エジプト国
水資源灌漑省（MWRI）

エジプト国
灌漑セクター情報収集・確認調査
（上エジプト及び中央デルタ）

ファイナル・レポート（ANNEX）

平成 30 年 2 月
（2018年）

独立行政法人
国際協力機構（JICA）

NTCインターナショナル株式会社

農村
JR
18-005

ANNEXES

ANNEX1
Minutes of Discussion

ANNEX2
Status of Irrigation Facilities in Sample Area and Principal Canals

ANNEX3
Inventory of Irrigation Facility (Principal Canals, Sample Area, Model Area and Others)

ANNEX4
Model Area Survey

ANNEX5
Calculation of Water Requirement

ANNEX6
Hydraulic Analysis of Tunsa-Kella Irrigation System

ANNEX7
Hydraulic Calculation of Bahr Yusef Principal Canal

ANNEX8
Result of Cross Section Survey on Bahr Yusef Principal Canal

ANNEX9
Location of Prioritized Sub Regions

ANNEX10
Cost of Project in Each Sub Region

ANNEX11
List of Drawings for Countermeasures

ANNEX12
GIS Map Data

ANNEX1 : Minutes of Discussion

MINUTES OF THE MEETING

of

THE KICKOFF MEETING

For the Cooperation Planning Survey on the Irrigation Sector
(Upper Egypt and Middle Delete) in the Arab Republic of Egypt

The Government of Egypt, through MWRI, has requested the Government of Japan to conduct a feasibility study for sector loan on rehabilitation of irrigation facility. Based on this request JICA has agreed to conduct a survey for "the Cooperation Planning Survey on the Irrigation Sector (Upper Egypt and Middle Delta) in the Arab Republic of Egypt" to collect information through surveys, analyze current status and challenges, and to propose draft cooperation programs and approaches for the irrigation sector in Egypt. Consequently, JICA has sent a JICA Survey Mission (The Survey Team) to Egypt on 4 November 2016. Accordingly, the Kickoff Meeting for the Survey was held on 10 November 2016. The Survey Team has presented the Inception Report of the Survey during the meeting. The attendants exchanged views and opinions on the implementation method, work schedule and proposed arrangement of counterpart personnel.

As a result, all parties have reached a mutual understanding on the matters referred to in the document attached hereto.

Cairo, November 10, 2016

Dr. Ragab Abdel Azim
Deputy Minister
Ministry of Water Resources and Irrigation (MWRI)

Mr. KUWAHARA Tsuneo
Team leader
JICA Survey Team

Witnessed by

Mr. NAKASONE Shiro
Senior representative
JICA Egypt Office

Place of meeting: **Ministry of Water Resources and Irrigation**

Date of meeting: **10 November 2016 from 12:00 to 14:30**

Attendee: **Refer to ANNEX-2 Attendant List**

Agenda:

1. Implementation Method

The Survey Team has presented the Inception Report (attached in ANNEX-1) and it is agreed that the Survey Team shall proceed with its activities on the implementation of the Survey.

2. Work Schedule

As indicated in the Inception Report, the Survey shall be conducted in two phases. During the first phase the Survey Team will conduct basic survey on the target three canals namely Bahr Yusef Canal, Ibrahimia Canal and Kased Canal and identify Sub-areas for further study. In the second phase the Survey Team will conduct survey at identified priority sites.

3. Agreed Arrangement at Kickoff Meeting

For better implementation of the Survey, the Survey Team requested arrangement to the attendants and it is agreed as followings.

1) To provide necessary documents, data and information
   The MWRI agreed to provide necessary documents, data, and information for the survey to the Survey Team.

2) To provide counterparts
   The MWRI agreed to provide counterpart personnel to support works of the Survey team. Counterparts are assigned from related offices and the General Director of the Technical Office of Irrigation Sector was assigned as focal point.

3) To coordinate the field visit
   The MWRI agreed to coordinate field visits for the Survey Team based on the advance notice from the Survey Team.

4) To obtain necessary permission for the survey
   The MWRI agreed to obtain necessary permission for the survey of the Survey Team.

5) To secure safety for the Survey Team
   The MWRI agreed to arrange the necessary safety measures for the survey of the Survey Team.

Recommendations made by MWRI participants during the Kick-Off Meeting

1) The main counterpart sector is going to be the **Irrigation Sector**.
2) A ministerial decree for the **steering committee**, that will follow the Survey, shall be issued soon.
3) Information about the Survey should be provided to MWRI-**Planning Sector**. (type of cooperation, the purpose of the Survey, the starting and ending dates, the current status, the role of both the JICA Survey Team and the MWRI)
4) Intellectual property right of any data and information will belong to MWRI.
5) The Surveying Form, Procedure and the Evaluation Criteria shall be agreed and settled by both the Irrigation Sector and **JICA Survey Team**.
6) Besides the description in the Inception Report, detailed location of each survey would be clarified through the Survey.
7) Periodical Progress Reports shall be provided by **JICA Survey Team** to the Irrigation Sector and presented to the **steering committee**.

RA

ANNEX-1 Inception Report

Inception Report shall be attached here and has been distributed during the Kick-Off Meeting. Please refer to the distributed Inception Report.

ANNEX-2 Attendant List

No	Name	Organization / Department	Job title	[redacted]
		Embassy of Japan		
1	Yosuke KAWAMOTO	Embassy of Japan	First Secretary	
		JICA Egypt Office		
2	Shiro NAKASONE	JICA Egypt Office	Senior Representative	
3	Hajime YAMAZAKI	JICA Egypt Office	Representative	
4	Ashraf El-Abd	JICA Egypt Office	Chief Program officer	
5	Mohamed Adam	JICA Egypt Office	Program Officer	
		JICA Expert		
6	Yuichi INAGAKI	JICA	JICA Expert	
7	Hana Rady	JICA	Program Officer	
		JICA Study Team / NTC-International Consultant		
8	Hisako SUMI	JICA Team	JICA Team Member	
9	Shinwa HORI	JICA Team	JICA Team Member	
10	Shuichi MATSUSHIMA	JICA Team	JICA Team Member	
11	Tsuneo KUWAHARA	JICA Team	JICA Team Member	
12	Kuniyoshi ISHIZAKA	JICA Team	JICA Team Member	
13	Masaya NEGISHI	JICA Team	JICA Team Member	
14	Salma Mounier	JICA Team	project Coordinator	
		MWRI		
15	Ragab Abde-Azim	MWRI	Deputy Minister	
16	Ali Abd Elmageed Menofy	Upper Egypt Irrigation Sector	Head of Sector of Upper Egypt Irrigation	
17	Mohamed Abul-Fetouh Hassan	Lower Egypt Irrigation Sector	Head of Sector of Lower Egypt Irrigation	
18	Ayman Elsayed Ibrahim	Irrigation Sector / Telemetry Department	Head of Central Directorate for Telemetry	
19	Saad El-Said Moussa	Irrigation Sector	Head of Central Directorate of Canal Maintenance	
20	Abd Ellatif Khaled	Irrigation Sector	Head of Central Directorate of Water Distribution	
21	Abd Elsalam Gaber	Irrigation Sector	General Director of Technical Office	
22	Alaa Abdel Salam	Irrigation Sector	General Director of West Fayoum Irrigation	
23	Ayman Mohamed Ahmed	Irrigation Sector	General Director of East Fayoum Irrigation	
24	Ahmed Sharif Aref	Irrigation Sector	General Director of Beni Suef Irrigation	
25	Hossam Sayed Abd Elaziz	Irrigation Sector	General Director of East Minya Irrigation	
26	Nady Samir Gerges	Irrigation Sector	General Director of West Minya Irrigation	
27	Hassan Mohammed Khattab	Irrigation Sector	General Director of Gharbeya Irrigation	
28	Asrar Mewafy	Planning Sector	Head of Planning Sector	
29	Mamdouh Antar	Planning Sector	Deputy head of Planning Sector	
30	Iman Taha Emam	Planning Sector	Head of Central Directorate of Planning and Monitoring	
31	Abeer Abo Alkasem	Planning Sector	Head of Central Directorate	
32	Hala Mohamed Saied	Planning Sector	Head of Central Directorate of Needs & Foreign Finance	
33	Ibrahim Mohamed Mahmoud	Irrigation Improvement Sector	Head of Central Directorate for Irrigation Improvement Projects	
34	Ahmed Alhady	Irrigation Improvement Sector	Technical Office engineer	
35	Yasser Qotb	CDIAS	Head of CDIAS	
36	Mona Zaghlool	CDIAS	General Director of Monitoring and Evaluation	
37	Mahmoud Mostafa	CDIAS	Technical Office Director	
38	Mohamed Hassan Hamed	EPAD-P	Head of Central Directorate of Quality Control	
39	Khaled Toubar	RGBS	Head of Central Directorate of Studies and Design	
40	Doaa Lashien	MWRI	Deputy Minister's Technical Office Engineer	

Minutes of Discussions
n
the Irrigation Sector Cooperation
between
Japan International Cooperation Agency
and
Ministry of Water Resources and Irrigation

: 9, 2017
Place : Cairo,

Japan International Cooperation Agency (hereinafter referred to "JICA") Contact (hereinafter referred to "JICA Mission") comprising Eng. Kazuo (Executive Technical Advisor to Director General, Development Department) and Mr. Kenta ONO, Deputy Director of Middle East Division 1, and Europe Department and others discussions with the of Ministry of Water Resources and Irrigation (hereinafter referred to as "MWRI") of the Arab Republic of Egypt the current result of JICA-GoE Cooperation Planning Survey on the Irrigation Sector (Upper Egypt and Middle Delta) in the Arab Republic of Egypt (hereinafter referred to "Cooperation Planning Survey") together with the of reference of the Preparatory Survey and tentative project description for "Irrigation Resources Management Improvement Project" (hereinafter referred to "the Project").

JICA and the of hereby reviewed the result of discussions in document, which is subject to approval by the competent higher authorities of both sides and with understanding that nothing in the Minutes of Discussions be understood by implying any kind of commitment of JICA to a technical cooperation, loan and/or grant.

AS

For
Japan International Cooperation Agency

島崎和夫

Eng. Kazuo SHIMAZAKI
Executive Technical Advisor to the
Director General,
Rural Development Department

For
Ministry of Water Resources and Irrigation

Asrar Mewafy

Eng. Asrar Mewafy
Head of Planning Sector

小野健太

Mr. Kenta ONO
Deputy Director
Middle East Division 1
Middle East and Europe Department

MAIN POINTS DISCUSSED IN GENERAL

In response to request for survey implementation for formulating irrigation loan project in August 2016, JICA has been conducting the Cooperation Planning Survey in the Irrigation Sector. For reviewing the progress and discuss further cooperation, JICA dispatched a Contact Mission (hereinafter referred to "JICA Mission") to in March 2017. The following points discussed between the sides.

2. Cooperation Planning Survey

JICA Survey Team conducted a workshop based on the draft interim report, by the MWRI officials, to present the of the Cooperation Planning Survey. MWRI's Project Steering Committee (PSC) will review the interim report and its within two weeks. Both sides agreed on the progress of Cooperation Planning Survey as ANNEX I.

3. Preparatory Survey for the Project

JICA would conduct a Preparatory Survey to a loan project the completion and approval of the Report of the Cooperation Planning Survey by both sides. TOR of the Preparatory Survey was as ANNEX II. Final TOR will be after confirming the results of Cooperation Planning Survey.

4. Expected Outline of the Project

JICA Mission explained that the forthcoming procedure of future cooperation as ANNEX III.

(End)

OF COOPERATION PLANNING SURVEY

I. BACKGROUND AND OBJECTIVES OF THE COOPERATION PLANNING SURVEY

Egypt has population of 91 million (2015) it is the income country with the GNI per capita of $ 3,340 (World 2015). Agriculture is of the major industries but the national average rainfall is very limited. Hence irrigation is necessary all though the year quite limited. Egypt depends the Nile River for water resources than 90 % but usable is limited to 55.5 billion m^3/year according to the agreement with Sudan in 1959. Demand and supply of water is quite tight due to rapid population growth (1.6 %/year, 2014) and influence of climate change. In general, 1,000 m^3/capita/year is the border of water scarcity but the figure of Egypt is estimated 738 m^3/capita/year in 2014/15, quite below the border. If the trend is kept, the figure might below m^3/capita/year, absolute scarcity, in 2025. Therefore, the efficient is a task to not only for agriculture but also to maintain living standard of people in Egypt.

JICA has supported the irrigation in Egypt mainly for recovery of distribution capacity of large and medium scale regulators along principal main in component, and for capacity improvement to farmers through institutional improvement of Water Users Associations (hereinafter referred to "WUAs") to water management and by irrigation operators as soft components. these outcomes, the Government of Egypt requires irrigation facility improvement overviewing the whole irrigation system for of water and requested a survey for formulating irrigation sector loan project in August 2016.

In response to the request from MWRI, JICA agreed to the Cooperation Planning Survey the Irrigation Sector (Upper Egypt and Delta) in order to the cooperation programs and concrete cooperation approaches.

CURRENT PROGRESS OF COOPERATION PLANNING SURVEY

1. A Way orward of JICA GOE Cooperation in rrigation Sector of Egypt

In order to promote water use, water management at principal and main canals be appropriately out, at the time, water management at the level managed by WUAs under branch canals be also improved. The Comprehensive Management(CWM), below, aims to realize efficient water management by establishing water management system at the regional level by integrating such government and WUAs entities. It is a concept of future cooperation between JICA and Egypt in irrigation which contributes to "Raise Water Use Efficiency" of National Water Plan (NWRP).

AS

2. **Concept of Comprehensive Water Management (CWM)**

The Comprehensive Water Management (CWM) is to promote effective of limited water by managing irrigation throughout in the irrigation system leading from principal, main, branch to terminal canals with appropriate management system by the government relevant stakeholders. From such a point of view, necessary functions of the irrigation system (water flow capacity, water distribution function, etc.) secured and appropriate water management would be improved.

3. **Approach Realize the Comprehensive Water Management (CWM)**

As for the hard component improvement, rehabilitation of irrigation facilities from the principal to level is to realize appropriate water distribution. As for the soft component cooperation, various issues to water management and distribution are observed from the principal to level; to be able to approach the issues with trainings conducted in Egypt, in Japan and Third Country, Technical Cooperation, etc.

III. THE COOPERATION PLANNING SURVEY PHASE 2

1. **The Area for the Cooperation Planning Survey from April 2017 to June 2017 (Phase 2)**

The of phase 1 of the survey is far not enough to identify the model required to formulate the Cooperation Program. JICA Mission explained that the phase 2 of the survey will be continued to identify such model in close cooperation with decision of selection on the model will be taken by MWRI by the of March 2017. The survey will the following target subjected to further specific elaboration on MWRI feedback:

No.	Target Area of the Survey
1	Bahr Yusef Canal (Minia, Benisuef, Faiyum) (From Dirout Reg to Faiyum)
2	Ibrahimia Canal (Minia, Benisuef) (From Dirout Reg. to El Wasta Reg.)
3	Kased Canal (Middle De'ta)

MWRI recommended its highly priority and interest in the following

(1) Improving the pumps along selected areas starting downstream Dirout till GIZA as will improve the reuse efficiency

(2) Irrigation Improvement in Faiyum (50,000 feddan)

2. **The Area for "Model Area Survey" in Phase 2 of Cooperation Planning Survey**

JICA Mission explained that the Survey Team will conduct "Model Area Survey" in Phase 2 of Cooperation Planning Survey within the three Target Areas of the survey in order to pre-formulae of possible cooperation to be guided by the Comprehensive Water Management (CWM). The selected Model Area(s), up to maximum three, (which the specific within the Target Areas) might also be the candidate for the future cooperation.

AS

These model area(s) will be selected by MWRI and the Survey Team, and will be finally decided by MWRI by the of March 2017, the following criteria agreed as Number 3. below. In order to conduct the survey the selected Model Area(s) smoothly, agreed to give necessary and available information to the Survey Team.

In this regard, strongly recommended to select following two model areas:

(1) Improving the pumps along selected starting downstream Dirout till GIZA as that will improve the reuse efficiency

(2) Irrigation Improvement in Faiyum (50,000 feddan)

3. Criteria for Model Area Selection

The both sides agreed to the following criteria for selection of the three Model Areas.

(1) Model Area has to improve the water resources efficiency through main, branch, and terminal canals.

(2) Model Area has to exhibit critical issues towards efficient water use.

(3) of Model Area has to be moderate Area Survey be completed within the planned survey period (April and early May).

4. Expected output for phase 2 of the Cooperation Planning Survey

JICA Mission explained the Cooperation Program and Approaches will be compiled which will include following at the end of the Phase 2 of Cooperation Planning Survey in May, 2017:

(1) component and component which the realization of the concept "Comprehensive Water Management" referred to in II. 2. above

(2) Three Candidate model areas of Hard component and component

(3) Possible JICA projects to realize the hard component and soft component.

5. Expected Future of Cooperation Planning Survey

March 2017:-Discussion the Report and of Discussion
-Selection of at least Area the required three Model Areas for the phase 2

From April to early May: Implementation of the selected Model Area Survey in the phase 2

May: Explanation discussion of Draft Report (the result of the Area Survey)

Late May: End of the Survey in the phase 2 of the Cooperation Planning Survey

Mid-June: Submission of the Final Report of the Cooperation Planning Survey

(END)

MINUTES OF THE MEETING
ON
THE WORKSHOP FOR PRESENTATION OF THE DRAFT FINAL REPORT

For the Cooperation Planning Survey on the Irrigation Sector
(Upper Egypt and Middle Delta) in the Arab Republic of Egypt

The Government of Egypt, through MWRI, requested the Government of Japan to conduct a feasibility study for sector loan on rehabilitation of irrigation facility. In response to this request JICA has been conducting the Cooperation Planning Survey on the Irrigation Sector (Upper Egypt and Middle Delta) in order to formulate the cooperation programs and concrete cooperation approaches.

Consequently, JICA sent a JICA Survey Team (The Survey Team) to Egypt on 4 November 2016. All the survey works had been submitted and the results had been compiled as the Draft Final Report (DFR) by the Survey Team, so the Team held the workshop for presentation of the DFR on 6 December 2017 to present the content and outline of the DFR. The attendants exchanged views and opinions on the presentation.

The major subjects discussed and approved in the workshop are as summarized hereinafter.

1. The Cooperation Program will be implemented based on the concept of Comprehensive Irrigation Water Management (CIWM).
2. The Cooperation Program of CIWM will be carried out on the basis the identified first priority sub regions (8 sub regions from Bahr Yousef, 6 sub regions from Ibrahimia and Kased sub region) and the two Principal Canals
3. MWRI will confirm the comments of DFR and give its feedback(s) to the Survey Team by 20th December, 2017. JICA Survey Team will finalize the DFR as Final Report (FR) by consulting with JICA, and JICA will send the FR to MWRI by the end of February 2018.

Cairo, December 7, 2017

Eng. Ahmed Fathy
Head of Irrigation Department
Ministry of Water Resources and Irrigation
(MWRI)

Mr. KUWAHARA Tsuneo
Team Leader
JICA Survey Team

Witnessed by

Mr. IWASAKI Akihiro
Senior representative
JICA Egypt Office

ANNEXES

ANNEX-1 Agenda of the workshop

ANNEX-2 Attendant list

ANNEX-3 Outline of Survey Result (presentation)

ANNEX-1 Agenda of the workshop

Workshop on the draft final report by
The Cooperation Planning Survey on the Irrigation Sector
(Upper Egypt and Middle Delta) in the Arab Republic of Egypt

Date: Wednesday December 6th, 2017
Venue: Conrad Hotel, Hall: Nile Ball Room, Cairo - Egypt
Chairperson: Head of Irrigation Department (ID)
Workshop facilitator: Eng. Mohamed Mokhtar/ GD of IIP in Fayoum
Program:

Time	Subject	Speaker
9:30 – 10:00	Registration	Participants
10:00 – 10:05	Opening Address	Head of ID
10:05 – 10:10	Opening Remarks	Head of Irrigation Sector
10:10 – 10:15	Opening Remarks	Senior Representative of JICA Egypt office
10:15 – 10:35	Outline of CIWM	Senior Advisor of JICA Tokyo Office
10:35 – 11:45	Explanation of the Draft final Report	Team Leader of JICA Survey Team
11:45 – 12:05	Coffee break	
12:05 – 13:15	Discussion	Participants
13:15 – 13:25	Closing Remarks	First Secretary of Embassy of Japan
13:25 – 13:30	Closing Remarks	Head of IS
13:30 – 14:30	Lunch	

ANNEX-2 Attendant list

The workshop on "the Draft Final report of the cooperation planning survey on the Irrigation Sector in Upper and Middle Egypt"

Date: 6th December, 2017

Venue: Conrad Hotel, Nile Ball Room, Cairo- Egypt

Number of participants: 50

No	Name	Position / Organization
First Undersecretary office/ MWRI		
1	Eng. Hesham El-Shazly	General Director of Monitoring and Evaluation department
2	Eng. Doaa Lasheen	Technical office
Irrigation Department/MWRI		
3	Eng. Ahmed Fathy	Head of Irrigation Department
4	Eng. Ahmed Abdel Rasoul	Technical office
5	Eng. Safaa Youssef	GD of ID's Information Center
6	Eng. Eman Abdel Aziz	Irrigation Inspector of ID's Technical office
7	Eng. Eman El-Masry	Head of Central Department of Monitoring and Planning
8	Ms. Walaa Mohamed	Administration
Irrigation Sector /MWRI		
9	Eng. El-Sayed Shalaby	Head of Irrigation Sector
10	Eng. Abdellatif Khalid	Head of the Water Distribution Sector
11	Eng. Nabil Nasif	Head of the Central department of Water Distribution
12	Eng. Shehata Ibrahim Abdel Fatah	Head of the Central department of Waterways maintenance
13	Eng. Ali Elmenoufy	Head of Irrigation Sector for Upper Egypt
14	Eng. Mohamed Sallam	Head of Irrigation Sector for Lower Egypt
15	Eng. Ayman Shedeed	GD of IS's technical office
16	Eng. Ayman Elsaid Ibrahim	Undersecretary of Telemetry
17	Eng. Sameh Rayan	Director of works of IS's technical office
Planning Sector /MWRI		
18	Eng. Hala Mohamed Saied	Head of the Central Department of Foreign Finance and needs
19	Eng. Dina Mamdouh	Senior Engineer of NWRP

20	Eng. Hoda Ahmed El-Shayeb	Senior Engineer
Irrigation Improvement Sector /MWRI		
21	Eng. Medhat Mohamed	Head of Irrigation Improvement Sector
22	Dr. Ibrahim Mahmoud	Head of Central Department of Irrigation Improvement
23	Eng. Mohamed Mokhtar	General Director of Irrigation Improvement projects in Fayoum
24	Eng. Yasser Qotb	Head of CDIAS
25	Eng. Mostafa Saad	General Director of IAS in Fayoum
EPAD/MWRI		
26	Eng. Ahmed Hammad	Head of Central Department of EPAD
27	Eng. Maiada Mohamed	Civil Engineer
28	Eng. Dina Mohamed	Civil Engineer
Horizontal Expansion Sector/MWRI		
29	Eng. Mohamed Aboul Fotouh. Mona Hassan	Head of Horizontal Expansion Sector
RGBS/MWRI		
30	Eng. Ashraf Mohamed Hassanen	Head of Central Department of RGBS
Gharbia Governorate/MWRI		
31	Eng. Gamal El-Sheemy	Undersecretary, Head of CDWRI of Gharbia Governorate
32	Eng. Adel Abdel Kader	General Director of GDWRI
33	Eng. Abdel Meneem Safina	Director of Tanta Irrigation District
Minia Governorate/MWRI		
34	Eng. Ahmed Mohamed El-Soady	General Director of GDWRI of West Minia
Faiyom Governorate/MWRI		
35	Eng. Gamal Abdel Fattah Ali	General Director of GDWRI of East Fayoum
Beni Suef Governorate/MWRI		
36	Eng. Ramadan Kamal	Undersecretary, Head of CDWRI of Beni Sewif Governorate
37	Eng. Nady Samir Gerges	General Director of GDWRI of Beni Sewif
TSWRI /MWRI		
38	Eng. Amal Mohamed	Head of Central Department of Training programs
Embassy of Japan		
39	Mr. Takaii Ikeya	First Secretary of Embassy of Japan
JICA Tokyo Office		

40	Dr. Nagayo Narihidi	Senior Advisor, Rural Development Department
JICA Egypt Office		
41	Mr. Akihiro Iwasaki	Senior Representative of JICA Egypt Office
42	Mr. Hajime YAMAZAKI	Representative of JICA Egypt Office
43	Mr. Mohamed Adam	Program Officer
JICA Expert (Planning sector)		
44	Mr. Yuichi INAGAKI	JICA Expert
45	Ms. Rashaa Samir	Program Officer
JICA Survey Team		
46	Mr. Tsuneo KUWAHARA	Team Leader
47	Mr. Eiichi TAKIGAWA	Deputy Team Leader
48	Mr. Shinwa HORI	Irrigation Planning/ O&M Planning
49	Ms. Salma Mounier	Team Manager
50	Mr. Mahmoud Gad Allah	Civil Engineer

ANNEX2 : Status of Irrigation Facilities in Sample Area and Principal Canals

Regulator along Ibrahimia Principal Canal

No	Station	Name	No. Canal Served	Facility Type	Description
1	32.1	Old Hafez Regulator	-	Regulator	It is a brick Regulator with 7 openings and is of very poor condition. It causes a loss of water head and requires its removal. It is used now as a bridge for cars and pedestrians transportation.
2	32.8	New Hafez Regulator	3 Canals	Regulator	It is a new Regulator replacing the old Hafez Regulator (1/13) and is equipped with 5 controlling gates. The Regulator condition is a very good.
3	65.8	Old El Menia Regulator	-	Regulator	The old El Menia Regulator has 5 opening with stone type supports. The gates cause loss of water head and require their removals.
4	71.75	New Menia Regulator	3 Canals	Regulator	It is a new Regulator that has 5 gates operated manually. The Regulator needs modernization by operating its gates through automated electric motors operated system.. The condition of the Regulator is excellent.
5	105.6	Matay Regulator	14 Canals	Regulator	The Matay Regulator or regulator has 6 gates and one lock. The regulator is of a very good condition.
6	133.65	Maghagha Regulator	16 Canals	Regulator	The Regulator has 5 gates of width 3m width for irrigation and additional two gates of 4m width for navigation lock. All gates are of very good condition. The structure is also good but needs some periodical maintenance.
7	134.6	Maghagha Weir	-	Weir	This is the weir of widthb30m that controls the flow head downstream of Maghagha Regulator. The structure is working properly and of very good conditions but needs some periodical maintenance.
8	157.234	Al Sharahna Regulator	10 Canals	Regulator	The regulator has 4 gates each of 4m width. The structure is of good condition.
9	191.65	El Genidi Regulator	11 Canals	Regulator	The regulator has 3 gates, each of 3m width. The structure has a very good condition.
10	203.85	Ashmant Principal Regulator	9 Canals	Regulator	The regulator has two gates, each of 4m width. The regulator is of an excellent condition.
11	211.637	Beni Hedear Weir	2 water pipes	Weir	The weir has a length of 12m and is of a good condition. At the two sides of the weir there are two water pipes of 2m diameters.
12	220.28	El Wasta Qebly Regulator		Regulator	This is the group of Qebly regulation of the El Wasta District. All the Regulator gates are of very good conditions.
13	224.2	El Wasta Bahry Regulator	4 Canals	Regulator	This is the group of Qebly regulation of the El Wasta District. All the Regulator gates are of very good conditions.

Intake and other structure along Ibrahimia Principal Canal

No	Station	Name	Length (km)	Area served (Fed)	Facility Type	Description
1	32.09	Serry Canal Intake	115.37	131,599	Canal Intake	A brick arch type intake has 7 control opening for feeding Old Serry Canal intake. Though the bridge is old, it still is of a very good condition.
2	32.2	Intake of East Hafez Canal	27.7	6,520	Canal Intakes	It is the intakes of East Hafez Canals. Each intake as one gate of width 2.5m and bot are of a good condition.
3	32.2	Intake of West Hafez Canal	14.07	11,943	Canal Intakes	It is the intakes of West Hafez Canals. Each intake as one gate of width 2.5m and bot are of a good condition.
Old Hafez Regulator						
New Hafez Regulator						
4	61.9	Magotha Spillway			Spillway	The spillway has wooden gates with width 2.2m diverting excessive Ibrahimia water directly to the main River Nile stream.
5	62.75	Dasout Canal Intake	7.87	2,500	Canal Intake	It is the intake of Dasout Canal with one gate of width 2.5m and is of a good condition.
Old El Menia Regulator						
6	70.36	Intake of Safsafa Canal	24.13	8,400	Canal Intake	It is the intake of Safsafa Canal. The canal intake is equipped with one gate of 1.5m width. The gate is of an excellent condition.
7	71.55	Intake of Abo Swealm Canal			Canal Intake	It is the intake of Abo SwealmCanal with one gate of width 1.5m. The gate is of an excellent condition.
New Menia Regulator						
8	74.28	Intake of Feeder to El Bergaya Bahry (East) Canal			Canal Feeder	It is the intake of the feeder to El Bergaya Bahry (East) Canal with one gate of width 1.5m. The gate is of an excellent condition. The feeder gives water substitute to the canal in case its water level is not sufficient.
9	77.56	Intake of Safsafa Branch			Canal Intake	It is the intake of Safsafa Branch Canal with one gate of width 1.5m. The gate is of an excellent condition.
10	79.52	Intake of Feeder to El Gabry Canal			Canal Feeder	It is the intake of the feeder to El Gabry Canal with one gate of width 1.5m. The gate is of an excellent condition. The feeder gives water substitute to the canal in case its water level is not sufficient.
11	82.16	Atsa El Mahata (Station) Bridge and Intake of Safsafa Branch 3			Canal Intake and Bridge	A surface concrete (non-navigable) bridge on sheet piles and of a good condition. For the intake of Branch 3 of Safsafa Canal, it has one gate of width 2m. The gate is of an excellent condition.
12	83.49	Intake of Feeder to El Hathatya Canal			Canal Feeder	It is the intake of the feeder El Hathatya Canal with one gate of width 1.5m. The gate is of an excellent condition. The feeder gives water substitute to the canal in case its water level is not sufficient.
13	87.58	Intake of Feeder to El Beaho Canal			Canal Feeder	It is the intake of the feeder to El Beaho Canal with one gate of width 1.5m. The gate is of an excellent condition. The feeder provides water substitute to the canal in case its water level is not sufficient.
14	90.4	Intake of Branch 4 of Safsafa Canal	6.36	1,850	Canal Intake	It is the intake of Branch 4 of Safsafa Canal with one gate of width 1.5m. The gate is of an excellent condition.
15	92.53	Intake of Samalout East Canal	5.14	2,200	Canal Intake	It is the intake of Samalout East Canal with one gate of width 2m. The gate is of an excellent condition.
16	95.06	Intake of Mixing Drain Bahry			Drain Intake	It is the intake Mixing Drain Bahry diverting excessive water directly to the main River Nile stream. The intake only operates at the high level of Ibrahimia principal canal.
17	95.38	Intake of Feeder to El Hatya West Canal			Canal Feeder	It is the intake of the feeder to El Hatya West Canal with one gate of width 2m. The gate is of an excellent condition. The feeder provides water substitute to the canal in case its water level is not sufficient.

No	Station	Name	Length (km)	Area served (Fed)	Facility Type	Description
18	96.58	Intake of Feeder to El Safsafa Canal at Dawood Exit			Canal Feeder	It is the intake of the feeder to El Safsafa Canal at Dawood Exit with one gate of width 2m. The gate is of an excellent condition. The feeder gives water substitute to the canal in case its water level is not sufficient.
19	97.44	Intake of Feeder to Nazlah Kalsa Canal	3.84	1,470	Canal Feeder	It is the intake of the feeder to Nazlah Kalsa Canal with one gate of width 1.5m. The gate is of an excellent condition. The feeder gives water substitute to the canal in case its water level is not sufficient.
20	101.6	Intakes of Abo Eassa Canal and Ganabia	17.9	4,340	Canal Intakes	It is the intake of Abo Eassa Canal and Ganabia. The canal has one gate of width 1.5m. The gate is of an excellent condition.
21	102.02	Intakes of Dakak Canal & West and East Ganabia	21.4	5,500	Canal Intakes	It is the Dakak Canal & West and East Ganabia with gates widths of 2m, 1.5m, and 1.5 m respectively. The gates are of excellent conditions.
22	104.91	Intakes of Darwish and Shaib Canals	18.27	5,295	Canal Intakes	It is the intake of Darwish and Shaib Canals. The first canal has one gate of width 4m while the second canal has one gate of 3m width. Both gates are of excellent conditions.
Matay Regulator						
23	106.25	Maglas El Madina (Town) Bridge			Bridge	A surface concrete (non-navigable) bridge on sheet piles and is of a good condition.
24	106.35	Matay Hospital Pedestrian Bridge			Bridge	It is a new metallic upper pedestrian bridge mounted on sheet piles and is of an excellent condition.
25	108.2	Intake of Feeder to Matay Canal	3.3	2,650	Canal Feeder	It is the intake of the feeder to to Matay Canal with one gate of width 1.5m. The gate is of an excellent condition. The feeder gives water substitute to the canal in case its water level is not sufficient.
26	110.12	Intake of Feeder to El Kofour Canal			Canal Feeder	It is the intake of the feeder to El Kofour Canal with one gate of width 1.5m. The gate is of an excellent condition. The feeder provides water substitute to the canal in case its water level is not sufficient.
27	112.13	Intake of Feeder to El Seadia Canal			Canal Feeder	It is the intake of the feeder to El Seadia Canal l with one gate of width 1.5m. The gate is of an excellent condition. The feeder provides water substitute to the canal in case its water level is not sufficient.
28	115.4	El Mahkama Bridge			Bridge	A surface concrete bridge on sheet piles and is of a very good condition.
29	115.6	Culvert of Beni Mazar Canal	4.17	1,400	Culvert	This culvert is used for diverting excessive water at Ibrahimia Canal directly to the main River Nile stream.
30	116.25	Intake of Bashir Canal	2.66	1,340	Canal Intake	It is the intake of Bashir Canal with one gate of width 2m. The gate is of an excellent condition.
31	117.9	Intake of Abo Asear Qeblia Canal	2.8	440	Canal Intake	It is the intake of Abo Asear Qeblia Canal with one gate of width 2.5m. The gate is of an excellent condition.
32	121.46	Intake of Feeder to El Zebony East Canal	3.4	790	Canal Feeder	It is the intake of the feeder to El Zebony East Canal with one gate of width 1.5. The gate is of an excellent condition. The feeder provides water substitute to the canal in case its water level is not sufficient.
33	123.73	Intake of Feeder to El Gharabawy Canal	9.24	3,300	Canal Feeder	It is the intake of the feeder to El Gharabawy Canal with one gate of width 3m. The gate is of an excellent condition. The feeder provides water substitute to the canal in case its water level is not sufficient.
34	125.14	Intake of Mahgoub			Canal Intake	It is the intake of Mahgoub Canal with one gate of width1.5m. The gate is of an excellent condition.
35	126.7	Intake of Aba East Canal	12.2	5,800	Canal Intake	It is the intake of Aba West Canal with one gate of width 2.5m. The gate is of an excellent condition.
36	126.7	Intake of Aba West Canal	8.34	3,500	Canal Intake	It is the intake of Aba West Canal with one gate of width 2.5m. The gate is of an excellent condition.

No	Station	Name	Length (km)	Area served (Fed)	Facility Type	Description
37	127.3	Intake of Dahrout North Canal	2.7	560	Canal Intake	It is the intake of Dahrout Qeblia Canal with one gate of width 2m. The gate is of an excellent condition.
38	128.9	Bridge and Intake of Dahrout Bahry Canal	2	1,500	Canal Intake and Bridge	It is the intake of of Dahrout Bahry Canal with one gate of width 2m. The gate is of an excellent condition. In the same location, there is a surface concrete bridge mounted in sheet piles in an excellent condition.
39	130.566	Intake of Ata Allah Canal	3.36	1,200	Canal Intake	It is the intake of Ata Allah Canal with one gate of width 2m. The gate is of an excellent condition.
40	132.2	Intake of El Gendia Canal	14.75	3,070	Canal Intake	It is the intake of El Gendia Canal with two gate each of width 3m. The gates are of excellent conditions
41	132.5	Intake of Ganabia El Ghasheba	0.32	475	Canal Intake	It is the intake of Ganabia El Ghasheba with one gate of width 2.5m. The gate is of an excellent condition.
42	133.19	Intake of Maghagha	7.6	2,050	Canal Intake	It is the intake of Maghagha Canal with three gates each of width 3m. The gates are is of excellent conditions.
43	133.3	Intake and Bridge of East El Ghasheba Canal			Canal Intake and Bridge	It is the intake of East El Ghasheba Canal with one gate of width 2.5m. The gate is of an excellent condition. The bridge of the concrete type and is also of a very good condition.
Maghagha Regulator						
44	140	Malatia Bridge with Canal Cross-section			Bridge	A surface concrete (non-navigable) bridge mounted on one support and is of an excellent condition. The cross-section has a width of about 40m with side slopes 3:2.
45	140.35	Intake of El Fant Canal	12.68	14,400	Canal Intake	It is the intake of El Fant Canal (East) with one gate of width 2m and is of a very good condition.
46	142.88	Intake of El Saidia Canal	12.29	11,380	Canal Intake	It is the intake of El Saidia Canal with one gate of width 2m and is of a very good condition
47	142.94	Intake of El Fashnia Qeblia Canal	5.15	5,030	Canal Intake	It is the intake of El Fashnia with one gate of width 1.2m and is of a very good condition.
48	148.24	Intake of Fashnia Wasta (Middle) Canal	1.15	225	Canal Intake	It is the intake Fashnia Wasta (Middle) with one gate of width 2m and is of an excellent condition.
49	149.91	Intake of El Fashnia Bahria Canal	4.78	7,610	Canal Intake	It is the intake El Fashnia Bahria Canal with one gate of width 2m and is of a good condition.
50	152.31	Intake of Abadia East	2.36	700	Canal Intake	It is the intake Abadia East Canal with one gate of width 2m. The intake structure is eroded and needs maintenance.
51	154.87	Intakes of Group of Canals (Abo Shousha Canal and Ganabia Abo Shousha East and West)	24.9	40,106	Canals Intakes	These are intakes of several canals as follows: 1) Intake of Abo Shousha Canal with two gates each of 2m width. 2) Intake of Ganabia Abo Shousha east with gate width 2m. 3) Intake of Ganabia Abo Shousha west with gate width 2m. All gates are in excellent condition.
52	155.8	Al Sharahna Siphon			Siphon	The Siphon was under the Ibrahimia Canal and could not be inspected.
53	157	Al Sharahna Spillway			Spillway	The spillway has 3 gates each of 3m width. It is of an excellent condition.
54	157.1	Intake of Abshoug Canal	9.58	19,523	Canal Intake	It is the intake of Abshoug Canal with one gate of width 3m and is of a very good condition.
55	157.17	Intake of Al Sultani Canal	41.03	66,044	Canal Intake	It is the intake of Al Sultani Canal with three gates each of width 3m. The gates are of a very good condition.
56	157.2	Intakes of Ahmed Pasha Qeblia and Al Sharahna Qeblia Canals	12.99	11,008	Canals Intakes	It is the intake of Ahmed Pasha Qeblia Canal with one gate of width 2m and is of a very good condition. Other canals are of similar conditions.

No	Station	Name	Length (km)	Area served (Fed)	Facility Type	Description
Al Sharahna Regulator						
57	168.75	Intake of Al Sharahna El Baharia Canal	9.14	8,386	Canal Intake	It is the intake of Al Sharahna El Baharia Canal with one gate of width 3m. The gate is of an excellent condition.
58	169	Intake of Ahmed Pasha El Baharia	11.04	25,900	Canal Intake	It is the intake of Ahmed Pasha El Baharia Canal with one gate of width 2m. The gate is of a very good condition.
59	176.45	Intake of Abo Remh Canal	2.72	250	Canal Intake	It is the intake of Abo Remh Canal with one gate of width 2m. The gate is of a very good condition.
60	178.1	Intake of Al Magroufa El Gharbia Canal	6.45	7,038	Canal Intake	It is the intake of Al Magroufa El Gharbia Canal with one gate of width 1.2m. The gate is of a very good condition.
61	178.43	Intakes of Tunsa Connection and Tunsa Left and Right Ganabia and Tunsa Right Canal Branch	17.63	26,100	Canal Intakes	These are a group of intakes in the same location as follows: 1) Intake of Ganabia Tunsa Left with gate width 1.2m. 2) Intake of Tunsa Connection with 2 gates each of 3m width. 3) Intake of Ganabia Tunsa Right with gate width 1.2m. 4) Intake of Tunsa Right Canal with gate width of 1.2. All gates are of very good conditions.
62	183.8	Intakes of Sheikh Haroun and Tazmant Canals & Tazmant Bridge	3.76	3,950	Canal Intakes and Bridge	These are two intakes in the same location as follows: 1) Intake of Sheikh Haroun with gate width 1.5m and of very good condition. 2) Intake of Tazmant Canal with gate width of 1.5m and of a very good condition. The Tazmant bridge is a surface concrete (non-navigable) bridge mounted on one support and is of an excellent condition.
63	184.8	Intake of Sheikh Haroun	7.19	2,950	Canal Intake	It is the intake of Sheikh Haroun Ganabia with one gate of width of 1m. The gate is of a very good condition.
64	186.35	Intakes of New Beni Suef and Ehnasia Canals	10.79	18,700	Canal Intakes	These are two intakes in the same location as follows: 1) Intake of New Beni Suef Canal with gate width of 1.5m of a good condition. Intake of Ehnasia Canals with gate width of 1.5m of a good condition.
65	187.4	Intake of Beni Haroun Canal	0.2	600	Canal Intake	It is the intake of Beni Haroun Canal with one gate of width 1m. The gate is of a very good condition
66	188.6	Intake of Al Azhary Canal	14.1	17,930	Canal Intake	It is the intake of Al Azhary Canal with two gates each of width 2m. The gates are very good conditions.
67	188.7	Intake of El Sahara Canal,Al Saida Spillway, and El Sadat Bridge	9.26	23,560	Canal Intake, Spillway and bridge	This location has three structures as follows: 1) Intake of El Sahara Canal with a gate of 2m width. 2) Al Saida Spillway with two gates each of 3m width to divert excess water directly to the River Nile main stream. 3) El Sadat bridge which is a new upper concrete bridge for car passing over the Ibrahimia Canal.
68	191	El Saidia Bridge and El Saida Siphon			Bridge and Siphon	A surface pedestrian bridge of good condition. The El Saida Siphon exit needs intensive maintenance due to its erosion.
El Genidi Regulator						
69	191.7	Intake of El Genidi Ganabia	4.2	1,866	Canal Intake	It is the intake of El Genidi Ganabia with two gates each of 1.2 m width. The gates are of very good conditions.
70	197.4	Intake of Bosh Canal	3.55	28,750	Canal Intake	It is the intake of Bosh Canal with two gates each of 4m width. The gate is of a very good condition.
71	197.555	Intake of Old Bosh Canal and Al Thanawia Bridge	0.72	64	Canal Intake and Bridge	A surface bridge mounted on sheet piles supports and is of a very good condition. The intake of Old Bosh Canal could not be well observed in the site survey and needs maintenance.

No	Station	Name	Length (km)	Area served (Fed)	Facility Type	Description
72	198.7	Intake of New Bosh Ganabia	7.8	1,443	Canal Intake	It is the intake of New Bosh Ganabia with one gate of width 2.5m. The gate is west of the road and has to be moved to be directly at the Ibrahimia Principal Canal.
73	202.2	Intake of El Zaytoun Canal	2.65	2,060	Canal Intake	It is the intake of El Zaytoun Canal with one gate of width 1.2m. The gate is eroded with a noticeable, and needs general maintenance.
74	203.2	Intake of Ashmant Qeblia Canal	9.5	5,920	Canal Intake	The intake could not be observed clearly during the site survey investigation.
75	203.38	Intake of El Mansour Left Ganabia	18.81	5,510	Canal Intake	It is the intake of El Mansour Left Ganabia with one gate of width 1m. The gate is of a very good condition
76	203.4	Intake of El Mansour Canal	3.88	510	Canal Intake	It is the intake of El Mansour Canal with one gate of width 4m. The gate is of a very good condition
77	203.55	Intake of Al Mansour Right Ganabia	0.9	1,270	Canal Intake	It is the intake of El Mansour Right Ganabia with one gate of width 1m. The gate is of a very good condition
Ashmant Principal Regulator						
78	206.8	Intake of Ashmant El Baharia Canal	6.15	13,100	Canal Intake	It is the intake of Ashmant El Baharia Canal with one gate of width 3m. The gate is of a very good condition
79	210	Intake of El Maymoun El Gharbia Canal			Canal Intake	It is the intake of El Maymoun El Gharbia Canal with one gate of width 1.2m. The gate is of a good condition
80	210.94	Intake of El Maymoun El Bahria Ganabia			Canal Intake	It is the intake El Maymoun El Bahria Ganabia with one gate of width 2m. The gate is of a good condition.
81	211.4	Intake of Kashisha El Wasta (Middle) Canal	2.14	5,800	Canal Intake	It is the intake Kashisha El Wasta (Middle) Canal with one gate of width 2m. The gate is of a very good condition.
Beni Hedear Weir						
82	217.4	Kosheasha Siphon and Ibrahimia Concrete Channel			Siphon and Concrete Channel	In this location, Ibrahimia canal is of the concrete type with u-section and of an excellent condition. The Kosheasha Siphon is moving perpendicular and beneath this Ibrahimia concrete channel

West Hafez Main Canal

No	Distance from West Hafez Intake (Kms)	Name	Length (km)	Area served (Fed)	Facility Type	Description/Purpose
1	0	Hafez Gharbia Canal Intake	14.7	11,943	Canal Intake	This intake is located in East Abo Qorqas Irrigation District. The total Command areas fed by this intake are 11,943 Acres (Feddans) and the length is 14.7kms. The intake has a gate of width 2.5m and in a very good condition but it needs some slight maintenance for the structure only. . Main crops of this command area are maize, sugar cane, wheat, vegetables and clover.
2	0.025	Hafez Gharbia Main Intake outlet after Road			Outlet of Canal Intake	The cross- section is trapezoidal. It has a bottom width of ~6m, with very small longitudinal slope, and side wall slope of 1:1. The cross-section is of good condition, but there are some cracks in left abutment. The dominant water depth is ~2.5m.
3	0.3	Cross-section on Hafez Gharbia Canal			Canal Cross-section	The cross- section has a bottom width of 6m, with longitudinal slope of 4cm/km, and side wall slope of 1:1. The cross-section is of good condition.
4	0.6	Cross-section on Hafez Gharbia Canal			Canal Cross-section	The cross- section has a bottom width of 6m, with longitudinal slope of 4cm/km, and side wall slope of 1:1. The cross-section is of good condition. A small residential area is located near this cross-section.
5	0.8	Pedestrian Bridge			Bridge	This is a small metallic pedestrian bridge for local inhabitants. The bridge condition is moderate.
6	1	Cross-section on Hafez Gharbia Canal			Canal Cross-section	The cross- section is like all other ones is trapezoidal. It has a bottom width of 5.5m, with longitudinal slope of ~3-4 cm/km, and side wall slope of 1:1. The cross-section is of good condition but has some underwater weeds.
7	1.3	Cross-section on Hafez Gharbia Canal			Canal Cross-section	The cross-section is also trapezoidal and is the same as previous one with some underwater weeds.
8	1.6	Cross-section on Hafez Gharbia Canal			Canal Cross-section	The canal cross-section gets wider at this section and the cross-section is suffering from some scouring.
9	1.8	Cross-section on Hafez Gharbia Canal			Canal Cross-section	The canal enters residential area and start turning with a sharp angle (~90^{o}). The condition of the cross-section is good but needs cleaning from dense weeds.
10	2.05	El Mahras Bridge			Bridge	The bridge is of acceptable condition but still needs some slight maintenance.
11	2.2	El Mahras Regulator			Regulator	Length around 18m and the regulator is located inside a residential area. The regulator has two gates each of width 2m. The regulator is in a very deteriorating condition and its gates are fully open all the time. The regulator needs replacement.
12	2.35	Cross-section on Hafez Gharbia Canal			Canal Cross-section	The cross- section has a bottom width of 5m, with longitudinal slope of ~3-4 cm/km, and side wall slope of 1:1. The cross-section is of good condition.
13	2.5	Ateldem Canal			Intake of Atledom Canal	Start of East Abo Qorqas District. This is the place of Atledom Canal (the first branch canal) with total length of 12.190kms and Command area of 2900 acres. The intake has two gates, each of width 2.5m. The bottom width of the intake channel is ~3m. This canal moves then near and parallel to Ibrahimia Principal Canal and it is of a good condition.
14	5.8	Sharmook Bridge			Bridge	Bridge measured length is 9m. The bridge has one opening without support in the middle. The bridge requires some slight maintenance at its abutment.

No	Distance from West Hafez Intake (Kms)	Name	Length (km)	Area served (Fed)	Facility Type	Description/Purpose
15	6.2	Hafez Bridge			Bridge	Bridge measured length is 5m. The bridge requires some slight maintenance at its abutment
16	7.2	Cross-section on Hafez Gharbia Canal			Canal Cross-section	The cross- section has a bottom width of 3.5m, with longitudinal slope of 4cm/km and side wall slope of 1:1. The cross-section is of an acceptable condition but has some little weeds.
17	5.6	Deyab canal	11.25	2,900	Intake of Deyab canal	Deyab canal is the second branch canal with total length of 11.250 km and Command Area of 2900 Feddans. The intake has one gate with a width of 2.0m. The bottom width of intake channel is ~2.0m and the dominant water level is ~1.9m. The gate is of a moderate condition and requires slight maintenance.
18	7.4	Azba Mohamed Hussain Bridge			Bridge	Bridge measured length is 11m. The bridge has one opening without support in the middle. The bridge is of excellent condition.
19	8.5	Diarotia Bridge			Bridge	Bridge measured length is 10m. The bridge has one support in the middle and is of an excellent condition.
20	10.4	Cross-section on Hafez Gharbia Canal			Canal Cross-section	Return to Hafez Gharbia Canal. The cross- section has a bottom width of 3m, with longitudinal slope of ~3- 4cm/km and side wall slope of 1:1. The cross-section is of an average condition but has some underwater weeds.
21	10.79	Intake of El Gahsha Bridge	1.74	660	Canal Intake	El Gahsha Canal has a length of 1.740km and Command area of 660 Feddans. The intake has a gate of width 1.25m and is of a good condition.
22	11	Safay Regulator and left and right Diroutia	10.7	2,750	Regulator	Measure length of regulator is 6m. The regulator has a gate of 4m width.At Safay Regulator there is El Diarotia Left Canal (Length 6.1 kms and Command area 2000 Feddans) and El Diarotia Right Canal (Length 4.6 km and Command Area 750 Feddans). The regulator is of a good condition but needs cleaning from garbage.
23	11.02	Left and Right Side Canal Intakes			Diarotia Canal Intake	At this point there is Diarotia Left and Diarotia Right branch Canals. The intakes have two gates, each of width 3m. The gates are of good condition. The point is the start of Diarotia Left branch canal. Total intakes measured length is 12m.
24	12.57	Azoz Bridge/ El Ghasheam Drain			Bridge and Drain	The bridge is deteriorating and has one support point from bricks. The bridge requires very intensive maintenance for support and hand rails.
25	13.15	Saleh Pasha Bridge			Bridge	Length of bridge is 10m. The bridge has only one opening The bridge is of a very good condition.
26	13.2	End Covering of Hafez Gharbia Canal			Canal Covering	Canal has U-shape of width 4m at its end before covering. After this point El Diarotia Canal starts.

El Gandia Main Canal

No	Distance from El Gendia Intake (Kms)	Name	Length (km)	Area served (Fed)	Facility Type	Description/Purpose
1	0	Intake of El Gendia Canal on Ibrahimia	14.75	8,970	Canal Intake	The intake of El Gendia Canal has two gates each of 3m width. The intake length on Ibrahimia canal is measured as 9m. The total length of the canal is 14.750km. The canal has a bottom width of 6m, side slope of 1:1 and a longitudinal slope of 5cm/km. Its command area is 8,970 Feddans. The intake was replaced by a new gate. However, the intake structure needs slight maintenance.
2	0.02	Outlet of Intake of the start of El Gendia Canal			Outlet of Canal Intake	This is the start of El Gendia Canal at the left side of Ibrahimia Highway. The measured length of intake 8m. The bridge of the intake is very old and has one brick support of bad condition. The bridge structure requires considerable maintenance especially at the abutment.
3	0.22	El Gendia Canal and intake of a small canal			Small canal intake	The canal has a bottom width of 6m, side slope of 1:1 and a longitudinal slope of 5cm/km. The cross-section is of good condition.
4	0.23	Bridge with a Water Pipeline at side			Bridge and Pipeline	The bridge width is 3m. The bridge is a simple metallic one on sheet piles. It requires some maintenance for its rusting.
5	0.3	Cross-section on El Gendia Canal			Canal Cross-Section	At this point El Gendia Canal start turning towards the north. The canal has a bottom width of 6m, side slope of 1:1 and a longitudinal slope of 5cm/km. The cross-section is of a very good condition.
6	0.35	El Gendia Canal and small canal intake			Small canal intake	The canal has a bottom width of 6m, side slope of 1:1 and a longitudinal slope of 5cm/km. The cross-section is of a very good condition.
7	0.5	El Gendia Canal			Small canal intake	The canal has a bottom width of 6m, side slope of 1:1 and a longitudinal slope of 5cm/km. The small canal intake has a width of 1.5m. The cross-section is suffering from spread of weeds at its two sides.
8	0.6	El Our Bridge			Bridge	The bridge width is 5m. The site has a mesqa at the right with a gate width of 1.00m. The bridge has one opening without any support inside the canal. The condition of the bridge is good, but requires some slight maintenance.
9	1.25	Cross-section on El Gendia Canal			Canal Cross-Section	The canal turns again at this point. The cross-section is of a very good condition.
10	1.445	El Rahmania Bridge			Bridge	The bridge has a width of 5m and a length of 6m. The bridge has one opening without any support inside the canal. The condition of the bridge is very bad and requires intensive maintenance due to its concrete wearing specially in its handrails.
11	2	Canal covering at El Shawany Street			Canal Covering	The width of the street is 14m and is covering the canal. The canal is close to a small residential area. The bridge condition is acceptable.
12	2.6	Intake of Branch Canal El Seka El Zeraia	0.41	900	Branch Canal Intake	This is the first branch canal that goes from El Seka El Zeraia and El Gendia Canal. The total length of the branch canal is 0.410 Km and Command Area is 900 Feddans. The branch canal at its intake has a bottom width of 1.5m, side slope of 1:1 and a longitudinal slope of 13cm/km. The intake is old and requires some maintenance.

No	Distance from El Gendia Intake (Kms)	Name	Length (km)	Area served (Fed)	Facility Type	Description/Purpose
13	2.6	Intake and Bridge of Kafr El-Madawer	7.66	1,200	Bridge & Branch Canal Intake.	This is the start of Kafr El Madawer, the Branch Canal #2. The intake has a gate of width 2m. There is a covering at the canal intake for a length of 32m for protecting the stream from garbage from the residential area. The branch canal has a length of ~7.660 Kms and a Command Area of 1200 acres. The conditions of both structures are very good.
14	2.65	El Makadas Bridge			Bridge	There are also covering at this area due to the existence of residential areas. The bridge has a width of 5m and a length of 6m. The bridge is of a good condition.
15	3.25	El Magawer Bridge and a Canal Intake		300	Bridge And Canal Intake	The bridge has a width of 5m and a length of 6m. The site has a canal intake of a 3m gate for branch canal of El Wabour. The bridge and the canal intake are of very good conditions.
16	3.45	Azba Gaber Bridge			Bridge	The bridge has a width of 5m and a length of 6m. The bridge has one opening and is of a good condition. Only the bridge abutment requires some slight maintenance.
17	3.8	Regulator and Bridge El Gharb			Regulator and Bridge	The bridge has a width of 5m and a length of 6m. The bridge has one opening and is of an excellent condition. The regulator has one new gate of width 3m and is of an excellent condition.
18	5.1	Covering under the Rotary Road to El Menia			Canal Covering	This is El Gendia Canal Coverage by Rotary Road. At the site there is a siphon under the road for drain crossing. The coverings have two U-shape openings and are of excellent condition..
19	5.15	End of covering under the Rotary Road			Canal Covering	This is the corresponding canal point at the other side of the Rotary Road .The end of covering has two U-shape openings and are of excellent condition.
20	5.94	Belhasa Bridge and Water Pipeline			Bridge and Water Pipeline	In this location there is Belhasa Bridge with a width of 5m and a length of 6m. Also passing across the canal a water pipeline. The bridge has one opening without support inside the canal and is of a very good condition.
21	6.2	Canal Intake (Atnya)		1,400	Canal Intake	The canal starts turning again at this point towards the North. The canal has a bottom width of 3m, side slope of 1:1 and a longitudinal slope of 5cm/km. The canal intake has a new gate of 2m width. The section is of a very good condition.
22	7.2	Bridge and Water Pipeline			Bridge and Water Pipeline	This is a branching point where El Gendia has a branch with regulator to its west side (El Gendia 2). The bridge has one opening and is of a good condition. Only the bridge handrails require some slight maintenance.
23	9.55	Cross-section On El Gendia Canal			Canal Cross-section	The canal has a bottom width of 2.5m, side slope of 1:1 and a longitudinal slope of 5cm/km. This section is upstream El Sawy Drain. The section is of a very good condition.
24	7.25	Right El Gendia 2 Branch Canal #3		2,400	Canal Intake	This is the main intake of the branch of El Gendia 2. The branch has a length of 1.2kms and a Command area of 200 Feddans. It is of a moderate condition.
25	7.85	Small bridge			Bridge	The branch canal turns towards north and passing by a residential area (Tramel village). The bridge has one opening and of excellent condition.
26	7.85	Ban El Alam Branch		2,070	Intake of Ban El Alam	This is the intake of Ban El Alam Branch Canal . The intake is small (~1.5m width) with very old gate. The .gate requires replacement

No	Distance from El Gendia Intake (Kms)	Name	Length (km)	Area served (Fed)	Facility Type	Description/Purpose
27	9.65	El Sawy Drain Bridge			Bridge	The bridge over El Sawy Drain has a width of 5m and a length of 6m. The bridge is of an excellent condition.
28	9.75	Cross-section On El Gendia Canal			Canal Cross-section	The canal has a bottom width of 2.5m, side slope of 1:1 and a longitudinal slope of 5cm/km. This section is downstream El l Sawy Drain. The section is of an average condition and requires some work for weeds removal.
29	12	Salaqyous Bridge			Bridge	The bridge has a width of 5m and a length of 6m. The bridge is of an excellent condition.
30	12.6	Start of Canal Covering at its Last Part			Canal Covering	This is the beginning of the covering at the last part of El Gendia Canal. The canal has a bottom width of 1m, and side slope of 1:1. The covering requires some garbage removal.
31	14.75	Covering the end of El Gendia Canal			Canal Covering	This is the covering at the end of El Gendia Canal. The canal at its ending has a bottom width of 1m, and side slope of 1:1. The coverage condition is acceptable.

No	Distance from Tunsa Intake (Kms)	Name	Length (km)	Area served (Fed)	Facility Type	Description/Purpose
1	0	Intake of Tunsa Main Canal and Tunsa Bridge	20.45	24,950	Canal Intake	This is the intake of Tunsa Connection at the Ibrahimia Canal. The barrage is of the concrete type and 12m width. It is equipped with two gates each gate of 3m width. It has one support made of bricks. The Tunsa connection has a length of 20.450km and Command area of 24,950. In general, the Tunsa barrage is of good condition and only requires some simple maintenance.
2	0.05	Downstream of Tunsa Main Canal			Bridge	This is the point downstream Tunsa Intake at the other side of the Ibrahimia Road. It is of an excellent condition. The channel has 9m bed width and side slope of 1:1. The sides are pitched with cemented stones. The channel slope is ~10 cm/km.
3	0.2	Bridge			Bridge	The bridge is of 6m width and 10m length. Though the bridge is old, yet it is kept in a good condition. The bridge has two opening and one brick support at the middle. Some repairs are needed for the bridge handrails.
4	0.4	Upper Rotary Bridge			Bridge	This upper bridge is a new one and crosses above the Tunsa stream without having any inside canal supports.
5	1	Abo Imran Bridge			Bridge	The bridge is of 6m width and 10m length.. The bridge has two opening and one brick support at the middle. The bridge is old but in a very good condition. Some repairs are needed for the bridge pier and handrails.
6	1.55	Bridge			Bridge	The channel has 9m bed width and side slope of 1:1. The sides are pitched with cemented stones. The channel slope is ~10 cm/km. The section is uniform but suffers some growing grass and weeds
7	1.7	Bridge at Bani Ahmed village and Cross-section			Bridge	The bridge is old but in a very good condition. It only needs adding had rails. The canal cross-section is almost same as the previous one at 1550m.
8	1.95	Bridge			Bridge	The channel has 8m bed width and side slope of 1:1. The sides are pitched with cemented stones. The channel slope is ~10 cm/km. The section is in a very good condition, but suffers some growing underwater grass and weeds
9	2	Beni Ahmed Bridge			Bridge and Aqueduct	At this point there is a 4-pipe Aqueduct to transfer water from Tunsa Connection to other Intakes: Amar El Baharia, Amar El Qeblia and Qulla. The Aqueduct is 4 pipes each pipe of 1.5m diameter and some of the pipes are leaking. Qulla Main Canal is considered as a main canal (extension of Tunsa Connection).
10	2	Intake of Qulla Main Canal	18.45	19,950	Regulator	This is the location of intakes of Qulla Main Canal (Extension of Tunsa Connection), Amar El Baharia and Amar El Qeblia Branch Canals (#1 and #2). Qulla Intake has two gates each of 3m width (one only is operating and the second is malfunctioned).
11	2	South Amar	9	3,400	Intake of South Amar branch canal	This is the intake of the first Branch Canal #1 (Amar El Baharia). The branch canal has a length of 9.000km and Command area of 10,850 Acres. The intake has deteriorating sides and needs urgent repair. Its gate width is 2.5m.
12	2	North Amar	2	1,600	Intake of North Amar branch canal	The intake has two gates of 2m width. One of the gates is operating well where the second needs replacement with a new one.

No	Distance from Tunsa Intake (Kms)	Name	Length (km)	Area served (Fed)	Facility Type	Description/Purpose
13	4	Qulla Main Canal Bridge 1			Bridge	This is an old bridge with one opening and without support. The bridge requires simple maintenance in its abutment.
14	4.3	Intake of Qulla1			Intake	This is the intake of Qulla 1 with a gate of width 0.8m. The gate needs some maintenance.
15	5	Intake of Toh Canal & Cross-section on Qulla Main Canal			Intake	In this site, there is the intake of Tow Canal with a gate of 3m width. The gate is not operating and requires replacement.
16	5.01	Regulator on Qulla & Intake of two side Canal			Regulator & two intakes	At this site, there are two gates with 1.25m width (the right gate is not operating). The structure is built of bricks that need some maintenance.
17	5.7	Qulla Left Canal Bridge 2			Bridge	This is an old deteriorated bridge that needs replacement.
18	6.6	Qulla Left Canal Bridge 3			Bridge	This is an old bridge on one support and requires only some simple maintenance.
19	7.7	Qulla Left Canal Bridge 4			Arch bridge	This is an Arch bridge of stone with three opening. Its condition is a very good but requires very minor maintenance at its abutment.
20	8	Intake of Side Qulla Main Canal			Two intakes	Each intake has a gate of 1m width. The gates are new and require no maintenance.
21	9.5	Qulla Left Canal Bridge 5			Bridge	This is a new bridge with one opening and without middle supports inside the canal. The bridge is of a good condition.
22	11.1	Qulla Left Canal Bridge 6			Bridge	This is a bridge with one opening. The bridge is of an excellent condition.
23	13	Qulla Left Canal Bridge 7			Bridge	This is the bridge at the end of Ehnasia District. The bridge is of an excellent condition.
24	16	Qulla Left Canal Bridge 8			Bridge	This is an old bridge with two opening and one support. The bridge is of an average condition but needs maintenance for the support and handrails.
25	17.15	Intake of Baha & Dandel on Qulla			Regulator and Canal Intake	This is the intake of Baha Branch Canal #3 with 3m gate width. The regulator has a 3m width gate. The gate is of a very good condition.
26	18	Qulla Left Canal Bridge 9			Bridge	Baha bridge is an old bridge with two opening and has one support. He bridge needs simple maintenance.
27	18.745	Regulator of Beshna & Dandel			Regulator and Canal Intake	The regulator of Beshna and the intake of Dandel are working without gates and are in a very deteriorated condition. They require replacement with new ones.
28	20	Extension of Qulla Main Canal			Baha Intake	This is a cross-section before the end of canal. The channel is small and has ~4.5m bed width and side slope of 1:1. The channel slope is ~5 cm/km. The section requires grass and weeds removal. At this point there is a branch canal called Baha getting the water from the Main Canal without gates.

Regulator Along Bahr Yusef Principal Canal

No	Name	Station	Purpose	Major Problem	Recommendation
1	El Abeed	77.8km	Water level Control in winter, during peak irrigation period all barrage gates are required to be fully open	No major problem except garbage	No major problem
2	Sakola	177.6 km		Riprap on the Left Upstream side bank is damaged	
3	Mazora	230.3 km		In a very good condition except the problem of garbage	
4	Lahoon	288km		In good condition	

Pumps Along Bahr Yusef Principal Canal

No	Name	(1) Command / (2)Catchment area (fed)	Type/Purpose	Status of the structure	Recommendation
1	Badraman	(2) 85,000	Drain pump. It pump water from Abujebal Canal end to Bahr Yousef canal (2.4m suction head)	6 newly installed pumps, No major problem	Constructed in 2012, rehabilitated after every 10,000hr
2	Arab Bani Khalid	(1) 2,130	Irrigation Pump Pumping water from Bahr Yousef to main canal in winter, in summer the water can enter the canal by gravity	Very old pump with low discharge (0.6m3/sec x 2pump) Suction and discharge pipes leaking	The water doesn't reach the end of the canal. It need urgent replacement
3	Beni Khalid	(1) 2,220	Irrigation Pump Pumping water from Bahr Yousef to main canal in winter, in summer the water can enter the canal by gravity	Very old pump with low discharge (0.6m3/sec x 2pump plus one Indian pump with very low suction head) Discharge pipes leaking heavily	The water doesn't reach the end of the canal. It need urgent replacement
4	Kabkab	(2) 60,000	Drain pump. It raise water from a Canal end to Bahr Yousef canal (3.7m suction head)	5 old pumps of 2.9m3/sec capacity. Control panel has problem. No spare parts and the manual crane is difficult to manage	Constructed in 1977. The unit which control electricity has problem (need investigation)
5	Tuna	(2) 18,000	Drain pump. It pump water from a Canal end to Bahr Yousef canal (3.1m suction head)	4 old pumps lacking spare parts.	Constructed in 1979. There is a plan by the MWRI to rehabilitate the station
El Dahab Regulator					
6	Kamadir	21,170 including illegal expansion area	Irrigation Pump. It takes water from Bahr Yousef and Dahab canal to irrigate extension area	4 new and (3m3/sec) 4 old pumps (1.34m3/sec), all of which are in good condition. Section head of old pump is 2.6m and new pump 3.4m	New pump built in 2011 and old one (1969) but rehabilitated in 2010.
7	Terfa	19,550 + illegal area (total about 3,000)	Irrigation Pump. It takes water from Bahr Yousef canal to irrigate extension area	The old pump station has 4 pumps with capacity of 1.9m3/sec and the new pump station with 6 pump of capacity 1.6m3/sec. All pumps has 3~4m lifting capacity. Scarcity of water to pump. Gates on guide canals are not working (old pump) or not available (new pump)	The suction pipe is set at higher level than the bed level of Bahr Yousef canal which leads to lack of water to pump specially during winter cropping. Pump with higher suction head need to be replaced.

No	Name	(1) Command / (2)Catchment area (fed)	Type/Purpose	Status of the structure	Recommendation
8	Der Sankoria	(2) xxxxx	Drain Pump It raise water level from Der Sankoria to Bahr Yousef canal	There are 4 old and 5 new pump (not yet started) with capacity of 3.5 and 5.8m3/sec respectively. Old pump has manually operated crane lifting mechanism, but the new pump house has an automatic crane lifting operation system	Old pump installed in 1973 and rehabilitated 2014. The New pump structure started in 2002 and the pump is being installed now
Sakola Regulator					
9	Sakoula El Gabal	8.6	Irrigation Pump Pump water to extension area 13,200 + illegal land	7 years ago all pumps are rehabilitated Side slope at the mouse of guide canal need rehab 8.6km canal	Guide canal is inside settlement area, dangerous for kids and animal
10	Abo Rahib		Irrigation Pump It feeds water from B.Y to Seery canal	One pump installedl but the pump has many problem 150m guide canal	The level of canal bed is higher so that winter irrigation is difficult Mixing water from El Mohid drain might be good
11	Hareeka Drain		Irrigation Pump It pumps water from B.Y to Hareeka Canal 8,000 + illegal land	Newly constructed pump of 3unit 800m canal and join Hareeka Main Canal	60m Guide canal is lined with concrete and in good condition
12	Delhans		Irrigation Pump It pumps water from B.Y to Delhans canal which is the extension of Hareeka Canal Irrigate about 5,000fedan	(4 units, 2 are working at a time) Initiation pump has problem, floating screen sunk, garbage entering pump station 3.5km canal	Critical curved area, 4years ago side protection was constructed but washed away
13	Bilhasa		Irrigation Pump It feeds water to Bilhasa canal which is the extension of Seery canal	No floating screen, the pumps has bad sound in operation There is a third pump not installed Pulley system not working	It needs rehabilitation
14	Sakula drain in Dilhanis		Drain Pump It pump water from the end of Sakula drain back to B.Y canal	4 units Drain pump. The motor parts has problem. The spare parts are locally made and broken frequentl 200m from canal supply water to B.Y	It needs rehabilitation
15	Mazora		Irrigation Pump It conveys water from B.Y to the extension area It irrigates 9,529 + illegal land	The station has an old and New pump station (4 units each).	No major rehabilitation is done on old pump since 1967
Mazora Regulator					
16	El Sahara (Saharit Mazora)		Mixing Pump It feeds Abo Shusha canal from El Mohiet Drain before it enters Bahr Yousef (the canal starts from intake at Ibrahimia Cana)	4units pump 2pump not working, Discharge pipe rusted and leaking, the gate destroyed	Installation of four new pump; provision of settling basin or new discharge canal with good cover, and re-fabrication of gate
17	Dashtoot		Irrigation Pump It feeds Abo Shusha canal	6 unit pump; very old structure; no screen at suction end, garbage (sometimes dead animal) enters the pipe, One of the pump make loud noise	Provision of suction pipe provided with screen, or provision of guide canal with floating screen Provision of 2 pump, gate rehabilitation on Abo Shusha canal

No	Name	(1) Command / (2)Catchment area (fed)	Type/Purpose	Status of the structure	Recommendation
18	Koom El Noor Pump Station		Irrigaton Pump It takes water to the Abo Shusha Canal	It has two pump, but one is not working and needs rehabilitation	There is a feeder next to the pump station. When water level is high, the feeder will be used.
19	Sediment		Irrigation Pump Station It takes water from Bahr yousef to a main canal	The station has 3 units of pump, and only 2units works per day. Each unit has discharge 0.5 m3/s The station has two standby units. New pump station which has 4 units is under construction. Each unit has 1.25 m3/s discharge	The pump station is found in good condition
20	Eldrasia Drain		Drain Pump It drains water to Bahr yousef	The pump station has 3 units which are made in Czechoslovakia and installed in 1975. One unit work at a time with discharge of =3 m3/sec. The station is in good condition but screen at intake is missing	It needs small maintenance
21	Tama Faium-1 It's also called Manhal Ghidans.		Drain Pump It drains water to Bahr yousef	It pump water from Ghidan drain to Bahr Youssif canal. The station has one unit which work using Petrol. It works only 4 hours per day. Many farmers complain about it, and they request to change the pump to electric pump.	New pump operated by electricity is necessary
22	Tama Faium-2		Drain Pump It drains water to Bahr yousef	The same condition as Tama Faiyum Drain pump station 1 The suction and discharge pipes are old and leaking	New pump operated by electricity is necessary
23	Tama Faium-3		Drain Pump It drains water to Bahr yousef	The same condition as Tama Faiyum Drain pump station 1	New pump operated by electricity is necessary
Lahoon Regulator					

Intakes facilities and other structures along Bahr Yousef

No	Name	Length (km)	Area served (Fed)	Status of the intake	Recommendation
1	Mousa	2.04	300	The intake elevation is set at higher level and water is not available in the canal during winter season The gate needs maintenance	Setting small pump for winter irrigation and rehabilitating
2	Asmant	2.45	450	No pump for intake There no water in winter	Setting small pump for winter irrigation
3	Khor Belnasora		350	No pump for intake There no water in winter	Setting small pump for winter irrigation
4	Belansora		250	Structure was rehabilitated two years ago No pump for intake There no water in winter	Setting small pump for winter irrigation
5	El Sultan Hassen	2.06	300	No pump for intake There no water in winter	Setting small pump for winter irrigation
6	El Nabt		200	No pump for intake There no water in winter	Setting small pump for winter irrigation
7	Mabrouk	3.59	750	No pump for intake There no water in winter	Setting small pump for winter irrigation
8	Manshat El Dahab	64	61,700	The longest canal covering West Menia and Beni Suef G.D.	A lot of rubbish
9	Reheel	6.68	1,200	There are many Rubbish in canal	Rubbish problem measures
10	Ganbid Tokh	14.65	1,600	No pump for intake There no water in winter There are many Rubbish in canal	Provide small pump Rubbish problem measures
El Dahab Regulator					
11	Moati	60(m)	Spill way	Spillway to and from Dahab and Bahr Yousef Canal Only in July, Bahr Yousef's water level is higher than Dahab.	Presently no water inside the canal
12	Nasir	50 (m)	Spill way	Spillway to and from Dahab and Bahr Yousef Canal The wing walls have cracks, the gate is taken away	Rehabilitation of the gate and wing wall
13	Faragalla	43	Spill way	Spillway to and from Dahab and Bahr Yousef Canal	
14	Terfa Mawafi	186	Ditto	Broken pipe, passing thru residential area, need to be covered The crossing has no wing wall	The community is active in cleaning of the canal
15	Mwati Abjaj	1,300	Ditto, but about 15Fedan is irrigated from this canal	There is no gate here	Many grasses along the canal
16	El Bahnasa el Qblia	9.9	4,710 + illegal area	The gate is rusted; one of the gate is not working. Since the bed level is higher, no water convey during winter season. Even the farmer along the approach canal complain about lack of water for more than 20days now	The gate should be rehabilitated and either set a pump station(for winter farming) or reduce the opening at
17	Sahl El Bahnasa	2.6	1,125	The gate and pipe canal is in bad shape. Similar to above, no water in winter season	Ditto
18	Sabaa and Harika intakeGroup	23 Sabaa 3.83 Left Gnebia 48 Harika 1.2 Right Harika 2.8 Left	71,900	There are 5 gates at this point serving 5 canals (2 main and three branches'. The main gates are for Sabaa and Harika main canals. The structure is constructed in 30's, but relatively in good condition. The gate is rusted and some cracks and breakage on the wall wings There is lack of water on the three branch canal (left Gnebia, Left and Right Harika)	Painting and oiling on the gate Rehabilitation of the wall wings Good water management system at the two bigger gates
Sakola Regulator					
19	El Aklia	1.6		It drains water from Harika to Bahr Yousef	Bushy, critical curve area
20	Beni Amir	3		Closed drain canal to Sakola, the pump has been removed	Water treatment plan drains into it. Some farmers use the water
21	Beni Minein	0.1		Spill way btn BY and Harika Presently no water inside	The canal is almost closed

No	Name	Length (km)	Area served (Fed)	Status of the intake	Recommendation
22	Link canal	0.05		It feeds water from B.Y to Bilhasa Canal by gravity	The gate is always open
23	Bushra		500	Intake structure has broken wing wall. Community clean the canal and got fertile soil to be used in the field	At the end of this canal a pump (by MoA) is set to feed three branch canal
24	El Gafadon Village		1,000	Intake to pump station owned by MoA, it feeds two Maska	Very close to this intake curve protection is set by MWRI, but the structure start to break
25	Koftan		12,134 + 7,000	Totally broken gates	Re-fabrication of intake gate
				Too much garbage	
26	Magror El Riga		200	Rehabilitated in 1998	
Mazora Regulator					
27	El Boyeb	1	Drain canal	It drains water from Abu Shoshal to B.Y. The community want it be closed	Demolition of the canal or total closing of the gate
28	El Regha		Feeder	The structure is made by bricks, and gate is working. Link canal which is soil canal feeds water to matrabet dashasha.The guide length is 35.00m Intake width = 1.0m Intake height = 3.5m Gate height =2.5m	The guide length 35.00m needs control and removal of bank weeds. The gate is working and needs repair
29	El Bahsamon		Feeder	The structure is made by bricks and concrete. The gate is not working. It feeds Matrabet Menshat El Haj, the end of Matrabet Deshasha canal. The intake made from masonry. The guide length =80.0m	The gate is not working (not moving), and the guide needs rehabilitation. The price of a gate is around 3,000 LE
30	Kom El Noor Bridge		Bridge	It's made from reinforced concrete, and the condition is very good. Construction year is 2008 The bridge width= 7.5m x 2 Sidewalk =1.0m each	
31	Kom El Noor Pump Station (Feeder)		Feeder	They use gate and pump depend on the water level of Bahr yousef. It feeds water to Abu Shusha. It's made by reinforced concrete and good condition. The guide is also made by concrete. It also serves access by boat. The pump station has 2 units with discharge 0.5 m3 per sec.	A pump is not working and needs fixing. Also the gate needs rehabilitation
32	Barawa Feeder		Feeder	There is no gate, and only a pipe is there. The intake made from masonry. Earth canal is connecting the feeder, and condition is good. It feeds water from Bahr yousef to Bahsamon canal. The intake condition is very bad and they use pipeline instead of the intake.	It needs reconstruction
33	Barawa Bridge		Bridge	It made from reinforce concrete, and it is very good condition Bridge width 5.0m x 2 Side walk width=0.5m length =60.0m	
34	Mnshat El Hag Feeder		Feeder	It feeds to Bah Samoon canal. There is no gate and a pipe is passing under the road. The structure and guide canal are made by masonry, and their condition are good. (The guide length:35.0m and the guide bed width:1.0 m Side slope: 1:1 Water height: 0.7 m)	No urgent rehabilitation
35	Wish El Bab Feeder		Feeder	The intake is made from reinforce concrete, and the condition is good. After the intake, there is a culvert to El Sultany canal. The guide canal and bridge are made by bricks and bad condition.	The guide canal and bridge should be reconstructed.
36	Menshat El Hag Bridge		Bridge	It's made from reinforce concrete, and construction year is 1961. (The bridge width: 8.0m)	

No	Name	Length (km)	Area served (Fed)	Status of the intake	Recommendation
37	Wady El Rayan	2,600	Intake	The intake and guide condition are good condition, and they are made by concrete. The intake has two vents each one are 2.0m width, and the intake height is 2.8m and good condition. In front of the intake, there are many Nile rose. At the off take of the canal, there is a pump station which has 3 units.	The intake condition is good, but intake of branch canal are not good condition. The gate was broken and should be replaced.
38	Matrabet Mayana	840	Intake	The intake is made by reinforce concrete, and earth canal is connecting. There are many bushes, and looks like, people don't maintenance it. The guide length is 20.0m, and bed width is 2.0m. It's good condition.	The condition of intake is bad, and it should be rehabilitated. The gate is rickety and needs replacement
39	El Assar	5,500	Intake	The guide is made by reinforce concrete, and the condition is bad. The intake has two gates which are not good condition. The intake is inside of residential area, so there are many rubbish and Nile rose. The guide canal is made by concrete. The length is15.0 m. The condition is good, but the intake condition which is made by concrete is not good.	The intake needs rehabilitation and, and the canal should be culvert for protecting residential area(100 m) .
40	Mayana Bridge		Bridge	made by reinforce concrete. The condition is good. The bridge width=7.0m x 2 Sidewalk =0.5m	
41	Myanah Intake	3,200	Intake	The intake which is made by reinforce concrete is good condition. The gate is not good condition. The guide canal is made by masonry and concrete. The connoting canal is good condition, looks like people do maintenance.	It needs maintenance
42	Elasara Intake		Feeder	The intake is made by reinforce concrete. The gate is broken and needs to be changed. Also a pipe connecting the intake is broken. The intake is inside of residential area, and canal condition is also not good.	It needs reconstruction
43	Fishta Feeder		Feeder	The intake is made by reinforce concrete. In front of gate, there are much rubbish, and they put a mesh at the gate. The structure condition is normal, and the gate is working. This water is sent to right banl	The intake needs some maintenance.
44	Menehro Bridge		Bridge	It's made on 1994. The bridge width is 6.0 m	
45	Msrfedrasia Intake	500	Intake	The Intake is made by rein concrete, and the condition is very bad. There is much rubbish because of inside of residential area.	It needs reconstruction, Also, a pipe form intake is broken and should change to box culvert.
46	El Awawna Bridge		Bridge	It's made by reinforce concrete , and the condition is good.	
47	El Mmaleak Feeder		Feeder	The intake is made by reinforce concrete and good condition. The gate is working. Also, the guide is good condition. Intake width =1.5 m intake height = 3.8 m gate width = 1.5 m gate height =3.5	The condition is good. Urgent response is nothing.
48	Edrassia Bridge		Bridge	It's very good condition. The bridge width =8.0m x 2 Sidewalk=1.0m	
49	Fanos Intake	600	Intake	There is no gate, and only a pipe passes water to the canal. The intake condition is very bad, also there are many Nile rose.	The intake has very bad condition and there are no gate so that it need to reconstruct anew one
50	Sediment Elgabal		Bridge	Very good condition The bridge width =8.0m x 2 sidewalk=1.0m	
51	Bani Hani Bridge		Bridge	the condition is very good condition The bridge width =26.0m	
52	Bani hani Feeder		Feeder	The intake is made by reinforce concrete, and the intake and the gate are good condition. The connecting canal is also made by concrete, and it is good condition.	No urgent rehabilitation

No	Name	Length (km)	Area served (Fed)	Status of the intake	Recommendation
53	Bahabshin Intake	2,950	Intake	The intake is made by reinforce concrete, and the condition is good, but a slight for moving a gate is not working, and gate condition is not good. There are many Nile rose in front of gate.	It needs maintenance for slight.
54	Elmaasra Bridge		Bridge	It's very good condition. The bridge width=5.40m x 2 Sidewalk =.3m	
55	Mnilgh Etan Bridge		Bridge	It's made by reinforce concrete, and the condition is good	
56	Wall for Closing		Closed drain	From right side drain	The length is around 30 m
57	Ganabet Giza Intake (right Giza)	3,300	Intake	The intake condition is good, but there is much rubbish, they should be removed	It has no handrail. The walls are made by bricks
58	Hassan Canal (Hawara)	1,440	Intake	The intake is made by bricks, and the condition is very bad. The gate is not working. The intake is inside residential area, there are much rubbish, and canal condition is not good.	It needs reconstruction or rehabilitation
59	Hassan Wassef		Bridge	It's made by reinforce concrete, and it's good condition The bridge width=8.0m plus 2 sidewalk =1.0m	
60	Hager Intake	3,700	Intake	The intake is made by bricks, and the structure is very old. The gate is not working. The intake is inside of residential	It needs reconstruction.
61	Agouz Intake		Intake	The intake is made by bricks, and the condition is not good. The intake contain from 2 vents each one has 1.5m width. The intake is inside of residential area, and in front of gate there are much rubbish.	The structure of intake needs rehabilitation, and both gates need
Lahoon Regulator					

Koftan survey area

No	Name	Length (km)	Area served (Fed)	Status of the intake	Remark
1	Koftan Intake	17.14	19,134	There are three gates, but one is broken and need to be changed, and two are not working. Irrigation sector is planning to rehabilitate, but the plan is not decided.The structure condition is good, problem is only gate. In font of the gate, there are many Nile rose. It's made on 1980.	Gates need rehabilitation and replacement.
2	Koftan Bridge			It's made by reinforce concrete, and the condition is good	
3	Soliman Intake	0.64	100	The gate condition is good, also the body doesn't have problem. Accumulating sediment is problem.A pipe after gate is 4m. It's made on1990.	The looks like, people don't do maintenance for the gate, and there are a lot of bushes. Some small maintenance is needed
4	Nosser Intake	2.225	350	It's working, but the canal's condition is not good. The structure is made by reinforce concrete. There are many bush, and sediment is accumulated. It's made on 1990.	There are many bushes at the offtake of gate and canal. Small maintenance is needed
5	Koftan Bridge			It's made by reinforce concrete, and the condition is good	
6	Abeed Intake	0.928	150	The gate is working, and the structure is made by reinforce concrete. There are many bush, and sediment is accumulated. , it' s made on 1990.	There are many bushes at the offtake of gate and canal. Small maintenance is needed
7	El Shafe			It's made by reinforce concrete, and the condition is good	
8	Koftan Bridge 3			It is made by reinforce concrete, and the condition is good. However, some soil was removed around the bridge	
9	Koftan Pump station			Mixing pump that needs reha bilitation and renovation	
10	El Regha Intake	8.03	1,960	There two gates. They are working and permanently open. The structure is made by reinforce concrete, and the condition is normal. After the gate, lining canal is connected which is good condition. Some soil was removed around the intake. It's made	The gates and structure need some rehabilitations.
11	Abo hashema Intake	1.75	450	There is one gate which is working. The structure condition is normal, and there are much rubbish and sediment inside of the structure. Around the intake of soil was removed by water. Also, the canal has much sediment and bushes. It's made on 1994.	Some maintenance and rehabilitation are needed for structure and canal.
12	Abo hashema Bridge			It is made by reinforce concrete, and the condition is good. However, some soil was removed around the bridge	
13	Khatab Intake	5.1	780	The Gate is not moving, and it is permanently open. However, this is not big problem for the people. The canal is not bad condition. It's made on 1994.	The gate need some maintenance
14	Farag Intake	2.5	750	The structure condition is not so bad. The farmer maintenance for removing vegetation. it's made on 1994.	Not urgent condition, but gate should take maintenance.
15	Deshasha Intake	3.45	750	There is one small gate, and a pipe line which is 1,2 km is connecting. Too much rubbish is bothering intaking water form the canal, and also water passes the pipe and become over flow because of Deshasha gate is broken and close. The structure is made by bricks and concrete. It's made on 1994.	This intake is inside of residential area, so much rubbish are thrown. The gate is working, but it needs maintenance, and the pipe line should be changed to culvert.
16	Deshasha Gate			The structure is made by bricks, and it's bit old. The gate is broken and not open. There are so much rubbish in front of gate. The purpose of the gate is importing water form Bahr yousef and sending overflow of water from Koftan canal to Bahr yousef. This problem should be solved urgently. It's made on 1984.	This is a big problem of Koftan canal. Fistly, the rubbished should be removed, and replace the gate.
17	Regha Feeder			The structure is made by bricks, and the condition is bit old. The gate is working. The purpose is send water form Bahr yousef to main canal.	The structure is bit old and need maintenance
18	Regha gate for connecting drain canal			The gate condition is good, and the structure is made by reinforce concrete.	No need urgent rehabilitation
19	Sadek Gate			The gate is working, and the structure is made by reinforce concrete and good condition. However, much rubbish around intake because of inside residential area. The canal is earth canal and not good condition. It's made on 1990.	The gate doesn't have a big problem, but canal needs some maintenance.

Terfa survey area

No	Name	Length (km)	Area served	Status of the structure	Remark
1	Terfa1 New&old Pump Station		30,000 + illegal area (total about 3,000)	The old pump station has 4 pumps with capacity of 1.9m3/sec and the new pump station with 6 pump of capacity 1.6m3/sec. All pumps has 3~4m lifting capacity. Scarcity of water to pump. Gates on guide canals are not working (old pump) or not available (new pump) Only 6 workers is working both of New & Old pump station	The suction pipe is set at higher level than the bed level of Bahr Yousef canal which leads to lack of water to pump specially during winter cropping. Pump with higher suction head need to be replaced.
2	Siphon		Siphon	Terfa Canal crosses El Dahab Canal	
3	Siphon		Siphon	Drain canal which leaches Deir El Sankouria Drain Pump station crosses Terfa Canal	Setting mixing pump or ground water pumping might be needed
4	El Galalat Bridge			It's made by reinforce concrete, and the condition is good	
5	Bridge			It's made by reinforce concrete, and the condition is good	
6	Terfa2 New&old Pump Station		30,000 + illegal area (total about 3,000)	The old pump station has 6 pumps with capacity of 1.47m3/sec and the new pump station with 4 pump of capacity 1.0m3/sec. Scarcity of water to pump.	The water doesn't reach the end of the canal. It need urgent replacement
7	Terfa 1 Intake		3,000	There are old small gate and new small gate. Old gate is not working. Side wall and concrete slab has crack and breakage	Need rehabilitation for the side wall and the concrete slab.
8	Terfa 2 Intake		3,000	There is one small gate. Side wall and concrete slab has crack and breakage	Need rehabilitation for the side wall and concrete slab.
9	Bridge			It's made by reinforce concrete, and the condition is good	
10	Terfa3 New&old Pump Station		2,400	The old pump station has 7 pumps with capacity of 1.4m3/sec and the new pump station with 5 pumps. The three of the pumps capacity are 2.1m3/sec and The two of the pumps capacity are 1.2m3/sec. Scarcity of water to pump.	The water doesn't reach the end of the canal. It need urgent replacement
11	Terfa 4 Intake		15,000	There are no gate for Tarfe 4th Branch Canal. This canal is directly controlled by Terfa3 New&Old Pump Station A lot of sand is flowing into the canal	Need cleaning canal
12	Bridge			It's made by reinforce concrete, and the condition is good	
13	Terfa 5 and 6 Intakes		10,000+	There are 3 small gates, 1 for Terfa 5 , 2 for Terfa 6. All gates are working	No need urgent rehabilitation
			23,400		

Saba survey area

No	Name	Length (km)	Area served (Fed)	Status of the intake	Remark
1	Saba Intake	23		Very old structure made of brick. Constructed in 1930, rusted gate, some cracks and breakage on wingwall. Every twice a year requires maintenance	Three gate each 2.70m (Change of gate) or Rehabilitation such as Painiting and plastering, oiling of gate needed
2	Left gnabia no 1	3.83	1,200	Gate is imobile; Intake level is higner by 1.2m from guide canal	One gate, 2.0m width Need rehabilitation
3	Bahnasa	4.83	3,100	The gate is in good condition, only some cracks on sie wall Bahnasa canal supply water to bahnasa branch and Pump No 4 on Sakola El Gabal Canal	Width of gate B=2.5m two gates. In a good condition
4	Left gnabia no 2	2.62	700	Gate is broken, wing wall damaged	gate width, B= 1.0, complete replacement is required
5	Right gnabia no 1	2.49	700	Gate is broken, wing wall damaged	gate width, B= 1.5, complete replacement
6	6.3km station	regulator		The regulator is very old (already expired) having many holes and not stable (rollers are missing). The side walls are broken	A 9m bridge is built with the regulator but it has no purpose as such (only serves as pedestrain crossing)
7	El Shikh Masood	1.52	556	The gate is imobile (tight with the wall). Even if tightly closed there is leake from the side of the gate). The canal crosses residential area (it needs canal covering)	Width of the gate is B = 1.0m Wall height = 2.5m, complete replacement
8	West El Gaiat	2.4	975	Recently rehabiliated gate. Has no problem	Side protection is being done on one side of the Main canal by local government to protect the road which is parrallel to Saba Main canal
9	East El Gaiat	1.3	756	The gate is imobile (tight with the wall).	Width of the gate is B = 1.0m Wall height = 2.5m, complete replacement
10	Siphon			El Kayat drain cross the canal	
11	Kafr El Maghrabi	3.46	1,000	The gate is imobile (tight with the wall). Side walls are totally broken	Width of the gate is B = 1.0m Wall height = 2.5m, complete replacement The first part of this canal (about 500m) is lined by road authority to protect the road which is parallel to the canal
12	East EL Monshaa	2.55	1,000	The gate is imobile (tight with the wall). Wing walls are totally broken	Width of the gate is B = 1.0m Wall height = 2.5m, complete replacement
13	West El Monshaa	2.55	1,000	The gate is imobile (tight with the wall). Wing walls are totally broken	Width of the gate is B = 1.0m Wall height = 2.5m, complete replacement
14	Siphon			Halfaya drain cross the canal	
15	El Halfaia	5.7	1,800	Recently rehabiliated gate. Has no problem	Width of the gate is B = 1.5m Wall height = 3.0m
16	Canal Cover	0.2		Saba canal crossing Barmasha village through closed concrete canal Water don't reach this area	The biggest problem is rubish infront of enterance to the closed canal. It hinder passage of water
17	Siphon			El Baskalon drian crosses sabaa canal	The farmer around this area use ground water for irrigation by pumping by private pump

No	Name	Length (km)	Area served (Fed)	Status of the intake	Remark
18	Barmasha	2.445	950	The gate doesn't work Scarsity of water in this area is critical Old broken weir can be seen inside Saba	Width of the gate is B = 1.0m Wall height = 2.60m, complete replacement is required
19	Siphon			El Baskalon-1 drian crosses sabaa canal	Setting mixing pump or ground water pumping might be needed
20	Zawit Barmasha	1.49	950	The gate is expired totally Critical problem of water	Width of the gate is B = 1.0m complete replacement is required
21	Harika branch	1.5	500	The gate is expired totally Critical problem of water farmers use ground water pumping with private pump	Width of the gate is B = 1.0m complete replacement is required
22	Mixing Station	-	-	No water inside Sabaa canal to mix from Sakola drain There is no water from Saba canal to mix with drain water Farmers use totally drain water of poor quality	The farmer request two pump operator so that they can irrigate during night time (or after 5PM) The gate to the pump need rehabilitation
23	Aqueduct	0.012	-	Convey water across Sakola drain to El Maseed canal	The bank holding the aqueduct is collapsed. Need maintenance
24	EL Maseed	2.25	1,400	The gate is working but it get water solely from mixing pump	Width of the gate is B = 1.0m minor maintenance is required

Kaesd Survey Area

No	Distance from Kased Dalil (Kms)	Name	Length (km)	Area served (Fed)	Facility Type	Description/Purpose
1	0	Mazora Bridge			Bridge	Mazora bridge is a metallic bridge of width 1m to transport an oil pipeline. The width of the bridge is 1m, length 35m, and volume of $105m^3$.
2	0.05	Railway Bridge			Bridge	This is a railway bridge near Dokhra Village. It has two opening and one bricks support. Bridge measured length is 24m. The bridge needs some repairs.
3	0.25	Cross-section on Kased Dalil			Cross-section	The Dalil is turning towards North-South. The section is wide and of excellent condition. It is almost free from weeds either floating or underwater. The bed width is 20m, a side slope of 3:2, and a longitudinal slope of 3 to 5cm/km.
4	0.6	Cross-section on Kased Dalil			Cross-section	The section is wide and of excellent condition. It is almost free from weeds either floating or underwater.
5	0.9	Upper Highway Bridge			Bridge	The upper bridge is a new one with one support of sheet piles inside the canal channel.
6	1.6	Cross-section on Kased Dalil			Cross-section	The cross-section is of an excellent condition and free from grass or weeds. The section has a bed width of 20m, a side slope of 3:2, and a longitudinal slope of 3 to 5cm/km.
7	2.1	Kafr Dawood Bridge			Bridge	The bridge has two supports of sheet piles. It has a length of 35m. It is used for both cars and pedestrian transportation. The Dalil at the left side is protected by steel fence at the residential area of Kafr Dawood. The bridge is of a very good condition.
8	2.45	Nefia Pedestrians Bridge			Bridge	The bridge is a metallic one with 2m width on two supports of pile sheets. It is used for pedestrian passing. The bridge length is 33m and is of a very good condition.
9	2.7	Tanta Railway Bridge			Railway Bridge	This is the main railway bridge of Cairo-Tanta route. The bridge is of an excellent condition.
10	4.4	Intake of Canal Kaem Tanta			Canal Intake	The canal is covered with a length of 1.300 kms. The intake before coverage has a gate of 1.5m and is of a very good condition. The canal side slope is 1:1.
11	5	Farouk Bridge of Tanta City			Bridge	This is a bridge with two roads, one for each direction. The bridge has two sheet piles supports. Its length is 50m, while the Dalil width is ~25m. The bridge is of an excellent condition.
12	5.4	Cross-section on Kased Dalil			Canal Cross-section	The section is wide free from weeds and grass. It is of a very good condition. The section has a bed width of ~20m, a side slope of 1:1, and a longitudinal slope of 5cm/km
13	5.8	Nayef Bridge			Bridge	The bridge has one support. Its measured length is 30m. The bridge has some broken points and was closed.
14	6.5	Cross-section on Kased Dalil			Canal Cross-section	The section is wide free from weeds and grass. It is of a very good condition. The section has a bed width of ~25m, a side slope of 1:1, and a longitudinal slope of 5cm/km.
15	6.7	Intake of Ikhnaway Canal (Right side) and Feeder			Canal Intake and Feeder	This intake of Ikhnaway Canal and Feeder is also a feeder to Kased Dalil. The canal intake has a gate of 2.5m while the feeder has a gate of 1m width. Both gates are of good condition.
16	6.8	Ikhnaway Bridge			Bridge	The bridge has two openings with one bricks support. The bridge is of an excellent condition except its hand rails need some simple maintenance. The length of the bridge is 25m.
17	7.1	Intake of Canal Shabshear (Right Side of Dalil Kased)			Canal Intake	The intake as a gate of width 3m and of a good condition except it has some leakage. The canal has a length of 11.150 Kms and a Command area of 1150 acres. The bed width at intake is 6m, side slope of 3:2, and a longitudinal slope of 5cm/km.
18	7.200 +0.000	Old Tanta Barrage and Intake of Kased Canal			Barrage and Railway Bridge	The site has the Old Tanta Barrage, and railway bridge. The barrage has 4 gates with each gate of 3m width. The bed width at this site is 20m, side slope of 3:2, and longitudinal slope of 5cm/km. The point is the end of Dalil Kased and the start of Kased Canal. The length of the barrage is 24m. The barrage requires some simple maintenance in gates and abutments.

No	Distance from Kased Dalil (Kms)	Name	Length (km)	Area served (Fed)	Facility Type	Description/Purpose
19	7200 +0.100	Boutros Bridge			Bridge	The bridge is for car transportation supported on sheet piles. Its measured length is 39m. There are two water pipes upstream the bridge with ~70m of diameter o.8m each. The bridge is of an excellent condition.
20	7.200 +0.500	Intake for Water Station El Merashaha			Water Intake	The intake has two opening with metallic net at entrance of 2m width. The barrage has 4 gates with each gate of 3m width. The bed width at this site is 20m, side slope of 3:2, and longitudinal slope of 5cm/km. The intake is of an excellent condition.
21	7.200 +0.700	New Tanta Barrage			Barrage	This is the New Tanta Barrage with four controlling gates, each of 3m width. The length of the barrage is 24m. The structure is new and is of an excellent condition. The bed width at this site is 20m, side slope of 3:2, and longitudinal slope of 5cm/km.
22	7.200 +1.200	Cross-section on Kased			Canal Cross-section	The section is of an excellent condition. It has a bed width of ~20m, a side slope of 1:1, and a longitudinal slope of 5cm/km. The section left side is pitched ad has a side metallic fence as it passes by the residential area.
23	7.200 +1.550	El Ghofran Bridge			Bridge	The bridge is on two sheet piles supports. It is a car transportation bridge located in Hay El Ghofran. The bridge measured length is 47m and is of a very good condition.
24	7.200 +2.100	El Toob (Bricks) and Highway Bridge			Bridges	The first bridge is used for truck transporting bricks. The bridge length is 31m. The second bridge is located at the Highway.
25	7.200 +3.700	Stadium Extension Bridge and Intake of New Hoqafa Canal			Bridge and Canal Intake	It is a new bridge constructed on sheet piles support. This bridge is at the extension of the Tanta Stadium. From this bridge there is New Hoqafa Canal.(Left side). The length of the bridge is ~33m. The first bridge needs some maintenance for its supports. The bridge is of an excellent condition.
26	7.20 +4.200	Faculty of Engineering Bridge and Water Pipeline			Bridge and Water Pipeline	In this site, there if the bridge of the Faculty of Engineering. Upstream of the bridge with ~60m there is a drinking water pipeline crossing the canal. The bridge is constructed on two sheet piles supports. The length of the bridge is ~33m and is of a
27	7.200 +4.800	Cross-section on the Kased Canal			Canal Cross-section	The section is of a very good condition. It has a bed width of ~20m, a side slope of 1:1, and a longitudinal slope of 5cm/km.
28	7.200 +5.400	Cross-section on the Kased Canal			Mesqa Intake	The section also has several intakes of Mesqas. The section is of a very good condition. It has a bed width of ~20m, a side slope of 1:1, and a longitudinal slope of 5cm/km.
29	7.200 +6.300	Cross-section on the Kased Canal and Intake of Smela Canal			Canal Intake	Intake of Smela Canal is at right side of Kased Principal Canal of a length of 10.380 Kms and a Command Area of 4295acres. It has a 2.5m width gate of a good condition. The cross-section shrinks at this point. It has a bed width of ~18m, a side slope of 1:1, and a longitudinal slope of 5cm/km.
30	7.200 +7.000	Intake of Ganabia 2			Canal Intake	The Intake of Ganabia 2 is at right side of Kased Principal Canal. It has one gate at the intake with a 2.5m width. The Ganabia 2 has a lengh of 3.450kms and a Command Area of 880 Acres. Its bed width is ~1.5m. side slope of 1:1, and a longitudinal slope of 5cm/km.
31	7.200 +7.300	Intake of Om Rabeha Canal			Canal Intake	The Intake of Om Rabeha Canal is at the left side of Kased Canal. It has a length of 3.660kms Command Area of 900 acres. The intake gate is 2.5m width. The canal has a bed width of 1.5m, a side slope of 1:1, and a longitudinal slope of 8cm/km. The intake is of a very deteriorating condition and needs a replacement.
32	7.200 +7.700	Bridge Meat El Sudan			Bridge	The bridge has two sheet piles supports and is of a very good condition. The length of the bridge is ~18m.
33	7.200 +8.100	Cross-section on the Kased Canal			Canal Cross-section	The canal start turning towards the left direction. The section has a bed width of ~18m, a side slope of 1:1, and a longitudinal slope of 5cm/km. The section is of a very good condition.

No	Distance from Kased Dalil (Kms)	Name	Length (km)	Area served (Fed)	Facility Type	Description/Purpose
34	7.200 +8.900	Cross-section on the Kased Canal			Canal Cross-section	The canal turs again towards the left direction. The section has a bed width of ~18m, a side slope of 1:1, and a longitudinal slope of 5cm/km. The section is of a very good condition.
35	7.200 +9.700	Cross-section on the Kased Canal			Canal Cross-section	The canal turs towards the right direction. The section has a bed width of ~18m, a side slope of 1:1, and a longitudinal slope of 5cm/km. The section is of a very good condition.
36	7.200 +10.200	Cross-section on the Kased Canal			Canal Cross-section	The canal turs again towards the right direction. The section has a bed width of ~18m, a side slope of 1:1, and a longitudinal slope of 5cm/km. The section is of a very good condition.
37	7.200 +10.400	Intake of El Nashwo Canal			Canal Intake	Intake of El Nashwo Smeala Canal is at right side of Kased Principal Canal. The intake has a gate of 1.25m width. The canal has a length of 4.160 Kms and a Command Area of 1900 Acres. The canal has a bed width at the intake of 2.5m.
38	7.200 +10.600	Khalila Bridge			Bridge	The bridge has one bricks support with a width of ~36m. The bridge is of a very good condition.
39	7.200 +11.250	Mehala Menouf Bridge			Bridge	This is a new bridge on steel sheet piles. The bridge is of an excellent condition.
40	7.200 +12.250	Mehala Menouf Regulator			Regulator	The regulator has 3 gates that are difficult to operate. length is ~32m and requires a complete replacement.
41	7.200 +12.500	Bahr Boreag Intake			Canal Intake	The canal is at the right side of Kased Principal Canal of a length of 3.570 Kms and a Command area of 1850 Acres. The gate has a 2m width gate that is not operating and needs replacement. The bed width is 2.5m, the side slope is 1:1, and the longitudinal slope is 10cm/km.
42	7.200 +12.700	Cross-section on the Canal			Floating screen	This section there is a floating screen for preventing passing of garbage formed by linked barrels all over the section. The section needs removal of the garbage.
43	7.200 +13.000	Cross-section on the Canal			Canal Cross-section	The canal is turning to the right. The section has a bed width of ~15m, a side slope of 1:1, and a longitudinal slope of 5cm/km. The section is of a very good condition.
44	7.200 +14.400	Azba El Far Bridge and Pedestrian Bridge			Bridges	Two bridges are located in this site. The first is a car transportation bridge and the second is a small pedestrian bridge. The two bridges have lengths of ~26m . The first bridge is constructed on concrete supports and needs some maintenance.
45	7.200 +16.200	Abo Gendi Bridge			Bridge	The bridge is constructed on two sheet piles. It has a measured length of ~31m and is of a good condition.
46	7.200 +16.500	Canal Intake of Ganabia 4			Canal Intake	The intake of Ganabia 4 has a 2m width gate and serving a canal length of 3.440 Kms and a Command Area of 360 Acres. The gate is of a good condition. The canal . bed width is 1m, side slope of 1:1, and longitudinal slope of 8m/km.
47	7.200 +17.800	Cross-section on the Canal			Canal Cross-section	The section has a bed width of ~13m, a side slope of 1:1, and a longitudinal slope of 5cm/km. The section is of a very good condition.
48	7.200 +18.000	Old Nabas Pedestrian Bridge			Bridge	The bridge is constructed on sheet piles. It has a measured length of ~33m and a width of 5m. The bridge needs maintenance for the metallic handrails.
49	7.200 +18.500	Intake of Damat Canal and Ganabia 5 with Nabas Bridge			Canal Intakes and Bridge	At this site there are two intakes for two canals as follows: i) Damat Canal (Length 11.540 Kms and a Command Area 4750 Acres) with bed width at intake of 4.5m, side slope of 1:1, and longitudinal slope of 5cm/km. 2) Ganabia 5 (Length of 1.805 Kms and a Command Area of 670 Acres). Both intakes are on the right side of Kased Principal Canal. The bridge is constructed on sheet piles and its length is measured as ~26m. The bridge is of a god condition.
50	7.200 +20.500	Saadon Bridge			Bridge	The bridge is constructed on two bricks supports. Its length is measured as ~24m. The bridge is of an excellent condition.

No	Distance from Kased Dalil (Kms)	Name	Length (km)	Area served (Fed)	Facility Type	Description/Purpose
51	7.200 +21.100	Canal Cross-section and Intake of El Ganabia 6			Canal Intake	The intake of El Ganabia 6 (Length of 1.640 Kms and a Command Area 185 Acres) is at the right side of Kased Principal canal. It has bed width at intake of 1m, side slope of 1:1, and longitudinal slope of 10cm/km. Kased Canal section has a bed width of ~12m, a side slope of 1:1, and a longitudinal slope of 10cm/km. The section is of an excellent condition.
52	7.200 +22.00	Intake of El Mestagada Canal			Canal Intake	The intake has a gate of 2.5m width and the gate is of a very good condition. The canal at the intake has a bed width of 1 m, side slope of 8cm/km, and a longitudinal slope of 10cm/km.
53	7.200 +22.700	Canal Intakes of Shoubra Balola and Serd Canal			Intakes	The intakes are on the right side of Kased Principal canal width a gate of 2.5m width. It serves two canals described as follows: 1) Shoubra Balola (Length of 6.00 Kms and a Command Area of 1900 Acres) which has a bed width of 3 m, side slope of 8cm/km, and a longitudinal slope of 8cm/km 2) Serd Canal (Length 7.850 Kms and a Command Area of 3900 Acres) and its intake has a length of 20m, length of 15m, and volume of 1050m3. The intake is constructed year 1937 from red bricks.
54	7.200 +22.750	Canal Intakes of Dalil El Thaaleb and El Samahat Canal			Intakes	The intakes are on the right side of Kased Principal canal. The intake of Dalil El Thaaleb serves a canal of a length 10.100 Kms and a Command Area of 2300 Acres, while the intake of El Samahat Canal has a length of 15.160 Ks and a Command Area of 9500 Acres. The intake of Dalil El Thaaleb has a bed width of 3m, side slope of 1;1, and a longitudinal slope of 6cm/km. The intake of El Samahat Canal has a bed width of 6m, side slope of 1;1, and a longitudinal slope of 5cm/km.
55	7.200 +23.00	Barrage and Regulator Sard			Barrage	The regulator has 4 new gates each with 2m width. The gates operate in an excellent condition. The barrage has a length of 20m, width of 15m, and volume of $1050m^3$.
56	7.200 +24.100	Canal Cross-section on Kased			Canal Cross-section	The section has a bed width of ~5m, a side slope of 1:1, and a longitudinal slope of 5cm/km. The section is of a good condition, but requires some cleaning from garbage
57	7.200 +25.800	Khalbata Bridge			Bridge	This is an old Arch bridge constructed on 3 bricks supports. Its bridge length was measured as ~24m. The site is close to Railway of Tanta-Kafr El Sheikh.
58	7.200 +26.700	Canal Cross-section on Kased			Canal Cross-section	The section has a bed width of ~8m, a side slope of 1:1, and a longitudinal slope of 15cm/km. The section is of a very good condition.
59	7.200 +27.200	El Atwa Qeblia Bridge			Bridge	The bridge is constructed on two sheet piles supports. The site has a dense residential area. The bridge length was measured as ~30m and is of a very good condition.
60	7.200 +28.000	El Atwa Bahria Bridge			Bridge	The bridge is constructed on one bricks support. Its length was measured as ~24m and is of a vey good condition.
61	7.200 +29.000	Canal Cross-section on Kased			Canal Cross-section	The section has a bed width of ~5m, a side slope of 1:1, and a longitudinal slope of 15cm/km. The section is of a good condition.
62	7.200 +30.200	Mizar Bridge and Intakes of El Gamayel El Qeblia and Shono Canals			Bridge and canal intake	The bridge has two bricks supports. Its bridge length was measured as ~21m. In the same sport there are the intakes of El Gamayel El Qeblia Cana l (Length of 3.000 Kms and a Command Areas of 1550 Acres). The section at intake has a bed width of 2m, a side slope of 1:1, and a longitudinal slope of 3cm/km. The Shono Canal (Length of 5.600 kms and a Command Area of 997 Acres). The section at intake has a bed width of 2m, a side slope of 1:1, and a longitudinal slope of 10cm/km.

No	Distance from Kased Dalil (Kms)	Name	Length (km)	Area served (Fed)	Facility Type	Description/Purpose
63	7.200 +31.600	Azba Abo Aly Bridge			Bridge	The bridge length was measured as ~11m
64	7.200 +33.400	Osman Bridge			Bridge	The bridge was constructed with two sheet piles supports. Its measure length is 32m and is of an excellent condition.
65	7.200 +33.700	Intake of Rowina Canal			Canal Intake	The canal has 3 gates each of 2m width. The intake is located at the left side of Kased Principal Canal and needs some routine maintenance.
66	7.200 +34.200	Intake of El Shakria Canal			Canal Intake	El Shakria Intake has a gate of 1.5m width. The canal is located at the left side of Kased Principal Canal and needs intensive cleaning from dense garbage.
67	7.200 +34.500	Intake of El Gamayel El Baharia			Canal Intake	El Gamayel El Baharia intake has a gate of 1.5m width. The intake serves a canal of length of 4.200 Kms and Command Area of 1650 Acres.. The canal has a bed width of 2.5m, a side slope of 1:1, and it is horizontal. This point is the end of Kased Canal.

ANNEX3 : Inventory of Irrigation Facility (Principal Canals, Sample Area, Model Area and Others)

Irrigation facility in the Target Area Condition rank A: Total Replacement, B: Rehabilitation + partial replacement, C:Rehabilitation, D:Simple Maintenance,

No	Irr Unit	ID	Location	Name Of Structure	Type of structure	Nomber of Gates	Gate Width	X	Y	Construction year	Feddan	Necessary work	Condition Rank
	Ibrahimia Principal Canal												
1		East Abu Kurka	Ibrahimia	El Ibrahimia@Dairotout Regulator	Intake			27.55874	30.81261	1873		Under D/D for improvements	-
2		East Abu Kurka	Ibrahimia	Serry	Intake								D
3		East Abu Kurka	Ibrahimia	Old Hafez	Regulator			27.80787	30.80648	1928		Requires its removal	A
4	East Hafez	East Abu Kurka	Ibrahimia	Hafez Canal El East	Intake	2	2.5	27.80794	30.80644	1930	6,520	One of the gates needs repair	A
5	East Hafez	East Abu Kurka	Ibrahimia	Hafez Canal El west	Intake	2	2.5	27.80794	30.80644	1930	6,520		C
6		East Abu Kurka	Ibrahimia	New Hafez	Regulator	5	4	27.81354	30.80458	1989			D
7			Ibrahimia	Magotha	Spillway		2.2	28.04947	30.78790				D
8	El Disout	East Samalout	Ibrahimia	Dasout Canal	Intake	1	2.5	28.07332	30.76346	1930	2,500		D
9		East Samalout	Ibrahimia	Old El Minia	Regulator			28.08571	30.75752	1902		Requires its removal	A
10	El Sefsafa	East Samalout	Ibrahimia	Sefsafa Canal	Intake	1	1.5	28.12450	30.74224	1940	8,400		D
11			Ibrahimia	Abo Swelm	Intake	1	1.5	28.14036	30.73534	1940	1,100		D
12		East Samalout	Ibrahimia	New Minia	Regulator	5	4	28.13607	30.73694	1993			D
13	El Sefsafa	East Samalout	Ibrahimia	El Brgaya	Feeder	1	1.5	28.16129	30.72721	1981			D
14	El Sefsafa	East Samalout	Ibrahimia	Sefsafa Branch	Intake	1	1.5	28.18889	30.72628	1981			D
15			Ibrahimia	El Gabry	Feeder	1	1.5	28.20537	30.72684	1981			D
16	El Sefsafa	East Samalout	Ibrahimia	Sefsafa Branch3	Intake	1	2	28.22723	30.72759	1981			D
17			Ibrahimia	El Hathya	Feeder	1	1.5	28.23824	30.72796	1981			D
18			Ibrahimia	El Beaho	Feeder	1	1.5	28.27199	30.72804	1981			D
19	El Sefsafa	East Samalout	Ibrahimia	Sefsafa Branch4	Intake	1	1.5	28.29467	30.71936	1981			D
20	Samalout	East Samalout	Ibrahimia	Samalout	Intake	1	2	28.31148	30.71304	1940	2,200		D
21			Ibrahimia	West El Hatya	Feeder	1	2	28.33492	30.71136	1981			D
22	El Sefsafa	East Samalout	Ibrahimia	El Sefsafa At Dawod Exit	Feeder	1	2	28.34623	30.72966	1981			D
23	Nazlah Kolosna	Matay	Ibrahimia	Nazlah Kolosna	Feeder	1	1.5	28.35314	30.74549	1981			D
24	Abo Essa	Matay	Ibrahimia	Abo Essa	Intake	1	1.5	28.38520	30.76729	1940			D
25	Adakak	Matay	Ibrahimia	Dakak Canal	Intake	1	2	28.38873	30.76963	1940			D
26	Right Adkak Gnabia	Matay	Ibrahimia	Right Dakak Gnabia	Intake	1	1.5	28.38873	30.76963	1940			D
27	Left Adkak Gnabia	Matay	Ibrahimia	Left Dakak Gnabia	Intake	1	1.5	28.38873	30.76963	1940			D
28	Darwish	Matay	Ibrahimia	Darwish & Shoaib	Intake	1	4	28.41053	30.78391	1940	3,600		D
29		Matay	Ibrahimia	Matay	Regulator	6		28.41568	30.78734	1985	1,150		D
30	Matay&Other	Matay	Ibrahimia	Matay	Feeder	1	1.5	28.42771	30.79516	2005			D
31	Matay&Other	Matay	Ibrahimia	El Kofour	Feeder	1	1.5	28.44912	30.80920	2005			D
32	Matay&Other	Matay	Ibrahimia	El Saadia	Feeder	1	1.5	28.46439	30.81640	2005	3,240		D
33	Matay&Other	Beni Mazar	Ibrahimia	Bashir	Intake	1	2	28.51441	30.79928	1978			D
34	Matay&Other	Beni Mazar	Ibrahimia	Abo Asear El Qeblia	Intake	1	2.5	28.53090	30.80248	1978			D
35	Matay&Other	Beni Mazar	Ibrahimia	Zebony East Canal	Feeder	1	1.5	28.55520	30.80797	1981			D
36	El Gharabawy	Beni Mazar	Ibrahimia	El Gharabawy	Feeder	1	3	28.57073	30.81153	1981			D
37	El Gharabawy	Beni Mazar	Ibrahimia	Mahgoub	Intake	1	1.5	28.58038	30.81363	1978			D
38	Aba West	East Maghagha	Ibrahimia	Aba West Canal	Intake	1	2.5	28.59135	30.81618	1978			D
39	Dahrout	East Maghagha	Ibrahimia	Dahrout El Qeblia	Intake	1	2	28.59597	30.81714	1971	560		D

ANNEX3-1

Irrigation facility in the Target Area Condition rank A: Total Replacement, B: Rehabilitation + partial replacement, C:Rehabilitation, D:Simple Maintenance,

No	Irr Unit	ID	Location	Name Of Structure	Type of structure	Nomber of Gates	Gate Width	X	Y	Construction year	Feddan	Necessary work	Condition Rank
40	Dahrout	East Maghagha	Ibrahimia	Dahrout El Bahrya	Intake	1	2	28.61284	30.82099	1971	1,500		D
41	Atta Allah	East Maghagha	Ibrahimia	Atta Allah	Intake	1	2	28.62743	30.82430	1940	1,200		D
42	El Gendeia	East Maghagha	Ibrahimia	El Gendeia	Intake	2	3	28.63533	30.82616	1940			D
43	El Gendeia	East Maghagha	Ibrahimia	Ganabia El Ghasheba	Intake			28.63533	30.82616				B
44	Maghagha&Elfashnya	East Maghagha	Ibrahimia	Maghagha	Intake	3	3	28.64818	30.83655	1940			D
45	Maghagha&Elfashnya	East Maghagha	Ibrahimia	East El Ghashiba	Intake	1	2.5	28.64860	30.83691	1940			D
46		East Maghagha	Ibrahimia	Maghagha	Regulator	5	3	28.64871	30.83702				D
47		East Maghagha	Ibrahimia	Maghagha	Weir			28.65850	30.84564			The structure is eroded and needs repair	C
48	El Fant	El Fashen	Ibrahimia	El Fant	Intake	1	2	28.70923	30.85715	1940	14,400		D
49	Saidia El Fashneia	El Fashen	Ibrahimia	Saidia El Fashneia	Intake	1	2	28.73177	30.86174	1940	63,000	The structure needs slight repair	C
50	El Fashneia	El Fashen	Ibrahimia	El Fashneia Qebleia	Intake	1	1.2	28.73226	30.86184	1940	5,030		D
51	El Fashneia	El Fashen	Ibrahimia	El Fashneia El Wasta	Intake	1	2	28.77714	30.88014	1940	225		D
52	El Fashneia	El Fashen	Ibrahimia	El Fashneia Bahreia	Intake	1	2	28.79122	30.88619	1940	7,610		D
53	El Fashneia	El Fashen	Ibrahimia	Abadia East Canal	Intake	1	2	28.81120	30.89511	1940	700	The Structure Is Eroded And Needs Maintenance	C
54	Abo Shosha	Somsta	Ibrahimia	Abo Shosha Canal	Intake	2	2	28.83189	30.90659	1940	42,484		D
55	Abo Shosha	Somsta	Ibrahimia	Gnabia Abo Shosha East	Intake	1	2	28.83189	30.90659	1940			D
56	Abo Shosha	Somsta	Ibrahimia	Gnabia Abo Shosha West	Intake	1	2	28.83189	30.90659	1940			D
57		Beba	Ibrahimia	El Sharahna	Spillway	3	3	28.85117	30.91293				D
58	Abshoug	El Fashen	Ibrahimia	Abshoug	Intake	1	3	28.85129	30.91299	1940	19,580		D
59	El Soltani	Somsta	Ibrahimia	El Soltani	Intake	3	3	28.85152	30.91305	1940	16,500		D
60	South Ahmed Basha	Beba	Ibrahimia	Ahmed Basha Qebleia	Intake	1	2	28.85177	30.91312	1940	25,900		D
61		Beba	Ibrahimia	El Sharahna	Regulator	4	4	28.85205	30.91333			The structure needs slight repair	C
62	North El Sharahna North	Beba	Ibrahimia	El Sharahna Bahareia	Intake	1	3	28.92969	30.98540	1940	8,380		D
63	North Ahmed Basha	Beba	Ibrahimia	Ahmed Basha Bahareia	Intake	1	2	28.93381	30.98679	1940	10,385	The structure needs slight repair	C
64	Abo Romh	Beba	Ibrahimia	Abo Romh	Intake	1	2	28.99739	31.01201	1940	250		D
65	Magroufa	East Beni Suef	Ibrahimia	El Magroufa El Gharbeia	Intake	1	1.2	29.00718	31.01899	1940			D
66	Tansa Left Gnabia	East Beni Suef	Ibrahimia	Tansa Left Gnabia	Intake	1	1.2	29.00951	31.02068	1940			D
67	Tansa Sub Branch	East Beni Suef	Ibrahimia	Tansa Sub Branah	Intake	1	1.2	29.00951	31.02068	1940			D
68	Tansa Right Canal	East Beni Suef	Ibrahimia	Tansa Right Canal	Intake	1	1.2	29.00951	31.02068	1940			D
69	Shikh Haroon	East Beni Suef	Ibrahimia	Shikh Haroon	Intake	1	1.5	29.04840	31.04859	1940	2,050		D
70	Tazment	East Beni Suef	Ibrahimia	Tazment	Intake	1	1.5	29.04840	31.04859	1940	3,900		D

ANNEX3-2

Irrigation facility in the Target Area Condition rank A: Total Replacement, B: Rehabilitation + partial replacement, C:Rehabilitation, D:Simple Maintenance,

No	Irr Unit	ID	Location	Name Of Structure	Type of structure	Nomber of Gates	Gate Width	X	Y	Construction year	Feddan	Necessary work	Condition Rank
71	Shikh Haroon Gnabia	East Beni Suef	Ibrahimia	Shikh Haroon Gnabia	Intake	1	1	29.05549	31.05362	1940	500		D
72	New Bani Suif	East Beni Suef	Ibrahimia	New Bani Suif	Intake	1	1.5	29.06677	31.06178	1940			D
73	Ahnasia	East Beni Suef	Ibrahimia	Ahnasia	Intake	1	1.5	29.06677	31.06178	1940			D
74	Bani Haroon	East Beni Suef	Ibrahimia	Bani Haroon	Intake	1	1	29.07223	31.06998	1940	400		D
75	El Azhari	West Beni Suef	Ibrahimia	El Azhari	Intake	2	2	29.07467	31.08346	1940	11,000	The structure needs slight repair	C
76	El Sahara	East Beni Suef	Ibrahimia	El Sahara	Intake	1	2	29.07484	31.08423	1940	17,930		D
77	Al-Saida	West Beni Suef	Ibrahimia	El Saida	Feeder	2	3	29.07484	31.08423				D
78		West Beni Suef	Ibrahimia	El Genidi	Regulator	3	4	29.09329	31.10790	1940			D
79	El Genidi	West Beni Suef	Ibrahimia	El Genidi	Intake	2	1.2	29.09419	31.10842	1940	3,066		D
80	Bosh	Nasr	Ibrahimia	Bosh	Intake	2	4	29.14278	31.13644	1940	11,400		D
81	Bosh	Nasr	Ibrahimia	New Bosh	Intake	1	2.5	29.15303	31.14237	1940	1,443		D
82		Nasr	Ibrahimia	El Zayton	Intake	1	1.2	29.18055	31.15832	1940	2,060	The gate is eroded and needs repair	B
83	South Ashment	Nasr	Ibrahimia	Ashment Qebleia	Intake			29.18803	31.16260	1940	6,020		D
84	El Mansour	Nasr	Ibrahimia	El Mansour Left Gnabia	Intake	1	1	29.18962	31.16354	1940	465		D
85	El Mansour	Nasr	Ibrahimia	El Mansour Canal	Intake	1	4	29.18975	31.16363	1940	4,900		D
86	El Mansour	Nasr	Ibrahimia	El Mansour Right Gnabia	Intake	1	1	29.18990	31.16370	1940	510		D
87			Ibrahimia	Ashment	Regulator	2	3.5	29.19027	31.16389	1940			D
88	North Ashment	El Wasta	Ibrahimia	Ashment El Bahareia	Intake	1	3	29.21667	31.17920	1940	7,000		D
89	South Qashisha	Nasr	Ibrahimia	El Maymoun El Gharbeia	Intake	1	1.2	29.24070	31.19291	1940	17,350		D
90		El Wasta	Ibrahimia	El Maymoun El Bahareia	Intake	1	2	29.24893	31.19458	1940	230		D
91		El Wasta	Ibrahimia	Kashisha El Wasta	Intake	1	2	29.26453	31.19232	1940	11,240		D
92		El Wasta	Ibrahimia	El Wasta El Qebly	Regulator			29.32796	31.19604	1940			D
93		El Wasta	Ibrahimia	El Wasta El Bahary	Regulator	3		29.34749	31.20295	1940			D
94		El Wasta	Ibrahimia	Gerza El Qebly	Regulator	1	4	29.42813	31.19229	1940			D
95		El Wasta	Ibrahimia	Gerza El Seify	Intake	1	1.2	29.43050	31.19506	1940	378		D
96		El Wasta	Ibrahimia	El Seify	Intake	1	1.2	29.44329	31.20500	1940			D
97		El Wasta	Ibrahimia	Kafr Turk	Intake	1	1.2	29.44329	31.20500	1940			D
98		El Wasta	Ibrahimia	El Barghouty Branch	Intake	1	1.2	29.44329	31.20500	1940	100	The structure needs slight repair	C
99		El Wasta	Ibrahimia	Kafr Gerza	Intake	1	1.2	29.44329	31.20500	1940	800	The structure needs slight repair	C
100		El Wasta	Ibrahimia	El Barghouty Canal	Intake	1	2	29.44329	31.20500	1940	2,150	The structure needs slight repair	C
101		El Wasta	Ibrahimia	Gerza El Bahary	Regulator	1	2.5	29.44339	31.20512	1940		The structure needs slight repair	C
102		El Wasta	Ibrahimia	Kafr Turk	Regulator	1	4	29.48199	31.22713	1940			D
103		El Wasta	Ibrahimia	Kafr Ammar	Intake	1	2	29.50127	31.23420	1940	914		D
104		El Wasta	Ibrahimia	Maktafia	Intake	1	4	29.50127	31.23420	1940			D
105		El Wasta	Ibrahimia	Kafr Ammar	Regulator	1	3	29.50133	31.23428	1940		The structure needs slight repair	C
106		El Wasta	Ibrahimia	Bemha	Intake	1	2	29.53014	31.25142	1950	100		D

Irrigation facility in the Target Area Condition rank A: Total Replacement, B: Rehabilitation + partial replacement, C:Rehabilitation, D:Simple Maintenance,

No	Irr Unit	ID	Location	Name Of Structure	Type of structure	Nomber of Gates	Gate Width	X	Y	Construction year	Feddan	Necessary work	Condition Rank
107		El Wasta	Ibrahimia	Village Meet El Kaed	Regulator	1	2.5	29.53034	31.25146	1940			D
	Sumple area West Hafez												
108	West Hafez	East Abu Kurka	Ibrahimia	Hafez Gharbeia	Intake	1	2.5	27.80795	30.80647	1940	11,943	The structure needs slight repair	C
109		East Abu Kurka	Ibrahimia	El Mahras	Regulator	2	2	27.82457	30.79658	1940		The rgulator needs replacement	A
110	West Hafez	East Abu Kurka	Ibrahimia	El Gahsha	Intake	1	1.25	27.89539	30.79869	1940	660		D
111	West Hafez	East Abu Kurka	Ibrahimia	Safay	Regulator	1	4	27.89768	30.79950	1940			D
112	West Hafez	East Abu Kurka	Ibrahimia	Atledm	Intake	2	2.5	27.85795	30.79829	1940	2,900		D
113	West Hafez	East Abu Kurka	Ibrahimia	Deyab	Intake	1	2	27.85075	30.78478	1940	2,900	The gate requires slight repair	C
114	West Hafez	East Abu Kurka	Ibrahimia	Dairotia	Regulator	2	3	27.93040	30.80344	1940			D
	Sumple area El Gendia												
115	El Gendia	East Maghagha	Ibrahimia	El Gendia	Intake	2	3	28.63519	30.82611	1940	8,970	The intake structure needs slight repair	C
116		East Maghagha	Ibrahimia	El Gharb	Regulator	1	3	28.66468	30.80946	1940			D
117	El Gendia	East Maghagha	Ibrahimia	El Seka El Zraaia	Intake			28.65920	30.81540	1940	900	There is no gate and needs a new gate	B
118	El Gendia	East Maghagha	Ibrahimia	Kafr El Madawer	Intake	1	2	28.65964	30.81561	1940	600		D
119	El Gendia	East Maghagha	Ibrahimia	Ban El Allam3	Intake	1	1.5	28.68321	30.78793	1940		The gate requires replacement	A
120	El Gendia	East Maghagha	Ibrahimia	El Sawy	Regulator			28.71207	30.80069	1940		There is no gate and needs a new gate	B
121		East Abu Kurka	Ibrahimia	Old Serry	Intake			27.80391	30.80806	1940	120,000		D
	Sumple area/Model area Tansa												
122	Tansa	East Beni Suef	Ibrahimia	Tansa Connection	Intake	2	3	29.00951	31.02068	1940	16,000	The structure needs slight repair	C
123		East Beni Suef	Ibrahimia	Barut	Mixing Pump			306960.598	3214935.553	1994		Reconstruction	A
124		East Beni Suef	Ibrahimia	El Hagary	Mixing Pump			308663.860	3217661.560			Need suction pool and some maintenance	B
125	Tensa	Ahnasia	Ibrahimia	Kella	Intake	2	3	304622.0	3211431.1			The gate requires replacement	B
126	Tensa	Ahnasia	Ibrahimia	Bani Ahmed	Intake		1	304468.4	3211192.0			Rehabilitation of grooves and replacement of gate	C
127	Tensa	Ahnasia	Ibrahimia	El Mashrake	Intake		0.95	304199.3	3210969.6			Rehabilitation of grooves and replacement of gate	C
128		Ahnasia	Ibrahimia	Beba End	Regulator		2.5	303988.8	3210655.8			Rehabilitation of grooves and replacement of gate	B
129	Tensa	Ahnasia	Ibrahimia	Kella Branch	Intake		1	305204.5	3212310.2			Rehabilitation of grooves and replacement of gate	C
130	Tensa	Ahnasia	Ibrahimia	Kella Branch1	Intake		0.6	303712.3	3213478.3		700	Replacement of gate and simple rehabilitaion on side walls	C

Irrigation facility in the Target Area Condition rank A: Total Replacement, B: Rehabilitation + partial replacement, C:Rehabilitation, D:Simple Maintenance,

No	Irr Unit	ID	Location	Name Of Structure	Type of structure	Nomber of Gates	Gate Width	X	Y	Construction year	Feddan	Necessary work	Condition Rank
131	Tensa	Ahnasia	Ibrahimia	Towa	Intake			303661.9	3214038.0			Installation of new sluice gate	A
132	Tensa	Ahnasia	Ibrahimia	Kella	Regulator	2	3	303675.4	3214054.7	1842		Rehabilitation of grooves and replacement of gate	B
133	Tensa	Ahnasia	Ibrahimia	Kella Old Left&Right	Intake			303675.4	3214054.7		360	Replacement of gate and simple rehabilitaion on side walls	C
134	Tensa	Ahnasia	Ibrahimia	Towa Branch 1	Intake	1	1	303283.5	3214403.2		200	Replacement of gate and simple rehabilitaion on side walls	C
135	Tensa	Ahnasia	Ibrahimia	El Masead	Intake	1	1.5	302987.9	3214831.5		1,400	Replacement of gate and simple rehabilitaion on side walls	C
136	Tensa	Ahnasia	Ibrahimia	Kella New Left&Right	Intake		1	305202.9	3216698.8	2002			D
137	Tensa	West Beni Suef	Ibrahimia	Kella	Mixing Pump			304439.000	3221237.040			Need suction pool and some maintenance	B
138	Tensa	West Beni Suef	Ibrahimia	Nwera	Branch	1	2	305011.1	3222756.8				D
139	Tensa	West Beni Suef	Ibrahimia	Zazoa	Intake	1	1	304538.3	3222827.1		800		D
140		West Beni Suef	Ibrahimia	Bahbashin	Intake			305958.0	3223894.6				D
141	Tensa	West Beni Suef	Ibrahimia	Baha	Regulator		3	306141.4	3224531.9			Replacement of gate and rehabilitation of side wall	A
142	Tensa	West Beni Suef	Ibrahimia	Baha	Mixing Pump			312222.710	3233992.880			Need suction pool and some maintenance	B
143	Tensa	West Beni Suef	Ibrahimia	Dandel	Regulator			307120.5	3225341.6		5,500	Replacement of gate and rehabilitation of side wall	A
144	Tensa	West Beni Suef	Ibrahimia	Dandel	Mixing Pump			313383.950	3229767.870			Need suction pool and some maintenance	B
	Model Area Aboshousha												
145	Abo Shosha	El Fashen	Ibrahimia	Abo Shosha	Intake	3	2	295736.0	3191130.0			The gate requires replacement	B
146		El Fashen	Ibrahimia	Sahar Dir	Aqueduct			292492.0	3192479.0				D
147	Absouge	El Fashen	Ibrahimia	Beni Saleh	Aqueduct			292279.0	3192565.0				D
148	Abo Shosha	El Fashen	Ibrahimia	Aboshosha Branch1	Intake	1	1	291850.0	3192196.0			The gate requires replacement	B
149	Elabaadya	El Fashen	Ibrahimia	Aref	Intake	1	1	291581.0	3192198.0			The gate requires replacement	B
150	Elabaadya	El Fashen	Ibrahimia	Aboshosha Branch2	Intake	1	1	291239.0	3192202.0			The gate requires replacement	B
151	Elabaadya	El Fashen	Ibrahimia	Aboshosha Branch3	Intake	1	1	289424.0	3192232.0			The gate requires replacement	B
152	Abo Shosha	Somsta	Ibrahimia	Moheit Drain	Aqueduct			288013.0	3192261.0			Aqueduct needs concrete cover	B
153	Abo Shosha	Somsta	Ibrahimia	Talt	Intake	1	1	287973.0	3192284.0			The gate requires replacement	B

Irrigation facility in the Target Area Condition rank A: Total Replacement, B: Rehabilitation + partial replacement, C:Rehabilitation, D:Simple Maintenance,

No	Irr Unit	ID	Location	Name Of Structure	Type of structure	Nomber of Gates	Gate Width	X	Y	Construction year	Feddan	Necessary work	Condition Rank
154	Abo Shosha	Somsta	Ibrahimia	Talt feeder Pump station	Mixing Pump			288613.000	3195405.000			Need suction pool and some maintenance	B
155	Abo Shosha	Somsta	Ibrahimia	Talt Branch	Intake	1	1	287360.9	3192278.9			The gate requires replacement	B
156	Abo Shosha	Somsta	Ibrahimia	Shawqy Branch	Intake	1	1	287338.2	3192260.3			The gate requires replacement	B
157	Abo Shosha	Somsta	Ibrahimia	Hanna Branch	Intake	1	1	286843.3	3192216.7			The gate requires replacement	B
158	Abo Shosha	Somsta	Ibrahimia	Tawfik Branch	Intake	1	1	286280.1	3193081.0			The gate requires replacement	B
159	Abo Shosha	Somsta	Ibrahimia	Rolea	Regulator	2	2.5	286415.0	3195183.0			The gate requires replacement	B
160	Abo Shosha	Somsta	Ibrahimia	Abo Shousha Branch1	Intake	1	1	286549.7	3195697.7			The gate requires replacement	B
161	Abo Shosha	Somsta	Ibrahimia	Mazora	Box culvert			286778.0	3196758.0			The structure needs slight repair	C
162	Abo Shosha	Somsta	Ibrahimia	Kamon Branch	Intake	1	1	286896.1	3197223.5			The gate requires replacement	B
163	Abo Shosha	Somsta	Ibrahimia	Saharit Mazoura Pump Station	Mixing Pump			287221.000	3198499.000			Need suction pool and some maintenance	B
164	Abo Shosha	Somsta	Ibrahimia	Saharit Mazoura	Aqueduct	3	1	287262.7	3198466.1			Aqueduct needs concrete cover	B
165	Abo Shosha	Somsta	Ibrahimia	Mazora Branch	Intake	1	1	287517.9	3198890.2			The gate requires replacement	B
166	Abo Shosha	Somsta	Ibrahimia	Bellawy Branch	Intake	1	1	287770.2	3199646.0			The gate requires replacement	B
167	Abo Shosha	Somsta	Ibrahimia	Naser Branch	Intake	1	1	288174.3	3200804.7			The gate requires replacement	B
168	Abo Shosha	Somsta	Ibrahimia	Sheikh Abed regulator	Regulator	2	2.5	288172.7	3200831.5			The gate requires replacement	B
169	Abo Shosha	Somsta	Ibrahimia	Bane Rashed	Box culvert			288110.5	3201333.7			The structure needs slight repair	C
170	Abo Shosha	Somsta	Ibrahimia	Sheikh Abed	Intake	2	2.5	289460.6	3204041.8			The gate requires replacement	B
171	Abo Shosha	Somsta	Ibrahimia	Boab Spillway	Spillway			289802.5	3204385.4			The gate requires replacement	B
172	Abo Shosha	Somsta	Ibrahimia	Waleeda Branch	Intake	1	1	290488.4	3205338.5			The gate requires replacement	B
173	Abo Shosha	Somsta	Ibrahimia	Qasaba Branch	Intake	1	1	290780.5	3206137.5			The gate requires replacement	B
174	Abo Shosha	Somsta	Ibrahimia	Aboshosha Branch 1	Intake	1	1	290906.3	3206710.6			The gate requires replacement	B
175	Abo Shosha	Somsta	Ibrahimia	Saleed	Regulator	1	2.5	290898.2	3206720.0			The gate requires replacement	B

Irrigation facility in the Target Area Condition rank A: Total Replacement, B: Rehabilitation + partial replacement, C:Rehabilitation, D:Simple Maintenance,

No	Irr Unit	ID	Location	Name Of Structure	Type of structure	Nomber of Gates	Gate Width	X	Y	Construction year	Feddan	Necessary work	Condition Rank
176	Abo Shosha	Somsta	Ibrahimia	Aboshosha Branch 2	Intake	1	1	292492.8	3208618.7			The gate requires replacement	B
177	Abo Shosha	Somsta	Ibrahimia	Dushtot	Intake	1	1	292364.0	3209092.0			The gate requires replacement	B
178	Abo Shosha	Somsta	Ibrahimia	Boushra	Intake	1	1	288545.1	3195323.4			The gate requires replacement	B
179	Abo Shosha	Somsta	Ibrahimia	Boushra	Siphone			288581.1	3195376.5			The structure needs slight repair	C
180	Abo Shosha	Somsta	Ibrahimia	Sleem Bek	Intake	1	1	288650.0	3195508.0			The gate requires replacement	B
181	Abo Shosha	Somsta	Ibrahimia	Branch1	Intake	1	1	289274.4	3196890.9			The gate requires replacement	B
182	Abo Shosha	Somsta	Ibrahimia	Shafiq	Intake	1	2	289224.3	3196722.1			The gate requires replacement	B
183	Abo Shosha	Somsta	Ibrahimia	Talt Regulator	Regulator	1	1	289703.0	3197875.0			The gate requires replacement	B
184	Abo Shosha	Somsta	Ibrahimia	Branch2	Intake	1	1	289680.0	3197858.0			The gate requires replacement	B
185	Abo Shosha	Somsta	Ibrahimia	Branch3	Intake	1	1	290169.1	3198732.7			The gate requires replacement	B
186	Abo Shosha	Somsta	Ibrahimia	Sheik Abed Branch 3	Intake	1	1	289609.5	3203583.6			The gate requires replacement	B
187	Abo Shosha	Somsta	Ibrahimia	Sheik Abed	Regulator	1	2	289581.0	3203559.2			The gate requires replacement	B
188	Abo Shosha	Somsta	Ibrahimia	Sheik Abed Branch 2	Intake	1	1	289443.3	3203327.2			Gate and wall need some repair	B
189	Abo Shosha	Somsta	Ibrahimia	Sheik Abed Branch 1	Intake	1	1	288599.2	3201954.6			The gate requires replacement	B
190	Abo Shosha	Somsta	Ibrahimia	Dushtot	Pump Station	1	2.1	292223.114	3207958.223	1997		Need suction pool and some maintenance	B
191	Abo Shosha	Somsta	Ibrahimia	Dashtot Blanch 1	Intake	1	1	292508.0	3209452.0			The gate requires replacement	B
192	Abo Shosha	Somsta	Ibrahimia	Dashtot Blanch 2	Intake	1	1	292895.0	3210213.0			The gate requires replacement	B
193	Abo Shosha	Somsta	Ibrahimia	Kom El Noor	Pump Station	1	1	294434.1	3210772.0			Need suction pool and some maintenance	B
	Bahr Yousef Principal Canal												
194			Bahr Yusef	Badraman	Drain Pump			276303.0	3062259.0	2012	85,000	Need some Maintenance	C
195	Bahr Yusef	Melwy	Bahr Yusef	Arab Bani Khalid	Pump Station			277375.0	3077148.0	1975	15,000	Need building and some maintenance	B
196	Bahr Yusef	Melwy	Bahr Yusef	Bani Khalid	Pump Station			276788.0	3080073.0		12,000	Need some Maintenance	C
197			Bahr Yusef	KapKap	Drain Pump			276412.2	3085766.9		60,000	Need some Maintenance	C
198			Bahr Yusef	Tuna	Drain Pump			274844.0	3086441.4		18,000	Need some Maintenance	C

Irrigation facility in the Target Area Condition rank A: Total Replacement, B: Rehabilitation + partial replacement, C:Rehabilitation, D:Simple Maintenance,

No	Irr Unit	ID	Location	Name Of Structure	Type of structure	Nomber of Gates	Gate Width	X	Y	Construction year	Feddan	Necessary work	Condition Rank
199	Mousa	Monshat El Dahab	Bahr Yusef	Mousa	Intake	1	1	275083.0	3086202.0		300	Setting small pump for winter irrigation and rehabilitating gate	B
200	Asment	Monshat El Dahab	Bahr Yusef	Asment	Intake	1	1	274831.0	3087442.0		400	Setting small pump for winter irrigation	D
201	Khor blansoura	Monshat El Dahab	Bahr Yusef	Khor blansoura	Intake	1	1	273421.0	3090164.0		100	Setting small pump for winter irrigation	D
202	Blansoura	Monshat El Dahab	Bahr Yusef	Blansoura	Intake	1	1	273232.0	3090368.0		300	Setting small pump for winter irrigation	D
203	Sultan Hassan	Monshat El Dahab	Bahr Yusef	Sultan Hassan	Intake	11	1	272565.0	3092093.0		200	Setting small pump for winter irrigation	D
204	El Nabt	Monshat El Dahab	Bahr Yusef	El Nabt	Intake	1	1	273106.0	3096635.0		200	Setting small pump for winter irrigation	D
205	Mabrouk	Monshat El Dahab	Bahr Yusef	Mabrouk	Intake	1	1	272930.0	3097318.0		300		D
206	Monshat El Dahab	Monshat El Dahab	Bahr Yusef	Monshat el dahab	Intake	1	2.5	272521.0	3099115.0		50,400	The structure needs slight repair	C
207	Sabaa	Edwa	Bahr Yusef	Ganbid Tokh	Intake	1	2	272536.3	3099091.3		1,600	The structure needs slight repair	C
208	Sabaa	Edwa	Bahr Yusef	El Dahab	Regulator	4		272894.0	3098874.0				D
209	Sabaa	Edwa	Bahr Yusef	Moati Faragallah	Feeder			269450.0	3123965.0			The structure needs slight repair	C
210			Bahr Yusef	Nasir	Feeder	1	1	269965.9	3134868.9			The structure needs slight repair	C
211			Bahr Yusef	Faragalbe	Feeder	1	2	269227.6	3137380.4			The structure needs slight repair	C
212			Bahr Yusef	Terfz Mamafi	Feeder		1.1	267478.9	3141871.7			The structure needs slight repair	C
213			Bahr Yusef	Mwati Abjaj	Feeder			269923.9	3148491.3			The structure needs slight repair	C
214	Saba	Edwa	Bahr Yusef	El Bahnese	Intake	2	1.85	271127.8	3161424.1	2012	5,000	The structure needs slight repair	C
215	Sahlel EL Bahnasa	Edwa	Bahr Yusef	Sahlel EL Belnesa	Intake	1	1.3	272032.1	3161357.8		500	The structure needs slight repair	C
216		Edwa	Bahr Yusef	Saba	Intake			272853.9	3163829.8			The structure needs slight repair	C
217	Sakoula	Edwa	Bahr Yusef	Sakouka	Regulator		8	273806.6	3162875.9	2006		The structure needs slight repair	C
218		Edwa	Bahr Yusef	El Ahlia	Intake	1		278054.1	3170155.4				D
219		Edwa	Bahr Yusef	Beni Amir	Drain			278574.1	3172238.1			The structure needs slight repair	C
220		Edwa	Bahr Yusef	Beni Minein	Feeder			275521.2	3177081.2			Rehabilitation	B
221	East Harika	El-Fashn	Bahr Yusef	Delhans	Feeder	1	1	286684.3	3188637.5				D
222			Bahr Yusef	Bushar	Intake	1	0.65	286225.5	3189805.0		500	The structure needs slight repair	C

Irrigation facility in the Target Area Condition rank A: Total Replacement, B: Rehabilitation + partial replacement, C:Rehabilitation, D:Simple Maintenance,

No	Irr Unit	ID	Location	Name Of Structure	Type of structure	Nomber of Gates	Gate Width	X	Y	Construction year	Feddan	Necessary work	Condition Rank
223				El Gafadon Village	Intake			286225.5	3189805.0				D
224	Koftan	Somsta	Bahr Yusef	El Regha	Intake	1	2.3	290837.0	3211057.0	1960		The gate requires replacement	B
225			Bahr Yusef	Magror El Regha	Intake		1.15	285585.2	3197761.1		200	The structure needs slight repair	C
226	Mazora	Somsta	Bahr Yusef	Mazoura	Regulator	4	8	286644.0	3198503.0	2002			D
227			Bahr Yusef	El Boyeb	Feeder	1	2.1	289804.5	3204391.0			Need closing	A
228			Bahr Yusef	Kam Bram	Feeder		1.5	291645.7	3211471.9	1997			D
229	Koftan	Ahnasia	Bahr Yusef	Sadeek	Intake			291916.0	3211987.1			The gate requires replacement	B
230	Koftan	Ahnasia	Bahr Yusef	El Bahsamon	Feeder	1	2	291921.0	3211989.0			Reconstruction	A
231	El-Zawia	Senories	Bahr Yusef	Barawa	Feeder	1	1	295298.0	3210987.0			The structure Requires reconstruct	A
232			Bahr Yusef	Mnshat El Hag	Feeder	1	1	295298.0	3210987.0				D
233			Bahr Yusef	Wish El Bab	Feeder	1	1	293373.0	3217044.0				d
234	Matrabet Mayana	Ahnasia	Bahr Yusef	Matrabet Mayana	Intake	1	1	293373.0	3217044.0		840	The gate requires replacement	B
235		Ahnasia	Bahr Yusef	El Assar	Intake	2	1.5	294092.0	3217926.5			The gate requires replacement	B
236		Ahnasia	Bahr Yusef	Mayana	Intake	1	1	293380.2	3217030.8			The gate requires replacement	B
237		Ahnasia	Bahr Yusef	Fishta	Feeder	1	1	297819.0	3219431.0				D
238		Ahnasia	Bahr Yusef	Msrfedrasia	Intake	1	1	297901.7	3220398.3			Reconstruction	A
239		Ahnasia	Bahr Yusef	El Mmaleak	Feeder	1	1	298744.8	3223862.5				D
240		Ahnasia	Bahr Yusef	Fanos	Feeder	1	1	297258.3	3225015.1			Reconstruction	A
241		West Beni Suef	Bahr Yusef	Elassar	Feeder	1	1	296295.0	3225642.0			Reconstruction	A
242		West Beni Suef	Bahr Yusef	Bani Hani	Feeder	1	1.5	298130.0	3227423.0				D
243		West Beni Suef	Bahr Yusef	Bahabshin	Intake	1	3	300838.0	3228533.0		2,950	Repairing the gear of	C
244	Ganabet Giza	West Beni Suef	Bahr Yusef	Ganabet Giza	Intake	1	2	302766.0	3232016.0		3,300	Repairing the gear of	D
245	Hassan wasef	Atsa	Bahr Yusef	Hassan wasef	Intake	1		302630.0	3232198.0				A
246	Giza	West Beni Suef	Bahr Yusef	Giza	Intake	4	4	302776.0	3232219.0	1997	139,627		D
247	El Hager	West Beni Suef	Bahr Yusef	El Hager	Intake	1	3.5	302838.0	3232439.0		3,700	Rehabilitation	A
248	Agouz	El-Faiyom	Bahr Yusef	Agouz	Intake	2	1.5	302836.0	3232452.0			Rehabilitation	B
249	Agouz	El-Faiyom	Bahr Yusef	Lahoun	Regulator	2	5	302749.0	3232490.0	1995			D
	Sumple Area Tarfa												
250	Terfa	West Terfa	Terfa	Terfa1 new	Pump Station	1	1	267486.000	3138977.000			Need some Maintenance	C
251	Terfa	West Terfa	Terfa	Terfa1 old	Pump Station			267486.000	3138933.000			Need some Maintenance	C
252	Terfa	West Terfa	Terfa	Terfa2 new	Pump Station			263437.000	3139511.000			Need some Maintenance	C
253	Terfa	West Terfa	Terfa	Terfa2 old	Pump Station			263571.000	3139710.000			Need some Maintenance	C
254	Terfa	West Terfa	Terfa	Terfa branch 1	Intake	1	1	262713.0	3139277.0		3,000	The gate requires replacement	B
255	Terfa	West Terfa	Terfa	Terfa branch 2	Intake	1	1	262738.0	3139229.0		3,000	The gate requires replacement	B
256	Terfa	West Terfa	Terfa	Terfa3 new	Pump Station			262070.000	3139083.000			Need some Maintenance	C

Irrigation facility in the Target Area Condition rank A: Total Replacement, B: Rehabilitation + partial replacement, C:Rehabilitation, D:Simple Maintenance,

No	Irr Unit	ID	Location	Name Of Structure	Type of structure	Nomber of Gates	Gate Width	X	Y	Construction year	Feddan	Necessary work	Condition Rank
257	Terfa	West Terfa	Terfa	Terfa3 old	Pump Station			262452.000	3139126.000			Need some Maintenance	C
258	Terfa	East Terfa	Terfa	Terfa branch 6	Intake	1	1	261406.0	3138849.0				D
259	Terfa	East Terfa	Terfa	Terfa branch 5	Intake	1	1	261407.0	3138865.0				D
260	Terfa	East Terfa	Terfa	Terfa branch 5 extension	Intake	1	1	262503.0	3147906.0				D
261	Terfa	East Terfa	Terfa	Terfa branch 3	Intake	1	1	262507.0	3147890.0		2,400		D
262	Terfa	East Terfa	Terfa	Terfa branch 7	Intake	1	1	262480.0	3147896.0				D
	Sumple Area Koftan												
263	Koftan	Somsta	Koftan	Koftan	Intake	3	2	285871.0	3198306.0	1980	12,134	The gate requires replacement	B
264	Koftan	Somsta	Koftan	Soliman	Intake	1	1	286357.0	3199641.0	1990	100	The gate requires replacement	D
265	Koftan	Somsta	Koftan	Nosser	Intake	1	1	286465.0	3200108.0	1990	350	The gate requires replacement	D
266	Koftan	Somsta	Koftan	Abeed	Intake	1	1	286620.0	3200840.0	1990	150	The gate requires replacement	D
267	Koftan	Somsta	Koftan	Abo Hashema	Intake	1	1	288033.0	3204197.0	1994	450	The gate requires replacement	C
268	Koftan	Somsta	Koftan	Khatab	Intake	1	1	288644.0	3204254.0	1994	780	The gate requires replacement	C
269	Koftan	Somsta	Koftan	Farag	Intake	1	1	289236.0	3204473.0	1994	750	The gate requires replacement	C
270	Koftan	Somsta	Koftan	Deshasha	Intake	1	1	291200.0	3207772.0	1998	750	The gate requires replacement	B
271	Koftan	Somsta	Koftan	Deshasha	Regulator	1	2	291678.0	3211846.0			Replacment of the gate and Rehabilitation of side wall with mortar and plastering	A
272	Koftan	Somsta	Koftan	El Regha	feeder	1	1	290836.0	3211057.0		0	The gate requires replacement	B
273	Koftan			Sadek	feeder	1	1	290836.0	3211057.0				B
273	Koftan	Somsta	Koftan	Qoftan	Mixing Pump			287111.240	3202624.820			Need suction pool and some maintenance	B
	Sumple Area Saba												
274	Sabaa	Edwa	Saba	Small Sekula Drain	Drain		3.2	272423.7	3169949.2				D
275	Sabaa	Edwa	Saba	Bahnasa	Intake	2	3.5	272423.7	3169949.2		3,100		D
276	Sabaa	Edwa	Saba	Left Gnabia No2	Intake	1	1.1	272423.7	3169949.2		700	Gate replacament is required	B
277	Sabaa	Edwa	Saba	6.3 station	Regulator		3	272423.7	3169949.2			Need some Maintenance	C
278	Sabaa	Edwa	Saba	El Shikh Masood	Intake		2.5	274189.9	3171686.5		550		D
279	Sabaa	Edwa	Saba	Kafr El Maghrabi	Intake		2.1	274094.2	3172312.6		975	Replacement of the gate and Rehabilitation of side wall with mortar and plastering	B

Irrigation facility in the Target Area Condition rank A: Total Replacement, B: Rehabilitation + partial replacement, C:Rehabilitation, D:Simple Maintenance,

No	Irr Unit	ID	Location	Name Of Structure	Type of structure	Nomber of Gates	Gate Width	X	Y	Construction year	Feddan	Necessary work	Condition Rank
280	Sabaa	Edwa	Saba	East El Gaiat	Intake			274346.3	3173394.3		700	Gate replacament is required	B
281	Sabaa	Edwa	Saba	El Kayat Drain	Siphone			274562.9	3174158.3				D
282	Sabaa	Edwa	Saba	East El Munshat	Intake			274896.8	3174942.5			Gate replacament is required	B
283	Sabaa	Edwa	Saba	West El Munshat	Intake			274896.8	274896.8			Gate replacament is required	B
284	Sabaa	Edwa	Saba	Halfaya Drain	Siphone			275188.5	3175577.6				D
285	Saba	Edwa	Saba	El Halfya	Intake		3	275336.0	3176035.5	2016			D
286	Sabaa	Edwa	Saba	Covering of canal	Box culvert			275459.6	3176578.4				D
287	El Hariqa	Edwa	Saba	El Baskalon	Siphone			275521.2	3177081.2				D
288	Sabaa	Edwa	Saba	Barmasha	Intake	1	3.6	275725.6	3177980.5	2445	950	Gate replacament is required	B
289	El Hariqa	Edwa	Saba	El Baskalon 1	Siphone			276241.8	3179500.3				D
290	Sabaa	Edwa	Saba	Zawyet Bermeyla	Intake			277903.6	3180528.4			Gate replacament is required	B
291	Harika	Edwa	Saba	Harika	Intake		3	282374.0	3178405.0	1989		Gate replacament is required	B
292	Saba	Edwa	Saba	Saba	Mixing Pump			280828.938	3180311.537		1,400	Need some Maintenance	C
	Kased Main Canal												
293	Kaym Tanta	Tanta	Kased	Kaym Tanta	Intake			30.76855	31.02012			The structure needs slight repair	C
294		Tanta	Kased	Ikhnaway	Intake	1	2.5	30.78889	31.01572			The structure needs slight repair	C
295	Shabsher	Tanta	Kased	Shabsher	Intake	1	3	30.79252	31.01418		1,150	Gate replacament is required	B
296		Tanta	Kased	Old Tanta	Regulator	4	3	30.79254	31.01393			The structure needs slight repair	C
297		Tanta	Kased	New Tanta	Regulator	4	3	30.79874	31.00982				D
298	Gnabia2	Tanta	Kased	Gnabia2	Intake	1	2.5	30.85045	30.98726			The structure needs slight repair	C
299	Om-Rabiaa	Tanta	Kased	Om-Rabiaa	Intake	1		30.85168	30.98669		900	The Gate Needs A Replacement.	B
300	El Nashwo	Tanta	Kased	El Nashwo	Intake	1	1.25	30.87685	30.96940		1,900	The structure needs slight repair	C
301		Tanta	Kased	Mehala Menouf	Regulator	3		30.88429	30.95683			The Regulator Requires Complete Replacement.	A
302	Boreag	Tanta	Kased	Boreag	Intake	1	2	30.88715	30.95343		1,850	The Gate Needs A Replacement.	B
303	Gnabia4	Tanta	Kased	Gnabia4	Intake	1	2	30.91697	30.92948		360	The structure needs slight repair	C
304	Damat	Tanta	Kased	Damat	Intake	1		30.93550	30.92044		4,750	The structure needs slight repair	C

Irrigation facility in the Target Area Condition rank A: Total Replacement, B: Rehabilitation + partial replacement, C:Rehabilitation, D:Simple Maintenance,

No	Irr Unit	ID	Location	Name Of Structure	Type of structure	Nomber of Gates	Gate Width	X	Y	Construction year	Feddan	Necessary work	Condition Rank
305	Gnabia5	Tanta	Kased	Gnabia5	Intake	1		30.93550	30.92044		670	The structure needs slight repair	C
306		Kotor	Kased	El Mostgada	Intake	1	2.5	30.97044	30.91307			The structure needs slight repair	C
307	El Taaleb	Kotor	Kased	El Taaleb	Intake	1		30.97153	30.91289		2,300		D
308	El Samahat	Kotor	Kased	El Samahat	Intake	1		30.97153	30.91289		9,500		D
309	Shobra Blola	Kotor	Kased	Shobra Blola	Intake	1	2.5	30.97119	30.91291		1,900	The structure needs slight repair	C
310	Kotor	Kotor	Kased	Kotor	Intake	1	2.5	30.97119	30.91291		3,150		D
311	Serd	Kotor	Kased	Serd	Intake	1	2.5	30.97119	30.91291		3,900	The structure needs slight repair	C
312		Kotor	Kased	Serd	Regulator	4	2	30.97282	30.91364			The structure needs slight repair	C
313		Kotor	Kased	El Gmaiel El Qeblia	Intake			31.03952	30.92863		1,550	The structure needs slight repair	C
314	Shnwo	Kotor	Kased	Shnwo	Intake			31.03952	30.92863		997	The structure needs slight repair	C
315	Rowina	Kotor	Kased	Rowina	Intake	3	2	31.06947	30.93280			The structure needs slight repair	C
316	El Shakria	Kotor	Kased	El Shakria	Intake	1	1.5	31.07400	30.93547			The Canal Needs Intensive Cleaning From Dense Garbage	C
317	El Gmaiel El Baharia	Kotor	Kased	El Gmaiel El Baharia	Intake	1	1.5	31.07547	30.93636		1,650		D
318	Shabsher	Tanta	Kased	Shabsher	Intake	1	3	30.79291	31.01387		13,250		D
319	Shabsher	Tanta	Kased	Shabsher Gnabia1	Intake	1		30.80117	31.02140		2,450	The structure needs slight repair	C
320	Shabsher	Tanta	Kased	Sebrbay	Intake	1	2	30.80774	31.02667			The Gate Needs Replacement	B
321	Shabsher	Tanta	Kased	El Awkaf	Intake	1	1.5	30.82544	31.03741		850		D
322	Shabsher	Tanta	Kased	El Regdia	Regulator	1	2	30.82573	31.03770				D
323	Shabsher	Tanta	Kased	El Malqa	Intake	1	1.5	30.83991	31.04392		3,550	The structure needs slight repair	C
324	Shabsher	Tanta	Kased	Abo Kharof	Intake	1	1.25	30.87349	31.06190			The Gate Needs Replacement	B
325	Shabsher	Tanta	Kased	Khabata	Intake			30.99481	30.90647				D
326	Shabsher	Tanta	Kased	El Helfaia	Intake			31.05116	30.89827				D
327	Kamadir	West Kamadir	Bahr Yusef	Kmadir New	Pump Station			270713.00000	3116804.00000		9,000		D
328	Kamadir	West Kamadir	Bahr Yusef	Kmadir Old	Pump Station			270720.00000	3116779.00000		25,000		D
329	Wahby	Sayla	Faiyom	Bahr Wahby	Intake	3	3.5	296914.83188	3237548.79391		76,935	The gate needs slight repair	C
330		El Faiyom	Faiyom	Elgeeb	Intake	1	0.6	296732.76402	3237665.57242	1880	605	Reconstruction	A
331		El Faiyom	Faiyom	Eldater Pump	Intake			295818.68984	3238059.88056	1980	181	The gate needs rehabilitation	B

Irrigation facility in the Target Area Condition rank A: Total Replacement, B: Rehabilitation + partial replacement, C:Rehabilitation, D:Simple Maintenance,

No	Irr Unit	ID	Location	Name Of Structure	Type of structure	Nomber of Gates	Gate Width	X	Y	Construction year	Feddan	Necessary work	Condition Rank
332	Hawara	El Faiyom	Faiyom	Hawara	Regulator	4	3	295583.99993	3238035.00005	1964	170,183	Improvement	C
333		El Faiyom	Faiyom	Snofer	Intake	1	1	292443.49573	3239592.51848	1880	153	The gate needs rehabilitation	B
334	El-Mahgara	El Faiyom	Faiyom	El-Mahgara	Intake	1	0.75	291293.20246	3241212.13888	2001/2002	758	The gate needs rehabilitation	B
335	Bahr Baga	El Faiyom	Faiyom	Bahr Baga	Intake	1	1.5	291724.50562	242046.32185		542	Reconstruction	A
336	Quhafa	El Faiyom	Faiyom	Quhafa	Intake	1	2	292017.14559	3242741.57823	1900	600	The gate needs slight repair	C
337	El-Ellam	El Faiyom	Faiyom	El-Ellam	Intake	1	1	292001.34683	3243264.41697	1880	10,964	The gate needs slight repair	C
338		El Faiyom	Faiyom	Bawbet elaellam elgharbiya	Intake		1.5	291969.56197	3243311.89847			The gate needs slight repair	C
339	El-Ellam	El Faiyom	Faiyom	Dar El Ramad	Intake	1	1	291804.18359	243552.19775	1880	832	The gate needs slight repair	C
340	El-Ellam	El Faiyom	Faiyom	Tanhalla	Intake	4	1	290703.49996	3244053.72467		21,401		D
341	Senories	Senories	Faiyom	Senories	Intake	2	1.7	290539.35548	3244111.18920				D
342	Disyia	Ebshaway	Faiyom	Disyia	Gates	2	1.4	289296.11248	3244292.72936	1990	19,180	The gate needs rehabilitation	B
343	El-Zawyia	Senories	Faiyom	El-Zawyia	Intake	1	3.7	289303.99998	244317.00005		10,426	The structure needs slight repair	C
344	ElGharbiya Elomomy	Ebshaway	Faiyom	ElGharbiya Elomomy	Intake	2	2.1	289230.83011	244372.44072	1990	24,135	The structure needs slight repair	C
345	Senrow	Ebshaway	Faiyom	Senrow	Intake	2	1.6	289233.05313	244382.26748	1990	10,927		D
	Pump Station in the Target Area												
346			Bahr Yousef	Der Sankoria	Drain Pump	5	3.7	270196.31540	3153577.61300	1973			D
347	Sakoula el	Idwa	Bahr Yousef	Sakoula El gabal	Pump Station			273082.65360	3168080.89800	1968	13,200		D
348			Bahr Yousef	Abo rahib	Pump Station		3	281396.34260	3171713.21800			Need suction pipe relocation	B
349	Hareeka	Idwa	Bahr Yousef	Hareeka drain	Pump Station			282347.23480	3178400.88800	2010			D
350	Delhans	El Fashen	Bahr Yousef	Del Hanes	Pump Station	4	2.1	284617.60520	3185889.27400	1997	5,000	Need suction pool and some maintenance	B
351		El Fashen	Bahr Yousef	Sakoula Drain In Delhans	Pump Station			285958.13480	3189935.17400	1978		Motors need	C
352		West samalu	Ibrahimia	El Deer	Mixing Pump			275422.41301	3152168.39187		10,840	Need suction pool and some maintenance	B
353		Maghagha	Ibrahimia	El Seka El Zraia Old	Mixing Pump			283028.19288	3173747.64930		200	Need suction pool and some maintenance	B
354		Maghagha	Ibrahimia	Kafr El Madawer	Mixing Pump			288454.03162	3178354.02400		1,200	Need suction pool and some maintenance	B
355		Ehnasya	Ibrahimia	Abshena	Pump Station			309709.25590	3225975.15500		480	Renovation of the pump house	B
356		West Beni Suef	Bahr Yusef	Tama Faiyum	Drain Pump			300876.00000	3228994.00000			Need to change petrol pump to electric pump	B
357		Beba	Sultani	El Sherif	Mixing Pump			302607.35000	3207051.51000			Need suction pool and some maintenance	B

Irrigation facility in the Target Area Condition rank A: Total Replacement, B: Rehabilitation + partial replacement, C:Rehabilitation, D:Simple Maintenance,

No	Irr Unit	ID	Location	Name Of Structure	Type of structure	Nomber of Gates	Gate Width	X	Y	Construction year	Feddan	Necessary work	Condition Rank
358		Beba	Sultani	Abo Shahba	Mixing Pump			299857.41000	3211900.57000			Need suction pool and some maintenance	B
359		Somosta	Sultani	El Shamashergy	Mixing Pump			295935.84000	3204692.15000			Need suction pool and some maintenance	B
360		El Fashn	Absoje	Absog	Mixing Pump			288329.55000	3193754.51000			Need suction pool and some maintenance	B
361		El Wosta	Ibrahimia	Kashesha	Mixing Pump			323819.35000	3242549.17000			Need suction pool and some maintenance	B
362		El Wosta	Middle Qashisha	Qomn El Arous	Mixing Pump			322311.22000	3242201.93000			Need suction pool and some maintenance	B
363		El Wosta	El Mansour	El Mansour	Mixing Pump			319439.75000	3244320.17000			Need suction pool and some maintenance	B
364		El Wosta	North Ashmont	El Diabia	Mixing Pump			324196.24000	3242577.19000			Need suction pool and some maintenance	B
365		Nasser	Bosh	Dalas	Mixing Pump			316193.77000	3235687.83000			Need suction pool and some maintenance	B
366		Nasser	Bosh	Ali Hafiz	Mixing Pump			313471.50000	3229972.46000			Need suction pool and some maintenance	B
367		East Beni Sweif	Ahnasia	El Walda	Mixing Pump			311231.66000	3216962.18000			Need suction pool and some maintenance	B
368		Beba	Ibrahimia	El Sharhara	Mixing Pump			296349.68000	3193267.75000			Need suction pool and some maintenance	B
369		El Wosta	El Mansour	Anfast	Mixing Pump			318877.97000	3239209.53000			Need suction pool and some maintenance	B
370		Nasser	El Mansour	El Mansur El Gded (New Mansur)	Mixing Pump			316262.79000	3236959.50000			Need suction pool and some maintenance	B
371		Beba	Sultani	Fazara	Mixing Pump			297282.20000	3207967.96000			Need suction pool and some maintenance	B
372		Mallawy	El Dairotia	El Ashmonin	Mixing Pump			279203.06000	3075790.16000			Need suction pool and some maintenance	B
373		Maghagha	West Aba	West Aba	Mixing Pump			284928.00000	3170140.12000			Need suction pool and some maintenance	B
374		Maghagha	El Gendia	El Seka El Zraeias Mesqa	Mixing Pump			282036.66000	3172230.71000			Need suction pool and some maintenance	B

ANNEX4 : Model Area Survey

1. Background of the Survey

As part of progress report of Phase 1 of "the Cooperation Planning Survey on the Irrigation Sector" a workshop was held in March 2017 to discuss the status of the survey and direct the way forward. During the discussion it was agreed that the survey will conduct "Model Area Survey" in Phase 2 of the Cooperation Planning Survey on three selected model area of the survey in order to pre-formulate contents of possible cooperation program that could be guided by the concept of Comprehensive Irrigation Water Management (CIWM).

In accordance with the suggestion given by Egyptian counterpart during the workshop and based on the M/D signed, the MWRI have recommended the high priority areas of interest as (1) improving the reuse pumps within the selected areas and (2) Irrigation Improvement in Faiyum Governorates.

JICA Survey Team have discussed thoroughly about the target model area with the counterpart at all level (such as at Ministry level and on the ground at GD level) so that the selected model area could address the recommendation made by MWRI and that address the concept of CIWM in the survey. Accordingly, three model survey area were identified and agreed upon by all side. The identified model survey area are: 1) Tunsa-Kella, 2) Aboshusha and 3) Aros-Aboseer sub-region.

The aims of the model area survey were to help confirm the situation of the irrigation facilities in the irrigation system, to gather further information on water management, facility management and other information required for the formulation of a development plan. This annex therefore contains the summary of the survey result on the three model survey area.

2. Tunsa-Kella Irrigation Unit

This irrigation unit is one of the Model Area identified for this survey. The description of the irrigation unit is presented below.

2.1 Basic Information

The basic information of the irrigation system is summarized below.

Table 1 General Information of Tunsa-Kella Irrigation System

Item	Description
Location	It is located in Beni Suef Governorate, covering three irrigation districts, namely: Ahnasiya, West and East Beni Suef
Source of water	Ibrahimia Canal Flow level is controlled by a small weir set at about 30m from the intake on Tunsa canal
Total length of main canal	Tunsa = 2.76 km Kella = 20.30 km
Total Command Area	The total command area irrigated in this unit is about 24,920 feddan including meska from main canal
Major Structures	4 Regulator (Kella, Towa, Baha, Dandeel) 5 Intake (North Amar, South Amar, Towa, Baha and Dandeel) 6 Pump Station (Baroot, El Hagry, Kella, Baha, Dandel, Abshna)
Major branch canal	4 major branch (North Amar, Towa, Baha and Dandeel)
Minor branch canal	10 on the main canal 44 on branch and sub branch canal
Total canal length in the system	About 167.00 km (23 km Main Canal + 144 km branch and sub branch canals)

2.2 Set-up of the Irrigation Unit

According to the information from Beni Suef GD, for the purpose of applying rotational irrigation in the system the main canal (Tunsa-Kella canal) is divided into three zones. The set-up of this irrigation unit is presented in the figure below.

(1) Zone-1: From Intake to Towa Regulator

In this zone North Amar, South Amar, and Towa sub-main canal are included (plus some small branch and meska). The rotation of irrigation is controlled by the operation of Towa and Kella Regulator. A total of over 9,890 feddan is irrigated in this zone having over 63 km canal network. There are two reuse pump station (El Hagry, Baroot) and two regulators (Kella and Towa) inside this zone. The summary of the irrigation facilities in this zone is presented in the table below.

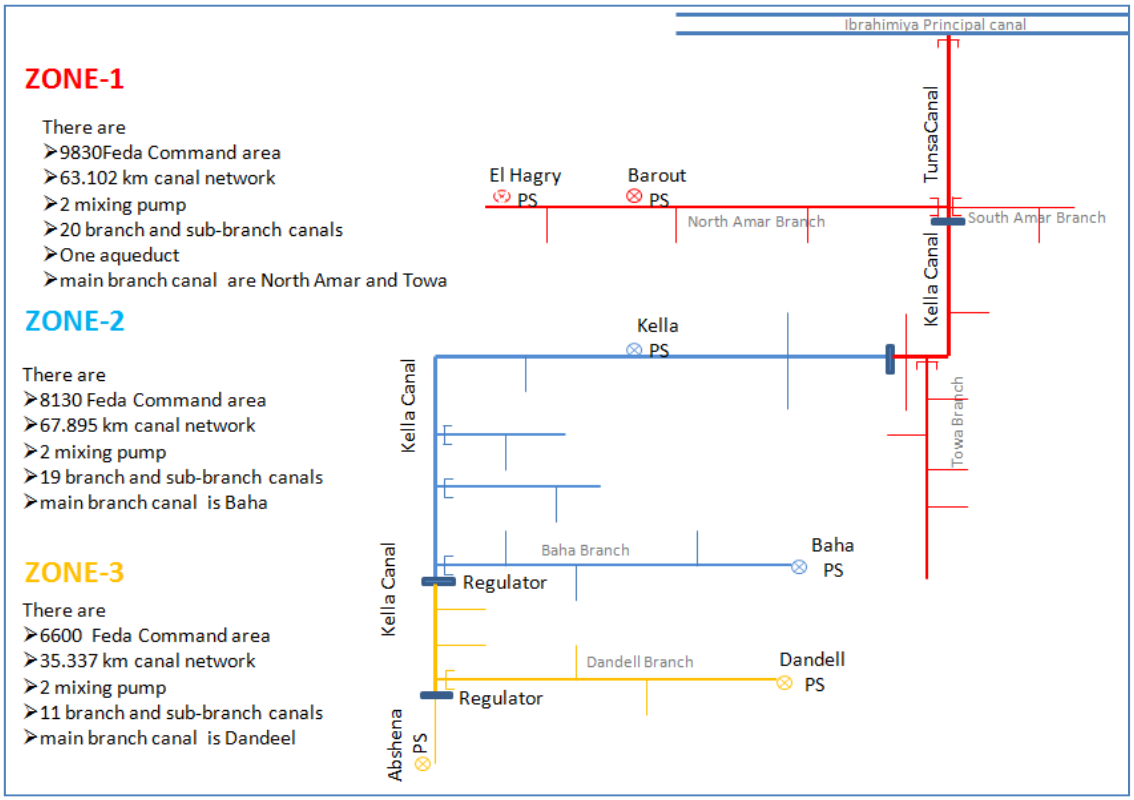


Figure 1 Sketch Showing the Set-up of Tunsa-Kella Model Area

One of the canals, South Amar canal, has a peculiar characteristic such that it gets water from both Tunsa-Kella and El Soultani Irrigation Unit. At 2 km from Kella intake there is an old regulator that controls the flow of water depending on the water level from either Tunsa-Kella or El Soultani canal. The total length of this canal is about 17 km. Hence the command area from South Amar is not included in Tunsa-Kella irrigation unit.

Table 2 List of Irrigation Facilities and Command Area in Zone-1

Name of Canal	Total Length Including Sub Branch (km)	Command Area (feddan)	No. of Branch / Sub-branch	Mixing Pump	Range of Canal Width (m)	Canal Slope (cm/km)
North Amar	22.42	3.400	6	2	1~4	8 ~ 15
South Amar*	2.0*	1,600*	3			
Kella Branch 1	1.09	90	1		1	10
Towa	27.992	5700	8		1~4	5~10
Old Kella Left Ganebia	3	350	1		1	15
Old Kella Right Ganabia	3	350	1		1	15
Total	63.102**	9,890	20	2		

Note: *South Amar is considered a branch from El Sultani Canal: ** include the length on main canal
Source: Data from each ID

(2) Zone-2: From Towa to Baha Regulator

In this zone Nwera, North Newara, Baha sub-main are located (in addition to a few branch and meska).

The rotation of irrigation is controlled by the operation of Baha and Towa Regulator. There are two mixing station inside this zone of which Kella pump station is found on Tunsa-Kella main canal and the other one (Baha Pump station) at the end of Baha Branch Canal.

In this zone a total of 8,130 feddan command area is irrigated from about 68km long canal length distributed over 19 branch canals system. The summary of the facilities in this zone is presented below.

Table 3 List of Irrigation Facilities and Command Area in Zone-2

Name of Canal	Length (km)	Command Area (feddan)	No. of Branch / Sub-branch	Mixing Pump	Range of Canal Width (m)	Canal Slope (cm/km)
New Kella Right G	2.335	300	1	0	1	15
New Kella Left G	2.69	300	1	0	1	15
Khaled	1.42	260	1	1 on Kella	1	15
Nowera	3.30	1400	2	0	1	10
North Nowera	11.11	1400	4	0	1~1.5	10~15
Bahbashin	2.25	270	1	0	1	15
Baha	32.29	4200	9	1	1 ~ 3.5	5~10
Total	67.895*	8130	19	2		

Note: * include the length on main canal

(3) Zone-3: From Baha to Dandeel Regulator

In this zone basically there is Dandeel sub-main (plus few small branch and meska). The rotation of irrigation is controlled by the operation of Dandeel Regulator. There are two mixing station inside this zone one at the end of Dandeel and the other in the middle of Abshena branch canal (around end of Tunsa-Kella canal). The area served in this zone is about 6,600 feddan networked over 34 km of canal system. The summary of the facilities in this zone is presented below.

Table 4 List of Irrigation Facilities and Command Area in Zone-3

Name of Canal	Length (km)	Command Area (feddan)	No. of Intake	Mixing Pump	Range of Canal Width (m)	Canal Slope (cm/km)
Baha Road	1.395	250	1	0	1	15
Baha Branch	3.890	600	1	0	1	15
Dandeel	23.305	5300	8	1	1~3	5~7
Abshena	1.950	450	1	1	1	15
Total	35.337*	6,600	11	2		

Note: * include the length on main canal

2.3 Irrigation Water Management

Presently all irrigation water management on the main canal is done by Sailors hired by the government. At each district there are 2 to 3 Sailors who are responsible for the operation of gates and regulators along the main canal. There is no water users' association established in the area at all level. Water distribution (rotation) at meska level is usually conducted according to the traditional way in which mutual understanding and communication is made between the users during the use of water from the meska.

Similarly, every reuse pump house are equipped with one or two pump operators who are responsible for the operation of the pump station. Generally, according to the standard rotation plan a pump unit works for 10 days in a month (Operating for 5 days and left idle for 10 days) and 8 hours per day, but mostly the pumps works for more than the plan which leads to problems such as overloading, wear and tear, shortening of its life etc.

2.4 Existing Condition of Irrigation Facilities

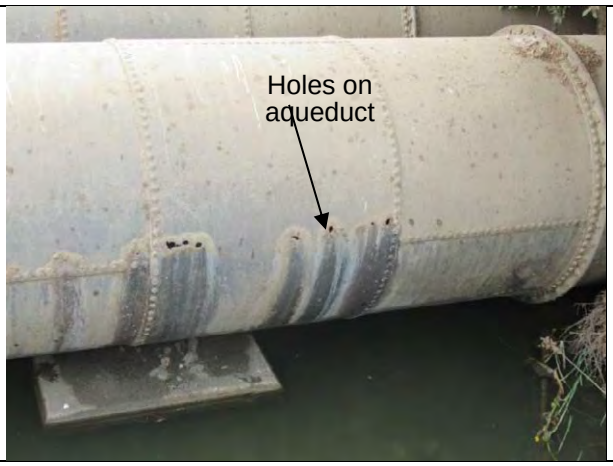
(1) Canal, Intake and Regulators

- Canal shapes are totally deformed by dredging and interpenetration of structures (eg. Mosque) are common which creates poor hydraulic performance of the canal
- Gates and regulators not working (either fully opened or closed) and most of them are old and worn out which needs total replacement
- Most of the structures are built long time ago and can be said expired
- Almost all gates on branch canals are malfunctioned
- Water does not reach the tails of most of branch and mesqa (Especially the area below Baha Regulator. At the time of visit the farmers informed the team that over 20days have passed since water reaches their area.
- It seems Zone-1 (Towa canal, North and South Amar canal) have a chance of getting more water than the other zones, provided the canal is freed from rubbish and other structures
- Even with proper irrigation rotation practiced on the main canal, the absence of properly working gates and regulator, in addition to canal system with deformed shape and interpenetrated structure, the efficiency of water use can't increase if it is left as it is now
- There is more water in drainage canal than in irrigation canal system which is the clear indication of poor water use efficiency
- Some of the problem in the main canal is presented in the following figures

Interpenetrated structure (mosque) inside Kella canal (affects the hydraulic performance)

Kella regulator (one gate is totally closed)

Broken Intake at South Amar intake



All of the 4 aquaduct has holes that leaks the scarce water resource into drain

With this background the idea of setting or rehabilitating reuse pump without proper conveyance system in the canal is futile attempt in solving the real problem of inefficient water use and attain fair distribution of the available water to all the users.

(2) Reuse Pump

The existing six reuse pumps are old and are inefficient in their performance. Some are totally flooded and destroyed; others are damaged by garbage entering the pump unit as the suction pipe is set directly to drain canal without the provision of suction pool and filter. Some of the conditions of the pump stations are shown below.

1) Kella Reuse Pump Station

Present condition and comment
➢ The pumps station feed water from Mohit drain to Kella Canal (extension of Tunsa Canal) ➢ There are 5 pump units of 0.5 m^3/sec capacity (2 pumps are not working due to problem on motor) ➢ Due to lack of suction pool and screen on suction pipe intrusion of garbage into the pump is the biggest problem in this site (every once in a month the suction pipe need to be cleaned) ➢ One of the delivery pipe has gate valve which is difficult to operate, it need to be replaced by butterfly valve ➢ This station is one of the 4 pump station inside Beni Suef that operate everyday 8 hour/day

5 units of pump inside Kella

Suction pipe set directly on drain water

2) Barout Reuse Pump Station

Present Condition	Comment
• Established in 1997 with 4 pump unit of 0.25 m^3/sec • It pump water from Mohiet de Moshiya drain to North Amar branch canal from Tunsa • Since the pump is set at lower level than the bank of drain the station is completely submerged by flood water from the drain • Not working since two years ago	• Establishment of new pump station set at higher elevation and provided with suction pool • However, the purpose of having two pump station along North Amar canal need to be checked (3 km apart from El Hagry pump Station)
	
Submerged pump station at Barout	Suction pipe set directly on drain water

3) Dandeel Reuse Pump Station

Present Condition	Comment
➢ Newly established pump station, installed in 2014 ➢ It has 2 pump unit of 0.5 m^3/sec capacity ➢ It pumps drain water from El Mohiet to Dandeel canal which is a branch canal from Kella canal ➢ In a very good condition, but the major problem is garbage inside suction pipe	➢ Suction pool should be installed to reduce intrusion of garbage into the pump ➢ Garbage entering the pump will shorten the lifespan of the pumps
	
Newly established pump	Garbage inside the pump

2.5 Summary of the Condition of Irrigation Facilities and Recommendation Made

The irrigation facilities in each model survey area and their condition with recommendation made are summarized in the following tables.

Table 5 Sample Survey Result of Tunsa-Kella Main Canal and Other Major Facility

No	Name of Structure	Condition of Structure	Recommendation
1	Tunsa Intake	The gate is working	It needs routine maintenance
2	Aqueduct	Leaking old 4 pipes of 2 m diameter	Welding the holes by cast iron patching compound
3	Kella Regulator (intake)	Very old (3 m wide each) double gates one of which is malfunction	Rehabilitation of grooves and replacement of gate
4	North Amar Intake	2.8 m wide One very old gates which is malfunction	Rehabilitation of grooves and replacement of gate
5	Sourth Amar Intake	2 m wide Two very old gates which are malfunction	Rehabilitation of grooves and replacement of gate
6	Canal cross-section	Interpenetrated Mosque affecting the hydraulic performance of the canal	Provision of canal transition
7	Kella-1 branch intake	0.8 m gate not working	Replacement of gate and simple rehabilitation on side walls
8	Towa Intak	The new type of gate installed by IIP project is not functioning well	Installation of new sluice gate
9	Kella Old Ruight G	1.0 m gate not working	Replacement of gate and simple rehabilitation on side walls
10	Kella old Left G	1.0 m gate not working	Replacement of gate and simple rehabilitation on side walls
11	Towa Regulator	3 m wide Two very old gates one of which is malfunction	Rehabilitation of grooves and replacement of gate
12	Kella New Right G	1.0 m wide Newly Constructed Intake	Newly constructed gate
13	Kella New Left G	1.0 m wide Newly Constructed Intake	Newly constructed gate
14	Khaled Intake	Old gate not working	Replacement of gate and simple rehabilitation on side walls
15	Nowera Intake	2m wide Very old gates which is malfunction	Rehabilitation of grooves and replacement of gate
16	Kella Pump station	Old pump house with no suction pool	Rehabilitation of the pump house, replacement of pump, installation of suction pool
17	North Nowera Intake	2 m wide Very old gates which is malfunction	Rehabilitation of grooves and replacement of gate
18	Bahbashin Side Canal	1.0 m wide gate, Malfunctioning gate	Replacement of gate and simple rehabilitation on side walls
19	Baha Intake	3.0 m wide gate, Malfunctioning gate	Replacement of gate and rehabilitation of side wall
20	Baha Regulator	3 m wide, Malfunctioning gate	Replacement of gate and rehabilitation of side wall
21	Baha road canal	1.0 m gate not working	Replacement of gate and rehabilitation of side wall
22	Baha branch	1.0 m gate not working	Replacement of gate and rehabilitation of side wall
23	Dandel Intake	3 m wide, Malfunctioning gate	Replacement of gate and rehabilitation of side wall
24	Dandel Regulator	2 m wide, Malfunctioning gate	Replacement of gate and rehabilitation of side wall
25	Abshena Pump Station	Old single unit pump with no pump house	Renovation of the pump house
26	Barout pump station	Totally inundated and not working	Replacement of the pump station
27	El Hagry pump station	Old mixing pump, working but lack suction pool and suffers from garbage inside the pump	Provision of suction pool and rehabilitation (replacement of old pumps)
28	Baha pump station	There are 3 pumps (Q = 0.5 m^3) . 2 of the 3 Pumps doesn't work since.	Need Pump rehabilitation, suction pool
29	Dandeel Pump station	Relatively new pump station (2unit) but suffer from garbage from drain water	It needs the provision of suction pool

2.6 Agriculture

Farmers group of Tunsa-Kella were interviewed for grasping farming situation. The command area owned by the interviewed group, the number of farmers belonging, the number of interviewed farmers and the date of survey are as shown in the table below.

Table 6 Command Area, Number of farmers, and Interview Date

Name of Group	Command Area (feddan)	No. of farmers	No. of interviewed farmers	Interview Date
Towa agriculture association	1,175	About 1,150	62	12th, 13th April, 2017

Source: JICA Survey Team prepared based on the interview survey.

Results of interview survey are summarized as below.

(1) Characteristic of Household Head

The distribution of the age of the household head is shown in the right figure. The largest age distribution was 51 to 60 years old, and the percentage of those aged 50 years or over accounted for approximately 44%. The average age of household head is about 47 years old, the head of household with the lowest age was 24 years old, and the household head with the highest age was 67 years old.

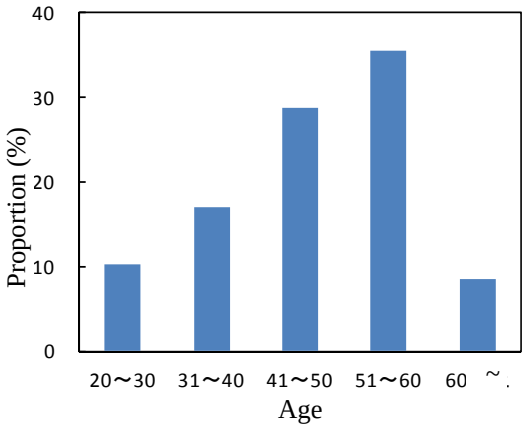


Figure 2 Distribution of Age of Household Head

The distribution of the educational level is shown in the figure below (left). It accounts for nearly 70% (about 68%) of household heads who replied that they do not receive education, indicating that education has not been fully received.

The distribution of farming experienced years is shown below (right). The ratio of farming experience 21 to 30 years was the highest (about 53%). The average years of farming experience is about 27 years, and the average of the age at which the head of household started farming was about 19 years old.

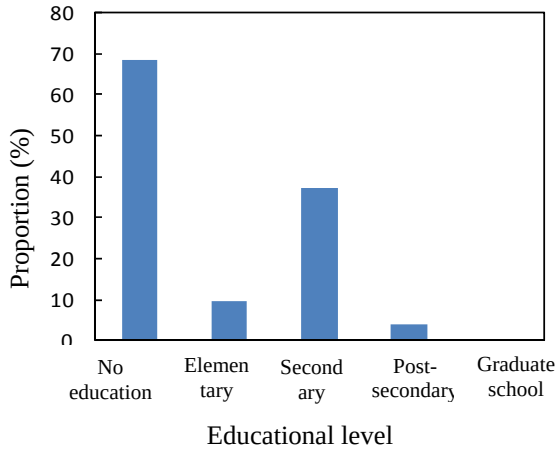


Figure 3 Distribution of Educational Level of Household Head

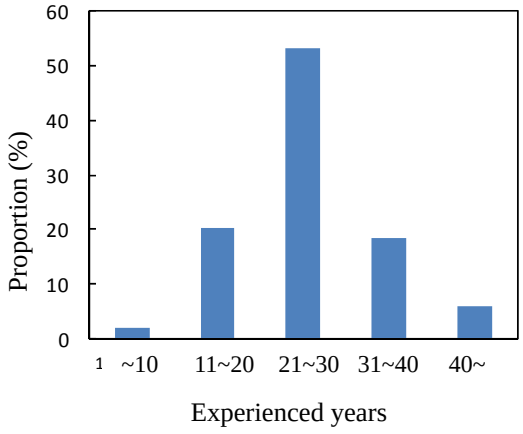


Figure 4 Distribution of Experienced Years of Household Head

(2) Family Structure

The family structure of farmers is shown in the right figure. The farmers with 4 to 6 household members showed a half rate (about 49%), followed by farm households with 7 to 9 family members,

accounting for about 37%. The average family size of the family composition is about 6, among them the minimum number of people is 1 (single farmer is running), the maximum number of people is 12. The most common age group in the family composition was young people of 15 to 35 years old.

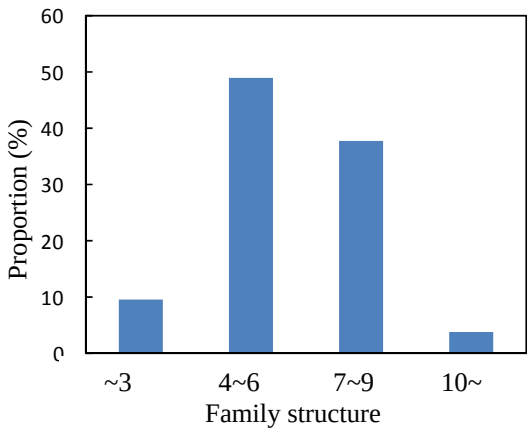


Figure 5 Distribution of family Structure

(3) Source of Income

Approximately 64% of respondents who answered that the farmers' main income source was "agriculture". By multiple answers, in addition to agriculture, about 21% answered "employment" as income source, about 5% answered "breeding of livestock", about 8% who responded "handicraft". About 56% of respondents answered "agriculture" only, so more than half of the farmers in this area live mainly on agriculture.

(4) Ownership of Cultivated Land and Land Area

Of the 51 household heads, 30 household heads own no farmland and borrow farmland and plant them. More than half of the farmers borrowed agricultural land and are engaged in farming.

The distribution of the cultivated land area is shown in the figure below. The average cultivated area of farmers was about 1.35 feddan. Approximately 41% of the farmers planted with cultivated land area of 1 to 2 feddan and about 33% farmers planted with cultivated areas less than 1 feddan. Most farmers is being carried out small-scale agriculture less than 2 feddan (about 0.84 ha).

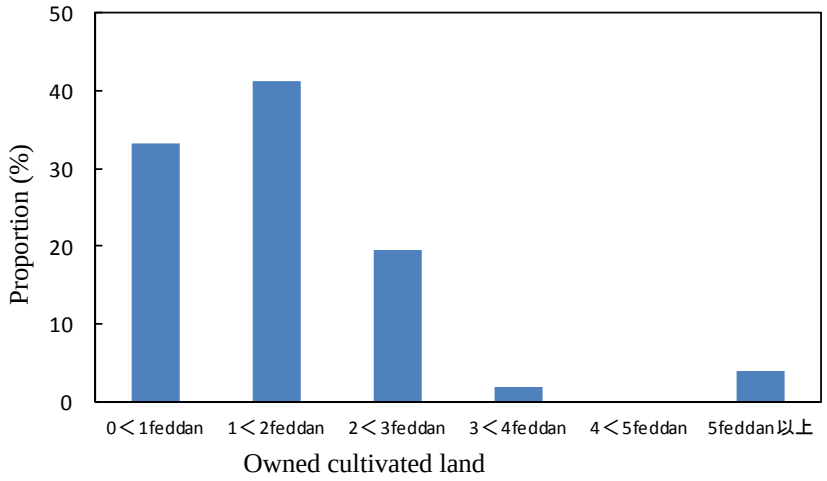


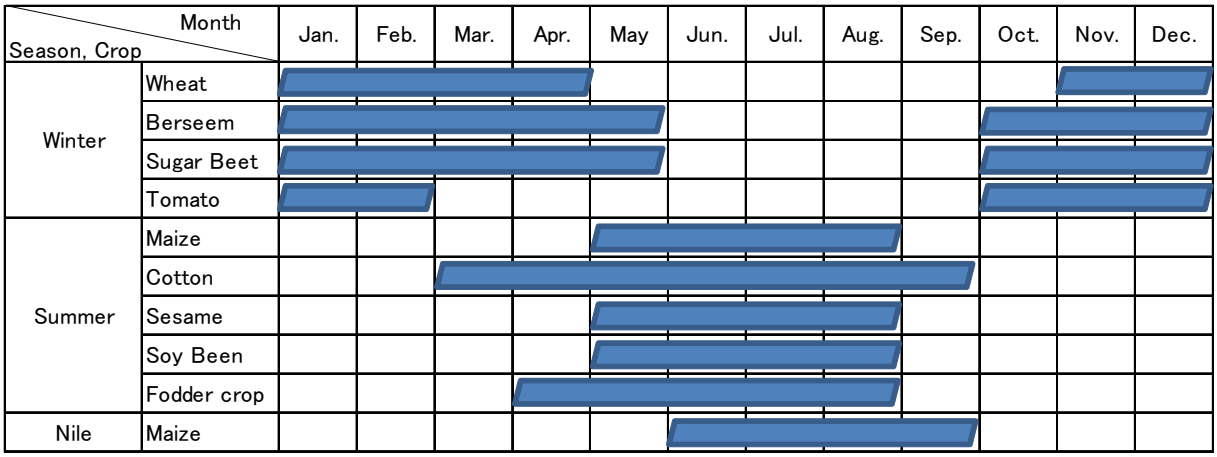
Figure 6 Distribution of Farmer's Cultivated Land

(5) Situation of Water Shortage

Regarding the time of the water shortage in the field, 50 farmers said that it is summer (especially June and July in particular). The shortage of water in summer was severe, and the water shortage was spreading over the whole cultivated land area of farmers.

(6) Major Crop and Main Person of Farming Work

The main crops and cropping patterns planted in each season are shown in the figure below.



Source: JICA Survey Team prepared based on "List of Cultivated Crops of Beni Suef Governorate (2016-2017)".

Figure 7 The main crops and cropping patterns

Many farmers plant wheat, Egyptian clover as the winter crop. Many farmers plant the field with wheat, Egyptian clover and half each. A few farmers plant sugar beets and tomatoes. Many farmers planted maize as the summer crop, and a few farmers planted sesame, cotton, livestock feed and soybean.

The results of examining who will be the main person of farming work are shown in the table below. In the work such as plowing which is heavy work, sowing / transplantation deciding the planting time and method, and selling, male is the main person, and work such as weeding and harvesting, women and children work as the main person.

Table 7 Main Person of Farming Work

Farming Work	Plowing	Sowing and transplanting	Weeding	Harvesting	Selling
Main Person	Mainly male	Mainly male	Female and children	Male and female	Mainly male

(7) Main Customer

The main costumer of each crop that could be confirmed by interview survey are shown in the table below.

Table 8 Main Customer of Crops

Crop	Main Customer
Wheat	Most farmers sell to union, some farmers sell to local market.
Egyptian clover	Many farmers sell to the local market.
Suger beet	It sells to unions and merchants. There were no farmers selling to the local market.
Vegitable in winter such as poteto, garlic, onion, tomato etc.	I sell to the local market.
Mayze	Many farmers sell to merchants. Some farmers are selling to the local market.
Sesami	I sell to a merchant.

(8) Livestock

18 households were raising livestock, such as cows, donkeys, goats and chickens. More than 70% of the respondents raised cows.

3. Abo Shousa Irrigation Unit

3.1 Basic Information

Abo Shousha irrigation unit is one of the irrigation unit found inside Beni Suef Governorate covering Somosta and El Fashen Districts. The canal is branched from Ibrahimia Principal Canal at station 155 km from Dairout Group Regulator. In addition to Ibrahimiya, this canal system is also fed from Bahr Yousef Canal by lifting pumps. The canal has a total of 33 km length and irrigating about 14,920 feddan.

In this irrigation unit there are a total of 6 regulators (3 on main canal and the other three on sub-main canal), four pump station (two are reuse and the remaining two are lifting pump station). Table below summarize the basic information of the irrigation unit.

Table 9 General Information on Abo Shousha Irrigation System

Item	Description
Source of water	Ibrahimia and Bahr Yusef Principal canal
Total length of main canal	33 km
Total Command Area	The total command area irrigated in this unit is about 14,920
Major Structures	3 Regulators (Qualia, Sheik-Abed and Saleed) and 3 small regulator along sub main canals 4 Pump Station (Telt and Saharit Mazora reuse pump and Dashtoot and Kom El Noor Lifting Pump)
Major branch canal	Talt, Sheik Abed and Dashtoot
Minor branch canal	There are around 38 branch canals in the system
Total canal length in the system	Total canal length in the system is around 105 km (excluding meska)

3.2 Set-up of the Irrigation Unit

Generally Abo Shousha Irrigation Unit gets water from Ibrahimia canal for 10 consecutive day with 5 days interval. During the 10 days water supply period rotation is applied on the main canals of the irrigation unit. According to this rotation the unit can be divided into two zones. The first zone covers the canal from the main intake to El Qaliaa Regulator (13 km from intake) and the second zone covers the branch canals between El Qalia Regulator and the end of the canal. The characteristics of each zone are presented. Figure below show the sketch of the set-up of irrigation system of Abo Shosha Irrigation Unit

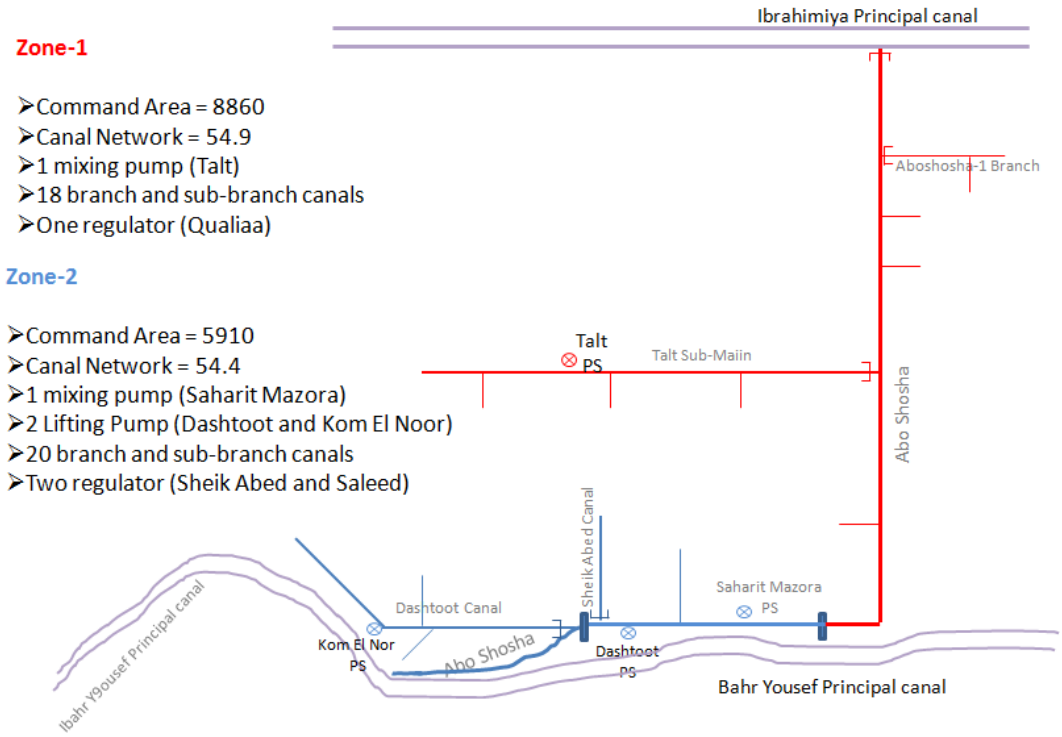


Figure 8 Layout of the Set-up of Abo Shousha Irrigation Unit

(1) Zone-1: From Intake to El Qaliaa Regulator (0+000 ~ 8+200)

In this zone there is one reuse pump on Talt branch canal with the capacity of total 1.5 m^3/sec (3 units of 0.5 m^3/sec). The total area irrigated in this zone is over 8,860 feddan covering 55 km canal network and 18 intake structures. The summary of the facilities in this zone is presented below.

Table 10 List of Irrigation Facilities in Zone-1

Name of Canal	Length (km)	Command Area (feddan)	No. of Intake	No of Pump	Canal Width	Canal Slope (cm/km)
Abo Shousha 1 Branch	2.7	1080	1		1-1.5	13
Aref	2.9	300	1		1	15
Abo Shousha 2 Branch	2.8	560	1		1	13
Abo Shousha 3 Branch	3.2	680	1		1	13
Telt sub-main	8.6	4580	10	1	1.5 ~ 3.5	0 ~ 10
Telt Branch	2.3	460	1		1	10
Shawky Branch	2.05	250	1		1	15
Hanna Branch	2.74	450	1		1	15
Tawfik	1.76	500	1		1	15
Total	54.9*	8,860**				

Note: * including part of the main canal and sub-branches; ** excluding meska irrigated by Main canal

(2) Zone-2: From El Qaliaa Regulator to canal end (8+200 ~ 33+000)

The total area irrigated in this zone is over 5,900 feddan covering 54 km canal network and 20 intake structures The water from Ibrahimia canal often fail to reach this zone (Zone-2), hence in this zone, as additional source of water, supplementary pump stations are installed. Totally there are one reuse pump (Saharit Mazor) and two lifting pumps (Dashtoot and Kom El Noor) which pumps water from Bahr Yousef to Abo Shousha canal. These pumps operate during the 5days rotation of the canal on this zone. The summary of the facilities in this zone is presented below.

Table 11 List of irrigation facilities in Zone-2

Name of Canal	Length (km)	Command Area (feddan)	No. of Intake	Mixing Pump	Range of Canal Width	Canal Slope
Abo Shousha 1 branch	1.76	300	1		1	15
Kamon	0.56	185	1		1	15
Mazora	2.625	333	1	1**	1	15
Nasir	0.77	165	1		1	15
Bilany	1.76	315	1		1	15
El Sheik Abed	2.26	1,710	6		1.5~2	15
Waleda	2.75	605	1		1	15
El Kaseba	1.33	247	1		1	15
Abo Shousha Branch	3.33	595	2		1	15
Abo Shousha 2	1.00	295	1	1**	1	15
Dashtoot	2.6	1160	4	1	1	15
Total	54.4*	5,910***				

Note: * including part of the main canal and all sub-branches; ** Pumps on main canal; *** excluding meska irrigated by Main canal

3.3 Irrigation Water Management

Generally the water management system is similar to Tunsa-Kella Irrigation Unit. There are a total of six (6) Sailors who are responsible for operating the intake gates and regulators along the canal during the rotation of irrigation water, however, the gates on regulator and intakes are not working properly.

3.4 Existing Condition of Irrigation Facilities

Generally the facilities in this irrigation unit (intake gates, regulators etc) are malfunctioned resulting in difficulty to apply rotation in the unit. Especially in the lower part of the unit (Zone-2) water from Ibrahimia can't reach even during its rotation period. The existing pump stations could cover the problem by pumping water from Bahr Yousef to the canal, however these pump stations are very old and found in a bad condition. Some need a total replacement or rehabilitation so that it supplement the irrigation unit with additional water.

Major structures such as regulators and gates on the main canal are debilitated and malfunctioned; the canal shape is deformed and widened too much.

In addition, holes on siphons and culverts on drain crossing the main canal are exposed to the canal bed and are resulting in water leaking from the main canal to the drains.

Exposed culvert across Abo Shosha canal

Immobile gate on the regulator

On the other hand, where the irrigation canal crosses drain through siphon, the entrance to siphon is broken and trashes entering the canal clogged the siphon, hence hinders the flow of irrigation water through the canal system.

The existing pump stations are very old and some are malfunctioned. During this survey, only Kom El Noor pump station is properly working and in good condition. The facilities in the pump station are corroded or rusted and have leaks on suction and delivery pipes. The pumps are getting older and poor in efficiency due to over working. This is because the pump station lacks reserve pump and the load per unit pump has increased due to overworking without reserve pump and they are very old. In addition, they get very hot after short time of operation and the sound of the motor is unhealthy.

3.5 Summary of the Condition of Irrigation Facilities and Recommendation Made

Table 12 Sample Survey Result of Aboshosha Main Canal and Other Major Facility

No	Name of Structure	Condition of Structure	Recommendation
1	Aboshosha Intake	The intake has 3 gates each of 2 m x 3 m of good condition. The canal along road side is protected by masonry.	Need some rehabilitation on the gate
2	Sahar dir	Aqueduct is getting old and exposed in canal bed.	Need urgent rehabilitation
3	Beni Saleh	Aqueduct is getting old and exposed in canal bed. holes in the aqueduct cause water loss	Need urgent rehabilitation
4	Aboshosha Branch1	The intake has a gate 1 m x 3 m. This gate is rusted and it does not work. The gate has been opened to certain level. Wet masonry that protect the side intake is broken.	Need intake gate replacement
5	Aref meska	The intake has a gate 1 m x 3 m. This gate is rusted and it does not work. The gate has been opened to certain level. Wet masonry that protect the side intake is broken.	Need intake gate replacement
6	Aboshosha Branch2	The intake has a gate 1 m x 3 m. This gate is rusted and it does not work. The gate has been opened to certain level. Wet masonry that protect the side intake is broken.	Need intake gate replacement
7	Aboshosha Branch3	The intake has a gate 1 m x 3 m. This gate is rusted and it does not work. The gate has been opened to certain level. Wet masonry that protect the side intake is broken.	Need intake gate replacement
8	Moheit Drain Siphone	Aqueduct is getting exposed to canal bed.	Need urgent rehabilitation
9	Talt Canal	The intake has a gate 2 m x 3 m. This gate is rust and it does not work.	Need intake gate replacement
10	Talt Branch	The intake has a gate 1 m x 3 m. This gate is rusted and it does not work. The gate has been opened to certain level.	Need intake gate replacement
11	Shawqy Branch	The intake has a gate 1 m x 3 m. This gate is rusted and it does not work. The gate has been opened to certain level.	Need intake gate replacement
12	Hanna Branch	The intake has a gate 1 m x 3 m. This gate is rusted and it does not work. The gate has been opened to certain level.	Need intake gate replacement
13	Tawfik Branch	The intake has a gate 1 m x 3 m. This gate is rusted and it does not work. The gate has been opened to certain level.	Need intake gate replacement
14	Rolea Regulator	The regulator has 2 gates 2 m x 3 m. A gate is rust and it does not work. Due to insufficient spec of the gate opening / closing device for this gate, there is a problem in gate operation.	The gates and structure need some rehabilitations.
15	Abo Shousha Branch1	The intake has a gate 1 m x 3 m. This gate is rusted and it does not work. The gate has been opened to certain level.	Need intake gate replacement
16	Mazora Box culvert	The box culvert size is 2.3 m x 2.5 m and length is 155 m.	It neds cleaning
17	Kamon Branch	The intake has a gate 1 m x 3 m. This gate is rusted and it does not work. The gate has been opened to certain level.	Need intake gate replacement
18	Saharit Mazoura Pump Station	There were 5 pumps ($Q = 0.5\ m^3$) but one pump is moved to another pump station. Delivery pipes has water leaking and leaked water cause electricity problem.	Need urgent rehabilitation
19	Saharit Mazoura Siphone	Aqueduct is getting exposed to canal bed.	Need urgent rehabilitation
20	Mazoura Branch	The intake has a gate 1 m x 3 m. This gate is rusted and it does not work. The gate has been opened to certain level.	Need intake gate replacement
21	Naser Branch	The intake has a gate 1 m x 3 m. This gate is rusted and it does not work. The gate has been opened to certain level.	Need intake gate replacement
22	Sheikh Abed regulator	The intake has 2 gates 2.5 m x 2.5 m. This gates is rust and it doesn't work.	It needs rehabilitation
23	Bellawy Branch	The intake has a gate 1 m x 3 m. This gate is rusted and it does not work. The gate has been opened to certain level.	Need intake gate replacement
24	Bane Rashed Box culvert	The box culvert size is 2.3 m x 2.5 m and length is 155 m. Due to locating residential area, many rubbish are getting into canal.	Need urgent rehabilitation Measure for rubbish problem
25	Sheikh Abed	The intake has a gate 2 m x 2.7 m. This gate is rust and it does not work.	Need intake gate replacement

No	Name of Structure	Condition of Structure	Recommendation
26	Boab Spillway	Totally closed The intake has a gate 2 m x 2.7 m. This gate is rust and it does not work.	It needs rehabilitation
27	Waleeda Branch	The intake has a gate 1 m x 3 m. This gate is rusted and it does not work. The gate has remain opened to a certain level.	Need intake gate replacement
28	Qasaba Branch	The intake has a gate 1 m x 3 m. This gate is rusted and it does not work. The gate has remain opened to a certain level.	Need intake gate replacement
29	Aboshosha Branch 1	The intake has a gate 1 m x 3 m. This gate is rusted and it does not work. The gate has remain opened to a certain level.	Need intake gate replacement
30	Saleed Regulator	The intake has a gate 2 m x 2.7 m. This gate is rust and it does not work.	Need intake gate replacement
31	Dushtut Pump station	There are 6 pumps (Q = 0.5 m^3) .This pump station pumping water from Bahr Yousef to Aboshosha. The pump units are very old and the suction pool lacks screen	It needs replacement and provision of good pipe suction set-up
32	Aboshosha Branch 2	The intake has a gate 1 m x 3 m. This gate is rusted and it does not work. The gate has remain opened to a certain level.	Need intake gate replacement
33	Dushtut	The intake has a gate 1 m x 3 m. This gate is rusted and it does not work. The gate has remain opened to a certain level.	Need intake gate replacement
34	Kom El Noor	There are 2 pumps (Q = 0.5 m^3) .This pump station pumping uo water from Bahr Yousef to Aboshosha and Kom el noor canal.	Small rehabilitation work is needed on the pump house
35	Talt Pump station	There are 3 old pump units (Q = 0.5 m^3). Canal discharge side lining is broken.	It needs some improvement in the pump house

4. Aros-Aboseer Sub-region

4.1 Basic Information

(1) Present Situation of the Irrigation Unit

Aros-Abo seer Irrigation unit is one of the model area identified focusing on investigation of meska Improvement. It has two main canals which belongs Bahr Yousef canal system, and the irrigation area is located inside Etsa Irrigation District in Faiyum Governorate. Generally, in this area continuous flow of water on the main and branch canal is common and rotation is applied at meska Level. In addition, Faiyum Governorate is considered by the MWRI as a hot spot area in relation to the existence of conflict over water usage especially during pick irrigation period.

The total command area of this irrigation unit is about 13,524 feddan (5,680 ha), with main canal system having 13 km length and branch canal of about 24 km. There are about seven (7) branch canals in the system, three (3) of them on Abo Seer and the remaining four (4) on Aros main canal. The lay-out of this irrigation unit is presented as follow.

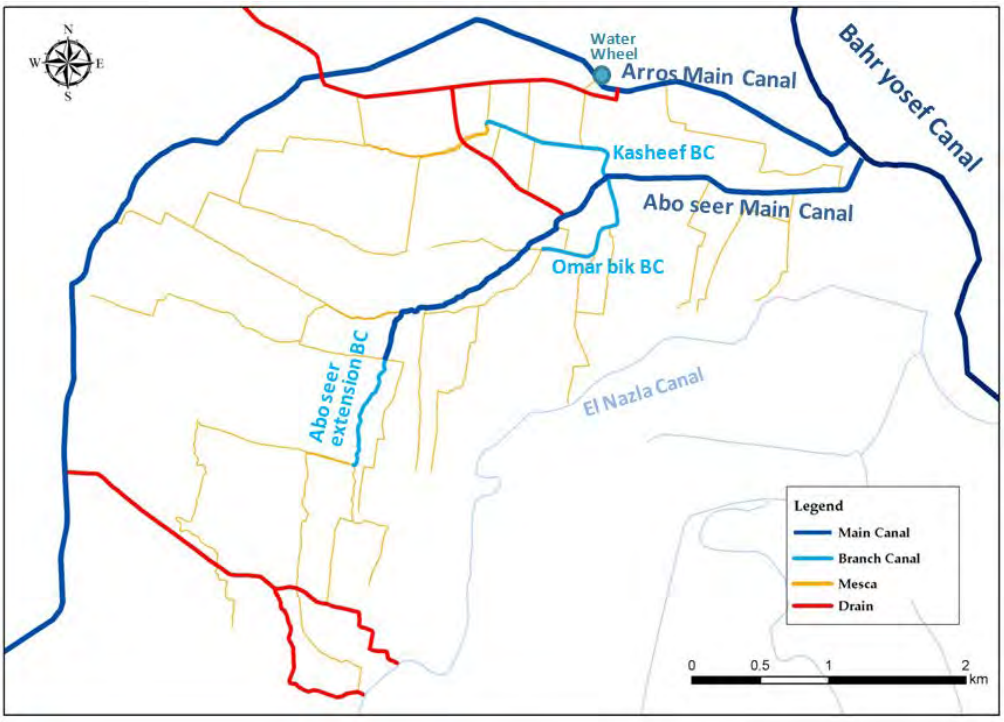


Figure 9 Lay-out of Aros & Abo Seer Irrigation Unit

Individually, Abo seer main canal has a total length of 3.78 km, with command area of 2,590 feddan (616 ha). The three branches are Omar bik and Kasheef and Abo seer extension branch that connects at end of the main canal. Total of number of meska in the system is around 38 lines (including 7 illegal meskas). From the result of hearing survey, the total number of farmers in Abo Seer canal is approximately 2,700 people, and average farm land area per owner is 0.9 feddan.

On the other hand, total length of Aros main canal is 9.71 km, with command area of 10,934 feddan (4,592 ha). The four branch canals in the system are; Defeno canal branches off at 6km from Aros intake, and Abo El Mair, El Ghaba, and South Itsa canal branch off from the end of main canal. There are about 20 meska along the main canal and two fixed weir that control water level on the main canal. Very recently the farm land on Aros irrigation system has been changed to residential area; hence the total command area might be different from the official data presented here above.

(2) General Condition of Meska in Aros-Abo Seer

In this model area there are big differences in total length and command area covered by each meska. For example, one of meska irrigates directly to an area of between 1 to 4 feddan using a pump, whereas another meska from the same system can have over 3 km long canal covering command area of more than 200 feddan. The intake flow of water into meska can be done either by gravity or pump. The ratio of gravity and pump type flow is 6:4. Generally the upstream sides of the schemes are irrigated by gravity, and downstream side by pump. Some of the meskas, (such as Mostgada and Bahnas meska), have an integrated pump station installed with fund from the beneficiary farmers, and the pump is maintained and managed by the beneficiaries themselves. The existing rule for rotation of irrigation water is set as 1 hour/ feddan/week, but WUA is not active and the proper rotation rule is not obeyed, rather traditional system of water distribution is more or less applied as in most of the irrigation system in the country.

Some farmers get to know about a good reputation of meska improvement in other area. Consequently, the farmers made effort to improve the meskas by themselves without government support. The farmer imitated the design of meska and gate from existing improved meska in the area. Most of improvement is made by white bricks and mortar, and steal gates are installed. However, some of the improved meskas has shown leaks from cracks because of wrong interpretation of the design and poor

quality of construction.

4.2 Existing Condition of Irrigation Facilities

The hearing survey shows that 15 out of 31 meskas inside Abo Seer canal system are reported to have problem of water reaching at the end of meska. Actually water reach at end, but the water level is low, and it makes pump to be used with higher suction head. Moreover, the number of day that water reaching the end of meska was reported as another problem of the area.

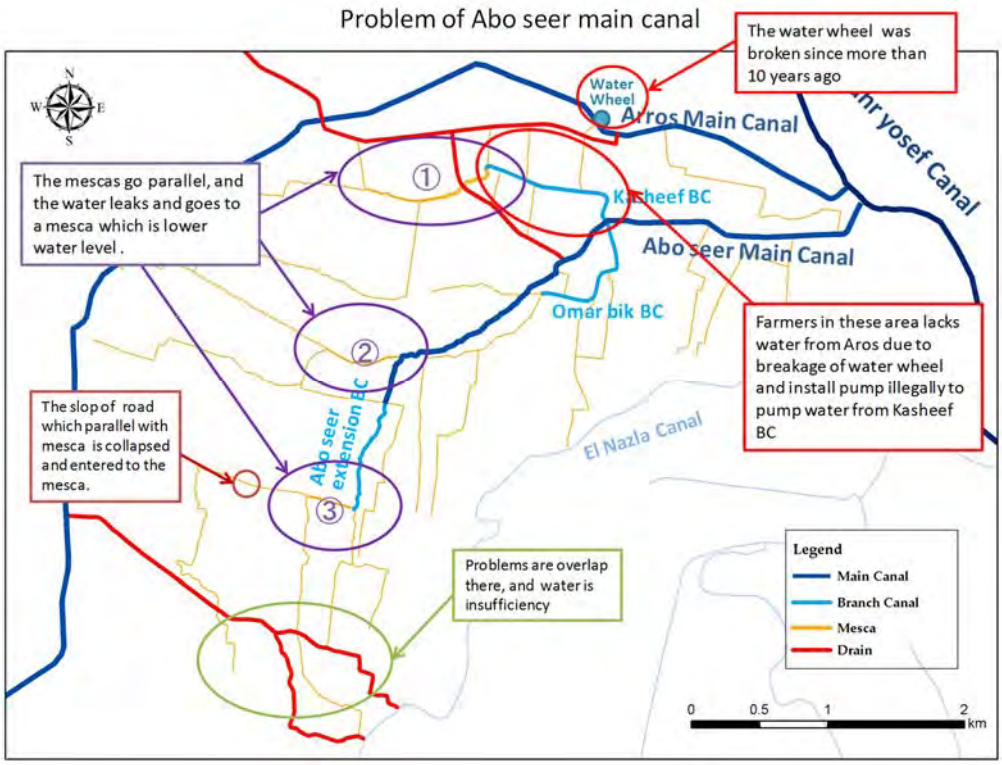


Figure 10 Sketch Showing the Existing Problem of Abo Seer

Summary of the problem in this irrigation unit is presented above. There are three places where some meskas are aligned parallel to each other. This condition create problem of water flowing from one meska to another where there is lower bank in between and some holes created by rodents also exasperate the leaks resulting in poor water distribution among the parallel meska.

Also, on the southern part of Abo seer, road which was built along meska has collapsed due to the traffic and the collapsed soil stops the flowing in the meska. The responsibility of road along meska is the farmer, but the road is not yet repaired which hinders the flow of water downstream and over flooding at the spot.

There is a meska form Aros main canal that was supposed to irrigate around Kasheef branch canal (from, Abo Seer), but a water wheel on Aros branch canal was broken since more than ten years ago, and water doesn't reach to the area. Therefore, the farmers who used to get water from Aros main canal are forced to use a pump and take water form Kasheef branch canal illegally. Additionally, a siphon crosses under Kasheef branch canal to send water to left side of Kasheef branch canal is stacked, which disrupt the fair distribution of water in the system at Kasheef branch.

Three meskas set parallel to each other at the end of Kasheef branch canal

Destroyed meska with interpenetrated structure

Collapse of the road along meska

The water wheel on Aros main canal

As a summary

- ✓ There is a lot of losses along maska canal
- ✓ The community show strong interest to Maska Improvement
- ✓ The Maska improvement shall be supported by branch canal improvement for better use of scarce water

4.3 Summary of the condition of irrigation Facilities and Recommendation Made

Table 13 Sample Survey Result of Abo-Seer Irrigation System (Survey on meska)

Name Meska or Facility	Length (km)	Number of Marwa	Intake Type	Canal Type	Water Sufficiency	Problem
Abo Seer canal						
El Mostagda Pump	1.70	5	Pump	265 m lined	Not enough in Summer	Irrigation water is not reaching to 50% of end of meska. Earth canal leaks water, and mole tunnel.
Bahnas Pump	1.50	10	Pump	50 m lined	Not enough	The meska irrigated around Khaleeg Sultan, but pipe culvert is broken and not sending water now. Earth canal leaks water, and mole tunnel.
Mohamed Saad Water Weel	0.50	0	Pump	Earth Canal	Good	No big problem
Khaleeg Sultan	1.20	4	Gravity	Earth Canal	Good	Rodent problem, and Water of Bhanas came by a pipe, but it has holes and does not work.

Name Meska or Facility	Length (km)	Number of Marwa	Intake Type	Canal Type	Water Sufficiency	Problem
Right Pipe	0.00	0	Pump	Earth Canal	Good	The farmer doesn't use a pool of meska, directly taking water from the main canal
Mawashy Dramaly	0.20	-	Pump	Earth Canal	Good	Water section need development Using water wheel is not efficient one side of meska is damaged so water goes to nearby homes
Fanos(Fam Mnfrios)	1.20	3	Gravity	Earth Canal	Not enough	Rodent problem, Need more water
El Deraa	1.70	3	Gravity	Earth Canal	Not enough need pump	Huge rodent problem, Need more water
Hassan Radwan	0.80	8	Gravity	Earth Canal	Not enough, need pump	Huge rodent problem, Need more water
Hareedi	1.80	11	Gravity	Earth Canal	Not enough	Rodent problem, too much grass & weed
Farahat	0.70	-	Gravity	Earth Canal	Not enough	Rodent problem, grass & weed everyone using pump which affect water sufficiency
Omar Bik Intake						
Sultan & Abo Greeda	0.50	0	Pump	Earth Canal	Good	Rodent problem.
Mashkoor	0.20	1	Gravity	Earth Canal	Good	No major problem
El Kharsa	0.80	8	Gravity	Earth Canal	Not enough	One big land owner uses water wheel and takes much water,
Small Omar Bik	1.00	6	Gravity	Earth Canal	Good	No major problem
El Nassary	0.8(2.6)	5	Gravity	100	Good	No major problem
El Kashef Intake						
Samoeel Pipe 1	0.00	-	Pump	Earth Canal	Good	Upland irrigation
Samoeel Pipe 2	0.40	2	Pump	300	Not enough	Need pump, Not enough water, Small leakage problem
Rostom Bik 2	0.40	1	Pump	Earth Canal	Good using pump	land is high, Not enough water, Small leakage problem
Rostom Bik 3	0.30	4	Pump	Earth Canal	Good using pump	land is high, Not enough water, Small leakage problem
Abd El Waheed Pipe	0.20	4	Gravity	Earth Canal	Not enough, need pump	land is high, leakage problem
Rostom Bik 4	0.30	5	Gravity	Earth Canal	-	
Abd El Waheed Afandi Pipe 1	0.30	2	Pump	Earth Canal	-	Garbage, using pump
Abd El Waheed Afandi Pipe 2	0.20	2	Gravity	Earth Canal	Not enough	Garbage, using pump
Left El Gnabia Pipe	1.20	10	Gravity	Earth Canal	Not enough	Garbage, using pump, Not enough water
Rostom Dalla	0.30	5	Grabity & Pump	Earth Canal	Not enough	Garbage
Off Take	3.00	18	Grabity	Earth Canal	Not enough	Garbage
Abo Seer extension						
El Dally	1.50	8	Gravity	Earth Canal	Good	
Gzer	1.60	3	Grabity	Earth Canal	Good	

Name Meska or Facility	Length (km)	Number of Marwa	Intake Type	Canal Type	Water Sufficiency	Problem
Nehia	2.70	10	Gravity	Earth Canal	Not enough	The road along mesca is collapsed and enter to the mesca.. Rubbish problem Farmer's land.is decreased by excavation work.

4.4 Agriculture

Farmers group of Abo seer were interviewed for grasping farming situation. The command area owned by the interviewed group, the number of farmers belonging, the number of interviewed farmers and the date of survey are as shown in the table below.

Table 14 Command Area, Number of farmers, and Interview Date

Name of Group	Command Area (feddan)	No. of farmers	No. of interviewed farmers	Interview Date
Abo Seer A	168	About 400	58	23rd, 24th April 2017
Elkashef	179	About 200		
Omar Bek	121	About 350		
Abo Seer B	265	About 200		
Abo Seer Extension	326	About 680		

Source: JICA Survey Team prepared based on the interview survey.

Results of interview survey are summarized as below.

(1) Characteristics of Household Head

The distribution of the age of the household head is shown in the right figure. The most common age distribution was 41 to 50 years old. The percentage of over 50 is about 48%. The average age of the household head was about 51 years old, the household head with the lowest age was 28 years old, and the household head with the highest age was 71 years old.

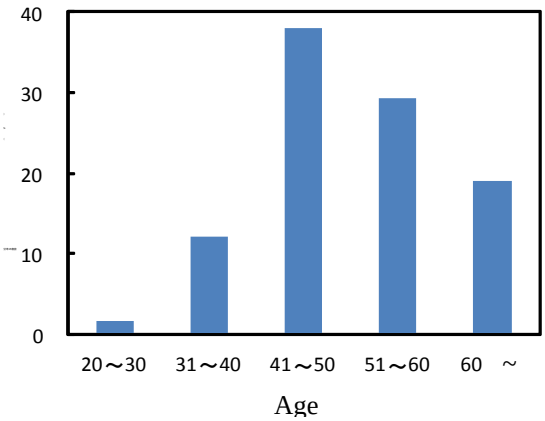


Figure 11 Distribution of Age of Household Head

The distribution of the educational level is shown in the figure below (left). Half of the household heads who answered that they did not receive education accounted for half (about 52%). Some household heads also had farmers who advanced to the educational background (graduate school etc).

The distribution of farming experienced years of agriculture is shown below (right). The percentage of farming experience 31 to 40 years was the highest (about 53%). As the average of farming experienced years is about 36 years and the average age at which household heads started farming is about 14.5 years old, in Abo seer the household head continues to engage in farming from young age.

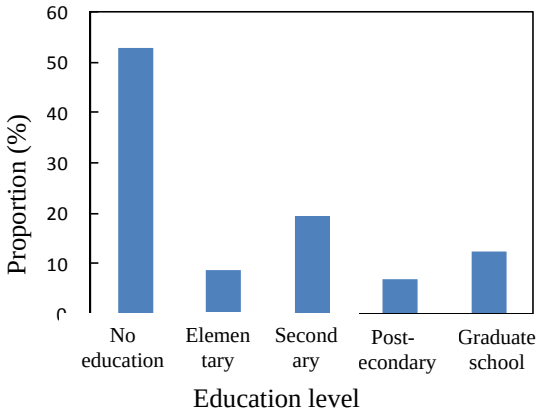


Figure 12 Distribution of Educational Level of Household Head

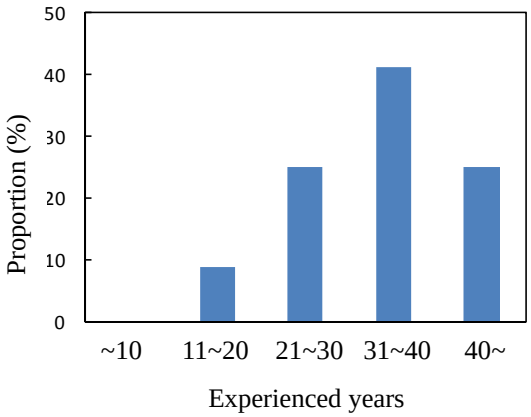


Figure 13 Distribution of Experienced Years of Household Head

(2) Family Structure

The family structure of farmers is shown in below figure. There are a large number of farmers whose number of household members is 4 to 6 and 7 to 9 (these account for about 90%). The average number of people in the family structure was about 7, of which the minimum number was 3 and the maximum number was 14. The most common age groups in the family structure were young people aged 15 to 35 as well as Beni Suef.

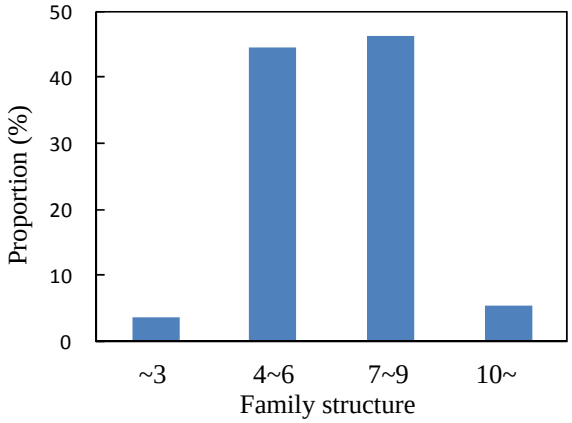


Figure 14 Distribution of Family Structure

(3) Source of Income

Approximately 77.5% accounted for farmers' main source of income "agriculture". By multiple answers, in addition to agriculture, about 40% answered "employment" as income source, about 10% answered "breeding of livestock", about 6% who responded "handicraft" About 46% of respondents answered "agriculture" only, so it was found that half of the farmers in Abo seer are concurrent farmers who also do other work.

(4) Ownership of Cultivated Land and Land Area

Of the 57 household heads who responded, there were two household heads who that they do not own farmland. Many farmers owned their own lands.

The distribution of the cultivated land area is shown in the figure below. The average cultivated area of farmers was about 2.3 feddan. Distribution of farmland's cultivated area is the same for farmers with less than 1 feddan and farmers with 2 to 3 feddan, and farmers with cultivated farmers with more

than 3 feddan also account for about 28% of the total. From this, it was suggested that the cultivated area of the Abo seer farmer is larger than Beni Suef.

In addition, 20 household heads do farming as leaseholds while holding individual farmlands. Many households have the same leased land area as the owned land area.

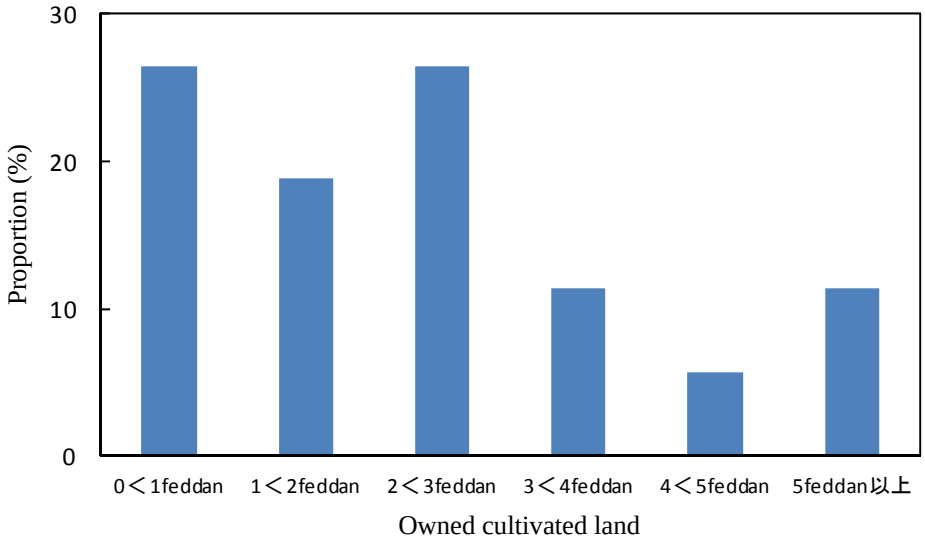


Figure 15 Distribution of Cultivated Area of Farmer

(5) Situation of Water Shortage

About the time of the water shortage in the field, 51 household heads who responded answer that there was a shortage of water in the summer. Some farmers who are water shortage also exist in winter (33 out of 51 people answered that has water shortage in winter).

(6) Major Crip and Main Person of Farming Work

Crops and cropping patterns mainly planted at each time are shown in the figure below.

Season, Crop \ Month		Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Winter	Wheat	■	■	■	■							■	■
	Berseem	■	■	■	■	■					■	■	■
	Sugar Beet	■	■	■	■	■					■	■	■
	Onion	■	■	■								■	■
	Garlic	■	■	■								■	■
	Tomato	■	■								■	■	■
Summer	Maize					■	■	■	■				
	Sorghum					■	■	■	■				
	Cotton			■	■	■	■	■	■	■			
	Fodder crop				■	■	■	■	■				
Nile	Maize						■	■	■	■			

Source: JICA Survey Team prepared based on “List of Cultivated Crops of Beni Suef Governorate (2016-2017)”.
Note: Since Faiyum is located in the same Egypt as Beni Suef, it was made the same planting pattern.

Figure 16 Major Crops and Cropping Patterns

Many farmers plant wheat and Egyptian clover in winter. Many farmers plant cultivated land area with wheat and Egyptian clover and half each. A few farmers plant sugar beet, onion, garlic and

tomato. In summer, many farmers planted maize and sorghum, and a few farmers planted cotton and livestock feed.

The results of examining who is the main person of farming work are shown in the table below. The result is the same as the result of Beni Suef, with male being the subject of plowing, seeding/transplantation deciding the timing and method of cropping, and sales of harvested crops, which is hard labor. In work such as weeding and harvesting in the crop cultivation, female and children participate in the work.

Table 15 Main Person of Farming Work

Farming Work	Plowing	Sowing and transplanting	Weeding	Harvesting	Selling
Main Person	Male	Mainly male	Female and children	Male and female	Male

(7) Customer of Crops

The main costumer of each crop that could be confirmed by interview survey are shown in the table below.

Table 16 Main Customer of Crops

Crop	Main Customer
Wheat	It is sold to unions, merchants, local markets. Depending on farmers, they sell them separately to their respective suppliers.
Egyptian cover	Wheat
Sugar beet	Egyptian cover
Garlic and Onion	Sugar beet
Maize	Many farmers sell to the local market. Some farmers also sell to merchants.
Sorghum	There are farmers who have merchants with sellers.

(8) Livestock

There were responses that 25 households were raising livestock, and the domesticated cattle were bulls, cows, donkeys, goats, chickens. More than 90% of farmers breed cows.

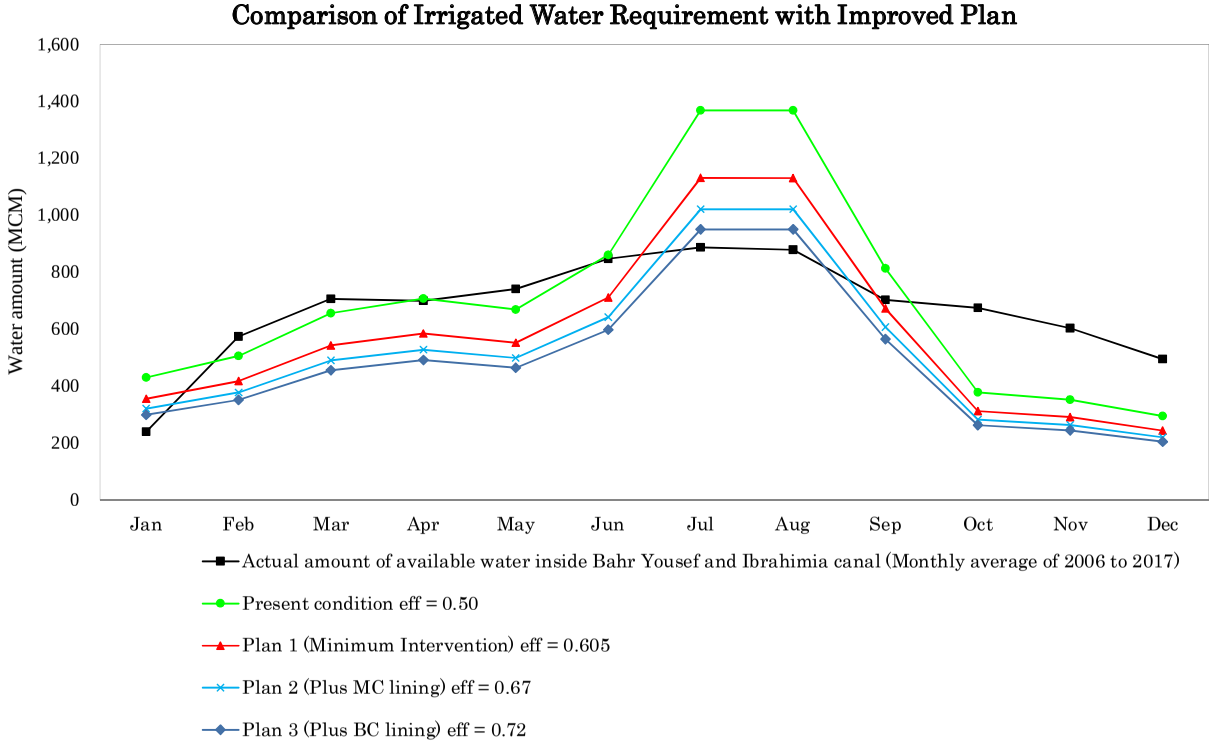
ANNEX5 : Calculation of Water Requirement

ANNEX5-1

Total Required water of 3 GD (BeniSuef,Minya abd Faiyoum)

Unit: MCM

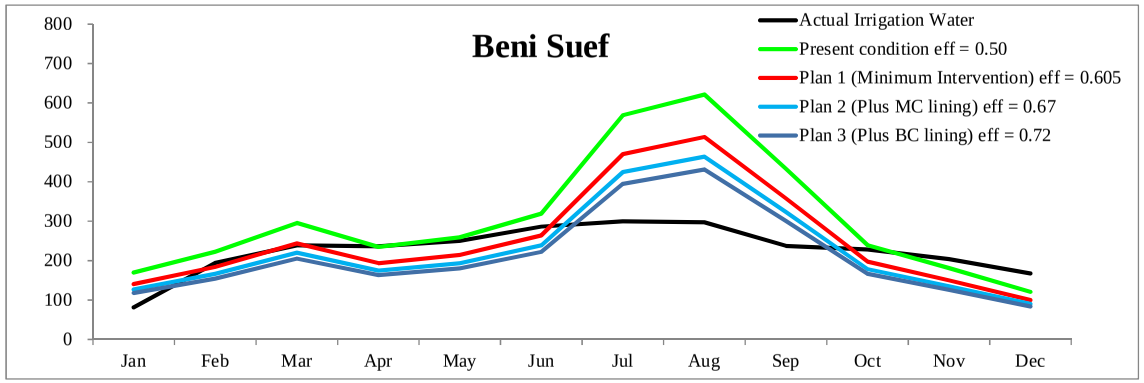
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Actual amount of available water inside Bahr Yousef and Ibrahimia canal (Monthly average of 2006 to 2017)	240	575	707	700	741	847	888	879	702	675	603	495	8,052
Present condition eff = 0.50	431	506	657	708	669	861	1,369	1,369	814	378	353	295	8,407
Plan 1 (Minimum Intervention) eff = 0.605	356	418	543	585	553	711	1,131	1,131	672	313	291	244	6,948
Plan 2 (Plus MC lining) eff = 0.67	321	378	490	528	499	642	1,022	1,021	607	282	263	220	6,274
Plan 3 (Plus BC lining) eff = 0.72	299	351	456	491	464	598	951	950	565	263	245	205	5,838



Beni Suef

Unit: MCM

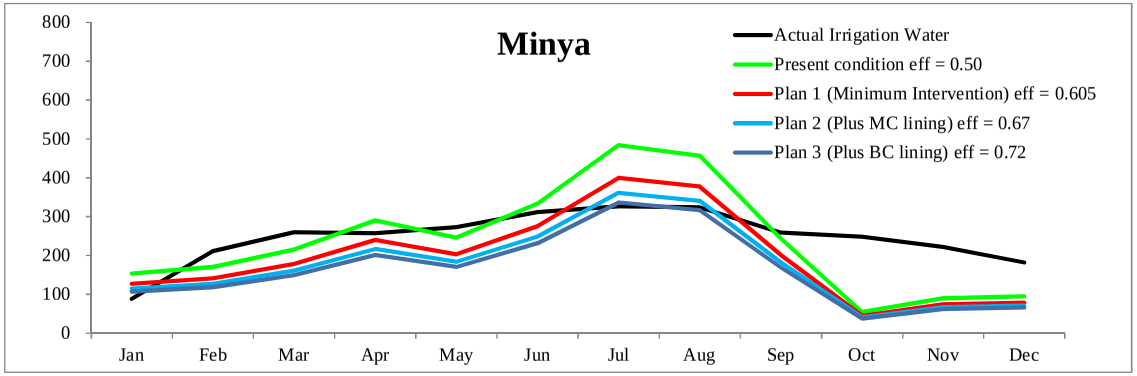
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Actual Irrigation Water	81	194	239	236	250	286	300	297	237	228	204	167	2,720
	54	71	95	75	83	102	182	199	139	77	58	39	1,174
	115	151	201	159	176	217	387	422	294	163	123	82	2,491
Present condition eff = 0.50	170	223	295	234	259	320	569	621	433	239	181	120	3,664
	45	59	78	62	69	85	151	165	115	63	48	32	970
	95	125	166	132	145	179	320	349	243	134	102	68	2,058
Plan 1 (Minimum Intervention) eff = 0.605	140	184	244	194	214	264	470	514	358	198	150	100	3,028
	41	53	71	56	62	76	136	149	104	57	43	29	876
	86	113	150	119	131	162	289	315	220	121	92	61	1,859
Plan 2 (Plus MC lining) eff = 0.67	127	166	220	175	193	238	424	464	323	178	135	90	2,735
	38	50	66	52	58	71	127	138	96	53	40	27	815
	80	105	139	111	122	151	268	293	204	113	85	57	1,730
Plan 3 (Plus BC lining) eff = 0.72	118	155	205	163	180	222	395	432	301	166	126	84	2,545



Minya

Unit: MCM

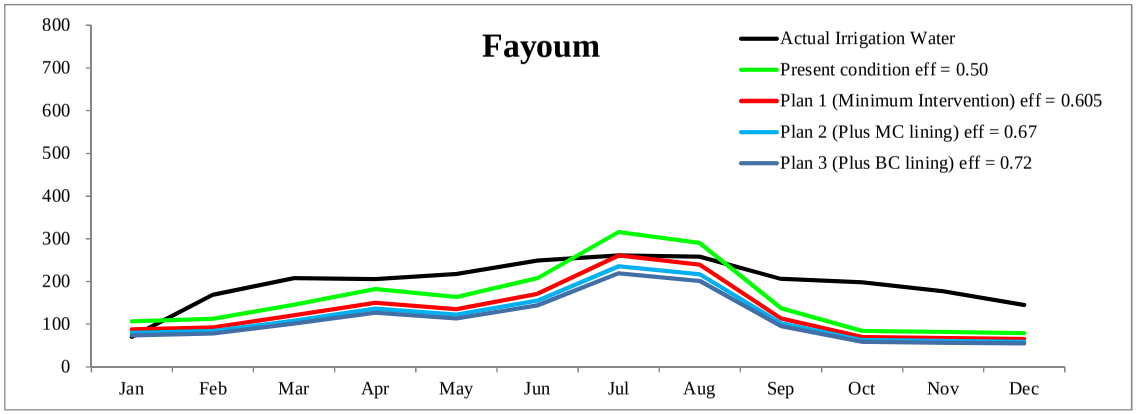
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Actual Irrigation Water	88	212	260	258	273	312	327	324	259	249	222	182	2,965
	55	61	78	105	89	120	174	164	88	20	32	34	1,020
	99	109	138	186	157	213	310	292	156	35	58	61	1,814
Present condition eff = 0.50	154	171	216	291	246	334	484	457	243	54	90	95	2,835
	46	51	64	86	73	99	144	136	72	16	27	28	843
	81	90	114	154	130	176	256	242	129	29	48	50	1,500
Plan 1 (Minimum Intervention) eff = 0.605	127	141	178	240	203	276	400	378	201	45	74	79	2,343
	41	46	58	78	66	90	130	123	65	15	24	26	761
	74	82	103	139	118	159	231	218	116	26	43	46	1,354
Plan 2 (Plus MC lining) eff = 0.67	115	127	161	217	184	249	361	341	182	41	67	71	2,115
	38	43	54	73	61	83	121	114	61	14	22	24	708
	68	76	96	129	109	148	215	203	108	24	40	42	1,260
Plan 3 (Plus BC lining) eff = 0.72	107	119	150	202	171	232	336	317	169	38	62	66	1,969



Fayoum

Unit: MCM

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Actual Irrigation Water	71	169	208	206	218	249	261	258	206	198	177	146	2,367
	107	113	146	183	164	208	316	290	137	85	82	79	1,908
	-	-	-	-	-	-	-	-	-	-	-	-	0
Present condition eff = 0.50	107	113	146	183	164	208	316	290	137	85	82	79	1,908
	88	93	120	151	135	172	261	240	113	70	68	65	1,577
	-	-	-	-	-	-	-	-	-	-	-	-	0
Plan 1 (Minimum Intervention) eff = 0.605	88	93	120	151	135	172	261	240	113	70	68	65	1,577
	80	84	109	136	122	155	236	217	102	63	61	59	1,424
	-	-	-	-	-	-	-	-	-	-	-	-	0
Plan 2 (Plus MC lining) eff = 0.67	80	84	109	136	122	155	236	217	102	63	61	59	1,424
	74	78	101	127	114	144	219	202	95	59	57	55	1,325
	-	-	-	-	-	-	-	-	-	-	-	-	0
Plan 3 (Plus BC lining) eff = 0.72	74	78	101	127	114	144	219	202	95	59	57	55	1,325

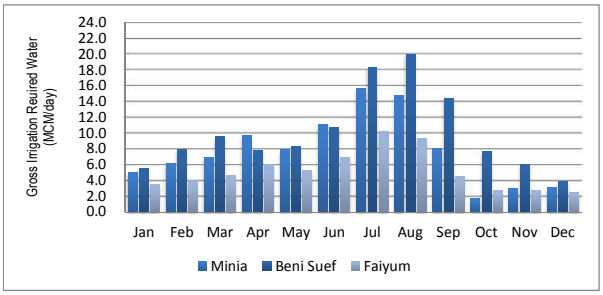


1-1.Total of 3 GD

Irri. Efficiency eff = 0.50

Bahar

	Gross Irri Reqd. inclusive losses(m^3/day)												Area(ha)	Area(%)
	31	28	31	30	31	30	31	31	30	31	30	31		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Beni Suef	1,754,548	2,546,550	3,049,144	2,503,513	2,674,426	3,411,387	5,877,154	6,421,358	4,623,572	2,470,881	1,932,129	1,244,597	57,789	9.6%
Minia	1,787,343	2,194,987	2,503,692	3,486,962	2,855,818	4,000,766	5,622,285	5,303,722	2,919,992	631,536	1,078,050	1,106,026	70,772	11.8%
Faiyum	3,447,792	4,020,723	4,701,886	6,083,332	5,285,017	6,928,243	10,186,487	9,362,561	4,573,330	2,729,742	2,726,326	2,554,668	157,105	26.1%
Giza	1,675,139	1,475,745	873,645	1,173,022	1,691,977	2,066,440	2,361,546	2,109,954	1,440,940	2,735,767	2,102,014	1,630,596	58,643	9.8%
													344,309	57.3%



Total												MCM/day
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Minia	5.0	6.1	7.0	9.7	7.9	11.1	15.6	14.7	8.1	1.8	3.0	3.1
Beni Suef	5.5	8.0	9.5	7.8	8.3	10.7	18.3	20.0	14.4	7.7	6.0	3.9
Faiyum	3.4	4.0	4.7	6.1	5.3	6.9	10.2	9.4	4.6	2.7	2.7	2.6

Ibrahimia

	Gross Irri Reqd. inclusive losses(m^3/day)												Area(ha)	Area(%)
	31	28	31	30	31	30	31	31	30	31	30	31		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Beni Suef	3,723,337	5,404,047	6,470,606	5,312,720	5,675,415	7,239,324	12,471,941	13,626,800	9,811,707	5,243,471	4,100,183	2,641,165	122,635	20.4%
Minia	3,179,052	3,904,109	4,453,185	6,202,076	5,079,493	7,115,952	10,000,063	9,433,452	5,193,637	1,123,279	1,917,471	1,967,231	125,879	20.9%
Faiyum	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Giza	236,718	208,541	123,457	165,762	239,097	292,013	333,715	298,162	203,622	386,597	297,040	230,423	8,287	1.4%
													256,801	42.7%

Bahar

	Gross Irri Reqd. inclusive losses(Mm^3/Month)												Area(ha)	Area(%)
	31	28	31	30	31	30	31	31	30	31	30	31		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Beni Suef	54.39	71.30	94.52	75.11	82.91	102.34	182.19	199.06	138.71	76.60	57.96	38.58	57,789	9.6%
Minia	55.41	61.46	77.61	104.61	88.53	120.02	174.29	164.42	87.60	19.58	32.34	34.29	70,772	11.8%
Faiyum	106.88	112.58	145.76	182.50	163.84	207.85	315.78	290.24	137.20	84.62	81.79	79.19	157,105	26.1%
Giza	51.93	41.32	27.08	35.19	52.45	61.99	73.21	65.41	43.23	84.81	63.06	50.55	58,643	9.8%
Total	268.61	286.66	344.97	397.41	387.73	492.20	745.47	719.13	406.74	265.61	235.15	202.61	344,309	57.3%

Ibrahimia

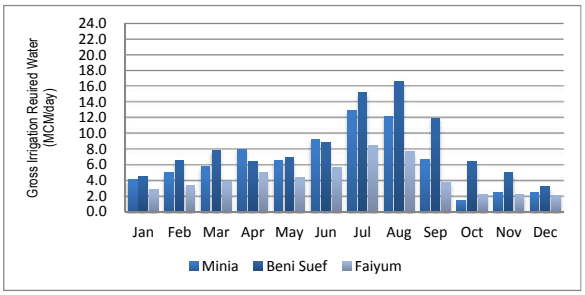
	Gross Irri Reqd. inclusive losses(Mm^3/Month)												Area(ha)	Area(%)
	31	28	31	30	31	30	31	31	30	31	30	31		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Beni Suef	115.4	151.3	200.6	159.4	175.9	217.2	386.6	422.4	294.4	162.6	123.0	81.9	122,635	20.4%
Minia	98.6	109.3	138.1	186.1	157.5	213.5	310.0	292.4	155.8	34.8	57.5	61.0	125,879	20.9%
Faiyum	-	-	-	-	-	-	-	-	-	-	-	-		-
Giza	7.3	5.8	3.8	5.0	7.4	8.8	10.4	9.2	6.1	12.0	8.9	7.1	8,287	1.4%
Total	221.31	266.47	342.47	350.41	340.81	439.42	706.98	724.11	456.27	209.35	189.44	150.00	256,801	42.7%

1-2.Total of 3 GD

Plan1 Irri. Efficiency eff = 0.605

Bahar

	Gross Irri Reqd. inclusive losses(m^3/day)												Area(ha)	Area(%)
	31	28	31	30	31	30	31	31	30	31	30	31		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Beni Suef	1,450,040	2,104,586	2,519,954	2,069,019	2,210,270	2,819,328	4,857,152	5,306,908	3,821,134	2,042,051	1,596,801	1,028,592	57,789	9.6%
Minya	1,477,143	1,814,039	2,069,167	2,881,786	2,360,180	3,306,418	4,646,516	4,383,241	2,413,217	521,930	890,950	914,071	70,772	11.8%
Faiyoum	2,849,415	3,322,912	3,885,856	5,027,547	4,367,782	5,725,821	8,418,584	7,737,654	3,779,611	2,255,985	2,253,162	2,111,296	157,105	26.1%
Giza	1,384,413	1,219,624	722,021	969,439	1,398,328	1,707,802	1,951,691	1,743,764	1,190,859	2,260,964	1,737,201	1,347,600	58,643	9.8%
													344,309	57.3%



Total												MCM/day
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Minya	4.1	5.0	5.7	8.0	6.6	9.2	12.9	12.2	6.7	1.5	2.5	2.5
Beni Suef	4.5	6.6	7.9	6.5	6.9	8.8	15.2	16.6	11.9	6.4	5.0	3.2
Faiyoum	2.8	3.3	3.9	5.0	4.4	5.7	8.4	7.7	3.8	2.3	2.3	2.1

Ibrahimia

	Gross Irri Reqd. inclusive losses(m^3/day)												Area(ha)	Area(%)
	31	28	31	30	31	30	31	31	30	31	30	31		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Beni Suef	3,077,138	4,466,155	5,347,608	4,390,677	4,690,426	5,982,912	10,307,389	11,261,818	8,108,849	4,333,447	3,388,581	2,182,781	122,635	20.4%
Minia	2,627,316	3,226,536	3,680,319	5,125,682	4,197,928	5,880,952	8,264,515	7,796,242	4,292,262	928,330	1,584,686	1,625,811	125,879	20.9%
Faiyum	-	-	-	-	-	-	-	-	-	-	-	-		-
Giza	195,634	172,348	102,030	136,994	197,601	241,333	275,798	246,415	168,283	319,502	245,488	190,432	8,287	1.4%
													256,801	42.7%

Bahar

	Gross Irri Reqd. inclusive losses(Mm^3/Month)												Area(ha)	Area(%)
	31	28	31	30	31	30	31	31	30	31	30	31		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Beni Suef	44.95	58.93	78.12	62.07	68.52	84.58	150.57	164.51	114.63	63.30	47.90	31.89	57,789	9.6%
Minia	45.79	50.79	64.14	86.45	73.17	99.19	144.04	135.88	72.40	16.18	26.73	28.34	70,772	11.8%
Faiyum	88.33	93.04	120.46	150.83	135.40	171.77	260.98	239.87	113.39	69.94	67.59	65.45	157,105	26.1%
Giza	42.92	34.15	22.38	29.08	43.35	51.23	60.50	54.06	35.73	70.09	52.12	41.78	58,643	9.8%
Total	221.99	236.91	285.10	328.43	320.44	406.77	616.09	594.32	336.15	219.51	194.34	167.46	344,309	57.3%

Ibrahimia

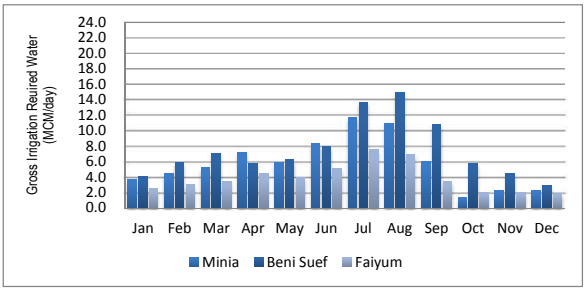
	Gross Irri Reqd. inclusive losses(Mm^3/Month)												Area(ha)	Area(%)
	31	28	31	30	31	30	31	31	30	31	30	31		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Beni Suef	95.4	125.1	165.8	131.7	145.4	179.5	319.5	349.1	243.3	134.3	101.7	67.7	122,635	20.4%
Minia	81.5	90.3	114.1	153.8	130.1	176.4	256.2	241.7	128.8	28.8	47.5	50.4	125,879	20.9%
Faiyum	-	-	-	-	-	-	-	-	-	-	-	-		-
Giza	6.1	4.8	3.2	4.1	6.1	7.2	8.6	7.6	5.1	9.9	7.4	5.9	8,287	1.4%
Total	182.9	220.2	283.0	289.6	281.7	363.2	584.3	598.4	377.1	173.0	156.6	124.0	256,801	42.7%

1-3.Total of 3 GD

Plan2 Irri. Efficiency eff = 0.67

Bahar

	Gross Irri Reqd. inclusive losses(m^3/day)												Area(ha)	Area(%)
	31	28	31	30	31	30	31	31	30	31	30	31		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Beni Suef	1,309,364	1,900,410	2,275,481	1,868,294	1,995,840	2,545,811	4,385,936	4,792,058	3,450,427	1,843,941	1,441,888	928,803	57,789	9.6%
Minia	1,333,838	1,638,050	1,868,427	2,602,210	2,131,207	2,985,646	4,195,735	3,958,002	2,179,099	471,295	804,515	825,393	70,772	11.8%
Faiyum	2,572,979	3,000,540	3,508,870	4,539,800	3,944,042	5,170,331	7,601,856	6,986,986	3,412,933	2,037,121	2,034,572	1,906,469	157,105	26.1%
Giza	1,250,104	1,101,303	651,974	875,389	1,262,669	1,542,119	1,762,348	1,574,593	1,075,328	2,041,617	1,568,667	1,216,863	58,643	9.8%
													344,309	57.3%



Total												MCM/day
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Minia	3.7	4.6	5.2	7.2	5.9	8.3	11.7	11.0	6.1	1.3	2.2	2.3
Beni Suef	4.1	5.9	7.1	5.8	6.2	7.9	13.7	15.0	10.8	5.8	4.5	2.9
Faiyum	2.6	3.0	3.5	4.5	3.9	5.2	7.6	7.0	3.4	2.0	2.0	1.9

Ibrahimia

	Gross Irri Reqd. inclusive losses(m^3/day)												Area(ha)	Area(%)
	31	28	31	30	31	30	31	31	30	31	30	31		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Beni Suef	2,778,610	4,032,871	4,828,811	3,964,716	4,235,384	5,402,481	9,307,419	10,169,254	7,322,170	3,913,038	3,059,838	1,971,019	122,635	20.4%
Minia	2,372,427	2,913,514	3,323,273	4,628,415	3,790,666	5,310,412	7,462,733	7,039,890	3,875,848	838,268	1,430,948	1,468,083	125,879	20.9%
Faiyum	-	-	-	-	-	-	-	-	-	-	-	-		-
Giza	176,655	155,628	92,132	123,703	178,431	217,920	249,041	222,509	151,957	288,505	221,672	171,958	8,287	1.4%
													256,801	42.7%

Bahar

	Gross Irri Reqd. inclusive losses(Mm^3/Month)												Area(ha)	Area(%)
	31	28	31	30	31	30	31	31	30	31	30	31		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Beni Suef	40.59	53.21	70.54	56.05	61.87	76.37	135.96	148.55	103.51	57.16	43.26	28.79	57,789	9.6%
Minia	41.35	45.87	57.92	78.07	66.07	89.57	130.07	122.70	65.37	14.61	24.14	25.59	70,772	11.8%
Faiyum	79.76	84.02	108.77	136.19	122.27	155.11	235.66	216.60	102.39	63.15	61.04	59.10	157,105	26.1%
Giza	38.75	30.84	20.21	26.26	39.14	46.26	54.63	48.81	32.26	63.29	47.06	37.72	58,643	9.8%
Total	200.45	213.94	257.44	296.57	289.35	367.31	556.32	536.66	303.53	198.21	175.50	151.20	344,309	57.3%

Ibrahimia

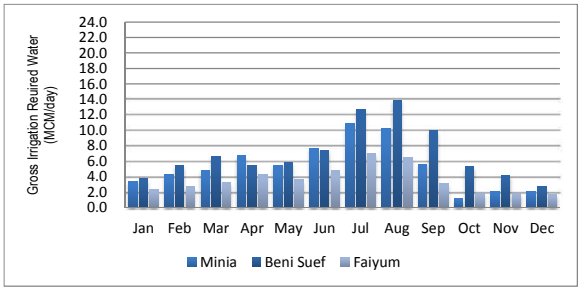
	Gross Irri Reqd. inclusive losses(Mm^3/Month)												Area(ha)	Area(%)
	31	28	31	30	31	30	31	31	30	31	30	31		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Beni Suef	86.1	112.9	149.7	118.9	131.3	162.1	288.5	315.3	219.7	121.3	91.8	61.1	122,635	20.4%
Minia	73.6	81.6	103.0	138.9	117.5	159.3	231.3	218.2	116.3	26.0	42.9	45.5	125,879	20.9%
Faiyum	-	-	-	-	-	-	-	-	-	-	-	-		-
Giza	5.5	4.4	2.9	3.7	5.5	6.5	7.7	6.9	4.6	8.9	6.7	5.3	8,287	1.4%
Total	165.2	198.9	255.6	261.5	254.3	327.9	527.6	540.4	340.5	156.2	141.4	111.9	256,801	42.7%

1-4.Total of 3 GD

PlanX Irri. Efficiency eff = 0.72

Bahar

	Gross Irri Reqd. inclusive losses(m^3/day)												Area(ha)	Area(%)
	31	28	31	30	31	30	31	31	30	31	30	31		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Beni Suef	1,218,436	1,768,437	2,117,461	1,738,551	1,857,240	2,369,019	4,081,357	4,459,276	3,210,814	1,715,890	1,341,757	864,303	57,789	9.6%
Minia	1,241,210	1,524,297	1,738,675	2,421,501	1,983,207	2,778,310	3,904,364	3,683,140	2,027,772	438,566	748,646	768,074	70,772	11.8%
Faiyum	2,394,300	2,792,169	3,265,198	4,224,536	3,670,150	4,811,280	7,073,949	6,501,779	3,175,923	1,895,654	1,893,282	1,774,075	157,105	26.1%
Giza	1,163,291	1,024,823	606,698	814,598	1,174,984	1,435,028	1,639,963	1,465,246	1,000,653	1,899,838	1,459,732	1,132,358	58,643	9.8%
													344,309	57.3%



Total												MCM/day
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Minia	3.4	4.2	4.8	6.7	5.5	7.7	10.8	10.2	5.6	1.2	2.1	2.1
Beni Suef	3.8	5.5	6.6	5.4	5.8	7.4	12.7	13.9	10.0	5.4	4.2	2.7
Faiyum	2.4	2.8	3.3	4.2	3.7	4.8	7.1	6.5	3.2	1.9	1.9	1.8

Ibrahimia

	Gross Irri Reqd. inclusive losses(m^3/day)												Area(ha)	Area(%)
	31	28	31	30	31	30	31	31	30	31	30	31		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Beni Suef	2,585,651	3,752,810	4,493,477	3,689,389	3,941,260	5,027,308	8,661,070	9,463,056	6,813,686	3,641,299	2,847,349	1,834,143	122,635	20.4%
Minia	2,207,675	2,711,187	3,092,490	4,306,997	3,527,426	4,941,633	6,944,488	6,551,008	3,606,692	780,055	1,331,577	1,366,132	125,879	20.9%
Faiyum	-	-	-	-	-	-	-	-	-	-	-	-		-
Giza	164,387	144,820	85,734	115,113	166,040	202,787	231,747	207,057	141,404	268,470	206,278	160,016	8,287	1.4%
													256,801	42.7%

Bahar

	Gross Irri Reqd. inclusive losses(Mm^3/Month)												Area(ha)	Area(%)
	31	28	31	30	31	30	31	31	30	31	30	31		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Beni Suef	37.77	49.52	65.64	52.16	57.57	71.07	126.52	138.24	96.32	53.19	40.25	26.79	57,789	9.6%
Minia	38.48	42.68	53.90	72.65	61.48	83.35	121.04	114.18	60.83	13.60	22.46	23.81	70,772	11.8%
Faiyum	74.22	78.18	101.22	126.74	113.77	144.34	219.29	201.56	95.28	58.77	56.80	55.00	157,105	26.1%
Giza	36.06	28.70	18.81	24.44	36.42	43.05	50.84	45.42	30.02	58.89	43.79	35.10	58,643	9.8%
Total	186.53	199.08	239.57	275.99	269.24	341.81	517.69	499.40	282.45	184.45	163.30	140.70	344,309	57.3%

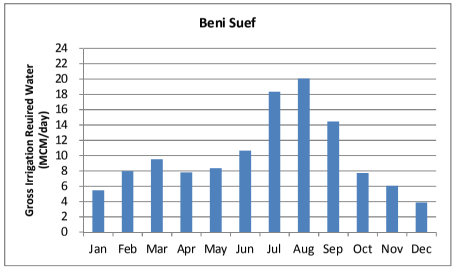
Ibrahimia

	Gross Irri Reqd. inclusive losses(Mm^3/Month)												Area(ha)	Area(%)
	31	28	31	30	31	30	31	31	30	31	30	31		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Beni Suef	80.2	105.1	139.3	110.7	122.2	150.8	268.5	293.4	204.4	112.9	85.4	56.9	122,635	20.4%
Minia	68.4	75.9	95.9	129.2	109.4	148.3	215.3	203.1	108.2	24.2	40.0	42.4	125,879	20.9%
Faiyum	-	-	-	-	-	-	-	-	-	-	-	-		-
Giza	5.1	4.1	2.7	3.5	5.2	6.1	7.2	6.4	4.2	8.3	6.2	5.0	8,287	1.4%
Total	153.7	185.0	237.8	243.3	236.7	305.2	491.0	502.9	316.9	145.4	131.6	104.2	256,801	42.7%

2-1.BeniSuef Sub Regions

Irrigation efficiency Eff = 0.50

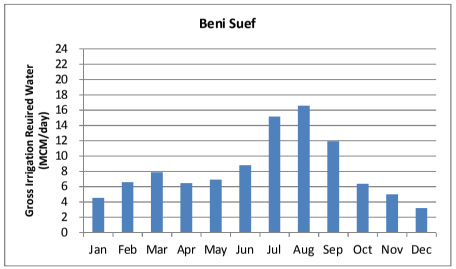
	Code	Sub Region	GD	ID	Area (ha)	Cultivated %	0.52	0.52	0.47	0.38	0.73	0.46	0.52	0.61	0.61	0.32	0.57	0.52
						Etc	5.86	8.51	11.33	11.30	6.30	12.95	19.68	18.18	13.09	13.19	5.90	4.16
							Gross Irri Reqd. inclusive losses(m^3/day)											
							Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
							31	28	31	30	31	30	31	31	30	31	30	31
Bah	10	Belhansa Irrigation Unit	Beni Suef	West Maghaga, El Fashen	4,761		144,540	209,785	251,189	206,240	220,319	281,030	484,160	528,992	380,890	203,551	159,169	102,530
	11	Hareeka-Delhans Irrigation Unit	Beni Suef	El Fashen	11,634		353,220	512,664	613,844	504,000	538,407	686,770	1,183,170	1,292,728	930,803	497,430	388,970	250,558
	12	Mazora PS Irrigation Unit	Beni Suef	Somusta	10,710		325,167	471,947	565,091	463,971	495,646	632,225	1,089,200	1,190,056	856,877	457,923	358,077	230,658
	13	Qoftan Irrigation Unit	Beni Suef	Somusta	8,036		243,990	354,126	424,018	348,142	371,909	474,392	817,285	892,962	642,960	343,604	268,684	173,075
	14	Monshaat El Hag Irrigation Unit	Beni Suef	Ahnasia	4,956		150,469	218,391	261,493	214,700	229,358	292,559	504,022	550,693	396,515	211,902	165,699	106,736
	15	Wady El Ryan & other Irrigation Unit	Beni Suef	Ahnasia	4,619		140,242	203,548	243,721	200,108	213,769	272,675	469,766	513,264	369,566	197,500	154,437	99,482
	16	Waslat Bahabshin & other Irrigation Unit	Beni Suef	Ahnasia	2,369		71,919	104,383	124,985	102,619	109,625	139,833	240,905	263,212	189,521	101,282	79,198	51,016
	17	El Soultany-2 Irrigation Unit	Beni Suef	Ahnasia	9,277		281,645	408,780	489,458	401,871	429,307	547,606	943,418	1,030,776	742,190	396,633	310,151	199,786
	18	Right Giza Irrigation Unit	Beni Suef	West Beni Seuf	1,428		43,356	62,926	75,346	61,863	66,086	84,297	145,227	158,674	114,250	61,056	47,744	30,754
		Subtotal			57,789		1,754,548	2,546,550	3,049,144	2,503,513	2,674,426	3,411,387	5,877,154	6,421,358	4,623,572	2,470,881	1,932,129	1,244,597
Ibra	50	El Fant Irrigation Unit	Beni Suef	El Fashen	2,940		89,261	129,554	155,123	127,365	136,060	173,552	298,996	326,682	235,221	125,704	98,296	63,318
	51	Saedyhat El Feshna Irrigation Unit	Beni Suef	El Fashen	2,428		73,704	106,975	128,087	105,167	112,346	143,304	246,885	269,746	194,225	103,796	81,164	52,283
	52	El Fashnya and other Irrigation Unit	Beni Suef	El Fashen	4,515		137,080	198,958	238,225	195,596	208,949	266,526	459,173	501,690	361,232	193,046	150,954	97,238
	53	Abo Shosha Irrigation Unit	Beni Suef	El Fashen, Samosta	6,266		190,254	276,135	330,634	271,468	290,001	369,914	637,289	696,300	501,357	267,930	209,510	134,958
	54	Absouge and other Irrigation Unit	Beni Suef	El Fashen	9,596		291,349	422,864	506,322	415,718	444,099	566,474	975,923	1,066,291	767,761	410,299	320,837	206,670
	55	El Soultany Irrigation Unit	Beni Suef	Samosta, Beba, Ahnasia	20,115		610,714	886,390	1,061,330	871,410	930,900	1,187,418	2,045,689	2,235,113	1,609,349	860,051	672,526	433,213
	56	South Ahmed Pasha Irrigation Unit	Beni Suef	Beba	2,908		88,280	128,129	153,417	125,964	134,563	171,643	295,707	323,089	232,634	124,322	97,215	62,621
	57	North Sharahna	Beni Suef	Beba	1,840		55,852	81,064	97,063	79,694	85,134	108,594	187,086	204,410	147,181	78,655	61,505	39,619
	58	North Amhmed Pasha	Beni Suef	Beba	2,100		63,758	92,539	110,802	90,975	97,185	123,966	213,569	233,344	168,015	89,789	70,211	45,227
	59	West Magroufa and other	Beni Suef	East Beni Suef	1,528		46,390	67,331	80,620	66,193	70,712	90,197	155,393	169,781	122,248	65,330	51,086	32,907
	60	Tansa-Kella	Beni Suef	East Beni Suef, Ahnasia, West Beni Suef	10,424		316,496	459,361	550,022	451,598	482,428	615,366	1,060,155	1,158,322	834,027	445,712	348,529	224,508
	61	Right Tansa-Tezment	Beni Suef	East Beni Suef	2,646		80,335	116,599	139,611	114,628	122,454	156,197	269,097	294,014	211,699	113,134	88,466	56,986
	62	El Sheikh Haroun and other	Beni Suef	East Beni Suef	1,218		36,980	53,672	64,265	52,765	56,368	71,900	123,870	135,340	97,449	52,078	40,723	26,232
	63	Ahanasya-Beni Haroun	Beni Suef	East Beni Suef	7,791		236,543	343,318	411,076	337,516	360,558	459,913	792,340	865,708	623,336	333,117	260,484	167,793
	64	El Shahra	Beni Suef	East Beni Suef	2,600		78,933	114,563	137,173	112,627	120,316	153,470	264,398	288,880	208,003	111,159	86,922	55,991
	65	El Azhary	Beni Suef	West Beni Suef	4,835		146,797	213,061	255,111	209,460	223,760	285,419	491,721	537,252	386,838	206,730	161,654	104,131
	66	El Sayda	Beni Suef	West Beni Suef	1,361		41,315	59,965	71,800	58,952	62,976	80,330	138,393	151,207	108,874	58,183	45,497	29,307
	67	Bosh and other	Beni Suef	Naser	5,572		169,163	245,523	293,980	241,374	257,852	328,906	566,640	619,109	445,777	238,228	186,285	119,997
	68	South Ashmant Canal	Beni Suef	Naser	1,940		58,913	85,506	102,381	84,061	89,799	114,544	197,337	215,610	155,246	82,965	64,875	41,790
	69	El Mansour Eyosra	Beni Suef	Naser	2,335		70,899	102,903	123,212	101,164	108,070	137,850	237,488	259,479	186,833	99,845	78,075	50,293
	70	South Qashisha	Beni Suef	Naser	3,053		92,704	134,551	161,106	132,277	141,308	180,246	310,529	339,283	244,294	130,553	102,087	65,760
	71	North Ashmant	Beni Suef	El Wasta	3,557		108,006	156,760	187,699	154,111	164,632	209,998	361,785	395,285	284,617	152,102	118,938	76,615
	72	Qashisha and otherr	Beni Suef	El Wasta	1,294		39,275	57,004	68,254	56,040	59,866	76,363	131,558	143,740	103,497	55,310	43,250	27,860
	73	El Zawya and other	Beni Suef	El Wasta	1,065		32,325	46,917	56,177	46,124	49,273	62,851	108,279	118,306	85,184	45,523	35,597	22,930
	74	Atwab-El houma	Beni Suef	El Wasta	1,770		53,748	78,010	93,406	76,692	81,927	104,503	180,038	196,709	141,637	75,692	59,188	38,126
	75	Medoum	Beni Suef	El Wasta	2,276		69,114	100,312	120,110	98,617	105,349	134,379	231,508	252,945	182,128	97,331	76,109	49,026
	76	Haram medoum and other	Beni Suef	El Wasta	4,390		133,280	193,443	231,621	190,173	203,156	259,138	446,444	487,783	351,219	187,695	146,770	94,543
	77	El mansaur	Beni Suef	El Wasta	1,961		59,550	86,431	103,489	84,970	90,771	115,784	199,473	217,944	156,926	83,863	65,577	42,242
	78	Ibrahimya and other	Beni Suef	El Wasta	1,890		57,382	83,285	99,722	81,877	87,467	111,569	192,212	210,010	151,214	80,810	63,190	40,704
	79	Atwab	Beni Suef	El Wasta	6,421		194,934	282,927	338,767	278,146	297,135	379,013	652,965	713,427	513,689	274,520	214,664	138,277
		Subtotal			122,635		3,723,337	5,404,047	6,470,606	5,312,720	5,675,415	7,239,324	12,471,941	13,626,800	9,811,707	5,243,471	4,100,183	2,641,165
		Total			180,425		5,477,885	7,950,597	9,519,750	7,816,233	8,349,841	10,650,711	18,349,094	20,048,158	14,435,279	7,714,352	6,032,312	3,885,762
					0.18		5	8	10	8	8	11	18	20	14	8	6	4



2-2.BeniSuef Sub Regions

Irrigation efficiency Eff = 0.605

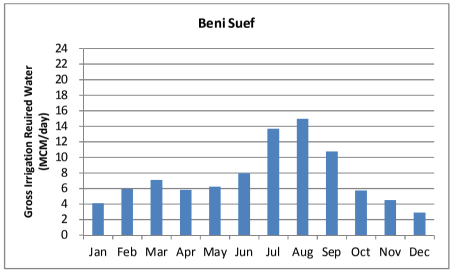
	Code	Sub Region	GD	ID	Area (ha)	Cultivated %	0.52	0.52	0.47	0.38	0.73	0.46	0.52	0.61	0.61	0.32	0.57	0.52
						Etc	4.84	7.03	9.37	9.34	5.21	10.70	16.27	15.02	10.82	10.90	4.88	3.44
							Gross Irri Reqd. inclusive losses(m^3/day)											
							Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
							31	28	31	30	31	30	31	31	30	31	30	31
Bah	10	Belhansa Irrigation Unit	Beni Suef	West Maghaga, El Fashen	4,761		119,454	173,376	207,594	170,446	182,082	232,256	400,132	437,183	314,785	168,224	131,545	84,735
	11	Hareeka-Delhans Irrigation Unit	Beni Suef	El Fashen	11,634		291,918	423,689	507,309	416,529	444,965	567,578	977,827	1,068,370	769,259	411,099	321,463	207,073
	12	Mazora PS Irrigation Unit	Beni Suef	Somusta	10,710		268,733	390,038	467,018	383,447	409,625	522,500	900,165	983,518	708,162	378,449	295,932	190,627
	13	Qoftan Irrigation Unit	Beni Suef	Somusta	8,036		201,644	292,667	350,428	287,721	307,363	392,059	675,442	737,985	531,372	283,970	222,053	143,037
	14	Monshaat El Hag Irrigation Unit	Beni Suef	Ahnasia	4,956		124,355	180,488	216,110	177,438	189,552	241,784	416,547	455,118	327,699	175,125	136,941	88,212
	15	Wady El Ryan & other Irrigation Unit	Beni Suef	Ahnasia	4,619		115,903	168,221	201,422	165,378	176,669	225,351	388,236	424,185	305,426	163,223	127,634	82,216
	16	Waslat Bahabshin & other Irrigation Unit	Beni Suef	Ahnasia	2,369		59,437	86,267	103,293	84,809	90,599	115,565	199,095	217,531	156,629	83,704	65,453	42,162
	17	El Soultany-2 Irrigation Unit	Beni Suef	Ahnasia	9,277		232,765	337,835	404,511	332,125	354,799	452,567	779,685	851,881	613,380	327,796	256,323	165,113
	18	Right Giza Irrigation Unit	Beni Suef	West Beni Seuf	1,428		35,831	52,005	62,269	51,126	54,617	69,667	120,022	131,136	94,422	50,460	39,458	25,417
		Subtotal			57,789		1,450,040	2,104,586	2,519,954	2,069,019	2,210,270	2,819,328	4,857,152	5,306,908	3,821,134	2,042,051	1,596,801	1,028,592
Ibra	50	El Fant Irrigation Unit	Beni Suef	El Fashen	2,940		73,770	107,069	128,201	105,260	112,446	143,431	247,104	269,985	194,398	103,888	81,236	52,329
	51	Saedyhat El Feshna Irrigation Unit	Beni Suef	El Fashen	2,428		60,913	88,409	105,857	86,915	92,848	118,433	204,038	222,931	160,517	85,782	67,078	43,209
	52	El Fashnya and other Irrigation Unit	Beni Suef	El Fashen	4,515		113,289	164,428	196,880	161,649	172,685	220,270	379,482	414,620	298,539	159,542	124,756	80,362
	53	Abo Shosha Irrigation Unit	Beni Suef	El Fashen, Samosta	6,266		157,235	228,211	273,251	224,354	239,671	305,714	526,685	575,454	414,344	221,430	173,149	111,535
	54	Absouge and other Irrigation Unit	Beni Suef	El Fashen	9,596		240,785	349,474	418,448	343,568	367,024	468,160	806,548	881,232	634,514	339,090	265,155	170,802
	55	El Soultany Irrigation Unit	Beni Suef	Samosta, Beba, Ahnasia	20,115		504,722	732,553	877,132	720,173	769,339	981,337	1,690,652	1,847,201	1,330,040	710,786	555,806	358,027
	56	South Ahmed Pasha Irrigation Unit	Beni Suef	Beba	2,908		72,958	105,892	126,791	104,102	111,209	141,854	244,386	267,015	192,259	102,745	80,343	51,753
	57	North Sharahna	Beni Suef	Beba	1,840		46,159	66,995	80,217	65,863	70,359	89,747	154,617	168,934	121,637	65,004	50,831	32,743
	58	North Amhmed Pasha	Beni Suef	Beba	2,100		52,693	76,478	91,572	75,186	80,319	102,451	176,503	192,847	138,855	74,206	58,026	37,378
	59	West Magroufa and other	Beni Suef	East Beni Suef	1,528		38,339	55,645	66,628	54,705	58,440	74,543	128,424	140,315	101,031	53,992	42,220	27,196
	60	Tansa-Kella	Beni Suef	East Beni Suef, Ahnasia, West Beni Suef	10,424		261,567	379,637	454,564	373,222	398,701	508,567	876,161	957,291	689,278	368,357	288,040	185,543
	61	Right Tansa-Tezment	Beni Suef	East Beni Suef	2,646		66,393	96,362	115,381	94,734	101,201	129,088	222,394	242,987	174,958	93,499	73,113	47,096
	62	El Sheikh Haroun and other	Beni Suef	East Beni Suef	1,218		30,562	44,357	53,112	43,608	46,585	59,422	102,372	111,851	80,536	43,039	33,655	21,679
	63	Ahanasya-Beni Haroun	Beni Suef	East Beni Suef	7,791		195,490	283,734	339,732	278,939	297,982	380,093	654,826	715,461	515,153	275,303	215,276	138,672
	64	El Shahra	Beni Suef	East Beni Suef	2,600		65,234	94,680	113,366	93,080	99,434	126,834	218,511	238,744	171,903	91,867	71,836	46,274
	65	El Azhary	Beni Suef	West Beni Suef	4,835		121,320	176,083	210,836	173,107	184,925	235,883	406,381	444,010	319,701	170,851	133,599	86,059
	66	El Sayda	Beni Suef	West Beni Suef	1,361		34,145	49,558	59,339	48,720	52,046	66,388	114,374	124,965	89,978	48,085	37,601	24,221
	67	Bosh and other	Beni Suef	Naser	5,572		139,804	202,912	242,959	199,483	213,101	271,823	468,298	511,661	368,411	196,882	153,954	99,171
	68	South Ashmant Canal	Beni Suef	Naser	1,940		48,688	70,666	84,613	69,472	74,214	94,665	163,089	178,190	128,302	68,566	53,616	34,537
	69	El Mansour Eyosra	Beni Suef	Naser	2,335		58,594	85,044	101,828	83,606	89,314	113,926	196,271	214,445	154,407	82,517	64,525	41,564
	70	South Qashisha	Beni Suef	Naser	3,053		76,615	111,199	133,146	109,320	116,783	148,964	256,635	280,399	201,896	107,895	84,370	54,347
	71	North Ashmant	Beni Suef	El Wasta	3,557		89,261	129,554	155,123	127,365	136,060	173,552	298,996	326,682	235,221	125,704	98,296	63,318
	72	Qashisha and otherr	Beni Suef	El Wasta	1,294		32,459	47,111	56,408	46,314	49,476	63,110	108,726	118,794	85,535	45,711	35,744	23,025
	73	El Zawya and other	Beni Suef	El Wasta	1,065		26,715	38,774	46,427	38,119	40,722	51,943	89,487	97,773	70,400	37,622	29,419	18,951
	74	Atwab-El houma	Beni Suef	El Wasta	1,770		44,420	64,471	77,195	63,382	67,709	86,366	148,792	162,570	117,055	62,555	48,916	31,509
	75	Medoum	Beni Suef	El Wasta	2,276		57,119	82,902	99,264	81,501	87,065	111,057	191,329	209,046	150,519	80,439	62,900	40,518
	76	Haram medoum and other	Beni Suef	El Wasta	4,390		110,149	159,870	191,422	157,168	167,898	214,164	368,962	403,127	290,263	155,120	121,297	78,135
	77	El mansaur	Beni Suef	El Wasta	1,961		49,215	71,431	85,528	70,223	75,018	95,689	164,854	180,119	129,691	69,308	54,196	34,911
	78	Ibrahimya and other	Beni Suef	El Wasta	1,890		47,423	68,830	82,415	67,667	72,287	92,206	158,853	173,562	124,970	66,785	52,223	33,640
	79	Atwab	Beni Suef	El Wasta	6,421		161,103	233,824	279,973	229,873	245,566	313,234	539,640	589,609	424,536	226,876	177,408	114,279
		Subtotal			122,635		3,077,138	4,466,155	5,347,608	4,390,677	4,690,426	5,982,912	10,307,389	11,261,818	8,108,849	4,333,447	3,388,581	2,182,781
		Total			180,425		4,527,178	6,570,741	7,867,562	6,459,697	6,900,695	8,802,241	15,164,541	16,568,726	11,929,983	6,375,498	4,985,382	3,211,373
					0.18		5	7	8	6	7	9	15	17	12	6	5	3



2-3.BeniSuef Sub Regions

Irrigation efficiency Eff = 0.67

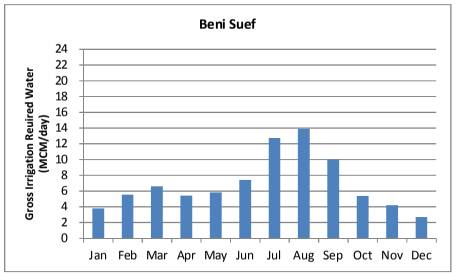
	Code	Sub Region	GD	ID	Area (ha)	Cultivated %	0.52	0.52	0.47	0.38	0.73	0.46	0.52	0.61	0.61	0.32	0.57	0.52
						Etc	4.37	6.35	8.46	8.44	4.70	9.66	14.69	13.57	9.77	9.85	4.41	3.10
							Gross Irri Reqd. inclusive losses(m^3/day)											
							Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
							31	28	31	30	31	30	31	31	30	31	30	31
Bah	10	Belhansa Irrigation Unit	Beni Suef	West Maghaga, El Fashen	4,761		107,866	156,556	187,454	153,910	164,417	209,724	361,314	394,770	284,246	151,904	118,783	76,515
	11	Hareeka-Delhans Irrigation Unit	Beni Suef	El Fashen	11,634		263,597	382,585	458,093	376,119	401,796	512,515	882,963	964,722	694,629	371,217	290,276	186,984
	12	Mazora PS Irrigation Unit	Beni Suef	Somusta	10,710		242,662	352,199	421,710	346,247	369,885	471,810	812,836	888,102	639,460	341,734	267,222	172,133
	13	Qoftan Irrigation Unit	Beni Suef	Somusta	8,036		182,082	264,273	316,431	259,807	277,544	354,024	609,914	666,390	479,821	256,421	200,511	129,161
	14	Monshaat El Hag Irrigation Unit	Beni Suef	Ahnasia	4,956		112,291	162,978	195,144	160,224	171,162	218,328	376,136	410,965	295,907	158,136	123,656	79,654
	15	Wady El Ryan & other Irrigation Unit	Beni Suef	Ahnasia	4,619		104,659	151,901	181,881	149,334	159,529	203,489	350,571	383,033	275,795	147,388	115,251	74,240
	16	Waslat Bahabshin & other Irrigation Unit	Beni Suef	Ahnasia	2,369		53,671	77,898	93,272	76,582	81,810	104,353	179,780	196,427	141,434	75,583	59,103	38,072
	17	El Soultany-2 Irrigation Unit	Beni Suef	Ahnasia	9,277		210,183	305,060	365,267	299,904	320,378	408,661	704,043	769,236	553,873	295,995	231,456	149,094
	18	Right Giza Irrigation Unit	Beni Suef	West Beni Seuf	1,428		32,355	46,960	56,228	46,166	49,318	62,908	108,378	118,414	85,261	45,564	35,630	22,951
		Subtotal			57,789		1,309,364	1,900,410	2,275,481	1,868,294	1,995,840	2,545,811	4,385,936	4,792,058	3,450,427	1,843,941	1,441,888	928,803
Ibra	50	El Fant Irrigation Unit	Beni Suef	El Fashen	2,940		66,613	96,682	115,764	95,048	101,537	129,516	223,131	243,793	175,538	93,809	73,355	47,252
	51	Saedyhat El Feshna Irrigation Unit	Beni Suef	El Fashen	2,428		55,003	79,832	95,588	78,483	83,841	106,944	184,243	201,303	144,944	77,460	60,570	39,017
	52	El Fashnya and other Irrigation Unit	Beni Suef	El Fashen	4,515		102,299	148,476	177,780	145,967	155,932	198,900	342,666	374,396	269,576	144,064	112,652	72,566
	53	Abo Shosha Irrigation Unit	Beni Suef	El Fashen, Samosta	6,266		141,981	206,071	246,742	202,588	216,419	276,055	475,589	519,627	374,147	199,948	156,351	100,715
	54	Absouge and other Irrigation Unit	Beni Suef	El Fashen	9,596		217,425	315,570	377,852	310,237	331,417	422,742	728,301	795,739	572,956	306,193	239,431	154,231
	55	El Soultany Irrigation Unit	Beni Suef	Samosta, Beba, Ahnasia	20,115		455,757	661,485	792,037	650,306	694,702	886,133	1,526,634	1,667,995	1,201,006	641,829	501,885	323,293
	56	South Ahmed Pasha Irrigation Unit	Beni Suef	Beba	2,908		65,880	95,619	114,490	94,003	100,420	128,092	220,677	241,111	173,607	92,777	72,548	46,732
	57	North Sharahna	Beni Suef	Beba	1,840		41,681	60,495	72,435	59,473	63,533	81,040	139,617	152,545	109,837	58,698	45,899	29,566
	58	North Amhmed Pasha	Beni Suef	Beba	2,100		47,581	69,059	82,688	67,892	72,526	92,512	159,380	174,138	125,384	67,007	52,396	33,752
	59	West Magroufa and other	Beni Suef	East Beni Suef	1,528		34,620	50,247	60,164	49,398	52,770	67,312	115,965	126,703	91,230	48,754	38,124	24,558
	60	Tansa-Kella	Beni Suef	East Beni Suef, Ahnasia, West Beni Suef	10,424		236,191	342,807	410,464	337,014	360,021	459,228	791,160	864,419	622,408	332,621	260,096	167,543
	61	Right Tansa-Tezment	Beni Suef	East Beni Suef	2,646		59,952	87,014	104,187	85,543	91,383	116,565	200,818	219,413	157,984	84,428	66,020	42,527
	62	El Sheikh Haroun and other	Beni Suef	East Beni Suef	1,218		27,597	40,054	47,959	39,377	42,065	53,657	92,440	101,000	72,723	38,864	30,390	19,576
	63	Ahanasya-Beni Haroun	Beni Suef	East Beni Suef	7,791		176,524	256,207	306,773	251,878	269,073	343,218	591,298	646,051	465,176	248,594	194,391	125,218
	64	El Shahra	Beni Suef	East Beni Suef	2,600		58,905	85,495	102,368	84,050	89,788	114,530	197,312	215,582	155,226	82,954	64,867	41,784
	65	El Azhary	Beni Suef	West Beni Suef	4,835		109,550	159,001	190,381	156,313	166,985	212,999	366,956	400,934	288,685	154,276	120,638	77,710
	66	El Sayda	Beni Suef	West Beni Suef	1,361		30,832	44,750	53,582	43,994	46,997	59,948	103,278	112,841	81,249	43,420	33,953	21,871
	67	Bosh and other	Beni Suef	Naser	5,572		126,241	183,226	219,388	180,130	192,427	245,452	422,866	462,022	332,670	177,782	139,018	89,550
	68	South Ashmant Canal	Beni Suef	Naser	1,940		43,965	63,810	76,404	62,732	67,014	85,481	147,267	160,903	115,855	61,914	48,414	31,186
	69	El Mansour Eyosra	Beni Suef	Naser	2,335		52,910	76,793	91,949	75,495	80,649	102,873	177,230	193,641	139,427	74,511	58,265	37,532
	70	South Qashisha	Beni Suef	Naser	3,053		69,182	100,411	120,229	98,714	105,453	134,512	231,738	253,196	182,309	97,428	76,184	49,075
	71	North Ashmant	Beni Suef	El Wasta	3,557		80,602	116,985	140,074	115,008	122,860	156,715	269,989	294,989	212,401	113,509	88,760	57,175
	72	Qashisha and otherr	Beni Suef	El Wasta	1,294		29,310	42,540	50,936	41,821	44,676	56,987	98,178	107,269	77,237	41,276	32,276	20,791
	73	El Zawya and other	Beni Suef	El Wasta	1,065		24,123	35,013	41,923	34,421	36,771	46,903	80,805	88,288	63,570	33,972	26,565	17,112
	74	Atwab-El houma	Beni Suef	El Wasta	1,770		40,111	58,216	69,706	57,233	61,140	77,987	134,357	146,798	105,699	56,487	44,170	28,453
	75	Medoum	Beni Suef	El Wasta	2,276		51,578	74,860	89,634	73,594	78,619	100,283	172,768	188,765	135,917	72,635	56,798	36,587
	76	Haram medoum and other	Beni Suef	El Wasta	4,390		99,463	144,360	172,851	141,920	151,609	193,386	333,167	364,017	262,103	140,071	109,530	70,554
	77	El mansaur	Beni Suef	El Wasta	1,961		44,440	64,501	77,231	63,411	67,740	86,406	148,861	162,645	117,109	62,584	48,938	31,524
	78	Ibrahimya and other	Beni Suef	El Wasta	1,890		42,823	62,153	74,419	61,102	65,274	83,261	143,442	156,724	112,846	60,306	47,157	30,376
	79	Atwab	Beni Suef	El Wasta	6,421		145,473	211,140	252,811	207,572	221,742	282,845	487,287	532,408	383,350	204,866	160,197	103,192
		Subtotal			122,635		2,778,610	4,032,871	4,828,811	3,964,716	4,235,384	5,402,481	9,307,419	10,169,254	7,322,170	3,913,038	3,059,838	1,971,019
		Total			180,425		4,087,974	5,933,281	7,104,291	5,833,010	6,231,225	7,948,292	13,693,354	14,961,312	10,772,596	5,756,979	4,501,725	2,899,822
					0.18		4	6	7	6	6	8	14	15	11	6	5	3



2-4.BeniSuef Sub Regions

Irrigation efficiency Eff = 0.72

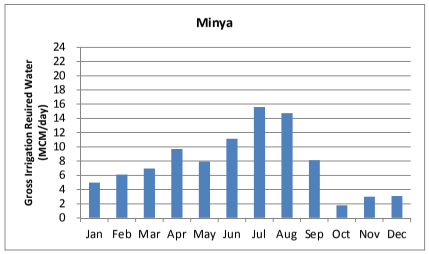
	Code	Sub Region	GD	ID	Area (ha)	Cultivated %	0.52	0.52	0.47	0.38	0.73	0.46	0.52	0.61	0.61	0.32	0.57	0.52
						Etc	4.07	5.91	7.87	7.85	4.37	8.99	13.67	12.62	9.09	9.16	4.10	2.89
							Gross Irri Reqd. inclusive losses(m^3/day)											
							Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
							31	28	31	30	31	30	31	31	30	31	30	31
Bah	10	Belhansa Irrigation Unit	Beni Suef	West Maghaga, El Fashen	4,761		100,375	145,684	174,437	143,222	153,000	195,160	336,222	367,355	264,507	141,355	110,534	71,201
	11	Hareeka-Delhans Irrigation Unit	Beni Suef	El Fashen	11,634		245,292	356,016	426,281	350,000	373,894	476,924	821,646	897,728	646,391	345,438	270,118	173,999
	12	Mazora PS Irrigation Unit	Beni Suef	Somusta	10,710		225,810	327,741	392,425	322,202	344,198	439,045	756,389	826,428	595,053	318,002	248,665	160,179
	13	Qoftan Irrigation Unit	Beni Suef	Somusta	8,036		169,437	245,921	294,457	241,765	258,270	329,439	567,559	620,113	446,500	238,614	186,586	120,191
	14	Monshaat El Hag Irrigation Unit	Beni Suef	Ahnasia	4,956		104,493	151,660	181,593	149,097	159,276	203,166	350,015	382,426	275,358	147,154	115,068	74,122
	15	Wady El Ryan & other Irrigation Unit	Beni Suef	Ahnasia	4,619		97,391	141,353	169,250	138,964	148,451	189,358	326,226	356,434	256,643	137,152	107,248	69,084
	16	Waslat Bahabshin & other Irrigation Unit	Beni Suef	Ahnasia	2,369		49,944	72,489	86,795	71,263	76,129	97,106	167,295	182,786	131,612	70,335	54,999	35,428
	17	El Soultany-2 Irrigation Unit	Beni Suef	Ahnasia	9,277		195,587	283,875	339,901	279,077	298,130	380,282	655,152	715,816	515,409	275,440	215,383	138,741
	18	Right Giza Irrigation Unit	Beni Suef	West Beni Seuf	1,428		30,108	43,699	52,323	42,960	45,893	58,539	100,852	110,190	79,340	42,400	33,155	21,357
		Subtotal			57,789		1,218,436	1,768,437	2,117,461	1,738,551	1,857,240	2,369,019	4,081,357	4,459,276	3,210,814	1,715,890	1,341,757	864,303
Ibra	50	El Fant Irrigation Unit	Beni Suef	El Fashen	2,940		61,987	89,968	107,724	88,448	94,486	120,522	207,636	226,863	163,348	87,295	68,261	43,971
	51	Saedyhat El Feshna Irrigation Unit	Beni Suef	El Fashen	2,428		51,184	74,288	88,950	73,032	78,018	99,517	171,448	187,324	134,879	72,080	56,364	36,307
	52	El Fashnya and other Irrigation Unit	Beni Suef	El Fashen	4,515		95,194	138,165	165,434	135,830	145,103	185,088	318,870	348,396	250,856	134,060	104,829	67,527
	53	Abo Shosha Irrigation Unit	Beni Suef	El Fashen, Samosta	6,266		132,121	191,760	229,607	188,520	201,390	256,884	442,562	483,541	348,164	186,062	145,493	93,721
	54	Absouge and other Irrigation Unit	Beni Suef	El Fashen	9,596		202,326	293,656	351,612	288,693	308,402	393,384	677,725	740,480	533,168	284,930	222,804	143,521
	55	El Soultany Irrigation Unit	Beni Suef	Samosta, Beba, Ahnasia	20,115		424,107	615,548	737,035	605,146	646,459	824,596	1,420,617	1,552,162	1,117,603	597,258	467,032	300,842
	56	South Ahmed Pasha Irrigation Unit	Beni Suef	Beba	2,908		61,305	88,978	106,539	87,475	93,446	119,196	205,352	224,367	161,551	86,334	67,510	43,487
	57	North Sharahna	Beni Suef	Beba	1,840		38,786	56,294	67,405	55,343	59,121	75,412	129,921	141,951	102,209	54,622	42,712	27,513
	58	North Amhmed Pasha	Beni Suef	Beba	2,100		44,277	64,263	76,946	63,177	67,490	86,087	148,312	162,045	116,677	62,353	48,758	31,408
	59	West Magroufa and other	Beni Suef	East Beni Suef	1,528		32,216	46,758	55,986	45,967	49,106	62,637	107,912	117,904	84,894	45,368	35,476	22,852
	60	Tansa-Kella	Beni Suef	East Beni Suef, Ahnasia, West Beni Suef	10,424		219,789	319,001	381,960	313,610	335,020	427,337	736,219	804,390	579,185	309,522	242,034	155,908
	61	Right Tansa-Tezment	Beni Suef	East Beni Suef	2,646		55,788	80,971	96,952	79,603	85,037	108,470	186,873	204,176	147,013	78,565	61,435	39,574
	62	El Sheikh Haroun and other	Beni Suef	East Beni Suef	1,218		25,680	37,272	44,629	36,643	39,144	49,931	86,021	93,986	67,673	36,165	28,280	18,216
	63	Ahanasya-Beni Haroun	Beni Suef	East Beni Suef	7,791		164,266	238,415	285,470	234,386	250,387	319,384	550,236	601,186	432,872	231,331	180,891	116,523
	64	El Shahra	Beni Suef	East Beni Suef	2,600		54,814	79,557	95,259	78,213	83,552	106,576	183,610	200,611	144,446	77,193	60,362	38,883
	65	El Azhary	Beni Suef	West Beni Suef	4,835		101,942	147,959	177,160	145,458	155,389	198,207	341,473	373,092	268,637	143,562	112,260	72,313
	66	El Sayda	Beni Suef	West Beni Suef	1,361		28,691	41,642	49,861	40,939	43,733	55,785	96,106	105,005	75,607	40,405	31,595	20,352
	67	Bosh and other	Beni Suef	Naser	5,572		117,474	170,502	204,153	167,621	179,064	228,407	393,500	429,937	309,568	165,436	129,364	83,331
	68	South Ashmant Canal	Beni Suef	Naser	1,940		40,911	59,379	71,098	58,375	62,361	79,545	137,040	149,729	107,810	57,615	45,052	29,021
	69	El Mansour Eyosra	Beni Suef	Naser	2,335		49,235	71,460	85,564	70,253	75,049	95,729	164,922	180,194	129,745	69,337	54,219	34,925
	70	South Qashisha	Beni Suef	Naser	3,053		64,378	93,438	111,879	91,859	98,130	125,171	215,645	235,613	169,649	90,662	70,894	45,667
	71	North Ashmant	Beni Suef	El Wasta	3,557		75,004	108,861	130,347	107,022	114,328	145,832	251,240	274,504	197,651	105,627	82,596	53,205
	72	Qashisha and otherr	Beni Suef	El Wasta	1,294		27,274	39,586	47,399	38,917	41,574	53,030	91,360	99,820	71,873	38,410	30,035	19,347
	73	El Zawya and other	Beni Suef	El Wasta	1,065		22,448	32,581	39,012	32,031	34,217	43,646	75,194	82,157	59,155	31,613	24,720	15,924
	74	Atwab-El houma	Beni Suef	El Wasta	1,770		37,325	54,174	64,865	53,258	56,894	72,572	125,027	136,604	98,359	52,564	41,103	26,477
	75	Medoum	Beni Suef	El Wasta	2,276		47,996	69,661	83,409	68,484	73,159	93,319	160,770	175,656	126,478	67,591	52,853	34,046
	76	Haram medoum and other	Beni Suef	El Wasta	4,390		92,556	134,335	160,848	132,065	141,081	179,957	310,031	338,738	243,902	130,343	101,923	65,655
	77	El mansaur	Beni Suef	El Wasta	1,961		41,354	60,022	71,868	59,007	63,036	80,406	138,523	151,350	108,976	58,238	45,540	29,335
	78	Ibrahimya and other	Beni Suef	El Wasta	1,890		39,849	57,837	69,251	56,859	60,741	77,479	133,480	145,840	105,009	56,118	43,882	28,267
	79	Atwab	Beni Suef	El Wasta	6,421		135,371	196,477	235,255	193,157	206,344	263,203	453,448	495,436	356,729	190,639	149,072	96,026
		Subtotal			122,635		2,585,651	3,752,810	4,493,477	3,689,389	3,941,260	5,027,308	8,661,070	9,463,056	6,813,686	3,641,299	2,847,349	1,834,143
		Total			180,425		3,804,087	5,521,248	6,610,938	5,427,940	5,798,501	7,396,327	12,742,427	13,922,332	10,024,499	5,357,189	4,189,106	2,698,446
					0.18		4	6	7	5	6	7	13	14	10	5	4	3



3-1.Minia Sub Regions

Irrigation efficiency eff = 0.50

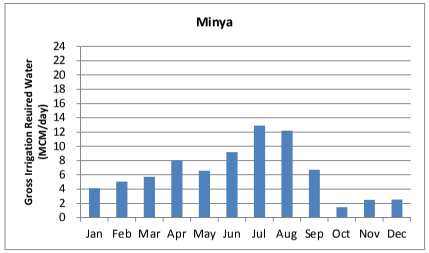
	Code	Sub Region	GD	ID	Area (ha)	Cultivated %	0.50	0.47	0.43	0.48	0.84	0.54	0.54	0.57	0.57	0.20	0.45	0.50
						Etc	5.08	6.54	8.27	10.27	4.79	10.40	14.62	13.23	7.28	4.49	3.36	3.14
							Gross Irri Reqd. inclusive losses(m^3/day)											
							Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
							31	28	31	30	31	30	31	31	30	31	30	31
Bah	1	Bani Khalid & Other Irr. Unit	East Menia	Der Mewas, Melwy, Monshat El Dahab	5,573		140,756	172,858	197,169	274,603	224,900	315,066	442,763	417,675	229,953	49,734	84,898	87,101
	2	Raaheel Irrigation Unit	West Menia	Monshat El Dahab	2,780		70,219	86,234	98,362	136,991	112,196	157,177	220,881	208,366	114,717	24,811	42,353	43,452
	3	El Dahab Irrigation Unit	West Menia	Monshat El Dahab; West Kamadir, East Terfa	28,363		716,295	879,662	1,003,379	1,397,433	1,144,496	1,603,345	2,253,185	2,125,518	1,170,215	253,094	432,039	443,251
	4	Kamadir Irrigation Unit	West Menia	West Kamadir	5,040		127,285	156,315	178,299	248,322	203,376	284,913	400,388	377,702	207,946	44,974	76,773	78,765
	5	Terfa Irrigation Unit	West Menia	West Terfa	8,211		207,368	254,663	290,479	404,558	331,333	464,170	652,299	615,339	338,778	73,271	125,076	128,321
	6	Bahnasa & other Irrigation Unit	West Menia	West Terfa, Edwa	2,451		61,892	76,008	86,698	120,747	98,891	138,539	194,689	183,658	101,114	21,869	37,331	38,300
	7	Sabaa Irrigation Unit	West Menia	Edwa	6,846		172,895	212,328	242,190	337,304	276,252	387,006	543,861	513,045	282,460	61,090	104,283	106,989
	8	Hareeka Irrigation Unit	West Menia	Edwa	6,468		163,349	200,604	228,817	318,680	260,999	365,638	513,832	484,717	266,864	57,717	98,525	101,082
	9	Sakola Irrigation Unit	West Menia	Sakoula	5,040		127,285	156,315	178,299	248,322	203,376	284,913	400,388	377,702	207,946	44,974	76,773	78,765
		Subtotal			70,772		1,787,343	2,194,987	2,503,692	3,486,962	2,855,818	4,000,766	5,622,285	5,303,722	2,919,992	631,536	1,078,050	1,106,026
Ibra	32	Seery Irrigation Unit	West Menia	West Abu Kurkas, West Menia, West Samalout, West Maghagha	50,511		1,275,647	1,566,588	1,786,914	2,488,686	2,038,231	2,855,394	4,012,691	3,785,329	2,084,033	450,734	769,417	789,384
	33	El Sahlyah Irrigation Unit	East Menia	East Abu Kurkas	2,940		74,249	91,184	104,008	144,855	118,636	166,199	233,560	220,326	121,302	26,235	44,784	45,946
	34	East Hafez Irrigation Unit	East Menia	East Abu Kurkas	2,738		69,158	84,931	96,876	134,922	110,501	154,802	217,544	205,218	112,984	24,436	41,713	42,796
	35	West Hafez Irrigation Unit	East Menia	East Abu Kurkas	9,763		246,572	302,808	345,395	481,042	393,973	551,923	775,619	731,672	402,826	87,123	148,722	152,581
	36	Kom El Zor and other Irrigation Unit	East Menia	East Abu Kurkas, East Samalout	7,752		195,785	240,438	274,254	381,961	312,826	438,243	615,864	580,969	319,855	69,178	118,089	121,154
	37	El Disout Irrigation Unit	East Menia	East Samalout	2,566		64,809	79,590	90,784	126,437	103,552	145,068	203,864	192,313	105,879	22,900	39,090	40,105
	38	Damains and other Irrigation Unit	East Menia	East Samalout	5,901		149,029	183,019	208,759	290,744	238,119	333,585	468,788	442,226	243,470	52,658	89,888	92,221
	39	El Safsaf Irrigation Unit	East Menia	East Samalout, Mataya	2,163		54,626	67,085	76,520	106,572	87,282	122,275	171,833	162,097	89,243	19,302	32,948	33,803
	40	Samalout Irrigation Unit	East Menia	East Samalout	2,184		55,157	67,736	77,263	107,606	88,129	123,462	173,502	163,671	90,110	19,489	33,268	34,132
	41	Abo Eisa and other Irrigation Unit	East Menia	Mataya	3,608		91,115	111,895	127,633	177,757	145,583	203,950	286,611	270,372	148,855	32,194	54,957	56,383
	42	Adqaq Irrigation Unit	East Menia	Mataya	2,310		58,339	71,644	81,720	113,814	93,214	130,585	183,511	173,113	95,308	20,613	35,188	36,101
	43	Shoieb Darwishl Irrigation Unit	East Menia	Mataya	2,992		75,565	92,799	105,850	147,421	120,737	169,143	237,697	224,229	123,450	26,700	45,577	46,760
	44	Abo Hasiba Irrigation Uni	East Menia	Mataya, Beni Mazar	3,885		98,115	120,493	137,439	191,415	156,769	219,620	308,633	291,145	160,292	34,668	59,179	60,715
	45	Mataua and other Irrigation Uni	East Menia	Mataya, Beni Mazar	5,756		145,359	178,512	203,618	283,584	232,255	325,370	457,243	431,336	237,474	51,361	87,675	89,950
	46	Beni Mazar and other Irrigatioin Unit	East Menia	Beni Mazar	3,121		78,810	96,785	110,397	153,753	125,923	176,408	247,907	233,860	128,753	27,847	47,535	48,769
	47	Dahrout and other Irrigation Unit	East Menia	Beni Mazar, East Maghagha	7,350		185,624	227,959	260,020	362,137	296,589	415,497	583,899	550,815	303,254	65,588	111,960	114,866
	48	El Gandia Irrigation Unit	East Menia	East Maghagha	5,141		129,830	159,441	181,865	253,289	207,443	290,611	408,396	385,256	212,105	45,874	78,308	80,340
	49	Maghagha and other Irrigation Unit	East Menia	East Maghagha	5,198		131,262	161,200	183,871	256,082	209,731	293,816	412,900	389,505	214,444	46,380	79,172	81,227
		Subtotal			125,879		3,179,052	3,904,109	4,453,185	6,202,076	5,079,493	7,115,952	10,000,063	9,433,452	5,193,637	1,123,279	1,917,471	1,967,231
		Total			196,651		4,966,395	6,099,096	6,956,877	9,689,037	7,935,310	11,116,718	15,622,348	14,737,174	8,113,629	1,754,815	2,995,520	3,073,257
							4.97	6.10	6.96	9.69	7.94	11.12	15.62	14.74	8.11	1.75	3.00	3.07



3-2.Minia Sub Regions

Irrigation efficiency eff = 0.605

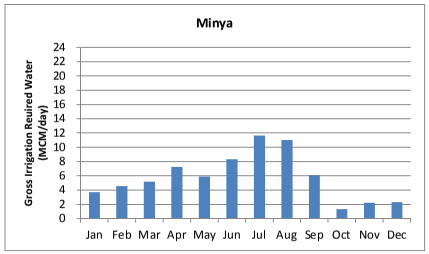
	Code	Sub Region	GD	ID	Area (ha)	Cultivated %	0.50	0.47	0.43	0.48	0.84	0.54	0.54	0.57	0.57	0.20	0.45	0.50
						Etc	4.20	5.40	6.84	8.49	3.96	8.60	12.08	10.93	6.02	3.71	2.78	2.60
							Gross Irri Reqd. inclusive losses(m^3/day)											
							Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
							31	28	31	30	31	30	31	31	30	31	30	31
Bah	1	Bani Khalid & Other Irr. Unit	East Menia	Der Mewas, Melwy, Monshat El Dahab	5,573		116,327	142,858	162,950	226,945	185,867	260,385	365,920	345,186	190,044	41,103	70,164	71,984
	2	Raaheel Irrigation Unit	West Menia	Monshat El Dahab	2,780		58,032	71,268	81,291	113,216	92,724	129,898	182,546	172,203	94,807	20,505	35,002	35,911
	3	El Dahab Irrigation Unit	West Menia	Monshat El Dahab; West Kamadir, East Terfa	28,363		591,979	726,994	829,239	1,154,904	945,865	1,325,079	1,862,136	1,756,626	967,120	209,169	357,057	366,323
	4	Kamadir Irrigation Unit	West Menia	West Kamadir	5,040		105,194	129,186	147,355	205,225	168,079	235,465	330,899	312,150	171,856	37,169	63,449	65,095
	5	Terfa Irrigation Unit	West Menia	West Terfa	8,211		171,379	210,465	240,065	334,346	273,829	383,612	539,090	508,545	279,982	60,555	103,368	106,051
	6	Bahnasa & other Irrigation Unit	West Menia	West Terfa, Edwa	2,451		51,151	62,817	71,651	99,791	81,728	114,495	160,900	151,783	83,565	18,073	30,852	31,653
	7	Sabaa Irrigation Unit	West Menia	Edwa	6,846		142,888	175,478	200,157	278,764	228,307	319,840	449,472	424,004	233,438	50,488	86,184	88,421
	8	Hareeka Irrigation Unit	West Menia	Edwa	6,468		134,999	165,789	189,105	263,372	215,701	302,180	424,654	400,593	220,549	47,700	81,426	83,539
	9	Sakola Irrigation Unit	West Menia	Sakoula	5,040		105,194	129,186	147,355	205,225	168,079	235,465	330,899	312,150	171,856	37,169	63,449	65,095
		Subtotal			70,772		1,477,143	1,814,039	2,069,167	2,881,786	2,360,180	3,306,418	4,646,516	4,383,241	2,413,217	521,930	890,950	914,071
Ibra	32	Seery Irrigation Unit	West Menia	West Abu Kurkas, West Menia, West Samalout, West Maghagha	50,511		1,054,254	1,294,701	1,476,789	2,056,765	1,684,488	2,359,829	3,316,273	3,128,371	1,722,341	372,508	635,882	652,383
	33	El Sahlyah Irrigation Unit	East Menia	East Abu Kurkas	2,940		61,363	75,358	85,957	119,715	98,046	137,355	193,025	182,088	100,249	21,682	37,012	37,972
	34	East Hafez Irrigation Unit	East Menia	East Abu Kurkas	2,738		57,155	70,191	80,063	111,506	91,323	127,936	179,789	169,602	93,375	20,195	34,474	35,368
	35	West Hafez Irrigation Unit	East Menia	East Abu Kurkas	9,763		203,778	250,255	285,451	397,555	325,597	456,135	641,007	604,687	332,914	72,003	122,910	126,100
	36	Kom El Zor and other Irrigation Unit	East Menia	East Abu Kurkas, East Samalout	7,752		161,806	198,709	226,656	315,670	258,534	362,184	508,978	480,139	264,343	57,172	97,594	100,127
	37	El Disout Irrigation Unit	East Menia	East Samalout	2,566		53,561	65,777	75,028	104,494	85,580	119,891	168,483	158,937	87,503	18,925	32,306	33,144
	38	Damains and other Irrigation Unit	East Menia	East Samalout	5,901		123,165	151,255	172,528	240,284	196,793	275,690	387,428	365,476	201,215	43,519	74,288	76,216
	39	El Safsaf Irrigation Unit	East Menia	East Samalout, Mataya	2,163		45,146	55,442	63,240	88,076	72,134	101,054	142,011	133,965	73,755	15,952	27,230	27,937
	40	Samalout Irrigation Unit	East Menia	East Samalout	2,184		45,584	55,981	63,854	88,931	72,834	102,035	143,390	135,265	74,471	16,107	27,494	28,208
	41	Abo Eisa and other Irrigation Unit	East Menia	Mataya	3,608		75,301	92,476	105,481	146,907	120,317	168,554	236,869	223,448	123,020	26,607	45,419	46,597
	42	Adqaq Irrigation Unit	East Menia	Mataya	2,310		48,214	59,210	67,538	94,061	77,036	107,921	151,662	143,069	78,767	17,036	29,081	29,835
	43	Shoieb Darwishl Irrigation Unit	East Menia	Mataya	2,992		62,450	76,693	87,480	121,835	99,783	139,788	196,444	185,313	102,025	22,066	37,667	38,645
	44	Abo Hasiba Irrigation Uni	East Menia	Mataya, Beni Mazar	3,885		81,087	99,581	113,586	158,194	129,561	181,504	255,068	240,616	132,472	28,651	48,908	50,178
	45	Mataua and other Irrigation Uni	East Menia	Mataya, Beni Mazar	5,756		120,132	147,530	168,279	234,367	191,946	268,901	377,887	356,476	196,260	42,447	72,458	74,339
	46	Beni Mazar and other Irrigatioin Unit	East Menia	Beni Mazar	3,121		65,133	79,988	91,237	127,068	104,069	145,792	204,882	193,273	106,408	23,014	39,285	40,305
	47	Dahrout and other Irrigation Unit	East Menia	Beni Mazar, East Maghagha	7,350		153,408	188,396	214,892	299,286	245,115	343,386	482,562	455,219	250,623	54,205	92,529	94,930
	48	El Gandia Irrigation Unit	East Menia	East Maghagha	5,141		107,298	131,770	150,302	209,329	171,441	240,174	337,517	318,393	175,293	37,912	64,718	66,397
	49	Maghagha and other Irrigation Unit	East Menia	East Maghagha	5,198		108,481	133,223	151,960	211,638	173,332	242,823	341,240	321,905	177,227	38,331	65,431	67,129
		Subtotal			125,879		2,627,316	3,226,536	3,680,319	5,125,682	4,197,928	5,880,952	8,264,515	7,796,242	4,292,262	928,330	1,584,686	1,625,811
		Total			196,651		4,104,459	5,040,575	5,749,485	8,007,469	6,558,108	9,187,370	12,911,031	12,179,483	6,705,478	1,450,260	2,475,637	2,539,882
							4.10	5.04	5.75	8.01	6.56	9.19	12.91	12.18	6.71	1.45	2.48	2.54



3-3.Minia Sub Regions

Irrigation efficiency eff = 0.67

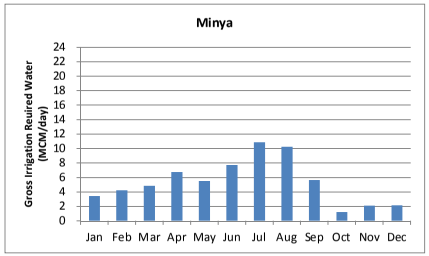
	Code	Sub Region	GD	ID	Area (ha)	Cultivated %	0.50	0.47	0.43	0.48	0.84	0.54	0.54	0.57	0.57	0.20	0.45	0.50
						Etc	3.79	4.88	6.17	7.66	3.58	7.76	10.91	9.87	5.43	3.35	2.51	2.34
							Gross Irri Reqd. inclusive losses(m^3/day)											
							Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
							31	28	31	30	31	30	31	31	30	31	30	31
Bah	1	Bani Khalid & Other Irr. Unit	East Menia	Der Mewas, Melwy, Monshat El Dahab	5,573		105,042	128,999	147,141	204,928	167,835	235,124	330,420	311,698	171,607	37,115	63,357	65,001
	2	Raaheel Irrigation Unit	West Menia	Monshat El Dahab	2,780		52,402	64,354	73,404	102,232	83,728	117,296	164,836	155,497	85,610	18,516	31,607	32,427
	3	El Dahab Irrigation Unit	West Menia	Monshat El Dahab; West Kamadir, East Terfa	28,363		534,548	656,464	748,790	1,042,861	854,102	1,196,526	1,681,481	1,586,207	873,295	188,876	322,417	330,784
	4	Kamadir Irrigation Unit	West Menia	West Kamadir	5,040		94,989	116,653	133,059	185,315	151,773	212,621	298,797	281,867	155,183	33,563	57,293	58,780
	5	Terfa Irrigation Unit	West Menia	West Terfa	8,211		154,752	190,047	216,775	301,909	247,263	346,396	486,790	459,209	252,820	54,680	93,340	95,762
	6	Bahnasa & other Irrigation Unit	West Menia	West Terfa, Edwa	2,451		46,188	56,722	64,700	90,109	73,800	103,387	145,290	137,058	75,458	16,320	27,859	28,582
	7	Sabaa Irrigation Unit	West Menia	Edwa	6,846		129,026	158,454	180,739	251,720	206,158	288,811	405,866	382,870	210,791	45,590	77,823	79,843
	8	Hareeka Irrigation Unit	West Menia	Edwa	6,468		121,902	149,705	170,759	237,821	194,775	272,864	383,456	361,729	199,152	43,073	73,526	75,434
	9	Sakola Irrigation Unit	West Menia	Sakoula	5,040		94,989	116,653	133,059	185,315	151,773	212,621	298,797	281,867	155,183	33,563	57,293	58,780
		Subtotal			70,772		1,333,838	1,638,050	1,868,427	2,602,210	2,131,207	2,985,646	4,195,735	3,958,002	2,179,099	471,295	804,515	825,393
Ibra	32	Seery Irrigation Unit	West Menia	West Abu Kurkas, West Menia, West Samalout, West Maghagha	50,511		951,976	1,169,096	1,333,518	1,857,228	1,521,068	2,130,891	2,994,545	2,824,872	1,555,248	336,369	574,192	589,092
	33	El Sahlyah Irrigation Unit	East Menia	East Abu Kurkas	2,940		55,410	68,048	77,618	108,100	88,534	124,029	174,298	164,422	90,524	19,578	33,421	34,288
	34	East Hafez Irrigation Unit	East Menia	East Abu Kurkas	2,738		51,610	63,381	72,295	100,688	82,463	115,524	162,346	153,148	84,316	18,236	31,129	31,937
	35	West Hafez Irrigation Unit	East Menia	East Abu Kurkas	9,763		184,009	225,976	257,758	358,986	294,009	411,883	578,820	546,024	300,616	65,017	110,986	113,867
	36	Kom El Zor and other Irrigation Unit	East Menia	East Abu Kurkas, East Samalout	7,752		146,108	179,432	204,667	285,046	233,452	327,047	459,600	433,559	238,698	51,626	88,126	90,413
	37	El Disout Irrigation Unit	East Menia	East Samalout	2,566		48,365	59,396	67,749	94,356	77,278	108,260	152,138	143,517	79,014	17,089	29,172	29,929
	38	Damains and other Irrigation Unit	East Menia	East Samalout	5,901		111,216	136,581	155,790	216,973	177,701	248,944	349,842	330,019	181,694	39,297	67,081	68,822
	39	El Safsaf Irrigation Unit	East Menia	East Samalout, Mataya	2,163		40,766	50,064	57,105	79,531	65,136	91,250	128,234	120,968	66,600	14,404	24,588	25,226
	40	Samalout Irrigation Unit	East Menia	East Samalout	2,184		41,162	50,550	57,659	80,303	65,768	92,136	129,479	122,142	67,246	14,544	24,827	25,471
	41	Abo Eisa and other Irrigation Unit	East Menia	Mataya	3,608		67,996	83,504	95,248	132,655	108,644	152,201	213,889	201,770	111,085	24,026	41,012	42,077
	42	Adqaq Irrigation Unit	East Menia	Mataya	2,310		43,536	53,466	60,985	84,936	69,563	97,451	136,949	129,189	71,126	15,383	26,259	26,941
	43	Shoieb Darwishl Irrigation Unit	East Menia	Mataya	2,992		56,392	69,253	78,993	110,015	90,102	126,226	177,386	167,335	92,127	19,925	34,013	34,896
	44	Abo Hasiba Irrigation Uni	East Menia	Mataya, Beni Mazar	3,885		73,220	89,920	102,566	142,847	116,992	163,896	230,323	217,273	119,621	25,872	44,163	45,310
	45	Mataua and other Irrigation Uni	East Menia	Mataya, Beni Mazar	5,756		108,477	133,218	151,953	211,630	173,325	242,814	341,226	321,892	177,219	38,329	65,429	67,127
	46	Beni Mazar and other Irrigatioin Unit	East Menia	Beni Mazar	3,121		58,814	72,228	82,386	114,741	93,973	131,648	185,005	174,523	96,084	20,781	35,474	36,395
	47	Dahrout and other Irrigation Unit	East Menia	Beni Mazar, East Maghagha	7,350		138,525	170,119	194,045	270,251	221,335	310,073	435,746	411,056	226,309	48,946	83,552	85,721
	48	El Gandia Irrigation Unit	East Menia	East Maghagha	5,141		96,888	118,986	135,720	189,021	154,808	216,874	304,773	287,504	158,287	34,234	58,439	59,956
	49	Maghagha and other Irrigation Unit	East Menia	East Maghagha	5,198		97,957	120,298	137,217	191,106	156,516	219,266	308,135	290,675	160,033	34,612	59,084	60,617
		Subtotal			125,879		2,372,427	2,913,514	3,323,273	4,628,415	3,790,666	5,310,412	7,462,733	7,039,890	3,875,848	838,268	1,430,948	1,468,083
		Total			196,651		3,706,265	4,551,564	5,191,700	7,230,625	5,921,873	8,296,058	11,658,468	10,997,891	6,054,947	1,309,563	2,235,463	2,293,475
							3.71	4.55	5.19	7.23	5.92	8.30	11.66	11.00	6.05	1.31	2.24	2.29



3-4.Minia Sub Regions

Irrigation efficiency eff = 0.72

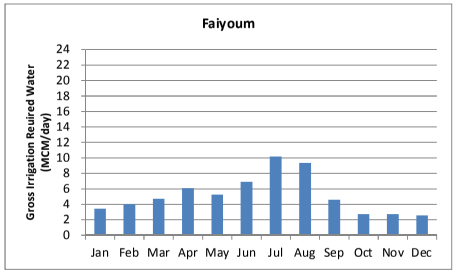
	Code	Sub Region	GD	ID	Area (ha)	Cultivated %	0.50	0.47	0.43	0.48	0.84	0.54	0.54	0.57	0.57	0.20	0.45	0.50
						Etc	3.53	4.54	5.75	7.13	3.33	7.22	10.15	9.19	5.06	3.12	2.33	2.18
							Gross Irri Reqd. inclusive losses(m^3/day)											
							Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
							31	28	31	30	31	30	31	31	30	31	30	31
Bah	1	Bani Khalid & Other Irr. Unit	East Menia	Der Mewas, Melwy, Monshat El Dahab	5,573		97,747	120,040	136,923	190,697	156,180	218,796	307,474	290,052	159,690	34,538	58,957	60,487
	2	Raaheel Irrigation Unit	West Menia	Monshat El Dahab	2,780		48,763	59,885	68,307	95,133	77,914	109,151	153,389	144,698	79,664	17,230	29,412	30,175
	3	El Dahab Irrigation Unit	West Menia	Monshat El Dahab; West Kamadir, East Terfa	28,363		497,427	610,877	696,791	970,440	794,789	1,113,434	1,564,712	1,476,054	812,649	175,760	300,027	307,813
	4	Kamadir Irrigation Unit	West Menia	West Kamadir	5,040		88,392	108,552	123,819	172,446	141,233	197,856	278,047	262,293	144,407	31,232	53,314	54,698
	5	Terfa Irrigation Unit	West Menia	West Terfa	8,211		144,006	176,849	201,722	280,943	230,092	322,340	452,986	427,319	235,263	50,883	86,858	89,112
	6	Bahnasa & other Irrigation Unit	West Menia	West Terfa, Edwa	2,451		42,981	52,783	60,207	83,852	68,675	96,207	135,201	127,540	70,218	15,187	25,924	26,597
	7	Sabaa Irrigation Unit	West Menia	Edwa	6,846		120,066	147,450	168,187	234,239	191,842	268,754	377,681	356,281	196,153	42,424	72,419	74,298
	8	Hareeka Irrigation Unit	West Menia	Edwa	6,468		113,437	139,308	158,901	221,306	181,249	253,915	356,827	336,609	185,322	40,081	68,420	70,196
	9	Sakola Irrigation Unit	West Menia	Sakoula	5,040		88,392	108,552	123,819	172,446	141,233	197,856	278,047	262,293	144,407	31,232	53,314	54,698
		Subtotal			70,772		1,241,210	1,524,297	1,738,675	2,421,501	1,983,207	2,778,310	3,904,364	3,683,140	2,027,772	438,566	748,646	768,074
Ibra	32	Seery Irrigation Unit	West Menia	West Abu Kurkas, West Menia, West Samalout, West Maghagha	50,511		885,866	1,087,909	1,240,913	1,728,254	1,415,438	1,982,912	2,786,591	2,628,701	1,447,245	313,010	534,317	548,183
	33	El Sahlyah Irrigation Unit	East Menia	East Abu Kurkas	2,940		51,562	63,322	72,228	100,594	82,386	115,416	162,194	153,004	84,237	18,219	31,100	31,907
	34	East Hafez Irrigation Unit	East Menia	East Abu Kurkas	2,738		48,026	58,980	67,275	93,696	76,737	107,502	151,072	142,513	78,461	16,970	28,968	29,719
	35	West Hafez Irrigation Unit	East Menia	East Abu Kurkas	9,763		171,230	210,283	239,858	334,057	273,592	383,280	538,624	508,105	279,740	60,502	103,279	105,959
	36	Kom El Zor and other Irrigation Unit	East Menia	East Abu Kurkas, East Samalout	7,752		135,962	166,971	190,454	265,251	217,240	304,335	427,683	403,450	222,122	48,040	82,006	84,135
	37	El Disout Irrigation Unit	East Menia	East Samalout	2,566		45,006	55,271	63,044	87,804	71,911	100,742	141,572	133,551	73,527	15,902	27,146	27,850
	38	Damains and other Irrigation Unit	East Menia	East Samalout	5,901		103,492	127,096	144,971	201,906	165,360	231,656	325,547	307,101	169,076	36,568	62,422	64,042
	39	El Safsaf Irrigation Unit	East Menia	East Samalout, Mataya	2,163		37,935	46,587	53,139	74,008	60,613	84,913	119,329	112,567	61,975	13,404	22,881	23,475
	40	Samalout Irrigation Unit	East Menia	East Samalout	2,184		38,303	47,039	53,655	74,727	61,201	85,738	120,487	113,660	62,576	13,534	23,103	23,702
	41	Abo Eisa and other Irrigation Unit	East Menia	Mataya	3,608		63,274	77,705	88,634	123,443	101,099	141,632	199,036	187,758	103,371	22,357	38,164	39,155
	42	Adqaq Irrigation Unit	East Menia	Mataya	2,310		40,513	49,753	56,750	79,038	64,732	90,684	127,438	120,218	66,186	14,315	24,436	25,070
	43	Shoieb Darwishl Irrigation Unit	East Menia	Mataya	2,992		52,475	64,444	73,507	102,375	83,845	117,460	165,067	155,715	85,730	18,542	31,651	32,472
	44	Abo Hasiba Irrigation Uni	East Menia	Mataya, Beni Mazar	3,885		68,136	83,676	95,444	132,927	108,867	152,514	214,328	202,184	111,314	24,075	41,097	42,163
	45	Mataua and other Irrigation Uni	East Menia	Mataya, Beni Mazar	5,756		100,944	123,966	141,401	196,933	161,288	225,951	317,530	299,539	164,913	35,667	60,885	62,465
	46	Beni Mazar and other Irrigatioin Unit	East Menia	Beni Mazar	3,121		54,729	67,212	76,665	106,773	87,447	122,506	172,158	162,403	89,412	19,338	33,011	33,867
	47	Dahrout and other Irrigation Unit	East Menia	Beni Mazar, East Maghagha	7,350		128,905	158,305	180,569	251,484	205,965	288,540	405,486	382,511	210,593	45,547	77,750	79,768
	48	El Gandia Irrigation Unit	East Menia	East Maghagha	5,141		90,160	110,723	126,295	175,895	144,058	201,813	283,608	267,539	147,295	31,857	54,381	55,792
	49	Maghagha and other Irrigation Unit	East Menia	East Maghagha	5,198		91,154	111,944	127,688	177,835	145,647	204,039	286,736	270,490	148,920	32,208	54,981	56,407
		Subtotal			125,879		2,207,675	2,711,187	3,092,490	4,306,997	3,527,426	4,941,633	6,944,488	6,551,008	3,606,692	780,055	1,331,577	1,366,132
		Total			196,651		3,448,885	4,235,483	4,831,165	6,728,498	5,510,632	7,719,943	10,848,853	10,234,149	5,634,465	1,218,621	2,080,222	2,134,206
							3.45	4.24	4.83	6.73	5.51	7.72	10.85	10.23	5.63	1.22	2.08	2.13



4-1.Faiyoum Sub Regions

Irrigation efficiency Eff = 0.50

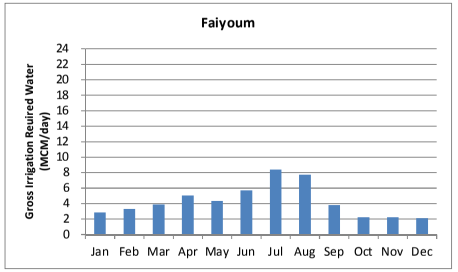
	Code	Sub Region	GD	ID	Area (ha)	Cultivated %	0.56	0.56	0.40	0.40	0.72	0.44	0.48	0.48	0.44	0.25	0.60	0.56
						Etc	4.0	4.6	7.5	9.8	4.6	10.0	13.4	12.3	6.5	6.9	2.9	2.9
							Gross Irri Reqd. inclusive losses(m^3/day)											
							Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
							31	28	31	30	31	30	31	31	30	31	30	31
Bah	19	El Ghark Irrigation Unit	Faiyoum	Atsa, El Ghark	20,174		442,732	516,303	603,771	781,163	678,651	889,659	1,308,051	1,202,251	587,263	350,527	350,089	328,046
	20	El Nazie Irrigation Unit	Faiyoum	Atsa, Yousif El Seddik, El Ghark, El Nazla	39,315		862,800	1,006,174	1,176,633	1,522,336	1,322,560	1,733,772	2,549,138	2,342,953	1,144,462	683,110	682,255	639,298
	21	Bahr Wahby Irrigation Unit	Faiyoum	Sayla, Tamya	16,462		361,276	421,311	492,686	637,441	553,790	725,975	1,067,390	981,055	479,216	286,036	285,678	267,691
	22	Aros & Abo Seer Irrigation Unit	Faiyoum	Atsa	5,680		124,654	145,368	169,996	219,942	191,079	250,489	368,290	338,501	165,348	98,693	98,570	92,363
	23	El Elam & Dar Ramada Irrigation Unit	Faiyoum	El Faiyoum	7,977		175,057	204,147	238,732	308,874	268,340	351,773	517,206	475,372	232,205	138,599	138,426	129,710
	24	Tanhala Irrigation Unit	Faiyoum	El Faiyoum, Tamya	9,260		203,225	236,996	277,146	358,574	311,518	408,376	600,428	551,863	269,569	160,901	160,700	150,581
	25	Senours Irrigation Unit	Faiyoum	Senories	13,237		290,491	338,763	396,154	512,546	445,285	583,734	858,255	788,835	385,322	229,992	229,705	215,242
	26	El Zawia Irrigation Unit	Faiyoum	Senories	6,520		143,093	166,872	195,142	252,476	219,343	287,542	422,769	388,573	189,806	113,292	113,150	106,026
	27	Sanhor Irrigation Unit	Faiyoum	Senories	6,892		151,246	176,379	206,260	266,860	231,840	303,925	446,856	410,712	200,620	119,747	119,597	112,067
	28	Senrw Irrigation Unit	Faiyoum	Ebshawy	7,964		174,778	203,821	238,351	308,380	267,911	351,211	516,380	474,613	231,834	138,378	138,205	129,503
	29	El Gharbia Irrigation Unit	Faiyoum	Ebshawy	10,902		239,248	279,004	326,271	422,132	366,736	480,762	706,856	649,683	317,351	189,421	189,184	177,272
	30	Bahr Talat Irrigation Unit	Faiyoum	Ebshawy	3,875		85,038	99,170	115,970	150,043	130,353	170,882	251,246	230,924	112,799	67,328	67,244	63,010
	31	Desia Irrigation Unit	Faiyoum	Ebshawy	8,847		194,152	226,415	264,773	342,565	297,610	390,144	573,622	527,225	257,534	153,717	153,525	143,859
Total					157,105		3,447,792	4,020,723	4,701,886	6,083,332	5,285,017	6,928,243	10,186,487	9,362,561	4,573,330	2,729,742	2,726,326	2,554,668
							3.45	4.02	4.70	6.08	5.29	6.93	10.19	9.36	4.57	2.73	2.73	2.55



4-2.Faiyoum Sub Regions

Irrigation efficiency Eff = 0.605

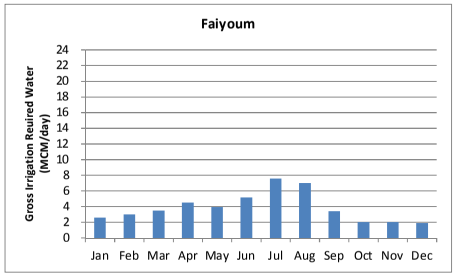
	Code	Sub Region	GD	ID	Area (ha)	Cultivated %	0.56	0.56	0.40	0.40	0.72	0.44	0.48	0.48	0.44	0.25	0.60	0.56
						Etc	3.3	3.8	6.2	8.1	3.8	8.3	11.1	10.2	5.4	5.7	2.4	2.4
							Gross Irri Reqd. inclusive losses(m^3/day)											
							Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
							31	28	31	30	31	30	31	31	30	31	30	31
Bah	19	El Ghark Irrigation Unit	Faiyoum	Atsa, El Ghark	20,174		365,895	426,697	498,984	645,590	560,869	735,255	1,081,034	993,596	485,342	289,692	289,330	271,112
	20	El Nazie Irrigation Unit	Faiyoum	Atsa, Yousif El Seddik, El Ghark, El Nazla	39,315		713,058	831,549	972,424	1,258,129	1,093,025	1,432,870	2,106,726	1,936,325	945,837	564,554	563,847	528,346
	21	Bahr Wahby Irrigation Unit	Faiyoum	Sayla, Tamya	16,462		298,576	348,191	407,179	526,811	457,677	599,979	882,140	810,789	396,046	236,393	236,097	221,232
	22	Aros & Abo Seer Irrigation Unit	Faiyoum	Atsa	5,680		103,020	120,139	140,492	181,770	157,916	207,016	304,372	279,753	136,651	81,565	81,463	76,333
	23	El Elam & Dar Ramada Irrigation Unit	Faiyoum	El Faiyoum	7,977		144,676	168,717	197,300	255,267	221,769	290,721	427,443	392,870	191,905	114,545	114,402	107,198
	24	Tanhala Irrigation Unit	Faiyoum	El Faiyoum, Tamya	9,260		167,955	195,864	229,046	296,342	257,453	337,501	496,222	456,085	222,784	132,976	132,810	124,447
	25	Senours Irrigation Unit	Faiyoum	Senories	13,237		240,075	279,969	327,400	423,592	368,004	482,425	709,301	651,930	318,448	190,076	189,838	177,886
	26	El Zawia Irrigation Unit	Faiyoum	Senories	6,520		118,259	137,910	161,274	208,658	181,276	237,638	349,396	321,135	156,865	93,630	93,513	87,625
	27	Sanhor Irrigation Unit	Faiyoum	Senories	6,892		124,997	145,768	170,463	220,546	191,604	251,177	369,302	339,431	165,802	98,964	98,841	92,617
	28	Senrw Irrigation Unit	Faiyoum	Ebshawy	7,964		144,444	168,447	196,984	254,860	221,414	290,257	426,760	392,242	191,598	114,362	114,219	107,027
	29	El Gharbia Irrigation Unit	Faiyoum	Ebshawy	10,902		197,725	230,582	269,646	348,869	303,087	397,324	584,179	536,928	262,273	156,546	156,351	146,506
	30	Bahr Talat Irrigation Unit	Faiyoum	Ebshawy	3,875		70,280	81,958	95,843	124,002	107,730	141,225	207,641	190,846	93,223	55,643	55,573	52,074
	31	Desia Irrigation Unit	Faiyoum	Ebshawy	8,847		160,456	187,120	218,821	283,112	245,959	322,433	474,068	435,723	212,838	127,039	126,880	118,891
Total					157,105		2,849,415	3,322,912	3,885,856	5,027,547	4,367,782	5,725,821	8,418,584	7,737,654	3,779,611	2,255,985	2,253,162	2,111,296
							2.85	3.32	3.89	5.03	4.37	5.73	8.42	7.74	3.78	2.26	2.25	2.11



4-3.Faiyoum Sub Regions

Irrigation efficiency Eff = 0.67

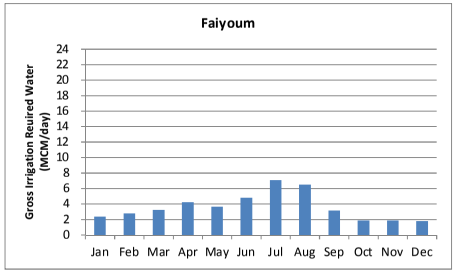
	Code	Sub Region	GD	ID	Area (ha)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cultivated %						0.56	0.56	0.40	0.40	0.72	0.44	0.48	0.48	0.44	0.25	0.60	0.56
Etc						3.0	3.4	5.6	7.3	3.5	7.5	10.0	9.2	4.9	5.1	2.2	2.2
						Gross Irri Reqd. inclusive losses(m^3/day)											
						31	28	31	30	31	30	31	31	30	31	30	31
Bah	19	El Ghark Irrigation Unit	Faiyoum	Atsa, El Ghark	20,174	330,397	385,301	450,576	582,958	506,456	663,924	976,158	897,202	438,256	261,588	261,260	244,810
	20	El Nazie Irrigation Unit	Faiyoum	Atsa, Youssif El Seddik, El Ghark, El Nazla	39,315	643,880	750,876	878,084	1,136,072	986,985	1,293,860	1,902,342	1,748,473	854,076	509,783	509,146	477,088
	21	Bahr Wahby Irrigation Unit	Faiyoum	Sayla, Tamya	16,462	269,609	314,411	367,676	475,702	413,276	541,772	796,559	732,130	357,624	213,459	213,192	199,769
	22	Aros & Abo Seer Irrigation Unit	Faiyoum	Atsa	5,680	93,026	108,484	126,862	164,136	142,596	186,932	274,843	252,613	123,394	73,652	73,560	68,928
	23	El Elam & Dar Ramada Irrigation Unit	Faiyoum	El Faiyoum	7,977	130,640	152,349	178,159	230,503	200,254	262,517	385,975	354,756	173,287	103,432	103,303	96,799
	24	Tanhala Irrigation Unit	Faiyoum	El Faiyoum, Tamya	9,260	151,661	176,863	206,825	267,592	232,476	304,758	448,081	411,838	201,171	120,075	119,925	112,374
	25	Senours Irrigation Unit	Faiyoum	Senories	13,237	216,784	252,808	295,637	382,497	332,302	435,622	640,489	588,683	287,554	171,636	171,421	160,628
	26	El Zawia Irrigation Unit	Faiyoum	Senories	6,520	106,786	124,531	145,628	188,415	163,689	214,584	315,499	289,980	141,647	84,546	84,441	79,124
	27	Sanhor Irrigation Unit	Faiyoum	Senories	6,892	112,870	131,626	153,925	199,150	173,015	226,809	333,474	306,502	149,717	89,363	89,252	83,632
	28	Senrw Irrigation Unit	Faiyoum	Ebshawy	7,964	130,431	152,105	177,874	230,134	199,934	262,098	385,358	354,189	173,011	103,267	103,138	96,644
	29	El Gharbia Irrigation Unit	Faiyoum	Ebshawy	10,902	178,543	208,212	243,486	315,024	273,683	358,777	527,505	484,838	236,829	141,359	141,182	132,293
	30	Bahr Talat Irrigation Unit	Faiyoum	Ebshawy	3,875	63,462	74,007	86,545	111,972	97,278	127,524	187,497	172,331	84,179	50,245	50,182	47,022
	31	Desia Irrigation Unit	Faiyoum	Ebshawy	8,847	144,890	168,967	197,592	255,646	222,097	291,152	428,076	393,452	192,189	114,714	114,571	107,357
Total					157,105	2,572,979	3,000,540	3,508,870	4,539,800	3,944,042	5,170,331	7,601,856	6,986,986	3,412,933	2,037,121	2,034,572	1,906,469
						2.57	3.00	3.51	4.54	3.94	5.17	7.60	6.99	3.41	2.04	2.03	1.91



4-4.Faiyoum Sub Regions

Irrigation efficiency Eff = 0.72

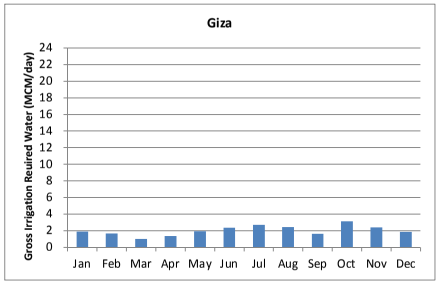
	Code	Sub Region	GD	ID	Area (ha)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cultivated %						0.56	0.56	0.40	0.40	0.72	0.44	0.48	0.48	0.44	0.25	0.60	0.56
Etc						2.7	3.2	5.2	6.8	3.2	7.0	9.3	8.5	4.5	4.8	2.0	2.0
						Gross Irri Reqd. inclusive losses(m^3/day)											
						31	28	31	30	31	30	31	31	30	31	30	31
Bah	19	El Ghark Irrigation Unit	Faiyoum	Atsa, El Ghark	20,174	307,453	358,544	419,286	542,475	471,286	617,819	908,369	834,896	407,822	243,422	243,117	227,810
	20	El Nazie Irrigation Unit	Faiyoum	Atsa, Youssif El Seddik, El Ghark, El Nazla	39,315	599,166	698,732	817,106	1,057,178	918,444	1,204,009	1,770,235	1,627,051	794,765	474,382	473,788	443,957
	21	Bahr Wahby Irrigation Unit	Faiyoum	Sayla, Tamya	16,462	250,886	292,577	342,143	442,667	384,576	504,149	741,243	681,288	332,789	198,636	198,387	185,896
	22	Aros & Abo Seer Irrigation Unit	Faiyoum	Atsa	5,680	86,565	100,950	118,053	152,737	132,694	173,951	255,757	235,070	114,825	68,537	68,451	64,141
	23	El Elam & Dar Ramada Irrigation Unit	Faiyoum	El Faiyoum	7,977	121,568	141,769	165,786	214,496	186,347	244,287	359,171	330,120	161,254	96,249	96,129	90,076
	24	Tanhala Irrigation Unit	Faiyoum	El Faiyoum, Tamya	9,260	141,129	164,581	192,463	249,009	216,332	283,594	416,964	383,238	187,200	111,737	111,597	104,570
	25	Senours Irrigation Unit	Faiyoum	Senories	13,237	201,730	235,252	275,107	355,935	309,226	405,371	596,010	547,802	267,585	159,717	159,517	149,473
	26	El Zawia Irrigation Unit	Faiyoum	Senories	6,520	99,370	115,883	135,515	175,330	152,322	199,682	293,589	269,843	131,810	78,675	78,577	73,629
	27	Sanhor Irrigation Unit	Faiyoum	Senories	6,892	105,032	122,485	143,236	185,320	161,000	211,059	310,316	285,217	139,320	83,158	83,054	77,824
	28	Senrw Irrigation Unit	Faiyoum	Ebshawy	7,964	121,373	141,542	165,521	214,153	186,050	243,896	358,597	329,592	160,996	96,096	95,975	89,933
	29	El Gharbia Irrigation Unit	Faiyoum	Ebshawy	10,902	166,144	193,753	226,577	293,147	254,678	333,862	490,873	451,169	220,382	131,542	131,378	123,106
	30	Bahr Talat Irrigation Unit	Faiyoum	Ebshawy	3,875	59,054	68,868	80,535	104,196	90,523	118,668	174,476	160,364	78,333	46,756	46,697	43,757
	31	Desia Irrigation Unit	Faiyoum	Ebshawy	8,847	134,828	157,233	183,870	237,892	206,674	270,933	398,349	366,129	178,843	106,748	106,615	99,902
Total					157,105	2,394,300	2,792,169	3,265,198	4,224,536	3,670,150	4,811,280	7,073,949	6,501,779	3,175,923	1,895,654	1,893,282	1,774,075
						2.39	2.79	3.27	4.22	3.67	4.81	7.07	6.50	3.18	1.90	1.89	1.77



5-1.Giza Sub Regions

Irrigation eff Eff = 0.50

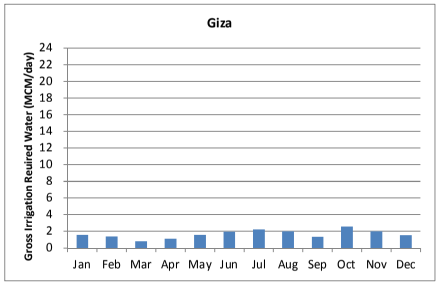
	Code	Sub Region	GD	ID	Feddan	Area (ha)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cultivated %							0.78	0.78	0.26	0.24	0.34	0.28	0.31	0.31	0.33	0.77	0.78	0.78
Etc							3.68	3.24	5.82	8.46	8.56	12.39	13.13	11.73	7.54	6.05	4.60	3.58
Gross Irri Reqd. inclusive losses(m^3/day)																		
							31	28	31	30	31	30	31	31	30	31	30	31
Bahar	-	Giza	-	-	139,627	58,643	1,675,139	1,475,745	873,645	1,173,022	1,691,977	2,066,440	2,361,546	2,109,954	1,440,940	2,735,767	2,102,014	1,630,596
Ibrahimia	-	Giza	-	-	19,731	8,287	236,718	208,541	123,457	165,762	239,097	292,013	333,715	298,162	203,622	386,597	297,040	230,423
Total					159,358	66,930	1,911,857	1,684,286	997,102	1,338,784	1,931,074	2,358,453	2,695,261	2,408,116	1,644,562	3,122,364	2,399,054	1,861,019
							1.91	1.68	1.00	1.34	1.93	2.36	2.70	2.41	1.64	3.12	2.40	1.86



5-2.Giza Sub Regions

Irrigation eff Eff = 0.605

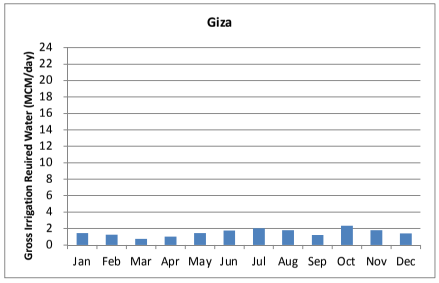
	Code	Sub Region	GD	ID	Feddan	Area (ha)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cultivated %							0.78	0.78	0.26	0.24	0.34	0.28	0.31	0.31	0.33	0.77	0.78	0.78
Etc							3.04	2.68	4.81	6.99	7.07	10.24	10.85	9.69	6.23	5.00	3.80	2.96
Gross Irri Reqd. inclusive losses(m^3/day)																		
							31	28	31	30	31	30	31	31	30	31	30	31
Bahar	-	Giza	-	-	139,627	58,643	1,384,413	1,219,624	722,021	969,439	1,398,328	1,707,802	1,951,691	1,743,764	1,190,859	2,260,964	1,737,201	1,347,600
Ibrahimia	-	Giza	-	-	19,731	8,287	195,634	172,348	102,030	136,994	197,601	241,333	275,798	246,415	168,283	319,502	245,488	190,432
Total					159,358	66,930	1,580,047	1,391,972	824,051	1,106,433	1,595,929	1,949,135	2,227,489	1,990,179	1,359,142	2,580,466	1,982,689	1,538,032
							1.58	1.39	0.82	1.11	1.60	1.95	2.23	1.99	1.36	2.58	1.98	1.54



5-3.Giza Sub Regions

Irrigation eff Eff = 0.67

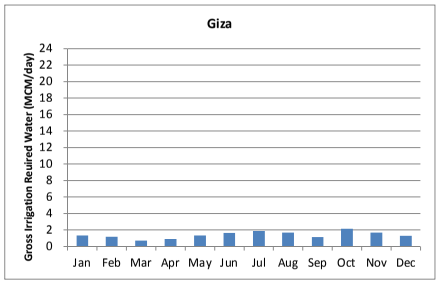
	Code	Sub Region	GD	ID	Feddan	Area (ha)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cultivated %							0.78	0.78	0.26	0.24	0.34	0.28	0.31	0.31	0.33	0.77	0.78	0.78
Etc							2.74	2.42	4.34	6.31	6.39	9.24	9.80	8.75	5.62	4.52	3.43	2.67
Gross Irri Reqd. inclusive losses(m^3/day)																		
							31	28	31	30	31	30	31	31	30	31	30	31
Bahar	-	Giza	-	-	139,627	58,643	1,250,104	1,101,303	651,974	875,389	1,262,669	1,542,119	1,762,348	1,574,593	1,075,328	2,041,617	1,568,667	1,216,863
Ibrahimia	-	Giza	-	-	19,731	8,287	176,655	155,628	92,132	123,703	178,431	217,920	249,041	222,509	151,957	288,505	221,672	171,958
Total					159,358	66,930	1,426,759	1,256,930	744,106	999,092	1,441,100	1,760,040	2,011,389	1,797,102	1,227,285	2,330,122	1,790,339	1,388,820
							1.43	1.26	0.74	1.00	1.44	1.76	2.01	1.80	1.23	2.33	1.79	1.39



5-4.Giza Sub Regions

Irrigation eff Eff = 0.72

	Code	Sub Region	GD	ID	Feddan	Area (ha)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cultivated %							0.78	0.78	0.26	0.24	0.34	0.28	0.31	0.31	0.33	0.77	0.78	0.78
Etc							2.55	2.25	4.04	5.87	5.94	8.60	9.12	8.15	5.23	4.20	3.19	2.49
Gross Irri Reqd. inclusive losses(m^3/day)																		
							31	28	31	30	31	30	31	31	30	31	30	31
Bahar	-	Giza	-	-	139,627	58,643	1,163,291	1,024,823	606,698	814,598	1,174,984	1,435,028	1,639,963	1,465,246	1,000,653	1,899,838	1,459,732	1,132,358
Ibrahimia	-	Giza	-	-	19,731	8,287	164,387	144,820	85,734	115,113	166,040	202,787	231,747	207,057	141,404	268,470	206,278	160,016
Total					159,358	66,930	1,327,678	1,169,643	692,432	929,711	1,341,023	1,637,815	1,871,709	1,672,303	1,142,057	2,168,308	1,666,010	1,292,374
							1.33	1.17	0.69	0.93	1.34	1.64	1.87	1.67	1.14	2.17	1.67	1.29



I.Beni Suef

1.ETc&Irrigation Requirement

Beneficiary area: 567022 fed 238149 ha

Description	Unit		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			31	28	31	30	31	30	31	31	30	31	30	31
ETo on Modified Penman	(mm/month)		93.59	115.79	176.92	166.38	304.60	328.90	325.30	285.52	258.07	203.61	136.02	94.20
↓														
Selected Eto	(mm/month)		93.59	115.79	176.92	166.38	304.60	328.90	325.30	285.52	258.07	203.61	136.02	94.20
ETC=ETO*Kc*Area														
Winter	Crop Area (fed)													
Wheat	143990	Kc	1.00	1.15	1.15	1.06	0.29						0.35	0.56
	60476	ETC	5,660,114	8,031,317	12,304,263	10,628,178	5,411,234	0	0	0	0	0	2,878,978	3,186,571
Berseem	29753	Kc	0.89	0.43								0.69	0.90	0.90
	12496	ETC	1,041,468	622,728	0	0	0	0	0	0	0	1,759,822	1,529,717	1,059,404
Onion	53624	Kc	1.05	1.05	1.05	0.98	0.54			0.53	0.84	1.00	1.05	1.05
	22522	ETC	2,213,305	2,738,337	4,183,829	3,674,430	3,735,056	0	0	3,376,066	4,878,479	4,577,128	3,216,521	2,227,598
Marjoram	46673	Kc	0.96	1.15	0.57									0.51
	19603	ETC	1,759,502	2,610,369	1,965,255	0	0	0	0	0	0	0	0	937,365
Summer														
Maize	174600	Kc					0.20	0.53	1.12	1.2	0.6			
	73332	ETC	0	0	0	0	4,467,457	12,888,656	26,613,043	25,125,683	11,354,814	0	0	0
Sorghum	5013	Kc					0.20	0.64	1.09	1.07	0.49			
	2105	ETC	0	0	0	0	128,267	445,174	746,872	642,907	265,639	0	0	0
Peanuts	12984	Kc					0.41	0.83	1.15	1.07	0.24			
	5453	ETC	0	0	0	0	679,269	1,486,126	2,040,039	1,662,145	333,066	0	0	0
Tomato	39520	Kc						0.60	0.73	1.07	1.15	1.15	1.03	
	16598	ETC	0	0	0	0	0	3,275,559	3,927,095	5,063,973	4,926,056	3,886,475	2,314,082	0
Nile														
Maize	34467	Kc							0.20	0.53	1.12	1.2	0.6	
	14476	ETC	0	0	0	0	0	0	941,815	2,208,727	4,167,794	3,536,925	1,181,388	0
Tomato	6703	Kc					0.60	0.73	1.07	1.15	1.15	1.03		
	2815	ETC	0	0	0	0	514,525	673,456	978,551	924,399	835,510	587,536	0	0
Permanent														
Sugar cane	106	Kc	0.40	0.55	0.97	1.24	1.25	1.25	1.25	1.25	1.25	1.22	1.05	0.85
	45	ETC	1,667	2,823	7,614	9,216	16,951	18,303	18,103	15,889	14,362	11,036	6,358	3,565
Citrus	19589	Kc	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
	8227	ETC	654,522	809,785	1,237,248	1,163,566	2,130,185	2,300,109	2,274,905	1,996,749	1,804,744	1,423,876	951,194	658,748
Adding for pre sowing (Special needs)														
Total consumptive use in the month			11,330,577	14,815,357	19,698,208	15,475,389	17,082,945	21,087,383	37,540,423	41,016,538	28,580,463	15,782,798	12,078,238	8,073,251
Net Irrigated area (ha)			123,369	123,369	110,872	91,270	174,976	108,576	123,052	145,575	145,575	77,180	134,841	123,369
Net Irrigation reqd. mm/ha			92	120	178	170	98	194	305	282	196	204	90	65
Effective Rainfall in mm			1	1	2	0	0	0	0	0	0	0	1	1
Net Irri. Required per month			91	119	176	170	98	194	305	282	196	204	89	64
Net Irri Required per day			2.9	4.3	5.7	5.7	3.1	6.5	9.8	9.1	6.5	6.6	3.0	2.1
Gross Irri Reqd. inclusive losses	Eff = 0.50		5.86	8.51	11.33	11.30	6.30	12.95	19.68	18.18	13.09	13.19	5.90	4.16
Gross Irri Reqd. inclusive losses	Eff = 0.605		4.84	7.03	9.37	9.34	5.21	10.70	16.27	15.02	10.82	10.90	4.88	3.44
Gross Irri Reqd. inclusive losses	Eff = 0.67		4.37	6.35	8.46	8.44	4.70	9.66	14.69	13.57	9.77	9.85	4.41	3.10
Gross Irri Reqd. inclusive losses	Eff = 0.72		4.07	5.91	7.87	7.85	4.37	8.99	13.67	12.62	9.09	9.16	4.10	2.89
Irrigation required for whole area			7,230,457	10,494,277	12,565,460	10,316,926	11,021,255	14,058,255	24,219,627	26,462,283	19,053,642	10,182,450	7,962,265	5,128,956
Design discharge lps/day			83,686	121,462	145,434	119,409	127,561	162,711	280,320	306,276	220,528	117,852	92,156	59,363
Cultivated Area %			0.52	0.52	0.47	0.38	0.73	0.46	0.52	0.61	0.61	0.32	0.57	0.52
PEAK WATER REQUIREMENT			**306,276**	**lps**										

ANNEX5-20

I.Beni Suef

2. Kc per Growth Stage

DURATION OF GROWTH STAGE FOR FIELD CROP

Approximate Duration of Growth Stages for Various Field Crops

Crops	Initial Stage	Crop Development Stage	Mid Season Stage	Late Season Stage	Total
Wheat	20	60	70	30	180
L.Berseem	N.A.	N.A.	N.A.	N.A.	N.A.
Sugar beet	25	35	50	50	160
Broad bean	90	45	40	60	235
Onion	20	45	165	45	275
Marjoram*1	20	30	40	10	100
S. Berseem*1	10	15	75	35	135
Rice	30	30	60	30	150
Maize	25	40	45	20	130
Sorghum	20	35	45	30	130
Peanuts	25	35	45	25	130
Cucumber	20	30	40	15	105
Basil	N.A.	N.A.	N.A.	N.A.	N.A.
Sugar cane	35	60	190	75	360
Cotton	30	50	60	55	195
Citrus	60	90	120	90	360
Tomato	35	45	70	30	180
Date	N.A.	N.A.	N.A.	N.A.	N.A.

Crop Factor (Kc)

Values of the Crop Factor (Kc) for Various Crops and Growth Stages

Crops	Initial Stage	Mid Season Stage	end
Wheat	0.70	1.15	0.40
L.Berseem	N.A.	N.A.	N.A.
Sugar beet	0.35	1.20	0.70
Broad bean	0.50	1.15	1.10
Onion	0.70	1.05	0.75
Marjoram*2	0.60	1.15	1.10
S. Berseem	0.40	0.90	0.85
Rice	1.05	1.20	0.90
Maize	0.30	1.20	0.60
Sorghum	0.30	1.10	0.55
Peanuts	0.40	1.15	0.60
Cucumber	0.60	1.00	0.75
Basil	N.A.	N.A.	N.A.
Sugar cane	0.40	1.25	0.75
Cotton	0.35	1.20	0.70
Citrus	0.85	0.85	0.85
Tomato	0.60	1.15	0.90
Date	0.85	0.85	0.85

*1 The growth durations of Marjoram and S. Berseem use those of Spinach and Bermuda for hay as substitutes.

*2 The Kc value of Marjoram uses that of Mint as a substitute.

I.Beni Suef

3. Kc per month

Wheat

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	15 20	60		70		30						
Kc per Groth stage	0.00 0.70	0.0075*x+0.4375		1.15		-0.025*x+5.275						
Calculation I	0.00*15/30 0.70*15/30 a b	0.70*5/30 0.79*25/30 a b	1*30/30 a	1.13*5/30 1.15*25/30 a b	1.15*30/30 a	1.15*15/30 0.96*15/30 a b	0.59*15/30 a					
Calculation II	0.00*15/30+0.70*15/30	0.70*5/30+0.79*25/30	1*30/30	1.13*5/30+1.15*25/30	1.15*30/30	1.15*15/30+0.96*15/30	0.59*15/30					
Kc per month (a+b)	0.35	0.56	1.00	1.15	1.15	1.06	0.29					

S.Berseem

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	10 15	75		35								
Kc per Groth stage	0.40 0.033*x+0.0667	0.90		-0.00143*x+1.04								
Calculation I	0.82*15/30 0.90*5/30 a b	0.90*30/30 a	0.90*30/30 a	0.90*10/30 0.89*20/30 a b	0.86*15/30 a							
Calculation II	0.82*15/30+0.90*5/30	0.90*30/30	0.90*30/30	0.90*10/30+0.89*20/30	0.86*15/30							
Kc per month (a+b)	0.69	0.90	0.90	0.89	0.43							

Onion

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	15 20	45		165					45			
Kc per Groth stage	0.00 0.70	0.00778*x+0.4278		1.05					-0.0067*x+2.683			
Calculation I	0.00*15/30 1.05*15/30 a b	1.05*5/30 0.8*25/30 a b	0.97*20/30 1.05*10/30 a b	1.05*30/30 a	1.05*30/30 a	1.05*30/30 a	1.05*30/30 a	1.05*30/30 a	1.05*5/30 0.97*25/30 a b	0.82*20/30 a		
Calculation II	0.00*15/30+1.05*15/30	1.05*5/30+0.8*25/30	0.97*20/30+1.05*10/30	1.05*30/30	1.05*30/30	1.05*30/30	1.05*30/30	1.05*30/30	1.05*5/30+0.97*25/30	0.82*20/30		
Kc per month (a+b)	0.53	0.84	1.00	1.05	1.05	1.05	1.05	1.05	0.98	0.54		

Other crops (Marjoram)

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	5 20	30	40	10								
Kc per Groth stage	0 0.6	0.0183*x+0.014167	1.15	-0.005*x+1.625								
Calculation I	0.6*20/30 0.65*5/30 a b	0.92*25/30 1.15*5/30 a b	1.15*30/30 a	1.15*5/30 1.13*10/30 a b								
Calculation II	0.6*20/30+0.65*5/30	0.92*25/30+1.15*5/30	1.15*30/30	1.15*5/30+1.13*10/30								
Kc per month (a+b)	0.51	0.96	1.15	0.57								

Maize

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	10 25	40	45		20							
Kc per Groth stage	0.00 0.30	0.0225*x-0.4875	1.20		-0.03*x+4.8 0.6	0.6						
Calculation I	0.00*10/30 0.30*20/30 a b	0.30*5/30 0.58*25/30 a b	1.03*15/30 1.20*15/30 a b	1.20*30/30 a	0.9*20/30 a							
Calculation II	0.00*10/30+0.30*20/30	0.30*5/30+0.58*25/30	1.03*15/30+1.20*15/30	1.20*30/30	0.9*20/30							
Kc per month (a+b)	0.20	0.53	1.12	1.20	0.60							

ANNEX5-22

Sorghum

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	10 20	35	45	30								
Kc per Groth stage	0.00 0.30	0.02286*x-0.38571	1.10	-0.01833*x+3.11667 0.55								
Calculation I	0.00*10/30 0.30*20/30 a b	0.64*30/30 a	1.04*5/30 1.10*25/30 a b	1.10*20/30 1.01*10/30 a b	0.73*20/30 a							
Calculation II	0.00*10/30+0.30*20/30	0.64*30/30	1.04*5/30+1.10*25/30	1.10*20/30+1.01*10/30	0.73*20/30							
Kc per month (a+b)	0.20	0.64	1.09	1.07	0.49							

Oil Crops(Peanuts)

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	25	35	45	25								
Kc per Groth stage	0.40	0.0214*x-0.1357	1.15	-0.022*x+3.46	0.6							
Calculation I	0.4*25/30 0.45*5/30 a b	0.83*30/30 a	1.15*30/30 a	1.15*15/30 0.99*15/30 a b	0.71*10/30 a							
Calculation II	0.4*25/30+0.45*5/30	0.83*30/30	1.15*30/30	1.15*15/30+0.99*15/30	0.71*10/30							
Kc per month (a+b)	0.41	0.83	1.15	1.07	0.24							

Sugar cane

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	35	60	190							75		
Kc per Groth stage	0.40	0.142*x-0.958	1.25							-0.0067*x+3.15		
Calculation I	0.40*30/30 a	0.40*5/30 0.58*25/30 a b	0.97*30/30 a	1.21*5/30 1.25*25/30 a b	1.25*30/30 a	1.25*30/30 a	1.25*30/30 a	1.25*30/30 a	1.25*30/30 a	1.25*15/30 1.19*15/30 a b	1.05*30/30 a	0.85*30/30 a
Calculation II	0.40*30/30	0.40*5/30+0.58*25/30	0.97*30/30	1.21*5/30+1.25*25/30	1.25*30/30	1.25*30/30	1.25*30/30	1.25*30/30	1.25*30/30	1.25*15/30+1.19*15/30	1.05*30/30	0.85*30/30
Kc per month (a+b)	0.40	0.55	0.97	1.24	1.25	1.25	1.25	1.25	1.25	1.22	1.05	0.85

Citrus

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	60		90			120				90		
Kc per Groth stage	0.85		0.85			0.85				0.85		
Calculation I	0.85*30/30 a	0.85*30/30 a	0.85*30/30 a	0.85*30/30 a	0.85*30/30 a	0.85*30/30 a	0.85*30/30 a	0.85*30/30 a	0.85*30/30 a	0.85*30/30 a	0.85*30/30 a	0.85*30/30 a
Calculation II	0.85*30/30	0.85*30/30	0.85*30/30	0.85*30/30	0.85*30/30	0.85*30/30	0.85*30/30	0.85*30/30	0.85*30/30	0.85*30/30	0.85*30/30	0.85*30/30
Kc per month (a+b)	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85

Tomato

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	35	45	70			30						
Kc per Groth stage	0.60	0.0122*x+0.1722	1.15			-0.0083*x+2.4						
Calculation I	0.60*30/30 a	0.60*5/30 0.75*25/30 a b	1.03*20/30 1.15*10/30 a b	1.15*30/30 a	1.15*30/30 a	1.03*30/30 a						
Calculation II	0.60*30/30	0.60*5/30+0.75*25/30	1.03*20/30+1.15*10/30	1.15*30/30	1.15*30/30	1.03*30/30						
Kc per month (a+b)	0.60	0.73	1.07	1.15	1.15	1.03						

I.Beni Suef

4. Eto Penman Montieth

Beni-suef

Table Crop Evapotranspiration

Method: Penman-Montieth equation

Longitude: 31.01 E°
Latitude : 29.2 N°
Altitude : 32 m above sea level

Data and elements		Unit	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
			1	2	3	4	5	6	7	8	9	10	11	12
			31	28	31	30	31	30	31	31	30	31	30	31
1. Monthly average daily maximum temprature	Tmax	°C	19.5	21.5	25.0	30.3	34.2	36.9	37.1	36.6	34.7	31.0	25.3	20.9
2. Monthly average daily minimum temprature	Tmin	°C	5.6	6.9	9.6	13.8	17.4	20.2	21.6	21.4	19.5	16.7	11.7	7.4
3. Wind speed	u_z	m/sec	3.20	4.00	4.80	2.30	6.10	6.50	6.40	5.30	5.90	5.20	4.40	3.20
4. Mean relative humidity	RHmean	%	59.0	51.0	46.0	37.0	33.0	36.0	43.0	46.0	48.0	52.0	57.0	62.0
5. Sunshine hour	n	hour	6.8	7.7	8.2	9.3	9.7	11.2	11.0	10.7	9.8	8.8	7.8	6.6
Parameters														
Mean monthly temprature	Tmean	°C	12.6	14.2	17.3	22.1	25.8	28.6	29.4	29.0	27.1	23.9	18.5	14.2
Slope of saturation vapour pressure curve	Δ	kPa/°C	0.10	0.10	0.12	0.16	0.20	0.23	0.24	0.23	0.21	0.18	0.13	0.10
Altitude [atmospheric pressure]	P	kPa	100.9											
Latitude [radian]	φ	rad	0.5											
Psychrometric constant	γ	kPa/°C	0.067											
Height of wind speed measurement	z	m	10											
Windspeed at 2 m above ground surface	u_2	ms^{-1}	2.39	2.99	3.59	1.72	4.56	4.86	4.79	3.96	4.41	3.89	3.29	2.39
$1+0.34u_2$			1.81	2.02	2.22	1.58	2.55	2.65	2.63	2.35	2.50	2.32	2.12	1.81
$\Delta/(\Delta+\gamma*(1+0.34*u_2))$			0.44	0.44	0.46	0.60	0.53	0.56	0.57	0.59	0.56	0.53	0.48	0.46
$\gamma/(\Delta+\gamma*(1+0.34*u_2))$			0.31	0.28	0.25	0.25	0.18	0.17	0.16	0.17	0.18	0.20	0.24	0.30
$(900/(Tmean+273)*u_2$			7.54	9.38	11.13	5.25	13.74	14.51	14.25	11.81	13.23	11.79	10.16	7.50
Vapour pressure deficit														
Saturation vapour pressure for Tmax	e°(Tmax)	kPa	2.27	2.56	3.17	4.32	5.38	6.24	6.31	6.14	5.53	4.49	3.22	2.47
Saturation vapour pressure for Tmin	e°(Tmin)	kPa	0.91	0.99	1.20	1.58	1.99	2.37	2.58	2.55	2.27	1.90	1.38	1.03
Saturation vapour pressure	es	kPa	1.59	1.78	2.18	2.95	3.68	4.30	4.44	4.34	3.90	3.20	2.30	1.75
Actual vapour pressure	ea	kPa	0.65	0.62	0.68	0.72	0.81	1.05	1.35	1.42	1.32	1.20	0.95	0.77
Vapour pressure deficit	es-ea	kPa	0.93	1.16	1.51	2.23	2.87	3.26	3.10	2.92	2.58	2.00	1.35	0.98
Radiation														
Number of the day in the year	J	days	15	45	76	106	137	167	197	228	258	289	319	349
Inverse relative distance Earth-Sun	dr	rad	1.032	1.024	1.009	0.992	0.977	0.968	0.968	0.977	0.991	1.009	1.023	1.032
Solar declination	δ	rad	-0.37	-0.24	-0.03	0.17	0.34	0.41	0.37	0.23	0.04	-0.18	-0.33	-0.41
Sunset hour angle	ωs	rad	1.352	1.436	1.552	1.668	1.768	1.814	1.790	1.704	1.591	1.472	1.375	1.327
sin(φ)sin(δ)			-0.177	-0.114	-0.016	0.084	0.161	0.193	0.177	0.113	0.018	-0.085	-0.160	-0.193
cos(φ)cos(δ)			0.814	0.849	0.872	0.860	0.824	0.801	0.813	0.849	0.872	0.860	0.824	0.802
Extraterrestial radiation	Ra	$MJm^{-2}day^{-1}$	21.6	26.1	32.1	37.1	40.1	41.1	40.4	38.0	33.6	27.7	22.6	20.2
Maximum possible duration of daylight hours	N	hours	10.3	11.0	11.9	12.7	13.5	13.9	13.7	13.0	12.2	11.2	10.5	10.1
Solar radiation	Rs	$MJm^{-2}day^{-1}$	12.48	15.66	19.13	22.81	24.44	26.86	26.36	25.09	21.91	17.75	14.05	11.64
Clear-sky solar radiation	Rso	$MJm^{-2}day^{-1}$	16.18	19.56	24.10	27.85	30.12	30.83	30.34	28.49	25.19	20.77	16.98	15.18
Net solar radiation	Rns	$MJm^{-2}day^{-1}$	9.61	12.06	14.73	17.57	18.82	20.68	20.30	19.32	16.87	13.67	10.82	8.96
Monthly average daily maximum temprature	Tmax	K	292.7	294.7	298.2	303.5	307.4	310.1	310.3	309.8	307.9	304.2	298.5	294.1
Monthly average daily minimum temprature	Tmin	K	278.8	280.1	282.8	287.0	290.6	293.4	294.8	294.6	292.7	289.9	284.9	280.6
$\sigma Tmax,K^2$		$MJm^{-2}day^{-1}$	36.0	37.0	38.7	41.6	43.8	45.3	45.4	45.1	44.0	42.0	38.9	36.7
$\sigma Tmin,K^2$		$MJm^{-2}day^{-1}$	29.6	30.2	31.3	33.2	34.9	36.3	37.0	36.9	36.0	34.6	32.3	30.4
$(\sigma Tmax,K4+\sigma Tmin,K4)/2$			32.8	33.6	35.0	37.4	39.4	40.8	41.2	41.0	40.0	38.3	35.6	33.5
$0.34-0.14*\sqrt{}ea$			0.23	0.23	0.22	0.22	0.21	0.20	0.18	0.17	0.18	0.19	0.20	0.22
1.35*Rs/Rso-0.33			0.69	0.73	0.72	0.76	0.75	0.83	0.82	0.84	0.82	0.80	0.77	0.68
Net longwave radiation	Rnl	$MJm^{-2}day^{-1}$	5.1	5.6	5.7	6.3	6.3	6.6	6.0	6.0	5.9	5.8	5.6	5.0
Net radiation	Rn	$MJm^{-2}day^{-1}$	4.5	6.4	9.0	11.3	12.5	14.0	14.3	13.4	11.0	7.9	5.3	4.0
Soil heat flux	G	$MJm^{-2}day^{-1}$	-0.22	0.23	0.43	0.67	0.53	0.39	0.11	-0.05	-0.27	-0.46	-0.75	-0.61
Rn-G		$MJm^{-2}day^{-1}$	4.69	6.19	8.61	10.65	12.01	13.66	14.17	13.41	11.24	8.37	6.00	4.59
0.408*(Rn-G)		mm/day	1.92	2.53	3.51	4.34	4.90	5.57	5.78	5.47	4.58	3.42	2.45	1.87
$(\Delta/(\Delta+\gamma*(1+0.34u_2)))*(0.408(Rn-G))$			0.84	1.10	1.60	2.62	2.62	3.12	3.31	3.26	2.55	1.82	1.19	0.87
$(\gamma/(\Delta+\gamma*(1+0.34u_2)))*(900/(T+273))*u_2(es-ea)$			2.18	3.03	4.11	2.93	7.21	7.84	7.19	5.96	6.05	4.75	3.35	2.17
Grass reference evapotranspiration	ETo	mm/day	3.02	4.14	5.71	5.55	9.83	10.96	10.49	9.21	8.60	6.57	4.53	3.04
		mm/month	94	116	177	166	305	329	325	286	258	204	136	94

Source : FAO Irrigation and Drainage Paper No.56, "Crop evapotranspiration", published 1998

mm/year 2488.91

II.Minya

1.ETc&Irrigation Requirement

Minya

Beneficiary area: 880272 fed 369714 ha

Description	Unit		Jan (31)	Feb (28)	Mar (31)	Apr (30)	May (31)	Jun (30)	Jul (31)	Aug (31)	Sep (30)	Oct (31)	Nov (30)	Dec (31)
ETo on Modified Penman	(mm/month)		87.91	100.47	150.00	198.07	248.92	259.78	237.98	212.40	192.50	162.80	109.54	83.07
↓														
Selected Eto	(mm/month)		87.91	100.47	150.00	198.07	248.92	259.78	237.98	212.40	192.50	162.80	109.54	83.07
ETC=ETO*Kc*Area														
Winter	Crop Area (fed)													
Wheat	262943	Kc	1.00	1.15	1.15	1.06	0.29						0.35	0.56
	110436	ETC	9,708,033	12,724,921	19,049,630	23,103,941	8,075,169	0	0	0	0	0	4,233,959	5,131,668
Berseem	79881	Kc	0.89	0.43								0.69	0.90	0.90
	33550	ETC	2,626,246	1,450,607	0	0	0	0	0	0	0	3,777,812	3,307,524	2,508,303
Tomato	20296	Kc	1.03							0.60	0.73	1.07	1.15	1.15
	8524	ETC	768,076	0	0	0	0	0	0	1,086,322	1,193,479	1,482,834	1,073,805	814,333
Marjoram	38696	Kc	0.96	1.15	0.57									0.51
	16252	ETC	1,370,146	1,877,765	1,381,404	0	0	0	0	0	0	0	0	685,354
Summer														
Maize	229736	Kc					0.20	0.53	1.12	1.2	0.6			
	96489	ETC	0	0	0	0	4,803,648	13,394,668	25,617,852	24,592,746	11,144,541	0	0	0
Sorghum	14548	Kc					0.20	0.64	1.09	1.07	0.49			
	6110	ETC	0	0	0	0	304,190	1,020,410	1,585,678	1,387,900	575,036	0	0	0
Peanuts	44976	Kc					0.41	0.83	1.15	1.07	0.24			
	18890	ETC	0	0	0	0	1,922,828	4,066,002	5,169,804	4,282,974	860,597	0	0	0
Tomato	84547	Kc				0.60	0.73	1.07	1.15	1.15	1.03			
	35510	ETC	0	0	0	4,219,949	6,428,842	9,856,825	9,718,326	8,673,468	7,006,545	0	0	0
Nile														
Maize	0	Kc					0.20	0.53	1.12	1.20	0.60			
	0	ETC	0	0	0	0	0	0	0	0	0	0	0	0
Potato	29868	Kc					0.51	0.92	1.15	1.10	0.87			
	12545	ETC	0	0	0	0	1,589,497	3,012,163	3,433,202	2,921,982	2,100,909	0	0	0
Permanent														
Sugar cane	36098	Kc	0.40	0.55	0.97	1.24	1.25	1.25	1.25	1.25	1.25	1.2175	1.05	0.85
	15161	ETC	533,105	834,065	2,198,300	3,735,900	4,717,428	4,923,228	4,510,125	4,025,222	3,648,170	3,005,053	1,743,771	1,070,523
Grape	38683	Kc			0.32	0.64	0.85	0.85	0.85	0.85	0.75	0.55		
	16247	ETC	0	0	786,933	2,071,549	3,437,567	3,587,533	3,286,506	2,933,160	2,345,650	1,454,731	0	0
Adding for pre sowing (Special needs)														
Total consumptive use in the month			14,472,501	16,053,293	20,431,034	27,323,890	23,124,175	31,350,067	45,524,862	42,945,391	22,881,107	5,260,645	8,615,288	9,139,658
Net Irrigated area (ha)			183,924	175,400	158,096	177,354	311,388	200,952	200,952	209,476	209,476	73,482	167,672	183,924
Net Irrigation reqd. mm/ha			79	92	129	154	74	156	227	205	109	72	51	50
Effective Rainfall in mm			0	0	1	0	0	0	0	0	0	2	1	1
Net Irri. Required per month			79	92	128	154	74	156	227	205	109	70	50	49
Net Irri. Required per month			2.5	3.3	4.1	5.1	2.4	5.2	7.3	6.6	3.6	2.2	1.7	1.6
Gross Irri Reqd. inclusive losses	eff = 0.50		5.08	6.54	8.27	10.27	4.79	10.40	14.62	13.23	7.28	4.49	3.36	3.14
Gross Irri Reqd. inclusive losses	eff = 0.605		4.20	5.40	6.84	8.49	3.96	8.60	12.08	10.93	6.02	3.71	2.78	2.60
Gross Irri Reqd. inclusive losses	eff = 0.67		3.79	4.88	6.17	7.66	3.58	7.76	10.91	9.87	5.43	3.35	2.51	2.34
Gross Irri Reqd. inclusive losses	eff = 0.72		3.53	4.54	5.75	7.13	3.33	7.22	10.15	9.19	5.06	3.12	2.33	2.18
Irrigation required for whole area			9,337,097	11,466,638	13,079,315	18,215,926	14,918,823	20,900,045	29,370,878	27,706,704	15,254,072	3,299,149	5,631,744	5,777,893
Design discharge lps/day			108,068	132,716	151,381	210,832	172,672	241,899	339,941	320,679	176,552	38,185	65,182	66,874
Cultivated Area %			0.50	0.47	0.43	0.48	0.84	0.54	0.54	0.57	0.57	0.20	0.45	0.50
PEAK WATER REQUIREMENT			**339,941 lps**											

II.Minya

2. Kc per Growth Stage

DURATION OF GROWTH STAGE FOR FIELD CROP

Approximate Duration of Growth Stages for Various Field Crops

Crops	Initial Stage	Crop Development Stage	Mid Season Stage	Late Season Stage	Total
Wheat	20	60	70	30	180
L.Berseem	N.A.	N.A.	N.A.	N.A.	N.A.
Sugar beet	25	35	50	50	160
Broad bean	90	45	40	60	235
Onion	20	45	165	45	275
Marjoram*1	20	30	40	10	100
S. Berseem*1	10	15	75	35	135
Rice	30	30	60	30	150
Maize	25	40	45	20	130
Sorghum	20	35	45	30	130
Peanuts	25	35	45	25	130
Cucumber	20	30	40	15	105
Basil	N.A.	N.A.	N.A.	N.A.	N.A.
Sugar cane	35	60	190	75	360
Cotton	30	50	60	55	195
Citrus	60	90	120	90	360
Tomato	35	45	70	30	180
Date	N.A.	N.A.	N.A.	N.A.	N.A.
Potato	25	30	45	50	150
Grape	20	40	120	60	240

Crop Factor (Kc)

Values of the Crop Factor (Kc) for Various Crops and Growth Stages

Crops	Initial Stage	Mid Season Stage	end
Wheat	0.70	1.15	0.40
L.Berseem	N.A.	N.A.	N.A.
Sugar beet	0.35	1.20	0.70
Broad bean	0.50	1.15	1.10
Onion	0.70	1.05	0.75
Marjoram*2	0.60	1.15	1.10
S. Berseem	0.40	0.90	0.85
Rice	1.05	1.20	0.90
Maize	0.30	1.20	0.60
Sorghum	0.30	1.10	0.55
Peanuts	0.40	1.15	0.60
Cucumber	0.60	1.00	0.75
Basil	N.A.	N.A.	N.A.
Sugar cane	0.40	1.25	0.75
Cotton	0.35	1.20	0.70
Citrus	0.85	0.85	0.85
Tomato	0.60	1.15	0.90
Date	0.85	0.85	0.85
Potato	0.50	1.15	0.75
Grape	0.30	0.85	0.45

*1 The growth durations of Marjoram and S. Berseem use those of Spinach and Bermuda for hay as substitutes.

*2 The Kc value of Marjoram uses that of Mint as a substitute.

II.Minya

3. Kc per month

Wheat

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	15 / 20	60		70		30						
Kc per Groth stage	0.00 / 0.70	0.0075*x+0.4375		1.15		-0.025*x+5.275						
Calculation I	0.00*15/30 (a) 0.70*15/30 (b)	0.70*5/30 (a) 0.79*25/30 (b)	1*30/30 (a)	1.13*5/30 (a) 1.15*25/30 (b)	1.15*30/30 (a)	1.15*15/30 (a) 0.96*15/30 (b)	0.59*15/30 (a)					
Calculation II	0.00*15/30+0.70*15/30	0.70*5/30+0.79*25/30	1*30/30	1.13*5/30+1.15*25/30	1.15*30/30	1.15*15/30+0.96*15/30	0.59*15/30					
Kc per month (a+b)	0.35	0.56	1.00	1.15	1.15	1.06	0.29					

S.Berseem

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	10 / 15 / 75			35								
Kc per Groth stage	0.40 / 0.033*x+0.0667 / 0.90			-0.00143*x+1.04								
Calculation I	0.82*15/30 (a) 0.90*5/30 (b)	0.90*30/30 (a)	0.90*30/30 (a)	0.90*10/30 (a) 0.89*20/30 (b)	0.86*15/30 (a)							
Calculation II	0.82*15/30+0.90*5/30	0.90*30/30	0.90*30/30	0.90*10/30+0.89*20/30	0.86*15/30							
Kc per month (a+b)	0.69	0.90	0.90	0.89	0.43							

Other crops (Marjoram)

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	5 / 20 / 30	40		10								
Kc per Groth stage	0 / 0.6 / 0.0183*x+0.014167	1.15		-0.005*x+1.625								
Calculation I	0.6*20/30 (a) 0.65*5/30 (b)	0.92*25/30 (a) 1.15*5/30 (b)	1.15*30/30 (a)	1.15*5/30 (a) 1.13*10/30 (b)								
Calculation II	0.6*20/30+0.65*5/30	0.92*25/30+1.15*5/30	1.15*30/30	1.15*5/30+1.13*10/30								
Kc per month (a+b)	0.51	0.96	1.15	0.57								

Maize

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	10 / 25	40	45		20							
Kc per Groth stage	0.00 / 0.30	0.0225*x-0.4875	1.20		-0.03*x+4.8 / 0.6	0.6						
Calculation I	0.00*10/30 (a) 0.30*20/30 (b)	0.30*5/30 (a) 0.58*25/30 (b)	1.03*15/30 (a) 1.20*15/30 (b)	1.20*30/30 (a)	0.9*20/30 (a)							
Calculation II	0.00*10/30+0.30*20/30	0.30*5/30+0.58*25/30	1.03*15/30+1.20*15/30	1.20*30/30	0.9*20/30							
Kc per month (a+b)	0.20	0.53	1.12	1.20	0.60							

Sorghum

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	10 20	35	45	30								
Kc per Groth stage	0.00 0.30	0.02286*x-0.38571	1.10	-0.01833* x+3.11667 0.55								
Calculation Ⅰ	0.00*10/30 0.30*20/30 a b	0.64*30/30 a	1.04*5/30 1.10*25/30 a b	1.10*20/30 1.01*10/30 a b	0.73*20/30 a							
Calculation Ⅱ	0.00*10/30+0.30*20/30	0.64*30/30	1.04*5/30+1.10*25/30	1.10*20/30+1.01*10/30	0.73*20/30							
Kc per month (a+b)	0.20	0.64	1.09	1.07	0.49							

Oil Crops(Peanuts)

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	25	35	45	25								
Kc per Groth stage	0.40	0.0214*x-0.1357	1.15	-0.022*x+3.46 0.6								
Calculation Ⅰ	0.4*25/30 0.45*5/30 a b	0.83*30/30 a	1.15*30/30 a	1.15*15/30 0.99*15/30 a b	0.71*10/30 a							
Calculation Ⅱ	0.4*25/30+0.45*5/30	0.83*30/30	1.15*30/30	1.15*15/30+0.99*15/30	0.71*10/30							
Kc per month (a+b)	0.41	0.83	1.15	1.07	0.24							

Sugar cane

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	35	60	190							75		
Kc per Groth stage	0.40	0.142*x-0.958	1.25							-0.0067*x+3.15		
Calculation Ⅰ	0.40*30/30 a	0.40*5/30 0.58*25/30 a b	0.97*30/30 a	1.21*5/30 1.25*25/30 a b	1.25*30/30 a	1.25*30/30 a	1.25*30/30 a	1.25*30/30 a	1.25*30/30 a	1.25*15/30 1.19*15/30 a b	1.05*30/30 a	0.85*30/30 a
Calculation Ⅱ	0.40*30/30	0.40*5/30+0.58*25/30	0.97*30/30	1.21*5/30+1.25*25/30	1.25*30/30	1.25*30/30	1.25*30/30	1.25*30/30	1.25*30/30	1.25*15/30+1.19*15/30	1.05*30/30	0.85*30/30
Kc per month (a+b)	0.40	0.55	0.97	1.24	1.25	1.25	1.25	1.25	1.25	1.22	1.05	0.85

Tomato

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	35	45	70			30						
Kc per Groth stage	0.60	0.0122*x+0.1722	1.15			-0.0083*x+2.4						
Calculation Ⅰ	0.60*30/30 a	0.60*5/30 0.75*25/30 a b	1.03*20/30 1.15*10/30 a b	1.15*30/30 a	1.15*30/30 a	1.03*30/30 a						
Calculation Ⅱ	p	0.60*5/30+0.75*25/30	1.03*20/30+1.15*10/30	1.15*30/30	1.15*30/30	1.03*30/30						
Kc per month (a+b)	0.60	0.73	1.07	1.15	1.15	1.03						

Potato

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	25	30	45	50								
Kc per Groth stage	0.50	0.0216*x-0.04167	1.15	-0.008*x+1.95								
Calculation Ⅰ	0.50*25/30 0.55*5/30 a b	0.88*25/30 1.15*5/30 a b	1/15*30/30 a	1.15*10/30 1.07*20/30 a b	0.87*30/30 a							
Calculation Ⅱ	0.50*25/30+0.55*5/30	0.88*25/30+1.15*5/30	1/15*30/30	1.15*10/30+1.07*20/30	0.87*30/30							
Kc per month (a+b)	0.51	0.92	1.15	1.10	0.87							

Grape

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	20	40	120				60					
Kc per Groth stage	0.30	0.01375*x+0.025	0.85				-0.0067*x+2.05		0.45			
Calculation Ⅰ	0.30*20/30 0.37*10/30 a b	0.64*30/30 a	0.85*30/30 a	0.85*30/30 a	0.85*30/30 a	0.85*30/30 a	0.75*30/30 a	0.55*30/30 a				
Calculation Ⅱ	0.30*20/30+0.37*10/30	0.64*30/30	0.85*30/30	0.85*30/30	0.85*30/30	0.85*30/30	0.75*30/30	0.55*30/30				
Kc per month (a+b)	0.32	0.64	0.85	0.85	0.85	0.85	0.75	0.55				

II.Minya

4. Eto Penman Montieth

Table Crop Evapotranspiration

Method: Penman-Montieth equation

Longitude: 30.73 E°
Latitude : 28.08 N°
Altitude : 40 m above sea level

Data and elements		Unit	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
			1	2	3	4	5	6	7	8	9	10	11	12
1. Monthly average daily maximum temprature	Tmax	°C	20.4	22.4	25.8	31.2	35.4	36.9	36.6	35.9	34.0	31.3	25.9	21.4
2. Monthly average daily minimum temprature	Tmin	°C	3.9	5.2	8.2	12.6	16.4	19.3	20.4	20.3	18.4	15.5	10.2	5.8
3. Wind speed	u_z	m/sec	2.50	2.60	3.00	3.40	3.60	3.80	3.00	2.60	3.10	3.00	2.50	2.20
4. Mean relative humidity	RHmean	%	63.0	54.0	50.0	40.0	34.0	38.0	45.0	50.0	52.0	53.0	59.0	65.0
5. Sunshine hour	n	hour	7.5	8.4	8.8	9.3	10.1	11.2	11.1	10.7	9.9	9.1	8.3	7.6
Parameters														
Mean monthly temprature	Tmean	°C	12.2	13.8	17.0	21.9	25.9	28.1	28.5	28.1	26.2	23.4	18.1	13.6
Slope of saturation vapour pressure curve	Δ	kPa/°C	0.09	0.10	0.12	0.16	0.20	0.22	0.23	0.22	0.20	0.17	0.13	0.10
Altitude [atmospheric pressure]	P	kPa	100.8											
Latitude [radian]	φ	rad	0.5											
Psychrometric constant	γ	kPa/°C	0.067											
Hight of wind speed measurement	z	m	10											
Windspeed at 2 m above ground surface	u_2	ms^{-1}	1.87	1.94	2.24	2.54	2.69	2.84	2.24	1.94	2.32	2.24	1.87	1.65
$1+0.34u_2$			1.64	1.66	1.76	1.86	1.92	1.97	1.76	1.66	1.79	1.76	1.64	1.56
$\Delta/(\Delta+\gamma*(1+0.34*u_2))$			0.46	0.48	0.51	0.56	0.61	0.63	0.66	0.67	0.63	0.59	0.54	0.49
$\gamma/(\Delta+\gamma*(1+0.34*u_2))$			0.33	0.31	0.28	0.24	0.21	0.19	0.19	0.20	0.21	0.23	0.28	0.33
$(900/(Tmean+273)*u_2$			5.90	6.10	6.96	7.76	8.11	8.50	6.70	5.81	6.97	6.81	5.78	5.17
Vapour pressure deficit														
Saturation vapour pressure for Tmax	e°(Tmax)	kPa	2.40	2.71	3.32	4.54	5.75	6.24	6.14	5.91	5.32	4.57	3.34	2.55
Saturation vapour pressure for Tmin	e°(Tmin)	kPa	0.81	0.88	1.09	1.46	1.87	2.24	2.40	2.38	2.12	1.76	1.24	0.92
Saturation vapour pressure	es	kPa	1.60	1.80	2.20	3.00	3.81	4.24	4.27	4.15	3.72	3.17	2.29	1.74
Actual vapour pressure	ea	kPa	0.64	0.60	0.68	0.73	0.80	1.05	1.32	1.45	1.34	1.14	0.90	0.74
Vapour pressure deficit	es-ea	kPa	0.97	1.20	1.52	2.27	3.01	3.19	2.95	2.69	2.37	2.02	1.39	0.99
Radiation														
Number of the day in the year	J	days	15	45	76	106	137	167	197	228	258	289	319	349
Inverse relative distance Earth-Sun	dr	rad	1.032	1.024	1.009	0.992	0.977	0.968	0.968	0.977	0.991	1.009	1.023	1.032
Solar declination	δ	rad	-0.37	-0.24	-0.03	0.17	0.34	0.41	0.37	0.23	0.04	-0.18	-0.33	-0.41
Sunset hour angle	ωs	rad	1.362	1.442	1.553	1.664	1.759	1.803	1.780	1.698	1.590	1.476	1.384	1.339
sin(φ)sin(δ)			-0.170	-0.110	-0.016	0.081	0.156	0.187	0.171	0.109	0.017	-0.082	-0.155	-0.186
cos(φ)cos(δ)			0.823	0.858	0.882	0.869	0.833	0.810	0.822	0.858	0.882	0.869	0.833	0.810
Extraterrestial radiation	Ra	$MJm^{-2}day^{-1}$	22.2	26.6	32.5	37.3	40.1	40.9	40.3	38.0	33.9	28.2	23.3	20.9
Maximum possible duration of daylight hours	N	hours	10.4	11.0	11.9	12.7	13.4	13.8	13.6	13.0	12.2	11.3	10.6	10.2
Solar radiation	Rs	$MJm^{-2}day^{-1}$	13.56	16.80	20.18	22.95	25.08	26.87	26.54	25.20	22.27	18.42	14.94	12.99
Clear-sky solar radiation	Rso	$MJm^{-2}day^{-1}$	16.68	19.99	24.40	27.98	30.09	30.73	30.28	28.56	25.43	21.16	17.46	15.69
Net solar radiation	Rns	$MJm^{-2}day^{-1}$	10.44	12.94	15.54	17.67	19.31	20.69	20.44	19.40	17.14	14.18	11.50	10.00
Monthly average daily maximum temprature	Tmax	K	293.6	295.6	299.0	304.4	308.6	310.1	309.8	309.1	307.2	304.5	299.1	294.6
Monthly average daily minimum temprature	Tmin	K	277.1	278.4	281.4	285.8	289.6	292.5	293.6	293.5	291.6	288.7	283.4	279.0
$\sigma Tmax,K^2$		$MJm^{-2}day^{-1}$	36.4	37.4	39.2	42.1	44.4	45.3	45.1	44.7	43.6	42.1	39.2	36.9
$\sigma Tmin,K^2$		$MJm^{-2}day^{-1}$	28.9	29.4	30.7	32.7	34.5	35.9	36.4	36.4	35.4	34.0	31.6	29.7
$(\sigma Tmax,K4+\sigma Tmin,K4)/2$			32.7	33.4	34.9	37.4	39.5	40.6	40.8	40.5	39.5	38.1	35.4	33.3
$0.34-0.14*\sqrt{}ea$			0.23	0.23	0.22	0.22	0.22	0.20	0.18	0.17	0.18	0.19	0.21	0.22
1.35*Rs/Rso-0.33			0.75	0.79	0.77	0.76	0.78	0.83	0.83	0.84	0.83	0.83	0.81	0.77
Net longwave radiation	Rnl	$MJm^{-2}day^{-1}$	5.6	6.1	6.0	6.2	6.6	6.6	6.1	5.8	5.8	6.0	5.9	5.6
Net radiation	Rn	$MJm^{-2}day^{-1}$	4.9	6.9	9.5	11.4	12.7	14.1	14.3	13.6	11.3	8.2	5.6	4.4
Soil heat flux	G	$MJm^{-2}day^{-1}$	-0.20	0.23	0.45	0.69	0.56	0.31	0.06	-0.06	-0.27	-0.39	-0.75	-0.62
Rn-G		$MJm^{-2}day^{-1}$	5.07	6.63	9.08	10.75	12.17	13.76	14.29	13.61	11.56	8.60	6.35	5.02
0.408*(Rn-G)		mm/day	2.07	2.70	3.70	4.39	4.97	5.62	5.83	5.55	4.72	3.51	2.59	2.05
$(\Delta/(\Delta+\gamma*(1+0.34u_2)))*(0.408(Rn-G))$			0.95	1.30	1.89	2.46	3.01	3.52	3.83	3.69	2.95	2.09	1.41	1.01
$(\gamma/(\Delta+\gamma*(1+0.34u_2)))*(900/(T+273))*u_2(es-ea)$			1.89	2.29	2.95	4.14	5.02	5.14	3.85	3.16	3.46	3.16	2.24	1.67
Grass reference evapotranspiration	ETo	mm/day	2.84	3.59	4.84	6.60	8.03	8.66	7.68	6.85	6.42	5.25	3.65	2.68
		mm/month	88	100	150	198	249	260	238	212	193	163	110	83

Source : FAO Irrigation and Drainage Paper No.56, "Crop evapotranspiration", published 1998

mm/year 2043.43

III.Faiyoum

1.ETc&Irrigation Requirement

Beneficiary area: 791648 fed 332492

Description	Unit		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			31	28	31	30	31	30	31	31	30	31	30	31
ETo on Modified Penman	(mm/month)		65.29	76.38	117.48	150.95	191.48	209.97	206.73	183.61	147.58	125.33	82.23	64.96
↓														
Selected Eto	(mm/month)		65.29	76.38	117.48	150.95	191.48	209.97	206.73	183.61	147.58	125.33	82.23	64.96
ETC=ETO*Kc*Area														
Winter	Crop Area (fed)													
Wheat	225753	Kc	1.00	1.15	1.15	1.06	0.29						0.35	0.56
	94816	ETC	6,190,655	8,305,224	12,809,863	15,117,199	5,333,132	0	0	0	0	0	2,728,777	3,445,593
Berseem	86372	Kc	0.89	0.43								0.69	0.90	0.90
	36276	ETC	2,109,106	1,192,350	0	0	0	0	0	0	0	3,144,543	2,684,615	2,121,011
Tomato	25028	Kc	1.15	1.03							0.60	0.73	1.07	1.15
	10512	ETC	789,273	822,909	0	0	0	0	0	0	930,776	958,156	923,580	785,329
Marjoram	70653	Kc	1.15	0.57									0.51	0.96
	29674	ETC	2,228,084	1,284,281	0	0	0	0	0	0	0	0	1,238,660	1,848,797
Summer														
Maize	114153	Kc					0.20	0.53	1.12	1.2	0.6			
	47944	ETC	0	0	0	0	1,836,066	5,379,470	11,057,295	10,563,817	4,245,279	0	0	0
Sorghum	117650	Kc					0.20	0.64	1.09	1.07	0.49			
	49413	ETC	0	0	0	0	1,892,312	6,669,794	11,139,134	9,702,920	3,565,084	0	0	0
Peanuts	6009	Kc					0.41	0.83	1.15	1.07	0.24			
	2524	ETC	0	0	0	0	197,615	439,074	599,989	494,678	88,147	0	0	0
Tomato	56887	Kc			0.60	0.73	1.07	1.15	1.15	1.03				
	23893	ETC	0	0	1,684,137	2,623,050	4,888,392	5,769,217	5,680,077	4,496,651	0	0	0	0
Nile														
Maize	36219	Kc							0.2	0.53	1.12	1.20	0.60	
	15212	ETC	0	0	0	0	0	0	628,941	1,492,571	2,504,508	2,287,734	750,506	0
Tomato	21309	Kc					0.60	0.73	1.07	1.15	1.15	1.03		
	8950	ETC	0	0	0	0	1,028,218	1,366,758	1,976,917	1,889,788	1,518,898	1,149,674	0	0
Permanent														
Sugar cane	464	Kc	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
	195	ETC	5,090	12,651	19,460	25,004	31,718	34,781	34,244	30,415	24,446	20,760	13,621	10,761
Citrus	31151	Kc	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
	13083	ETC	726,096	849,362	1,306,484	1,678,657	2,129,422	2,335,054	2,298,975	2,041,941	1,641,189	1,393,730	914,445	722,467
Adding for pre sowing (Special needs)														
Total consumptive use in the month			12,048,302	12,466,776	15,819,944	19,443,910	17,336,875	21,994,147	33,415,571	30,712,780	14,518,326	8,954,597	9,254,203	8,933,958
Net Irrigated area (ha)			184,557	184,557	131,987	131,987	240,818	146,002	161,214	161,214	147,833	84,228	199,769	184,557
Net Irrigation reqd. mm/ha			65	68	120	147	72	151	207	191	98	106	46	48
Effective Rainfall in mm			4.0	3.0	3.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0
Net Irri. Required per month			61	65	117	146	72	151	207	191	98	106	43	45
Net Irri Required per day			2.0	2.3	3.8	4.9	2.3	5.0	6.7	6.1	3.3	3.4	1.4	1.5
Gross Irri Reqd. inclusive losses	Eff = 0.50		4.0	4.6	7.5	9.8	4.6	10.0	13.4	12.3	6.5	6.9	2.9	2.9
Gross Irri Reqd. inclusive losses	Eff = 0.605		3.3	3.8	6.2	8.1	3.8	8.3	11.1	10.2	5.4	5.7	2.4	2.4
Gross Irri Reqd. inclusive losses	Eff = 0.67		3.0	3.4	5.6	7.3	3.5	7.5	10.0	9.2	4.9	5.1	2.2	2.2
Gross Irri Reqd. inclusive losses	Eff = 0.72		2.75	3.20	5.24	6.77	3.23	6.97	9.29	8.54	4.55	4.76	2.01	2.03
Irrigation required for whole area			7,296,823	8,509,361	9,950,956	12,874,616	11,185,081	14,662,765	21,558,433	19,814,697	9,678,884	5,777,159	5,769,931	5,406,637
Design discharge lps/day			84,454	98,488	115,173	149,012	129,457	169,708	249,519	229,337	112,024	66,865	66,782	62,577
Cultivated Area %			0.56	0.56	0.40	0.40	0.72	0.44	0.48	0.48	0.44	0.25	0.60	0.56
PEAK WATER REQUIREMENT			**249,519**	**lps**										

III.Faiyoum
2. Kc per Growth Stage

DURATION OF GROWTH STAGE FOR FIELD CROP

Approximate Duration of Growth Stages for Various Field Crops

Crops	Initial Stage	Crop Development Stage	Mid Season Stage	Late Season Stage	Total
Wheat	20	60	70	30	180
L.Berseem	N.A.	N.A.	N.A.	N.A.	N.A.
Sugar beet	25	35	50	50	160
Broad bean	90	45	40	60	235
Onion	20	45	165	45	275
Marjoram*1	20	30	40	10	100
S. Berseem*1	10	15	75	35	135
Rice	30	30	60	30	150
Maize	25	40	45	20	130
Sorghum	20	35	45	30	130
Peanuts	25	35	45	25	130
Cucumber	20	30	40	15	105
Basil	N.A.	N.A.	N.A.	N.A.	N.A.
Sugar cane	35	60	190	75	360
Cotton	30	50	60	55	195
Citrus	60	90	120	90	360
Tomato	35	45	70	30	180
Date	N.A.	N.A.	N.A.	N.A.	N.A.
Potato	25	30	45	50	150
Grape	30	60	40	80	210

Crop Factor (Kc)

Values of the Crop Factor (Kc) for Various Crops and Growth Stages

Crops	Initial Stage	Mid Season Stage	end
Wheat	0.70	1.15	0.40
L.Berseem	N.A.	N.A.	N.A.
Sugar beet	0.35	1.20	0.70
Broad bean	0.50	1.15	1.10
Onion	0.75	1.05	0.75
Marjoram*2	0.60	1.15	1.10
S. Berseem	0.40	0.90	0.85
Rice	1.05	1.20	0.90
Maize	0.30	1.20	0.60
Sorghum	0.30	1.10	0.55
Peanuts	0.40	1.15	0.60
Cucumber	0.60	1.00	0.75
Basil	N.A.	N.A.	N.A.
Sugar cane	0.40	1.25	0.75
Cotton	0.35	1.20	0.70
Citrus	0.85	0.85	0.85
Tomato	0.60	1.15	0.90
Date	0.85	0.85	0.85
Potato	0.50	1.15	0.75
Grape	0.30	0.85	0.45

*1 The growth durations of Marjoram and S. Berseem use those of Spinach and Bermuda for hay as substitutes.

*2 The Kc value of Marjoram uses that of Mint as a substitute.

III.Faiyoum
3. Kc per month

Wheat

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	15 / 20	60		70		30						
Kc per Groth stage	0.00 / 0.70	0.0075*x+0.4375		1.15		-0.025*x+5.275						
Calculation Ⅰ	0.00*15/30 (a) 0.70*15/30 (b)	0.70*5/30 (a) 0.79*25/30 (b)	1*30/30 (a)	1.13*5/30 (a) 1.15*25/30 (b)	1.15*30/30 (a)	1.15*15/30 (a) 0.96*15/30 (b)	0.59*15/30 (a)					
Calculation Ⅱ	0.00*15/30+0.70*15/30	0.70*5/30+0.79*25/30	1*30/30	1.13*5/30+1.15*25/30	1.15*30/30	1.15*15/30+0.96*15/30	0.59*15/30					
Kc per month (a+b)	0.35	0.56	1.00	1.15	1.15	1.06	0.29					

S.Berseem

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	10 / 15 / 75			35								
Kc per Groth stage	0.40 / 0.033*x+0.0667 / 0.90			-0.00143*x+1.04								
Calculation Ⅰ	0.82*15/30 (a) 0.90*5/30 (b)	0.90*30/30 (a)	0.90*30/30 (a)	0.90*10/30 (a) 0.89*20/30 (b)	0.86*15/30 (a)							
Calculation Ⅱ	0.82*15/30+0.90*5/30	0.90*30/30	0.90*30/30	0.90*10/30+0.89*20/30	0.86*15/30							
Kc per month (a+b)	0.69	0.90	0.90	0.89	0.43							

Other crops (Marjoram)

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	5 / 20 / 30	40		10								
Kc per Groth stage	0 / 0.6 / 0.0183*x+0.014167	1.15		-0.005*x+1.625								
Calculation Ⅰ	0.6*20/30 (a) 0.65*5/30 (b)	0.92*25/30 (a) 1.15*5/30 (b)	1.15*30/30 (a)	1.15*5/30 (a) 1.13*10/30 (b)								
Calculation Ⅱ	0.6*20/30+0.65*5/30	0.92*25/30+1.15*5/30	1.15*30/30	1.15*5/30+1.13*10/30								
Kc per month (a+b)	0.51	0.96	1.15	0.57								

Maize

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	10 / 25	40	45		20							
Kc per Groth stage	0.00 / 0.30	0.0225*x-0.4875	1.20		-0.03*x+4.8 / 0.6	0.6						
Calculation Ⅰ	0.00*10/30 (a) 0.30*20/30 (b)	0.30*5/30 (a) 0.58*25/30 (b)	1.03*15/30 (a) 1.20*15/30 (b)	1.20*30/30 (a)	0.9*20/30 (a)							
Calculation Ⅱ	0.00*10/30+0.30*20/30	0.30*5/30+0.58*25/30	1.03*15/30+1.20*15/30	1.20*30/30	0.9*20/30							
Kc per month (a+b)	0.20	0.53	1.12	1.20	0.60							

Sorghum

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	10 20	35	45	30	0.55							
Kc per Groth stage	0.00 0.30	0.02286*x-0.38571	1.10	-0.0183 3*x+3.11667								
Calculation I	0.00*10/30 0.30*20/30 a b	0.64*30/30 a	1.10*25/30 1.10*20/30 a b	1.10*20/30 1.01*10/30 a b	0.73*20/30 a							
Calculation II	0.00*10/30+0.30*20/30	0.64*30/30	1.04*5/30+1.10*25/30	1.10*20/30+1.01*10/30	0.73*20/30							
Kc per month (a+b)	0.20	0.64	1.09	1.07	0.49							

Oil Crops(Peanuts)

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	25	35	45	25	0.6							
Kc per Groth stage	0.40	0.0214*x-0.1357	1.15	-0.022*x+3.46								
Calculation I	0.4*25/30 0.45*5/30 a b	0.83*30/30 a	1.15*30/30 1.15*15/30 a b	1.15*15/30 0.99*15/30 a b	0.71*10/30 a							
Calculation II	0.4*25/30+0.45*5/30	0.83*30/30	1.15*30/30	1.15*15/30+0.99*15/30	0.71*10/30							
Kc per month (a+b)	0.41	0.83	1.15	1.07	0.24							

Sugar cane

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	35	60	190							70		
Kc per Groth stage	0.40	0.142*x-0.958	1.25	-0.0067*x+3.15								
Calculation I	0.40*30/30 a	0.40*5/30 0.58*25/30 a b	0.97*30/30 a	1.21*5/30 1.25*25/30 a b	1.25*30/30 a	1.25*30/30 a	1.25*30/30 a	1.25*30/30 a	1.25*30/30 a	1.25*15/30 1.19*15/30 a b	1.05*30/30 a	0.85*30/30 a
Calculation II	0.40*30/30	0.40*5/30+0.58*25/30	0.97*30/30	1.21*5/30+1.25*25/30	1.25*30/30	1.25*30/30	1.25*30/30	1.25*30/30	1.25*30/30	1.25*15/30+1.19*15/30	1.05*30/30	0.85*30/30
Kc per month (a+b)	0.40	0.55	0.97	1.24	1.25	1.25	1.25	1.25	1.25	1.22	1.05	0.85

Citrus

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	60		90			120				90		
Kc per Groth stage	0.85		0.85			0.85				0.85		
Calculation I	0.85*30/30 a	0.85*30/30 a	0.85*30/30 a	0.85*30/30 a	0.85*30/30 a	0.85*30/30 a	0.85*30/30 a	0.85*30/30 a	0.85*30/30 a	0.85*30/30 a	0.85*30/30 a	0.85*30/30 a
Calculation II	0.85*30/30	0.85*30/30	0.85*30/30	0.85*30/30	0.85*30/30	0.85*30/30	0.85*30/30	0.85*30/30	0.85*30/30	0.85*30/30	0.85*30/30	0.85*30/30
Kc per month (a+b)	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85

Tomato

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	35	45	70			30						
Kc per Groth stage	0.60	0.0122*x+0.1722	1.15			-0.0083*x+2.4						
Calculation I	0.60*30/30 a	0.60*5/30 0.75*25/30 a b	1.03*20/30 1.15*10/30 a b	1.15*30/30 a	1.15*30/30 a	1.03*30/30 a						
Calculation II	0.60*30/30	0.60*5/30+0.75*25/30	1.03*20/30+1.15*10/30	1.15*30/30	1.15*30/30	1.03*30/30						
Kc per month (a+b)	0.60	0.73	1.07	1.15	1.15	1.03						

III.Faiyoum

4. Eto Penman Montieth

Table Crop Evapotranspiration

Method: Penman-Montieth equation

Longitude: 31.21
Latitude : 30.5
Altitude : 19

Data and elements		Unit	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Nov.	Dec.
			1	2	3	4	5	6	7	8	9	11	12
1. Monthly average daily maximum temprature	Tmax	°C	19.5	21.0	24.2	28.2	31.7	34.7	34.2	34.3	32.5	25.3	21.2
2. Monthly average daily minimum temprature	Tmin	°C	6.3	6.6	10.1	12.0	15.2	18.8	20.1	20.3	18.5	12.2	8.2
3. Wind speed	u_z	m/sec	2.00	2.10	2.40	2.40	2.70	2.90	2.70	2.10	1.90	1.90	1.80
4. Mean relative humidity	RHmean	%	77.0	72.0	66.0	59.0	52.0	57.0	62.0	66.0	70.0	75.0	75.0
5. Sunshine hour	n	hour	6.8	7.7	8.2	9.3	9.7	11.2	11.0	10.7	9.8	7.8	6.6
Parameters													
Mean monthly temprature	Tmean	°C	12.9	13.8	17.2	20.1	23.5	26.8	27.2	27.3	25.5	18.8	14.7
Slope of saturation vapour pressure curve	Δ	kPa/°C	0.10	0.10	0.12	0.15	0.17	0.21	0.21	0.21	0.19	0.14	0.11
Altitude [atmospheric pressure]	P	kPa	101.1										
Latitude [radian]	φ	rad	0.5										
Psychrometric constant	γ	kPa/°C	0.067										
Hight of wind speed measurement	z	m	10										
Windspeed at 2 m above ground surface	u_2	ms^{-1}	1.50	1.57	1.80	1.80	2.02	2.17	2.02	1.57	1.42	1.42	1.35
$1+0.34u_2$			1.51	1.53	1.61	1.61	1.69	1.74	1.69	1.53	1.48	1.48	1.46
$\Delta/(\Delta+\gamma*(1+0.34*u_2))$			0.49	0.50	0.53	0.57	0.61	0.64	0.65	0.67	0.66	0.58	0.52
$\gamma/(\Delta+\gamma*(1+0.34*u_2))$			0.34	0.33	0.29	0.26	0.23	0.21	0.21	0.21	0.23	0.29	0.33
$(900/(Tmean+273)*u_2$			4.71	4.93	5.57	5.51	6.13	6.51	6.06	4.71	4.28	4.38	4.21
Vapour pressure deficit													
Saturation vapour pressure for Tmax	e°(Tmax)	kPa	2.27	2.49	3.02	3.82	4.67	5.53	5.38	5.41	4.89	3.22	2.52
Saturation vapour pressure for Tmin	e°(Tmin)	kPa	0.95	0.97	1.24	1.40	1.73	2.17	2.35	2.38	2.13	1.42	1.09
Saturation vapour pressure	es	kPa	1.61	1.73	2.13	2.61	3.20	3.85	3.87	3.90	3.51	2.32	1.80
Actual vapour pressure	ea	kPa	0.89	0.86	0.99	1.02	1.11	1.51	1.75	1.89	1.79	1.28	0.98
Vapour pressure deficit	es-ea	kPa	0.72	0.87	1.14	1.59	2.09	2.34	2.11	2.01	1.72	1.04	0.82
Radiation													
Number of the day in the year	J	days	15	45	76	106	137	167	197	228	258	319	349
Inverse relative distance Earth-Sun	dr	rad	1.032	1.024	1.009	0.992	0.977	0.968	0.968	0.977	0.991	1.023	1.032
Solar declination	δ	rad	-0.37	-0.24	-0.03	0.17	0.34	0.41	0.37	0.23	0.04	-0.33	-0.41
Sunset hour angle	ωs	rad	1.340	1.429	1.551	1.673	1.779	1.828	1.802	1.711	1.593	1.364	1.314
sin(φ)sin(δ)			-0.184	-0.119	-0.017	0.087	0.168	0.201	0.184	0.117	0.019	-0.167	-0.201
cos(φ)cos(δ)			0.803	0.838	0.861	0.849	0.813	0.791	0.803	0.838	0.861	0.814	0.791
Extraterrestial radiation	Ra	$MJm^{-2}day^{-1}$	20.8	25.4	31.6	36.9	40.2	41.2	40.5	37.8	33.2	21.9	19.4
Maximum possible duration of daylight hours	N	hours	10.2	10.9	11.8	12.8	13.6	14.0	13.8	13.1	12.2	10.4	10.0
Solar radiation	Rs	$MJm^{-2}day^{-1}$	12.10	15.30	18.86	22.65	24.38	26.84	26.31	24.94	21.66	13.65	11.25
Clear-sky solar radiation	Rso	$MJm^{-2}day^{-1}$	15.60	19.04	23.74	27.69	30.14	30.93	30.40	28.39	24.90	16.41	14.58
Net solar radiation	Rns	$MJm^{-2}day^{-1}$	9.32	11.78	14.52	17.44	18.77	20.66	20.26	19.21	16.68	10.51	8.66
Monthly average daily maximum temprature	Tmax	K	292.7	294.2	297.4	301.4	304.9	307.9	307.4	307.5	305.7	298.5	294.4
Monthly average daily minimum temprature	Tmin	K	279.5	279.8	283.3	285.2	288.4	292.0	293.3	293.5	291.7	285.4	281.4
$\sigma Tmax,K^2$		$MJm^{-2}day^{-1}$	36.0	36.7	38.3	40.4	42.4	44.0	43.8	43.8	42.8	38.9	36.8
$\sigma Tmin,K^2$		$MJm^{-2}day^{-1}$	29.9	30.0	31.6	32.4	33.9	35.6	36.3	36.4	35.5	32.5	30.7
(σTmax,K4+σTmin,K4)/2			32.9	33.4	34.9	36.4	38.1	39.8	40.0	40.1	39.1	35.7	33.8
$0.34-0.14*\sqrt{ea}$			0.21	0.21	0.20	0.20	0.19	0.17	0.15	0.15	0.15	0.18	0.20
1.35*Rs/Rso-0.33			0.70	0.73	0.72	0.75	0.74	0.82	0.82	0.84	0.82	0.77	0.69
Net longwave radiation	Rnl	$MJm^{-2}day^{-1}$	4.8	5.2	5.1	5.5	5.4	5.5	5.1	4.9	4.9	5.0	4.7
Net radiation	Rn	$MJm^{-2}day^{-1}$	4.5	6.6	9.5	12.0	13.3	15.2	15.2	14.3	11.8	5.5	4.0
Soil heat flux	G	$MJm^{-2}day^{-1}$	-0.25	0.13	0.47	0.41	0.47	0.46	0.06	0.02	-0.25	-0.60	-0.57
Rn-G		$MJm^{-2}day^{-1}$	4.79	6.50	8.99	11.57	12.85	14.71	15.14	14.24	12.01	6.10	4.53
0.408*(Rn-G)		mm/day	1.96	2.65	3.67	4.72	5.24	6.00	6.18	5.81	4.90	2.49	1.85
$(\Delta/(\Delta+\gamma*(1+0.34u_2)))*(0.408(Rn-G))$			0.96	1.32	1.96	2.71	3.17	3.83	4.02	3.91	3.23	1.43	0.97
$(\gamma/(\Delta+\gamma*(1+0.34u_2)))*(900/(T+273))*u_2(es-ea)$			1.15	1.41	1.83	2.32	3.00	3.16	2.65	2.01	1.68	1.31	1.13
Grass reference evapotranspiration	ETo	mm/day	2.11	2.73	3.79	5.03	6.18	7.00	6.67	5.92	4.92	2.74	2.10
		mm/month	65	76	117	151	191	210	207	184	148	82	65

Source : FAO Irrigation and Drainage Paper No.56, "Crop evapotranspiration", published 1998

mm/year 1621.97

IV.Giza

1.ETc&Irrigation Requirement

Beneficiary area: 878712 fed 369059

Description	Unit		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			31	28	31	30	31	30	31	31	30	31	30	31
ETo on Modified Penman	(mm/month)		65.29	76.38	117.48	150.95	191.48	209.97	206.73	183.61	147.58	125.33	82.23	64.96
↓														
Selected Eto	(mm/month)		65.29	76.38	117.48	150.95	191.48	209.97	206.73	183.61	147.58	125.33	82.23	64.96
ETC=ETO*Kc*Area														
Winter	Crop Area (fed)													
Wheat	46278	Kc	1.00	1.15	1.15	1.06	0.29						0.35	0.56
	19437	ETC	1,269,047	1,702,521	2,625,944	3,098,934	1,093,260	0	0	0	0	0	559,383	706,326
Berseem	440615		0.89	0.43								0.69	0.90	0.90
	185058	ETC	10,759,316	6,082,610	0	0	0	0	0	0	0	16,041,460	13,695,196	10,820,047
Sugar beet		Kc												
		ETC	0	0	0	0	0	0	0	0	0	0	0	0
Broad Bean		Kc												
		ETC	0	0	0	0	0	0	0	0	0	0	0	0
Tomato	105084		1.15	1.03							0.60	0.73	1.07	1.15
	44135	ETC	3,313,885	3,455,112	0	0	0	0	0	0	3,908,009	4,022,970	3,877,797	3,297,325
Marjoram	17203	Kc	0.96	1.15	0.57									0.51
	7225	ETC	452,416	634,605	481,000	0	0	0	0	0	0	0	0	238,279
S.Berseem		Kc												
		ETC	0	0	0	0	0	0	0	0	0	0	0	0
Summer														
Rice		Kc												
		ETC	0	0	0	0	0	0	0	0	0	0	0	0
Maize	41589	Kc					0.20	0.53	1.12	1.2	0.6			
	17467	ETC	0	0	0	0	668,928	1,959,885	4,028,469	3,848,682	1,546,669	0	0	0
Sorghum	1778	Kc					0.20	0.64	1.09	1.07	0.49			
	747	ETC	0	0	0	0	28,598	100,798	168,342	146,637	53,878	0	0	0
Peanuts	6719	Kc					0.41	0.83	1.15	1.07	0.24			
	2822	ETC	0	0	0	0	220,965	490,954	670,881	553,127	98,562	0	0	0
Cucumber		Kc												
		ETC	0	0	0	0	0	0	0	0	0	0	0	0
Tomato	88092	Kc			0.60	0.73	1.07	1.15	1.15	1.03				
	36999	ETC	0	0	2,607,959	4,061,907	7,569,887	8,933,884	8,795,846	6,963,260	0	0	0	0
Nile														
Maize	19577	Kc							0.2	0.53	1.12	1.20	0.60	
	8222	ETC	0	0	0	0	0	0	339,953	806,760	1,353,730	1,236,560	405,662	0
Tomato	38307	Kc					0.60	0.73	1.07	1.15	1.15	1.03		
	16089	ETC	0	0	0	0	1,848,418	2,457,008	3,553,886	3,397,256	2,730,509	2,066,759	0	0
Cucumber		Kc												
		ETC	0	0	0	0	0	0	0	0	0	0	0	0
Basil		Kc												
		ETC	0	0	0	0	0	0	0	0	0	0	0	0
Permanent														
Sugar cane	1623	Kc	0.40	0.55	0.97	1.24	1.25	1.25	1.25	1.25	1.25	1.22	1.05	0.85
	682	ETC	17,803	28,508	77,412	128,010	163,155	178,910	176,146	156,452	125,747	104,010	58,854	37,641
Citrus	71847	Kc	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
	30176	ETC	1,674,675	1,958,977	3,013,288	3,871,673	4,911,323	5,385,593	5,302,380	4,709,555	3,785,256	3,214,514	2,109,085	1,666,307
Date	26439	Kc												
	11104	ETC	0	0	0	0	0	0	0	0	0	0	0	0
Adding for pre sowing (Special needs)														
Total consumptive use in the month			17,487,142	13,862,333	8,805,604	11,160,525	16,504,533	19,507,032	23,035,904	20,581,728	13,602,359	26,686,272	20,705,976	16,765,926
Net Irrigated area (ha)			286,713	286,713	94,518	87,293	124,418	104,981	113,203	113,203	120,340	284,362	287,710	286,713
Net Irrigation reqd. mm/ha			61	48	93	128	133	186	203	182	113	94	72	58
Effective Rainfall in mm			4.0	3.0	3.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0
Net Irri. Required per month			57	45	90	127	133	186	203	182	113	94	69	55
Net Irri Required per day			1.8	1.6	2.9	4.2	4.3	6.2	6.6	5.9	3.8	3.0	2.3	1.8
Gross Irri Reqd. inclusive losses	Eff = 0.50		3.7	3.2	5.8	8.5	8.6	12.4	13.1	11.7	7.5	6.1	4.6	3.6
Gross Irri Reqd. inclusive losses	Eff = 0.605		3.0	2.7	4.8	7.0	7.1	10.2	10.8	9.7	6.2	5.0	3.8	3.0
Gross Irri Reqd. inclusive losses	Eff = 0.67		2.7	2.4	4.3	6.3	6.4	9.2	9.8	8.8	5.6	4.5	3.4	2.7
Gross Irri Reqd. inclusive losses	Eff = 0.72		2.6	2.2	4.0	5.9	5.9	8.6	9.1	8.1	5.2	4.2	3.2	2.5
Irrigation required for whole area			10,542,123	9,287,281	5,498,097	7,382,154	10,648,086	13,004,688	14,861,874	13,278,534	9,068,239	17,216,950	13,228,564	10,261,798
Design discharge lps/day			122,015	107,492	63,635	85,442	123,242	150,517	172,012	153,687	104,956	199,270	153,108	118,771
Cultivated Area %			0.78	0.78	0.26	0.24	0.34	0.28	0.31	0.31	0.33	0.77	0.78	0.78

PEAK WATER REQUIREMENT **199,270 lps**

IV.Giza
2. Kc per Growth Stage

DURATION OF GROWTH STAGE FOR FIELD CROP

Approximate Duration of Growth Stages for Various Field Crops

Crops	Initial Stage	Crop Development Stage	Mid Season Stage	Late Season Stage	Total
Wheat	20	60	70	30	180
L.Berseem	N.A.	N.A.	N.A.	N.A.	N.A.
Sugar beet	25	35	50	50	160
Broad bean	90	45	40	60	235
Onion	20	45	165	45	275
Marjoram*1	20	30	40	10	100
S. Berseem*1	10	15	75	35	135
Rice	30	30	60	30	150
Maize	25	40	45	20	130
Sorghum	20	35	45	30	130
Peanuts	25	35	45	25	130
Cucumber	20	30	40	15	105
Basil	N.A.	N.A.	N.A.	N.A.	N.A.
Sugar cane	35	60	190	75	360
Cotton	30	50	60	55	195
Citrus	60	90	120	90	360
Tomato	35	45	70	30	180
Date	N.A.	N.A.	N.A.	N.A.	N.A.
Potato	25	30	45	50	150
Grape	30	60	40	80	210

Crop Factor (Kc)

Values of the Crop Factor (Kc) for Various Crops and Growth Stages

Crops	Initial Stage	Mid Season Stage	end
Wheat	0.70	1.15	0.40
L.Berseem	N.A.	N.A.	N.A.
Sugar beet	0.35	1.20	0.70
Broad bean	0.50	1.15	1.10
Onion	0.70	1.05	0.75
Marjoram*2	0.60	1.15	1.10
S. Berseem	0.40	0.90	0.85
Rice	1.05	1.20	0.90
Maize	0.30	1.20	0.60
Sorghum	0.30	1.10	0.55
Peanuts	0.40	1.15	0.60
Cucumber	0.60	1.00	0.75
Basil	N.A.	N.A.	N.A.
Sugar cane	0.40	1.25	0.75
Cotton	0.35	1.20	0.70
Citrus	0.85	0.85	0.85
Tomato	0.60	1.15	0.90
Date	0.85	0.85	0.85
Potato	0.50	1.15	0.75
Grape	0.30	0.85	0.45

*1 The growth durations of Marjoram and S. Berseem use those of Spinach and Bermuda for hay as substitutes.

*2 The Kc value of Marjoram uses that of Mint as a substitute.

IV.Giza

3. Kc per month

Wheat

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	0 20		60		70		30					
Kc per Groth stage	0.00 0.70		0.0075*x+0.4375		1.15		-0.025*x+5.275					
Calculation I	0.00*15/30 a 0.70*15/30 b	0.70*5/30 a 0.79*25/30 b	1*30/30 a	1.13*5/30 a 1.15*25/30 b	1.15*30/30 a	1.15*15/30 a 0.96*15/30 b	0.59*15/30 a					
Calculation II	0.00*15/30+0.70*15/30	0.70*5/30+0.79*25/30	1*30/30	1.13*5/30+1.15*25/30	1.15*30/30	1.15*15/30+0.96*15/30	0.59*15/30					
Kc per month (a+b)	0.35	0.56	1.00	1.15	1.15	1.06	0.29					

S.Berseem

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	10 15		75	35								
Kc per Groth stage	0.40 0.033*x+0.0667		0.90	-0.00143*x+1.04								
Calculation I	0.82*15/30 a 0.90*5/30 b	0.90*30/30 a	0.90*30/30 a	0.90*10/30 a 0.89*20/30 b	0.86*15/30 a							
Calculation II	0.82*15/30+0.90*5/30	0.90*30/30	0.90*30/30	0.90*10/30+0.89*20/30	0.86*15/30							
Kc per month (a+b)	0.69	0.90	0.90	0.89	0.43							

Other crops (Marjoram)

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	5 20	30	40	10								
Kc per Groth stage	0 0.6	0.0183*x+0.014167	1.15	-0.005*x+1.625								
Calculation I	0.6*20/30 a 0.65*5/30 b	0.92*25/30 a 1.15*5/30 b	1.15*30/30 a	1.15*5/30 a 1.13*10/30 b								
Calculation II	0.6*20/30+0.65*5/30	0.92*25/30+1.15*5/30	1.15*30/30	1.15*5/30+1.13*10/30								
Kc per month (a+b)	0.51	0.96	1.15	0.57								

Maize

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	10 25	40		45	20							
Kc per Groth stage	0.00 0.30	0.0225*x-0.4875		1.20	-0.03*x+4.8 0.6	0.6						
Calculation I	0.00*10/30 a 0.30*20/30 b	0.30*5/30 a 0.58*25/30 b	1.03*15/30 a 1.20*15/30 b	1.20*30/30 a	0.9*20/30 a							
Calculation II	0.00*10/30+0.30*20/30	0.30*5/30+0.58*25/30	1.03*15/30+1.20*15/30	1.20*30/30	0.9*20/30							
Kc per month (a+b)	0.20	0.53	1.12	1.20	0.60							

Sorghum

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	10 20	35	45	30	0.55							
Kc per Groth stage	0.00 0.30	0.02286*x-0.38571	1.10	-0.01833* x+3.11667								
Calculation Ⅰ	0.00*10/30 0.30*20/30 a b	0.64*30/30 a	1.04*5/30 1.10*25/30 a b	1.10*20/30 1.01*10/30 a b	0.73*20/30 a							
Calculation Ⅱ	0.00*10/30+0.30*20/30	0.64*30/30	1.04*5/30+1.10*25/30	1.10*20/30+1.01*10/30	0.73*20/30							
Kc per month (a+b)	0.20	0.64	1.09	1.07	0.49							

Oil Crops(Peanuts)

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	25	35	45	25								
Kc per Groth stage	0.40	0.0214*x-0.1357	1.15	-0.022*x+3.46	0.6							
Calculation Ⅰ	0.4*25/30 0.45*5/30 a b	0.83*30/30 a	1.15*30/30 a	1.15*15/30 0.99*15/30 a b	0.71*10/30 a							
Calculation Ⅱ	0.4*25/30+0.45*5/30	0.83*30/30	1.15*30/30	1.15*15/30+0.99*15/30	0.71*10/30							
Kc per month (a+b)	0.41	0.83	1.15	1.07	0.24							

Sugar cane

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	35	60	190							75		
Kc per Groth stage	0.40	0.142*x-0.958	1.25							-0.0067*x+3.15		
Calculation Ⅰ	0.40*30/30 a	0.40*5/30 0.58*25/30 a b	0.97*30/30 a	1.21*5/30 1.25*25/30 a b	1.25*30/30 a	1.25*30/30 a	1.25*30/30 a	1.25*30/30 a	1.25*30/30 a	1.25*15/30 1.19*15/30 a b	1.05*30/30 a	0.85*30/30 a
Calculation Ⅱ	0.40*30/30	0.40*5/30+0.58*25/30	0.97*30/30	1.21*5/30+1.25*25/30	1.25*30/30	1.25*30/30	1.25*30/30	1.25*30/30	1.25*30/30	1.25*15/30+1.19*15/30	1.05*30/30	0.85*30/30
Kc per month (a+b)	0.40	0.55	0.97	1.24	1.25	1.25	1.25	1.25	1.25	1.22	1.05	0.85

Citrus

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	60		90			120				90		
Kc per Groth stage	0.85		0.85			0.85				0.85		
Calculation Ⅰ	0.85*30/30 a	0.85*30/30 a	0.85*30/30 a	0.85*30/30 a	0.85*30/30 a	0.85*30/30 a	0.85*30/30 a	0.85*30/30 a	0.85*30/30 a	0.85*30/30 a	0.85*30/30 a	0.85*30/30 a
Calculation Ⅱ	0.85*30/30	0.85*30/30	0.85*30/30	0.85*30/30	0.85*30/30	0.85*30/30	0.85*30/30	0.85*30/30	0.85*30/30	0.85*30/30	0.85*30/30	0.85*30/30
Kc per month (a+b)	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85

Tomato

Month	1st Month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month	8th Month	9th Month	10th Month	11th Month	12th Month
Groth Stage	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30	5 10 15 20 25 30
Groth Duration	35	45	70			30						
Kc per Groth stage	0.60	0.0122* x+0.1722	1.15			-0.0083*x+2.4						
Calculation Ⅰ	0.60*30/30 a	0.60*5/30 0.75*25/30 a b	1.03*20/30 1.15*10/30 a b	1.15*30/30 a	1.15*30/30 a	1.03*30/30 a						
Calculation Ⅱ	0.60*30/30	0.60*5/30+0.75*25/30	1.03*20/30+1.15*10/30	1.15*30/30	1.15*30/30	1.03*30/30						
Kc per month (a+b)	0.60	0.73	1.07	1.15	1.15	1.03						

IV.Giza

4. Eto Penman Montieth

Table Crop Evapotranspiration

Method: Penman-Montieth equation

Longitude: 31.21 E°
Latitude : 30.5 N°
Altitude : 19 m above sea level

Data and elements		Unit	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
			1	2	3	4	5	6	7	8	9	10	11	12
1. Monthly average daily maximum temprature	Tmax	°C	19.5	21.0	24.2	28.2	31.7	34.7	34.2	34.3	32.5	30.1	25.3	21.2
2. Monthly average daily minimum temprature	Tmin	°C	6.3	6.6	10.1	12.0	15.2	18.8	20.1	20.3	18.5	16.0	12.2	8.2
3. Wind speed	u_z	m/sec	2.00	2.10	2.40	2.40	2.70	2.90	2.70	2.10	1.90	2.20	1.90	1.80
4. Mean relative humidity	RHmean	%	77.0	72.0	66.0	59.0	52.0	57.0	62.0	66.0	70.0	69.0	75.0	75.0
5. Sunshine hour	n	hour	6.8	7.7	8.2	9.3	9.7	11.2	11.0	10.7	9.8	8.8	7.8	6.6
Parameters														
Mean monthly temprature	Tmean	°C	12.9	13.8	17.2	20.1	23.5	26.8	27.2	27.3	25.5	23.1	18.8	14.7
Slope of saturation vapour pressure curve	Δ	kPa/°C	0.10	0.10	0.12	0.15	0.17	0.21	0.21	0.21	0.19	0.17	0.14	0.11
Altitude [atmospheric pressure]	P	kPa	101.1											
Latitude [radian]	φ	rad	0.5											
Psychrometric constant	γ	kPa/°C	0.067											
Hight of wind speed measurement	z	m	10											
Windspeed at 2 m above ground surface	u_2	ms^{-1}	1.50	1.57	1.80	1.80	2.02	2.17	2.02	1.57	1.42	1.65	1.42	1.35
$1+0.34u_2$			1.51	1.53	1.61	1.61	1.69	1.74	1.69	1.53	1.48	1.56	1.48	1.46
$\Delta/(\Delta+\gamma*(1+0.34*u_2))$			0.49	0.50	0.53	0.57	0.61	0.64	0.65	0.67	0.66	0.62	0.58	0.52
$\gamma/(\Delta+\gamma*(1+0.34*u_2))$			0.34	0.33	0.29	0.26	0.23	0.21	0.21	0.21	0.23	0.24	0.29	0.33
$(900/(Tmean+273)*u_2$			4.71	4.93	5.57	5.51	6.13	6.51	6.06	4.71	4.28	5.00	4.38	4.21
Vapour pressure deficit														
Saturation vapour pressure for Tmax	e°(Tmax)	kPa	2.27	2.49	3.02	3.82	4.67	5.53	5.38	5.41	4.89	4.27	3.22	2.52
Saturation vapour pressure for Tmin	e°(Tmin)	kPa	0.95	0.97	1.24	1.40	1.73	2.17	2.35	2.38	2.13	1.82	1.42	1.09
Saturation vapour pressure	es	kPa	1.61	1.73	2.13	2.61	3.20	3.85	3.87	3.90	3.51	3.04	2.32	1.80
Actual vapour pressure	ea	kPa	0.89	0.86	0.99	1.02	1.11	1.51	1.75	1.89	1.79	1.52	1.28	0.98
Vapour pressure deficit	es-ea	kPa	0.72	0.87	1.14	1.59	2.09	2.34	2.11	2.01	1.72	1.53	1.04	0.82
Radiation														
Number of the day in the year	J	days	15	45	76	106	137	167	197	228	258	289	319	349
Inverse relative distance Earth-Sun	dr	rad	1.032	1.024	1.009	0.992	0.977	0.968	0.968	0.977	0.991	1.009	1.023	1.032
Solar declination	δ	rad	-0.37	-0.24	-0.03	0.17	0.34	0.41	0.37	0.23	0.04	-0.18	-0.33	-0.41
Sunset hour angle	ωs	rad	1.340	1.429	1.551	1.673	1.779	1.828	1.802	1.711	1.593	1.466	1.364	1.314
sin(φ)sin(δ)			-0.184	-0.119	-0.017	0.087	0.168	0.201	0.184	0.117	0.019	-0.089	-0.167	-0.201
cos(φ)cos(δ)			0.803	0.838	0.861	0.849	0.813	0.791	0.803	0.838	0.861	0.848	0.814	0.791
Extraterrestial radiation	Ra	$MJm^{-2}day^{-1}$	20.8	25.4	31.6	36.9	40.2	41.2	40.5	37.8	33.2	27.1	21.9	19.4
Maximum possible duration of daylight hours	N	hours	10.2	10.9	11.8	12.8	13.6	14.0	13.8	13.1	12.2	11.2	10.4	10.0
Solar radiation	Rs	$MJm^{-2}day^{-1}$	12.10	15.30	18.86	22.65	24.38	26.84	26.31	24.94	21.66	17.40	13.65	11.25
Clear-sky solar radiation	Rso	$MJm^{-2}day^{-1}$	15.60	19.04	23.74	27.69	30.14	30.93	30.40	28.39	24.90	20.31	16.41	14.58
Net solar radiation	Rns	$MJm^{-2}day^{-1}$	9.32	11.78	14.52	17.44	18.77	20.66	20.26	19.21	16.68	13.40	10.51	8.66
Monthly average daily maximum temprature	Tmax	K	292.7	294.2	297.4	301.4	304.9	307.9	307.4	307.5	305.7	303.3	298.5	294.4
Monthly average daily minimum temprature	Tmin	K	279.5	279.8	283.3	285.2	288.4	292.0	293.3	293.5	291.7	289.2	285.4	281.4
$\sigma Tmax,K^2$		$MJm^{-2}day^{-1}$	36.0	36.7	38.3	40.4	42.4	44.0	43.8	43.8	42.8	41.5	38.9	36.8
$\sigma Tmin,K^2$		$MJm^{-2}day^{-1}$	29.9	30.0	31.6	32.4	33.9	35.6	36.3	36.4	35.5	34.3	32.5	30.7
$(\sigma Tmax,K4+\sigma Tmin,K4)/2$			32.9	33.4	34.9	36.4	38.1	39.8	40.0	40.1	39.1	37.9	35.7	33.8
$0.34-0.14*\sqrt{}ea$			0.21	0.21	0.20	0.20	0.19	0.17	0.15	0.15	0.15	0.17	0.18	0.20
1.35*Rs/Rso-0.33			0.70	0.73	0.72	0.75	0.74	0.82	0.82	0.84	0.82	0.81	0.77	0.69
Net longwave radiation	Rnl	$MJm^{-2}day^{-1}$	4.8	5.2	5.1	5.5	5.4	5.5	5.1	4.9	4.9	5.1	5.0	4.7
Net radiation	Rn	$MJm^{-2}day^{-1}$	4.5	6.6	9.5	12.0	13.3	15.2	15.2	14.3	11.8	8.3	5.5	4.0
Soil heat flux	G	$MJm^{-2}day^{-1}$	-0.25	0.13	0.47	0.41	0.47	0.46	0.06	0.02	-0.25	-0.34	-0.60	-0.57
Rn-G		$MJm^{-2}day^{-1}$	4.79	6.50	8.99	11.57	12.85	14.71	15.14	14.24	12.01	8.62	6.10	4.53
0.408*(Rn-G)		mm/day	1.96	2.65	3.67	4.72	5.24	6.00	6.18	5.81	4.90	3.52	2.49	1.85
$(\Delta/(\Delta+\gamma*(1+0.34u_2)))*(0.408(Rn-G))$			0.96	1.32	1.96	2.71	3.17	3.83	4.02	3.91	3.23	2.18	1.43	0.97
$(\gamma/(\Delta+\gamma*(1+0.34u_2)))*(900/(T+273))*u_2(es-ea)$			1.15	1.41	1.83	2.32	3.00	3.16	2.65	2.01	1.68	1.87	1.31	1.13
Grass reference evapotranspiration	ETo	mm/day	2.11	2.73	3.79	5.03	6.18	7.00	6.67	5.92	4.92	4.04	2.74	2.10
		mm/month	65	76	117	151	191	210	207	184	148	125	82	65

Source : FAO Irrigation and Drainage Paper No.56, "Crop evapotranspiration", published 1998

mm/year 1621.97

V.Tunsa Kella

1.ETc&Irrigation Requirement Beni Suef

	Total area	Tunsa area
Beneficiary area: 24809.52381 fed	10420 ha	567,022	24,810

Description	Unit		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			31	28	31	30	31	30	31	31	30	31	30	31
ETo on Modified Penman	(mm/month)		93.59	115.79	176.92	166.38	304.60	328.90	325.30	285.52	258.07	203.61	136.02	94.20
Eto on Modified Criddle	(mm/month)		97.48	96.87	144.19	174.65	207.45	214.40	210.53	192.69	169.31	140.70	116.95	99.75
↓														
Selected Eto	(mm/month)		93.59	115.79	176.92	166.38	304.60	328.90	325.30	285.52	258.07	203.61	136.02	94.20
Crop evapo-transpiration	mm/day		3.02	4.14	5.71	5.55	9.83	10.96	10.49	9.21	8.60	6.57	4.53	3.04
ETC=ETO*Kc*Area														
Winter	Crop Area (fed)													
Wheat	6,300	Kc	1.00	1.15	1.15	1.06	0.29						0.35	0.56
	2646	ETC	247,653	351,403	538,362	465,026	236,764	0	0	0	0	0	125,967	139,425
Berseem	1,302	Kc	0.89	0.43								0.69	0.90	0.90
	547	ETC	45,568	27,247	0	0	0	0	0	0	0	76,999	66,931	46,353
Sugar beet		Kc												
		ETC	0	0	0	0	0	0	0	0	0	0	0	0
Broad Bean	30	Kc												
		ETC	0	0	0	0	0	0	0	0	0	0	0	0
Onion	2,346	Kc	1.05	1.05	1.05	0.98	0.54			0.53	0.84	1.00	1.05	1.05
	985	ETC	96,841	119,813	183,060	160,771	163,424	0	0	147,717	213,453	200,268	140,736	97,466
Marjoram	2,042	Kc	0.96	1.15	0.57									0.51
	858	ETC	76,985	114,214	85,988	0	0	0	0	0	0	0	0	41,014
S.Berseem		Kc												
		ETC	0	0	0	0	0	0	0	0	0	0	0	0
Summer														
Rice		Kc												
		ETC	0	0	0	0	0	0	0	0	0	0	0	0
Maize	7,639	Kc					0.20	0.53	1.12	1.2	0.6			
	3209	ETC	0	0	0	0	195,469	563,931	1,164,429	1,099,351	496,819	0	0	0
Sorghum	219	Kc					0.20	0.64	1.09	1.07	0.49			
	92	ETC	0	0	0	0	5,612	19,478	32,679	28,130	11,623	0	0	0
Peanuts	568	Kc					0.41	0.83	1.15	1.07	0.24			
	239	ETC	0	0	0	0	29,721	65,024	89,260	72,726	14,573	0	0	0
Cucumber	0	Kc												
		ETC	0	0	0	0	0	0	0	0	0	0	0	0
Tomato	1,729	Kc						0.60	0.73	1.07	1.15	1.15	1.03	
	726	ETC	0	0	0	0	0	143,319	171,826	221,569	215,535	170,049	101,251	0
Nile														
Maize	1,508	Kc							0.20	0.53	1.12	1.2	0.6	
	633	ETC	0	0	0	0	0	0	41,208	96,641	182,358	154,755	51,691	0
Tomato	293	Kc					0.60	0.73	1.07	1.15	1.15	1.03		
	123	ETC	0	0	0	0	22,513	29,466	42,816	40,446	36,557	25,707	0	0
Cucumber		Kc												
		ETC	0	0	0	0	0	0	0	0	0	0	0	0
Basil		Kc												
		ETC	0	0	0	0	0	0	0	0	0	0	0	0
Permanent														
Sugar cane	5	Kc	0.40	0.55	0.97	1.24	1.25	1.25	1.25	1.25	1.25	1.22	1.05	0.85
	2	ETC	73	124	333	403	742	801	792	695	628	483	278	156
Citrus	857	Kc	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
	360	ETC	28,638	35,431	54,135	50,911	93,204	100,639	99,536	87,366	78,965	62,300	41,619	28,823
Date	341	Kc												
		ETC	0	0	0	0	0	0	0	0	0	0	0	0
Adding for pre sowing (Special needs)														
Total consumptive use in the month			495,759	648,232	861,877	677,111	747,448	922,659	1,642,547	1,794,641	1,250,512	690,562	528,472	353,238
Net Irrigated area (ha)			5,398	5,398	4,851	3,993	7,656	4,751	5,384	6,369	6,369	3,377	5,900	5,398
Net Irrigation reqd. mm/ha			92	120	178	170	98	194	305	282	196	204	90	65
Effective Rainfall in mm			1	1	2	0	0	0	0	0	0	0	1	1
Net Irri. Required per month			91	119	176	170	98	194	305	282	196	204	89	64
Net Irri Required per day			2.9	4.3	5.7	5.7	3.1	6.5	9.8	9.1	6.5	6.6	3.0	2.1
Gross Irri Reqd. inclusive losses Eff = 0.5			4.84	7.03	9.37	9.34	5.21	10.70	16.27	15.02	10.82	10.90	4.88	3.44
Gross Irri Reqd. inclusive losses Eff = 0.605			4.37	6.35	8.46	8.44	4.70	9.66	14.69	13.57	9.77	9.85	4.41	3.10
Gross Irri Reqd. inclusive losses Eff = 0.67			4.07	5.91	7.87	7.85	4.37	8.99	13.67	12.62	9.09	9.16	4.10	2.89
Gross Irri Reqd. inclusive losses Eff = 0.72			3.91	5.67	7.56	7.54	4.20	8.63	13.12	12.12	8.73	8.80	3.94	2.77
Present state (current demand)			9.81	12.86	17.04	13.54	14.95	18.45	32.85	35.89	25.01	13.81	10.45	6.96
Plan 1: minimum intervention			8.11	10.63	14.09	11.19	12.35	15.25	27.15	29.66	20.67	11.41	8.64	5.75
Plan 2: Plus MC lining			7.32	9.59	12.72	10.11	11.16	13.77	24.52	26.79	18.66	10.31	7.80	5.19
Plan 3: Plus BC lining			6.81	8.93	11.84	9.40	10.38	12.81	22.81	24.93	17.37	9.59	7.26	4.83
Water requirment including Meska development			6.54	8.57	11.36	9.03	9.97	12.30	21.90	23.93	16.67	9.21	6.97	4.64
PEAK WATER REQUIREMENT			**13,401**	**lps**										

ANNEX5-40

ANNEX6 : Hydraulic Analysis of Tunsa-Kella Irrigation System

Figure A: Flow of Tunsa-Kella Irrigation System in the present condition for rotation 1, 2 and 3 (in m^3/sec)

IBRAHIMIA PRINCIPAL CANAL

Rotaion	Designed flow (m^3/sec)
Rotation 1	10.39
Rotation 2	8.54
Rotation 3	6.93

Tunsa Connection
South Amar Canal 0.00
Q_1 0.74 Q_2 0.70 Q_3 0.66
10.39
Kella Main Canal
Kella Regulator
6.82
Kella branch 0.10
Q_1 0.09 Q_2 0.09 Q_3 0.08
6.72
Q_1 4.78 Q_2 0.46 Q_3 0.43
Towa Canal
5.99
Towa Branch 1 0.43
Q_1 0.33 Q_2 NA Q_3 NA
Towa Branch 2 0.30
Q_1 0.38 Q_2 NA Q_3 NA
Towa Branch 3 0.48
Q_1 0.37 Q_2 NA Q_3 NA
El-Esarah Branch 0.98
Q_1 0.71 Q_2 NA Q_3 NA
0.00
Q_1 0.30 Q_2 NA Q_3 NA
North Amar Canal
3.57
Q_1 2.96 Q_2 0.98 Q_3 0.92
Old Right Ganabia 0.37
Q_1 0.33 Q_2 0.08 Q_3 0.07
Towa Regulator
Old Left Ganabia 0.37
Q_1 0.33 Q_2 0.08 Q_3 0.07
El-Masaed Branch 1.80
Q_1 1.27 Q_2 NA Q_3 NA
Towa Branch 4 0.60
Q_1 0.65 Q_2 NA Q_3 NA
Towa Branch 5 0.80
Q_1 0.58 Q_2 NA Q_3 NA
Kellah Branch 1.00
Q_1 0.19 Q_2 NA Q_3 NA
Baha PS ($0.5m^3$/sec)
0.00
Q_1 NA Q_2 0.53 Q_3 NA
Kella Main Canal
8.54
Q_1 1.14 Q_2 6.15 Q_3 4.69
Shasheen Branch Canal
0.63
Q_1 NA Q_2 0.53 Q_3 NA
Qulla 0.65
Q_1 0.53 Q_2 NA Q_3 NA
Ahouh 0.72
Q_1 0.57 Q_2 NA Q_3 NA
Barot PS (Broken)
Barout 1 0.51
Q_1 0.41 Q_2 NA Q_3 NA
Barout 2 0.56
Q_1 0.45 Q_2 NA Q_3 NA
Demoshia 1 0.75
Q_1 0.60 Q_2 NA Q_3 NA
El Hagery PS ($0.5m^3$/sec)
Demoshia 2 0.39
Q_1 0.36 Q_2 NA Q_3 NA
0.00
Q_1 0.52 Q_2 NA Q_3 NA
New Right Ganabia 0.32
Q_1 NA Q_2 0.26 Q_3 0.08
New Left Ganabia 0.32
Q_1 NA Q_2 0.26 Q_3 0.08
7.906
Q_1 NA Q_2 0.43 Q_3 NA
Bahbasheen Branch 0.26
Q_1 NA Q_2 0.23 Q_3 NA
North Nowera Canal 0.63
North Nowera 2 branch 0.11
Q_1 NA Q_2 0.10 Q_3 NA
North Nowera Branch 0.21
Q_1 NA Q_2 0.19 Q_3 NA
Khalid Branch Canal 0.27
Q_1 NA Q_2 0.23 Q_3 0.16
Nowera canal 1.47
Nowera branch 0.16
Q_1 NA Q_2 0.13 Q_3 NA
Shaweesh Branch Canal 1.31
Q_1 NA Q_2 1.19 Q_3 0.16
Q_1 NA Q_2 1.06 Q_3 NA
Kella PS ($1.0m^3$/sec)
North Nowera Sub-branch canal 1.47
Za'azou Branch 0.27
Q_1 NA Q_2 0.25 Q_3 NA
Q_1 NA Q_2 1.19 Q_3 0.15
Baltsheen S56e cana3 0.26
Q_1 NA Q_2 0.24 Q_3 0.15
Q_1 NA Q_2 3.38 Q_3 0.45
Baha canal 4.41
Hager Beni Selim Extension 0.60
Q_1 NA Q_2 0.36 Q_3 NA
Hager Beni Selim 1 branch 0.72
Q_1 NA Q_2 0.65 Q_3 NA
Hager beni Selimah Canal 0.00
1.32
Q_1 NA Q_2 1.00 Q_3 NA
Baha 4 Branch Canal 0.38
Q_1 NA Q_2 0.32 Q_3 NA
Baha 3 Branch Canal 0.50
Q_1 NA Q_2 0.43 Q_3 NA
Baha 2 Branch Canal 0.63
Q_1 NA Q_2 0.52 Q_3 NA
Baha 1 Branch Canal 0.63
Q_1 NA Q_2 0.50 Q_3 NA
Noour Branch Canal 0.32
Q_1 NA Q_2 0.25 Q_3 NA
Baha Reg.
Q_1 NA Q_2 0.39 Q_3 4.46
6.16
4.69
4.41
6.93
Bahar Road canal 0.26
Q_1 NA Q_2 NA Q_3 0.20
6.67
Baha branch canal 0.63
Q_1 NA Q_2 NA Q_3 0.48
6.04
Dandell canal 5.57
Dandell PS $0.5m^3$/sec
Q_1 NA Q_2 NA Q_3 0.35
Abo Khalid 2 branch 0.83
Q_1 NA Q_2 NA Q_3 0.60
Eisaa branch canal 0.55
Q_1 NA Q_2 NA Q_3 0.42
Abo Khalid 1 branch 0.76
Q_1 NA Q_2 NA Q_3 0.55
Kom Abo Khalid Canal
2.17
Q_1 NA Q_2 NA Q_3 1.92
Dandeel 2 branch 1.26
Q_1 NA Q_2 NA Q_3 0.84
Dandeel 1 branch 1.01
Q_1 NA Q_2 NA Q_3 0.73
New Dandell branch 1.13
Q_1 NA Q_2 NA Q_3 0.79
Dandeel Reg
Q_1 NA Q_2 3.78
0.47
0.00
Abshen canal 0.47
Q_1 NA Q_2 0.00 Q_3 NA
Abshena PS ($0.25m^3$/sec)

Note:

Number inside each canal represent the designed flow during each rotation

Q_1	Calculated flow during rotation 1
Q_2	Calculated flow during rotation 2
Q_3	Calculated flow during rotation 3

For example, the value of Qr2 inside North Amar and Towa canal indicates the loss due to malfunction of the gate (because during rotation 2 they were supposed to be closed).

NA = means not calculated (not important)

This calculated flow data during each rotation is brought from the following excel

Rotation 1
Rotation 2
Rotation 3

ANNEX6-2

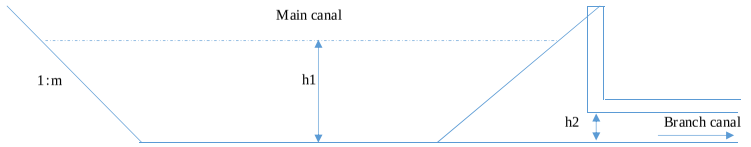
Calculated Flow of Main Canal (with Kella pumps) on Respective Rotations

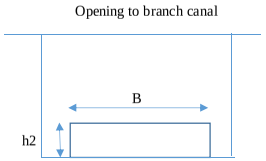
Basic Information				Rotaition 1 (without reuse pump on deformed main canal)						Rotaition 2 (with reuse pump on deformed main canal)							Rotaition 3 (with reuse pump on deformed main canal)						
1	2	3	4	5	6	7	8	9	10	5	6	7	8	9	10	11	5	6	7	8	9	10	11
Station (m)	Name of intake structure	Design bed width (m)	Actual bed width (m)	Width of opening B (m)	Water level on main canal h1 (m)	Height of opening h2 (m)	Discharge of branch canals (m^3/s)	Discharge of main canal (m3/s)	Required discharge of canal (m^3/s)	Width of opening B (m)	Water level on main canal h1 (m)	Height of opening h2 (m)	Discharge of branch canals (m^3/s)	Discharge of main canal (m3/s)	Required discharge of canal (m^3/s)	Discharge from Kella PS (m^3/s)	Width of opening B (m)	Water level on main canal h1 (m)	Height of opening h2 (m)	Discharge of branch canals (m^3/s)	Discharge of main canal (m3/s)	Required discharge of canal (m^3/s)	Discharge from Kella PS (m^3/s)
0+000	Tunsa	9.00	9.00					**10.39**						**8.54**							**6.93**		
2+600		9.00	9.00		2.00			10.39			1.79			8.54				1.59			6.93		
2+700	S. Amar	9.00	9.00	2.00	2.00	0.10	0.74	9.64	closed	2.00	1.79	0.10	0.70	7.83	closed		2.00	1.59	0.10	0.66	6.27	closed	
2+700	N. Amar	9.00	9.00	2.80	2.00	0.30	2.96	6.68	3.57	2.80	1.79	0.10	0.98	6.85	closed		2.80	1.59	**0.10**	0.92	5.35	closed	
2+700	Kella Reg.	9.00	9.00		1.56			6.68			1.58			6.85				1.37			5.35		
4+200		9.00			1.34			6.68			1.36			6.85				1.20			5.35		
4+300	Kella-1 branch	9.00	11.00	0.80	1.34	0.04	0.09	6.59	0.10	0.80	1.36	0.04	0.09	6.76	closed		0.80	1.20	0.04	0.08	5.26	closed	
4+300		9.00			1.33			6.59			1.35			6.76				1.19			5.26		
5+500		9.00			1.33			6.59			1.35			6.76				1.19			5.26		
5+600	Towa intake	9.00	11.00	3.00	1.33	0.92	4.78	1.81	5.99	3.00	1.35	0.05	0.46	6.30	closed		3.00	1.19	0.05	0.43	4.83	closed	
5+600	Old L/R Kella intake	9.00	11.00	1.00	1.33	0.24	0.67	1.14	0.74	1.00	1.30	0.05	0.15	6.15	closed		1.00	1.14	**0.05**	0.14	4.69	closed	
5+600	Towa Reg.	6.00	8.00					1.14	closed					6.15							4.69		
7+900		6.00									1.57			7.15		1.00		1.41			5.69		1.00
8+000	New L/R Kella intake	6.00	8.00	**12**	Total water required (m3/s)				10.39	1.00	1.57	0.16	0.53	6.62	0.63		1.00	1.41	**0.05**	0.16	5.53	closed	
12+200		6.00		**13**	Total Q in the branch canal (m3/s)				8.50		1.51			6.62				1.39			5.53		
12+300	Khalid intake	6.00	8.00	**14**	Efficiency				82%	1.00	1.51	0.07	0.23	6.39	0.27		1.00	1.39	**0.05**	0.16	5.38	closed	
13+400		6.00									1.49			6.39				1.37			5.38		
13+500	Nwera intake	6.00	8.00							1.00	1.49	0.43	1.19	5.20	1.47		1.00	1.37	**0.05**	0.16	5.22	closed	
14+200		6.00									1.35			5.20				1.35			5.22		
14+300	North Nwera intake	6.00	8.00							1.00	1.35	0.47	1.19	4.01	1.47		1.00	1.35	**0.05**	0.15	5.07	closed	
16+900		6.00									1.19			4.01				1.33			5.07		
17+000	Bahbasheen	6.00	8.00							1.00	1.19	0.09	0.24	3.77	0.28		1.00	1.33	**0.05**	0.15	4.92	closed	
18+000		6.00									1.15			3.768				1.31			4.92		
18+100	Baha intake	6.00	8.00							3.00	1.15	0.53	3.38	0.39	4.41		3.00	1.31	**0.05**	0.45	4.46		
18+100	Baha Reg.	6.00	8.00											0.39	closed			1.38			4.46		
20+300	Baha Road	4.00	6.00							**12**	Total water required (m3/s)				8.54		1.00	1.38	0.07	0.20	4.26	0.26	
20+400	Baha branch	4.00	6.00							**13**	Total Q in the branch canal (m3/s)				6.76		1.00	1.35	0.16	0.48	3.78	0.63	
21+600		4.00								**14**	Efficiency				79%			1.28			3.78		
21+700	Dandeel intake	4.00	6.00														3.00	1.28	0.55	3.78	0.00	5.57	
21+800	Dandeel Reg.	4.00	6.00																		0.00		
21+900	Abshena canal	1.50	4.00														1.50	0.00	0.00	0.00	0.00	0.47	
																	12	Total water required (m3/s)				6.93	
																	13	Total Q in the branch canal (m3/s)				4.46	
																	14	Efficiency				64%	

Rotation 1	
Water Reached (R: m3/s)	8.18
Water Supplied (S: m3/s)	10.89
Ratio (R/S: %)	75
Rotation 2	
Water Reached (R: m3/s)	6.93
Water Supplied (S: m3/s)	10.24
Ratio (R/S: %)	68
Rotation 3	
Water Reached (R: m3/s)	4.61
Water Supplied (S: m3/s)	8.43
Ratio (R/S: %)	55
Averaged Ration (%)	66.7

Note

1 Station: the distance from intake of Tunsa-kella canal
2 Name of intake structure: the names of intake structures along North Amar canal
3 Design bed width: obtained from Irrigation District
4 Width of opening (B): the width of each gate (orifice) at intakes to branch canals
5 Width of opening (B): the width of each gate to branch canal
6 Water level on Main Canal (h1): calculated from the discharge on main canal using Manning formula (S = 1/10,000 and m = 1.5 on original design canal, m = 5 on deformed canal)
7 Height of oepenning (h2): determined from the required discharge to each branch canal on the original flow
8 Discharge on the branch canal: calculated using orifice formula with C = 0.61
9 Discharge on Main canal: the remaining discharge on main canal after subtracting the discharge to branch canal
10 Required discharge: the originally designed discharge required for irrigation command areas of each branch canal
11 Discharge from Kella PS: the available discharge to the main canal from Kella Pump Station
12 Total water required: water supplied in original design during the rotation, and total summed of column 10 (same as required discharge)
13 Total Q in the branch canal: the amount totaled discharges in column 8 (Discharge taken into the branch canals)
14 Efficiency: calculated by dividing column 13 by column 12 (= Total Q in the branch canal/ Total water required)





Water flows in the North Amar canal

Basic Parameter		Original Design flow							Flow of deformation on North Amar canal (without pump) under less distribution from main canal							Flow of deformed North Amar canal (with pump) under less distribution from main canal							
1	2	3	4	5	6	7	8	9	3	4	5	6	7	8	9	3	4	5	6	7	8	9	10
Station (m)	Name of intake structure	Design bed width (m)	Width of opening B (m)	Water level on canal h1 (m)	Height of opening h2 (m)	Discharge of branch canals (m^3/s)	Discharge of canal (m^3/s)	Required discharge of canal (m^3/s)	Design bed width (m)	Width of opening B (m)	Water level on canal h1 (m)	Height of opening h2 (m)	Discharge of branch canals (m^3/s)	Discharge of canal (m^3/s)	Required discharge of canal (m^3/s)	Design bed width (m)	Width of opening B (m)	Water level on canal h1 (m)	Height of opening h2 (m)	Discharge of branch canals (m^3/s)	Discharge of canal (m^3/s)	Required discharge of canal (m^3/s)	Discharge from reuse pump (m3/s)
0+000	North Amar	4.00		1.74			**3.57**		4.00					**2.96**		4.00					**3.46**		
		4.00		1.74			3.57		4.00		1.15			2.96		4.00		1.23			3.46		
1+000	Qulla	4.00	1.00	1.74	0.19	0.65	2.92	0.65	4.00	1.00	1.15	0.19	0.51	2.45	0.65	4.00	1.00	1.23	0.19	0.53	2.93	0.65	
		3.00		1.77			2.92		3.00		1.12			2.45		3.00		1.21			2.93		
2+300	Ahouh	3.00	1.00	1.77	0.21	0.72	2.21	0.72	3.00	1.00	1.12	0.21	0.55	1.90	0.72	3.00	1.00	1.21	0.21	0.57	2.35	0.72	
		2.50		1.65			2.21		2.50		1.04			1.90		2.50		1.14			2.35		
4+000	Barout PS	2.50		1.65			2.21		2.50		1.04			1.90		2.50		1.14			2.35		
		2.50		1.65			2.21		2.50		1.04			1.90		2.50		1.14			2.35		
4+100	Barout 1	2.00	1.25	1.65	0.12	0.51	1.70	0.51	2.00	1.25	1.04	0.12	0.39	1.51	0.51	2.00	1.25	1.14	0.12	0.41	1.94	0.51	
		2.00		1.57			1.70		2.00		0.97			1.51		2.00		1.08			1.94		
5+200	Barout 2	2.00	1.00	1.57	0.18	0.56	1.14	0.56	2.00	1.00	0.97	0.18	0.42	1.09	0.56	2.00	1.00	1.08	0.18	0.45	1.49	0.56	
		1.50		1.42			1.14		1.50		0.88			1.09		1.50		1.01			1.49		
5+800	Demoshia 1	1.00	1.00	1.42	0.26	0.75	0.39	0.75	1.00	1.00	0.88	0.26	0.55	0.53	0.75	1.00	1.00	1.01	0.26	0.60	0.88	0.75	0.50
7+000	El Hagry PS	1.00		0.95			0.39		1.00		0.69			0.53		1.00		0.85			0.88		
8+800	Demoshiia 2	1.00	1.00	0.95	0.16	0.39	0.00	0.39	1.00	1.00	0.69	0.16	0.32	0.22	0.39	1.00	1.00	0.85	0.16	0.36	0.52	0.39	
			11	Total water required (m^3/s)				3.57		**11**	Total water required (m3/s)				3.57		**11**	Total water required (m3/s)				3.57	
			12	Total Q in the branch canal (m^3/s)				3.57		**12**	Total Q in the branch canal (m3/s)				2.74		**12**	Total Q in the branch canal (m3/s)				2.94	
			13	Efficiency				100%		**13**	Efficiency				77%		**13**	Efficiency				82%	

ANNEX6-3

Note

1 Station: the distance from intake of North Amar canal of Tunsa-kella canal

2 Name of intake structure: the names of intake structures along North Amar canal

3 Design bed width: obtained from Irrigation District

4 Width of opening (B): the width of each gate (orifice) at intakes to branch canals

5 Water level on North Amar Canal (h1): calculated from the discharge on North Amar canal using Manning formula

6 Height of opening (h2): determined from the required discharge to each branch canal

7 Discharge of branch canals: calculated using orifice formula with C = 0.61

8 Discharge on North Amar canal: the remaining discharge on North Amar canal after subtracting the discharge to branch canal

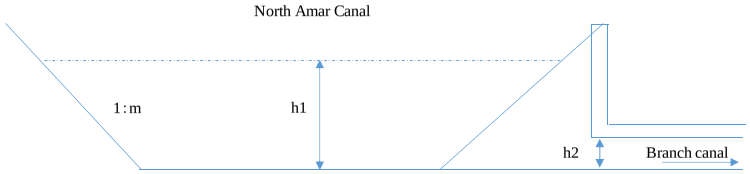
9 Required discharge: the originally designed discharge required for irrigation command areas of each branch canal

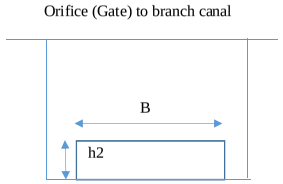
10 Discharge from reuse pump: the discharge supplied by El- Hagery reuse pump station

11 Total water required: water supplied in original design during the rotation, and total summed of column 9 (same as required discharge)

12 Total Q in the branch canal: the amount totaled discharges in column 7 (Discharge taken into the branch canals)

13 Efficiency: calculated by dividing column 12 by column 11 (= Total Q in the branch canal/ Total water required)





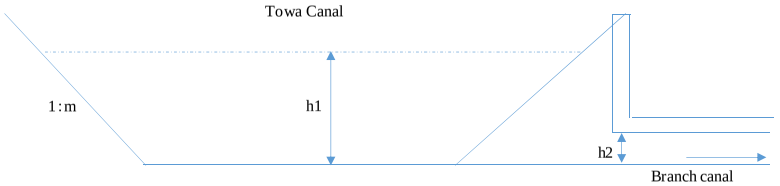
Water flows in the Towa canal

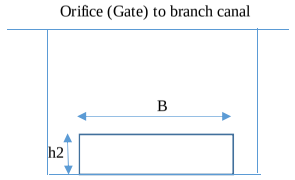
Basic Parameter		Original Design flow							Flow of deformed Towa canal							Flow in deformed Towa canal under less distribution from main canal						
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Station (m)	Name of intake structure	Design bed width (m)	Width of opening B (m)	Water level on canal h1 (m)	Height of opening h2 (m)	Discharge of branch canals (m^3/s)	Discharge of canal (m^3/s)	Required discharge of canal (m^3/s)	Design bed width (m)	Width of opening B (m)	Water level on canal h1 (m)	Height of opening h2 (m)	Discharge of branch canals (m^3/s)	Discharge of canal (m^3/s)	Required discharge of canal (m^3/s)	Design bed width (m)	Width of opening B (m)	Water level on canal h1 (m)	Height of opening h2 (m)	Discharge of branch canals (m^3/s)	Discharge of canal (m^3/s)	Required discharge of canal (m^3/s)
0+000	Intake	4.00					**5.99**		4.00					**5.99**		4.00					**4.78**	
				2.30			5.99				1.58			5.99				1.43			4.78	
	Towa branch 1	4.00	1.00	2.30	0.11	0.43	5.55	0.43	4.00	1.00	1.58	0.11	0.35	5.63	0.43	4.00	1.00	1.43	0.11	0.33	4.45	0.43
				2.21			5.55				1.54			5.63				1.38			4.45	
1+165	El Maseed branch	4.00	1.50	2.21	0.30	1.69	3.86	1.69	4.00	1.50	1.54	0.30	1.36	4.27	1.69	4.00	1.50	1.38	0.30	1.27	3.18	1.69
		2.50		2.20			3.86		2.50		1.47			4.27		2.50		1.30			3.18	
	Towa branch 2	2.50	1.00	2.20	0.13	0.50	3.36	0.50	2.50	1.00	1.47	0.13	0.41	3.87	0.50	2.50	1.00	1.30	0.13	0.38	2.80	0.50
		2.50		2.05			3.36		2.50		1.41			3.87		2.50		1.23			2.80	
4+305	Towa branch 3	2.50	1.00	2.05	0.13	0.49	2.87	0.49	2.50	1.00	1.41	0.13	0.40	3.46	0.49	2.50	1.00	1.23	0.13	0.37	2.43	0.49
		2.00		2.04			2.87		2.00		1.39			3.46		2.00		1.19			2.43	
5+375	Towa branch 4	2.00	1.00	2.04	0.25	0.90	1.96	0.90	2.00	1.00	1.39	0.25	0.72	2.75	0.90	2.00	1.00	1.19	0.25	0.65	1.77	0.90
		1.50		1.86			1.96		1.50		1.30			2.75		1.50		1.08			1.77	
6+480	Towa branch 5	1.50	1.00	1.85	0.23	0.80	1.17	0.80	1.50	1.00	1.30	0.23	0.65	2.10	0.80	1.50	1.00	1.08	0.23	0.58	1.19	0.80
		1.50		1.44			1.17		1.50		1.16			2.10		1.50		0.92			1.19	
10+050	El Esarah branch	1.00	1.00	1.44	0.35	0.98	0.19	0.98	1.00	1.00	1.16	0.35	0.85	1.25	0.98	1.00	1.00	0.92	0.35	0.71	0.49	0.98
		1.00		0.66			0.19		1.00		0.98			1.25		1.00		0.66			0.49	
	Kellah branch	1.00	1.00	0.66	0.09	0.19	0.00	0.19	1.00	1.00	0.98	0.09	0.24	1.01	0.19	1.00	1.00	0.66	0.09	0.19	0.30	0.19
			10	Total water required (m3/s)				5.98		**10**	Total water required (m3/s)				5.98		**10**	Total water required (m3/s)				5.98
			11	Total Q in the branch canal (m3/s)				5.98		**11**	Total Q in the branch canal (m3/s)				4.97		**11**	Total Q in the branch canal (m3/s)				4.49
			12	Efficiency				100%		**12**	Efficiency				83%		**12**	Efficiency				75%

ANNEX6-4

Note

1 Station: the distance from intake of Towa canal of Tunsa-kella canal
2 Name of intake structure: the names of intake structures along Towa canal
3 Design bed width: obtained from Irrigation District
4 Width of opening (B): the width of each gate (orifice) at intakes to branch canals
5 Water level on Towa Canal (h1): calculated from the discharge on Towa canal using Manning formula
6 Height of opening (h2): determined from the required discharge to each branch canal
7 Discharge on the branch canal: calculated using orifice formula with C = 0.61
8 Discharge on Towa canal: the remaining discharge on Towa canal after subtracting the discharge to branch canal
9 Required discharge: the originally designed discharge required for irrigation command areas of each branch canal
10 Total water required: water supplied in original design during the rotation, and total summed of column 9 (same as required discharge)
11 Total Q in the branch canal: the amount totaled discharges in column 7 (Discharge taken into the branch canals)
12 Efficiency: calculated by dividing column 12 by column 11 (= Total Q in the branch canal/ Total water required)





Water Flows in Baha canal

Basic Parameter		Original Design flow							Flow of deformed Baha canal without reuse pump							Flow of deformed Baha canal (with pump) under less distribution from main canal							
1	2	3	4	5	6	7	8	9	3	4	5	6	7	8	9	3	4	5	6	7	8	9	10
Station (m)	Name of intake structure	Design bed width (m)	Width of opening B (m)	Water level on canal h1 (m)	Height of opening h2 (m)	Discharge of branch canals (m^3/s)	Discharge of canal (m^3/s)	Required discharge of canal (m^3/s)	Design bed width (m)	Width of opening B (m)	Water level on canal h1 (m)	Height of opening h2 (m)	Discharge of branch canals (m^3/s)	Discharge of canal (m^3/s)	Required discharge of canal (m^3/s)	Design bed width (m)	Width of opening B (m)	Water level on canal h1 (m)	Height of opening h2 (m)	Discharge of branch canals (m^3/s)	Discharge of canal (m^3/s)	Required discharge of canal (m^3/s)	Discharge from reuse pump (m3/s)
	Baha intake	3.50					**4.41**		3.50					**4.41**		3.50					**4.08**		
		3.50		2.07			4.41		3.50		1.41			4.41		3.50		1.37			4.08		
	Nour branch canal	3.50	1.50	2.07	0.05	0.32	4.09	0.32	3.50	1.50	1.41	0.05	0.26	4.15	0.32	3.50	1.50	1.37	0.05	0.25	3.83	0.32	
		3.50		1.99			4.09		3.50		1.38			4.15		3.50		1.33			3.83		
	Baha 1 branch canal	3.50	1.00	1.99	0.17	0.63	3.47	0.63	3.50	1.00	1.38	0.17	0.51	3.64	0.63	3.50	1.00	1.33	0.17	0.50	3.33	0.63	
		3.00		1.94			3.47		3.00		1.34			3.64		3.00		1.28			3.33		
	Hager Beni Seliman canal	3.00	1.00	1.94	0.39	1.32	2.14	1.32	3.00	1.00	1.34	0.39	1.03	2.61	1.32	3.00	1.00	1.28	0.39	1.00	2.32	1.32	0.70
				1.50			2.14				1.15			2.61				1.09			2.32		
	Baha 2 branch canal	3.00	1.00	1.50	0.21	0.63	1.51	0.63	3.00	1.00	1.15	0.21	0.54	2.07	0.63	3.00	1.00	1.09	0.21	0.52	1.80	0.63	
		2.50		1.35			1.51		2.50		1.07			2.07		2.50		1.01			1.80		
	Baha 3 branch canal	2.50	1.00	1.35	0.17	0.50	1.01	0.50	2.50	1.00	1.07	0.17	0.44	1.63	0.50	2.50	1.00	1.01	0.17	0.43	1.37	0.50	
		1.50		1.33			1.01		1.50		1.05			1.63		1.50		0.97			1.37		
	Baha 4 branch canal	1.50	1.00	1.33	0.13	0.38	0.63	0.38	1.50	1.00	1.05	0.13	0.33	1.30	0.38	1.50	1.00	0.97	0.13	0.32	1.06	0.38	
		1.00		1.20			0.63		1.00		0.99			1.30		1.00		0.91			1.06		
	Shaheen branch canal	1.00	1.00	1.20	0.24	0.63	0.00	0.63	1.00	1.00	0.99	0.24	0.56	0.74	0.63	1.00	1.00	0.91	0.24	0.53	0.53	0.63	
			11	Total water required (m3/s)				4.41		**11**	Total water required (m3/s)				4.41		**11**	Total water required (m3/s)				4.41	
			12	Total Q in the branch canal (m3/s)				4.41		**12**	Total Q in the branch canal (m3/s)				3.67		**12**	Total Q in the branch canal (m3/s)				3.55	
			13	Efficiency				100%		**13**	Efficiency				83%		**13**	Efficiency				81%	

ANNEX6-5

Note

1 Station: the distance from intake of Baha canal of Tunsa-kella canal

2 Name of intake structure: the names of intake structures along Baha canal

3 Design bed width: obtained from Irrigation District

4 Width of opening (B): the width of each gate (orifice) at intakes to branch canals

5 Water level on Baha Canal (h1): calculated from the discharge on Baha canal using Manning formula

6 Height of opening (h2): determined from the required discharge to each branch canal

7 Discharge on the branch canal: calculated using orifice formula with C = 0.61

8 Discharge on Baha canal: the remaining discharge on Baha canal after subtracting the discharge to branch canal

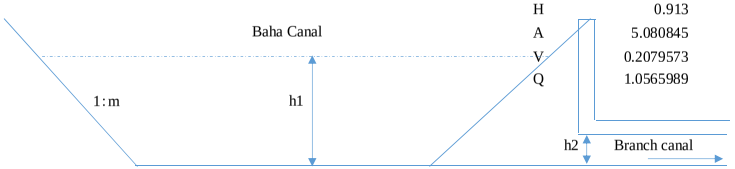
9 Required discharge: the originally designed discharge required for irrigation command areas of each branch canal

10 Discharge from reuse pump: the discharge supplied by Baha reuse pump station

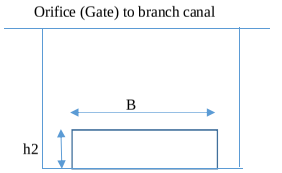
11 Total water required: water supplied in original design during the rotation, and total summed of column 9 (same as required discharge)

12 Total Q in the branch canal: the amount totaled discharges in column 7 (Discharge taken into the branch canals)

13 Efficiency: calculated by dividing column 12 by column 11 (= Total Q in the branch canal/ Total water required)



B	1
m	5
H	0.913
A	5.080845
V	0.2079573
Q	1.0565989



Water Flows in Dandeel canal

Basic Parameter		Original flow							The result of Deformation							Flow of deformed Dandeel canal (with pump) under less distribution from main canal							
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Station (m)	Name of intake structure	Design bed width (m)	Width of opening B (m)	Water level on the main canal h1 (m)	Height of opening h2 (m)	Discharge of the branch canal (m3/s)	Discharge of the main canal (m3/s)	Required discharge (m3/s)	Design bed width (m)	Width of opening B (m)	Water level on the main canal h1 (m)	Height of opening h2 (m)	Discharge of the branch canal (m3/s)	Discharge of the main canal (m3/s)	Required discharge (m3/s)	Design bed width (m)	Width of opening B (m)	Water level on the main canal h1 (m)	Height of opening h2 (m)	Discharge of the branch canal (m3/s)	Discharge of the main canal (m3/s)	Required discharge (m3/s)	Dischrage from Dandeel pump (m3/s)
0+000	Dandeel Intake	3.00					**5.57**		3.00					**5.57**		3.00					**3.78**		
		3.00		2.48			5.57		3.00		1.61			5.57		3.00		1.36			3.78		
	New Dandel Canal	3.00	1.00	2.48	0.28	1.13	4.44	1.13	3.00	1.00	1.61	0.28	0.88	4.69	1.13	3.00	1.00	1.36	0.28	0.79	2.99	1.13	
		3.00		2.21			4.44		3.00		1.49			4.69		3.00		1.22			2.99		
1+165	Dandell 1 branch	3.00	1.50	2.21	0.18	1.01	3.42	1.01	3.00	1.50	1.49	0.18	0.81	3.88	1.01	3.00	1.50	1.22	0.18	0.73	2.26	1.01	
		2.50		2.07			3.42		2.50		1.41			3.88		2.50		1.12			2.26		
	Dandell 2 branch	2.00	1.00	2.07	0.36	1.26	2.16	1.26	2.00	1.00	1.41	0.36	0.99	2.89	1.26	2.00	1.00	1.12	0.36	0.84	1.42	1.26	
		2.00		1.77			2.16		2.00		1.28			2.89		2.00		1.08			1.92		
4+305	Kom Abo Khallad Canal	2.00	1.50	1.77	0.47	2.16	0.000	2.16	2.00	1.50	1.28	0.47	1.71	1.18	2.16	2.00	1.50	1.08	0.47	1.92	0.00	2.16	0.50
			11	Total water required (m3/s)				5.57		**11**	Total water required (m3/s)				5.57		**11**	Total water required (m3/s)				5.57	
			12	Total Q in the branch canal (m3/s)				5.57		**12**	Total Q in the branch canal (m3/s)				4.39		**12**	Total Q in the branch canal (m3/s)				3.93	
			13	Efficiency				100%		**13**	Efficiency				79%		**13**	Efficiency				71%	

ANNEX6-6

Note

1 Station: the distance from intake of Dandeel canal of Tunsa-kella canal

2 Name of intake structure: the names of intake structures along Dandeel canal

3 Design bed width: obtained from Irrigation District

4 Width of opening (B): the width of each gate (orifice) at intakes to branch canals

5 Water level on Dandeel Canal (h1): calculated from the discharge on Dandeel canal using Manning formula

6 Height of opening (h2): determined from the required discharge to each branch canal

7 Discharge on the branch canal: calculated using orifice formula with C = 0.61

8 Discharge on Dandeel canal: the remaining discharge on Baha canal after subtracting the discharge to branch canal

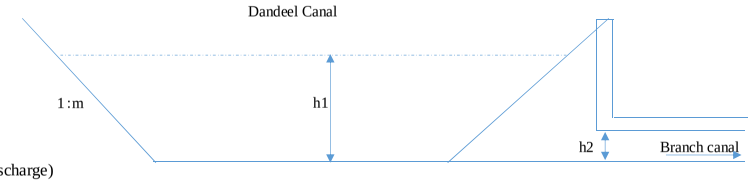
9 Required discharge: the originally designed discharge required for irrigation command areas of each branch canal

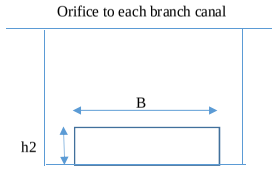
10 Discharge from reuse pump: the discharge supplied by Dandeel reuse pump station

11 Total water required: water supplied in original design during the rotation, and total summed of column 9 (same as required discharge)

12 Total Q in the branch canal: the amount totaled discharges in column 7 (Discharge taken into the branch canals)

13 Efficiency: calculated by dividing column 12 by column 11 (= Total Q in the branch canal/ Total water required)



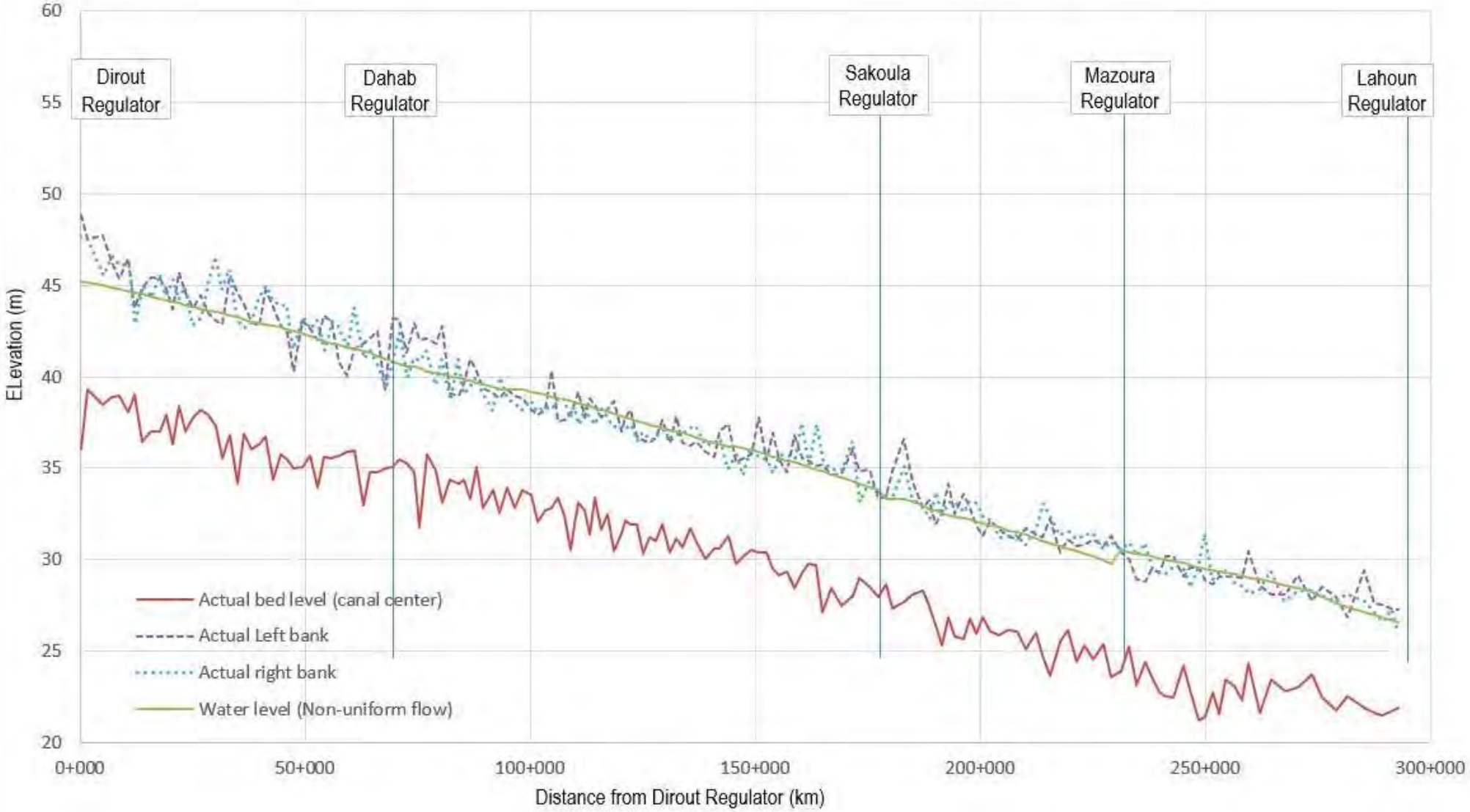


ANNEX7 : Hydraulic Calculation of Bahr Yusef Principal Canal

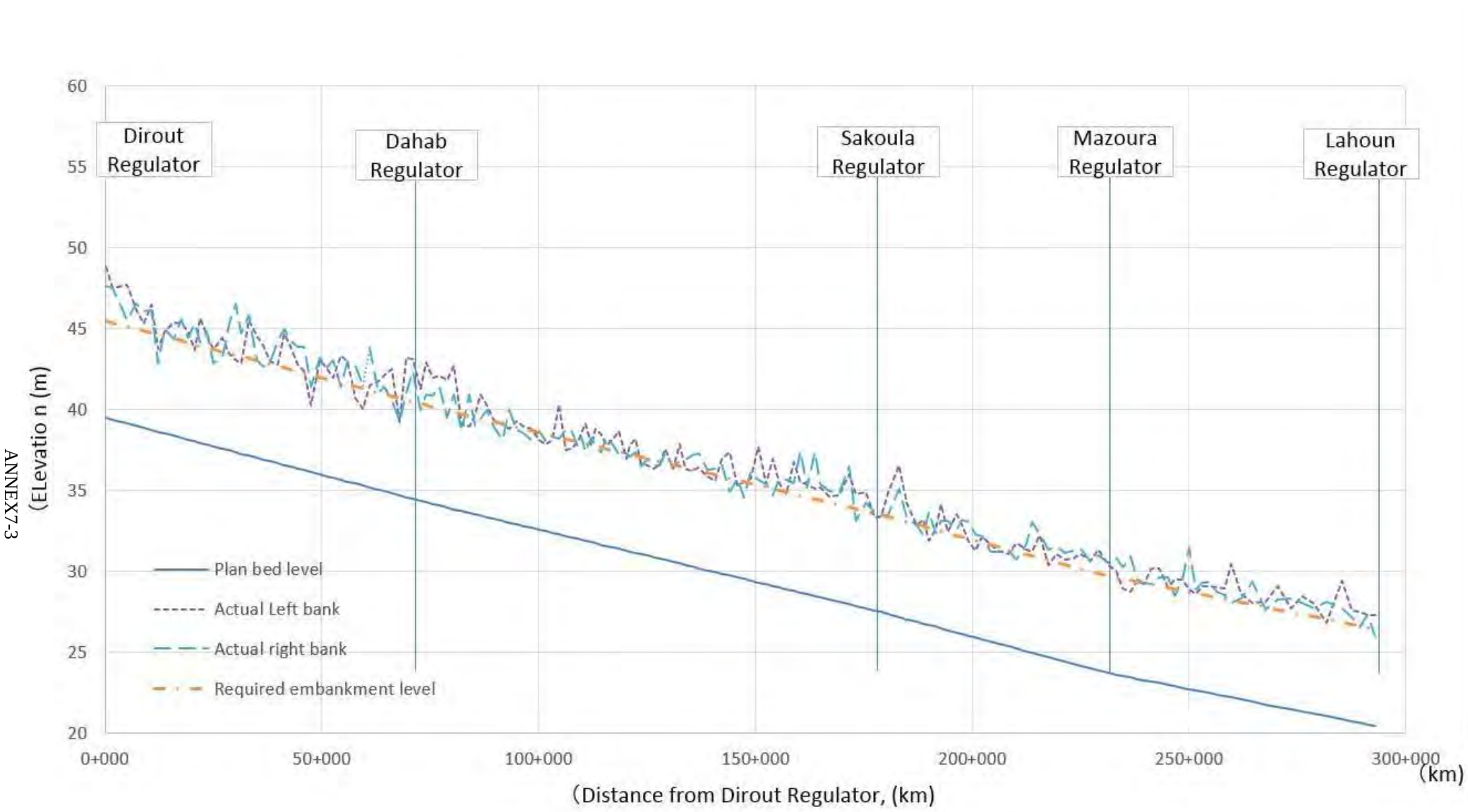
・Non-uniform Flow has been calculated for each four regulators by Manning formula
・The water discharge and the specified water level in each section are based on past reports
・The calculation pitch is the same as the surveying pitch

		Regulator Bottom Level		High Water level		Water
		Upstream	Downstream	Upstream	Downstream	Discharge
	km	m	m	m	m	m^3/sec
Dirout	0.00	39.5	39.5	46.30	45.40	226.50
	10.00					225.84
Badraman Pump Station	20.00					232.46
	38.30					229.24
kapKap Pump Station	56.50					233.40
	57.50					234.06
Tuna Pump Station	58.40					234.06
	63.80					233.29
	77.30					213.44
	77.60					212.89
	77.60					210.15
Dahab	77.60	34.10	34.05	40.40	39.22	210.15
	91.10					209.82
	104.60					206.01
	110.70					205.89
	116.70					206.29
Dahab Pump Station	127.40					205.74
	130.30					205.40
	143.90					201.59
	154.20					201.34
beni Mazar Pump Station	162.50					204.50
Sancoria Pump Station	164.50					207.43
	177.20					193.64
Sakoula	177.73	27.55	27.50	33.70	32.78	193.64
	181.30					193.56
	184.90					191.86
	202.00					191.47
Sakoula Pump Station	219.00					195.26
	219.30					195.25
	219.40					194.88
	219.50					193.19
	229.00					187.79
Mazoura	230.26	23.80	23.40	29.70	29.31	187.79
	230.50					187.78
Aboharasu Pump Station	230.80					194.86
	252.50					191.01
Mazoura Pump station	274.30					193.33
	281.30					190.50
	288.30					132.75
	288.40					80.06
Lahoon	288.70	20.48	20.48	26.60	24.30	80.07
End Point	312.70					

ANNEX7-2


Dirout Regulator
Dahab Regulator
Sakoula Regulator
Mazoura Regulator
Lahoun Regulator
ELevation (m)
60
55
50
45
40
35
30
25
20
0+000
50+000
100+000
150+000
200+000
250+000
300+000
Distance from Dirout Regulator (km)
Actual bed level (canal center)
Actual Left bank
Actual right bank
Water level (Non-uniform flow)

ANNEX7-3


Dirout Regulator
Dahab Regulator
Sakoula Regulator
Mazoura Regulator
Lahoun Regulator
60
55
50
45
40
35
30
25
20
(Elevatio n (m)
Plan bed level
Actual Left bank
Actual right bank
Required embankment level
0+000
50+000
100+000
150+000
200+000
250+000
300+000
(km)
(Distance from Dirout Regulator, (km)

STNO	CSNO	Actual bed level (canal center)	Plan bed level	Required embankment level	Water level (Non-uniform flow)	Actual Left bank	Actual right bank	Amount of Water
m	No	m	m	m	m	m	m	m^3/sec
0+150	1	36.05	39.50	45.50	45.25	48.837	47.664	226.50
0+331	2	38.58	39.49	45.49	45.23	50.595	44.239	226.50
0+506	3	39.64	39.47	45.47	45.22	48.982	51.232	226.50
0+601	4	39.06	39.47	45.47	45.22	48.682	52.051	226.50
0+704	5	39.09	39.46	45.46	45.21	48.192	48.075	226.50
0+907	6	38.85	39.45	45.45	45.21	49.471	58.082	226.50
1+151	7	40.05	39.43	45.43	45.20	51.402	45.072	226.50
1+249	8	40.52	39.42	45.42	45.19	49.157	42.153	226.50
1+352	9	40.59	39.42	45.42	45.19	48.579	47.572	226.50
1+520	10	38.68	39.40	45.40	45.17	47.286	46.925	226.50
1+708	11	39.32	39.39	45.39	45.17	47.518	47.496	226.50
2+013	12	39.44	39.37	45.37	45.16	47.157	45.030	226.50
2+358	13	39.46	39.34	45.34	45.15	46.848	44.455	226.50
2+749	14	39.81	39.32	45.32	45.14	46.376	43.854	226.50
3+108	15	39.67	39.29	45.29	45.12	49.028	45.245	226.50
3+489	16	39.67	39.26	45.26	45.10	46.203	46.316	226.50
3+796	17	39.79	39.24	45.24	45.08	48.608	45.806	226.50
4+251	18	40.04	39.21	45.21	45.06	46.572	53.002	226.50
4+584	19	38.65	39.19	45.19	45.04	49.127	46.167	226.50
4+849	20	38.62	39.17	45.17	45.02	49.543	43.855	226.50
5+093	21	38.48	39.15	45.15	45.01	47.745	45.561	226.50
5+397	22	38.76	39.13	45.13	45.00	51.537	45.090	226.50
5+508	23	39.82	39.12	45.12	44.98	47.549	41.514	226.50
5+604	24	40.20	39.12	45.12	44.97	48.554	42.631	226.50
5+702	25	39.29	39.11	45.11	44.97	48.665	42.653	226.50
5+979	26	37.84	39.09	45.09	44.96	48.843	46.299	226.50
6+071	27	37.64	39.08	45.08	44.95	45.756	48.901	226.50
6+211	28	36.50	39.07	45.07	44.95	47.645	46.595	226.50
6+520	29	39.12	39.05	45.05	44.94	45.462	48.412	226.50
6+860	30	39.11	39.03	45.03	44.91	45.660	52.152	226.50
7+055	31	38.87	39.01	45.01	44.88	46.251	46.559	226.50
7+314	32	39.65	38.99	44.99	44.87	46.858	42.104	226.50
7+400	33	38.76	38.99	44.99	44.85	46.633	48.383	226.50
7+493	34	36.68	38.98	44.98	44.84	49.528	45.141	226.50
7+752	35	39.02	38.96	44.96	44.84	43.410	45.547	226.50
7+848	36	39.22	38.96	44.96	44.82	46.341	45.414	226.50
7+951	37	38.03	38.95	44.95	44.82	44.870	45.467	226.50
8+266	38	39.23	38.93	44.93	44.81	45.031	48.093	226.50
8+504	39	39.73	38.91	44.91	44.79	46.175	47.726	226.50
8+680	40	39.24	38.90	44.90	44.79	45.415	48.714	226.50
8+837	41	38.97	38.89	44.89	44.77	45.352	46.061	226.50
8+992	42	38.39	38.88	44.88	44.75	44.573	46.319	226.50
9+220	43	37.41	38.86	44.86	44.77	42.575	43.545	226.50
9+435	44	38.33	38.85	44.85	44.76	41.911	46.767	226.50
9+799	45	39.29	38.82	44.82	44.74	47.840	45.845	226.50
10+037	46	39.10	38.80	44.80	44.71	46.658	44.998	226.50
10+381	47	38.69	38.78	44.78	44.71	45.267	45.729	226.50
10+493	48	38.75	38.77	44.77	44.70	41.655	45.281	226.50
10+601	49	37.67	38.76	44.76	44.67	42.406	46.445	226.50
10+744	50	38.07	38.75	44.75	44.68	44.572	46.450	226.50
10+802	51	38.08	38.75	44.75	44.65	46.502	46.176	226.50
10+848	52	38.69	38.75	44.75	44.65	47.912	47.371	226.50
11+019	53	38.51	38.73	44.73	44.66	46.344	42.056	226.50
11+192	54	38.42	38.72	44.72	44.65	47.112	45.436	226.50
11+234	55	37.60	38.72	44.72	44.65	42.075	45.544	226.50
11+292	56	38.02	38.71	44.71	44.65	42.963	46.391	226.50
11+529	57	38.49	38.70	44.70	44.64	43.778	45.089	226.50
11+828	58	38.36	38.68	44.68	44.63	42.272	43.956	226.50
11+919	59	38.37	38.67	44.67	44.62	39.521	43.376	226.50
12+001	60	36.03	38.66	44.66	44.60	40.447	42.916	226.50
12+251	61	39.05	38.65	44.65	44.61	43.767	42.876	226.50
12+352	62	38.34	38.64	44.64	44.60	44.157	44.376	226.50
12+440	63	38.09	38.63	44.63	44.59	42.958	44.448	226.50
12+800	64	38.25	38.61	44.61	44.59	45.582	45.229	226.00
12+862	65	38.40	38.60	44.60	44.58	46.912	44.991	226.00
12+957	66	37.99	38.60	44.60	44.59	43.001	43.377	226.00
13+282	67	38.82	38.57	44.57	44.56	45.177	44.774	226.00
13+565	68	38.20	38.55	44.55	44.54	45.180	42.944	226.00

STNO	CSNO	Actual bed level (canal center)	Plan bed level	Required embankment level	Water level (Non-uniform flow)	Actual Left bank	Actual right bank	Amount of Water
m	No	m	m	m	m	m	m	m^3/sec
13+652	69	37.93	38.55	44.55	44.53	44.500	45.159	226.00
13+784	70	37.79	38.54	44.54	44.53	44.956	44.999	226.00
13+910	71	36.47	38.53	44.53	44.52	44.872	44.994	226.00
14+026	72	37.25	38.52	44.52	44.51	44.992	44.897	226.00
14+277	73	39.08	38.50	44.50	44.50	44.737	45.500	226.00
14+421	74	35.93	38.49	44.49	44.47	44.571	45.998	226.00
14+559	75	38.23	38.48	44.48	44.47	44.568	46.000	226.00
14+758	76	37.71	38.47	44.47	44.45	45.756	44.809	226.00
15+008	77	38.62	38.45	44.45	44.44	45.000	44.627	226.00
15+193	78	38.60	38.44	44.44	44.43	44.845	44.975	226.00
15+551	79	38.49	38.41	44.41	44.40	44.519	44.727	226.00
15+806	80	38.76	38.40	44.40	44.39	45.409	44.097	226.00
15+938	81	36.98	38.39	44.39	44.38	45.420	44.366	226.00
16+084	82	38.20	38.38	44.38	44.36	44.722	45.250	226.00
16+280	83	37.83	38.36	44.36	44.35	45.468	45.413	226.00
16+527	84	38.72	38.35	44.35	44.34	44.973	44.930	226.00
16+747	85	38.75	38.33	44.33	44.33	45.529	45.244	226.00
16+923	86	39.04	38.32	44.32	44.32	44.719	44.343	226.00
17+022	87	38.66	38.31	44.31	44.32	43.994	45.077	226.00
17+170	88	38.59	38.30	44.30	44.30	44.600	46.665	226.00
17+329	89	37.16	38.29	44.29	44.29	45.523	46.230	226.00
17+436	90	36.84	38.28	44.28	44.28	45.590	45.944	226.00
17+652	91	37.01	38.27	44.27	44.27	45.329	45.616	226.00
17+783	92	38.71	38.26	44.26	44.26	44.620	46.212	226.00
17+920	93	37.19	38.25	44.25	44.26	44.000	44.298	226.00
18+133	94	38.04	38.23	44.23	44.25	42.009	44.636	226.00
18+287	95	38.32	38.22	44.22	44.23	41.870	44.119	226.00
18+470	96	36.82	38.21	44.21	44.22	44.097	43.191	226.00
18+600	97	38.12	38.20	44.20	44.21	42.018	45.601	226.00
18+717	98	38.81	38.19	44.19	44.21	47.384	45.976	226.00
18+822	99	38.93	38.18	44.18	44.21	45.614	45.719	226.00
18+927	100	39.02	38.18	44.18	44.19	42.902	46.065	226.00
19+139	101	37.88	38.16	44.16	44.19	44.837	44.414	226.00
19+326	102	38.32	38.15	44.15	44.18	43.999	44.850	226.00
19+426	103	38.20	38.14	44.14	44.17	43.756	44.698	226.00
19+545	104	33.05	38.13	44.13	44.16	44.969	44.001	226.00
19+734	105	38.99	38.12	44.12	44.15	44.498	44.919	226.00
19+909	106	38.23	38.11	44.11	44.15	44.272	44.529	226.00
20+096	107	38.19	38.09	44.09	44.13	44.148	44.654	226.00
20+232	108	38.02	38.08	44.08	44.12	44.309	45.400	226.00
20+442	109	37.47	38.07	44.07	44.10	44.229	44.986	226.00
20+527	110	37.72	38.06	44.06	44.10	43.985	45.888	226.00
20+628	111	36.31	38.06	44.06	44.09	43.669	45.320	226.00
20+764	112	36.09	38.05	44.05	44.08	44.341	45.107	226.00
20+920	113	37.72	38.04	44.04	44.08	44.350	44.711	226.00
21+055	114	38.04	38.03	44.03	44.07	44.100	45.405	226.00
21+179	115	37.76	38.02	44.02	44.06	44.147	44.603	226.00
21+324	116	37.82	38.01	44.01	44.05	44.199	44.849	226.00
21+433	117	37.49	38.00	44.00	44.05	44.370	45.576	226.00
21+524	118	37.12	37.99	43.99	44.04	44.074	44.018	226.00
21+653	119	37.51	37.98	43.98	44.03	42.006	44.880	226.00
21+850	120	36.42	37.97	43.97	44.03	45.852	44.333	230.00
21+951	121	38.42	37.96	43.96	44.02	45.678	44.200	230.00
22+072	122	36.95	37.95	43.95	44.01	46.146	44.200	230.00
22+311	123	37.65	37.94	43.94	44.00	44.057	43.801	230.00
22+529	124	38.04	37.92	43.92	43.99	44.023	43.771	230.00
22+618	125	38.48	37.92	43.92	43.97	44.196	44.181	230.00
22+713	126	35.54	37.91	43.91	43.96	44.644	43.990	230.00
22+861	127	37.53	37.90	43.90	43.96	44.454	43.934	230.00
23+004	128	37.94	37.89	43.89	43.95	44.422	44.007	230.00
23+161	129	37.02	37.88	43.88	43.94	45.870	45.081	230.00
23+261	130	37.26	37.87	43.87	43.92	43.952	45.467	230.00
23+375	131	37.03	37.86	43.86	43.92	44.602	44.873	230.00
23+584	132	36.41	37.85	43.85	43.90	46.126	46.989	230.00
23+843	133	37.25	37.83	43.83	43.90	45.082	44.648	230.00
23+964	134	36.87	37.82	43.82	43.89	44.868	44.055	230.00
24+099	135	36.26	37.81	43.81	43.89	45.344	44.039	230.00
24+211	136	36.15	37.80	43.80	43.87	44.004	44.784	230.00

STNO	CSNO	Actual bed level (canal center)	Plan bed level	Required embankment level	Water level (Non-uniform flow)	Actual Left bank	Actual right bank	Amount of Water
m	No	m	m	m	m	m	m	m^3/sec
24+284	137	36.48	37.80	43.80	43.86	45.162	42.775	230.00
24+405	138	34.48	37.79	43.79	43.86	44.463	44.770	230.00
24+639	139	37.56	37.77	43.77	43.85	43.545	44.224	230.00
24+859	140	37.41	37.76	43.76	43.84	42.734	45.801	230.00
25+111	141	37.77	37.74	43.74	43.83	43.730	42.839	230.00
25+329	142	37.75	37.72	43.72	43.81	43.551	43.347	230.00
25+560	143	37.14	37.71	43.71	43.79	43.763	43.461	230.00
25+765	144	37.53	37.69	43.69	43.78	43.640	44.347	230.00
25+880	145	36.63	37.69	43.69	43.77	43.289	42.943	230.00
25+978	146	35.49	37.68	43.68	43.77	43.987	43.602	230.00
26+193	147	37.48	37.66	43.66	43.75	43.251	43.380	230.00
26+354	148	37.52	37.65	43.65	43.75	43.090	43.988	230.00
26+543	149	37.12	37.64	43.64	43.74	43.249	43.824	230.00
26+746	150	36.79	37.63	43.63	43.72	43.200	43.193	230.00
26+947	151	38.18	37.61	43.61	43.72	44.479	43.244	230.00
27+088	152	36.85	37.60	43.60	43.70	44.489	43.951	230.00
27+226	153	36.50	37.59	43.59	43.70	43.032	43.343	230.00
27+445	154	38.14	37.58	43.58	43.69	43.912	43.621	230.00
27+669	155	37.43	37.56	43.56	43.67	44.488	44.098	230.00
27+849	156	37.39	37.55	43.55	43.66	44.443	44.609	230.00
27+982	157	36.93	37.54	43.54	43.66	43.723	47.636	230.00
28+111	158	36.43	37.53	43.53	43.65	43.835	45.301	230.00
28+197	159	38.18	37.52	43.52	43.64	43.643	47.229	230.00
28+402	160	36.30	37.51	43.51	43.63	42.648	42.387	230.00
28+564	161	37.89	37.50	43.50	43.63	43.499	45.241	230.00
28+742	162	38.27	37.48	43.48	43.62	42.087	44.079	230.00
28+841	163	37.41	37.48	43.48	43.61	42.817	43.412	230.00
28+987	164	36.57	37.47	43.47	43.59	44.443	46.612	230.00
29+141	165	36.30	37.46	43.46	43.58	43.990	45.464	230.00
29+318	166	36.26	37.44	43.44	43.58	41.870	41.523	230.00
29+521	167	36.88	37.43	43.43	43.57	43.104	44.445	230.00
29+616	168	36.84	37.42	43.42	43.57	43.094	42.680	230.00
29+729	169	34.70	37.41	43.41	43.55	43.644	44.459	230.00
29+868	170	36.47	37.40	43.40	43.55	43.255	43.978	230.00
30+129	171	37.30	37.39	43.39	43.54	43.045	46.567	230.00
30+258	172	36.98	37.38	43.38	43.53	42.934	44.000	230.00
30+406	173	36.28	37.37	43.37	43.52	42.759	45.750	230.00
30+504	174	34.20	37.36	43.36	43.52	42.442	43.416	230.00
30+608	175	34.16	37.35	43.35	43.51	42.663	44.014	230.00
30+790	176	36.84	37.34	43.34	43.51	42.713	44.204	230.00
30+970	177	36.66	37.33	43.33	43.51	42.740	43.298	230.00
31+096	178	37.15	37.32	43.32	43.50	42.729	42.248	230.00
31+217	179	37.62	37.31	43.31	43.49	42.511	43.519	230.00
31+314	180	34.55	37.30	43.30	43.47	42.680	43.727	230.00
31+541	181	35.56	37.29	43.29	43.47	42.867	44.740	230.00
31+810	182	36.69	37.27	43.27	43.44	43.402	43.257	230.00
32+054	183	36.51	37.25	43.25	43.42	43.884	44.295	230.00
32+250	184	36.66	37.24	43.24	43.42	41.674	45.490	230.00
32+406	185	35.93	37.23	43.23	43.42	41.819	45.371	230.00
32+537	186	36.59	37.22	43.22	43.41	45.630	43.472	230.00
32+808	187	36.54	37.20	43.20	43.39	45.439	43.689	230.00
32+867	188	36.62	37.19	43.19	43.40	45.482	42.572	230.00
32+936	189	37.52	37.19	43.19	43.38	45.488	45.143	230.00
33+102	190	35.31	37.18	43.18	43.38	44.836	45.217	230.00
33+217	191	36.83	37.17	43.17	43.37	45.573	45.854	230.00
33+359	192	36.74	37.16	43.16	43.37	44.217	44.561	230.00
33+463	193	35.04	37.15	43.15	43.36	43.082	43.794	230.00
33+564	194	36.38	37.14	43.14	43.35	43.158	44.086	230.00
33+815	195	35.39	37.13	43.13	43.32	43.642	44.233	230.00
33+972	196	36.26	37.12	43.12	43.31	42.984	43.948	230.00
34+114	197	35.59	37.11	43.11	43.30	43.974	42.976	230.00
34+357	198	34.66	37.09	43.09	43.29	44.661	43.585	230.00
34+614	199	35.92	37.07	43.07	43.29	43.954	44.760	230.00
34+842	200	34.87	37.05	43.05	43.26	43.311	44.155	230.00
34+919	201	34.16	37.05	43.05	43.26	44.578	43.071	230.00
34+993	202	35.70	37.04	43.04	43.26	43.731	42.002	230.00
35+214	203	36.05	37.03	43.03	43.25	44.357	44.407	230.00
35+406	204	36.15	37.01	43.01	43.24	43.984	43.944	230.00

STNO	CSNO	Actual bed level (canal center)	Plan bed level	Required embankment level	Water level (Non-uniform flow)	Actual Left bank	Actual right bank	Amount of Water
m	No	m	m	m	m	m	m	m^3/sec
35+583	205	39.30	37.00	43.00	43.14	44.071	44.929	230.00
35+734	206	35.09	36.99	42.99	43.16	40.906	44.186	230.00
35+892	207	34.58	36.98	42.98	43.14	42.519	43.835	230.00
36+062	208	34.10	36.97	42.97	43.14	42.971	43.948	230.00
36+169	209	36.04	36.96	42.96	43.13	43.728	43.885	230.00
36+262	210	32.51	36.95	42.95	43.13	43.933	43.787	230.00
36+495	211	36.88	36.94	42.94	43.12	43.964	42.669	230.00
36+725	212	37.46	36.92	42.92	43.11	41.973	45.223	230.00
36+865	213	36.74	36.91	42.91	43.11	42.705	44.992	230.00
36+968	214	35.19	36.90	42.90	43.08	44.490	44.974	230.00
37+096	215	36.56	36.90	42.90	43.08	44.952	44.971	230.00
37+180	216	35.93	36.89	42.89	43.07	45.290	44.917	230.00
37+288	217	35.53	36.88	42.88	43.05	43.635	43.379	230.00
37+523	218	35.72	36.87	42.87	43.04	44.973	46.208	230.00
37+747	219	36.00	36.85	42.85	43.04	44.455	44.000	230.00
37+990	220	36.86	36.83	42.83	43.03	45.437	43.019	230.00
38+075	221	36.04	36.83	42.83	43.02	43.017	42.964	230.00
38+185	222	33.62	36.82	42.82	43.02	43.989	42.755	230.00
38+367	223	36.12	36.81	42.81	43.01	43.915	43.270	230.00
38+598	224	36.21	36.79	42.79	42.99	44.949	43.733	230.00
38+793	225	36.67	36.78	42.78	42.98	43.009	45.196	230.00
39+002	226	36.70	36.76	42.76	42.97	41.763	43.727	230.00
39+072	227	30.19	36.76	42.76	42.98	43.116	44.498	230.00
39+118	228	34.59	36.75	42.75	42.97	42.458	44.055	230.00
39+319	229	36.85	36.74	42.74	42.96	43.853	44.847	230.00
39+512	230	36.56	36.73	42.73	42.96	42.587	42.239	230.00
39+738	231	36.31	36.71	42.71	42.95	42.775	44.274	230.00
39+841	232	36.21	36.70	42.70	42.94	44.928	41.982	230.00
39+934	233	36.16	36.70	42.70	42.93	42.326	42.105	230.00
40+136	234	35.52	36.68	42.68	42.93	42.524	40.473	230.00
40+329	235	36.13	36.67	42.67	42.92	44.199	41.956	230.00
40+501	236	36.55	36.66	42.66	42.92	40.991	41.677	230.00
40+665	237	35.40	36.64	42.64	42.92	42.620	40.221	230.00
40+822	238	36.35	36.63	42.63	42.91	41.555	43.453	230.00
40+982	239	36.42	36.62	42.62	42.90	41.711	43.489	230.00
41+162	240	37.08	36.61	42.61	42.90	42.003	43.835	230.00
41+308	241	36.74	36.60	42.60	42.89	44.739	44.999	230.00
41+477	242	36.32	36.59	42.59	42.89	43.857	42.773	230.00
41+578	243	36.11	36.58	42.58	42.88	41.552	38.822	230.00
41+672	244	33.73	36.57	42.57	42.87	43.037	41.564	230.00
41+873	245	36.10	36.56	42.56	42.86	43.619	43.077	230.00
42+053	246	36.13	36.55	42.55	42.85	42.874	43.612	230.00
42+283	247	36.88	36.53	42.53	42.85	43.060	42.419	230.00
42+446	248	37.41	36.52	42.52	42.84	44.593	42.673	230.00
42+579	249	36.47	36.51	42.51	42.83	44.127	42.917	230.00
42+717	250	35.80	36.50	42.50	42.82	44.124	44.957	230.00
42+819	251	34.40	36.49	42.49	42.81	43.828	44.246	230.00
43+000	252	34.76	36.48	42.48	42.80	47.353	44.659	230.00
43+136	253	35.26	36.47	42.47	42.80	43.541	44.589	230.00
43+256	254	36.19	36.46	42.46	42.80	44.144	42.367	230.00
43+434	255	35.39	36.45	42.45	42.77	45.176	43.100	230.00
43+633	256	35.36	36.43	42.43	42.76	45.268	42.875	230.00
43+771	257	35.42	36.42	42.42	42.75	47.616	44.940	230.00
43+906	258	36.07	36.42	42.42	42.74	42.915	45.722	230.00
44+162	259	35.36	36.40	42.40	42.71	43.430	42.897	230.00
44+329	260	35.46	36.39	42.39	42.70	43.940	43.969	230.00
44+479	261	35.76	36.37	42.37	42.70	42.782	43.878	230.00
44+598	262	36.03	36.37	42.37	42.69	42.723	42.986	230.00
44+682	263	32.79	36.36	42.36	42.68	42.999	41.188	230.00
44+857	264	35.02	36.35	42.35	42.68	38.969	39.999	230.00
45+046	265	35.41	36.33	42.33	42.66	42.364	43.010	230.00
45+234	266	34.53	36.32	42.32	42.64	41.156	42.639	230.00
45+445	267	36.47	36.31	42.31	42.64	42.332	42.818	230.00
45+517	268	36.39	36.30	42.30	42.63	41.146	42.928	230.00
45+604	269	32.34	36.30	42.30	42.62	43.937	46.000	230.00
45+809	270	36.12	36.28	42.28	42.62	41.983	43.220	230.00
45+930	271	35.44	36.27	42.27	42.61	42.412	43.902	230.00
46+085	272	34.27	36.26	42.26	42.59	44.488	45.904	230.00

STNO	CSNO	Actual bed level (canal center)	Plan bed level	Required embankment level	Water level (Non-uniform flow)	Actual Left bank	Actual right bank	Amount of Water
m	No	m	m	m	m	m	m	m^3/sec
46+243	273	34.71	36.25	42.25	42.58	45.374	43.718	230.00
46+422	274	35.73	36.24	42.24	42.57	45.503	43.910	230.00
46+522	275	35.84	36.23	42.23	42.56	43.449	42.956	230.00
46+630	276	32.25	36.22	42.22	42.55	43.110	44.813	230.00
46+844	277	36.11	36.21	42.21	42.53	43.458	45.341	230.00
47+047	278	35.77	36.19	42.19	42.51	43.814	42.855	230.00
47+236	279	34.37	36.18	42.18	42.50	43.252	45.556	230.00
47+339	280	34.44	36.17	42.17	42.50	41.319	42.597	230.00
47+423	281	34.97	36.17	42.17	42.48	40.292	41.467	230.00
47+578	282	32.60	36.16	42.16	42.48	40.046	42.515	230.00
47+900	283	35.61	36.13	42.13	42.48	43.170	42.872	230.00
48+159	284	34.86	36.12	42.12	42.46	43.036	42.122	230.00
48+323	285	34.93	36.10	42.10	42.45	42.538	42.830	230.00
48+565	286	35.39	36.09	42.09	42.43	42.388	41.873	230.00
48+753	287	35.99	36.07	42.07	42.42	42.777	42.094	230.00
48+897	288	35.26	36.06	42.06	42.40	42.850	41.843	230.00
49+049	289	35.22	36.05	42.05	42.38	42.970	42.267	230.00
49+257	290	34.66	36.04	42.04	42.35	43.093	43.233	230.00
49+457	291	35.03	36.02	42.02	42.36	43.049	43.210	230.00
49+727	292	34.77	36.00	42.00	42.35	43.438	43.360	230.00
49+947	293	35.73	35.99	41.99	42.33	42.137	42.822	230.00
50+046	294	33.42	35.98	41.98	42.32	42.866	42.393	230.00
50+117	295	33.67	35.98	41.98	42.32	43.055	41.250	230.00
50+318	296	35.22	35.96	41.96	42.30	43.330	43.326	230.00
50+454	297	35.18	35.95	41.95	42.30	43.919	43.410	230.00
50+621	298	35.77	35.94	41.94	42.29	43.426	43.079	230.00
50+783	299	35.78	35.93	41.93	42.29	42.242	42.410	230.00
50+981	300	35.77	35.92	41.92	42.27	42.442	43.400	230.00
51+133	301	35.69	35.91	41.91	42.26	42.612	42.605	230.00
51+276	302	34.52	35.90	41.90	42.24	42.299	43.120	230.00
51+450	303	35.91	35.88	41.88	42.23	42.115	42.644	230.00
51+602	304	35.72	35.87	41.87	42.22	43.222	42.965	230.00
51+774	305	35.29	35.86	41.86	42.21	43.036	43.112	230.00
51+907	306	35.29	35.85	41.85	42.19	42.238	42.423	230.00
52+023	307	35.07	35.84	41.84	42.18	41.623	41.863	230.00
52+135	308	33.01	35.84	41.84	42.18	42.333	42.915	230.00
52+272	309	35.56	35.83	41.83	42.15	43.120	43.161	230.00
52+493	310	34.89	35.81	41.81	42.11	42.833	43.022	230.00
52+721	311	33.95	35.79	41.79	42.10	42.012	43.098	230.00
52+807	312	32.09	35.79	41.79	42.09	41.790	43.099	230.00
52+897	313	34.88	35.78	41.78	42.08	41.947	43.945	230.00
53+121	314	34.79	35.77	41.77	42.06	43.024	43.071	230.00
53+342	315	35.97	35.75	41.75	42.06	43.028	42.731	230.00
53+583	316	35.43	35.73	41.73	42.03	43.150	42.854	230.00
53+864	317	36.06	35.71	41.71	42.02	42.570	41.602	230.00
53+976	318	35.93	35.71	41.71	42.01	42.365	42.957	230.00
54+095	319	35.84	35.70	41.70	42.00	42.465	42.374	230.00
54+196	320	32.59	35.69	41.69	41.98	42.629	42.020	230.00
54+294	321	35.59	35.68	41.68	41.98	43.359	41.422	230.00
54+461	322	35.28	35.67	41.67	41.96	41.917	42.250	230.00
54+673	323	35.34	35.66	41.66	41.94	42.650	42.465	230.00
54+886	324	35.30	35.64	41.64	41.93	42.284	43.396	230.00
54+988	325	35.14	35.63	41.63	41.91	42.634	43.387	230.00
55+098	326	34.45	35.63	41.63	41.90	42.884	43.930	230.00
55+302	327	34.26	35.61	41.61	41.89	42.134	43.359	230.00
55+496	328	35.04	35.60	41.60	41.87	43.171	43.552	230.00
55+647	329	35.07	35.59	41.59	41.86	43.189	43.696	230.00
55+802	330	34.62	35.58	41.58	41.85	43.724	42.695	230.00
55+971	331	35.52	35.56	41.56	41.84	43.010	43.031	230.00
56+051	332	35.86	35.56	41.56	41.84	42.447	43.343	230.00
56+141	333	33.64	35.55	41.55	41.82	43.130	43.541	230.00
56+333	334	35.74	35.54	41.54	41.80	43.350	42.436	230.00
56+497	335	35.50	35.53	41.53	41.80	41.557	42.326	230.00
56+568	336	35.71	35.52	41.52	41.80	41.608	42.580	230.00
56+643	337	33.50	35.52	41.52	41.77	41.281	42.923	230.00
56+889	338	35.69	35.50	41.50	41.75	39.841	42.910	230.00
57+150	339	35.82	35.48	41.48	41.75	40.340	42.050	230.00
57+382	340	35.84	35.47	41.47	41.74	41.110	41.667	230.00

STNO	CSNO	Actual bed level (canal center)	Plan bed level	Required embankment level	Water level (Non-uniform flow)	Actual Left bank	Actual right bank	Amount of Water
m	No	m	m	m	m	m	m	m^3/sec
57+598	341	35.69	35.45	41.45	41.72	40.780	42.750	230.00
57+797	342	35.90	35.44	41.44	41.71	40.498	40.699	230.00
57+985	343	35.72	35.42	41.42	41.70	40.031	41.172	230.00
58+070	344	35.11	35.42	41.42	41.69	41.050	41.590	230.00
58+166	345	30.60	35.41	41.41	41.67	42.130	42.348	230.00
58+400	346	33.72	35.39	41.39	41.67	42.324	41.540	230.00
58+601	347	35.40	35.38	41.38	41.66	42.259	41.510	230.00
58+797	348	36.13	35.37	41.37	41.65	42.010	41.950	230.00
58+998	349	35.20	35.35	41.35	41.64	40.147	41.199	230.00
59+255	350	35.33	35.33	41.33	41.63	39.891	40.935	230.00
59+407	351	35.89	35.32	41.32	41.63	40.060	41.490	230.00
59+538	352	35.76	35.31	41.31	41.62	39.599	42.130	230.00
59+633	353	33.93	35.31	41.31	41.61	39.845	41.230	230.00
59+720	354	34.10	35.30	41.30	41.59	39.870	41.722	230.00
59+996	355	35.27	35.28	41.28	41.59	38.999	41.381	230.00
60+222	356	34.55	35.27	41.27	41.58	39.924	40.652	230.00
60+350	357	31.33	35.26	41.26	41.58	39.039	39.950	230.00
60+465	358	33.27	35.25	41.25	41.57	39.310	40.452	230.00
60+542	359	34.30	35.24	41.24	41.55	40.248	41.010	230.00
60+732	360	35.27	35.23	41.23	41.54	42.573	41.143	230.00
61+000	361	35.96	35.21	41.21	41.54	41.524	43.824	233.29
61+202	362	35.51	35.20	41.20	41.53	41.909	41.942	233.29
61+445	363	35.65	35.18	41.18	41.52	41.526	41.262	233.29
61+720	364	35.35	35.16	41.16	41.50	41.725	41.257	233.29
61+962	365	34.73	35.14	41.14	41.44	41.025	41.682	233.29
62+163	366	34.97	35.13	41.13	41.46	42.404	41.771	233.29
62+401	367	35.23	35.11	41.11	41.43	41.816	41.681	233.29
62+642	368	35.17	35.09	41.09	41.41	42.167	43.633	233.29
62+864	369	35.19	35.08	41.08	41.40	41.999	40.792	233.29
62+981	370	34.36	35.07	41.07	41.40	38.394	41.581	233.29
63+093	371	32.95	35.06	41.06	41.39	41.797	40.994	233.29
63+257	372	33.89	35.05	41.05	41.40	42.828	39.158	233.29
63+357	373	36.34	35.04	41.04	41.38	42.373	41.791	233.29
63+485	374	35.76	35.03	41.03	41.37	43.621	41.801	233.29
63+544	375	35.05	35.03	41.03	41.36	43.123	43.258	233.29
63+598	376	34.70	35.03	41.03	41.35	43.230	42.320	233.29
63+838	377	36.08	35.01	41.01	41.34	42.821	41.789	233.29
64+105	378	35.82	34.99	40.99	41.33	42.475	41.375	233.29
64+191	379	35.34	34.99	40.99	41.33	41.487	41.994	233.29
64+286	380	34.44	34.98	40.98	41.31	41.349	43.159	233.29
64+484	381	34.80	34.96	40.96	41.30	42.087	41.410	233.29
64+768	382	35.43	34.94	40.94	41.28	40.713	41.489	233.29
64+938	383	34.95	34.93	40.93	41.27	40.352	41.361	233.29
65+134	384	34.11	34.92	40.92	41.26	41.428	41.105	233.29
65+220	385	35.41	34.91	40.91	41.26	40.970	42.490	233.29
65+309	386	34.01	34.91	40.91	41.24	40.445	42.203	233.29
65+483	387	35.34	34.89	40.89	41.22	40.677	41.352	233.29
65+697	388	35.59	34.88	40.88	41.20	40.986	41.657	233.29
65+793	389	35.82	34.87	40.87	41.19	42.046	41.678	233.29
65+869	390	35.69	34.87	40.87	41.18	42.291	41.352	233.29
66+097	391	34.80	34.85	40.85	41.15	42.514	40.610	233.29
66+297	392	35.03	34.84	40.84	41.13	46.753	40.827	233.29
66+514	393	34.99	34.82	40.82	41.11	46.759	41.150	233.29
66+746	394	34.95	34.81	40.81	41.11	47.220	38.731	233.29
66+972	395	36.01	34.79	40.79	41.08	47.230	41.194	233.29
67+140	396	35.49	34.78	40.78	41.07	40.940	41.147	233.29
67+305	397	35.20	34.77	40.77	41.05	39.888	41.120	233.29
67+402	398	35.42	34.76	40.76	41.05	39.579	40.800	233.29
67+491	399	34.89	34.75	40.75	41.03	41.061	41.100	233.29
67+667	400	35.15	34.74	40.74	41.02	41.329	39.215	233.29
67+908	401	35.02	34.72	40.72	41.01	39.269	39.318	233.29
68+008	402	35.40	34.72	40.72	40.99	40.218	40.283	233.29
68+109	403	34.08	34.71	40.71	40.97	40.457	40.690	233.29
68+353	404	35.42	34.69	40.69	40.94	42.596	40.470	233.29
68+466	405	34.60	34.68	40.68	40.93	42.052	40.545	233.29
68+700	406	35.27	34.67	40.67	40.91	42.790	41.632	233.29
68+911	407	35.30	34.65	40.65	40.89	38.588	40.953	233.29
68+983	408	35.55	34.65	40.65	40.89	39.675	40.588	233.29

STNO	CSNO	Actual bed level (canal center)	Plan bed level	Required embankment level	Water level (Non-uniform flow)	Actual Left bank	Actual right bank	Amount of Water
m	No	m	m	m	m	m	m	m^3/sec
69+056	409	33.14	34.64	40.64	40.87	39.702	41.625	233.29
69+271	410	35.89	34.63	40.63	40.87	38.752	42.969	233.29
69+502	411	35.09	34.61	40.61	40.86	43.228	41.026	233.29
69+604	412	35.08	34.60	40.60	40.83	42.913	41.291	233.29
69+729	413	33.79	34.59	40.59	40.84	40.837	40.894	233.29
69+860	414	36.25	34.59	40.59	40.82	41.826	41.358	233.29
69+986	415	34.66	34.58	40.58	40.81	47.799	40.600	233.29
70+047	416	32.75	34.57	40.57	40.81	47.036	39.927	233.29
70+133	417	32.02	34.57	40.57	40.80	48.671	40.284	233.29
70+360	418	35.32	34.55	40.55	40.77	46.026	37.542	233.29
70+572	419	35.59	34.54	40.54	40.76	42.172	41.071	233.29
70+772	420	35.55	34.52	40.52	40.75	41.441	41.466	233.29
70+996	421	35.47	34.51	40.51	40.73	43.149	42.411	233.29
71+071	422	35.50	34.50	40.50	40.72	42.990	42.809	233.29
71+180	423	28.16	34.49	40.49	40.73	42.466	35.908	233.29
71+435	424	36.39	34.47	40.47	40.71	41.234	38.156	233.29
71+720	425	35.66	34.45	40.45	40.69	41.761	40.694	233.29
71+824	426	35.59	34.45	40.45	40.67	40.503	40.663	233.29
71+941	427	35.09	34.44	40.44	40.64	40.919	40.086	233.29
72+170	428	34.89	34.42	40.42	40.61	40.785	40.838	233.29
72+367	429	35.41	34.41	40.41	40.58	39.951	42.289	233.29
72+603	430	35.21	34.39	40.39	40.56	40.964	40.812	233.29
72+716	431	35.29	34.38	40.38	40.53	41.314	39.977	233.29
72+800	432	33.42	34.38	40.38	40.53	42.158	43.030	210.15
73+006	433	34.57	34.36	40.36	40.53	41.745	41.650	210.15
73+144	434	34.83	34.35	40.35	40.53	41.146	40.253	210.15
73+377	435	34.71	34.34	40.34	40.52	41.208	40.967	210.15
73+470	436	34.86	34.33	40.33	40.53	41.051	41.151	210.15
73+573	437	36.16	34.32	40.32	40.52	40.883	42.917	210.15
73+693	438	34.36	34.32	40.32	40.53	42.861	40.681	210.15
73+783	439	33.33	34.31	40.31	40.53	40.047	40.279	210.15
73+972	440	34.87	34.30	40.30	40.53	46.574	41.730	210.15
74+182	441	34.75	34.28	40.28	40.53	42.921	40.987	210.15
74+397	442	34.75	34.27	40.27	40.54	46.034	39.549	210.15
74+581	443	34.88	34.25	40.25	40.53	41.075	40.872	210.15
74+685	444	33.54	34.25	40.25	40.52	41.951	41.000	210.15
74+779	445	30.83	34.24	40.24	40.52	41.087	41.305	210.15
74+874	446	34.05	34.23	40.23	40.51	40.420	41.954	210.15
75+039	447	35.04	34.22	40.22	40.50	40.403	43.487	210.15
75+276	448	35.10	34.20	40.20	40.48	41.425	40.772	210.15
75+358	449	35.03	34.20	40.20	40.48	41.843	41.102	210.15
75+428	450	32.62	34.19	40.19	40.46	41.509	41.093	210.15
75+476	451	31.81	34.19	40.19	40.49	41.993	40.887	210.15
75+544	452	34.57	34.18	40.18	40.46	41.150	40.727	210.15
75+737	453	34.94	34.17	40.17	40.45	42.708	41.288	210.15
75+908	454	35.48	34.16	40.16	40.45	40.271	40.961	210.15
76+024	455	35.18	34.15	40.15	40.44	40.857	42.382	210.15
76+160	456	33.78	34.14	40.14	40.43	40.931	42.709	210.15
76+374	457	35.00	34.13	40.13	40.42	40.224	41.306	210.15
76+562	458	32.91	34.11	40.11	40.40	41.225	43.831	210.15
76+748	459	35.45	34.10	40.10	40.40	41.439	41.386	210.15
76+871	460	34.15	34.09	40.09	40.31	40.055	41.291	209.82
77+029	461	35.75	34.08	40.08	40.31	42.094	41.402	209.82
77+151	462	35.17	34.07	40.07	40.31	33.543	41.415	209.82
77+439	463	34.58	34.06	40.06	40.30	31.601	37.285	209.82
77+624	464	34.22	34.04	40.04	40.26	45.449	41.591	209.82
77+805	465	34.93	34.03	40.03	40.25	41.027	40.619	209.82
77+929	466	35.51	34.02	40.02	40.24	40.379	39.950	209.82
78+047	467	35.92	34.02	40.02	40.22	40.654	38.621	209.82
78+207	468	35.69	34.01	40.01	40.21	41.683	40.059	209.82
78+429	469	34.58	33.99	39.99	40.19	39.598	40.023	209.82
78+737	470	34.64	33.97	39.97	40.19	41.888	36.647	209.82
79+004	471	34.86	33.95	39.95	40.18	41.811	39.517	209.82
79+241	472	34.77	33.94	39.94	40.17	38.752	36.978	209.82
79+494	473	34.94	33.92	39.92	40.17	37.981	37.594	209.82
79+621	474	34.14	33.92	39.92	40.16	39.946	35.857	209.82
79+738	475	34.87	33.91	39.91	40.14	40.519	36.002	209.82
79+814	476	34.14	33.90	39.90	40.15	41.784	34.790	209.82

STNO	CSNO	Actual bed level (canal center)	Plan bed level	Required embankment level	Water level (Non-uniform flow)	Actual Left bank	Actual right bank	Amount of Water
m	No	m	m	m	m	m	m	m^3/sec
79+895	477	33.30	33.90	39.90	40.13	40.178	35.334	209.82
80+094	478	33.31	33.88	39.88	40.13	39.729	36.624	209.82
80+249	479	34.27	33.87	39.87	40.12	40.541	42.194	209.82
80+333	480	33.68	33.87	39.87	40.12	39.893	36.620	209.82
80+426	481	33.13	33.86	39.86	40.11	42.768	40.957	209.82
80+591	482	32.28	33.85	39.85	40.10	41.951	37.250	209.82
80+697	483	33.40	33.85	39.85	40.09	39.476	41.475	209.82
80+891	484	32.99	33.83	39.83	40.09	40.134	35.600	209.82
81+121	485	34.03	33.82	39.82	40.06	42.183	43.308	209.82
81+336	486	34.79	33.80	39.80	40.07	40.020	35.445	209.82
81+516	487	35.33	33.79	39.79	40.05	43.880	39.964	209.82
81+690	488	35.11	33.78	39.78	40.05	41.877	37.419	209.82
81+915	489	34.85	33.77	39.77	40.04	39.440	39.891	209.82
82+069	490	34.66	33.76	39.76	40.03	38.074	38.240	209.82
82+223	491	34.37	33.75	39.75	40.03	39.107	38.683	209.82
82+440	492	33.06	33.73	39.73	39.99	43.308	41.675	209.82
82+680	493	34.86	33.72	39.72	40.00	41.703	41.820	209.82
82+777	494	34.57	33.71	39.71	39.99	41.909	39.595	209.82
82+877	495	34.83	33.71	39.71	39.97	41.823	40.960	209.82
83+088	496	34.41	33.69	39.69	39.95	40.002	40.547	209.82
83+291	497	34.28	33.68	39.68	39.95	38.823	39.956	209.82
83+495	498	34.69	33.67	39.67	39.94	39.256	41.107	209.82
83+702	499	34.57	33.65	39.65	39.93	40.910	39.410	209.82
83+863	500	34.06	33.64	39.64	39.92	36.892	37.702	209.82
84+050	501	34.17	33.63	39.63	39.91	38.951	40.974	209.82
84+225	502	33.94	33.62	39.62	39.89	35.934	38.818	209.82
84+354	503	33.82	33.61	39.61	39.89	39.108	36.846	209.82
84+445	504	33.07	33.60	39.60	39.88	33.696	39.721	209.82
84+485	505	32.84	33.60	39.60	39.88	39.716	39.384	209.82
84+538	506	30.04	33.60	39.60	39.89	40.359	37.851	209.82
84+721	507	34.75	33.59	39.59	39.89	37.640	38.180	209.82
84+850	508	35.04	33.58	39.58	39.87	39.189	43.139	209.82
84+979	509	35.02	33.57	39.57	39.88	38.230	38.010	209.82
85+121	510	34.65	33.56	39.56	39.87	39.519	36.613	209.82
85+227	511	34.37	33.55	39.55	39.85	39.626	39.069	209.82
85+334	512	33.26	33.55	39.55	39.84	39.441	35.764	209.82
85+556	513	33.52	33.53	39.53	39.85	39.630	35.509	209.82
85+688	514	32.32	33.52	39.52	39.83	40.041	38.013	209.82
85+829	515	33.88	33.52	39.52	39.83	39.111	41.361	209.82
85+981	516	31.83	33.51	39.51	39.81	40.758	39.620	209.82
86+165	517	34.01	33.49	39.49	39.81	37.283	37.801	209.82
86+239	518	34.79	33.49	39.49	39.81	37.230	34.899	209.82
86+338	519	35.40	33.48	39.48	39.78	39.859	33.909	209.82
86+468	520	33.85	33.47	39.47	39.78	38.719	36.924	209.82
86+700	521	33.34	33.46	39.46	39.78	40.980	39.417	209.82
86+877	522	34.83	33.45	39.45	39.77	38.850	40.473	209.82
87+021	523	34.92	33.44	39.44	39.76	41.318	38.611	209.82
87+234	524	34.57	33.42	39.42	39.75	40.271	40.460	209.82
87+352	525	33.77	33.42	39.42	39.74	40.000	40.572	209.82
87+420	526	32.03	33.41	39.41	39.72	39.600	40.357	209.82
87+496	527	30.74	33.41	39.41	39.72	39.175	40.295	209.82
87+562	528	31.61	33.40	39.40	39.72	39.001	40.399	209.82
87+750	529	33.61	33.39	39.39	39.70	39.476	40.435	209.82
87+945	530	34.96	33.38	39.38	39.69	39.685	40.198	209.82
88+072	531	35.09	33.37	39.37	39.69	40.303	39.993	209.82
88+202	532	35.43	33.36	39.36	39.68	39.696	39.540	209.82
88+420	533	34.90	33.35	39.35	39.66	41.180	40.100	209.82
88+665	534	34.51	33.33	39.33	39.65	42.508	40.100	209.82
88+849	535	33.96	33.32	39.32	39.64	38.270	39.196	209.82
88+998	536	34.34	33.31	39.31	39.63	37.997	38.416	209.82
89+127	537	34.24	33.30	39.30	39.62	37.500	39.149	209.82
89+225	538	34.36	33.30	39.30	39.61	37.800	38.895	209.82
89+327	539	33.48	33.29	39.29	39.61	38.091	38.749	209.82
89+484	540	32.69	33.28	39.28	39.60	37.933	38.779	209.82
89+640	541	32.83	33.27	39.27	39.58	39.366	38.995	209.82
89+782	542	33.89	33.26	39.26	39.58	38.400	38.861	209.82
89+979	543	33.24	33.25	39.25	39.55	39.099	39.266	209.82
90+167	544	34.09	33.24	39.24	39.54	40.509	42.441	209.82

STNO	CSNO	Actual bed level (canal center)	Plan bed level	Required embankment level	Water level (Non-uniform flow)	Actual Left bank	Actual right bank	Amount of Water
m	No	m	m	m	m	m	m	m^3/sec
90+286	545	34.76	33.23	39.23	39.53	40.808	39.611	209.82
90+412	546	32.79	33.22	39.22	39.51	40.051	38.946	209.82
90+734	547	33.81	33.20	39.20	39.49	39.700	38.913	209.82
91+062	548	33.76	33.18	39.18	39.48	38.430	38.669	209.82
91+336	549	34.15	33.16	39.16	39.47	39.367	38.890	209.82
91+553	550	34.16	33.15	39.15	39.45	38.978	38.895	209.82
91+746	551	33.80	33.13	39.13	39.43	39.101	38.159	209.82
91+853	552	29.70	33.13	39.13	39.43	39.147	37.688	209.82
91+966	553	33.91	33.12	39.12	39.41	38.903	39.431	209.82
92+065	554	33.68	33.11	39.11	39.41	39.116	39.400	209.82
92+231	555	32.81	33.10	39.10	39.39	38.797	38.781	209.82
92+497	556	33.04	33.09	39.09	39.39	38.100	38.744	209.82
92+673	557	33.51	33.07	39.07	39.38	38.955	38.868	209.82
92+873	558	33.63	33.06	39.06	39.36	38.886	38.940	209.82
92+967	559	34.39	33.06	39.06	39.35	39.026	38.797	209.82
93+079	560	33.13	33.05	39.05	39.33	39.219	39.026	209.82
93+267	561	32.55	33.04	39.04	39.31	38.822	39.973	209.82
93+493	562	32.32	33.02	39.02	39.30	38.762	39.995	209.82
93+777	563	33.15	33.00	39.00	39.29	38.710	38.777	209.82
93+991	564	33.37	32.99	38.99	39.28	39.125	38.905	209.82
94+145	565	33.72	32.98	38.98	39.27	39.117	38.810	209.82
94+252	566	32.79	32.97	38.97	39.27	38.468	41.084	209.82
94+350	567	33.94	32.97	38.97	39.25	38.934	37.439	209.82
94+568	568	32.66	32.95	38.95	39.24	38.045	39.021	209.82
94+638	569	32.87	32.95	38.95	39.24	41.977	38.480	209.82
94+700	570	32.77	32.94	38.94	39.23	43.569	39.022	209.82
94+900	571	33.94	32.93	38.93	39.29	39.327	38.754	209.82
95+068	572	33.98	32.92	38.92	39.29	39.520	38.689	209.82
95+240	573	33.90	32.91	38.91	39.28	38.319	38.814	209.82
95+364	574	33.96	32.90	38.90	39.28	39.501	38.789	209.82
95+479	575	33.40	32.89	38.89	39.29	39.181	38.768	209.82
95+602	576	31.40	32.89	38.89	39.28	39.534	38.390	209.82
95+798	577	32.62	32.87	38.87	39.28	40.605	38.713	209.82
95+891	578	33.22	32.87	38.87	39.28	41.759	38.622	209.82
96+022	579	34.27	32.86	38.86	39.29	39.284	38.638	209.82
96+192	580	34.25	32.85	38.85	39.29	38.837	38.723	209.82
96+461	581	32.84	32.83	38.83	39.29	38.973	38.546	209.82
96+639	582	33.47	32.82	38.82	39.29	39.134	39.846	209.82
96+789	583	33.81	32.81	38.81	39.29	38.926	38.068	209.82
96+885	584	33.92	32.80	38.80	39.29	38.708	38.560	209.82
97+008	585	31.73	32.80	38.80	39.29	37.107	38.194	209.82
97+226	586	33.38	32.78	38.78	39.29	38.587	38.767	209.82
97+415	587	31.42	32.77	38.77	39.29	38.698	38.653	209.82
97+705	588	33.07	32.75	38.75	39.29	41.656	37.944	209.82
97+835	589	31.99	32.74	38.74	39.29	39.081	37.550	209.82
98+001	590	30.14	32.73	38.73	39.28	38.101	38.429	209.82
98+243	591	33.81	32.72	38.72	39.29	38.799	38.164	209.82
98+494	592	34.31	32.70	38.70	39.29	38.284	38.949	209.82
98+746	593	34.17	32.68	38.68	39.28	38.586	39.839	209.82
98+996	594	33.66	32.67	38.67	39.27	40.278	39.666	209.82
99+245	595	33.51	32.65	38.65	39.26	39.230	38.663	209.82
99+545	596	33.50	32.63	38.63	39.24	39.164	38.281	209.82
99+691	597	33.44	32.62	38.62	39.24	38.988	37.438	209.82
99+835	598	32.95	32.61	38.61	39.23	38.321	38.267	209.82
99+928	599	33.38	32.61	38.61	39.22	38.430	38.827	209.82
100+049	600	32.61	32.60	38.60	39.21	37.156	38.546	209.82
100+152	601	33.51	32.59	38.59	39.20	38.164	38.699	209.82
100+280	602	31.60	32.59	38.59	39.19	37.970	38.524	209.82
100+486	603	33.76	32.57	38.57	39.18	40.481	39.069	209.82
100+743	604	32.22	32.56	38.56	39.16	38.905	38.379	209.82
100+836	605	31.16	32.55	38.55	39.17	37.590	38.417	209.82
100+938	606	29.94	32.54	38.54	39.16	38.445	38.357	209.82
101+048	607	32.75	32.54	38.54	39.15	39.794	38.431	209.82
101+139	608	32.16	32.53	38.53	39.14	39.052	38.092	209.82
101+257	609	31.64	32.52	38.52	39.13	38.532	37.985	209.82
101+425	610	33.13	32.51	38.51	39.13	38.046	37.867	209.82
101+641	611	32.07	32.50	38.50	39.12	37.883	38.099	209.82
101+826	612	32.06	32.49	38.49	39.11	38.108	38.020	209.82

STNO	CSNO	Actual bed level (canal center)	Plan bed level	Required embankment level	Water level (Non-uniform flow)	Actual Left bank	Actual right bank	Amount of Water
m	No	m	m	m	m	m	m	m^3/sec
102+012	613	32.13	32.47	38.47	39.10	38.155	38.355	209.82
102+101	614	33.48	32.47	38.47	39.09	38.134	38.422	209.82
102+205	615	32.73	32.46	38.46	39.08	38.005	38.605	209.82
102+294	616	33.32	32.46	38.46	39.08	38.529	38.100	209.82
102+353	617	32.07	32.45	38.45	39.07	38.277	37.885	209.82
102+578	618	31.20	32.44	38.44	39.06	38.797	39.671	209.82
102+780	619	33.77	32.42	38.42	39.05	38.154	38.675	209.82
103+021	620	33.22	32.41	38.41	39.03	37.965	37.900	209.82
103+255	621	32.67	32.39	38.39	39.02	38.162	38.340	209.82
103+308	622	28.34	32.39	38.39	39.01	37.864	37.924	209.82
103+368	623	28.52	32.39	38.39	39.02	38.809	37.861	209.82
103+650	624	33.65	32.37	38.37	39.00	38.885	38.319	209.82
103+775	625	32.95	32.36	38.36	38.99	38.806	38.044	209.82
103+957	626	30.98	32.35	38.35	38.96	38.779	38.009	209.82
104+098	627	31.53	32.34	38.34	38.95	39.115	38.095	209.82
104+241	628	31.20	32.33	38.33	38.95	38.822	38.095	209.82
104+484	629	31.88	32.31	38.31	38.94	38.471	38.368	209.82
104+644	630	32.91	32.30	38.30	38.94	37.917	38.539	209.82
104+792	631	32.82	32.29	38.29	38.92	40.338	38.201	209.82
104+854	632	32.30	32.29	38.29	38.92	40.494	38.257	209.82
104+928	633	30.91	32.29	38.29	38.91	39.392	38.268	209.82
105+036	634	29.71	32.28	38.28	38.90	39.568	38.254	209.82
105+163	635	31.45	32.27	38.27	38.89	38.989	38.646	209.82
105+300	636	33.22	32.26	38.26	38.89	39.107	39.451	209.82
105+430	637	33.06	32.25	38.25	38.89	40.210	38.913	209.82
105+637	638	33.65	32.24	38.24	38.88	37.999	37.558	209.82
105+799	639	33.67	32.23	38.23	38.86	37.727	39.301	209.82
105+995	640	33.52	32.22	38.22	38.85	37.933	38.911	209.82
106+163	641	33.42	32.21	38.21	38.84	37.562	38.764	209.82
106+315	642	33.41	32.20	38.20	38.83	37.907	38.649	209.82
106+471	643	33.23	32.19	38.19	38.82	40.286	37.701	209.82
106+541	644	33.19	32.18	38.18	38.81	39.839	38.970	209.82
106+605	645	31.67	32.18	38.18	38.81	39.563	38.968	209.82
106+818	646	32.74	32.16	38.16	38.79	41.050	38.486	209.82
106+977	647	32.67	32.15	38.15	38.78	38.801	38.473	209.82
107+092	648	31.65	32.15	38.15	38.77	38.093	38.176	209.82
107+175	649	31.71	32.14	38.14	38.76	38.148	38.565	209.82
107+338	650	32.33	32.13	38.13	38.75	42.164	37.540	209.82
107+526	651	32.41	32.12	38.12	38.74	37.605	38.762	209.82
107+702	652	32.94	32.11	38.11	38.74	37.661	38.126	209.82
107+800	653	32.78	32.10	38.10	38.73	37.612	37.863	209.82
107+916	654	32.74	32.09	38.09	38.72	37.672	37.761	209.82
108+100	655	32.67	32.08	38.08	38.71	37.756	37.560	209.82
108+290	656	32.69	32.07	38.07	38.70	37.668	37.550	209.82
108+458	657	32.56	32.06	38.06	38.69	37.932	37.519	209.82
108+529	658	31.99	32.05	38.05	38.68	37.974	37.523	209.82
108+615	659	30.92	32.05	38.05	38.67	38.061	37.520	209.82
108+778	660	32.59	32.04	38.04	38.66	37.973	37.511	209.82
108+934	661	30.53	32.03	38.03	38.65	37.989	37.724	209.82
108+984	662	29.55	32.02	38.02	38.65	37.806	37.658	209.82
109+047	663	30.36	32.02	38.02	38.64	37.812	37.510	209.82
109+177	664	31.29	32.01	38.01	38.64	37.505	37.480	209.82
109+205	665	31.17	32.01	38.01	38.64	37.486	37.500	209.82
109+235	666	31.83	32.01	38.01	38.64	37.504	37.460	209.82
109+347	667	32.85	32.00	38.00	38.63	37.832	37.489	209.82
109+471	668	32.89	31.99	37.99	38.62	38.523	37.721	209.82
109+540	669	27.06	31.99	37.99	38.62	38.913	38.451	209.82
109+592	670	30.19	31.99	37.99	38.60	39.869	38.843	209.82
109+750	671	31.92	31.98	37.98	38.60	38.530	38.350	206.29
109+921	672	32.88	31.96	37.96	38.59	37.400	37.981	206.29
110+002	673	33.02	31.96	37.96	38.58	37.772	37.396	206.29
110+073	674	32.51	31.95	37.95	38.57	37.827	39.790	206.29
110+183	675	30.50	31.95	37.95	38.58	38.093	37.424	206.29
110+310	676	32.10	31.94	37.94	38.57	37.595	38.219	206.29
110+354	677	32.60	31.94	37.94	38.57	37.401	37.905	206.29
110+392	678	32.84	31.93	37.93	38.56	37.499	37.993	206.29
110+545	679	32.81	31.92	37.92	38.54	37.824	38.395	206.29
110+670	680	32.80	31.92	37.92	38.54	38.321	38.049	206.29

STNO	CSNO	Actual bed level (canal center)	Plan bed level	Required embankment level	Water level (Non-uniform flow)	Actual Left bank	Actual right bank	Amount of Water
m	No	m	m	m	m	m	m	m^3/sec
110+826	681	33.09	31.91	37.91	38.53	39.170	37.391	206.29
110+960	682	32.89	31.90	37.90	38.52	40.142	37.388	206.29
111+027	683	31.86	31.89	37.89	38.52	39.000	37.575	206.29
111+114	684	31.35	31.89	37.89	38.51	39.119	37.829	206.29
111+271	685	33.58	31.88	37.88	38.51	37.500	37.415	206.29
111+446	686	32.66	31.87	37.87	38.50	38.700	38.226	206.29
111+620	687	32.02	31.86	37.86	38.48	38.741	37.650	206.29
111+710	688	33.10	31.85	37.85	38.47	37.521	37.706	206.29
111+790	689	32.82	31.84	37.84	38.46	38.820	37.615	206.29
111+960	690	32.77	31.83	37.83	38.45	38.411	37.705	206.29
112+145	691	32.69	31.82	37.82	38.44	37.802	38.307	206.29
112+288	692	33.59	31.81	37.81	38.43	37.217	38.035	206.29
112+458	693	31.59	31.80	37.80	38.43	38.325	37.478	206.29
112+495	694	30.28	31.80	37.80	38.42	38.650	37.810	206.29
112+532	695	29.68	31.80	37.80	38.41	39.027	37.780	206.29
112+691	696	32.27	31.79	37.79	38.41	38.743	37.817	206.29
112+809	697	32.84	31.78	37.78	38.40	38.500	38.134	206.29
112+950	698	32.99	31.77	37.77	38.40	37.310	37.849	206.29
113+110	699	32.76	31.76	37.76	38.39	38.105	37.749	206.29
113+174	700	32.38	31.76	37.76	38.38	38.550	37.781	206.29
113+236	701	31.38	31.75	37.75	38.37	38.840	37.787	206.29
113+379	702	30.97	31.74	37.74	38.37	38.860	37.912	206.29
113+535	703	32.20	31.73	37.73	38.37	37.567	37.515	206.29
113+615	704	31.54	31.73	37.73	38.36	37.648	37.894	206.29
113+710	705	32.33	31.72	37.72	38.36	37.595	37.155	206.29
113+886	706	32.71	31.71	37.71	38.34	38.000	38.826	206.29
114+063	707	31.47	31.70	37.70	38.33	38.249	39.040	206.29
114+125	708	31.12	31.69	37.69	38.33	38.110	39.780	206.29
114+178	709	31.80	31.69	37.69	38.31	38.160	38.000	206.29
114+413	710	31.88	31.68	37.68	38.30	38.220	37.827	206.29
114+512	711	33.36	31.67	37.67	38.28	38.473	37.421	206.29
114+611	712	31.15	31.66	37.66	38.28	38.500	37.478	206.29
114+710	713	31.33	31.66	37.66	38.27	38.150	37.342	206.29
114+824	714	31.07	31.65	37.65	38.26	38.250	37.416	206.29
115+037	715	31.29	31.64	37.64	38.25	38.200	37.416	206.29
115+253	716	32.81	31.62	37.62	38.24	37.842	37.248	206.29
115+329	717	32.77	31.62	37.62	38.24	37.774	37.250	206.29
115+418	718	32.63	31.61	37.61	38.23	37.849	37.621	206.29
115+542	719	32.28	31.60	37.60	38.21	38.150	37.887	206.29
115+692	720	32.17	31.59	37.59	38.20	37.798	37.650	206.29
115+767	721	31.65	31.59	37.59	38.19	37.800	38.319	206.29
115+845	722	31.44	31.58	37.58	38.19	37.849	37.709	206.29
115+989	723	30.58	31.57	37.57	38.20	37.850	37.815	206.29
116+154	724	31.35	31.56	37.56	38.17	38.000	37.600	206.29
116+221	725	31.55	31.56	37.56	38.18	37.650	37.310	206.29
116+302	726	31.70	31.55	37.55	38.16	37.849	37.720	206.29
116+492	727	32.30	31.54	37.54	38.15	39.000	37.884	206.29
116+660	728	32.08	31.53	37.53	38.14	38.496	37.720	206.29
116+857	729	32.38	31.52	37.52	38.13	39.000	37.796	206.29
117+025	730	32.00	31.51	37.51	38.12	39.017	37.194	206.29
117+200	731	32.48	31.50	37.50	38.11	38.198	37.789	206.29
117+282	732	30.92	31.49	37.49	38.10	38.146	37.578	206.29
117+364	733	31.84	31.49	37.49	38.09	38.200	37.406	206.29
117+531	734	30.50	31.47	37.47	38.10	38.344	37.691	206.29
117+616	735	31.56	31.47	37.47	38.08	38.198	37.289	206.29
117+680	736	31.90	31.47	37.47	38.07	38.200	37.710	206.29
117+878	737	31.30	31.45	37.45	38.06	38.080	38.048	206.29
118+069	738	32.82	31.44	37.44	38.04	38.450	37.348	206.29
118+328	739	32.64	31.42	37.42	38.02	38.534	37.371	206.29
118+421	740	31.94	31.42	37.42	38.02	37.330	37.113	206.29
118+541	741	30.47	31.41	37.41	38.01	38.675	37.253	206.29
118+730	742	32.76	31.40	37.40	37.99	38.550	37.930	206.29
118+899	743	31.57	31.39	37.39	37.97	38.950	37.491	206.29
119+130	744	32.40	31.37	37.37	37.95	39.210	37.927	206.29
119+400	745	32.47	31.35	37.35	37.94	37.372	37.449	206.29
119+559	746	32.41	31.34	37.34	37.92	37.977	37.332	206.29
119+745	747	32.46	31.33	37.33	37.91	37.631	37.475	206.29
119+819	748	32.44	31.33	37.33	37.91	37.500	36.987	206.29

STNO	CSNO	Actual bed level (canal center)	Plan bed level	Required embankment level	Water level (Non-uniform flow)	Actual Left bank	Actual right bank	Amount of Water
m	No	m	m	m	m	m	m	m^3/sec
119+887	749	31.27	31.32	37.32	37.90	37.641	37.617	206.29
120+027	750	32.31	31.31	37.31	37.89	37.450	37.650	206.29
120+182	751	31.42	31.30	37.30	37.88	37.000	37.319	206.29
120+248	752	29.27	31.30	37.30	37.87	37.250	37.328	206.29
120+332	753	30.59	31.29	37.29	37.85	38.010	37.400	206.29
120+467	754	31.41	31.29	37.29	37.83	38.683	37.400	206.29
120+599	755	31.63	31.28	37.28	37.84	37.613	37.477	206.29
120+623	756	31.40	31.28	37.28	37.83	38.330	38.156	206.29
120+642	757	31.67	31.27	37.27	37.83	38.046	38.130	206.29
120+758	758	29.15	31.27	37.27	37.83	37.750	37.100	206.29
120+807	759	30.87	31.26	37.26	37.83	37.779	37.288	206.29
120+881	760	31.80	31.26	37.26	37.82	37.863	37.487	206.29
121+072	761	32.16	31.25	37.25	37.81	37.786	37.116	206.29
121+322	762	32.01	31.23	37.23	37.79	37.497	38.001	206.29
121+420	763	31.48	31.22	37.22	37.78	37.449	38.570	206.29
121+506	764	31.40	31.22	37.22	37.76	37.438	38.821	206.29
121+686	765	30.60	31.21	37.21	37.75	37.399	38.279	206.29
121+906	766	31.65	31.19	37.19	37.73	37.318	38.200	206.29
122+001	767	32.28	31.19	37.19	37.72	37.479	38.172	206.29
122+089	768	32.66	31.18	37.18	37.72	37.347	37.495	206.29
122+214	769	31.19	31.17	37.17	37.69	38.200	37.193	206.29
122+260	770	31.69	31.17	37.17	37.69	38.216	37.217	206.29
122+332	771	31.95	31.17	37.17	37.68	38.200	37.387	206.29
122+588	772	32.19	31.15	37.15	37.66	38.430	39.280	206.29
122+617	773	31.79	31.15	37.15	37.67	38.511	39.320	206.29
122+659	774	30.00	31.14	37.14	37.67	38.716	39.350	206.29
122+800	775	29.60	31.14	37.14	37.66	37.370	37.065	205.74
123+018	776	32.07	31.12	37.12	37.65	36.550	40.402	205.74
123+218	777	32.11	31.11	37.11	37.63	36.670	36.652	205.74
123+296	778	30.90	31.10	37.10	37.61	36.702	38.460	205.74
123+377	779	31.18	31.10	37.10	37.61	37.013	42.520	205.74
123+525	780	31.56	31.09	37.09	37.58	36.491	38.139	205.74
123+707	781	31.94	31.08	37.08	37.57	36.705	36.490	205.74
123+756	782	30.99	31.07	37.07	37.57	36.762	36.490	205.74
123+798	783	31.10	31.07	37.07	37.56	36.659	36.490	205.74
123+910	784	30.58	31.06	37.06	37.56	36.962	36.470	205.74
124+065	785	31.36	31.05	37.05	37.54	37.016	36.427	205.74
124+276	786	30.78	31.04	37.04	37.53	37.005	36.396	205.74
124+480	787	31.14	31.03	37.03	37.53	36.439	36.410	205.74
124+641	788	31.19	31.02	37.02	37.51	36.420	36.930	205.74
124+800	789	31.25	31.01	37.01	37.50	36.408	37.421	205.74
124+962	790	30.95	31.00	37.00	37.50	36.400	35.847	205.74
125+052	791	30.35	30.99	36.99	37.49	36.538	36.977	205.74
125+150	792	29.03	30.98	36.98	37.48	36.609	37.129	205.74
125+358	793	31.41	30.97	36.97	37.46	36.905	37.065	205.74
125+511	794	30.96	30.96	36.96	37.45	37.250	37.020	205.74
125+615	795	29.96	30.95	36.95	37.44	36.738	36.823	205.74
125+735	796	30.13	30.95	36.95	37.44	36.500	37.370	205.74
125+858	797	32.22	30.94	36.94	37.42	37.104	37.661	205.74
126+078	798	31.67	30.92	36.92	37.42	36.598	36.748	205.74
126+260	799	31.26	30.91	36.91	37.41	36.666	38.234	205.74
126+475	800	30.72	30.90	36.90	37.39	36.385	37.973	205.74
126+586	801	31.22	30.89	36.89	37.38	36.364	36.575	205.74
126+693	802	30.89	30.88	36.88	37.36	36.450	36.792	205.74
126+856	803	31.07	30.87	36.87	37.34	36.963	37.180	205.74
127+033	804	27.11	30.86	36.86	37.35	36.343	37.501	205.74
127+082	805	29.15	30.86	36.86	37.34	36.542	36.761	205.74
127+134	806	27.91	30.86	36.86	37.34	36.317	37.600	205.74
127+306	807	31.37	30.85	36.85	37.33	36.500	36.800	205.74
127+485	808	28.91	30.83	36.83	37.32	37.479	36.424	205.74
127+629	809	29.34	30.82	36.82	37.30	37.433	36.274	205.74
127+765	810	30.52	30.82	36.82	37.29	37.492	36.338	205.74
127+868	811	31.05	30.81	36.81	37.29	36.647	36.559	205.74
128+032	812	29.97	30.80	36.80	37.29	38.766	36.945	205.74
128+178	813	32.30	30.79	36.79	37.27	37.229	36.078	205.74
128+354	814	31.45	30.78	36.78	37.27	37.516	36.851	205.74
128+457	815	29.68	30.77	36.77	37.25	38.115	36.805	205.74
128+537	816	29.14	30.77	36.77	37.25	38.079	36.917	205.74

STNO	CSNO	Actual bed level (canal center)	Plan bed level	Required embankment level	Water level (Non-uniform flow)	Actual Left bank	Actual right bank	Amount of Water
m	No	m	m	m	m	m	m	m^3/sec
128+703	817	30.05	30.76	36.76	37.24	38.099	38.139	205.74
128+880	818	31.37	30.74	36.74	37.23	36.040	36.840	205.74
129+090	819	30.93	30.73	36.73	37.23	36.014	36.837	205.74
129+154	820	31.49	30.73	36.73	37.22	36.196	36.902	205.74
129+293	821	31.91	30.72	36.72	37.22	37.607	37.315	205.74
129+492	822	32.08	30.70	36.70	37.21	37.469	37.869	205.74
129+683	823	31.62	30.69	36.69	37.19	37.014	37.492	205.74
129+780	824	30.02	30.69	36.69	37.19	37.078	37.520	205.74
129+858	825	29.49	30.68	36.68	37.17	36.830	35.588	205.74
129+945	826	30.41	30.68	36.68	37.16	36.808	35.920	205.74
130+079	827	30.23	30.67	36.67	37.14	36.402	40.646	205.74
130+287	828	31.18	30.65	36.65	37.13	38.031	36.593	205.74
130+493	829	31.73	30.64	36.64	37.13	37.048	36.646	205.74
130+726	830	31.79	30.63	36.63	37.11	37.402	37.021	205.74
130+942	831	30.41	30.61	36.61	37.10	36.387	36.504	205.74
131+009	832	30.77	30.61	36.61	37.08	36.339	37.170	205.74
131+087	833	26.90	30.60	36.60	37.10	36.316	36.731	205.74
131+334	834	32.12	30.59	36.59	37.08	36.636	36.794	205.74
131+557	835	31.13	30.57	36.57	37.06	37.920	36.381	205.74
131+711	836	31.21	30.56	36.56	37.05	36.934	36.582	205.74
131+881	837	31.26	30.55	36.55	37.04	38.120	36.556	205.74
132+079	838	30.81	30.54	36.54	37.02	38.253	36.828	205.74
132+240	839	30.86	30.53	36.53	37.02	37.461	37.090	205.74
132+353	840	30.89	30.52	36.52	37.01	38.323	36.844	205.74
132+469	841	31.20	30.51	36.51	37.00	37.873	36.866	205.74
132+550	842	30.44	30.51	36.51	37.00	39.421	39.642	205.74
132+650	843	30.58	30.50	36.50	37.00	36.624	36.757	205.40
132+803	844	31.42	30.49	36.49	36.99	36.700	36.623	205.40
132+977	845	30.12	30.48	36.48	36.98	36.602	36.552	205.40
133+141	846	31.64	30.47	36.47	36.97	36.666	36.576	205.40
133+242	847	30.38	30.46	36.46	36.96	36.746	37.500	205.40
133+325	848	27.34	30.46	36.46	36.96	36.185	37.628	205.40
133+544	849	31.29	30.44	36.44	36.94	36.500	36.218	205.40
133+745	850	30.86	30.43	36.43	36.93	36.719	36.149	205.40
133+937	851	30.71	30.42	36.42	36.91	36.397	36.904	205.40
134+115	852	30.45	30.41	36.41	36.89	36.798	36.699	205.40
134+352	853	30.83	30.39	36.39	36.88	36.867	35.793	205.40
134+452	854	31.35	30.39	36.39	36.88	36.997	36.156	205.40
134+548	855	30.77	30.38	36.38	36.87	36.575	36.112	205.40
134+735	856	29.82	30.37	36.37	36.85	36.504	36.488	205.40
134+884	857	30.60	30.36	36.36	36.83	36.650	36.422	205.40
135+017	858	31.04	30.35	36.35	36.83	36.551	36.348	205.40
135+136	859	31.28	30.34	36.34	36.82	36.497	36.298	205.40
135+237	860	31.61	30.33	36.33	36.81	36.891	36.571	205.40
135+430	861	31.70	30.32	36.32	36.80	36.217	37.157	205.40
135+612	862	30.92	30.31	36.31	36.79	36.245	36.377	205.40
135+749	863	29.27	30.30	36.30	36.78	37.094	36.316	205.40
135+860	864	30.03	30.29	36.29	36.76	36.236	36.254	205.40
135+973	865	30.45	30.29	36.29	36.76	36.482	36.509	205.40
136+162	866	30.47	30.28	36.28	36.73	36.616	36.410	205.40
136+346	867	30.34	30.26	36.26	36.71	36.516	36.399	205.40
136+519	868	30.60	30.25	36.25	36.70	36.988	36.370	205.40
136+699	869	31.29	30.24	36.24	36.69	36.478	37.051	205.40
136+818	870	31.36	30.23	36.23	36.68	36.435	36.382	205.40
136+911	871	30.97	30.23	36.23	36.67	36.420	37.307	205.40
137+095	872	31.52	30.22	36.22	36.65	36.455	37.346	205.40
137+287	873	30.08	30.20	36.20	36.64	36.296	37.409	205.40
137+510	874	29.92	30.19	36.19	36.62	36.206	36.297	205.40
137+740	875	30.96	30.17	36.17	36.60	37.243	36.190	205.40
137+969	876	30.98	30.16	36.16	36.58	36.275	36.712	205.40
138+241	877	30.48	30.14	36.14	36.57	37.160	35.832	205.40
138+504	878	29.81	30.12	36.12	36.55	36.635	36.395	205.40
138+704	879	30.05	30.11	36.11	36.53	36.426	36.295	205.40
138+812	880	28.70	30.10	36.10	36.53	36.386	36.499	205.40
138+906	881	30.05	30.10	36.10	36.51	35.911	36.269	205.40
139+142	882	30.15	30.08	36.08	36.49	35.917	36.589	205.40
139+388	883	30.07	30.07	36.07	36.48	37.130	36.349	205.40
139+654	884	30.93	30.05	36.05	36.46	36.650	35.971	205.40

STNO	CSNO	Actual bed level (canal center)	Plan bed level	Required embankment level	Water level (Non-uniform flow)	Actual Left bank	Actual right bank	Amount of Water
m	No	m	m	m	m	m	m	m^3/sec
139+759	885	30.93	30.04	36.04	36.45	36.597	35.858	205.40
139+924	886	29.65	30.03	36.03	36.44	38.037	35.987	205.40
140+092	887	30.35	30.02	36.02	36.43	38.212	35.909	205.40
140+308	888	30.46	30.01	36.01	36.42	36.599	36.105	205.40
140+472	889	30.47	30.00	36.00	36.41	36.998	36.499	205.40
140+675	890	30.48	29.98	35.98	36.40	35.700	36.378	205.40
140+829	891	30.59	29.97	35.97	36.38	35.622	36.362	205.40
140+992	892	30.88	29.96	35.96	36.37	35.852	36.394	205.40
141+092	893	31.14	29.96	35.96	36.36	36.493	36.397	205.40
141+193	894	29.68	29.95	35.95	36.35	36.482	37.015	205.40
141+333	895	28.29	29.94	35.94	36.34	37.984	36.780	205.40
141+512	896	30.59	29.93	35.93	36.33	37.161	36.453	205.40
141+577	897	30.30	29.93	35.93	36.32	38.793	36.698	205.40
141+663	898	30.80	29.92	35.92	36.32	36.708	36.586	205.40
141+835	899	29.91	29.91	35.91	36.30	35.545	36.512	205.40
141+931	900	28.19	29.90	35.90	36.30	35.352	36.482	205.40
142+145	901	30.63	29.89	35.89	36.28	36.978	36.627	205.40
142+411	902	30.14	29.87	35.87	36.27	36.498	36.359	205.40
142+645	903	30.35	29.86	35.86	36.25	37.035	36.127	205.40
142+881	904	30.80	29.84	35.84	36.24	37.999	36.249	205.40
143+086	905	30.22	29.83	35.83	36.23	37.660	36.041	205.40
143+306	906	30.22	29.82	35.82	36.21	37.697	36.735	205.40
143+494	907	30.51	29.80	35.80	36.20	39.104	35.990	205.40
143+593	908	29.79	29.80	35.80	36.20	37.874	35.885	205.40
143+700	909	27.55	29.79	35.79	36.20	37.312	37.840	201.59
143+847	910	31.23	29.78	35.78	36.20	37.067	36.546	201.59
144+013	911	31.34	29.77	35.77	36.21	37.397	34.952	201.59
144+245	912	30.27	29.76	35.76	36.20	36.323	35.892	201.59
144+371	913	30.51	29.75	35.75	36.20	34.684	35.640	201.59
144+527	914	30.15	29.74	35.74	36.20	37.988	35.496	201.59
144+746	915	30.67	29.72	35.72	36.20	36.681	36.274	201.59
144+945	916	29.85	29.71	35.71	36.21	33.363	35.629	201.59
145+108	917	29.84	29.70	35.70	36.20	33.960	35.377	201.59
145+286	918	30.24	29.69	35.69	36.20	33.284	35.446	201.59
145+451	919	29.48	29.68	35.68	36.20	36.584	35.613	201.59
145+622	920	29.82	29.67	35.67	36.19	35.767	35.825	201.59
145+762	921	29.75	29.66	35.66	36.19	35.355	35.754	201.59
145+902	922	29.88	29.65	35.65	36.18	36.775	35.429	201.59
146+078	923	29.02	29.64	35.64	36.17	36.892	35.156	201.59
146+250	924	29.15	29.63	35.63	36.16	35.935	35.689	201.59
146+401	925	29.22	29.62	35.62	36.15	35.739	36.789	201.59
146+491	926	30.18	29.61	35.61	36.15	35.692	36.603	201.59
146+570	927	30.43	29.61	35.61	36.15	35.532	36.065	201.59
146+755	928	30.07	29.59	35.59	36.13	35.769	34.199	201.59
146+958	929	29.73	29.58	35.58	36.12	35.669	35.551	201.59
147+143	930	29.85	29.57	35.57	36.11	36.002	35.721	201.59
147+295	931	30.19	29.56	35.56	36.10	35.565	34.613	201.59
147+451	932	29.96	29.55	35.55	36.09	35.536	35.809	201.59
147+569	933	29.20	29.54	35.54	36.09	33.710	35.778	201.59
147+708	934	28.16	29.53	35.53	36.08	35.185	36.352	201.59
147+909	935	30.56	29.52	35.52	36.06	35.742	37.981	201.59
148+107	936	29.74	29.51	35.51	36.05	37.038	35.280	201.59
148+312	937	30.64	29.49	35.49	36.04	36.502	38.618	201.59
148+405	938	28.42	29.49	35.49	36.03	38.640	36.022	201.59
148+507	939	30.18	29.48	35.48	36.02	33.966	35.231	201.59
148+748	940	30.37	29.47	35.47	36.01	36.193	36.415	201.59
148+999	941	30.56	29.45	35.45	35.99	35.726	36.141	201.59
149+174	942	30.33	29.44	35.44	35.98	35.401	35.889	201.59
149+377	943	29.38	29.42	35.42	35.96	34.894	35.596	201.59
149+562	944	29.21	29.41	35.41	35.95	34.798	35.671	201.59
149+753	945	30.24	29.40	35.40	35.94	34.994	35.825	201.59
149+906	946	29.78	29.39	35.39	35.93	34.164	36.141	201.59
150+051	947	29.29	29.38	35.38	35.92	34.892	37.137	201.59
150+215	948	30.19	29.37	35.37	35.91	35.362	35.940	201.59
150+387	949	30.43	29.36	35.36	35.90	34.478	35.528	201.59
150+555	950	29.94	29.35	35.35	35.88	34.448	35.677	201.59
150+742	951	30.38	29.34	35.34	35.87	37.747	35.663	201.59
150+985	952	29.83	29.32	35.32	35.85	36.143	35.690	201.59

STNO	CSNO	Actual bed level (canal center)	Plan bed level	Required embankment level	Water level (Non-uniform flow)	Actual Left bank	Actual right bank	Amount of Water
m	No	m	m	m	m	m	m	m^3/sec
151+155	953	29.92	29.31	35.31	35.84	35.974	35.800	201.59
151+300	954	29.89	29.30	35.30	35.83	36.011	36.509	201.59
151+592	955	29.52	29.28	35.28	35.82	35.220	37.248	201.59
151+688	956	29.40	29.28	35.28	35.80	35.103	36.127	201.59
151+774	957	28.72	29.27	35.27	35.80	35.500	36.229	201.59
152+008	958	30.65	29.26	35.26	35.77	35.458	37.959	201.59
152+207	959	30.47	29.24	35.24	35.76	35.136	37.306	201.59
152+381	960	30.54	29.23	35.23	35.75	35.333	35.161	201.59
152+543	961	30.43	29.22	35.22	35.73	35.423	35.416	201.59
152+661	962	29.90	29.21	35.21	35.72	35.339	35.631	201.59
152+806	963	28.67	29.20	35.20	35.72	35.458	36.201	201.59
152+952	964	28.88	29.19	35.19	35.71	36.048	35.853	201.59
153+051	965	30.60	29.19	35.19	35.70	36.226	35.529	201.59
153+156	966	28.67	29.18	35.18	35.70	36.751	35.289	201.59
153+384	967	29.75	29.17	35.17	35.68	36.922	35.684	201.59
153+597	968	30.24	29.15	35.15	35.66	36.357	36.440	201.59
153+740	969	30.10	29.14	35.14	35.66	36.906	35.644	201.59
153+892	970	29.72	29.13	35.13	35.65	36.884	35.287	201.59
154+014	971	29.50	29.13	35.13	35.64	36.963	34.727	201.59
154+152	972	28.09	29.12	35.12	35.62	35.362	34.503	201.59
154+384	973	28.01	29.10	35.10	35.60	35.444	35.619	201.59
154+550	974	28.69	29.09	35.09	35.59	35.252	35.565	201.59
154+634	975	29.61	29.09	35.09	35.58	35.507	36.293	201.59
154+727	976	27.85	29.08	35.08	35.59	35.191	35.388	201.59
154+867	977	29.69	29.07	35.07	35.57	35.870	35.523	201.59
155+019	978	29.02	29.06	35.06	35.56	35.620	35.855	201.59
155+131	979	27.99	29.05	35.05	35.55	35.499	36.533	201.59
155+239	980	29.03	29.05	35.05	35.55	35.321	36.249	201.59
155+445	981	29.13	29.03	35.03	35.52	35.475	35.751	201.59
155+665	982	29.83	29.02	35.02	35.50	36.850	35.532	201.59
155+798	983	29.42	29.01	35.01	35.49	35.472	35.975	201.59
155+901	984	27.24	29.00	35.00	35.49	35.569	35.147	201.59
156+041	985	28.83	29.00	35.00	35.48	34.827	33.873	201.59
156+214	986	29.19	28.98	34.98	35.46	35.850	35.439	201.59
156+396	987	28.79	28.97	34.97	35.45	35.323	35.397	201.59
156+557	988	28.93	28.96	34.96	35.44	35.656	35.279	201.59
156+737	989	29.76	28.95	34.95	35.44	35.011	34.601	201.59
156+902	990	30.00	28.94	34.94	35.42	34.811	34.605	201.59
157+063	991	29.34	28.93	34.93	35.41	34.769	35.692	201.59
157+244	992	28.83	28.92	34.92	35.40	35.064	35.501	201.59
157+417	993	29.69	28.91	34.91	35.39	35.215	35.734	201.59
157+581	994	29.73	28.90	34.90	35.38	36.374	35.618	201.59
157+751	995	29.76	28.89	34.89	35.37	34.626	35.904	201.59
157+922	996	29.76	28.87	34.87	35.36	35.315	35.802	201.59
158+097	997	29.84	28.86	34.86	35.35	35.310	35.548	201.59
158+260	998	29.34	28.85	34.85	35.34	35.178	35.603	201.59
158+500	999	29.84	28.84	34.84	35.34	35.149	35.516	207.43
158+666	1000	29.47	28.83	34.83	35.33	36.908	35.407	207.43
158+851	1001	28.48	28.81	34.81	35.32	36.801	35.486	207.43
159+013	1002	28.48	28.80	34.80	35.31	36.783	35.371	207.43
159+174	1003	28.61	28.79	34.79	35.30	36.002	35.150	207.43
159+355	1004	28.50	28.78	34.78	35.29	35.265	35.435	207.43
159+515	1005	28.62	28.77	34.77	35.29	35.299	34.804	207.43
159+680	1006	29.35	28.76	34.76	35.27	34.118	35.732	207.43
159+852	1007	29.24	28.75	34.75	35.26	34.814	35.288	207.43
159+984	1008	28.93	28.74	34.74	35.25	36.164	35.384	207.43
160+122	1009	29.45	28.73	34.73	35.25	34.179	36.800	207.43
160+213	1010	28.90	28.73	34.73	35.23	35.273	37.035	207.43
160+316	1011	29.30	28.72	34.72	35.22	35.543	37.430	207.43
160+477	1012	29.40	28.71	34.71	35.19	35.000	39.507	207.43
160+649	1013	28.52	28.70	34.70	35.18	35.128	38.000	207.43
160+857	1014	30.00	28.69	34.69	35.18	34.481	38.450	207.43
160+954	1015	30.07	28.68	34.68	35.16	35.486	37.252	207.43
161+046	1016	28.22	28.67	34.67	35.14	35.808	36.288	207.43
161+256	1017	28.77	28.66	34.66	35.11	37.573	34.760	207.43
161+433	1018	28.66	28.65	34.65	35.09	36.387	34.539	207.43
161+608	1019	28.93	28.64	34.64	35.08	35.711	35.849	207.43
161+791	1020	29.55	28.63	34.63	35.06	35.488	35.276	207.43

STNO	CSNO	Actual bed level (canal center)	Plan bed level	Required embankment level	Water level (Non-uniform flow)	Actual Left bank	Actual right bank	Amount of Water
m	No	m	m	m	m	m	m	m^3/sec
161+953	1021	29.75	28.62	34.62	35.05	35.420	35.218	207.43
162+122	1022	29.39	28.60	34.60	35.04	36.130	34.887	207.43
162+302	1023	29.09	28.59	34.59	35.03	34.892	34.496	207.43
162+485	1024	29.18	28.58	34.58	35.02	34.580	34.646	207.43
162+649	1025	28.76	28.57	34.57	35.00	34.617	34.687	207.43
162+803	1026	28.52	28.56	34.56	34.98	34.800	35.885	207.43
162+958	1027	27.98	28.55	34.55	34.97	35.392	34.620	207.43
163+119	1028	29.14	28.54	34.54	34.96	34.220	34.009	207.43
163+292	1029	29.45	28.53	34.53	34.95	35.210	36.103	207.43
163+473	1030	28.93	28.52	34.52	34.94	35.060	35.541	207.43
163+630	1031	29.69	28.51	34.51	34.92	35.109	37.399	207.43
163+775	1032	28.43	28.50	34.50	34.91	36.357	33.960	207.43
163+919	1033	29.28	28.49	34.49	34.89	35.849	34.288	207.43
164+105	1034	29.51	28.48	34.48	34.88	35.400	35.987	207.43
164+257	1035	29.19	28.47	34.47	34.87	34.748	35.293	207.43
164+388	1036	29.11	28.46	34.46	34.87	35.969	34.934	207.43
164+560	1037	29.21	28.45	34.45	34.86	36.707	35.170	207.43
164+693	1038	28.64	28.44	34.44	34.84	35.989	35.400	207.43
164+832	1039	29.08	28.43	34.43	34.83	35.201	35.297	207.43
164+932	1040	29.74	28.42	34.42	34.81	35.050	35.273	207.43
165+066	1041	27.13	28.41	34.41	34.82	35.208	35.419	207.43
165+265	1042	28.89	28.40	34.40	34.79	34.670	34.574	207.43
165+470	1043	29.00	28.39	34.39	34.77	35.120	34.891	207.43
165+645	1044	29.21	28.38	34.38	34.76	35.107	34.974	207.43
165+814	1045	28.97	28.37	34.37	34.75	35.000	36.408	207.43
165+998	1046	29.56	28.35	34.35	34.74	34.990	35.642	207.43
166+201	1047	29.08	28.34	34.34	34.73	35.000	35.100	207.43
166+413	1048	28.99	28.33	34.33	34.71	34.949	35.230	207.43
166+609	1049	28.40	28.32	34.32	34.69	34.600	35.046	207.43
166+761	1050	27.18	28.31	34.31	34.69	34.639	34.994	207.43
166+922	1051	28.47	28.30	34.30	34.66	34.647	34.987	207.43
167+077	1052	29.77	28.29	34.29	34.64	35.596	35.218	207.43
167+261	1053	28.90	28.27	34.27	34.62	35.896	35.248	207.43
167+482	1054	28.58	28.26	34.26	34.61	34.755	35.279	207.43
167+783	1055	28.80	28.24	34.24	34.58	34.819	35.867	207.43
167+998	1056	28.26	28.23	34.23	34.57	35.181	33.922	207.43
168+220	1057	29.01	28.21	34.21	34.54	35.000	34.500	207.43
168+483	1058	28.94	28.19	34.19	34.52	34.880	35.310	207.43
168+704	1059	28.70	28.18	34.18	34.50	35.197	35.240	207.43
168+955	1060	28.02	28.16	34.16	34.49	35.148	35.030	207.43
169+207	1061	27.45	28.15	34.15	34.47	34.710	34.885	207.43
169+454	1062	27.97	28.13	34.13	34.45	35.200	35.075	207.43
169+700	1063	28.57	28.12	34.12	34.43	35.910	34.517	207.43
169+953	1064	27.72	28.10	34.10	34.42	34.851	34.709	207.43
170+191	1065	28.23	28.08	34.08	34.41	35.538	34.569	207.43
170+454	1066	28.07	28.07	34.07	34.39	35.000	34.368	207.43
170+705	1067	28.20	28.05	34.05	34.37	34.769	33.055	207.43
170+953	1068	28.74	28.04	34.04	34.35	34.750	33.088	207.43
171+206	1069	28.97	28.02	34.02	34.33	34.668	35.730	207.43
171+402	1070	28.85	28.01	34.01	34.32	34.849	36.870	207.43
171+650	1071	28.06	27.99	33.99	34.32	36.000	36.496	193.64
171+745	1072	27.49	27.98	33.98	34.30	33.886	35.971	193.64
171+872	1073	28.47	27.98	33.98	34.28	34.697	35.629	193.64
172+008	1074	26.29	27.97	33.97	34.28	35.199	34.854	193.64
172+065	1075	27.90	27.96	33.96	34.28	35.268	34.415	193.64
172+190	1076	29.62	27.96	33.96	34.27	34.117	33.382	193.64
172+341	1077	28.30	27.95	33.95	34.25	34.554	33.133	193.64
172+537	1078	28.96	27.93	33.93	34.22	34.300	33.437	193.64
172+706	1079	28.63	27.92	33.92	34.20	34.360	33.478	193.64
172+903	1080	28.53	27.91	33.91	34.19	34.281	33.279	193.64
173+141	1081	29.03	27.89	33.89	34.16	34.819	33.119	193.64
173+394	1082	28.68	27.88	33.88	34.13	33.499	34.268	193.64
173+662	1083	28.93	27.86	33.86	34.11	33.432	35.395	193.64
173+893	1084	28.31	27.85	33.85	34.09	34.510	34.089	193.64
174+139	1085	28.23	27.83	33.83	34.07	33.190	34.315	193.64
174+356	1086	28.11	27.82	33.82	34.05	33.341	34.217	193.64
174+546	1087	27.92	27.80	33.80	33.99	33.770	34.272	193.64
174+752	1088	27.71	27.79	33.79	33.99	33.298	34.233	193.64

STNO	CSNO	Actual bed level (canal center)	Plan bed level	Required embankment level	Water level (Non-uniform flow)	Actual Left bank	Actual right bank	Amount of Water
m	No	m	m	m	m	m	m	m^3/sec
174+874	1089	27.88	27.78	33.78	33.97	33.497	34.080	193.64
175+094	1090	27.24	27.77	33.77	33.95	34.669	34.237	193.64
175+348	1091	28.50	27.75	33.75	33.93	34.901	34.228	193.64
175+595	1092	28.86	27.74	33.74	33.92	35.121	34.398	193.64
175+845	1093	29.29	27.72	33.72	33.90	34.547	35.208	193.64
176+127	1094	29.13	27.70	33.70	33.88	34.742	34.722	193.64
176+371	1095	28.68	27.69	33.69	33.86	34.298	34.141	193.64
176+531	1096	27.80	27.68	33.68	33.85	34.200	34.276	193.64
176+641	1097	28.00	27.67	33.67	33.83	34.436	34.416	193.64
176+741	1098	28.07	27.66	33.66	33.82	34.250	34.549	193.64
176+929	1099	27.38	27.65	33.65	33.82	34.520	35.129	193.64
177+139	1100	27.34	27.64	33.64	33.80	34.107	33.559	193.64
177+392	1101	27.95	27.62	33.62	33.77	33.354	33.699	193.64
177+639	1102	27.27	27.61	33.61	33.75	33.080	34.144	193.64
177+744	1103	26.26	27.60	33.60	33.74	33.296	34.207	193.64
177+836	1104	25.91	27.59	33.59	33.74	33.210	34.169	193.64
178+052	1105	28.35	27.58	33.58	33.72	34.258	34.257	193.64
178+189	1106	29.04	27.57	33.57	33.72	34.670	35.044	193.64
178+347	1107	28.98	27.56	33.56	33.71	35.000	33.247	193.64
178+506	1108	28.74	27.55	33.55	33.70	35.650	36.016	193.64
178+749	1109	26.56	27.53	33.53	33.30	32.948	33.242	193.56
178+950	1110	28.36	27.52	33.52	33.29	35.796	33.661	193.56
179+144	1111	28.62	27.50	33.50	33.29	33.435	33.491	193.56
179+338	1112	28.78	27.49	33.49	33.29	34.603	33.340	193.56
179+423	1113	28.78	27.48	33.48	33.29	33.908	33.312	193.56
179+516	1114	27.44	27.48	33.48	33.26	33.995	33.748	193.56
179+626	1115	27.95	27.47	33.47	33.27	33.970	33.952	193.56
179+710	1116	28.89	27.46	33.46	33.29	34.912	33.534	193.56
179+824	1117	27.80	27.45	33.45	33.28	34.747	34.051	193.56
179+947	1118	27.86	27.45	33.45	33.28	34.776	33.556	193.56
180+084	1119	28.20	27.44	33.44	33.28	34.600	33.580	193.56
180+247	1120	28.52	27.42	33.42	33.28	34.964	33.350	193.56
180+545	1121	27.31	27.40	33.40	33.29	34.826	33.476	193.56
180+794	1122	28.27	27.38	33.38	33.29	33.954	35.274	193.56
181+125	1123	28.26	27.36	33.36	33.29	33.749	34.199	193.56
181+294	1124	28.00	27.35	33.35	33.29	35.107	34.529	193.56
181+480	1125	28.13	27.33	33.33	33.27	33.556	33.537	193.56
181+789	1126	27.60	27.31	33.31	33.29	34.149	33.726	193.56
182+050	1127	27.72	27.29	33.29	33.28	34.197	33.749	193.56
182+302	1128	27.52	27.27	33.27	33.29	33.693	33.002	193.56
182+546	1129	26.63	27.26	33.26	33.29	34.045	33.638	193.56
182+796	1130	27.17	27.24	33.24	33.29	35.456	33.746	193.56
183+050	1131	27.65	27.22	33.22	33.29	36.568	35.112	193.56
183+195	1132	27.86	27.21	33.21	33.29	34.888	35.246	193.56
183+327	1133	27.70	27.20	33.20	33.29	34.307	34.018	193.56
183+653	1134	27.55	27.18	33.18	33.28	34.573	34.929	193.56
183+900	1135	28.55	27.16	33.16	33.28	33.033	33.692	191.86
184+159	1136	28.41	27.14	33.14	33.26	39.762	33.491	191.86
184+399	1137	27.43	27.12	33.12	33.24	37.556	34.736	191.86
184+648	1138	28.56	27.10	33.10	33.22	34.371	33.119	191.86
184+809	1139	27.88	27.09	33.09	33.20	32.024	33.673	191.86
184+908	1140	28.40	27.08	33.08	33.19	30.958	33.175	191.86
184+998	1141	28.09	27.08	33.08	33.16	34.240	33.329	191.86
185+099	1142	28.11	27.07	33.07	33.15	34.800	34.648	191.86
185+192	1143	24.86	27.06	33.06	33.15	33.650	34.095	191.86
185+503	1144	28.04	27.04	33.04	33.12	32.725	33.024	191.86
185+767	1145	28.10	27.02	33.02	33.10	32.520	32.815	191.86
185+996	1146	27.89	27.01	33.01	33.07	32.897	33.476	191.86
186+249	1147	28.02	26.99	32.99	33.05	33.049	33.166	191.86
186+503	1148	28.14	26.97	32.97	33.03	33.229	33.235	191.86
186+761	1149	27.87	26.95	32.95	33.02	33.999	33.864	191.86
187+005	1150	28.44	26.93	32.93	33.00	33.022	32.862	191.86
187+279	1151	28.29	26.91	32.91	32.97	32.840	32.893	191.86
187+501	1152	27.57	26.90	32.90	32.94	33.397	32.975	191.86
187+834	1153	27.00	26.87	32.87	32.92	32.581	33.906	191.86
187+862	1154	26.74	26.87	32.87	32.93	32.787	33.209	191.86
187+888	1155	25.95	26.87	32.87	32.92	32.986	33.484	191.86
188+045	1156	27.59	26.86	32.86	32.89	32.891	33.174	191.86

STNO	CSNO	Actual bed level (canal center)	Plan bed level	Required embankment level	Water level (Non-uniform flow)	Actual Left bank	Actual right bank	Amount of Water
m	No	m	m	m	m	m	m	m^3/sec
188+125	1157	27.04	26.85	32.85	32.89	32.593	33.514	191.86
188+202	1158	27.18	26.84	32.84	32.88	32.469	32.940	191.86
188+441	1159	28.39	26.83	32.83	32.86	32.640	32.669	191.86
188+640	1160	27.96	26.81	32.81	32.82	32.552	32.942	191.86
188+745	1161	27.50	26.81	32.81	32.80	33.226	32.225	191.86
188+858	1162	26.70	26.80	32.80	32.79	33.159	33.235	191.86
189+106	1163	23.97	26.78	32.78	32.79	33.507	32.046	191.86
189+152	1164	25.47	26.78	32.78	32.78	33.706	32.592	191.86
189+189	1165	26.32	26.77	32.77	32.78	32.840	29.949	191.86
189+465	1166	26.60	26.75	32.75	32.76	33.547	33.383	191.86
189+513	1167	26.59	26.75	32.75	32.75	34.291	32.796	191.86
189+586	1168	26.44	26.74	32.74	32.74	33.165	32.998	191.86
189+795	1169	27.68	26.73	32.73	32.72	33.218	33.685	191.86
190+023	1170	27.68	26.71	32.71	32.71	31.813	33.772	191.86
190+114	1171	26.45	26.71	32.71	32.70	31.941	33.690	191.86
190+190	1172	26.29	26.70	32.70	32.68	31.896	33.596	191.86
190+396	1173	26.94	26.69	32.69	32.67	32.239	33.952	191.86
190+488	1174	21.35	26.68	32.68	32.67	32.439	32.816	191.86
190+593	1175	27.10	26.67	32.67	32.65	33.425	33.180	191.86
190+869	1176	27.66	26.65	32.65	32.63	33.020	33.256	191.86
191+087	1177	26.89	26.63	32.63	32.61	32.858	34.051	191.86
191+145	1178	27.16	26.63	32.63	32.61	32.657	33.031	191.86
191+209	1179	27.72	26.63	32.63	32.60	33.812	32.773	191.86
191+419	1180	26.24	26.61	32.61	32.60	32.347	32.516	191.86
191+455	1181	25.29	26.61	32.61	32.59	32.578	32.402	191.86
191+494	1182	23.34	26.61	32.61	32.59	32.570	32.010	191.86
191+680	1183	24.99	26.59	32.59	32.56	32.971	33.016	191.86
191+739	1184	23.09	26.59	32.59	32.56	32.134	33.116	191.86
191+809	1185	25.12	26.58	32.58	32.56	34.080	32.781	191.86
192+132	1186	26.61	26.56	32.56	32.53	34.157	32.690	191.86
192+248	1187	26.92	26.55	32.55	32.52	32.069	33.175	191.86
192+430	1188	26.91	26.54	32.54	32.49	32.616	32.376	191.86
192+592	1189	25.33	26.53	32.53	32.47	33.007	34.471	191.86
192+702	1190	25.00	26.52	32.52	32.45	31.758	34.812	191.86
192+933	1191	26.85	26.50	32.50	32.44	34.175	33.169	191.86
193+065	1192	27.34	26.49	32.49	32.43	34.230	35.720	191.86
193+210	1193	28.32	26.48	32.48	32.42	32.934	32.323	191.86
193+351	1194	26.66	26.47	32.47	32.40	32.174	32.949	191.86
193+415	1195	26.21	26.47	32.47	32.40	32.357	35.207	191.86
193+520	1196	27.15	26.46	32.46	32.39	33.103	33.446	191.86
193+766	1197	26.75	26.44	32.44	32.38	33.423	32.959	191.86
193+993	1198	26.71	26.42	32.42	32.37	33.730	32.270	191.86
194+110	1199	27.01	26.42	32.42	32.35	32.637	33.207	191.86
194+201	1200	27.18	26.41	32.41	32.35	33.051	31.779	191.86
194+450	1201	25.80	26.39	32.39	32.35	32.460	33.150	191.86
194+707	1202	26.56	26.37	32.37	32.34	32.593	33.353	191.86
194+936	1203	26.37	26.36	32.36	32.33	32.426	33.320	191.86
195+086	1204	26.35	26.34	32.34	32.32	32.494	32.350	191.86
195+238	1205	26.22	26.33	32.33	32.31	32.416	32.510	191.86
195+416	1206	26.17	26.32	32.32	32.29	32.328	32.576	191.86
195+653	1207	26.40	26.30	32.30	32.29	33.097	32.221	191.86
195+740	1208	26.14	26.30	32.30	32.28	33.047	32.360	191.86
195+827	1209	26.16	26.29	32.29	32.27	32.775	32.429	191.86
196+095	1210	25.98	26.27	32.27	32.26	32.619	32.569	191.86
196+340	1211	25.67	26.25	32.25	32.25	33.568	32.600	191.86
196+396	1212	26.43	26.25	32.25	32.25	32.919	32.680	191.86
196+474	1213	24.32	26.24	32.24	32.24	33.290	32.900	191.86
196+714	1214	25.99	26.23	32.23	32.23	32.880	32.936	191.86
196+932	1215	25.93	26.21	32.21	32.21	32.734	32.859	191.86
197+042	1216	26.21	26.20	32.20	32.21	32.600	32.750	191.86
197+135	1217	25.56	26.20	32.20	32.20	32.976	32.748	191.86
197+323	1218	25.81	26.18	32.18	32.19	32.910	32.800	191.86
197+384	1219	25.99	26.18	32.18	32.19	33.267	32.780	191.86
197+450	1220	26.15	26.17	32.17	32.19	32.999	33.187	191.86
197+706	1221	26.77	26.15	32.15	32.18	32.845	33.200	191.86
197+990	1222	26.65	26.13	32.13	32.16	32.591	32.352	191.86
198+074	1223	26.58	26.13	32.13	32.16	32.555	32.481	191.86
198+170	1224	20.79	26.12	32.12	32.17	31.446	32.204	191.86

STNO	CSNO	Actual bed level (canal center)	Plan bed level	Required embankment level	Water level (Non-uniform flow)	Actual Left bank	Actual right bank	Amount of Water
m	No	m	m	m	m	m	m	m^3/sec
198+268	1225	26.63	26.11	32.11	32.15	32.343	27.132	191.86
198+388	1226	26.44	26.10	32.10	32.13	32.424	32.733	191.86
198+550	1227	26.33	26.09	32.09	32.13	32.499	32.867	191.86
198+739	1228	26.14	26.08	32.08	32.12	32.329	32.895	191.86
198+922	1229	25.45	26.07	32.07	32.11	32.272	32.900	191.86
199+077	1230	25.74	26.05	32.05	32.10	32.328	32.899	191.86
199+175	1231	25.95	26.05	32.05	32.09	31.866	33.050	191.86
199+299	1232	25.60	26.04	32.04	32.08	32.200	33.157	191.86
199+465	1233	25.67	26.03	32.03	32.07	32.078	33.059	191.86
199+562	1234	25.27	26.02	32.02	32.07	32.350	32.298	191.86
199+661	1235	26.47	26.01	32.01	32.06	32.620	32.149	191.86
199+765	1236	26.03	26.00	32.00	32.05	32.200	32.221	191.86
200+017	1237	25.71	25.99	31.99	32.04	31.268	32.169	191.86
200+206	1238	26.12	25.97	31.97	32.02	31.220	32.080	191.86
200+320	1239	26.21	25.96	31.96	32.01	31.497	32.240	191.86
200+449	1240	25.76	25.95	31.95	32.00	31.279	32.165	191.86
200+612	1241	26.82	25.94	31.94	31.98	31.299	32.329	191.86
200+781	1242	26.73	25.93	31.93	31.98	31.867	32.692	191.86
200+885	1243	26.51	25.92	31.92	31.97	31.699	32.580	191.86
200+988	1244	26.41	25.91	31.91	31.96	31.877	32.068	191.86
201+231	1245	25.89	25.90	31.90	31.94	32.495	32.150	191.86
201+472	1246	25.86	25.88	31.88	31.93	32.893	32.267	191.86
201+638	1247	26.18	25.87	31.87	31.91	32.497	32.164	191.86
201+733	1248	25.94	25.86	31.86	31.91	32.576	32.347	191.86
201+848	1249	25.57	25.85	31.85	31.90	32.400	32.410	191.86
202+055	1250	26.25	25.84	31.84	31.89	32.350	32.248	191.86
202+323	1251	26.07	25.82	31.82	31.88	32.155	32.180	191.86
202+435	1252	26.18	25.81	31.81	31.86	32.333	32.200	191.86
202+550	1253	26.19	25.80	31.80	31.86	32.060	32.170	191.86
202+787	1254	26.02	25.78	31.78	31.85	32.070	32.110	191.86
203+030	1255	26.30	25.77	31.77	31.82	32.641	32.656	191.86
203+233	1256	26.57	25.75	31.75	31.82	32.502	33.751	191.86
203+579	1257	26.72	25.73	31.73	31.79	32.150	33.549	191.86
203+624	1258	26.45	25.72	31.72	31.79	32.509	33.570	191.86
203+669	1259	25.91	25.72	31.72	31.77	32.738	33.510	191.86
204+000	1260	26.01	25.70	31.70	31.77	32.561	32.155	195.26
204+244	1261	25.90	25.68	31.68	31.76	31.669	31.230	195.26
204+509	1262	26.38	25.66	31.66	31.74	31.090	31.272	195.26
204+728	1263	25.61	25.64	31.64	31.72	31.179	31.889	195.26
204+877	1264	25.76	25.63	31.63	31.71	32.072	31.677	195.26
204+984	1265	25.66	25.62	31.62	31.71	30.855	31.259	195.26
205+104	1266	25.22	25.62	31.62	31.69	31.214	31.789	195.26
205+341	1267	25.61	25.60	31.60	31.67	31.757	32.130	195.26
205+568	1268	25.66	25.58	31.58	31.66	31.249	31.753	195.26
205+817	1269	25.24	25.56	31.56	31.64	31.179	31.839	195.26
206+030	1270	25.67	25.55	31.55	31.62	32.010	31.489	195.26
206+197	1271	26.14	25.54	31.54	31.61	31.292	31.257	195.26
206+344	1272	25.29	25.53	31.53	31.60	30.904	31.141	195.26
206+546	1273	25.61	25.51	31.51	31.59	30.483	29.768	195.26
206+820	1274	25.30	25.49	31.49	31.57	30.766	30.834	195.26
207+064	1275	25.43	25.47	31.47	31.56	31.221	31.323	195.26
207+185	1276	25.45	25.46	31.46	31.56	31.020	30.688	195.26
207+324	1277	26.36	25.45	31.45	31.54	31.350	30.679	195.26
207+559	1278	25.21	25.44	31.44	31.53	31.755	31.376	195.26
207+817	1279	25.89	25.42	31.42	31.51	30.860	31.143	195.26
208+048	1280	25.41	25.40	31.40	31.50	31.030	31.343	195.26
208+299	1281	26.05	25.38	31.38	31.48	31.096	31.329	195.26
208+587	1282	26.05	25.36	31.36	31.46	30.837	30.715	195.26
208+926	1283	25.63	25.34	31.34	31.43	30.929	30.984	195.26
209+005	1284	25.15	25.33	31.33	31.43	29.996	31.339	195.26
209+083	1285	24.26	25.33	31.33	31.42	30.511	31.208	195.26
209+299	1286	25.81	25.31	31.31	31.41	30.441	31.699	195.26
209+550	1287	25.98	25.29	31.29	31.40	29.621	32.318	195.26
209+762	1288	25.29	25.28	31.28	31.40	30.166	28.328	195.26
209+936	1289	25.63	25.26	31.26	31.38	33.352	31.310	195.26
210+047	1290	25.11	25.26	31.26	31.37	31.165	31.160	195.26
210+132	1291	25.13	25.25	31.25	31.35	31.747	30.749	195.26
210+397	1292	25.27	25.23	31.23	31.34	30.681	31.465	195.26

STNO	CSNO	Actual bed level (canal center)	Plan bed level	Required embankment level	Water level (Non-uniform flow)	Actual Left bank	Actual right bank	Amount of Water
m	No	m	m	m	m	m	m	m^3/sec
210+650	1293	25.81	25.21	31.21	31.32	30.480	31.844	195.26
210+898	1294	25.39	25.19	31.19	31.30	30.839	31.035	195.26
211+152	1295	25.77	25.18	31.18	31.27	31.087	30.792	195.26
211+338	1296	25.39	25.16	31.16	31.26	30.618	30.668	195.26
211+399	1297	25.72	25.16	31.16	31.25	30.455	30.920	195.26
211+464	1298	25.93	25.15	31.15	31.24	31.157	30.865	195.26
211+937	1299	25.24	25.12	31.12	31.19	30.926	31.879	195.26
212+275	1300	25.69	25.09	31.09	31.16	31.399	33.416	195.26
212+400	1301	26.04	25.08	31.08	31.15	31.399	31.689	195.26
212+530	1302	25.91	25.08	31.08	31.14	31.381	31.473	195.26
212+714	1303	25.57	25.06	31.06	31.12	31.751	31.404	195.26
212+975	1304	24.50	25.04	31.04	31.09	31.708	32.691	195.26
213+038	1305	23.86	25.04	31.04	31.10	31.429	31.555	195.26
213+122	1306	25.54	25.03	31.03	31.09	32.019	30.948	195.26
213+327	1307	25.16	25.02	31.02	31.07	31.864	31.112	195.26
213+553	1308	24.12	25.00	31.00	31.06	32.508	31.461	195.26
213+704	1309	25.07	24.99	30.99	31.05	31.139	31.770	195.26
213+793	1310	22.94	24.98	30.98	31.04	31.205	31.715	195.26
213+866	1311	24.75	24.98	30.98	31.04	31.261	33.094	195.26
213+998	1312	25.84	24.97	30.97	31.03	31.532	31.638	195.26
214+149	1313	24.96	24.96	30.96	31.02	31.808	30.790	195.26
214+315	1314	25.49	24.95	30.95	31.01	31.466	29.193	195.26
214+613	1315	24.74	24.92	30.92	31.00	30.437	30.526	195.26
214+899	1316	25.51	24.90	30.90	30.98	32.510	29.980	195.26
215+158	1317	25.35	24.88	30.88	30.96	30.746	30.048	195.26
215+264	1318	25.39	24.88	30.88	30.94	31.226	32.285	195.26
215+355	1319	26.27	24.87	30.87	30.94	31.074	30.775	195.26
215+540	1320	24.73	24.86	30.86	30.93	31.306	32.226	195.26
215+633	1321	23.64	24.85	30.85	30.89	32.226	32.337	195.26
215+747	1322	28.27	24.84	30.84	30.91	32.277	30.741	195.26
216+029	1323	25.40	24.82	30.82	30.88	31.214	31.925	195.26
216+300	1324	26.03	24.80	30.80	30.88	32.255	32.601	195.26
216+623	1325	27.25	24.78	30.78	30.87	31.359	31.798	195.26
216+721	1326	26.23	24.77	30.77	30.85	30.849	32.236	195.26
216+841	1327	26.21	24.76	30.76	30.83	30.767	31.877	195.26
217+051	1328	25.50	24.75	30.75	30.81	30.596	31.739	195.26
217+306	1329	26.24	24.73	30.73	30.79	30.397	31.760	195.26
217+529	1330	26.25	24.71	30.71	30.77	30.419	31.746	195.26
217+714	1331	25.50	24.70	30.70	30.75	30.418	31.345	195.26
217+819	1332	25.87	24.69	30.69	30.74	31.603	31.373	195.26
217+950	1333	25.01	24.68	30.68	30.73	31.110	31.197	195.26
218+140	1334	24.78	24.67	30.67	30.70	30.792	31.133	195.26
218+337	1335	25.20	24.65	30.65	30.69	31.359	31.798	195.26
218+395	1336	23.74	24.65	30.65	30.69	30.504	31.592	195.26
218+469	1337	25.21	24.64	30.64	30.68	30.880	31.514	195.26
218+724	1338	25.01	24.62	30.62	30.65	30.983	31.465	195.26
219+005	1339	25.62	24.60	30.60	30.64	31.130	31.751	195.26
219+273	1340	25.83	24.59	30.59	30.62	31.621	31.477	195.26
219+493	1341	26.14	24.57	30.57	30.60	31.083	31.574	195.26
219+626	1342	26.09	24.56	30.56	30.59	31.194	31.515	195.26
219+762	1343	25.22	24.55	30.55	30.58	30.675	31.404	195.26
220+015	1344	25.29	24.53	30.53	30.56	31.021	31.555	195.26
220+266	1345	25.85	24.51	30.51	30.54	30.256	31.096	195.26
220+561	1346	25.98	24.49	30.49	30.51	30.747	31.493	195.26
220+709	1347	25.93	24.48	30.48	30.49	30.457	31.809	195.26
220+872	1348	25.47	24.47	30.47	30.47	30.923	31.404	195.26
221+169	1349	24.76	24.45	30.45	30.45	31.003	30.988	195.26
221+263	1350	26.22	24.44	30.44	30.45	30.923	30.756	195.26
221+371	1351	24.40	24.43	30.43	30.44	30.769	31.141	195.26
221+602	1352	24.76	24.42	30.42	30.42	30.997	31.286	195.26
221+721	1353	25.68	24.41	30.41	30.42	30.716	31.260	195.26
221+830	1354	25.32	24.40	30.40	30.41	30.628	31.214	195.26
222+057	1355	25.37	24.38	30.38	30.39	30.809	31.766	195.26
222+286	1356	24.88	24.37	30.37	30.37	30.653	30.854	195.26
222+362	1357	24.81	24.36	30.36	30.37	31.218	30.699	195.26
222+479	1358	25.78	24.35	30.35	30.36	30.898	30.509	195.26
222+753	1359	24.64	24.33	30.33	30.34	30.819	30.678	195.26
222+957	1360	25.55	24.32	30.32	30.32	30.797	30.950	195.26

STNO	CSNO	Actual bed level (canal center)	Plan bed level	Required embankment level	Water level (Non-uniform flow)	Actual Left bank	Actual right bank	Amount of Water
m	No	m	m	m	m	m	m	m^3/sec
223+203	1361	25.34	24.30	30.30	30.31	30.839	31.328	195.26
223+468	1362	25.65	24.28	30.28	30.29	30.867	31.303	195.26
223+755	1363	25.70	24.26	30.26	30.27	30.730	31.296	195.26
224+038	1364	25.15	24.24	30.24	30.24	30.836	31.785	195.26
224+156	1365	24.87	24.23	30.23	30.23	30.868	31.455	195.26
224+282	1366	24.35	24.22	30.22	30.23	30.738	31.494	195.26
224+444	1367	25.05	24.21	30.21	30.22	30.910	31.599	195.26
224+668	1368	23.83	24.19	30.19	30.20	30.831	31.556	195.26
224+779	1369	22.70	24.18	30.18	30.19	30.675	31.309	195.26
224+865	1370	23.19	24.18	30.18	30.19	31.061	30.990	195.26
224+969	1371	24.54	24.17	30.17	30.19	31.101	31.451	195.26
225+236	1372	25.18	24.15	30.15	30.16	31.436	30.861	195.26
225+520	1373	24.96	24.13	30.13	30.13	31.271	31.177	195.26
225+794	1374	25.58	24.11	30.11	30.11	31.117	30.952	195.26
225+997	1375	25.20	24.10	30.10	30.09	31.182	31.557	195.26
226+190	1376	24.51	24.08	30.08	30.07	31.495	31.560	195.26
226+507	1377	24.76	24.06	30.06	30.04	30.855	31.321	195.26
226+865	1378	24.54	24.03	30.03	30.01	30.932	30.478	195.26
226+982	1379	24.37	24.02	30.02	30.00	30.931	31.214	195.26
227+116	1380	25.10	24.01	30.01	29.99	31.331	30.646	195.26
227+232	1381	25.40	24.01	30.01	29.97	30.715	30.587	195.26
227+332	1382	25.44	24.00	30.00	29.96	30.776	30.530	195.26
227+486	1383	21.88	23.99	29.99	29.96	31.176	30.936	195.26
227+673	1384	24.54	23.97	29.97	29.93	31.105	31.415	195.26
227+867	1385	24.88	23.96	29.96	29.91	31.213	30.459	195.26
228+031	1386	23.16	23.95	29.95	29.89	31.264	30.346	195.26
228+201	1387	24.14	23.94	29.94	29.87	31.102	30.646	195.26
228+449	1388	24.22	23.92	29.92	29.84	31.184	30.769	195.26
228+702	1389	25.02	23.90	29.90	29.82	31.130	30.771	195.26
228+919	1390	23.37	23.88	29.88	29.80	31.341	30.866	195.26
228+994	1391	23.57	23.88	29.88	29.79	31.336	30.998	195.26
229+066	1392	24.50	23.87	29.87	29.78	31.275	30.880	195.26
229+287	1393	23.49	23.86	29.86	29.76	31.260	30.924	195.26
229+400	1394	24.21	23.85	29.85	29.76	31.328	30.634	195.26
229+557	1395	23.97	23.84	29.84	29.75	31.392	30.546	195.26
230+061	1396	24.16	23.80	29.80	29.70	31.313	30.635	195.26
230+550	1397	23.89	23.77	29.77	30.56	30.199	31.199	194.86
230+926	1398	25.24	23.75	29.75	30.54	29.820	28.989	194.86
231+092	1399	24.41	23.75	29.75	30.53	30.364	30.434	194.86
231+207	1400	24.95	23.74	29.74	30.52	30.823	30.601	194.86
231+312	1401	23.90	23.73	29.73	30.51	30.421	30.575	194.86
231+447	1402	25.40	23.73	29.73	30.50	29.181	30.856	194.86
231+614	1403	22.79	23.72	29.72	30.50	30.709	30.544	194.86
231+734	1404	23.96	23.71	29.71	30.49	30.404	30.795	194.86
232+050	1405	25.48	23.69	29.69	30.47	30.729	30.667	194.86
232+384	1406	25.21	23.68	29.68	30.44	31.000	31.386	194.86
232+479	1407	25.43	23.67	29.67	30.45	29.043	28.929	194.86
232+597	1408	25.19	23.67	29.67	30.45	29.376	31.936	194.86
232+721	1409	25.78	23.66	29.66	30.45	30.155	31.699	194.86
232+925	1410	25.83	23.65	29.65	30.43	30.047	30.496	194.86
233+135	1411	25.25	23.64	29.64	30.42	30.031	30.911	194.86
233+350	1412	24.40	23.63	29.63	30.42	31.100	28.884	194.86
233+474	1413	23.39	23.62	29.62	30.40	31.596	30.148	194.86
233+604	1414	24.72	23.61	29.61	30.39	30.172	29.506	194.86
233+801	1415	24.94	23.60	29.60	30.38	31.633	29.698	194.86
233+933	1416	24.03	23.60	29.60	30.37	31.628	29.861	194.86
234+087	1417	23.98	23.59	29.59	30.36	30.873	29.903	194.86
234+225	1418	23.56	23.58	29.58	30.35	30.095	31.320	194.86
234+433	1419	23.42	23.57	29.57	30.35	29.834	30.913	194.86
234+582	1420	23.20	23.56	29.56	30.33	29.004	30.910	194.86
234+801	1421	23.15	23.55	29.55	30.32	28.940	30.239	194.86
235+013	1422	24.82	23.54	29.54	30.31	30.395	31.961	194.86
235+125	1423	22.22	23.53	29.53	30.31	29.643	29.531	194.86
235+228	1424	23.64	23.53	29.53	30.29	30.532	29.959	194.86
235+413	1425	23.88	23.52	29.52	30.29	30.724	29.279	194.86
235+504	1426	24.44	23.51	29.51	30.27	31.435	30.196	194.86
235+614	1427	23.32	23.51	29.51	30.28	30.306	30.038	194.86
235+719	1428	22.89	23.50	29.50	30.27	29.701	30.105	194.86

STNO	CSNO	Actual bed level (canal center)	Plan bed level	Required embankment level	Water level (Non-uniform flow)	Actual Left bank	Actual right bank	Amount of Water
m	No	m	m	m	m	m	m	m^3/sec
236+015	1429	24.13	23.48	29.48	30.25	29.843	30.175	194.86
236+273	1430	24.30	23.47	29.47	30.25	29.631	29.682	194.86
236+560	1431	24.41	23.46	29.46	30.23	28.797	30.946	194.86
236+828	1432	24.53	23.44	29.44	30.22	28.662	28.637	194.86
236+986	1433	22.52	23.43	29.43	30.21	28.679	30.709	194.86
237+096	1434	23.10	23.43	29.43	30.21	28.695	31.228	194.86
237+257	1435	23.49	23.42	29.42	30.20	28.616	30.437	194.86
237+418	1436	24.08	23.41	29.41	30.19	28.804	31.455	194.86
237+584	1437	24.06	23.40	29.40	30.18	29.629	29.650	194.86
237+691	1438	24.39	23.40	29.40	30.18	30.391	29.620	194.86
237+828	1439	24.59	23.39	29.39	30.18	30.467	29.277	194.86
237+959	1440	23.89	23.38	29.38	30.17	29.281	29.312	194.86
238+109	1441	23.59	23.37	29.37	30.16	29.469	29.542	194.86
238+200	1442	24.23	23.37	29.37	30.16	29.479	30.512	194.86
238+283	1443	21.82	23.36	29.36	30.15	29.432	29.643	194.86
238+454	1444	24.78	23.36	29.36	30.15	29.449	30.459	194.86
238+619	1445	25.07	23.35	29.35	30.14	29.362	29.975	194.86
238+755	1446	23.78	23.34	29.34	30.14	28.677	28.677	194.86
238+929	1447	24.76	23.33	29.33	30.12	30.441	29.918	194.86
239+130	1448	23.57	23.32	29.32	30.11	29.325	29.616	194.86
239+319	1449	22.32	23.31	29.31	30.10	29.339	29.753	194.86
239+489	1450	24.66	23.30	29.30	30.09	29.197	30.038	194.86
239+680	1451	22.73	23.29	29.29	30.08	29.257	29.325	194.86
239+782	1452	24.01	23.29	29.29	30.08	29.337	29.518	194.86
239+881	1453	22.24	23.28	29.28	30.07	29.476	29.250	194.86
240+136	1454	24.71	23.27	29.27	30.06	28.746	29.947	194.86
240+299	1455	24.12	23.26	29.26	30.05	29.560	28.886	194.86
240+497	1456	24.05	23.25	29.25	30.04	29.086	29.370	194.86
240+685	1457	22.99	23.24	29.24	30.03	29.452	29.795	194.86
240+808	1458	24.03	23.23	29.23	30.02	29.849	29.770	194.86
241+001	1459	22.75	23.22	29.22	30.01	29.921	29.532	194.86
241+178	1460	22.54	23.21	29.21	30.00	30.444	29.332	194.86
241+343	1461	22.50	23.20	29.20	29.99	30.176	29.227	194.86
241+464	1462	24.15	23.20	29.20	29.98	29.923	29.646	194.86
241+767	1463	23.31	23.18	29.18	29.98	29.321	29.487	194.86
241+837	1464	23.32	23.18	29.18	29.97	28.586	29.312	194.86
241+916	1465	23.74	23.17	29.17	29.97	26.694	29.216	194.86
242+286	1466	23.09	23.15	29.15	29.97	26.011	29.480	194.86
242+373	1467	22.61	23.15	29.15	29.96	26.786	30.380	194.86
242+482	1468	21.73	23.14	29.14	29.95	29.183	29.203	194.86
242+714	1469	23.45	23.13	29.13	29.94	29.285	29.463	194.86
242+892	1470	23.65	23.12	29.12	29.94	27.233	29.306	194.86
243+044	1471	22.46	23.11	29.11	29.93	30.194	29.646	194.86
243+129	1472	23.19	23.11	29.11	29.93	29.373	29.949	194.86
243+235	1473	21.74	23.10	29.10	29.92	29.474	29.962	194.86
243+400	1474	24.34	23.09	29.09	29.90	30.145	30.905	194.86
243+550	1475	23.51	23.09	29.09	29.90	29.519	29.469	187.78
243+899	1476	23.19	23.07	29.07	29.88	29.542	29.509	187.78
244+180	1477	22.95	23.05	29.05	29.87	29.544	29.706	187.78
244+485	1478	23.61	23.04	29.04	29.86	29.516	29.354	187.78
244+760	1479	23.62	23.02	29.02	29.85	28.638	29.237	187.78
244+972	1480	24.06	23.01	29.01	29.83	28.980	29.673	187.78
245+164	1481	24.17	23.00	29.00	29.82	29.068	29.627	187.78
245+275	1482	24.57	22.99	28.99	29.81	29.158	29.128	187.78
245+387	1483	24.64	22.99	28.99	29.80	29.179	29.163	187.78
245+616	1484	22.13	22.98	28.98	29.78	29.819	29.089	187.78
245+820	1485	24.22	22.97	28.97	29.76	29.466	29.477	187.78
245+973	1486	24.76	22.96	28.96	29.76	29.332	29.508	187.78
246+117	1487	24.20	22.95	28.95	29.75	28.951	29.314	187.78
246+280	1488	23.62	22.94	28.94	29.74	32.720	29.113	187.78
246+396	1489	21.45	22.94	28.94	29.73	29.164	29.147	187.78
246+570	1490	23.25	22.93	28.93	29.72	29.385	29.426	187.78
246+680	1491	22.86	22.92	28.92	29.72	29.543	28.480	187.78
246+797	1492	23.13	22.91	28.91	29.71	29.579	30.065	187.78
247+027	1493	23.01	22.90	28.90	29.68	29.507	29.318	187.78
247+293	1494	23.06	22.89	28.89	29.67	29.065	29.147	187.78
247+577	1495	23.88	22.87	28.87	29.65	29.128	29.098	187.78
247+688	1496	24.57	22.87	28.87	29.64	29.134	29.215	187.78

STNO	CSNO	Actual bed level (canal center)	Plan bed level	Required embankment level	Water level (Non-uniform flow)	Actual Left bank	Actual right bank	Amount of Water
m	No	m	m	m	m	m	m	m^3/sec
247+789	1497	24.22	22.86	28.86	29.63	29.322	29.330	187.78
248+023	1498	23.91	22.85	28.85	29.61	29.564	29.367	187.78
248+248	1499	22.55	22.84	28.84	29.59	29.499	29.486	187.78
248+427	1500	22.71	22.83	28.83	29.58	29.640	29.470	187.78
248+546	1501	21.24	22.82	28.82	29.57	29.550	29.566	187.78
248+677	1502	22.23	22.81	28.81	29.56	29.188	29.527	187.78
248+777	1503	22.74	22.81	28.81	29.56	29.319	29.079	187.78
248+924	1504	22.58	22.80	28.80	29.55	29.519	29.657	187.78
249+131	1505	22.74	22.79	28.79	29.54	29.505	29.638	187.78
249+242	1506	22.46	22.79	28.79	29.54	29.400	29.552	187.78
249+350	1507	20.95	22.78	28.78	29.53	30.946	29.380	187.78
249+541	1508	22.67	22.77	28.77	29.52	29.565	29.077	187.78
249+756	1509	24.02	22.76	28.76	29.51	29.765	29.432	187.78
249+840	1510	22.37	22.75	28.75	29.51	29.355	29.981	187.78
249+934	1511	21.42	22.75	28.75	29.50	28.885	31.408	187.78
250+170	1512	22.38	22.74	28.74	29.50	29.915	29.757	187.78
250+413	1513	22.71	22.72	28.72	29.48	29.220	29.455	187.78
250+508	1514	21.83	22.72	28.72	29.48	30.844	29.096	187.78
250+633	1515	21.69	22.71	28.71	29.48	29.329	28.880	187.78
250+870	1516	22.26	22.70	28.70	29.46	29.396	29.657	187.78
251+078	1517	22.57	22.69	28.69	29.45	29.456	29.994	187.78
251+176	1518	22.61	22.68	28.68	29.45	29.449	28.905	187.78
251+267	1519	21.32	22.68	28.68	29.44	29.098	29.614	187.78
251+411	1520	23.03	22.67	28.67	29.44	28.996	28.984	187.78
251+562	1521	22.73	22.66	28.66	29.43	28.648	28.929	187.78
251+624	1522	23.12	22.66	28.66	29.43	29.366	28.887	187.78
251+735	1523	21.87	22.65	28.65	29.42	29.399	29.285	187.78
251+954	1524	21.89	22.64	28.64	29.41	29.315	29.493	187.78
252+021	1525	21.42	22.64	28.64	29.40	29.636	29.281	187.78
252+098	1526	21.61	22.63	28.63	29.40	29.499	29.069	187.78
252+258	1527	22.47	22.63	28.63	29.40	29.117	29.105	187.78
252+352	1528	22.27	22.62	28.62	29.39	29.396	29.217	187.78
252+625	1529	21.94	22.61	28.61	29.38	28.792	28.871	187.78
252+873	1530	23.39	22.59	28.59	29.37	29.014	28.895	187.78
253+116	1531	21.56	22.58	28.58	29.36	29.099	29.334	187.78
253+280	1532	23.11	22.57	28.57	29.35	29.079	29.295	187.78
253+449	1533	22.89	22.56	28.56	29.35	29.436	30.297	187.78
253+669	1534	22.20	22.55	28.55	29.34	29.107	29.217	187.78
253+858	1535	22.72	22.54	28.54	29.33	29.132	29.197	187.78
253+927	1536	22.75	22.54	28.54	29.33	29.210	28.996	187.78
254+008	1537	22.91	22.53	28.53	29.32	28.431	28.899	187.78
254+203	1538	22.69	22.52	28.52	29.31	29.481	29.049	187.78
254+278	1539	23.02	22.52	28.52	29.31	28.923	29.459	187.78
254+348	1540	22.78	22.51	28.51	29.30	29.415	29.399	187.78
254+507	1541	23.44	22.51	28.51	29.29	29.077	29.380	187.78
254+587	1542	23.69	22.50	28.50	29.29	29.281	29.400	187.78
254+654	1543	23.90	22.50	28.50	29.29	28.997	29.186	187.78
254+916	1544	22.87	22.48	28.48	29.28	28.667	29.099	187.78
255+180	1545	23.36	22.47	28.47	29.27	28.348	29.014	187.78
255+423	1546	23.46	22.46	28.46	29.25	28.129	29.162	187.78
255+686	1547	24.57	22.44	28.44	29.24	29.176	29.249	187.78
255+937	1548	23.84	22.43	28.43	29.23	28.963	29.910	187.78
256+184	1549	22.88	22.42	28.42	29.22	29.356	29.058	187.78
256+350	1550	23.05	22.41	28.41	29.22	29.154	29.009	193.33
256+449	1551	23.10	22.40	28.40	29.21	29.049	28.761	193.33
256+550	1552	22.81	22.40	28.40	29.19	30.064	28.987	193.33
256+711	1553	23.97	22.39	28.39	29.19	28.211	27.877	193.33
256+777	1554	22.90	22.39	28.39	29.19	28.301	27.792	193.33
256+883	1555	22.89	22.38	28.38	29.19	27.893	28.028	193.33
257+147	1556	23.56	22.37	28.37	29.17	29.027	28.805	193.33
257+525	1557	22.72	22.35	28.35	29.16	28.903	28.593	193.33
257+808	1558	23.03	22.33	28.33	29.15	28.321	28.739	193.33
257+898	1559	23.61	22.33	28.33	29.14	28.870	28.408	193.33
257+989	1560	23.52	22.32	28.32	29.13	28.620	28.588	193.33
258+207	1561	22.31	22.31	28.31	29.11	28.976	28.549	193.33
258+391	1562	22.64	22.30	28.30	29.10	28.968	28.862	193.33
258+491	1563	22.43	22.30	28.30	29.10	28.811	28.607	193.33
258+600	1564	22.69	22.29	28.29	29.09	29.071	28.827	193.33

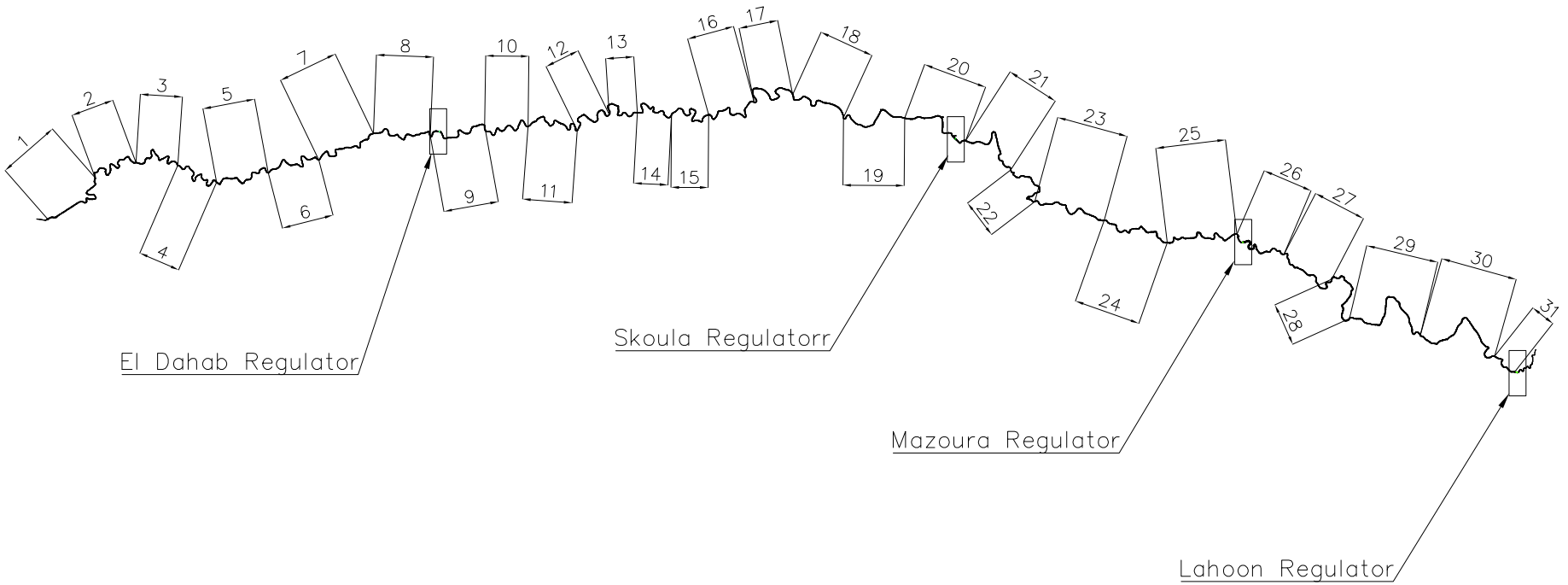
STNO	CSNO	Actual bed level (canal center)	Plan bed level	Required embankment level	Water level (Non-uniform flow)	Actual Left bank	Actual right bank	Amount of Water
m	No	m	m	m	m	m	m	m^3/sec
258+764	1565	23.10	22.28	28.28	29.08	28.347	28.786	193.33
258+944	1566	22.88	22.27	28.27	29.07	28.857	28.596	193.33
259+069	1567	24.28	22.27	28.27	29.06	28.137	28.394	193.33
259+194	1568	21.42	22.26	28.26	29.05	28.538	28.501	193.33
259+319	1569	20.85	22.25	28.25	29.05	28.623	28.342	193.33
259+447	1570	23.51	22.25	28.25	29.04	29.904	28.890	193.33
259+679	1571	24.37	22.23	28.23	29.02	30.476	28.101	193.33
259+950	1572	22.71	22.22	28.22	29.01	28.816	28.551	193.33
260+197	1573	23.42	22.21	28.21	28.99	28.702	28.635	193.33
260+438	1574	23.28	22.19	28.19	28.98	28.539	29.173	193.33
260+641	1575	22.46	22.18	28.18	28.97	28.716	28.746	193.33
260+742	1576	21.93	22.18	28.18	28.97	28.361	28.671	193.33
260+849	1577	22.29	22.17	28.17	28.96	28.539	28.561	193.33
261+191	1578	20.85	22.15	28.15	28.95	29.001	28.209	193.33
261+440	1579	22.84	22.14	28.14	28.94	29.397	28.439	193.33
261+686	1580	21.78	22.13	28.13	28.93	28.498	28.715	193.33
261+999	1581	21.61	22.11	28.11	28.92	28.599	28.318	193.33
262+400	1582	21.94	22.09	28.09	28.90	29.810	28.168	193.33
262+851	1583	23.02	22.06	28.06	28.87	28.912	28.718	193.33
263+138	1584	22.72	22.05	28.05	28.86	29.457	29.682	193.33
263+242	1585	23.30	22.04	28.04	28.86	28.176	28.531	193.33
263+346	1586	23.63	22.04	28.04	28.84	28.098	29.444	193.33
263+588	1587	23.06	22.03	28.03	28.83	28.948	29.728	193.33
263+840	1588	22.80	22.01	28.01	28.81	32.040	29.170	193.33
264+079	1589	22.91	22.00	28.00	28.80	28.933	29.351	193.33
264+419	1590	24.17	21.98	27.98	28.78	28.050	28.431	193.33
264+600	1591	23.44	21.97	27.97	28.77	28.086	29.379	193.33
264+754	1592	23.10	21.96	27.96	28.76	27.330	29.540	193.33
265+128	1593	22.71	21.94	27.94	28.74	28.255	28.074	193.33
265+637	1594	22.59	21.92	27.92	28.72	29.275	28.407	193.33
266+140	1595	23.10	21.89	27.89	28.70	28.611	28.183	193.33
266+657	1596	22.66	21.86	27.86	28.68	28.164	28.402	193.33
266+813	1597	23.16	21.86	27.86	28.67	28.058	28.271	193.33
266+930	1598	22.94	21.85	27.85	28.66	27.484	28.303	193.33
267+081	1599	22.35	21.84	27.84	28.65	27.925	28.372	193.33
267+522	1600	22.55	21.82	27.82	28.63	28.036	27.847	193.33
267+701	1601	22.79	21.81	27.81	28.62	28.129	27.700	193.33
267+876	1602	22.79	21.80	27.80	28.60	28.344	28.265	193.33
268+215	1603	22.36	21.78	27.78	28.59	28.661	28.369	193.33
268+599	1604	23.18	21.76	27.76	28.54	28.539	27.842	193.33
268+727	1605	22.81	21.75	27.75	28.54	30.812	27.649	193.33
268+842	1606	23.10	21.75	27.75	28.53	28.198	29.974	193.33
269+136	1607	23.22	21.73	27.73	28.50	28.250	27.031	193.33
269+421	1608	23.07	21.72	27.72	28.48	26.325	27.001	193.33
269+740	1609	23.45	21.70	27.70	28.48	27.695	29.216	193.33
270+218	1610	24.05	21.68	27.68	28.45	27.702	27.970	193.33
270+552	1611	23.00	21.66	27.66	28.43	29.140	28.300	193.33
270+776	1612	23.20	21.65	27.65	28.41	28.629	28.360	193.33
271+031	1613	22.88	21.63	27.63	28.40	28.670	28.054	193.33
271+504	1614	23.09	21.61	27.61	28.37	28.652	27.836	193.33
272+004	1615	22.47	21.58	27.58	28.34	28.714	28.880	193.33
272+522	1616	22.92	21.55	27.55	28.31	28.684	28.634	193.33
273+014	1617	22.96	21.53	27.53	28.27	27.993	28.033	193.33
273+109	1618	22.13	21.52	27.52	28.26	28.000	29.000	193.33
273+212	1619	23.30	21.52	27.52	28.25	28.185	28.744	193.33
273+542	1620	23.04	21.50	27.50	28.22	29.550	28.128	193.33
273+643	1621	23.75	21.49	27.49	28.21	27.763	28.358	193.33
273+769	1622	22.41	21.49	27.49	28.19	29.800	28.209	193.33
274+006	1623	24.32	21.47	27.47	28.18	28.196	27.880	193.33
274+215	1624	22.31	21.46	27.46	28.15	27.750	28.000	193.33
274+289	1625	21.44	21.46	27.46	28.14	27.740	29.550	193.33
274+405	1626	21.92	21.45	27.45	28.12	27.770	29.009	193.33
274+651	1627	22.19	21.44	27.44	28.10	27.791	28.049	193.33
274+957	1628	22.00	21.42	27.42	28.08	30.176	28.340	193.33
275+286	1629	22.26	21.41	27.41	28.05	28.220	28.030	193.33
275+666	1630	22.32	21.39	27.39	28.02	28.100	28.190	193.33
275+946	1631	22.49	21.37	27.37	27.99	28.520	28.090	193.33
276+289	1632	21.88	21.35	27.35	27.96	28.000	27.642	193.33

STNO	CSNO	Actual bed level (canal center)	Plan bed level	Required embankment level	Water level (Non-uniform flow)	Actual Left bank	Actual right bank	Amount of Water
m	No	m	m	m	m	m	m	m^3/sec
276+576	1633	22.95	21.34	27.34	27.92	28.331	28.010	193.33
276+685	1634	22.52	21.33	27.33	27.92	27.950	28.550	193.33
276+793	1635	22.59	21.33	27.33	27.86	28.000	29.429	193.33
277+446	1636	23.48	21.29	27.29	27.77	27.660	28.018	193.33
277+758	1637	22.86	21.28	27.28	27.74	28.010	27.800	193.33
278+141	1638	23.05	21.26	27.26	27.71	28.090	28.306	193.33
278+494	1639	21.65	21.24	27.24	27.68	28.170	27.650	193.33
278+749	1640	22.33	21.22	27.22	27.64	28.020	27.359	193.33
279+007	1641	21.80	21.21	27.21	27.62	27.991	27.730	193.33
279+262	1642	22.28	21.20	27.20	27.60	27.363	27.786	193.33
279+533	1643	22.41	21.18	27.18	27.58	28.110	27.706	193.33
279+752	1644	21.75	21.17	27.17	27.56	27.860	27.772	193.33
280+272	1645	22.81	21.14	27.14	27.51	28.002	28.019	193.33
280+757	1646	22.07	21.12	27.12	27.47	27.570	27.839	193.33
280+887	1647	22.65	21.11	27.11	27.45	27.850	28.146	193.33
281+098	1648	21.85	21.10	27.10	27.43	27.511	28.209	193.33
281+304	1649	22.77	21.09	27.09	27.40	27.735	27.899	193.33
281+460	1650	23.22	21.08	27.08	27.38	28.100	28.400	193.33
281+600	1651	22.50	21.07	27.07	27.38	26.841	28.118	190.00
281+748	1652	21.21	21.07	27.07	27.36	28.820	27.906	190.00
281+944	1653	22.59	21.05	27.05	27.33	29.785	27.337	190.00
282+199	1654	22.13	21.04	27.04	27.31	29.261	27.860	190.00
282+686	1655	22.05	21.02	27.02	27.28	27.903	27.417	190.00
283+196	1656	22.87	20.99	26.99	27.25	27.568	27.088	190.00
283+682	1657	22.35	20.96	26.96	27.23	27.816	27.343	190.00
283+972	1658	22.57	20.95	26.95	27.19	27.644	28.087	190.00
284+263	1659	23.46	20.93	26.93	27.17	27.574	27.316	190.00
284+772	1660	22.43	20.91	26.91	27.14	27.967	27.402	190.00
285+279	1661	21.89	20.88	26.88	27.11	29.425	27.727	190.00
285+735	1662	21.71	20.85	26.85	27.08	27.867	27.080	190.00
286+208	1663	22.54	20.83	26.83	27.04	28.584	27.284	190.00
286+480	1664	21.39	20.81	26.81	27.03	27.574	24.021	190.00
286+558	1665	22.87	20.81	26.81	27.03	27.406	27.427	190.00
286+628	1666	20.13	20.81	26.81	27.02	27.380	27.396	190.00
286+876	1667	21.45	20.79	26.79	27.01	27.679	27.599	190.00
287+119	1668	22.20	20.78	26.78	27.00	28.916	27.435	190.00
287+342	1669	21.51	20.77	26.77	26.98	27.489	28.645	190.00
287+393	1670	21.36	20.77	26.77	26.98	27.524	27.959	190.00
287+447	1671	21.62	20.76	26.76	26.98	27.578	27.172	190.00
287+717	1672	21.65	20.75	26.75	26.96	27.439	27.380	190.00
287+858	1673	22.07	20.74	26.74	26.94	28.473	27.346	190.00
287+952	1674	22.87	20.74	26.74	26.93	27.350	27.406	190.00
288+078	1675	22.63	20.73	26.73	26.91	27.416	28.533	190.00
288+300	1676	22.87	20.72	26.72	26.88	27.813	28.407	190.00
288+511	1677	22.28	20.71	26.71	26.87	28.054	28.254	190.00
288+837	1678	21.57	20.69	26.69	26.86	27.645	26.984	190.00
288+953	1679	22.65	20.68	26.68	26.86	27.514	25.726	190.00
289+080	1680	22.77	20.68	26.68	26.85	28.119	24.778	190.00
289+354	1681	21.51	20.66	26.66	26.85	27.512	26.580	190.00
289+771	1682	22.42	20.64	26.64	26.81	27.324	27.303	190.00
290+108	1683	21.54	20.62	26.62	26.78	26.955	27.258	190.00
290+170	1684	22.57	20.62	26.62	26.78	27.904	27.275	190.00
290+242	1685	22.63	20.62	26.62	26.78	28.078	27.376	190.00
290+497	1686	20.75	20.60	26.60	26.75	28.543	27.333	190.00
290+602	1687	18.89	20.60	26.60	26.76	27.641	27.122	190.00
290+764	1688	22.33	20.59	26.59	26.74	27.454	29.953	190.00
291+025	1689	22.05	20.57	26.57	26.72	27.349	26.858	190.00
291+158	1690	22.31	20.57	26.57	26.71	27.379	28.091	190.00
291+257	1691	21.71	20.56	26.56	26.70	27.314	27.297	190.00
291+444	1692	21.34	20.55	26.55	26.67	26.784	27.025	190.00
291+519	1693	20.63	20.55	26.55	26.67	27.159	27.061	190.00
291+600	1694	21.63	20.54	26.54	26.67	27.447	27.094	190.00
291+926	1695	21.38	20.53	26.53	26.65	27.335	27.095	190.00
292+258	1696	21.96	20.51	26.51	26.64	27.285	26.661	190.00
292+376	1697	22.18	20.50	26.50	26.62	27.151	27.100	190.00
292+498	1698	22.03	20.50	26.50	26.59	27.282	27.670	190.00
292+630	1699	21.93	20.49	26.49	26.58	27.475	25.880	190.00
292+761	1700	22.31	20.48	26.48	26.61	29.358	24.509	132.75

STNO	CSNO	Actual bed level (canal center)	Plan bed level	Required embankment level	Water level (Non-uniform flow)	Actual Left bank	Actual right bank	Amount of Water
m	No	m	m	m	m	m	m	m^3/sec
292+804	1701	21.88	20.48	26.48	26.60	27.293	26.025	132.75

ANNEX8 : Result of Cross Section Survey on Bahr Yusef Principal Canal

ANNEX8-1

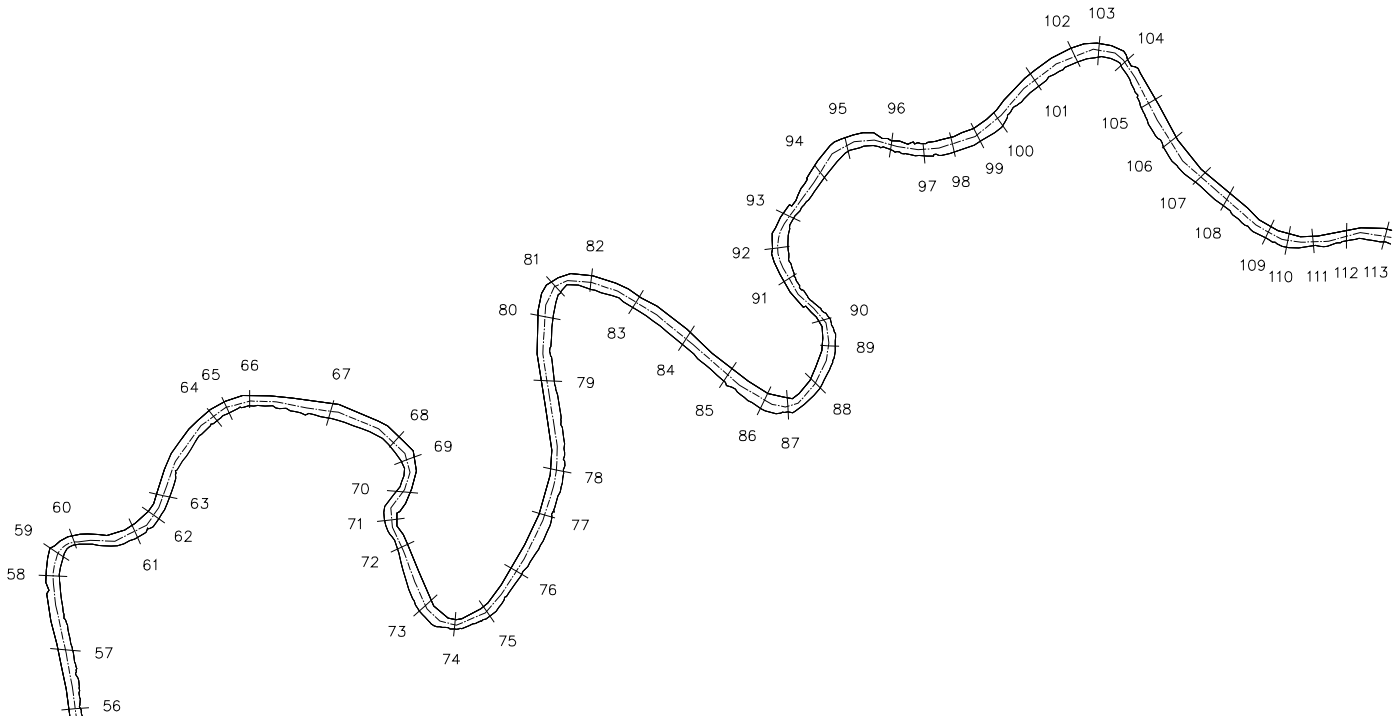


PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** P-0
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY LOCATION MAP	**SCALE** 1:800.000	**SERIAL NO.** 0

ANNEX8-2

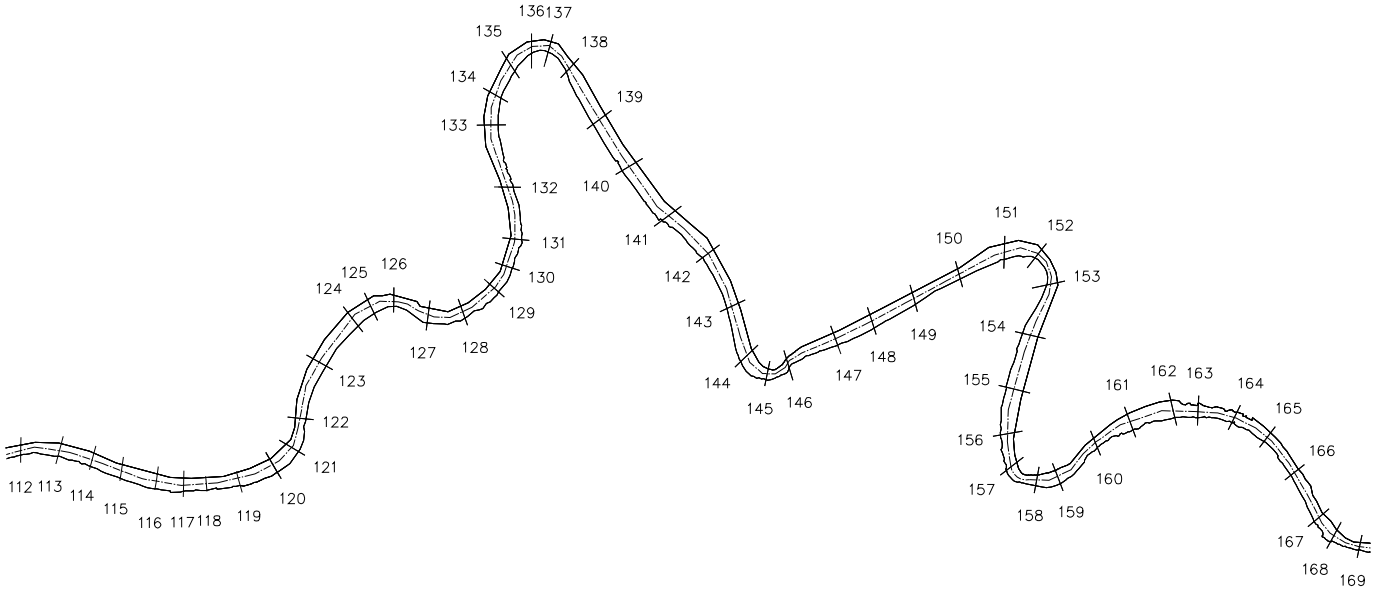
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** P-1
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY PLAN NO. 1 - 56	**SCALE** 1:30.000	**SERIAL NO.** 1

ANNEX8-3



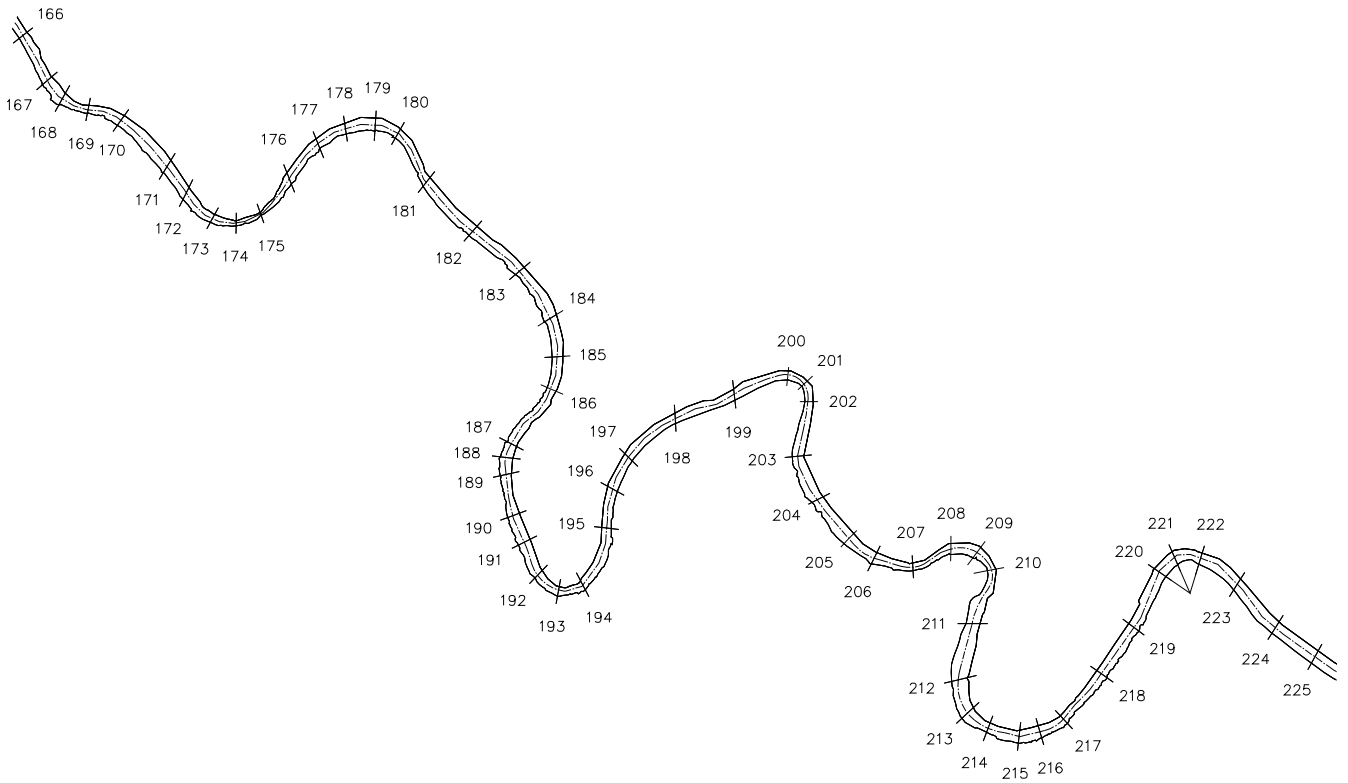
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** P-2
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY PLAN NO. 57 - 112	**SCALE** 1:30.000	**SERIAL NO.** 2

ANNEX8-4



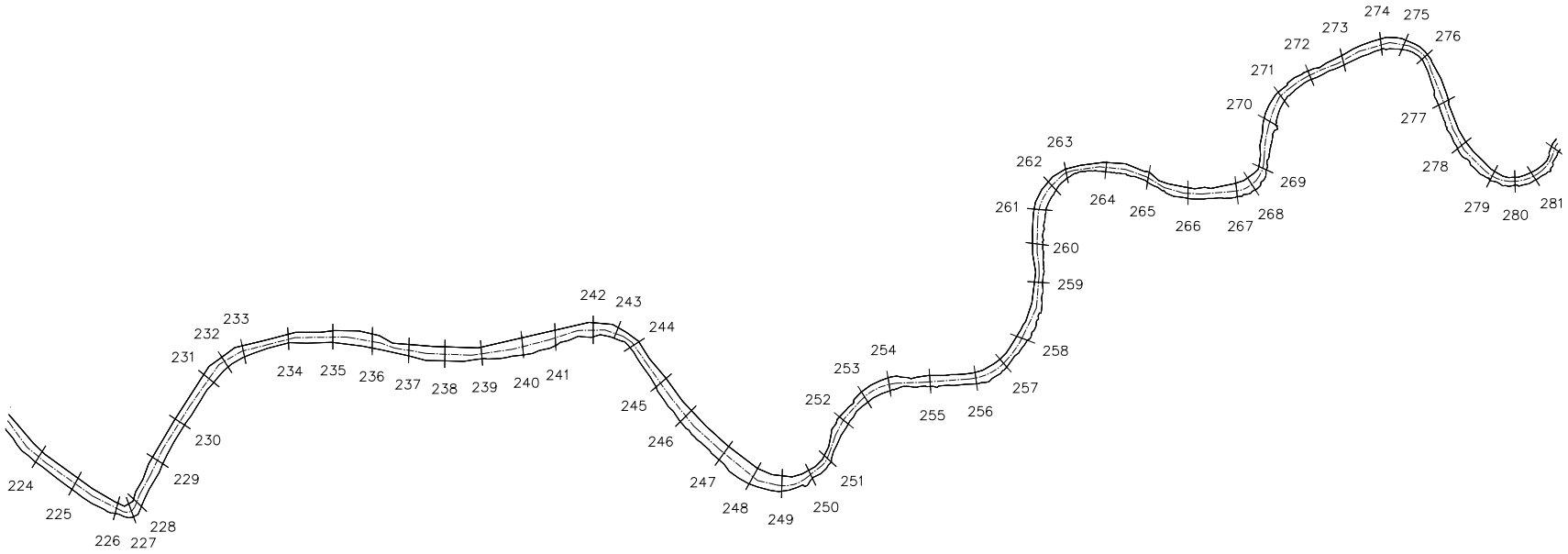
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** P-3
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY PLAN NO. 113 - 168	**SCALE** 1:30.000	**SERIAL NO.** 3

ANNEX8-5



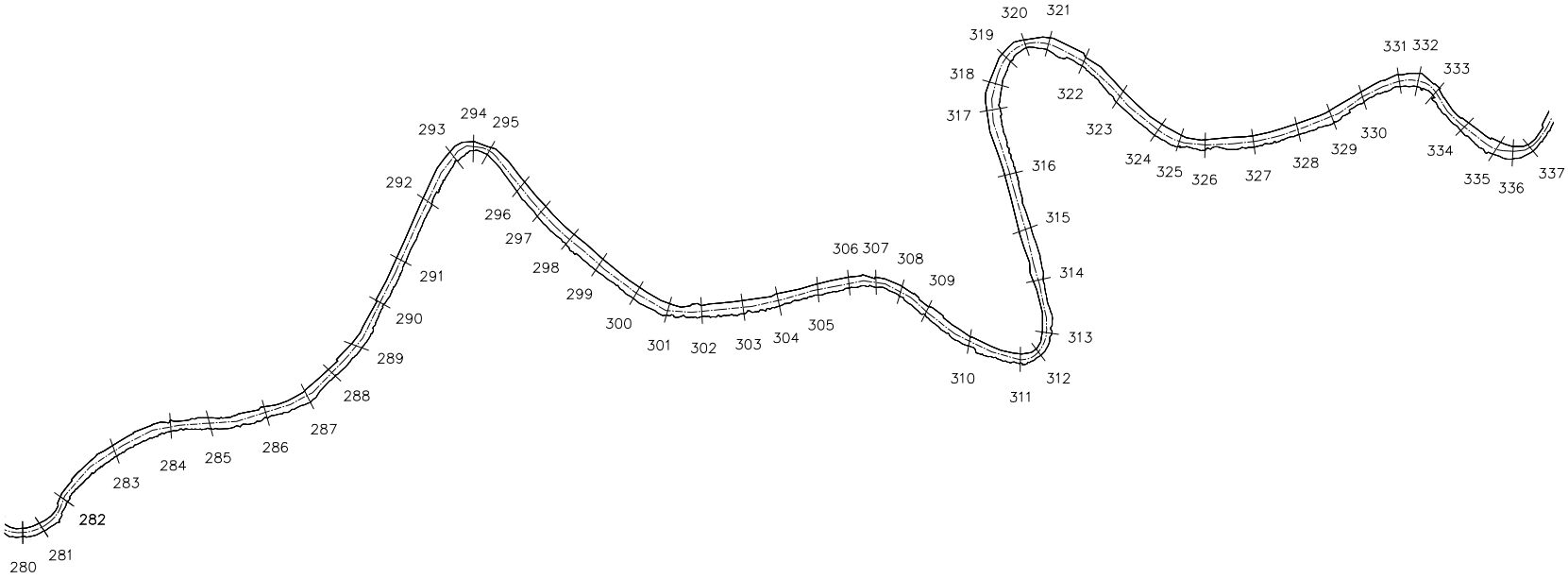
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** P-4
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY PLAN NO. 167 - 224	**SCALE** 1:30.000	**SERIAL NO.** 4

ANNEX8-6



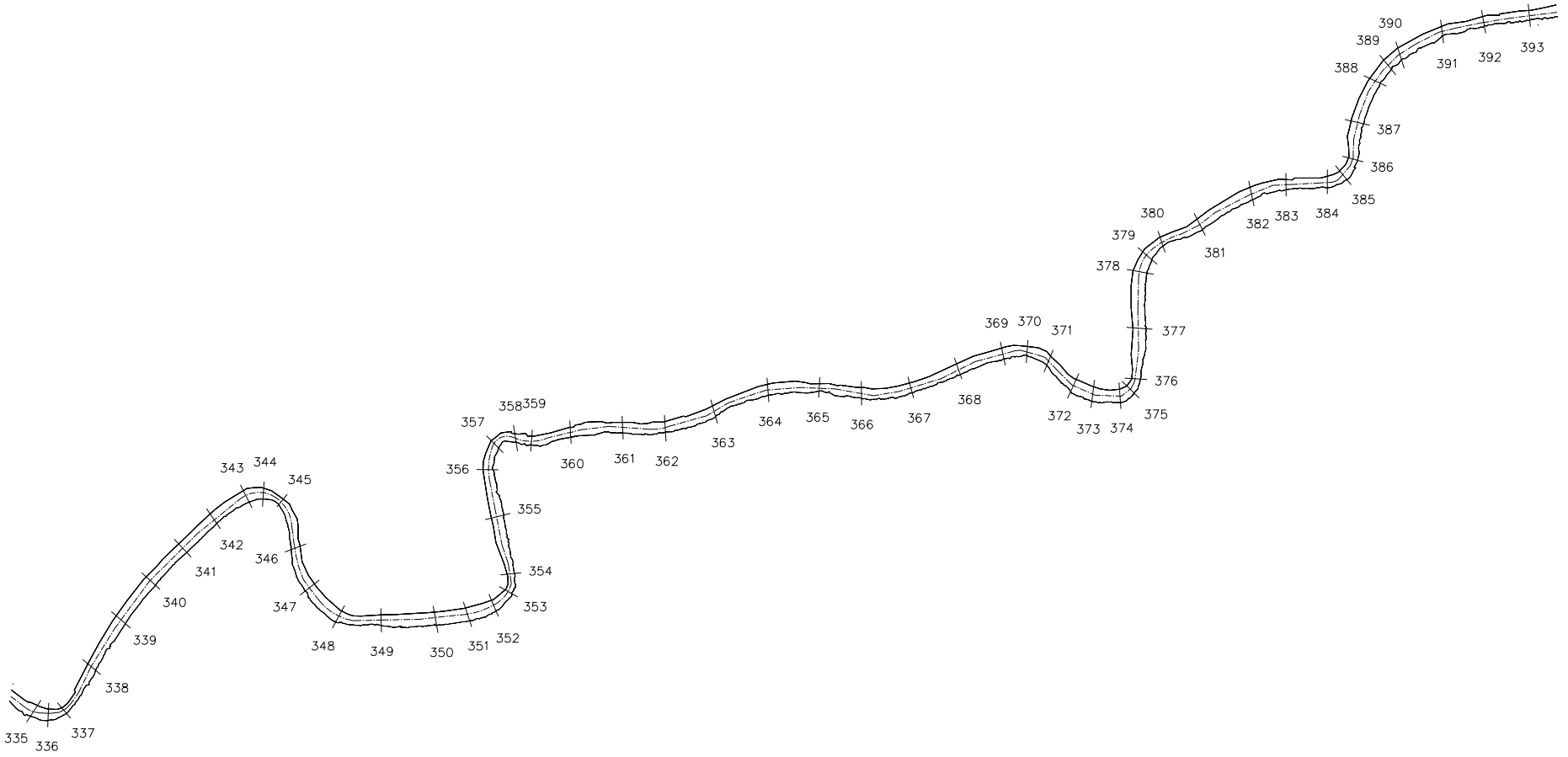
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** P-5
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY PLAN NO. 225 - 280	**SCALE** 1:30.000	**SERIAL NO.** 5

ANNEX8-7



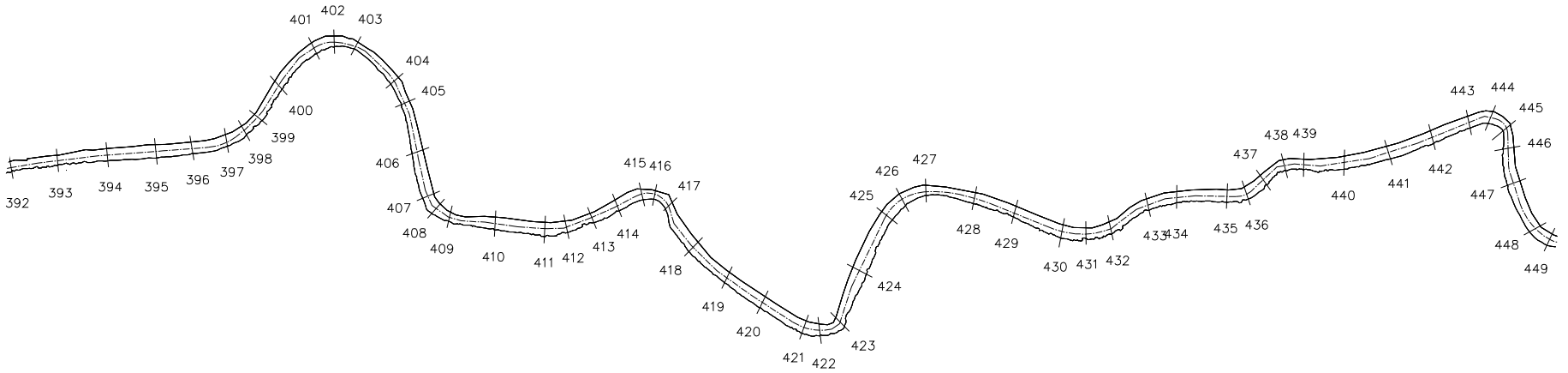
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** P-6
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY PLAN NO. 281 - 336	**SCALE** 1:30.000	**SERIAL NO.** 6

ANNEX8-8



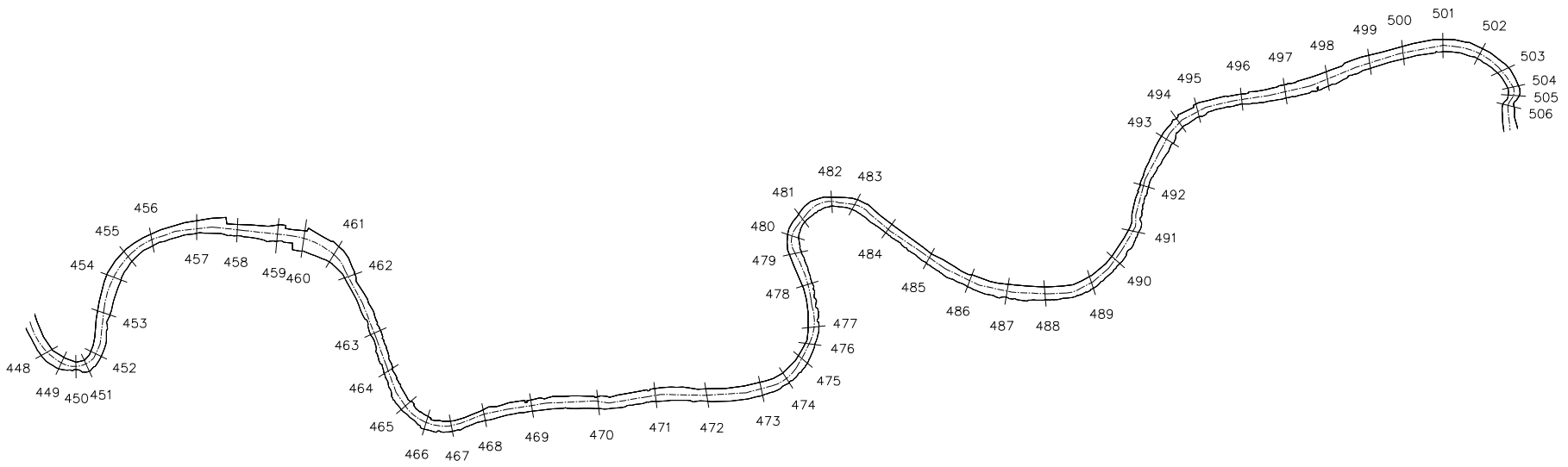
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** P-7
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY PLAN NO. 337 - 392	**SCALE** 1:30.000	**SERIAL NO.** 7

ANNEX8-9



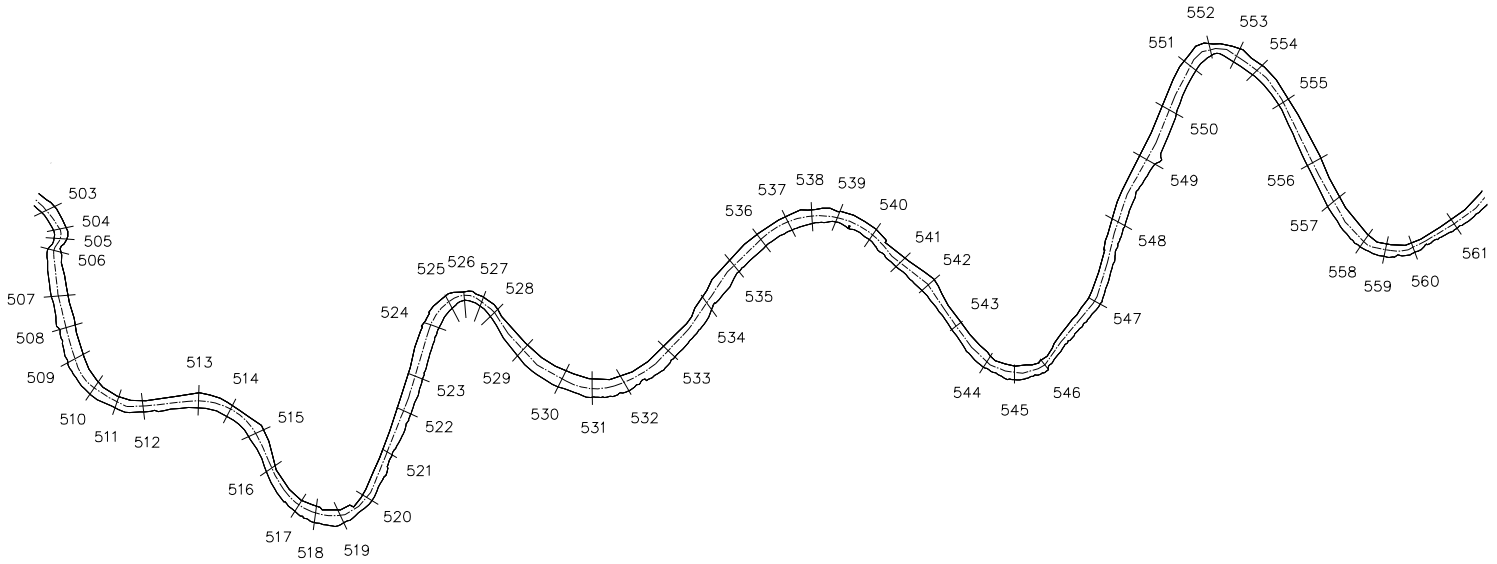
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** P-8
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY PLAN NO. 393 - 448	**SCALE** 1:30.000	**SERIAL NO.** 8

ANNEX8-10



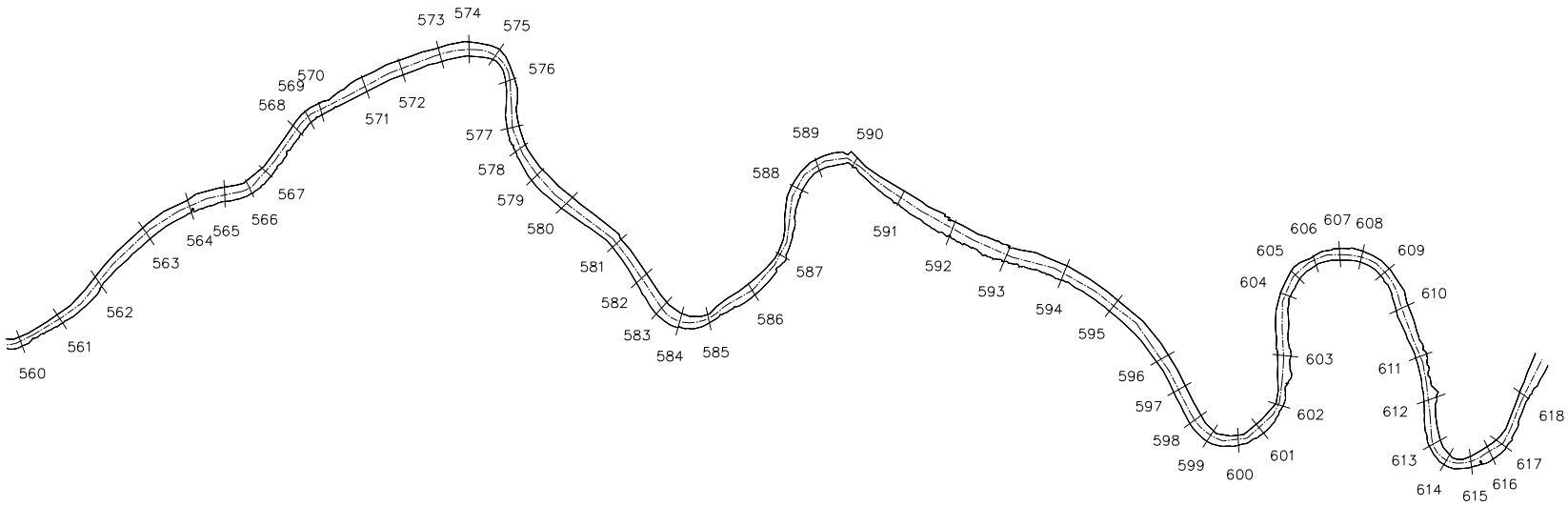
PROJECT TITLE	DATE	DWG NO.
COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	9/2017	P-9
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY PLAN NO. 449 - 504	**SCALE** 1:30.000	**SERIAL NO.** 9

ANNEX8-11



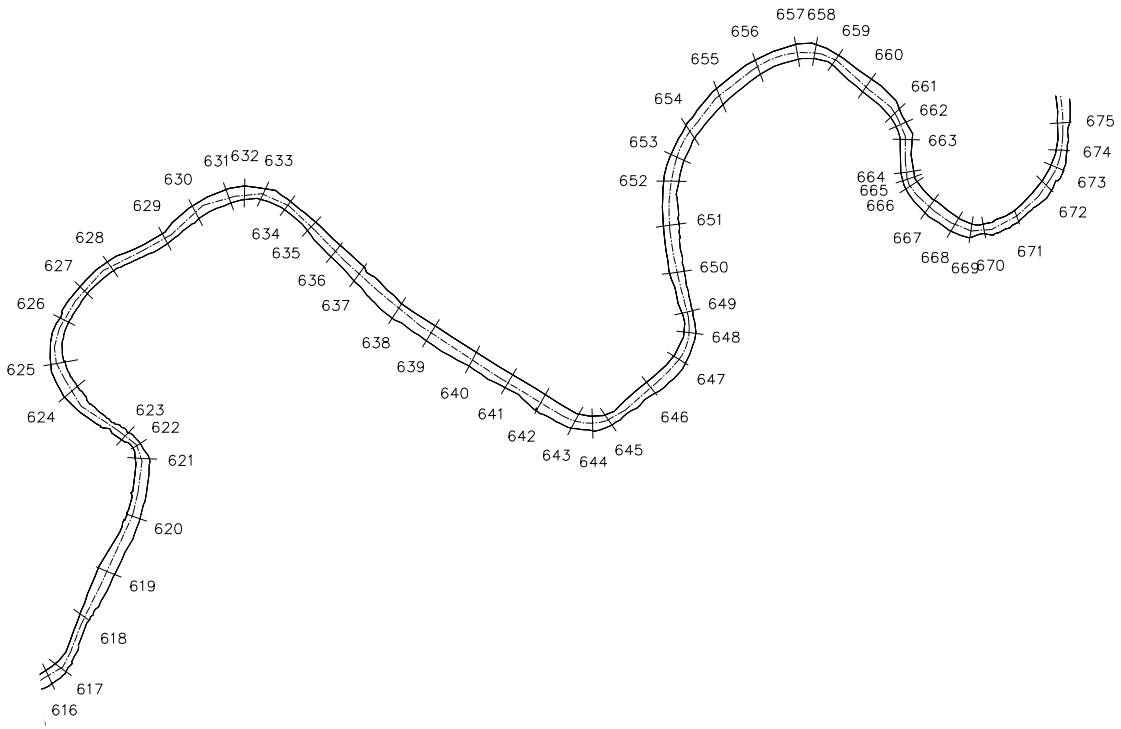
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** P-10
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY PLAN NO. 505 - 560	**SCALE** 1:30.000	**SERIAL NO.** 10

ANNEX8-12

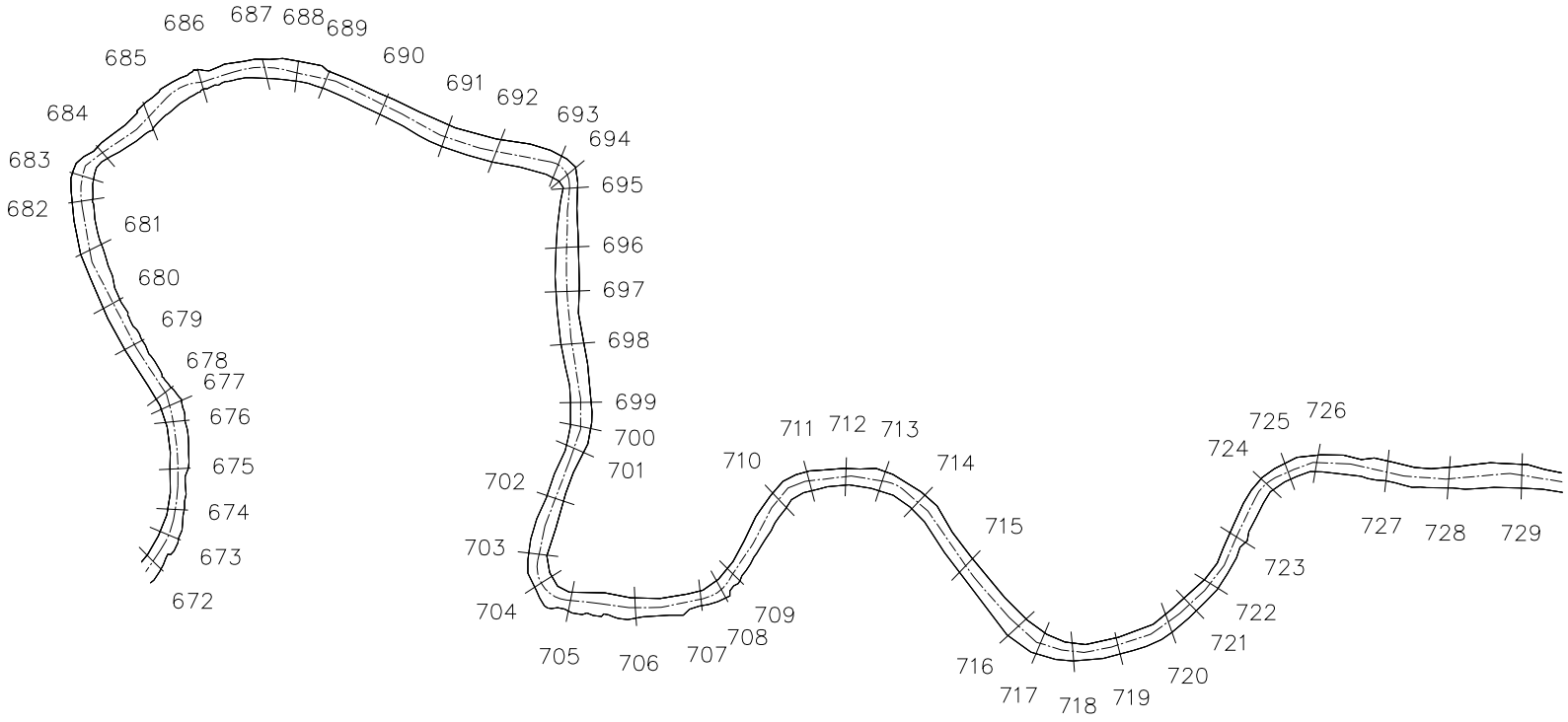


PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** P-11
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY PLAN NO. 561 - 616	**SCALE** 1:30.000	**SERIAL NO.** 11

ANNEX8-13

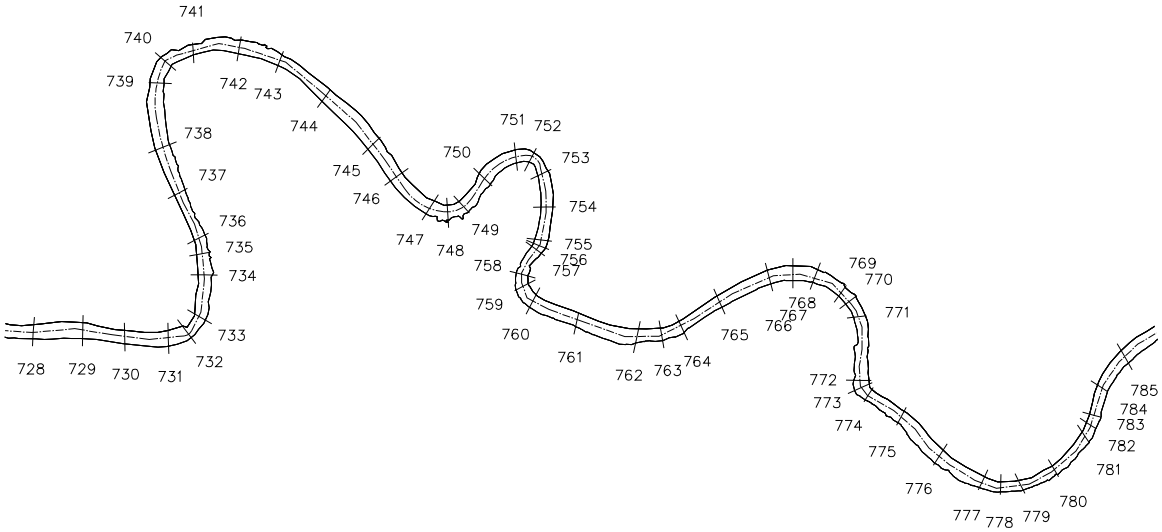


PROJECT TITLE	DATE	DWG NO.
COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	9/2017	P-12
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY PLAN NO. 617 - 672	**SCALE** 1:30.000	**SERIAL NO.** 12



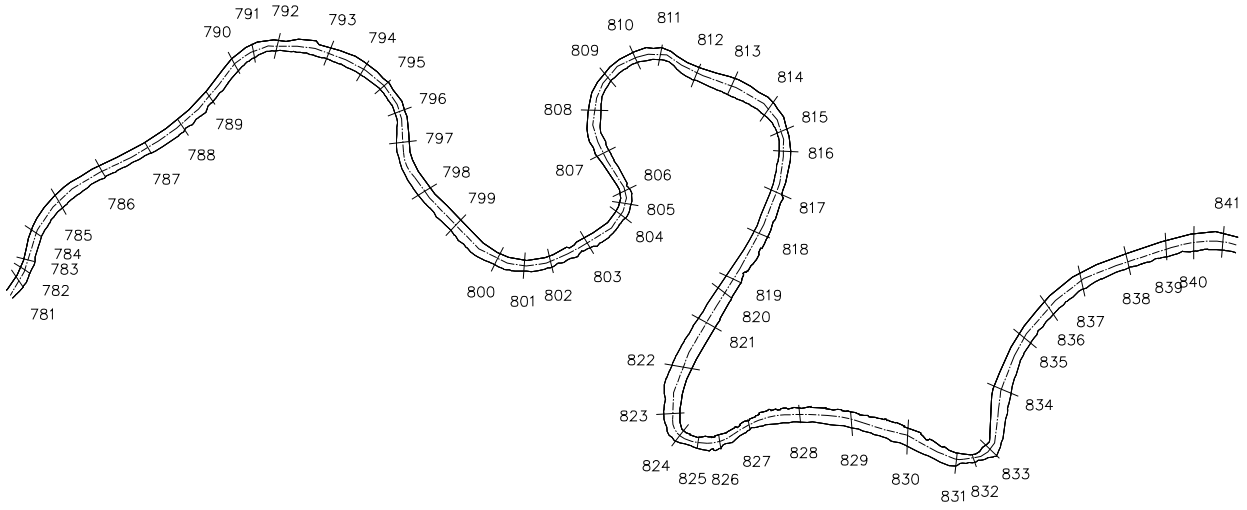
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** P-13
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY PLAN NO. 673 - 728	**SCALE** 1:30.000	**SERIAL NO.** 13

ANNEX8-15



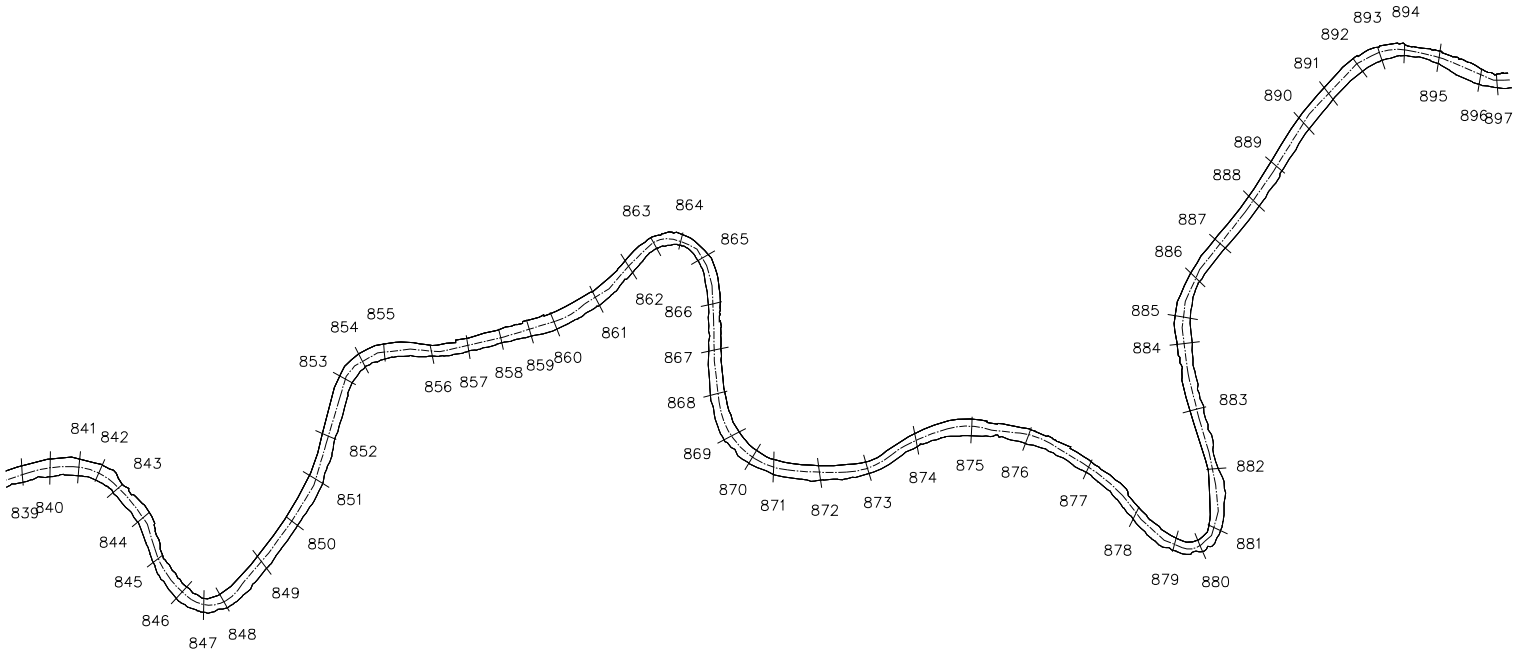
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** P-14
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY PLAN NO. 729 - 784	**SCALE** 1:30.000	**SERIAL NO.** 14

ANNEX8-16

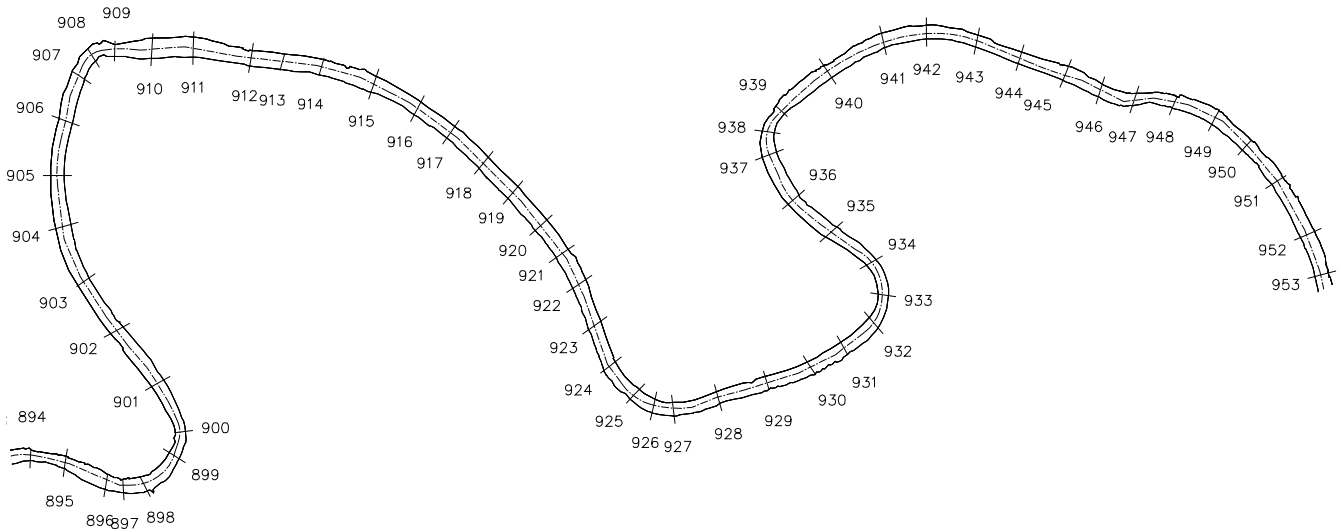


PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** P-15
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY PLAN NO. 785 - 840	**SCALE** 1:30.000	**SERIAL NO.** 15

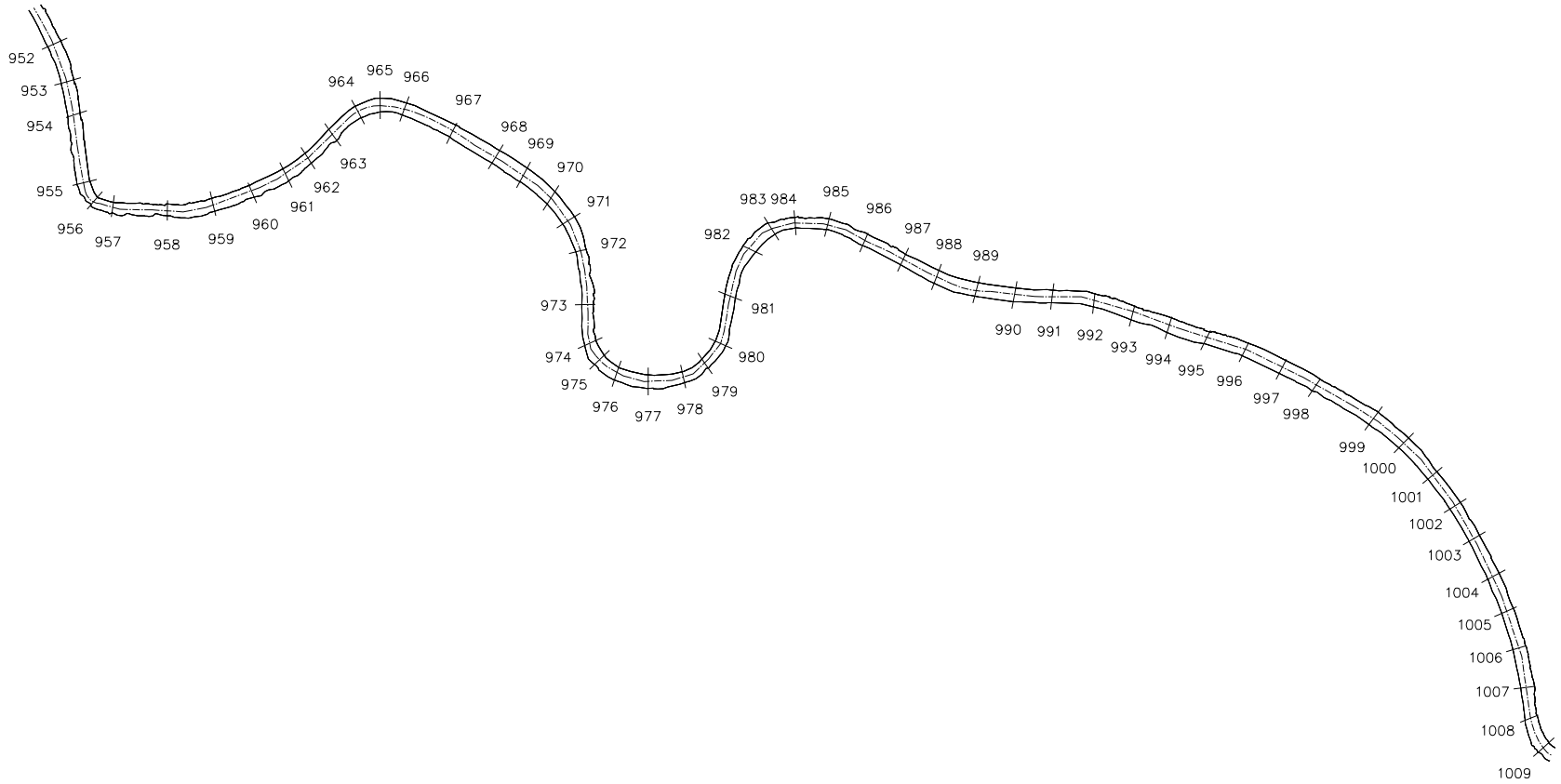
ANNEX8-17



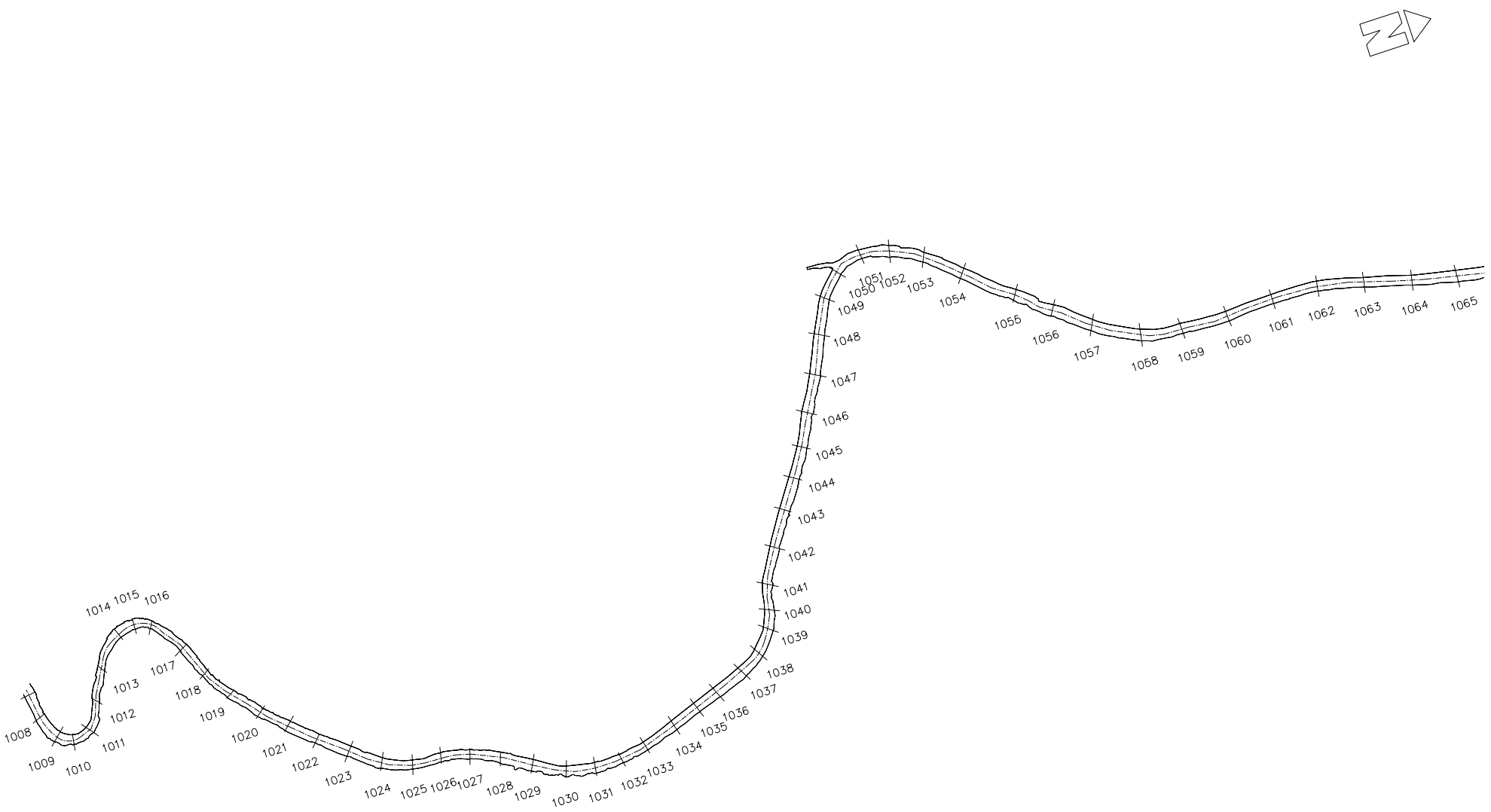
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** P-16
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY PLAN NO. 841 - 896	**SCALE** 1:30.000	**SERIAL NO.** 16



PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** P-17
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY PLAN NO. 897 - 952	**SCALE** 1:30.000	**SERIAL NO.** 17

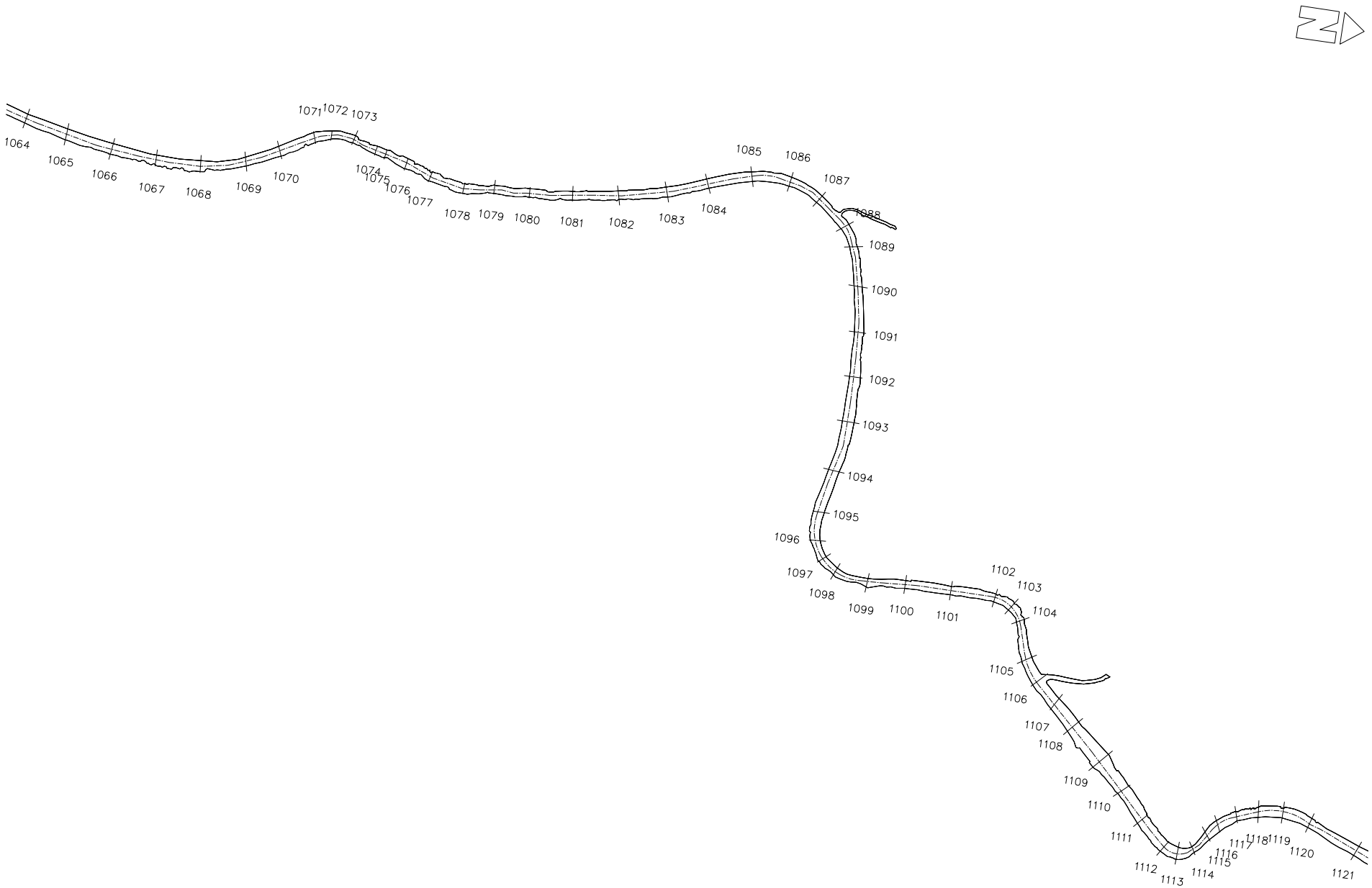


PROJECT TITLE	DATE	DWG NO.
COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	9/2017	P-18
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY PLAN NO. 953 - 1008	**SCALE** 1:30.000	**SERIAL NO.** 18



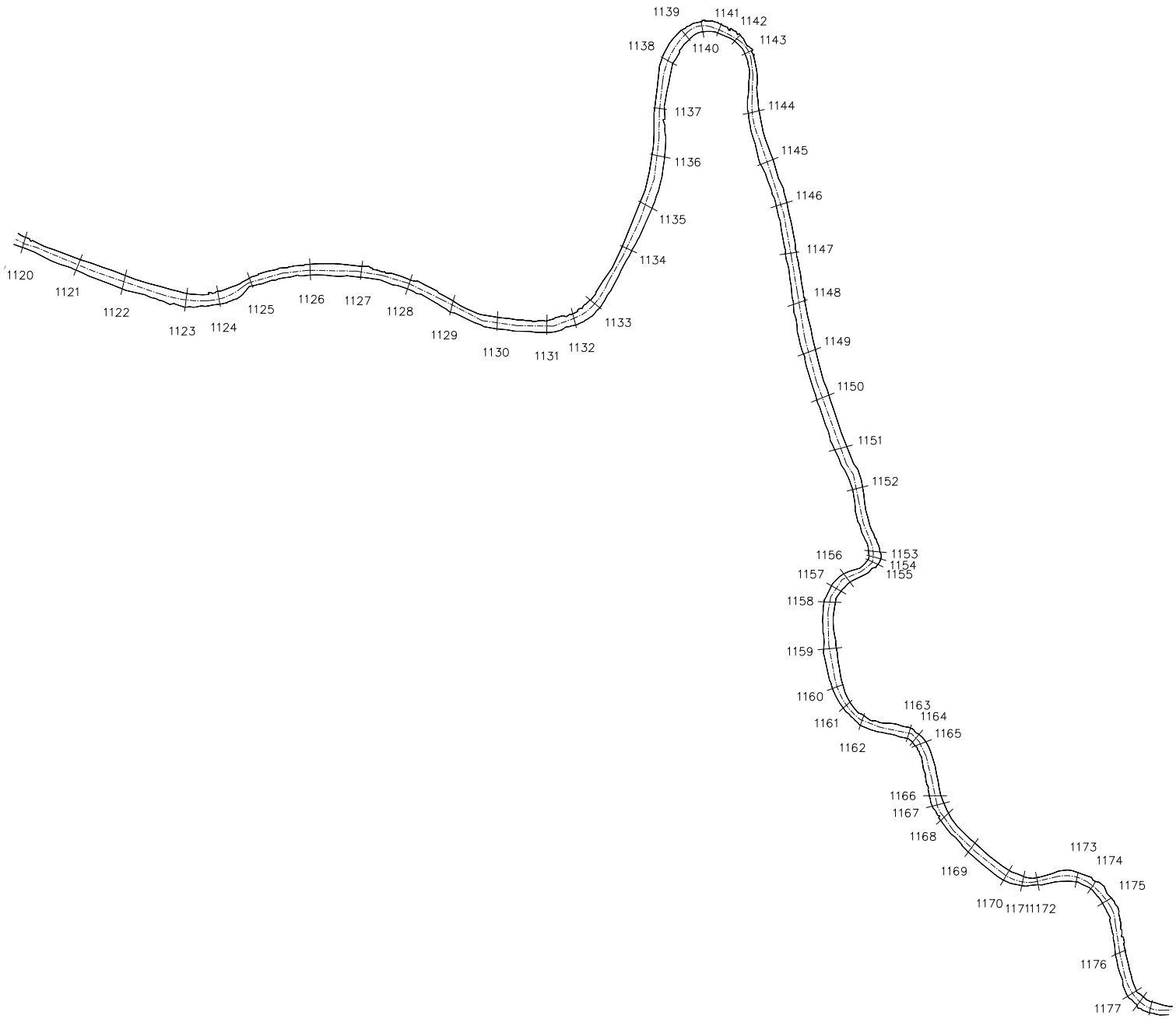
PROJECT TITLE	DATE	DWG NO.
COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	9/2017	P-19
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY PLAN NO. 1009 - 1064	**SCALE** 1:30.000	**SERIAL NO.** 19

ANNEX8-21



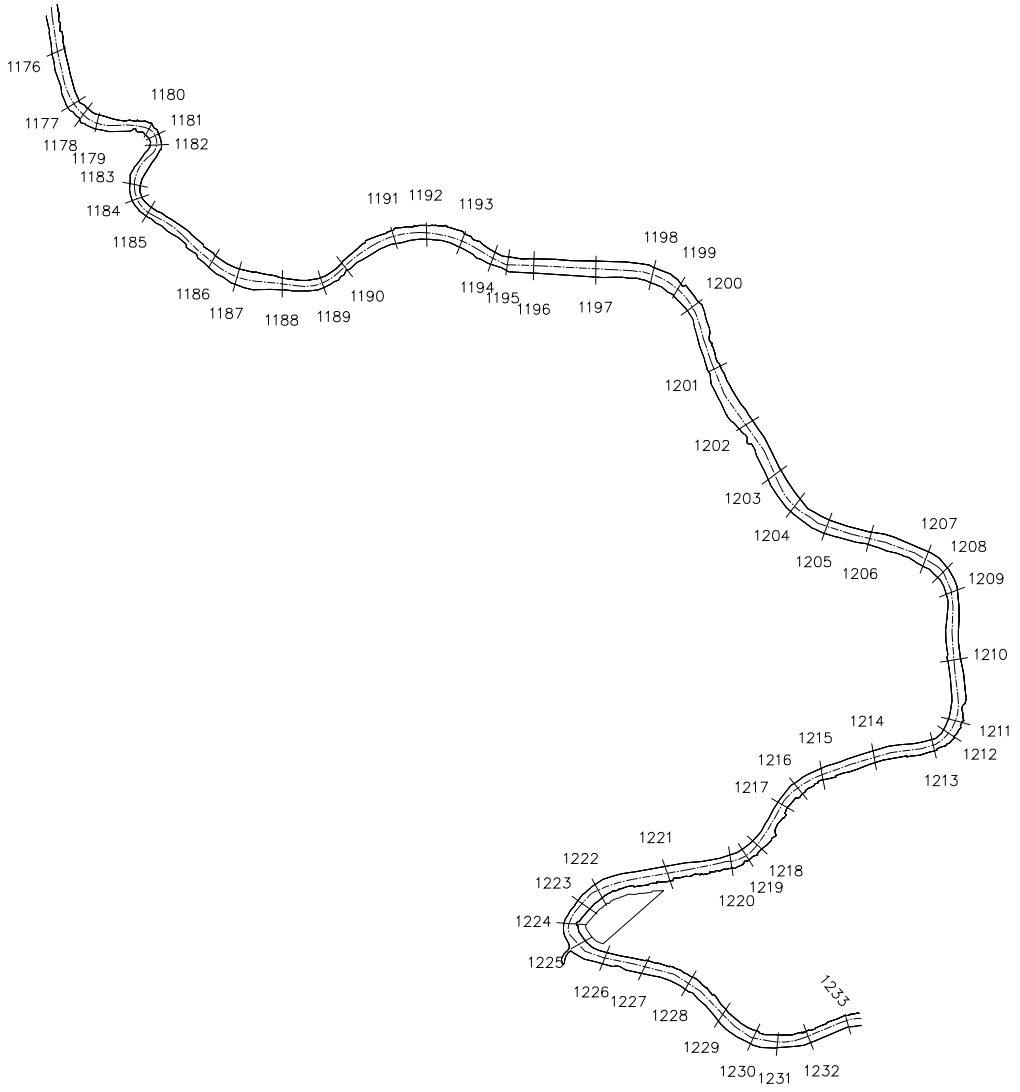
PROJECT TITLE	DATE	DWG NO.
COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	9/2017	P-20
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY PLAN NO. 1065 - 1120	**SCALE** 1:30.000	**SERIAL NO.** 20

ANNEX8-22



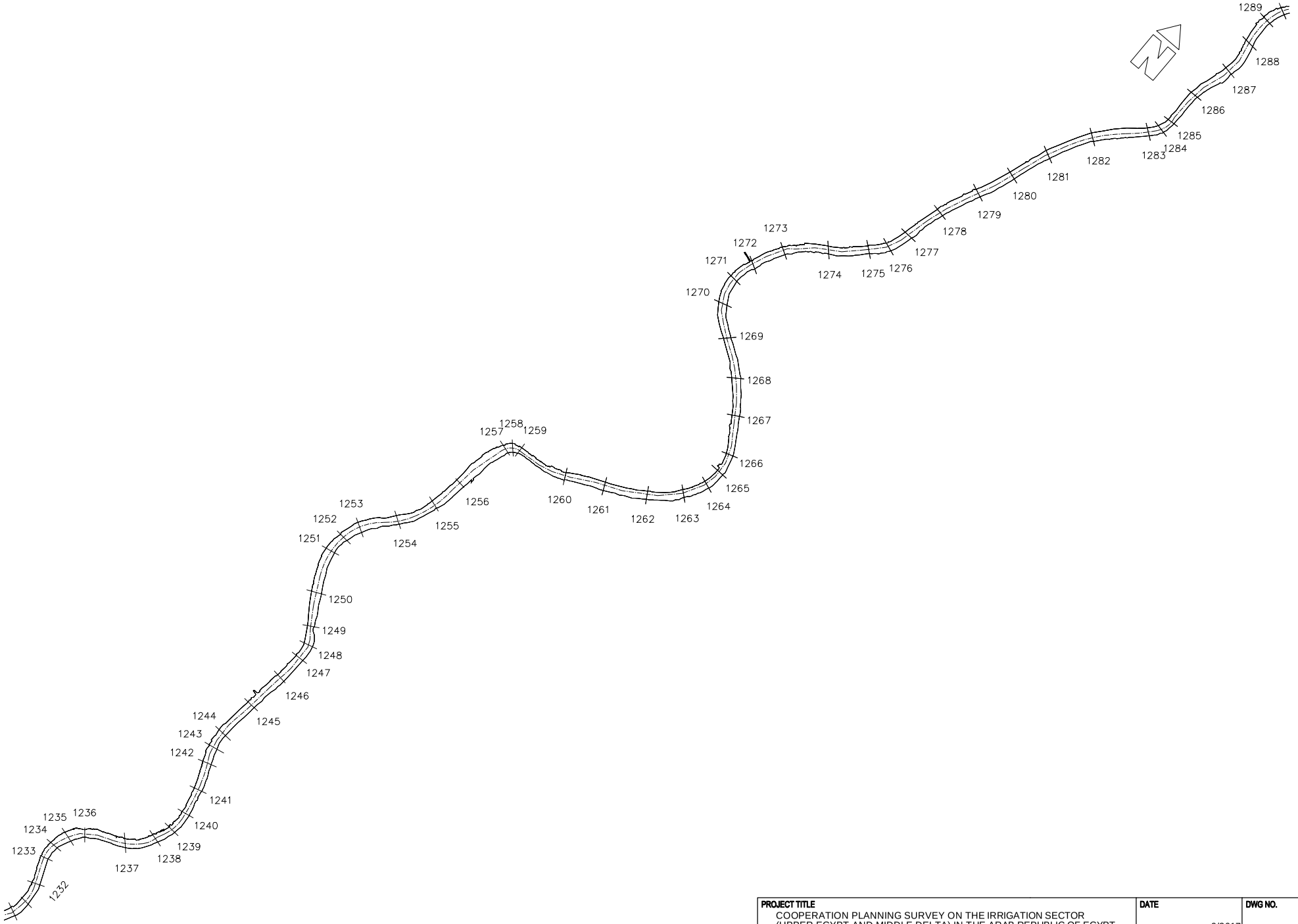
PROJECT TITLE	DATE	DWG NO.
COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	9/2017	P-21
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY PLAN NO. 1121 - 1176	**SCALE** 1:30.000	**SERIAL NO.** 21

ANNEX8-23

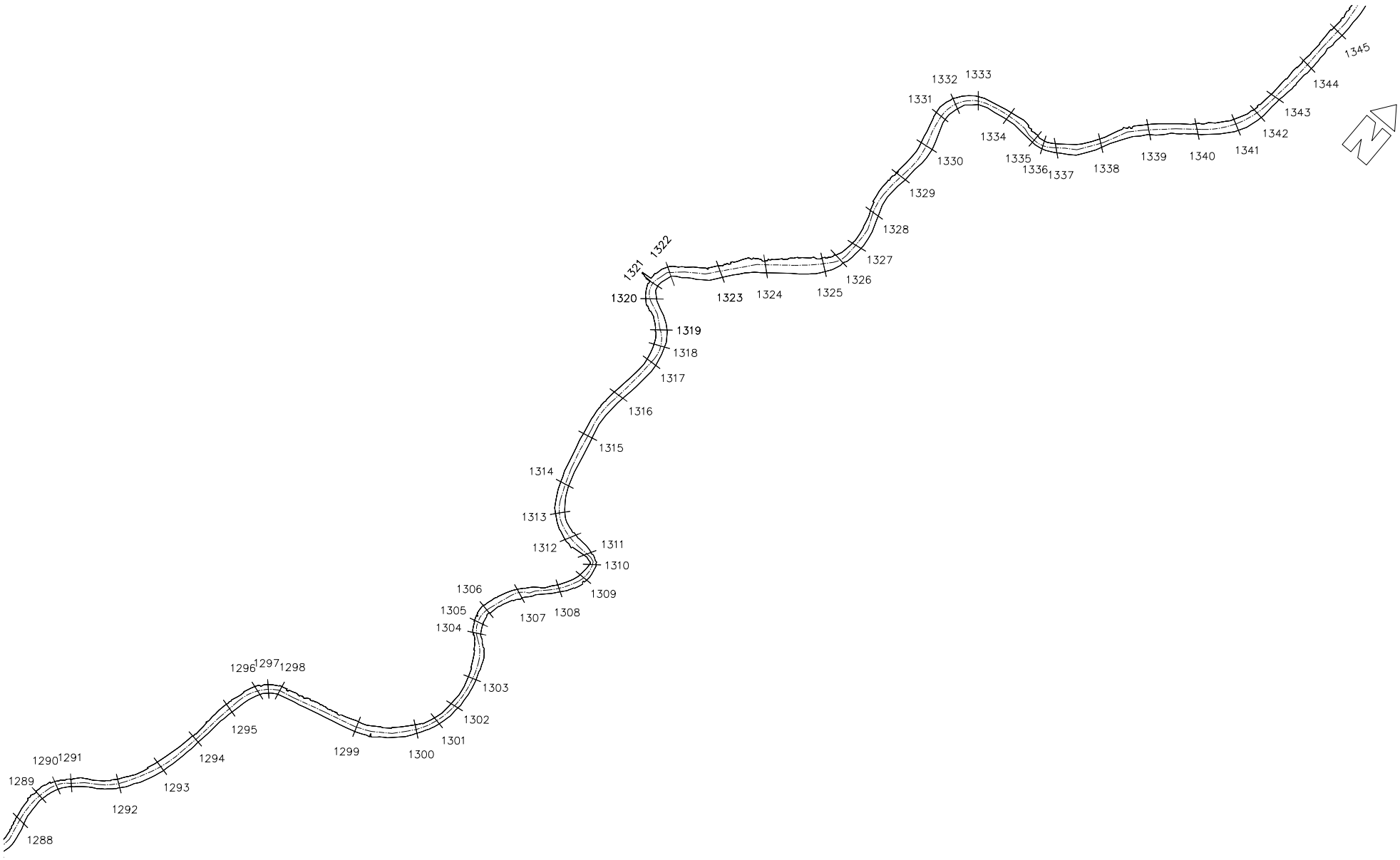


PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** P-22
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY PLAN NO. 1177 - 1232	**SCALE** 1:30.000	**SERIAL NO.** 22

ANNEX8-24

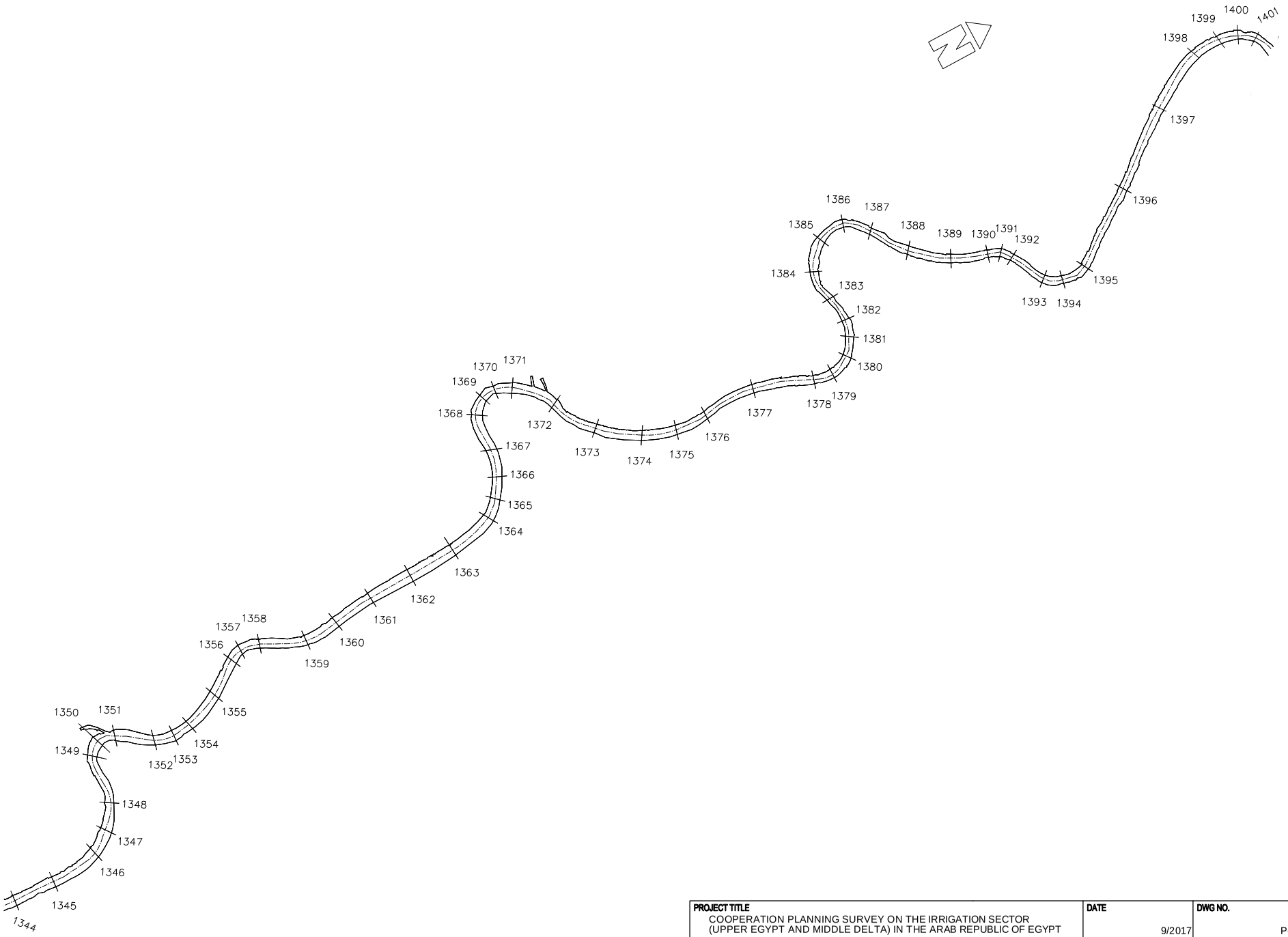


PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** P-23
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY PLAN NO. 1233 - 1288	**SCALE** 1:30.000	**SERIAL NO.** 23

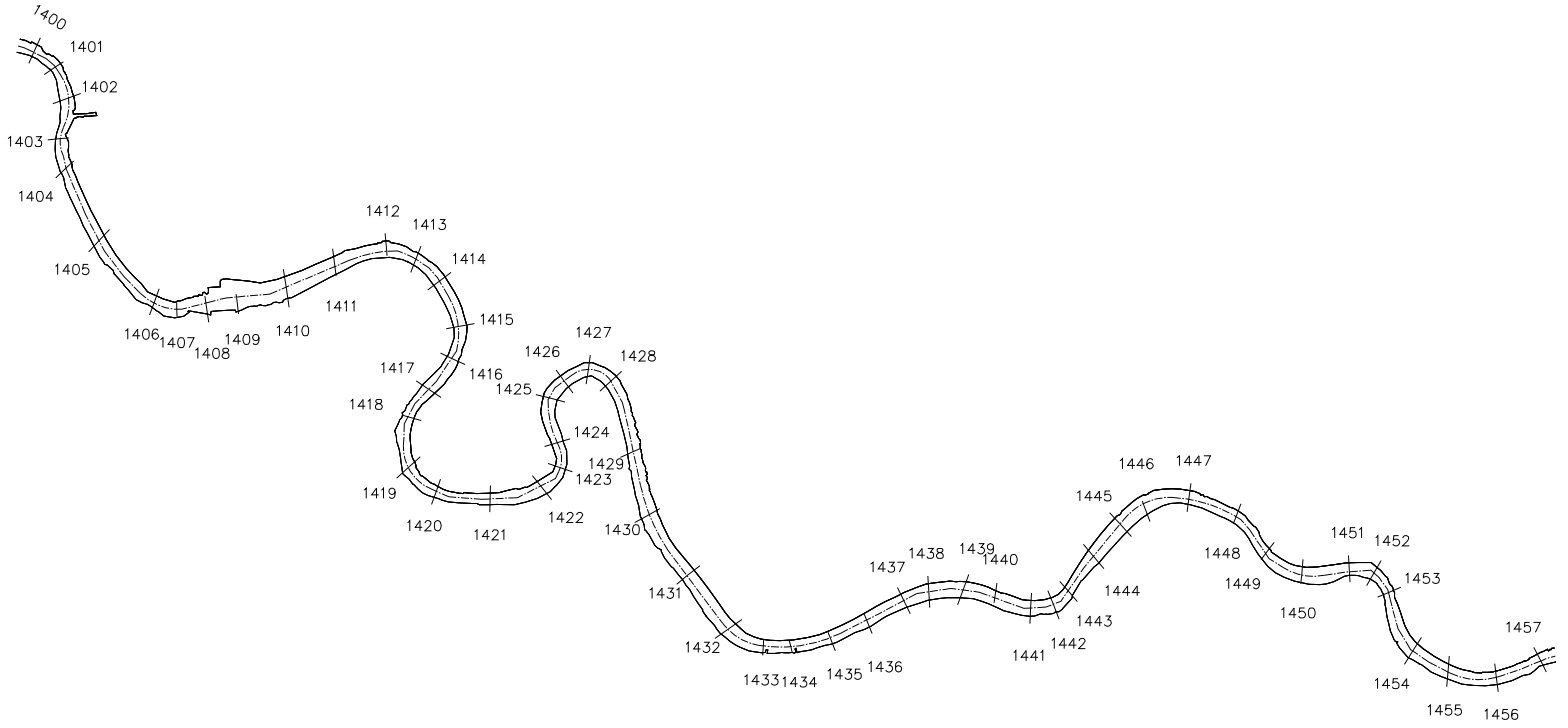


PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** P-24
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY PLAN NO. 1289 - 1344	**SCALE** 1:30.000	**SERIAL NO.** 24

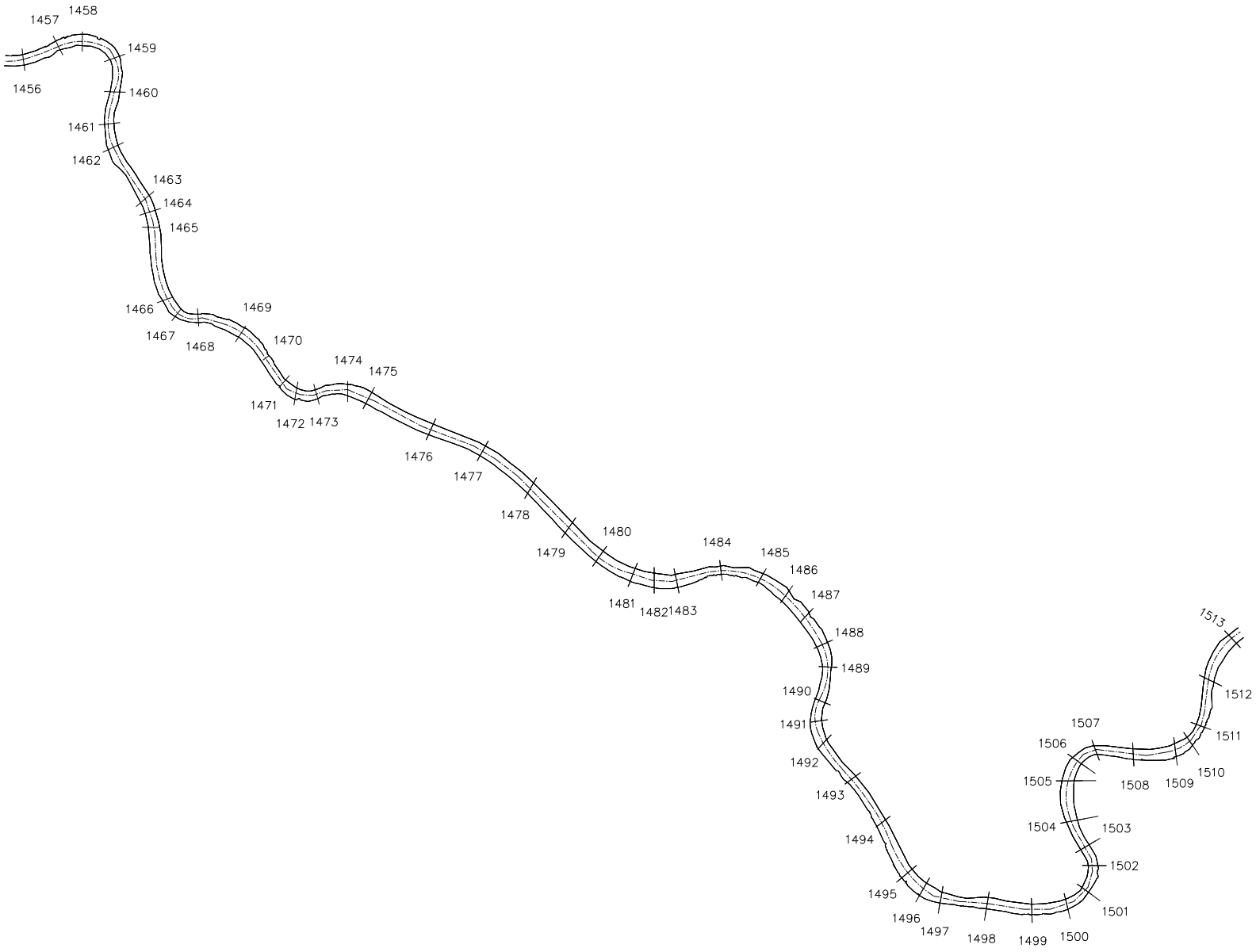
ANNEX8-26



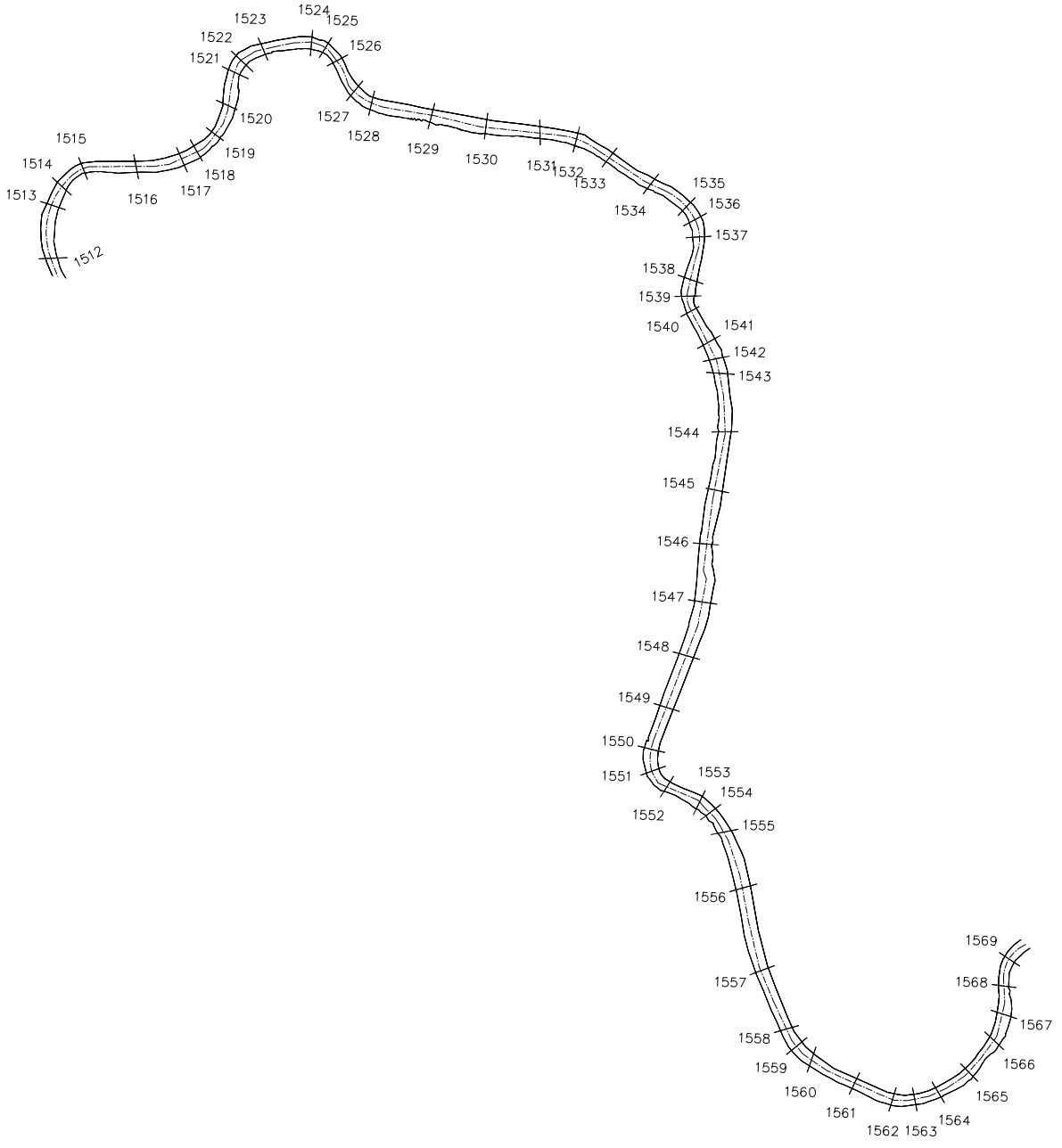
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** P-25
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY PLAN NO. 1345 - 1400	**SCALE** 1:30.000	**SERIAL NO.** 25



PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** P-26
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY PLAN NO. 1401 - 1456	**SCALE** 1:30.000	**SERIAL NO.** 26

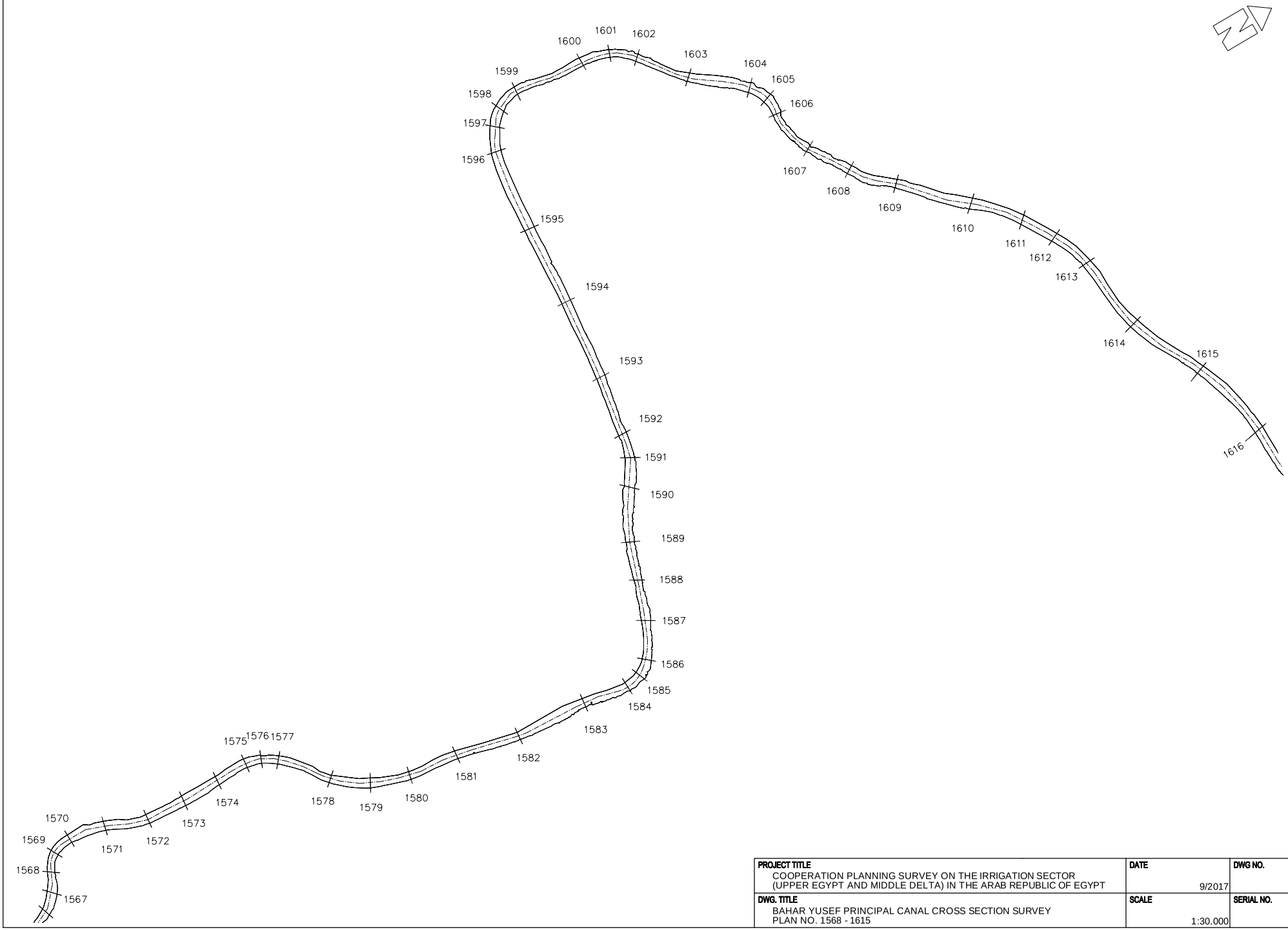


PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** P-27
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY PLAN NO. 1457 - 1512	**SCALE** 1:30.000	**SERIAL NO.** 27



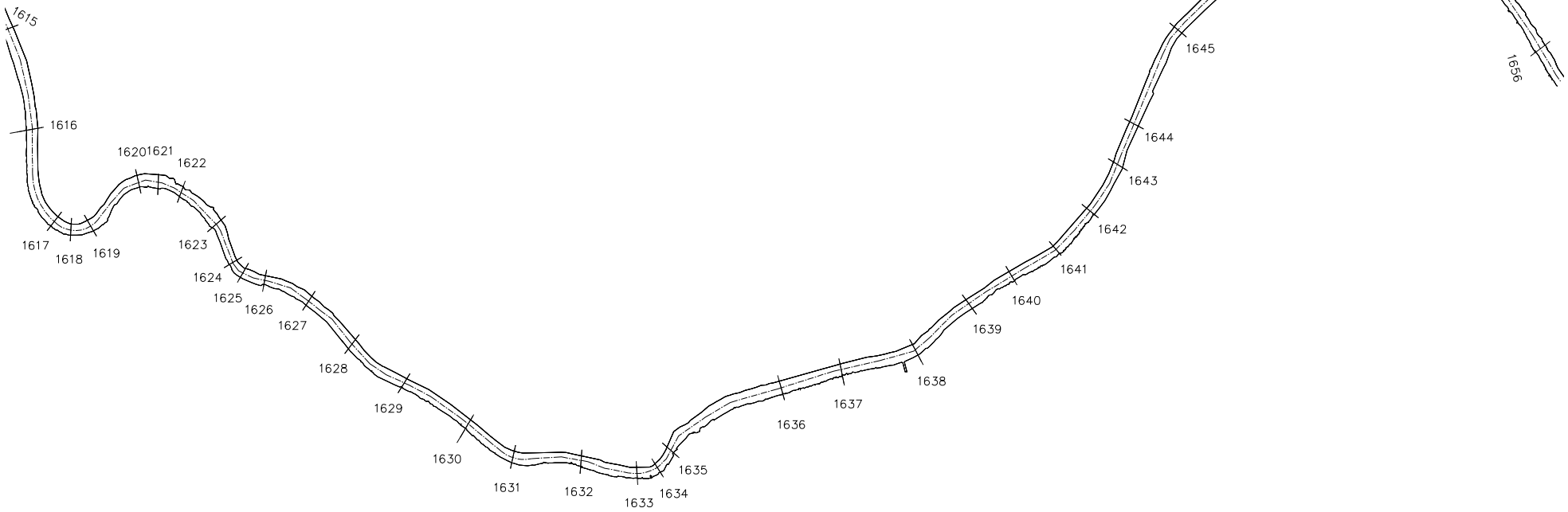
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** P-28
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY PLAN NO. 1513 - 1568	**SCALE** 1:30.000	**SERIAL NO.** 28

ANNEX8-30



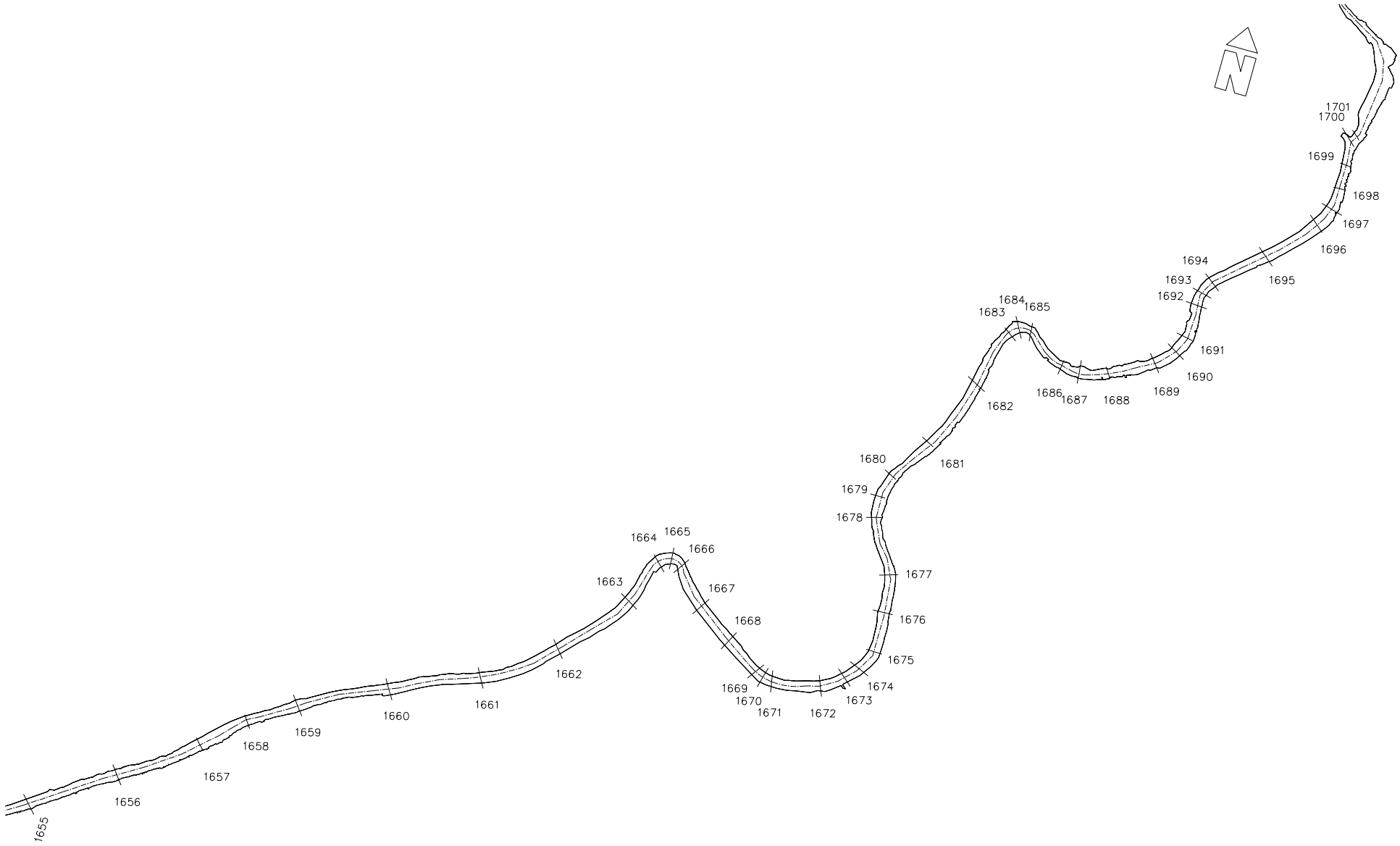
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** P-29
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY PLAN NO. 1568 - 1615	**SCALE** 1:30.000	**SERIAL NO.** 29

ANNEX8-31

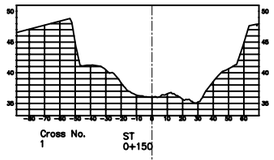


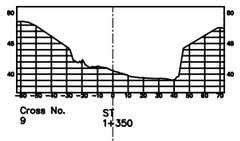
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** P-30
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY PLAN NO. 1616 - 1655	**SCALE** 1:30.000	**SERIAL NO.** 30

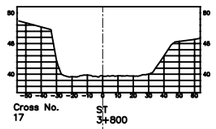
ANNEX8-32

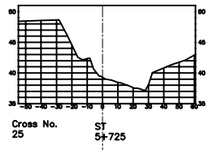


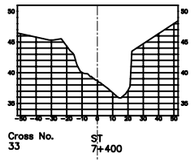
PROJECT TITLE	DATE	DWG NO.
COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	9/2017	P-31
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY PLAN NO. 1656 - 1736	**SCALE** 1:30.000	**SERIAL NO.** 31

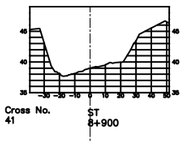


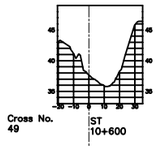


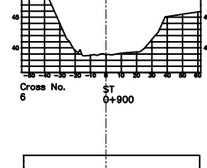


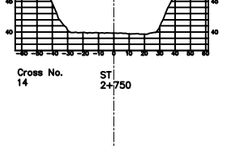


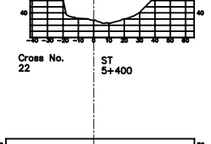


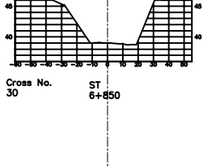


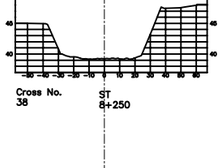


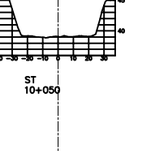


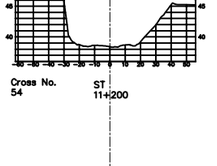


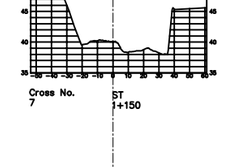


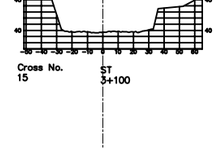


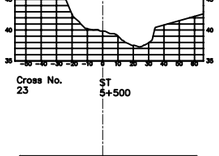


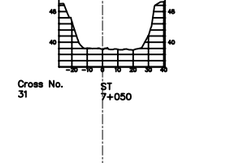


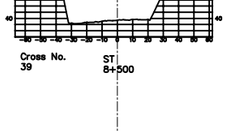


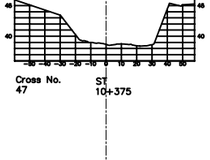


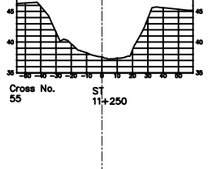


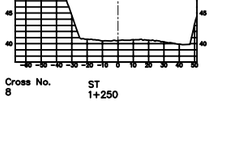


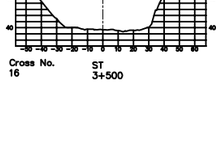


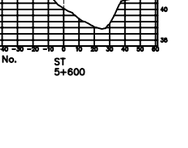


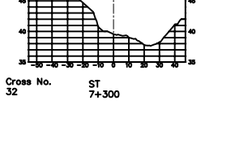


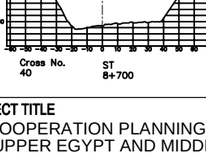


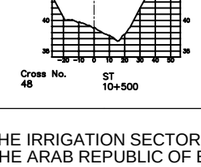


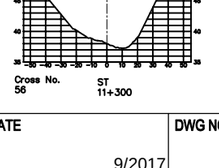


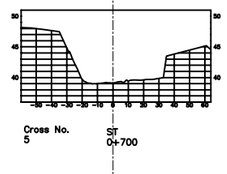


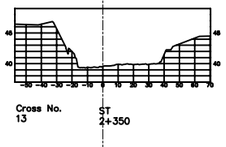


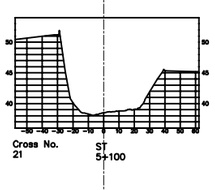


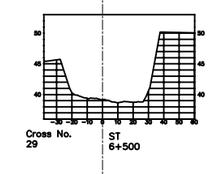


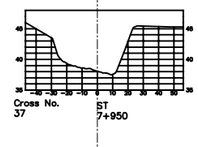


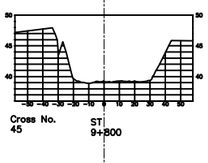


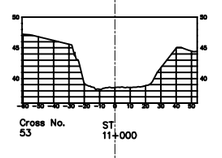


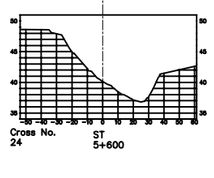




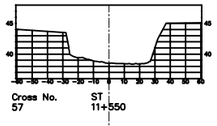


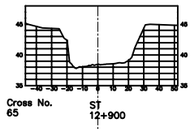


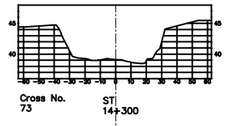


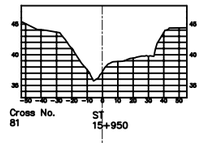


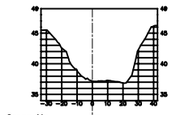
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** C-1
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY CROSS SECTION NO. 1 - 56	**SCALE** X=1:4000 Y=1:1000	**SERIAL NO.** 32

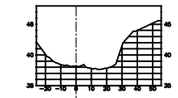


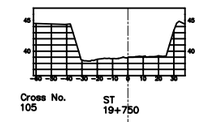


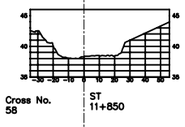


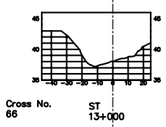


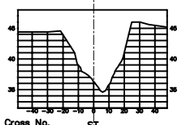


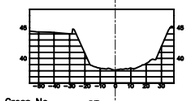


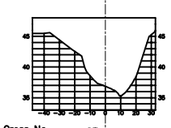


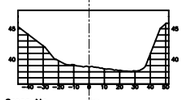


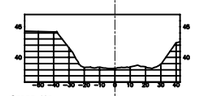


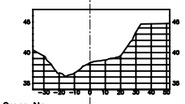


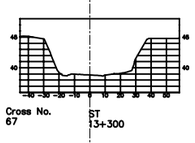


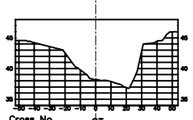


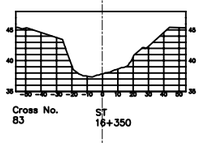


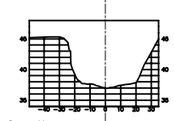


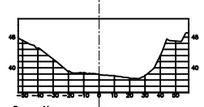


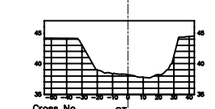


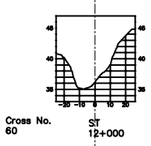


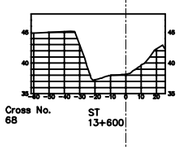


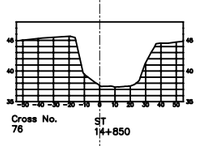


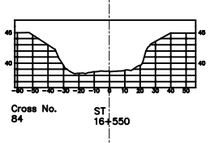


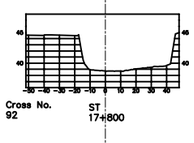


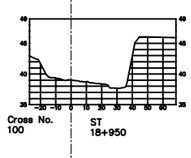


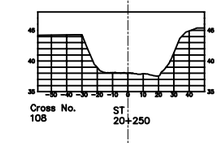


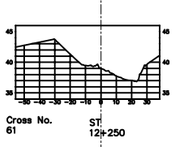


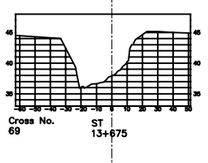


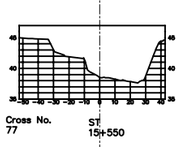


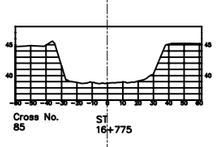


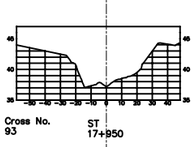


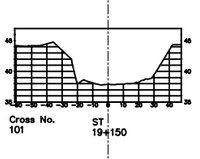


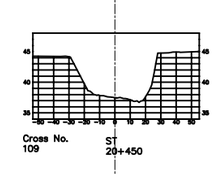


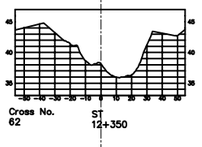


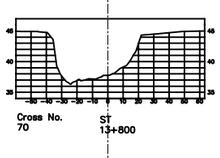


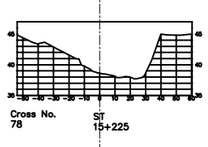


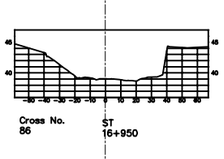


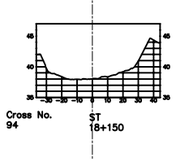


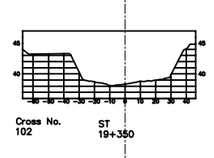


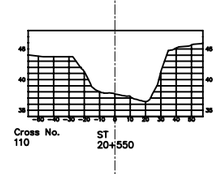


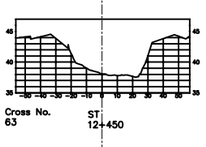


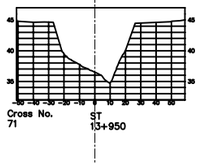


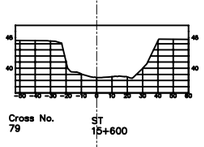


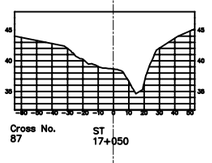


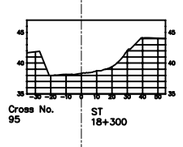


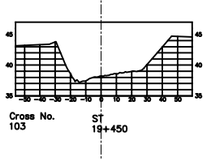


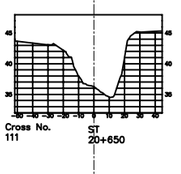


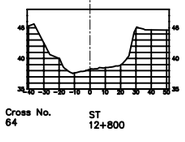


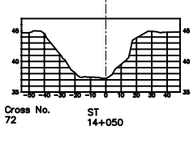


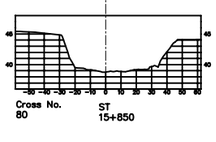


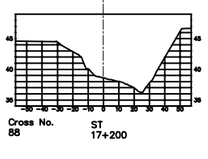


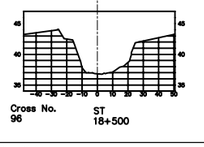


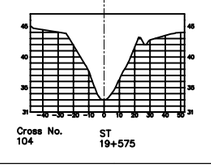


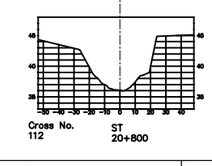




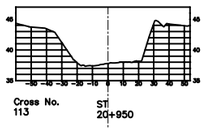


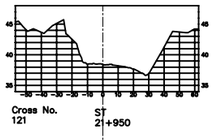


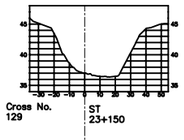


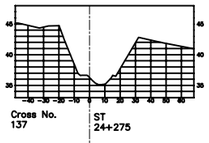


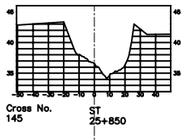
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** C-2
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY CROSS SECTION NO. 57 - 112	**SCALE** X=1:4000 Y=1:1000	**SERIAL NO.** 33

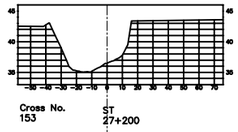


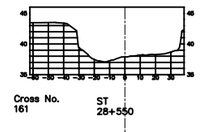


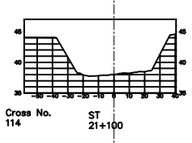


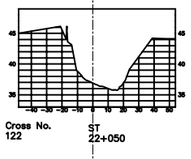


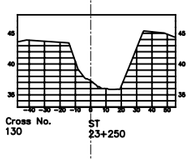


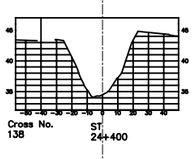


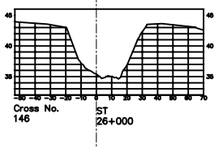


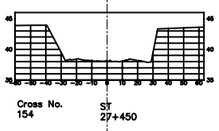


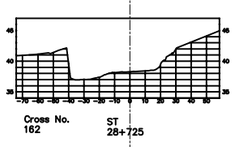


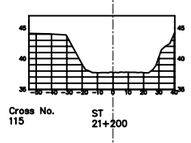


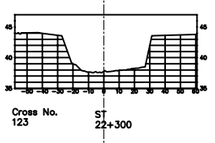


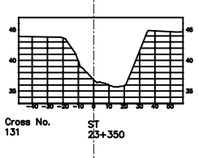


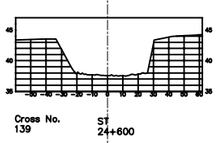


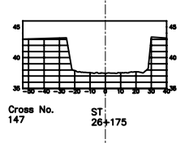


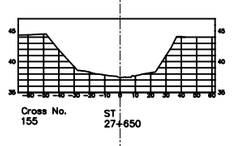


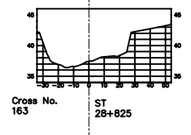


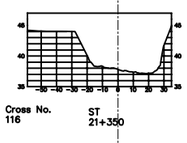


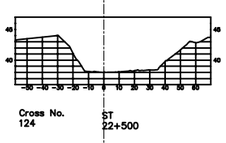


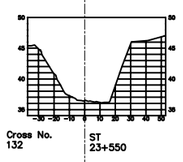


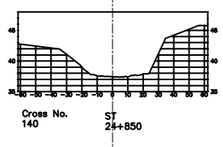


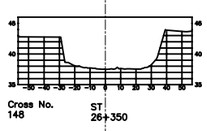


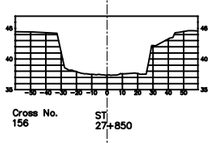


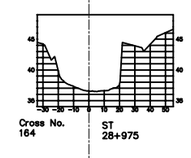


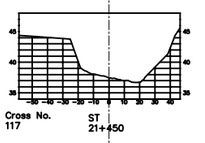


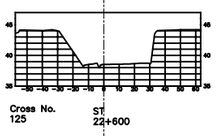


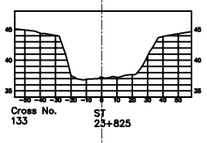


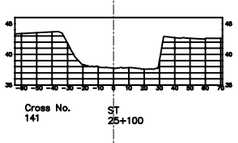


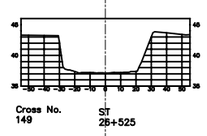


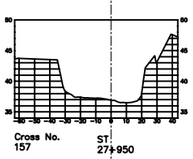


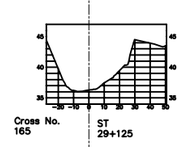


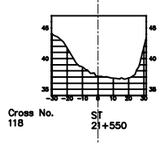


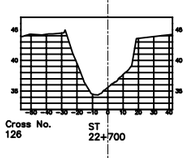


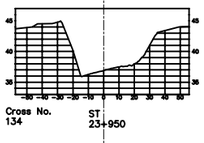


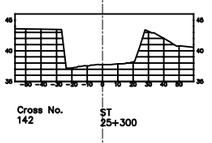


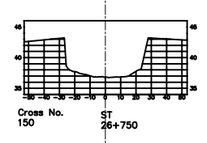


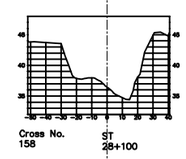


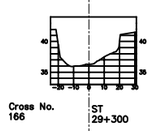


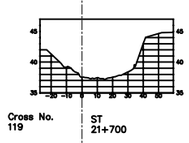


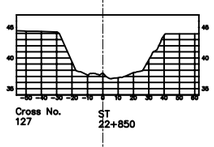


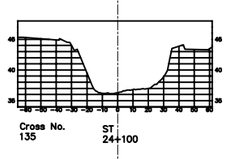


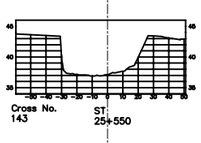


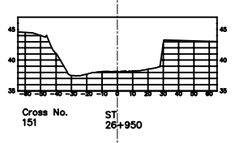


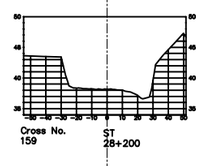


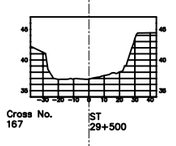


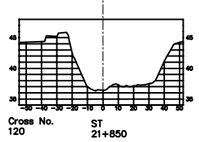


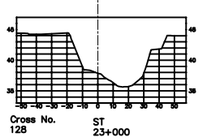


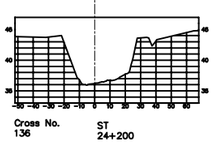


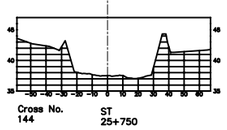


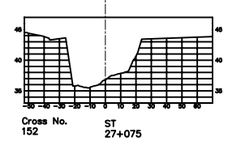


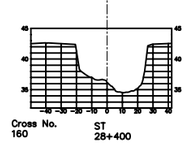


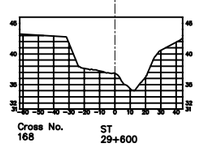




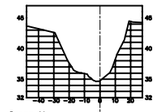


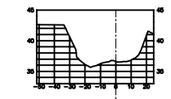


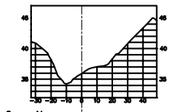


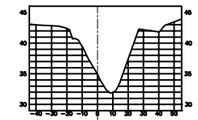


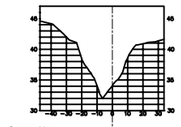
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** C-3
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY CROSS SECTION NO. 113 - 168	**SCALE** X=1:4000 Y=1:1000	**SERIAL NO.** 34

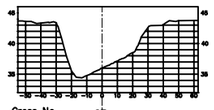

Cross No. 169 ST 29+700

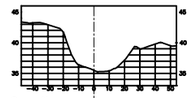

Cross No. 177 ST 30+950

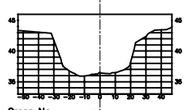

Cross No. 185 ST 32+425

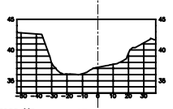

Cross No. 193 ST 33+500

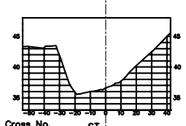

Cross No. 201 ST 34+950

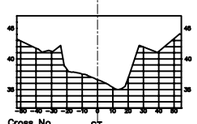

Cross No. 209 ST 36+200

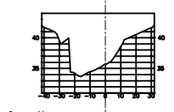

Cross No. 217 ST 37+300

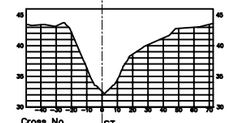

Cross No. 170 ST 29+850

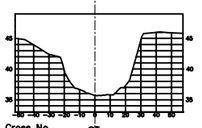

Cross No. 178 ST 31+075

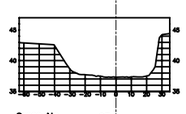

Cross No. 186 ST 32+550

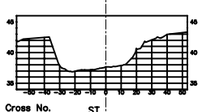

Cross No. 194 ST 33+600

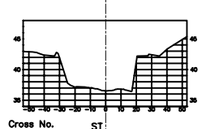

Cross No. 202 ST 35+000

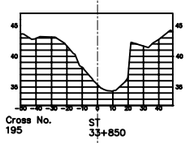

Cross No. 210 ST 36+275

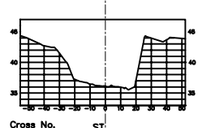

Cross No. 218 ST 37+550

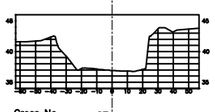

Cross No. 171 ST 30+100

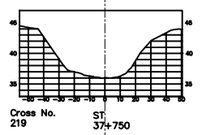

Cross No. 179 ST 31+200

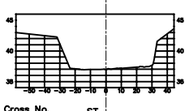

Cross No. 187 ST 32+825

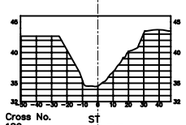

Cross No. 195 ST 33+850

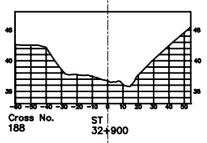

Cross No. 203 ST 35+250

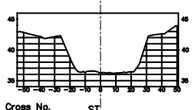

Cross No. 211 ST 36+500

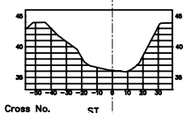

Cross No. 219 ST 37+750

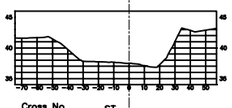

Cross No. 172 ST 30+250

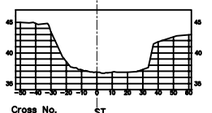

Cross No. 180 ST 31+300

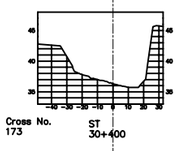

Cross No. 188 ST 32+900

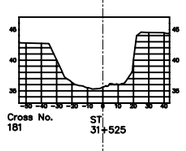

Cross No. 196 ST 34+000

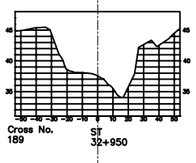

Cross No. 204 ST 35+425

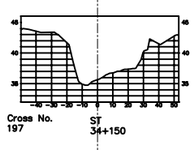

Cross No. 212 ST 36+750

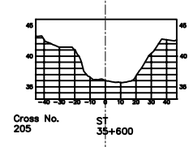

Cross No. 220 ST 38+000

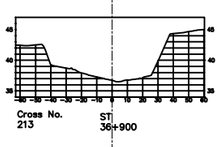

Cross No. 173 ST 30+400

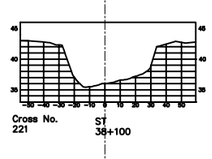

Cross No. 181 ST 31+525

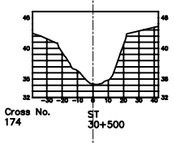

Cross No. 189 ST 32+950

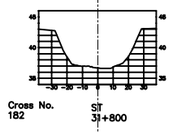

Cross No. 197 ST 34+150

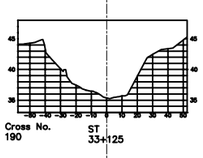

Cross No. 205 ST 35+600

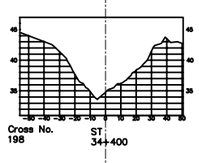

Cross No. 213 ST 36+900

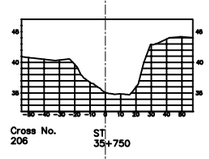

Cross No. 221 ST 38+100

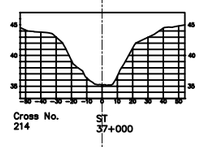

Cross No. 174 ST 30+500

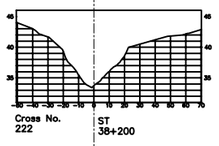

Cross No. 182 ST 31+800

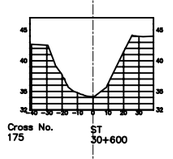

Cross No. 190 ST 33+125

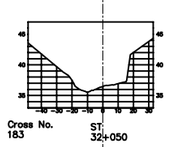

Cross No. 198 ST 34+400

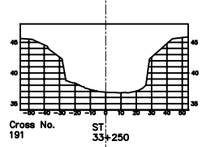

Cross No. 206 ST 35+750

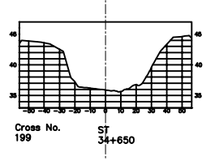

Cross No. 214 ST 37+000

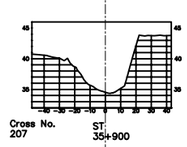

Cross No. 222 ST 38+200

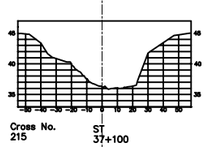

Cross No. 175 ST 30+600

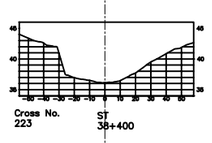

Cross No. 183 ST 32+050

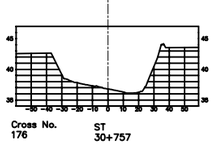

Cross No. 191 ST 33+250

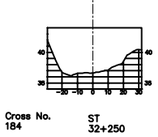

Cross No. 199 ST 34+650

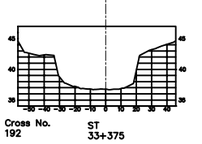

Cross No. 207 ST 35+900

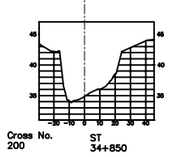

Cross No. 215 ST 37+100

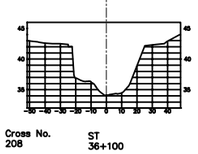

Cross No. 223 ST 38+400

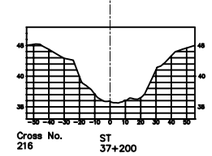

Cross No. 176 ST 30+757

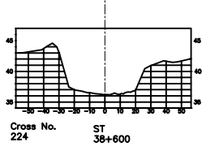

Cross No. 184 ST 32+250


Cross No. 192 ST 33+375

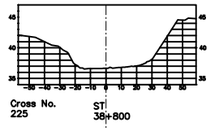

Cross No. 200 ST 34+850

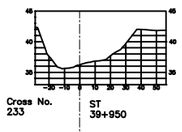

Cross No. 208 ST 36+100

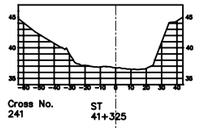

Cross No. 216 ST 37+200

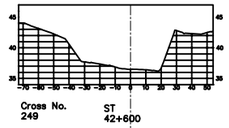

Cross No. 224 ST 38+600

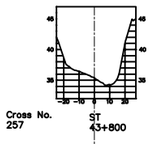
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** C-4
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY CROSS SECTION NO. 167 - 224	**SCALE** X=1:4000 Y=1:1000	**SERIAL NO.** 35

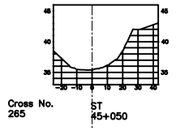


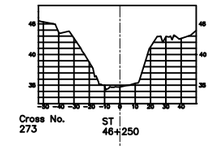


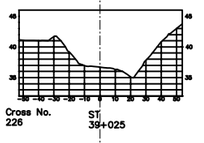


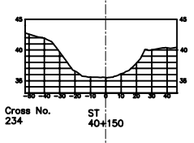


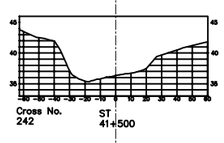


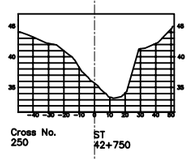


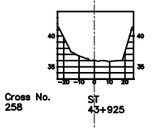


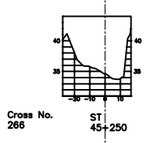


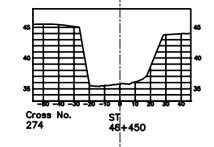


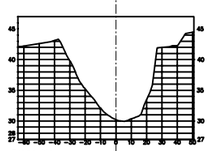


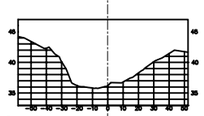


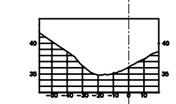


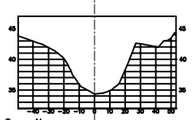


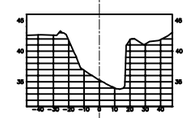


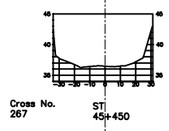


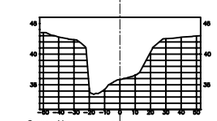


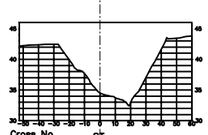


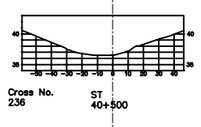


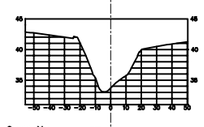


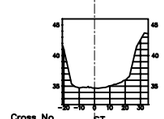


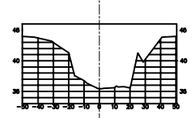


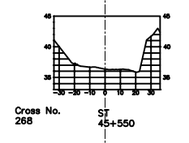


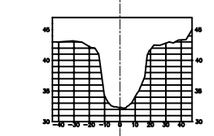


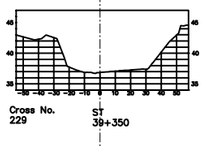


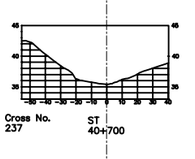


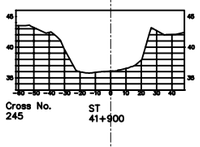


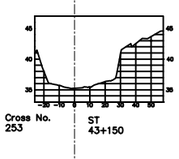


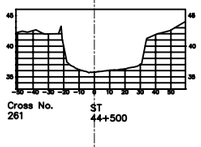


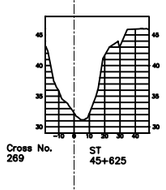


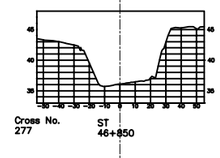


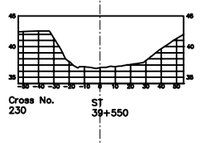


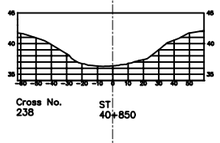


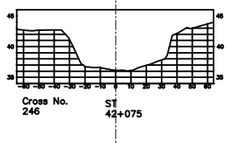


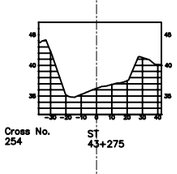


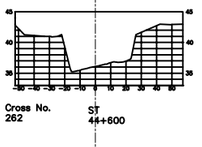


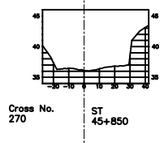


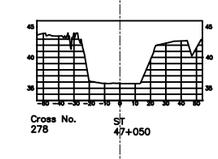


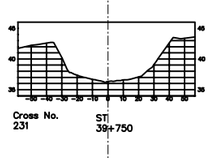


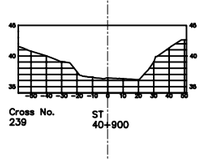


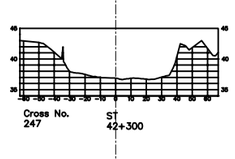


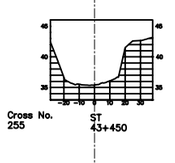


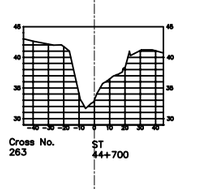


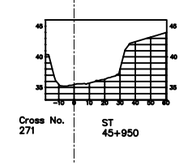


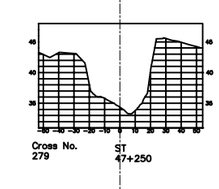


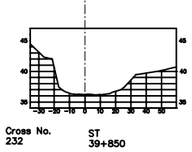


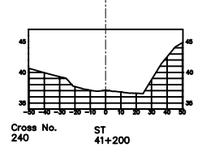


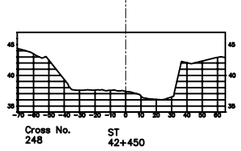


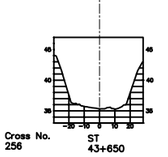


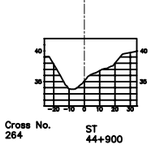


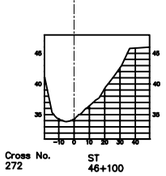


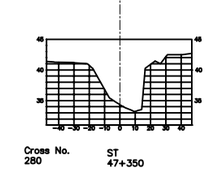




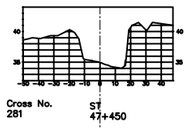


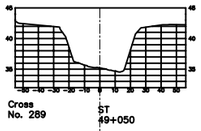


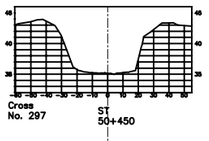


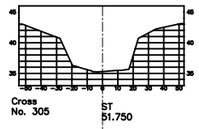


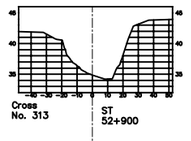
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** C-5
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY CROSS SECTION NO. 225 - 280	**SCALE** X=1:4000 Y=1:1000	**SERIAL NO.** 36

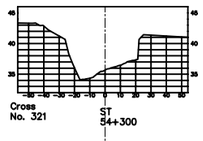

Cross No. 281 ST 47+450

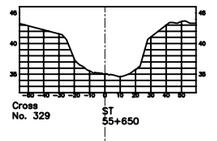

Cross No. 289 ST 49+050

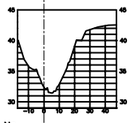

Cross No. 297 ST 50+450

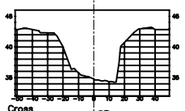

Cross No. 305 ST 51+750

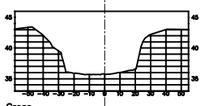

Cross No. 313 ST 52+900

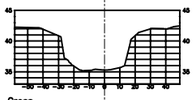

Cross No. 321 ST 54+300

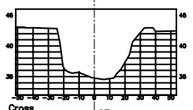

Cross No. 329 ST 55+650

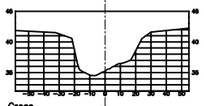

Cross No. 282 ST 47+600

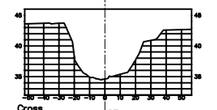

Cross No. 290 ST 49+250

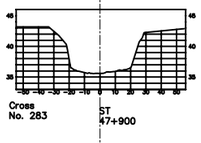

Cross No. 298 ST 50+600

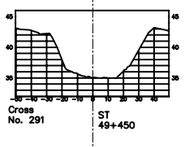

Cross No. 306 ST 51+950

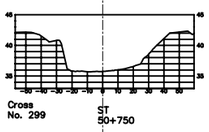

Cross No. 314 ST 53+100

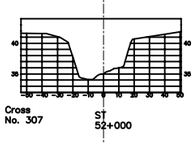

Cross No. 322 ST 54+500

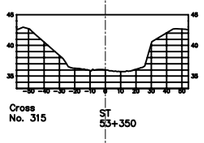

Cross No. 330 ST 55+800

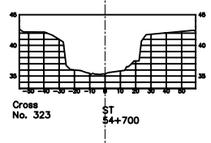

Cross No. 283 ST 47+900

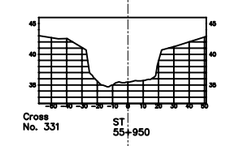

Cross No. 291 ST 49+450

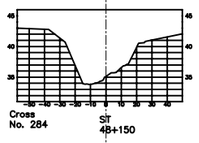

Cross No. 299 ST 50+750

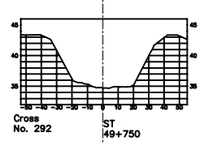

Cross No. 307 ST 52+000

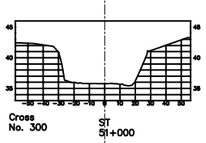

Cross No. 315 ST 53+350

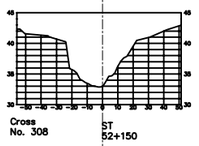

Cross No. 323 ST 54+700

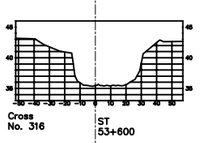

Cross No. 331 ST 55+950

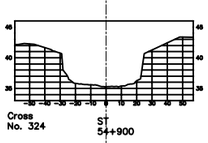

Cross No. 284 ST 48+150

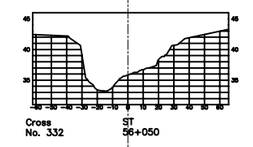

Cross No. 292 ST 49+750

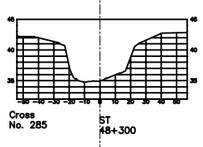

Cross No. 300 ST 51+000

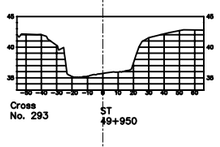

Cross No. 308 ST 52+150

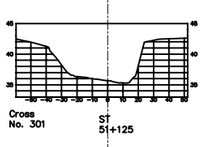

Cross No. 316 ST 53+600

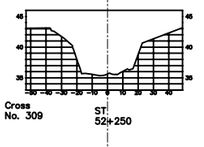

Cross No. 324 ST 54+900

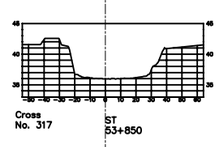

Cross No. 332 ST 56+050

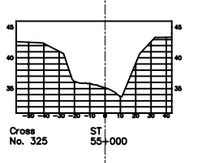

Cross No. 285 ST 48+300

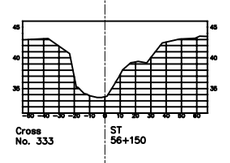

Cross No. 293 ST 49+950

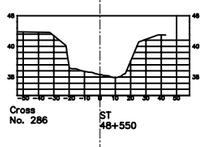

Cross No. 301 ST 51+125

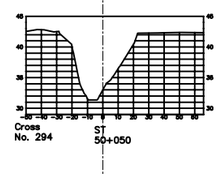

Cross No. 309 ST 52+250

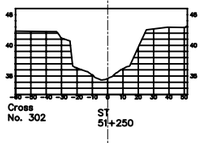

Cross No. 317 ST 53+850

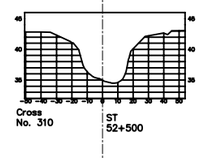

Cross No. 325 ST 55+000

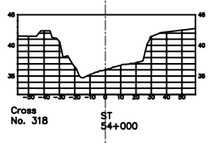

Cross No. 333 ST 56+150

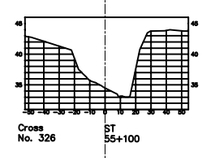

Cross No. 286 ST 48+550

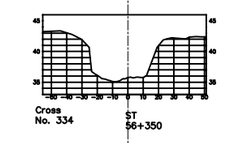

Cross No. 294 ST 50+050

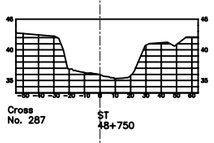

Cross No. 302 ST 51+250

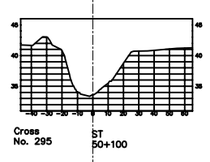

Cross No. 310 ST 52+500

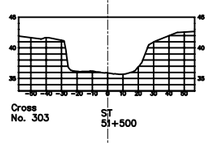

Cross No. 318 ST 54+000

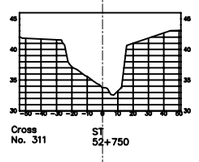

Cross No. 326 ST 56+100

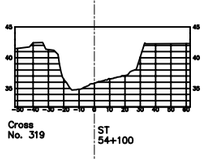

Cross No. 334 ST 56+350

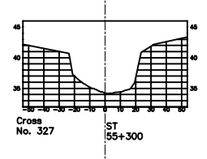

Cross No. 287 ST 48+750

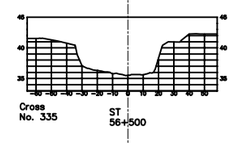

Cross No. 295 ST 50+100

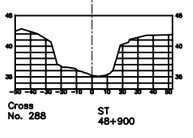

Cross No. 303 ST 51+500

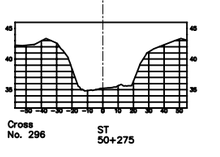

Cross No. 311 ST 52+750

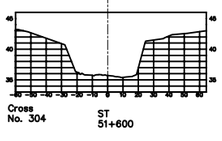

Cross No. 319 ST 54+100

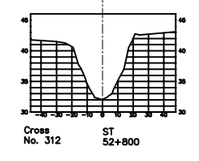

Cross No. 327 ST 55+300

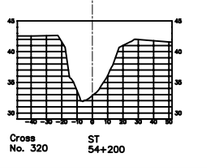

Cross No. 335 ST 56+500

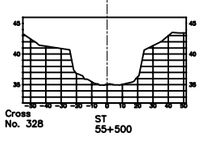

Cross No. 288 ST 48+900

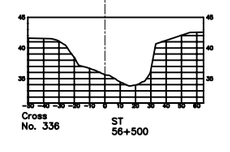

Cross No. 296 ST 50+275


Cross No. 304 ST 51+600

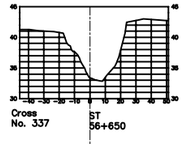

Cross No. 312 ST 52+800

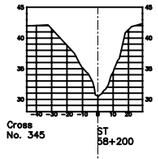

Cross No. 320 ST 54+200

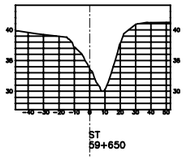

Cross No. 328 ST 55+500

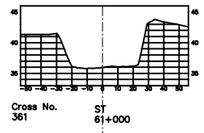

Cross No. 336 ST 56+500

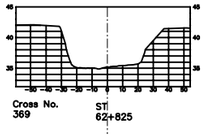
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** C-6
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY CROSS SECTION NO. 281 - 336	**SCALE** X=1:4000 Y=1:1000	**SERIAL NO.** 37

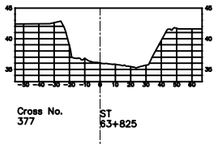


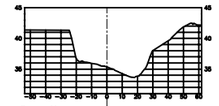


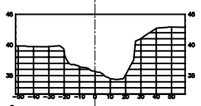


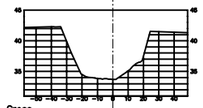


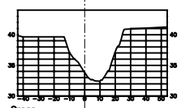


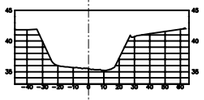


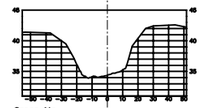


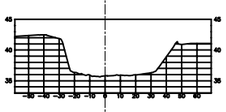


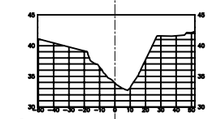


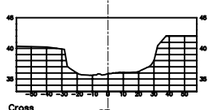


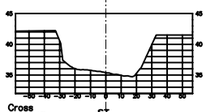


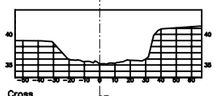


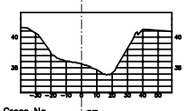


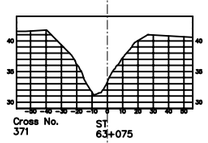


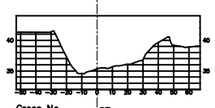


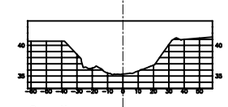


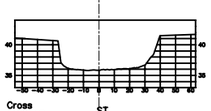


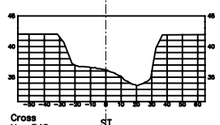


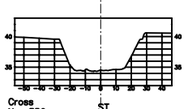


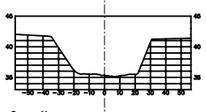


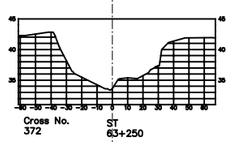


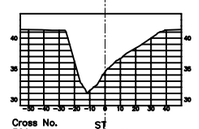


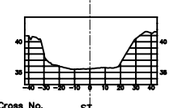


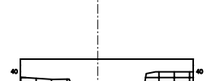


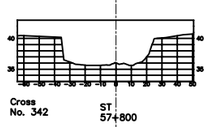


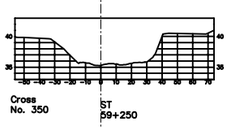


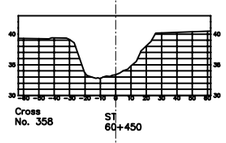


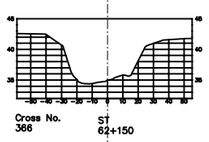


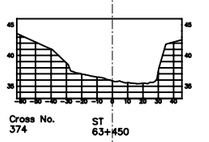


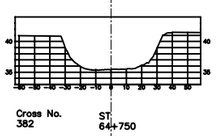


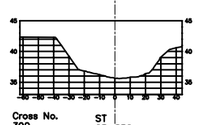


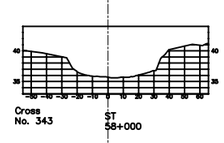


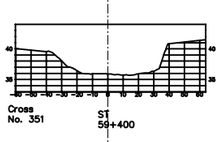


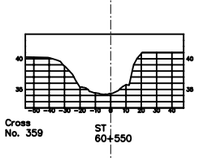


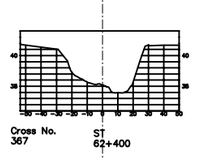


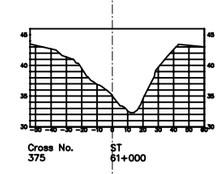


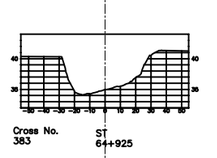


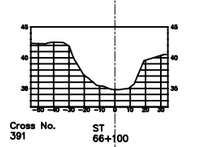


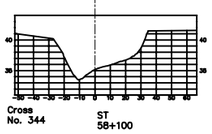


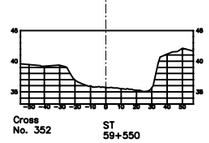


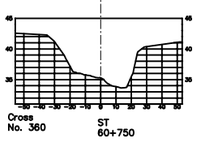


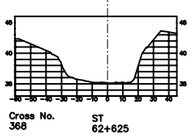


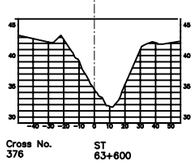


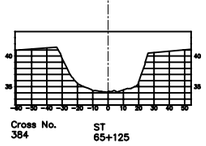


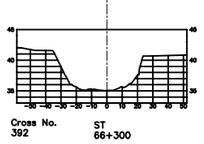




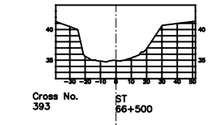


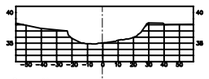


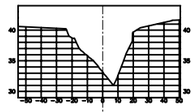


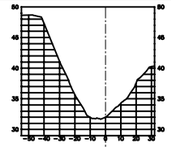


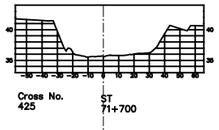
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** C-7
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY CROSS SECTION NO. 337 - 392	**SCALE** X=1:4000 Y=1:1000	**SERIAL NO.** 38

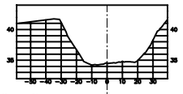

Cross No. 393 ST 66+500

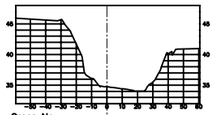

Cross No. 401 ST 67+900

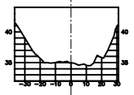

Cross No. 409 ST 69+050

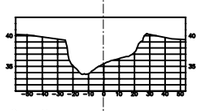

Cross No. 417 ST 70+125

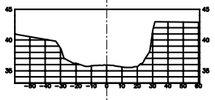

Cross No. 425 ST 71+700

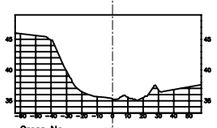

Cross No. 433 ST 73+025

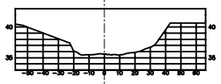

Cross No. 441 ST 74+200

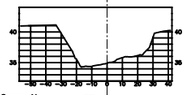

Cross No. 394 ST 66+750

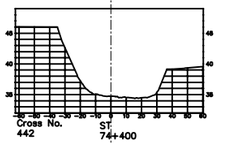

Cross No. 402 ST 68+000

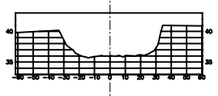

Cross No. 410 ST 69+250

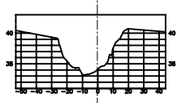

Cross No. 418 ST 70+350

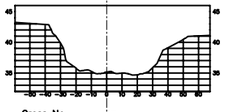

Cross No. 426 ST 71+800

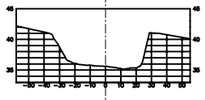

Cross No. 434 ST 73+150

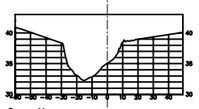

Cross No. 442 ST 74+400

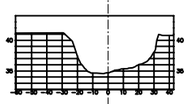

Cross No. 395 ST 66+950

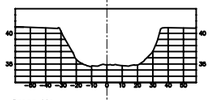

Cross No. 403 ST 68+100

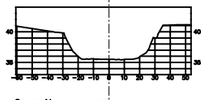

Cross No. 411 ST 69+500

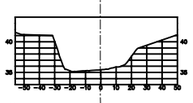

Cross No. 419 ST 70+550

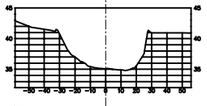

Cross No. 427 ST 71+925

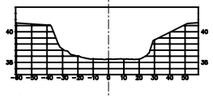

Cross No. 435 ST 73+400

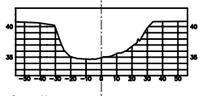

Cross No. 443 ST 74+600

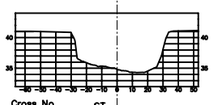

Cross No. 396 ST 67+125

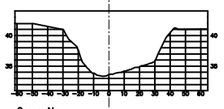

Cross No. 404 ST 68+350

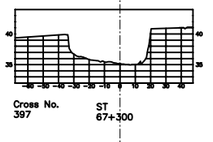

Cross No. 412 ST 69+600

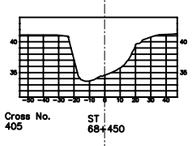

Cross No. 420 ST 70+750

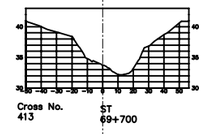

Cross No. 428 ST 72+150

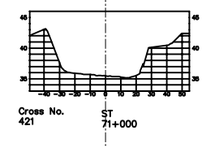

Cross No. 436 ST 73+500

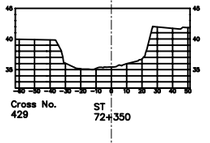

Cross No. 444 ST 74+700

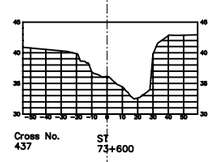

Cross No. 397 ST 67+300

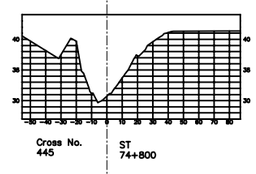

Cross No. 405 ST 68+450

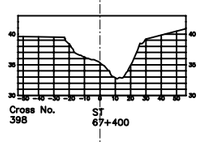

Cross No. 413 ST 69+700

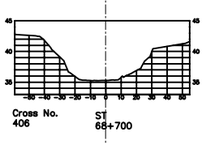

Cross No. 421 ST 71+000

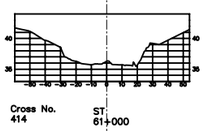

Cross No. 429 ST 72+350

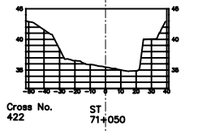

Cross No. 437 ST 73+600

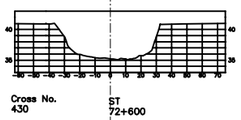

Cross No. 445 ST 74+800

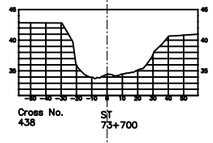

Cross No. 398 ST 67+400

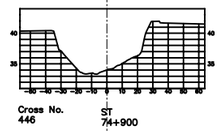

Cross No. 406 ST 68+700

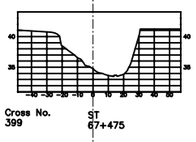

Cross No. 414 ST 61+000

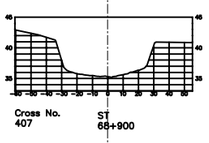

Cross No. 422 ST 71+050

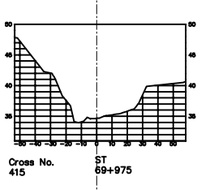

Cross No. 430 ST 72+600

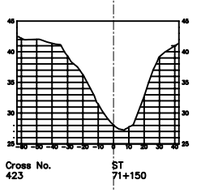

Cross No. 438 ST 73+700

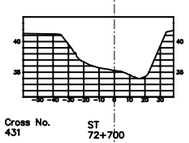

Cross No. 446 ST 74+900

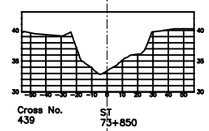

Cross No. 399 ST 67+475

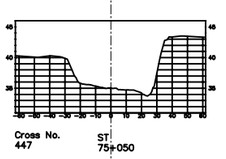

Cross No. 407 ST 68+900

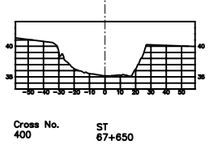

Cross No. 415 ST 69+975

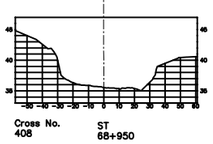

Cross No. 423 ST 71+150

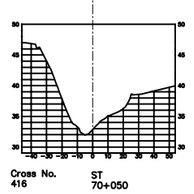

Cross No. 431 ST 72+700

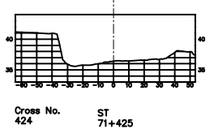

Cross No. 439 ST 73+850

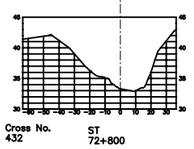

Cross No. 447 ST 75+050

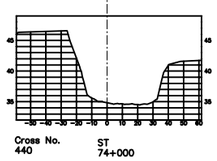

Cross No. 400 ST 67+650

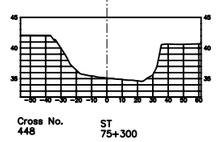

Cross No. 408 ST 68+950


Cross No. 416 ST 70+050

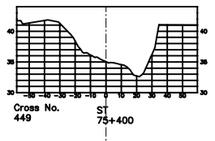

Cross No. 424 ST 71+425

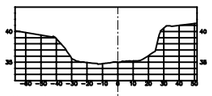

Cross No. 432 ST 72+800

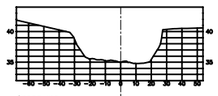

Cross No. 440 ST 74+000

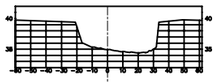

Cross No. 448 ST 75+300

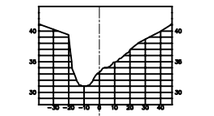
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** C-8
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY CROSS SECTION NO. 393 - 448	**SCALE** X=1:4000 Y=1:1000	**SERIAL NO.** 39

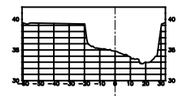


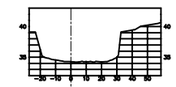


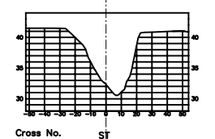


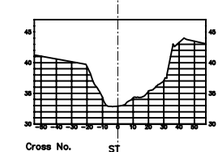


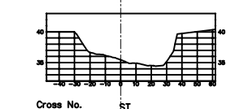


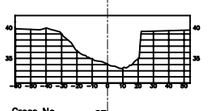


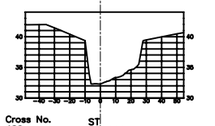


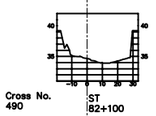


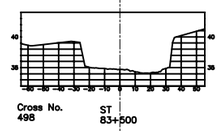


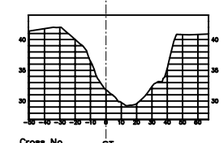


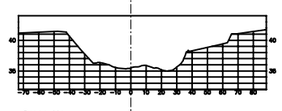


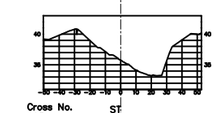


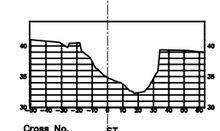


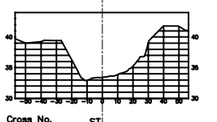


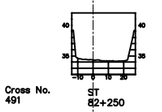


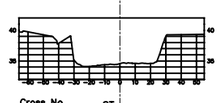


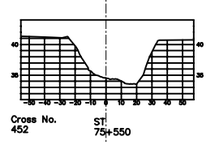


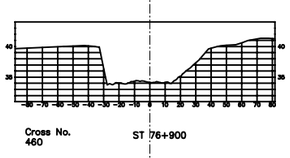


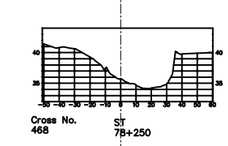


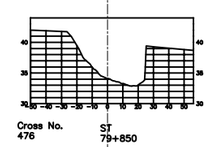


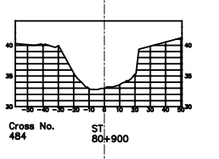


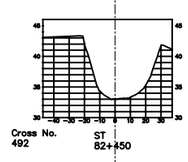


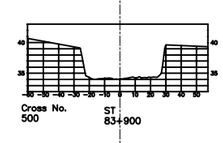


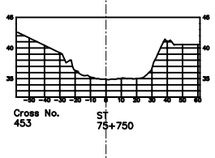


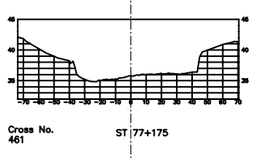


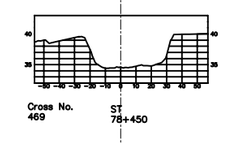


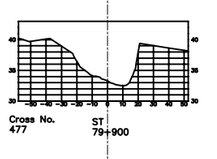


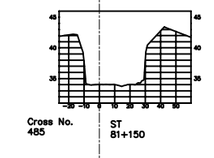


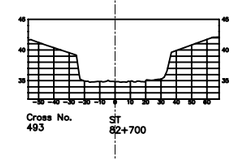


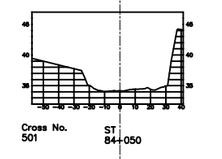


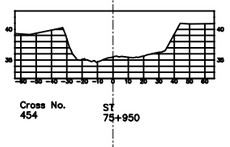


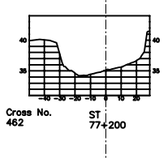


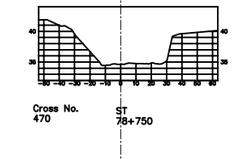


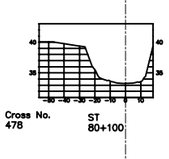


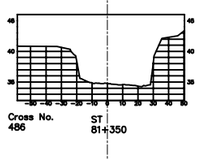


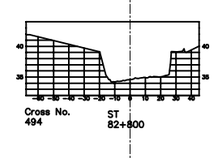


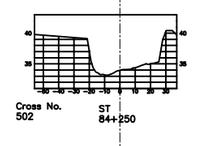


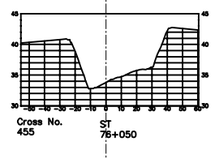


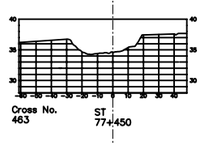


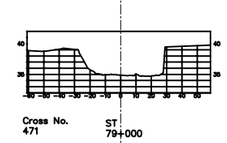


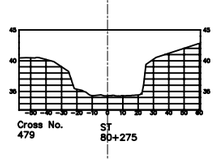


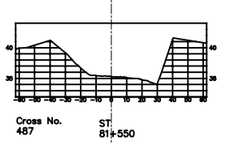


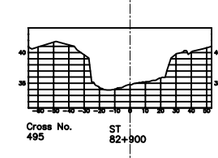


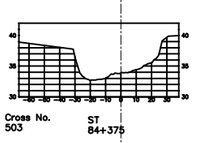


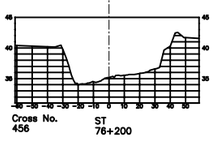


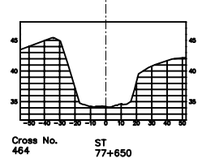


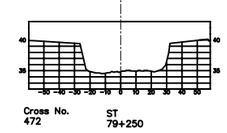


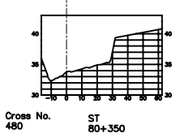


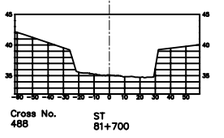


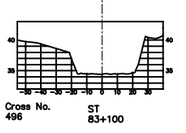


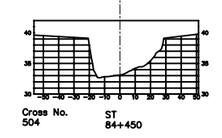




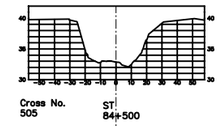


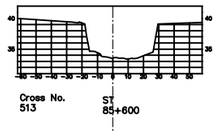


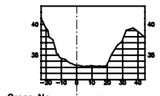


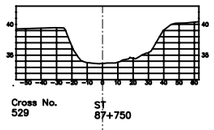


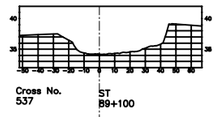
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** C-9
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY CROSS SECTION NO. 449 - 504	**SCALE** X=1:4000 Y=1:1000	**SERIAL NO.** 40

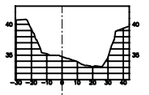

Cross No. 505 ST 84+500

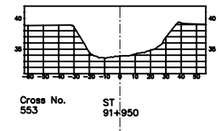

Cross No. 513 ST 85+600

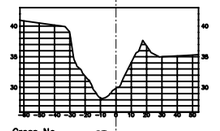

Cross No. 521 ST 86+700

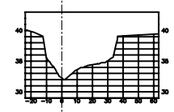

Cross No. 529 ST 87+750

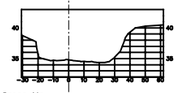

Cross No. 537 ST 89+100

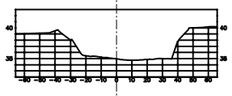

Cross No. 545 ST 90+250

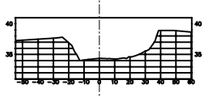

Cross No. 553 ST 91+950

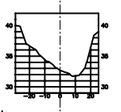

Cross No. 506 ST 84+800

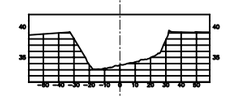

Cross No. 514 ST 85+700

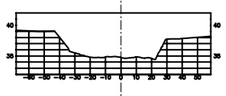

Cross No. 522 ST 86+850

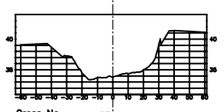

Cross No. 530 ST 87+950

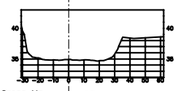

Cross No. 538 ST 89+200

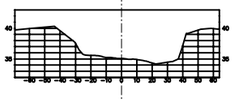

Cross No. 546 ST 90+400

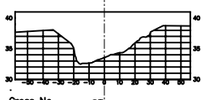

Cross No. 554 ST 92+050

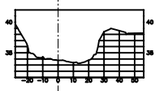

Cross No. 507 ST 84+750

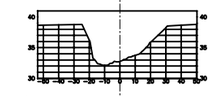

Cross No. 515 ST 85+850

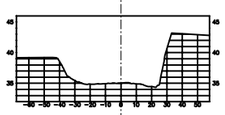

Cross No. 523 ST 87+000

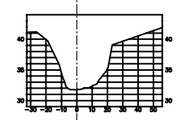

Cross No. 531 ST 88+050

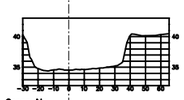

Cross No. 539 ST 89+350

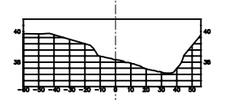

Cross No. 547 ST 90+750

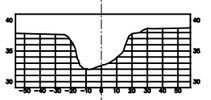

Cross No. 555 ST 92+250

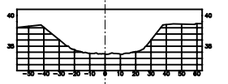

Cross No. 508 ST 84+875

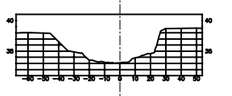

Cross No. 516 ST 86+000

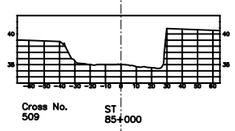

Cross No. 524 ST 87+200

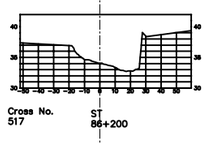

Cross No. 532 ST 88+200

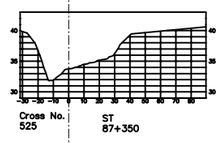

Cross No. 540 ST 89+450

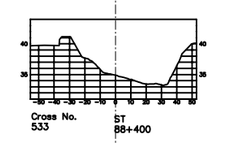

Cross No. 548 ST 91+050

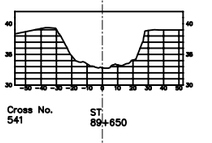

Cross No. 556 ST 92+500

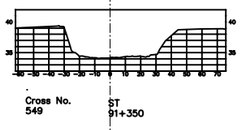

Cross No. 509 ST 85+000

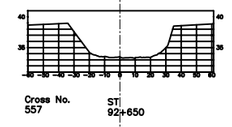

Cross No. 517 ST 86+200

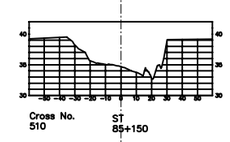

Cross No. 525 ST 87+350

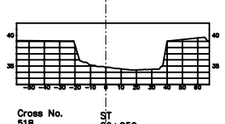

Cross No. 533 ST 88+400

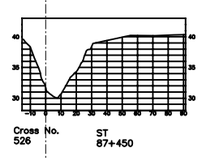

Cross No. 541 ST 89+650

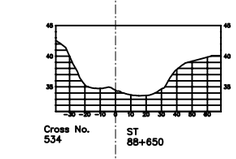

Cross No. 549 ST 91+350

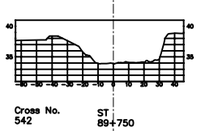

Cross No. 557 ST 92+650

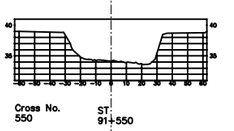

Cross No. 510 ST 85+150

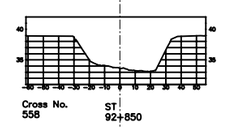

Cross No. 518 ST 86+250

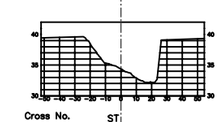

Cross No. 526 ST 87+450

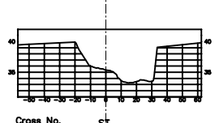

Cross No. 534 ST 88+650

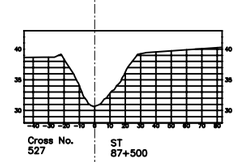

Cross No. 542 ST 89+750

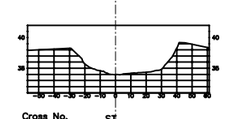

Cross No. 550 ST 91+550

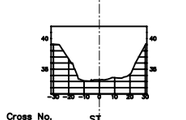

Cross No. 558 ST 92+850

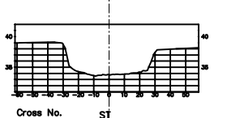

Cross No. 511 ST 85+250

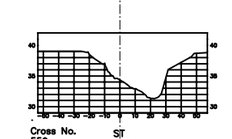

Cross No. 519 ST 86+350

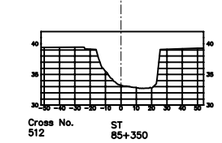

Cross No. 527 ST 87+500

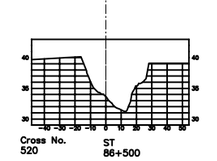

Cross No. 535 ST 88+850

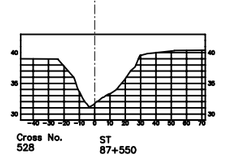

Cross No. 543 ST 89+950

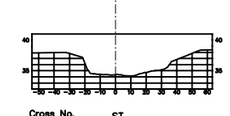

Cross No. 551 ST 91+750

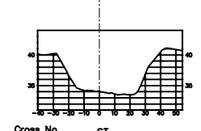

Cross No. 559 ST 92+950

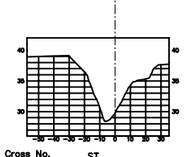

Cross No. 512 ST 85+350

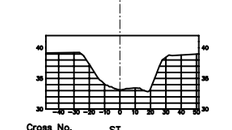

Cross No. 520 ST 86+500


Cross No. 528 ST 87+550

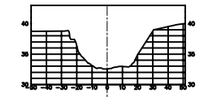

Cross No. 536 ST 89+000

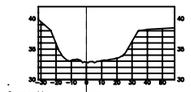

Cross No. 544 ST 90+150

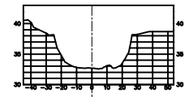

Cross No. 552 ST 91+850

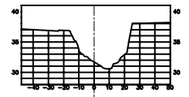

Cross No. 560 ST 93+050

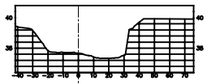
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** C-10
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY CROSS SECTION NO. 505 - 560	**SCALE** X=1:4000 Y=1:1000	**SERIAL NO.** 41

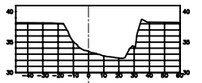

Cross No. 561 ST 93+250

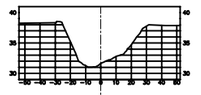

Cross No. 569 ST 94+650

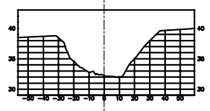

Cross No. 577 ST 95+800

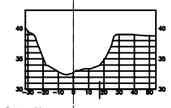

Cross No. 585 ST 97+025

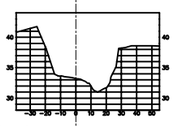

Cross No. 593 ST 98+750

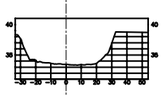

Cross No. 601 ST 100+150

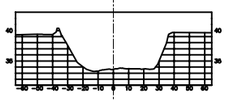

Cross No. 609 ST 101+270

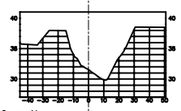

Cross No. 562 ST 93+500

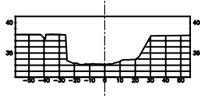

Cross No. 570 ST 94+700

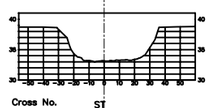

Cross No. 578 ST 95+900

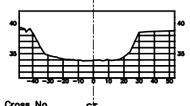

Cross No. 586 ST 97+225

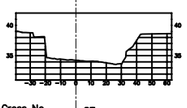

Cross No. 594 ST 99+000

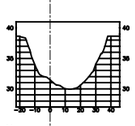

Cross No. 602 ST 100+275

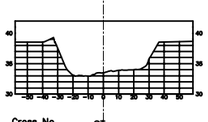

Cross No. 610 ST 101+425

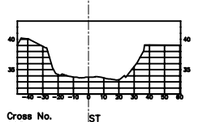

Cross No. 563 ST 93+750

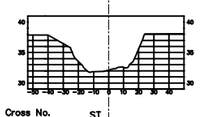

Cross No. 571 ST 94+900

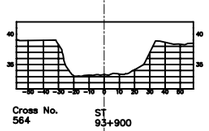

Cross No. 579 ST 96+025

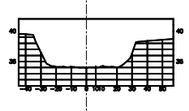

Cross No. 587 ST 97+425

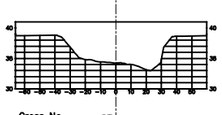

Cross No. 595 ST 99+250

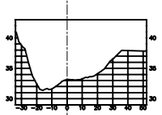

Cross No. 603 ST 100+500

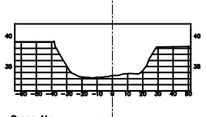

Cross No. 611 ST 101+650

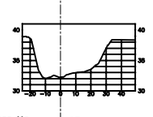

Cross No. 564 ST 93+900

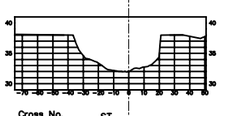

Cross No. 572 ST 95+075


Cross No. 580 ST 96+200

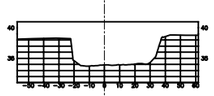

Cross No. 588 ST 97+725

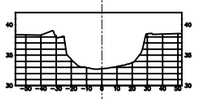

Cross No. 596 ST 99+550

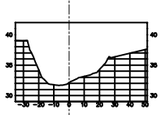

Cross No. 604 ST 100+750

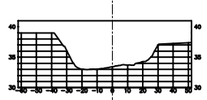

Cross No. 612 ST 101+825

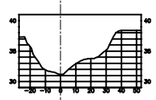

Cross No. 565 ST 94+150

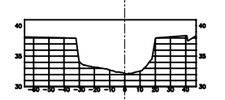

Cross No. 573 ST 95+250

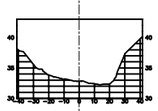

Cross No. 581 ST 96+475

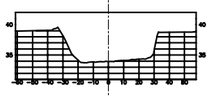

Cross No. 589 ST 97+850

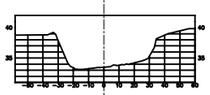

Cross No. 597 ST 99+700

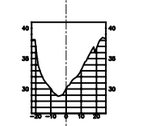

Cross No. 605 ST 100+850

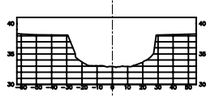

Cross No. 613 ST 102+025

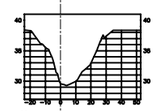

Cross No. 566 ST 94+250

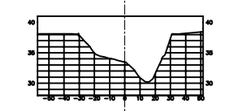

Cross No. 574 ST 95+375

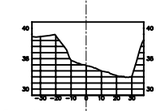

Cross No. 582 ST 96+600

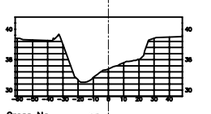

Cross No. 590 ST 98+015

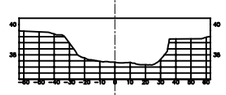

Cross No. 598 ST 99+850

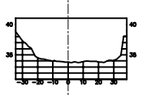

Cross No. 606 ST 100+950

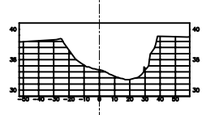

Cross No. 614 ST 102+100

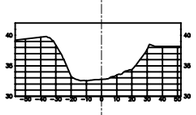

Cross No. 567 ST 94+350

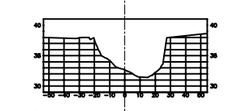

Cross No. 575 ST 95+475

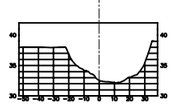

Cross No. 583 ST 96+800

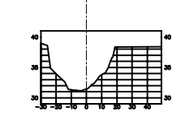

Cross No. 591 ST 98+250

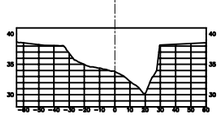

Cross No. 599 ST 99+940


Cross No. 607 ST 101+050

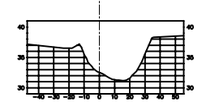

Cross No. 615 ST 102+200

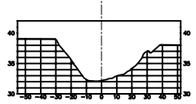

Cross No. 568 ST 94+550

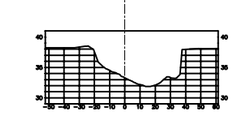

Cross No. 576 ST 95+600


Cross No. 584 ST 96+900

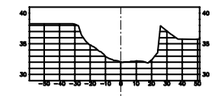

Cross No. 592 ST 98+500

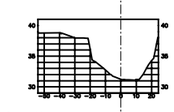

Cross No. 600 ST 100+050

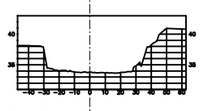

Cross No. 608 ST 101+150

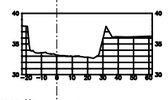

Cross No. 616 ST 102+300

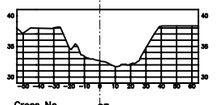
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** C-11
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY CROSS SECTION NO. 561 - 616	**SCALE** X=1:4000 Y=1:1000	**SERIAL NO.** 42

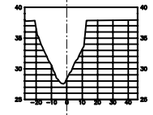

Cross No. 617 ST 102+300

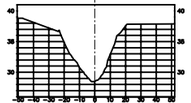

Cross No. 618 ST 102+575

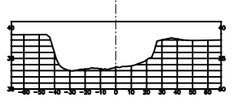

Cross No. 619 ST 102+775

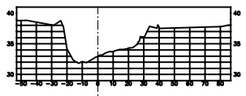

Cross No. 620 ST 103+025

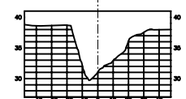

Cross No. 621 ST 103+250

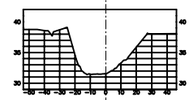

Cross No. 622 ST 103+325

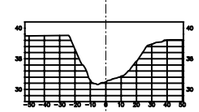

Cross No. 623 ST 103+375

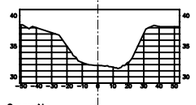

Cross No. 624 ST 103+650

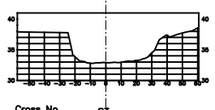

Cross No. 625 ST 103+775

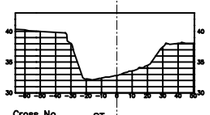

Cross No. 626 ST 103+960

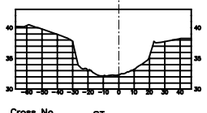

Cross No. 627 ST 104+100

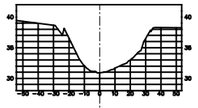

Cross No. 628 ST 104+250

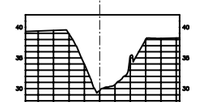

Cross No. 629 ST 104+490

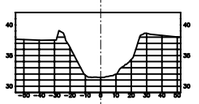

Cross No. 630 ST 104+650

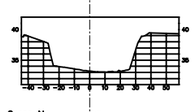

Cross No. 631 ST 104+800

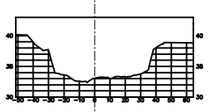

Cross No. 632 ST 104+800

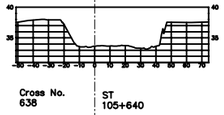

Cross No. 633 ST 104+925

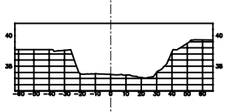

Cross No. 634 ST 105+045

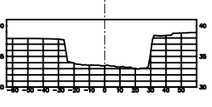

Cross No. 635 ST 105+175

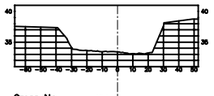

Cross No. 636 ST 105+300

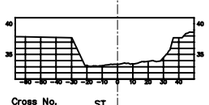

Cross No. 637 ST 105+430

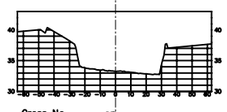

Cross No. 638 ST 105+640

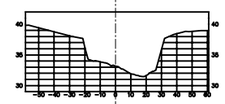

Cross No. 639 ST 105+800

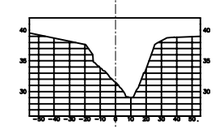

Cross No. 640 ST 106+000

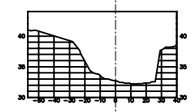

Cross No. 641 ST 106+175

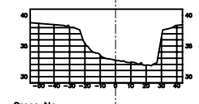

Cross No. 642 ST 106+325

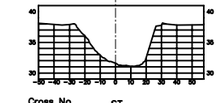

Cross No. 643 ST 106+475

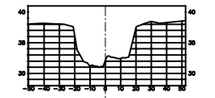

Cross No. 644 ST 106+550

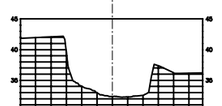

Cross No. 645 ST 106+600

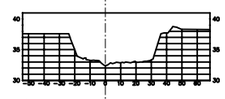

Cross No. 646 ST 106+825

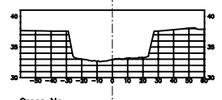

Cross No. 647 ST 106+975

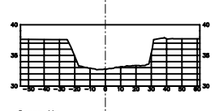

Cross No. 648 ST 107+100

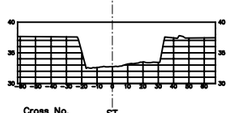

Cross No. 649 ST 107+175

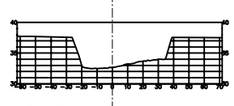

Cross No. 650 ST 107+350

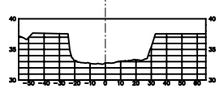

Cross No. 651 ST 107+525

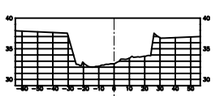

Cross No. 652 ST 107+700

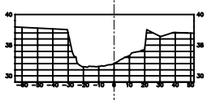

Cross No. 653 ST 107+800

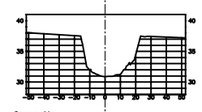

Cross No. 654 ST 107+925

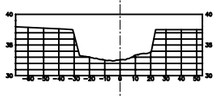

Cross No. 655 ST 108+100

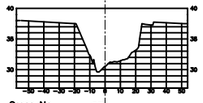

Cross No. 656 ST 108+250

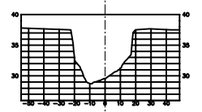

Cross No. 657 ST 108+460

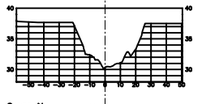

Cross No. 658 ST 108+530

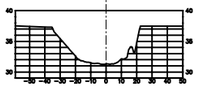

Cross No. 659 ST 108+625

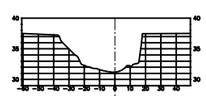

Cross No. 660 ST 108+775

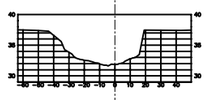

Cross No. 661 ST 108+940

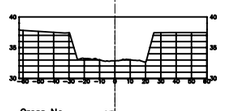

Cross No. 662 ST 108+990

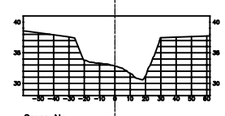

Cross No. 663 ST 109+050

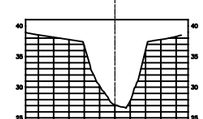

Cross No. 664 ST 109+175

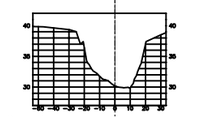

Cross No. 665 ST 109+200

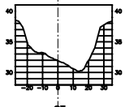

Cross No. 666 ST 109+250

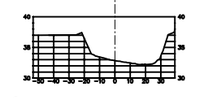

Cross No. 667 ST 109+350


Cross No. 668 ST 109+475

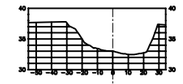

Cross No. 669 ST 109+550

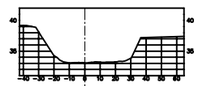

Cross No. 670 ST 109+600

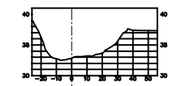

Cross No.671 ST 109+750


Cross No.672 ST 109+910

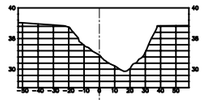
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** C-12
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY CROSS SECTION NO. 617 - 672	**SCALE** X=1:4000 Y=1:1000	**SERIAL NO.** 43

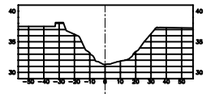

Cross No.673 ST 110+000

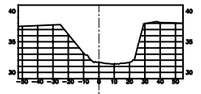

Cross No. 681 ST 110+815

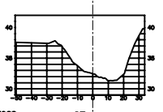

Cross No. 689 ST 111+775

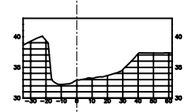

Cross No. 697 ST 112+800

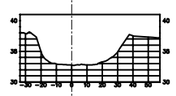

Cross No.705 ST 113+700

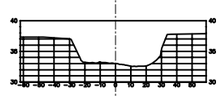

Cross No. 713 ST 114+700

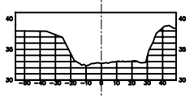

Cross No. 721 ST 115+780

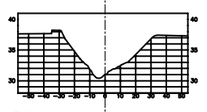

Cross No.674 ST 110+060

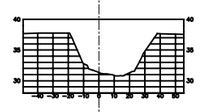

Cross No.682 ST 110+950

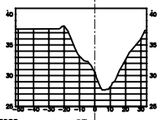

Cross No.690 ST 111+950

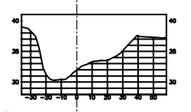

Cross No. 698 ST 112+950

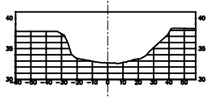

Cross No. 706 ST 113+875

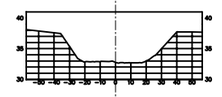

Cross No.714 ST 114+825

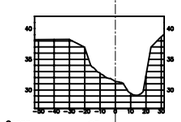

Cross No.722 ST 115+840

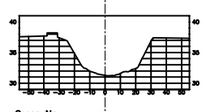

Cross No.675 ST 110+175

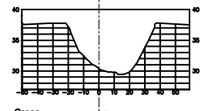

Cross No.683 ST 111+020

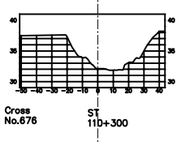

Cross No.691 ST 112+125

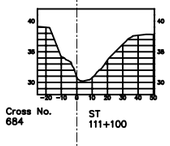

Cross No. 699 ST 113+100

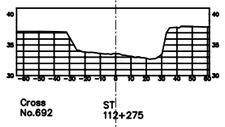

Cross No.707 ST 114+050

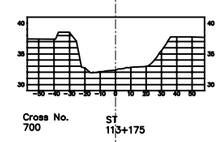

Cross No. 715 ST 115+025

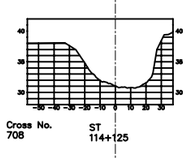

Cross No.723 ST 115+975

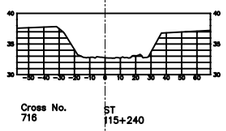

Cross No.676 ST 110+300

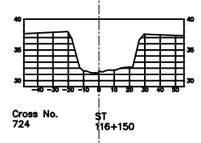

Cross No. 684 ST 111+100

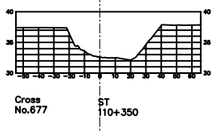

Cross No.692 ST 112+275

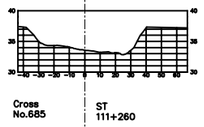

Cross No. 700 ST 113+175

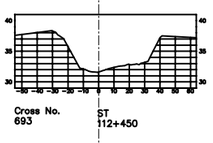

Cross No. 708 ST 114+125

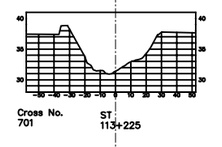

Cross No. 716 ST 115+240

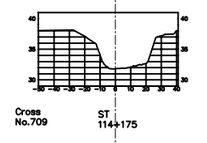

Cross No. 724 ST 116+150

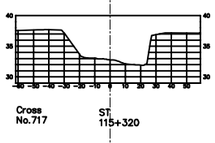

Cross No.677 ST 110+350

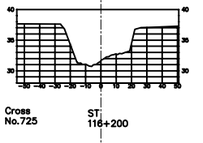

Cross No.685 ST 111+260

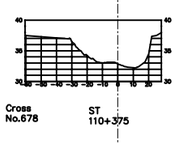

Cross No. 693 ST 112+450

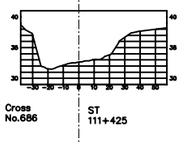

Cross No. 701 ST 113+225

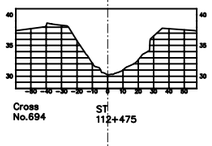

Cross No.709 ST 114+175

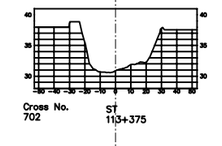

Cross No.717 ST 115+320

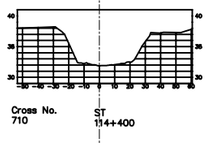

Cross No.725 ST 116+200

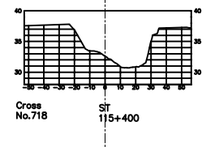

Cross No.678 ST 110+375

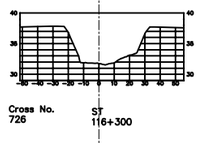

Cross No.686 ST 111+425

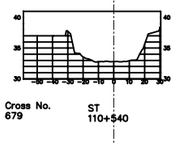

Cross No.694 ST 112+475

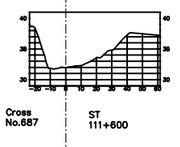

Cross No. 702 ST 113+375

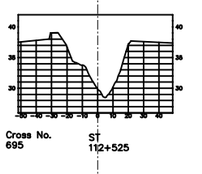

Cross No. 710 ST 114+400

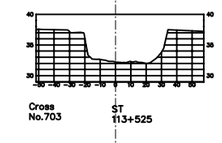

Cross No.718 ST 115+400

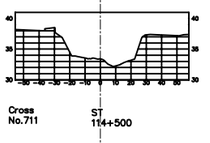

Cross No. 726 ST 116+300

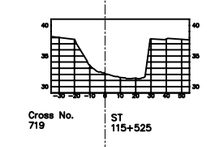

Cross No. 679 ST 110+540

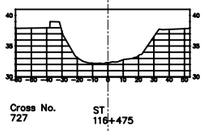

Cross No.687 ST 111+600

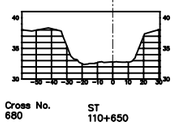

Cross No. 695 ST 112+525

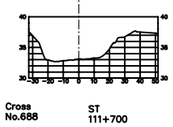

Cross No.703 ST 113+525

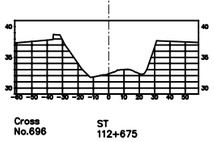

Cross No.711 ST 114+500

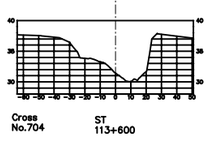

Cross No. 719 ST 115+525

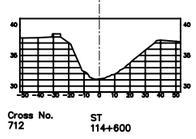

Cross No. 727 ST 116+475

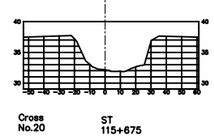

Cross No. 680 ST 110+650

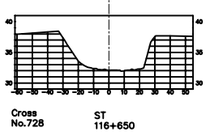

Cross No. 688 ST 111+700


Cross No. 696 ST 112+675

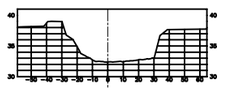

Cross No. 704 ST 113+600

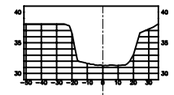

Cross No. 712 ST 114+600

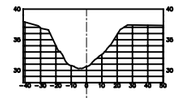

Cross No. 20 ST 115+675

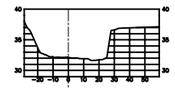

Cross No. 728 ST 116+650

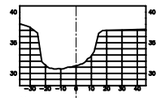
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** C-13
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY CROSS SECTION NO. 673 - 728	**SCALE** X=1:4000 Y=1:1000	**SERIAL NO.** 44

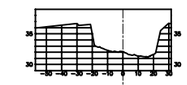


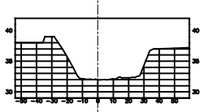


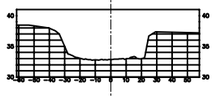


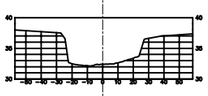


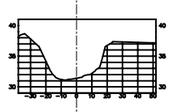


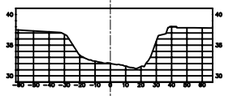


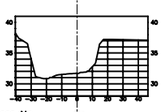


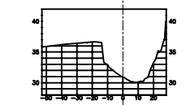


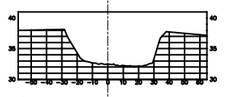


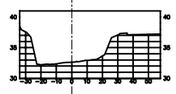


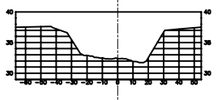


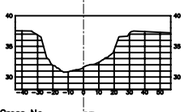


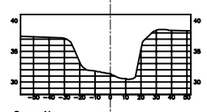


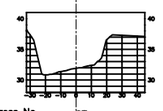


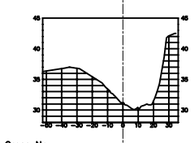


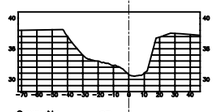


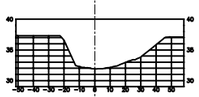


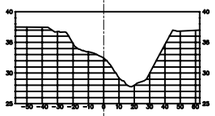


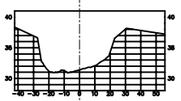


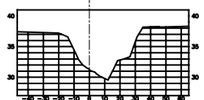


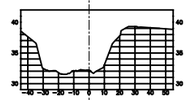


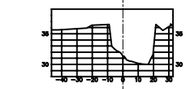


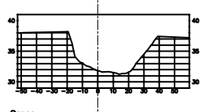


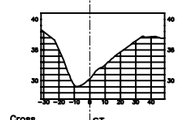


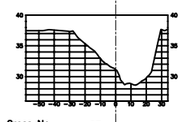


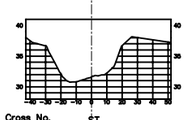


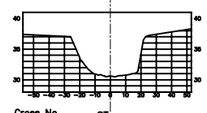


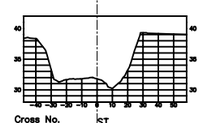


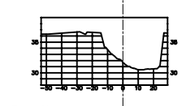


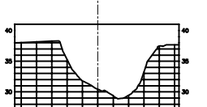


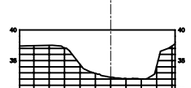


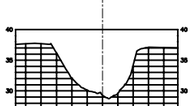


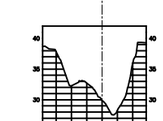


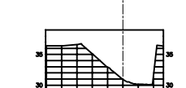


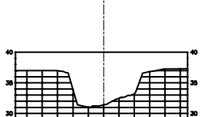


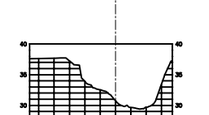


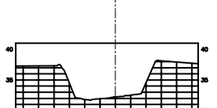


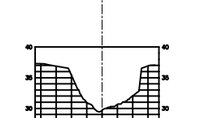


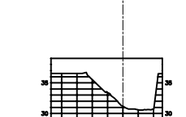


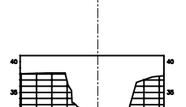


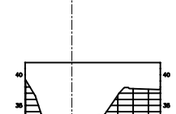


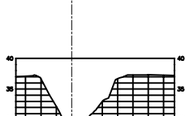


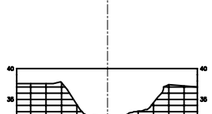


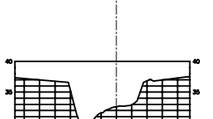


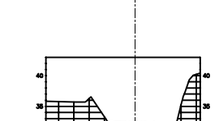




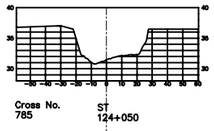


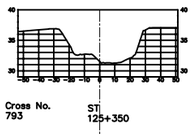


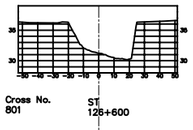


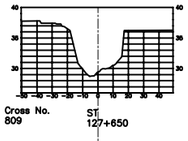


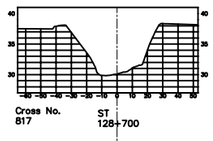
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** C-14
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY CROSS SECTION NO. 729 - 784	**SCALE** X=1:4000 Y=1:1000	**SERIAL NO.** 45

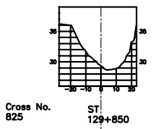

Cross No. 785 ST 124+050

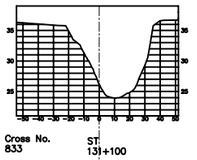

Cross No. 793 ST 125+350

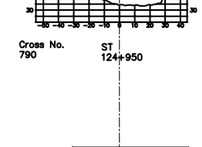

Cross No. 801 ST 126+600

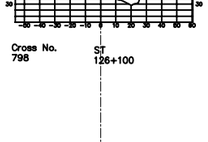

Cross No. 809 ST 127+650

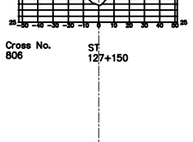

Cross No. 817 ST 128+700

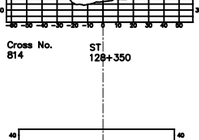

Cross No. 825 ST 129+850

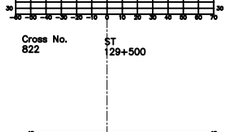

Cross No. 833 ST 131+100

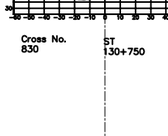

Cross No. 786 ST 124+300

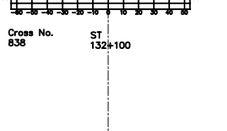

Cross No. 794 ST 125+500

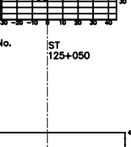

Cross No. 802 ST 126+700

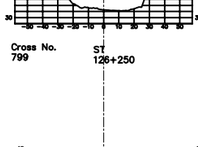

Cross No. 810 ST 127+750

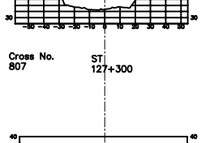

Cross No. 818 ST 128+900

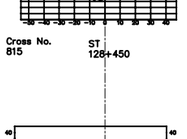

Cross No. 826 ST 129+950

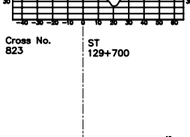

Cross No. 834 ST 131+350

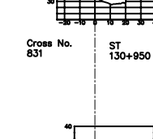

Cross No. 787 ST 124+500

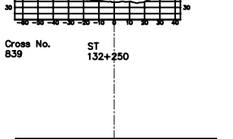

Cross No. 795 ST 125+600

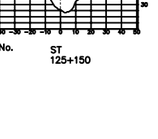

Cross No. 803 ST 126+850

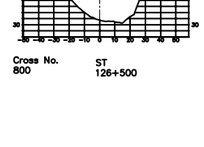

Cross No. 811 ST 127+900

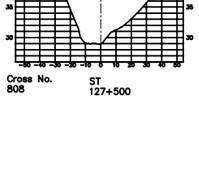

Cross No. 819 ST 129+100

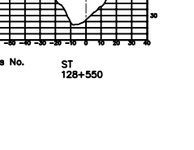

Cross No. 827 ST 130+100

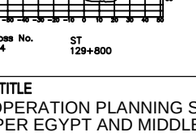

Cross No. 835 ST 131+550

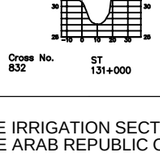

Cross No. 788 ST 124+650

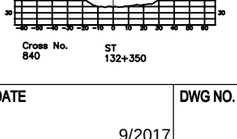

Cross No. 796 ST 125+750


Cross No. 804 ST 127+050


Cross No. 812 ST 128+050


Cross No. 820 ST 129+150


Cross No. 828 ST 130+300


Cross No. 836 ST 131+700

Cross No. 789 ST 124+800

Cross No. 797 ST 125+850

Cross No. 805 ST 127+100

Cross No. 813 ST 128+200

Cross No. 821 ST 129+300

Cross No. 829 ST 130+500

Cross No. 837 ST 131+900

Cross No. 790 ST 124+950

Cross No. 798 ST 126+100

Cross No. 806 ST 127+150

Cross No. 814 ST 128+350

Cross No. 822 ST 129+500

Cross No. 830 ST 130+750

Cross No. 838 ST 132+100

Cross No. 791 ST 125+050

Cross No. 799 ST 126+250

Cross No. 807 ST 127+300

Cross No. 815 ST 128+450

Cross No. 823 ST 129+700

Cross No. 831 ST 130+950

Cross No. 839 ST 132+250

Cross No. 792 ST 125+150

Cross No. 800 ST 126+500

Cross No. 808 ST 127+500

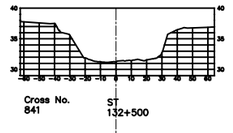
Cross No. 816 ST 128+550

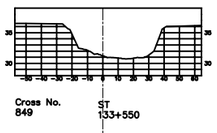
Cross No. 824 ST 129+800

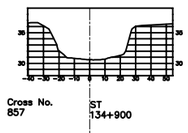
Cross No. 832 ST 131+000

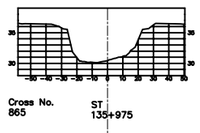
Cross No. 840 ST 132+350

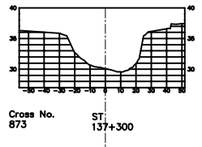
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** C-15
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY CROSS SECTION NO. 785 - 840	**SCALE** X=1:4000 Y=1:1000	**SERIAL NO.** 46

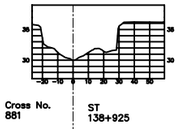

Cross No. 841 ST 132+500

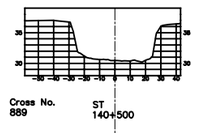

Cross No. 849 ST 133+550

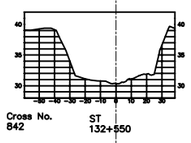

Cross No. 857 ST 134+900

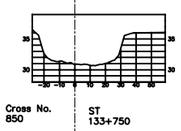

Cross No. 865 ST 135+975

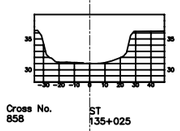

Cross No. 873 ST 137+300

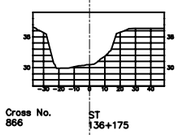

Cross No. 881 ST 138+925

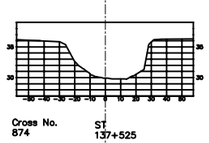

Cross No. 889 ST 140+500

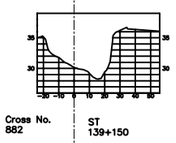

Cross No. 842 ST 132+550

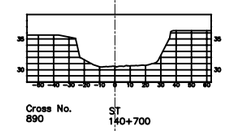

Cross No. 850 ST 133+750

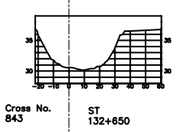

Cross No. 858 ST 135+025

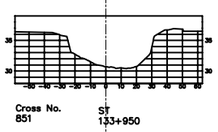

Cross No. 866 ST 136+175

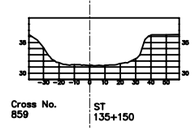

Cross No. 874 ST 137+525

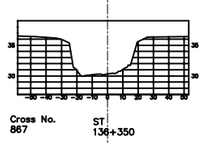

Cross No. 882 ST 139+150

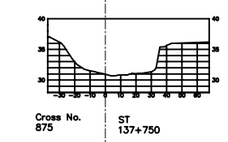

Cross No. 890 ST 140+700

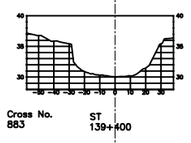

Cross No. 843 ST 132+650

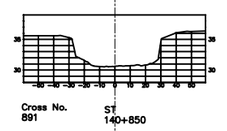

Cross No. 851 ST 133+950

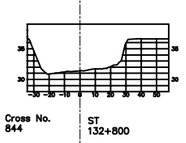

Cross No. 859 ST 135+150

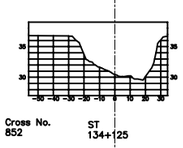

Cross No. 867 ST 136+350

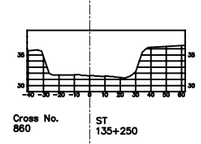

Cross No. 875 ST 137+750

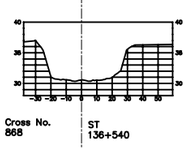

Cross No. 883 ST 139+400

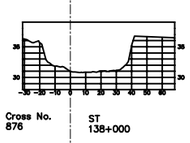

Cross No. 891 ST 140+850

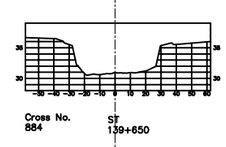

Cross No. 844 ST 132+800

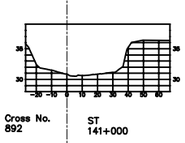

Cross No. 852 ST 134+125

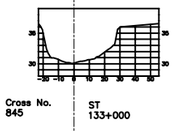

Cross No. 860 ST 135+250

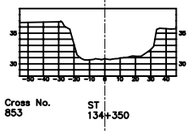

Cross No. 868 ST 136+540

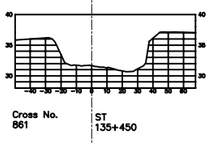

Cross No. 876 ST 138+000

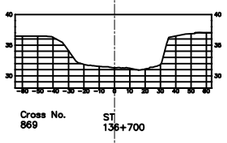

Cross No. 884 ST 139+650

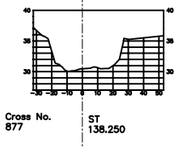

Cross No. 892 ST 141+000

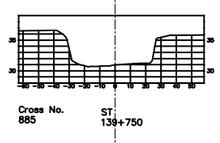

Cross No. 845 ST 133+000

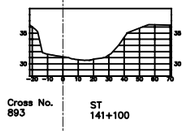

Cross No. 853 ST 134+350

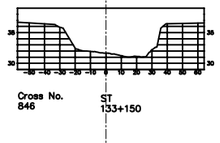

Cross No. 861 ST 135+450

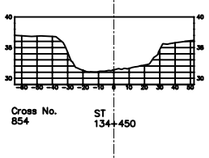

Cross No. 869 ST 136+700

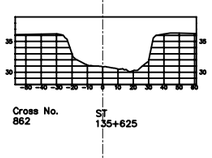

Cross No. 877 ST 138.250

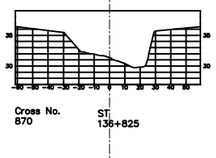

Cross No. 885 ST 139+750

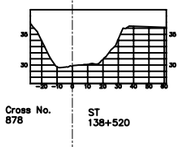

Cross No. 893 ST 141+100

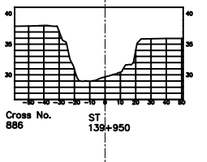

Cross No. 846 ST 133+150

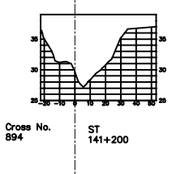

Cross No. 854 ST 134+450

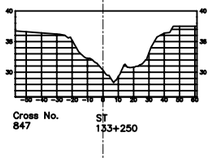

Cross No. 862 ST 135+625

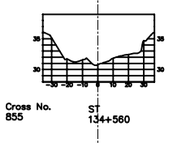

Cross No. 870 ST 136+825

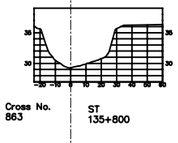

Cross No. 878 ST 138+520

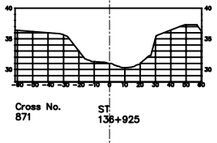

Cross No. 886 ST 139+950

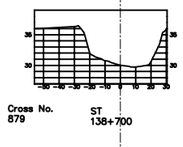

Cross No. 894 ST 141+200

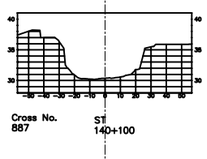

Cross No. 847 ST 133+250

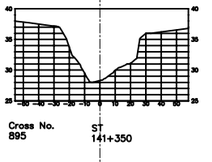

Cross No. 855 ST 134+560

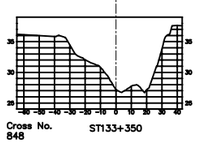

Cross No. 863 ST 135+800

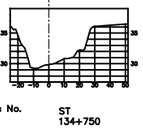

Cross No. 871 ST 136+925

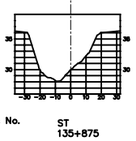

Cross No. 879 ST 138+700

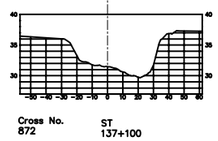

Cross No. 887 ST 140+100

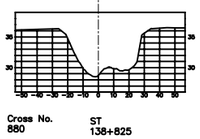

Cross No. 895 ST 141+350

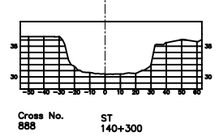

Cross No. 848 ST133+350

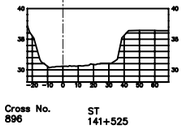

Cross No. 856 ST 134+750


Cross No. 864 ST 135+875

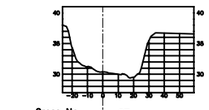

Cross No. 872 ST 137+100

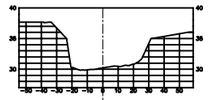

Cross No. 880 ST 138+825

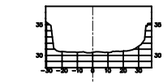

Cross No. 888 ST 140+300

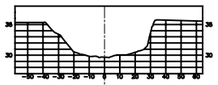

Cross No. 896 ST 141+525

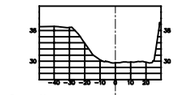
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** C-16
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY CROSS SECTION NO. 841 - 896	**SCALE** X=1:4000 Y=1:1000	**SERIAL NO.** 47

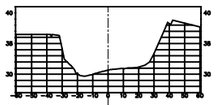

Cross No. 897 ST 141+575

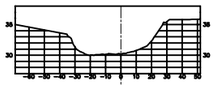

Cross No. 905 ST 143+100

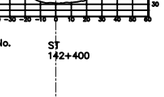

Cross No. 913 ST 144+375

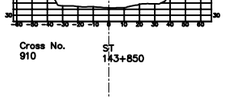

Cross No. 921 ST 145+750

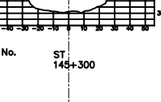

Cross No. 929 ST 146+950

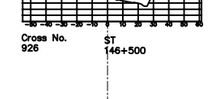

Cross No. 937 ST 148+300

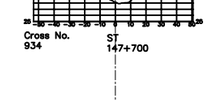

Cross No. 945 ST 149+750

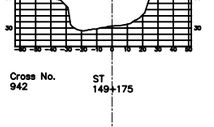

Cross No. 898 ST 141+675

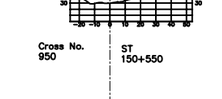

Cross No. 906 ST 143+325

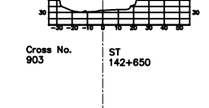

Cross No. 914 ST 144+550

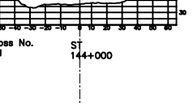

Cross No. 922 ST 145+900

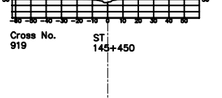

Cross No. 930 ST 147+150

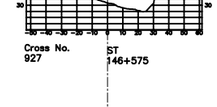

Cross No. 938 ST 148+400

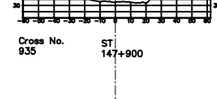

Cross No. 946 ST 149+900

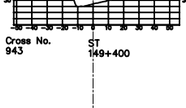

Cross No. 899 ST 141+850

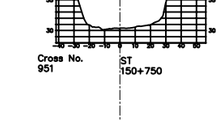

Cross No. 907 ST 143+500

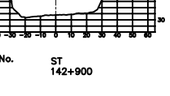

Cross No. 915 ST 144+750

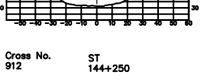

Cross No. 923 ST 146+100

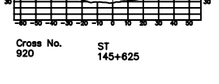

Cross No. 931 ST 147+300

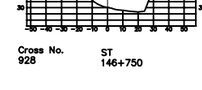

Cross No. 939 ST 148+500

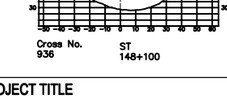

Cross No. 947 ST 150+050

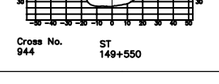

Cross No. 900 ST 141+950

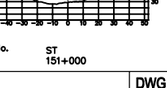

Cross No. 908 ST 143+600

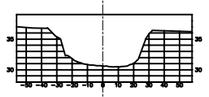

Cross No. 916 ST 144+950

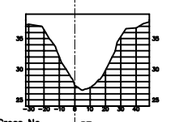

Cross No. 924 ST 146+250

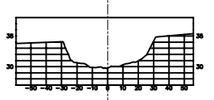

Cross No. 932 ST 147+450

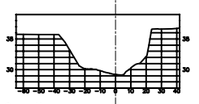

Cross No. 940 ST 148+750

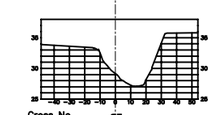

Cross No. 948 ST 150+200

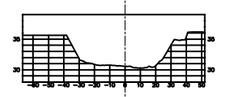

Cross No. 901 ST 142+150

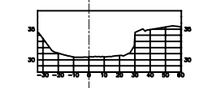

Cross No. 909 ST 143+700

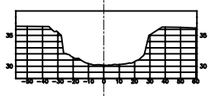

Cross No. 917 ST 145+100


Cross No. 925 ST 146+400

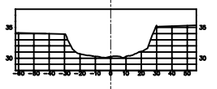

Cross No. 933 ST 147+550

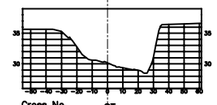

Cross No. 941 ST 149+000

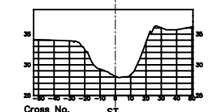

Cross No. 949 ST 150+400


Cross No. 902 ST 142+400

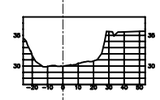

Cross No. 910 ST 143+850

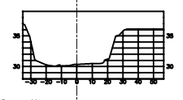

Cross No. 918 ST 145+300

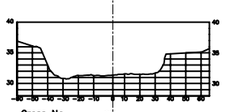

Cross No. 926 ST 146+500

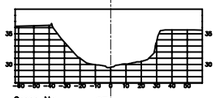

Cross No. 934 ST 147+700

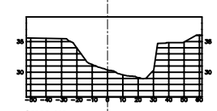
Cross No. 942 ST 149+175

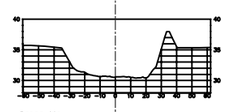

Cross No. 950 ST 150+550

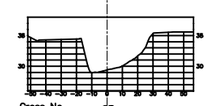

Cross No. 903 ST 142+650

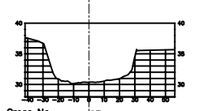

Cross No. 911 ST 144+000

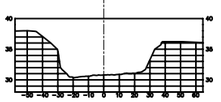

Cross No. 919 ST 145+450

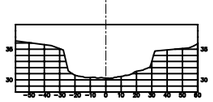

Cross No. 927 ST 146+575

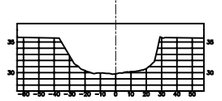

Cross No. 935 ST 147+900

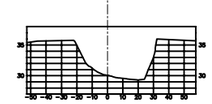

Cross No. 943 ST 149+400

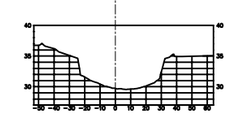

Cross No. 951 ST 150+750

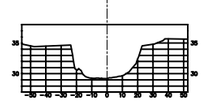

Cross No. 904 ST 142+900

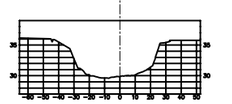

Cross No. 912 ST 144+250


Cross No. 920 ST 145+625

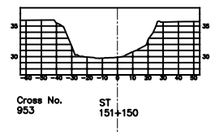

Cross No. 928 ST 146+750

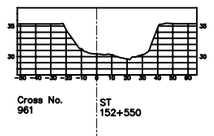

Cross No. 936 ST 148+100

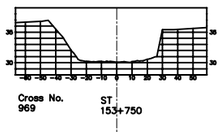

Cross No. 944 ST 149+550

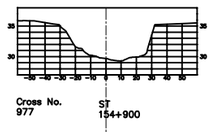

Cross No. 952 ST 151+000

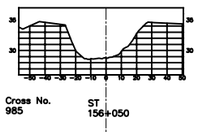
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** C-17
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY CROSS SECTION NO. 897 - 952	**SCALE** X=1:4000 Y=1:1000	**SERIAL NO.** 48

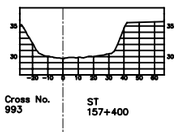

Cross No. 953 ST 151+150

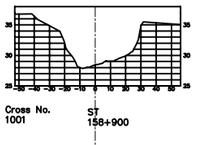

Cross No. 961 ST 152+550

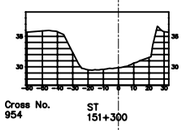

Cross No. 969 ST 153+750

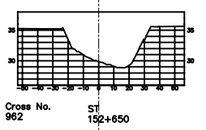

Cross No. 977 ST 154+900

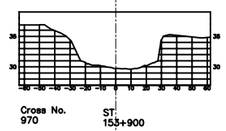

Cross No. 985 ST 156+050

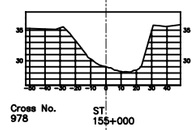

Cross No. 993 ST 157+400

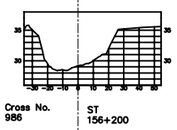

Cross No. 1001 ST 158+900

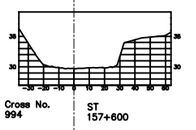

Cross No. 954 ST 151+300

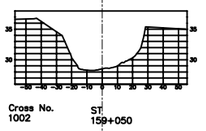

Cross No. 962 ST 152+650

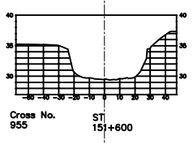

Cross No. 970 ST 153+900

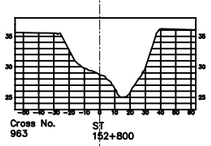

Cross No. 978 ST 155+000

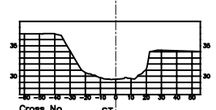

Cross No. 986 ST 156+200

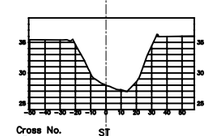

Cross No. 994 ST 157+600

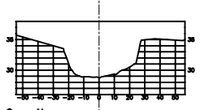

Cross No. 1002 ST 159+050

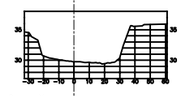

Cross No. 955 ST 151+600

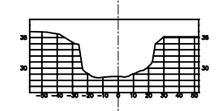

Cross No. 963 ST 152+800

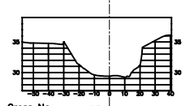

Cross No. 971 ST 154+000

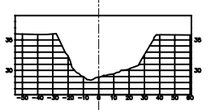

Cross No. 979 ST 155+150

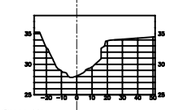

Cross No. 987 ST 156+400

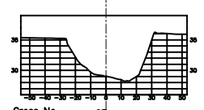

Cross No. 995 ST 157+750

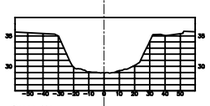

Cross No. 1003 ST 159+225

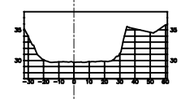

Cross No. 956 ST 151+700

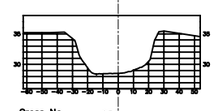

Cross No. 964 ST 152+950

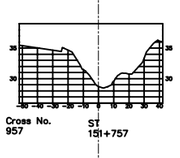

Cross No. 972 ST 154+150

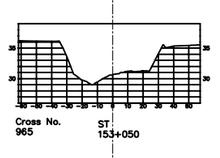

Cross No. 980 ST 155+250

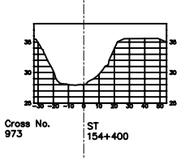

Cross No. 988 ST 156+550

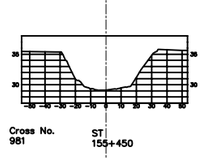

Cross No. 996 ST 157+925

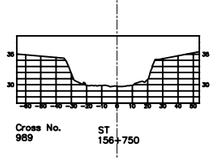

Cross No. 1004 ST 159+400

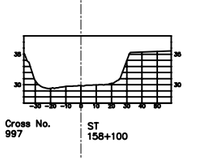

Cross No. 957 ST 151+757

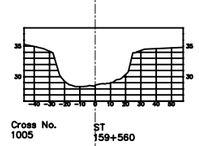

Cross No. 965 ST 153+050

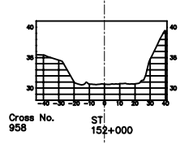

Cross No. 973 ST 154+400

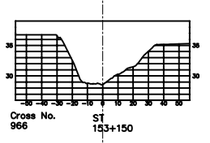

Cross No. 981 ST 155+450

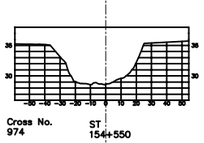

Cross No. 989 ST 156+750

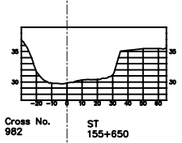

Cross No. 997 ST 158+100

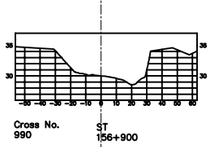

Cross No. 1005 ST 159+560

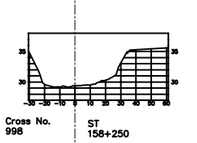

Cross No. 958 ST 152+000

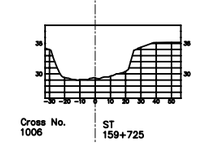

Cross No. 966 ST 153+150

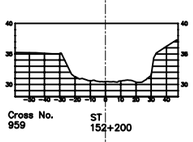

Cross No. 974 ST 154+550

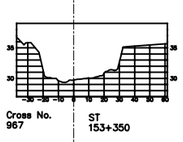

Cross No. 982 ST 155+650

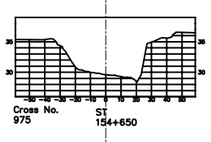

Cross No. 990 ST 156+900

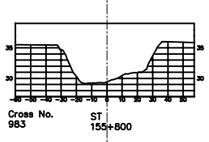

Cross No. 998 ST 158+250

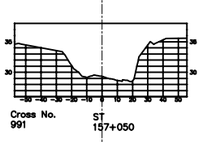

Cross No. 1006 ST 159+725

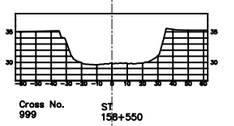

Cross No. 959 ST 152+200

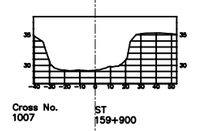

Cross No. 967 ST 153+350

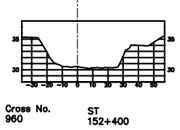

Cross No. 975 ST 154+650

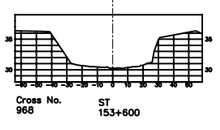

Cross No. 983 ST 155+800

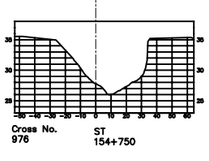

Cross No. 991 ST 157+050

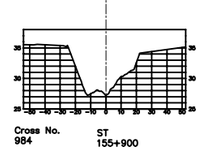

Cross No. 999 ST 158+550

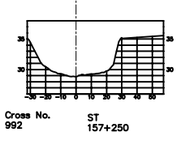

Cross No. 1007 ST 159+900

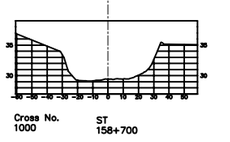

Cross No. 960 ST 152+400

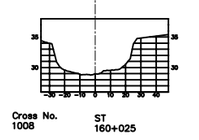

Cross No. 968 ST 153+600


Cross No. 976 ST 154+750

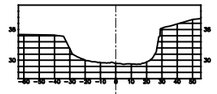

Cross No. 984 ST 155+900

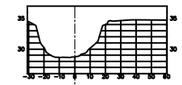

Cross No. 992 ST 157+250


Cross No. 1000 ST 158+700

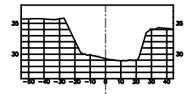

Cross No. 1008 ST 160+025

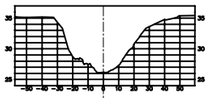
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** C-18
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY CROSS SECTION NO. 953 - 1008	**SCALE** X=1:4000 Y=1:1000	**SERIAL NO.** 49

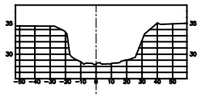

Cross No. 1009 ST 160+170

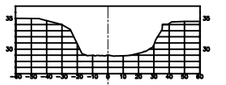

Cross No. 1017 ST 161+300

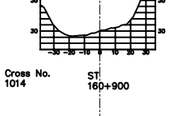

Cross No. 1025 ST 162+700

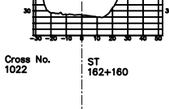

Cross No. 1033 ST 163+960

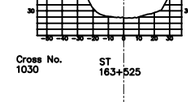

Cross No. 1041 ST 165+115

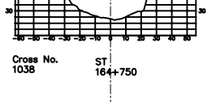

Cross No. 1049 ST 166+650

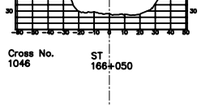

Cross No. 1057 ST 168+260

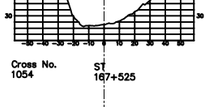

Cross No. 1010 ST 160+260

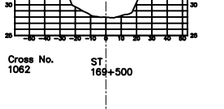

Cross No. 1018 ST 161+475

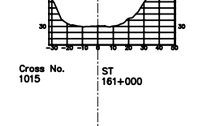

Cross No. 1026 ST 162+850

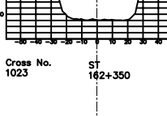

Cross No. 1034 ST 164+150

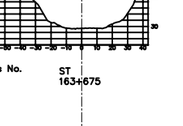

Cross No. 1042 ST 165+310

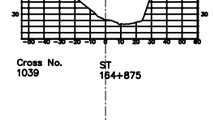

Cross No. 1050 ST 166+800

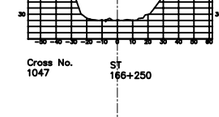

Cross No. 1058 ST 168+525

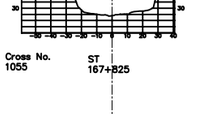

Cross No. 1011 ST 160+360

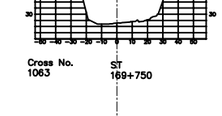

Cross No. 1019 ST 161+650

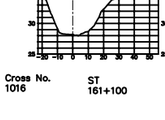

Cross No. 1027 ST 163+000

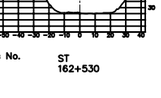

Cross No. 1035 ST 164+300

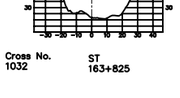

Cross No. 1043 ST 165+520

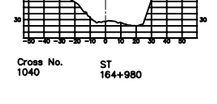

Cross No. 1051 ST 166+960

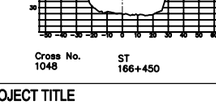

Cross No. 1059 ST 168+750

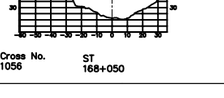

Cross No. 1012 ST 160+525

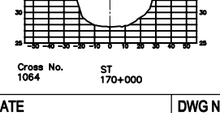

Cross No. 1020 ST 161+840

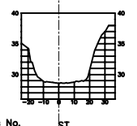

Cross No. 1028 ST 163+150

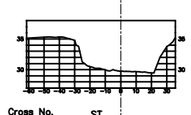

Cross No. 1036 ST 116+475

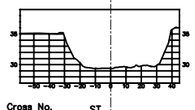

Cross No. 1044 ST 165+690

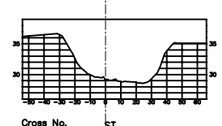

Cross No. 1052 ST 167+110

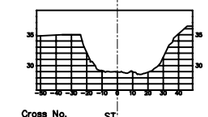

Cross No. 1060 ST 169+000

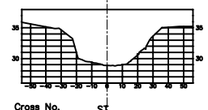

Cross No. 1013 ST 160+700

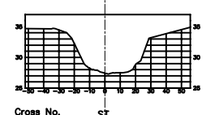

Cross No. 1021 ST 162+000


Cross No. 1029 ST 163+350

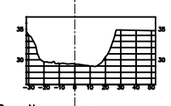

Cross No. 1037 ST 164+600


Cross No. 1045 ST 165+850


Cross No. 1053 ST 167+300

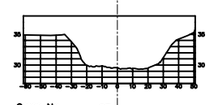

Cross No. 1061 ST 169+250

Cross No. 1014 ST 160+900


Cross No. 1022 ST 162+160

Cross No. 1030 ST 163+525

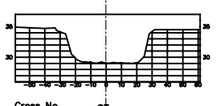
Cross No. 1038 ST 164+750


Cross No. 1046 ST 166+050

Cross No. 1054 ST 167+525

Cross No. 1062 ST 169+500

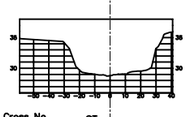
Cross No. 1015 ST 161+000


Cross No. 1023 ST 162+350

Cross No. 1031 ST 163+675

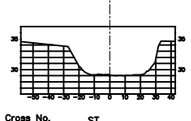
Cross No. 1039 ST 164+875

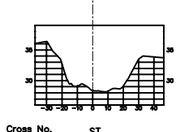
Cross No. 1047 ST 166+250


Cross No. 1055 ST 167+825

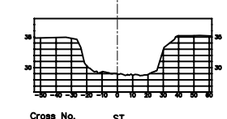
Cross No. 1063 ST 169+750

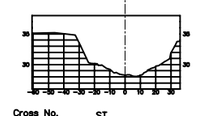
Cross No. 1016 ST 161+100


Cross No. 1024 ST 162+530


Cross No. 1032 ST 163+825

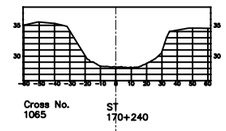
Cross No. 1040 ST 164+980

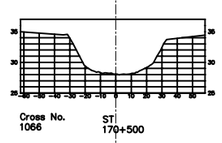

Cross No. 1048 ST 166+450

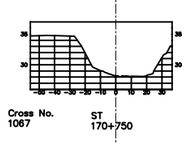

Cross No. 1056 ST 168+050

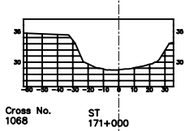
Cross No. 1064 ST 170+000

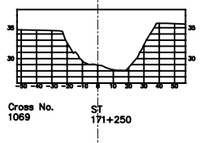
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** C-19
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY CROSS SECTION NO. 1009 - 1064	**SCALE** X=1:4000 Y=1:1000	**SERIAL NO.** 50

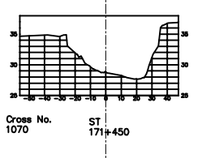

Cross No. 1065 ST 170+240

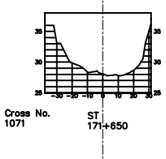

Cross No. 1066 ST 170+500

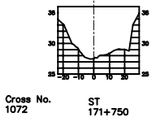

Cross No. 1067 ST 170+750

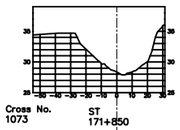

Cross No. 1068 ST 171+000

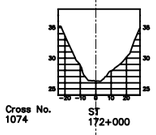

Cross No. 1069 ST 171+250

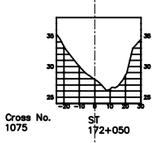

Cross No. 1070 ST 171+450

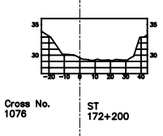

Cross No. 1071 ST 171+650

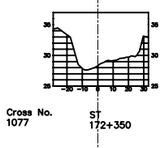

Cross No. 1072 ST 171+750

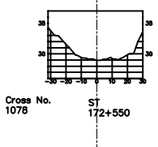

Cross No. 1073 ST 171+850

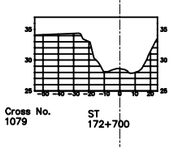

Cross No. 1074 ST 172+000

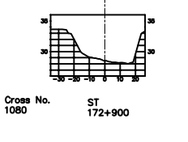

Cross No. 1075 ST 172+050

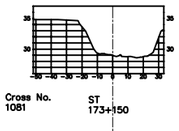

Cross No. 1076 ST 172+200

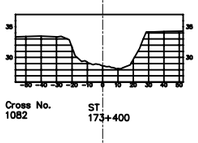

Cross No. 1077 ST 172+350

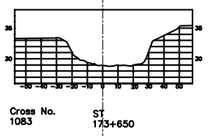

Cross No. 1078 ST 172+550

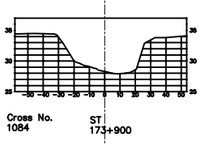

Cross No. 1079 ST 172+700

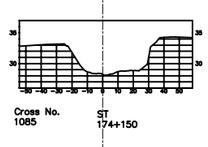

Cross No. 1080 ST 172+900

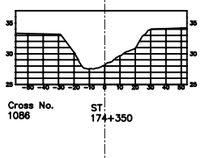

Cross No. 1081 ST 173+150

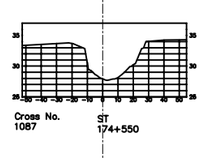

Cross No. 1082 ST 173+400

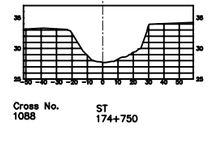

Cross No. 1083 ST 173+650

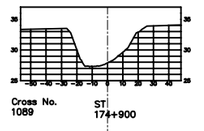

Cross No. 1084 ST 173+900

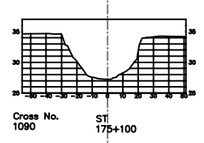

Cross No. 1085 ST 174+150

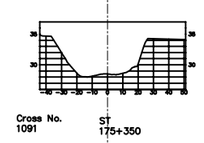

Cross No. 1086 ST 174+350

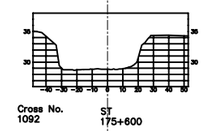

Cross No. 1087 ST 174+550

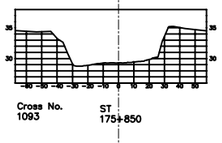

Cross No. 1088 ST 174+750

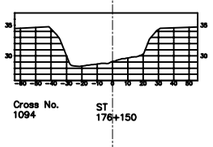

Cross No. 1089 ST 174+900

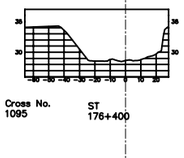

Cross No. 1090 ST 175+100

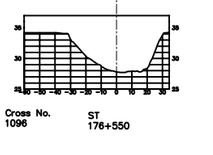

Cross No. 1091 ST 175+350

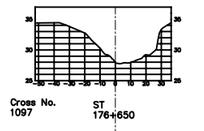

Cross No. 1092 ST 175+600

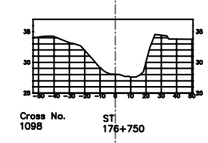

Cross No. 1093 ST 175+850

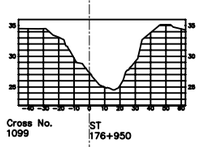

Cross No. 1094 ST 176+150

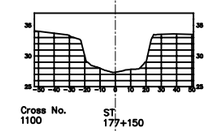

Cross No. 1095 ST 176+400

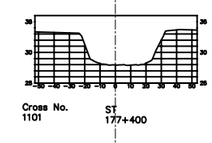

Cross No. 1096 ST 176+550

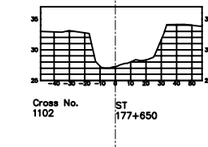

Cross No. 1097 ST 176+650

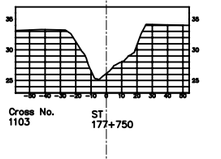

Cross No. 1098 ST 176+750

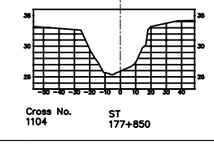

Cross No. 1099 ST 176+950

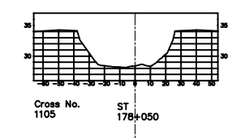

Cross No. 1100 ST 177+150

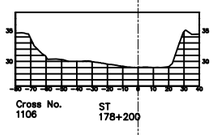

Cross No. 1101 ST 177+400

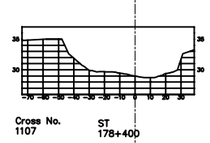

Cross No. 1102 ST 177+650

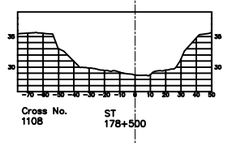

Cross No. 1103 ST 177+750

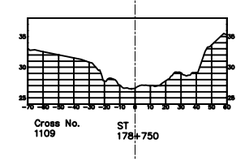

Cross No. 1104 ST 177+850

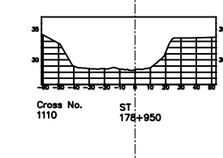

Cross No. 1105 ST 178+050

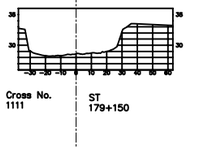

Cross No. 1106 ST 178+200

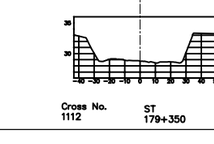

Cross No. 1107 ST 178+400

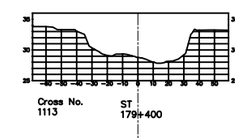

Cross No. 1108 ST 178+500

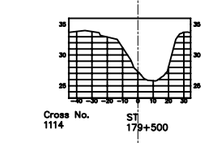

Cross No. 1109 ST 178+750

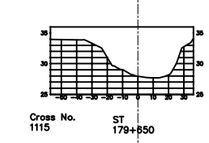

Cross No. 1110 ST 178+950

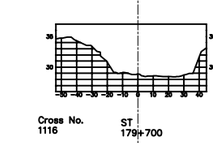

Cross No. 1111 ST 179+150

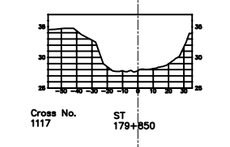

Cross No. 1112 ST 179+350

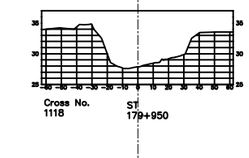

Cross No. 1113 ST 179+400

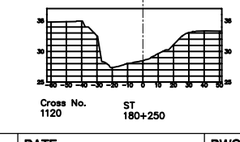

Cross No. 1114 ST 179+500

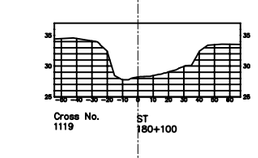

Cross No. 1115 ST 179+650


Cross No. 1116 ST 179+700

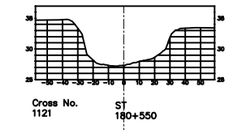

Cross No. 1117 ST 179+850

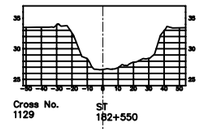

Cross No. 1118 ST 179+950

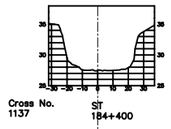

Cross No. 1120 ST 180+250

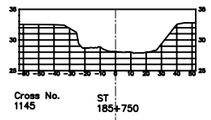

Cross No. 1119 ST 180+100

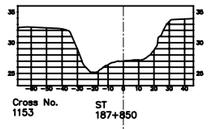
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** C-20
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY CROSS SECTION NO. 1065 - 1120	**SCALE** X=1:4000 Y=1:1000	**SERIAL NO.** 51

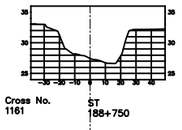


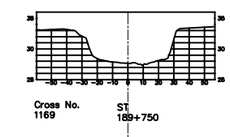


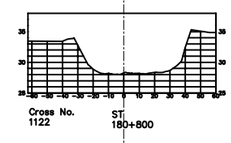


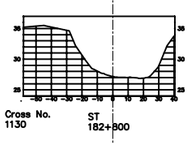


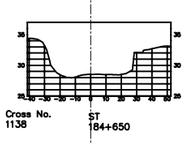


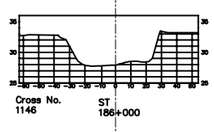


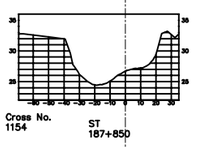


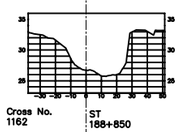


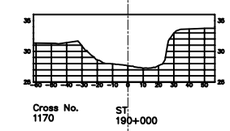


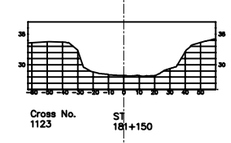


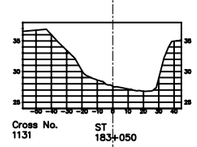


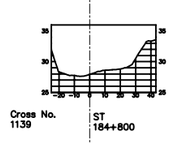


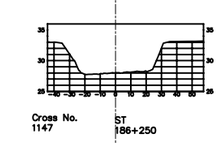


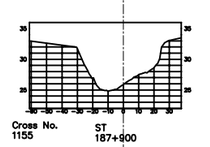


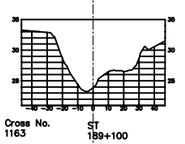


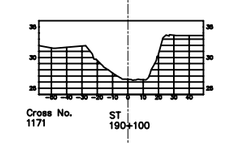


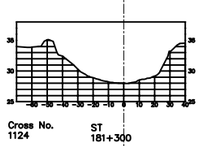


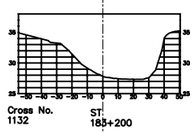


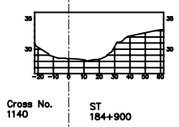


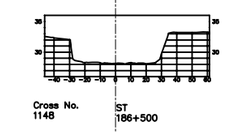


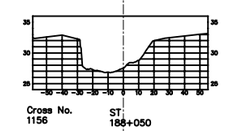


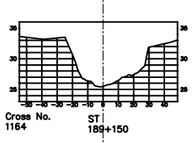


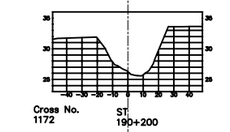


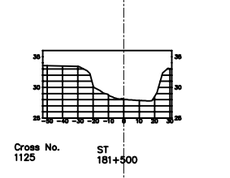


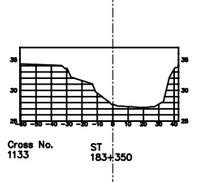


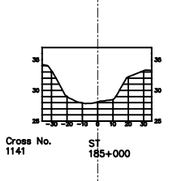


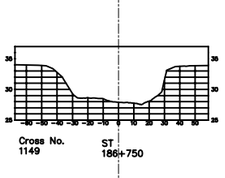


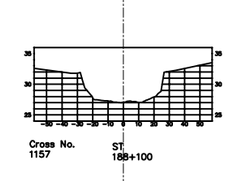


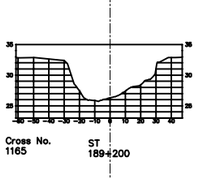


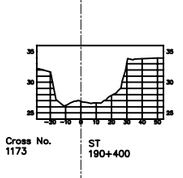


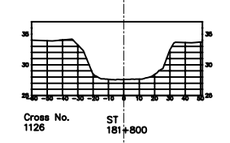


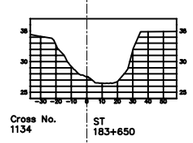


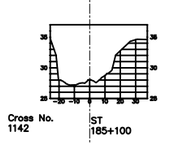


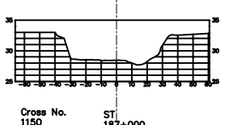


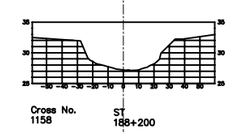


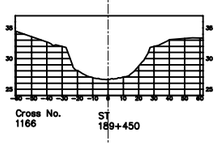


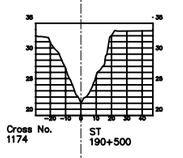


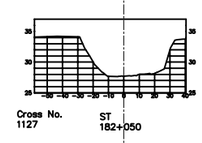


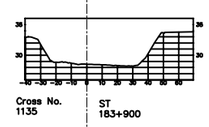


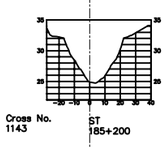


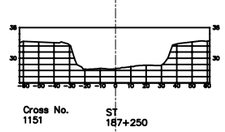


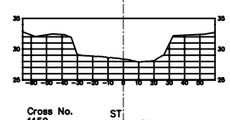


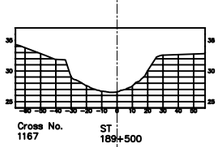


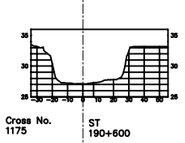


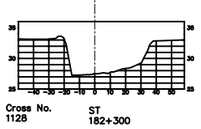


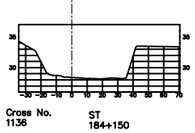


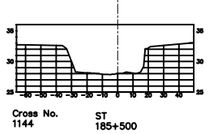


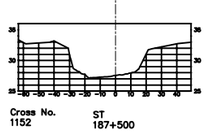


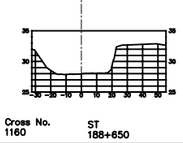


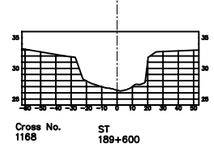


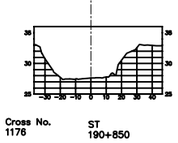




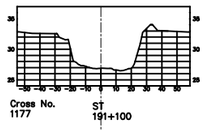


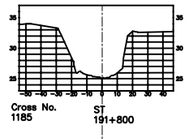


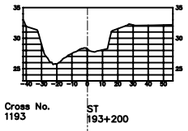


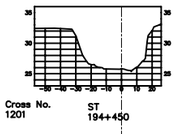


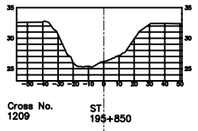
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** C-21
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY CROSS SECTION NO. 1121 - 1176	**SCALE** X=1:4000 Y=1:1000	**SERIAL NO.** 52

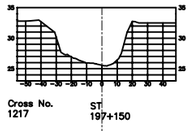

Cross No. 1177 ST 191+100

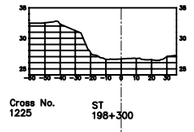

Cross No. 1185 ST 191+800

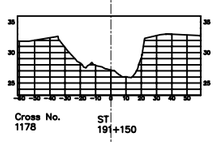

Cross No. 1193 ST 193+200

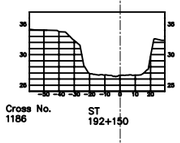

Cross No. 1201 ST 194+450

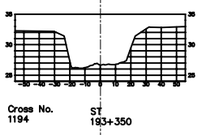

Cross No. 1209 ST 195+850

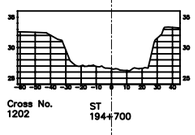

Cross No. 1217 ST 197+150

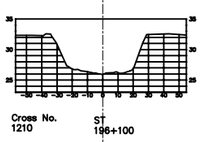

Cross No. 1225 ST 198+300

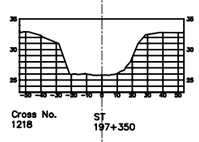

Cross No. 1178 ST 191+150

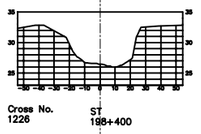

Cross No. 1186 ST 192+150

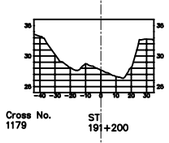

Cross No. 1194 ST 193+350

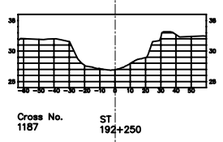

Cross No. 1202 ST 194+700

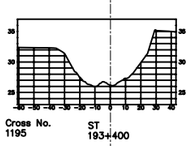

Cross No. 1210 ST 196+100

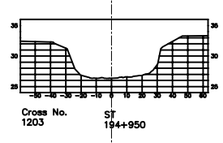

Cross No. 1218 ST 197+350

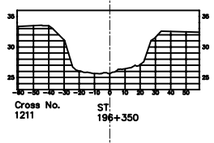

Cross No. 1226 ST 198+400

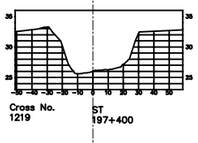

Cross No. 1179 ST 191+200

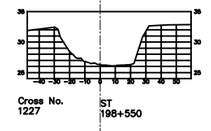

Cross No. 1187 ST 192+250

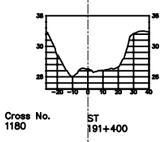

Cross No. 1195 ST 193+400

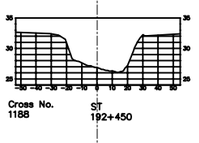

Cross No. 1203 ST 194+950

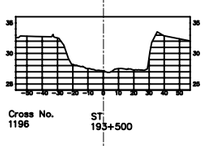

Cross No. 1211 ST 196+350

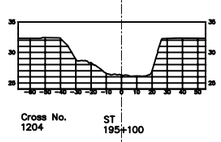

Cross No. 1219 ST 197+400

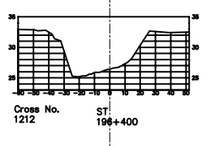

Cross No. 1227 ST 198+550

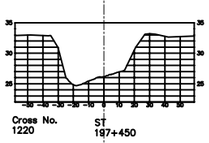

Cross No. 1180 ST 191+400

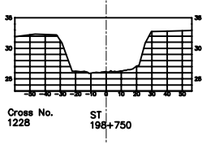

Cross No. 1188 ST 192+450

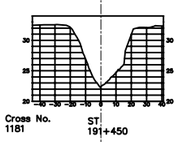

Cross No. 1196 ST 193+500

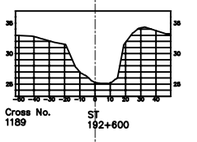

Cross No. 1204 ST 195+100

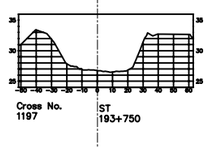

Cross No. 1212 ST 196+400

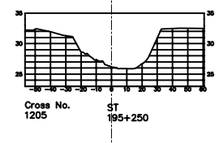

Cross No. 1220 ST 197+450

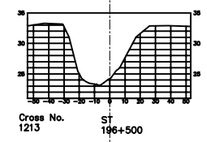

Cross No. 1228 ST 198+750

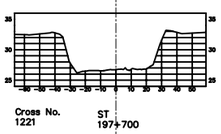

Cross No. 1181 ST 191+450

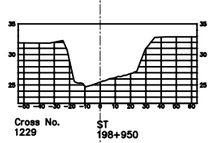

Cross No. 1189 ST 192+600

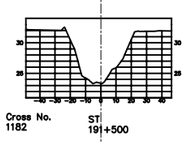

Cross No. 1197 ST 193+750

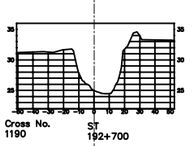

Cross No. 1205 ST 195+250

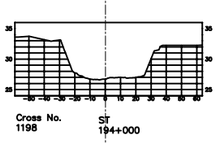

Cross No. 1213 ST 196+500

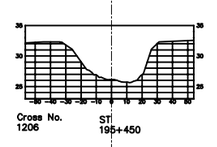

Cross No. 1221 ST 197+700

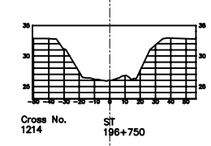

Cross No. 1229 ST 198+950

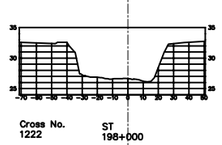

Cross No. 1182 ST 191+500

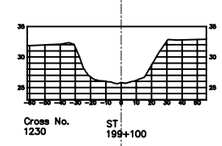

Cross No. 1190 ST 192+700

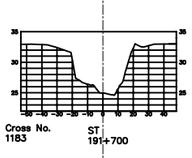

Cross No. 1198 ST 194+000

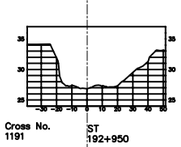

Cross No. 1206 ST 195+450

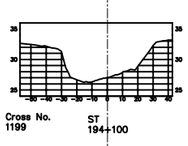

Cross No. 1214 ST 196+750

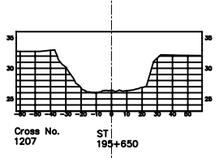

Cross No. 1222 ST 198+000

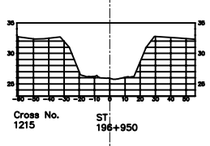

Cross No. 1230 ST 199+100

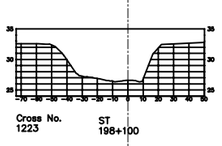

Cross No. 1183 ST 191+700

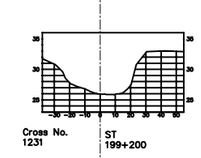

Cross No. 1191 ST 192+950

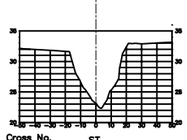

Cross No. 1199 ST 194+100

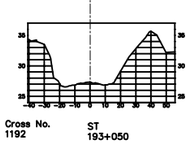

Cross No. 1207 ST 195+650

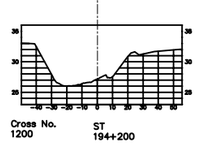

Cross No. 1215 ST 196+950

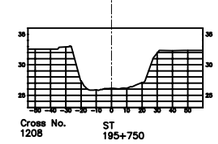

Cross No. 1223 ST 198+100

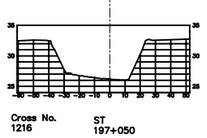

Cross No. 1231 ST 199+200

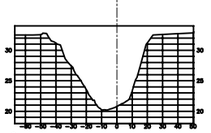

Cross No. 1184 ST 191+750

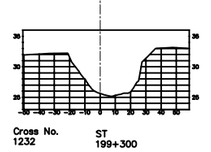

Cross No. 1192 ST 193+050


Cross No. 1200 ST 194+200

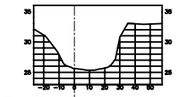

Cross No. 1208 ST 195+750

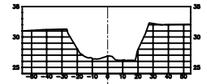

Cross No. 1216 ST 197+050

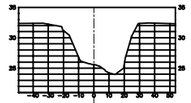

Cross No. 1224 ST 198+200

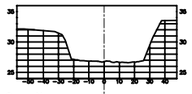

Cross No. 1232 ST 199+300

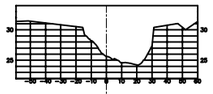
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** C-22
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY CROSS SECTION NO. 1177 - 1232	**SCALE** X=1:4000 Y=1:1000	**SERIAL NO.** 53

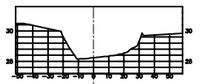

Cross No. 1233 ST 199+500

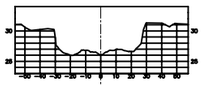

Cross No. 1241 ST 200+600

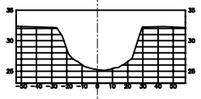

Cross No. 1249 ST 201+850

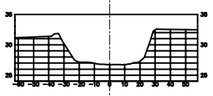

Cross No. 1257 ST 203+600

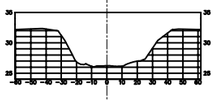

Cross No. 1265 ST 205+000

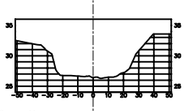

Cross No. 1273 ST 206+550

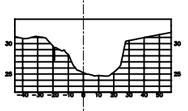

Cross No. 1281 ST 208+300

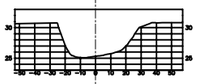

Cross No. 1234 ST 199+600

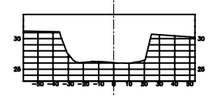

Cross No. 1242 ST 200+800

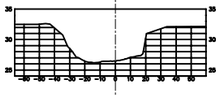

Cross No. 1250 ST 202+050

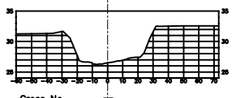

Cross No. 1258 ST 203+650

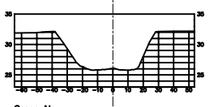

Cross No. 1266 ST 205+100

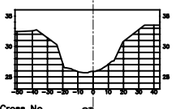

Cross No. 1274 ST 206+800

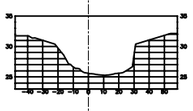

Cross No. 1282 ST 208+600

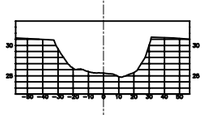

Cross No. 1235 ST 199+700

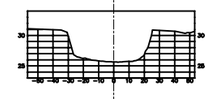

Cross No. 1243 ST 200+900

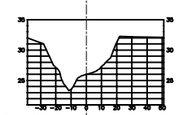

Cross No. 1251 ST 202+350

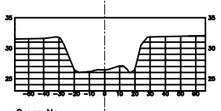

Cross No. 1259 ST 203+700

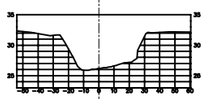

Cross No. 1267 ST 205+350

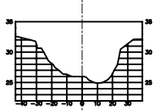

Cross No. 1275 ST 207+050

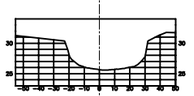

Cross No. 1283 ST 208+950

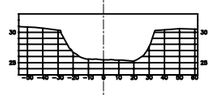

Cross No. 1236 ST 199+800

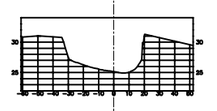

Cross No. 1244 ST 201+000

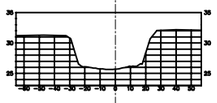

Cross No. 1252 ST 202+450

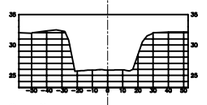

Cross No. 1260 ST 204+000

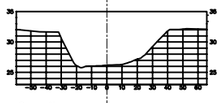

Cross No. 1268 ST 205+550

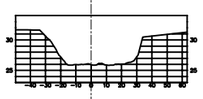

Cross No. 1276 ST 207+200

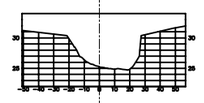

Cross No. 1284 ST 209+000

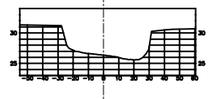

Cross No. 1237 ST 200+050

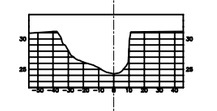

Cross No. 1245 ST 201+250

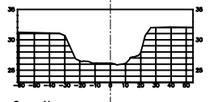

Cross No. 1253 ST 202+550

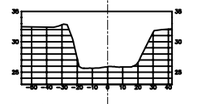

Cross No. 1261 ST 204+250

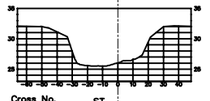

Cross No. 1269 ST 205+800

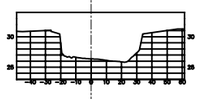

Cross No. 1277 ST 207+300

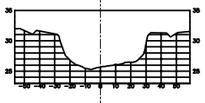

Cross No. 1285 ST 209+100

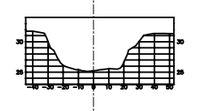

Cross No. 1238 ST 200+200

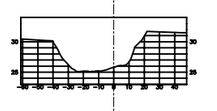

Cross No. 1246 ST 201+500

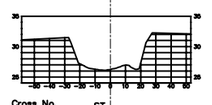

Cross No. 1254 ST 202+800

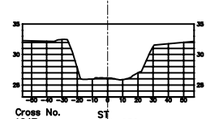

Cross No. 1262 ST 204+500

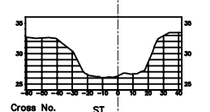

Cross No. 1270 ST 206+050

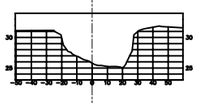

Cross No. 1278 ST 207+550

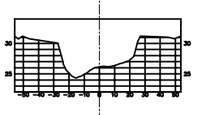

Cross No. 1286 ST 209+300

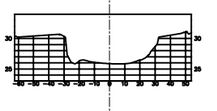

Cross No. 1239 ST 200+350

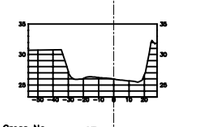

Cross No. 1247 ST 201+650

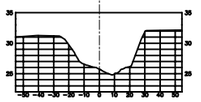

Cross No. 1255 ST 203+050

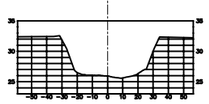

Cross No. 1263 ST 204+750

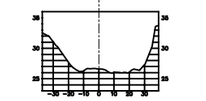

Cross No. 1271 ST 206+200

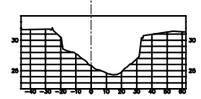

Cross No. 1279 ST 207+800

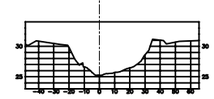

Cross No. 1287 ST 209+550

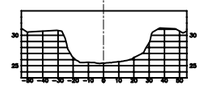

Cross No. 1240 ST 200+450

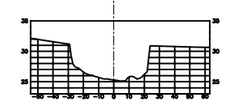

Cross No. 1248 ST 201+750


Cross No. 1256 ST 203+250

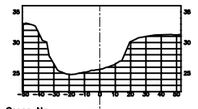

Cross No. 1264 ST 204+900

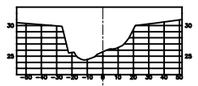

Cross No. 1272 ST 206+350

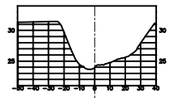

Cross No. 1280 ST 208+050

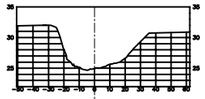

Cross No. 1288 ST 209+750

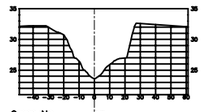
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** C-23
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY CROSS SECTION NO. 1233 - 1288	**SCALE** X=1:4000 Y=1:1000	**SERIAL NO.** 54

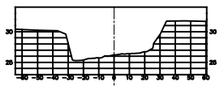

Cross No. 1289 ST 209+950

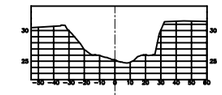

Cross No. 1297 ST 211+400

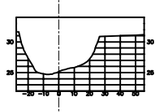

Cross No. 1305 ST 213+050

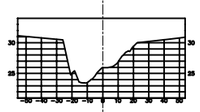

Cross No. 1313 ST 214+150

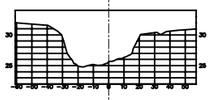

Cross No. 1321 ST 215+650

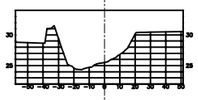

Cross No. 1329 ST 217+300

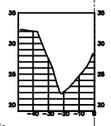

Cross No. 1337 ST 218+450

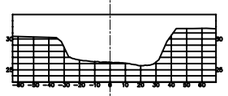

Cross No. 1290 ST 210+050

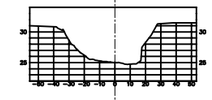

Cross No. 1298 ST 211+450

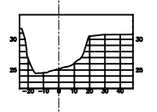

Cross No. 1306 ST 213+150

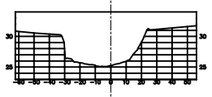

Cross No. 1314 ST 214+300

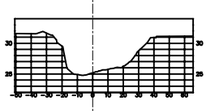

Cross No. 1322 ST 215+750

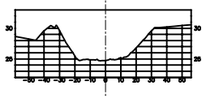

Cross No. 1330 ST 217+500

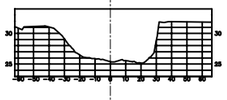

Cross No. 1338 ST 218+700

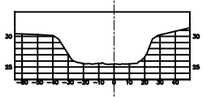

Cross No. 1291 ST 210+150

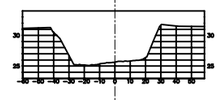

Cross No. 1299 ST 211+950

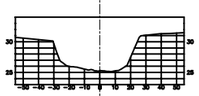

Cross No. 1307 ST 213+300

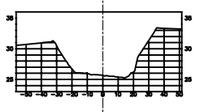

Cross No. 1315 ST 214+600

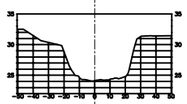

Cross No. 1323 ST 216+000

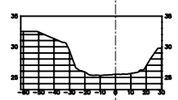

Cross No. 1331 ST 217+700

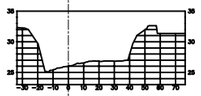

Cross No. 1339 ST 219+000

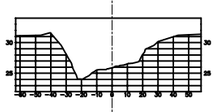

Cross No. 1292 ST 210+400

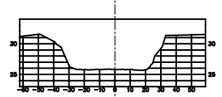

Cross No. 1300 ST 212+250

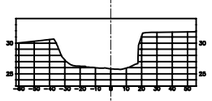

Cross No. 1308 ST 213+550

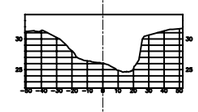

Cross No. 1316 ST 214+900

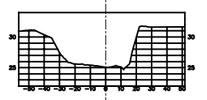

Cross No. 1324 ST 216+300

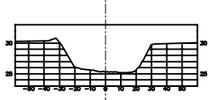

Cross No. 1332 ST 217+800

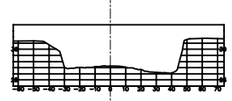

Cross No. 1340 ST 219+250

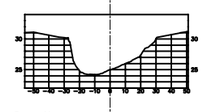

Cross No. 1293 ST 210+650

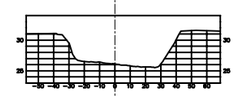

Cross No. 1301 ST 212+400

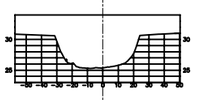

Cross No. 1309 ST 213+700

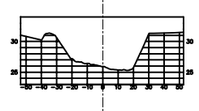

Cross No. 1317 ST 215+150

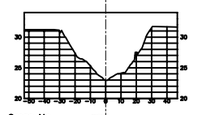

Cross No. 1325 ST 216+600

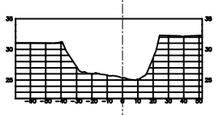

Cross No. 1333 ST 217+950

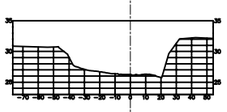

Cross No. 1341 ST 219+500

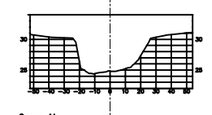

Cross No. 1294 ST 210+900

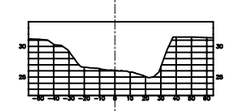

Cross No. 1302 ST 212+500

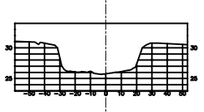

Cross No. 1310 ST 213+800

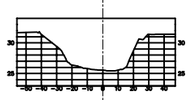

Cross No. 1318 ST 215+250

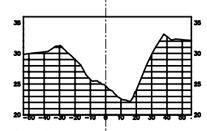

Cross No. 1326 ST 216+700

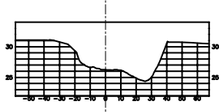

Cross No. 1334 ST 218+150

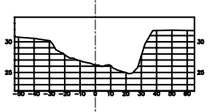

Cross No. 1342 ST 219+600

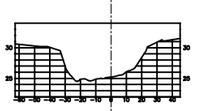

Cross No. 1295 ST 211+150

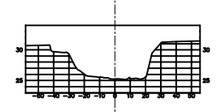

Cross No. 1303 ST 212+700

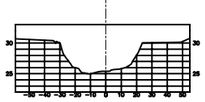

Cross No. 1311 ST 213+850

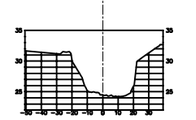

Cross No. 1319 ST 215+350

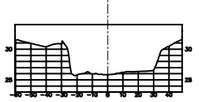

Cross No. 1327 ST 216+800

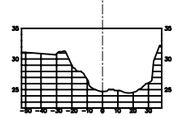

Cross No. 1335 ST 218+300

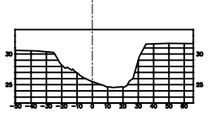

Cross No. 1343 ST 219+750

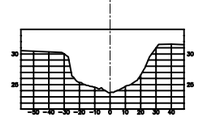

Cross No. 1296 ST 211+350

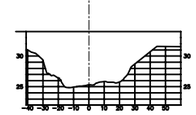

Cross No. 1304 ST 213+000


Cross No. 1312 ST 214+000

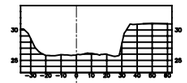

Cross No. 1320 ST 215+550

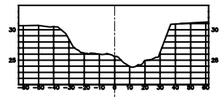

Cross No. 1328 ST 217+050

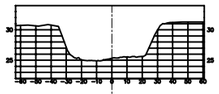

Cross No. 1336 ST 218+400

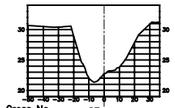

Cross No. 1344 ST 220+000

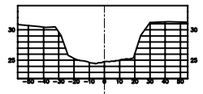
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** C-24
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY CROSS SECTION NO. 1289 - 1344	**SCALE** X=1:4000 Y=1:1000	**SERIAL NO.** 55

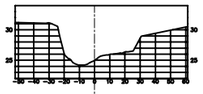

Cross No. 1345 ST 220+250

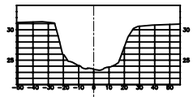

Cross No. 1353 ST 221+700

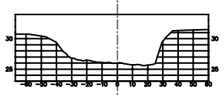

Cross No. 1361 ST 225+200

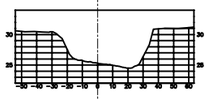

Cross No. 1369 ST 224+750

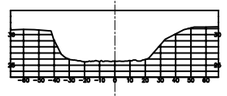

Cross No. 1377 ST 226+500

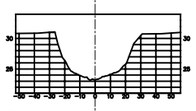

Cross No. 1385 ST 227+850

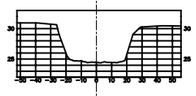

Cross No. 1393 ST 229+300

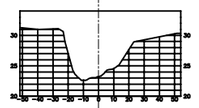

Cross No. 1346 ST 220+550

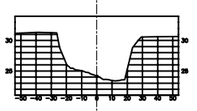

Cross No. 1354 ST 221+850

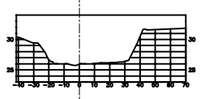

Cross No. 1362 ST 223+450

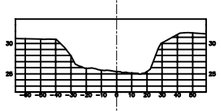

Cross No. 1370 ST 224+850

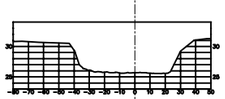

Cross No. 1378 ST 226+850

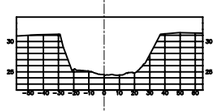

Cross No. 1386 ST 228+000

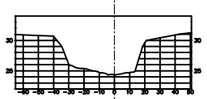

Cross No. 1394 ST 229+400

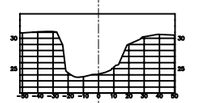

Cross No. 1347 ST 220+700

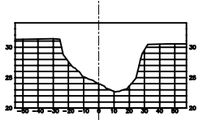

Cross No. 1355 ST 222+050

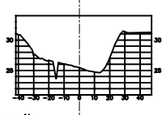

Cross No. 1363 ST 223+750

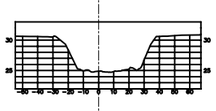

Cross No. 1371 ST 224+950

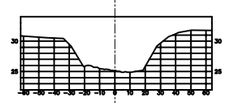

Cross No. 1379 ST 226+950

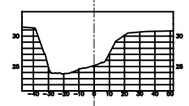

Cross No. 1387 ST 228+200

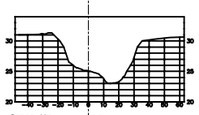

Cross No. 1395 ST 229+550

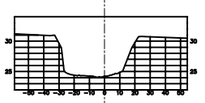

Cross No. 1348 ST 220+850

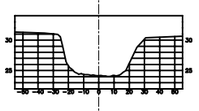

Cross No. 1356 ST 222+250

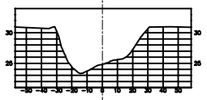

Cross No. 1364 ST 224+000

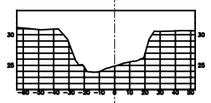

Cross No. 1372 ST 225+250

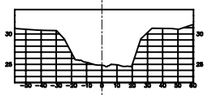

Cross No. 1380 ST 227+100

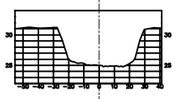

Cross No. 1388 ST 228+450

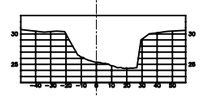

Cross No. 1396 ST 230+050

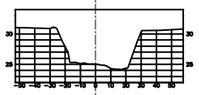

Cross No. 1349 ST 221+150

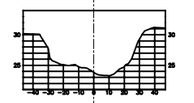

Cross No. 1357 ST 222+350

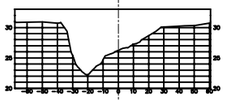

Cross No. 1365 ST 224+150

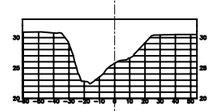

Cross No. 1373 ST 225+500

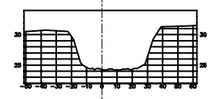

Cross No. 1381 ST 227+200

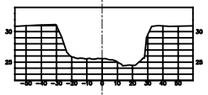

Cross No. 1389 ST 228+700

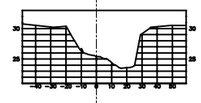

Cross No. 1397 ST 230+550

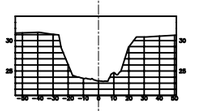

Cross No. 1350 ST 221+250

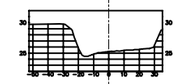

Cross No. 1358 ST 222+450

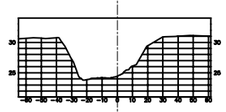

Cross No. 1366 ST 224+250

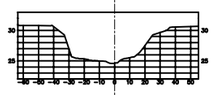

Cross No. 1374 ST 225+800

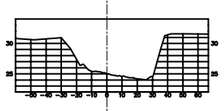

Cross No. 1382 ST 227+300

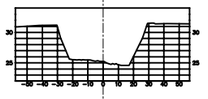

Cross No. 1390 ST 228+900

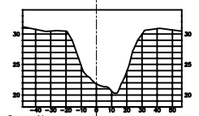

Cross No. 1398 ST 230+950

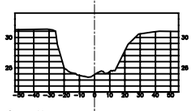

Cross No. 1351 ST 223+350

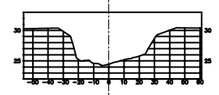

Cross No. 1359 ST 222+750

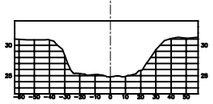

Cross No. 1367 ST 224+450

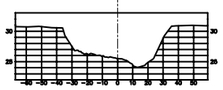

Cross No. 1375 ST 226+000

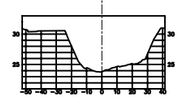

Cross No. 1383 ST 227+450

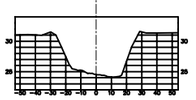

Cross No. 1391 ST 229+000

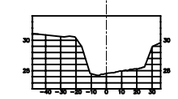

Cross No. 1399 ST 231+100

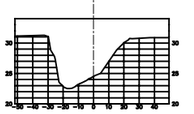

Cross No. 1352 ST 221+600

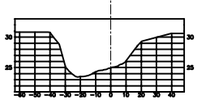

Cross No. 1360 ST 222+950


Cross No. 1368 ST 224+650

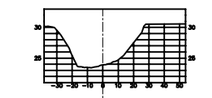

Cross No. 1376 ST 226+200

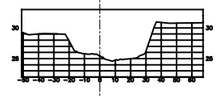

Cross No. 1384 ST 227+650

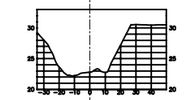

Cross No. 1392 ST 229+050

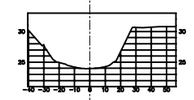

Cross No. 1400 ST 231+225

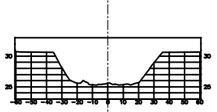
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** C-25
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY CROSS SECTION NO. 1345 - 1400	**SCALE** X=1:4000 Y=1:1000	**SERIAL NO.** 56

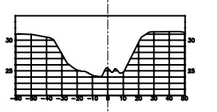

Cross No. 1401 ST 231+325

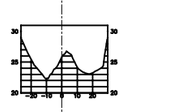

Cross No. 1402 ST 231+450

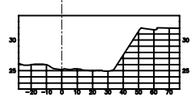

Cross No. 1403 ST 231+650

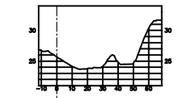

Cross No. 1404 ST 231+750


Cross No. 1405 ST 232+050

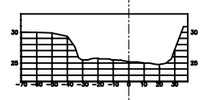

Cross No. 1406 ST 232+400

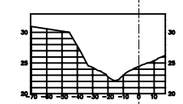

Cross No. 1407 ST 232+500

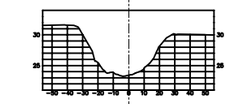

Cross No. 1408 ST 232+600

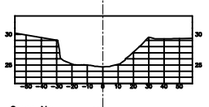

Cross No. 1409 ST 232+750

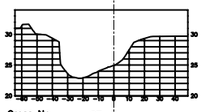

Cross No. 1410 ST 232+950

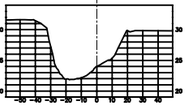

Cross No. 1411 ST 233+150

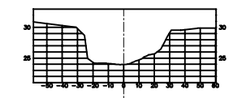

Cross No. 1412 ST 233+350

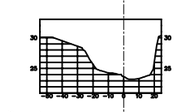

Cross No. 1413 ST 233+500

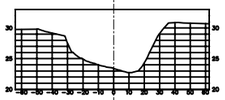

Cross No. 1414 ST 233+600

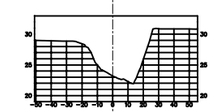

Cross No. 1415 ST 233+800

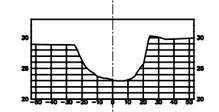

Cross No. 1416 ST 233+950

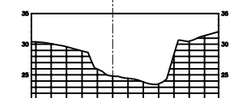

Cross No. 1417 ST 234+100

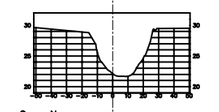

Cross No. 1418 ST 234+250

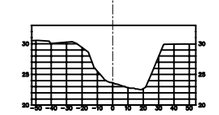

Cross No. 1419 ST 234+450

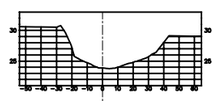

Cross No. 1420 ST 234+600

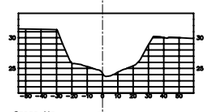

Cross No. 1421 ST 234+800

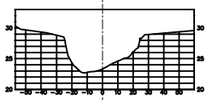

Cross No. 1422 ST 235+025

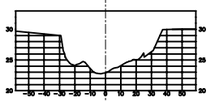

Cross No. 1423 ST 235+150

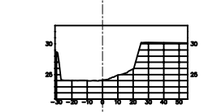

Cross No. 1424 ST 235+250

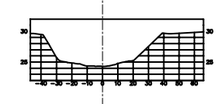

Cross No. 1425 ST 235+425

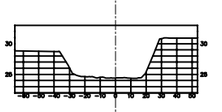

Cross No. 1426 ST 235+525

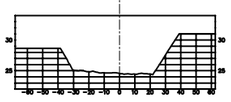

Cross No. 1427 ST 235+850

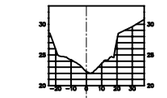

Cross No. 1428 ST 235+750

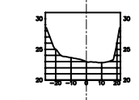

Cross No. 1429 ST 236+025

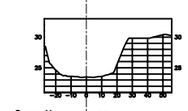

Cross No. 1430 ST 236+300

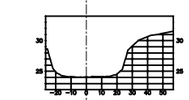

Cross No. 1431 ST 236+575

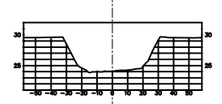

Cross No. 1432 ST 236+850

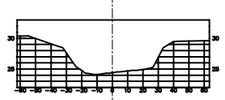

Cross No. 1433 ST 237+000

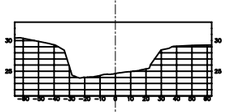

Cross No. 1434 ST 237+100

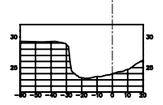

Cross No. 1435 ST 237+250

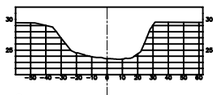

Cross No. 1436 ST 237+450

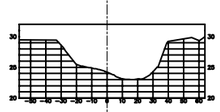

Cross No. 1437 ST 237+600

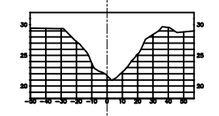

Cross No. 1438 ST 237+700

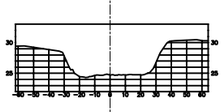

Cross No.1439 ST 237+850

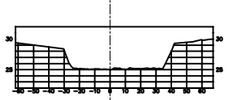

Cross No. 1440 ST 238+000

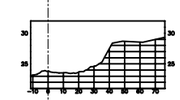

Cross No. 1441 ST 238+125

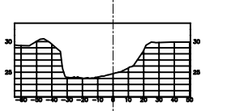

Cross No. 1442 ST 238+200

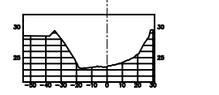

Cross No. 1443 ST 238+300

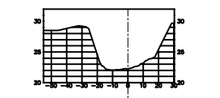

Cross No. 1444 ST 238+475

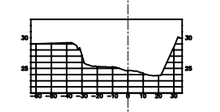

Cross No. 1445 ST 238+650

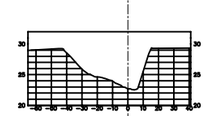

Cross No. 1446 ST 238+750

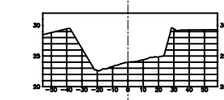

Cross No. 1447 ST 238+950

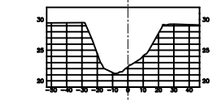

Cross No. 1448 ST 239+150

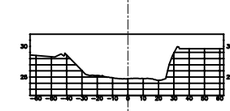

Cross No. 1449 ST 239+350

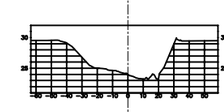

Cross No. 1450 ST 239+500

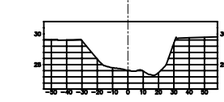

Cross No. 1451 ST 239+700


Cross No. 1452 ST 239+800

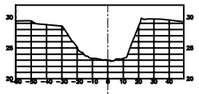

Cross No. 1453 ST 239+900

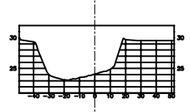

Cross No. 1454 ST 240+150

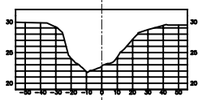

Cross No. 1455 ST 240+300

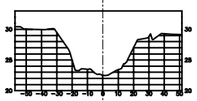

Cross No. 1456 ST 240+500

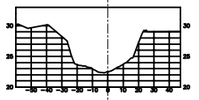
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** C-26
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY CROSS SECTION NO. 1401 - 1456	**SCALE** X=1:4000 Y=1:1000	**SERIAL NO.** 57

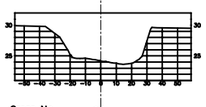

Cross No. 1457 ST 240+700

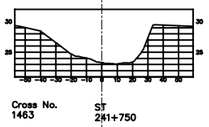

Cross No. 1458 ST 240+825

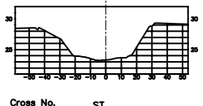

Cross No. 1459 ST 241+000

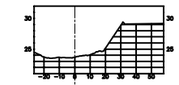

Cross No. 1460 ST 241+200

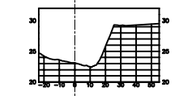

Cross No. 1461 ST 241+300

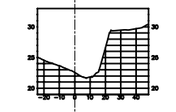

Cross No. 1462 ST 241+500

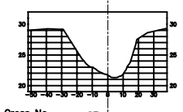

Cross No. 1463 ST 241+750

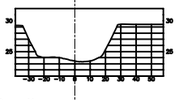

Cross No. 1464 ST 241+850


Cross No. 1465 ST 241+950

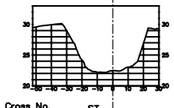

Cross No. 1466 ST 242+300

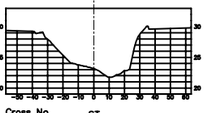

Cross No. 1467 ST 242+400

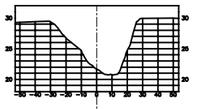

Cross No. 1468 ST 242+500

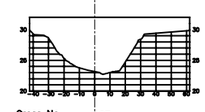

Cross No. 1469 ST 242+725

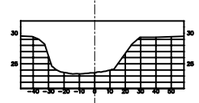

Cross No. 1470 ST 242+900

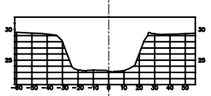

Cross No. 1471 ST 243+050

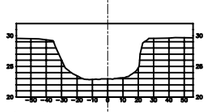

Cross No. 1472 ST 243+150

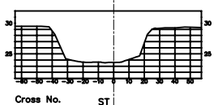

Cross No. 1473 ST 243+250

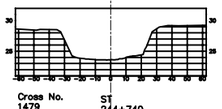

Cross No. 1474 ST 243+400

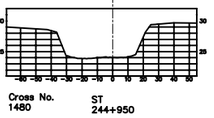

Cross No. 1475 ST 243+550

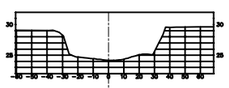

Cross No. 1476 ST 243+875

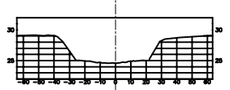

Cross No. 1477 ST 244+150

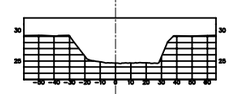

Cross No. 1478 ST 244+450

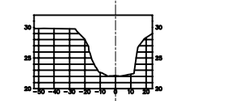

Cross No. 1479 ST 244+740

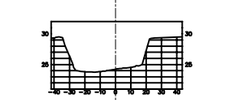

Cross No. 1480 ST 244+950

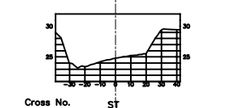

Cross No. 1481 ST 245+130

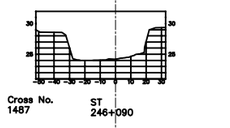

Cross No. 1482 ST 245+250

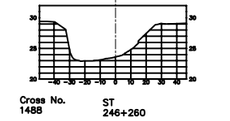

Cross No. 1483 ST 245+360

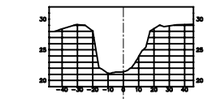

Cross No. 1484 ST 245+590

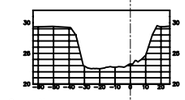

Cross No. 1485 ST 245+800

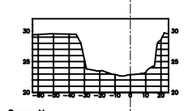

Cross No. 1486 ST 245+950

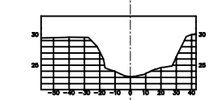

Cross No. 1487 ST 246+090

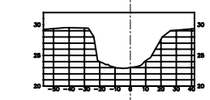

Cross No. 1488 ST 246+260

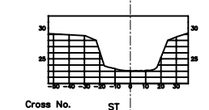

Cross No. 1489 ST 246+365

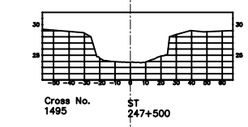

Cross No. 1490 ST 246+540

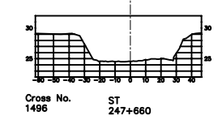

Cross No. 1491 ST 246+650

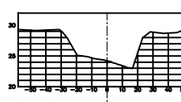

Cross No. 1492 ST 246+775

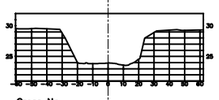

Cross No. 1493 ST 247+000

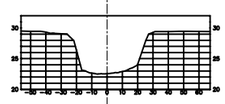

Cross No. 1494 ST 247+265

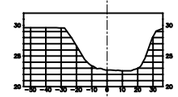

Cross No. 1495 ST 247+500

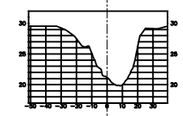

Cross No. 1496 ST 247+660

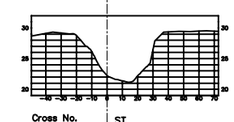

Cross No. 1497 ST 247+760

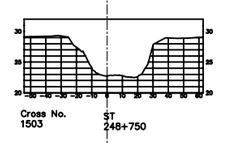

Cross No. 1498 ST 248+000

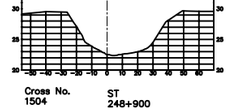

Cross No. 1499 ST 248+250

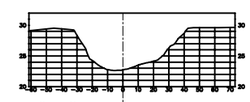

Cross No. 1500 ST 248+400

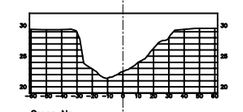

Cross No. 1501 ST 248+525

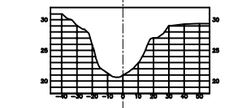

Cross No. 1502 ST 248+650

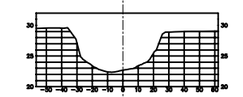

Cross No. 1503 ST 248+750

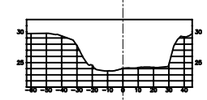

Cross No. 1504 ST 248+900

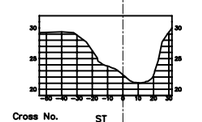

Cross No. 1505 ST 249+100

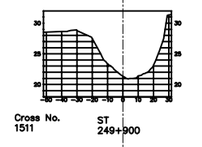

Cross No. 1506 ST 249+210

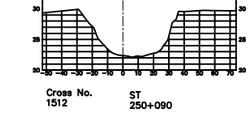

Cross No. 1507 ST 249+325


Cross No. 1508 ST 249+515

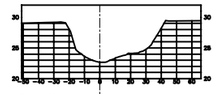

Cross No. 1509 ST 249+730

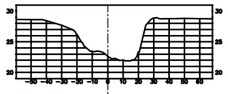

Cross No. 1510 ST 249+810

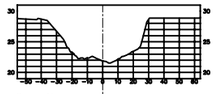

Cross No. 1511 ST 249+900

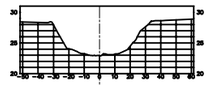

Cross No. 1512 ST 250+090

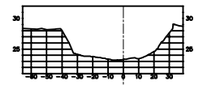
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** C-27
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY CROSS SECTION NO. 1457 - 1512	**SCALE** X=1:4000 Y=1:1000	**SERIAL NO.** 58

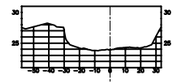

Cross No. 1513 ST 250+400

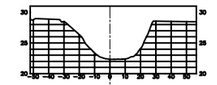

Cross No. 1521 ST 251+540

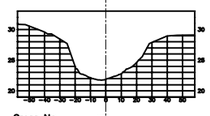

Cross No. 1529 ST 252+600

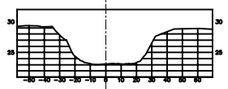

Cross No. 1537 ST 253+975

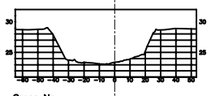

Cross No. 1545 ST 255+150

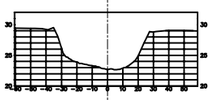

Cross No. 1553 ST 256+700

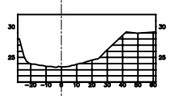

Cross No. 1561 ST 258+200

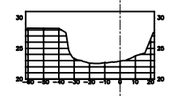

Cross No. 1514 ST 250+480

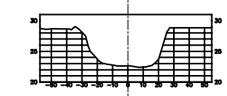

Cross No. 1522 ST 251+600

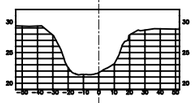

Cross No. 1530 ST 252+850

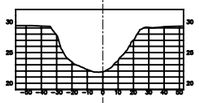

Cross No. 1538 ST 254+175

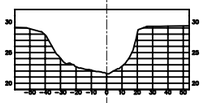

Cross No. 1546 ST 255+400

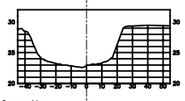

Cross No. 1554 ST 256+800


Cross No. 1562 ST 258+400

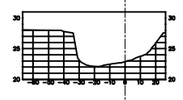

Cross No. 1515 ST 250+600

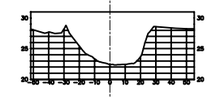

Cross No. 1523 ST 251+700

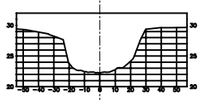

Cross No. 1531 ST 253+090

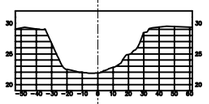

Cross No. 1539 ST 254+250

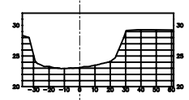

Cross No. 1547 ST 255+650

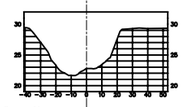

Cross No. 1555 ST 256+900

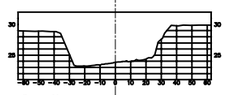

Cross No. 1563 ST 258+500

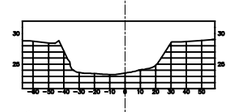

Cross No. 1516 ST 250+850

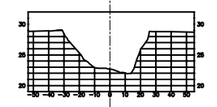

Cross No. 1524 ST 251+925

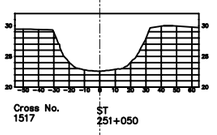

Cross No. 1532 ST 253+300

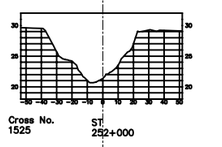

Cross No. 1540 ST 254+325

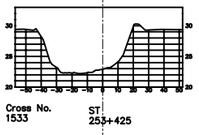

Cross No. 1548 ST 255+900

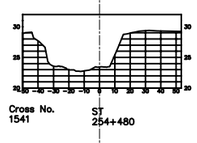

Cross No. 1556 ST 257+150

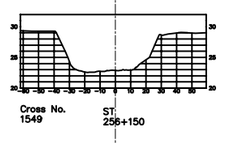

Cross No. 1564 ST 258+600

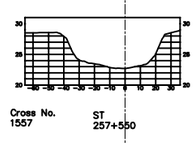

Cross No. 1517 ST 251+050

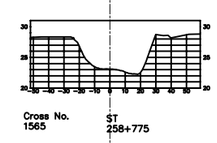

Cross No. 1525 ST 252+000

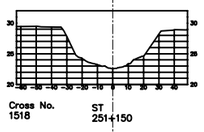

Cross No. 1533 ST 253+425

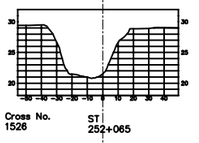

Cross No. 1541 ST 254+480

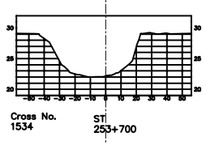

Cross No. 1549 ST 256+150

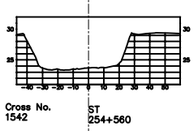

Cross No. 1557 ST 257+550

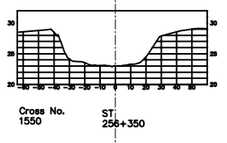

Cross No. 1565 ST 258+775

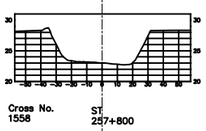

Cross No. 1518 ST 251+150

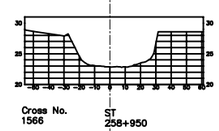

Cross No. 1526 ST 252+065

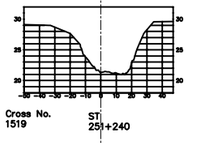

Cross No. 1534 ST 253+700

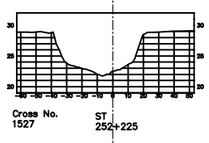

Cross No. 1542 ST 254+560

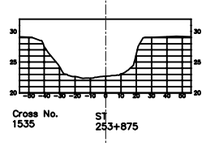

Cross No. 1550 ST 256+350

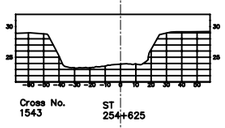

Cross No. 1558 ST 257+800

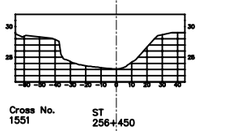

Cross No. 1566 ST 258+950

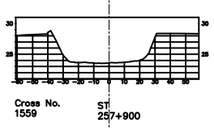

Cross No. 1519 ST 251+240

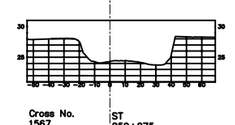

Cross No. 1527 ST 252+225

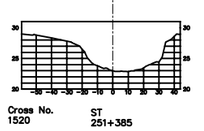

Cross No. 1535 ST 253+875

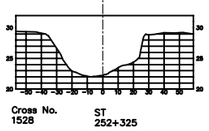

Cross No. 1543 ST 254+625

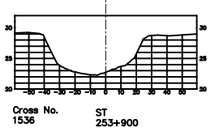

Cross No. 1551 ST 256+450

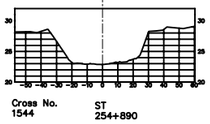

Cross No. 1559 ST 257+900

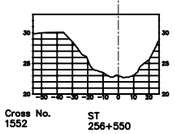

Cross No. 1567 ST 259+075

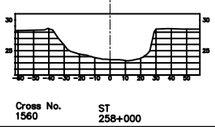

Cross No. 1520 ST 251+385

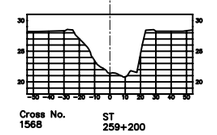

Cross No. 1528 ST 252+325


Cross No. 1536 ST 253+900

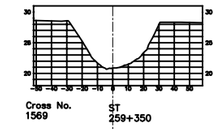

Cross No. 1544 ST 254+890

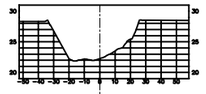

Cross No. 1552 ST 256+550

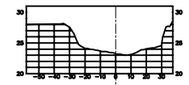

Cross No. 1560 ST 258+000

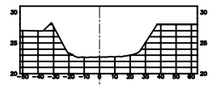

Cross No. 1568 ST 259+200

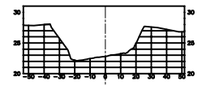
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** C-28
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY CROSS SECTION NO. 1513 - 1568	**SCALE** X=1:4000 Y=1:1000	**SERIAL NO.** 59

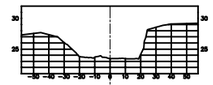

Cross No. 1569 ST 259+350

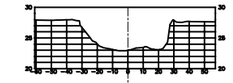

Cross No. 1577 ST 260+850

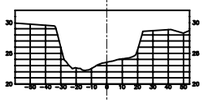

Cross No. 1585 ST 263+250

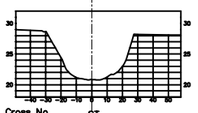

Cross No. 1593 ST 265+150

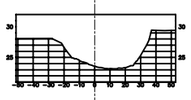

Cross No. 1601 ST 267+700

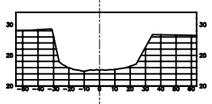

Cross No. 1609 ST 269+740

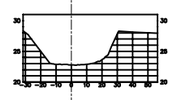

Cross No. 1617 ST 273+010

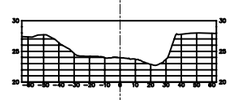

Cross No. 1570 ST 259+450

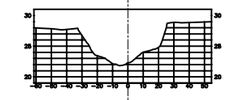

Cross No. 1578 ST 261+200

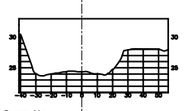

Cross No. 1586 ST 263+350

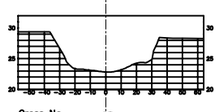

Cross No. 1594 ST 265+650

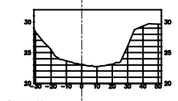

Cross No. 1602 ST 267+900

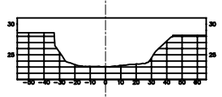

Cross No. 1610 ST 270+210

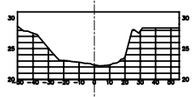

Cross No. 1618 ST 273+100

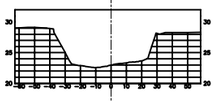

Cross No. 1571 ST 259+700

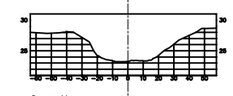

Cross No. 1579 ST 261+450

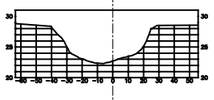

Cross No. 1587 ST 263+600

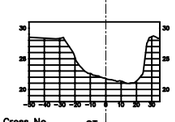

Cross No. 1595 ST 266+150

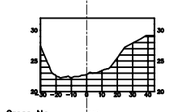

Cross No. 1603 ST 268+225

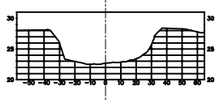

Cross No. 1611 ST 270+550

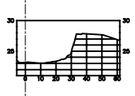

Cross No. 1619 ST 273+200


Cross No. 1572 ST 259+950

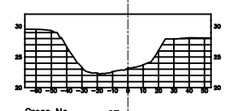

Cross No. 1580 ST 261+700

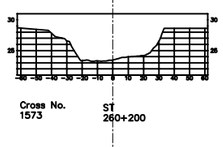

Cross No. 1588 ST 263+850

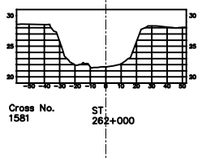

Cross No. 1596 ST 266+650

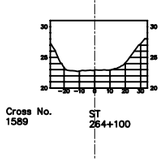

Cross No. 1604 ST 268+600

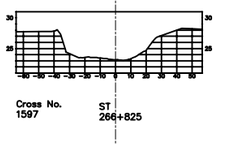

Cross No. 1612 ST 270+775

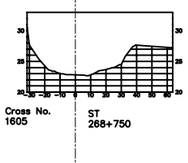

Cross No. 1620 ST 273+540

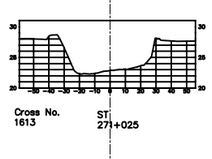

Cross No. 1573 ST 260+200

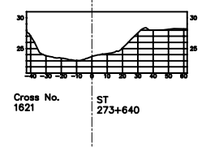

Cross No. 1581 ST 262+000

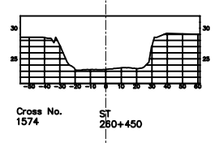

Cross No. 1589 ST 264+100

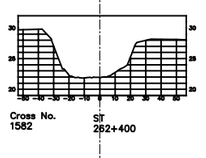

Cross No. 1597 ST 266+825

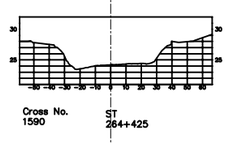

Cross No. 1605 ST 268+750

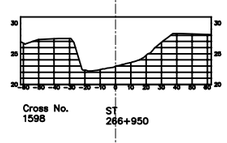

Cross No. 1613 ST 271+025

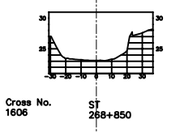

Cross No. 1621 ST 273+640

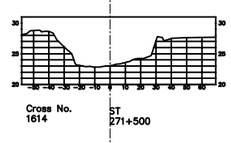

Cross No. 1574 ST 260+450

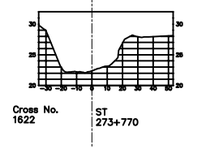

Cross No. 1582 ST 262+400

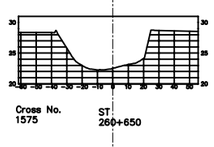

Cross No. 1590 ST 264+425

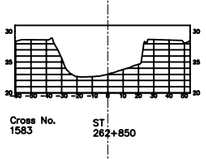

Cross No. 1598 ST 266+950

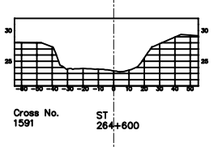

Cross No. 1606 ST 268+850

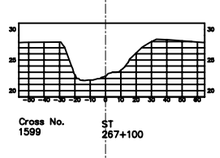

Cross No. 1614 ST 271+500

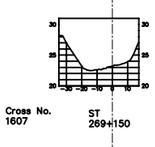

Cross No. 1622 ST 273+770

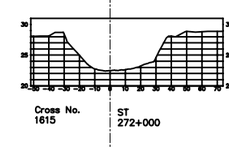

Cross No. 1575 ST 260+650

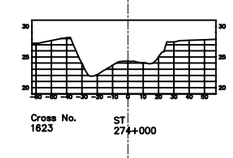

Cross No. 1583 ST 262+850

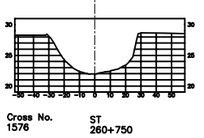

Cross No. 1591 ST 264+600

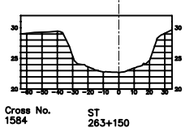

Cross No. 1599 ST 267+100

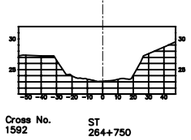

Cross No. 1607 ST 269+150

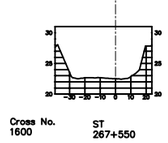

Cross No. 1615 ST 272+000

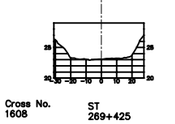

Cross No. 1623 ST 274+000

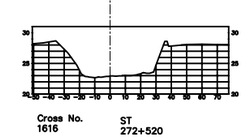

Cross No. 1576 ST 260+750

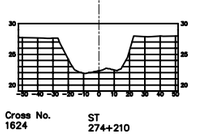

Cross No. 1584 ST 263+150


Cross No. 1592 ST 264+750

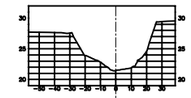

Cross No. 1600 ST 267+550

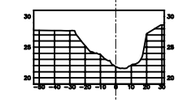

Cross No. 1608 ST 269+425

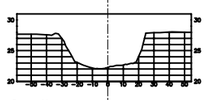

Cross No. 1616 ST 272+520

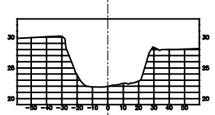

Cross No. 1624 ST 274+210

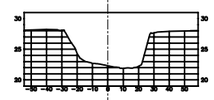
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** C-29
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY CROSS SECTION NO. 1569 - 1624	**SCALE** X=1:4000 Y=1:1000	**SERIAL NO.** 60

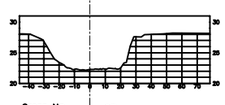

Cross No. 1625 ST 274+280

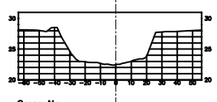

Cross No. 1626 ST 274+400

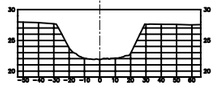

Cross No. 1627 ST 274+650

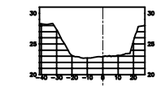

Cross No. 1628 ST 274+950

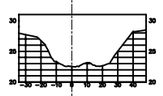

Cross No. 1629 ST 275+285

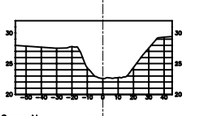

Cross No. 1630 ST 275+650

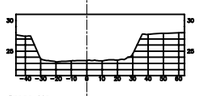

Cross No. 1631 ST 275+940

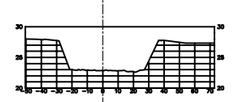

Cross No. 1632 ST 276+280

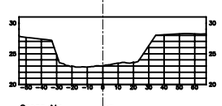

Cross No. 1633 ST 276+570

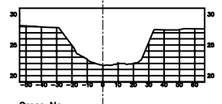

Cross No. 1634 ST 276+675

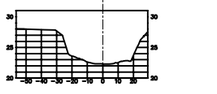

Cross No. 1635 ST 276+780

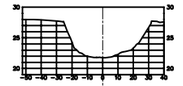

Cross No. 1636 ST 277+440

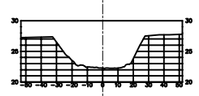

Cross No. 1637 ST 277+750

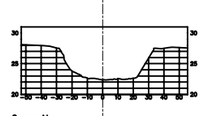

Cross No. 1638 ST 278+125

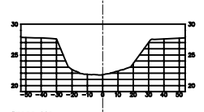

Cross No. 1639 ST 278+480

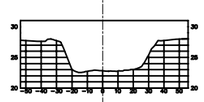

Cross No. 1640 ST 278+740

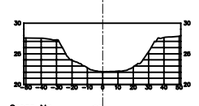

Cross No. 1641 ST 279+000

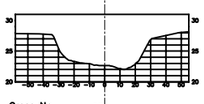

Cross No. 1642 ST 279+250

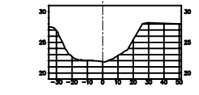

Cross No. 1643 ST 279+525

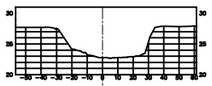

Cross No. 1644 ST 279+750

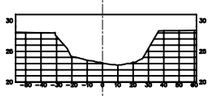

Cross No. 1645 ST 280+260

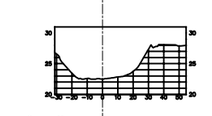

Cross No. 1646 ST 280+750

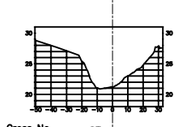

Cross No. 1647 ST 280+880

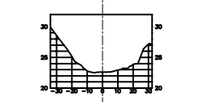

Cross No. 1648 ST 281+090

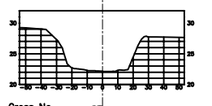

Cross No. 1649 ST 281+300

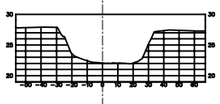

Cross No. 1650 ST 281+455

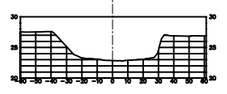

Cross No. 1651 ST 281+600

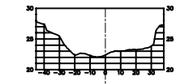

Cross No. 1652 ST 281+750

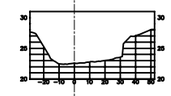

Cross No. 1653 ST 281+950


Cross No. 1654 ST 282+200

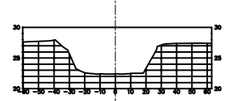

Cross No. 1655 ST 282+700

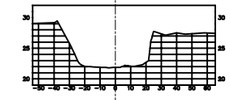

Cross No. 1656 ST 283+200

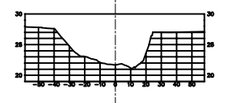

Cross No. 1657 ST 283+675

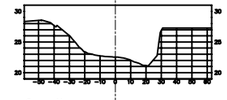

Cross No. 1658 ST 283+950

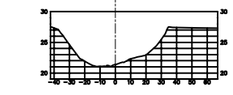

Cross No. 1659 ST 284+250

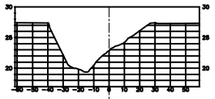

Cross No. 1660 ST 284+750

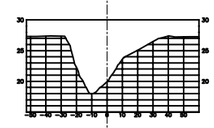

Cross No. 1661 ST 285+250

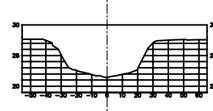

Cross No. 1662 ST 285+725

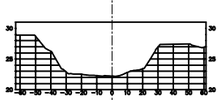

Cross No. 1663 ST 286+200

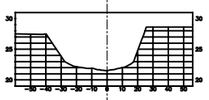

Cross No. 1664 ST 286+475

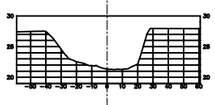

Cross No. 1665 ST 286+550

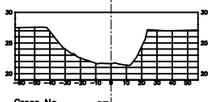

Cross No. 1666 ST 286+625

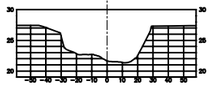

Cross No. 1667 ST 286+875

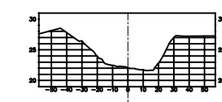

Cross No. 1668 ST 287+100

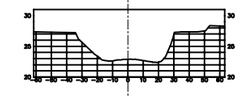

Cross No. 1669 ST 287+350

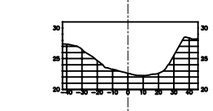

Cross No. 1670 ST 287+400

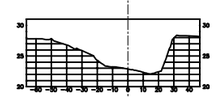

Cross No. 1671 ST 287+450

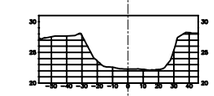

Cross No. 1672 ST 287+700

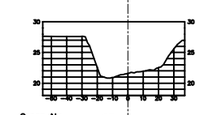

Cross No. 1673 ST 287+850

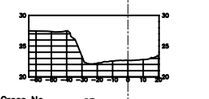

Cross No. 1674 ST 287+950

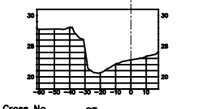

Cross No. 1675 ST 288+075


Cross No. 1676 ST 288+300

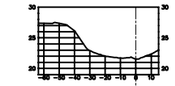

Cross No. 1677 ST 288+500

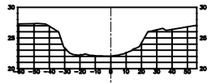

Cross No. 1678 ST 288+825

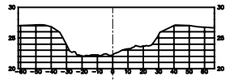

Cross No. 1679 ST 288+950

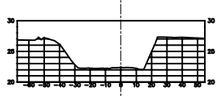

Cross No. 1680 ST 289+075

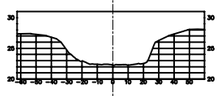
PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** C-30
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY CROSS SECTION NO. 1625 - 1680	**SCALE** X=1:4000 Y=1:1000	**SERIAL NO.** 61

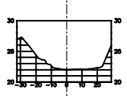

Cross No. 1681 ST 289+350

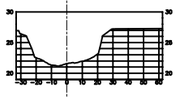

Cross No. 1689 ST 291+000

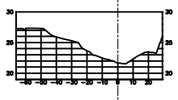

Cross No. 1697 ST 292+375

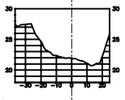

Cross No. 1682 ST 289+750

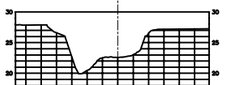

Cross No. 1690 ST 291+150

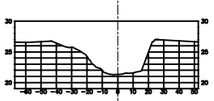

Cross No. 1698 ST 292+500

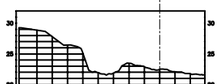

Cross No. 1683 ST 290+100

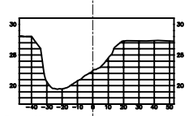

Cross No. 1691 ST 291+250

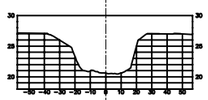

Cross No. 1699 ST 292+625

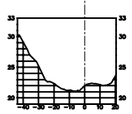

Cross No. 1684 ST 290+150

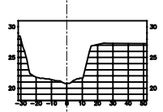

Cross No. 1692 ST 291+450

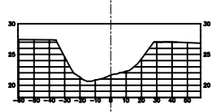

Cross No. 1700 ST 292+750

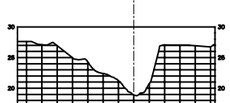

Cross No. 1685 ST 290+250

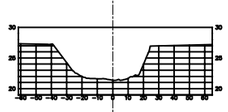

Cross No. 1693 ST 291+500

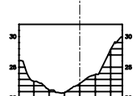

Cross No. 1701 ST 292+800

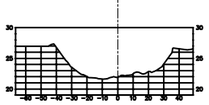

Cross No. 1686 ST 290+500


Cross No. 1694 ST 291+600


Cross No. 1687 ST 290+600

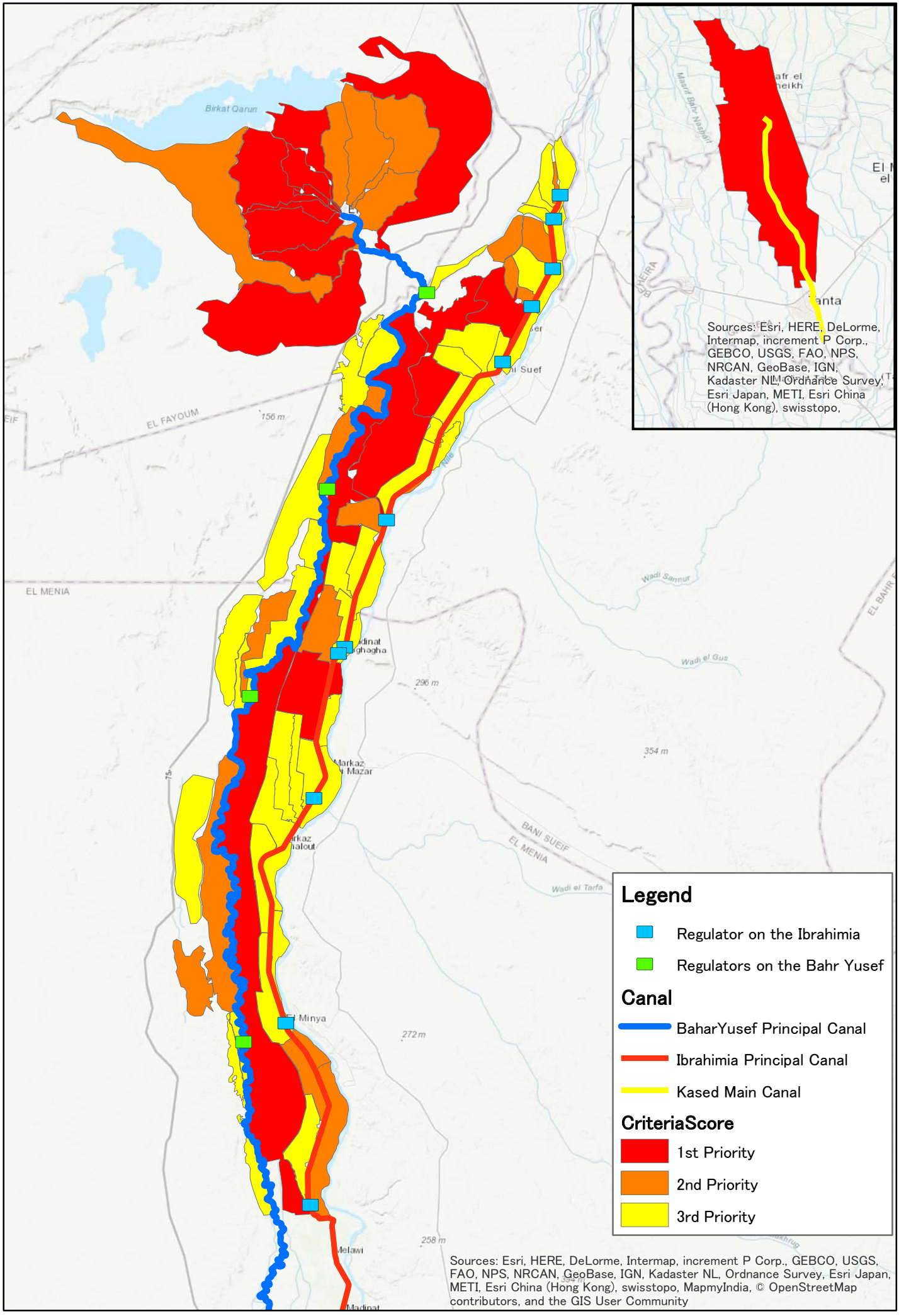

Cross No. 1695 ST 291+925


Cross No. 1688 ST 290+750


Cross No. 1696 ST 292+250

PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.** C-31
DWG. TITLE BAHAR YUSEF PRINCIPAL CANAL CROSS SECTION SURVEY CROSS SECTION NO. 1681 - 1736	**SCALE** X=1:4000 Y=1:1000	**SERIAL NO.** 62

ANNEX9 ：Location of Prioritized Sub Regions


Birkat Qarun
EL FAYOUM
156 m
EL MENIA
296 m
354 m
272 m
258 m
Wadi Sannur
Wadi el Gus
Wadi el Tarfa
BANI SUEIF
EL MENIA
Minya
Legend
Regulator on the Ibrahimia
Regulators on the Bahr Yusef
Canal
BaharYusef Principal Canal
Ibrahimia Principal Canal
Kased Main Canal
CriteriaScore
1st Priority
2nd Priority
3rd Priority
Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo,

ANNEX10 ：Cost of Project in Each Sub Region

1.Sample area construction cost for each component

(1,000US$)

	Sumple Survey Area					
	1	2	3	4	5	6
	El Gandia	West Hafez	Tunsa-Kella	Sabaa	Koftan	Aboshosha
①Small Structure	347	616	983	587	359	163
②Pump Station	2,503	-	10,589	2,326	836	4,022
③Main Canal lining	3,221	4,826	4,832	5,429	6,791	4,804
④Branch Canal	(3,369)	(13,199)	6,750	(4,487)	(5,267)	(4,107)
Plan1 (①+②)	2,850	616	11,572	2,913	1,195	4,185
Plan2 (①+②+③)	6,071	5,442	16,404	8,342	7,986	8,989
Plan3 (①+②+③+④)	9,440	18,641	23,154	12,829	13,253	13,096

2.Average construction cost of sample area

	1	2	3	4	5	6	Average
	El Gandia	West Hafez	Tunsa-Kella	Sabaa	Koftan	Aboshosha	
Command Area	5,141	9,763	10,424	6,846	8,036	6,266	(ha)
Cost/ha							(US$/ha)
With Pump Station							
Plan1	554		1,110	426	149	668	**581**
Plan2	1,181		1,574	1,219	994	1,435	**1,281**
Plan3	1,836		2,221	1,874	1,649	2,090	**1,934**
Without Pump Station							
Plan1	67	63	94	86	45	26	**64**
Plan2	694	557	558	879	890	793	**729**
Plan3	1,551	2,571	2,020	1,837	1,545	1,856	**1,897**

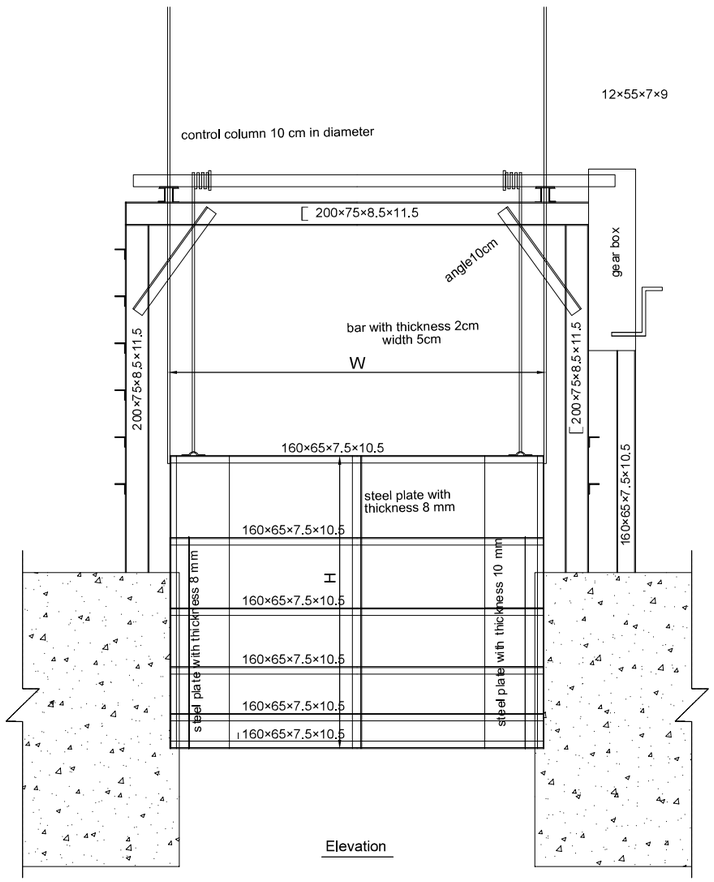
3.Construction cost of each sub regions

Sub Region	GD	ID	Water Scarcity	Size (Area)	Canal Intensity	Structure Distribution	MWRI Priority	MWRI Priority (Reuse pump)	MWRI Priority (Meska)	Water Users formation	Score	Rank	Priority	Area (ha)	Construction Cost Plan 1 ($US)	Construction Cost Plan 2 ($US)	Construction Cost Plan 3 ($US)	Source of Water
Bahr Wahby	Faiyum	Sayla, Tamya	3	3	3	3	3	0	3	3	18	3	1	16,462	21,236,000	36,801,000	51,316,000	Bahr Yusef
Bahr Talat	Faiyum	Ebshawy	3	1	3	3	3	0	3	3	16	8	1	3,875	1,366,000	4,845,000	10,957,000	Bahr Yusef
El Ghark	Faiyum	Atsa, El Ghark	3	3	2	1	3	0	3	3	15	5	1	20,174	16,847,000	34,958,000	66,782,000	Bahr Yusef
Aros & Abo Seer	Faiyum	Atsa	3	2	1	3	3	0	3	3	15	1	1	5,680	11,030,000	16,130,000	25,090,000	Bahr Yusef
Sanhor	Faiyum	Senories	3	2	2	2	3	0	3	3	15	4	1	6,892	12,756,000	18,943,000	29,815,000	Bahr Yusef
Sery	West Minia	West Abu Kurkas, West Minia, West Samalout, West Maghaga	2	3	3	2	3	3	0	2	15	14	1	50,511	39,598,000	87,359,000	131,895,000	Ibrahimia
Tansa-Kella	Beni Suef	East Beni Suef, Ahnasia, West Beni Suef	2	3	3	3	3	3	0	1	15	13	1	10,424	8,173,000	18,029,000	27,221,000	Ibrahimia
Kased	Gharbia	Tanta, Kotor	3	3	2	1	3	0	0	3	15	18	1	21,531	1,852,000	21,184,000	55,148,000	Kased
El Gharbia	Faiyum	Ebshawy	2	3	2	1	3	0	3	3	14	7	1	10,902	5,544,000	15,333,000	32,530,000	Bahr Yusef
Senrw	Faiyum	Ebshawy	3	2	1	2	3	0	3	3	14	2	1	7,964	1,932,000	9,081,000	21,645,000	Bahr Yusef
Desia	Faiyum	Ebshawy	3	2	2	1	3	0	3	3	14	6	1	8,847	5,369,000	13,311,000	27,267,000	Bahr Yusef
Dahrout and other	East Minia	Beni Mazar, East Maghagha	2	2	3	2	3	3	0	2	14	25	1	7,350	5,763,000	12,713,000	19,193,000	Ibrahimia
Abo Shosha	Beni Suef	El Fashen, Samosta	2	2	3	3	3	3	0	1	14	24	1	6,266	4,913,000	10,838,000	16,363,000	Ibrahimia
El Soultani	Beni Suef	Samosta, Beba, Ahnasia	2	3	3	2	3	3	0	1	14	22	1	20,115	15,769,000	34,790,000	52,526,000	Ibrahimia
Bosh and other	Beni Suef	Naser	2	2	3	3	3	3	0	1	14	23	1	5,572	4,369,000	9,636,000	14,549,000	Ibrahimia
Senours	Faiyum	Senories	3	3	2	2	0	0	0	3	13	10	2	13,237	1,139,000	13,023,000	33,904,000	Bahr Yusef
El Zawia	Faiyum	Senories	3	2	2	3	0	0	0	3	13	9	2	6,520	562,000	6,415,000	16,701,000	Bahr Yusef
Saba	West Minia	Edwa	2	2	2	2	3	3	0	2	13	12	2	6,846	5,368,000	11,841,000	17,877,000	Bahr Yusef
El Gandia	East Minia	East Maghagha	2	2	2	2	3	3	0	2	13	11	2	5,141	4,031,000	8,891,000	13,424,000	Ibrahimia
El Mansour Eyosra	Beni Suef	Naser	2	1	3	3	3	3	0	1	13	30	2	2,335	1,832,000	4,039,000	6,098,000	Ibrahimia
Qashisha and otherr	Beni Suef	El Wasta	2	1	3	3	3	3	0	1	13	29	2	1,294	1,015,000	2,238,000	3,379,000	Ibrahimia
Ibrahimya and other	Beni Suef	El Wasta	2	1	3	3	3	3	0	1	13	28	2	1,890	1,482,000	3,270,000	4,936,000	Ibrahimia
Kom El Zohir and other	East Minia	East Abu Kurkas, East Samalout	2	2	2	2	3	3	0	2	13	15	2	7,752	6,078,000	13,408,000	20,243,000	Ibrahimia
Koftan	Beni Suef	Somusta	2	2	2	2	3	3	0	1	12	21	2	8,036	6,300,000	13,900,000	20,986,000	Bahr Yusef
El Nazie	Faiyum	Atsa, Yousif El Seddik, El Ghark, El Nazla	3	3	2	1	0	0	0	3	12	19	2	39,315	3,382,000	38,680,000	100,697,000	Bahr Yusef
El Elam & Dar Ramada	Faiyum	El Faiyum	2	2	2	3	0	0	0	3	12	16	2	7,977	6,255,000	13,797,000	20,829,000	Bahr Yusef
El Dahab	West Minia	Monshat El Dahab; West Kamadir, East Terfa	2	3	3	2	0	0	0	2	12	40	2	28,363	22,235,000	49,054,000	74,061,000	Bahr Yusef
Absouge and other	Beni Suef	El Fashen	2	2	2	2	3	3	0	1	12	17	2	9,596	7,524,000	16,597,000	25,059,000	Ibrahimia
Tanhala	Faiyum	El Faiyum, Tamya	2	2	2	2	0	0	0	3	11	27	2	9,260	7,260,000	16,016,000	24,181,000	Bahr Yusef
Kamadir	West Minia	West Kamadir	2	2	3	2	0	0	0	2	11	60	2	5,040	3,951,000	8,717,000	13,161,000	Bahr Yusef
East Hafez	East Minia	East Abu Kurkas	2	1	3	3	0	0	0	2	11	59	2	2,738	236,000	2,695,000	7,015,000	Ibrahimia
Bani Khalid & Other	East Minia	Der Mewas, Melwy, Monshat El Dahab	2	2	2	2	0	0	0	2	10	41	3	5,573	4,370,000	9,640,000	14,554,000	Bahr Yusef
Harika	West Minia	Edwa	2	2	2	2	0	0	0	2	10	37	3	6,468	558,000	6,364,000	16,567,000	Bahr Yusef
Sakola PS	West Minia	Sakoula	2	2	2	2	0	0	0	2	10	38	3	5,040	3,951,000	8,717,000	13,161,000	Bahr Yusef
Ahanasya-Beni Haroun	Beni Suef	East Beni Suef	2	2	1	1	3	3	0	1	10	20	3	7,791	6,109,000	13,476,000	20,345,000	Ibrahimia
South Ashmant Canal	Beni Suef	Naser	2	1	3	3	0	0	0	1	10	66	3	1,940	167,000	1,910,000	4,971,000	Ibrahimia
El Zawya and other	Beni Suef	El Wasta	2	1	3	3	0	0	0	1	10	65	3	1,065	92,000	1,048,000	2,727,000	Ibrahimia
Atwab-El houma	Beni Suef	El Wasta	2	1	3	3	0	0	0	1	10	69	3	1,770	1,389,000	3,062,000	4,624,000	Ibrahimia
Medoum	Beni Suef	El Wasta	2	1	3	3	0	0	0	1	10	68	3	2,276	1,785,000	3,938,000	5,945,000	Ibrahimia
El mansaur	Beni Suef	El Wasta	2	1	3	3	0	0	0	1	10	67	3	1,961	1,538,000	3,393,000	5,122,000	Ibrahimia
Damaris and other	East Minia	East Samalout	2	2	2	2	0	0	0	2	10	39	3	5,901	508,000	5,806,000	15,115,000	Ibrahimia
Mazora PS	Beni Suef	Somusta	2	3	2	1	0	0	0	1	9	52	3	10,710	922,000	10,537,000	27,432,000	Bahr Yusef
Raaheel	West Minia	Monshat El Dahab	2	1	2	2	0	0	0	2	9	55	3	2,780	240,000	2,736,000	7,123,000	Bahr Yusef
Terfa	West Minia	West Terfa	2	2	2	1	0	0	0	2	9	56	3	8,211	6,438,000	14,202,000	21,441,000	Bahr Yusef
Shoieb Darwishl	East Minia	Mataya	2	1	2	2	0	0	0	2	9	47	3	2,992	258,000	2,944,000	7,664,000	Ibrahimia
Mataua and other	East Minia	Mataya, Beni Mazar	2	2	2	1	0	0	0	2	9	54	3	5,756	495,000	5,663,000	14,742,000	Ibrahimia
Maghagha El Fashina	East Minia	East Maghagha	2	2	2	1	0	0	0	2	9	53	3	5,198	448,000	5,114,000	13,312,000	Ibrahimia
Saedyhat El Feshna	Beni Suef	El Fashen	2	1	3	2	0	0	0	1	9	77	3	2,428	209,000	2,390,000	6,218,000	Ibrahimia
North Sharahna	Beni Suef	Beba	2	1	3	2	0	0	0	1	9	79	3	1,840	159,000	1,810,000	4,713,000	Ibrahimia
El Azhay	Beni Suef	West Beni Suef	2	1	3	2	0	0	0	1	9	72	3	4,835	3,791,000	8,363,000	12,627,000	Ibrahimia
El Saayda	Beni Suef	West Beni Suef	2	1	2	3	0	0	0	1	9	42	3	1,361	117,000	1,339,000	3,486,000	Ibrahimia
South Qashisha	Beni Suef	Naser	2	1	3	2	0	0	0	1	9	76	3	3,053	263,000	3,005,000	7,821,000	Ibrahimia
West Hafez	East Minia	East Abu Kurkas	2	2	2	1	0	0	0	2	9	51	3	9,763	840,000	9,607,000	25,007,000	Ibrahimia
El Disout	East Minia	East Samalout	2	1	2	2	0	0	0	2	9	49	3	2,566	221,000	2,526,000	6,573,000	Ibrahimia
El Safsaf	East Minia	East Samalout, Mataya	2	1	1	3	0	0	0	2	9	26	3	2,163	186,000	2,129,000	5,540,000	Ibrahimia
Samalout	East Minia	East Samalout	2	1	2	2	0	0	0	2	9	58	3	2,184	189,000	2,149,000	5,594,000	Ibrahimia
Harika Delhans	Beni Suef	El Fashen	2	3	1	1	0	0	0	1	8	36	3	11,634	9,121,000	20,122,000	30,379,000	Bahr Yusef
Bahnasa & other	West Minia	West Terfa, Edwa	2	1	2	1	0	0	0	2	8	70	3	2,451	212,000	2,411,000	6,278,000	Bahr Yusef
Adkak	East Minia	Mataya	2	1	1	2	0	0	0	2	8	34	3	2,310	200,000	2,273,000	5,917,000	Ibrahimia
Beni Mazar and other	East Minia	Beni Mazar	2	1	1	2	0	0	0	2	8	33	3	3,121	269,000	3,071,000	7,993,000	Ibrahimia
El Fant	Beni Suef	El Fashen	2	1	2	2	0	0	0	1	8	64	3	2,940	2,306,000	5,085,000	7,677,000	Ibrahimia
El Fashnya and other	Beni Suef	El Fashen	2	1	2	2	0	0	0	1	8	62	3	4,515	389,000	4,443,000	11,564,000	Ibrahimia
South Ahmed Pasha	Beni Suef	Beba	2	1	3	1	0	0	0	1	8	80	3	2,908	251,000	2,861,000	7,448,000	Ibrahimia
Sheikh Haroun	Beni Suef	East Beni Suef	2	1	1	3	0	0	0	1	8	31	3	1,218	105,000	1,199,000	3,120,000	Ibrahimia
El Shahra	Beni Suef	East Beni Suef	2	1	1	3	0	0	0	1	8	32	3	2,600	2,039,000	4,497,000	6,789,000	Ibrahimia
North Ashmant	Beni Suef	El Wasta	2	1	2	2	0	0	0	1	8	63	3	3,557	2,789,000	6,153,000	9,289,000	Ibrahimia
Atwab	Beni Suef	El Wasta	2	2	1	2	0	0	0	1	8	35	3	6,421	5,034,000	11,105,000	16,766,000	Ibrahimia
Haram medoum and other	Beni Suef	El Wasta	2	1	2	2	0	0	0	1	8	61	3	4,390	378,000	4,320,000	11,244,000	Ibrahimia
Belhansa	Beni Suef	West Maghaga, El Fashen	2	1	2	1	0	0	0	1	7	73	3	4,761	3,733,000	8,234,000	12,432,000	Bahr Yusef
Wady El Ryan & other	Beni Suef	Ahnasia	2	1	2	1	0	0	0	1	7	75	3	4,619	398,000	4,545,000	11,831,000	Bahr Yusef
Waslat Bahabshin & other	Beni Suef	Ahnasia	2	1	2	1	0	0	0	1	7	74	3	2,369	204,000	2,331,000	6,068,000	Bahr Yusef
El Soultany-2	Beni Suef	Ahnasia	2	2	1	1	0	0	0	1	7	45	3	9,277	798,000	9,127,000	23,760,000	Bahr Yusef
Right Giza	Beni Suef	West Beni Seuf	2	1	2	1	0	0	0	1	7	78	3	1,428	123,000	1,405,000	3,659,000	Bahr Yusef
Abo Essa	East Minia	Mataya	2	1	1	1	0	0	0	2	7	48	3	3,608	311,000	3,551,000	9,241,000	Ibrahimia
Abo Hasiba	East Minia	Mataya, Beni Mazar	2	1	1	1	0	0	0	2	7	46	3	3,885	335,000	3,823,000	9,951,000	Ibrahimia
El Sahlyah	East Minia	East Abu Kurkas	2	1	1	1	0	0	0	2	7	50	3	2,940	254,000	2,893,000	7,530,000	Ibrahimia
North Amhmed Pasha	Beni Suef	Beba	2	1	1	2	0	0	0	1	7	57	3	2,100	181,000	2,067,000	5,380,000	Ibrahimia
West Magroufa and other	Beni Suef	East Beni Suef	2	1	1	2	0	0	0	1	7	44	3	1,528	132,000	1,504,000	3,914,000	Ibrahimia
Right Tansa-Tezment	Beni Suef	East Beni Suef	2	1	1	2	0	0	0	1	7	43	3	2,646	228,000	2,604,000	6,778,000	Ibrahimia
Monshaat El Hag	Beni Suef	Ahnasia	2	1	2	1	0	0	0	1	7	71	3	4,956	427,000	4,876,000	12,694,000	Bahr Yusef
*Construction Cost = Direct Cost + Indirect Cost (35% of Direct Cost)										Total				555,711	300,627,000	812,900,000	1,494,974,000	

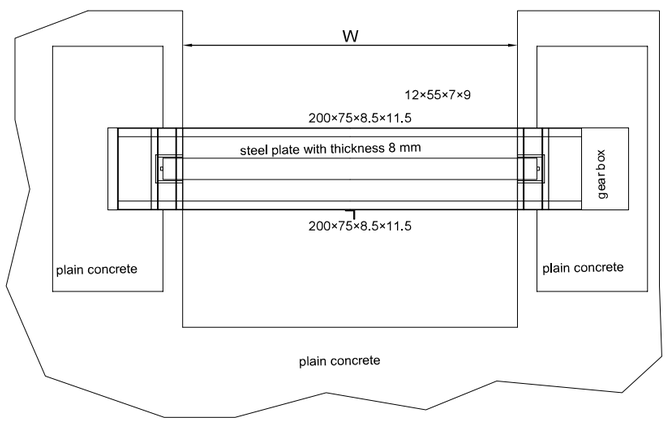
ANNEX11　：List of Drawings for Countermeasures

Intake and Regulator Gates (Rehabilitation Plan)

Type 1 : Steel truss gate (W>3.0m)

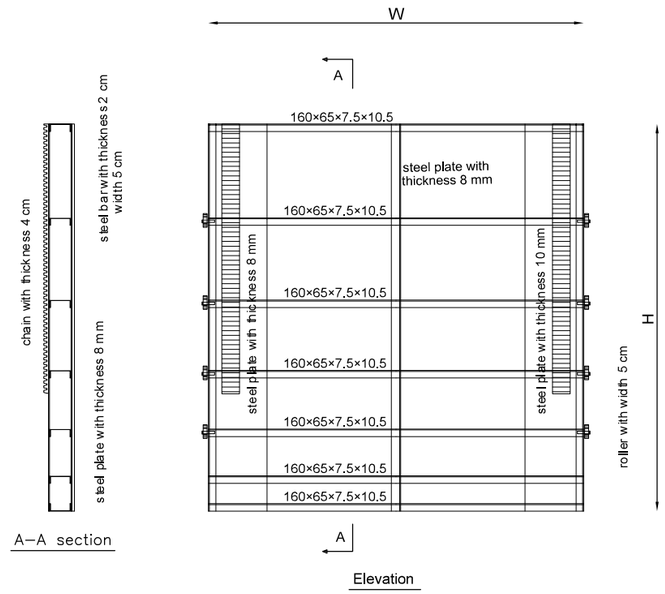


Elevation

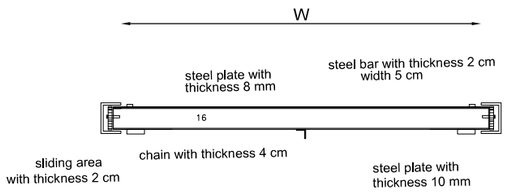


plan

Type 2 : Fahmy honin model (1.5m<W<3.0m)

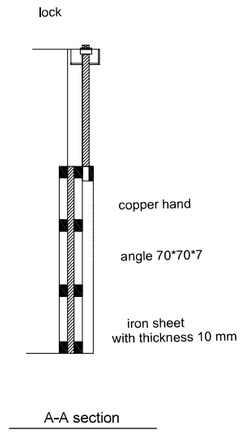


Elevation

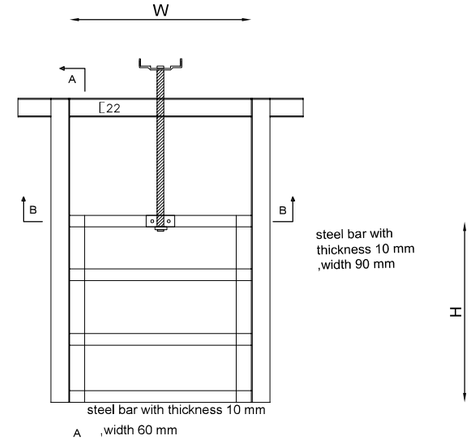


plan

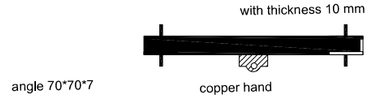
Type 3 : Nomal model (W=<1.5m)



A-A section



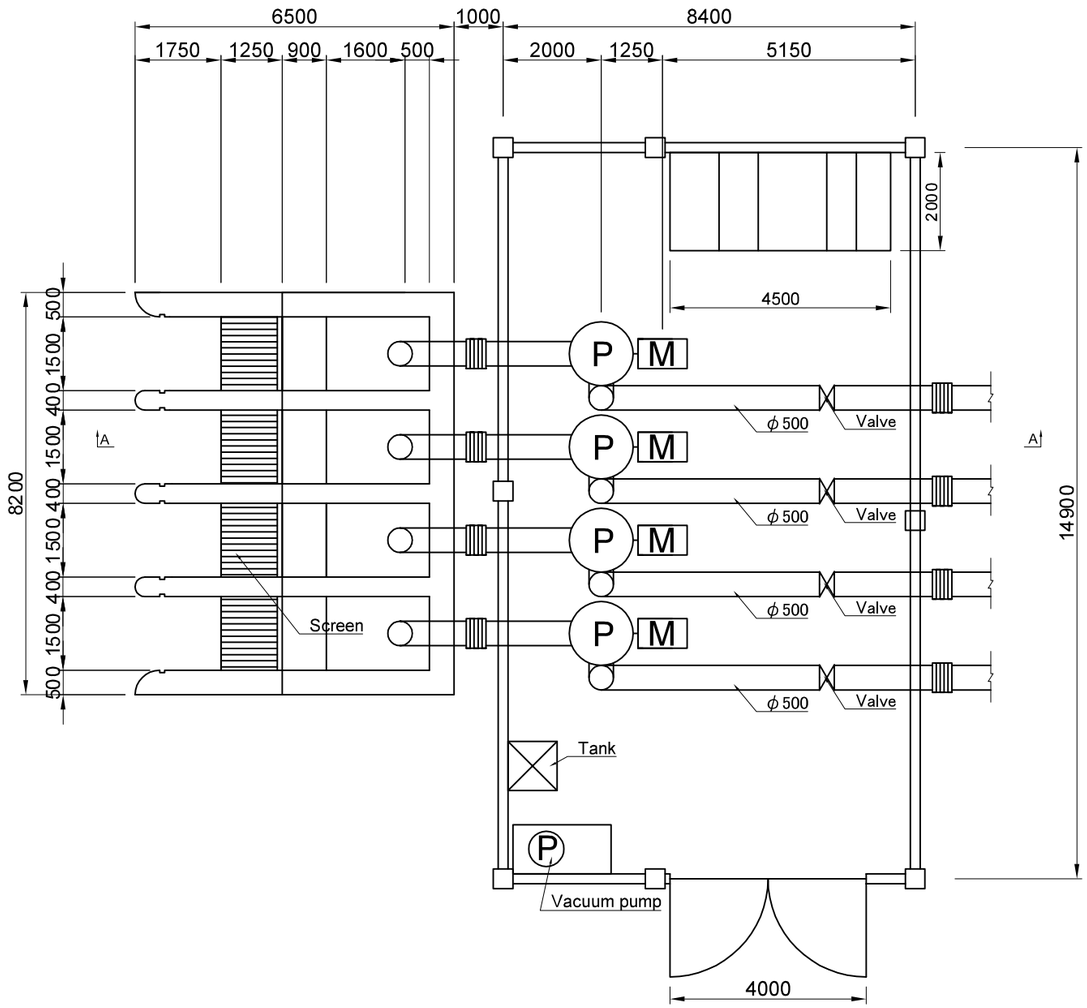
Elevation



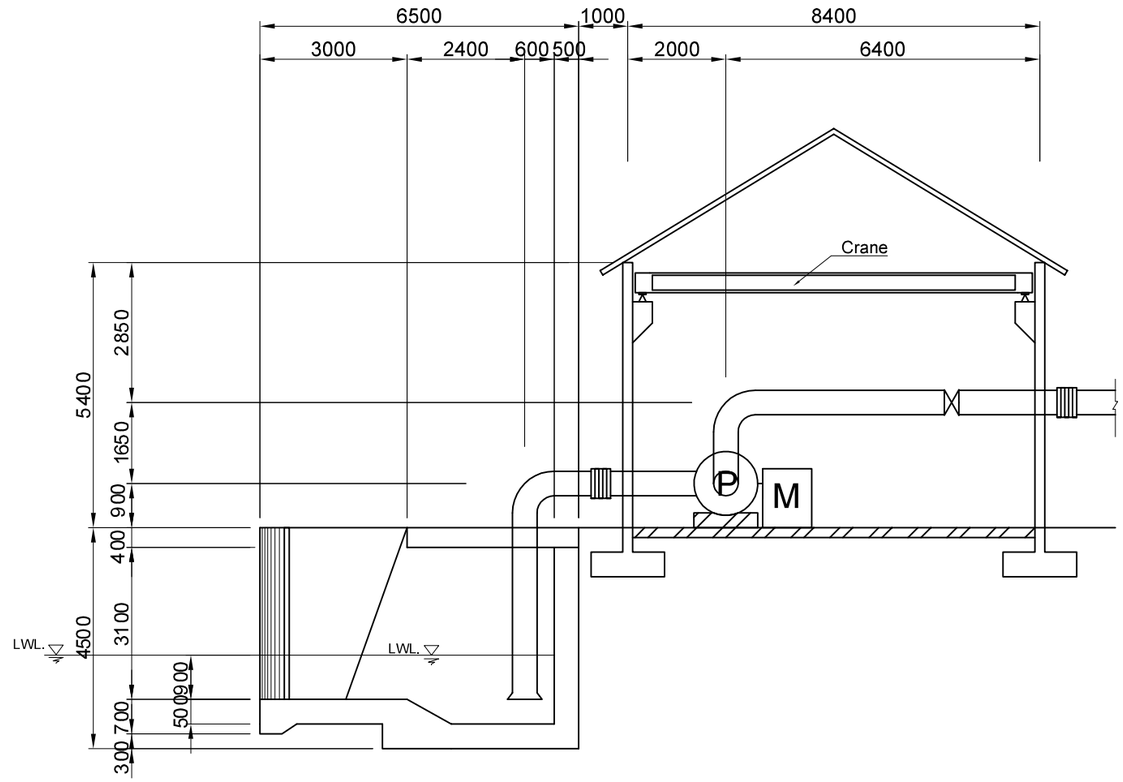
B-B section

PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.**
DWG. TITLE Intake and Regulators (Rehabilitation Plan)	**SCALE**	**SERIAL NO.**

Reuse Pump Station (Rehabilitation Plan)



Plan



A-A Section

PROJECT TITLE COOPERATION PLANNING SURVEY ON THE IRRIGATION SECTOR (UPPER EGYPT AND MIDDLE DELTA) IN THE ARAB REPUBLIC OF EGYPT	**DATE** 9/2017	**DWG NO.**
DWG. TITLE Reuse Pump Station (Rehabilitation Plan)	**SCALE** 1:125	**SERIAL NO.**