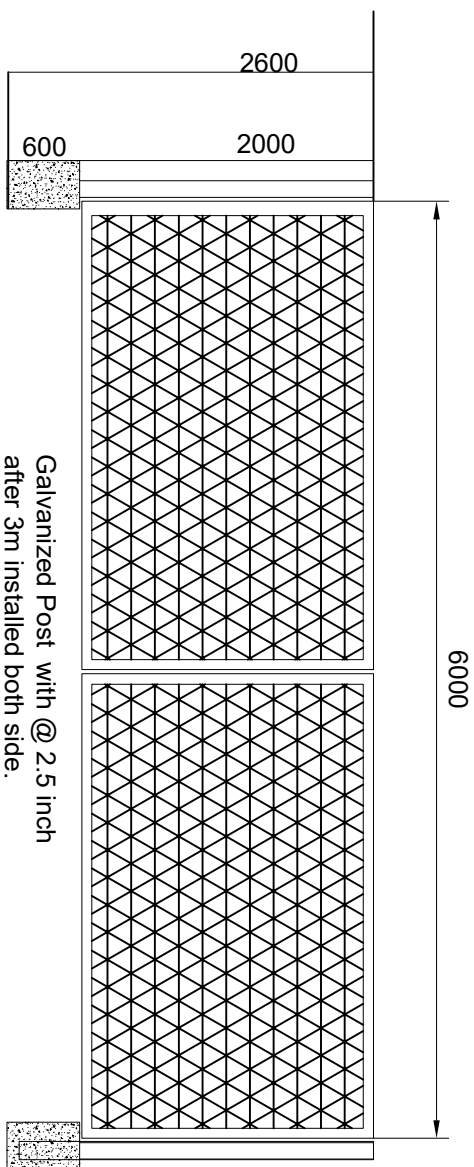


CLEARVU FENCE SPECIFICATION (This is a Minimum specification required	
ITEM #	DESCRIPTION'
1	PANEL 2m High Security Clearvu or similar approved Galvanized Fence. 76x12.7mm Mesh aperture. Wire diameter of 3mm Horizontal and 4mm Vertical. 4 locking bolts per panel. Internal features:Anti VandalClimb etc.
2	POST Galvanized Taper Locking Post sealed with steel Cap 2.5 inch after 3m installed both side.
3	CLAMPS Galvanized Single and Double combo Clamp or similar Approved
4	FOUNDATION
Total length of fence 70m	

Water Network Project (Fence for 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	Khawghayni	Unit	cm	
				Scale	NO	
				Sheet No	0	

(Typical door for fence)



Water Network Project (Fence)

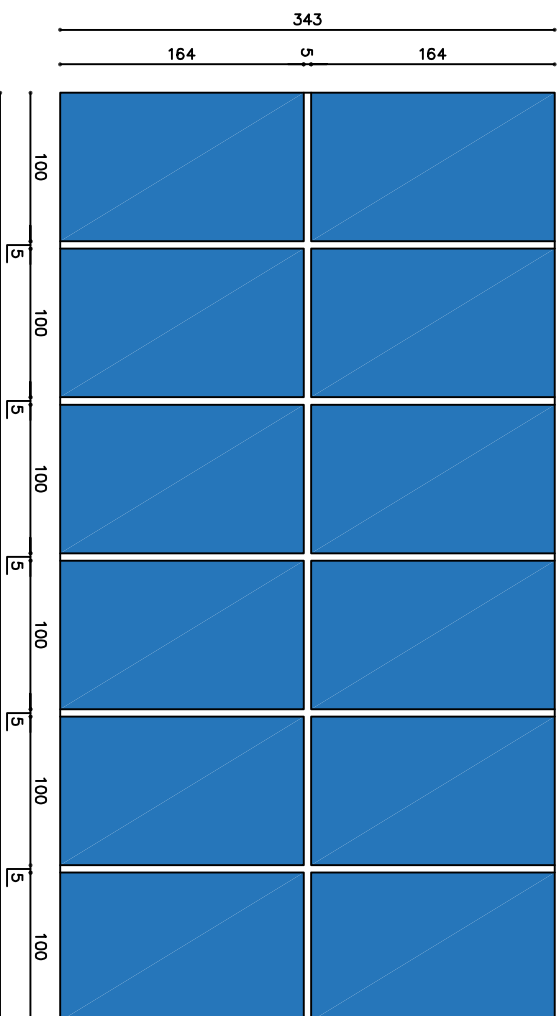
Islamic Relief Worldwide					
IR-W					
Survey: By	Eng.M.Moaine & M.Mehdi	Project	Shelter		
Drawing: By	Eng.M.Mehdi	Section	Water Network		
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		Village	Khawghyani		



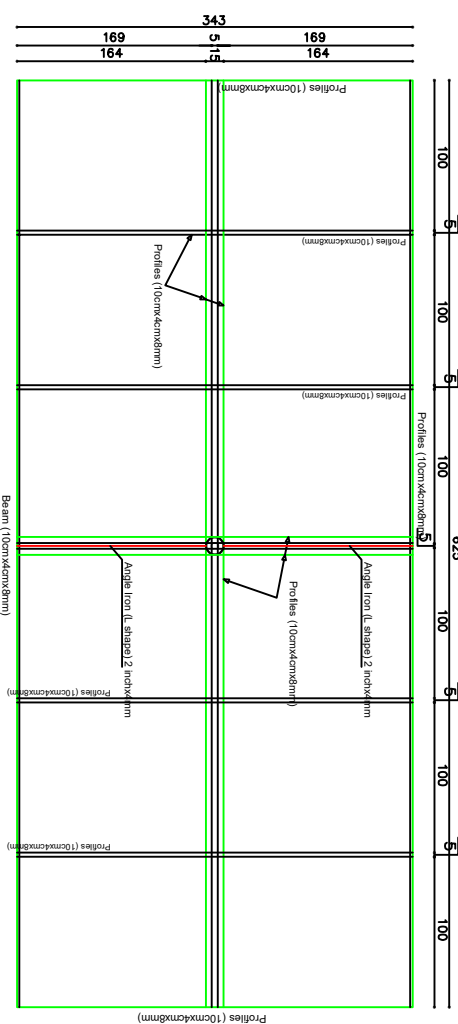


### Typical Solar Panel Frame

plan of solar panels



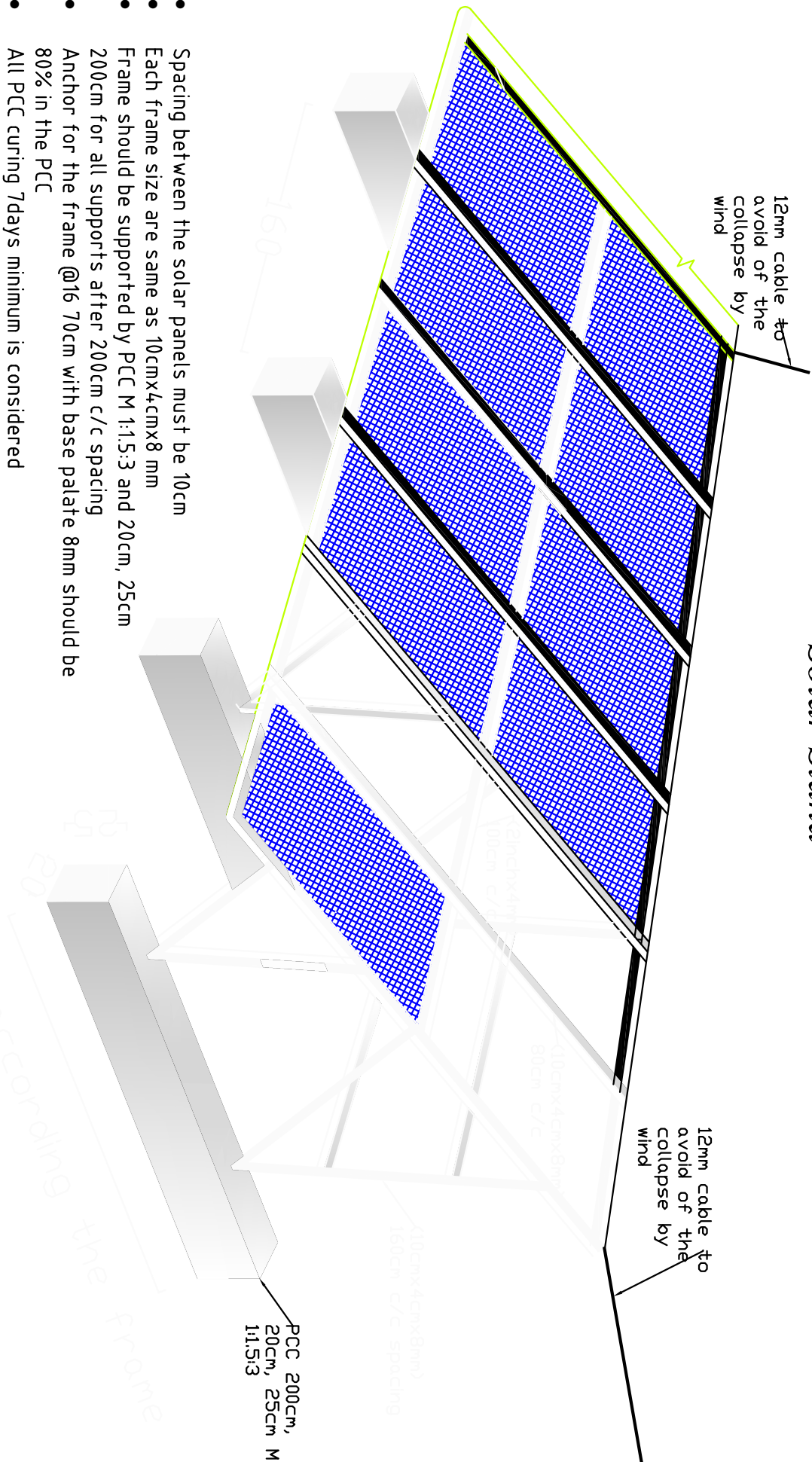
plan of solar panel's frame




# Water Network Project Solar Panel Frame

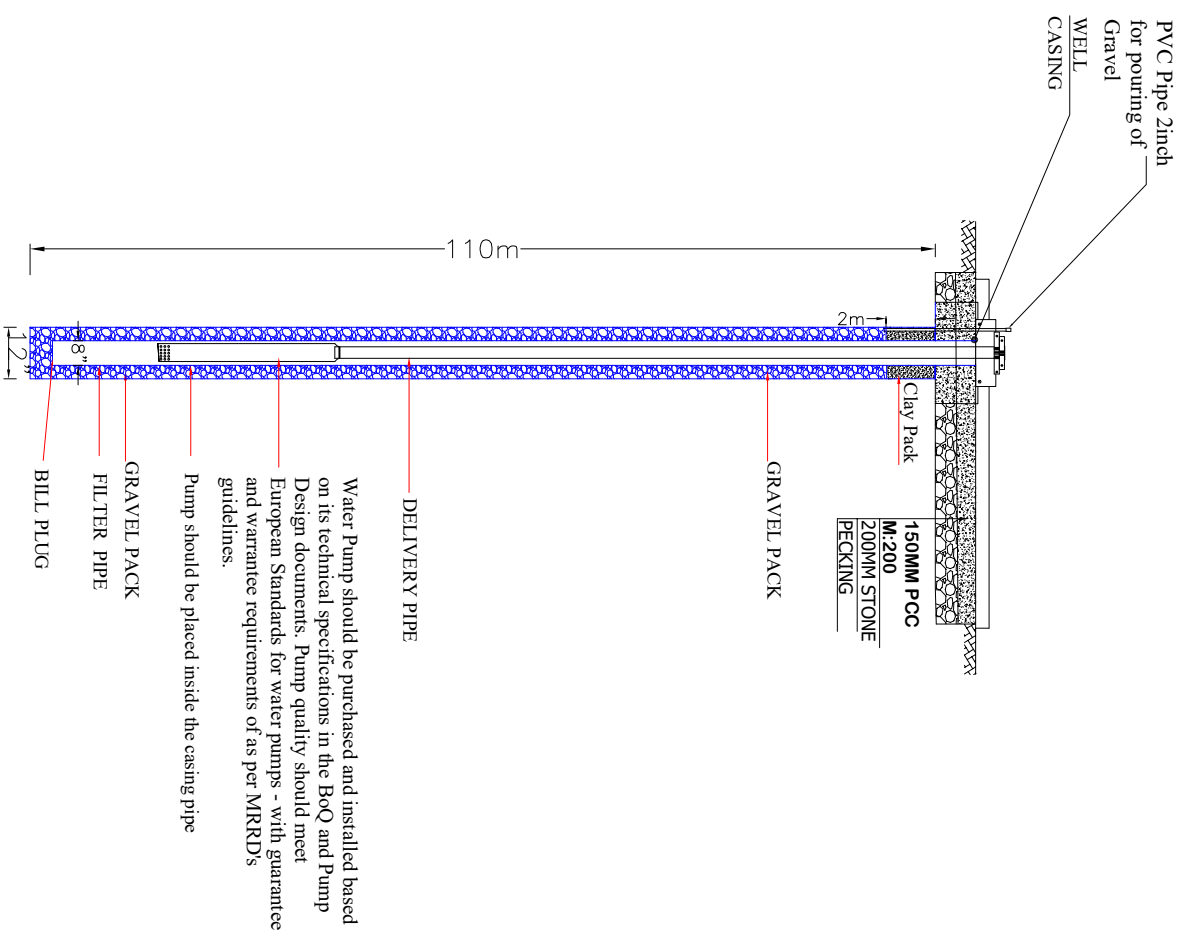
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IR-W			
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Approved: By		District	Arghastan
		Village	Khawghyani
		Unit	cm
		Scale	NO
		Sheet No	0
			

# 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		
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Approved: By		District	Arghastan		
		Village	Khawghyani		
			Unit	cm	
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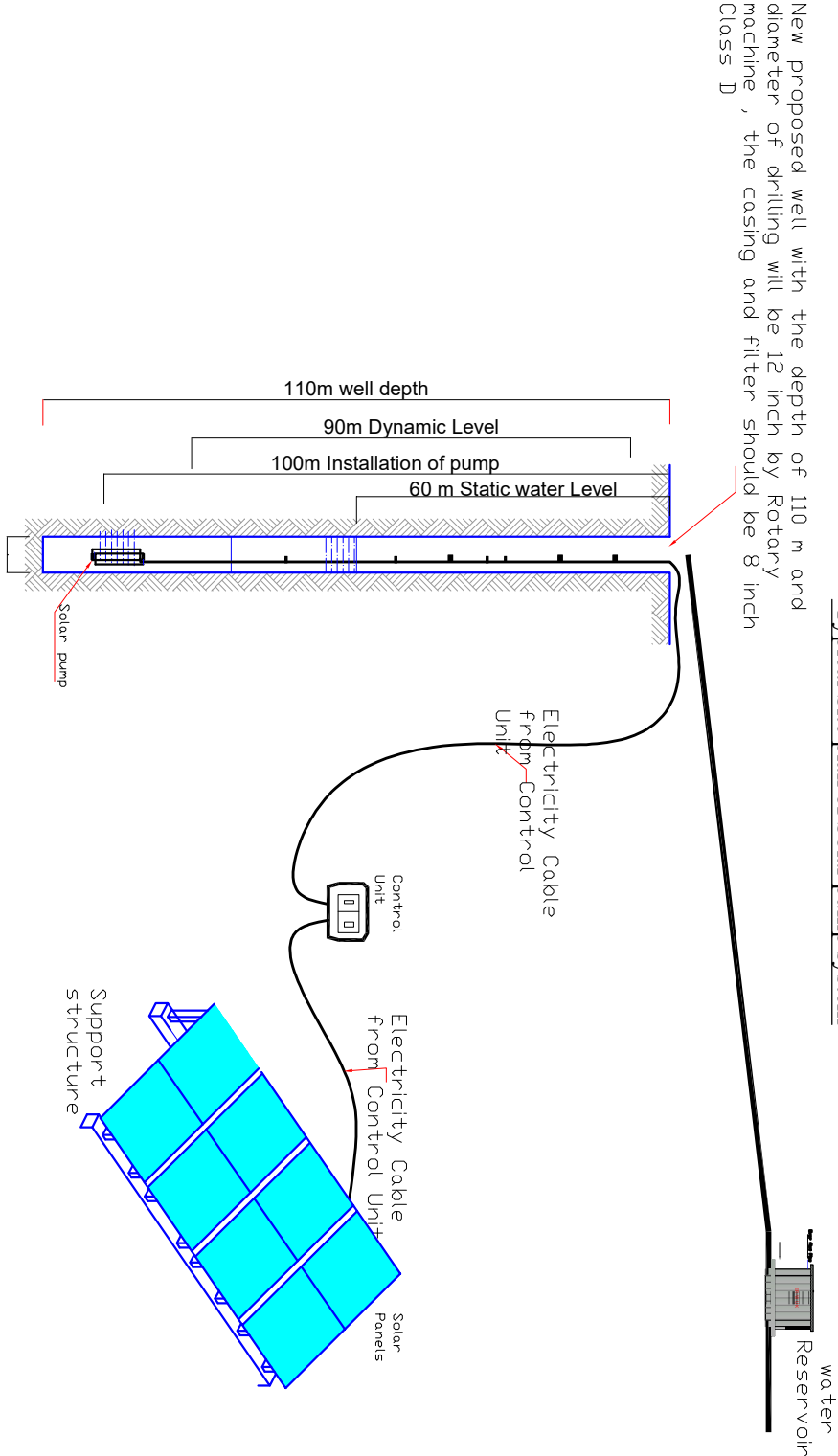
## Notes

- 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

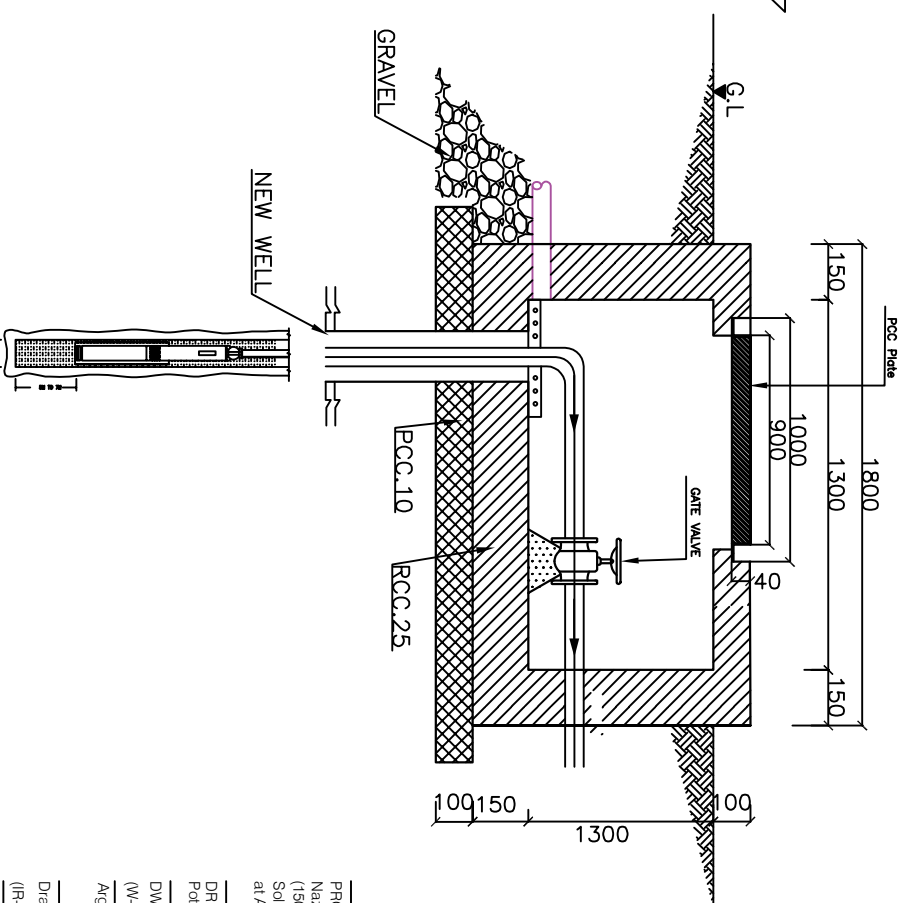
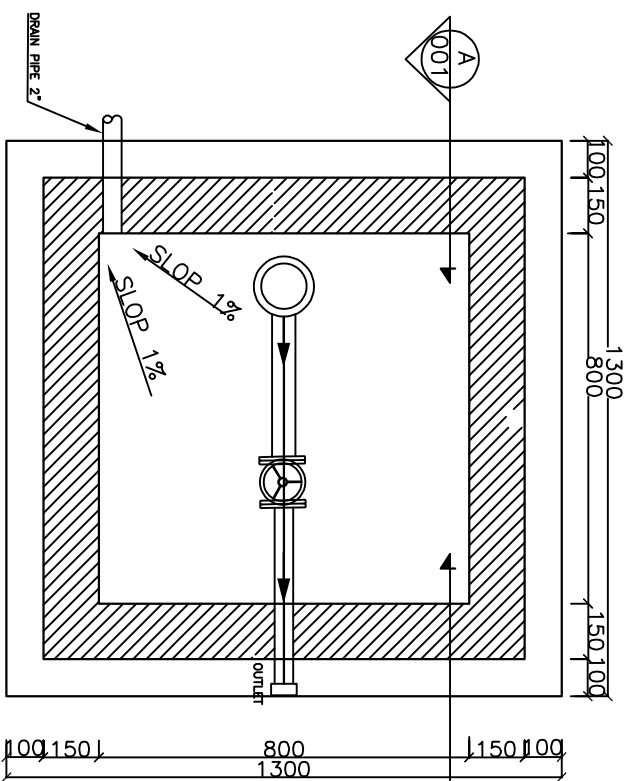
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Survey: By	Eng. M. Moaine & M. Mehdi	Project	Shelter	
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Approved: By		District	Arghastan	
		Village	Khwgyani	
		Unit	cm	
		Scale	NO	
		Sheet No	0	
				

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
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Approved: By		District	Arghastan
		Village	Khwyani
		Unit	cm
		Scale	NO
		Sheet No	0



Remarks

**PROJECT NAME :** Shelter  
Nazad Khil PROJECT  
(150)m Deep Well With Pump and  
Solar System For Each House canicition  
at Arghastan

**DRAWING TITLE**  
Potable Water Well Plan and Section

DWG NUMBER  
(W-01)

### Arghastan District

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

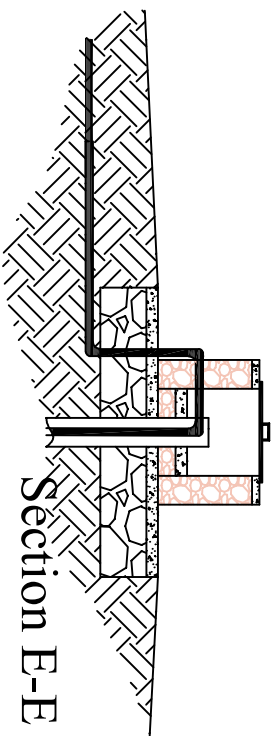
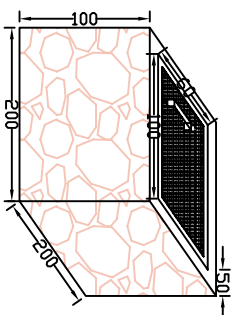
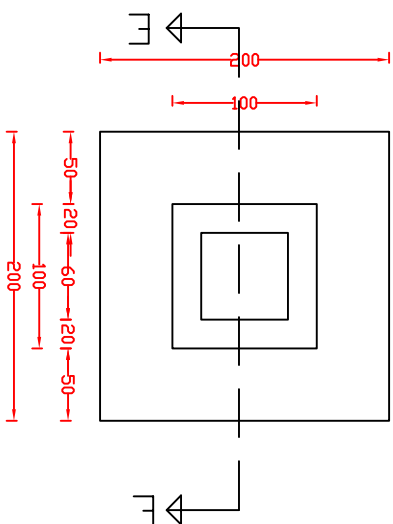
APPROVED BY INDEX

SCALE(NTS) DATE:Oct 2023

# Water Network Project Well

		<i>Islamic Relief Worldwide</i>	
		<i>IR-W</i>	
<i>Survey: By</i>	<i>Eng.M.Moaine &amp; 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>Khawghyani</i>
		<i>Unit</i>	<i>cm</i>
		<i>Scale</i>	<i>NO</i>
		<i>Sheet No</i>	<i>0</i>
			

Plan of Well Apron protection



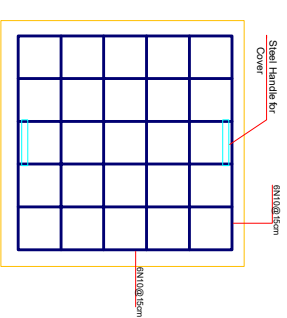
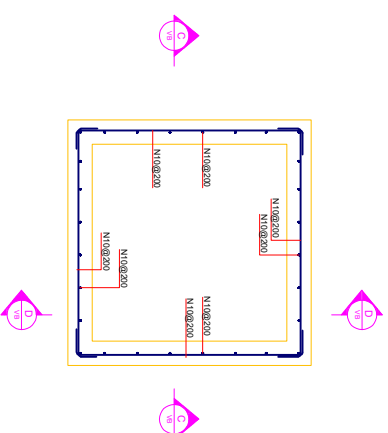
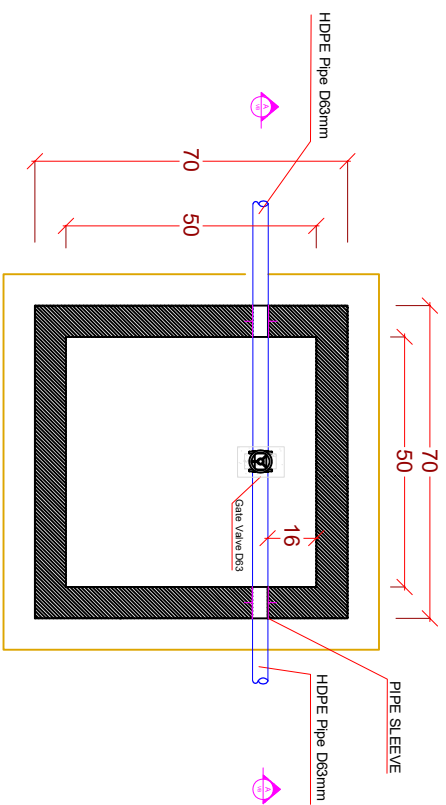
Water Network Project Plan of Well Apron

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		Khawghyani		Sheet No	
								0	





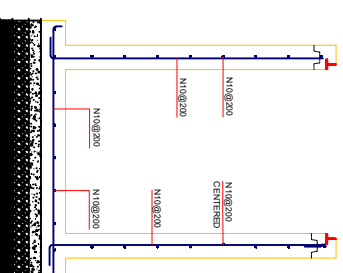
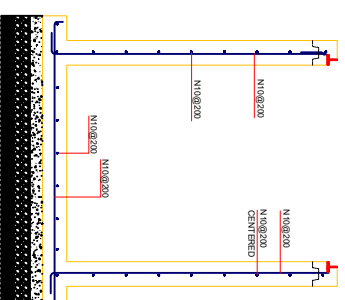
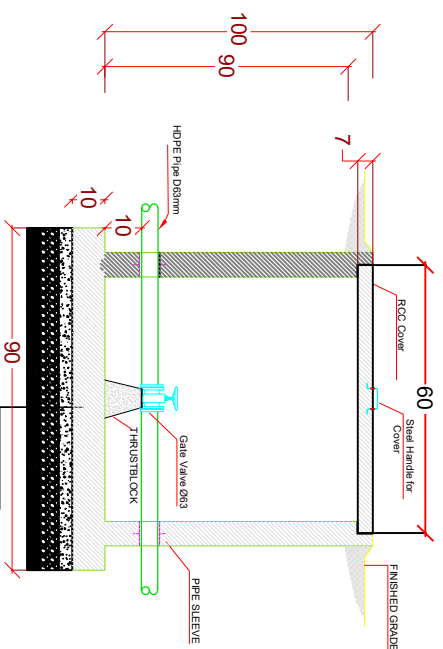
# Well Manhole



VALVE Box plan  
SCALE N.T.S.

**VB VB Reinforcement Plan**  
SCALE N.T.S

### Cover of Manhole



**SECTION A-A**

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**SCALE N.T.S**

Section C-C  
SCALE N.T.S.

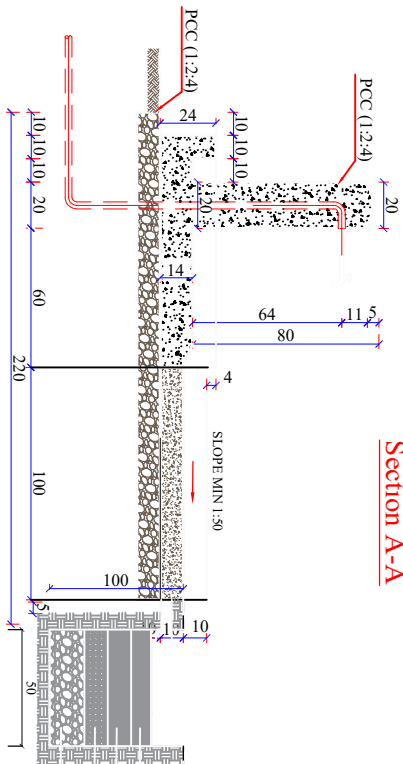
Section D-D  
SCALE N.T.S

# Water Network Project Well Manhole

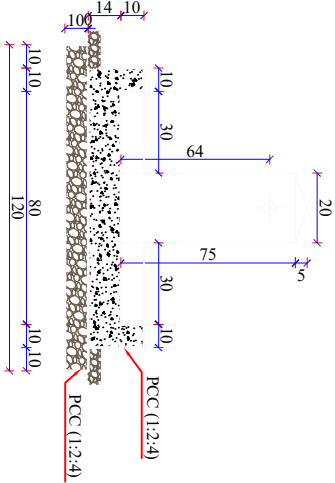
		<i>Islamic Relief Worldwide</i>	
<i>Survey: By</i>	<i>Eng.M.Moaine &amp; M.Mehdi</i>	<i>Project</i>	<i>Shelter</i>
<i>Drawing: By</i>	<i>Eng.M.Mehdi</i>	<i>Section</i>	<i>Water Network</i>
<i>Design : By</i>	<i>Eng.M.Moaine</i>	<i>Date</i>	<i>16/10/2023</i>
<i>Checked: By</i>	<i>Eng.Dawod Shafiq</i>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

Plan of Stand Tap

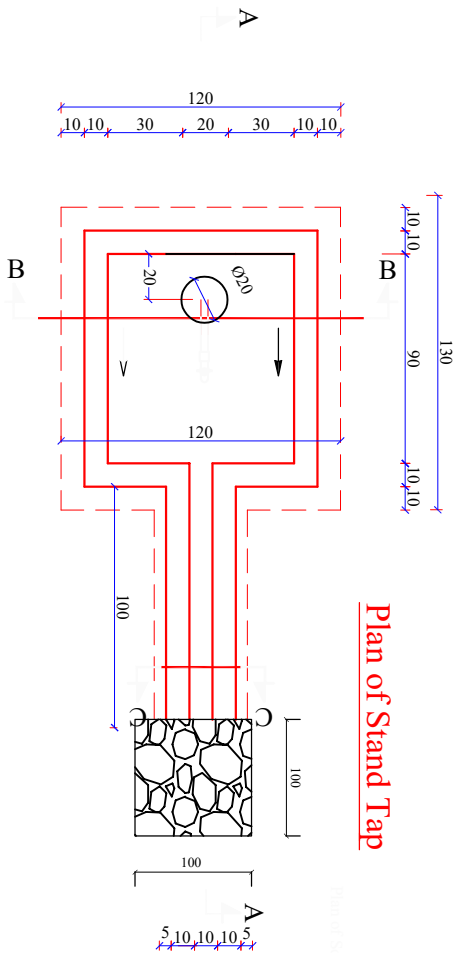
Section A-A



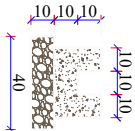
Section B-B




Plan of Stand Tap



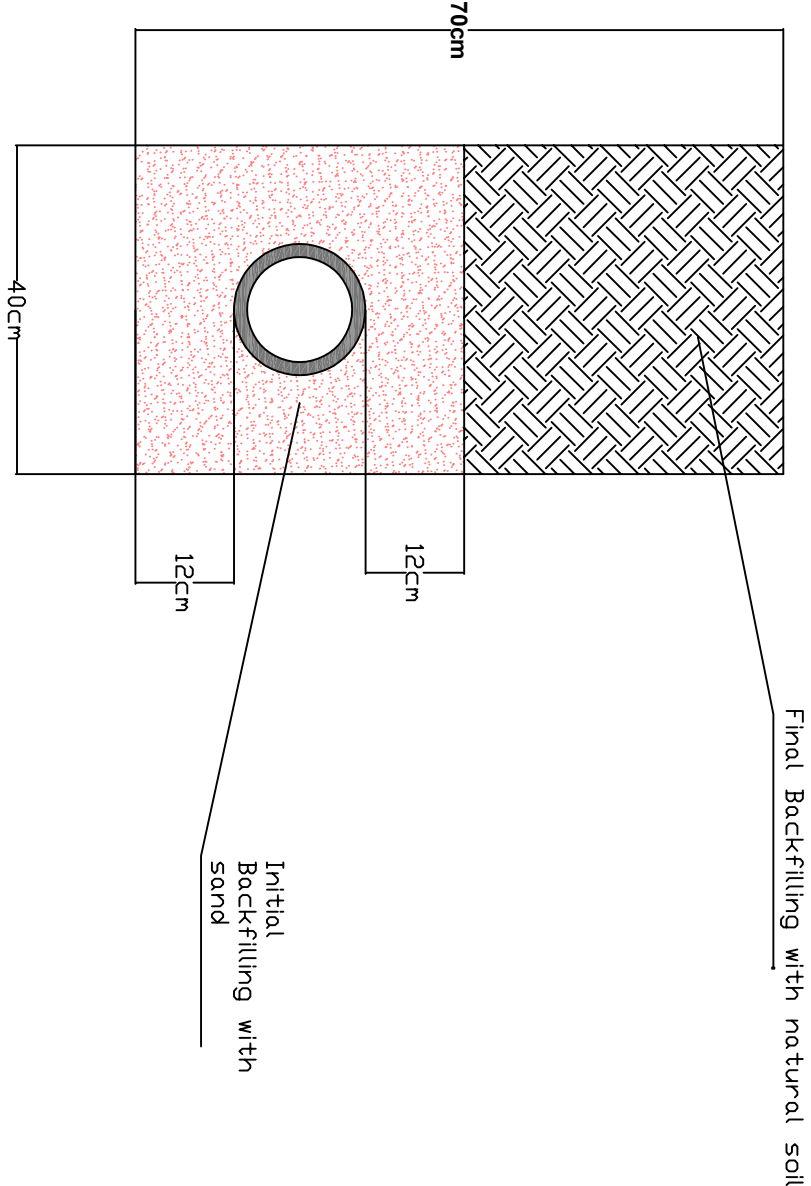
Section C-C




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	Khawghyani			

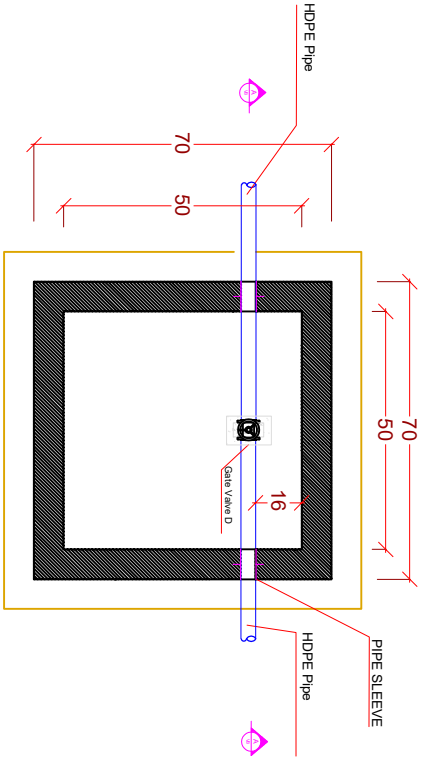
Trench for Pipe



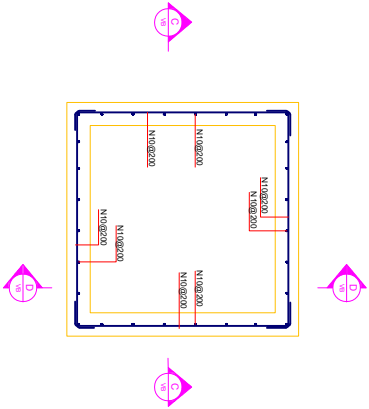
Section of trench for pipe laying

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	Khawghyani			

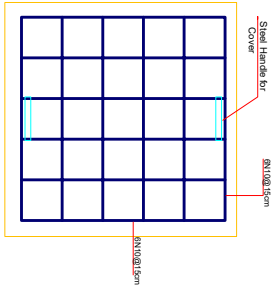
Gate Manhole



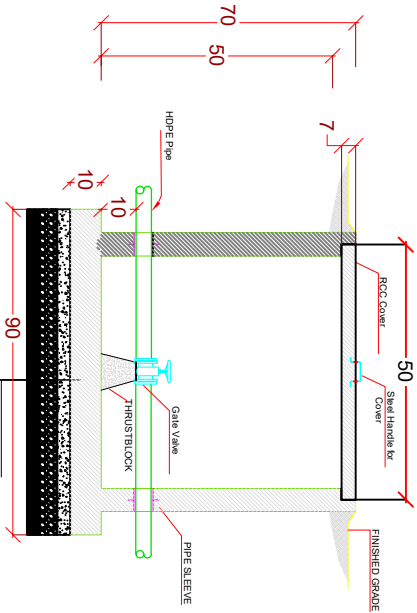
Valve Box Plan  
SCALE N.T.S



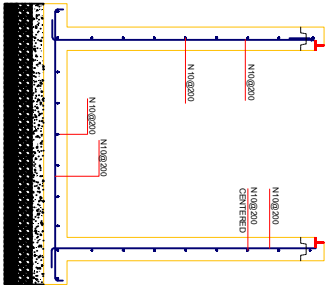
V/B Reinforcement Plan  
SCALE N.T.S



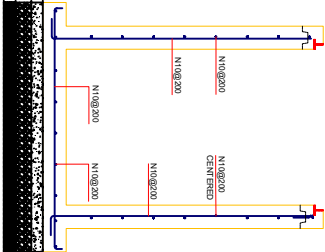
Cover of Manhole



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	Khawghyani		



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

Khawgyani Village

دسولر پمپ محاسبوی جدول

شماره	تشریحات	ارقام
1	نفوس	595
2	دفاعیلونو تعداد	85
3	دنفوس کلنی زیاتوالی	2.2
4	د دیزاین زمان	15
5	دیزاین نفوس	825
6	په روځ کي دمصرف نورم	30
7	ددیزاین شوی نفوس لپاره د متوسطی روځی جریان	24.7
8	دروځنی اعظمی مصرف ضریب	1.3
9	د هغه روځی لپارابه چي مصرف یي اعظمی وی	32.2
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	4.0
11	د واټر پمپ لپاره ارتفاع، دڅاه له دینامیک سطحی تر ذخیری ارتفاع جمعه د فشار ضایعات یو متر دخروج لپاره فشار په متر	100+25+2+1=128 m
	مجموعی ارتفاع	128.0
12	هایدرولیکی فشار Ph	1.4
13	دپمپ موثریت ۷۵٪	1.25
14	دواټر پمپ د شافت قدرت ۷۵٪ Ph	1.8
15	د موټور د موثریت ضریب ۱.۱-۱.۲-۱.۵ -co= 2	1.24
16	دواټر پمپ د موټور یانصب قدرت Pm	2.2
17	دتولید ستندر	2.2
18	د انورتر موثریت ۸۵٪	0.85
19	د سستم موثریت ۸۰٪	0.80
20	دلمریزو تختو د بریښنا قدرت په کیلووات	3.2
	دلمریزو تختو د بریښنا قدرت په واط	3235.3
	دلمریزو تختو تعداد بریښنا قدرت په واط	6.5
		8.0

دشبکی د دیزاین د ارقامو جدول

Khawgyani Village			
ارقام	تشریحات		شماره
595	Population	نفوس	1
85	Famil	د فامیلونو تعداد	2
2.2	Population growth/year	د نفوس کلنی زیاتوالی	3
15	Design period	د دیزاین زمان	4
825	Design population	دیزاین نفوس	5
30	Daliy Demend l/c/d	په روځ کې دمصرف نورم	6
0.3	Everege daliy Flow for design population L/se	ددیزاین شوی نفوس لپاره د متوسطی روځی جریان	7
1.3	Peak daily factor	د روځنی اعظمی مصرف ضریب	8
0.4	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
0.9	Peak horly flow l/sec	د اعظمی مصرف په ساعت کې لیتر فی ثانه (دشبکی د دیزاین جریان)	11
1.10	Well water yald= Pumped water l/sec- 4x1000/3600=1.1	د څاه ابدھی لیتر فی ثابنه، د واټر پمپ استخراج لیتر فی ثابنه	12
16	Volume of Reservoir 49% of(32m3)	د ذخیزی حجم د اعظمی روځی د مصرف (32متر مکعب) ۴۹ فیصده په متر مکعب	13



## **Technical Specification for Khawghyani Water Supply Pipe Scheme Project**

1. Population: The village has 85 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 20 cubic meters RCC water Tank. - Construction of 2 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 20 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 110 meters. The perceived static water level is 60 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 28.
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 ( Khawghyani) Pipe scheme project

ID-number: KDR-003 Water Network

Province: Kandahar

District: Aghastan

Village:Khawghani

Project purpose:Water Supply

Date: 11 /01/2024

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 solar panels	21																
5	Construction and Installation of 20 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.

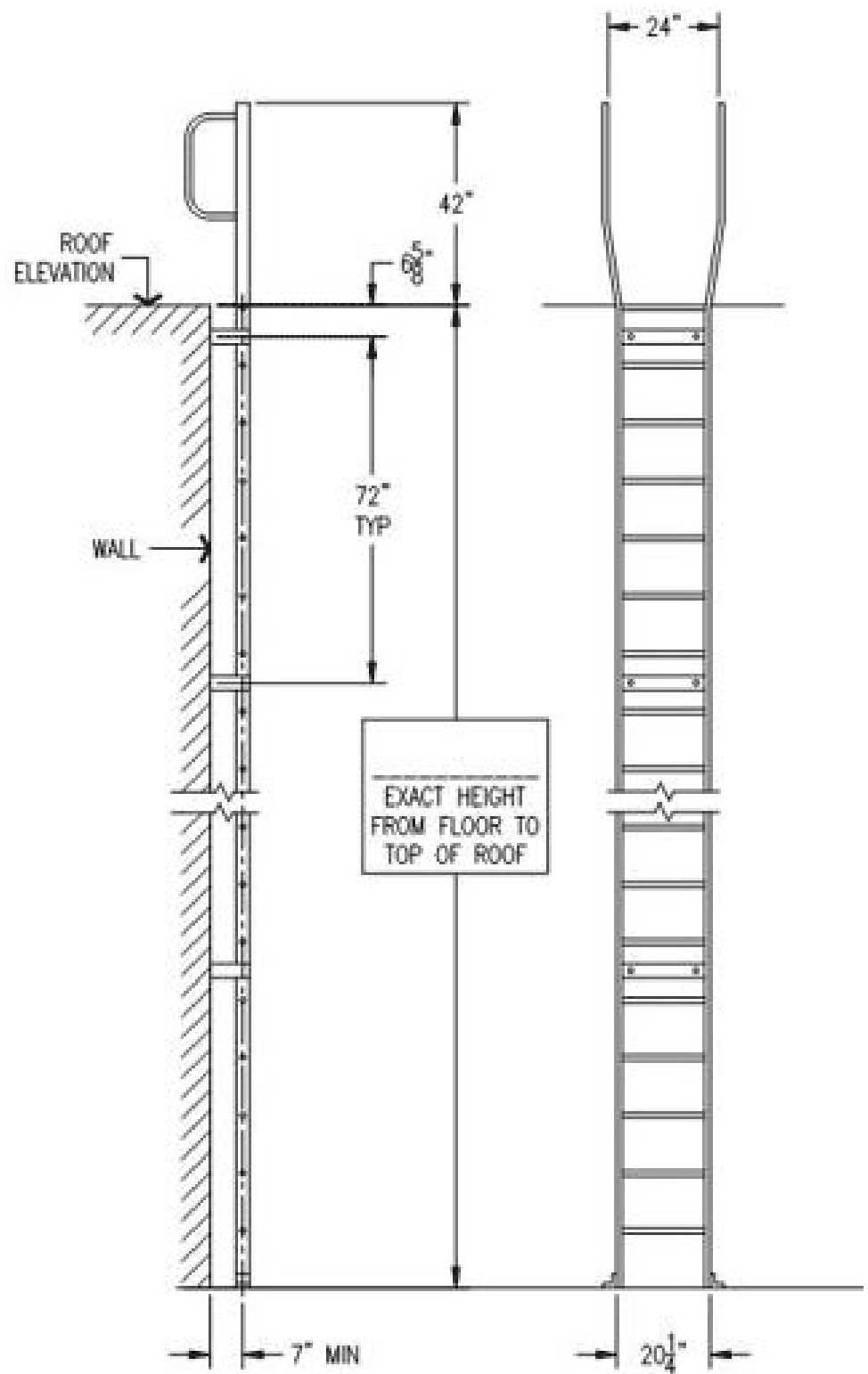
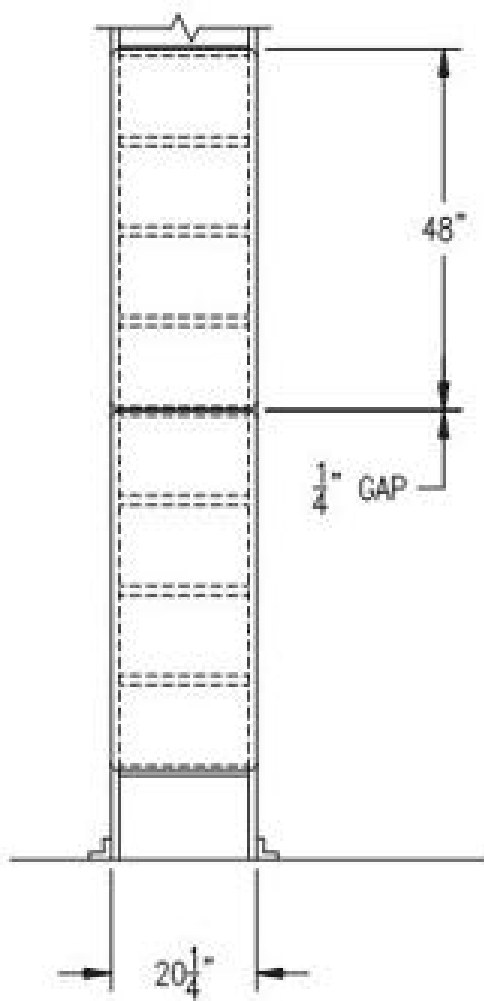
### **FIXED LADDER WITH WALK-THRU HANDRAILS AND SAFETY CAGES:**

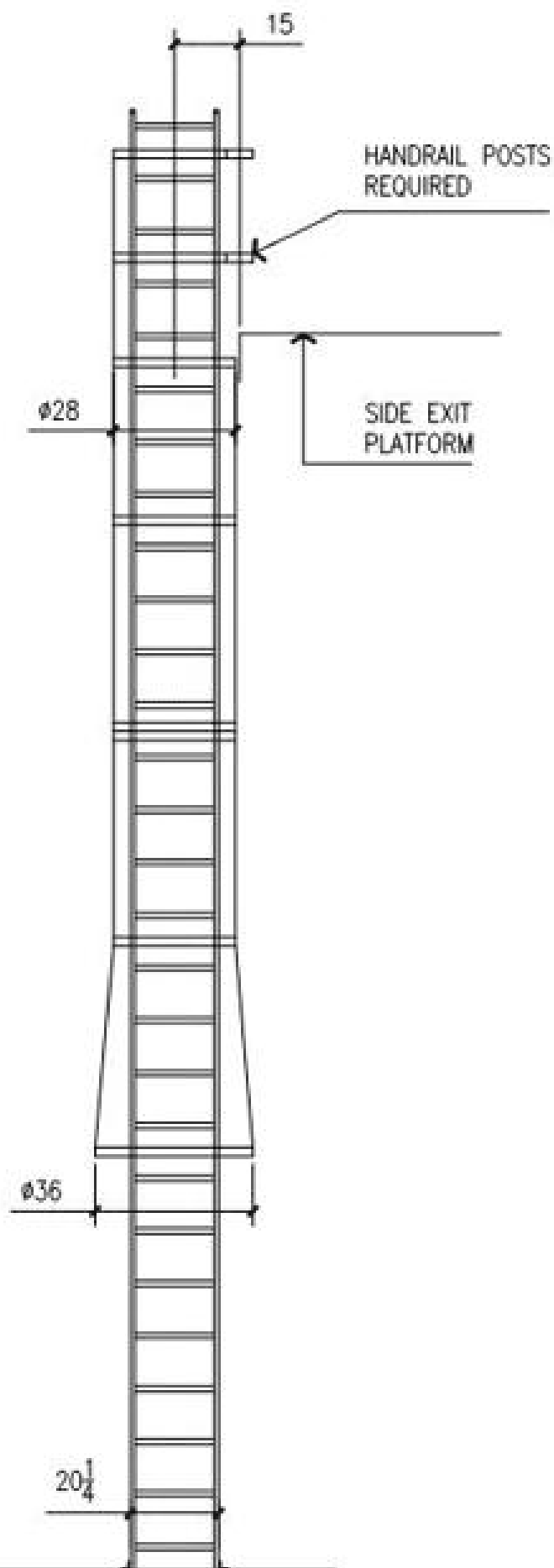
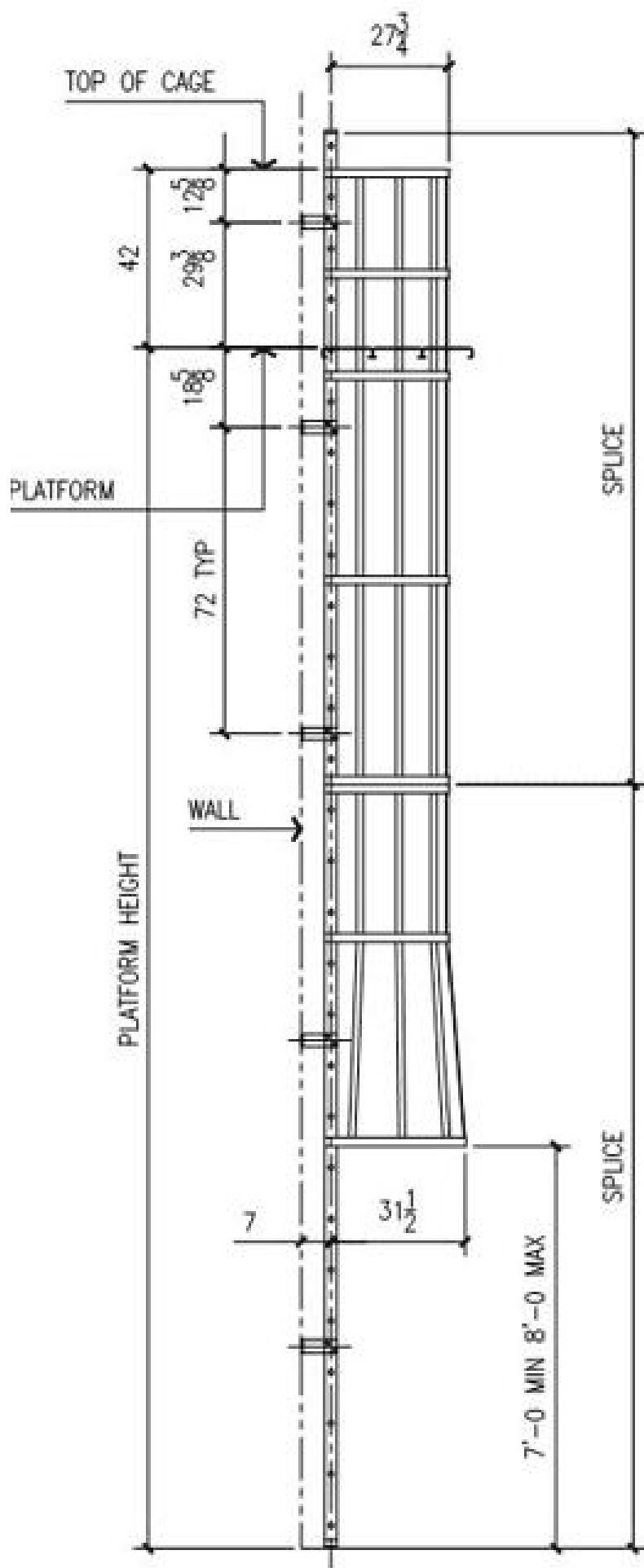
Designed for safe landing access and available from 10' to 29'. Cages and walk-thru handrails extend 42" above landing surface.

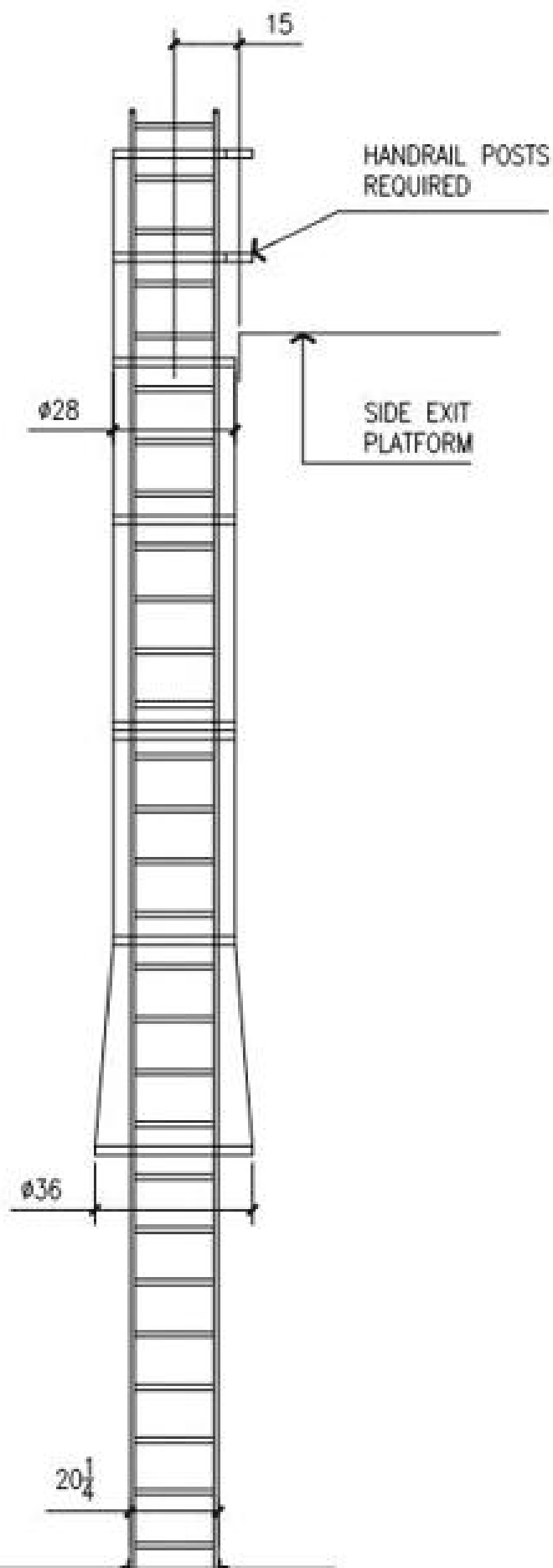
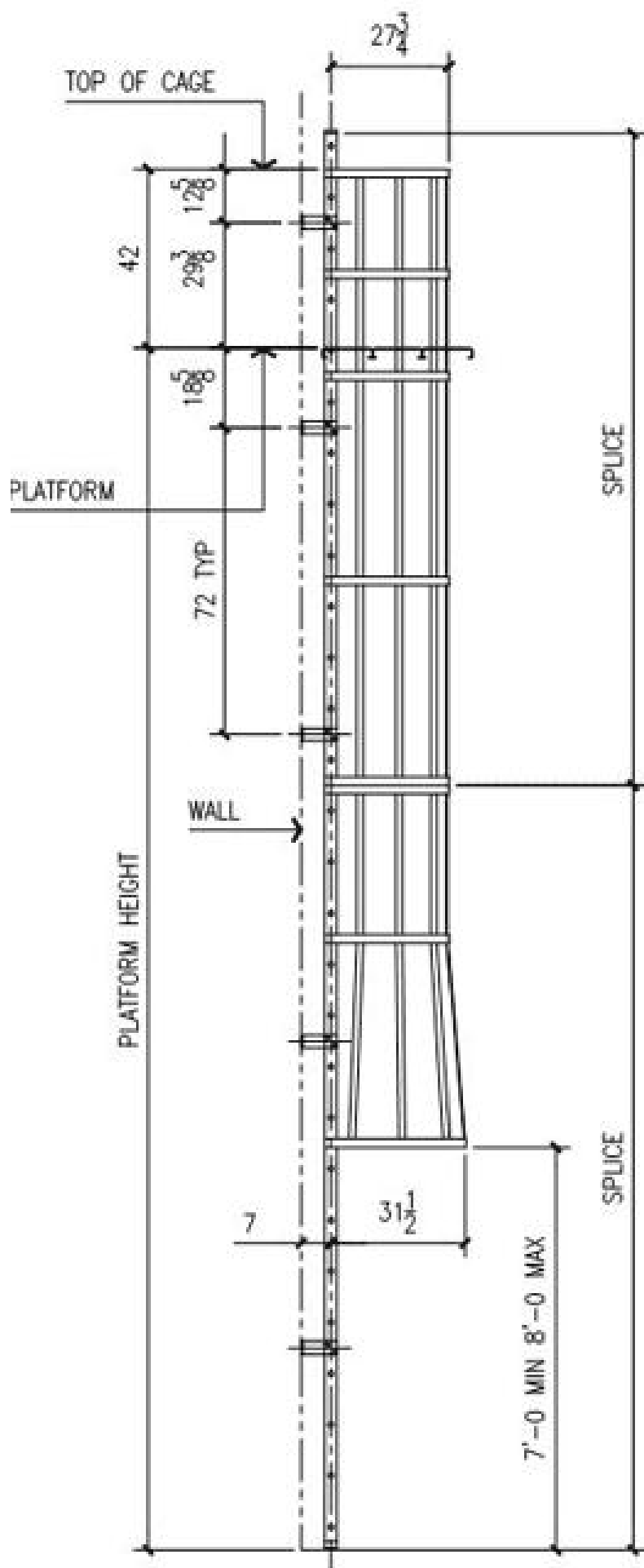
#### **CAGE FEATURES:**

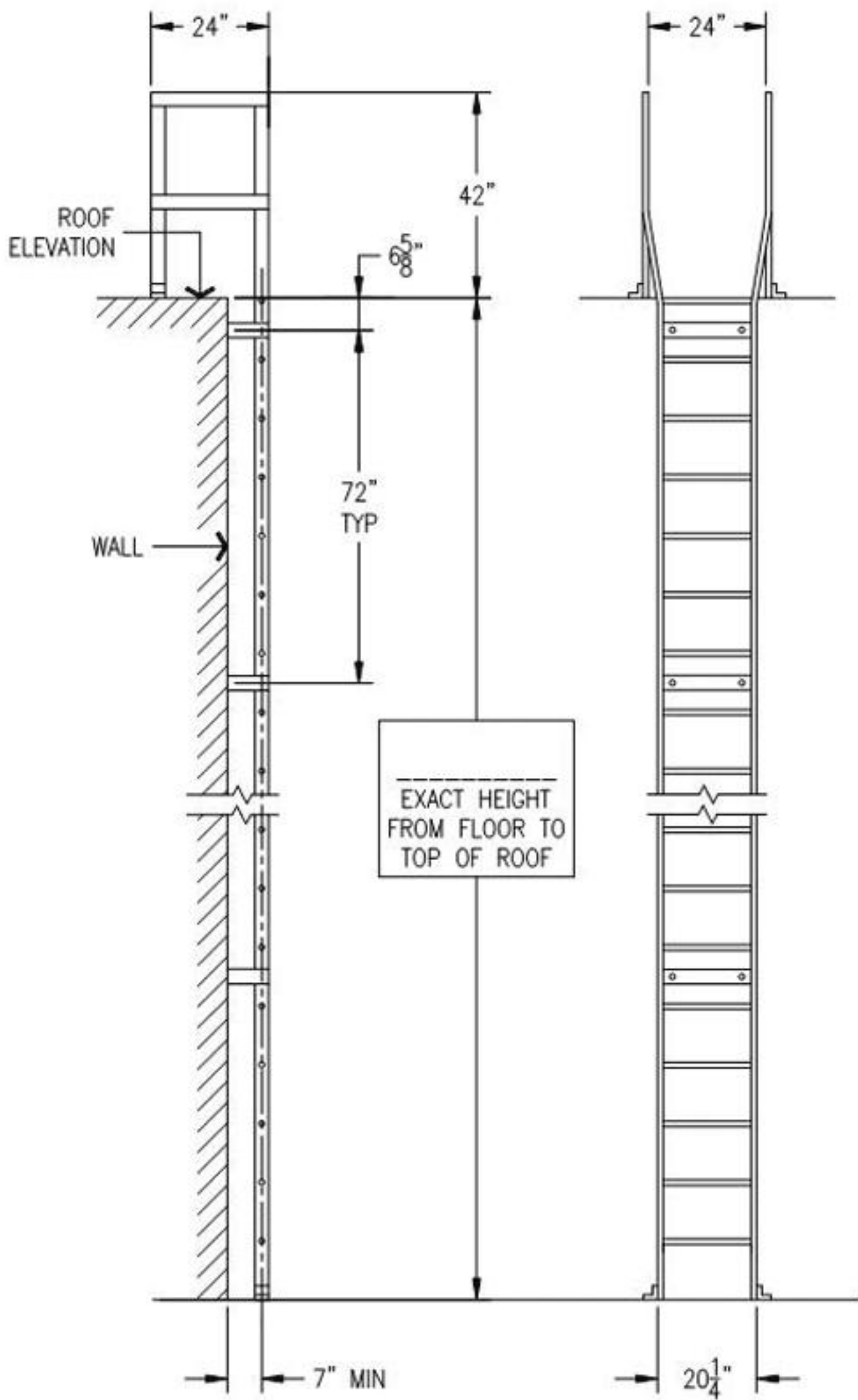
- Safety cages are designed to OSHA specifications with flared bottom opening for easy entry.
- Cage begins 7' from bottom of ladder.
- Gray powder coat finish, yellow available.

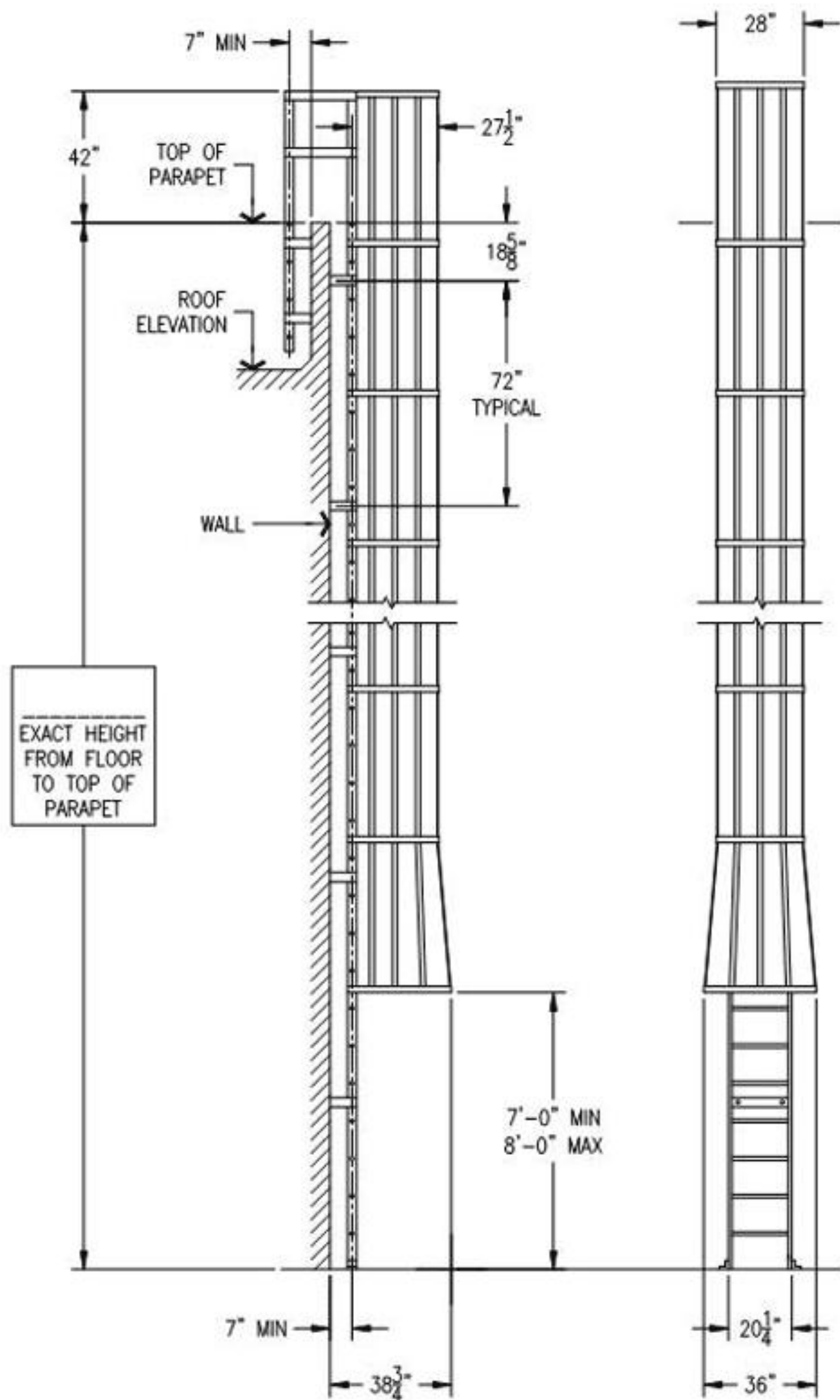












Submittal Data

PROJECT:	UNIT TAG:	QUANTITY:
REPRESENTATIVE: _____	TYPE OF SERVICE:	DATE: _____
ENGINEER:	SUBMITTED BY:	DATE:
CONTRACTOR:	APPROVED BY:	DATE:
	ORDER NO.:	DATE:

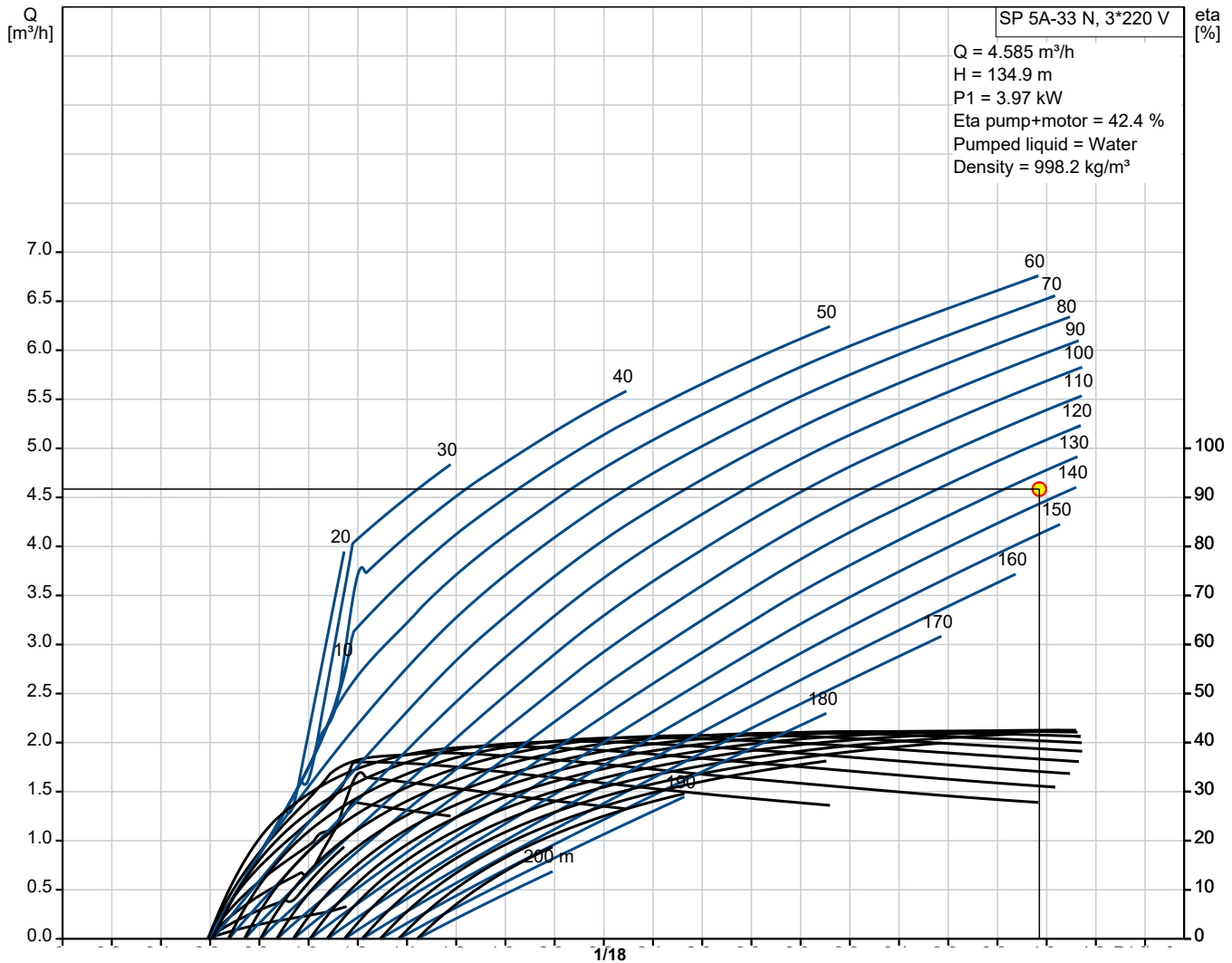


SP 5A-33 N

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.

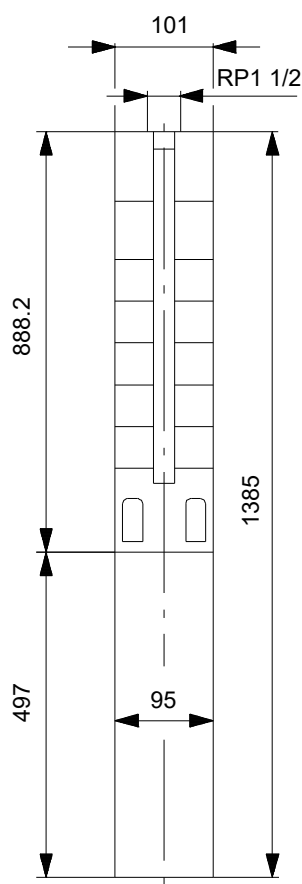
Note! Product picture may differ from actual product

Conditions of Service	Pump Data	Motor Data
Liquid: Water	Liquid temperature range: -15 .. 40 °C Product number: On request	Mains frequency: 50 Hz Enclosure class: IP68





# Submittal Data



**Materials:**  
Impeller: Stainless steel  
Impeller: AISI 316  
Impeller: EN 1.4401



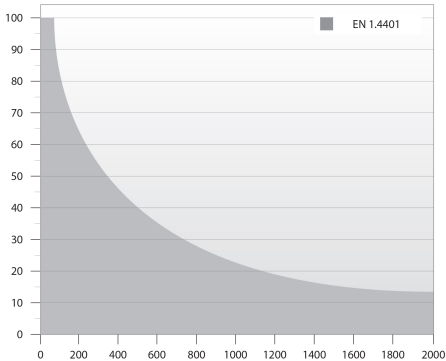
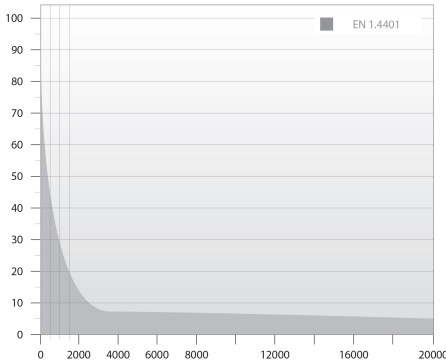
Project:

Reference Number:

Client:

Client Number:

Contact:

Qty.	Description
1	<p><b>SP 5A-33 N</b></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 1.4401 (AISI 316), that ensures high corrosive resistance.</p> <p><b>Further product details</b></p> <p>The pump is suitable for applications similar to the following:</p> <ul style="list-style-type: none"> <li>- raw-water supply</li> <li>- irrigation</li> <li>- groundwater lowering</li> <li>- pressure boosting</li> <li>- fountain applications</li> <li>- mining applications</li> <li>- off-shore applications.</li> </ul> <p>The Grundfos SP pump is renowned for its high efficiency and already complies with the requirements of the Minimum Efficiency Index, and therefore Grundfos is amongst the best in class within submersible pumps.</p>  <p><b>Pump</b></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>   </div>

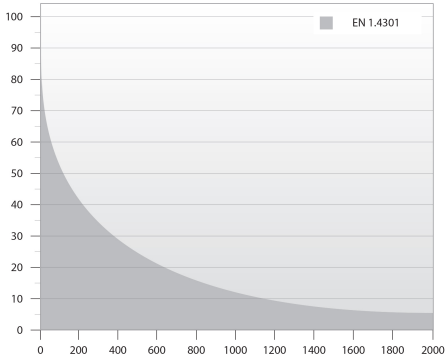
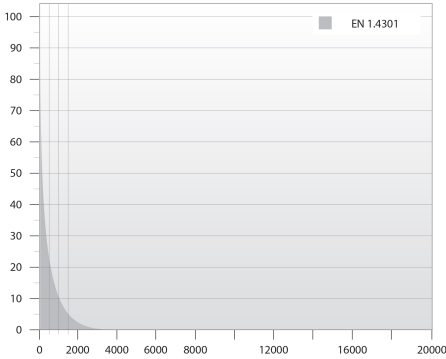
Project:

Reference Number:

Client:

Client Number:

Contact:

Qty.	Description
1	<div>   </div> <p>The elastomer parts in the pump are made of NBR (Nitrile-Butadiene Rubber) and TPU (Thermoplastic Poly-Urethane) which offers good wear resistance and long service intervals.</p> <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><b>Motor</b></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>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: 5 m³/h  Rated head: 135 m  Approvals: CE,EAC,UKCA,SEPRO,MOROCCO  Approvals for motor: CE,EACMOROCCO,UKCA,SEPRO  Curve tolerance: ISO9906:2012 3B  Motor version: T40  Return valve: YES  Specification for shaft end: CYLINDRICAL</p> <p>Materials:  Pump: Stainless steel  EN 1.4401  AISI 316  Impeller: Stainless steel  EN 1.4401  AISI 316  Motor: Stainless steel  EN 1.4539  Shaft seal: SiC/SiC</p> <p>Installation:  Maximum ambient pressure: 60 bar  Maximum operating pressure: 60 bar  Maximum outlet pressure: 21.5 bar  Type of connection: Rp  Size of connection: 1 1/2 inch</p>



Company name:

Created by:

Phone:

Date: 07/07/2024

Project:

Reference Number:

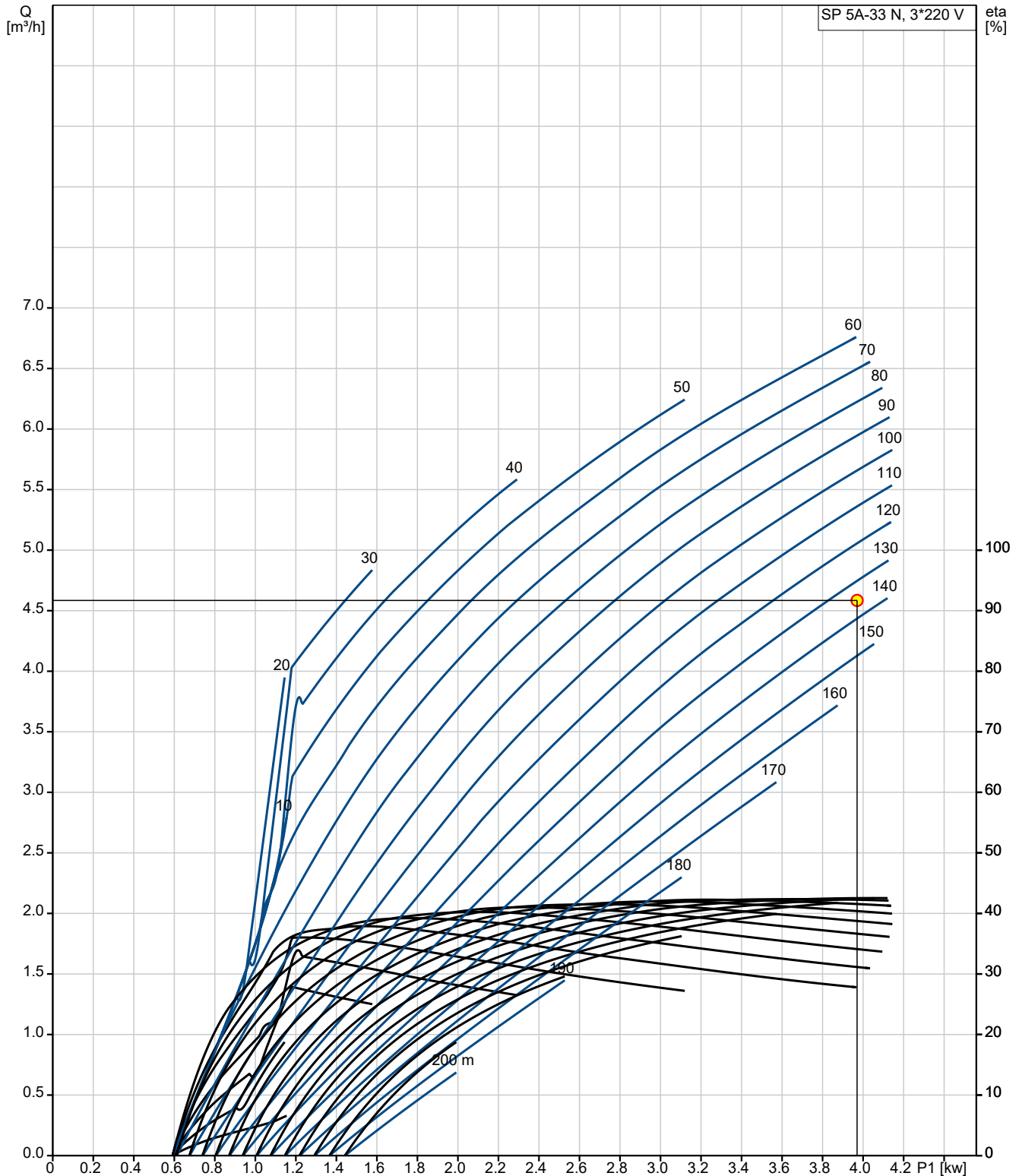
Client:

Client Number:

Contact:

Qty.	Description
1	<p>Motor diameter: 4 inch Minimum borehole diameter: 105 mm</p> <p>Electrical data: Motor type: MS4000 Motor flange design: Grundfos Rated power - P2: 3 kW Power (P2) required by pump: 3 kW Mains frequency: 50 Hz Rated voltage: 3 x 220-230 V Rated current: 14.2-14.6 A Starting current: 440-450 % Cos phi - power factor: 0.77 Rated speed: 2860-2870 rpm Method of start: Direct-on-line (DOL) Enclosure class (IEC 34-5): IP68 Insulation class (IEC 85): F Built-in motor protection: NONE Thermal protection: External Built-in temp. transmitter: Yes Length of cable: 1.7 m Power cable type: FLAT Motor No: 7C103708 Windings: Enameled</p> <p>Others: Minimum efficiency index, MEI <math>\geq</math>: 0.50 Net weight: 30.9 kg Gross weight: 32.6 kg Shipping volume: 0.021 m<sup>3</sup> Environmental approvals: WEEE</p>

## On request SP 5A-33 N



$Q = 4.585 \text{ m}^3/\text{h}$   
 $P_1 = 3.97 \text{ kW}$   
 Pumped liquid = Water

$H = 134.9 \text{ m}$   
 $\eta_{\text{pump+motor}} = 42.4 \%$   
 Density =  $998.2 \text{ kg/m}^3$

**Project:**

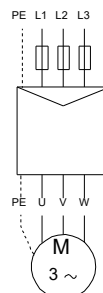
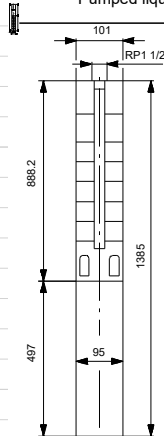
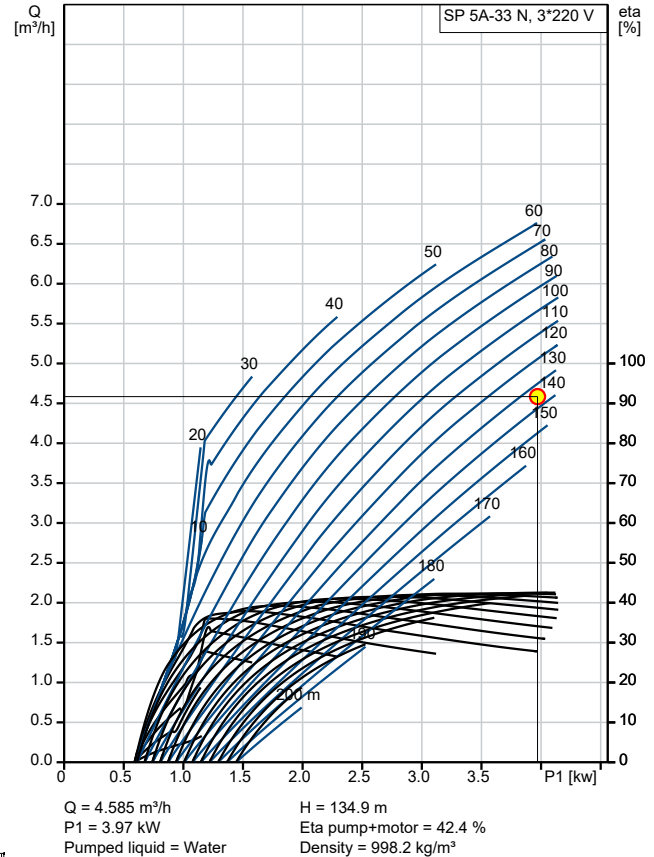
Reference Number:

**Client:**

Client Number:

Contact:

Description	Value
<b>General information:</b>	
Product name:	SP 5A-33 N
Product No:	On request
EAN number:	On request
<b>Technical:</b>	
Pump speed on which pump data are based:	2900 rpm
Rated flow:	5 m³/h
Rated head:	135 m
Stages:	33
Number of reduced-diameter impellers:	NONE
Approvals:	CE, EAC, UKCA, SEPRO, MOR OCCO
Approvals for motor:	CE, EAC, MOROCCO, UKCA, SEPRO
Curve tolerance:	ISO9906:2012 3B
Pump No:	05200033
Model:	B
Motor version:	T40
Return valve:	YES
Specification for shaft end:	CYLINDRICAL
<b>Materials:</b>	
Pump:	Stainless steel
Pump:	EN 1.4401
Pump:	AISI 316
Impeller:	Stainless steel
Impeller:	EN 1.4401
Impeller:	AISI 316
Motor:	Stainless steel
Motor:	EN 1.4539
Shaft seal:	SiC/SiC
<b>Installation:</b>	
Maximum ambient pressure:	60 bar
Maximum operating pressure:	60 bar
Maximum outlet pressure:	21.5 bar
Type of connection:	Rp
Size of connection:	1 1/2 inch
Motor diameter:	4 inch
Minimum borehole diameter:	105 mm
<b>Liquid:</b>	
Pumped liquid:	Water
Liquid temperature range:	-15 .. 40 °C
<b>Electrical data:</b>	
Motor type:	MS4000
Motor flange design:	Grundfos
Rated power - P2:	3 kW
Power (P2) required by pump:	3 kW
Mains frequency:	50 Hz
Rated voltage:	3 x 220-230 V
Rated current:	14.2-14.6 A
Starting current:	440-450 %
Cos phi - power factor:	0.77
Rated speed:	2860-2870 rpm
Method of start:	Direct-on-line (DOL)
Enclosure class (IEC 34-5):	IP68





Company name:

Created by:

Phone:

Date: 07/07/2024

Project:

Reference Number:

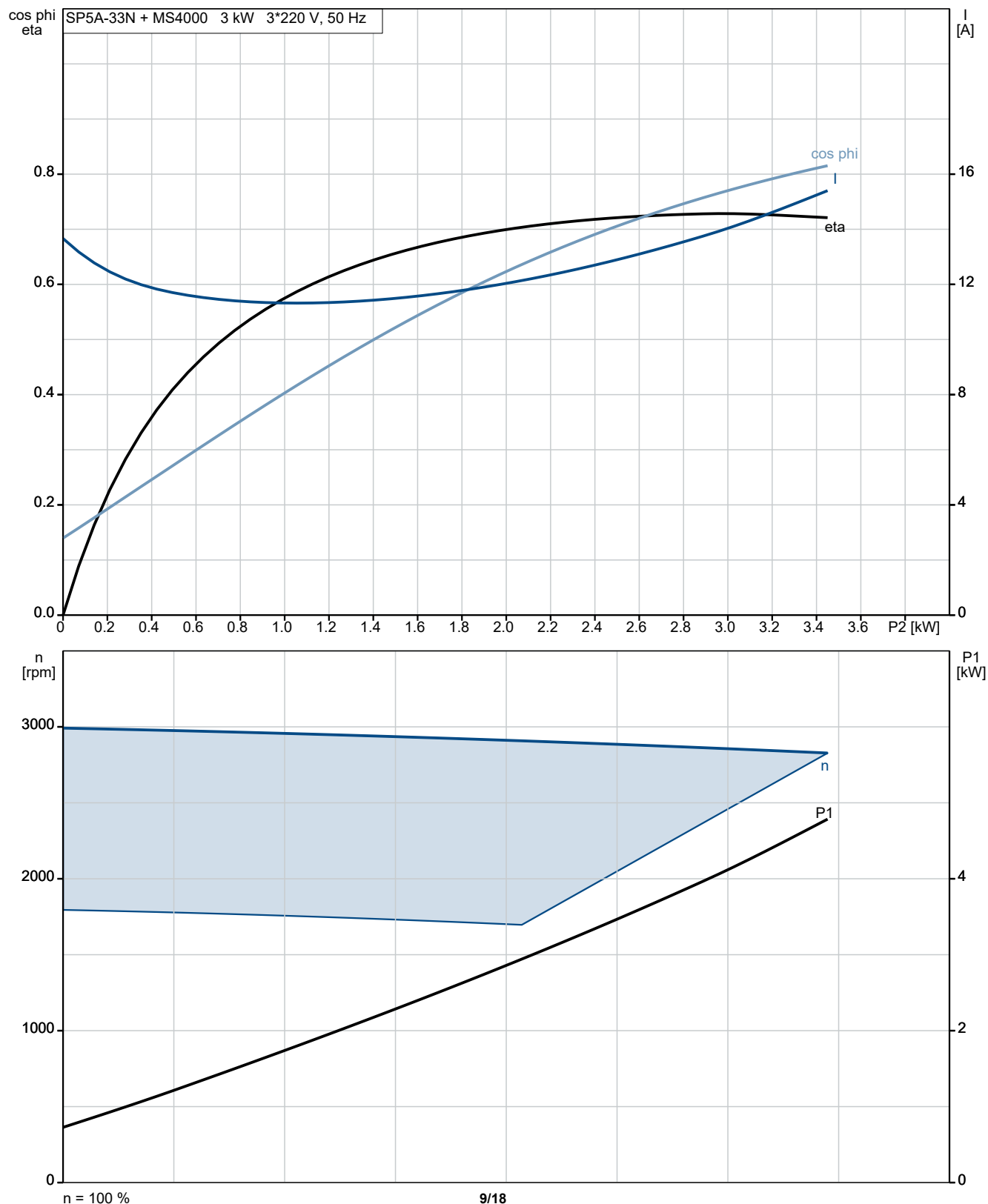
Client:

Client Number:

Contact:

Description	Value
Insulation class (IEC 85):	F
Built-in motor protection:	NONE
Thermal protection:	External
Built-in temp. transmitter:	Yes
Length of cable:	1.7 m
Power cable type:	FLAT
Motor No:	7C103708
Cable number:	99411278
Windings:	Enameled
<b>Others:</b>	
Minimum efficiency index, MEI ≥:	0.50
Net weight:	30.9 kg
Gross weight:	32.6 kg
Shipping volume:	0.021 m <sup>3</sup>
Environmental approvals:	WEEE

## On request SP 5A-33 N







Company name:

Created by:

Phone:

Date:

07/07/2024

Project:

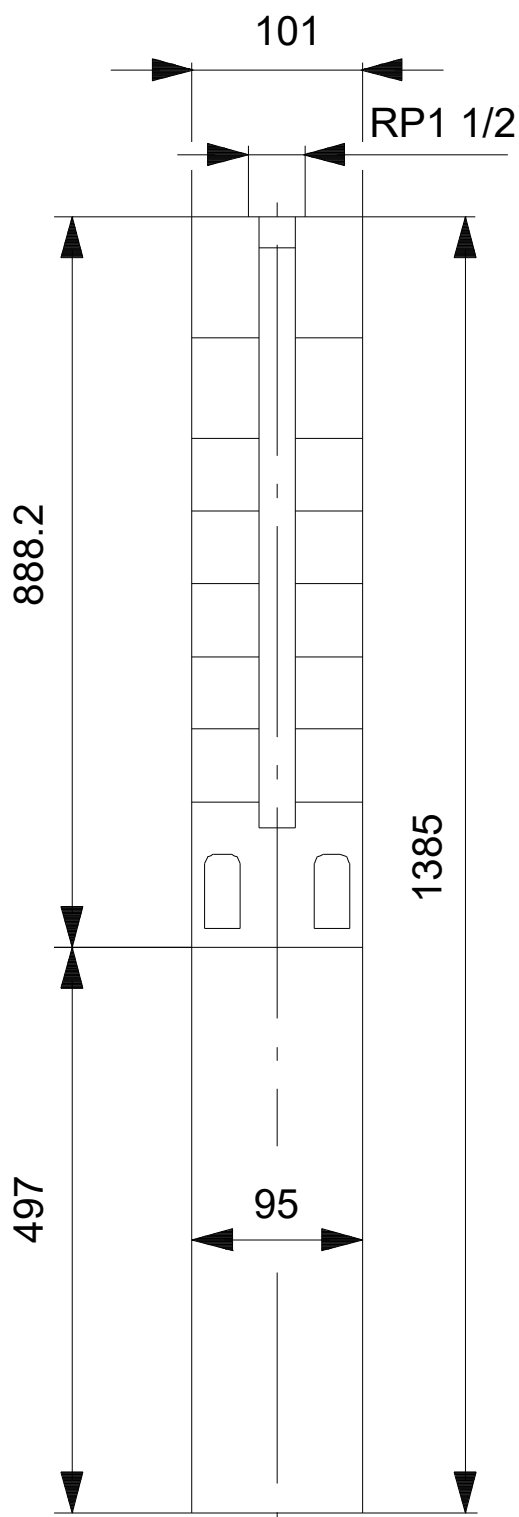
Reference Number:

Client:

Client Number:

Contact:

On request SP 5A-33 N



Note! All units are in [mm] unless others are stated.

Disclaimer: This simplified dimensional drawing does not show all details.

Project:

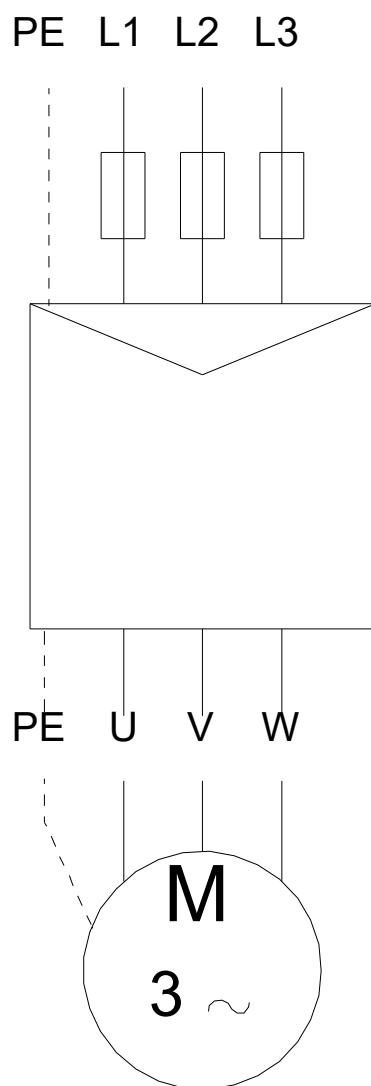
Reference Number:

Client:

Client Number:

Contact:

## On request SP 5A-33 N



## On request SP 5A-33 N

### Input - summary

Water volume (max): 32.2 m<sup>3</sup>/day  
 Month for sizing: April  
 Static lift above ground: 38 m  
 Dynamic water level: 90 m  
 Sun tracking: No (fixed)  
 Location: ناندس غرا, Kandahar, Afghanistan  
 Latitude: 31.5629 DD, Longitude: 66.5604 DD

### Products

Pump: SP 5A-33 N, 1 x On request  
 Solar module: 20 x GF 270

### Sizing results - summary

#### Water production, Peak flow and Price

Total water production per year: 13000 m<sup>3</sup>  
 Avg. water production per day: 35.5 m<sup>3</sup>/day  
 Average water production per watt per day: 6.6 l/Wp/day

#### Solar module configuration:

Number of solar modules in series: 10, in parallel: 2  
 Solar array rated power: 5.4 kW  
 Solar array rated volts: 316 V  
 Sun tracking: No (fixed)  
 Tilt angle: 31 deg.

#### Typical performance at solar radiation 800 W/m<sup>2</sup>

Flow: 4.6 m<sup>3</sup>/h  
 Total head: 134.9 m

#### Cables and pipes:

Pump cable length: 230 m  
 Pump cable size: 25 mm<sup>2</sup>  
 Total cable loss: 1.6 %

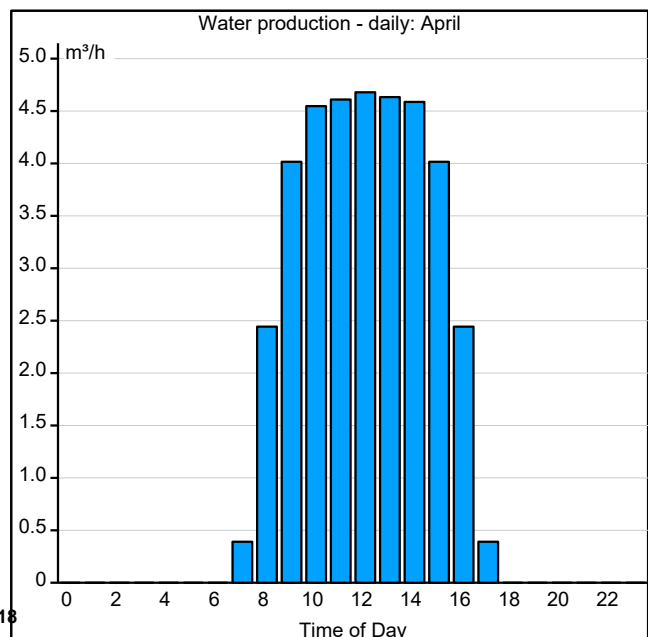
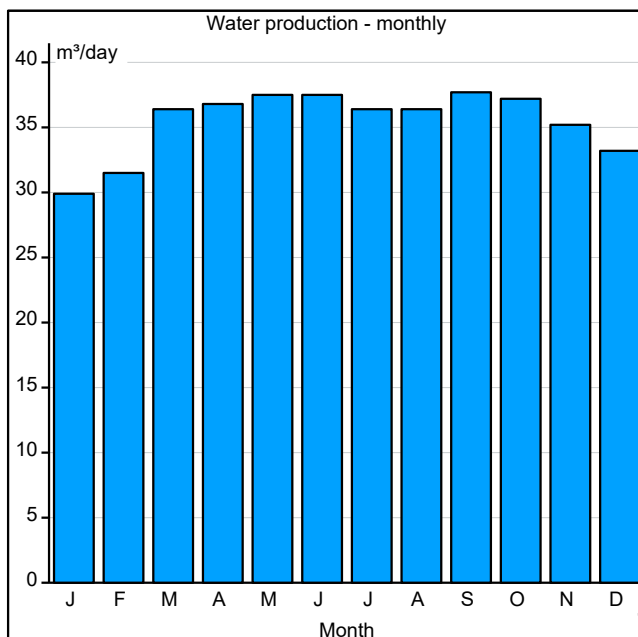
#### Material, riser pipe: PEH

Pipe length of riser pipe: 90 m  
 Friction losses: 6.938 m

### System performance - monthly average

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Water production [m <sup>3</sup> /day]	29.9	31.5	36.4	36.8	37.5	37.5	36.4	36.4	37.7	37.2	35.2	33.2
Energy production Solar [kWh/day]	28.8	30.8	39.5	38.7	39.0	38.4	36.1	37.4	41.6	42.3	38.0	32.3
Radiation horizontal [kWh/m <sup>2</sup> 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 <sup>2</sup> 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:

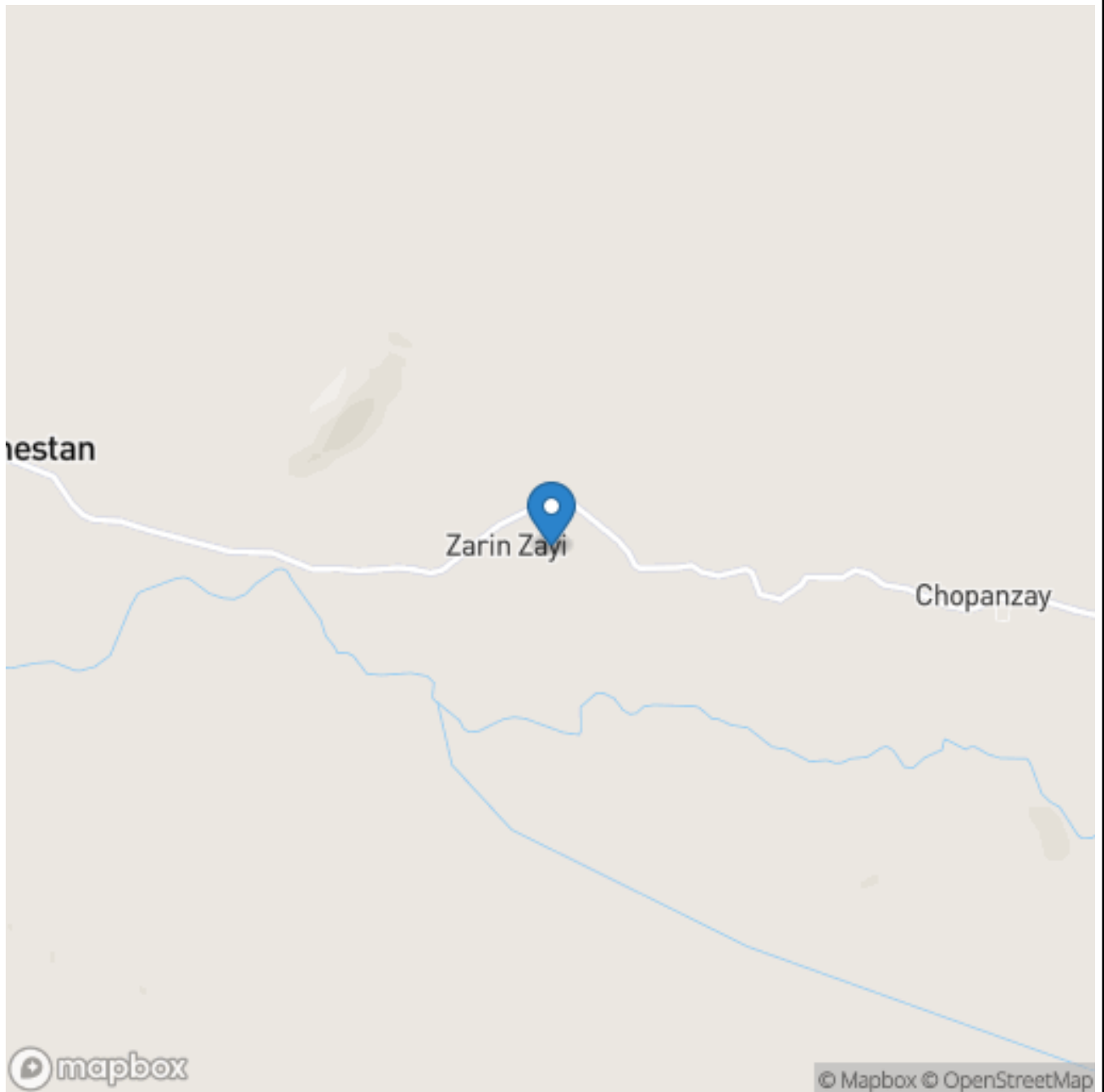
Client:

Client Number:

Contact:

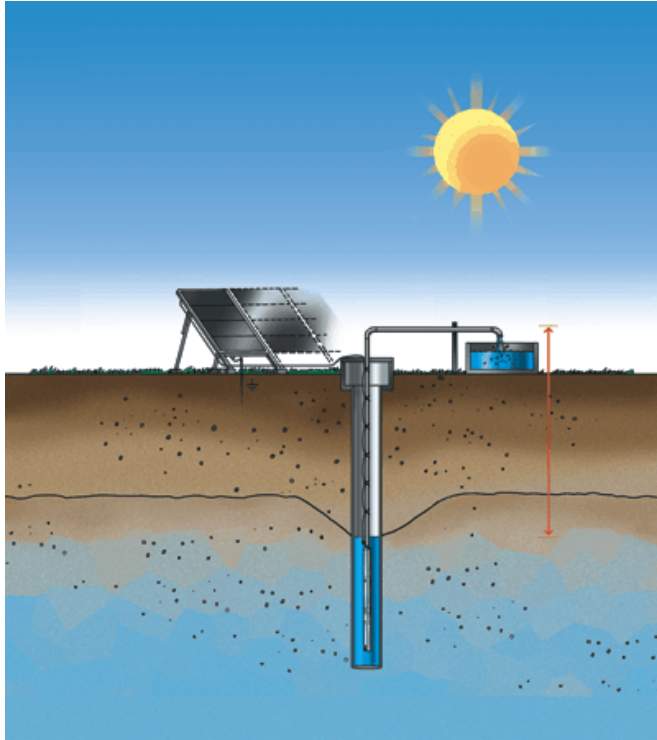
## On request SP 5A-33 N

### Location Map



Location: ناندس غرا, Kandahar, Afghanistan  
Latitude: 31.5629 DD, Longitude: 66.5604 DD

## Installation and Input



## Sizing Results

### Water production, Peak flow and Price

Total water production per year: 13000 m<sup>3</sup>

Avg. water production per day: 35.5 m<sup>3</sup>/day

Average water production per watt per day: 6.6 l/Wp/day

### Solar module configuration:

Number of solar modules in series: 10, in parallel: 2

Solar array rated power: 5.4 kW

Solar array rated volts: 316 V

Sun tracking: No (fixed)

Tilt angle: 31 deg.

### Typical performance at solar radiation 800 W/m<sup>2</sup>

Flow: 4.6 m<sup>3</sup>/h

Total head: 134.9 m

### Cables and pipes:

Pump cable length: 230 m

Pump cable size: 25 mm<sup>2</sup>

Total cable loss: 1.6 %

Material, riser pipe: PEH

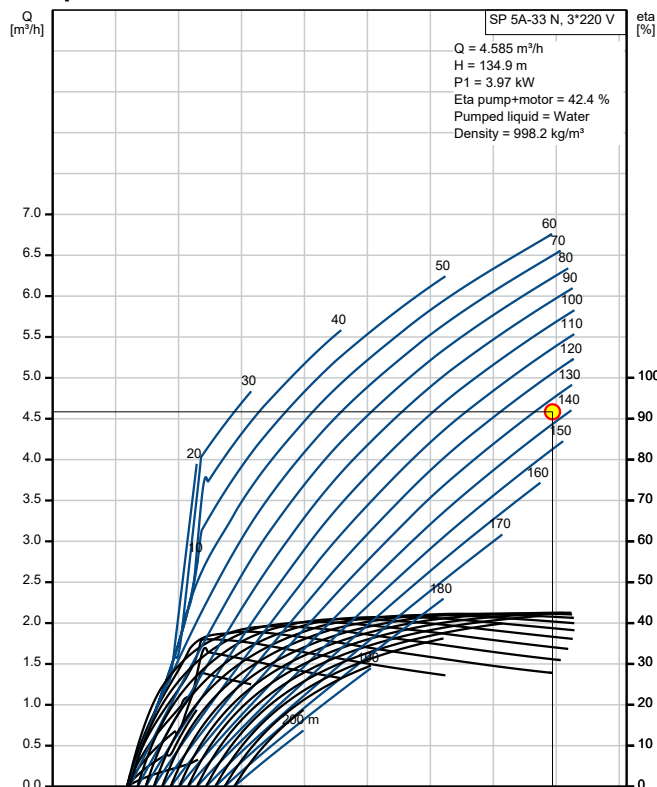
Pipe length of riser pipe: 90 m

Friction losses: 6.938 m

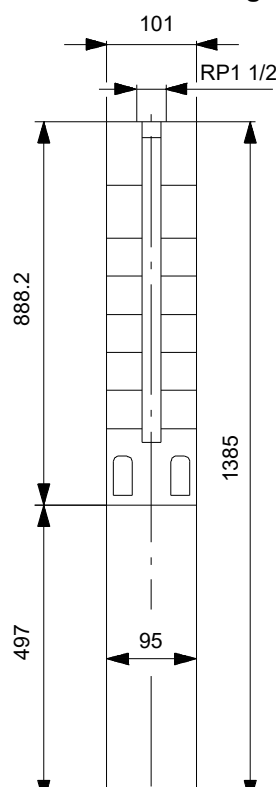
Location: نانس غرا, Kandahar, Afghanistan

Latitude: 31.5629 DD, Longitude: 66.5604 DD

## Pump Curve

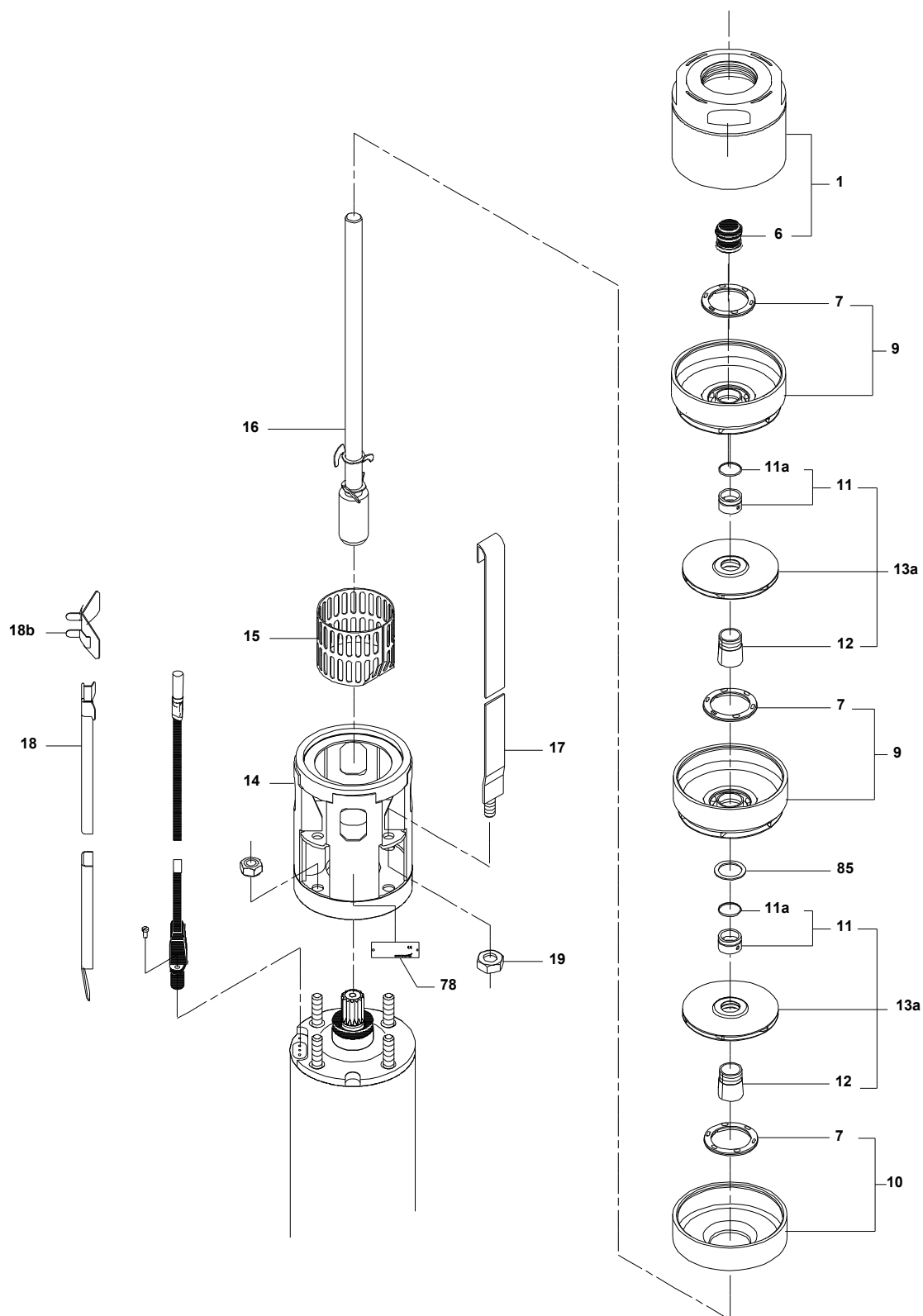


## Dimensional Drawing

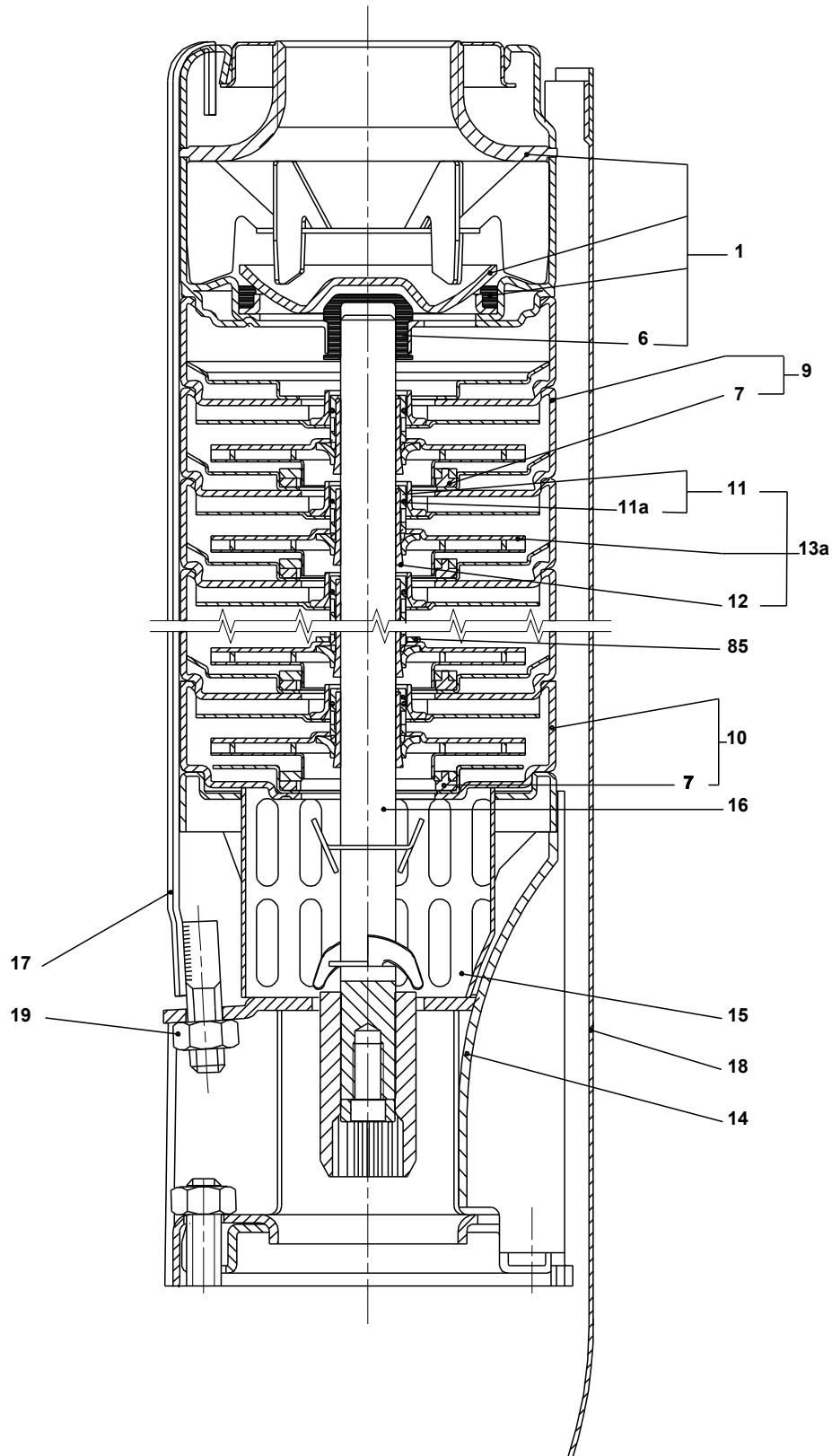




(tm019316 1600)



(tm008314 3300)







Company name:

Created by:

Phone:

Date: 07/07/2024

Project:

Reference Number:

Client:

Client Number:

Contact:

Islamic Relief Worldwide-Afghanistan Kandahar Area Office Shelter- UK -Solar powered Pump V

Produced After 2407 (production year and week number)

Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
-	Pump w/o motor				1	pcs
-	Kit, Wear parts			00105059	1	pcs
6	Bearing				1	pcs
7	Neck ring				39	pcs
	Bulk, Stop ring (10 PC)			96927076	3	pcs
	Bulk, Stop ring (50 PC)			98527989	3	pcs
	Stop ring			96550777	3	pcs
6	Bearing			96550792	1	pcs
7	Bulk, Neck ring (10 PC)			97534360	1	pcs
7	Neck ring			96591921	1	pcs
- 10	Chamber, bottom			99093699	1	pcs
7	Bulk, Neck ring (10 PC)			97534360	1	pcs
7	Neck ring			96591921	1	pcs
- 13a	Bulk, Impeller cpl. (5 PC)			96915592	33	pcs
- 11	Bulk, Split cone nut (10 PC)			96602963	1	pcs
	Bulk, Split cone nut (10 PC)			96602958	1	pcs
11a	O-ring			99113822	1	pcs
12	Bulk, Split cone (10 PC)			96551287	1	pcs
+ 13a	Bulk, Impeller cpl. (10 PC)			96537778	33	pcs
+ 13a	Impeller cpl.			96903196	33	pcs
15	Strainer			99434652	1	pcs
18d	Bulk, Combi Torx screw (4 PC)			98653089	2	pcs
18b	Support for cable guard			96550771	1	pcs
78	Bulk, Nameplate (100 PC)			99534979	1	pcs
	Motor			92960190	1	pcs