

**ARAB REPUBLIC OF EGYPT  
MINISTRY OF WATER RESOURCES AND IRRIGATION  
RESERVOIR AND GRAND BARRAGES SECTOR**

**THE ARAB REPUBLIC OF EGYPT  
THE PROJECT FOR CONSTRUCTION OF  
THE NEW DIROUT GROUP OF REGULATORS**

**DETAILED DESIGN STUDY**

**FINAL REPORT**

**Appendix (3/3)**

**Drawings**

**May, 2017**

**JAPAN INTERNATIONAL COOPERATION AGENCY**

**SANYU CONSULTANTS INC.**

RD
GR (2)
17-034

## LIST OF DRAWINGS

DRAWING NO.	NAME OF DRAWING	DRAWING NO.	NAME OF DRAWING
<b>PART I</b>	<b>GENERAL</b>		<b>BADRAMAN REGULATOR (DIROUTIAH)</b>
GN-1	General plan of New Dirout Group of Regulators	1	CD-1
GN-2	Location of coordinates	1	CD-2
GN-3 ~ 4	General notes	2	CD-3
	<b>PART I total</b>	<b>4</b>	CD-4 ~ 5
<b>PART II</b>	<b>CIVIL WORK</b>		CD-6
	<b>BAHR YUSEF REGULATOR</b>		CD-7 ~ 19
CB-1	Plan	1	CD-20 ~ 22
CB-2	Elevation	1	
CB-3 ~ 6	Longitudinal section	4	<b>Sub-Total</b>
CB-7 ~ 11	Sections	5	
CB-12	Pile layout	1	<b>ABO GABAL REGULATOR</b>
CB-13	Approach cushion slab	1	CA-1
CB-14 ~ 33	Bar arrangement of weir body	20	CA-2
CB-34 ~ 39	Bar arrangement of downstream apron	6	CA-3
CB-40	Detail of cast-in-place pile	1	CA-4 ~ 5
CB-41	Detail of hydraulic pipe pit	1	CA-6 ~ 23
CB-42	Bar arrangement of hydraulic pipe pit	1	CA-24 ~ 26
CB-43 ~ 51	Cross section of earthworks	9	
	<b>Sub-Total</b>	<b>51</b>	<b>Sub-Total</b>
	<b>IBRAHIMIA REGULATOR</b>		CS-1
CI-1	Plan	1	CS-2
CI-2	Elevation	1	CS-3
CI-3 ~ 6	Longitudinal section	4	CS-4 ~ 5
CI-7 ~ 11	Sections	5	CS-6 ~ 19
CI-12	Pile layout	1	CS-20 ~ 22
CI-13	Approach cushion slab	1	
CI-14 ~ 33	Bar arrangement of weir body	20	<b>Sub-Total</b>
CI-34 ~ 39	Bar arrangement of downstream apron	6	
CI-40	Detail of cast-in-place pile	1	<b>CANAL BED PROTECTION AND BANK PROTECTION</b>
CI-41	Detail of hydraulic pipe pit	1	CP-1
CI-42 ~ 44	Bar arrangement of hydraulic pipe pit	3	CP-2 ~ 4
CI-45 ~ 54	Cross section of earthworks	10	CP-5
	<b>Sub-Total</b>	<b>54</b>	CP-6 ~ 9
	<b>BADRAMAN REGULATOR (BADRAMAN)</b>		CP-10
CN-1	Plan	1	
CN-2	Elevation	1	<b>Sub-Total</b>
CN-3	Longitudinal section	1	
CN-4	Sections	1	<b>RORD AND BRIDGE</b>
CN-5	Approach cushion slab	1	CR-1
CN-6 ~ 18	Bar arrangement of pier	13	CR-2
CN-19 ~ 21	Cross section of earthworks	3	CR-3 ~ 6
	<b>Sub-Total</b>	<b>21</b>	CR-7 ~ 11
			CR-12 ~ 14
			CR-15 ~ 16
			CR-17 ~ 19
			CR-20 ~ 21
			<b>Sub-Total</b>
			<b>MISCELLANEOUS WORKS</b>
			CM-1
			CM-2
			CM-3
			CM-4
			CM-5
			<b>Sub-Total</b>
			<b>PART II total</b>
			<b>232</b>

## LIST OF DRAWINGS

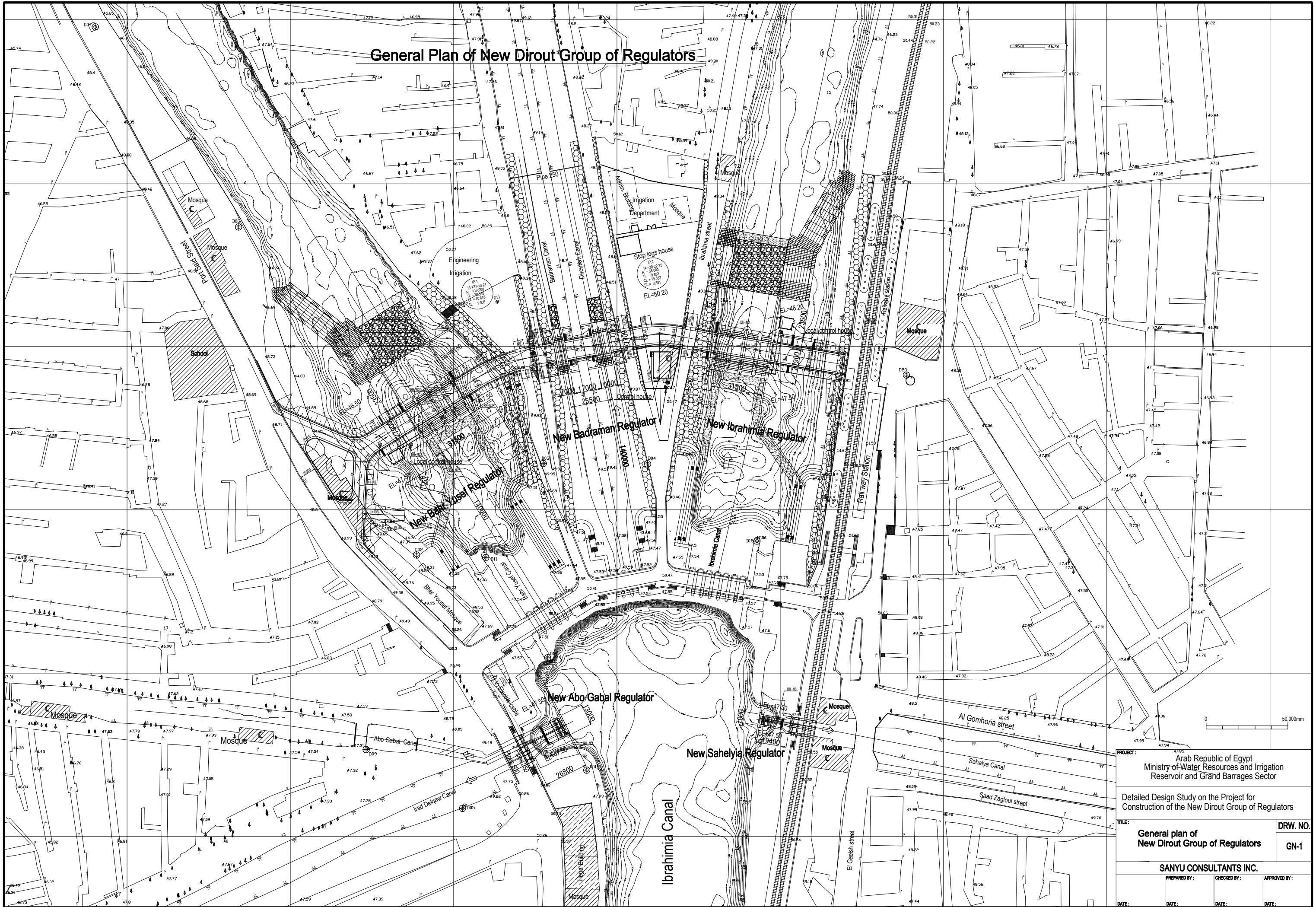
DRAWING NO.	NAME OF DRAWING		DRAWING NO.	NAME OF DRAWING	
<b>PART III</b>	<b>ARCHITECTURE</b>		<b>BADRAMAN REGULATOR (DIROUTIAH)</b>		
<b>CONTROL HOUSE</b>			MD-1	General drawing	1
AC-1 ~ 2	General layout	2	MD-2	Gate leaf assembling	1
AC-3 ~ 4	Views and cross sections	2	MD-3	Gate guide assembling	1
AC-5	Roof plan	1	MD-4	Detail of seal	1
AC-6	Detail of windows and doors	1	MD-5	Hoisting device assembling	1
AC-7 ~ 10	Bar arrangement	4	MD-6	Blockout and anchors	1
AC-11 ~ 16	Electrical works	6	MD-7	Local control panel and single line diagram	1
AC-17	Water supply and sewage plan for lavatory area	1	MD-8	Water level detector pipe	1
	<b>Sub-Total</b>	<b>17</b>		<b>Sub-Total</b>	<b>8</b>
<b>LOCAL CONTROL HOUSE</b>			<b>ABO GABAL REGULATOR</b>		
AL-1	General layout	1	MA-1	General drawing	1
AL-2 ~ 4	Bar arrangement	3	MA-2	Gate leaf assembling	1
AL-5	Electrical works	1	MA-3	Gate guide assembling	1
	<b>Sub-Total</b>	<b>5</b>	MA-4	Detail of seal	1
<b>STOP LOGS HOUSE</b>			MA-5	Hoisting device assembling	1
AS-1	Views and cross sections	1	MA-6	Blockout and anchors	1
AS-2	Roof and cross section	1	MA-7	Local control panel and single line diagram	1
AS-3	Finishing schedule	1	MA-8	Water level detector pipe	1
AS-4 ~ 6	Bar arrangement	3		<b>Sub-Total</b>	<b>8</b>
AS-7	Electrical works	1	<b>SAHELYIA REGULATOR</b>		
	<b>Sub-Total</b>	<b>7</b>	MS-1	General drawing	1
	<b>PART III total</b>	<b>29</b>	MS-2	Gate leaf assembling	1
<b>PART IV</b>	<b>MECHANICAL&amp;ELECTRIC WORKS FOR GATE</b>		MS-3	Gate guide assembling	1
<b>BAHR-YUSEF &amp; IBRAHIMIA REGULATOR</b>			MS-4	Detail of seal	1
MBI-1	General drawing	1	MS-5	Hoisting device assembling	1
MBI-2	Gate leaf assembling	1	MS-6	Blockout and anchors	1
MBI-3	Gate guide assembling	1	MS-7	Local control panel and single line diagram	1
MBI-4	Detail of seal	1	MS-8	Water level detector pipe	1
MBI-5	Hoisting device assembling	1		<b>Sub-Total</b>	<b>8</b>
MBI-6	Blockout and anchors	1	<b>STOP LOGS AND OTHERS</b>		
MBI-7	Upper leaf hydraulic cylinder	1	ML-1	Stop logs for large regulators Gate leaf assembling	1
MBI-8	Lower leaf hydraulic cylinder	1	ML-2 ~ 3	Stop logs for large regulators Gate guide assembling(1/2)~(2/2)	2
MBI-9	Outline drawing of hydraulic unit	1	ML-4	Stop logs for large regulators Detail of seal	1
MBI-10 ~ 12	Hydraulic circuit	3	ML-5	Stop logs for large regulators Blockout and anchors	1
MBI-13 ~ 16	Hydraulic pipe arrangement	4	ML-6	Stop logs for large regulators Lifting beam	1
MBI-17	Local control panel and single line diagram	1	ML-7	Stop logs for small regulators Gate leaf assembling	1
MBI-18 ~ 19	Water level detector pipe	2	ML-8 ~ 15	Stop logs for small regulators Gate guide assembling(1/8)~(8/8)	8
	<b>Sub-Total</b>	<b>19</b>	ML-16	Stop logs for small regulators Detail of seal	1
<b>BADRAMAN REGULATOR (BADRAMAN)</b>			ML-17 ~ 20	Stop logs for small regulators Blockout and anchors(1/4)~(4/4)	4
MN-1	General drawing	1	ML-21	Stop logs for small regulators Lifting beam	1
MN-2	Gate leaf assembling	1	ML-22 ~ 23	Stop logs storage stand assembling (1/2)~(2/2)	2
MN-3	Gate guide assembling	1	ML-24	Outline drawing of power distribution panels	1
MN-4	Detail of seal	1	ML-25	Power source single line diagram	1
MN-5	Hoisting device assembling	1	ML-26 ~ 27	General plan of wiring	2
MN-6	Blockout and anchors	1	ML-28 ~ 30	Layout of local wiring	3
MN-7	Local control panel and single line diagram	1	ML-31	Wiring diagram	1
MN-8	Water level detector pipe	1		<b>Sub-Total</b>	<b>31</b>
	<b>Sub-Total</b>	<b>8</b>		<b>PART IV total</b>	<b>82</b>

## LIST OF DRAWINGS

DRAWING NO.	NAME OF DRAWING	DRAWING NO.	NAME OF DRAWING		
<b>PART V</b>	<b>WATER MANAGEMENT SYSTEM</b>	<b>PART VI</b>	<b>TEMPORARY WORKS</b>		
WM-1	PROJECT LOCATION MAP	1	TW-1	General plan of Temporary Works (1) (Badraman)	1
WM-2	SYSTEM DIAGRAM	1	TW-2	General plan of Temporary Works (2) (Diroutiah)	1
WM-3	TYPICAL FACILITY LAYOUT PLAN FOR GAUGING STATION TYPE-A	1	TW-3	Typical Cross Section of Bahr Yusef	1
WM-4	TYPICAL FACILITY LAYOUT PLAN FOR GAUGING STATION TYPE-B	1	TW-4	Temporary Bridge of Cross Section at 213.75 of Bahr Yusef	1
WM-5	FLOOR PLAN FOR MONITORING AND OPERATING ROOM	1	TW-5	Cross Section of Bahr Yusef (1)	1
WM-6	FLOOR PLAN FOR WATER MONITORING ROOM IN MINIA	1	TW-6	Cross Section of Bahr Yusef (2)	1
WM-7	Location plan of Ibrahimia Head Regulator	1	TW-7	Cross Section of Bahr Yusef (3)	1
WM-8	Location plan of Dahab Regulator	1	TW-8	Cross Section of Bahr Yusef (4)	1
WM-9	Location plan of Sakoula Regulator	1	TW-9	Double Sheet Pile of Bahr Yusef	1
WM-10	Location plan of Mazoura Regulator	1	TW-10	Temporary Bridge of Bahr Yusef Cross Section 213.75 B=8m	1
WM-11	Location plan of Lahoun Regulator	1	TW-11	Temporary Bridge of Bahr Yusef B=6m (In Double Sheet Pile)	1
WM-12	Location plan of Abo El Shekok Regulator	1	TW-12	Temporary Bridge of Bahr Yusef Cross Section 213.75 B=6m	1
WM-13	Location plan of Regulator km39	1	TW-13	Temporary Retement Works of Bahr Yusef at Right Side	1
WM-14	Location plan of New Hafez Regulator	1	TW-14	Typical Cross Section of Ibrahimia	1
WM-15	Location plan of Matay Regulator	1	TW-15	Cross Section of Ibrahimia (1)	1
WM-16	Location plan of Maghagha Regulator	1	TW-16	Cross Section of Ibrahimia (2)	1
WM-17	Location plan of Sharahna Regulator	1	TW-17	Cross Section of Ibrahimia (3)	1
WM-18	Location plan of Elgandy Regulator	1	TW-18	Cross Section of Ibrahimia (4)	1
WM-19	Location plan of Ashmont Regulator	1	TW-19	Double Sheet Pile of Ibrahimia	1
WM-20	Location plan of Manshat El Dahab	1	TW-20	Temporary Bridge of Ibrahimia B=6m (In Double Sheet Pile)	1
WM-21	Location plan of El Hareka canal	1	TW-21	Temporary Retement Works of Ibrahimia at Left Upper	1
WM-22	Location plan of El Sabaa canal	1	TW-22	Temporary Retement Works of Ibrahimia at Left Lower	1
WM-23	Location plan of Quftan canal	1	TW-23	Temporary Retement Works of Ibrahimia at Right	1
WM-24	Location plan of Wesh El Bab canal	1	TW-24	Longitudinal Section of Badraman	1
WM-25	Location plan of El-Giza Canal Intake	1	TW-25	Longitudinal Section of Diroutiah	1
WM-26	Location plan of Hassan Wasef Weir	1	TW-26	Temporary Bridge of Badraman and Diroutiah B=8m	1
WM-27	Location plan of Irad El Maharak canal	1	TW-27	Temporary Retement Works (Badraman and Diroutiah)	1
WM-28	Location plan of El Kosia canal	1	TW-28	Double Sheet Pile of Abo Gabal	1
WM-29	Location plan of East Hafze canal	1	TW-29	Double Sheet Pile of Sahelyia	1
WM-30	Location plan of West Hafze canal	1	TW-30	Diversion Canal of Abo Gabal and Sahelyia	1
WM-31	Location plan of Adkak canal	1	TW-31	Construction Roads (1)	1
WM-32	Location plan of Gendia canal	1	TW-32	Construction Roads (2)	1
WM-33	Location plan of Abo Shosha canal	1	TW-33	Construction Roads (3)	1
WM-34	Location plan of El Soultany canal	1	TW-34	Well-point Work (1)	1
WM-35	Location plan of Tansa canal	1	TW-35	Well-point Work (2)	1
WM-36	Location plan of El Mansour canal	1	TW-36	Well-point Work (3)	1
WM-37	Location plan of Serry Weir	1		<b>PART VI total</b>	<b>36</b>
WM-38	Location plan of Maghaghah Weir	1		<b>Grand total</b>	<b>430</b>
WM-39	Plan of Five Monitoring Pump Stations	1			
WM-40	Location Plan of Quarun Lake	1			
WM-41	TYPICAL WIRING DIAGRAM For GAUGING STATION TYPE-A	1			
WM-42	TYPICAL WIRING DIAGRAM For GAUGING STATION TYPE-B	1			
WM-43	TYPICAL WIRING DIAGRAM FOR GAUGING STATION FOR PUMP STATION	1			
WM-44	TYPICAL WIRING DIAGRAM FOR MONITORING AND OPERATING ROOM	1			
WM-45	TYPICAL WIRING DIAGRAM FOR MONITORING ROOM IN MINIA	1			
WM-46	TYPICAL INSTALLATION OF WATER LEVEL SENSOR	1			
WM-47	FENCE AND OPENING DETAILS FOR GAUGING STATION	1			
	<b>PART V total</b>	<b>47</b>			

**PART I    GENERAL**

# General Plan of New Dirout Group of Regulators



PROJECT: Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
TITLE: Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
GENERAL PLAN OF New Dirout Group of Regulators		DRW. NO. GN-1
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

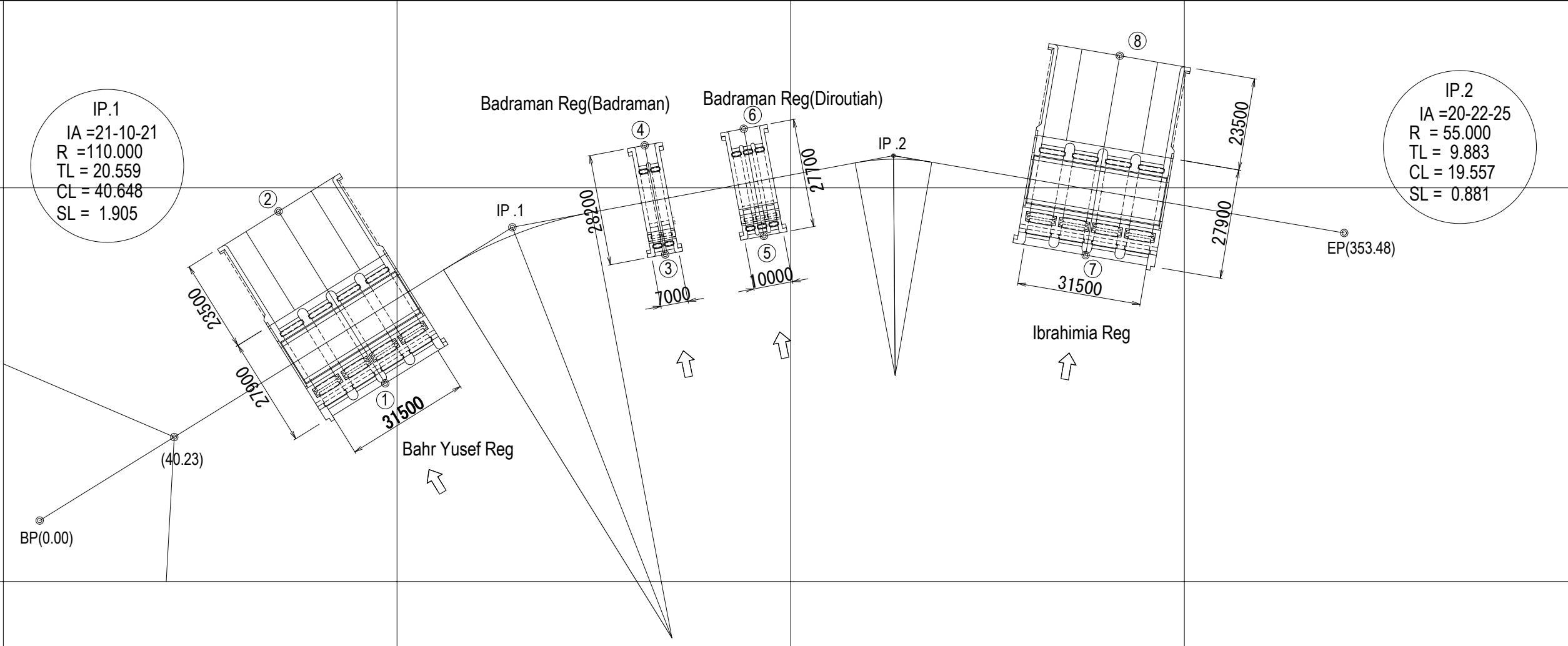
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3050300

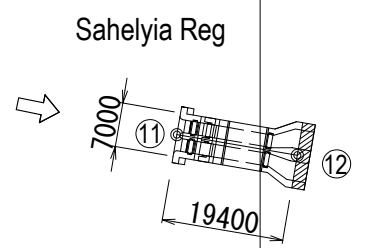
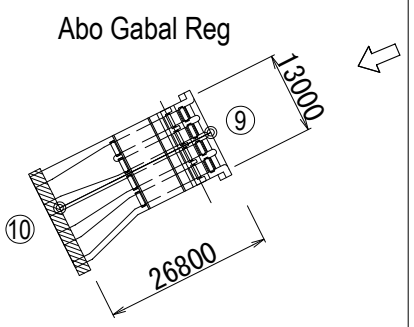
3050200

IP.1  
 IA = 21-10-21  
 R = 110.000  
 TL = 20.559  
 CL = 40.648  
 SL = 1.905

IP.2  
 IA = 20-22-25  
 R = 55.000  
 TL = 9.883  
 CL = 19.557  
 SL = 0.881



Point ID		Easting (m)	Northing (m)
Road	BP(0.00)	283,709.228	3,050,315.491
	(40.23)	283,743.411	3,050,336.699
	IP .1	283,829.305	3,050,389.988
	IP .2	283,926.110	3,050,408.180
	EP(353.48)	284,040.622	3,050,388.544
Bahr Yusef Reg	① Upstream	283,797.013	3,050,350.360
	② Downstream	283,769.915	3,050,394.037
Badraman Reg (Badraman)	③ Upstream	283,868.133	3,050,383.091
	④ Downstream	283,862.925	3,050,410.806
Badraman Reg (Diroutiah)	⑤ Upstream	283,893.194	3,050,387.800
	⑥ Downstream	283,888.078	3,050,415.024
Ibrahimia Reg	⑦ Upstream	283,974.914	3,050,382.918
	⑧ Downstream	283,983.600	3,050,433.579
Abo Gabal Reg	⑨ Upstream	283,868.656	3,050,168.317
	⑩ Downstream	283,844.682	3,050,156.339
Sahelyia Reg	⑪ Upstream	283,986.786	3,050,171.466
	⑫ Downstream	284,005.908	3,050,168.193



283700

283800

283900

284000

PROJECT: Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
TITLE: Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Location of coordinates			DRW. NO. GN-2
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# GENERAL NOTES (1/2)

## 1 GENERAL NOTES

- 1.1 All dimensions are in millimeter and elevations are in meter unless otherwise specified.
- 1.2 Any questions or discrepancy, defective description, errors, or ambiguity between the Drawing and/or Specifications shall be referred to the Consultant.
- 1.3 Unless otherwise indicated, chamfer(corner cut off) for the exposed concrete edges shall be 2cm.
- 1.4 Reinforcement bar support, spacers and other accessories shall be subject to the approval of the Consultant.
- 1.5 Unless otherwise specified, concrete cover to the main reinforcement (distance between concrete surface and center of main reinforcement )shall be 100mm.
- 1.6 Dimensions and locations of block-outs shown in the Drawings are tentative and may be modified by the Contractor, subject to the approval of the Consultant.
- 1.7 Location and design of construction joint shall be subject to the approval of the Engineer.
- 1.8 Strength of concrete at 28 days shall be shown in the table below.  
Class of concrete in the Drawings is reinforced concrete if not otherwise specified.

Class of concrete	Cube strength (N/mm <sup>2</sup> )	Cylinder strength (N/mm <sup>2</sup> )	Slump ( cm )	Maximum size of aggregate(mm)
Reinforced concrete	25	21	8 to 12	40
Plain concrete	20	17	8 to 12	40
Leveling concrete	20	17	8 to 12	40
Second stage concrete	25	21	8 to 12	40

- 1.9 Sulfate resisting Portland cement shall be used for members in contact with water.
- 2.0 Density of riprap shall be more than 2.2 t/m<sup>3</sup>.
- 2.1 Any adverse effect to the structural function of the existing regulators shall not be allowed during the demolition works.  
Especially on the construction of the New Abo Gabal and Sahelyia regulators, the Contractor shall propose the demolition method and working plan to the Engineer for approval.

## 2 ABBREVIATION

cm	Centimeter
m	Meter
Km	Kilometer
L	Length
B,b	Width
t	Thickness
R,r	Radius of Curvature
Max	Maximum
Min	Minimum
Approx.	Approximately
No	Number
EL	Elevation
H.H.W.L	Highest High Water Level
H.W.L	High Water Level
N.W.L	Normal Water Level
L.L.W.L	Lowest Low Water Level
L.W.L	Low Water Level
U.W.L	Upstream Water Level
D.W.L	Downstream Water Level
U/S	Upstream
D/S	Downstream
DWG	Drawing
Dia,φ	Diameter
CJ	Construction Joint
Exp.j	Expansion Joint
Rebar	Reinforcement bar
RC	Reinforced concrete

Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
General notes (1)			<b>DRW. NO.</b> GN-3
SANYU CONSULTANTS INC.			
PREPARED BY :	CHECKED BY :	APPROVED BY :	
DATE :	DATE :	DATE :	DATE :



# GENERAL NOTES (2/2)

## 3 REBAR STANDARD

### 3.1 SHAPE OF BAR (1) HOOK

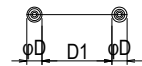
TYPE	A	B	C
FIGURE			
L	$L \geq 8\phi$ AND NOT LESS THAN 12cm	$L \geq 10\phi$	$L \geq 12.0\phi$
r	$r \geq 2.5\phi$		

### (2) HOOP STIRRUP

FIGURE	BENDING RADIUS
	$r \geq 2.5\phi$

### 3.2 SPACING BETWEEN BARS : D1

Spacing between rebars shall be not less than 25mm and 1.5 times of maximum size of coarse aggregate.



### 3.3 BENDING SCHEDULE (REINFORCEMENT DRAWING)

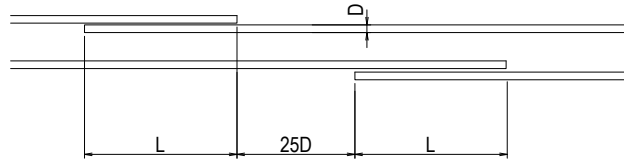
Bending schedule shall be prepared in the manner agreed by the Engineer and submit for the approval of the Engineer prior to the bending and fixing of the rebars at site.

### 3.4 REBAR CAGE OF CAST-IN-PLACE PILE

Welding shall not allowed except for the parts designated in the Drawings.

### 3.5 ANCHORING AND LAP SPLICING

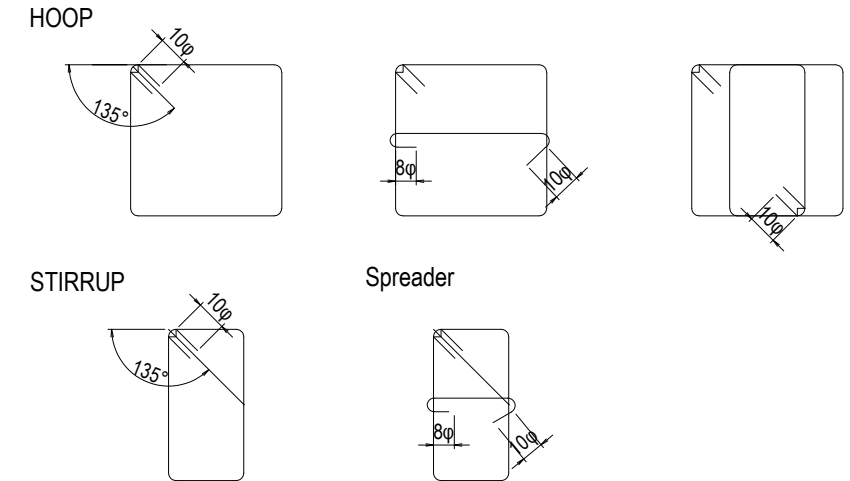
BAR SIZE	L (55D) mm NOT LESS THAN 1m
D10	1000mm
D12	1000mm
D14	1000mm
D16	1000mm
D18	1000mm
D20	1100mm
D22	1210mm
D25	1375mm
D28	1540mm
D32	1760mm



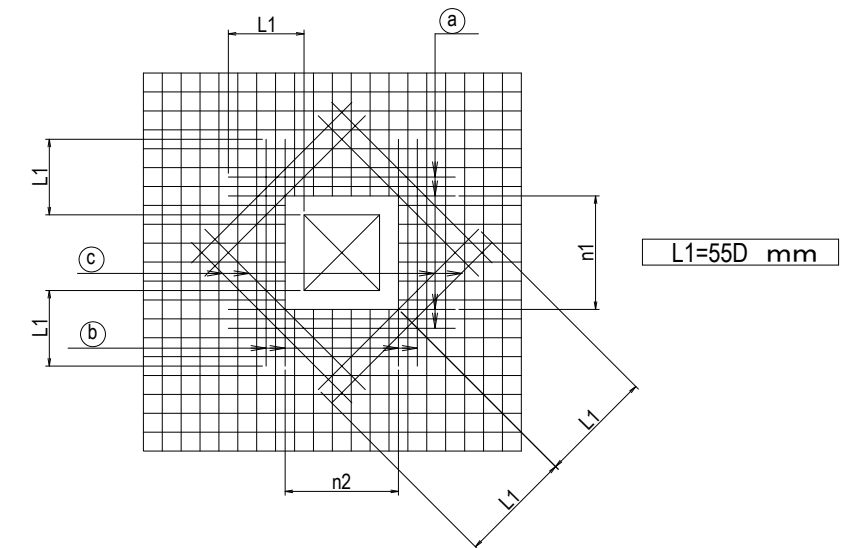
### 3.6 BENDING RADIUS OF REBAR

HOOP STIRRUP	BENT BAR	
$r \geq 2.5\phi$	$r \geq 5\phi$	$r \geq 10\phi$

### 3.7 SHAPE OF HOOP STIRRUP



### 3.8 REBAR FOR OPENING



n1, n2 : the number of cut off bar for opening

(1) Required number of extra bars

(a)  $\geq n1=1/2$

(b)  $\geq n2=1/2$

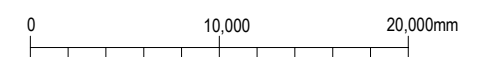
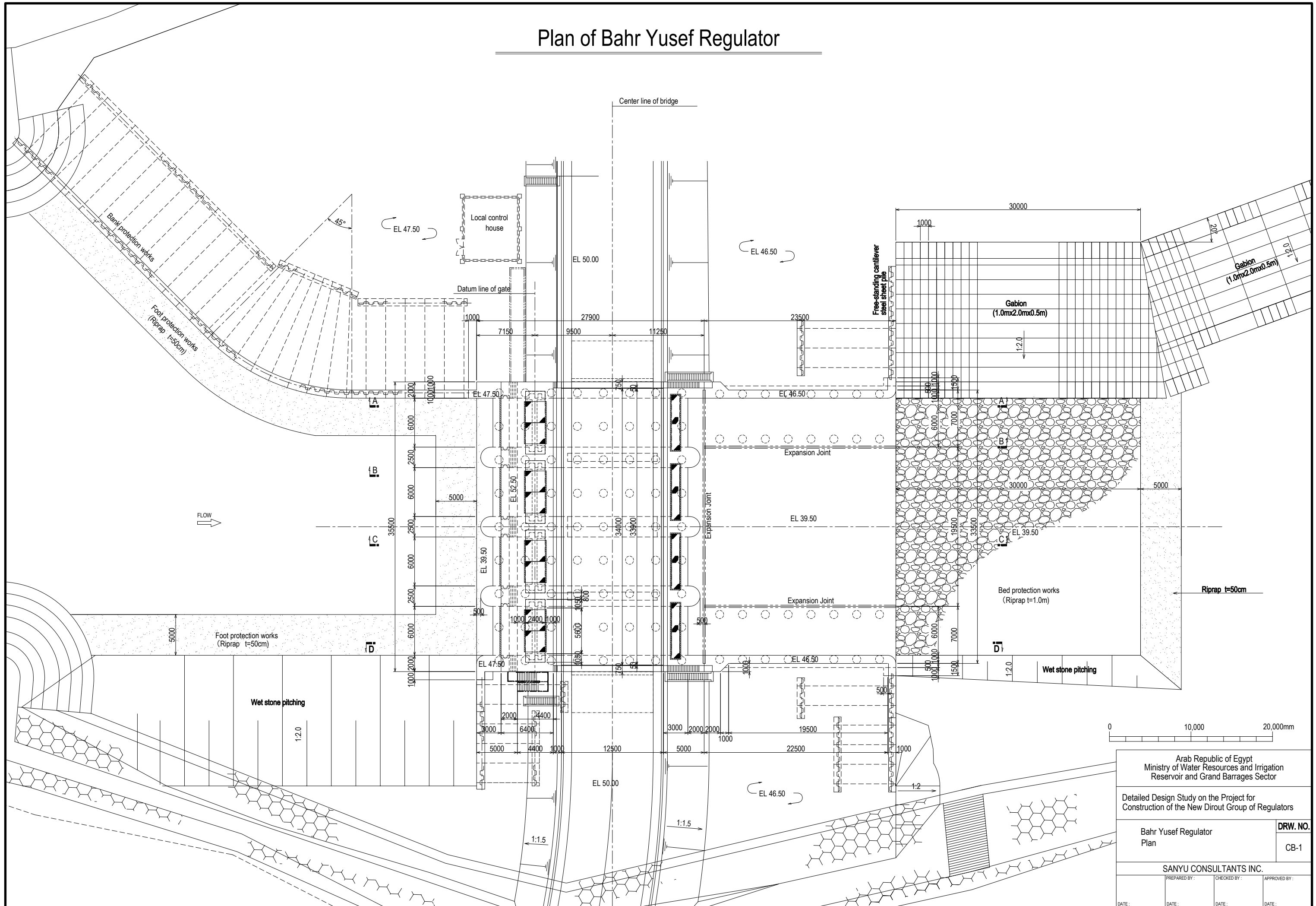
(c) =2

(2) Length of extra bar  $L1 \geq 55D$ mm

Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
General notes (2)			DRW. NO. GN-4
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

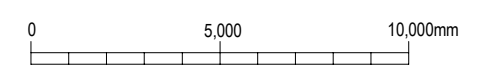
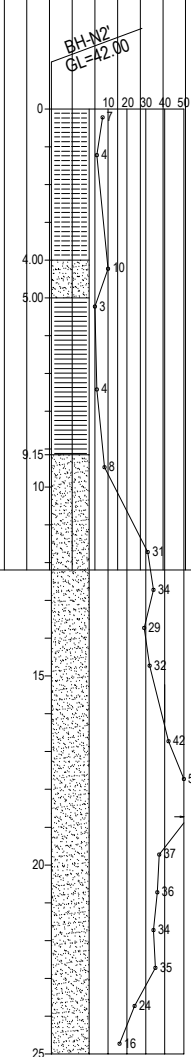
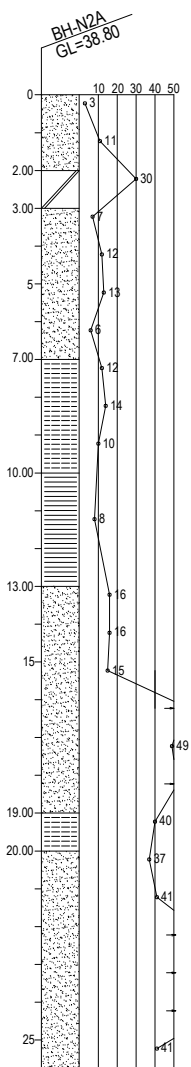
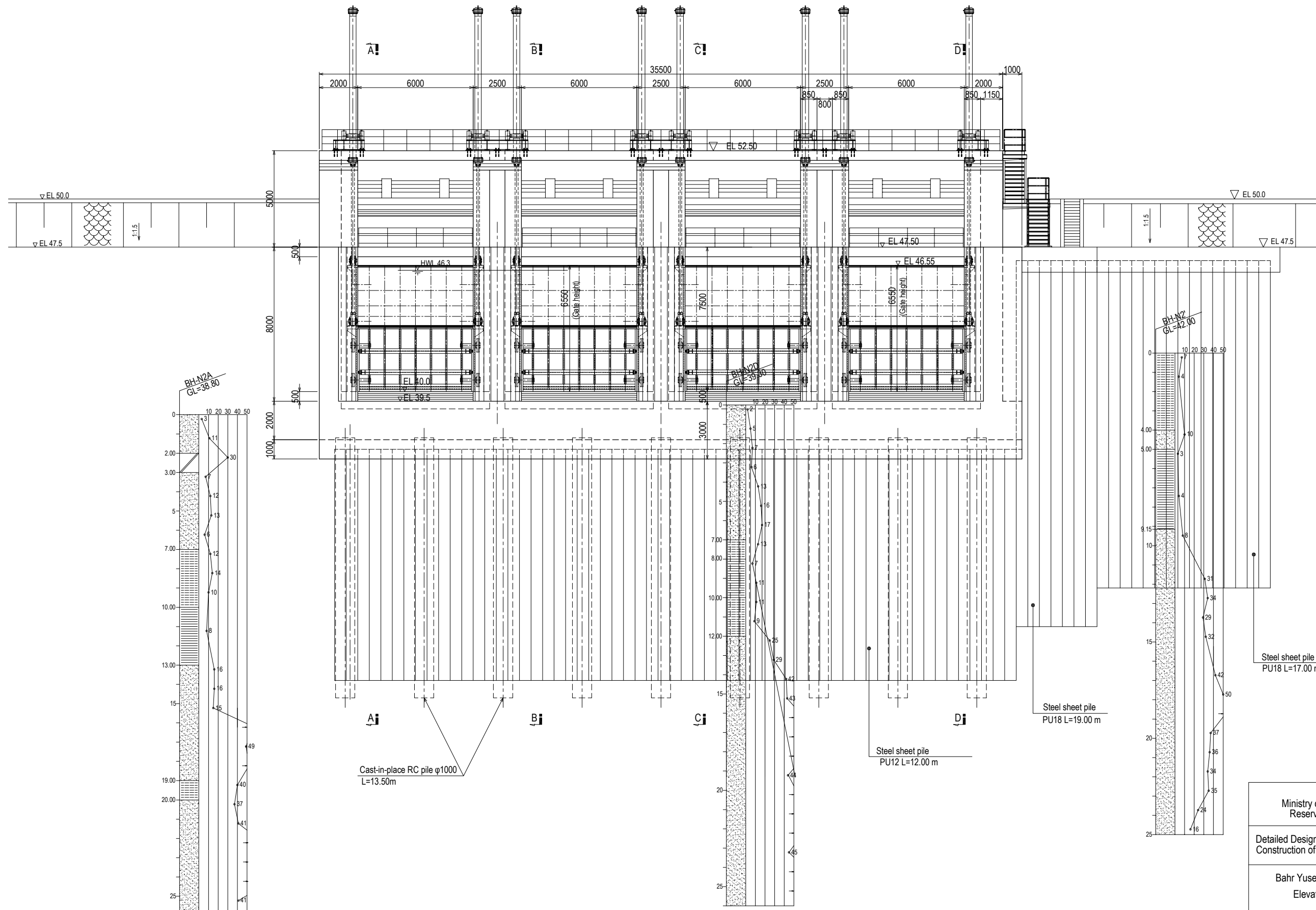
**PART II      CIVIL WORK**

# Plan of Bahr Yusef Regulator



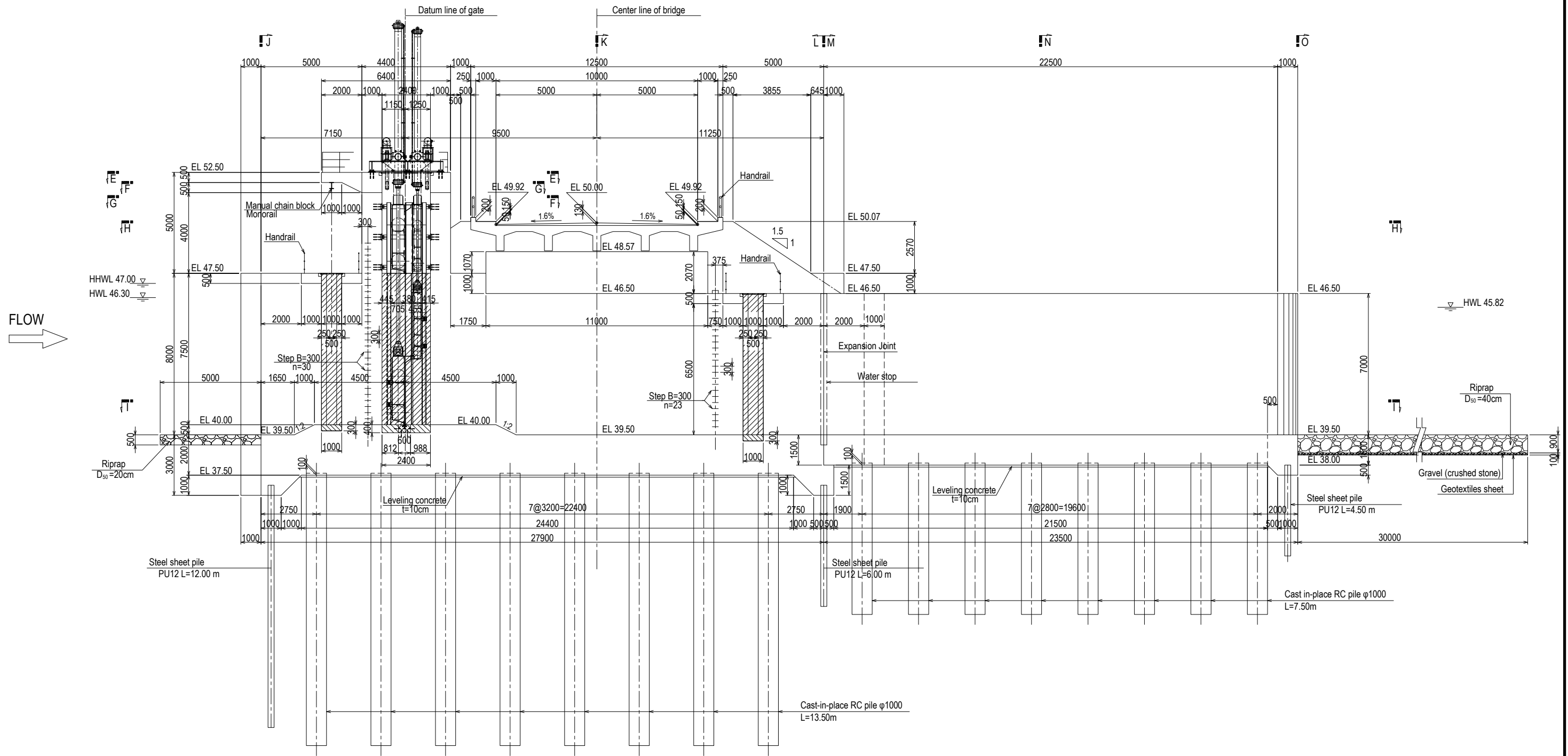
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Bahr Yusef Regulator Plan	DRW. NO. CB-1	
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

# Elevation of Bahr Yusef Regulator



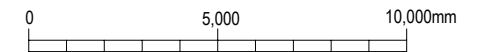
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Bahr Yusef Regulator Elevation	<b>DRW. NO.</b> CB-2	
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

# Longitudinal Section of Bahr Yusef Regulator (Section A—A)



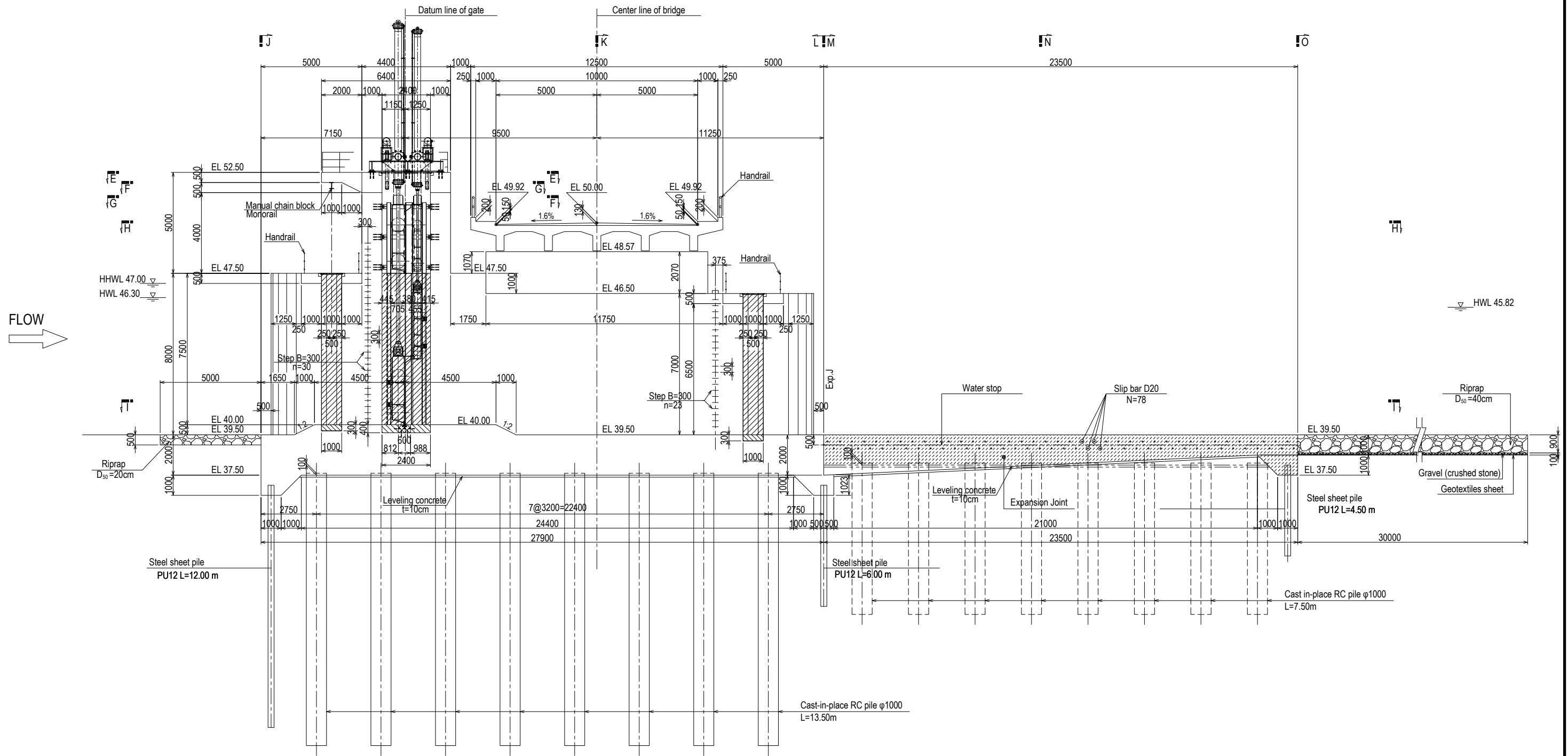
Note:

Shaded area indicates the range of second stage concrete to be placed with steel gate guide.

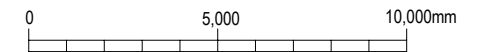


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Bahr Yusef Regulator Longitudinal section (1)	DRW. NO CB-3	
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

# Longitudinal Section of Bahr Yusef Regulator (Section B—B)



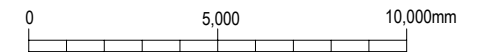
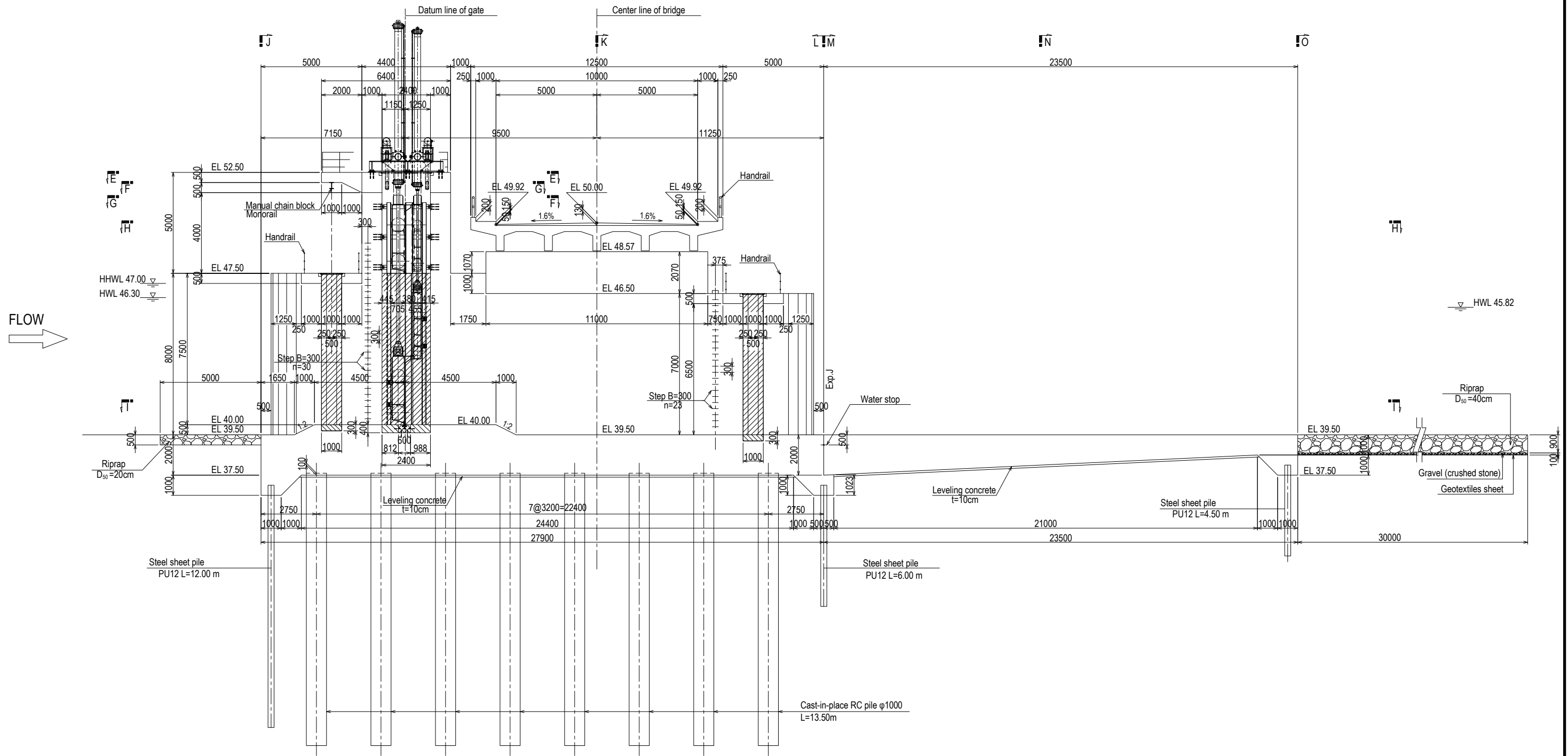
FLOW →



Note:  
 Shaded area indicates the range of second stage concrete to be placed with steel gate guide.

Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Bahr Yusef Regulator Longitudinal section (2)	DRW. NO CB-4	
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

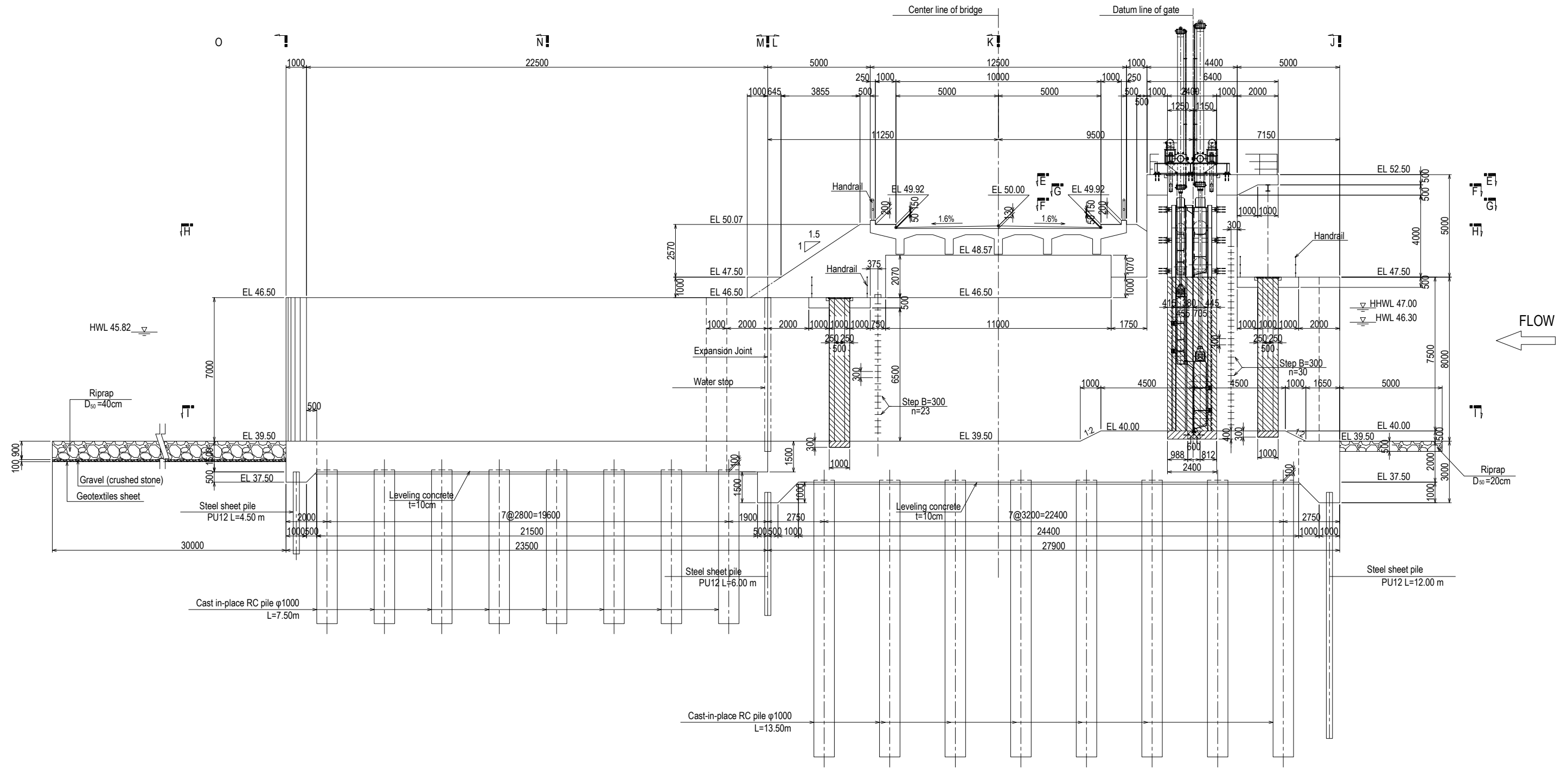
# Longitudinal Section of Bahr Yusef Regulator (Section C—C)



Note:  
 Shaded area indicates the range of second stage concrete to be placed with steel gate guide.

Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Bahr Yusef Regulator Longitudinal section (3)	DRW. NO CB-5	
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

# Longitudinal Section of Bahr Yusef Regulator (Section D—D)



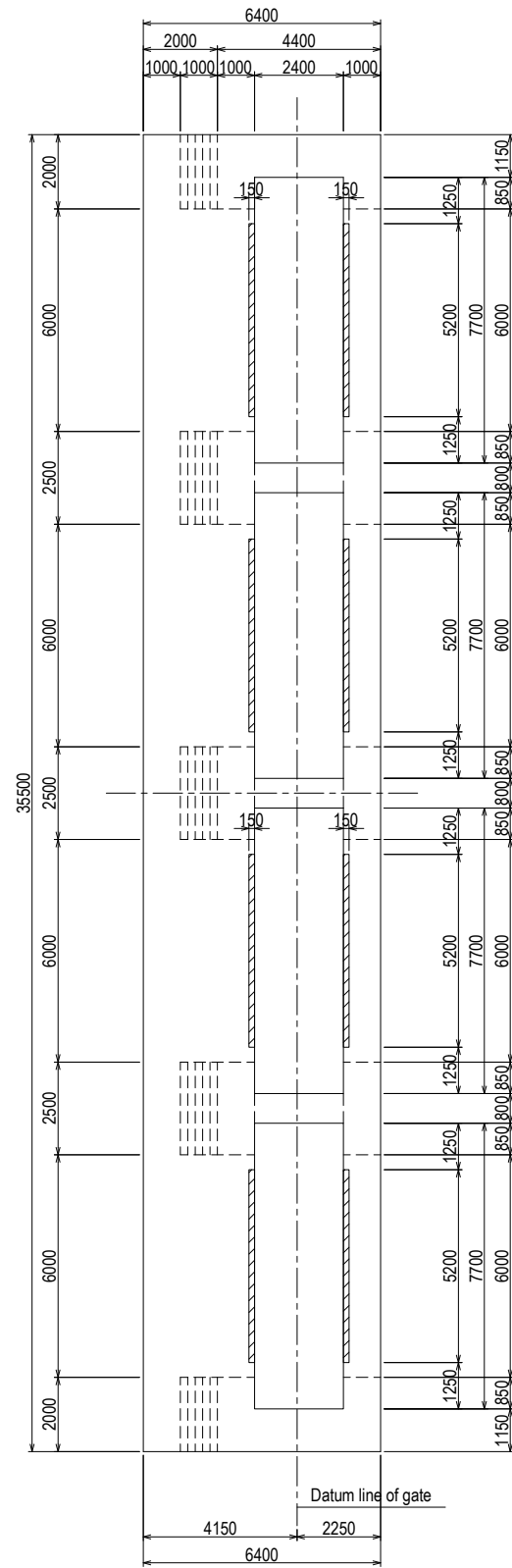
Note;  
 Shaded area indicates the range of second stage concrete to be placed with steel gate guide.

Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Bahr Yusef Regulator Longitudinal section (4)	DRW. NO CB-6	
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

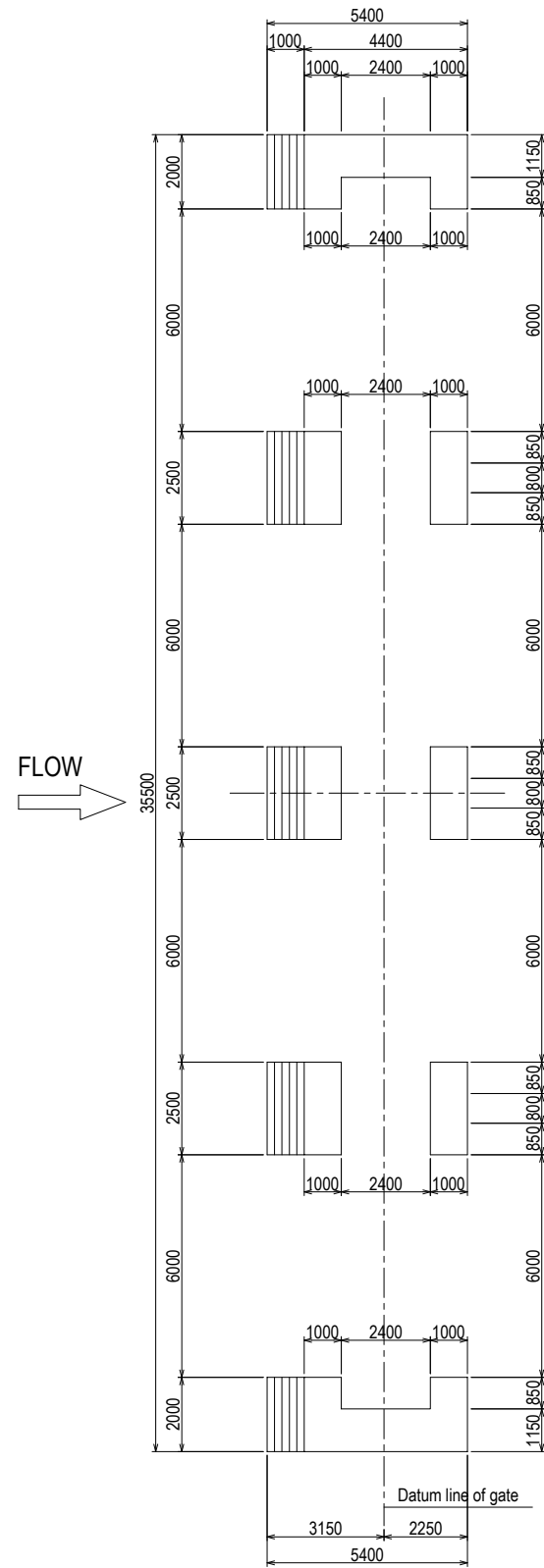


# Section of Bahr Yusef Regulator (1/5)

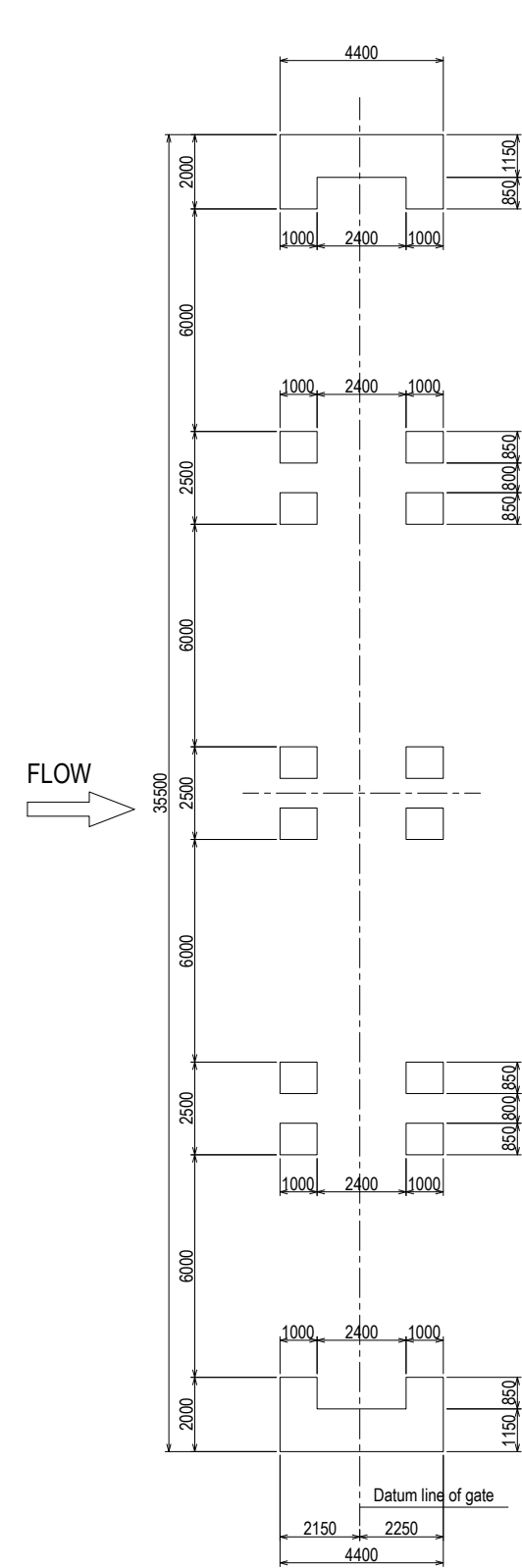
Section E—E



Section F—F



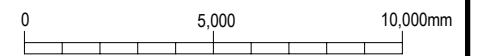
Section G—G



FLOW →

FLOW →

FLOW →



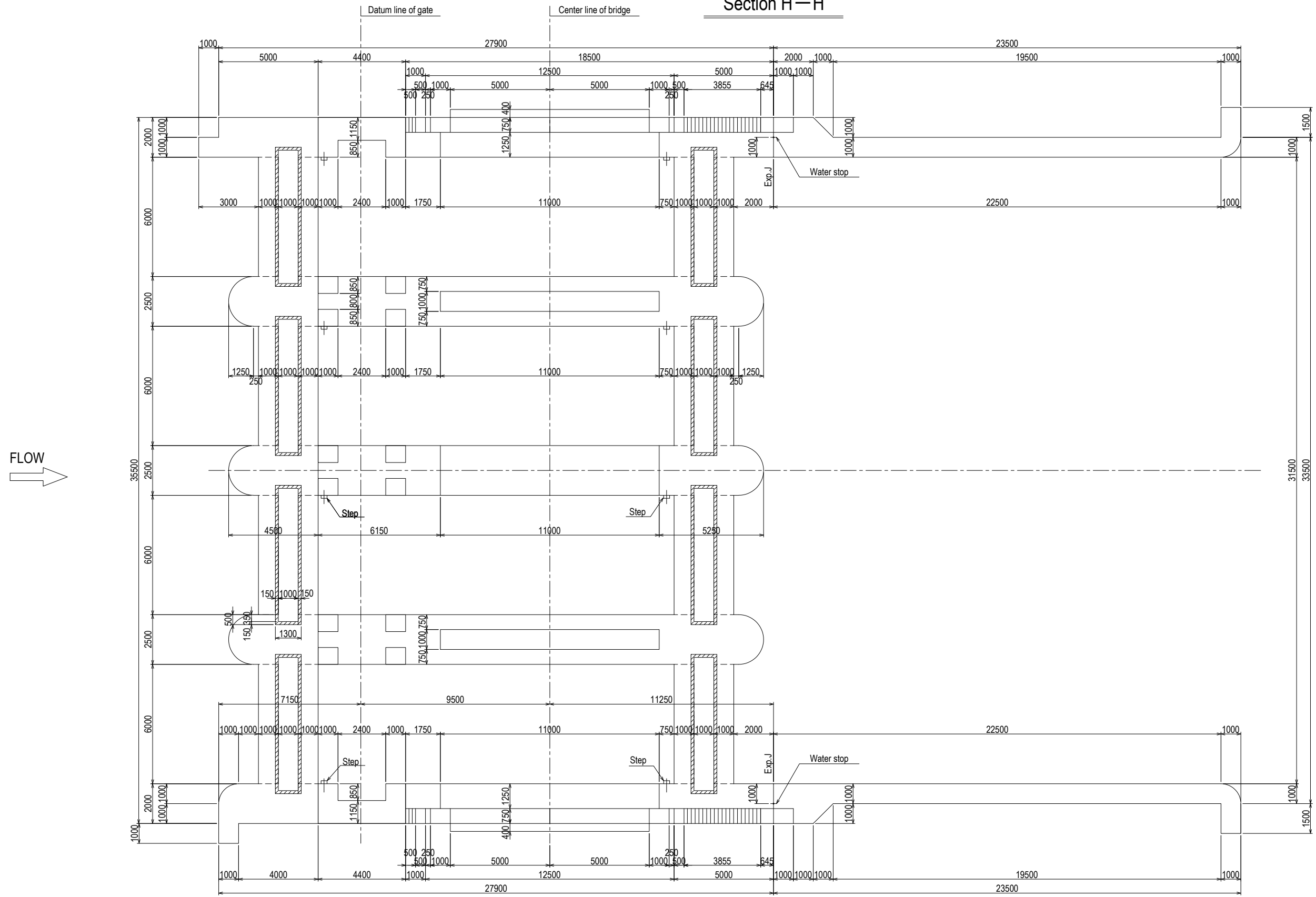
Note:

Shaded area indicates the range of second stage concrete to be placed with steel gate guide.

Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Bahr Yusef Regulator Sections (1)			<b>DRW. NO.</b> CB-7
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

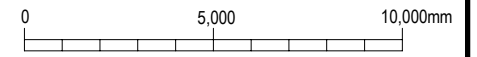
# Section of Bahr Yusef Regulator (2/5)

## Section H—H



Note:

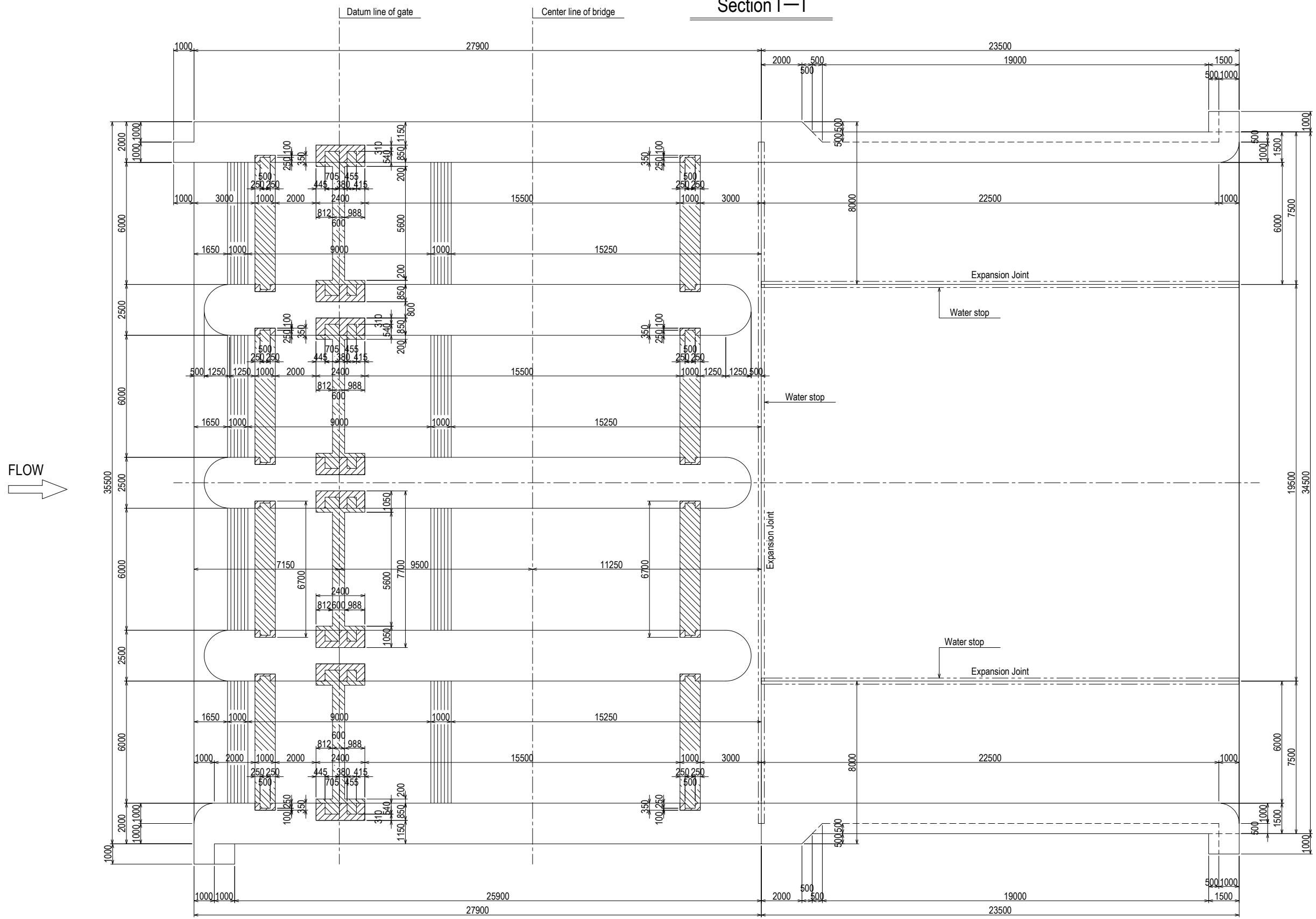
Shaded area indicates the range of second stage concrete to be placed with steel gate guide.




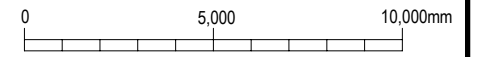
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Bahr Yusef Regulator Sections (2)			<b>DRW. NO.</b> CB-8
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Section of Bahr Yusef Regulator (3/5)

## Section I—I



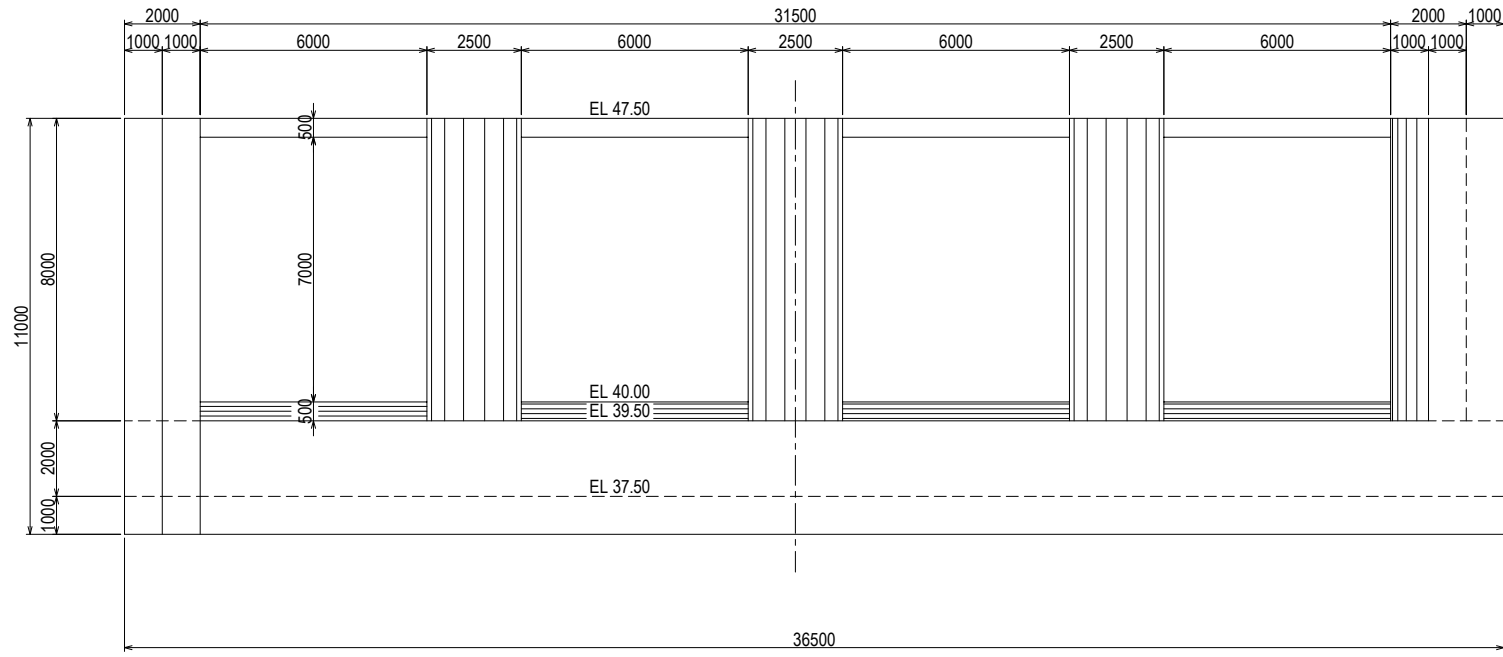
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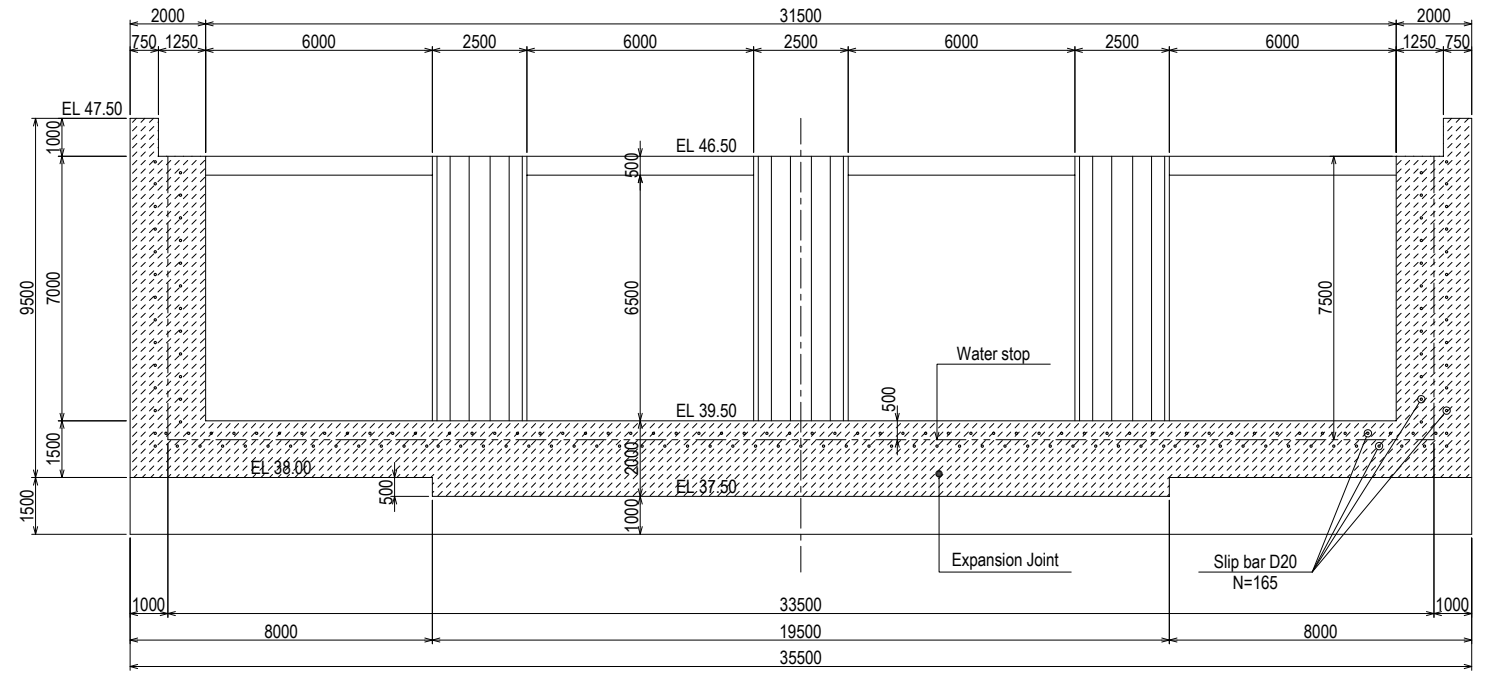
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Bahr Yusef Regulator Sections (3)		DRW. NO. CB-9
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

# Section of Bahr Yusef Regulator (4/5)

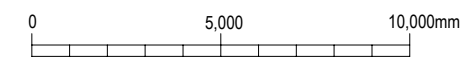
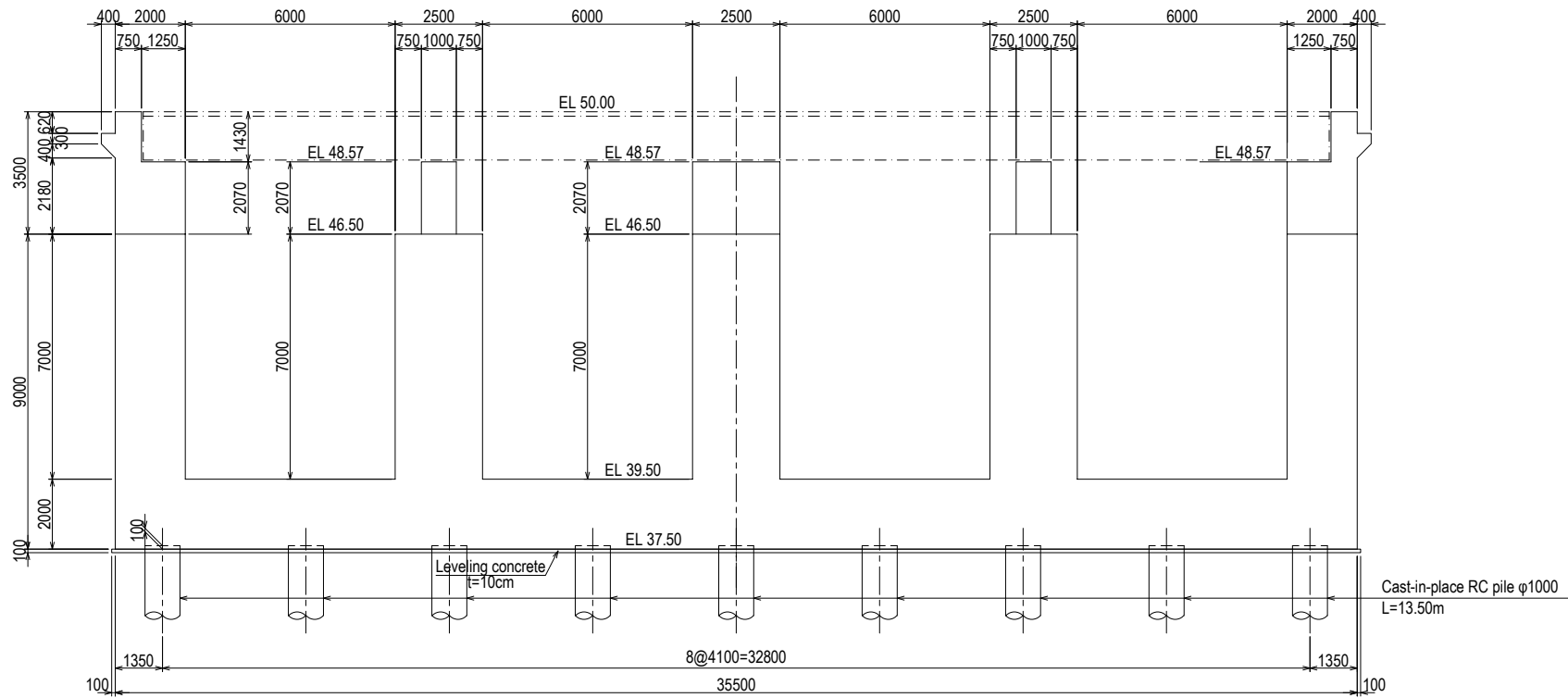
## Section J—J



## Section L—L



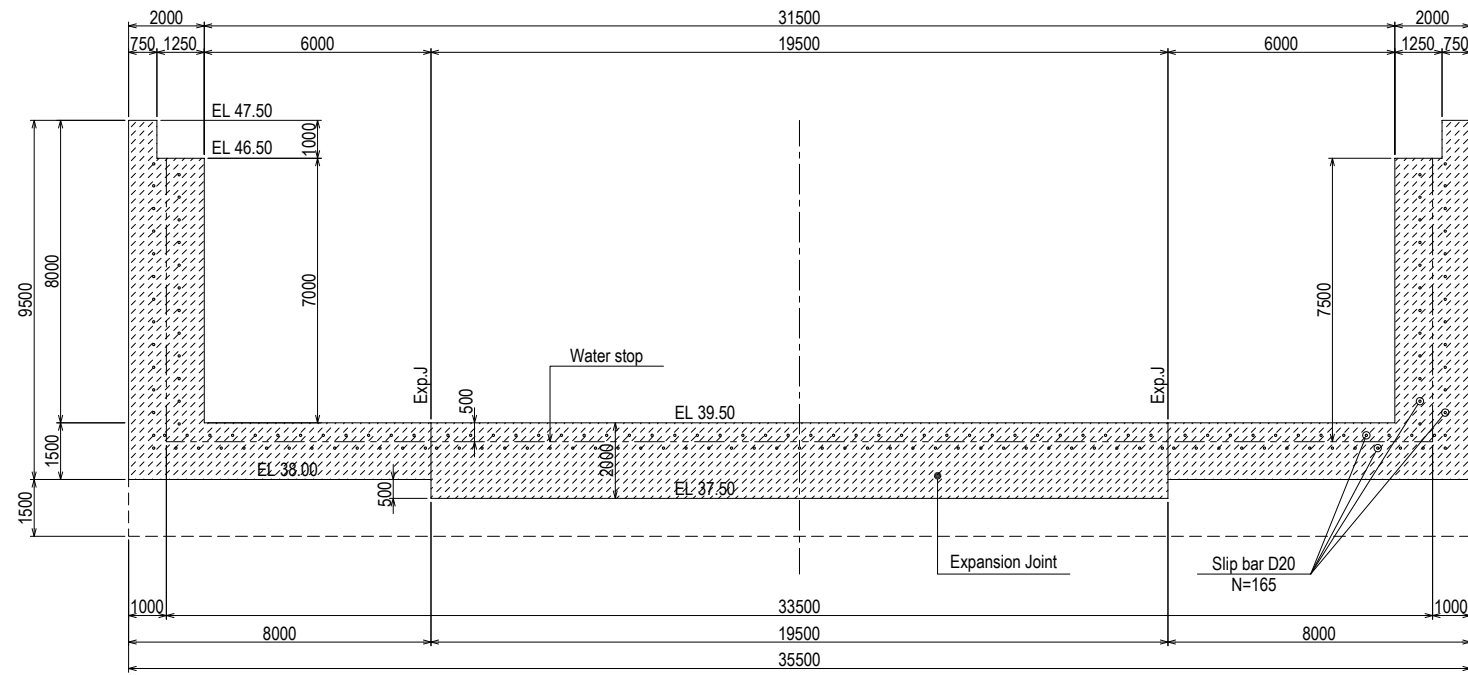
## Section K—K



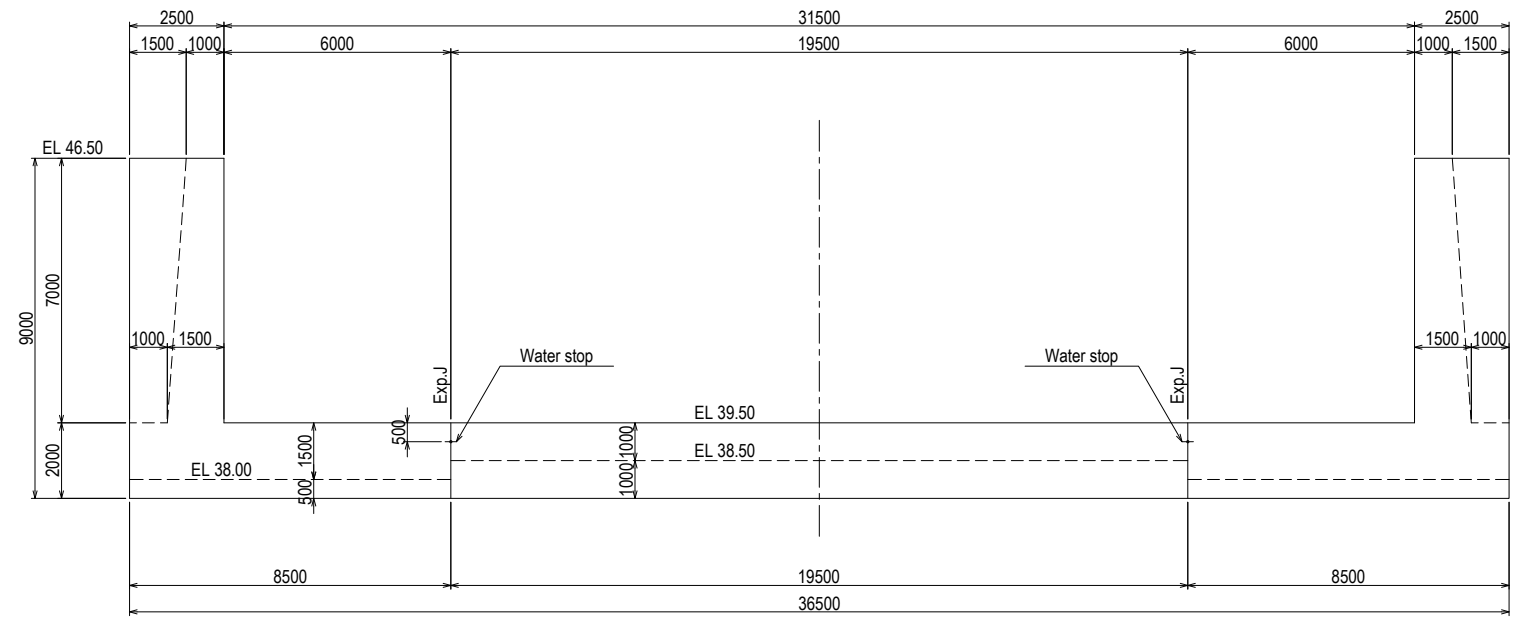
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Bahr Yusef Regulator Sections (4)			<b>DRW. NO.</b> CB-10
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Section of Bahr Yusef Regulator (5/5)

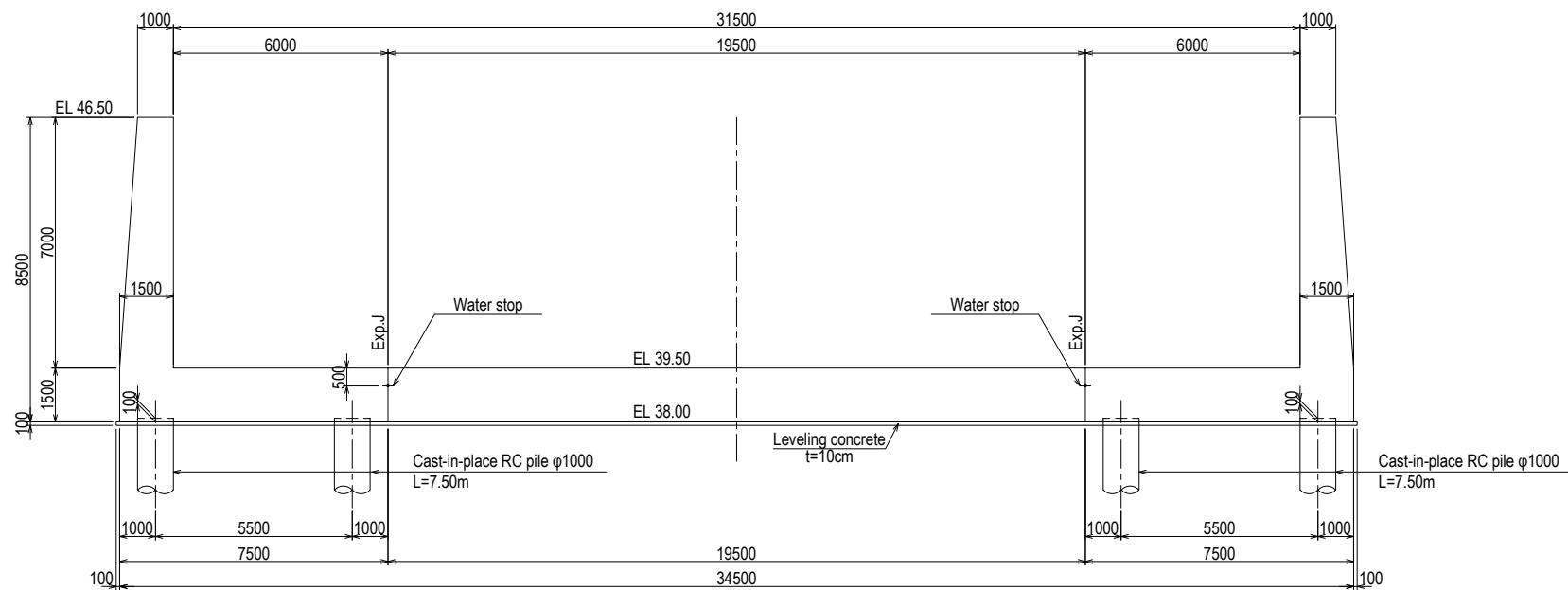
## Section M—M



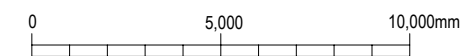
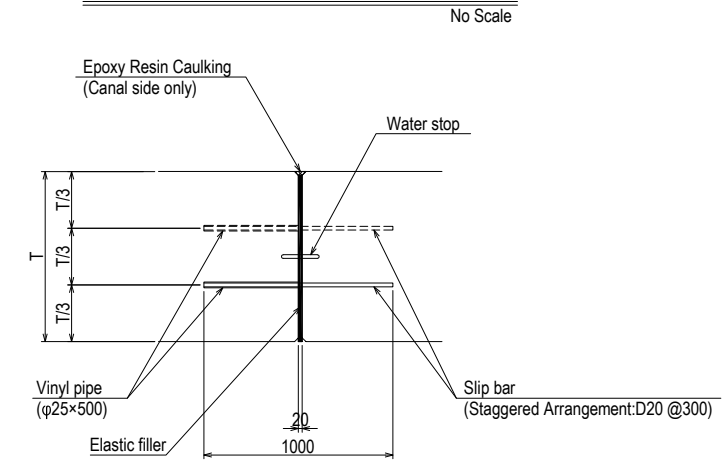
## Section O—O



## Section N—N



## Typical of Expansion Joint

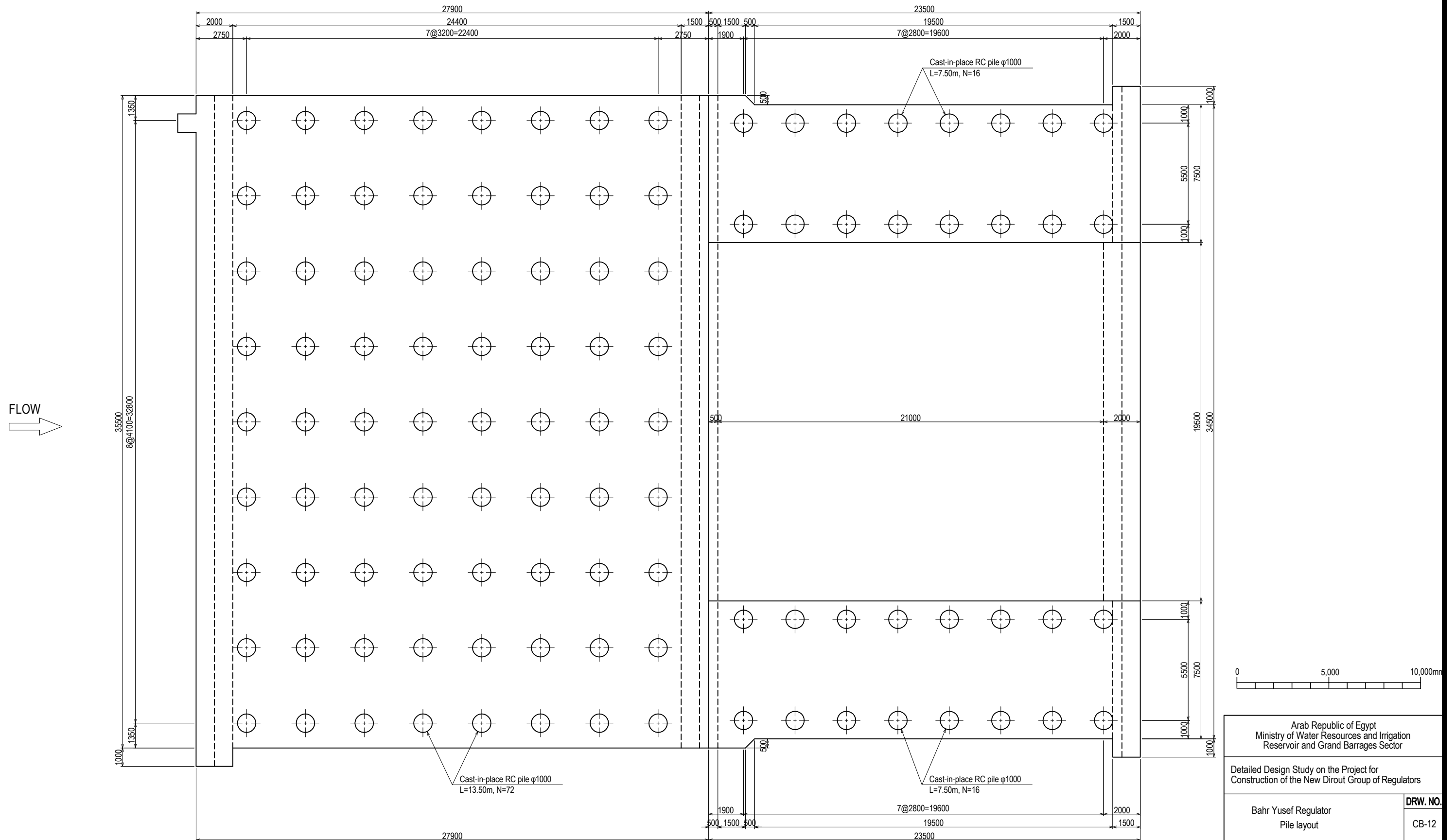


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Bahr Yusef Regulator Sections (5)			<b>DRW. NO.</b> CB-11
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Pile layout of Bahr Yusef Regulator

## Pile layout of Regulator

## Pile layout of Ltype Wall



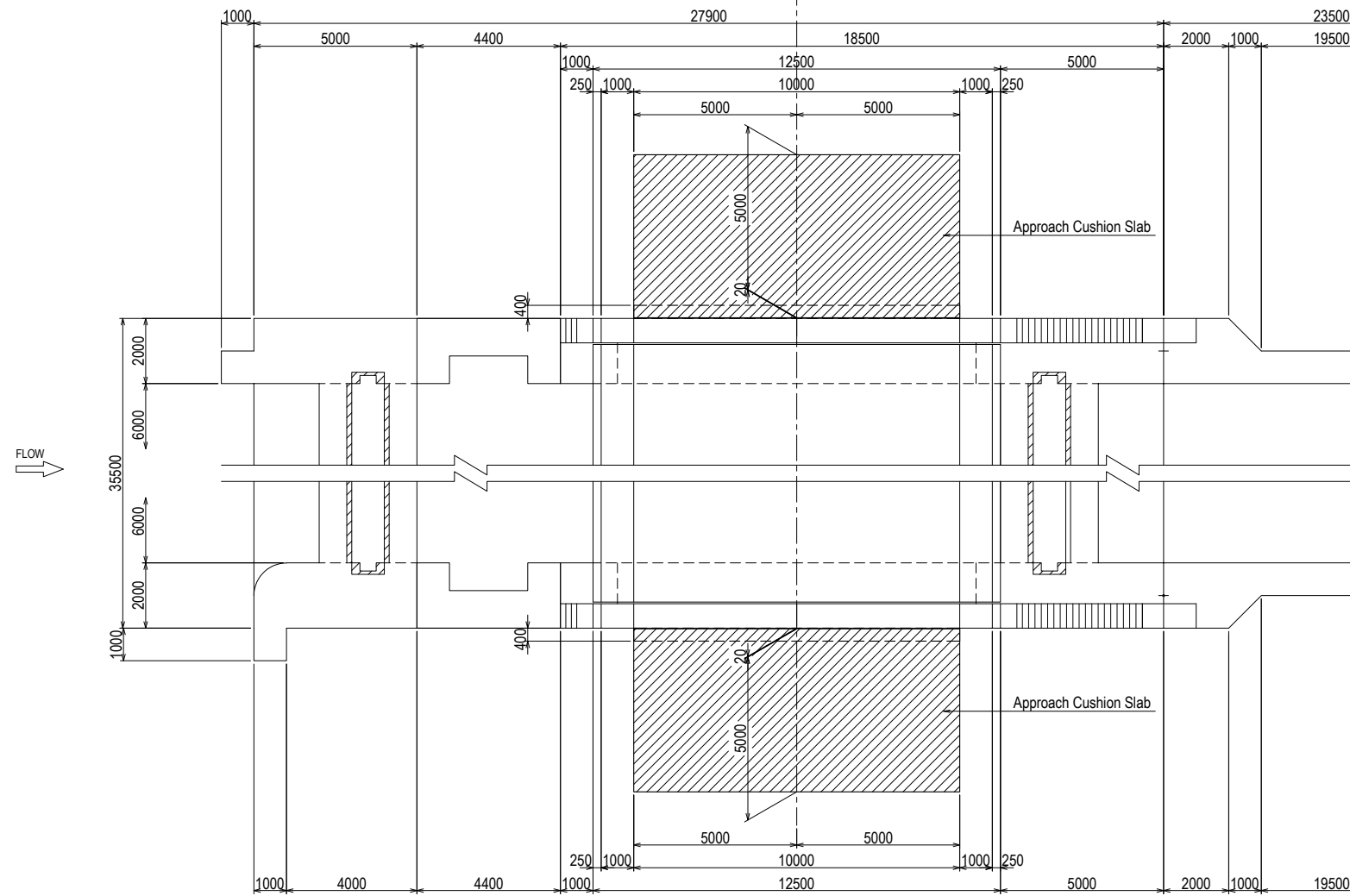
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Bahr Yusef Regulator Pile layout			<b>DRW. NO.</b> CB-12
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Approach Cushion Slab of Bahr Yusef Regulator

Plan

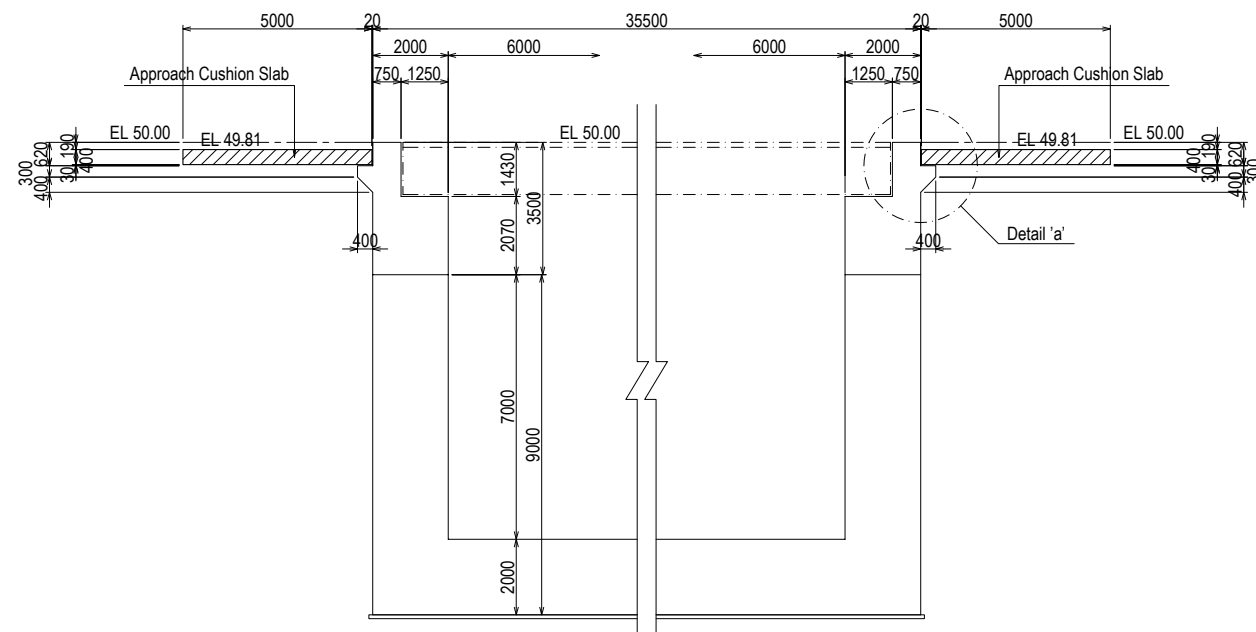
Scale A

Center line of bridge



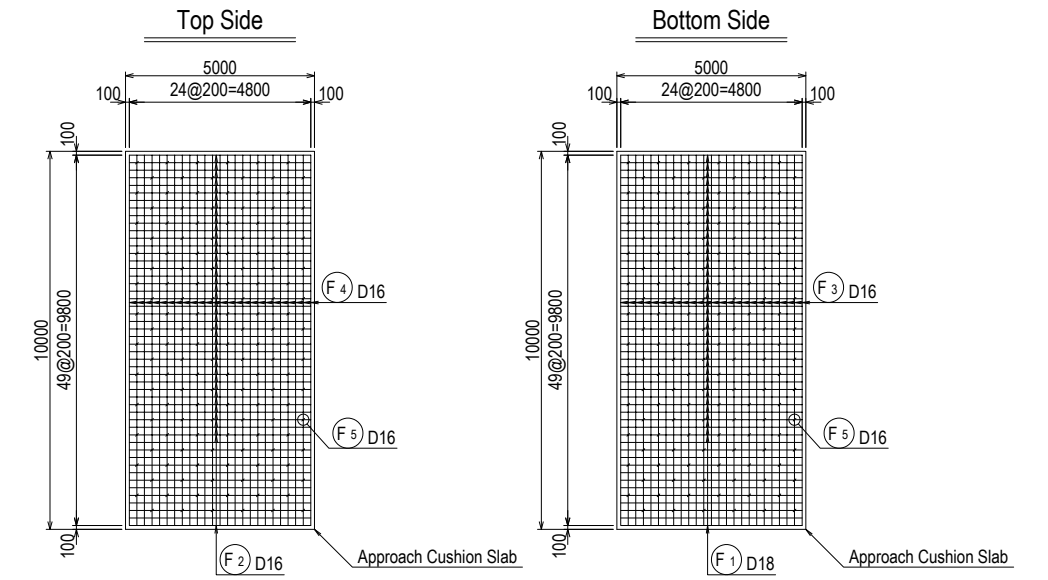
Section A-A

Scale A



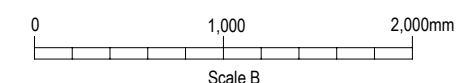
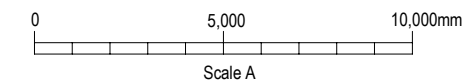
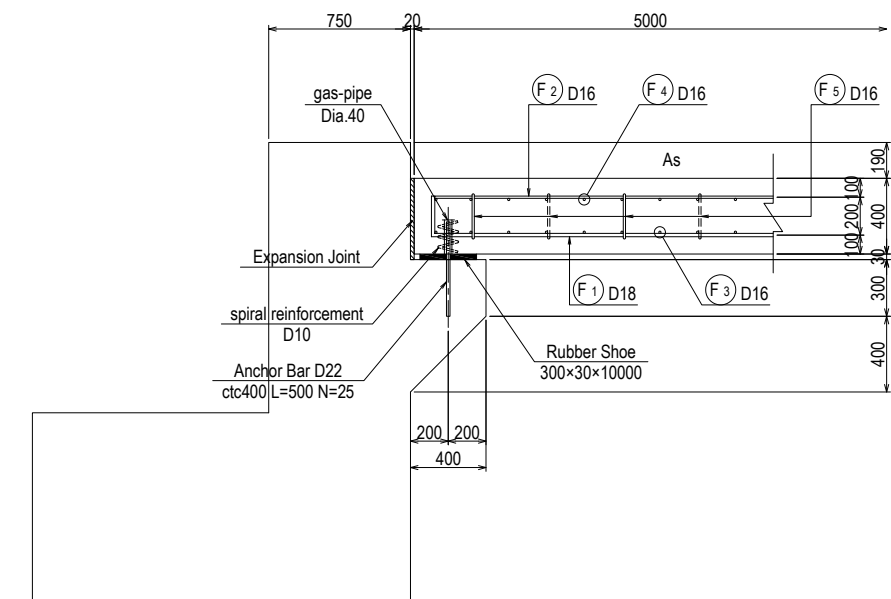
Reinforcement Plan

Scale A



Detail 'a'

Scale B

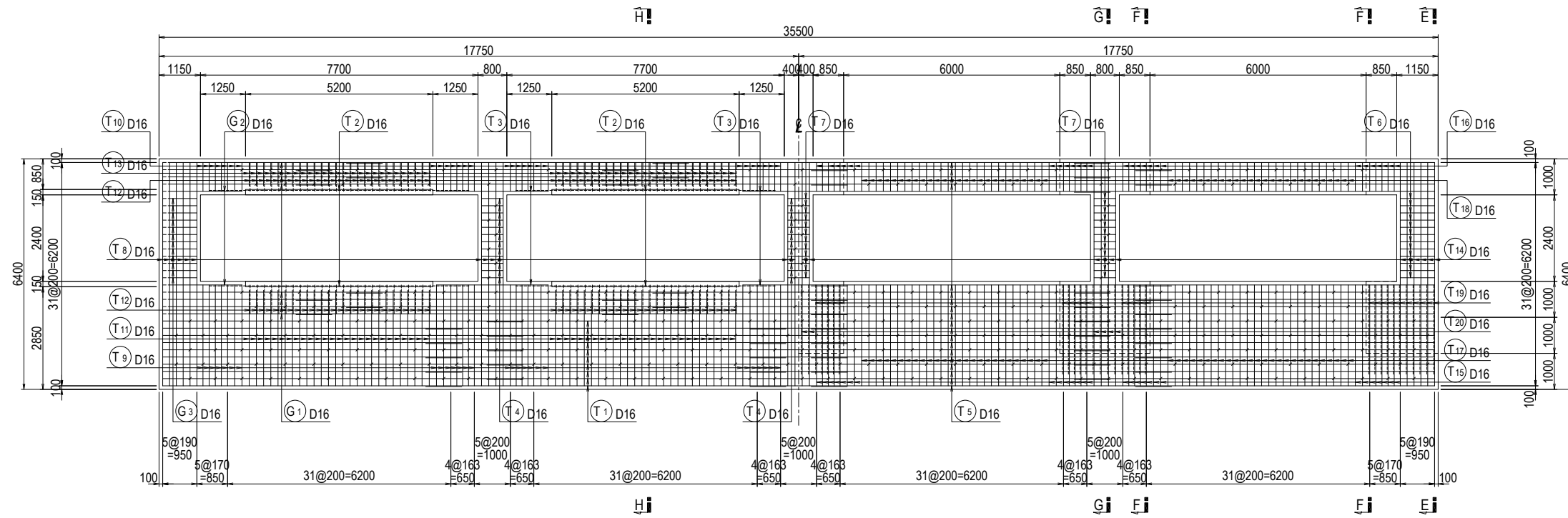


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Bahr Yusef Regulator Approach Cushion Slab		DRW. NO. CB-13
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

# Detail of Gate Abutment and Pier of Bahr Yusef Regulator

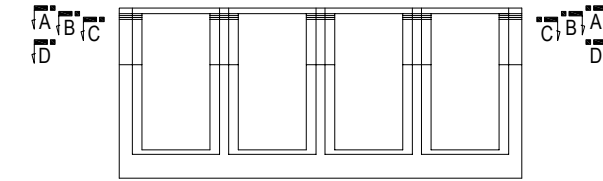
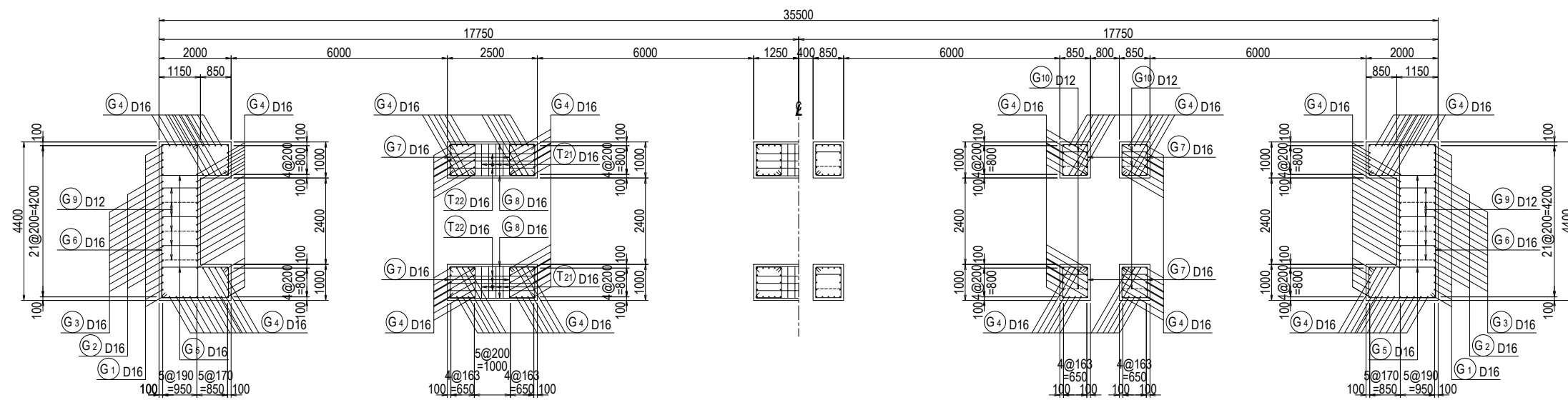
Section A—A

Section B—B



Section C—C

Section D—D

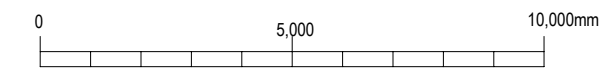
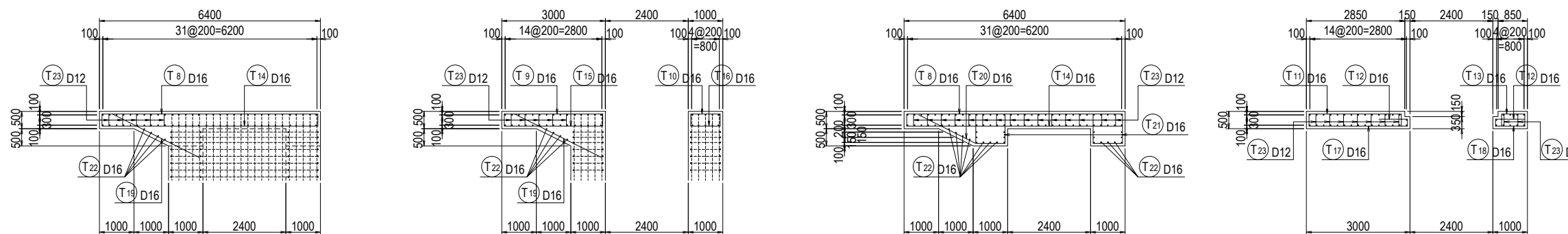


Section E—E

Section F—F

Section G—G

Section H—H



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Bahr Yusef Regulator Bar arrangement of weir body (1)	DRW. NO CB-14	
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

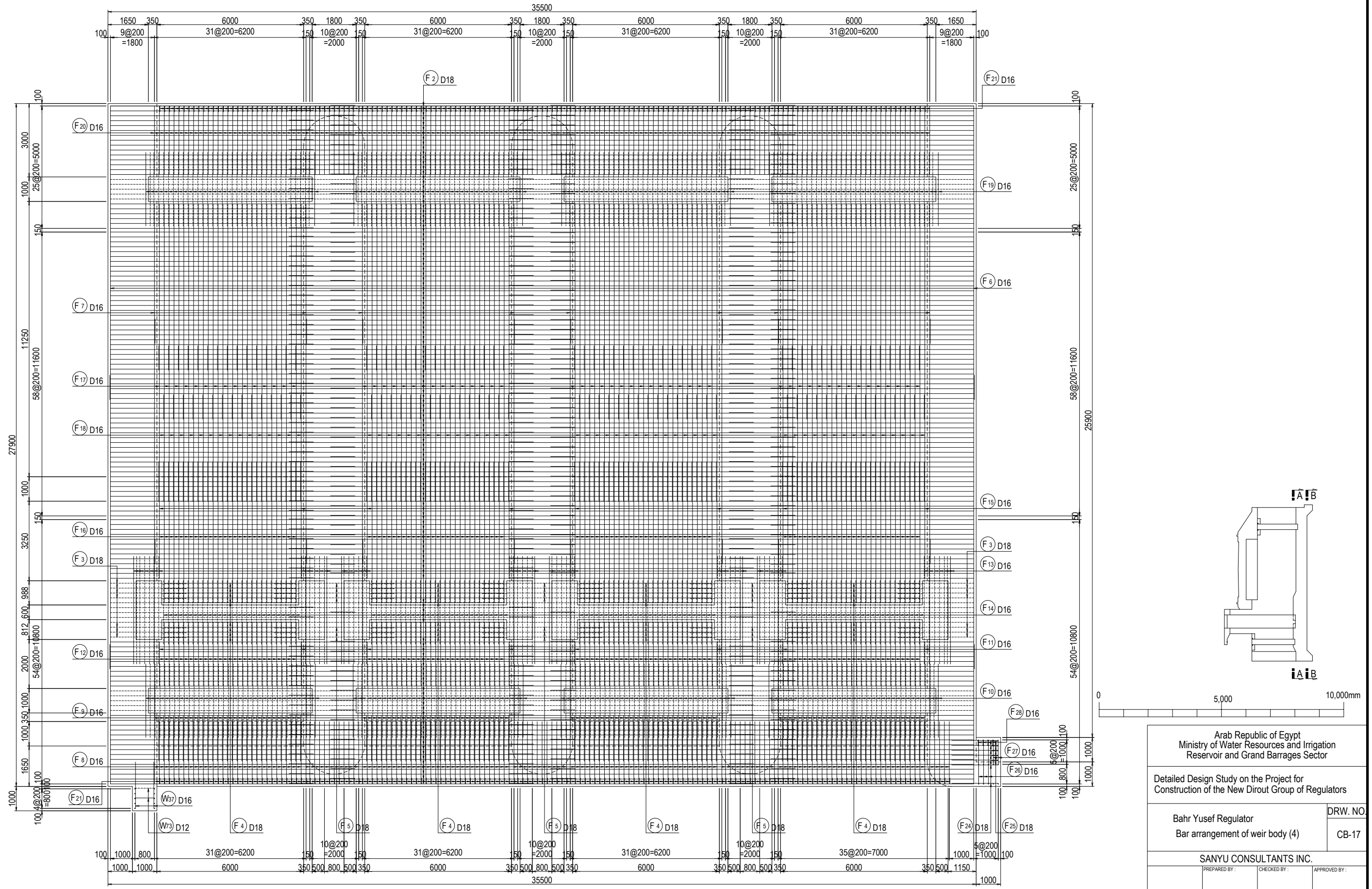






# Plan of Upstream Apron of Bahr Yusef Regulator (1/2)

## Section A—A



Arab Republic of Egypt  
Ministry of Water Resources and Irrigation  
Reservoir and Grand Barrages Sector

Detailed Design Study on the Project for  
Construction of the New Dirout Group of Regulators

Bahr Yusef Regulator  
Bar arrangement of weir body (4)

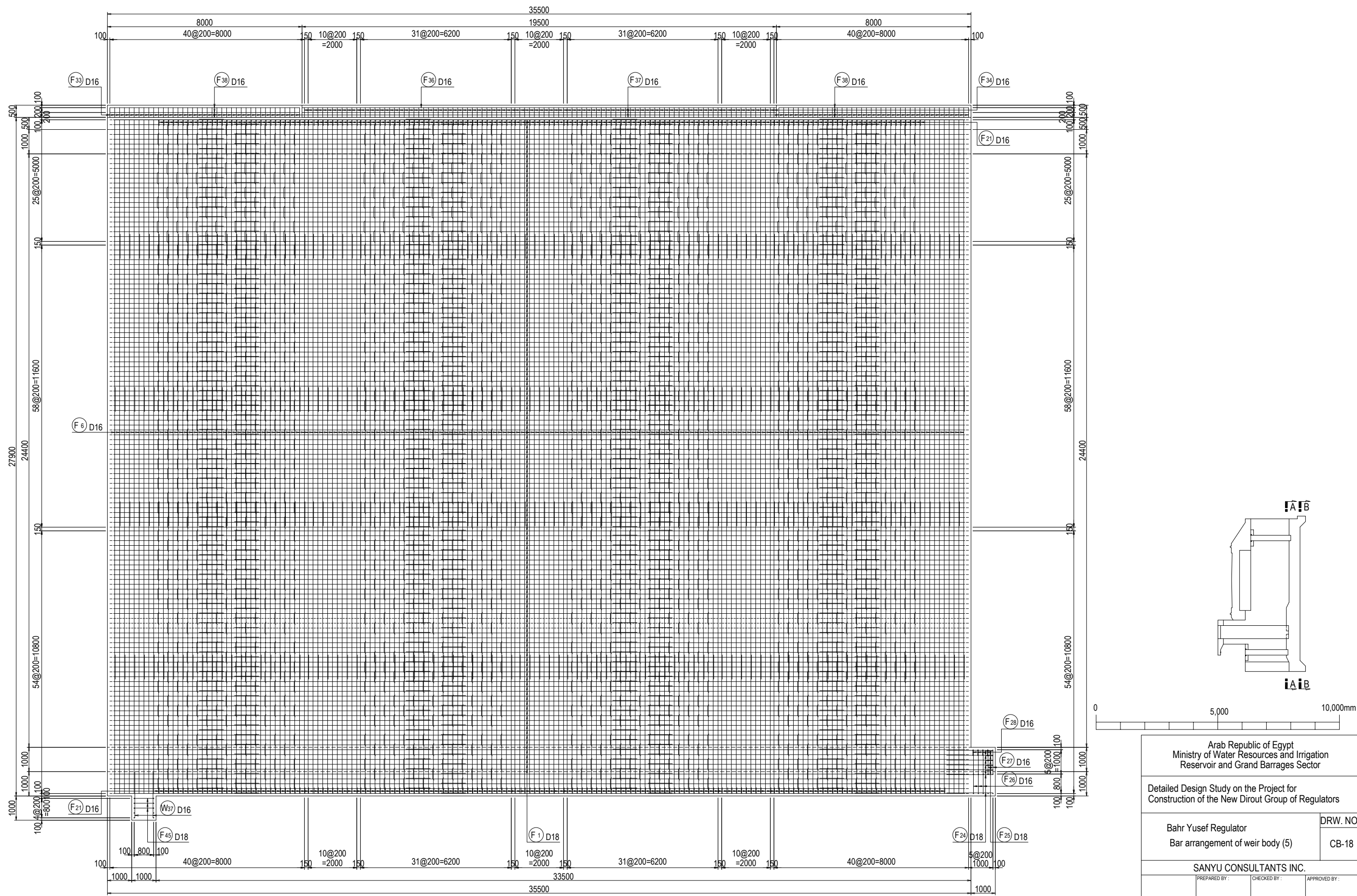
SANYU CONSULTANTS INC.

PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

DRW. NO  
CB-17

# Plan of Upstream Apron of Bahr Yusef Regulator (2/2)

## Section B—B



Arab Republic of Egypt  
Ministry of Water Resources and Irrigation  
Reservoir and Grand Barrages Sector

Detailed Design Study on the Project for  
Construction of the New Dirout Group of Regulators

Bahr Yusef Regulator  
Bar arrangement of weir body (5)

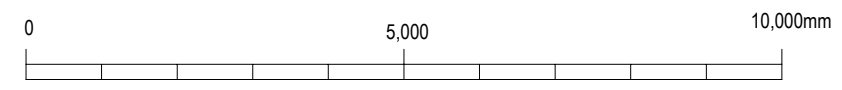
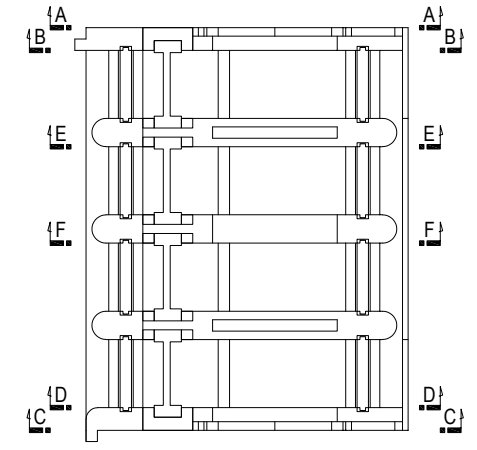
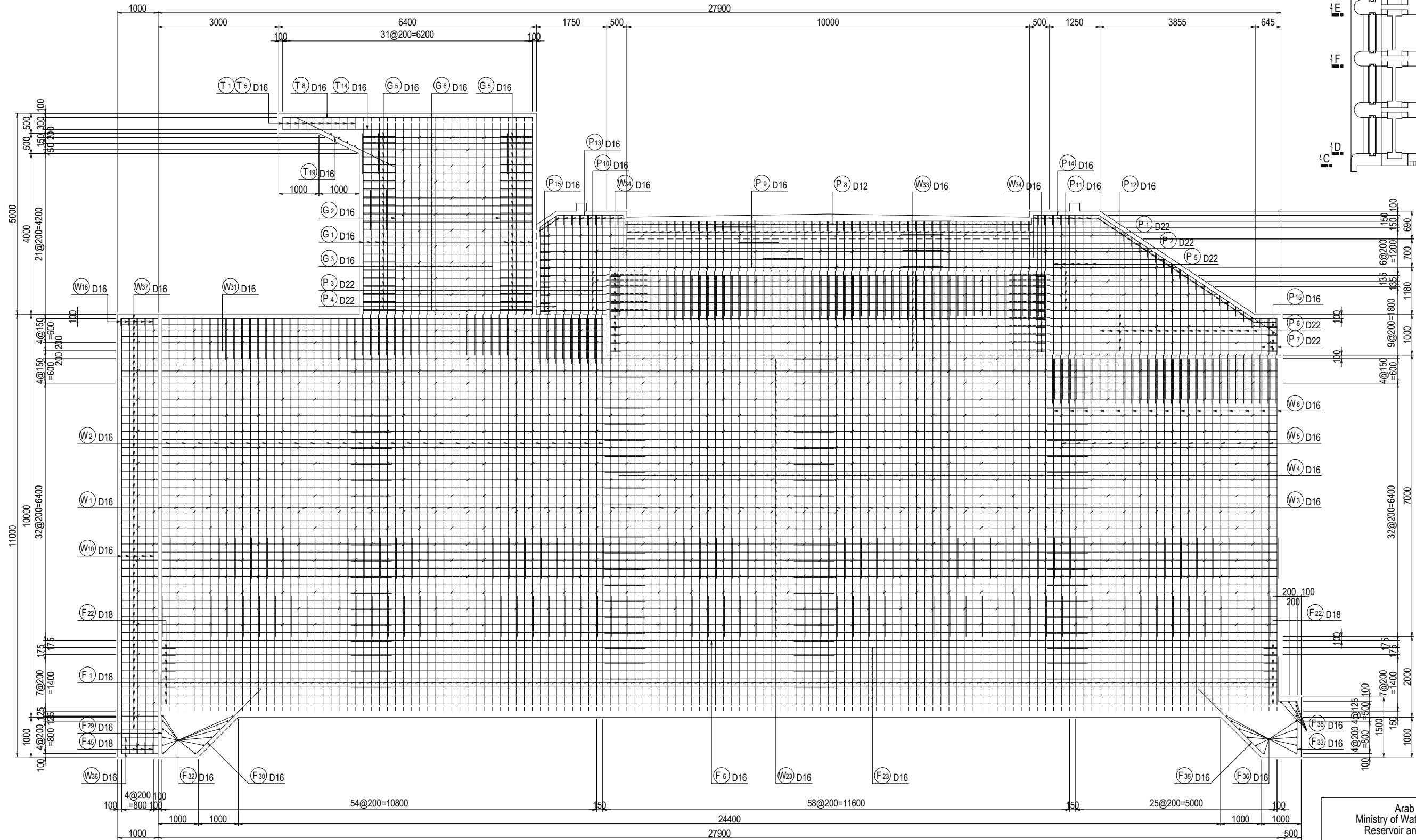
SANYU CONSULTANTS INC.

PREPARED BY: \_\_\_\_\_ CHECKED BY: \_\_\_\_\_ APPROVED BY: \_\_\_\_\_  
DATE: \_\_\_\_\_ DATE: \_\_\_\_\_ DATE: \_\_\_\_\_

DRW. NO  
CB-18

# Longitudinal Section of Gate Abutment and Pier of Bahr Yusef Regulator (1/6)

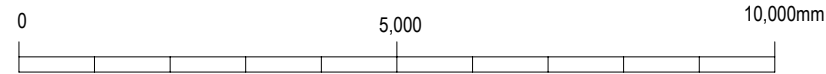
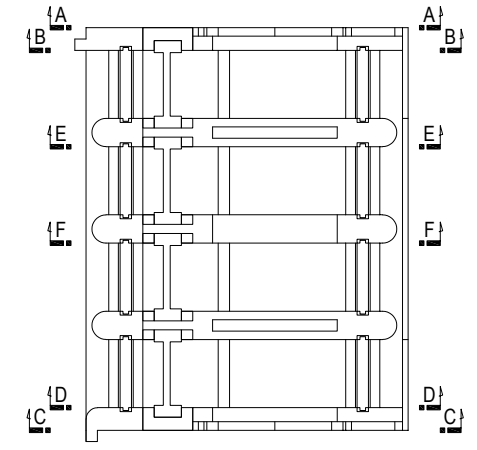
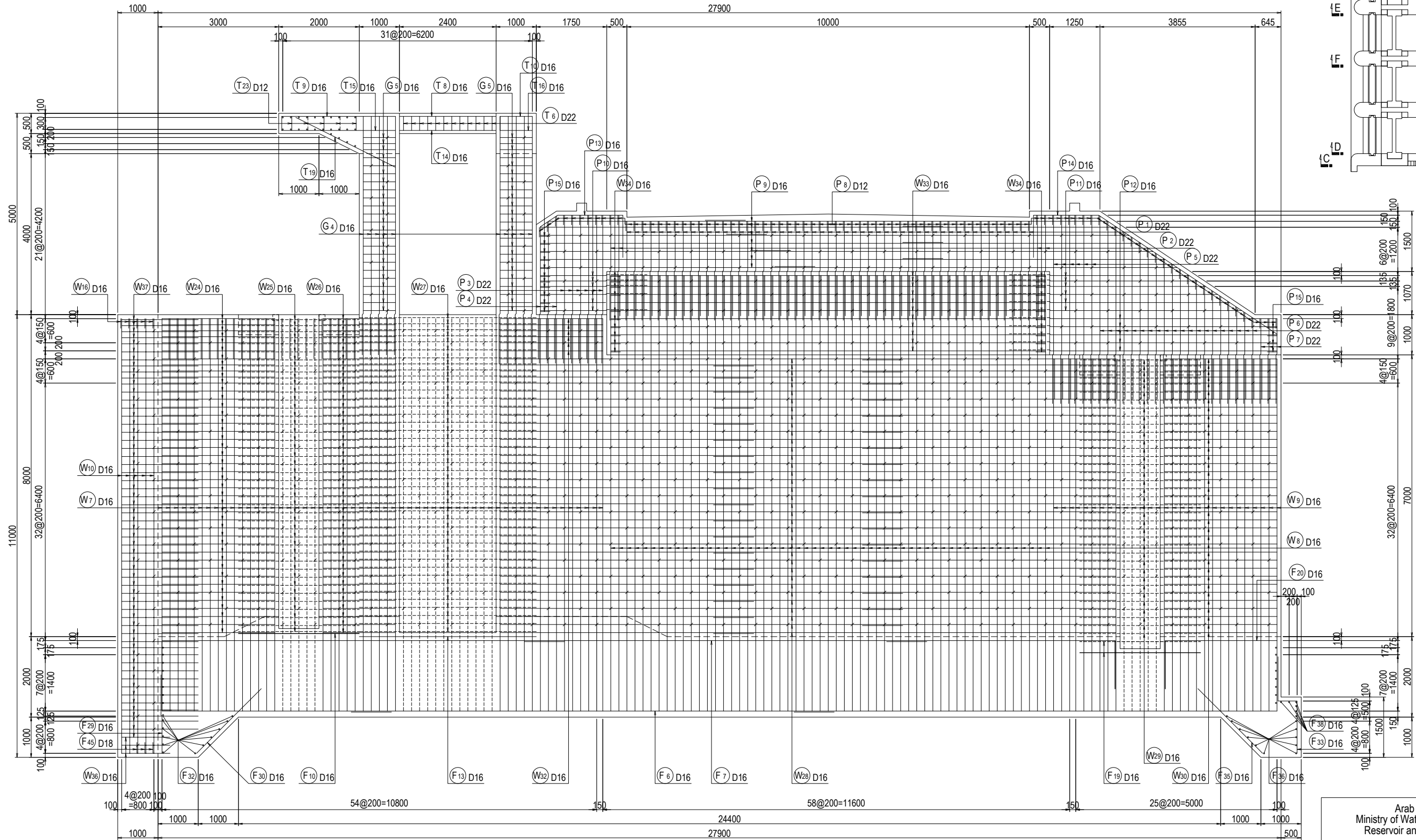
## Section A—A



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Bahr Yusef Regulator Bar arrangement of weir body (6)	DRW. NO CB-19	
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

# Longitudinal Section of Gate Abutment and Pier of Bahr Yusef Regulator (2/6)

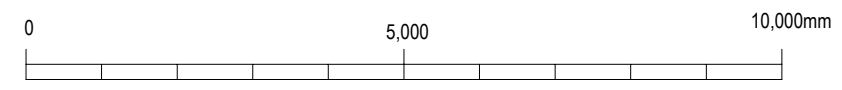
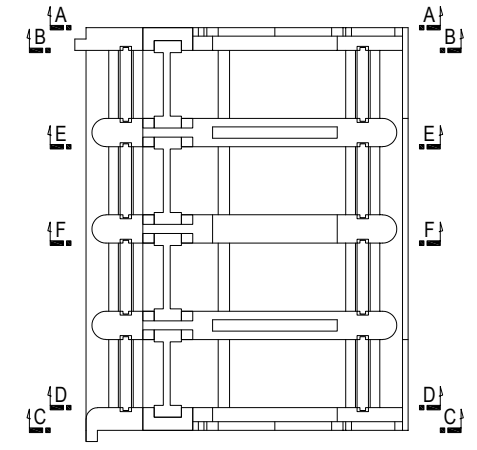
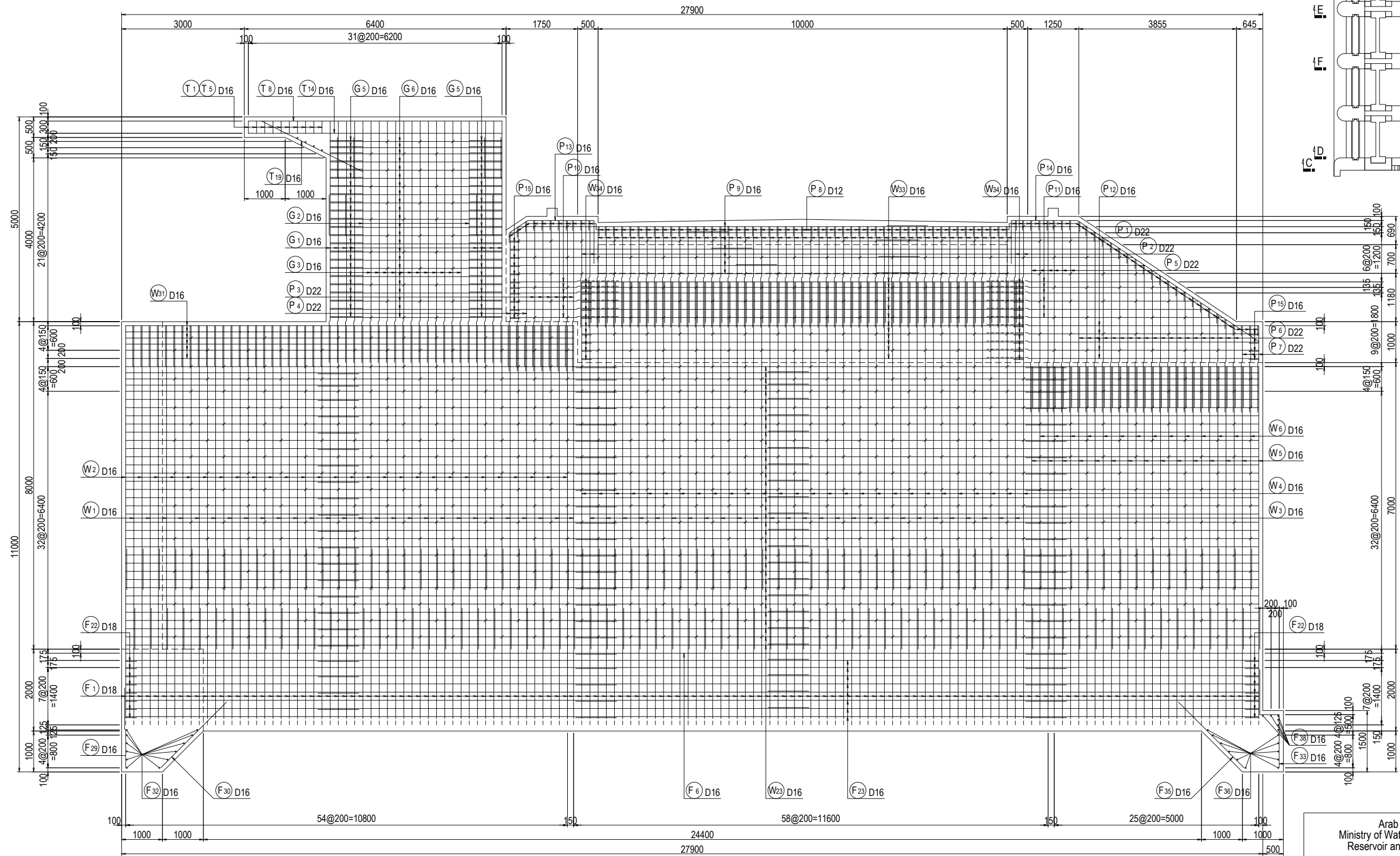
## Section B—B



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Bahr Yusef Regulator Bar arrangement of weir body (7)	DRW. NO CB-20	
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

# Longitudinal Section of Gate Abutment and Pier of Bahr Yusef Regulator (3/6)

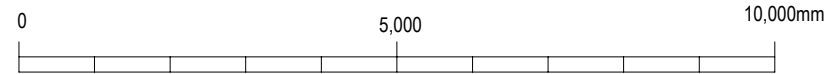
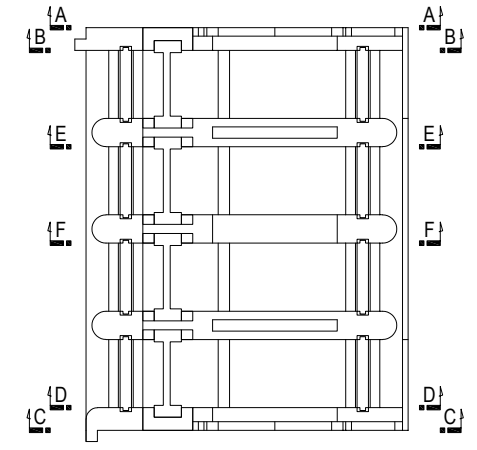
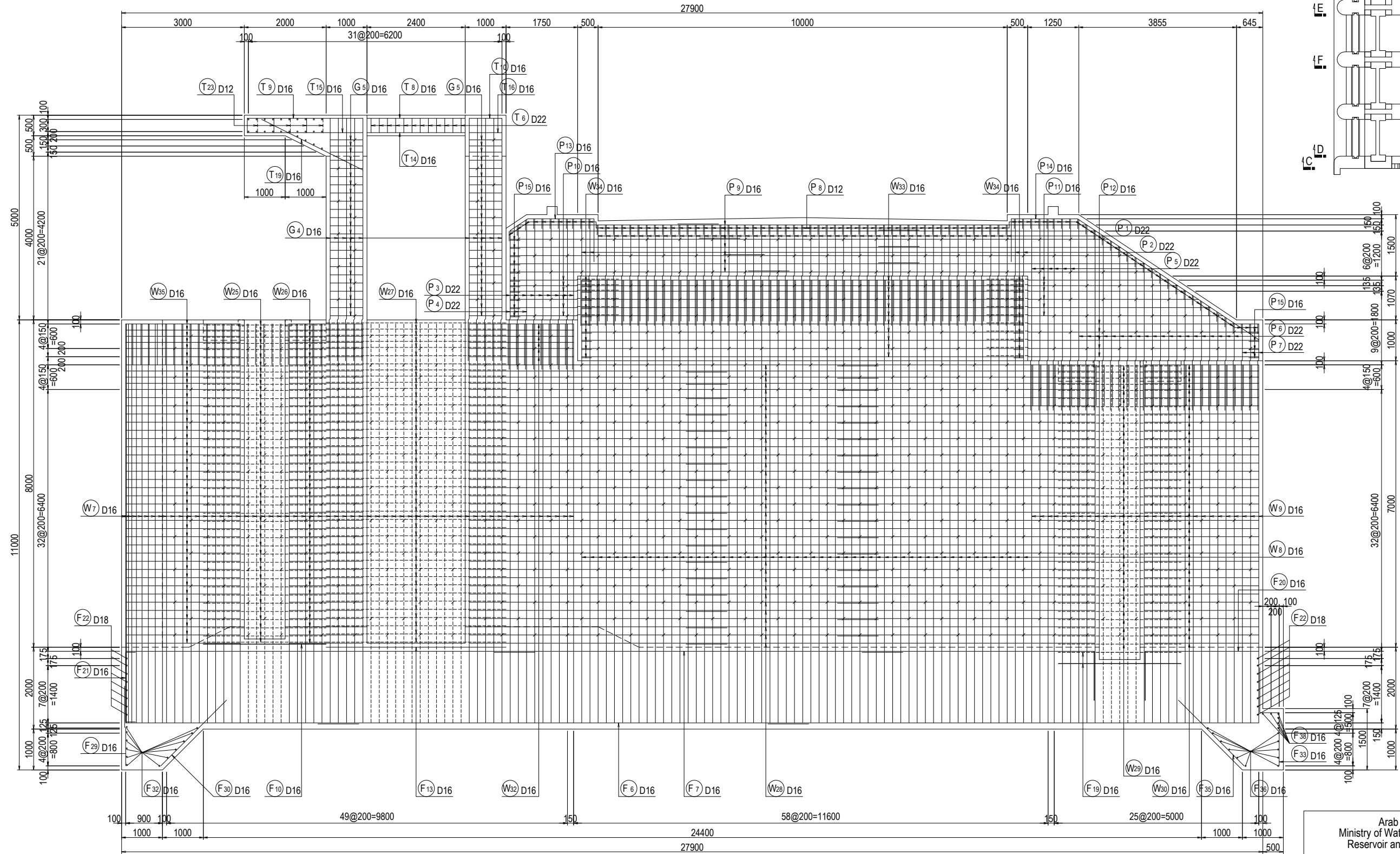
## Section C—C



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Bahr Yusef Regulator Bar arrangement of weir body (8)	DRW. NO CB-21	
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

# Longitudinal Section of Gate Abutment and Pier of Bahr Yusef Regulator (4/6)

## Section D—D

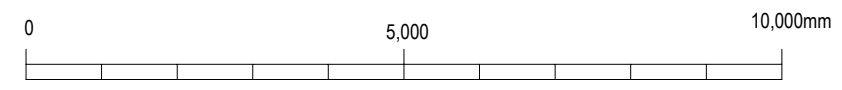
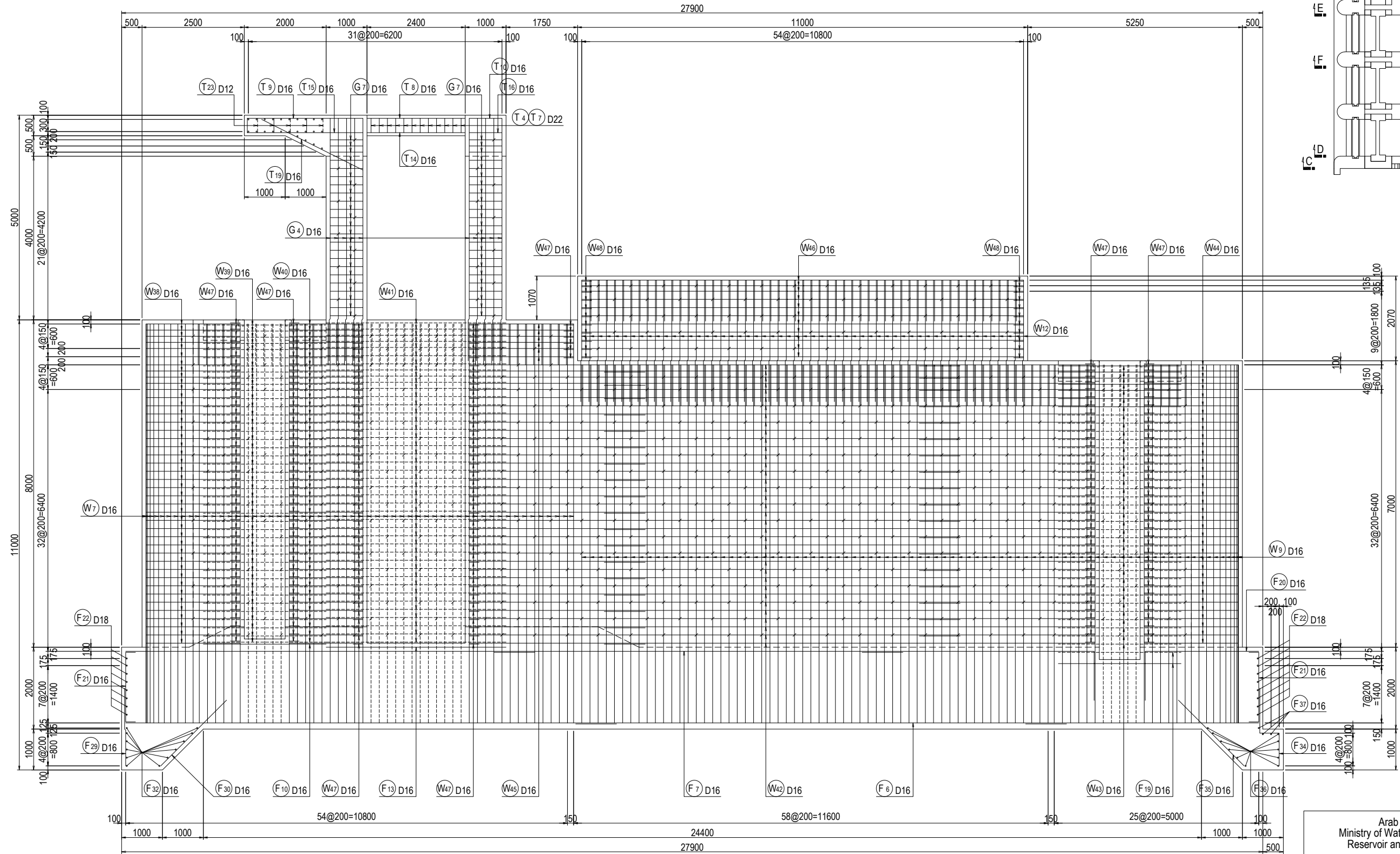


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Bahr Yusef Regulator Bar arrangement of weir body (9)	DRW. NO CB-22	
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:



# Longitudinal Section of Gate Abutment and Pier of Bahr Yusef Regulator (5/6)

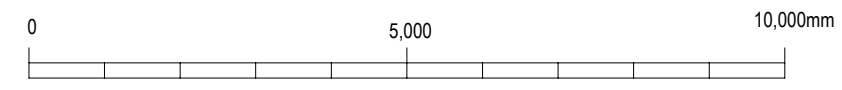
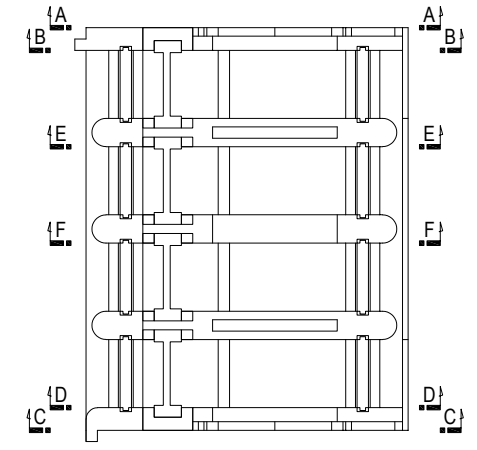
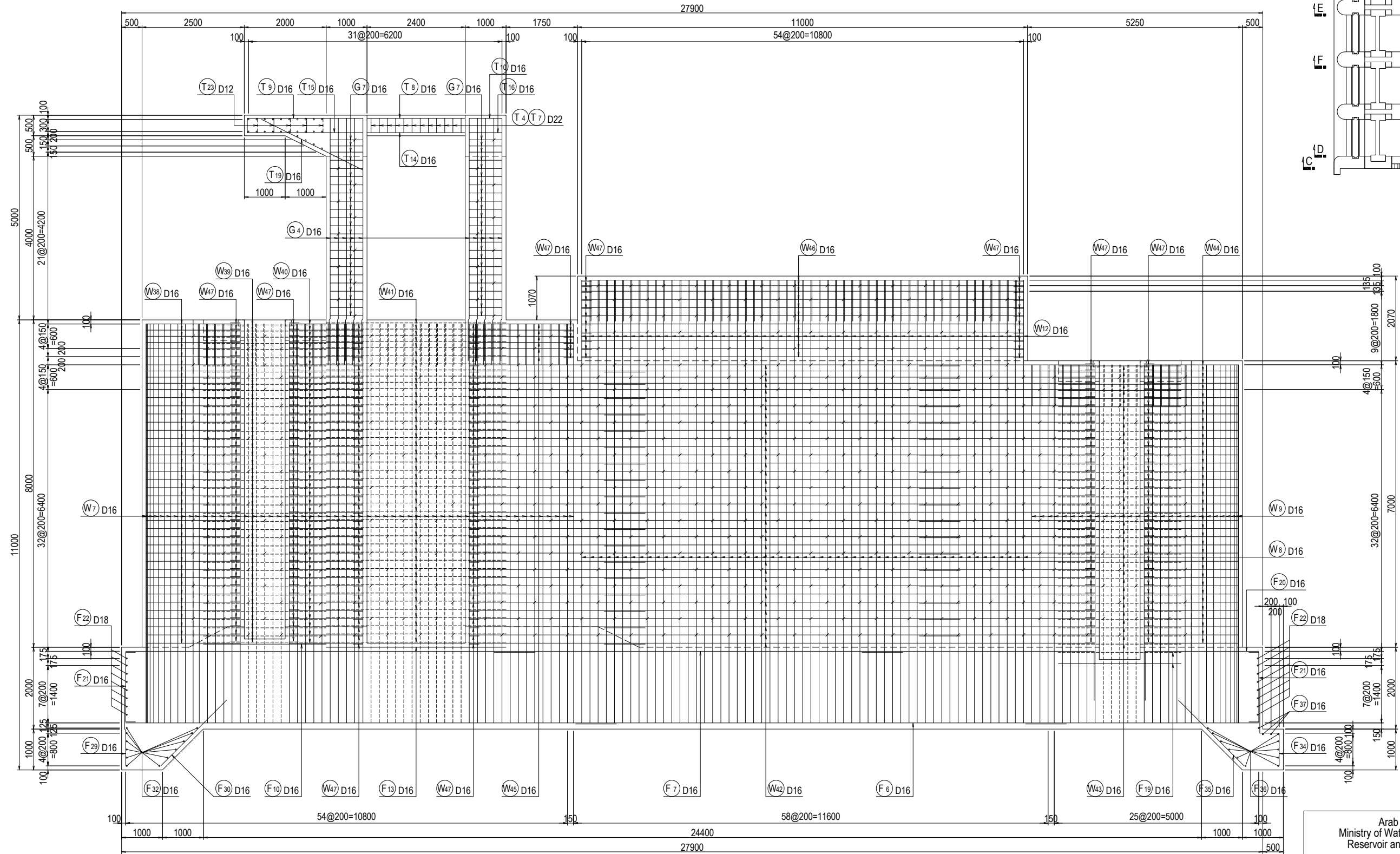
## Section E—E



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Bahr Yusef Regulator Bar arrangement of weir body (10)	DRW. NO CB-23	
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

# Longitudinal Section of Gate Abutment and Pier of Bahr Yusef Regulator (6/6)

## Section F—F

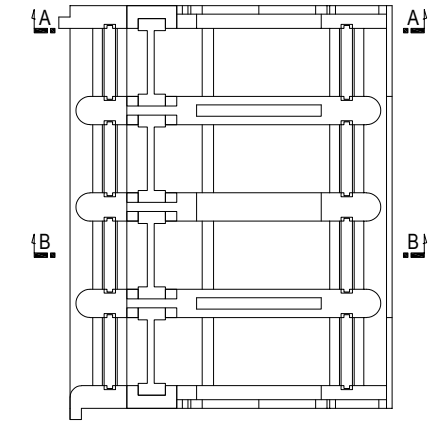
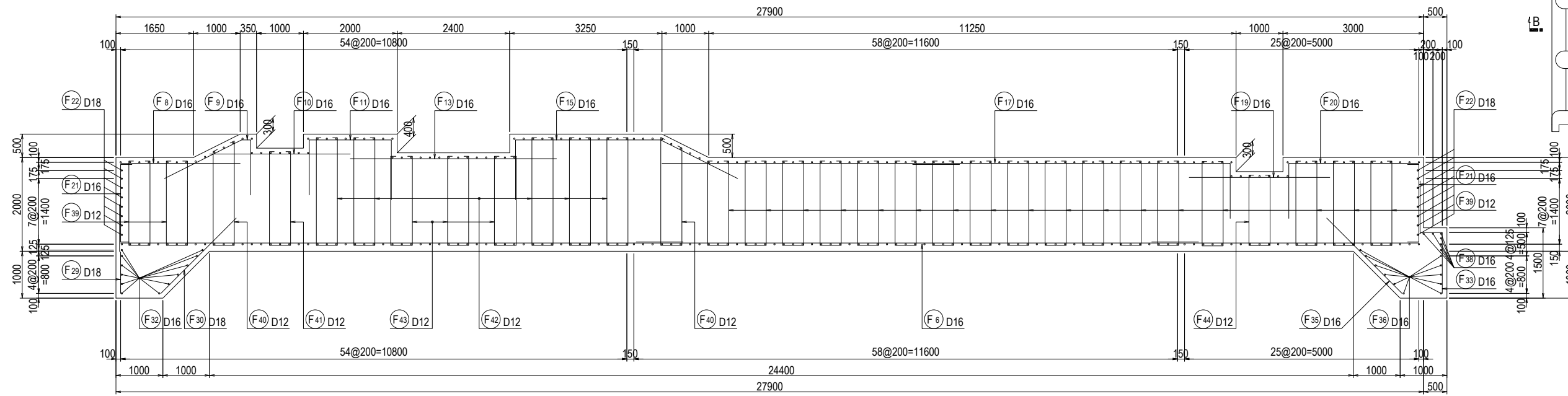


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Bahr Yusef Regulator Bar arrangement of weir body (11)			DRW. NO CB-24
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

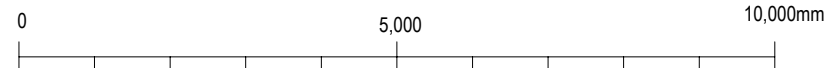
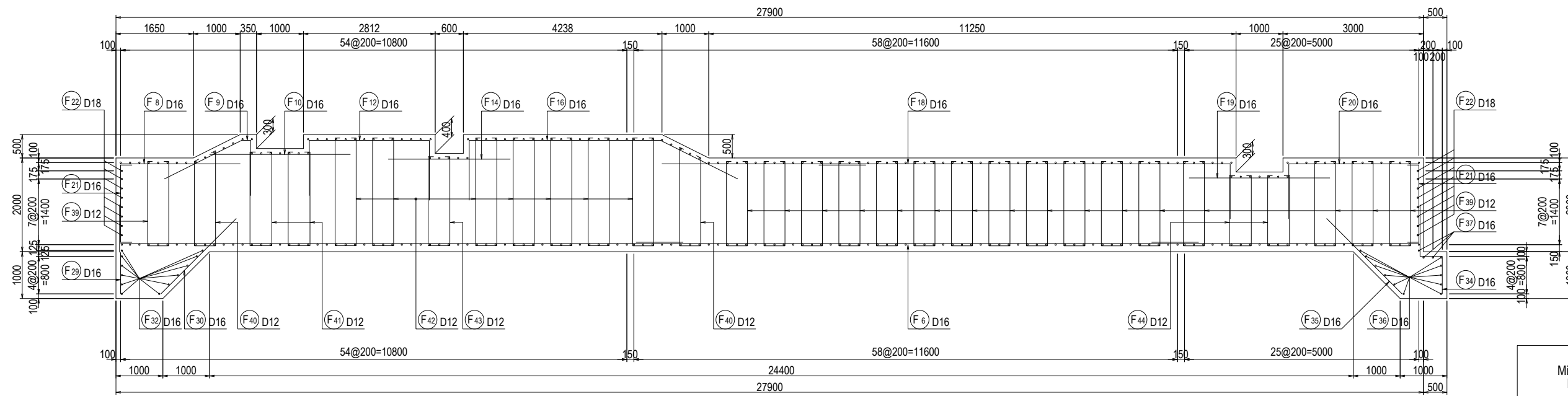


# Longitudinal Section of Upstream Apron of Bahr Yusef Regulator

## Section A—A



## Section B—B



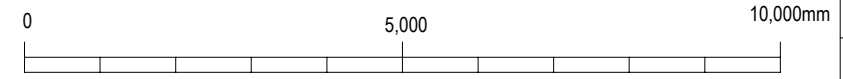
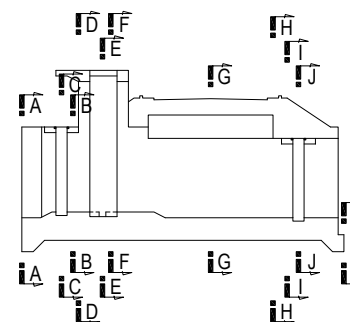
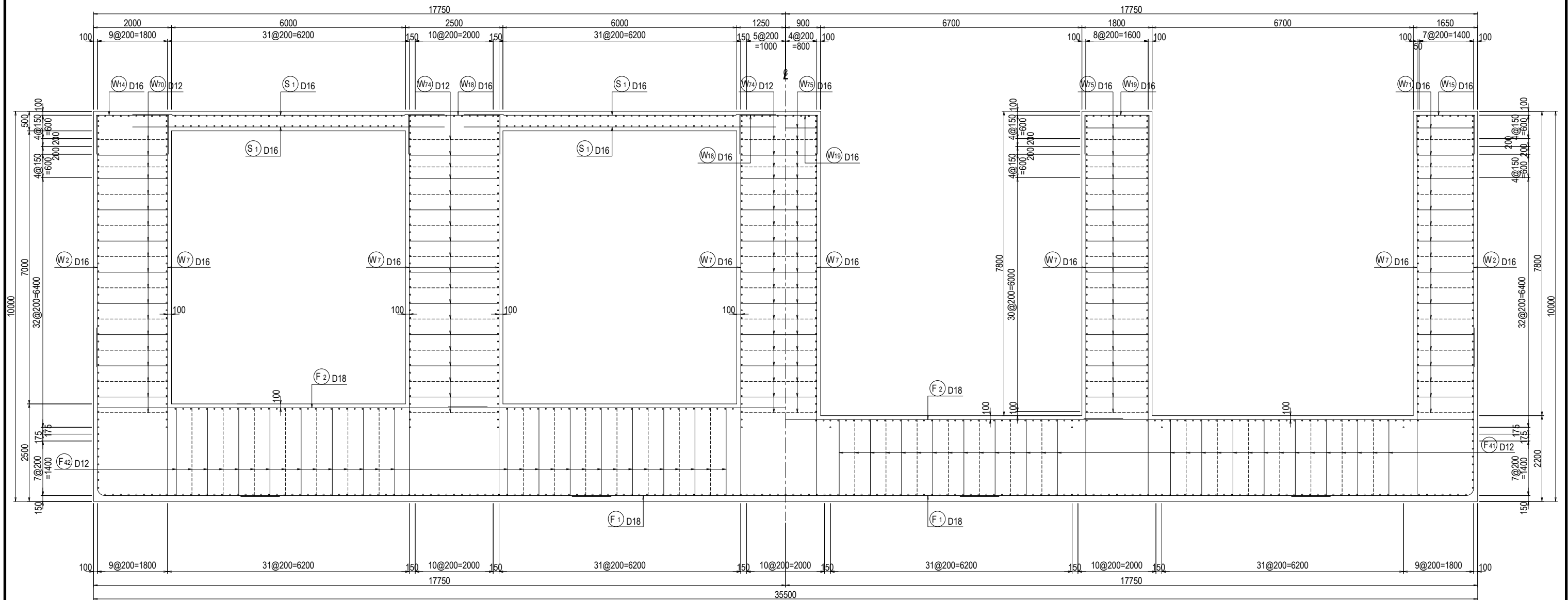
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Bahr Yusef Regulator Bar arrangement of weir body (13)	DRW. NO CB-26	
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:



# Section of Gate Abutment and Pier of Bahr Yusef Regulator (2/7)

## Section B—B

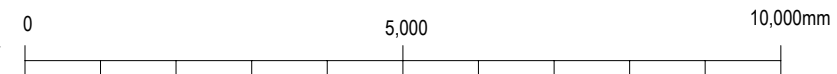
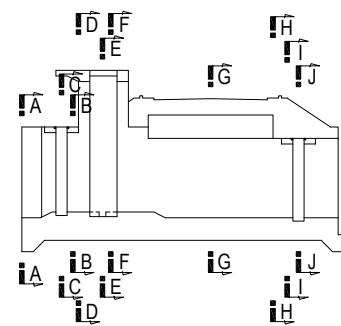
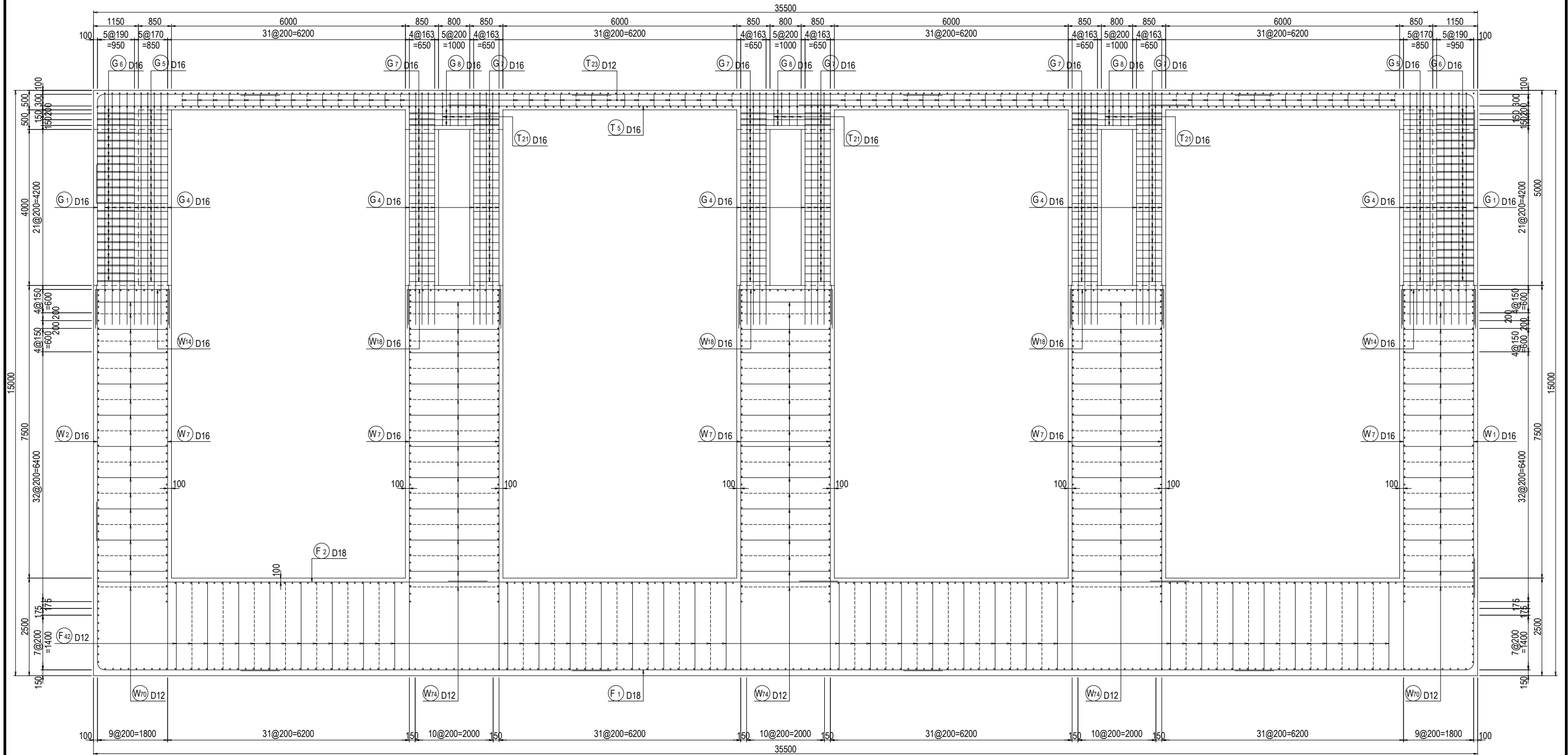
## Section C—C



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Bahr Yusef Regulator Bar arrangement of weir body (15)			DRW. NO CB-28
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Section of Gate Abutment and Pier of Bahr Yusef Regulator (3/7)

## Section D—D

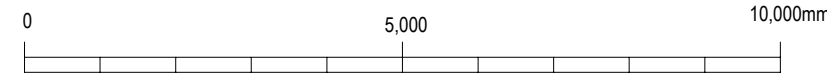
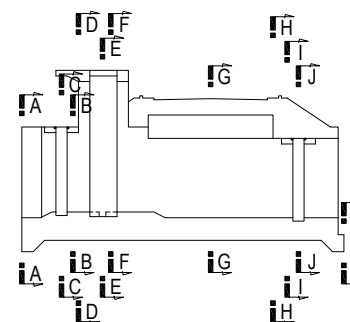
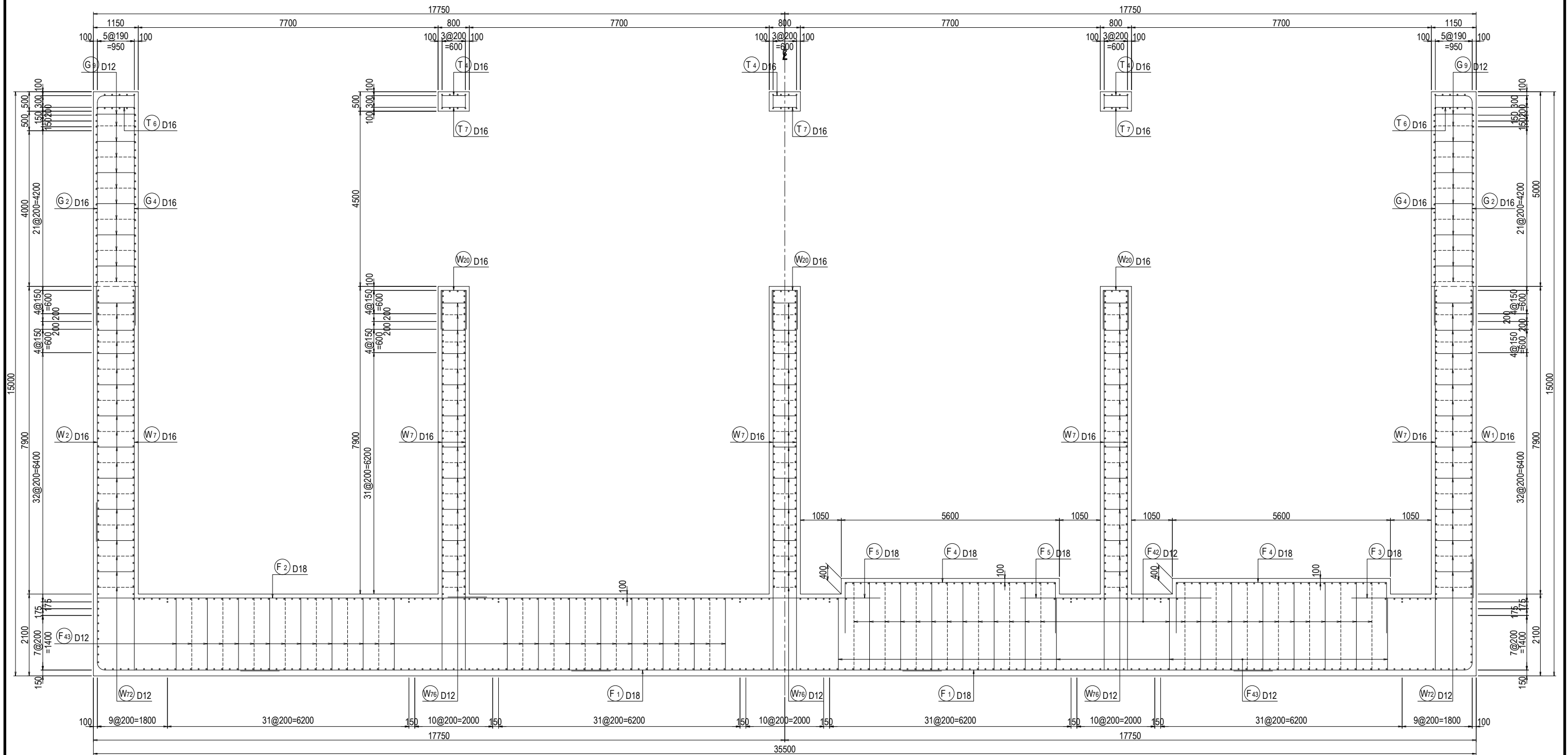


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Bahr Yusef Regulator Bar arrangement of weir body (16)	DRW. NO CB-29	
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

# Section of Gate Abutment and Pier of Bahr Yusef Regulator (4/7)

## Section E—E

## Section F—F



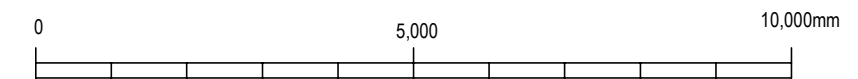
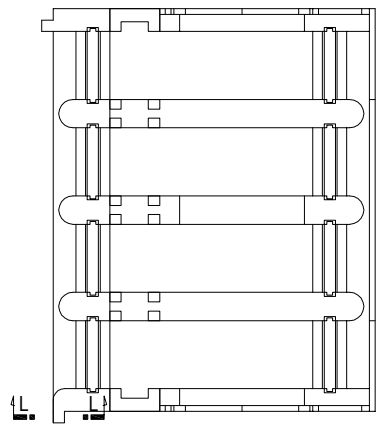
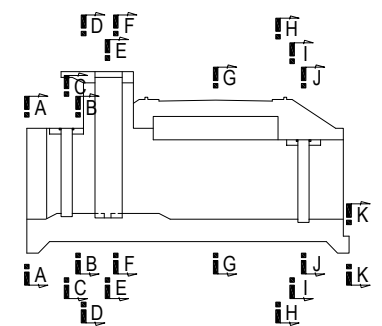
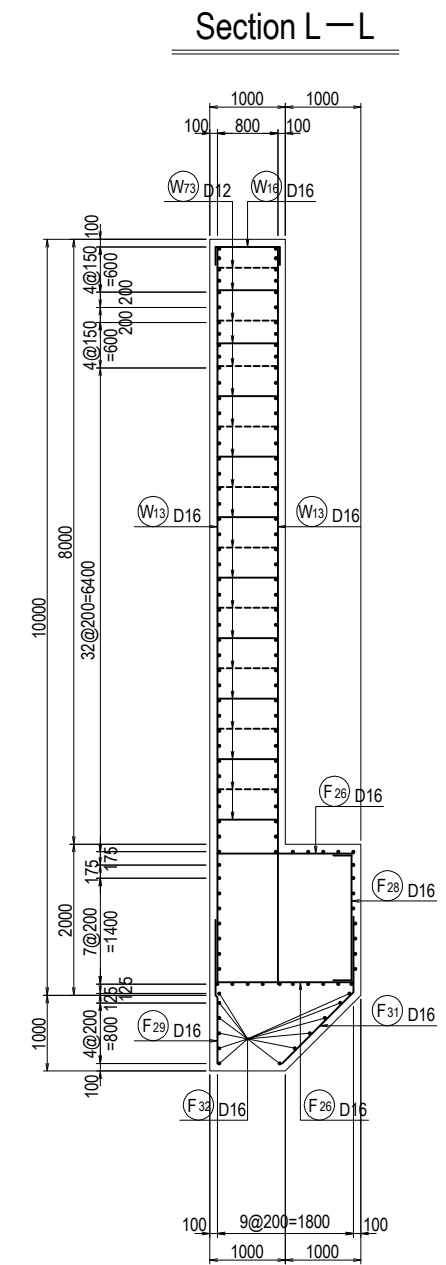
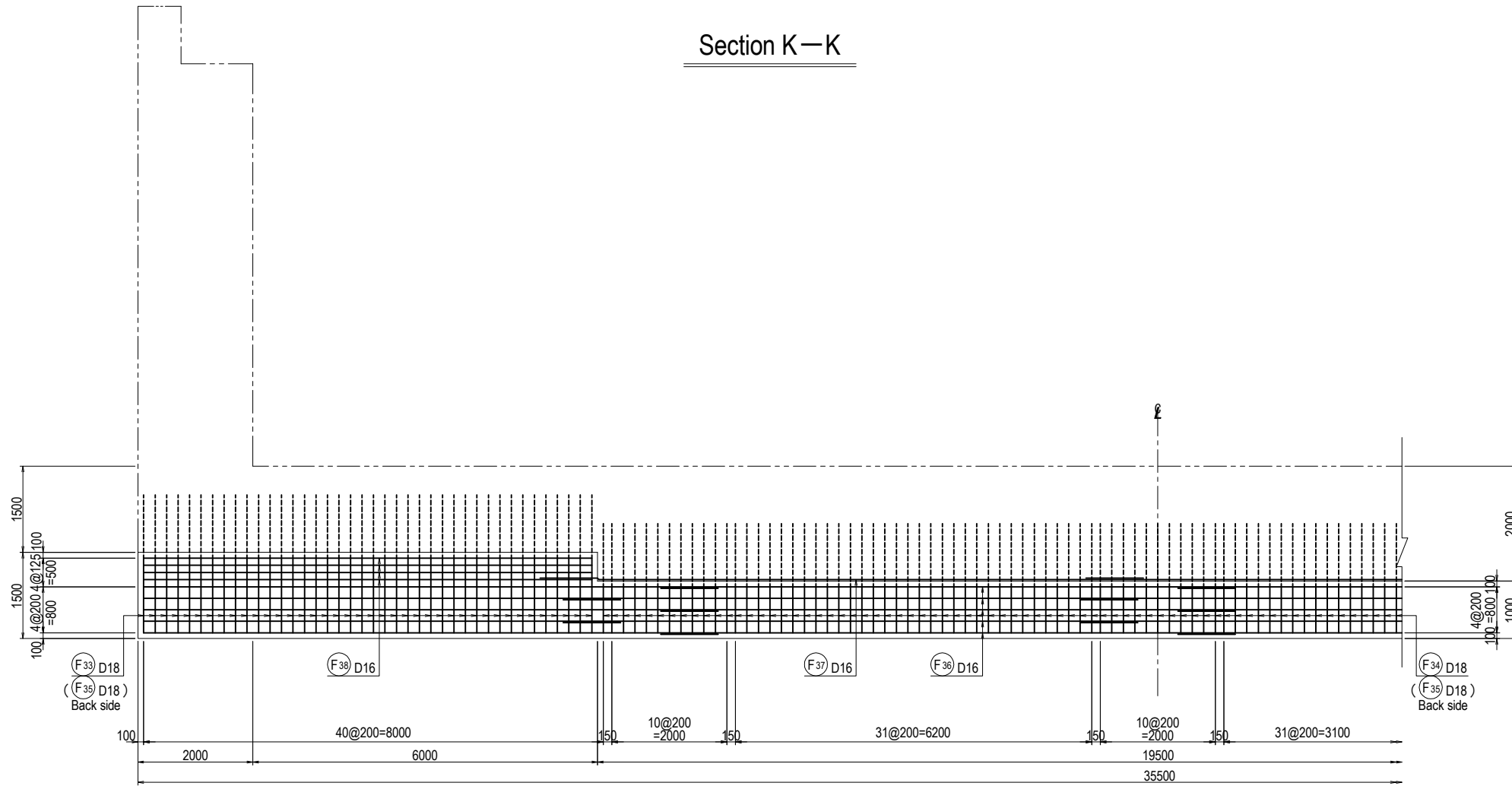
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Bahr Yusef Regulator Bar arrangement of weir body (17)			DRW. NO CB-30
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:







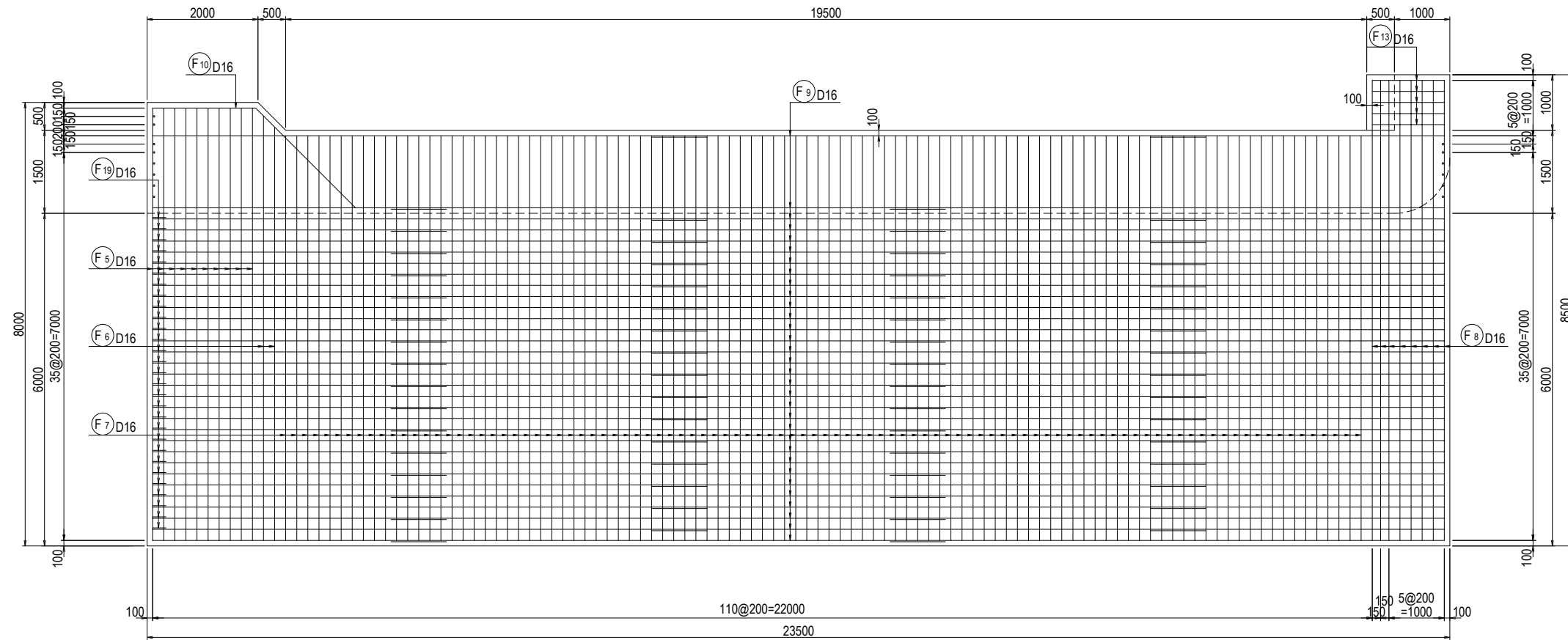
# Section of Gate Abutment and Pier of Bahr Yusef Regulator (7/7)



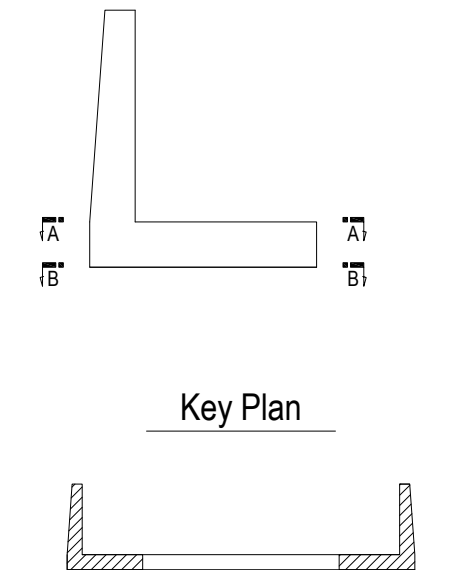
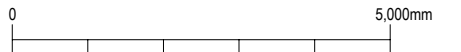
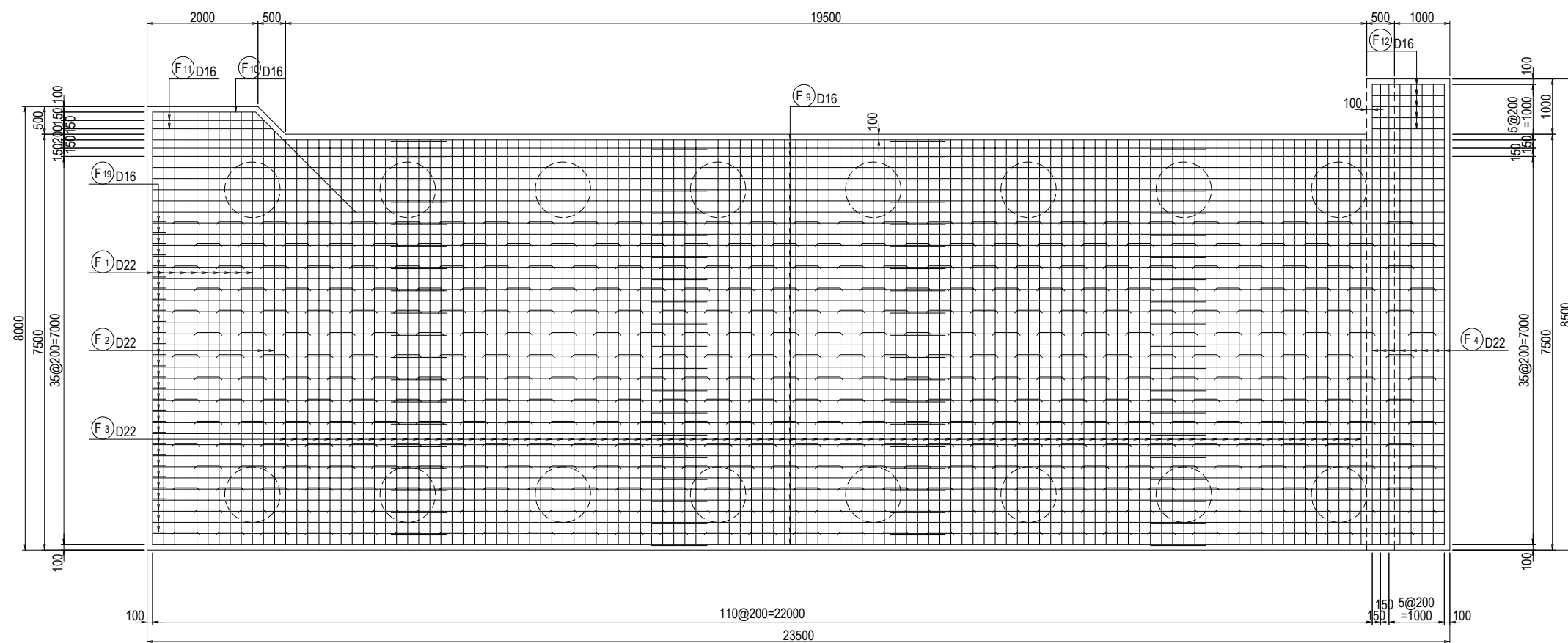
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Bahr Yusef Regulator Bar arrangement of weir body (20)			DRW. NO CB-33
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Detail of Down Stream Apron for Bahr Yusef Regulator (1/6)

## Section A—A



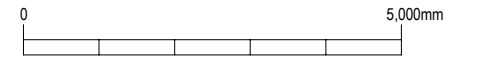
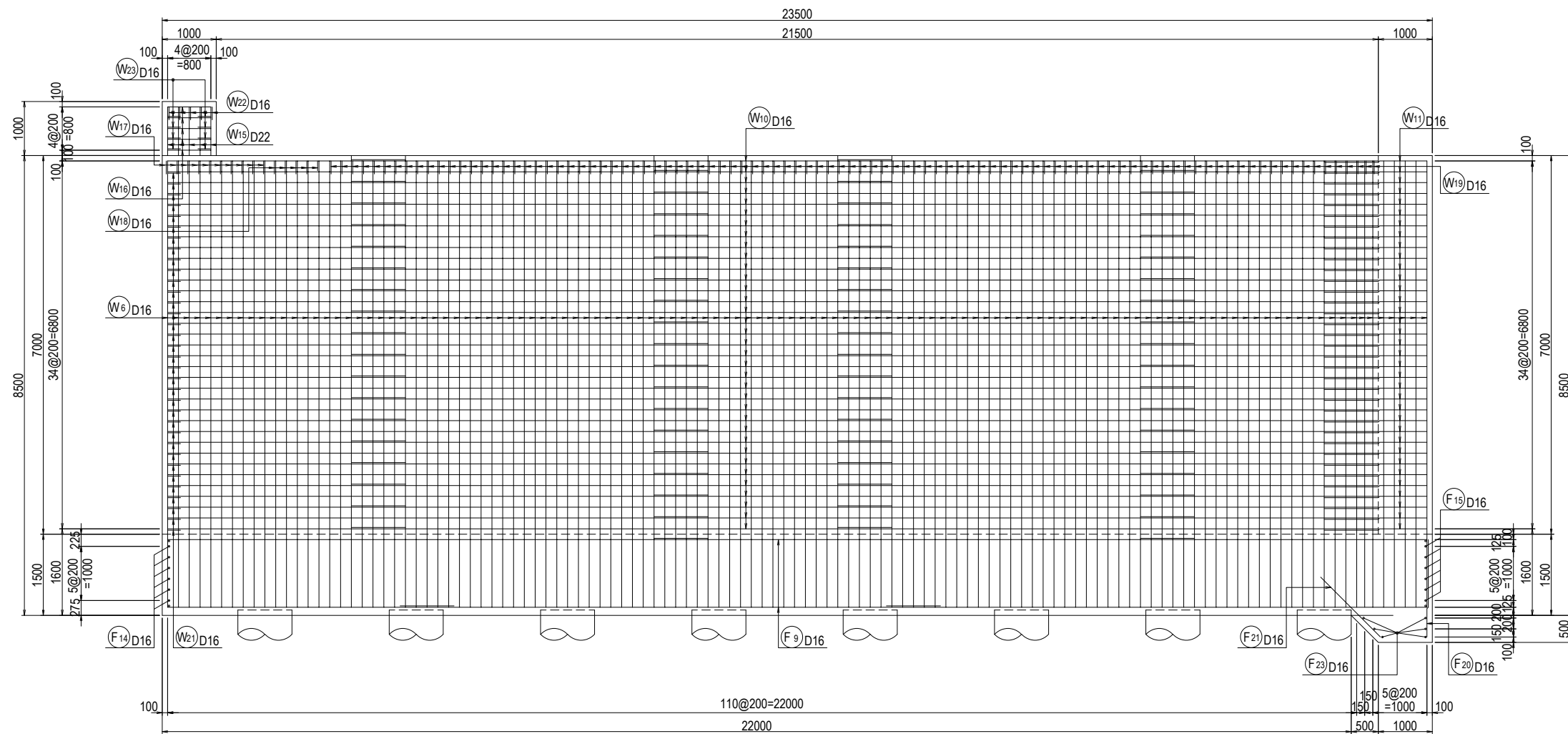
## Section B—B



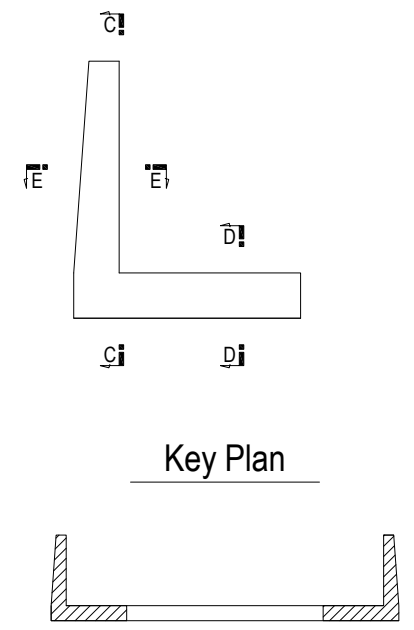
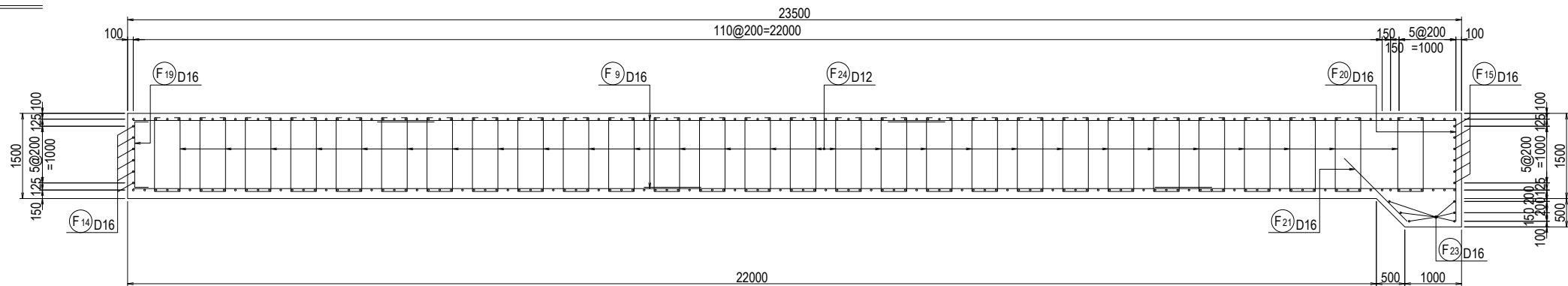
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Bahr Yusef Regulator Bar arrangement of downstream apron (1)			<b>DRW. NO.</b> CB-34
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Detail of Down Stream Apron for Bahr Yusef Regulator (2/6)

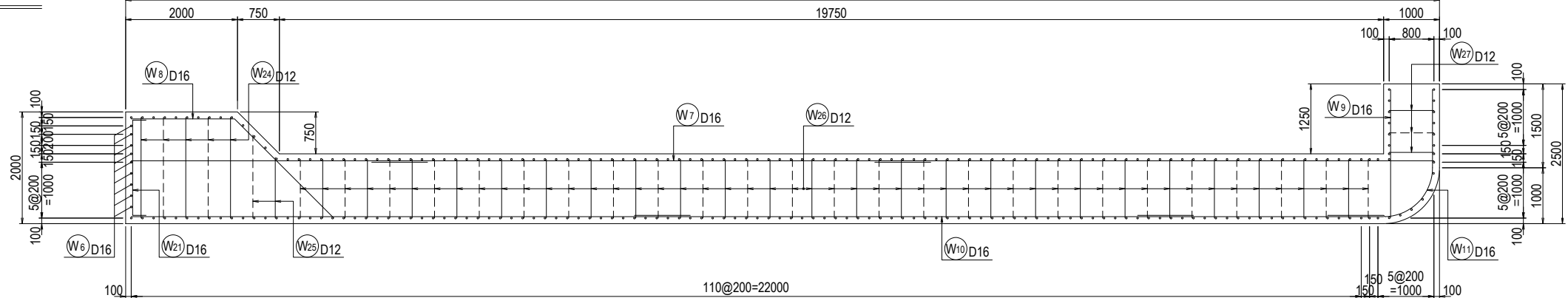
## Section C—C



## Section D—D

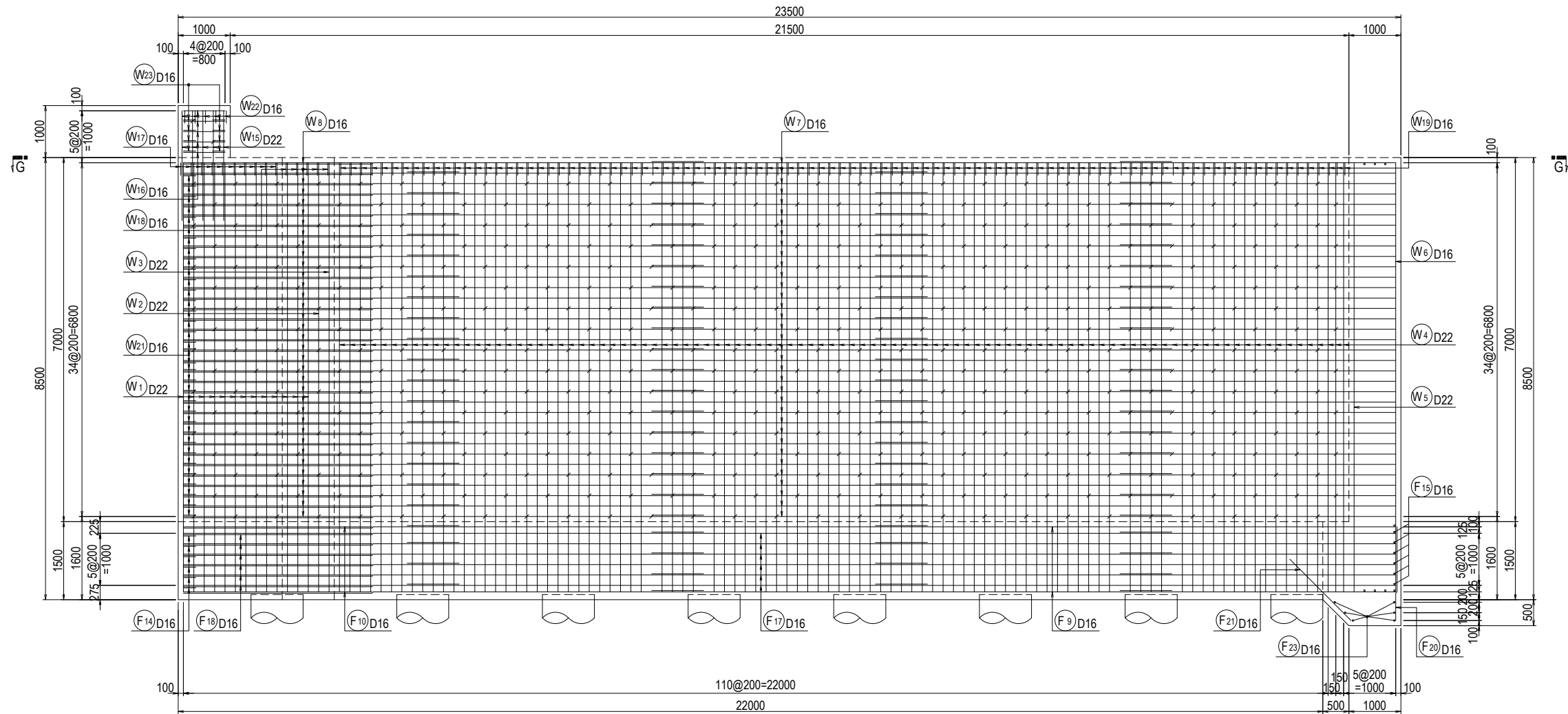


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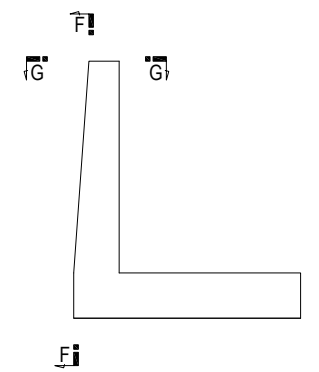
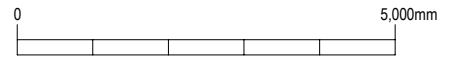
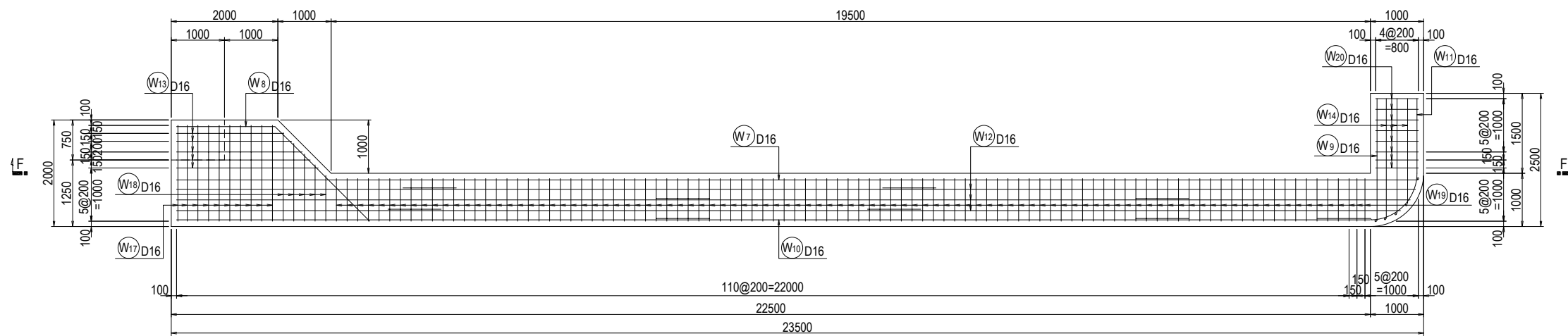


# Detail of Down Stream Apron for Bahr Yusef Regulator (3/6)

## Section F—F



## Section G—G



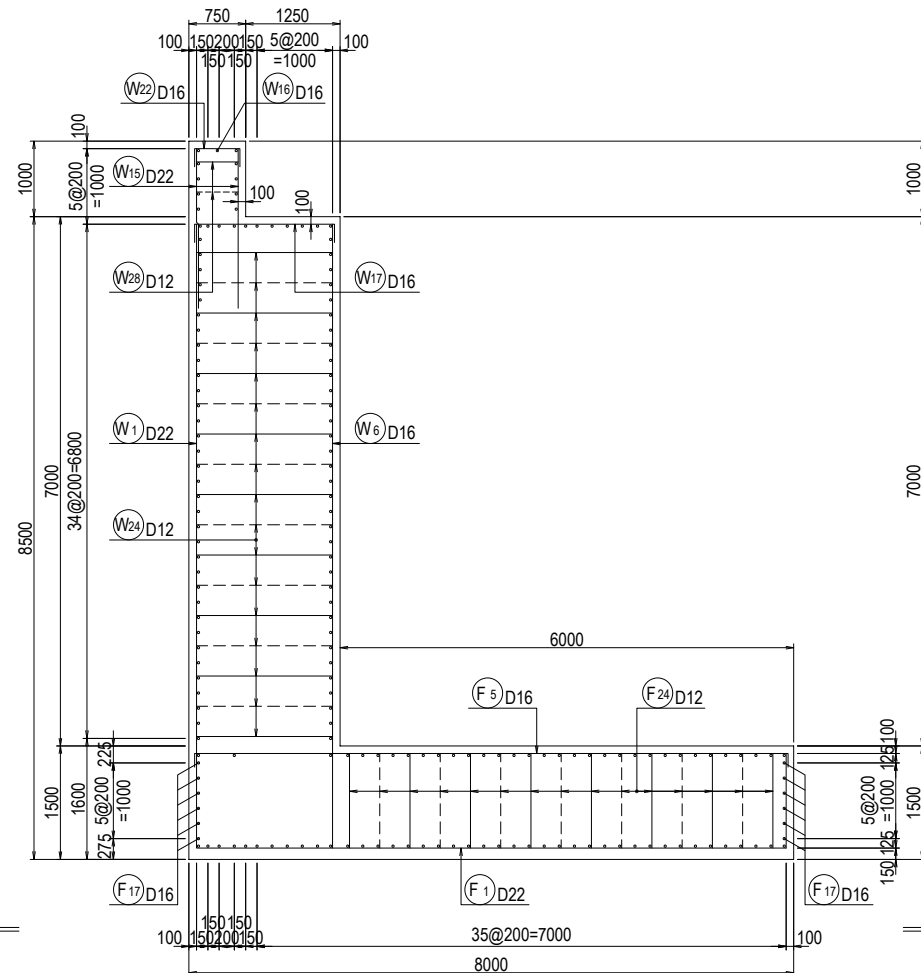
### Key Plan



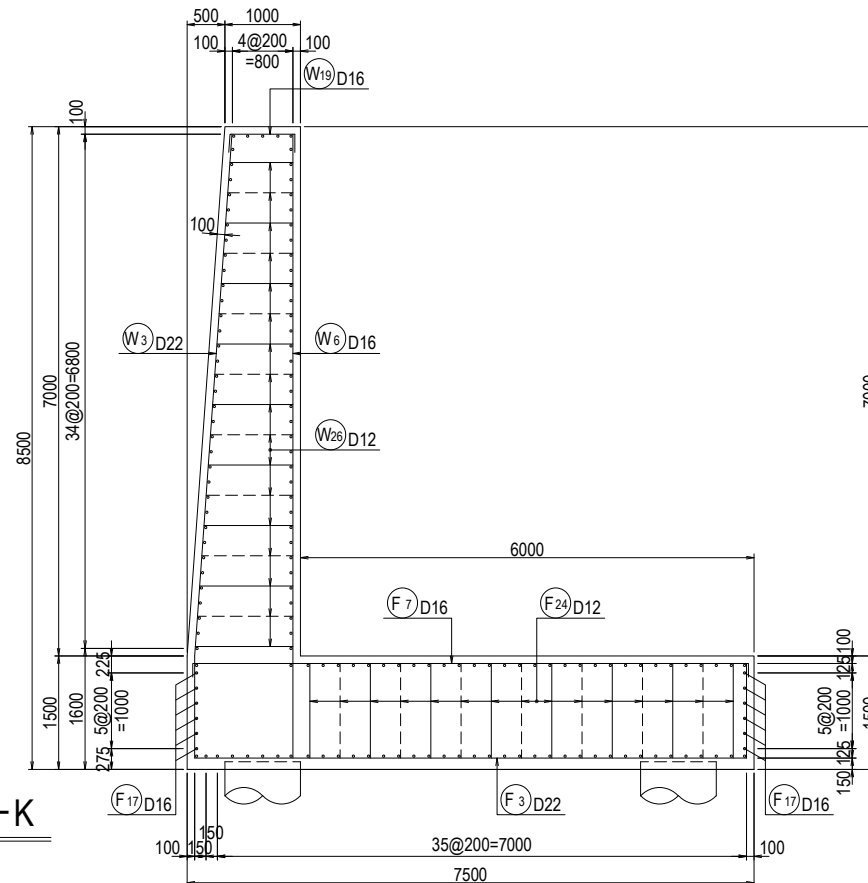
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Bahr Yusef Regulator Bar arrangement of downstream apron (3)			<b>DRW. NO.</b> CB-36
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Detail of Down Stream Apron for Bahr Yusef Regulator (4/6)

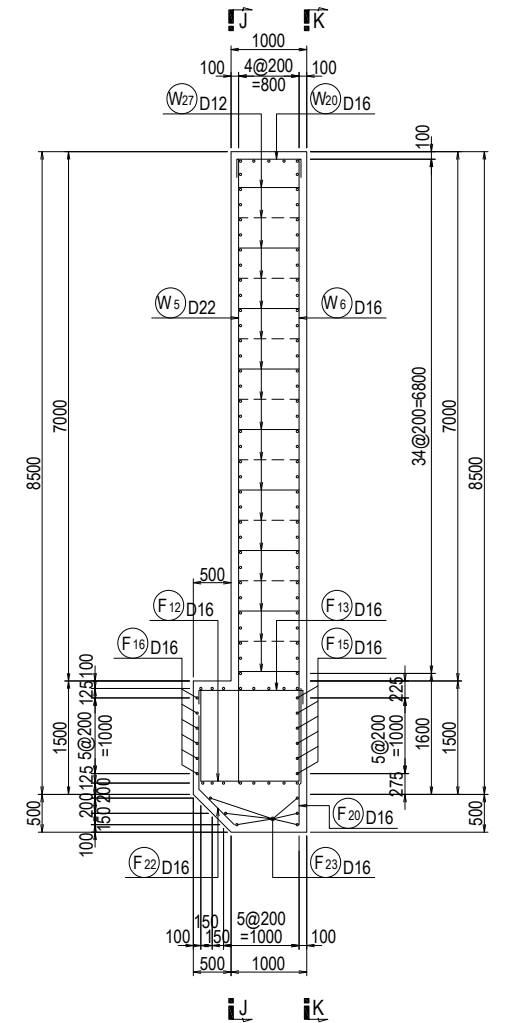
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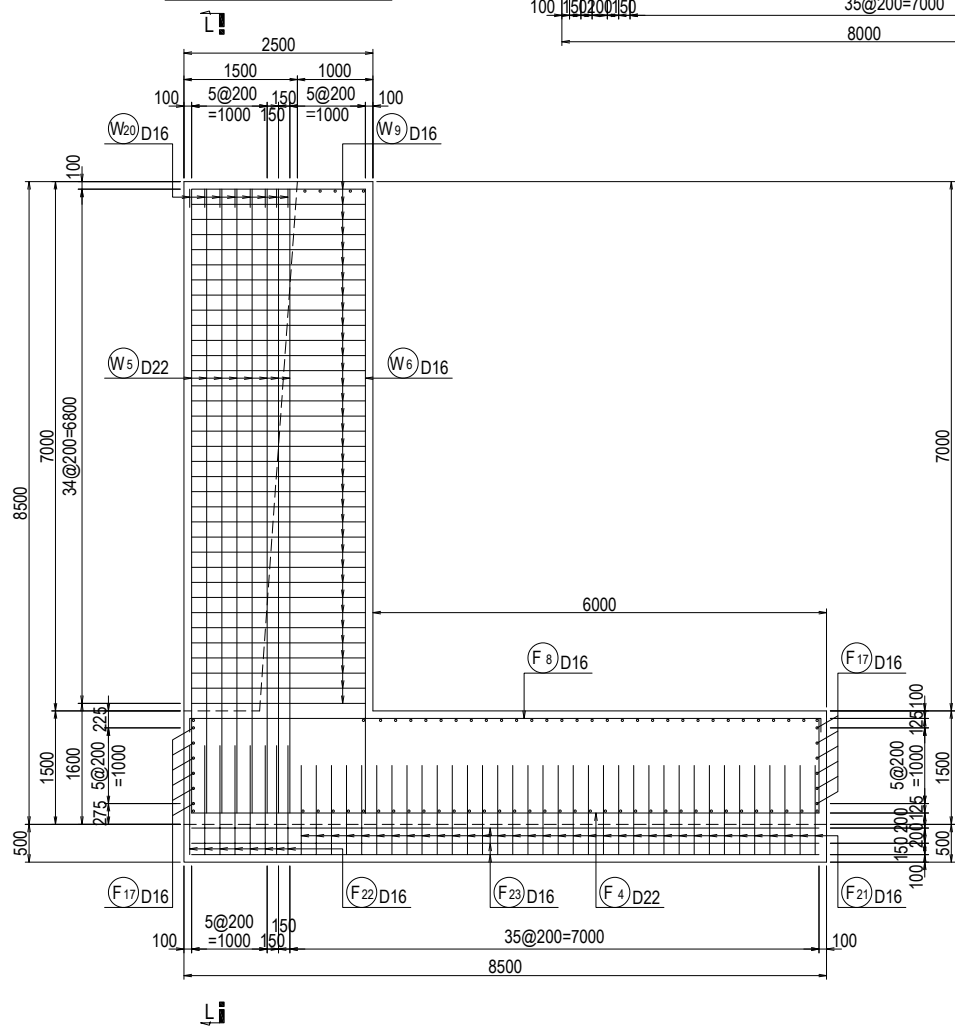
Section I—I



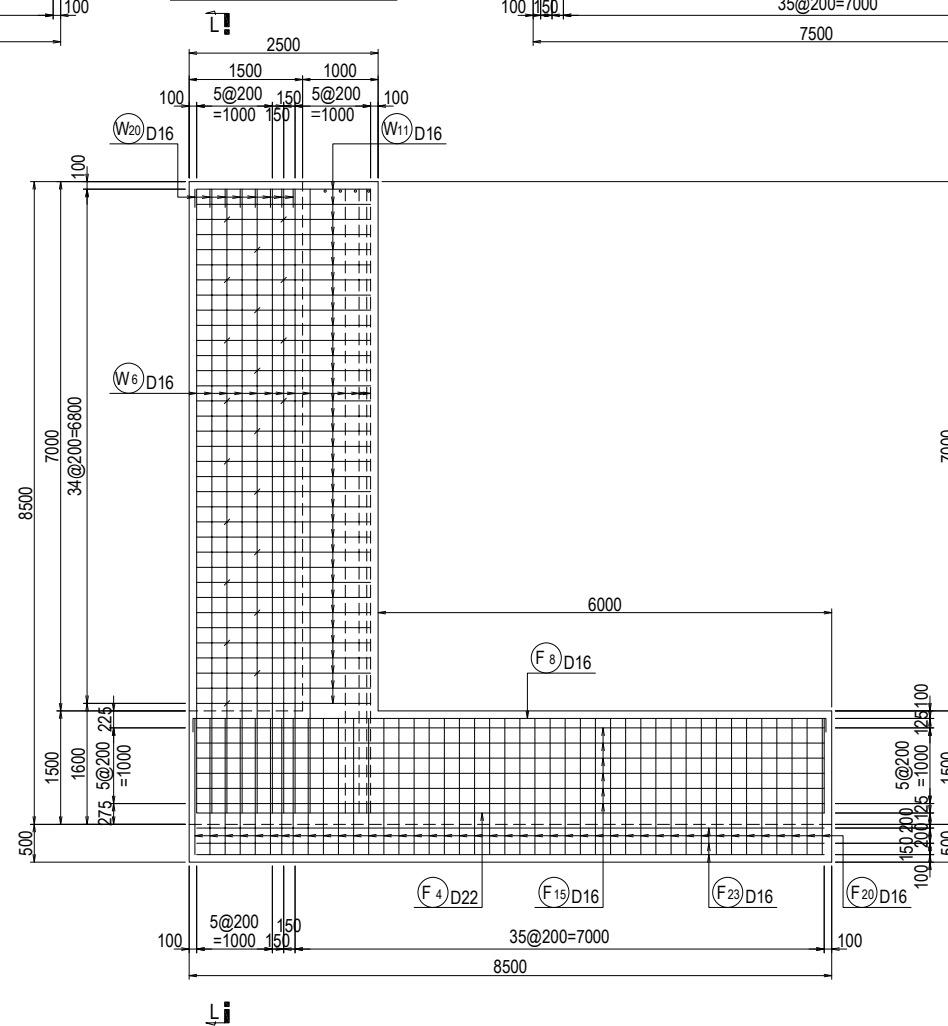
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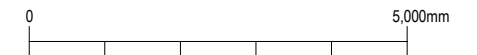
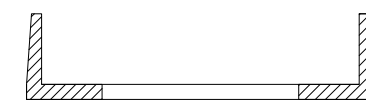
Section J—J



Section K—K



Key Plan

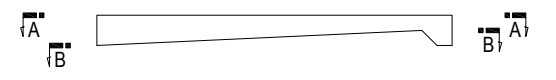
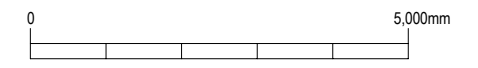
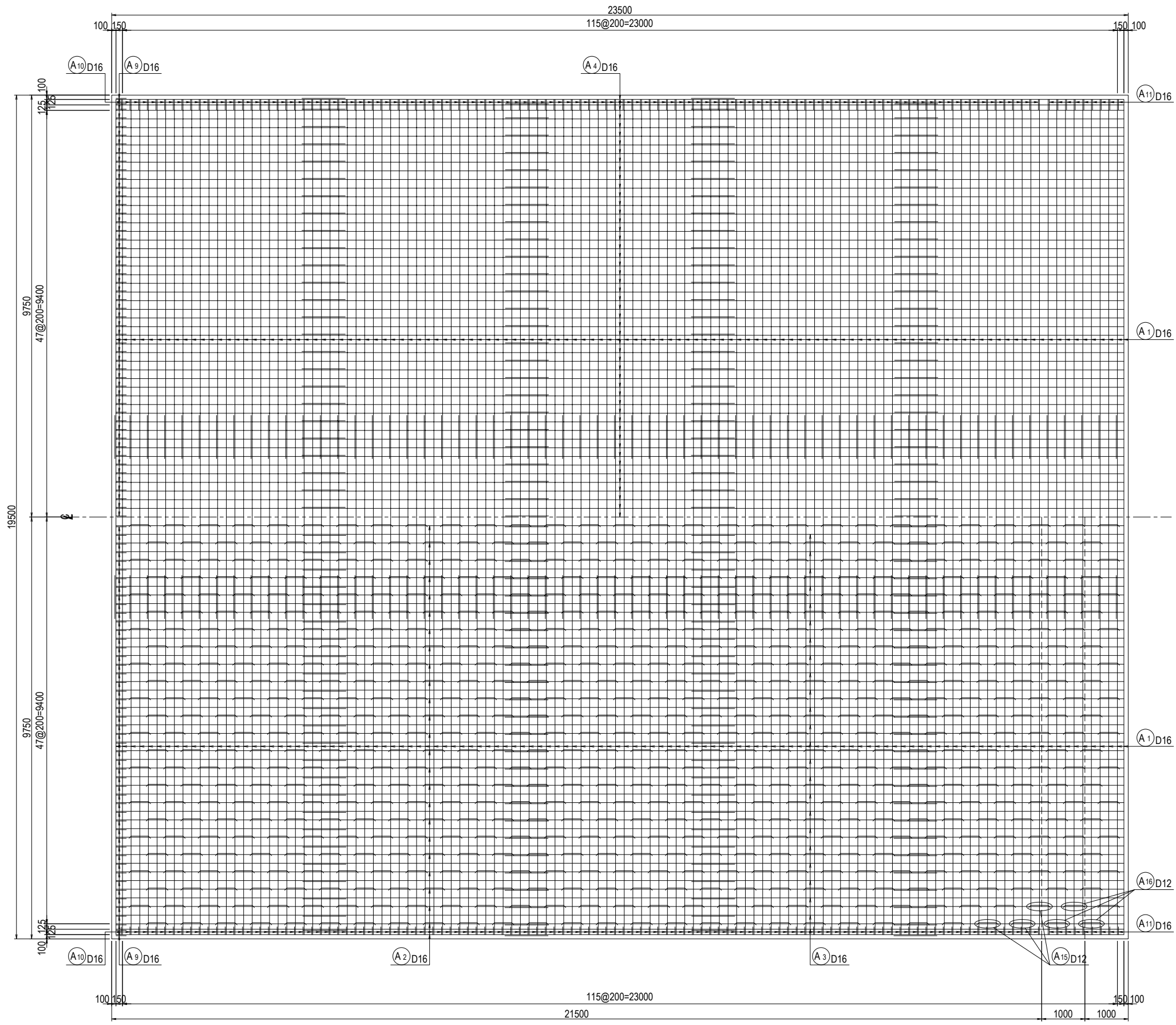


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Bahr Yusef Regulator Bar arrangement of downstream apron (4)	DRW. NO. CB-37	
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

# Detail of Down Stream Apron for Bahr Yusef Regulator (5/6)

Section A — A

Section B — B



Key Plan

Arab Republic of Egypt  
Ministry of Water Resources and Irrigation  
Reservoir and Grand Barrages Sector

Detailed Design Study on the Project for  
Construction of the New Dirout Group of Regulators

Bahr Yusef Regulator  
Bar arrangement of downstream apron (5)

**DRW. NO.**  
CB-38

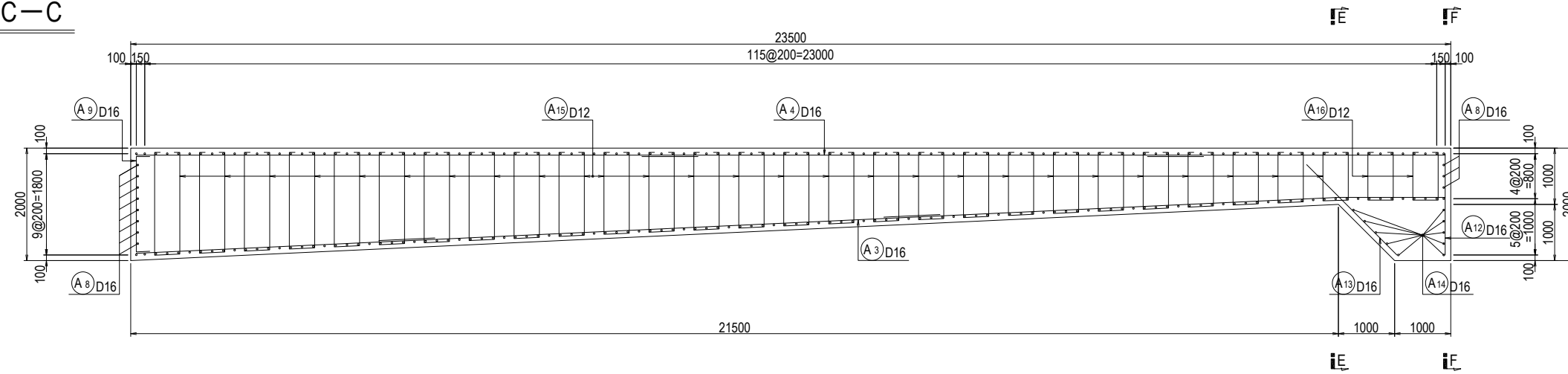
SANYU CONSULTANTS INC.

PREPARED BY :	CHECKED BY :	APPROVED BY :	
DATE :	DATE :	DATE :	DATE :

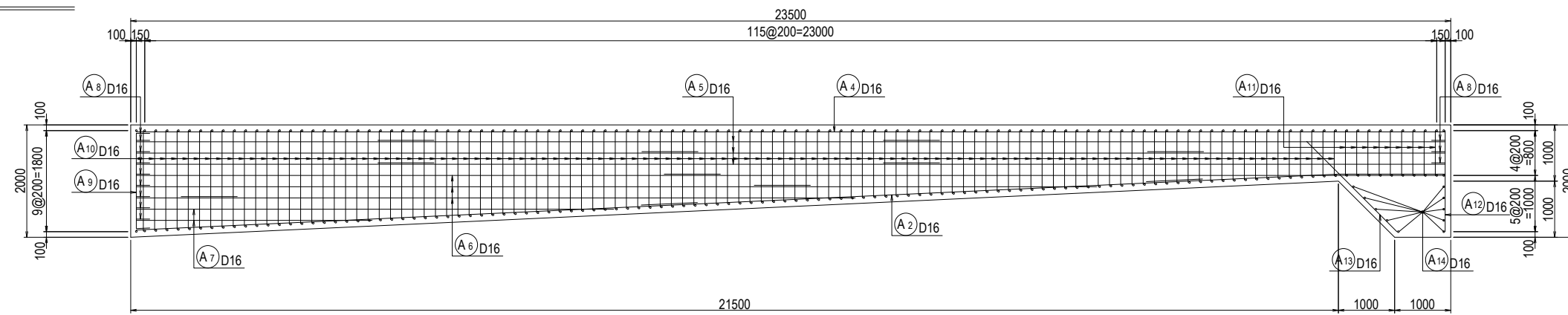


# Detail of Down Stream Apron for Bahr Yusef Regulator (6/6)

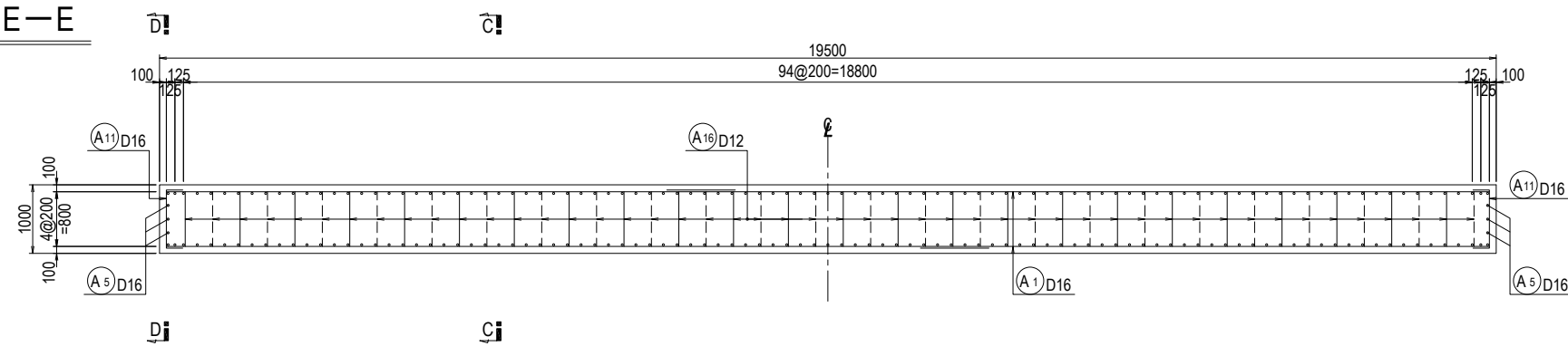
**Section C—C**



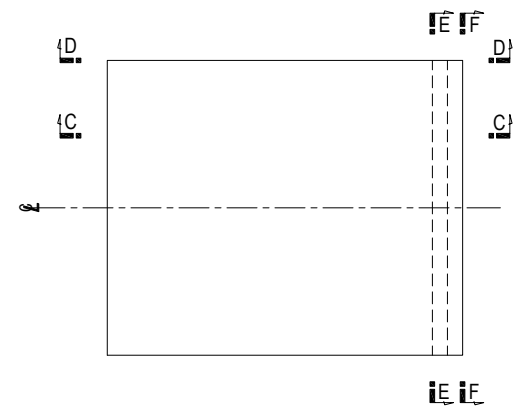
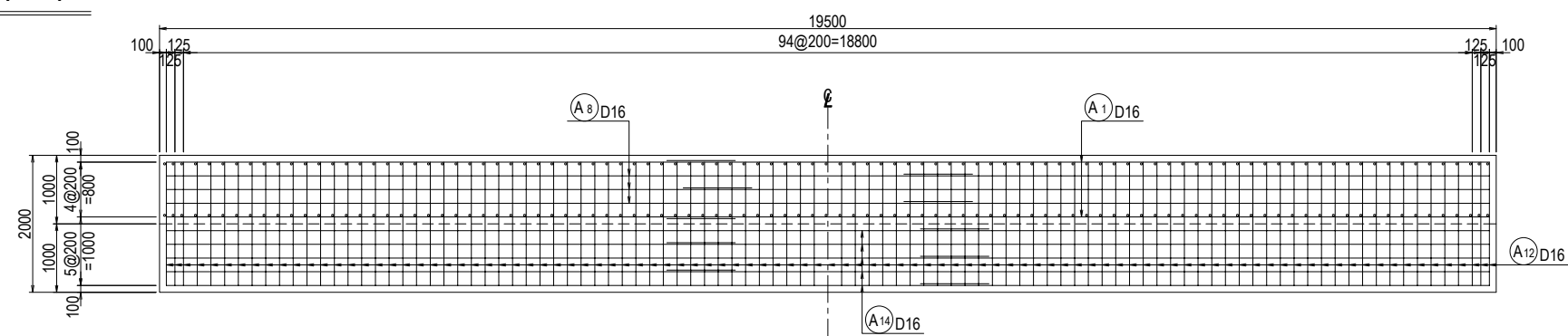
**Section D—D**



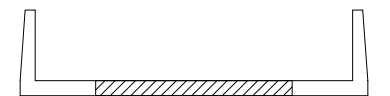
**Section E—E**



**Section F—F**



**Key Plan**



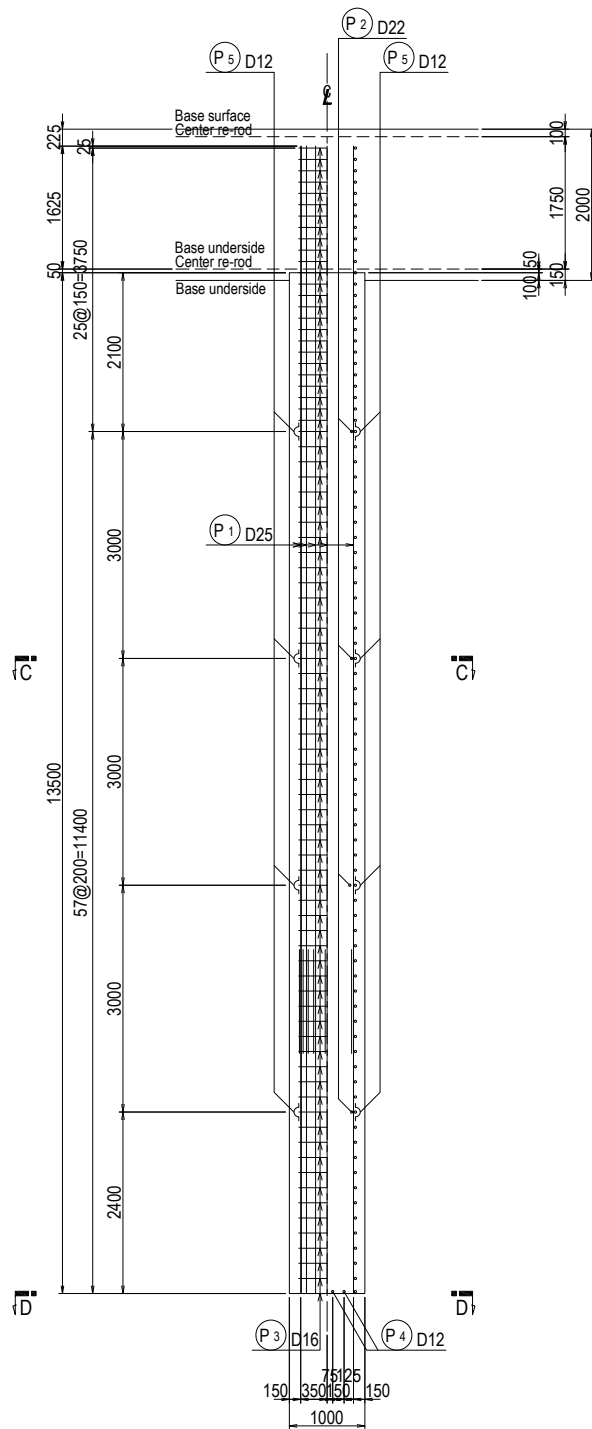
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Bahr Yusef Regulator Bar arrangement of downstream apron (6)			<b>DRW. NO.</b> CB-39
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Detail of Pile Bahr Yusef Regulator

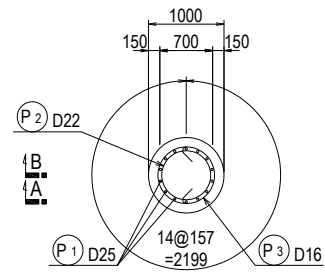
## Regulator

Scale A

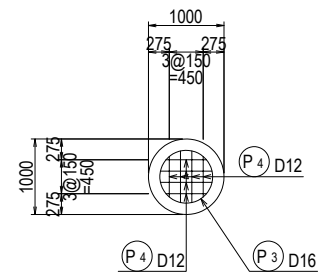
### Section A—A    Section B—B



### Section C—C



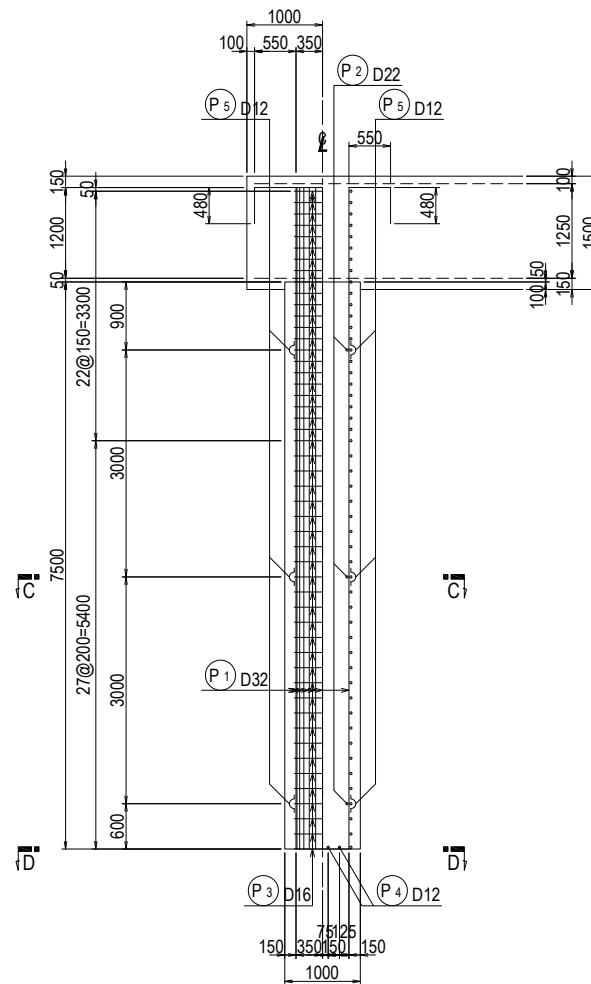
### Section D—D



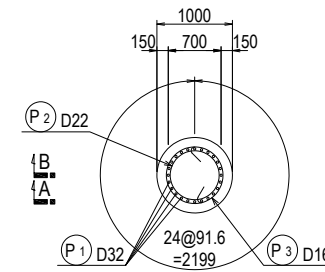
## Ltype Wall

Scale A

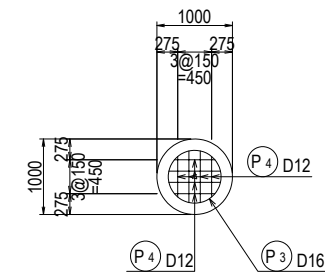
### Section A—A    Section B—B



### Section C—C

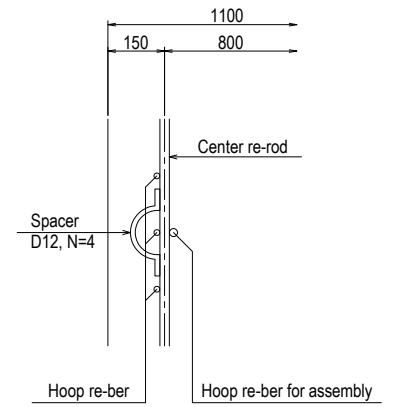


### Section D—D

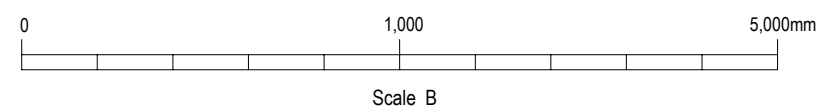
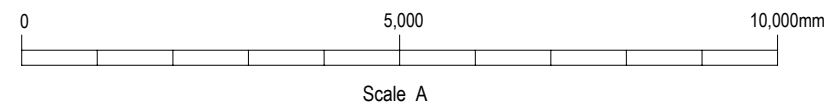


## Detail of Spacer

Scale B



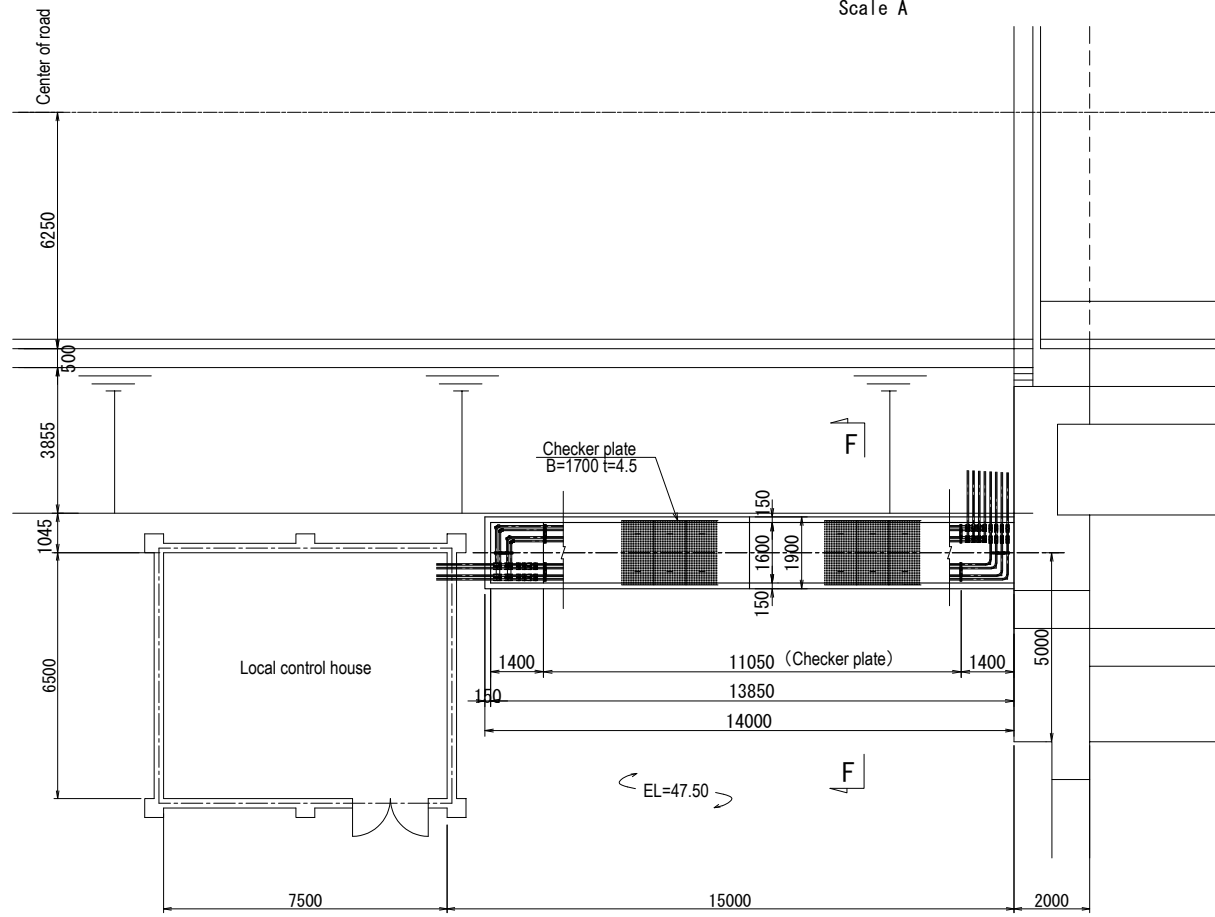
Note:  
When assembling a rebar cage, welding to keep its shape must be avoided.



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Bahr Yusef Regulator Detail of cast-in-place pile			DRW. NO. CB-40
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

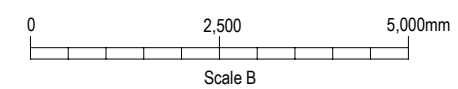
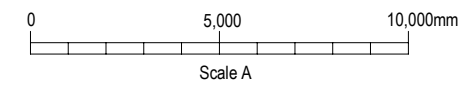
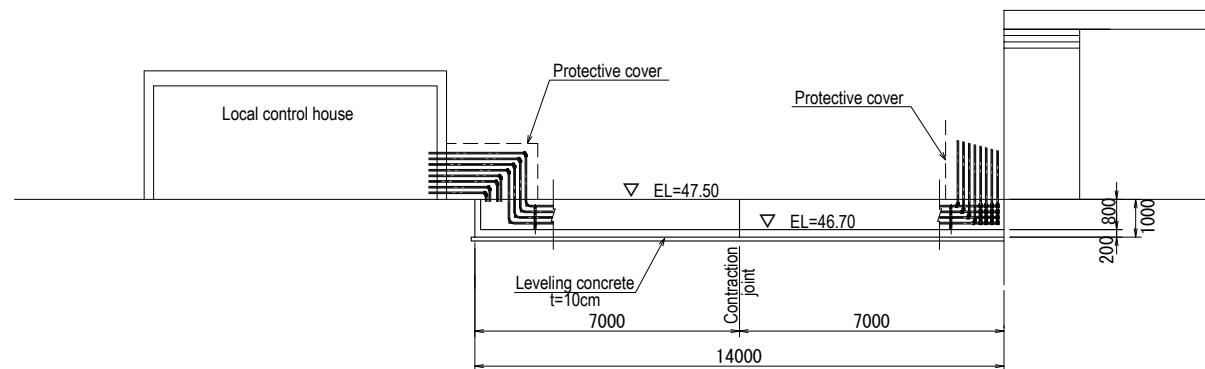
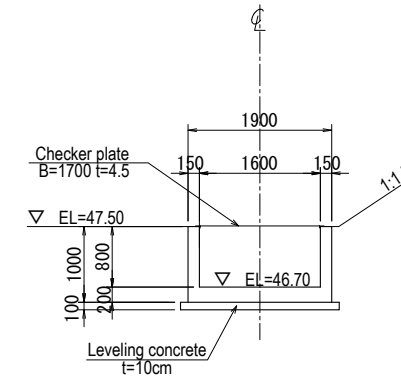
# Plan (Bahr Yusef Regulator)

Scale A



# Section F-F

Scale B



Arab Republic of Egypt  
Ministry of Water Resources and Irrigation  
Reservoir and Grand Barrages Sector

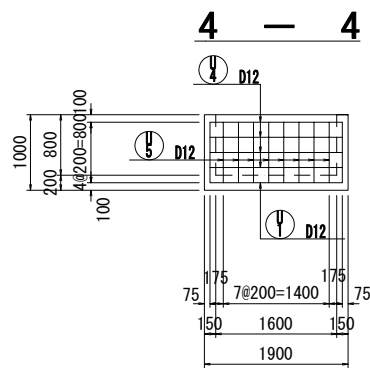
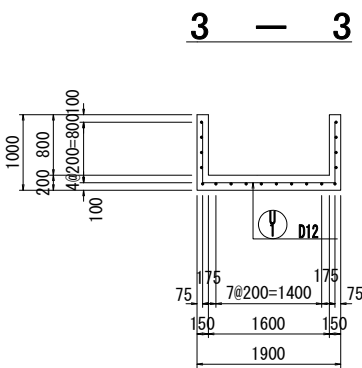
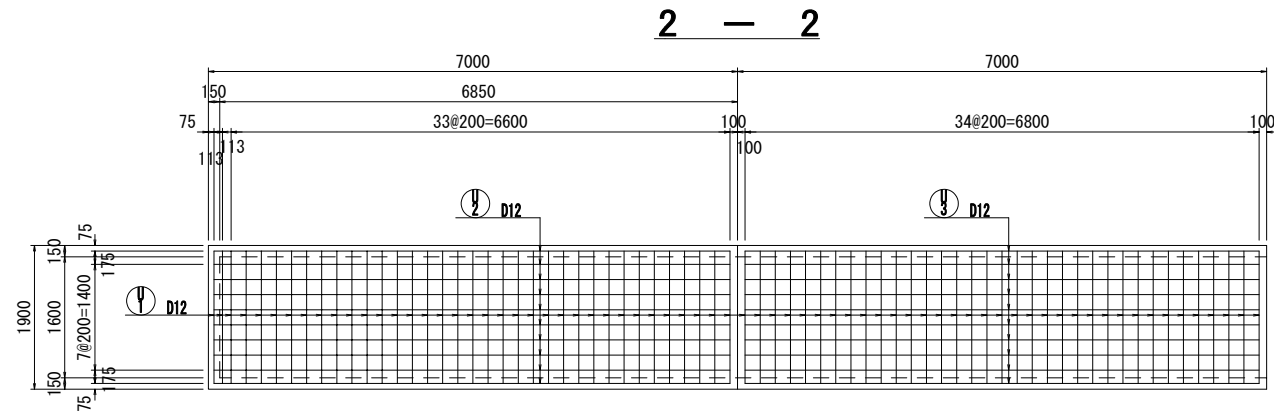
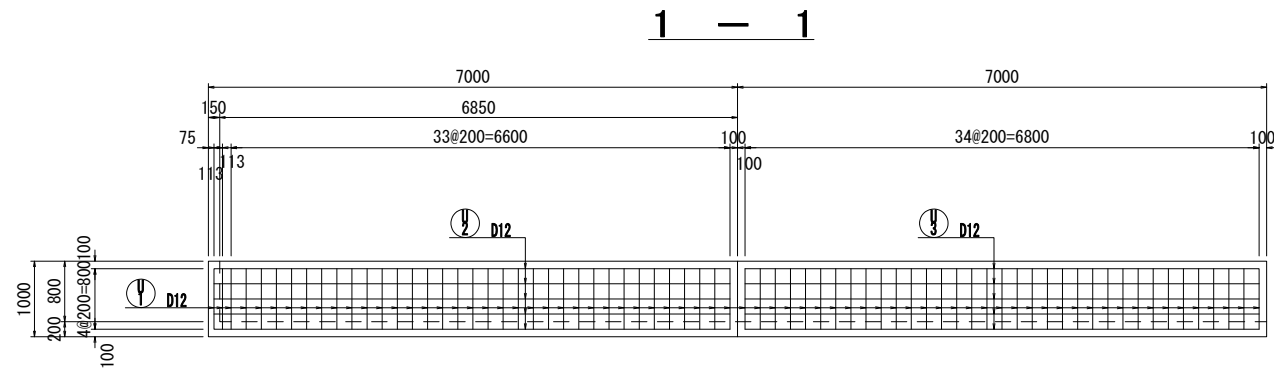
Detailed Design Study on the Project for  
Construction of the New Dirout Group of Regulators

Bahr Yusef Regulator  
Detail of hydraulic pipe pit  
DRW. NO.  
CB-41

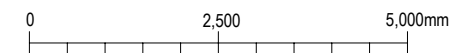
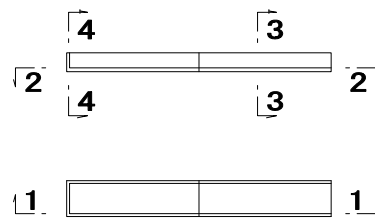
SANYU CONSULTANTS INC.

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DATE:	DATE:	DATE:

# Bahr Yusef pipe pit



Position diagram



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Bahr Yusef Regulator Bar arrangement of hydraulic pipe pit			DRW. NO. CB-42
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

Item	Unit	Quantity
Excavation	C1 m2	0.23
Excavation	C2 m2	-
Backfilling	R m2	-
Embankment	B0 m2	-
Embankment	BL m2	-
Embankment	BR m2	-
Earth Finishing Foundation	L1 m	-
Rough Finishing	L2 m	-

252.2

DL=35.00

Item	Unit	Quantity
Excavation	C1 m2	0.73
Excavation	C2 m2	-
Backfilling	R m2	-
Embankment	B0 m2	-
Embankment	BL m2	11.46
Embankment	BR m2	-
Earth Finishing Foundation	L1 m	-
Rough Finishing	L2 m	-

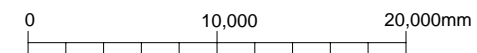
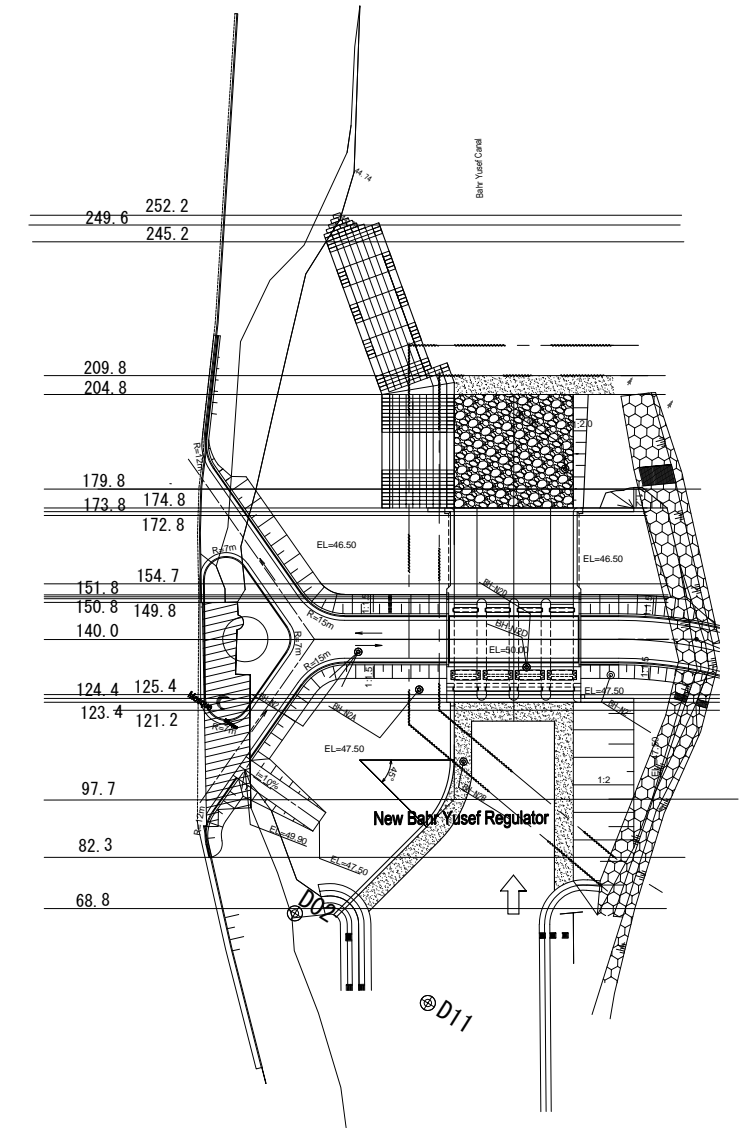
249.6

DL=35.00

Item	Unit	Quantity
Excavation	C1 m2	3.21
Excavation	C2 m2	-
Backfilling	R m2	-
Embankment	B0 m2	-
Embankment	BL m2	21.03
Embankment	BR m2	-
Earth Finishing Foundation	L1 m	-
Rough Finishing	L2 m	-

245.2

DL=35.00



Arab Republic of Egypt  
Ministry of Water Resources and Irrigation  
Reservoir and Grand Barrages Sector

Detailed Design Study on the Project for  
Construction of the New Dirout Group of Regulators

Bahr Yusef Regulator  
Cross section of earth works (1)

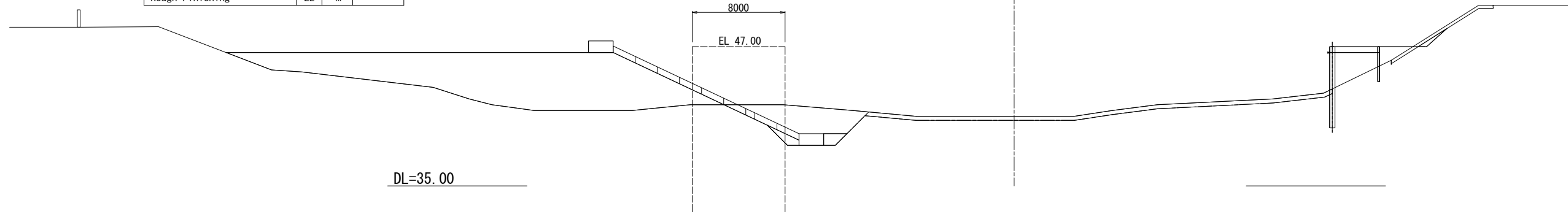
DRW. NO.  
CB-43

SANYU CONSULTANTS INC.

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DATE :	DATE :	DATE :

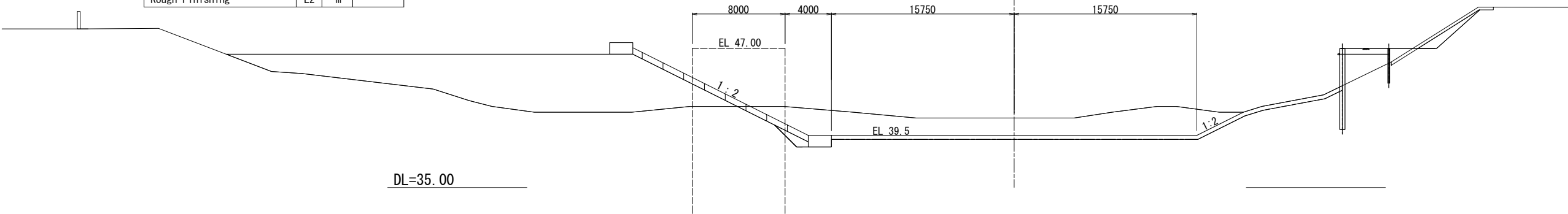
Item	Unit	Quantity
Excavation	C1 m2	40.09
Excavation	C2 m2	-
Backfilling	R m2	1.98
Embankment	B0 m2	-
Embankment	BL m2	127.55
Embankment	BR m2	-
Earth Finishing Foundation	L1 m	-
Rough Finishing	L2 m	-

209.8



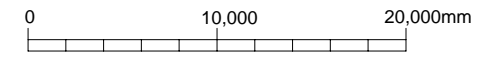
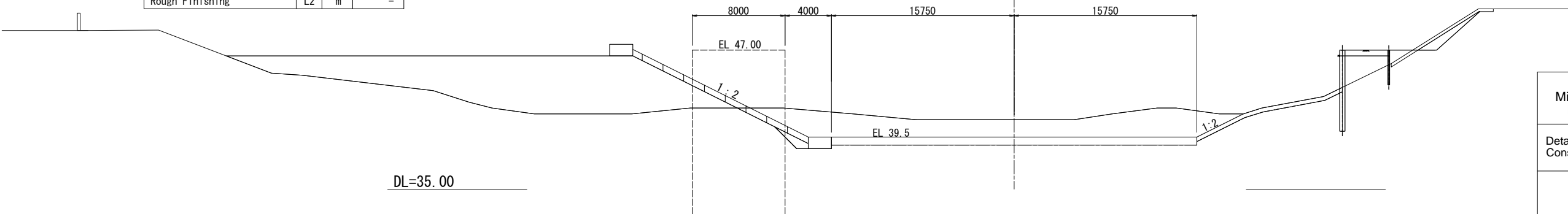
Item	Unit	Quantity
Excavation	C1 m2	93.80
Excavation	C2 m2	-
Backfilling	R m2	1.58
Embankment	B0 m2	-
Embankment	BL m2	133.93
Embankment	BR m2	-
Earth Finishing Foundation	L1 m	-
Rough Finishing	L2 m	-

204.8 (+)



Item	Unit	Quantity
Excavation	C1 m2	104.82
Excavation	C2 m2	-
Backfilling	R m2	1.58
Embankment	B0 m2	-
Embankment	BL m2	133.93
Embankment	BR m2	-
Earth Finishing Foundation	L1 m	-
Rough Finishing	L2 m	-

204.8 (-)



Arab Republic of Egypt  
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Reservoir and Grand Barrages Sector

Detailed Design Study on the Project for  
Construction of the New Dirout Group of Regulators

Bahr Yusef Regulator  
Cross section of earth works (2)

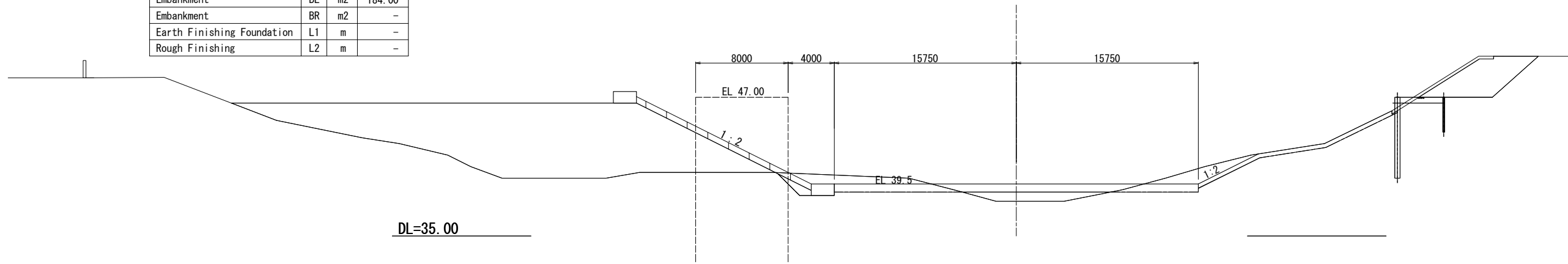
DRW. NO.  
CB-44

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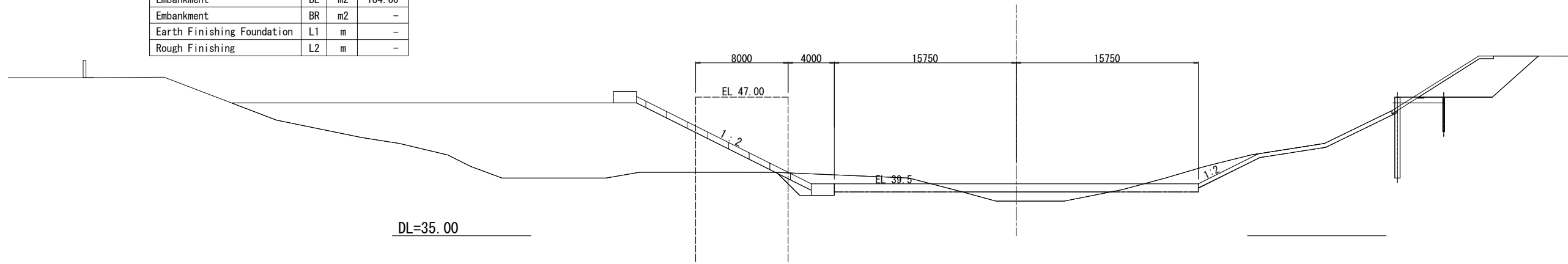
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Excavation	C1 m2	36.09
Excavation	C2 m2	-
Backfilling	R m2	1.58
Embankment	B0 m2	7.50
Embankment	BL m2	184.00
Embankment	BR m2	-
Earth Finishing Foundation	L1 m	-
Rough Finishing	L2 m	-

179.8(+)



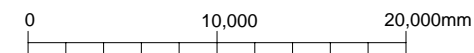
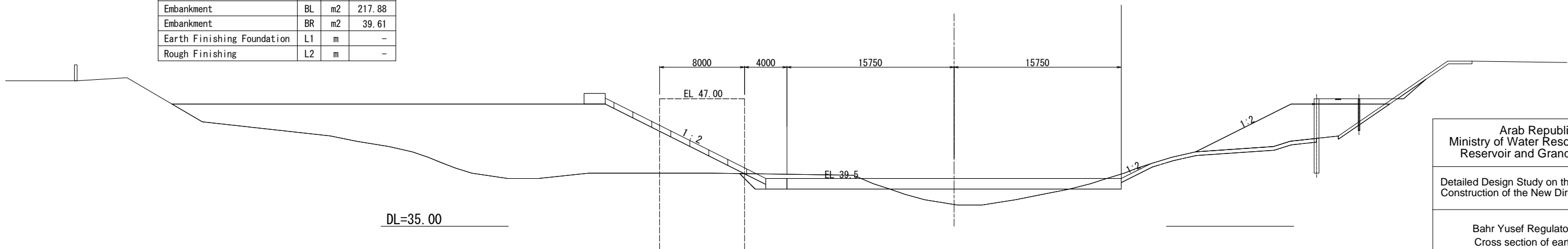
Item	Unit	Quantity
Excavation	C1 m2	36.09
Excavation	C2 m2	-
Backfilling	R m2	1.58
Embankment	B0 m2	7.50
Embankment	BL m2	184.00
Embankment	BR m2	-
Earth Finishing Foundation	L1 m	-
Rough Finishing	L2 m	-

179.8(-)



Item	Unit	Quantity
Excavation	C1 m2	26.37
Excavation	C2 m2	-
Backfilling	R m2	1.49
Embankment	B0 m2	15.60
Embankment	BL m2	217.88
Embankment	BR m2	39.61
Earth Finishing Foundation	L1 m	-
Rough Finishing	L2 m	-

174.8(+)



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Detailed Design Study on the Project for  
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Bahr Yusef Regulator  
Cross section of earth works (3)

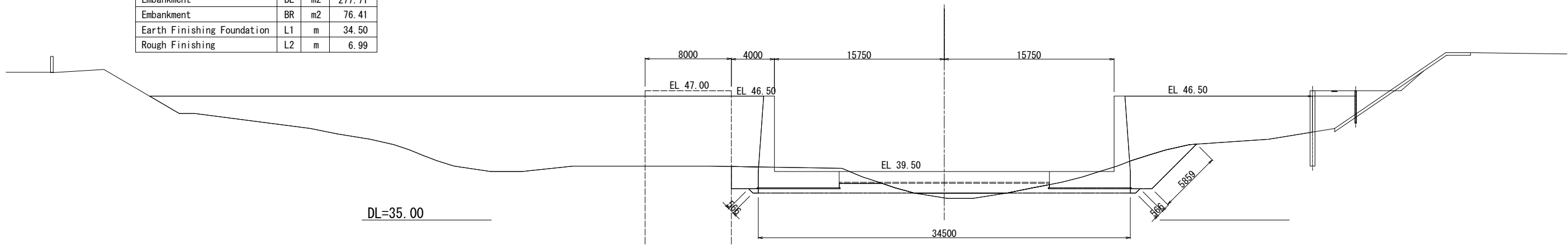
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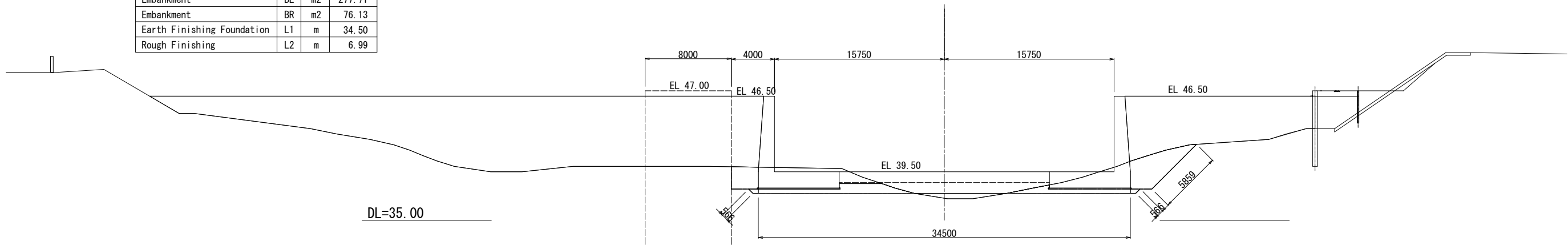
Item	Unit	Quantity
Excavation	C1	m2 22.99
Excavation	C2	m2 12.96
Backfilling	R	m2 18.47
Embankment	B0	m2 2.74
Embankment	BL	m2 277.71
Embankment	BR	m2 76.41
Earth Finishing Foundation	L1	m 34.50
Rough Finishing	L2	m 6.99

174.8 (-)



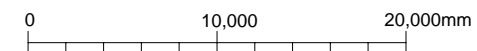
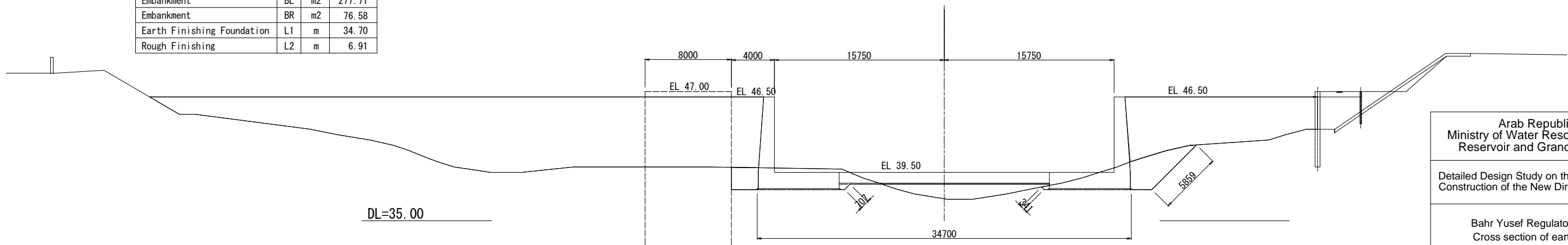
Item	Unit	Quantity
Excavation	C1	m2 22.99
Excavation	C2	m2 12.96
Backfilling	R	m2 18.47
Embankment	B0	m2 2.74
Embankment	BL	m2 277.71
Embankment	BR	m2 76.13
Earth Finishing Foundation	L1	m 34.50
Rough Finishing	L2	m 6.99

173.8



Item	Unit	Quantity
Excavation	C1	m2 23.18
Excavation	C2	m2 -
Backfilling	R	m2 18.47
Embankment	B0	m2 13.87
Embankment	BL	m2 277.71
Embankment	BR	m2 76.58
Earth Finishing Foundation	L1	m 34.70
Rough Finishing	L2	m 6.91

172.8



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Detailed Design Study on the Project for  
Construction of the New Dirout Group of Regulators

Bahr Yusef Regulator  
Cross section of earth works (4)

DRW. NO.  
CB-46

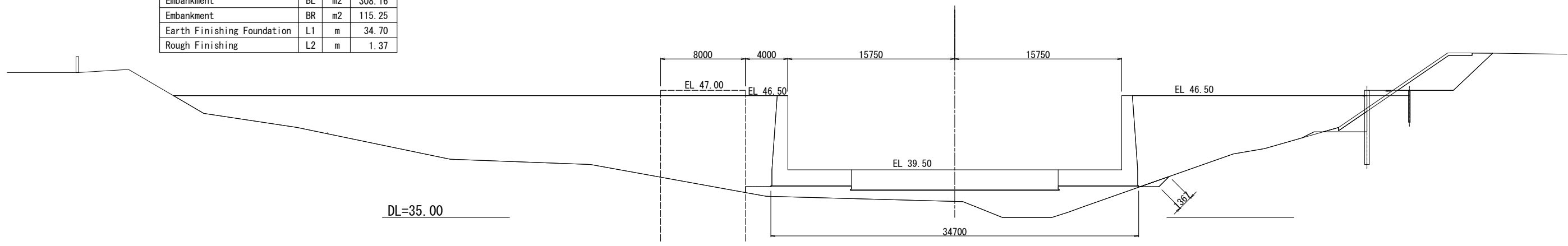
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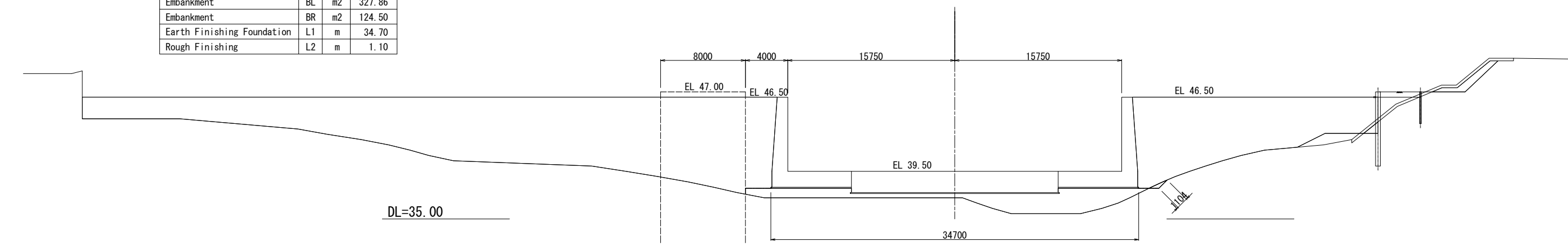
Item	Unit	Quantity
Excavation	C1 m2	0.86
Excavation	C2 m2	-
Backfilling	R m2	19.41
Embankment	B0 m2	49.79
Embankment	BL m2	308.16
Embankment	BR m2	115.25
Earth Finishing Foundation	L1 m	34.70
Rough Finishing	L2 m	1.37

154.7



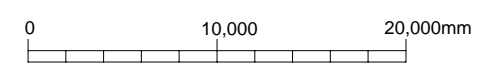
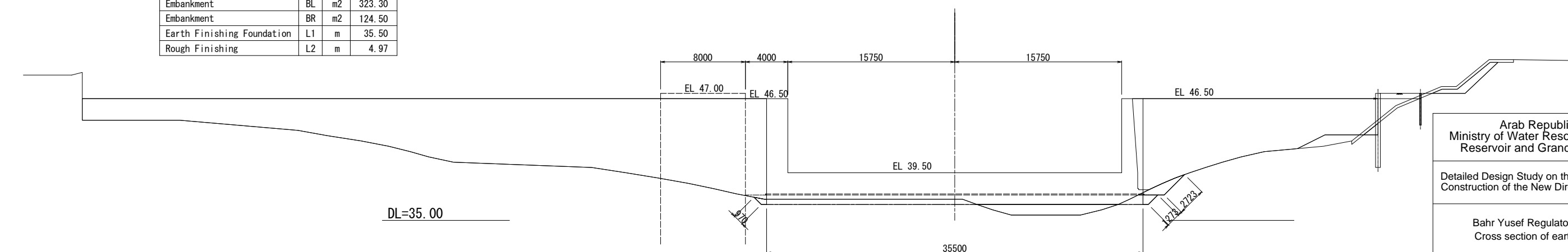
Item	Unit	Quantity
Excavation	C1 m2	0.38
Excavation	C2 m2	-
Backfilling	R m2	4.64
Embankment	B0 m2	40.76
Embankment	BL m2	327.86
Embankment	BR m2	124.50
Earth Finishing Foundation	L1 m	34.70
Rough Finishing	L2 m	1.10

151.8(+)



Item	Unit	Quantity
Excavation	C1 m2	3.84
Excavation	C2 m2	12.12
Backfilling	R m2	8.10
Embankment	B0 m2	10.12
Embankment	BL m2	323.30
Embankment	BR m2	124.50
Earth Finishing Foundation	L1 m	35.50
Rough Finishing	L2 m	4.97

151.8(-)



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Reservoir and Grand Barrages Sector

Detailed Design Study on the Project for  
Construction of the New Dirout Group of Regulators

Bahr Yusef Regulator  
Cross section of earth works (5)

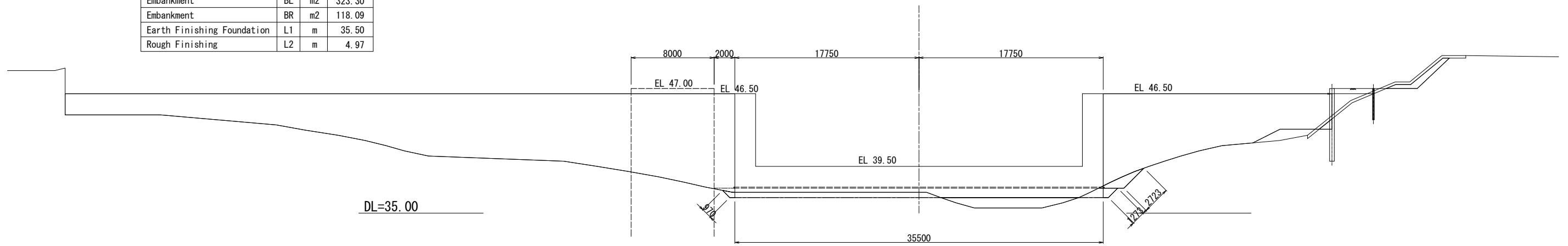
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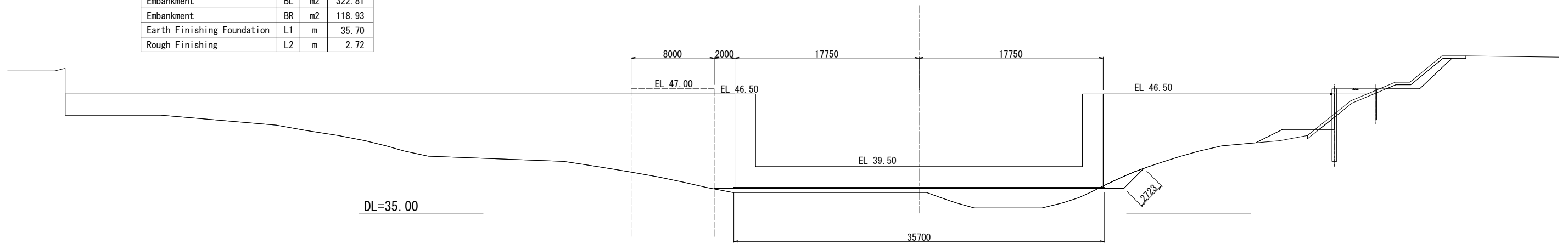
Item	Unit	Quantity
Excavation	C1	m2 3.84
Excavation	C2	m2 12.12
Backfilling	R	m2 7.63
Embankment	B0	m2 10.12
Embankment	BL	m2 323.30
Embankment	BR	m2 118.09
Earth Finishing Foundation	L1	m 35.50
Rough Finishing	L2	m 4.97

150.8



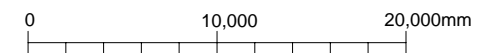
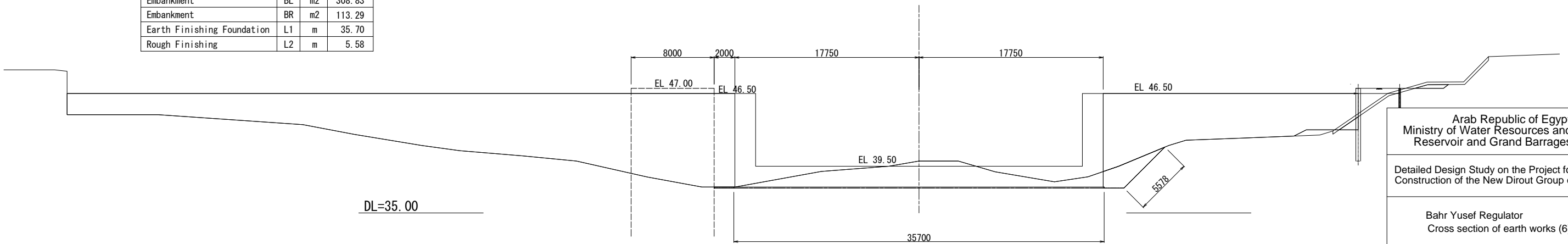
Item	Unit	Quantity
Excavation	C1	m2 2.54
Excavation	C2	m2 -
Backfilling	R	m2 7.26
Embankment	B0	m2 31.75
Embankment	BL	m2 322.81
Embankment	BR	m2 118.93
Earth Finishing Foundation	L1	m 35.70
Rough Finishing	L2	m 2.72

149.8



Item	Unit	Quantity
Excavation	C1	m2 62.64
Excavation	C2	m2 -
Backfilling	R	m2 10.62
Embankment	B0	m2 -
Embankment	BL	m2 308.83
Embankment	BR	m2 113.29
Earth Finishing Foundation	L1	m 35.70
Rough Finishing	L2	m 5.58

140.0(+)



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Detailed Design Study on the Project for  
Construction of the New Dirout Group of Regulators

Bahr Yusef Regulator  
Cross section of earth works (6)

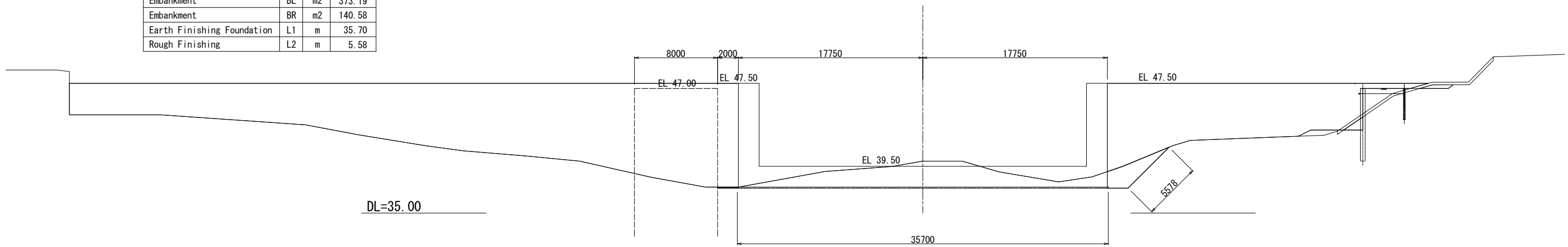
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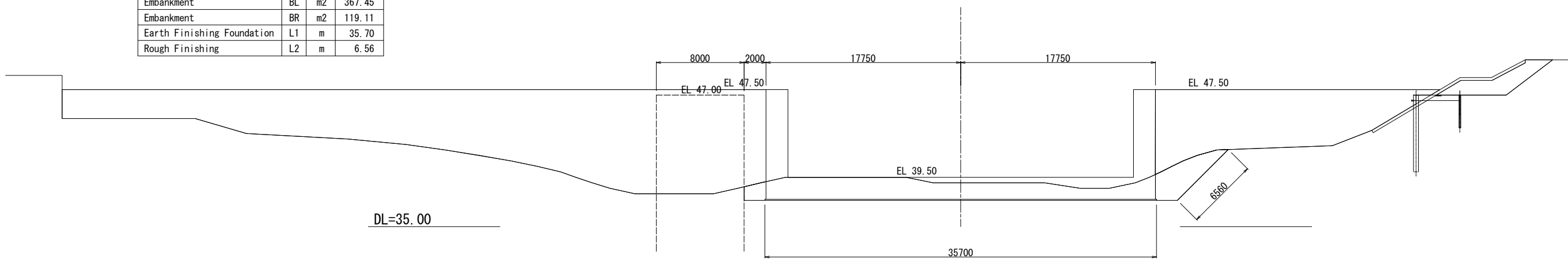
Item	Unit	Quantity
Excavation	C1 m2	62.64
Excavation	C2 m2	-
Backfilling	R m2	10.62
Embankment	B0 m2	-
Embankment	BL m2	373.19
Embankment	BR m2	140.58
Earth Finishing Foundation	L1 m	35.70
Rough Finishing	L2 m	5.58

140.0 (-)



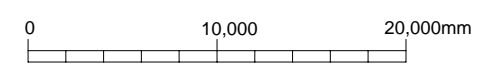
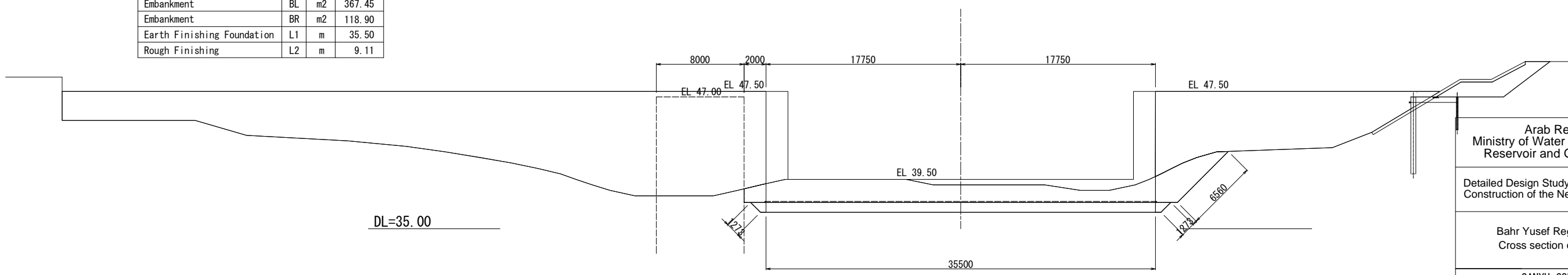
Item	Unit	Quantity
Excavation	C1 m2	78.66
Excavation	C2 m2	-
Backfilling	R m2	30.29
Embankment	B0 m2	-
Embankment	BL m2	367.45
Embankment	BR m2	119.11
Earth Finishing Foundation	L1 m	35.70
Rough Finishing	L2 m	6.56

125.4



Item	Unit	Quantity
Excavation	C1 m2	78.66
Excavation	C2 m2	33.66
Backfilling	R m2	31.23
Embankment	B0 m2	-
Embankment	BL m2	367.45
Embankment	BR m2	118.90
Earth Finishing Foundation	L1 m	35.50
Rough Finishing	L2 m	9.11

124.4



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Detailed Design Study on the Project for  
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Bahr Yusef Regulator  
Cross section of earth works (7)

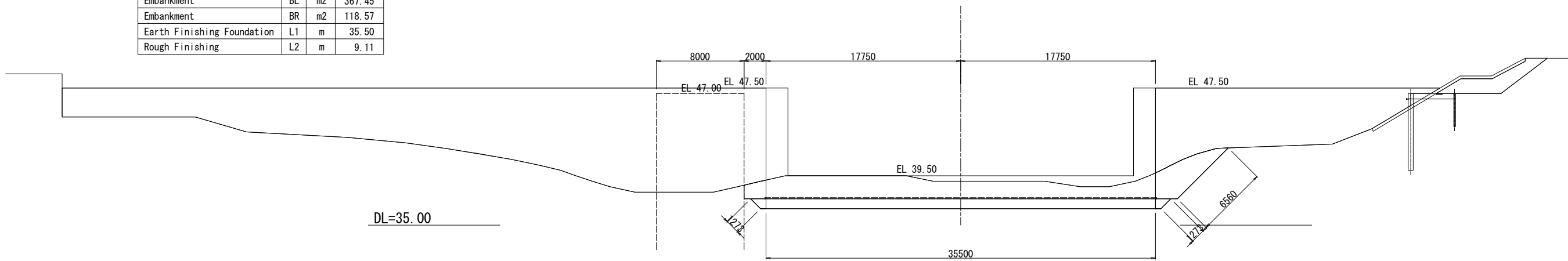
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CB-49

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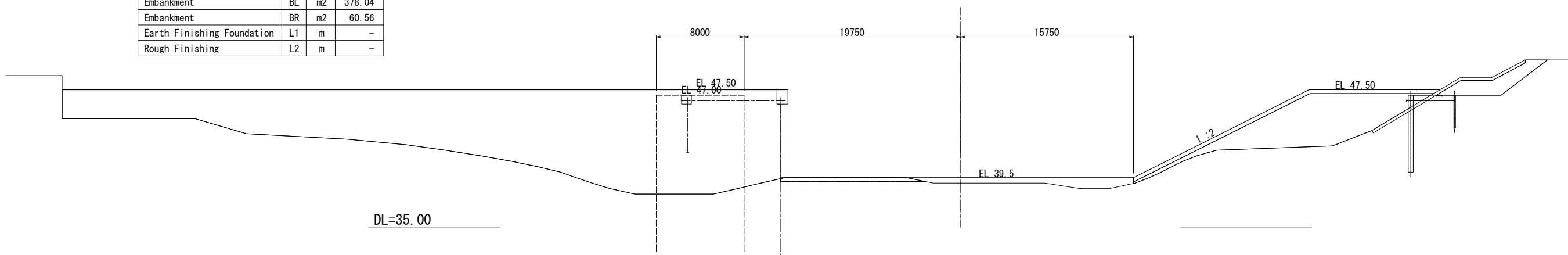
Item	Unit	Quantity
Excavation	C1 m2	78.66
Excavation	C2 m2	33.66
Backfilling	R m2	30.49
Embankment	B0 m2	-
Embankment	BL m2	367.45
Embankment	BR m2	118.57
Earth Finishing Foundation	L1 m	35.50
Rough Finishing	L2 m	9.11

123.4(+)



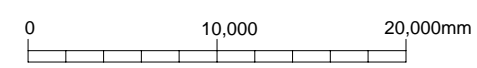
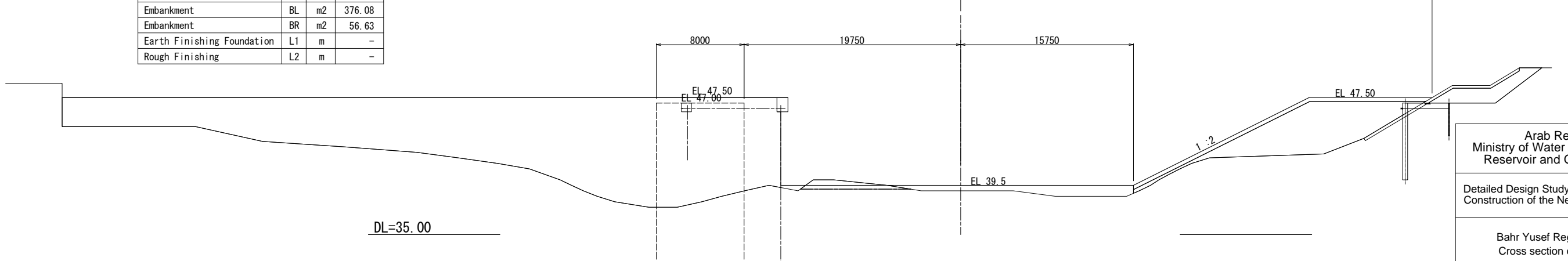
Item	Unit	Quantity
Excavation	C1 m2	4.28
Excavation	C2 m2	-
Backfilling	R m2	11.54
Embankment	B0 m2	-
Embankment	BL m2	378.04
Embankment	BR m2	60.56
Earth Finishing Foundation	L1 m	-
Rough Finishing	L2 m	-

123.4(-)



Item	Unit	Quantity
Excavation	C1 m2	5.39
Excavation	C2 m2	-
Backfilling	R m2	11.53
Embankment	B0 m2	-
Embankment	BL m2	376.08
Embankment	BR m2	56.63
Earth Finishing Foundation	L1 m	-
Rough Finishing	L2 m	-

121.2



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Detailed Design Study on the Project for  
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Bahr Yusef Regulator  
Cross section of earth works (8)

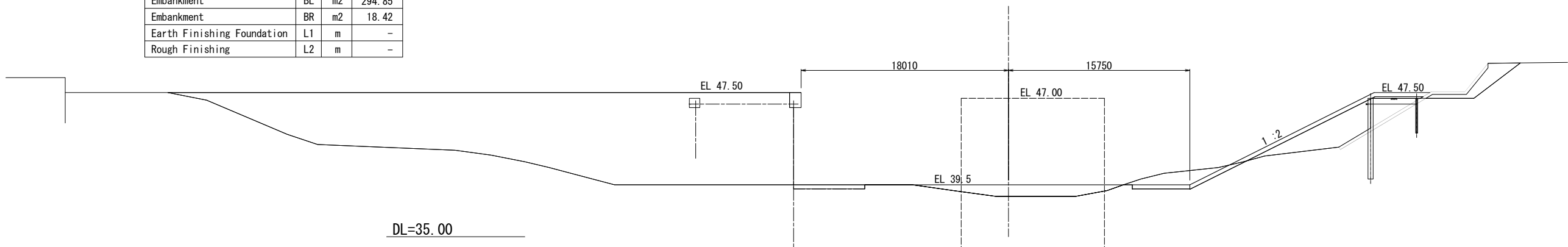
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CB-50

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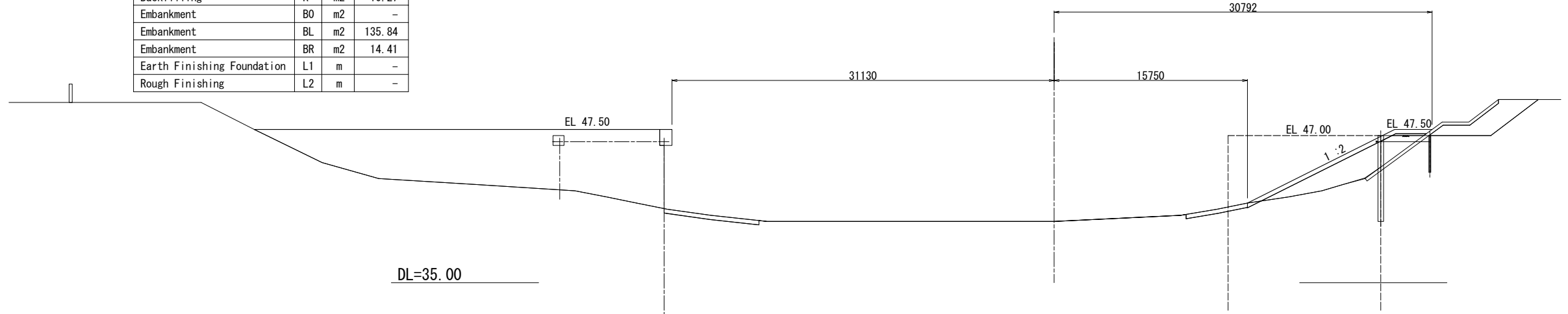
Item	Unit	Quantity
Excavation	C1 m2	9.78
Excavation	C2 m2	-
Backfilling	R m2	6.29
Embankment	B0 m2	-
Embankment	BL m2	294.85
Embankment	BR m2	18.42
Earth Finishing Foundation	L1 m	-
Rough Finishing	L2 m	-

97.7



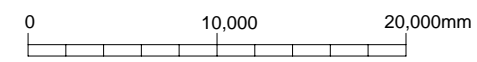
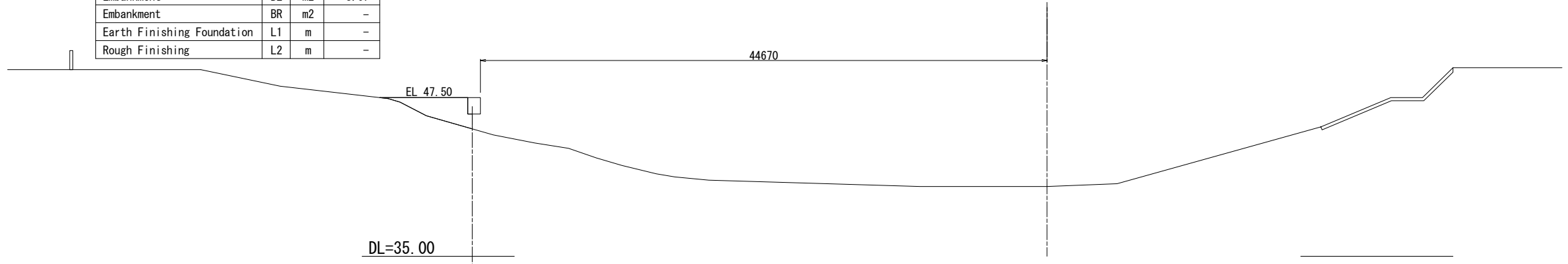
Item	Unit	Quantity
Excavation	C1 m2	4.71
Excavation	C2 m2	-
Backfilling	R m2	10.27
Embankment	B0 m2	-
Embankment	BL m2	135.84
Embankment	BR m2	14.41
Earth Finishing Foundation	L1 m	-
Rough Finishing	L2 m	-

82.3



Item	Unit	Quantity
Excavation	C1 m2	-
Excavation	C2 m2	-
Backfilling	R m2	-
Embankment	B0 m2	-
Embankment	BL m2	8.67
Embankment	BR m2	-
Earth Finishing Foundation	L1 m	-
Rough Finishing	L2 m	-

68.8



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Detailed Design Study on the Project for  
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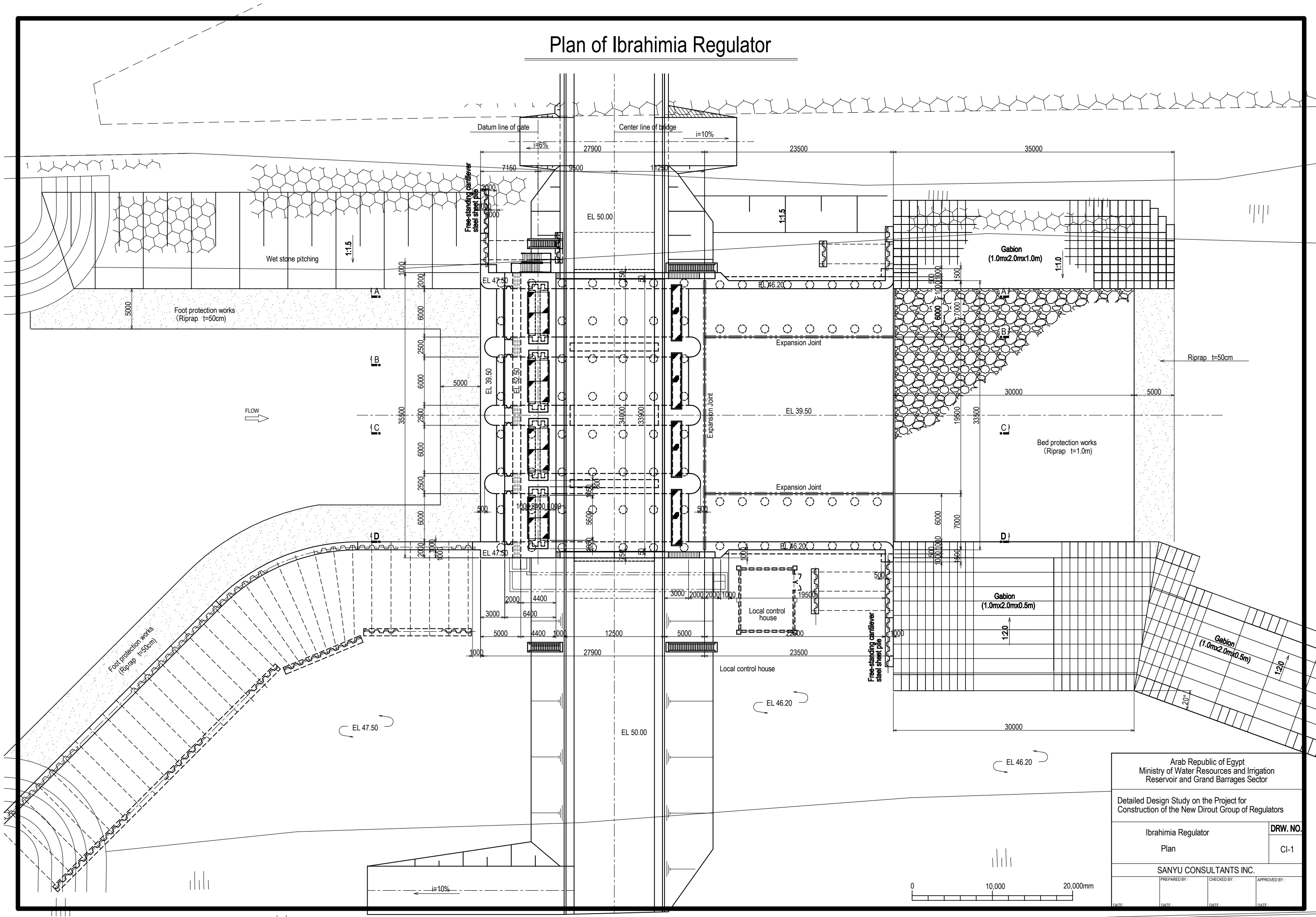
Bahr Yusef Regulator  
Cross section of earth works (9)

DRW. NO.  
CB-51

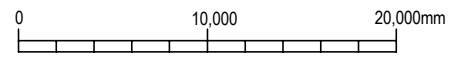
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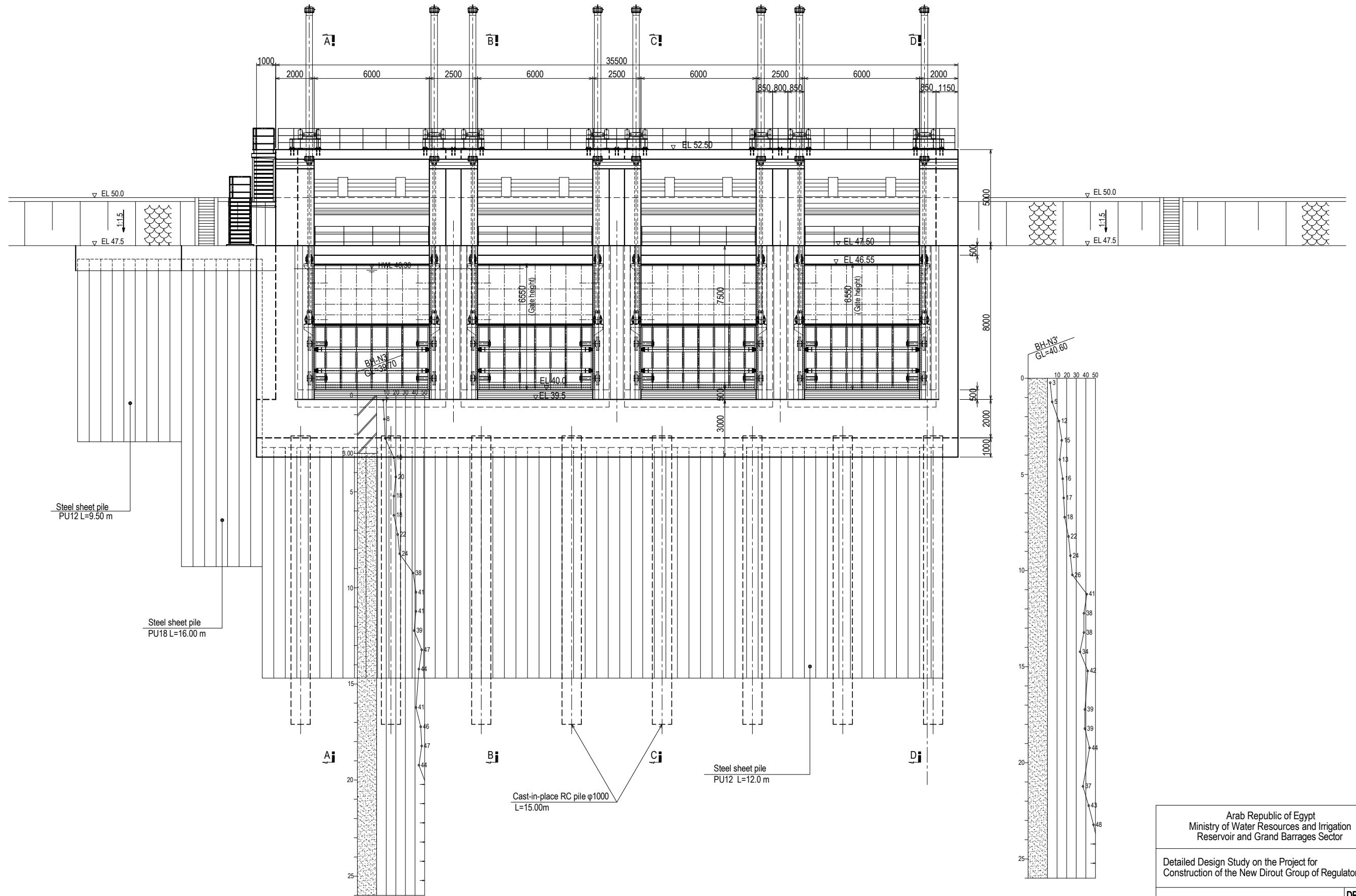
# Plan of Ibrahimia Regulator



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Ibrahimia Regulator	DRW. NO.	
Plan	CI-1	
SANYU CONSULTANTS INC.		
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# Elevation of Ibrahimia Regulator

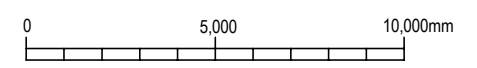
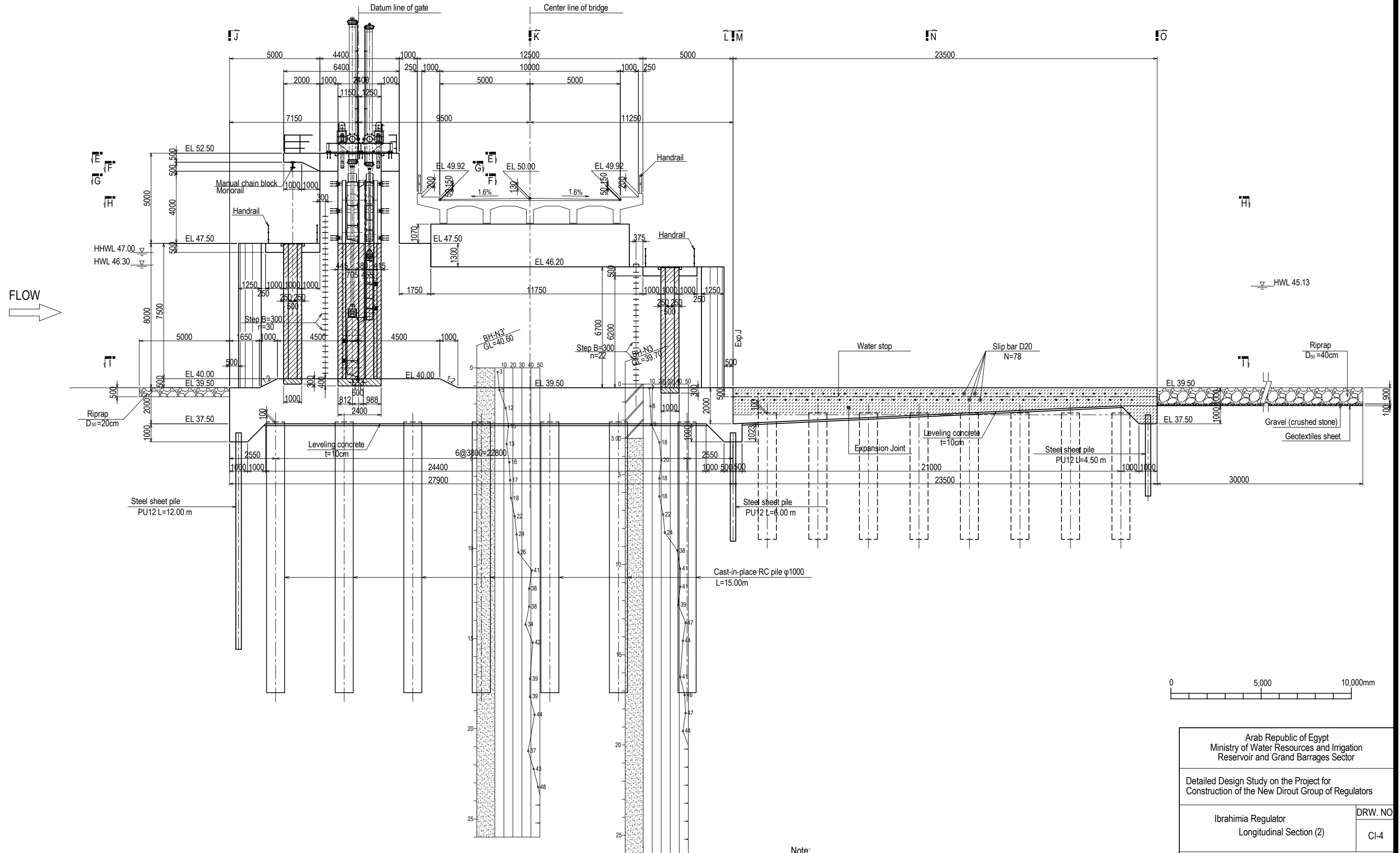


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Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Ibrahimia Regulator Elevation	DRW. NO. CI-2	
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:





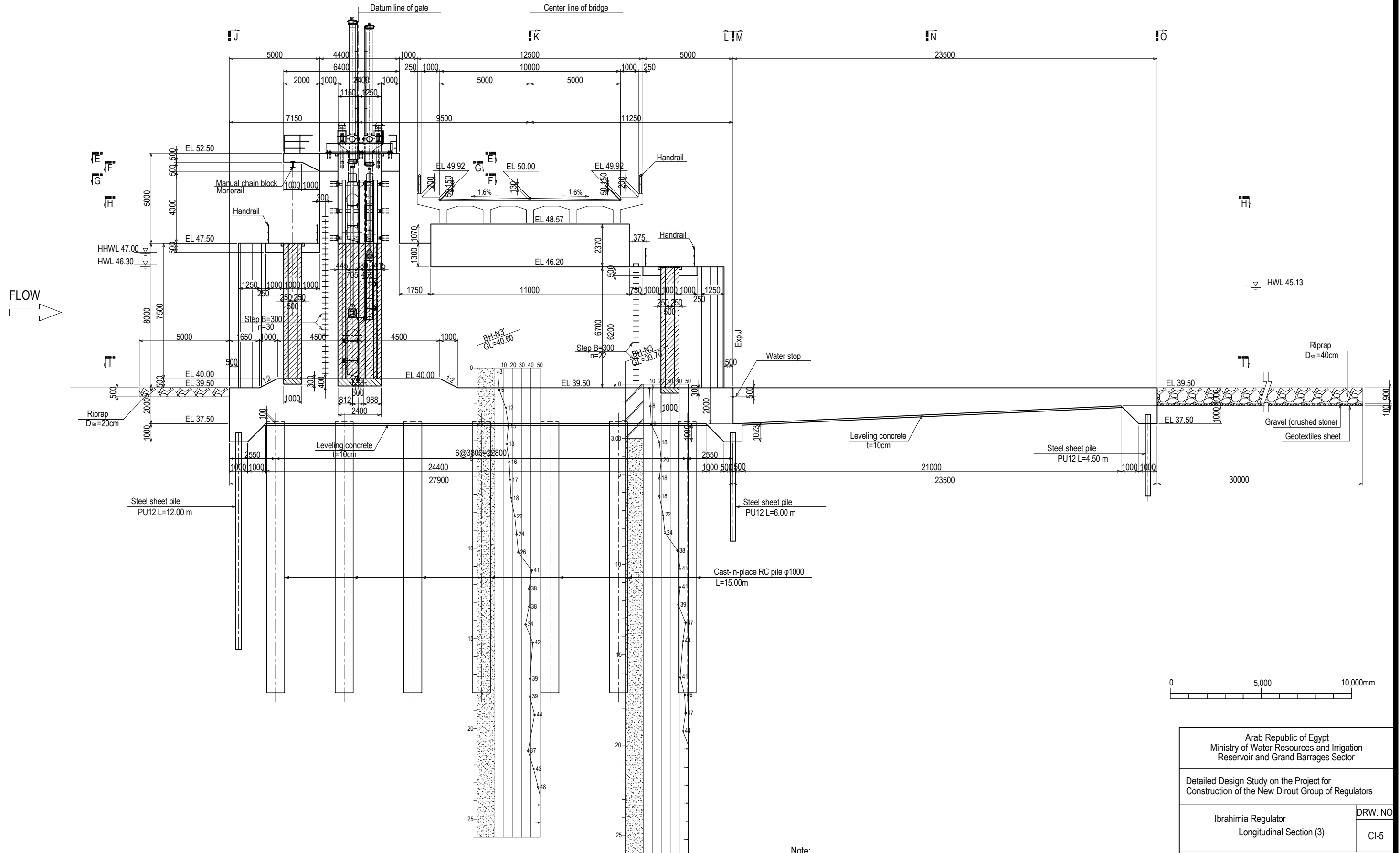
# Longitudinal Section of Ibrahimia Regulator (Section B—B)



Note:  
 Shaded area indicates the range of second stage concrete to be placed with steel materials.

Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Ibrahimia Regulator Longitudinal Section (2)		DRW. NO CI-4
SANYU CONSULTANTS INC.		
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DATE:	DATE:	DATE:

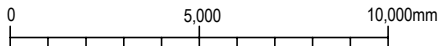
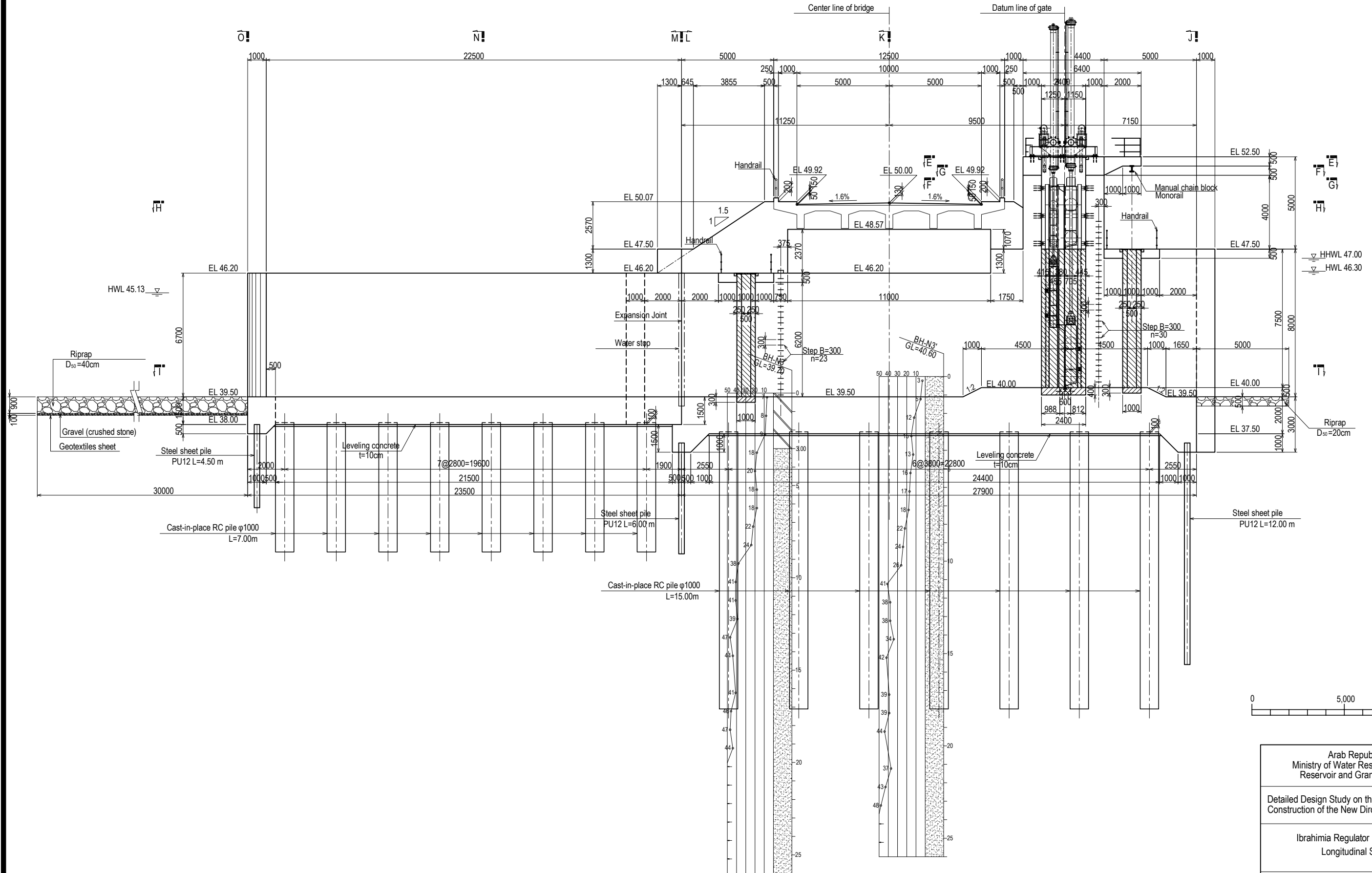
# Longitudinal Section of Ibrahimia Regulator (Section C—C)



Note:  
 Shaded area indicates the range of second stage concrete to be placed with steel materials.

Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Ibrahimia Regulator Longitudinal Section (3)		DRW. NO CI-5
SANYU CONSULTANTS INC.		
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DATE:	DATE:	DATE:

# Longitudinal Section of Ibrahimia Regulator (Section D—D)

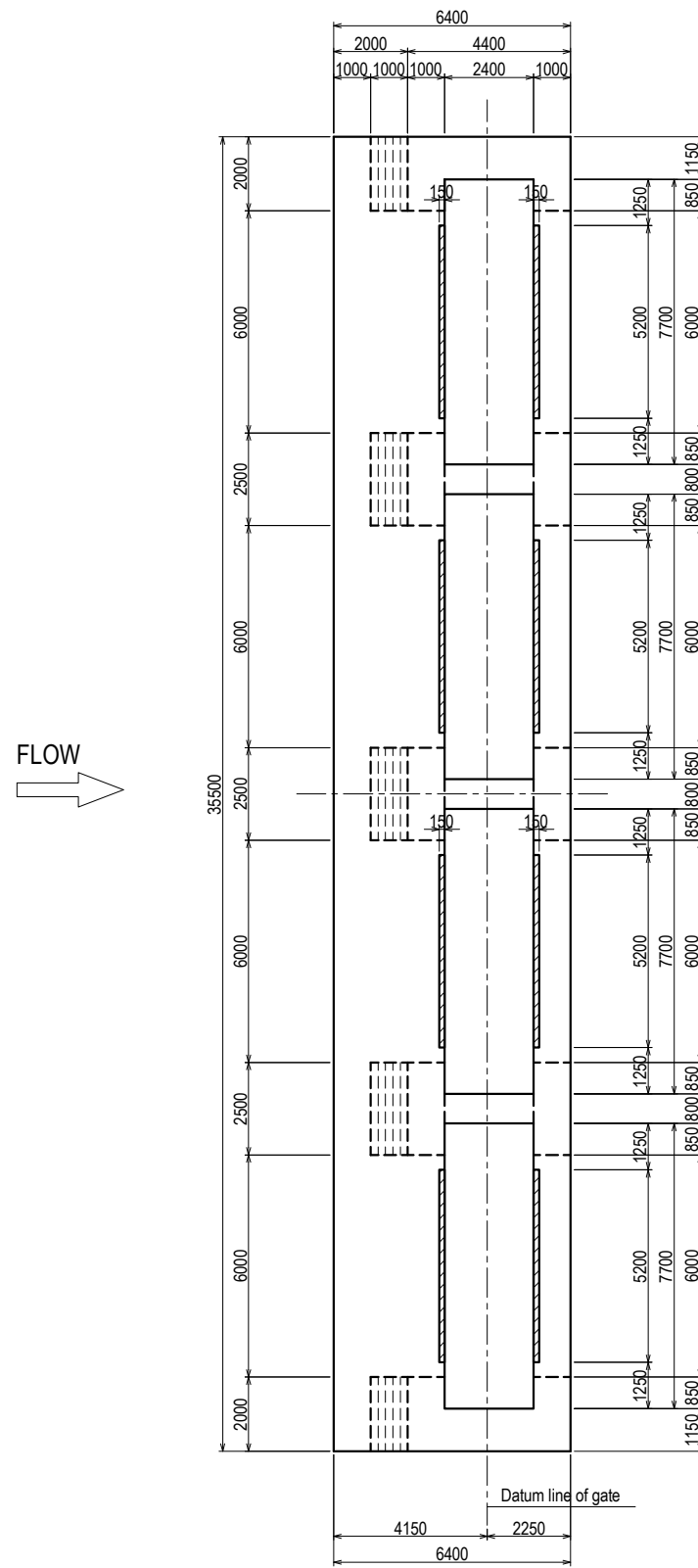


**Note:**  
 Shaded area indicates the range of second stage concrete to be placed with steel materials.

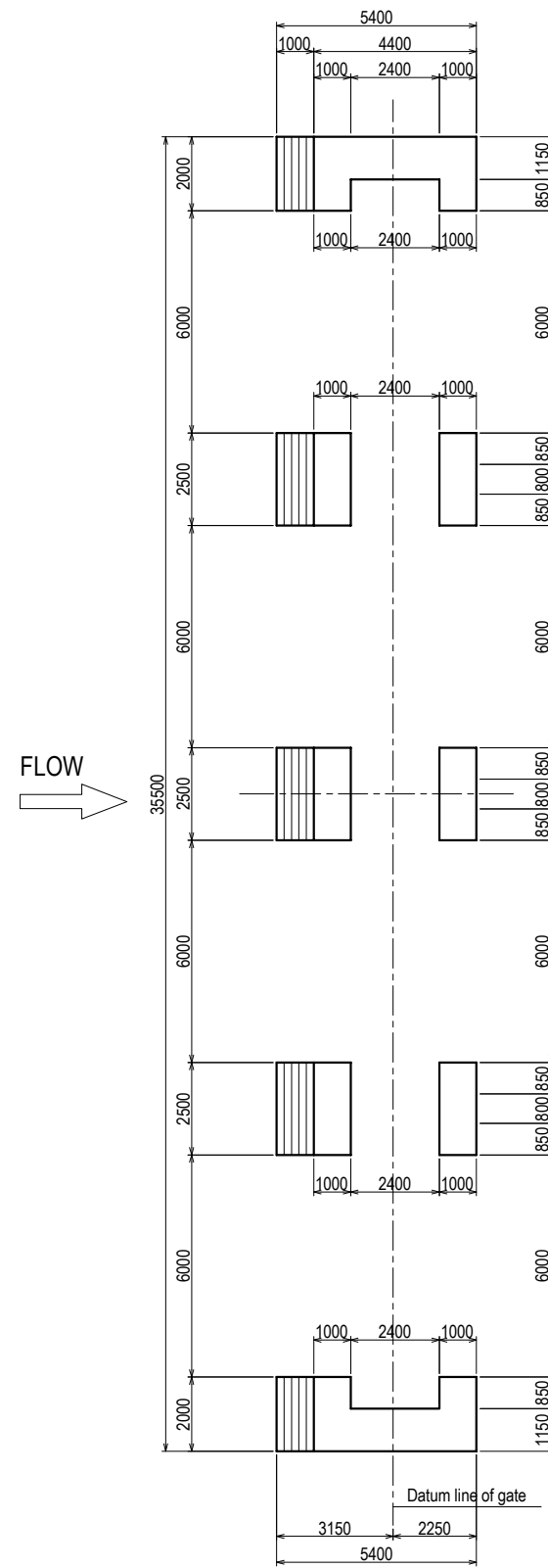
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Ibrahimia Regulator Longitudinal Section (4)		DRW. NO CI-6
SANYU CONSULTANTS INC.		
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DATE:	DATE:	DATE:

# Section of Ibrahimia Regulator (1/5)

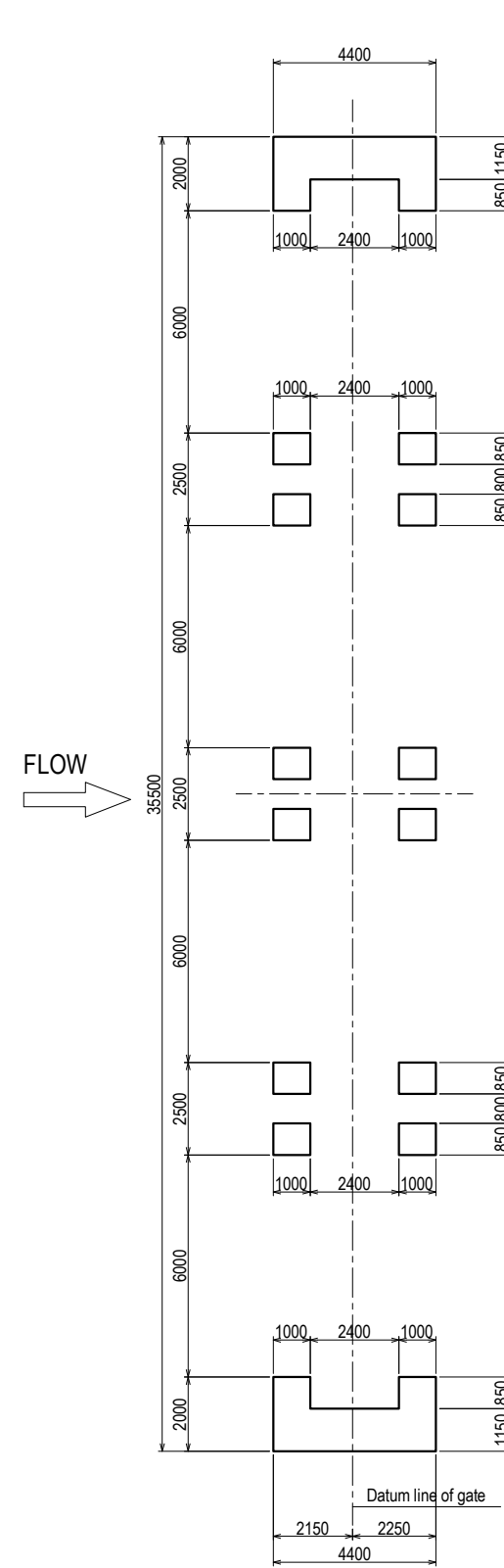
## Section E—E



## Section F—F

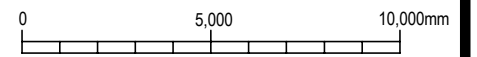


## Section G—G



Note:

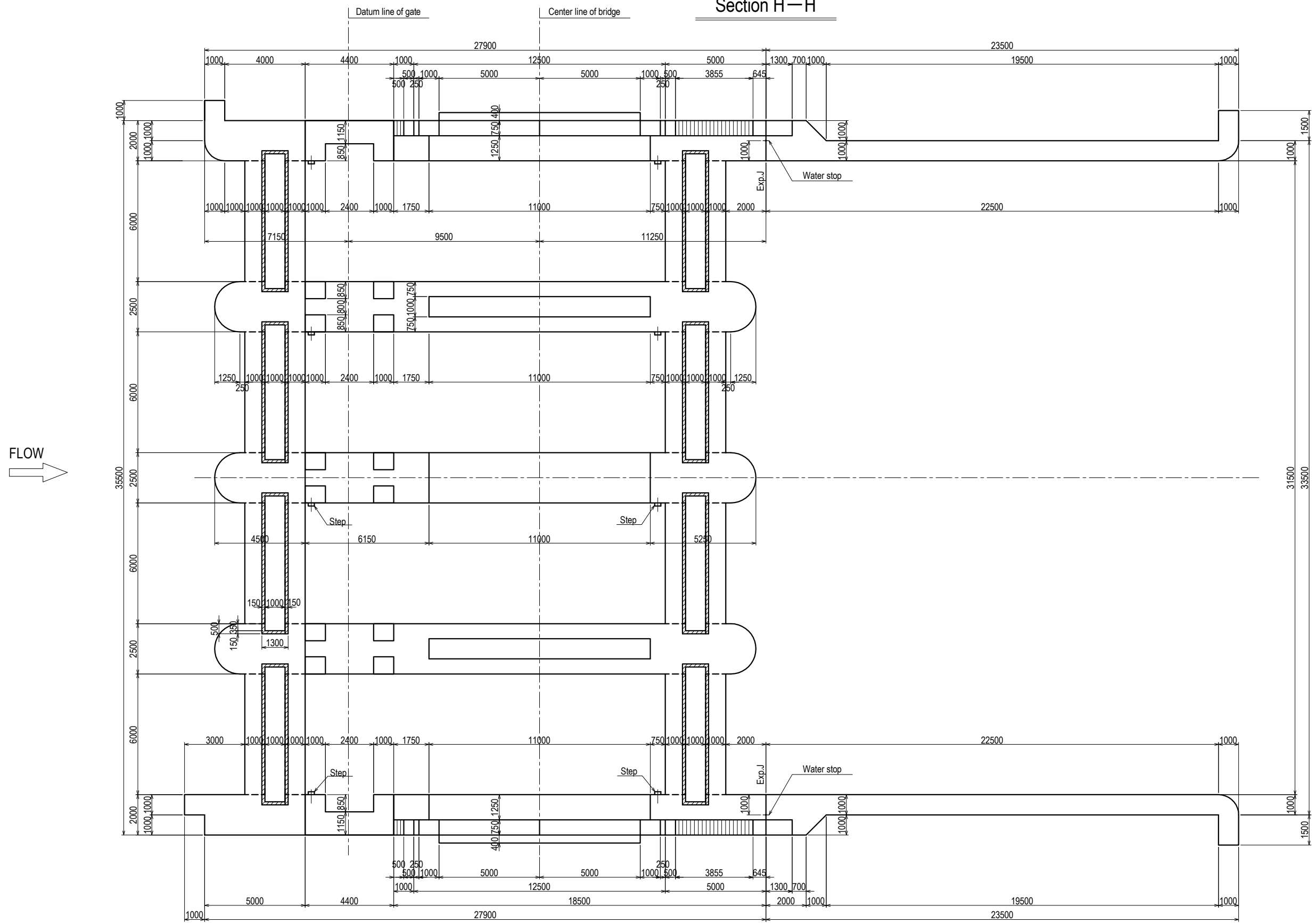
Shaded area indicates the range of secondary concrete to be placed with steel gate guide.




Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Ibrahimia Regulator Sections (1)			DRW. NO. CI-7
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

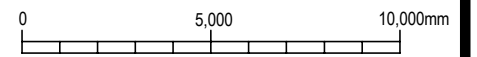
# Section of Ibrahimia Regulator (2/5)

## Section H—H



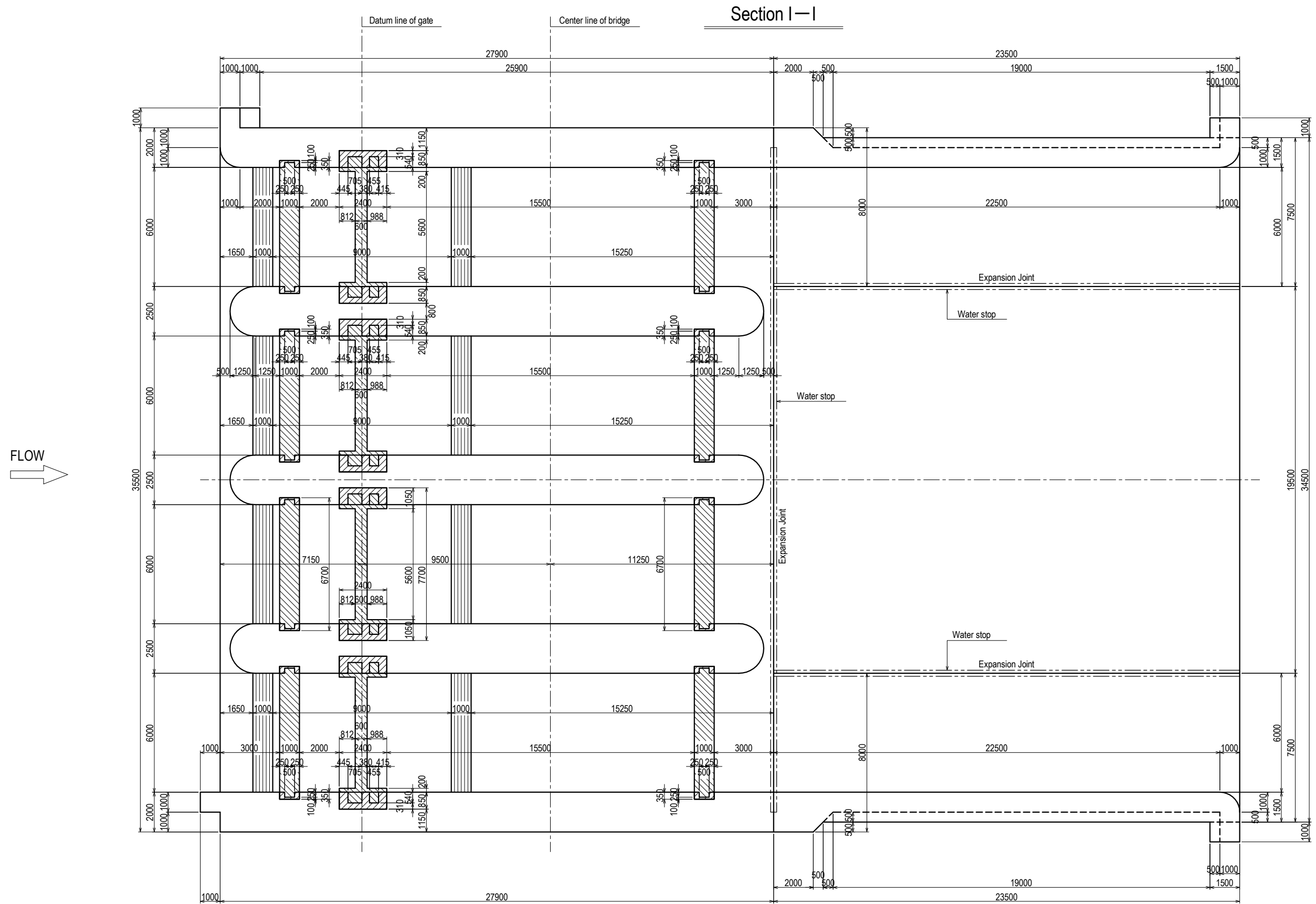
Note:

 Shaded area indicates the range of secondary concrete to be placed with steel gate guide.

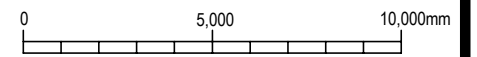


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Ibrahimia Regulator Sections (2)			DRW. NO. CI-8
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Section of Ibrahimia Regulator (3/5)



Note:  
 Shaded area indicates the range of secondary concrete to be placed with steel gate guide.

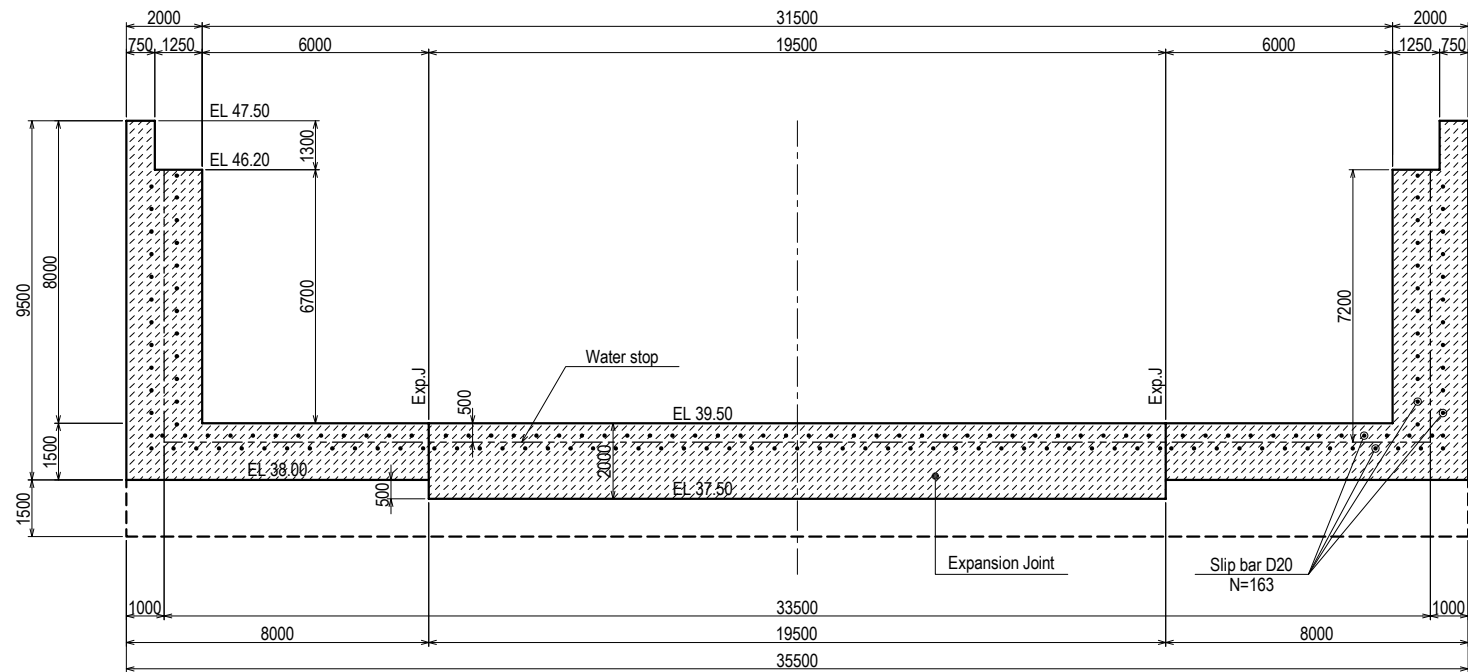


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Ibrahimia Regulator Sections (3)	DRW. NO. CI-9	
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

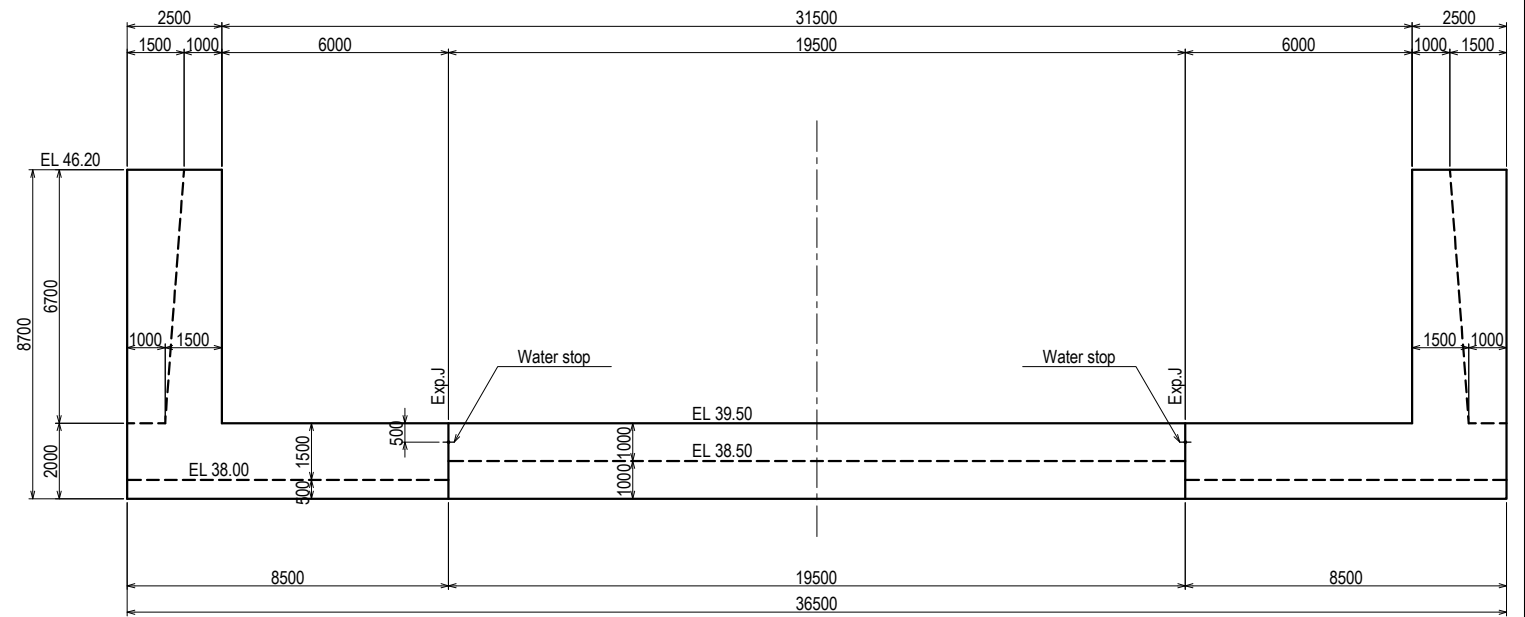


# Section of Ibrahimia Regulator (5/5)

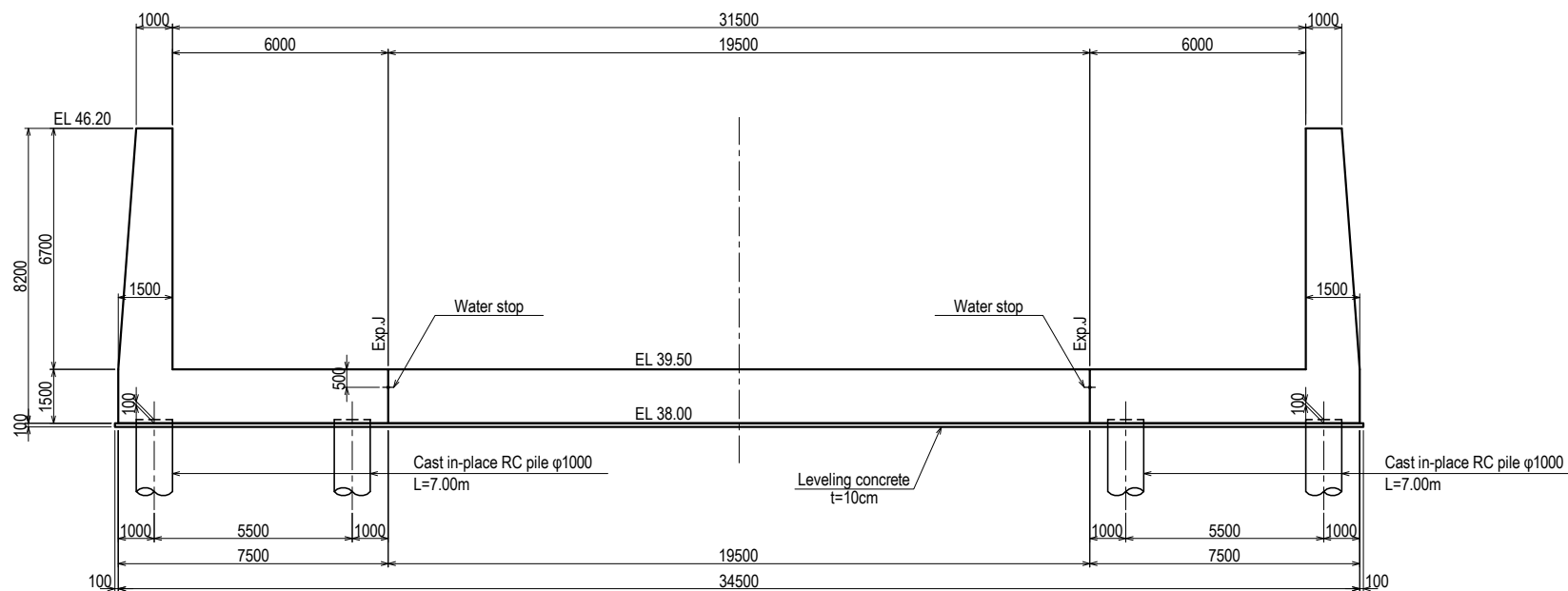
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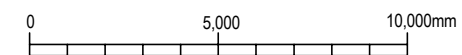
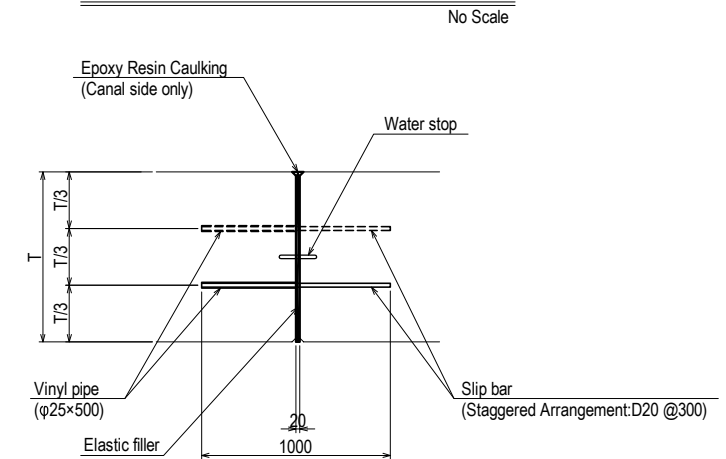
## Section O—O



## Section N—N



## Typical of Expansion Joint



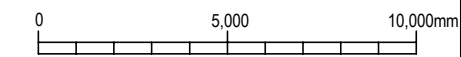
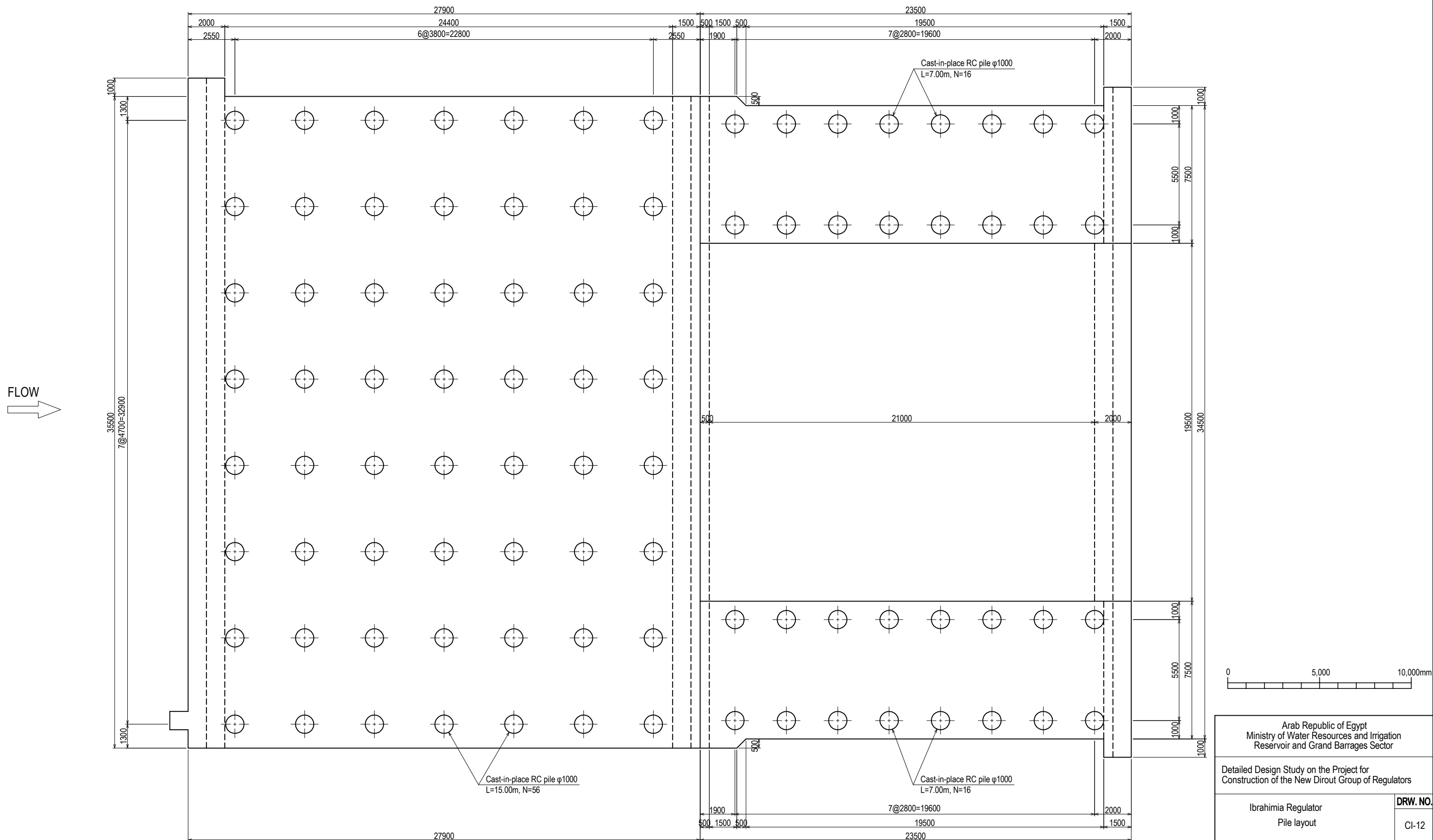
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Ibrahimia Regulator Sections (5)			DRW. NO. CI-11
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:



# Pile layout of Ibrahimia Regulator

## Pile layout of Regulator

## Pile layout of Ltype Wall



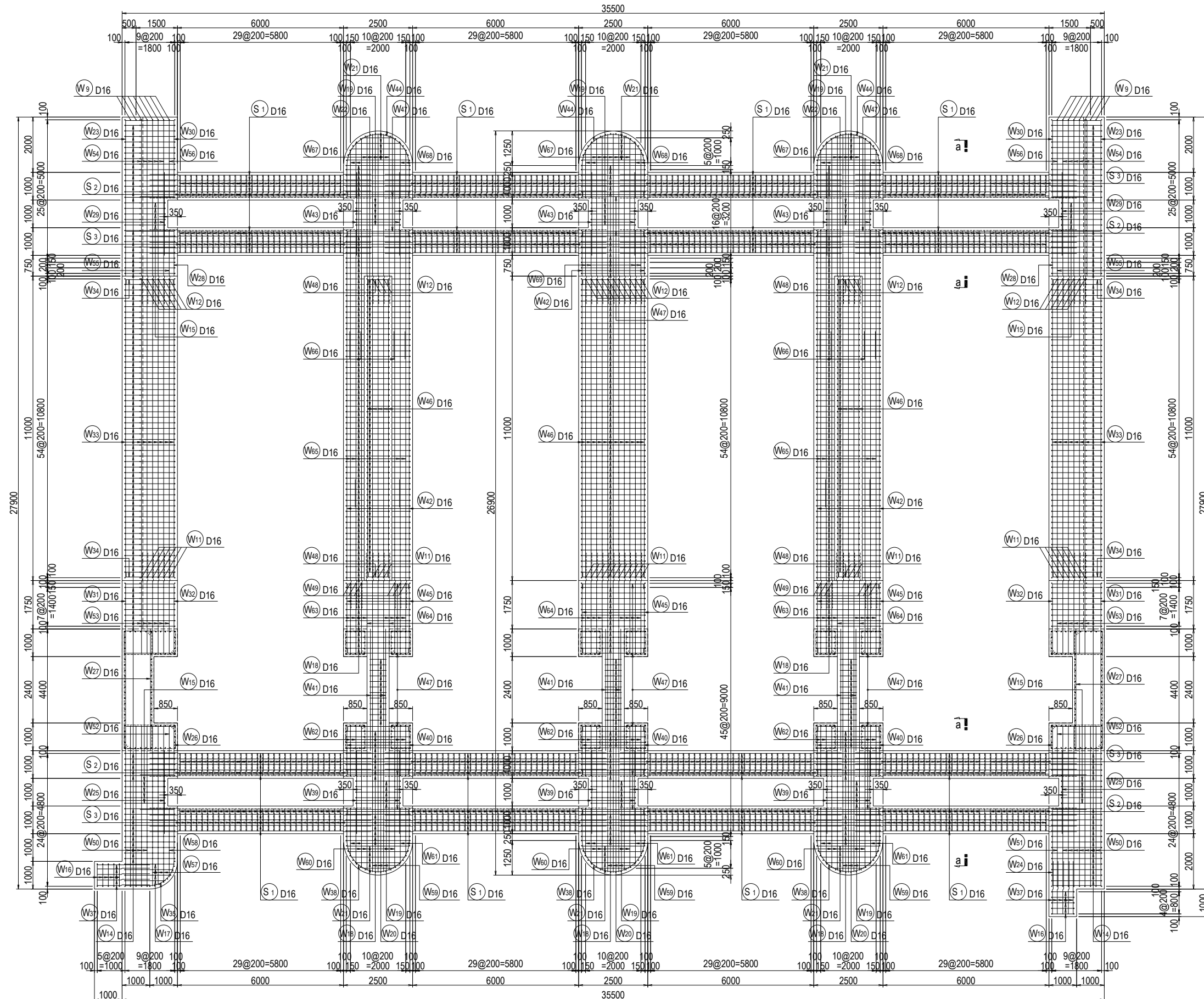
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Ibrahimia Regulator Pile layout			<b>DRW. NO.</b> CI-12
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:



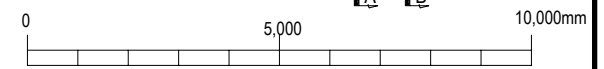
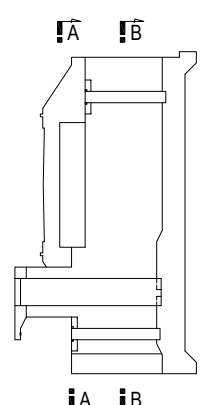
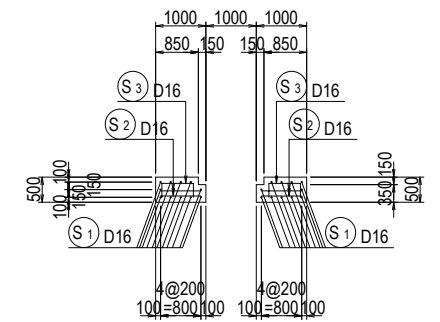


# Plan of Gate Abutment and Pier of Ibrahimia Regulator (1/2)

## Section A—A



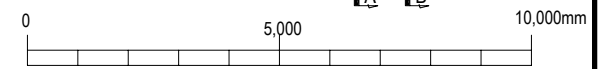
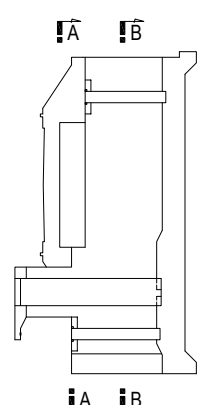
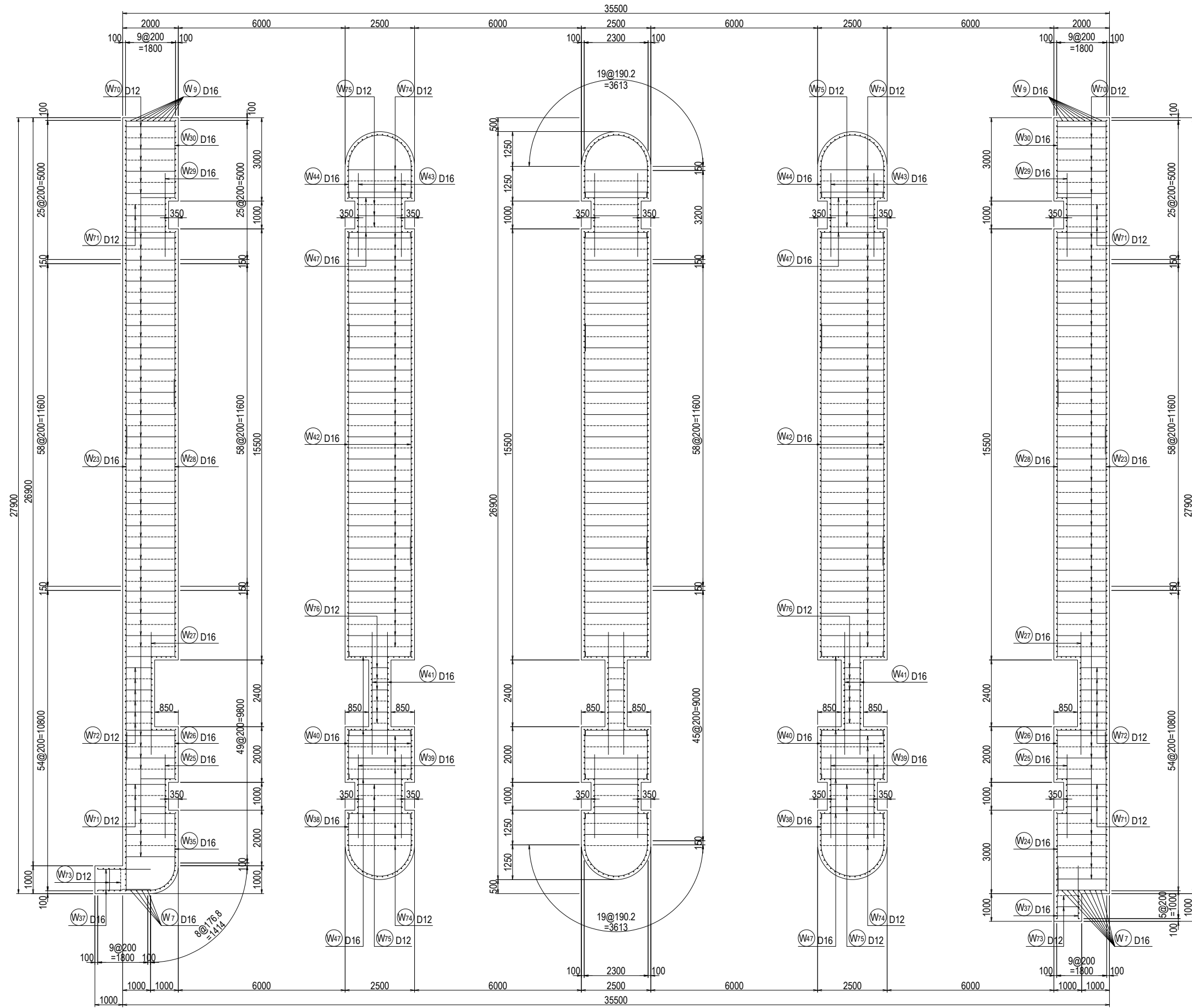
## Section a—a



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Ibrahimia Regulator Bar arrangement of weir body (2)			DRW. NO CI-15
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Plan of Gate Abutment and Pier of Ibrahimia Regulator (2/2)

## Section B—B



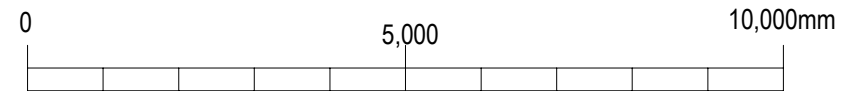
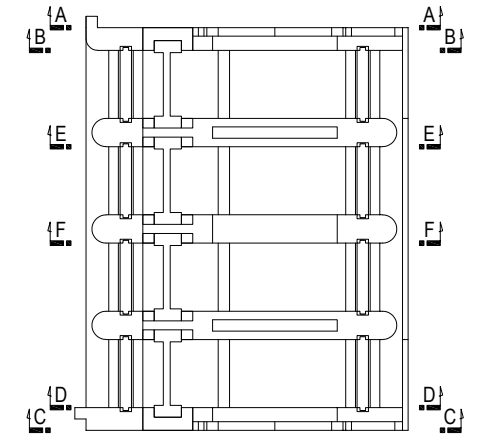
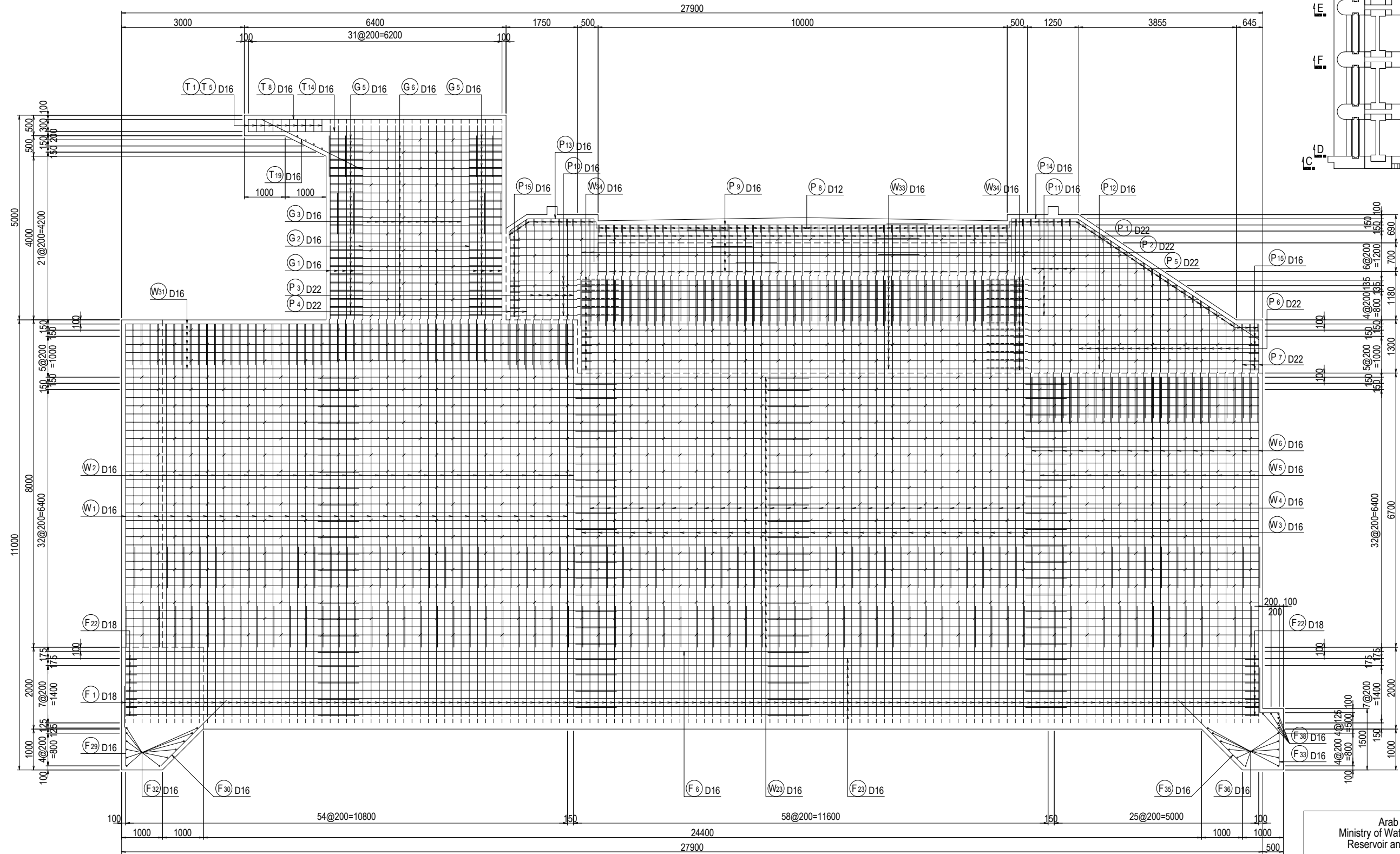
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Ibrahimia Regulator Bar arrangement of weir body (3)			DRW. NO CI-16
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:





# Longitudinal Section of Gate Abutment and Pier of Ibrahimia Regulator (1/6)

## Section A—A

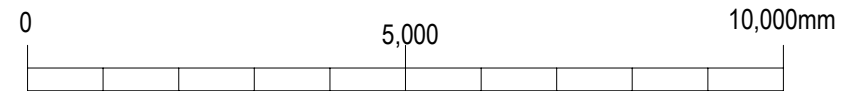
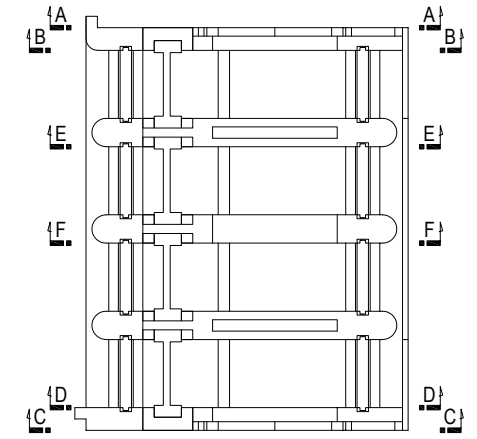
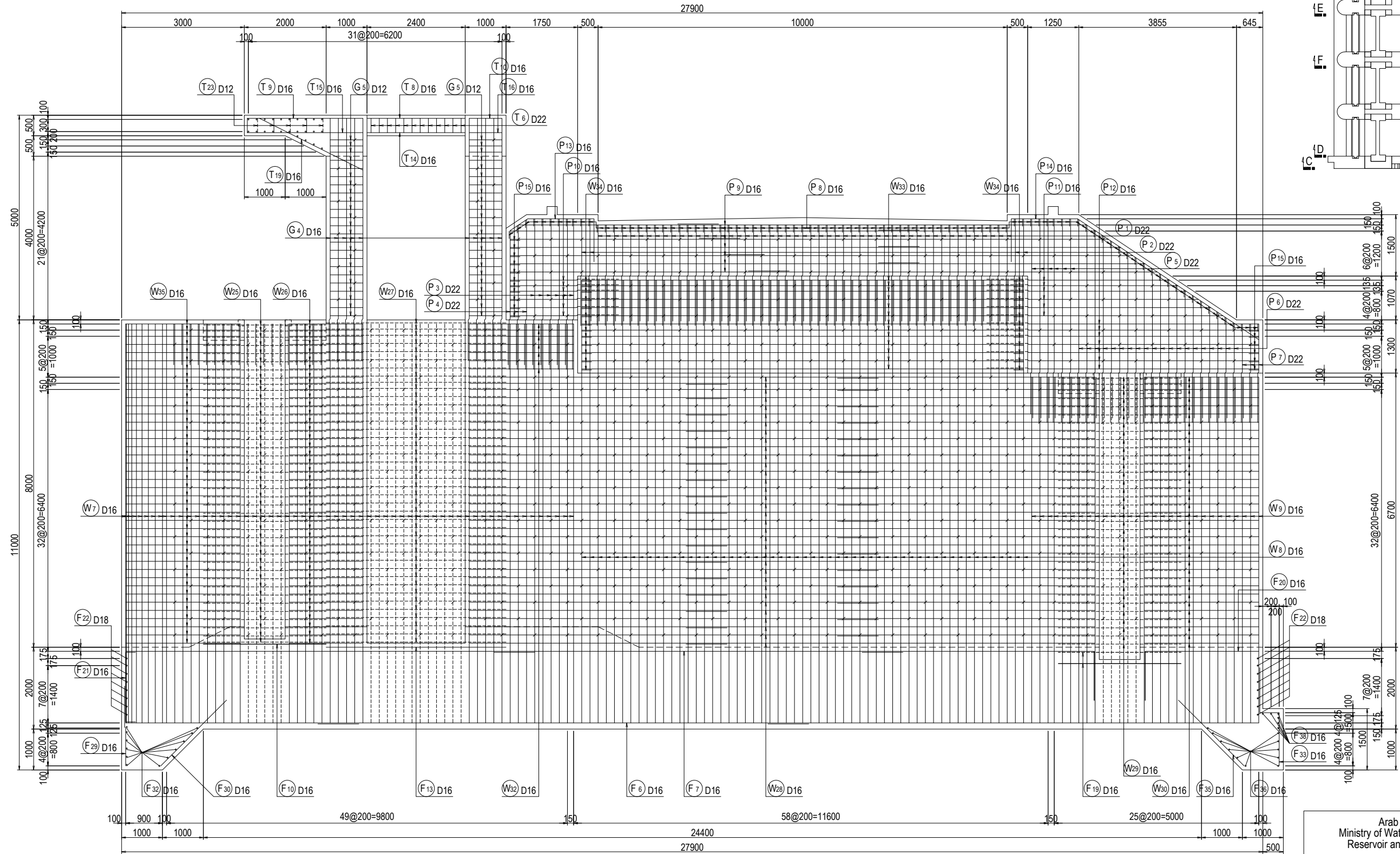


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Ibrahimia Regulator Bar arrangement of weir body (6)	DRW. NO CI-19	
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:



# Longitudinal Section of Gate Abutment and Pier of Ibrahimia Regulator (2/6)

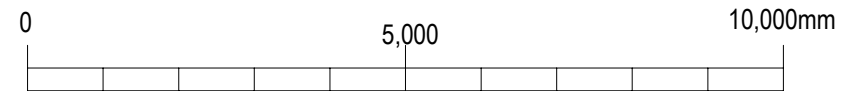
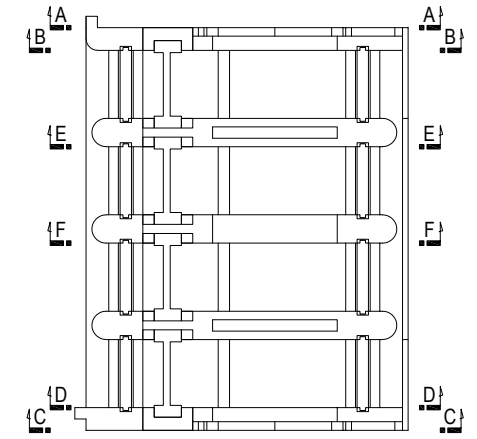
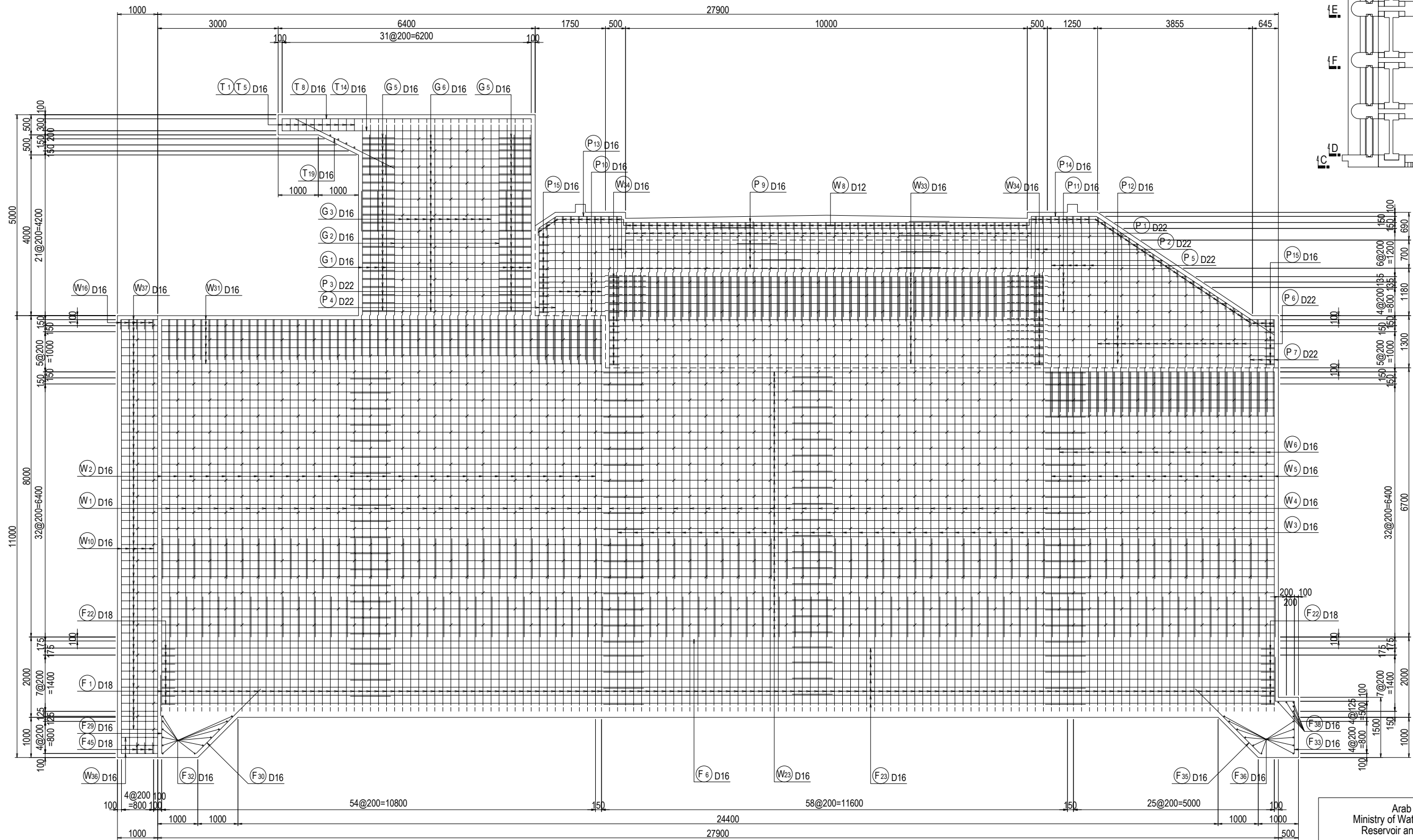
## Section B—B



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Ibrahimia Regulator Bar arrangement of weir body (7)	DRW. NO CI-20	
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

# Longitudinal Section of Gate Abutment and Pier of Ibrahimia Regulator (3/6)

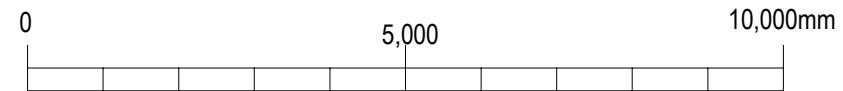
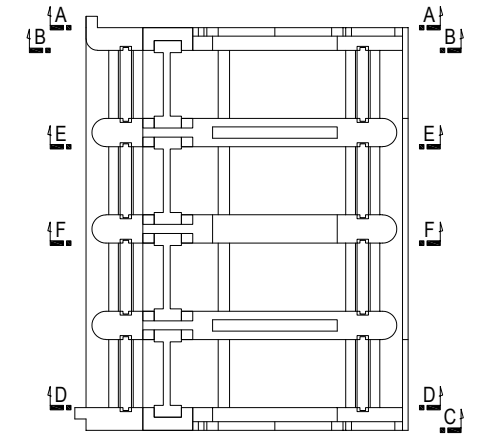
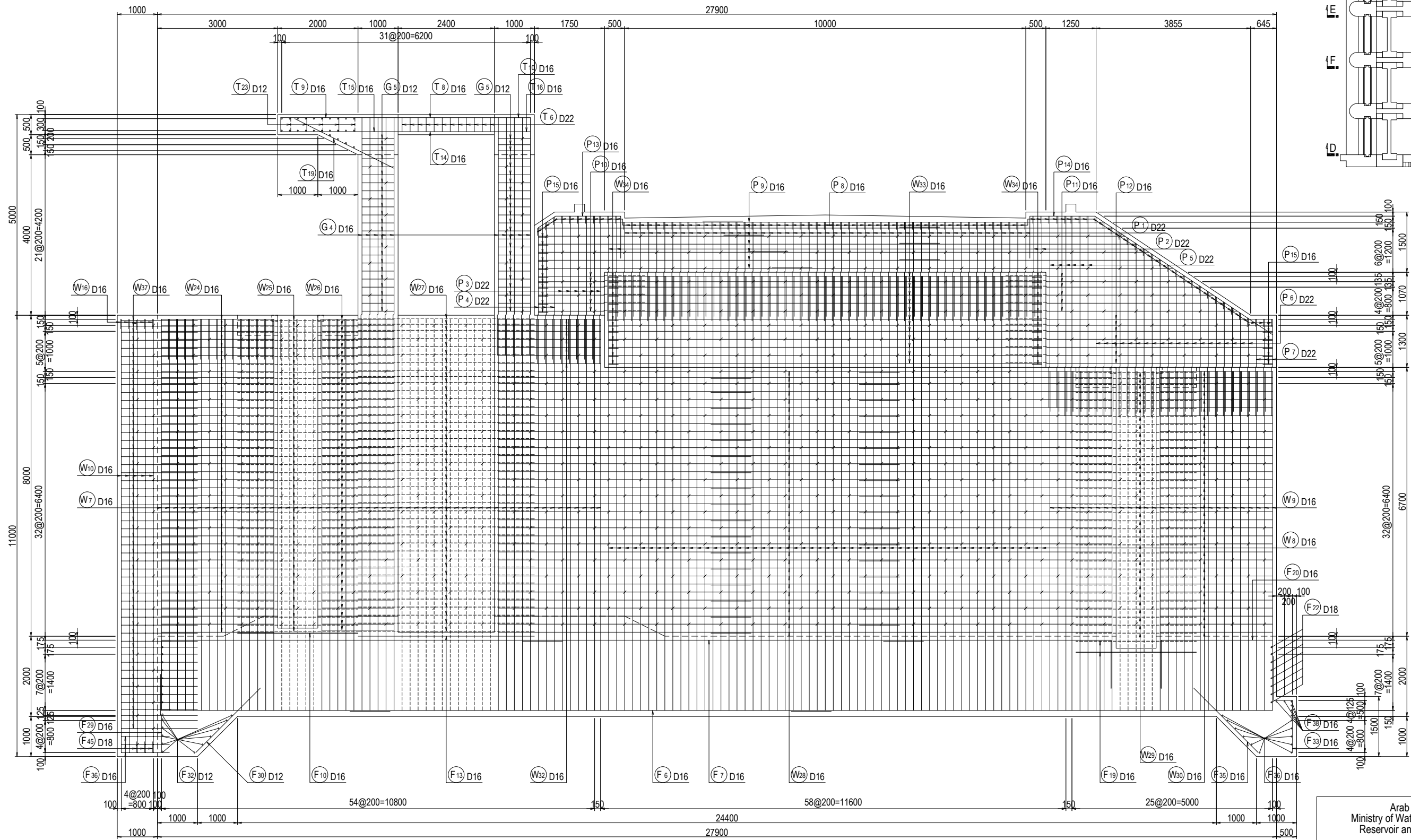
## Section C—C



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Ibrahimia Regulator Bar arrangement of weir body (8)	DRW. NO CI-21	
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

# Longitudinal Section of Gate Abutment and Pier of Bahr Yusef Regulator (4/6)

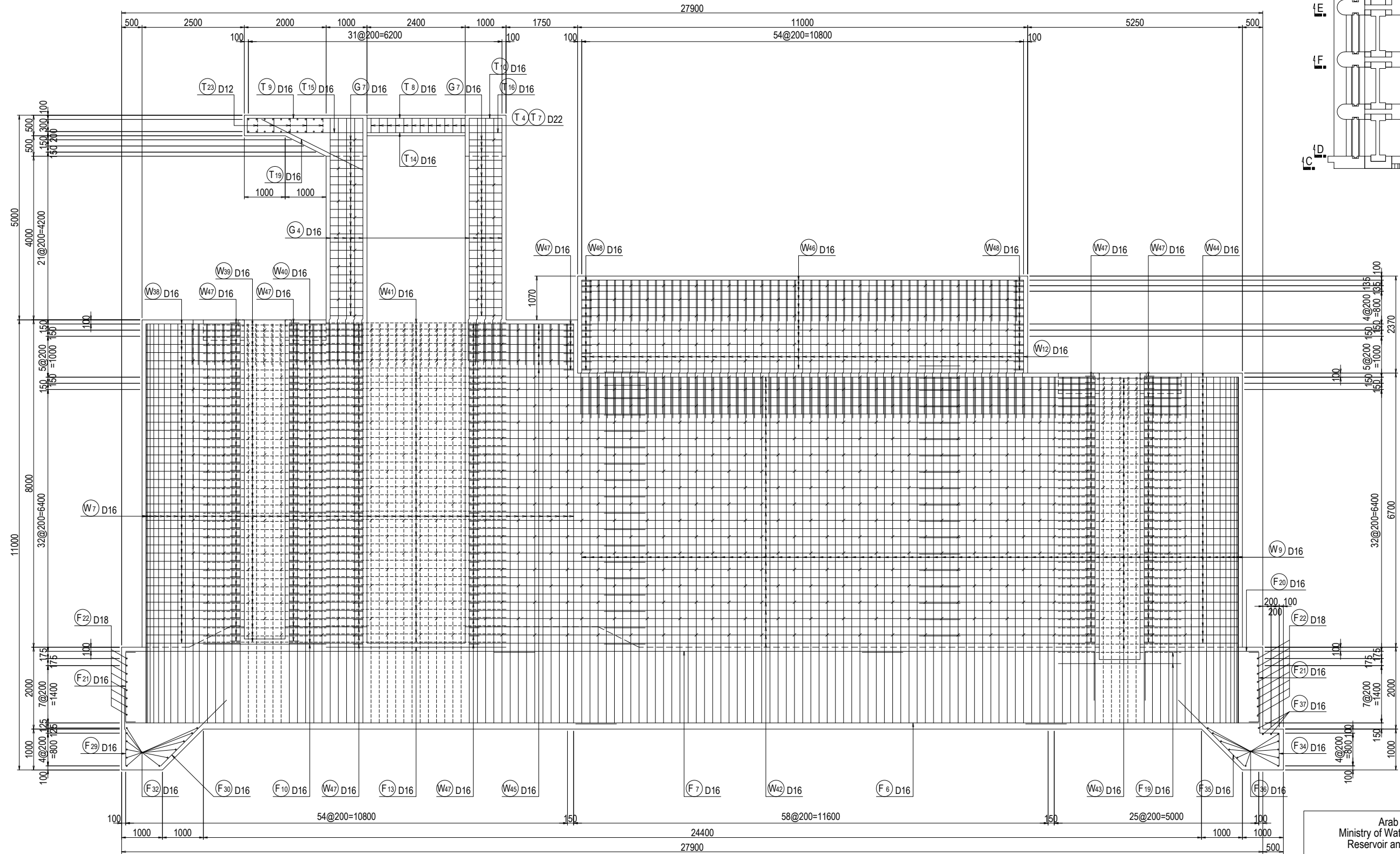
## Section D—D



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Ibrahimia Regulator Bar arrangement of weir body (9)	DRW. NO CI-22	
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

# Longitudinal Section of Gate Abutment and Pier of Ibrahimia Regulator (5/6)

## Section E—E



Arab Republic of Egypt  
Ministry of Water Resources and Irrigation  
Reservoir and Grand Barrages Sector

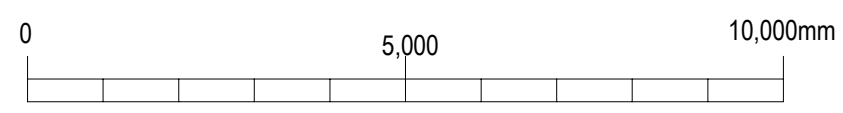
Detailed Design Study on the Project for  
Construction of the New Dirout Group of Regulators

Ibrahimia Regulator  
Bar arrangement of weir body (10)

SANYU CONSULTANTS INC.

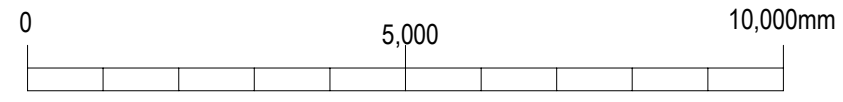
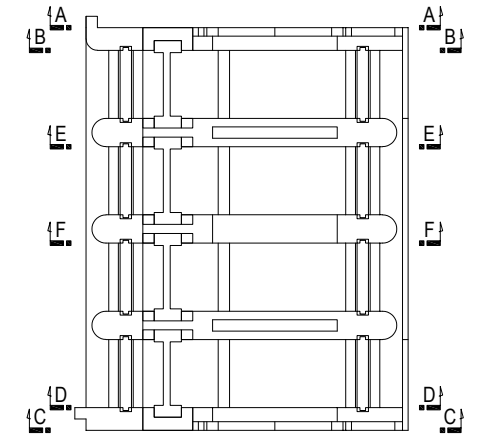
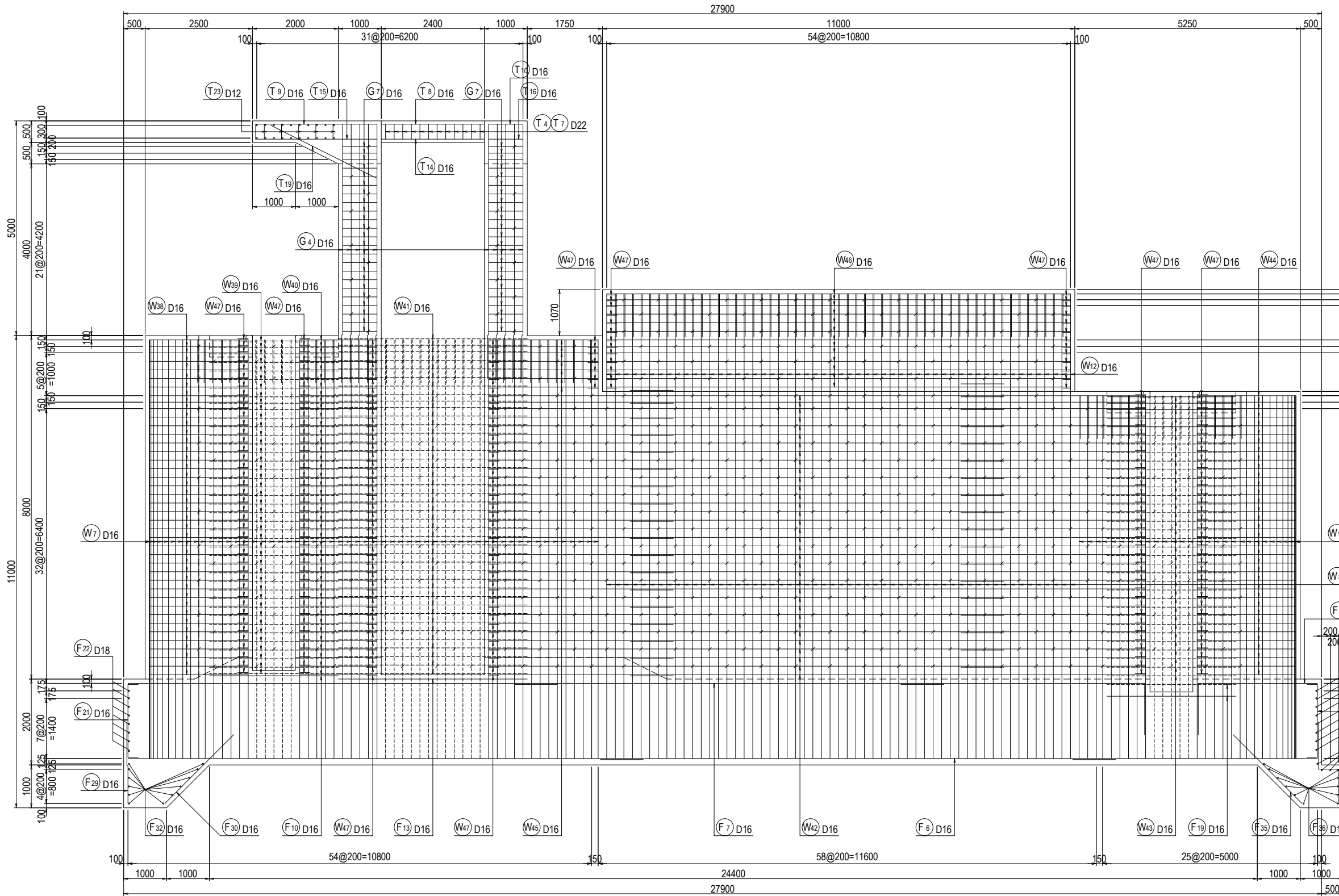
PREPARED BY: \_\_\_\_\_ CHECKED BY: \_\_\_\_\_ APPROVED BY: \_\_\_\_\_  
DATE: \_\_\_\_\_ DATE: \_\_\_\_\_ DATE: \_\_\_\_\_

DRW. NO  
CI-23



# Longitudinal Section of Gate Abutment and Pier of Ibrahimia Regulator (6/6)

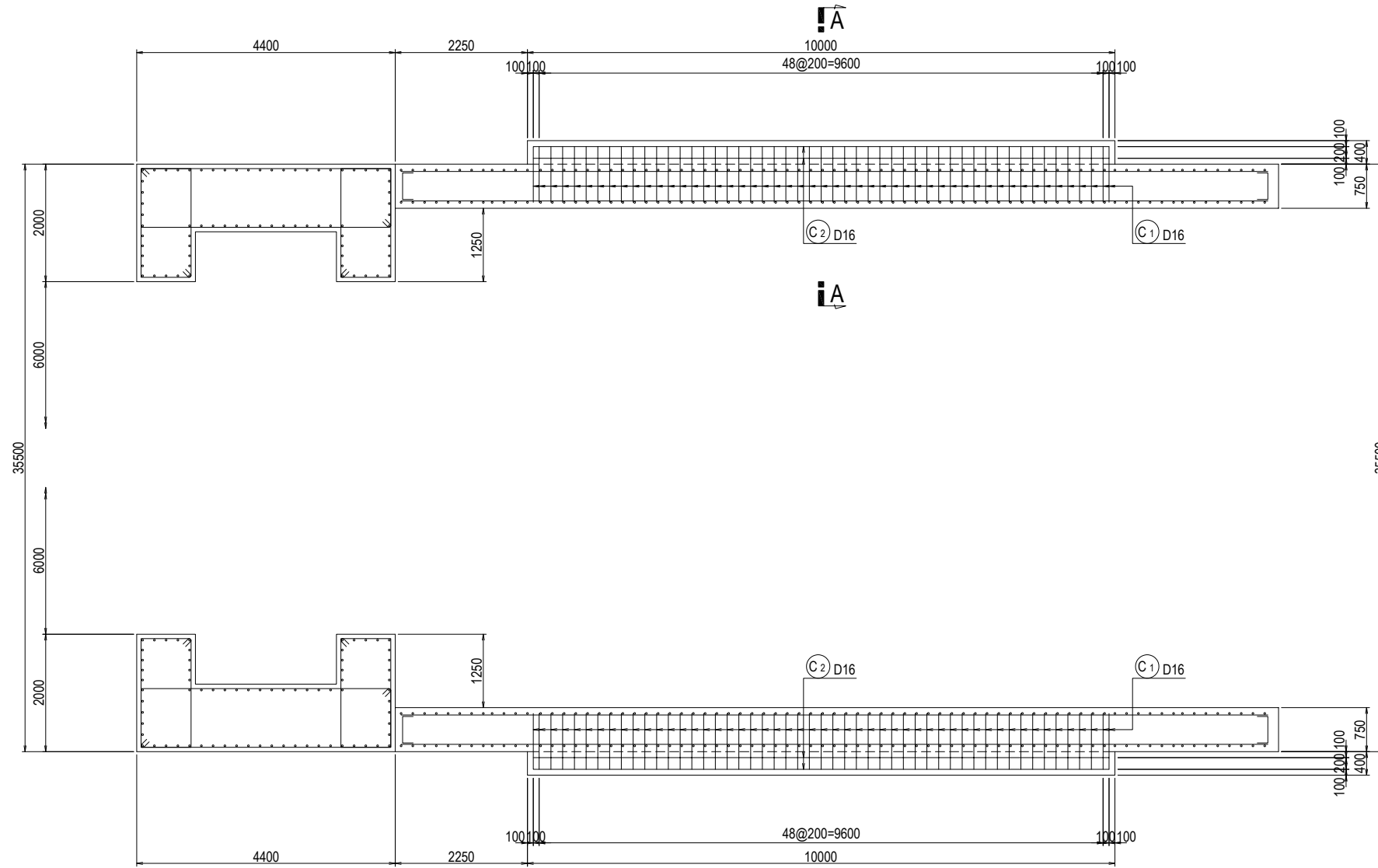
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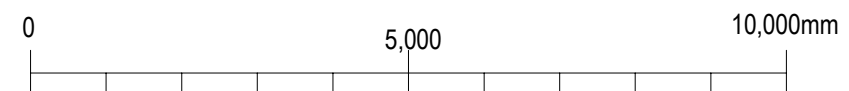
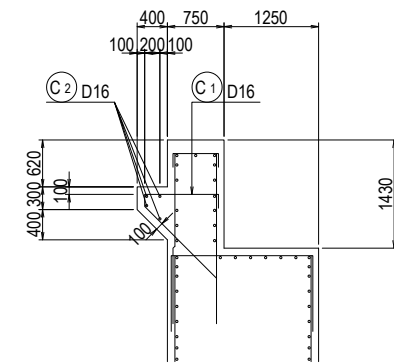
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Ibrahimia Regulator Bar arrangement of weir body (11)			DRW. NO CI-24
SANYU CONSULTANTS INC.			
PREPARED BY :	CHECKED BY :	APPROVED BY :	
DATE :	DATE :	DATE :	DATE :

# Detail of Cradle of Ibrahimia Regulator

Plan



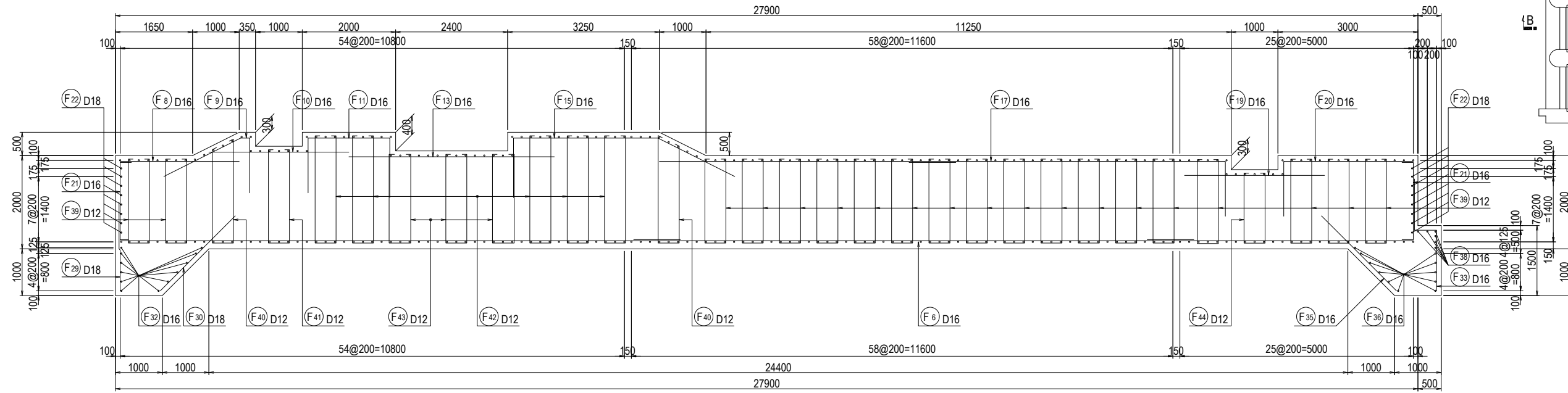
Section A—A



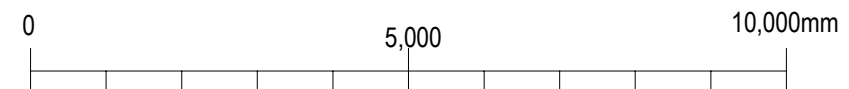
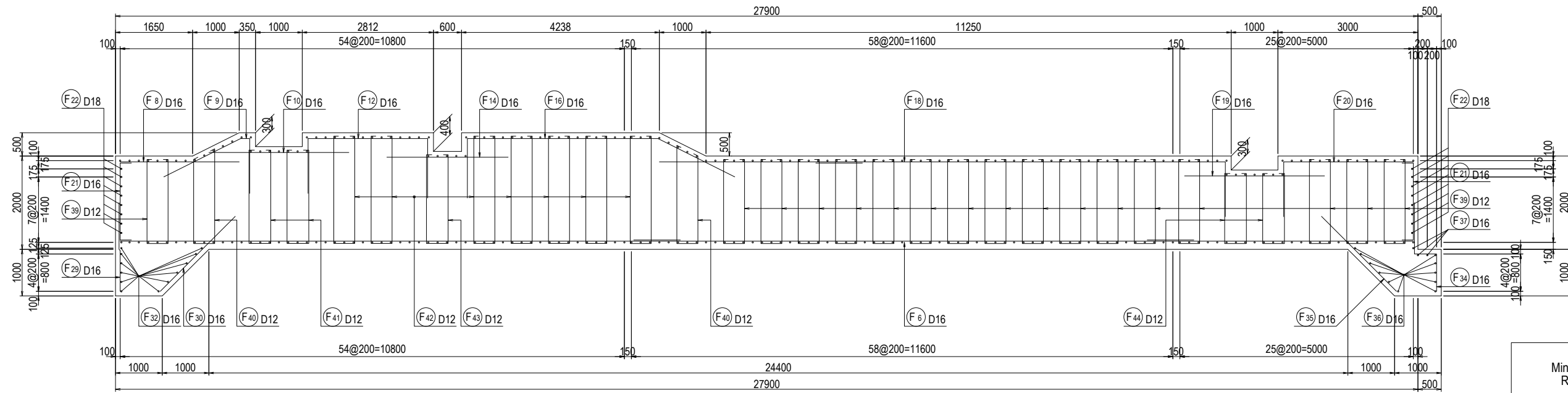
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Ibrahimia Regulator Bar arrangement of weir body (12)			DRW. NO CI-25
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	DATE:
DATE:	DATE:	DATE:	DATE:

# Longitudinal Section of Upstream Apron of Ibrahimia Regulator

## Section A—A



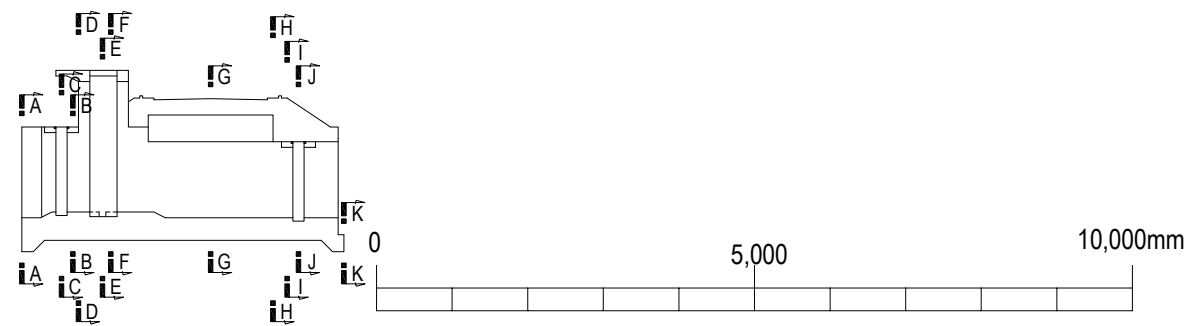
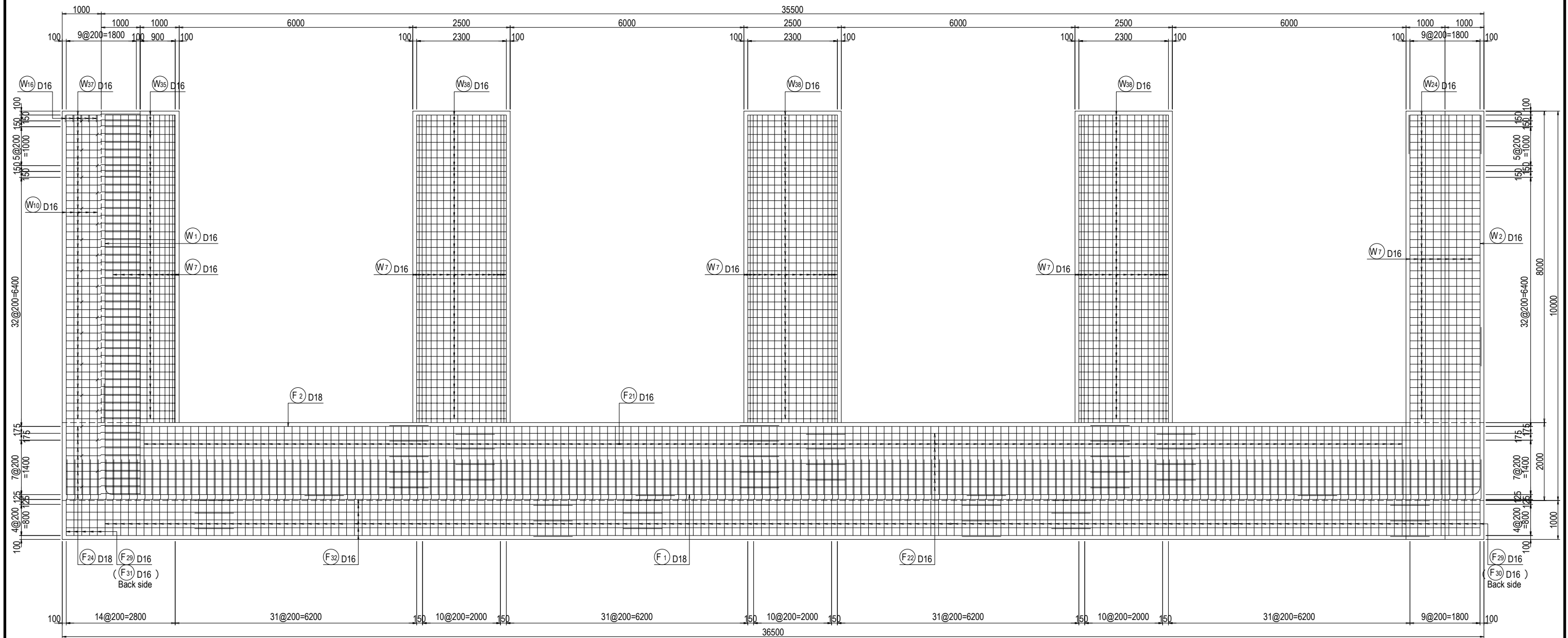
## Section B—B



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Ibrahimia Regulator Bar arrangement of weir body (13)	DRW. NO CI-26	
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

# Section of Gate Abutment and Pier of Ibrahimia Regulator (1/7)

## Section A—A



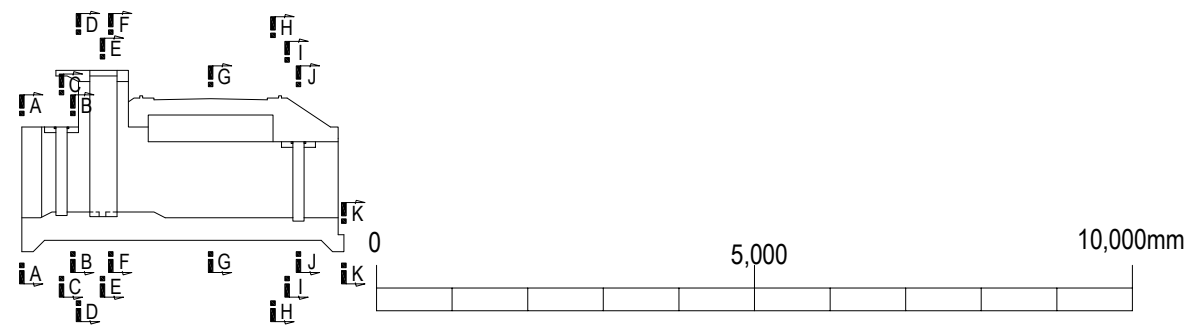
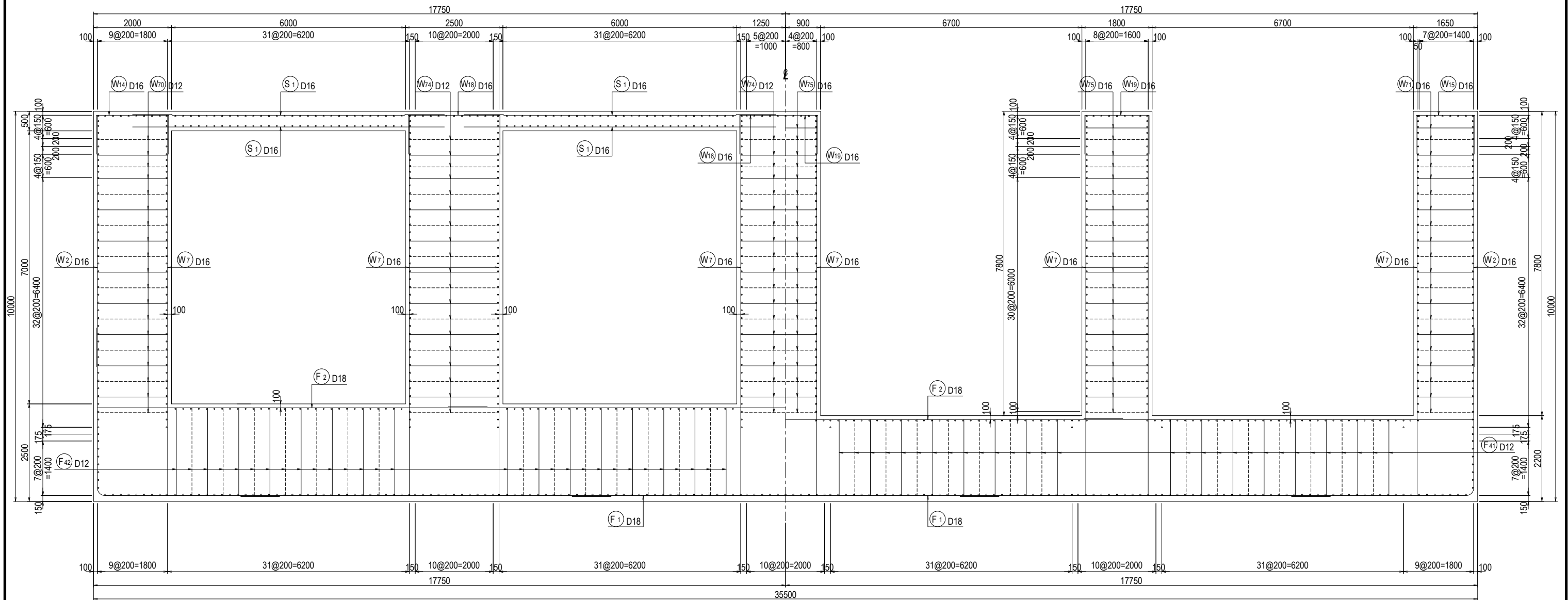
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Ibrahimia Regulator Bar arrangement of weir body (14)			DRW. NO CI-27
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:



# Section of Gate Abutment and Pier of Ibrahimia Regulator (2/7)

## Section B—B

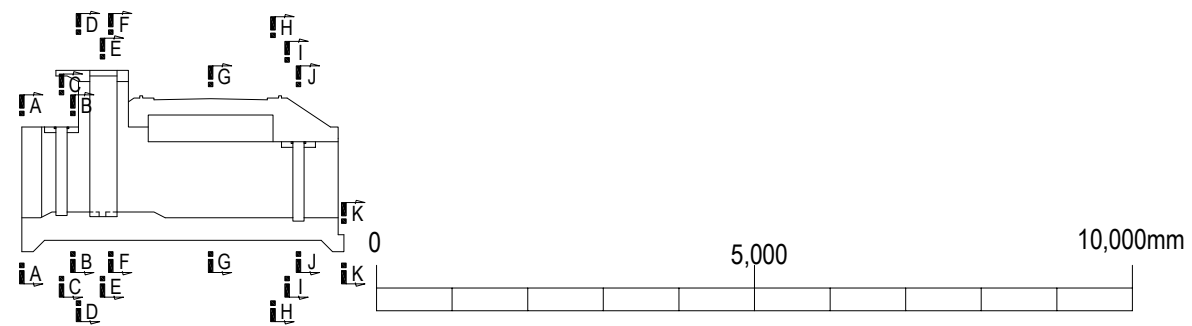
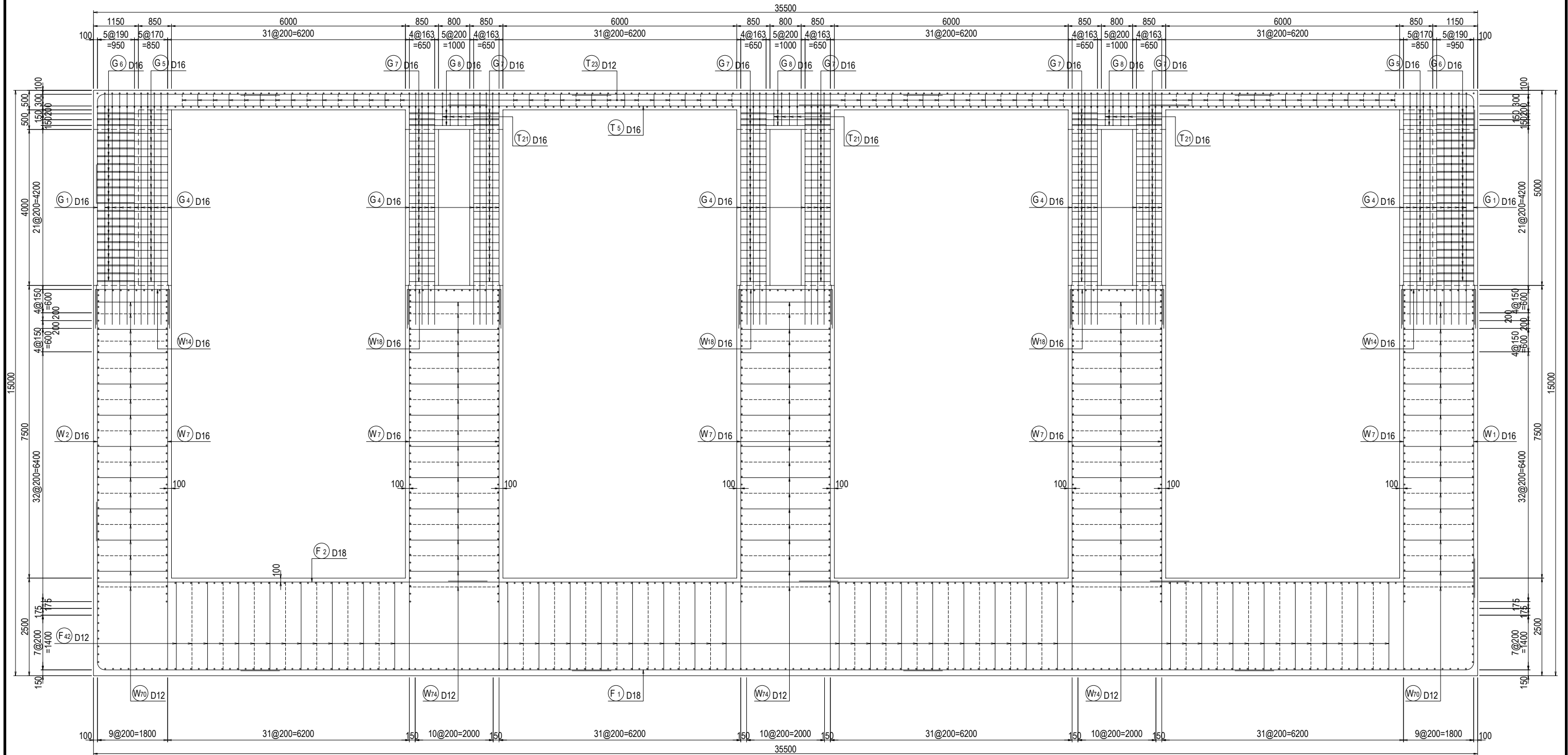
## Section C—C



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Ibrahimia Regulator Bar arrangement of weir body (15)			DRW. NO CI-28
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Section of Gate Abutment and Pier of Ibrahimia Regulator (3/7)

## Section D—D

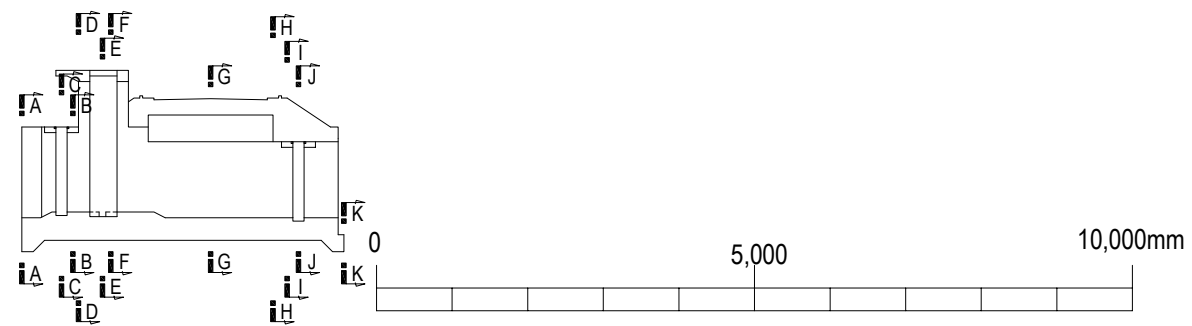
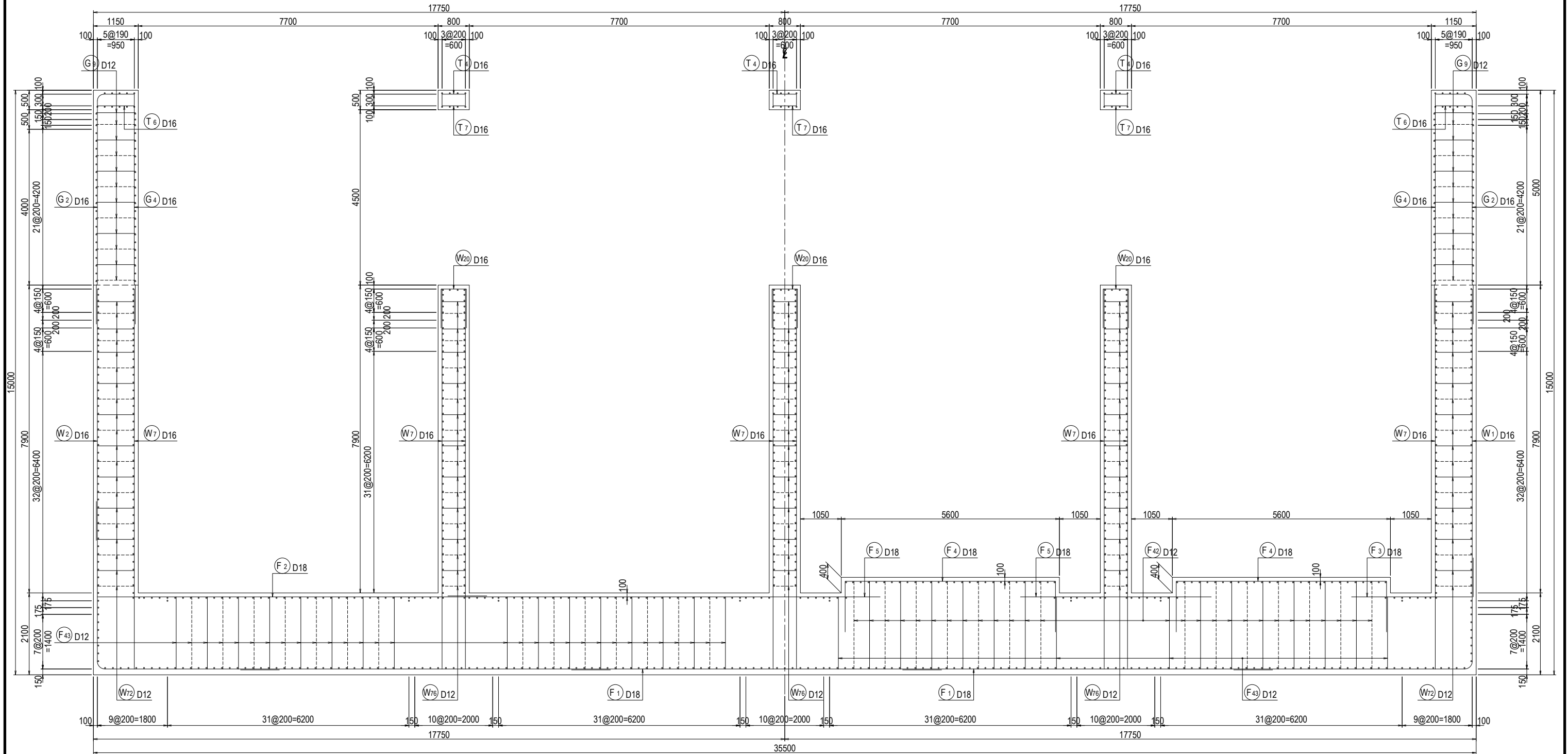


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Ibrahimia Regulator Bar arrangement of weir body (16)	DRW. NO CI-29	
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

# Section of Gate Abutment and Pier of Ibrahimia Regulator (4/7)

## Section E—E

## Section F—F

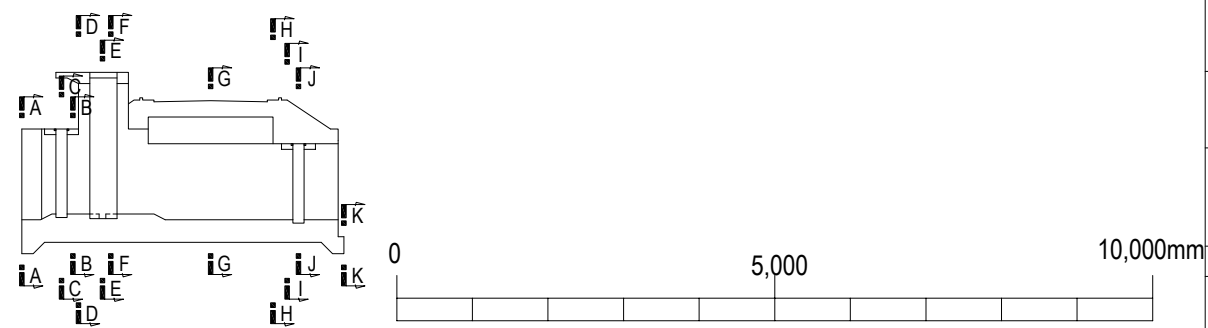
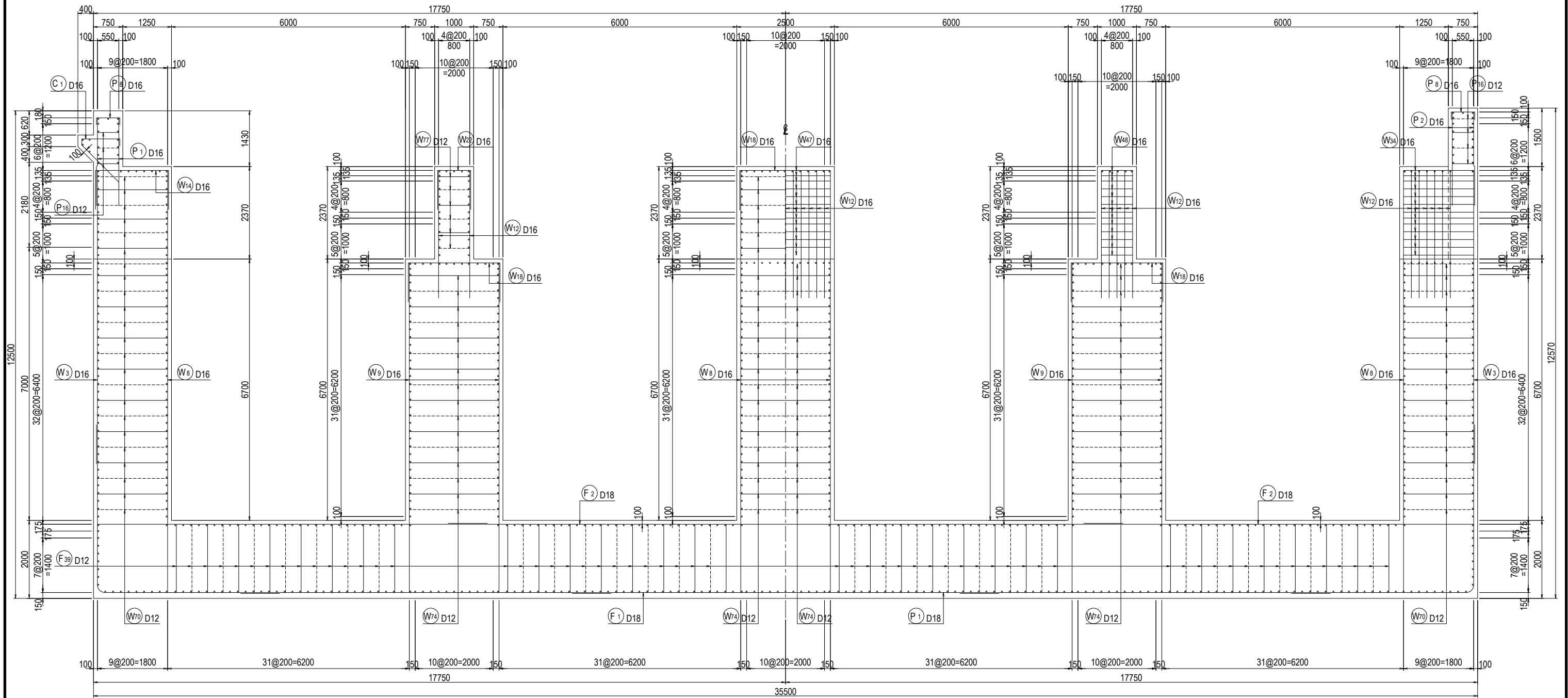


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Ibrahimia Regulator Bar arrangement of weir body (17)			DRW. NO CI-30
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Section of Gate Abutment and Pier of Ibrahimia Regulator (5/7)

Section G—G

Section H—H

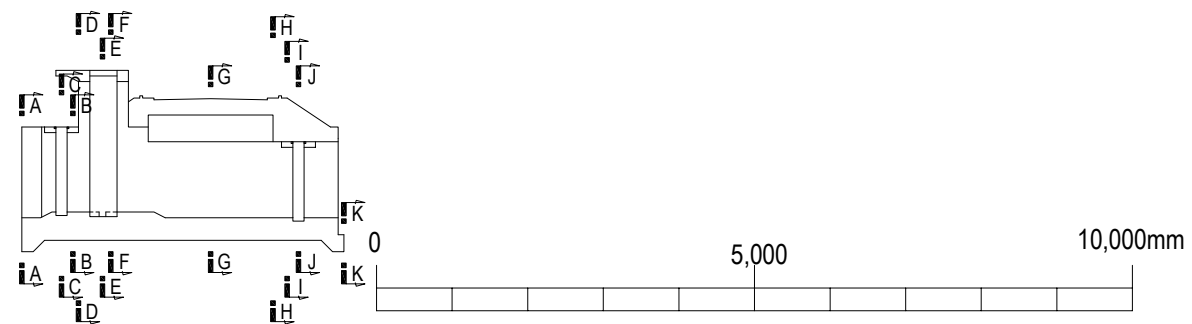
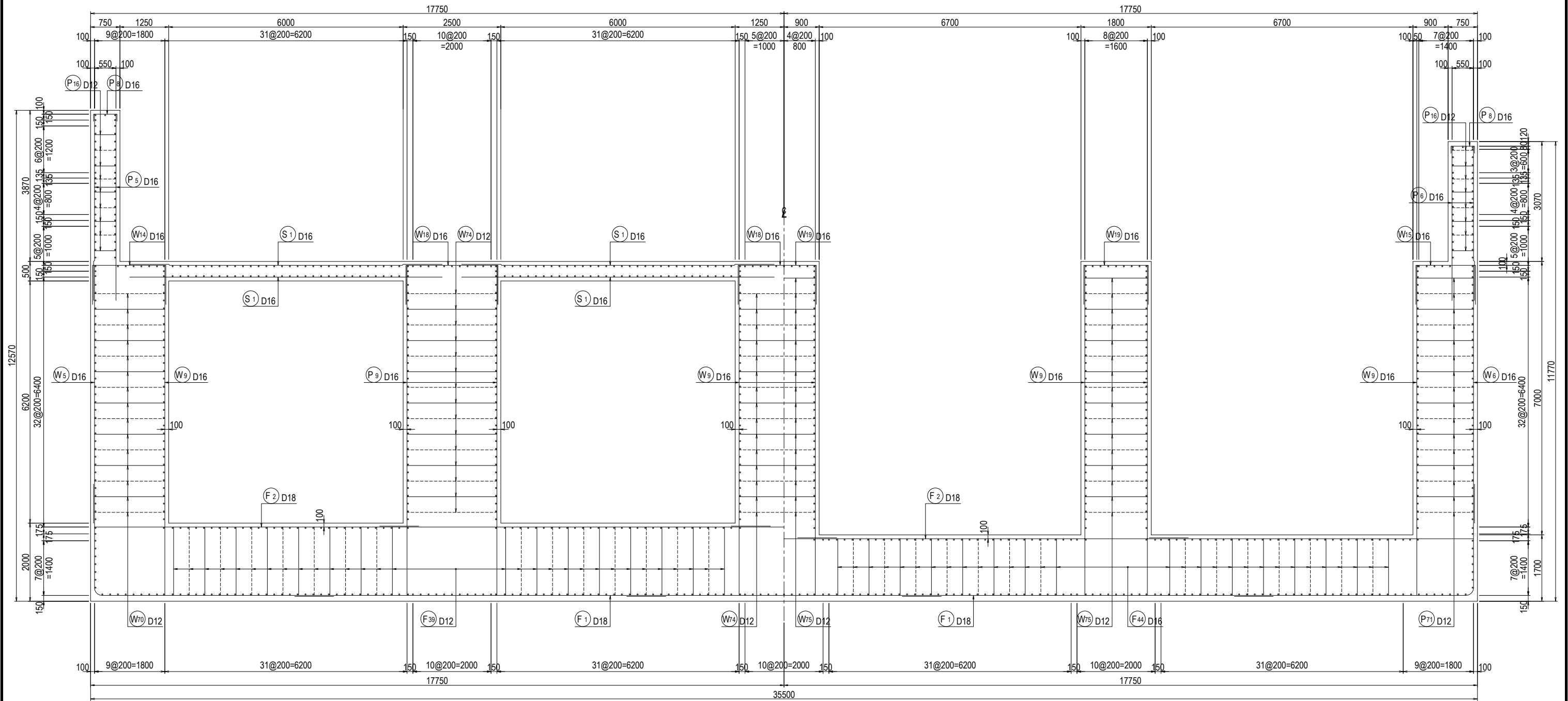


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Ibrahimia Regulator Bar arrangement of weir body (18)	DRW. NO CI-31	
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

# Section of Gate Abutment and Pier of Ibrahimia Regulator (6/7)

Section I—I

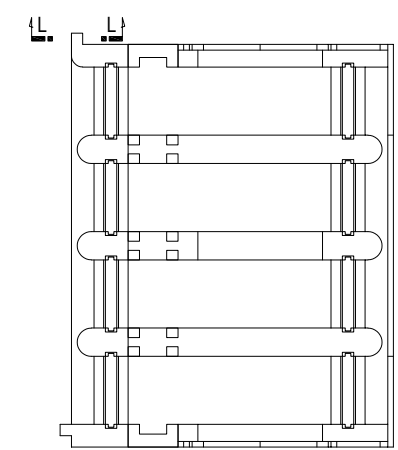
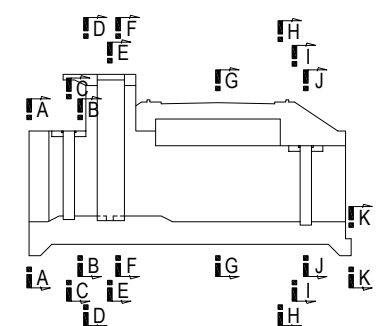
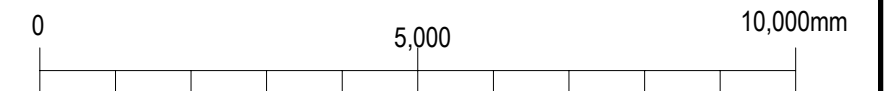
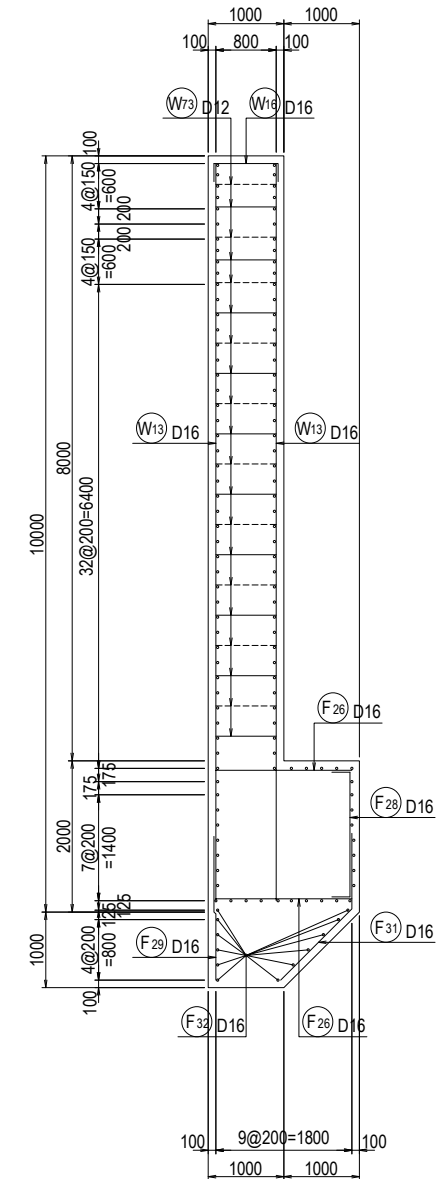
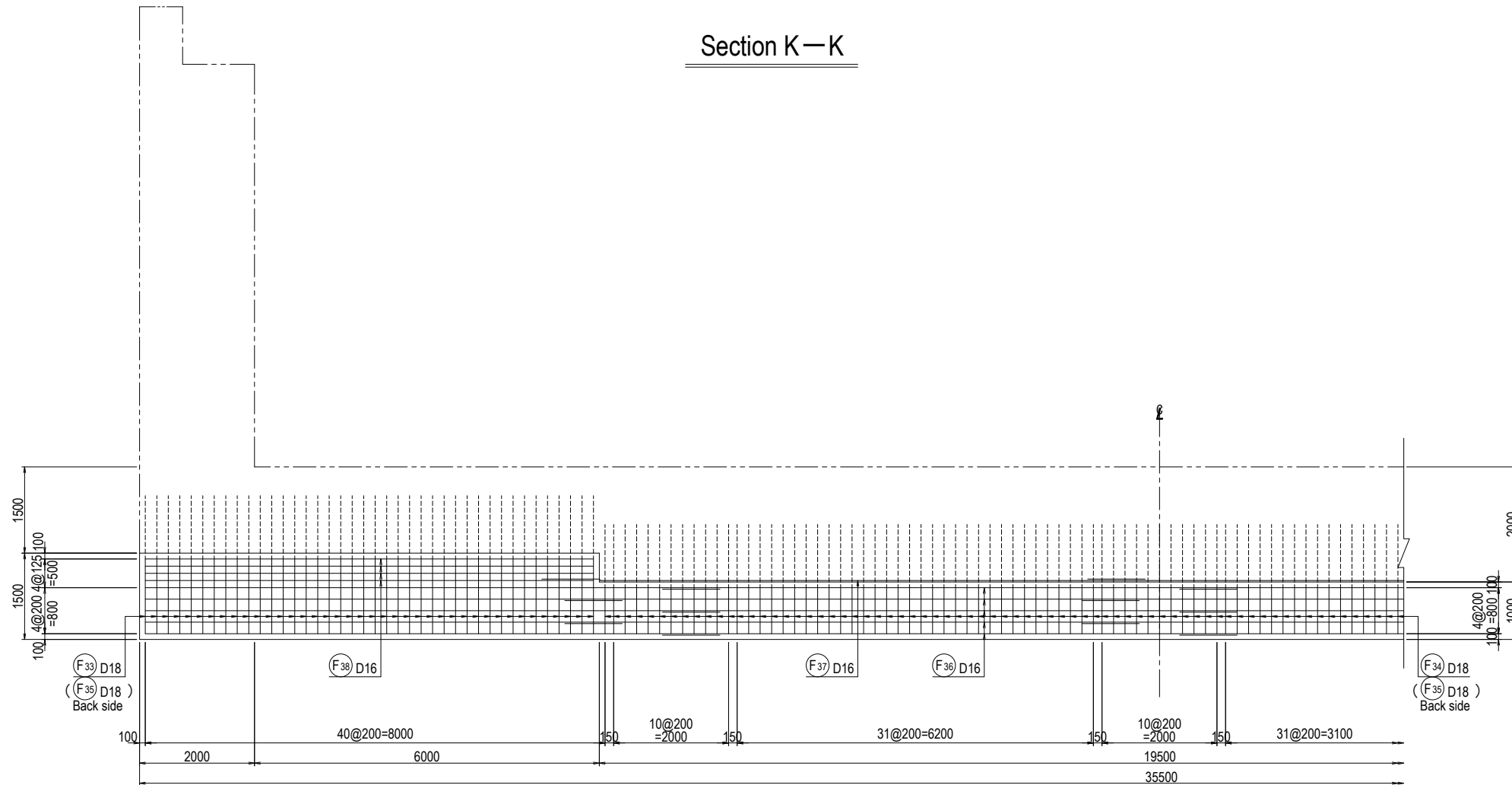
Section J—J



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Ibrahimia Regulator Bar arrangement of weir body (19)			DRW. NO CI-32
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Section of Gate Abutment and Pier of Ibrahimia Regulator (7/7)

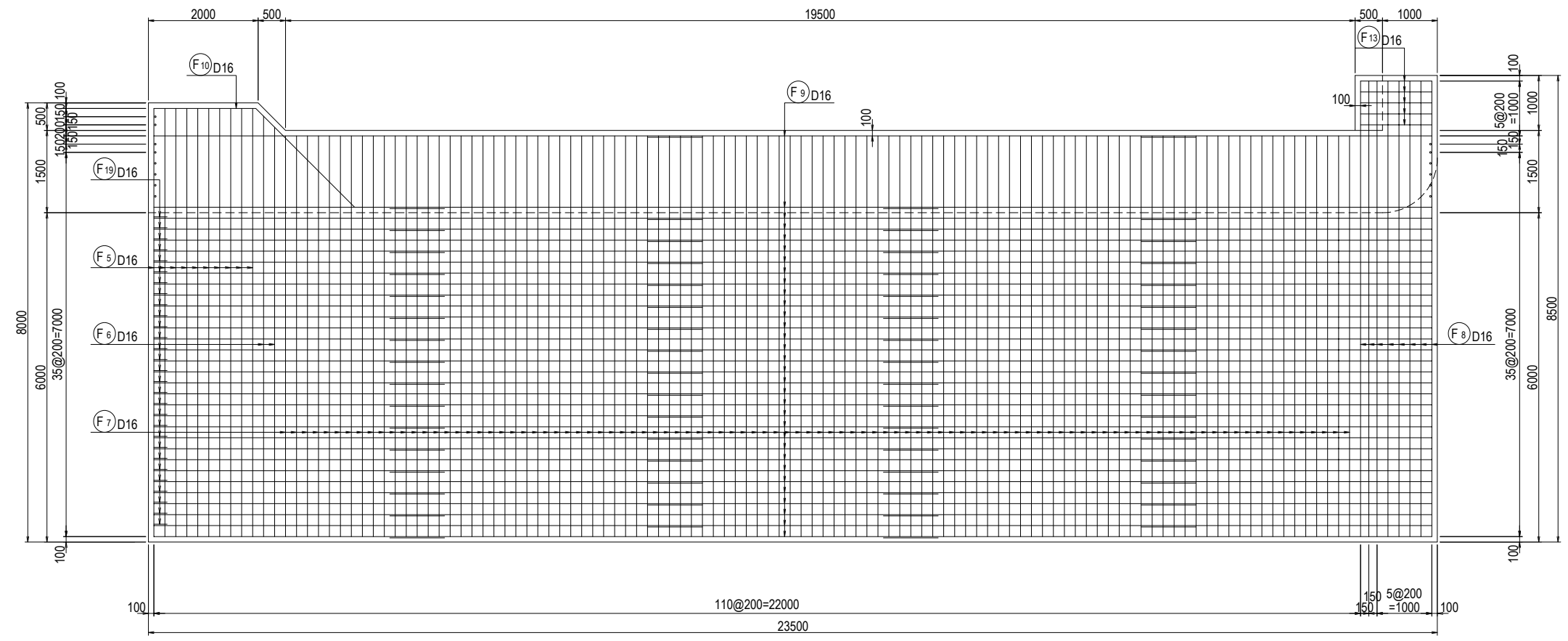
Section K—K



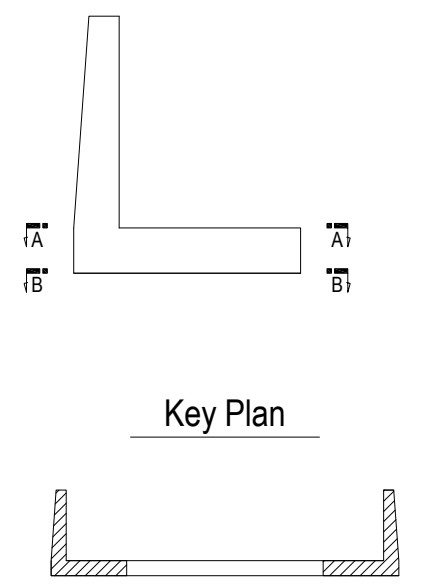
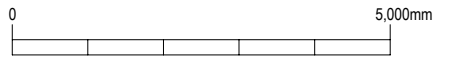
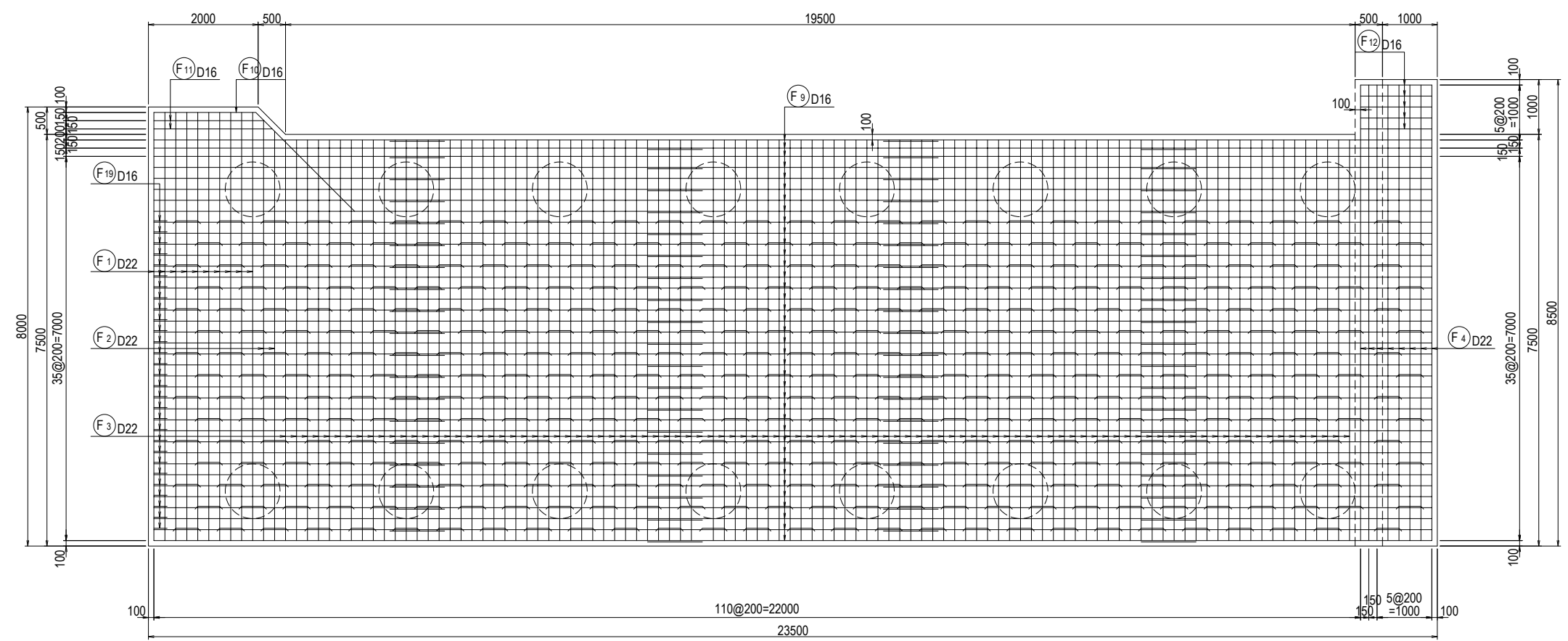
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Ibrahimia Regulator Bar arrangement of weir body (20)			DRW. NO CI-33
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Detail of Down Stream Apron for Ibrahimia Regulator (1/6)

## Section A—A



## Section B—B

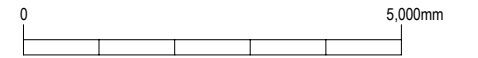
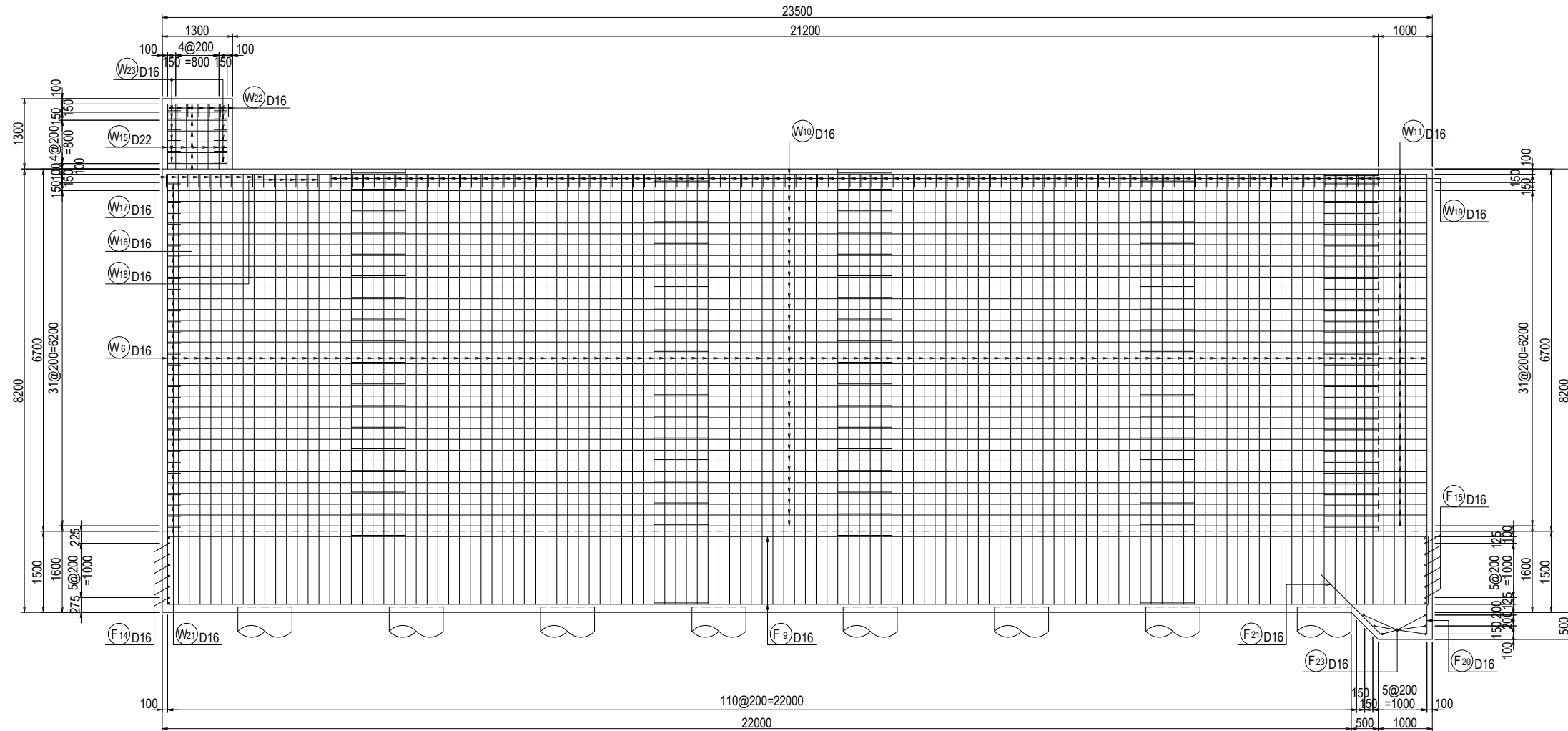


Key Plan

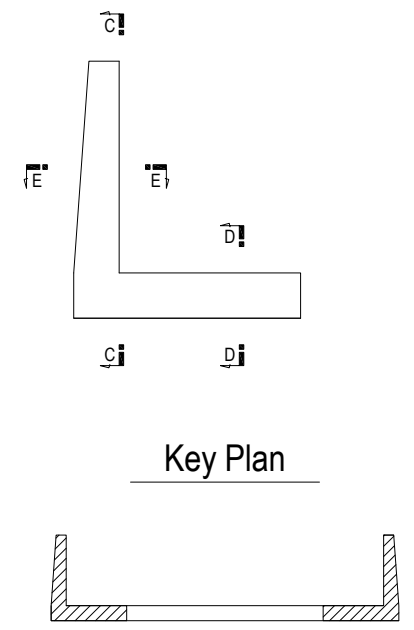
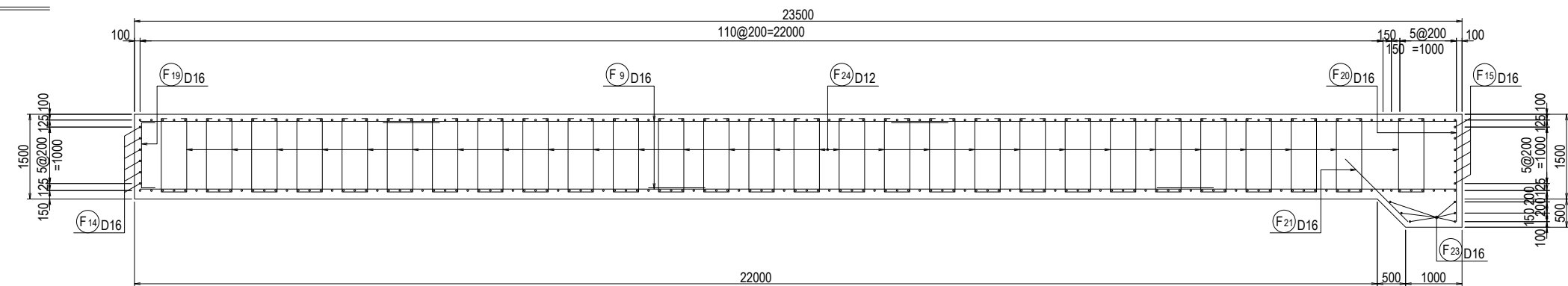
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Ibrahimia Regulator Bar arrangement of downstream apron (1)			<b>DRW. NO.</b> CI-34
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Detail of Down Stream Apron for Ibrahimia Regulator (2/6)

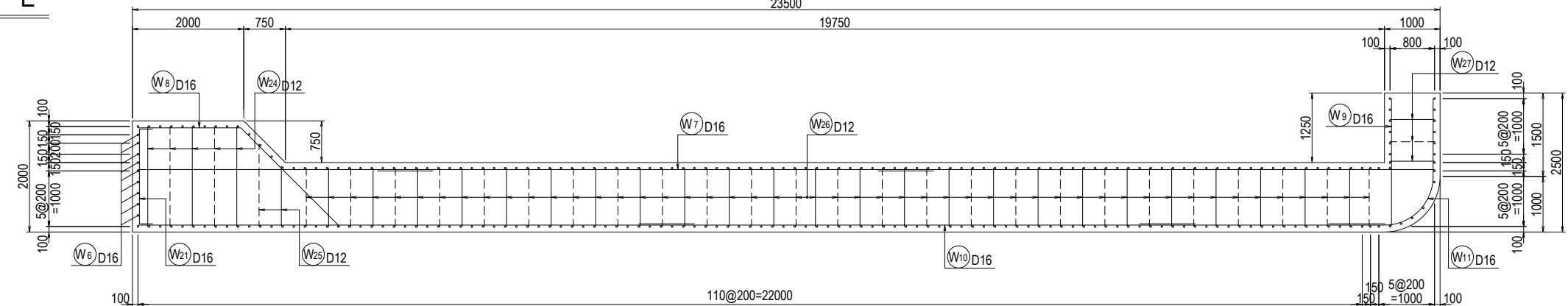
**Section C—C**



**Section D—D**



**Section E—E**

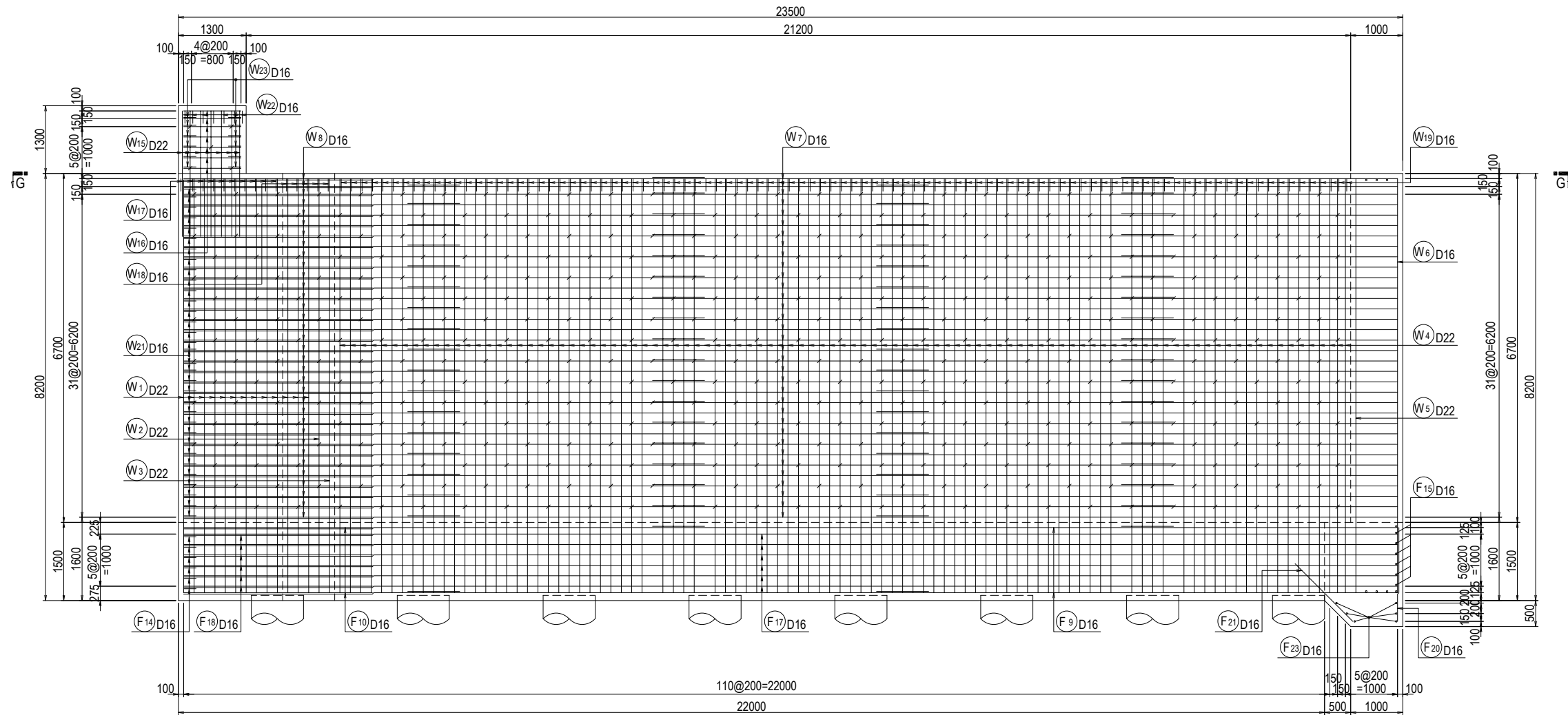


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Ibrahimia Regulator Bar arrangement of downstream apron (2)			<b>DRW. NO.</b> CI-35
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

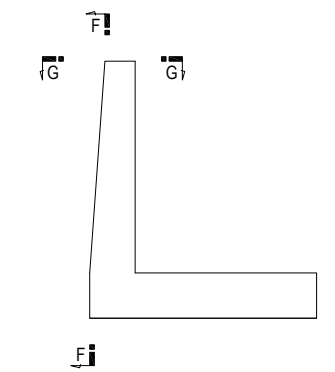
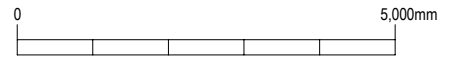
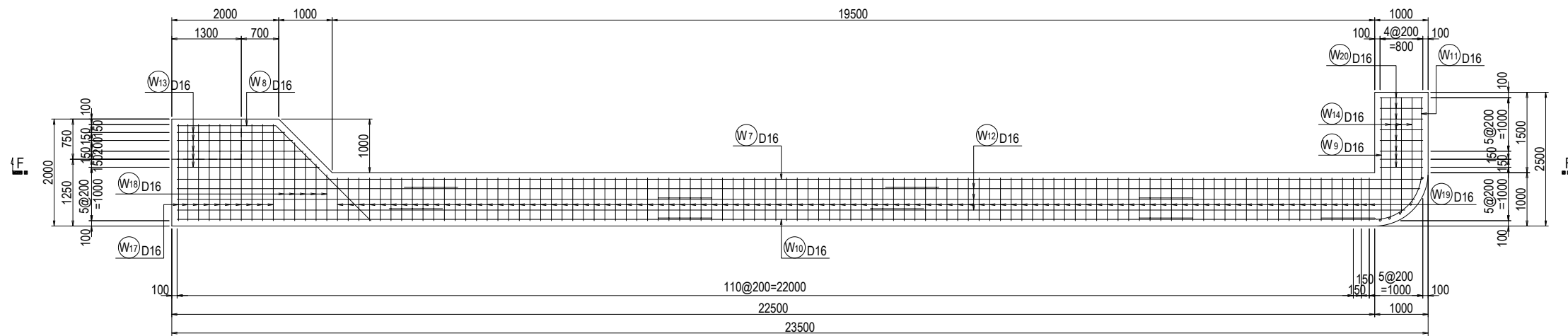


# Detail of Down Stream Apron for Ibrahimia Regulator (3/6)

## Section F—F



## Section G—G



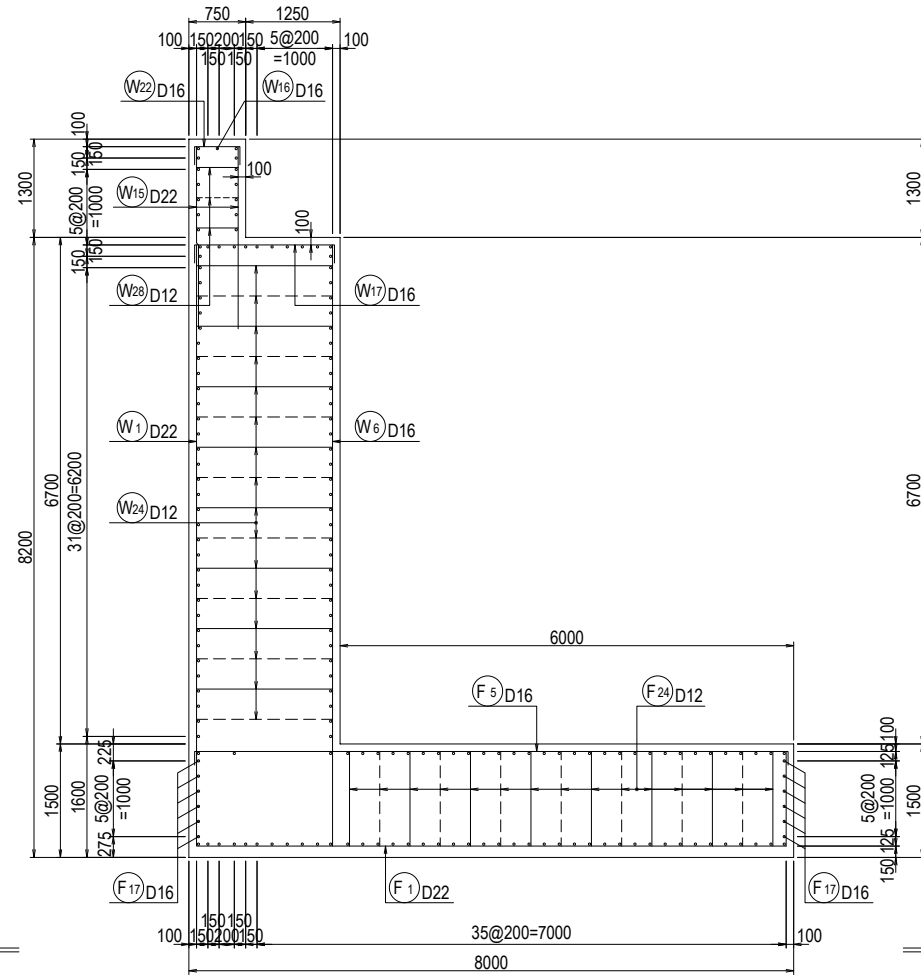
### Key Plan



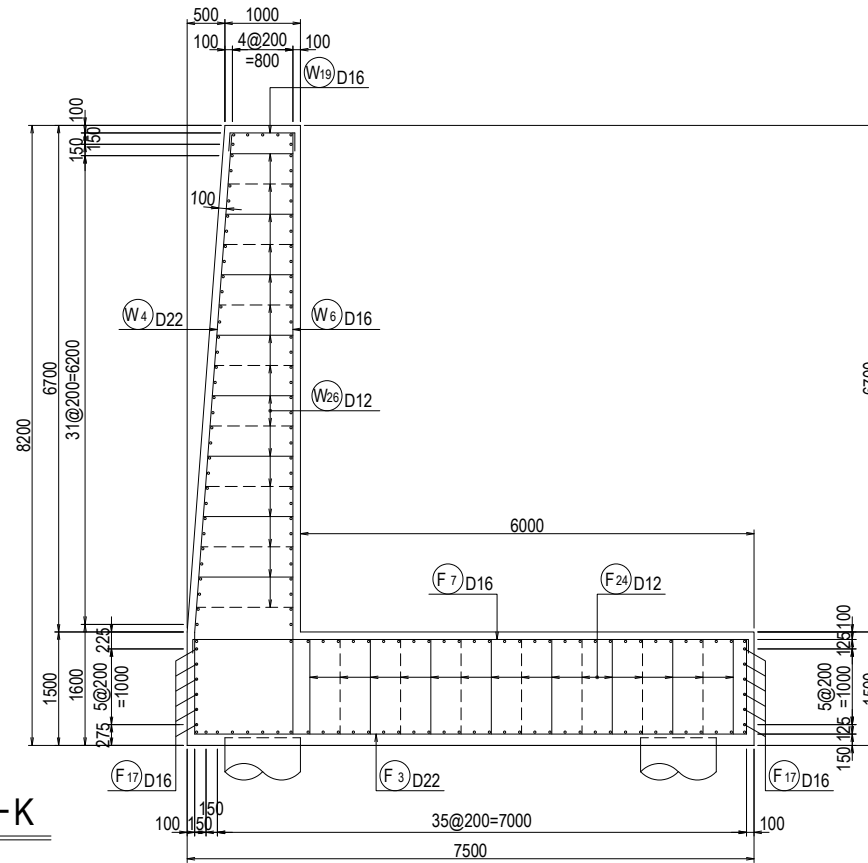
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Ibrahimia Regulator Bar arrangement of downstream apron (3)			DRW. NO. CI-36
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Detail of Down Stream Apron for Ibrahimia Regulator (4/6)

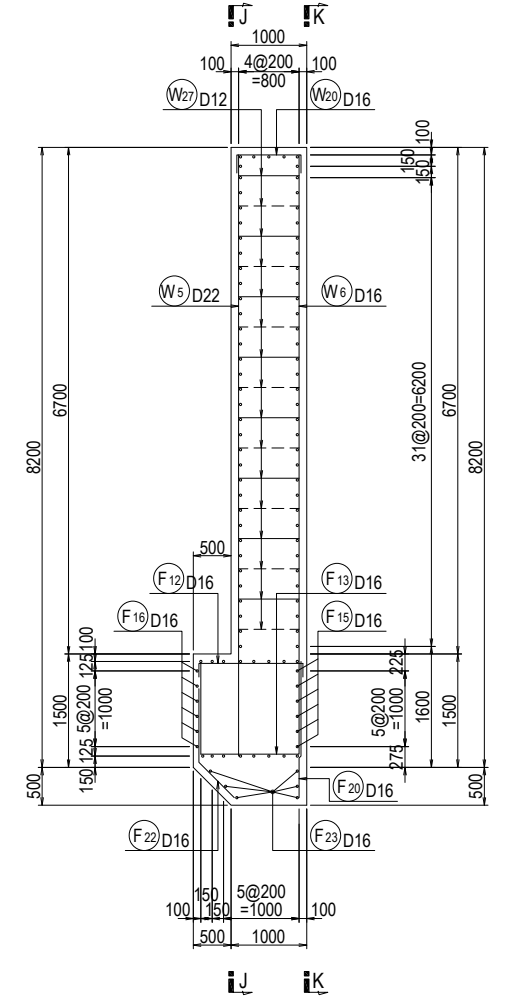
Section H—H



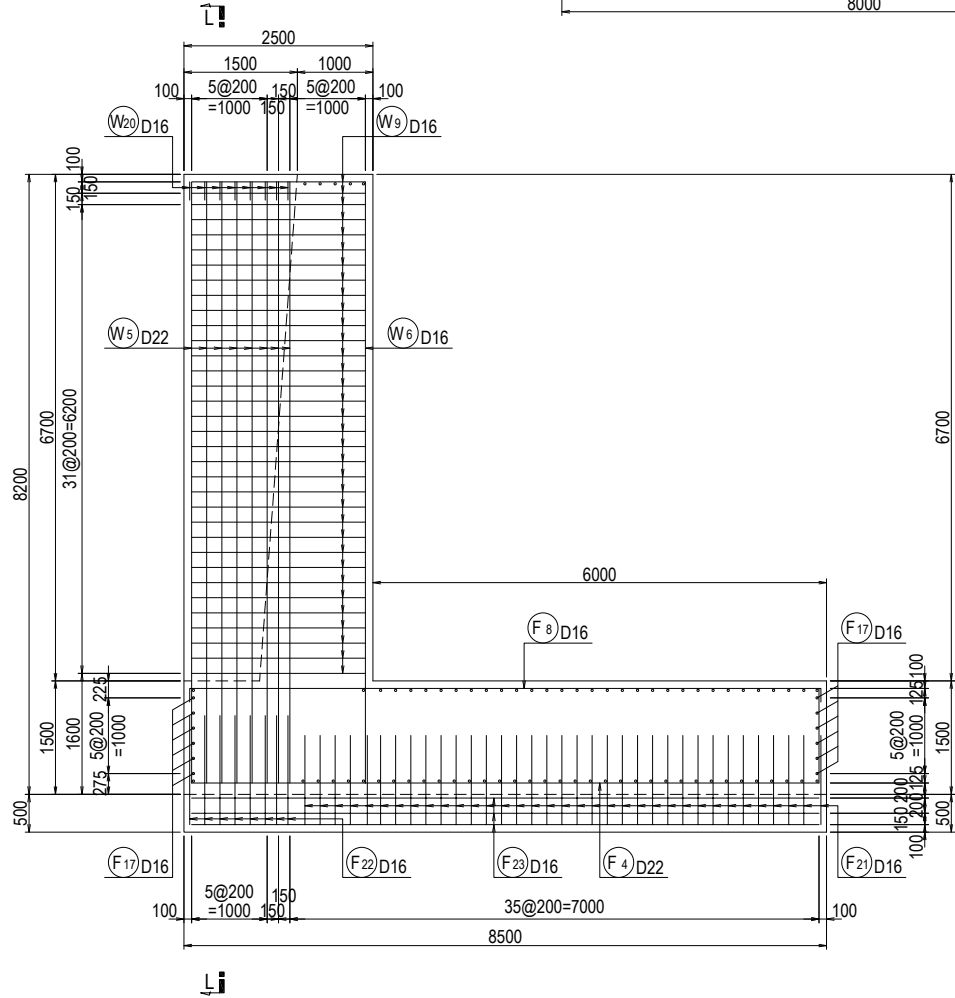
Section I—I



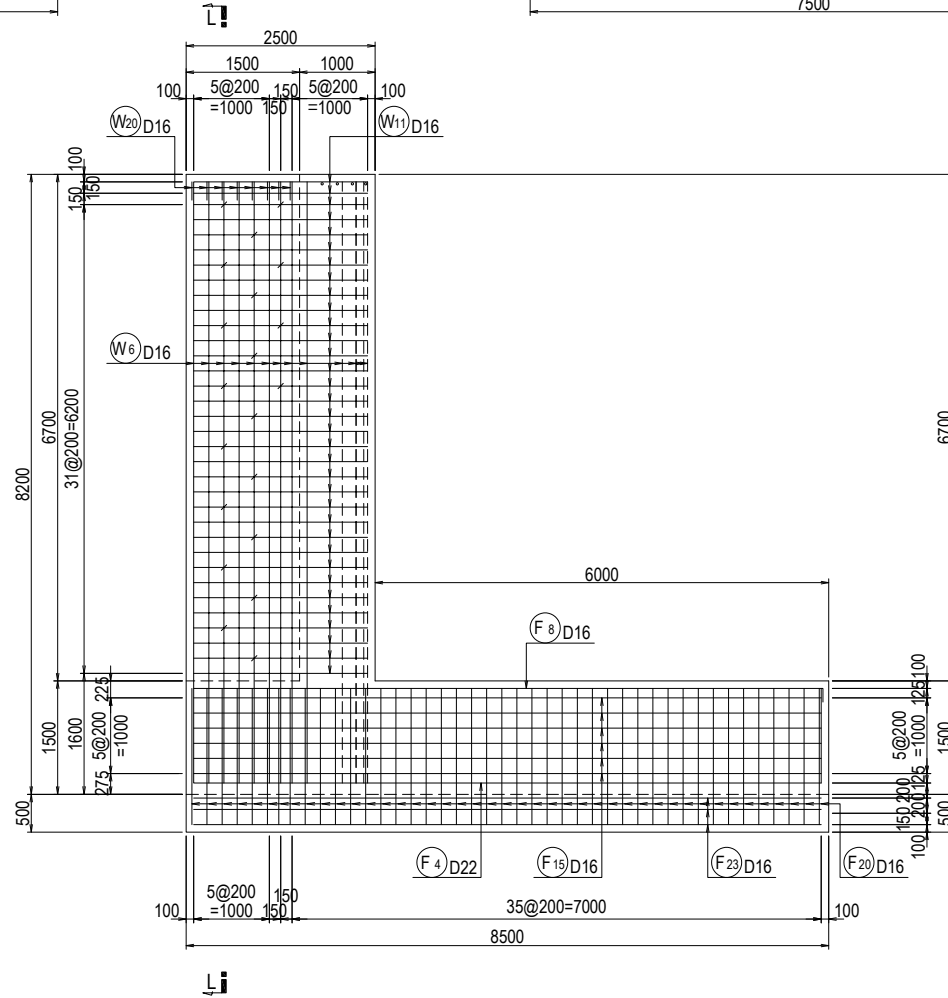
Section L—L



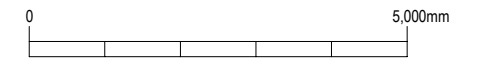
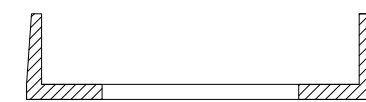
Section J—J



Section K—K



Key Plan

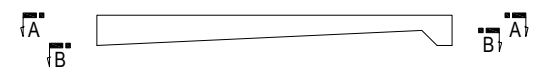
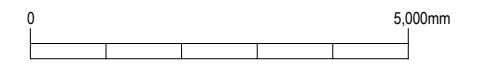
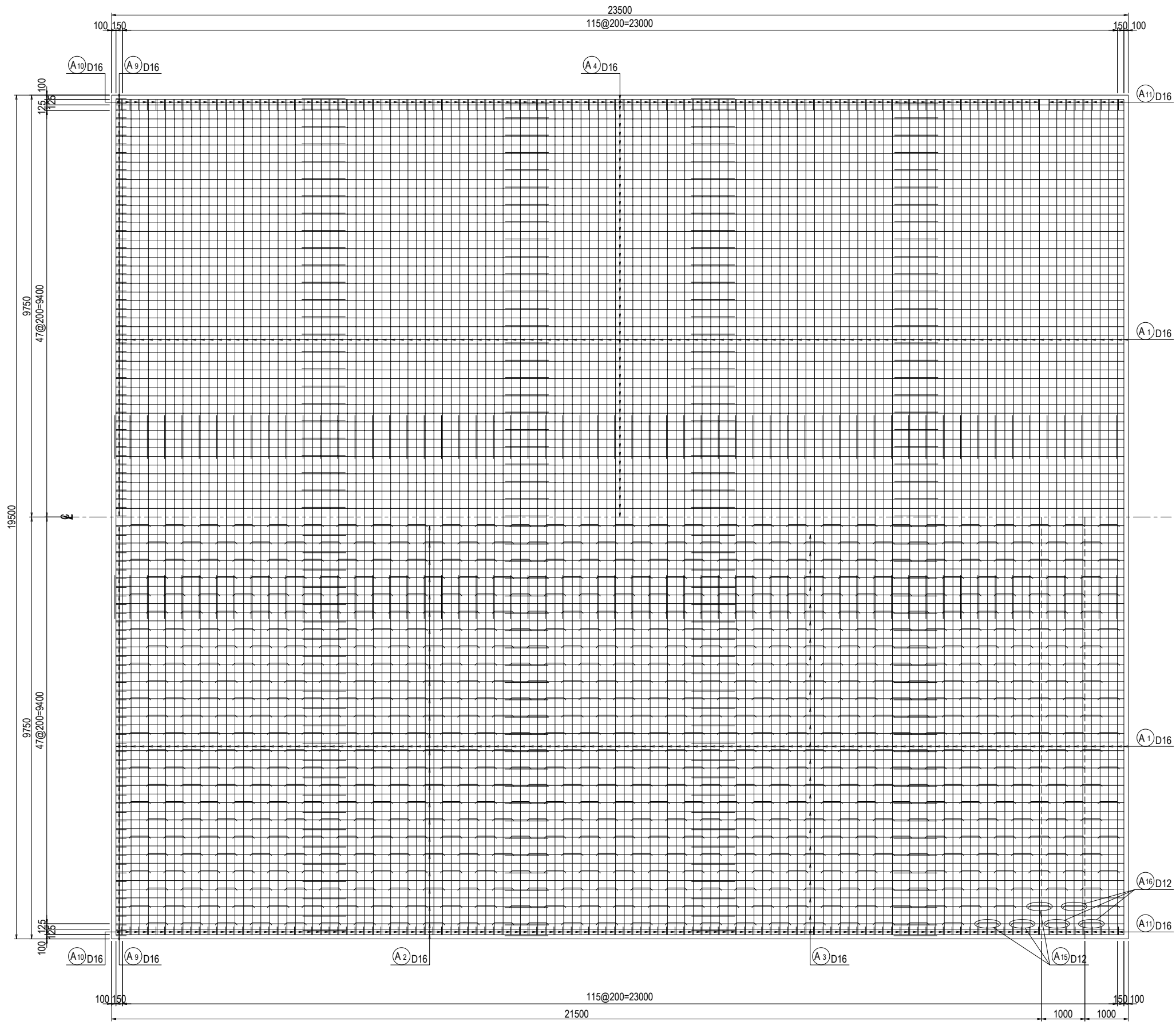


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Ibrahimia Regulator Bar arrangement of downstream apron (4)	DRW. NO. CI-37	
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

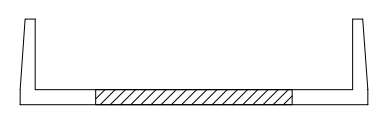
# Detail of Down Stream Apron for Ibrahimia Regulator (5/6)

Section A — A

Section B — B



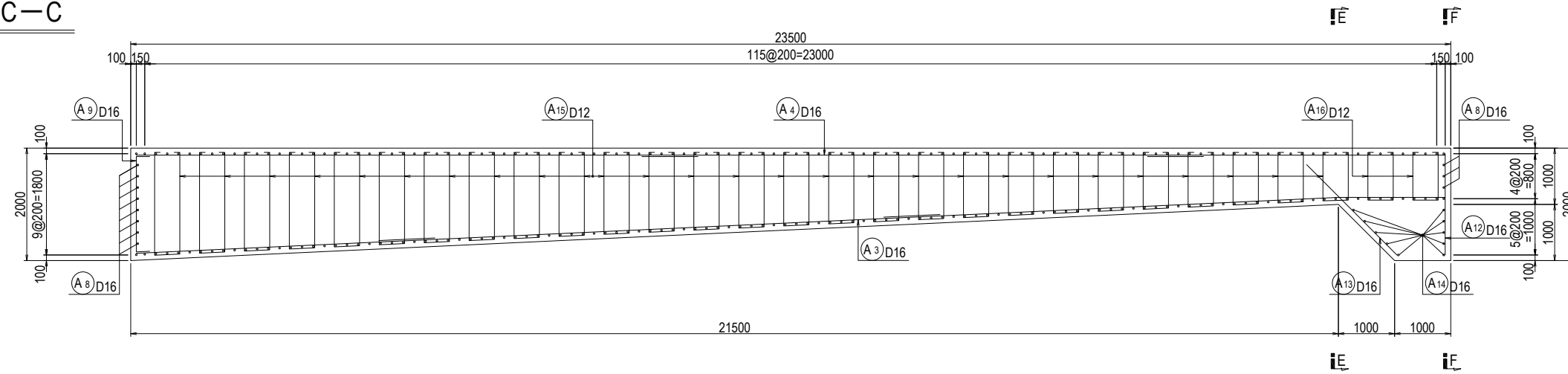
Key Plan



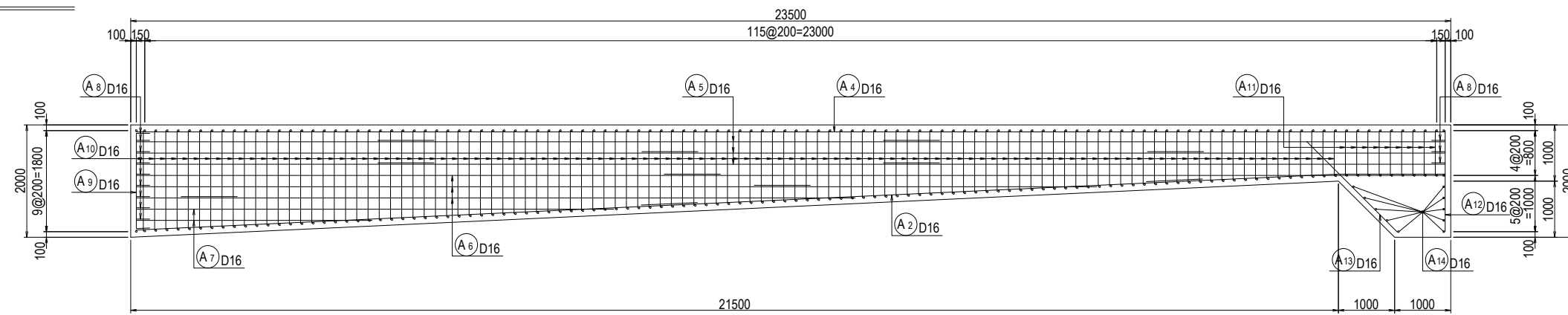
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Ibrahimia Regulator Bar arrangement of downstream apron (5)			<b>DRW. NO.</b> CI-38
SANYU CONSULTANTS INC.			
PREPARED BY :	CHECKED BY :	APPROVED BY :	
DATE :	DATE :	DATE :	DATE :

# Detail of Down Stream Apron for Ibrahimia Regulator (6/6)

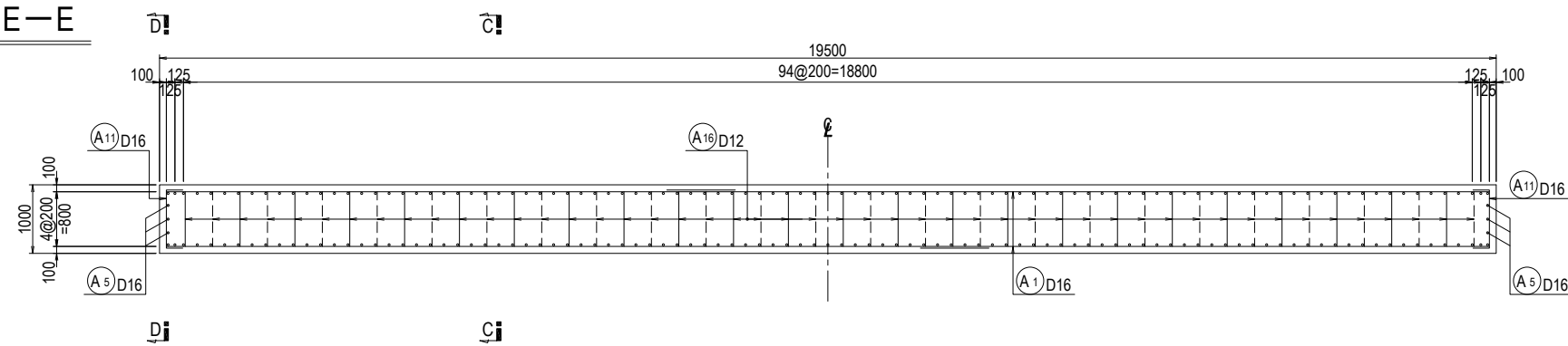
**Section C—C**



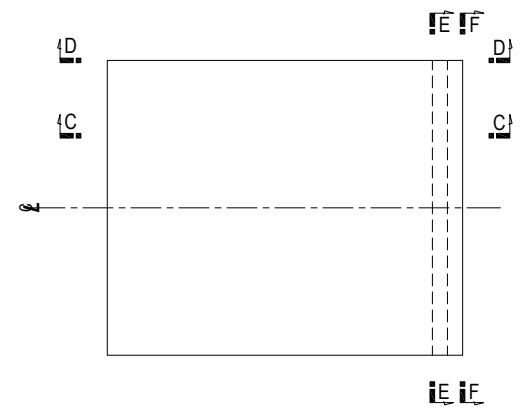
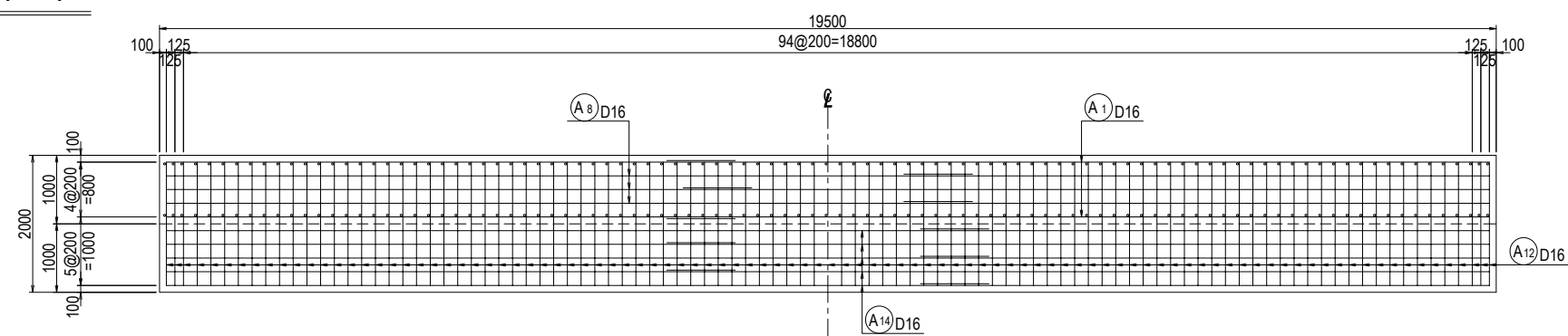
**Section D—D**



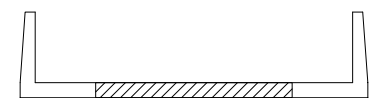
**Section E—E**



**Section F—F**



**Key Plan**



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Ibrahimia Regulator Bar arrangement of downstream apron (6)			<b>DRW. NO.</b> CI-39
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

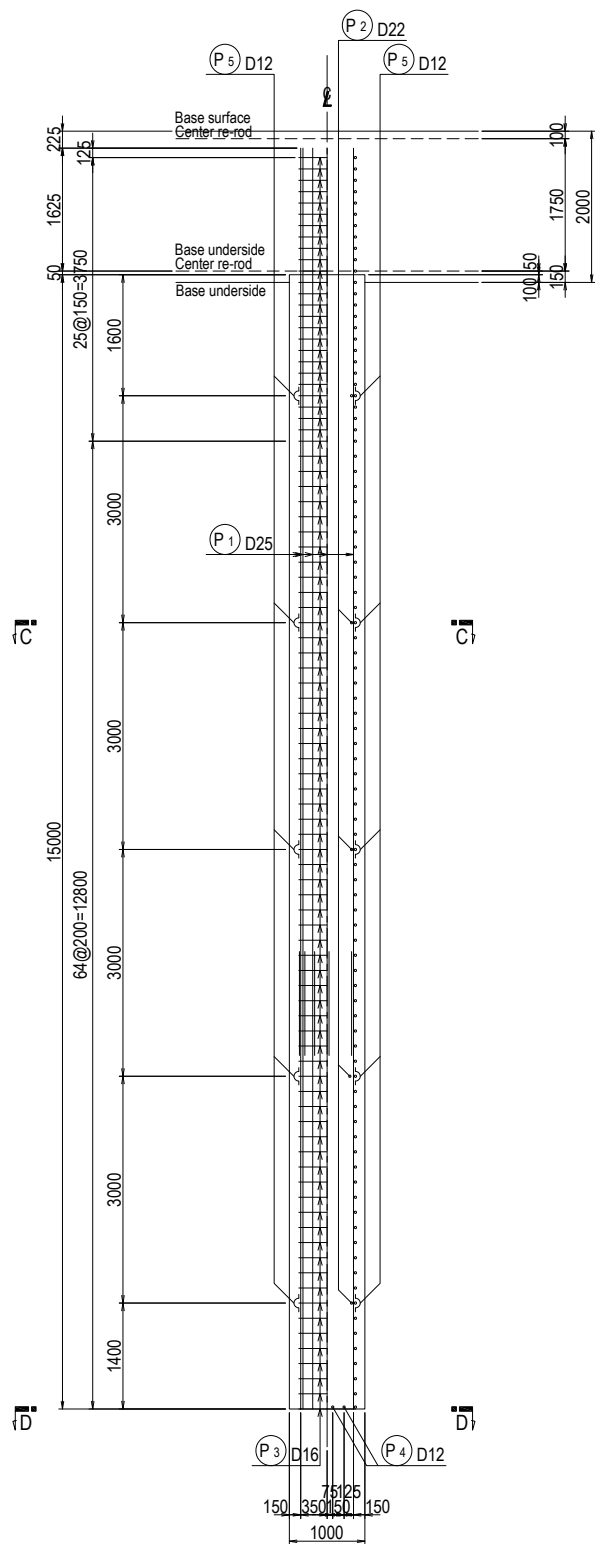
# Detail of Pile Ibrahimia Regulator

## Regulator

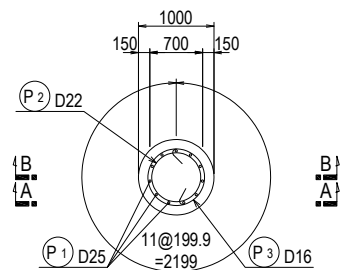
Scale A

### Section A—A

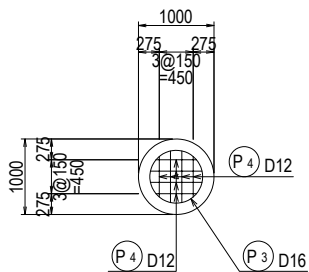
### Section B—B



### Section C—C



### Section D—D

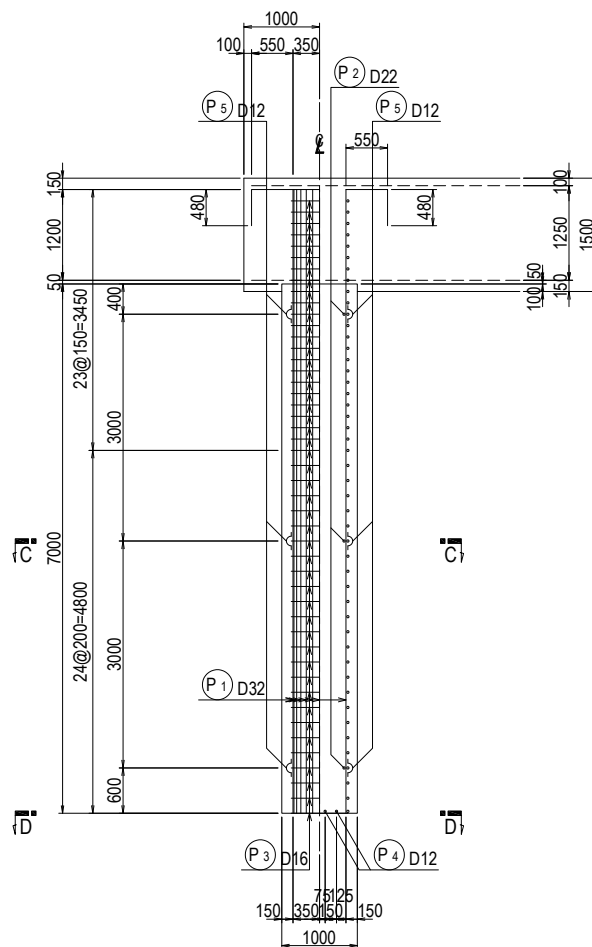


## Ltype Wall

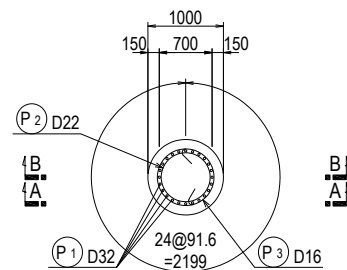
Scale A

### Section A—A

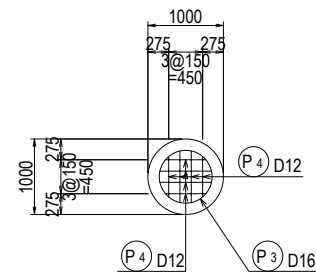
### Section B—B



### Section C—C

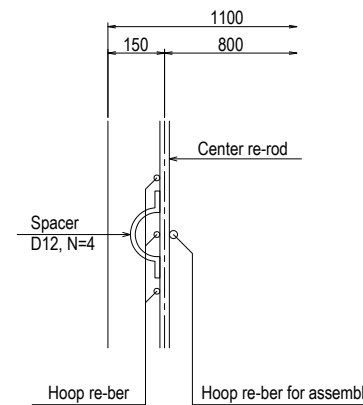


### Section D—D

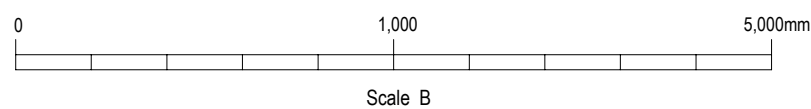
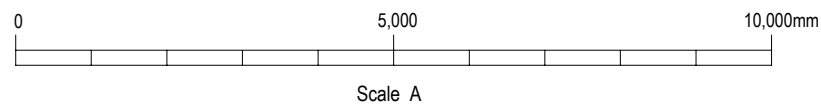


## Detail of Spacer

Scale B



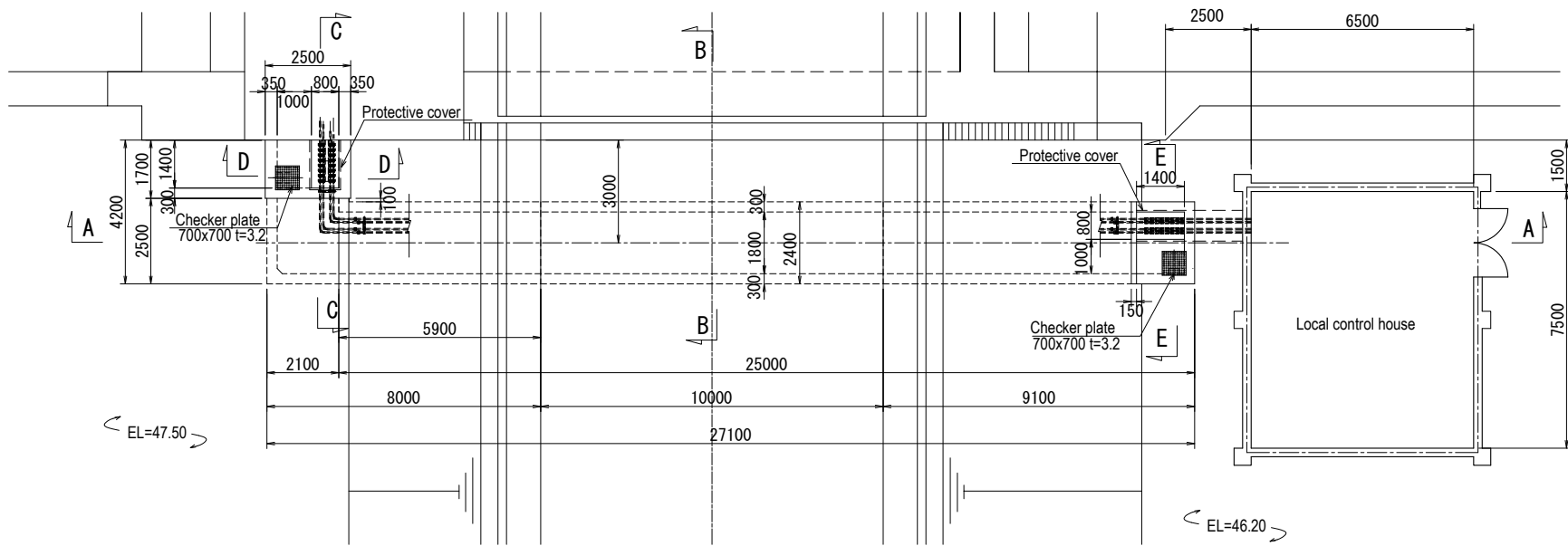
Note:  
When assembling a rebar cage, welding to keep its shape must be avoided.



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Ibrahimia Regulator Detail of cast-in-place pile	<b>DRW. NO.</b> CI-40	
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

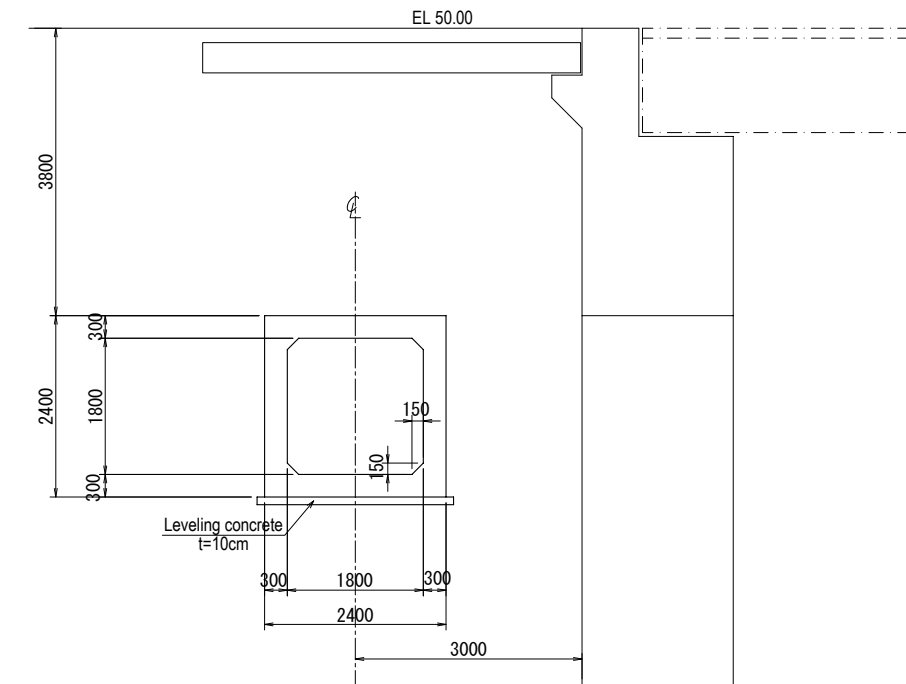
# Plan (Ibrahimia Regulator)

Scale A



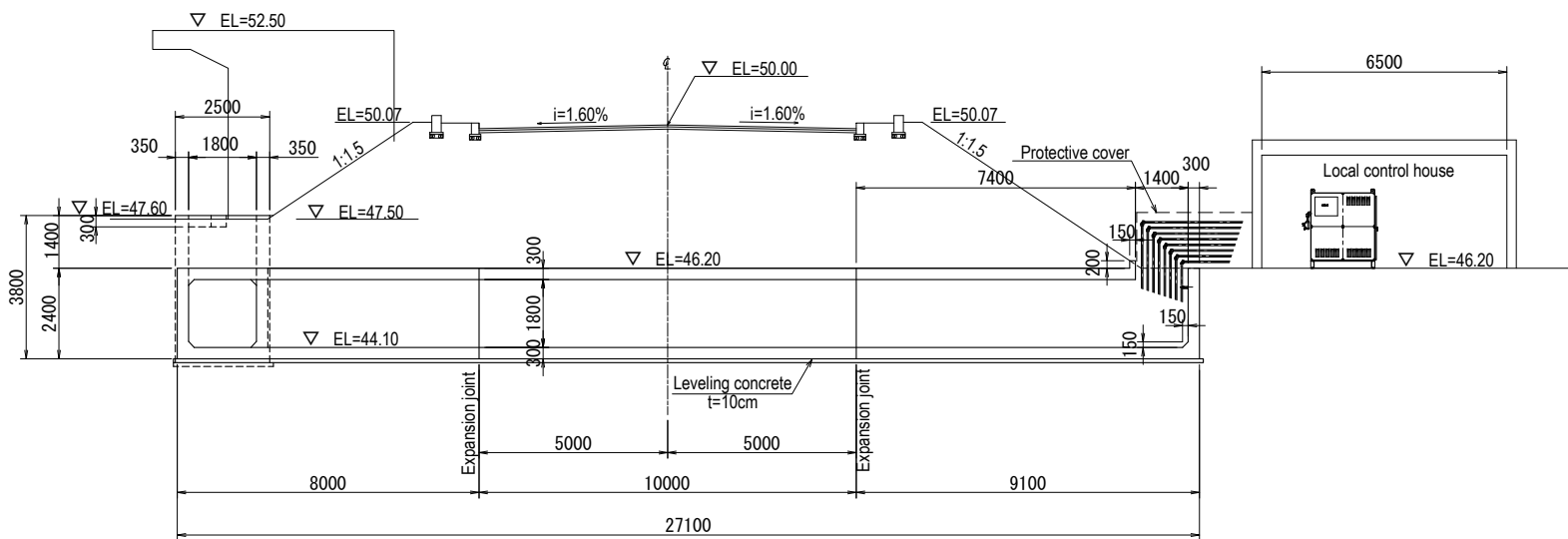
# Section B-B

Scale B



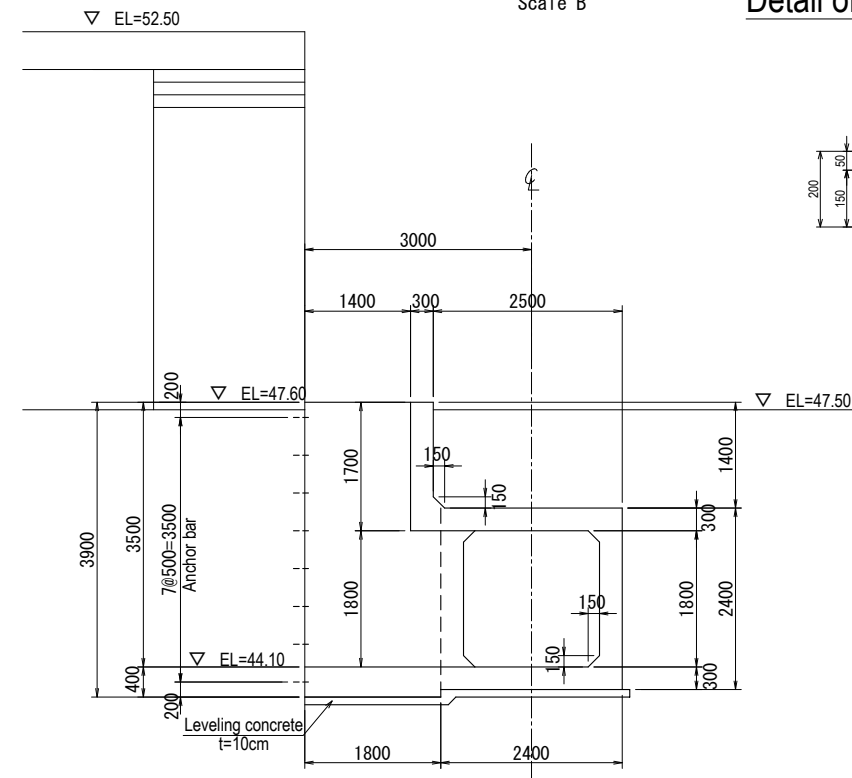
# Section A-A

Scale A



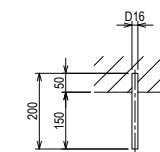
# Section C-C

Scale B



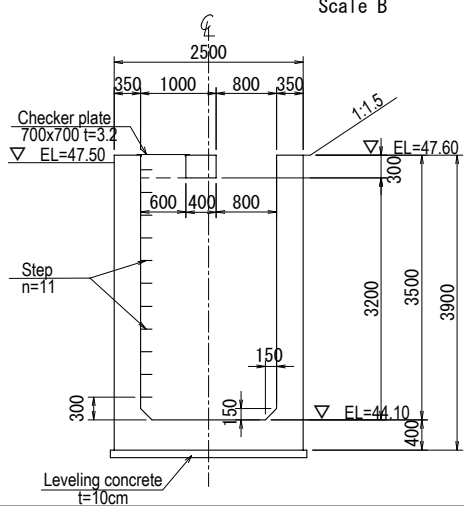
# Detail of Anchor bar

No scale



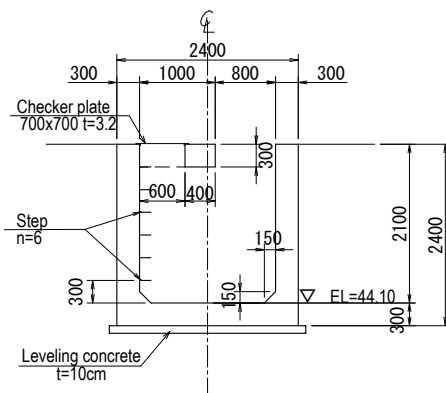
# Section D-D

Scale B



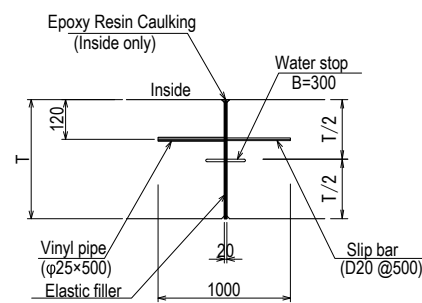
# Section E-E

Scale B

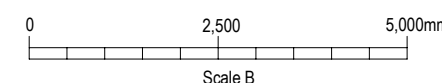
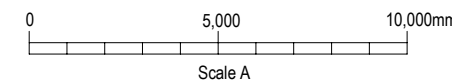
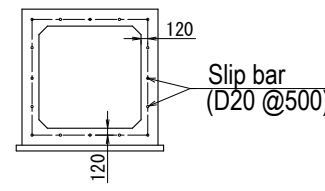


# Typical of Expansion Joint

No scale

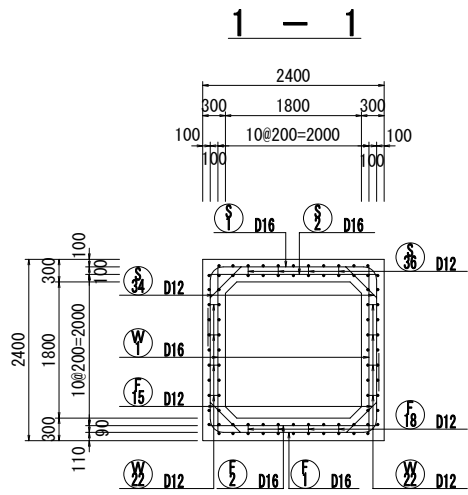


# Slip bar arrangement

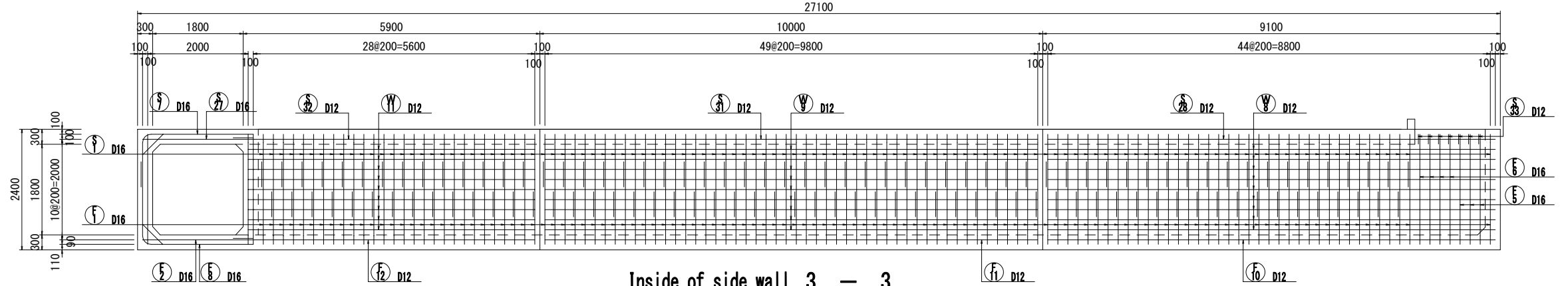


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Ibrahimia Regulator	DRW. NO.	
Detail of hydraulic pipe pit	CI-41	
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

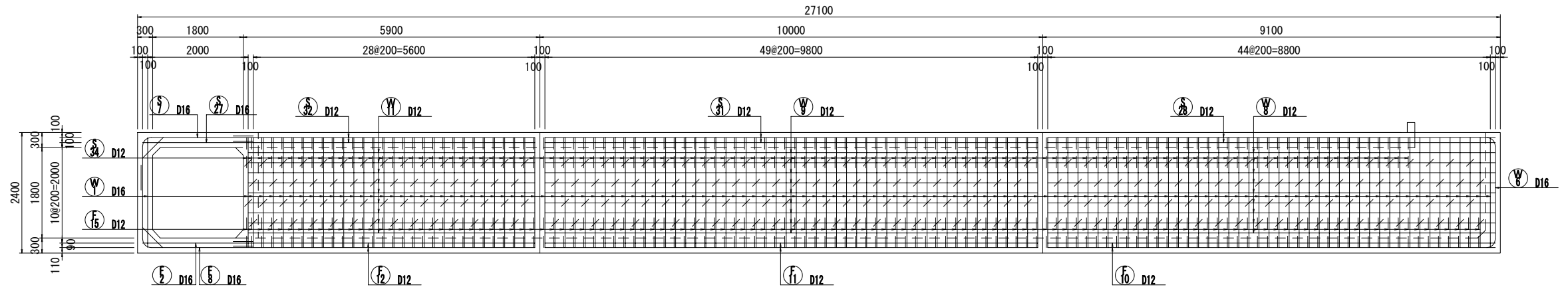
# Ibrahimia pipe pit(1)



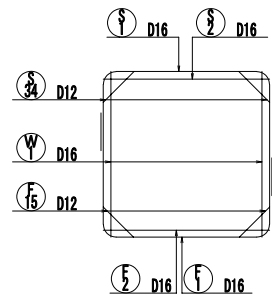
## Outside of side wall 2 - 2



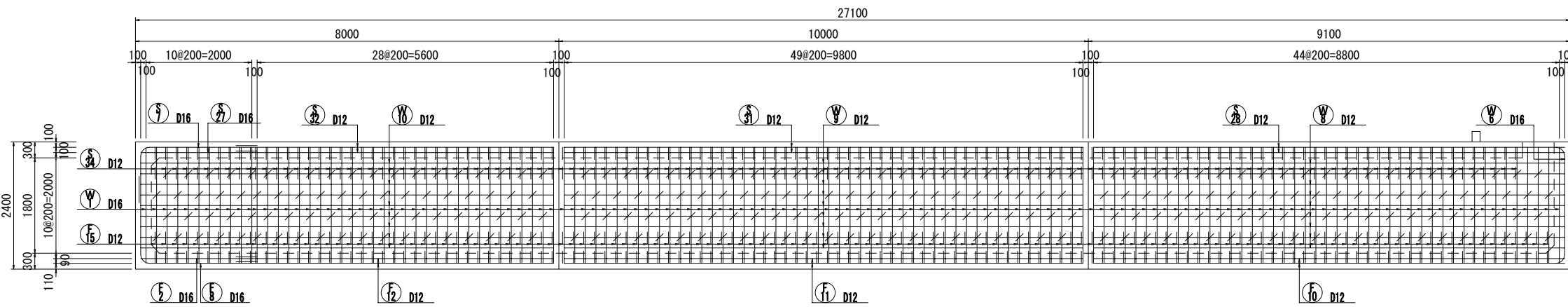
## Inside of side wall 3 - 3



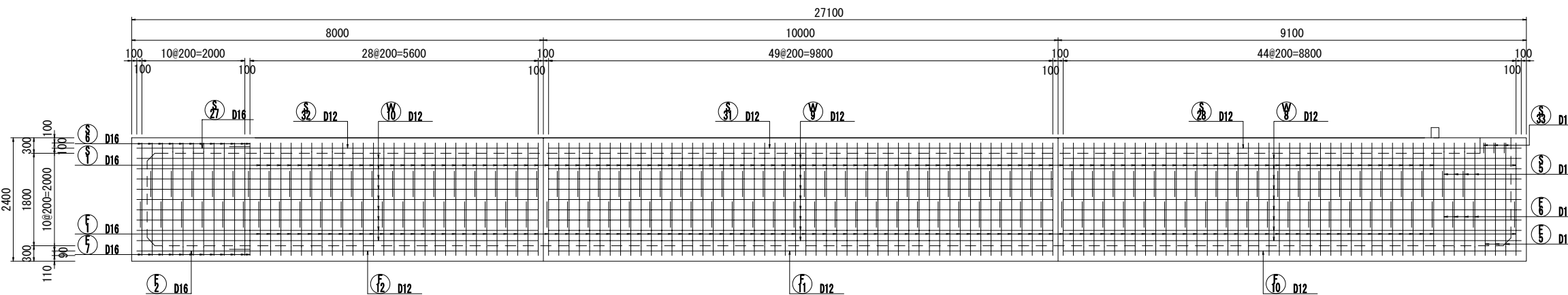
## Main bar assembly c/c 200 mm



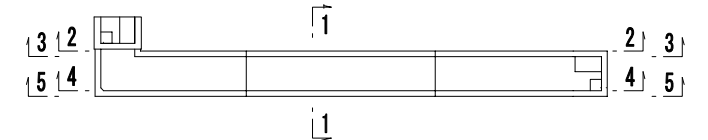
## Inside of side wall 4 - 4



## Outside of side wall 5 - 5



## Position diagram



Arab Republic of Egypt  
Ministry of Water Resources and Irrigation  
Reservoir and Grand Barrages Sector

Detailed Design Study on the Project for  
Construction of the New Dirout Group of Regulators

Ibrahimia Regulator  
Bar arrangement of hydraulic pipe pit (1)

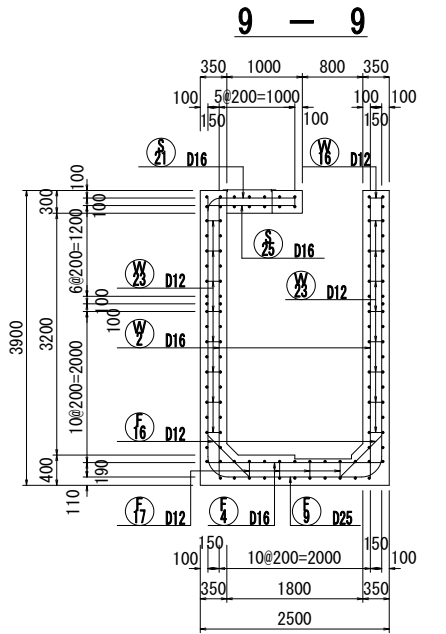
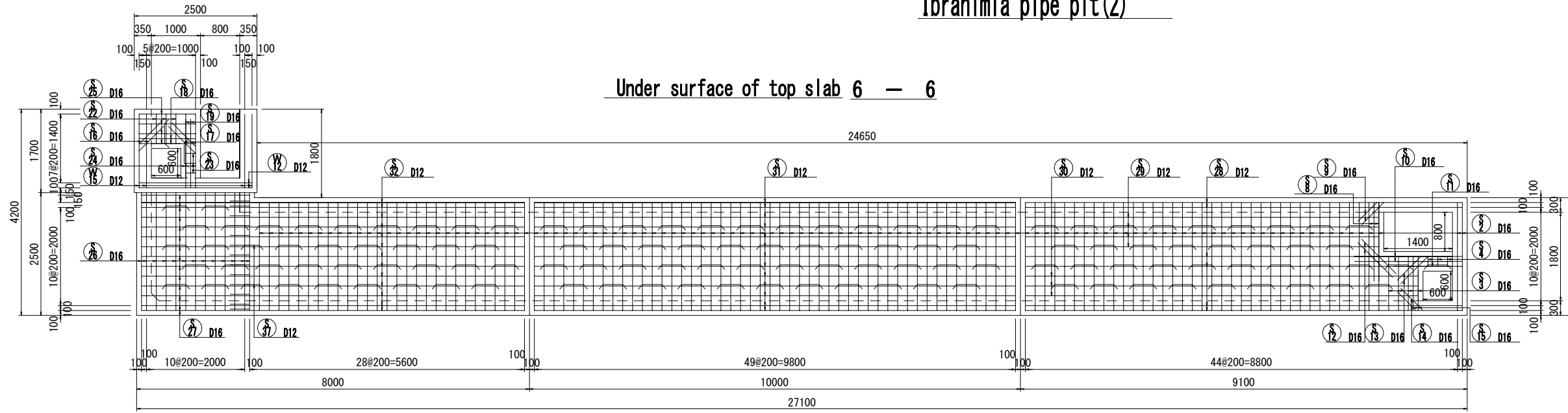
DRW. NO.  
CI-42

SANYU CONSULTANTS INC.

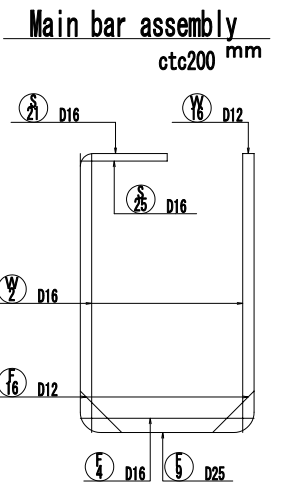
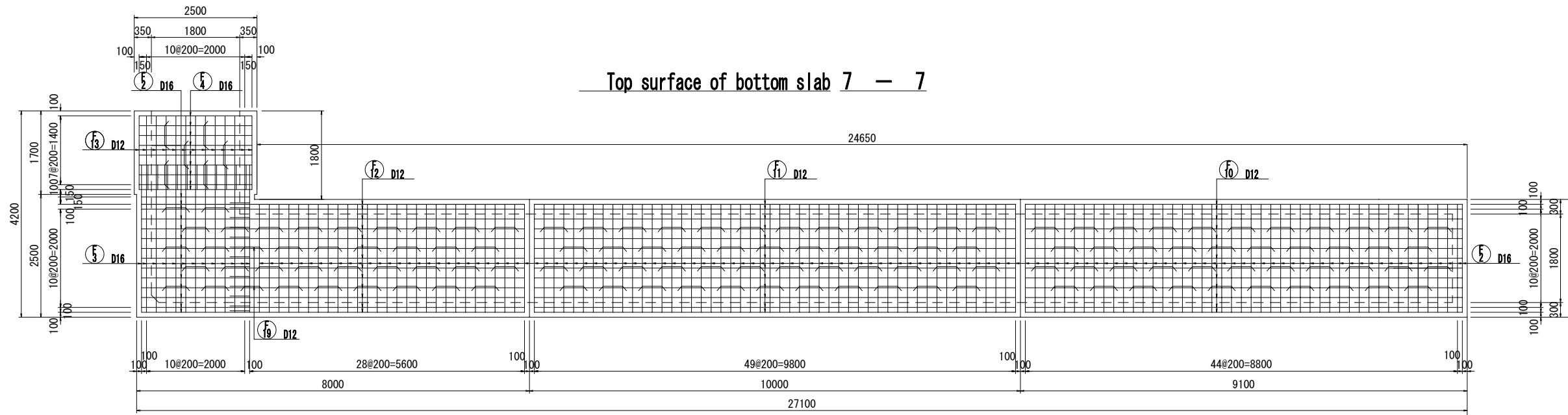
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

# Ibrahimia pipe pit(2)

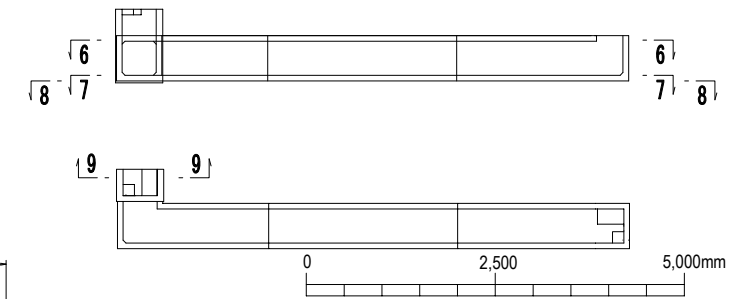
## Under surface of top slab 6 - 6



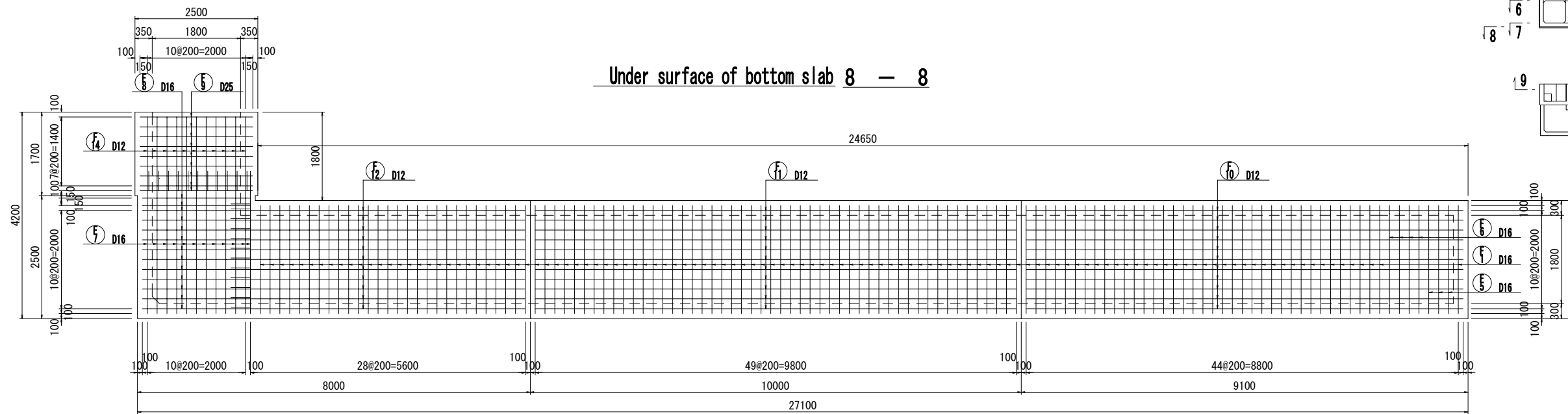
## Top surface of bottom slab 7 - 7



## Position diagram



## Under surface of bottom slab 8 - 8

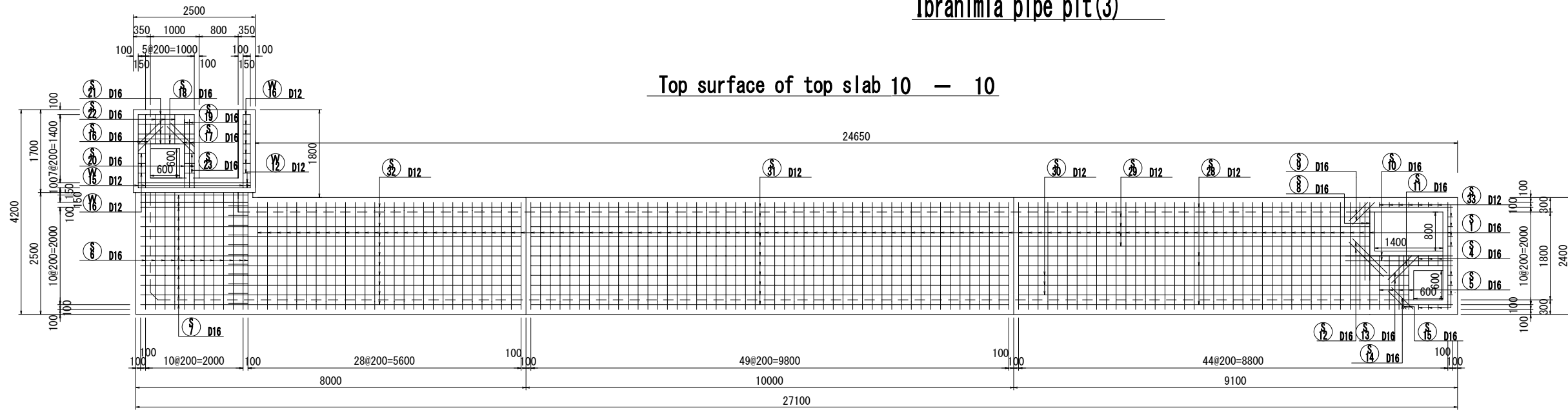


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulator			
Ibrahimia Regulator Bar arrangement of hydraulic pipe pit (2)			DRW. NO. CI-43
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	DATE:

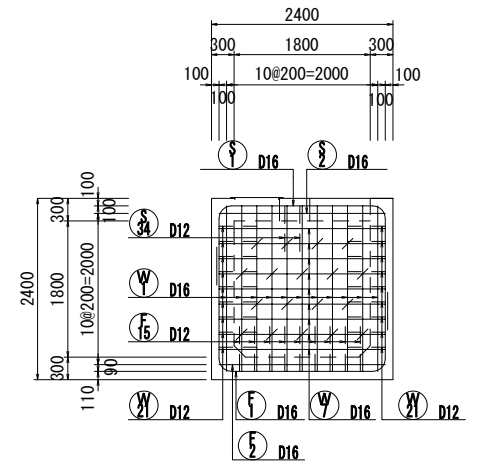


# Ibrahimia pipe pit(3)

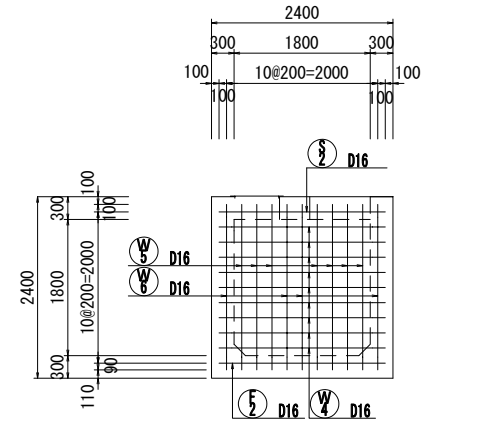
Top surface of top slab 10 - 10



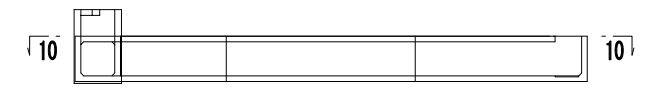
18 - 18



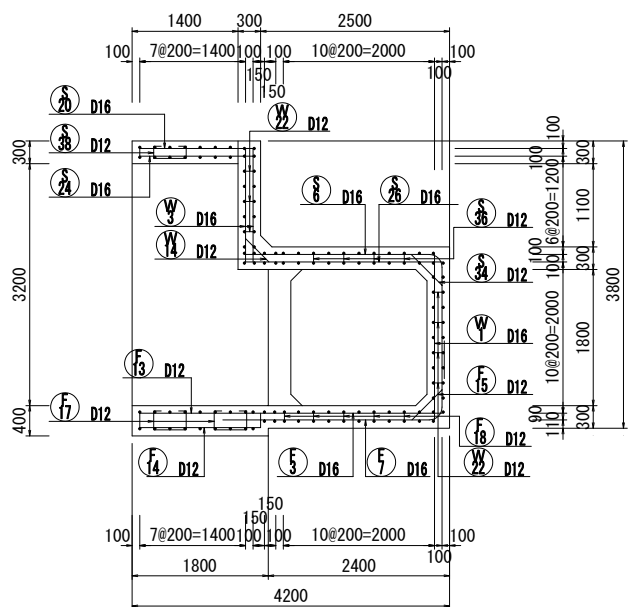
19 - 19



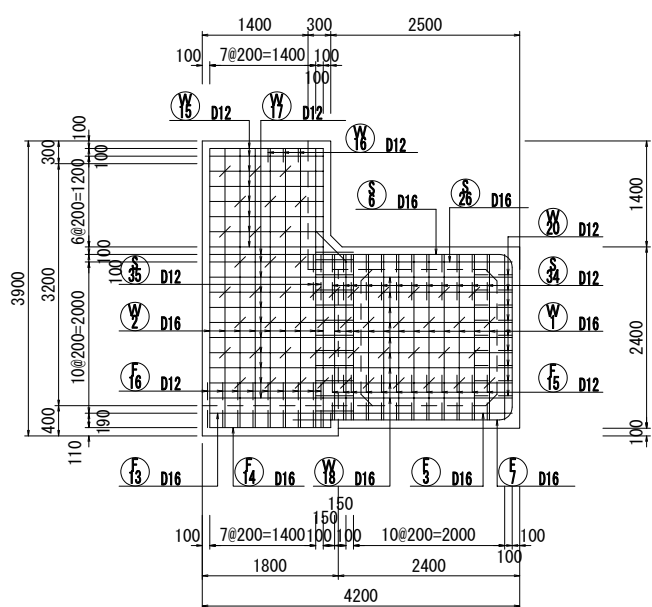
Position diagram



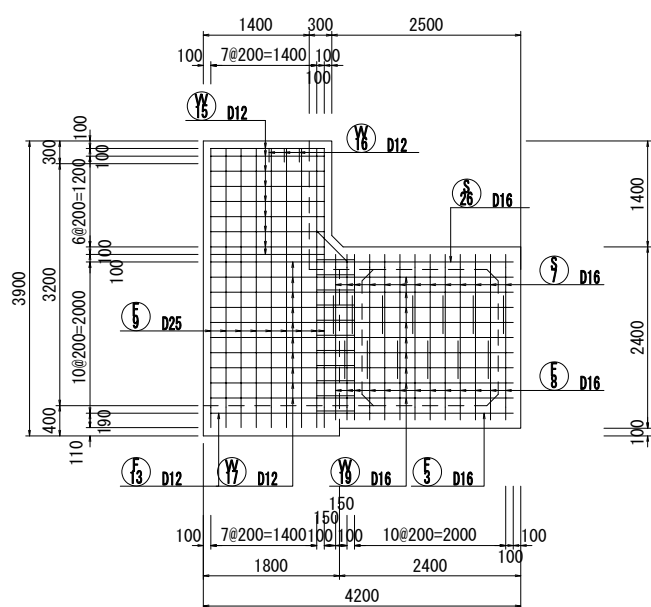
11 - 11



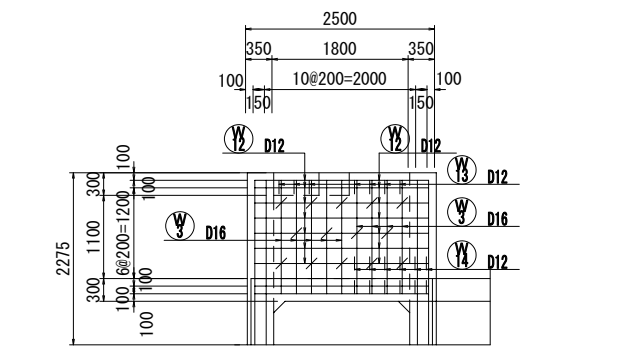
12 - 12



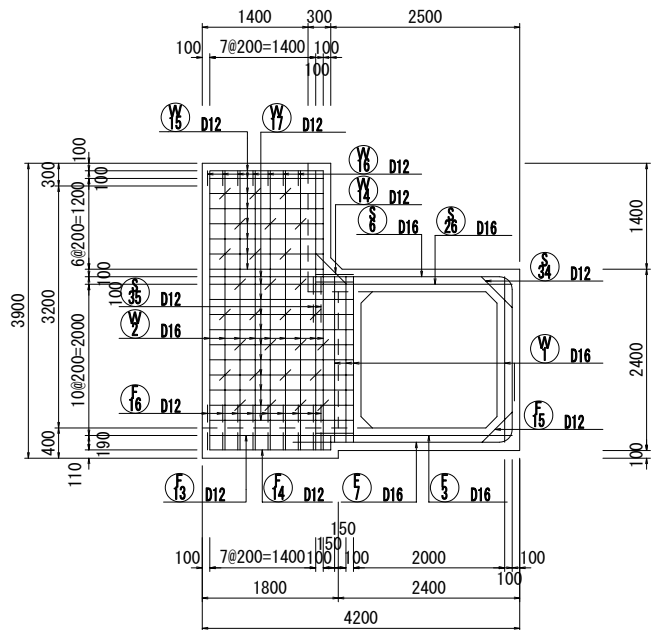
13 - 13



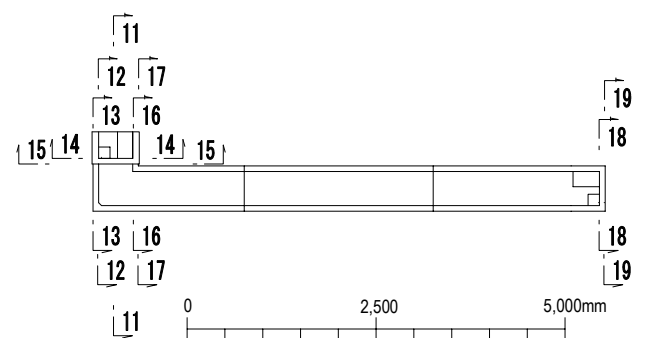
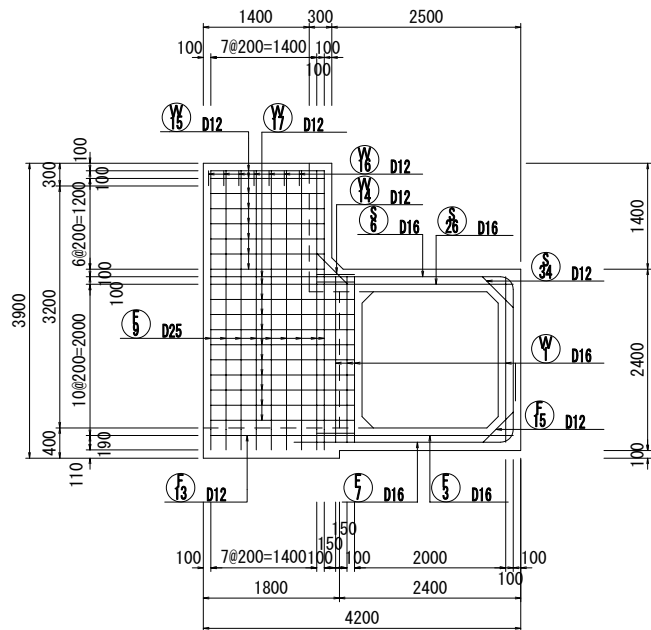
14 - 14 15 - 15



16 - 16



17 - 17



Arab Republic of Egypt  
Ministry of Water Resources and Irrigation  
Reservoir and Grand Barrages Sector

Detailed Design Study on the Project for  
Construction of the New Dirout Group of Regulators

Ibrahimia Regulator  
Bar arrangement of hydraulic pipe pit (3)

DRW. NO.  
CI-44

SANYU CONSULTANTS INC.

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DATE: \_\_\_\_\_ DATE: \_\_\_\_\_ DATE: \_\_\_\_\_

Item	Unit	Quantity
Excavation	C1 m2	-
Excavation	C2 m2	-
Backfilling	R m2	-
Embankment	B0 m2	-
Embankment	BL m2	-
Embankment	BR m2	-
Earth Finishing Foundation	L1 m	-
Rough Finishing	L2 m	-

255.7

DL=35.00

Item	Unit	Quantity
Excavation	C1 m2	0.65
Excavation	C2 m2	-
Backfilling	R m2	-
Embankment	B0 m2	-
Embankment	BL m2	-
Embankment	BR m2	7.35
Earth Finishing Foundation	L1 m	-
Rough Finishing	L2 m	-

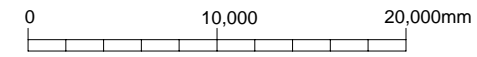
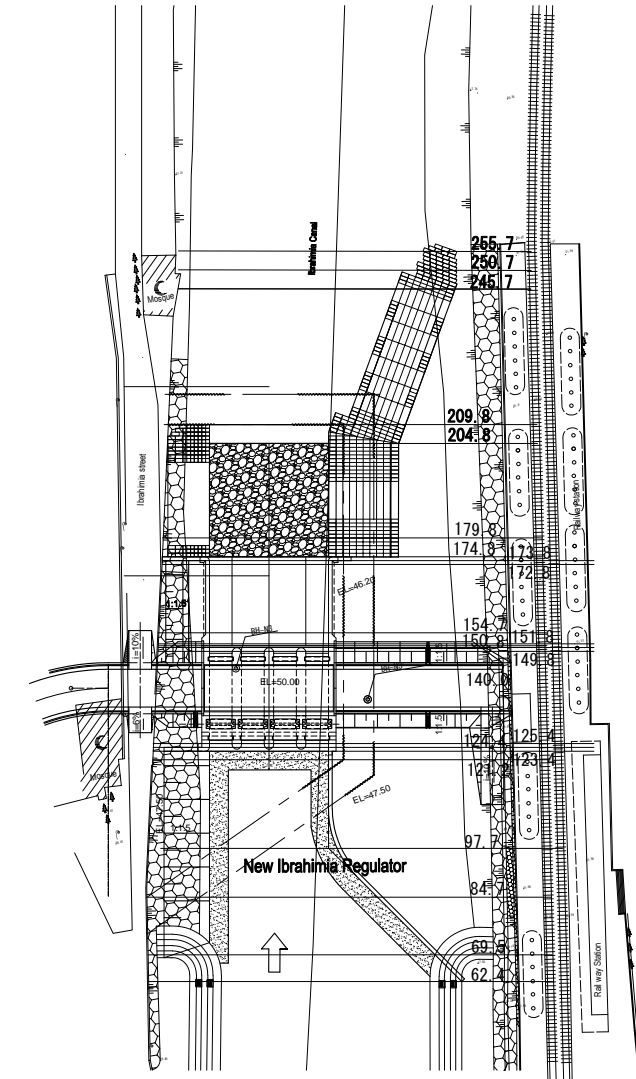
250.7

DL=35.00

Item	Unit	Quantity
Excavation	C1 m2	5.09
Excavation	C2 m2	-
Backfilling	R m2	0.19
Embankment	B0 m2	-
Embankment	BL m2	-
Embankment	BR m2	10.01
Earth Finishing Foundation	L1 m	-
Rough Finishing	L2 m	-

245.7

DL=35.00



Arab Republic of Egypt  
Ministry of Water Resources and Irrigation  
Reservoir and Grand Barrages Sector

Detailed Design Study on the Project for  
Construction of the New Dirout Group of Regulators

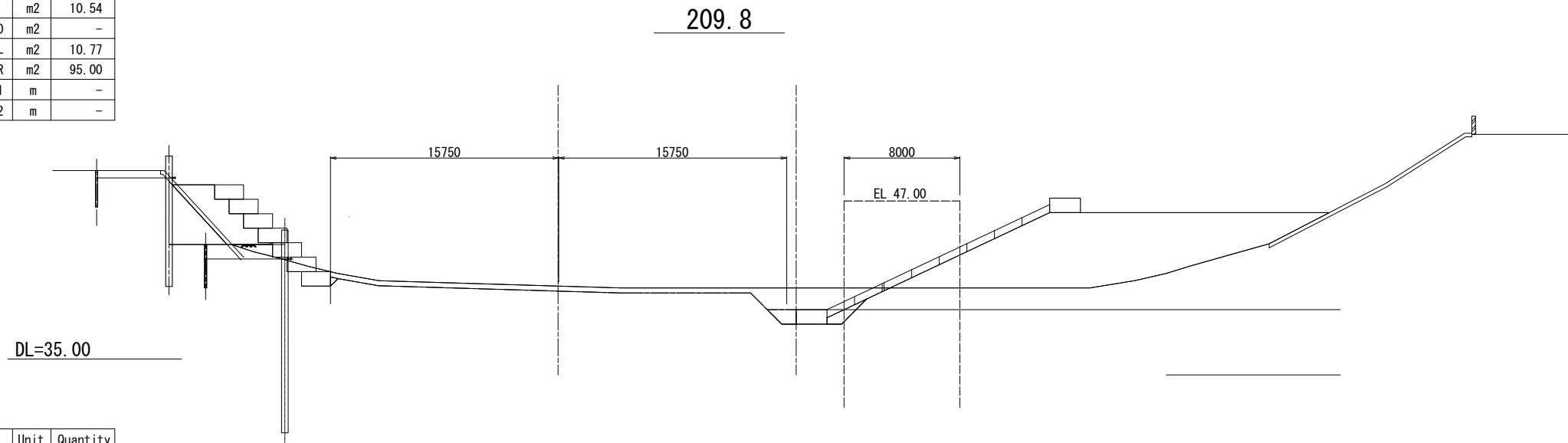
Ibrahimia Regulator  
Cross section of earth works (1)

DRW. NO.  
CI-45

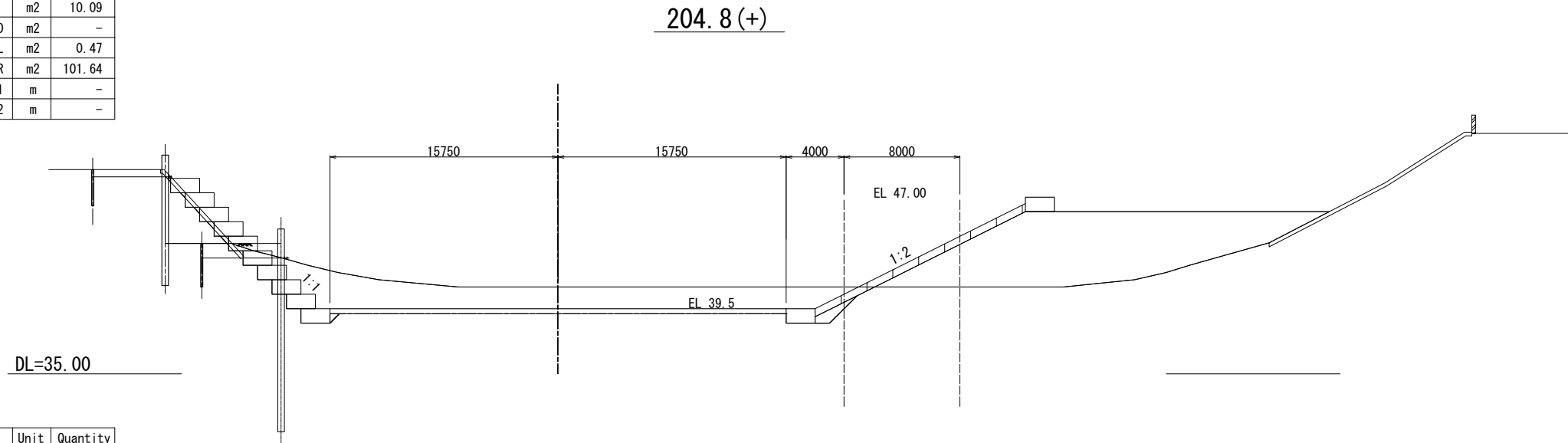
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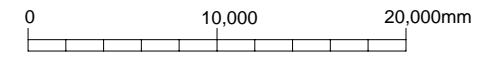
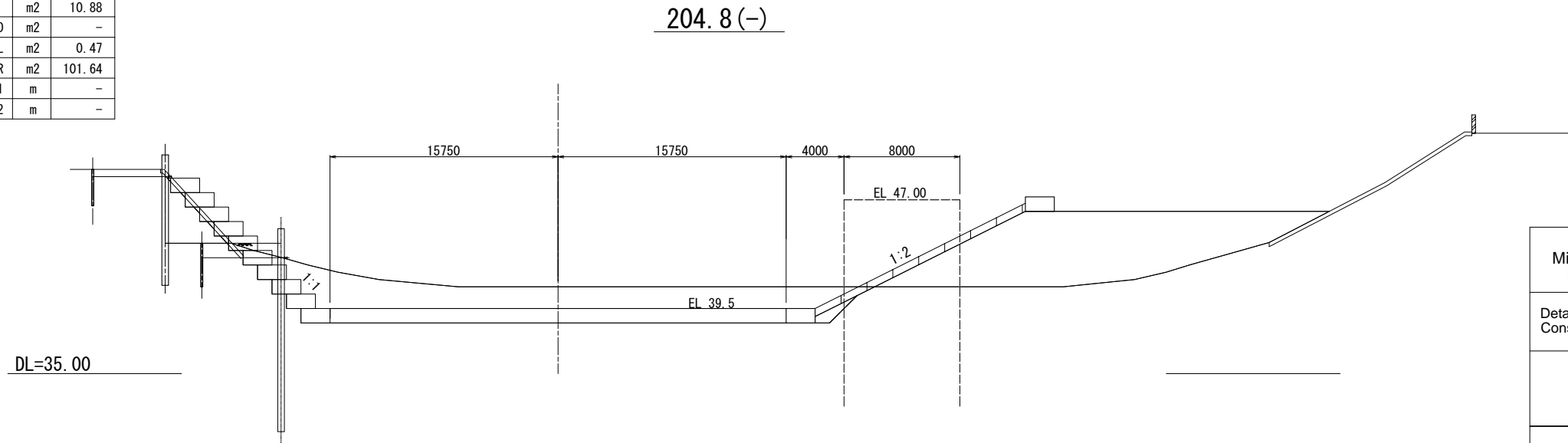
Item	Unit	Quantity
Excavation	C1 m2	31.55
Excavation	C2 m2	-
Backfilling	R m2	10.54
Embankment	B0 m2	-
Embankment	BL m2	10.77
Embankment	BR m2	95.00
Earth Finishing Foundation	L1 m	-
Rough Finishing	L2 m	-



Item	Unit	Quantity
Excavation	C1 m2	90.25
Excavation	C2 m2	-
Backfilling	R m2	10.09
Embankment	B0 m2	-
Embankment	BL m2	0.47
Embankment	BR m2	101.64
Earth Finishing Foundation	L1 m	-
Rough Finishing	L2 m	-



Item	Unit	Quantity
Excavation	C1 m2	110.51
Excavation	C2 m2	-
Backfilling	R m2	10.88
Embankment	B0 m2	-
Embankment	BL m2	0.47
Embankment	BR m2	101.64
Earth Finishing Foundation	L1 m	-
Rough Finishing	L2 m	-



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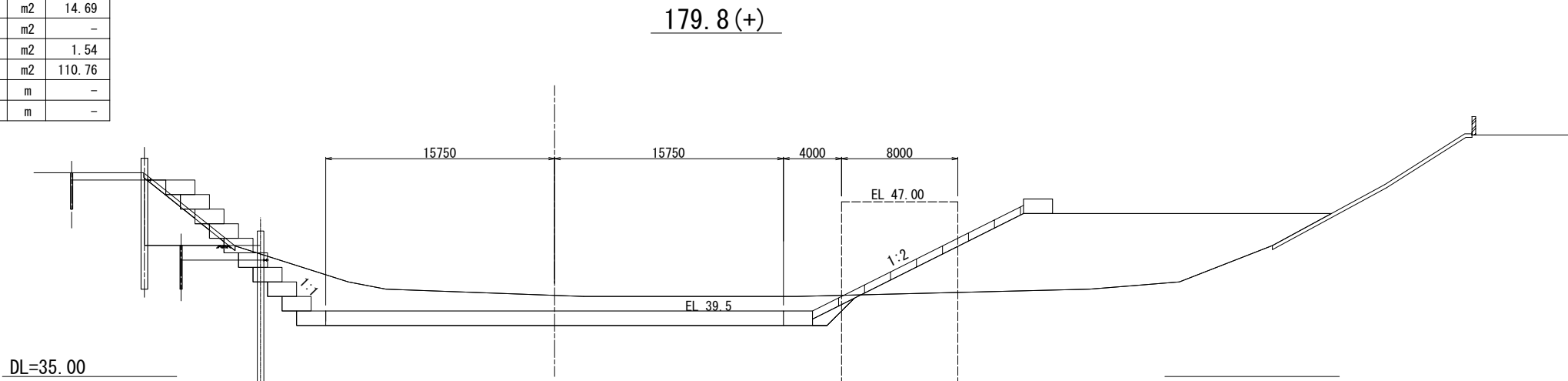
Ibrahimia Regulator  
Cross section of earth works (2)

DRW. NO.  
CI-46

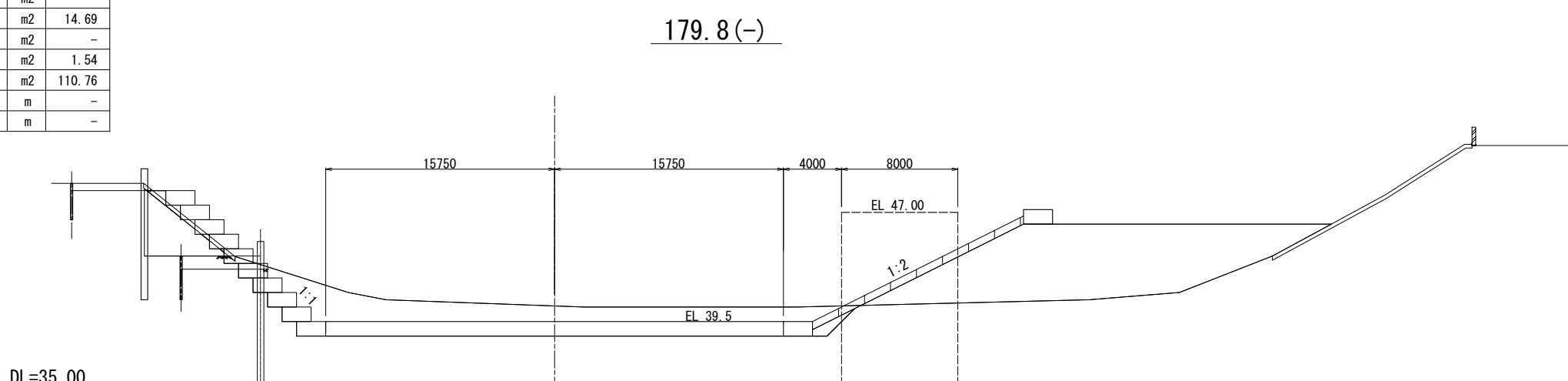
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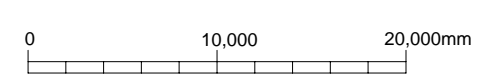
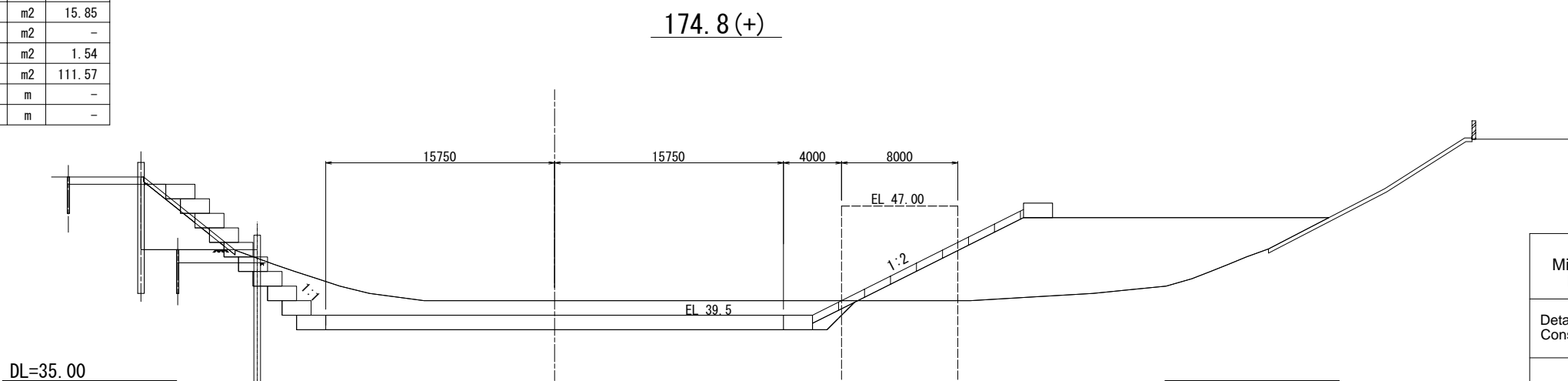
Item	Unit	Quantity
Excavation	C1 m2	95.58
Excavation	C2 m2	-
Backfilling	R m2	14.69
Embankment	B0 m2	-
Embankment	BL m2	1.54
Embankment	BR m2	110.76
Earth Finishing Foundation	L1 m	-
Rough Finishing	L2 m	-



Item	Unit	Quantity
Excavation	C1 m2	95.58
Excavation	C2 m2	-
Backfilling	R m2	14.69
Embankment	B0 m2	-
Embankment	BL m2	1.54
Embankment	BR m2	110.76
Earth Finishing Foundation	L1 m	-
Rough Finishing	L2 m	-



Item	Unit	Quantity
Excavation	C1 m2	90.92
Excavation	C2 m2	-
Backfilling	R m2	15.85
Embankment	B0 m2	-
Embankment	BL m2	1.54
Embankment	BR m2	111.57
Earth Finishing Foundation	L1 m	-
Rough Finishing	L2 m	-



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Detailed Design Study on the Project for  
Construction of the New Dirout Group of Regulators

Ibrahimia Regulator  
Cross section of earth works (3)

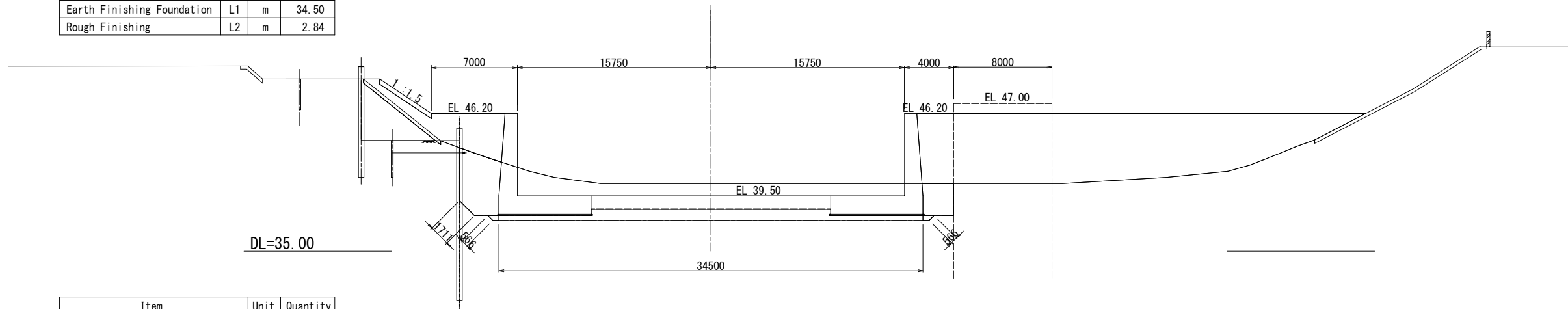
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CI-47

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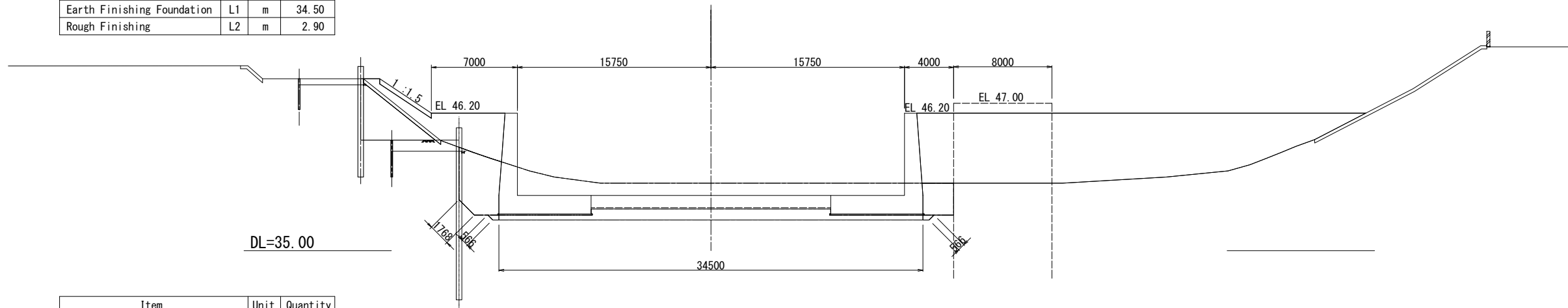
Item	Unit	Quantity
Excavation	C1	m2 107.56
Excavation	C2	m2 24.09
Backfilling	R	m2 37.11
Embankment	B0	m2 -
Embankment	BL	m2 24.06
Embankment	BR	m2 166.33
Earth Finishing Foundation	L1	m 34.50
Rough Finishing	L2	m 2.84

174.8 (-)



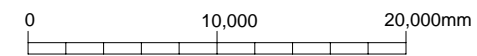
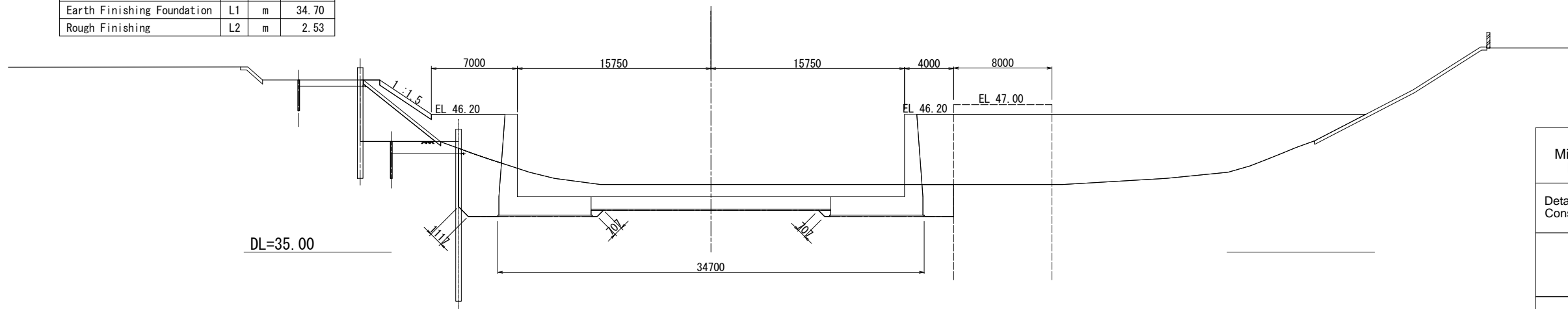
Item	Unit	Quantity
Excavation	C1	m2 107.71
Excavation	C2	m2 24.09
Backfilling	R	m2 37.48
Embankment	B0	m2 -
Embankment	BL	m2 24.06
Embankment	BR	m2 166.33
Earth Finishing Foundation	L1	m 34.50
Rough Finishing	L2	m 2.90

173.8



Item	Unit	Quantity
Excavation	C1	m2 109.13
Excavation	C2	m2 -
Backfilling	R	m2 37.78
Embankment	B0	m2 -
Embankment	BL	m2 24.06
Embankment	BR	m2 166.33
Earth Finishing Foundation	L1	m 34.70
Rough Finishing	L2	m 2.53

172.8



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Ministry of Water Resources and Irrigation  
Reservoir and Grand Barrages Sector

Detailed Design Study on the Project for  
Construction of the New Dirout Group of Regulators

Ibrahimia Regulator  
Cross section of earth works (4)

DRW. NO.  
CI-48

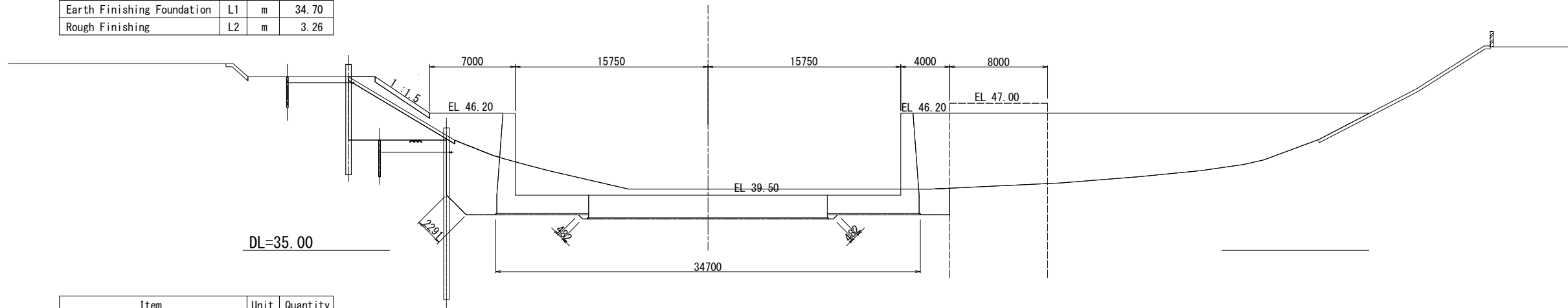
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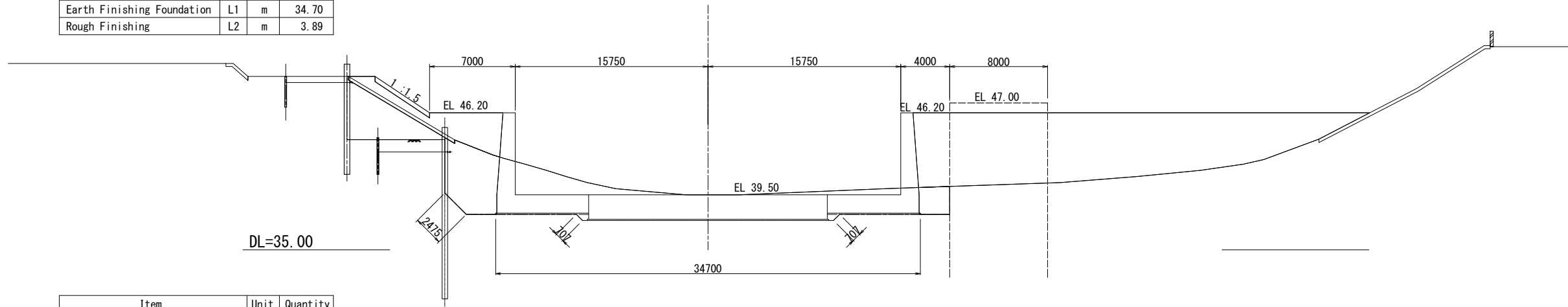
Item	Unit	Quantity
Excavation	C1	m2 119.84
Excavation	C2	m2 -
Backfilling	R	m2 46.85
Embankment	B0	m2 -
Embankment	BL	m2 21.78
Embankment	BR	m2 170.60
Earth Finishing Foundation	L1	m 34.70
Rough Finishing	L2	m 3.26

154.7



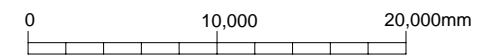
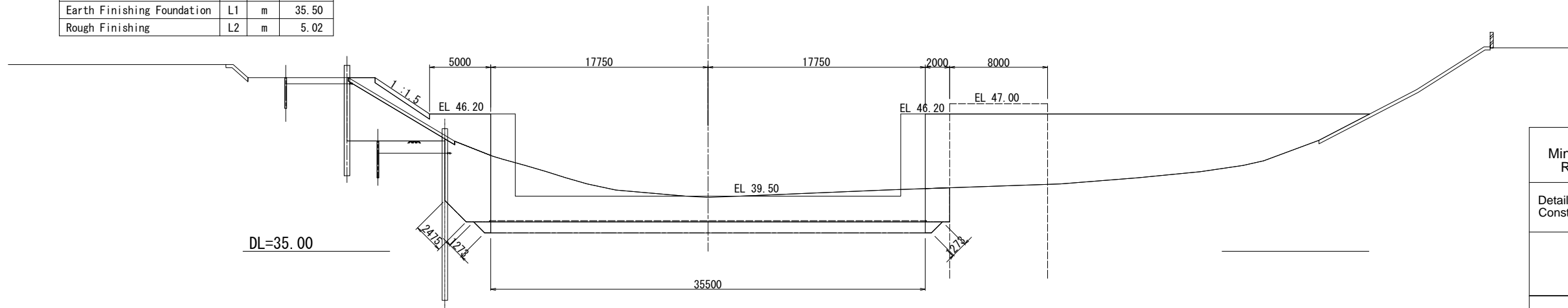
Item	Unit	Quantity
Excavation	C1	m2 116.31
Excavation	C2	m2 -
Backfilling	R	m2 48.33
Embankment	B0	m2 -
Embankment	BL	m2 21.77
Embankment	BR	m2 169.77
Earth Finishing Foundation	L1	m 34.70
Rough Finishing	L2	m 3.89

151.8(+)



Item	Unit	Quantity
Excavation	C1	m2 126.20
Excavation	C2	m2 33.66
Backfilling	R	m2 49.02
Embankment	B0	m2 -
Embankment	BL	m2 18.73
Embankment	BR	m2 165.05
Earth Finishing Foundation	L1	m 35.50
Rough Finishing	L2	m 5.02

151.8(-)



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Reservoir and Grand Barrages Sector

Detailed Design Study on the Project for  
Construction of the New Dirout Group of Regulators

Ibrahimia Regulator  
Cross section of earth works (5)

DRW. NO.  
CI-49

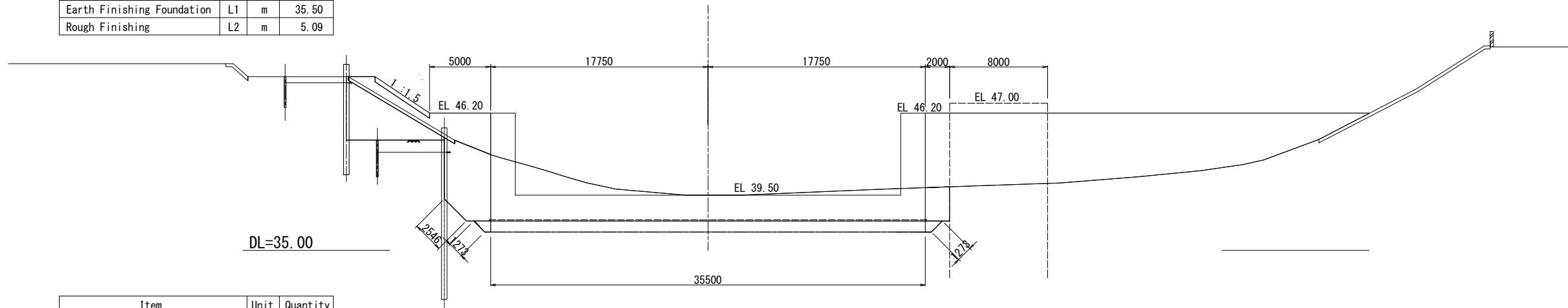
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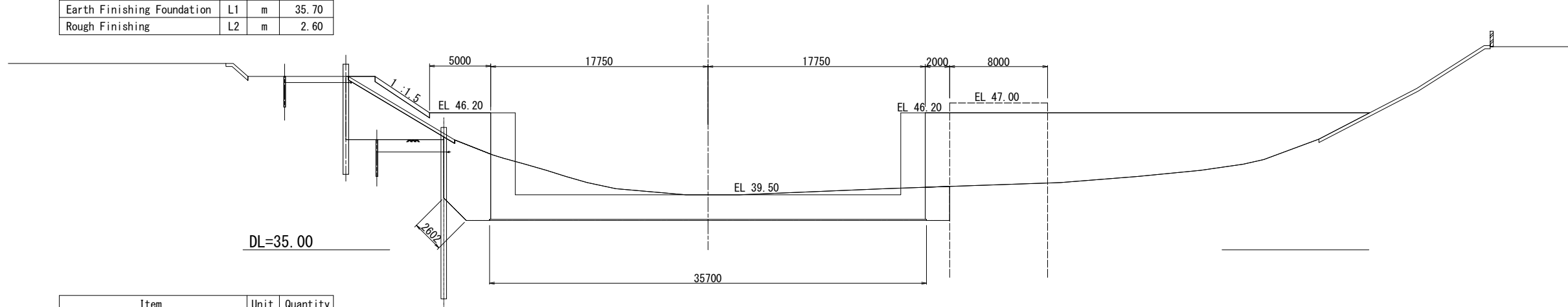
Item	Unit	Quantity
Excavation	C1	m2 126.69
Excavation	C2	m2 33.66
Backfilling	R	m2 49.52
Embankment	B0	m2 -
Embankment	BL	m2 18.74
Embankment	BR	m2 165.06
Earth Finishing Foundation	L1	m 35.50
Rough Finishing	L2	m 5.09

150.8



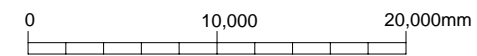
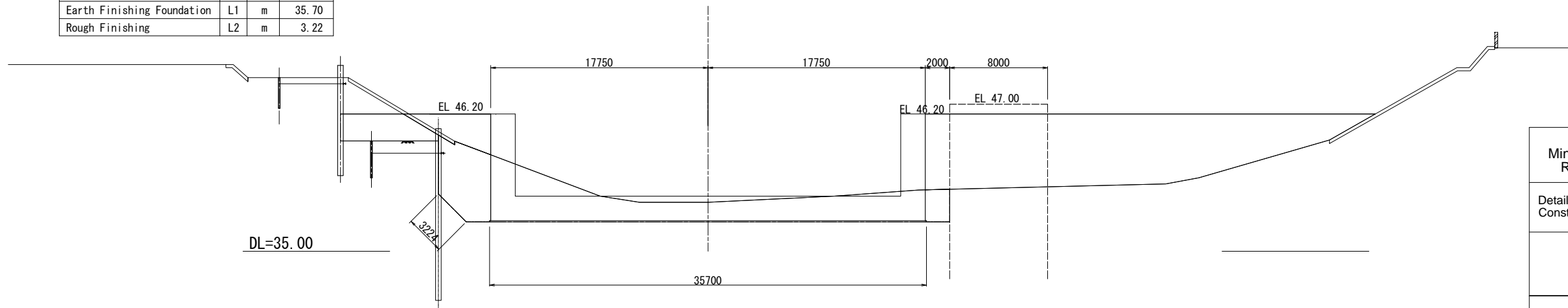
Item	Unit	Quantity
Excavation	C1	m2 126.89
Excavation	C2	m2 -
Backfilling	R	m2 48.27
Embankment	B0	m2 -
Embankment	BL	m2 18.74
Embankment	BR	m2 165.06
Earth Finishing Foundation	L1	m 35.70
Rough Finishing	L2	m 2.60

149.8



Item	Unit	Quantity
Excavation	C1	m2 114.83
Excavation	C2	m2 -
Backfilling	R	m2 44.48
Embankment	B0	m2 -
Embankment	BL	m2 13.44
Embankment	BR	m2 174.56
Earth Finishing Foundation	L1	m 35.70
Rough Finishing	L2	m 3.22

140.0(+)



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Detailed Design Study on the Project for  
Construction of the New Dirout Group of Regulators

Ibrahimia Regulator  
Cross section of earth works (6)

DRW. NO.  
CI-50

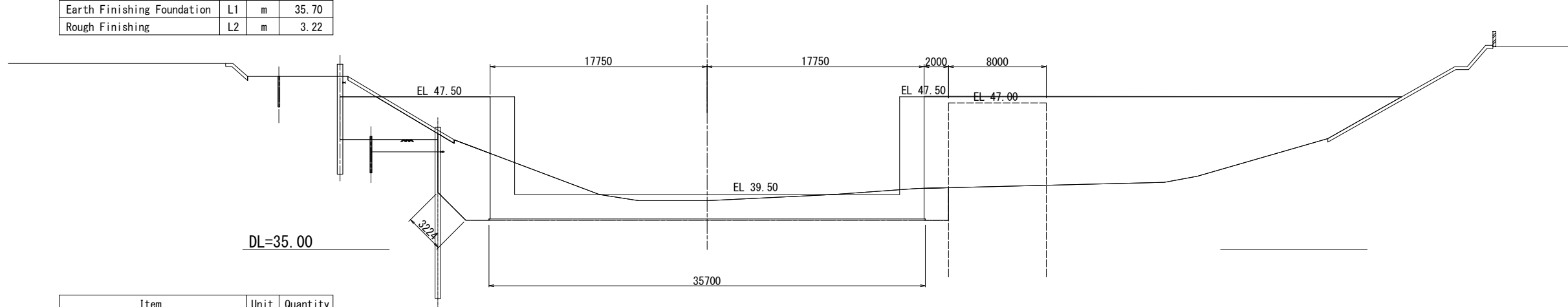
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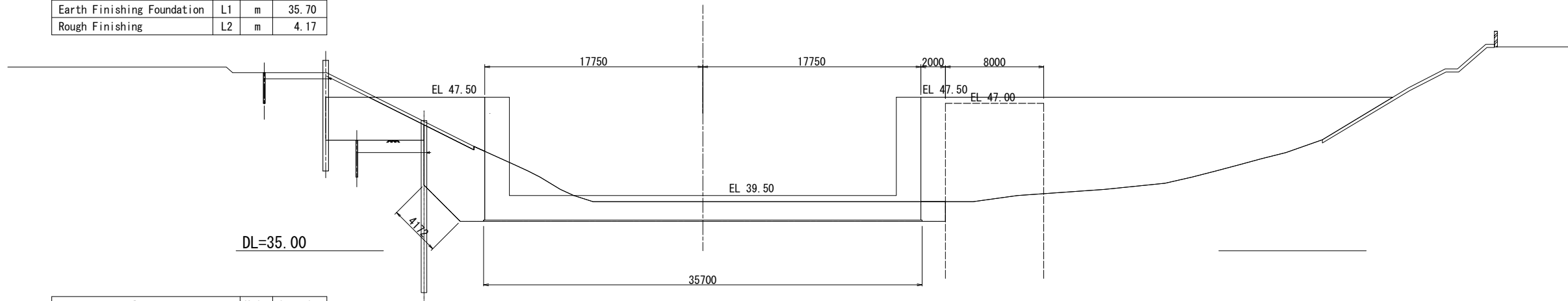
Item	Unit	Quantity
Excavation	C1	m2 114.83
Excavation	C2	m2 -
Backfilling	R	m2 49.74
Embankment	B0	m2 -
Embankment	BL	m2 24.15
Embankment	BR	m2 224.72
Earth Finishing Foundation	L1	m 35.70
Rough Finishing	L2	m 3.22

140.0 (-)



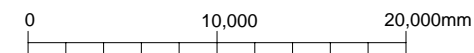
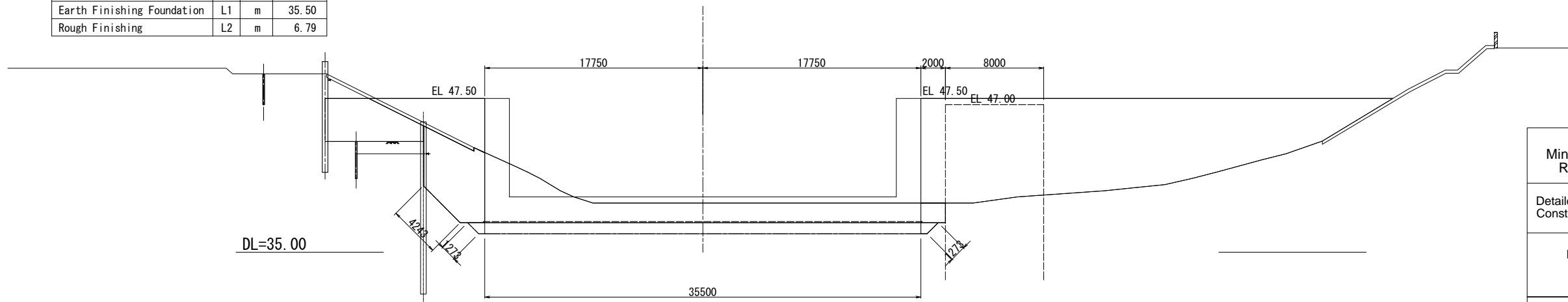
Item	Unit	Quantity
Excavation	C1	m2 106.20
Excavation	C2	m2 -
Backfilling	R	m2 54.81
Embankment	B0	m2 -
Embankment	BL	m2 22.01
Embankment	BR	m2 235.13
Earth Finishing Foundation	L1	m 35.70
Rough Finishing	L2	m 4.17

125.4



Item	Unit	Quantity
Excavation	C1	m2 106.20
Excavation	C2	m2 33.66
Backfilling	R	m2 56.01
Embankment	B0	m2 -
Embankment	BL	m2 22.01
Embankment	BR	m2 235.13
Earth Finishing Foundation	L1	m 35.50
Rough Finishing	L2	m 6.79

124.4



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Reservoir and Grand Barrages Sector

Detailed Design Study on the Project for  
Construction of the New Dirout Group of Regulators

Ibrahimia Regulator  
Cross section of earth works (7)

DRW. NO.  
CI-51

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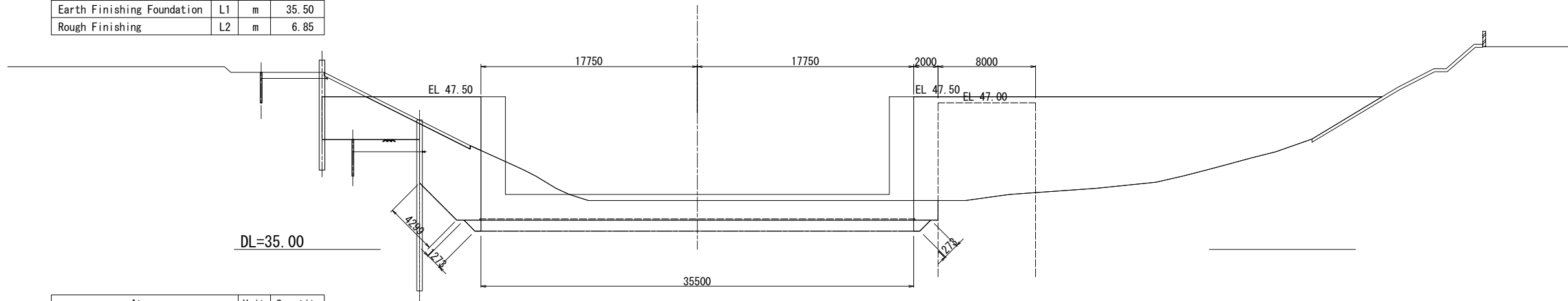
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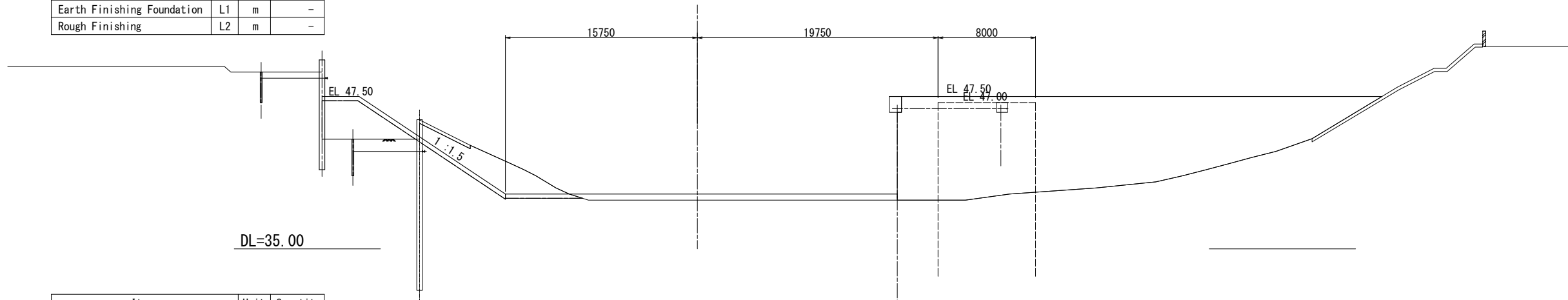
Item	Unit	Quantity
Excavation	C1	m2 106.64
Excavation	C2	m2 33.66
Backfilling	R	m2 57.18
Embankment	B0	m2 -
Embankment	BL	m2 22.01
Embankment	BR	m2 235.13
Earth Finishing Foundation	L1	m 35.50
Rough Finishing	L2	m 6.85

123.4(+)



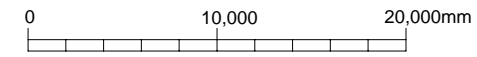
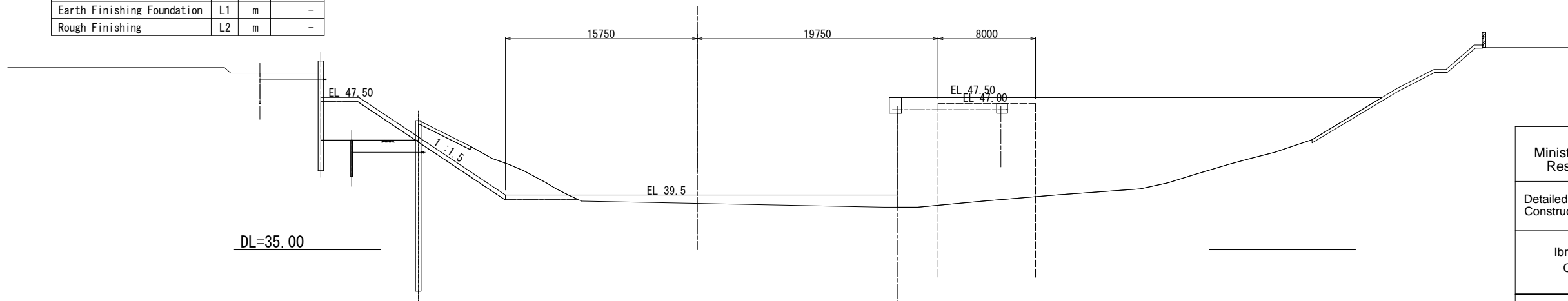
Item	Unit	Quantity
Excavation	C1	m2 25.13
Excavation	C2	m2 -
Backfilling	R	m2 16.68
Embankment	B0	m2 -
Embankment	BL	m2 -
Embankment	BR	m2 246.15
Earth Finishing Foundation	L1	m -
Rough Finishing	L2	m -

123.4(-)



Item	Unit	Quantity
Excavation	C1	m2 24.75
Excavation	C2	m2 -
Backfilling	R	m2 17.00
Embankment	B0	m2 -
Embankment	BL	m2 -
Embankment	BR	m2 252.98
Earth Finishing Foundation	L1	m -
Rough Finishing	L2	m -

121.2



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Reservoir and Grand Barrages Sector

Detailed Design Study on the Project for  
Construction of the New Dirout Group of Regulators

Ibrahimia Regulator  
Cross section of earth works (8)

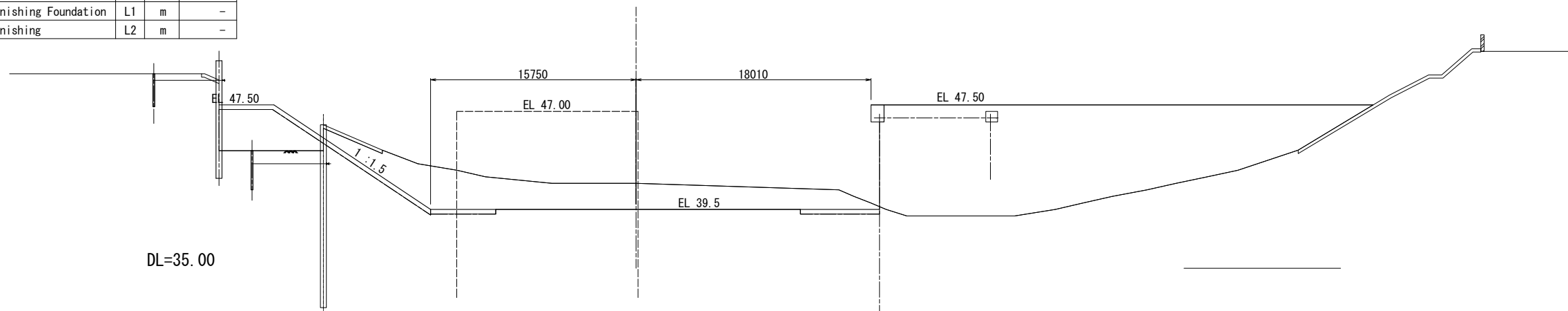
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CI-52

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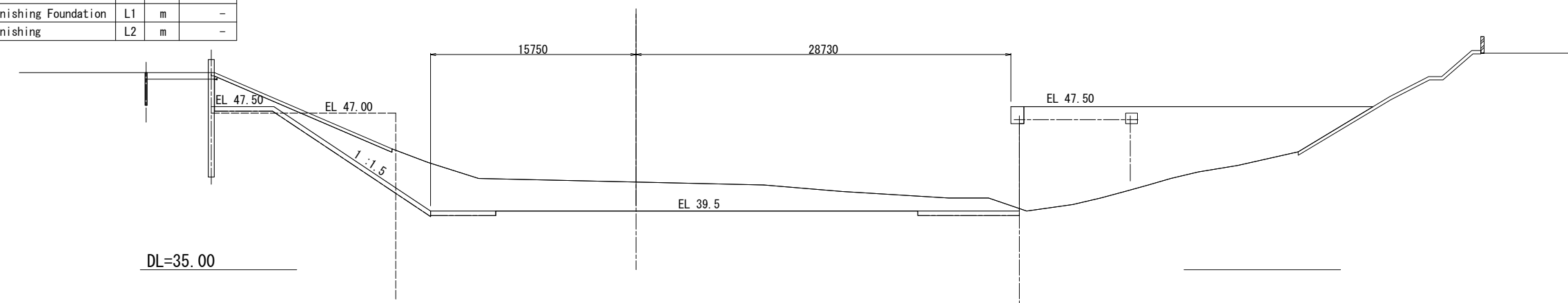
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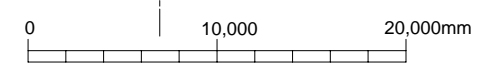
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Excavation	C1	m2 89.42
Excavation	C2	m2 -
Backfilling	R	m2 20.14
Embankment	B0	m2 -
Embankment	BL	m2 -
Embankment	BR	m2 232.78
Earth Finishing Foundation	L1	m -
Rough Finishing	L2	m -



Item	Unit	Quantity
Excavation	C1	m2 125.78
Excavation	C2	m2 -
Backfilling	R	m2 -
Embankment	B0	m2 -
Embankment	BL	m2 -
Embankment	BR	m2 134.33
Earth Finishing Foundation	L1	m -
Rough Finishing	L2	m -



Item	Unit	Quantity
Excavation	C1	m2 2.76
Excavation	C2	m2 -
Backfilling	R	m2 -
Embankment	B0	m2 -
Embankment	BL	m2 -
Embankment	BR	m2 33.47
Earth Finishing Foundation	L1	m -
Rough Finishing	L2	m -



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Detailed Design Study on the Project for  
Construction of the New Dirout Group of Regulators

Ibrahimia Regulator  
Cross section of earth works (9)

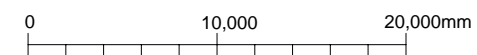
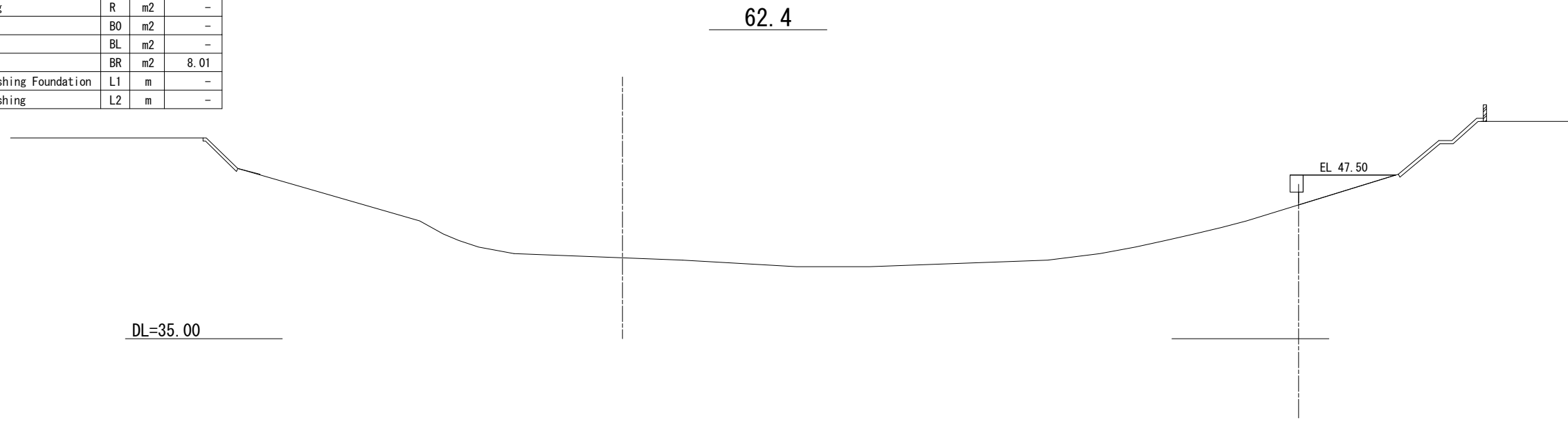
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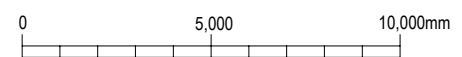
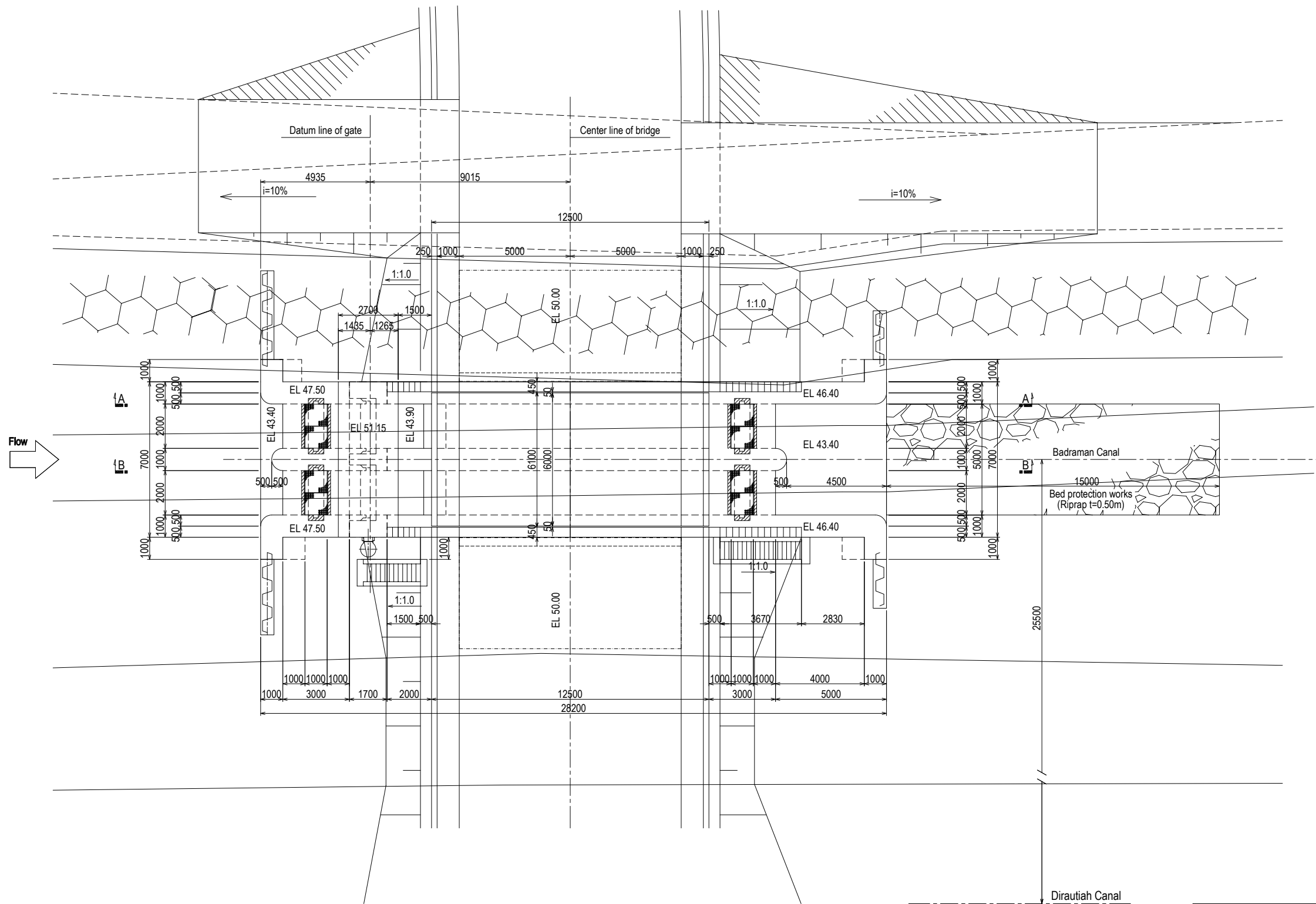
DATE :  
DATE :  
DATE :  
DATE :

Item	Unit	Quantity
Excavation	C1	m2 -
Excavation	C2	m2 -
Backfilling	R	m2 -
Embankment	B0	m2 -
Embankment	BL	m2 -
Embankment	BR	m2 8.01
Earth Finishing Foundation	L1	m -
Rough Finishing	L2	m -



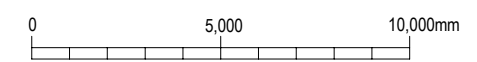
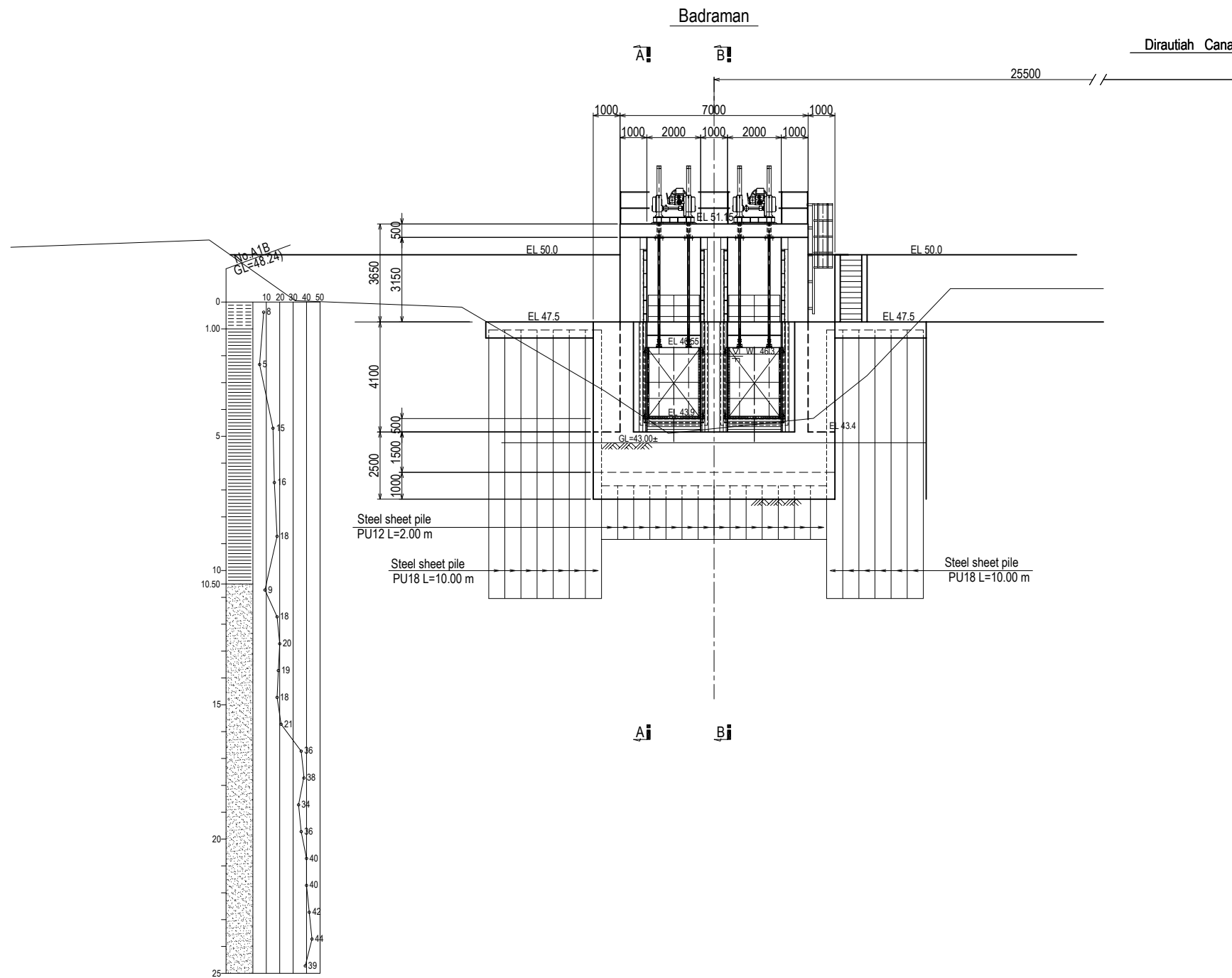
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Ibrahimia Regulator Cross section of earth works (10)			DRW. NO. CI-54
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# Plan of Badraman Regulator (Badraman)



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Badraman Regulator (Badraman) Plan			<b>DRW. NO.</b> CN-1
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	DATE:
DATE:	DATE:	DATE:	DATE:

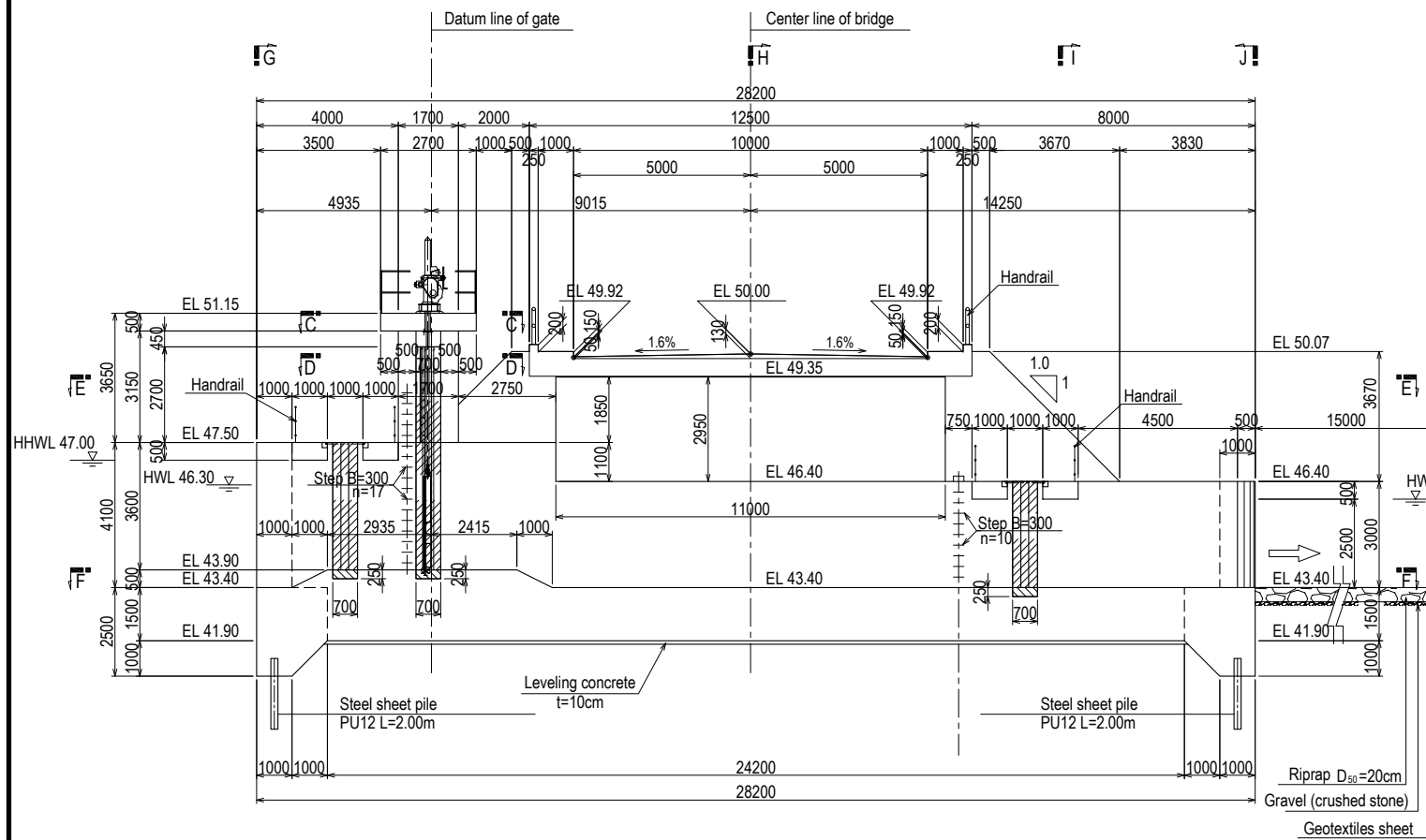
# Elevation of Badraman Regulator (Badraman)



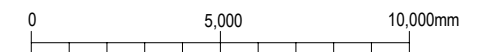
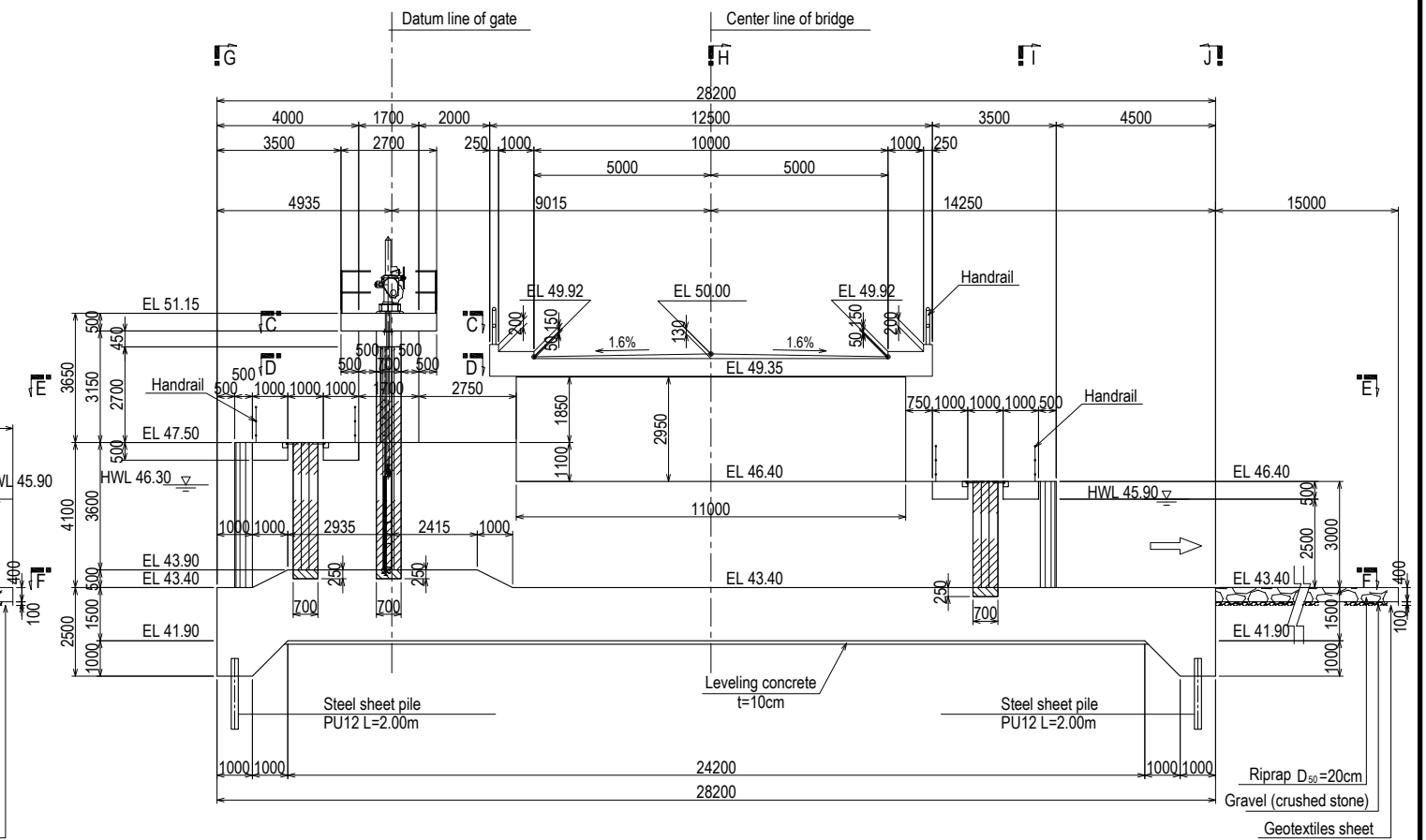
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Badraman Regulator (Badraman) Elevation			DRW. NO. CN-2
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Longitudinal Section of Badraman Regulator (Badraman)

## Section A — A



## Section B — B



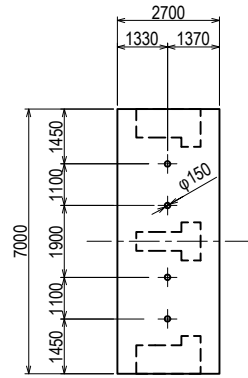
Note;

Shaded area indicates the range of second stage concrete to be placed with steel materials.

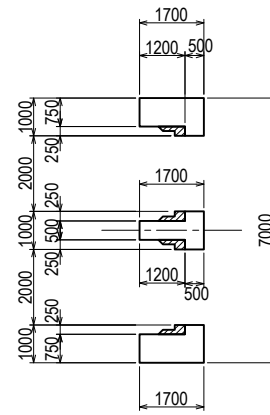
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Badraman Regulator (Badraman) Longitudinal section	<b>DRW. NO.</b> CN-3	
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

# Section of Badraman Regulator (Badraman)

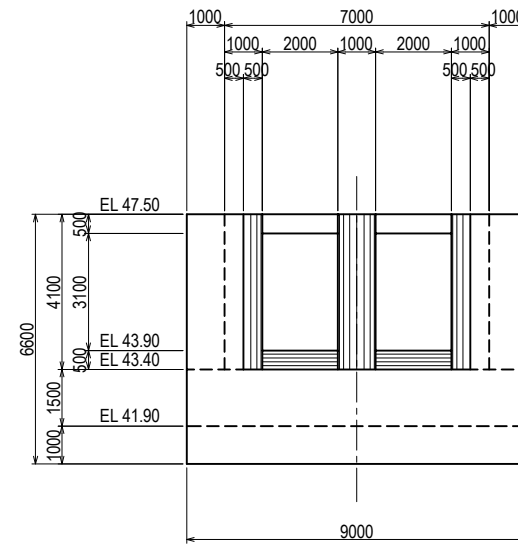
Section C—C



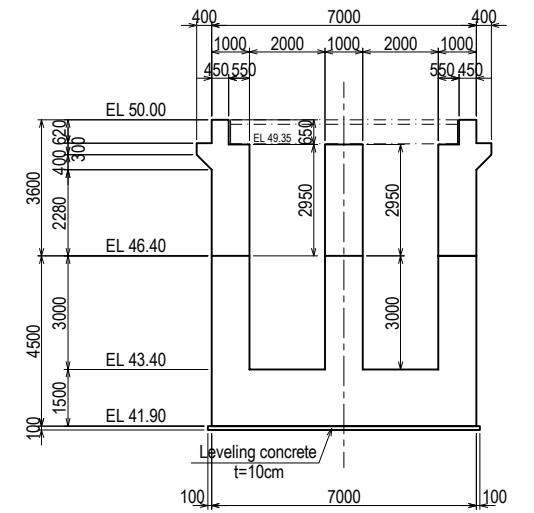
Section D—D



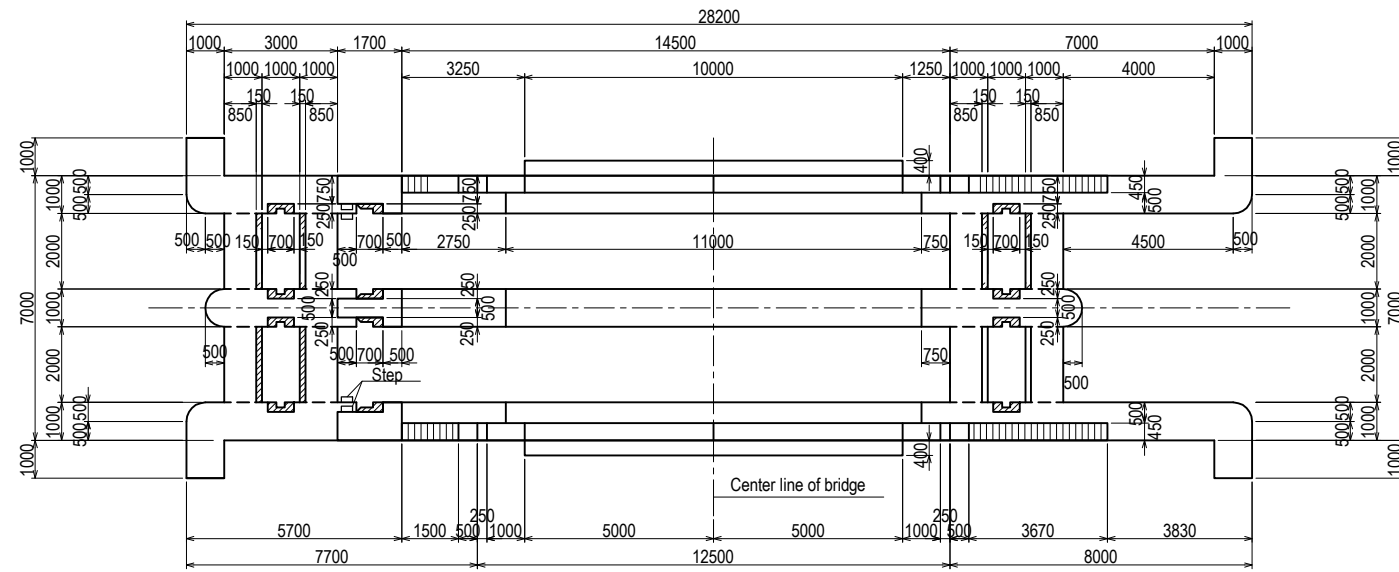
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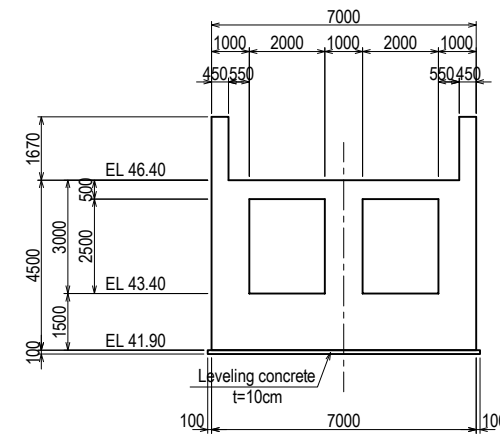
Section H—H



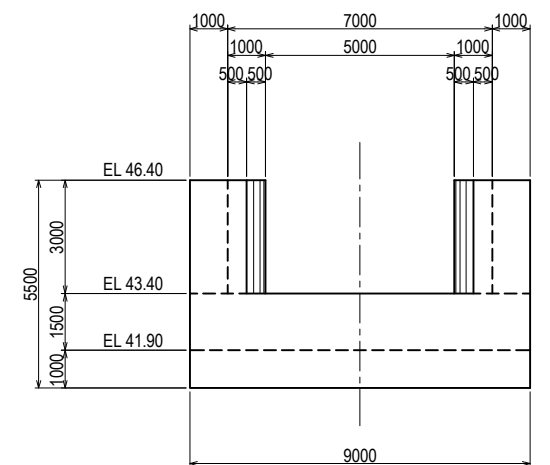
Section E—E



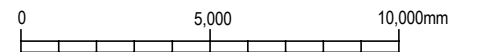
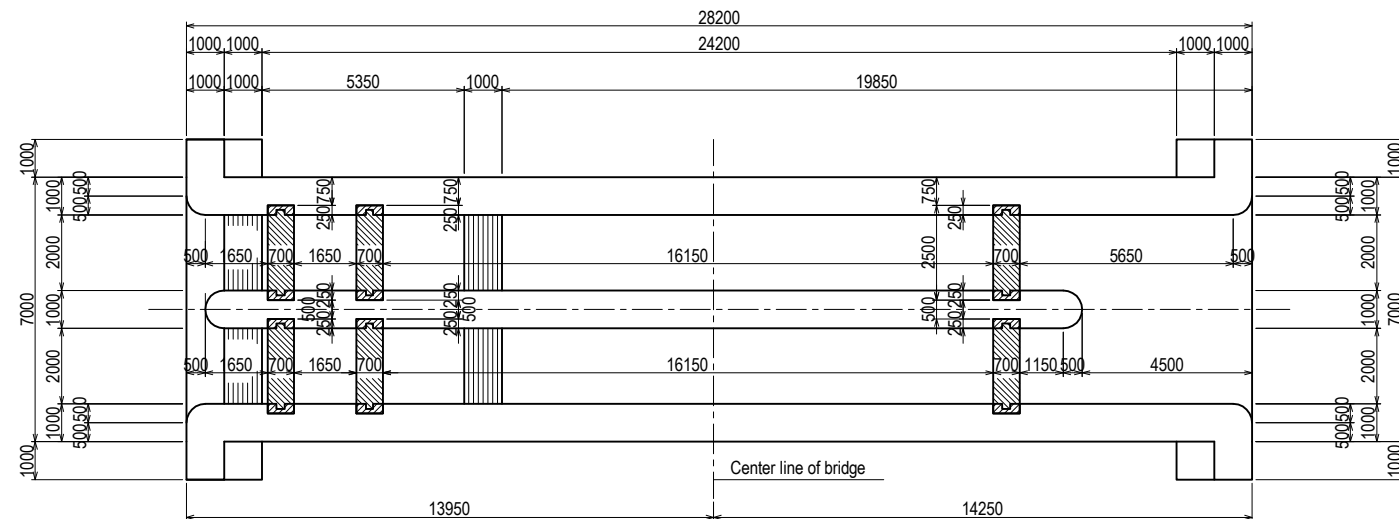
Section I—I



Section J—J



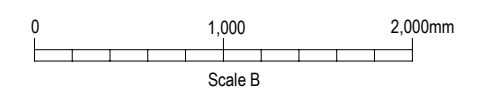
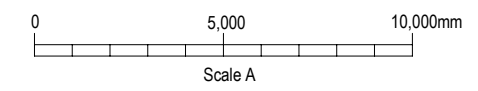
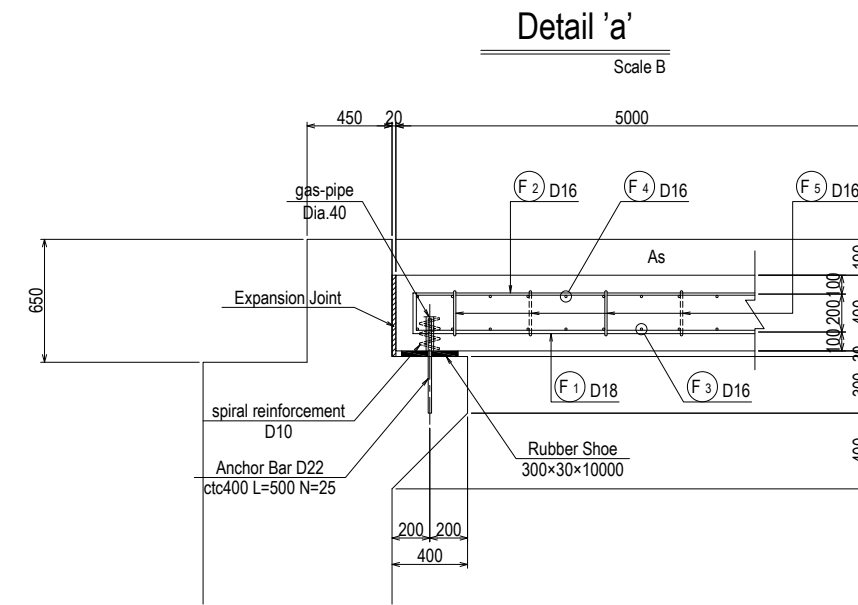
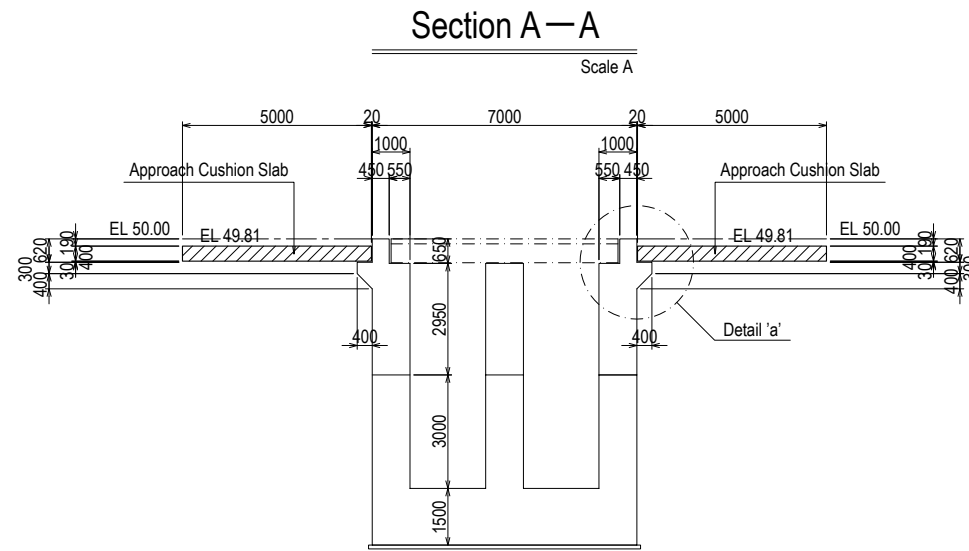
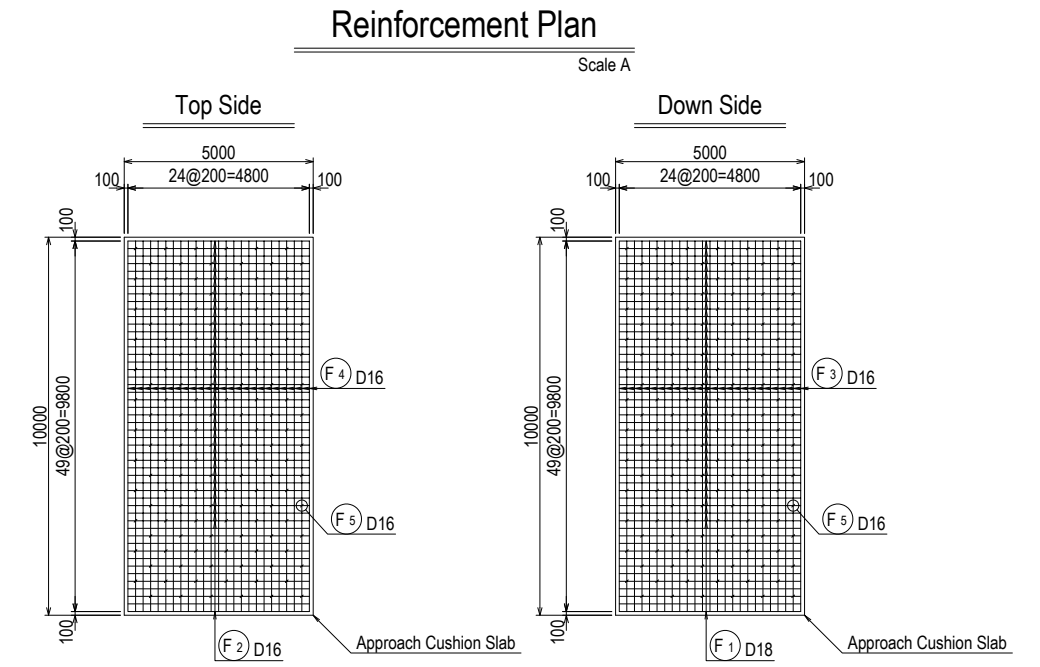
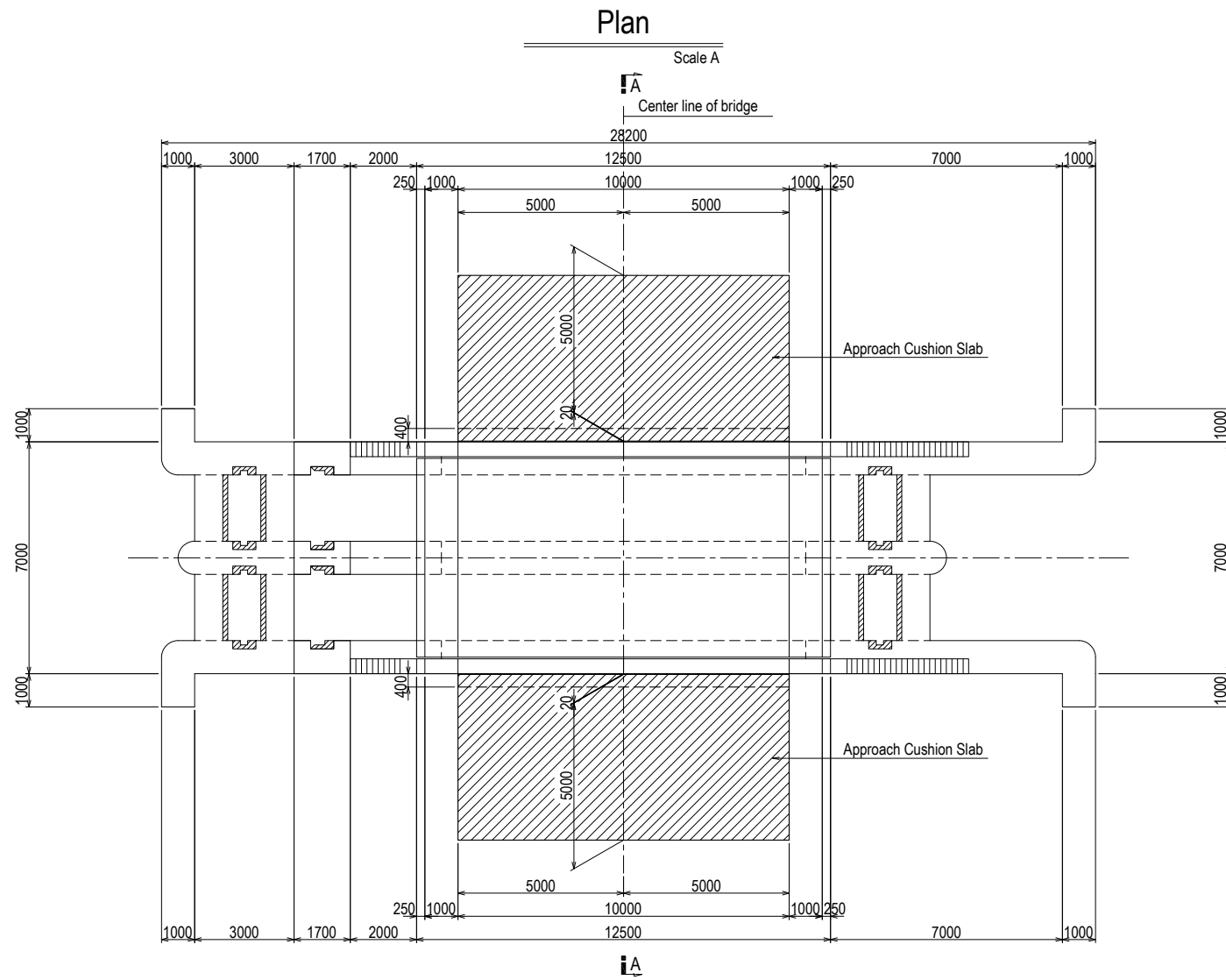
Section F—F



Note:  
 Shaded area indicates the range of second stage concrete to be placed with steel materials.

Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Badraman Regulator (Badraman) Sections		<b>DRW. NO.</b> CN-4
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

# Approach Cushion Slab of Badraman Regulator (Badraman)

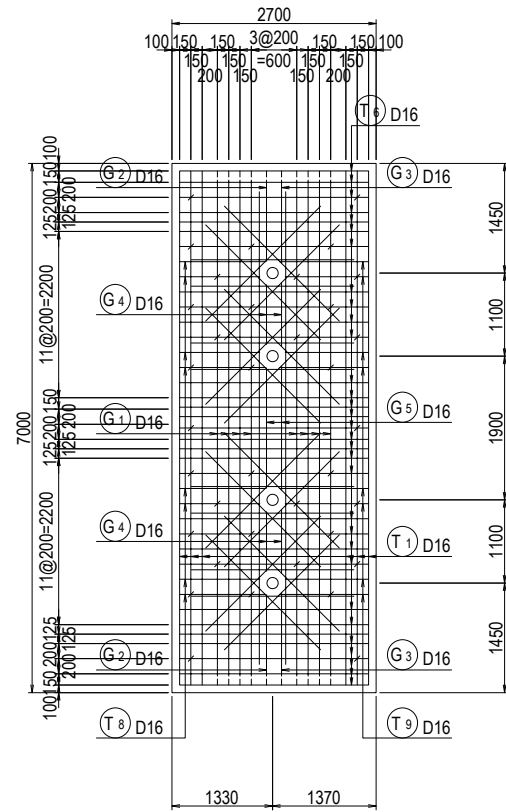


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Badraman Regulator (Badraman) Approach Cushion Slab			<b>DRW. NO.</b> CN-5
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

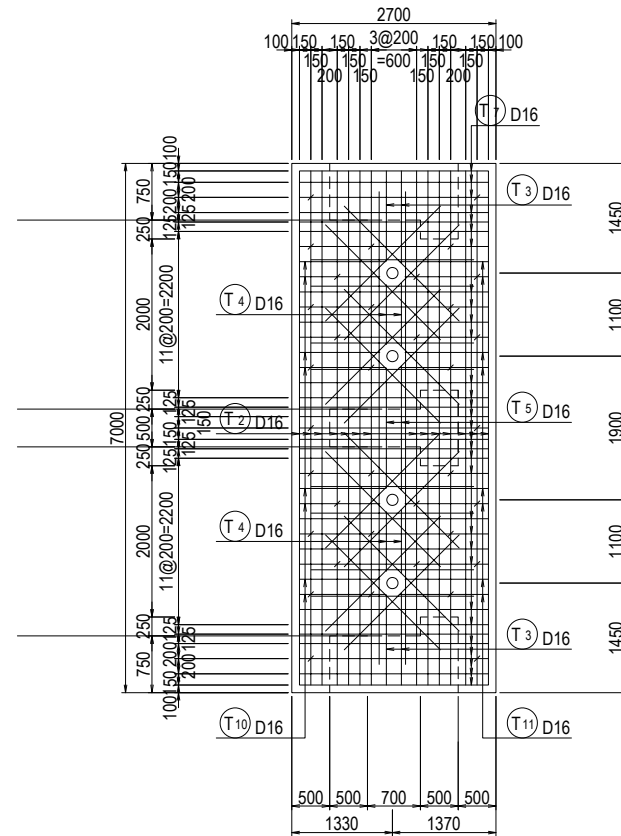


# Detail of Gate Abutment and Pier of Badraman Regulator (Badraman)

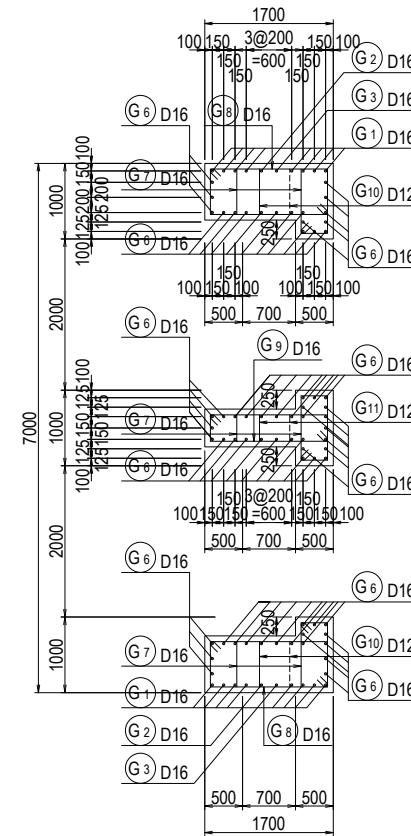
Section A—A



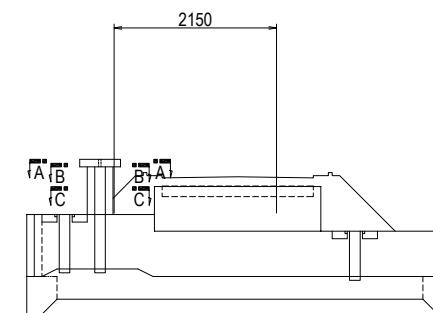
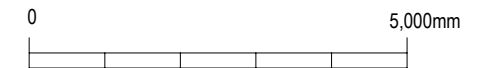
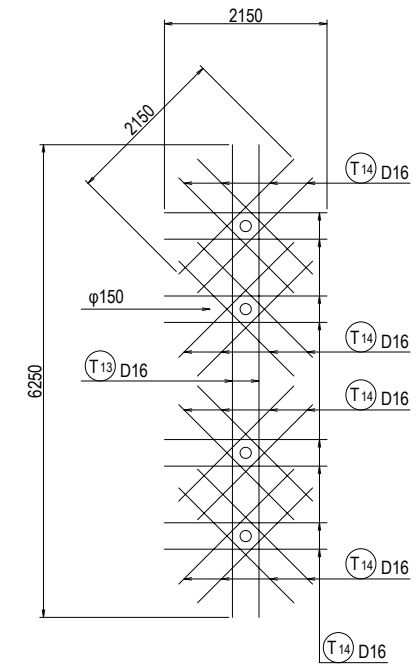
Section B—B



Section C—C



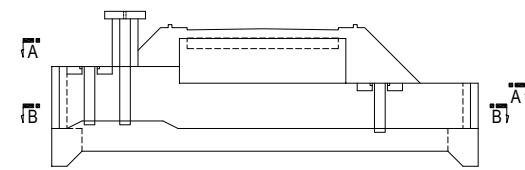
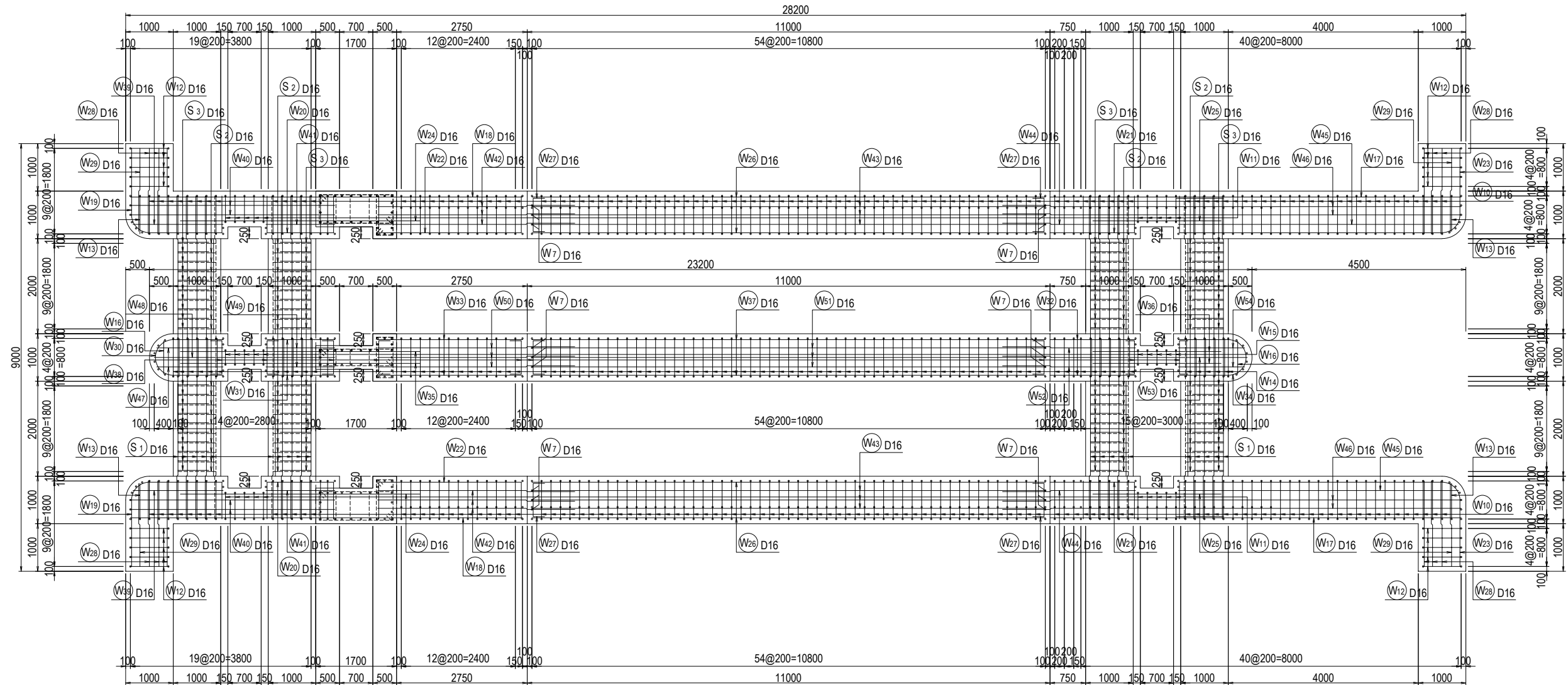
Detail of reinforcement for slab openings



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Badraman Regulator (Badraman) Bar arrangement of pier (1)			DRW. NO. CN-6
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	DATE:
DATE:	DATE:	DATE:	DATE:

# Plan of Gate Abutment and Pier of Badraman Regulator (Badraman) (1/2)

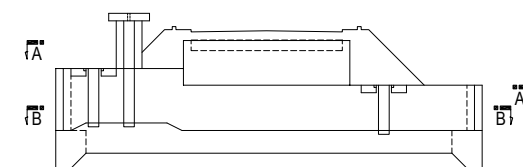
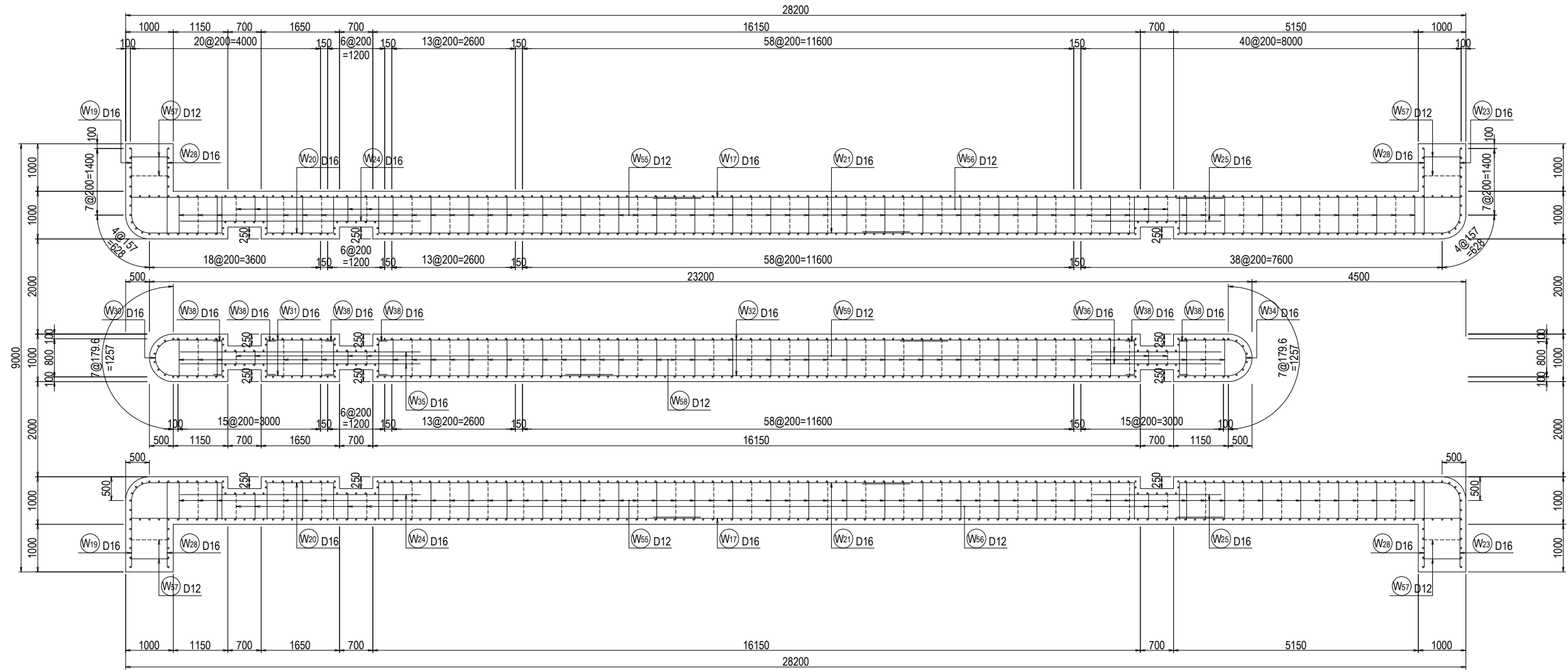
## Section A - A



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Badraman Regulator (Badraman) Bar arrangement of pier (2)		DRW. NO. CN-7
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

# Plan of Gate Abutment and Pier of Badraman Regulator (Badraman) (2/2)

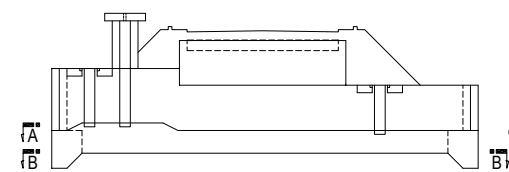
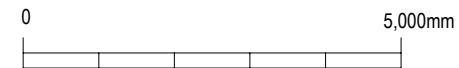
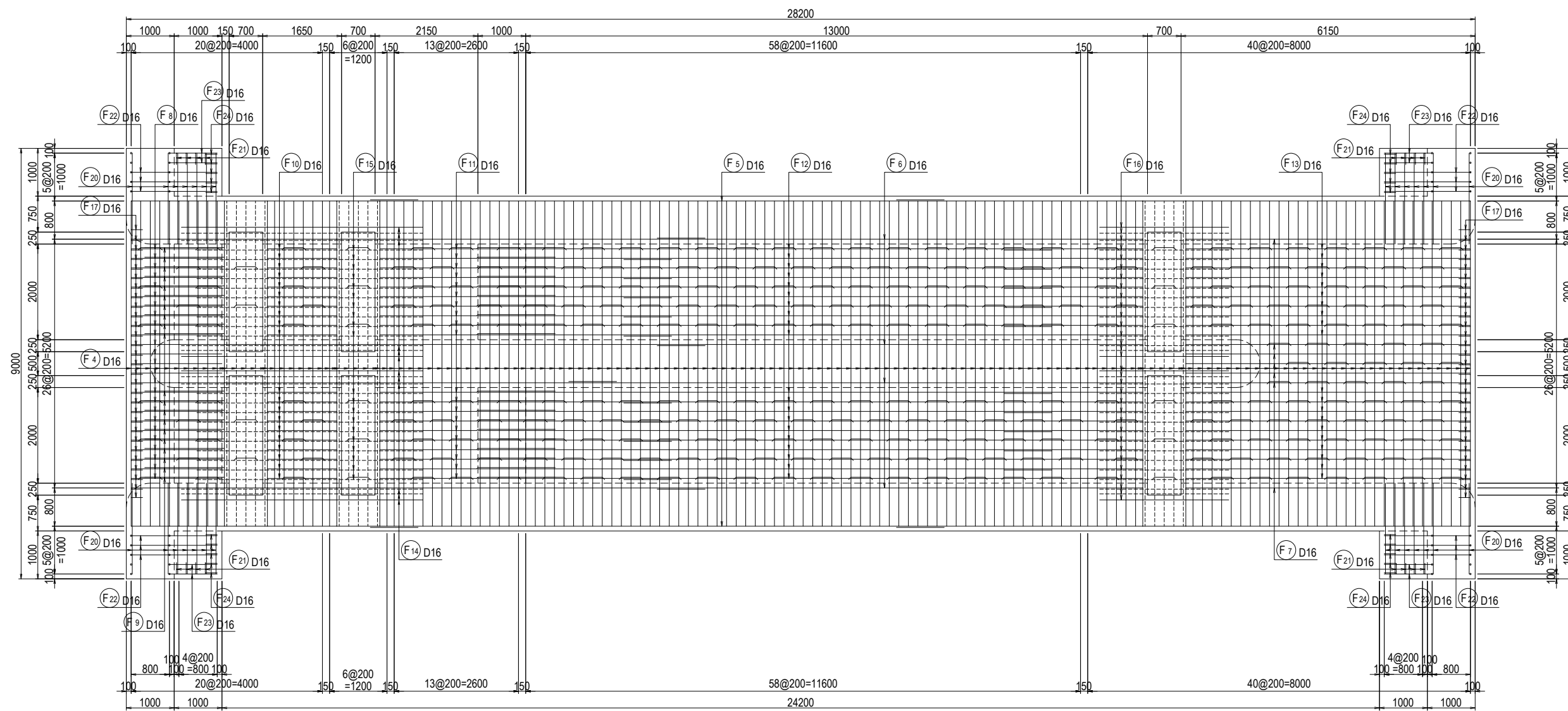
## Section B—B



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Badraman Regulator (Badraman) Bar arrangement of pier (3)			DRW. NO. CN-8
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Plan of Upstream Apron of Badraman Regulator (Badraman) (1/2)

## Section A—A

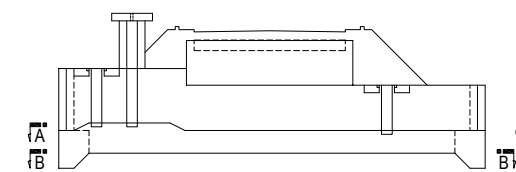
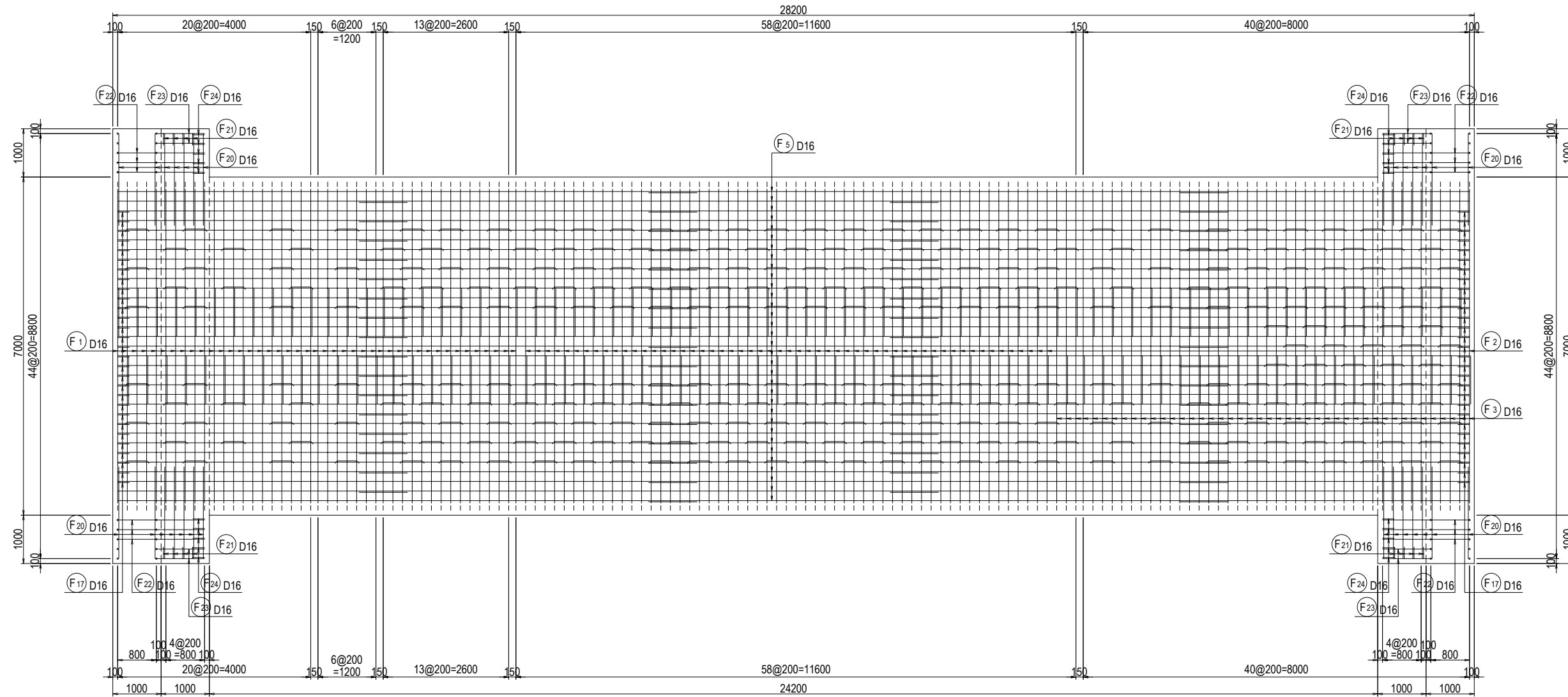


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Badraman Regulator (Badraman) Bar arrangement of pier (4)			<b>DRW. NO.</b> CN-9
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Plan of Upstream Apron of Badraman Regulator (Badraman) (2/2)

S=1:50

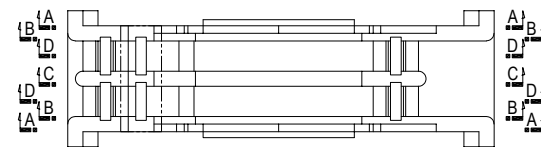
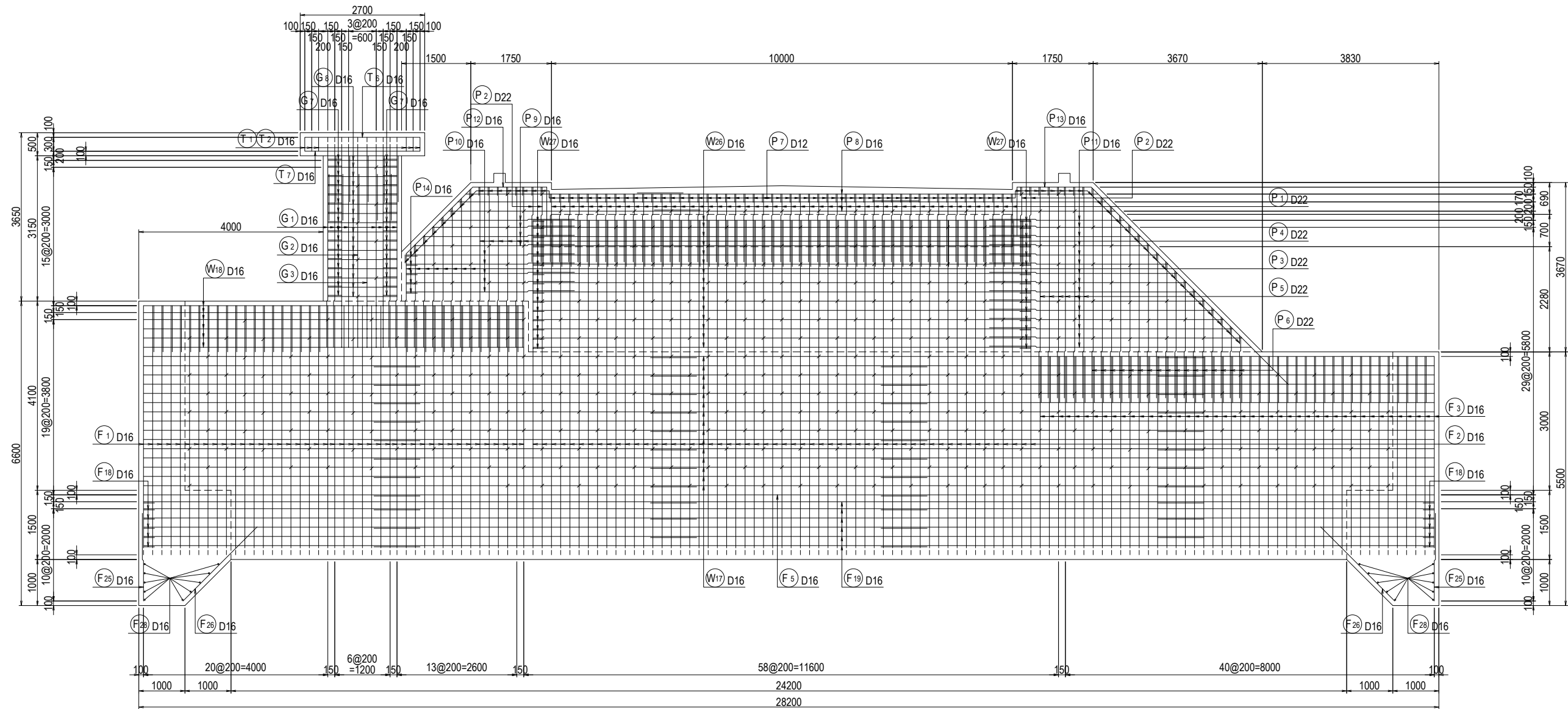
## Section B—B



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Badraman Regulator (Badraman) Bar arrangement of pier (5)			DRW. NO. CN-10
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Longitudinal Section of Gate Abutment and Pier of Badraman Regulator (Badraman) (1/4)

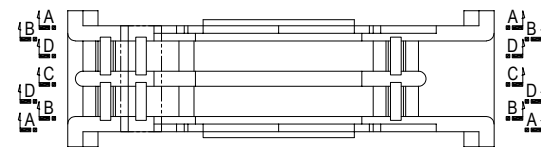
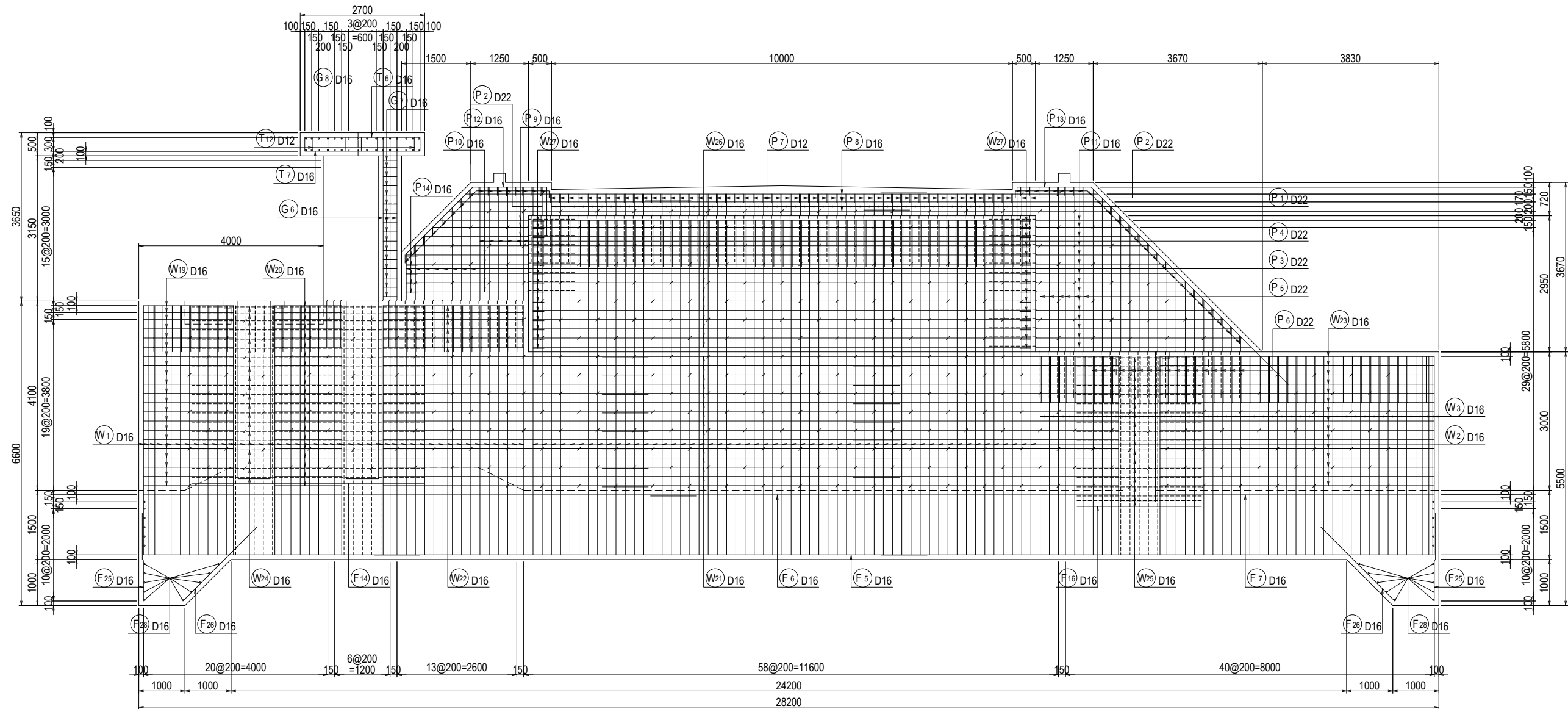
## Section A—A



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Badraman Regulator (Badraman) Bar arrangement of pier (6)			DRW. NO. CN-11
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Longitudinal Section of Gate Abutment and Pier of Badraman Regulator (Badraman) (2/4)

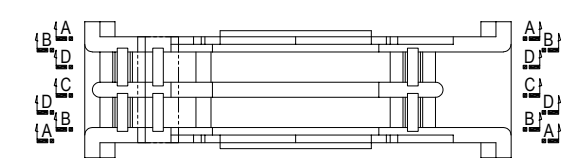
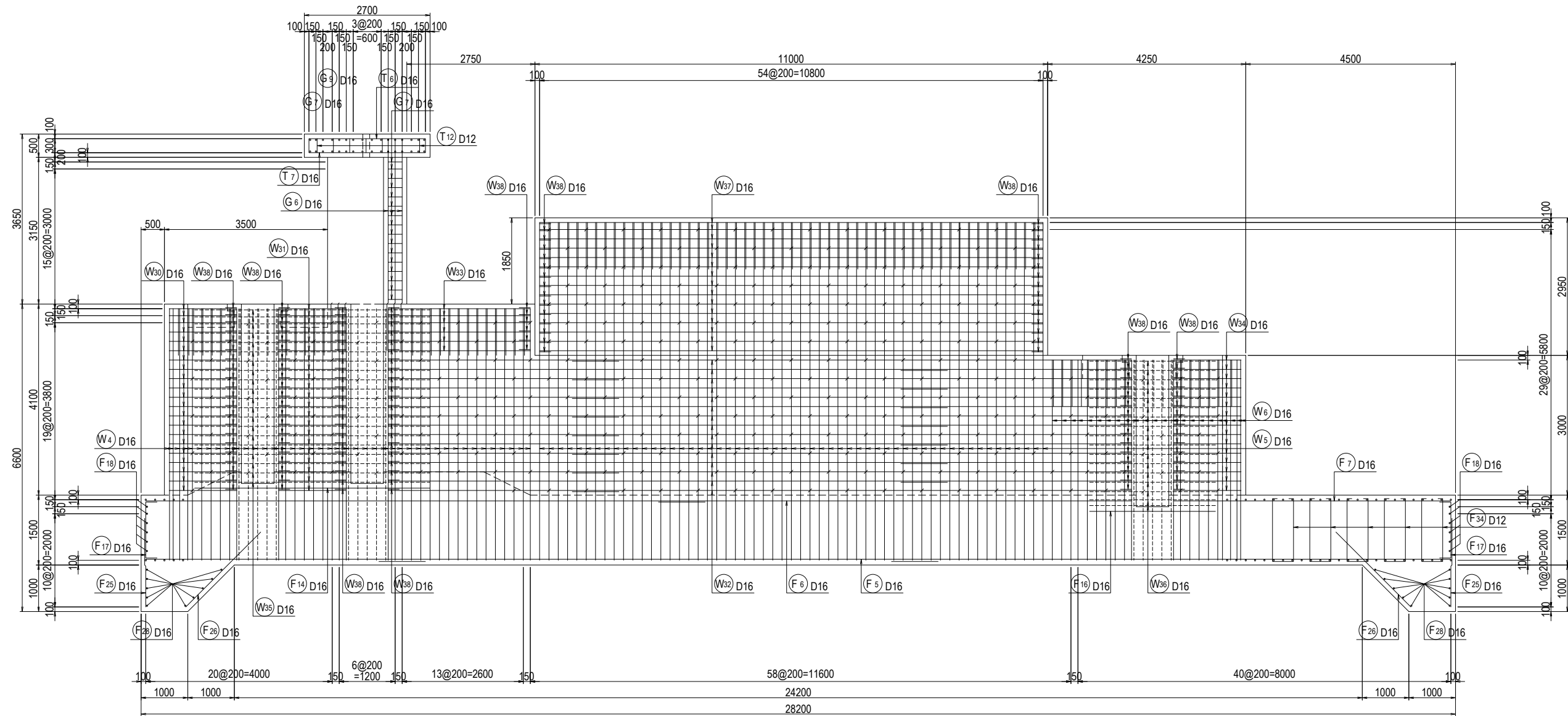
## Section B—B



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Badraman Regulator (Badraman) Bar arrangement of pier (7)			DRW. NO. CN-12
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Longitudinal Section of Gate Abutment and Pier of Badraman Regulator (Badraman) (3/4)

## Section C—C

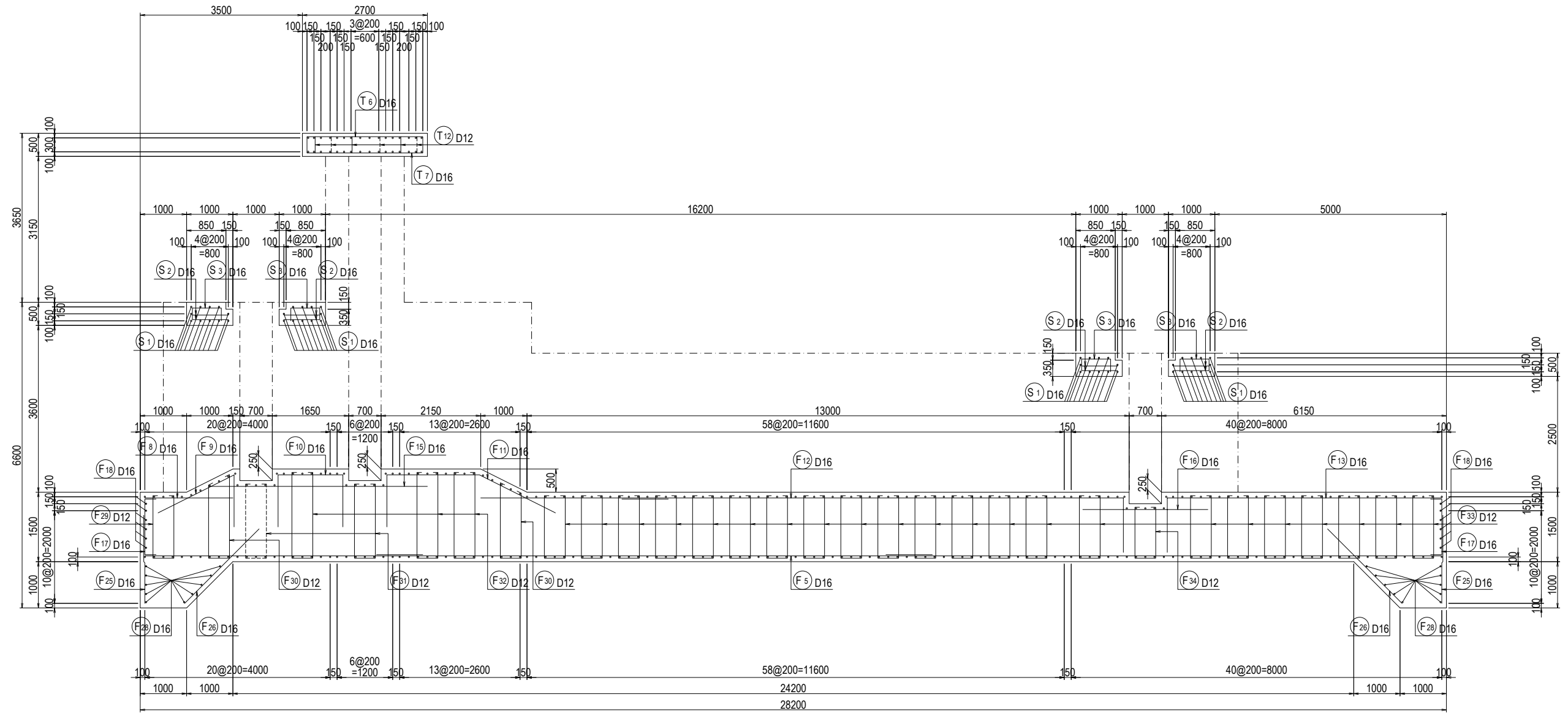


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Badraman Regulator (Badraman) Bar arrangement of pier (8)			DRW. NO. CN-13
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:



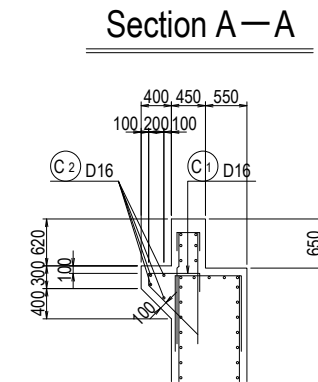
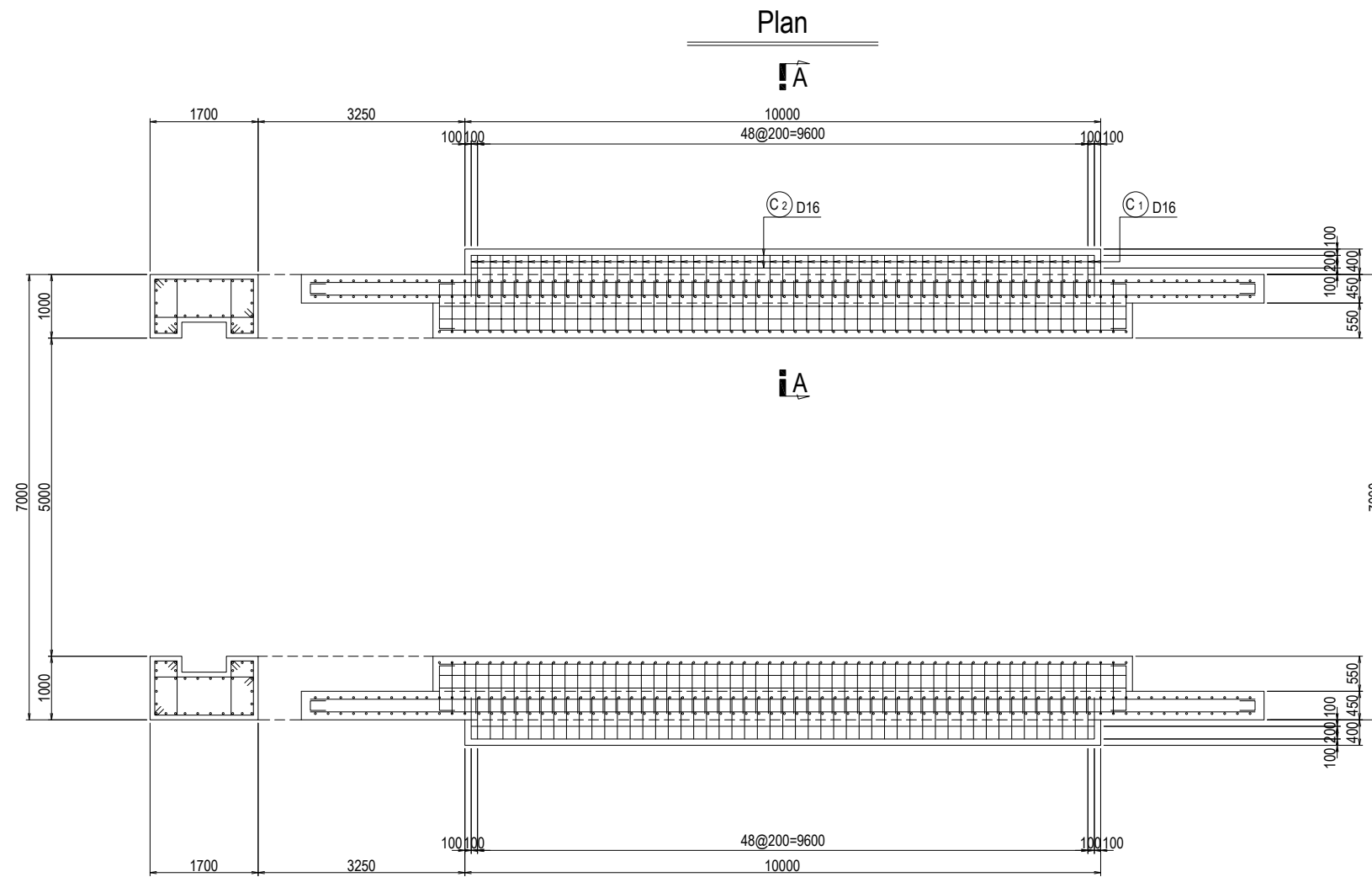
# Longitudinal Section of Gate Abutment and Pier of Badraman Regulator (Badraman) (4/4)

## Section D—D



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Badraman Regulator (Badraman) Bar arrangement of pier (9)			DRW. NO. CN-14
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

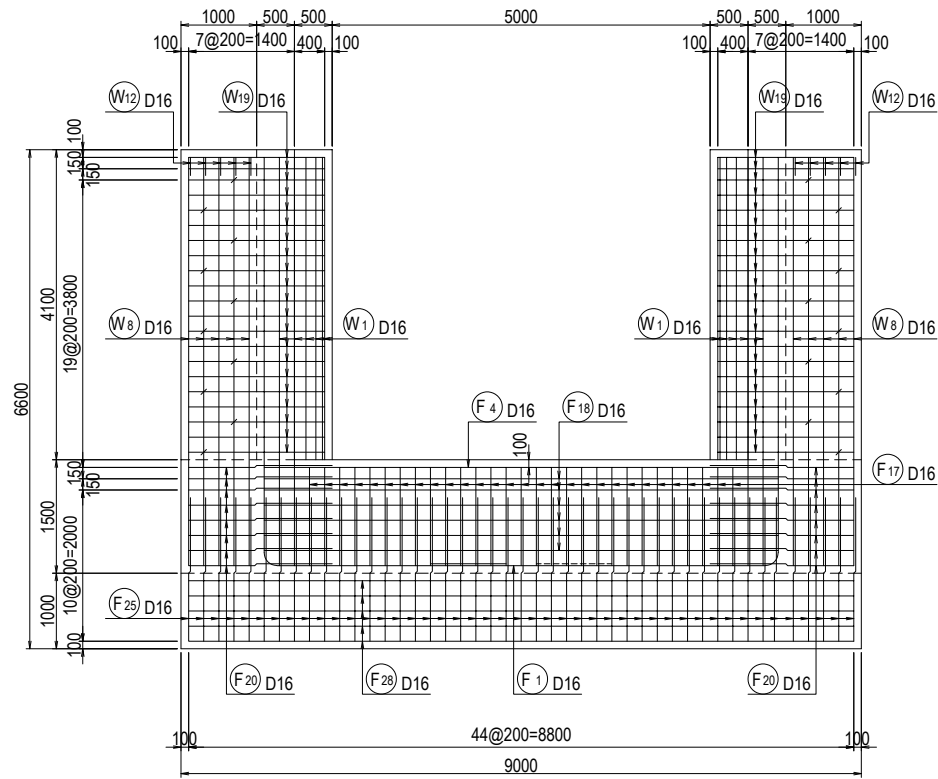
# Detail of Cradle of Badraman Regulator (Badraman)



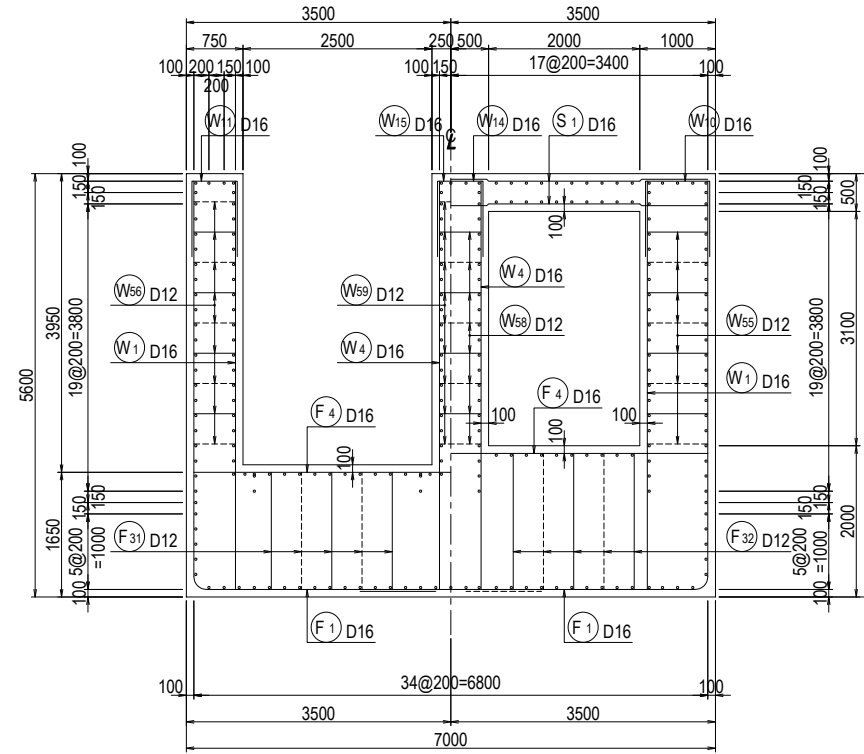
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Badraman Regulator (Badraman) Bar arrangement of pier (10)			DRW. NO CN-15
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	DATE:
DATE:	DATE:	DATE:	DATE:

# Section of Gate Abutment and Pier of Badraman Regulator (Badraman) (1/3)

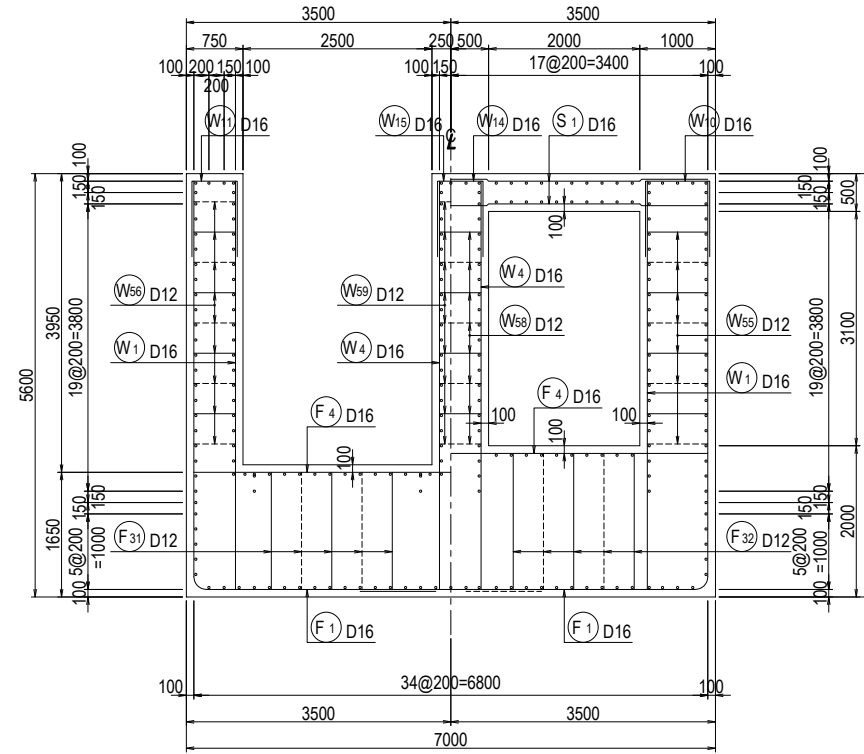
## Section A—A



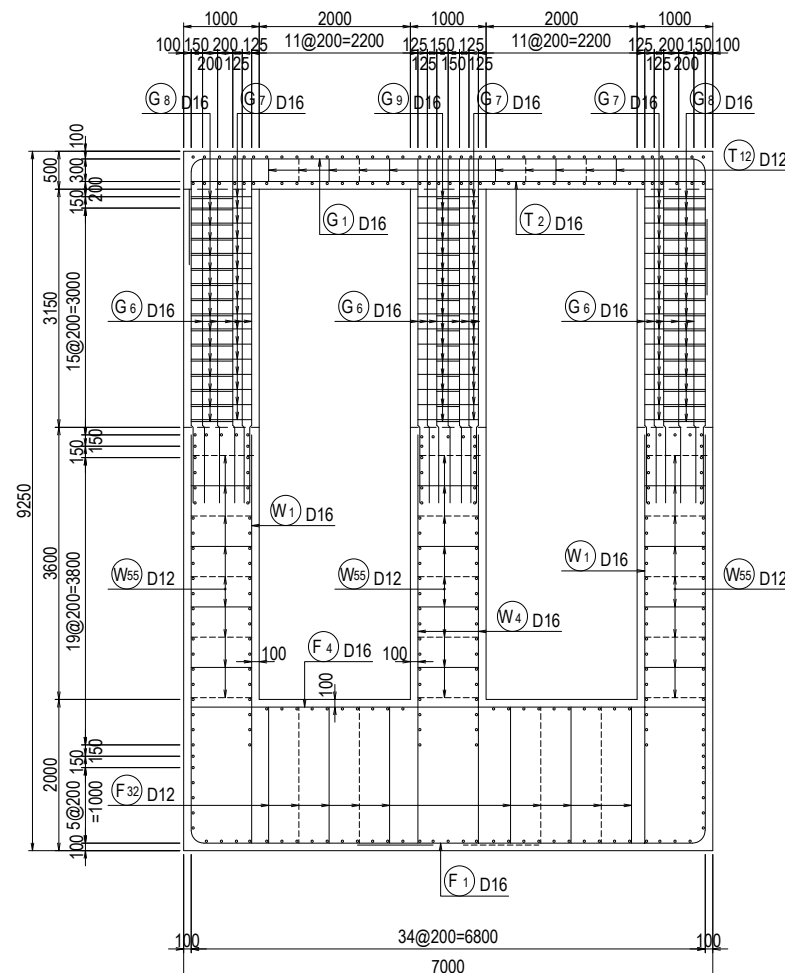
## Section B—B



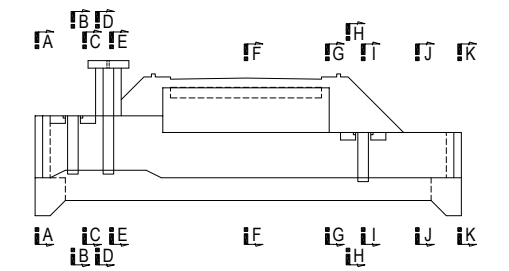
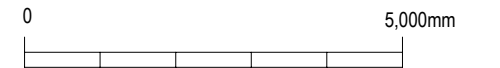
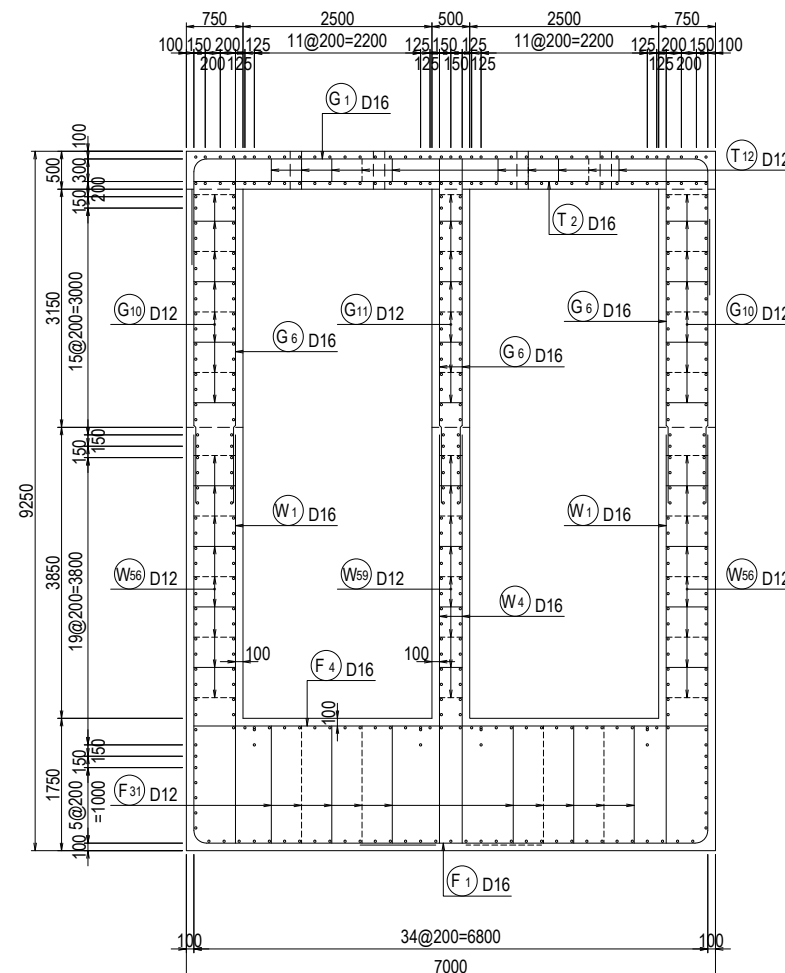
## Section C—C



## Section D—D

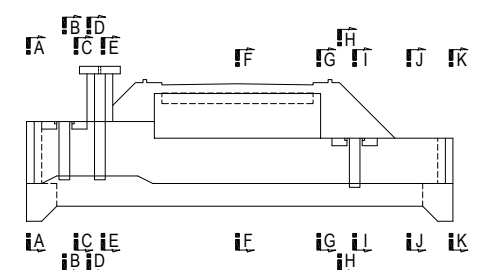
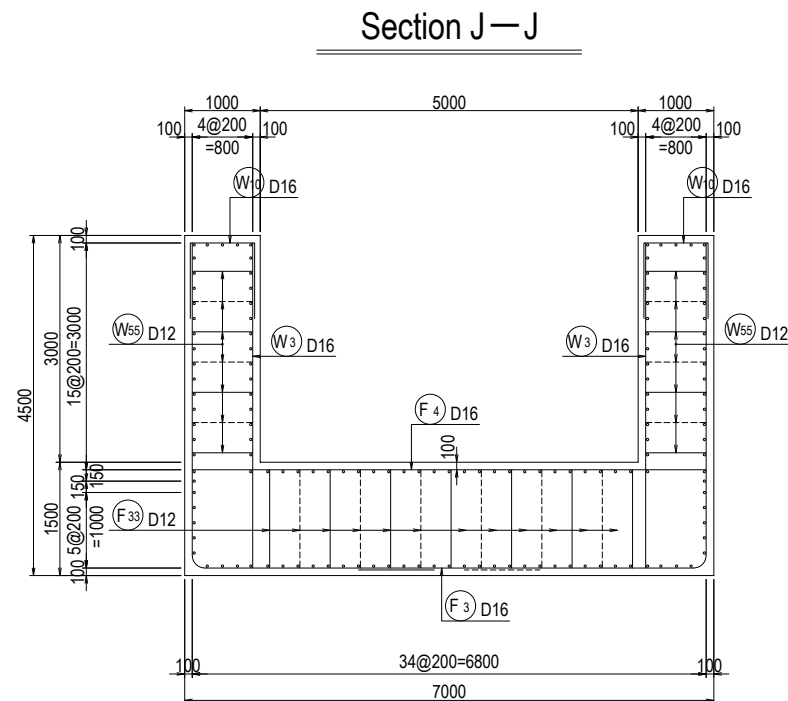
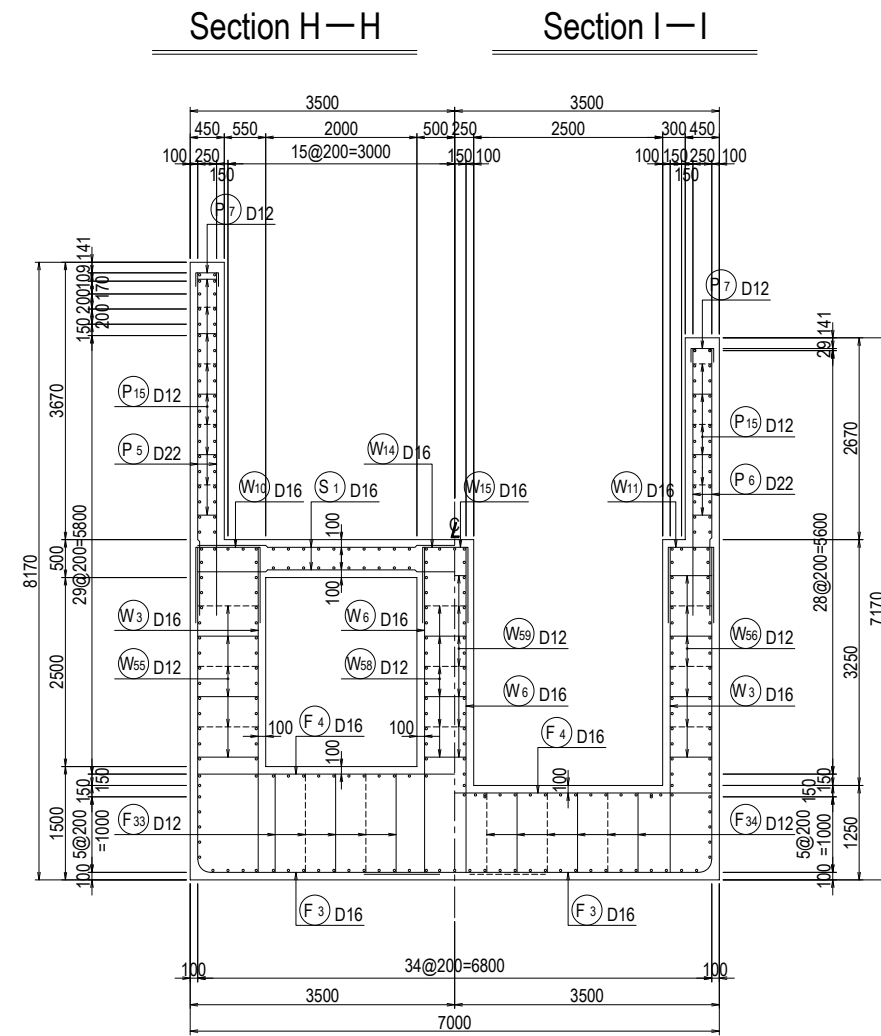
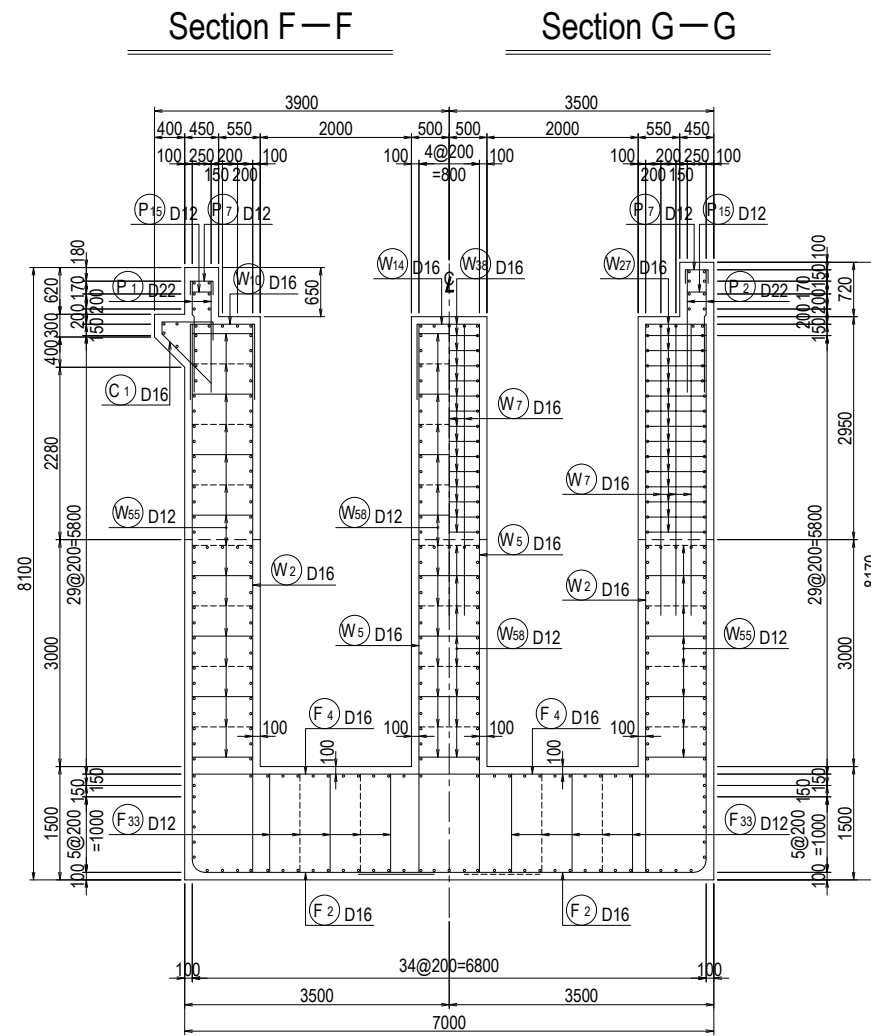


## Section E—E



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Badraman Regulator (Badraman) Bar arrangement of pier (11)			DRW. NO. CN-16
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

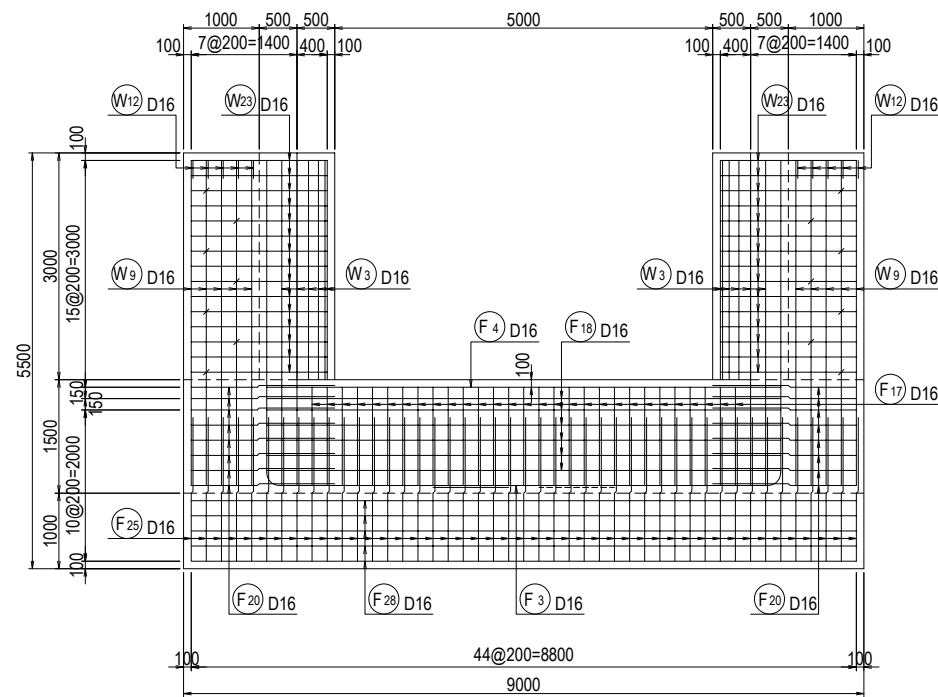
# Section of Gate Abutment and Pier of Badraman Regulator (Badraman) (2/3)



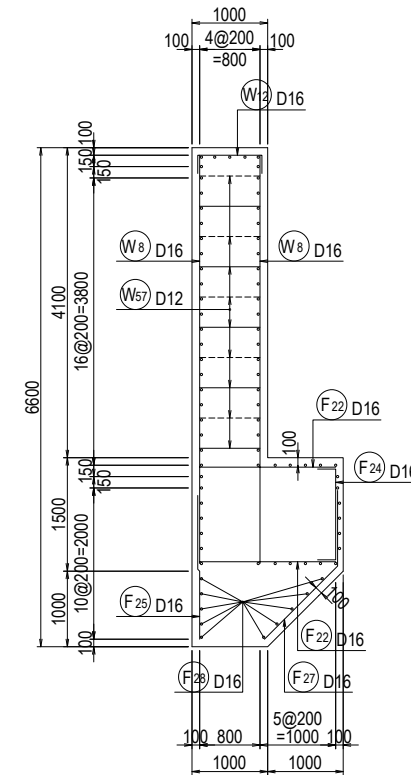
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Badraman Regulator (Badraman) Bar arrangement of pier (12)			<b>DRW. NO.</b> CN-17
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Section of Gate Abutment and Pier of Badraman Regulator (Badraman) (3/3)

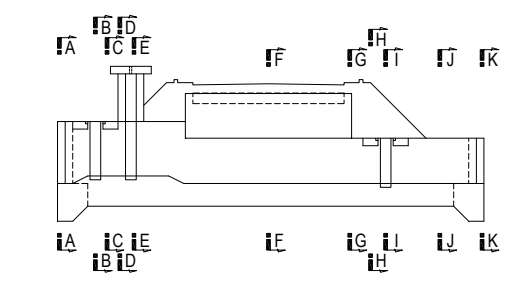
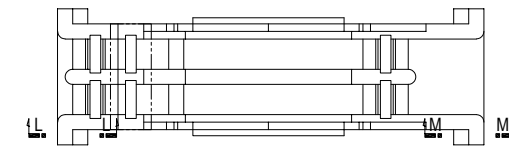
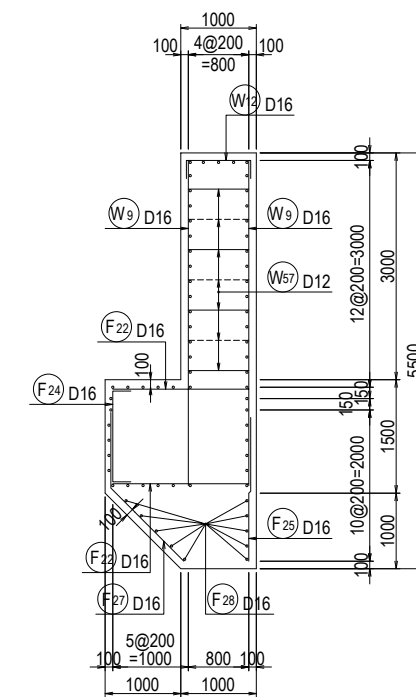
Section K—K



Section L—L

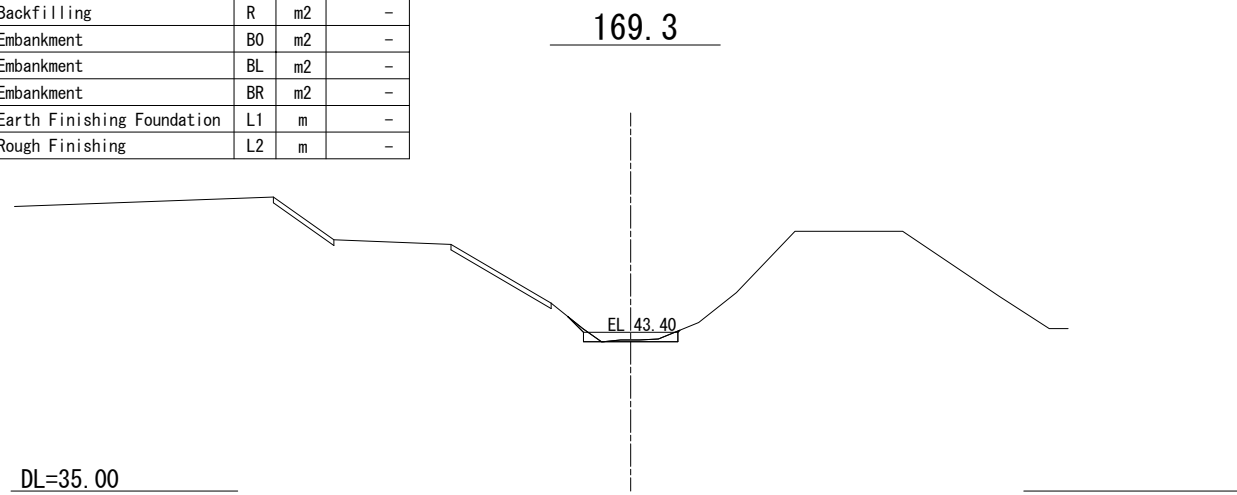


Section M—M



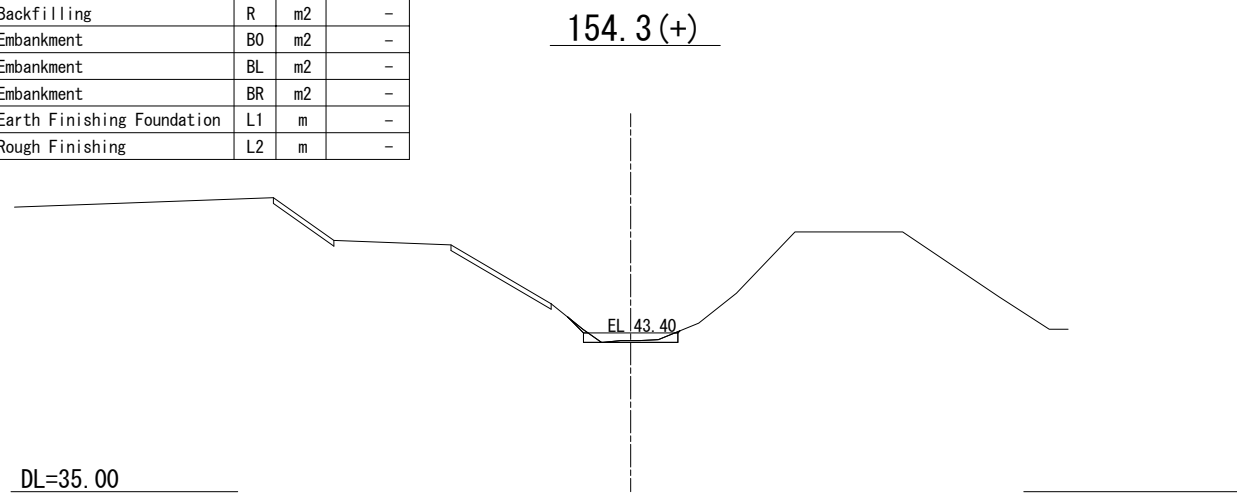
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Badraman Regulator (Badraman) Bar arrangement of pier (13)	<b>DRW. NO.</b> CN-18	
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

Item	Unit	Quantity
Excavation	C1	m2 1.00
Excavation	C2	m2 -
Backfilling	R	m2 -
Embankment	B0	m2 -
Embankment	BL	m2 -
Embankment	BR	m2 -
Earth Finishing Foundation	L1	m -
Rough Finishing	L2	m -



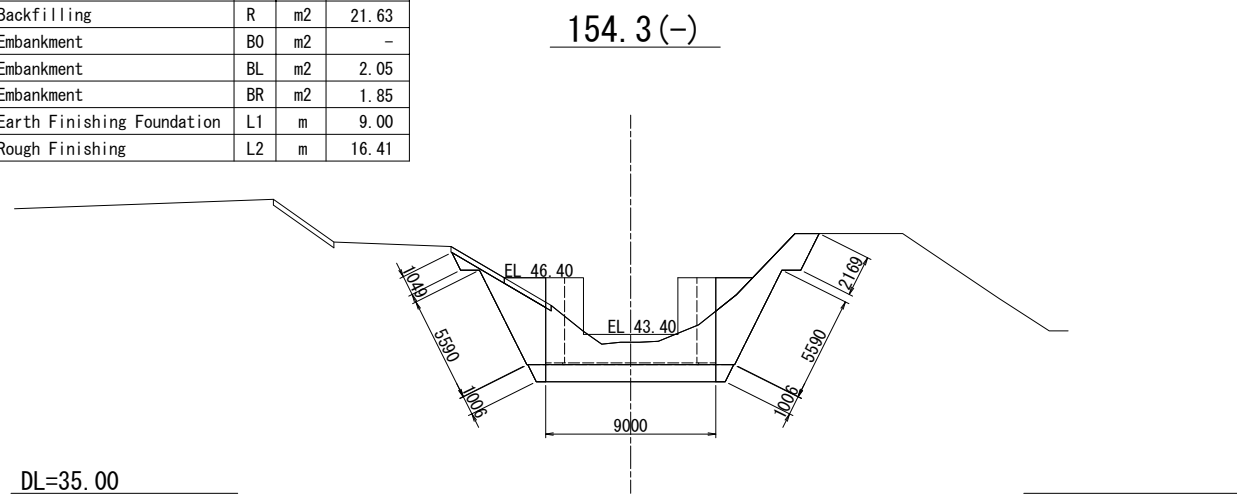
DL=35.00

Item	Unit	Quantity
Excavation	C1	m2 1.00
Excavation	C2	m2 -
Backfilling	R	m2 -
Embankment	B0	m2 -
Embankment	BL	m2 -
Embankment	BR	m2 -
Earth Finishing Foundation	L1	m -
Rough Finishing	L2	m -

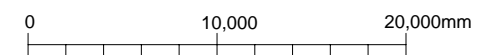
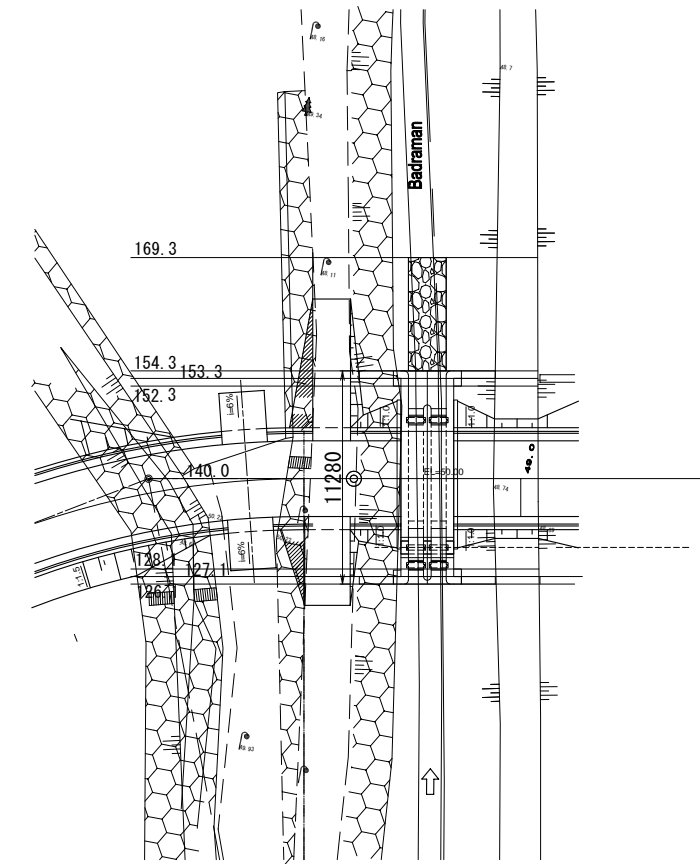


DL=35.00

Item	Unit	Quantity
Excavation	C1	m2 36.10
Excavation	C2	m2 9.41
Backfilling	R	m2 21.63
Embankment	B0	m2 -
Embankment	BL	m2 2.05
Embankment	BR	m2 1.85
Earth Finishing Foundation	L1	m 9.00
Rough Finishing	L2	m 16.41



DL=35.00



Arab Republic of Egypt  
Ministry of Water Resources and Irrigation  
Reservoir and Grand Barrages Sector

Detailed Design Study on the Project for  
Construction of the New Dirout Group of Regulators

Badraman Regulator (Badraman)  
Cross section of earth works (1)

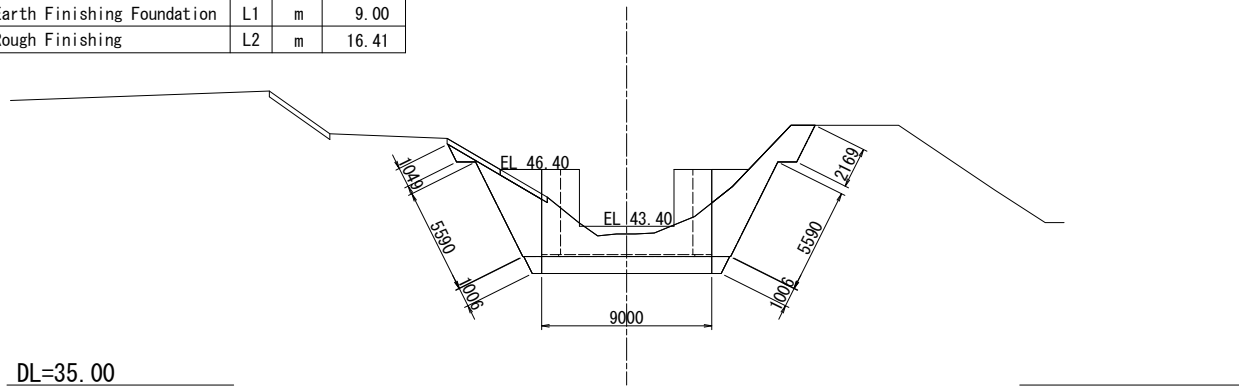
SANYU CONSULTANTS INC.

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DATE :	DATE :	DATE :

DRW. NO.  
CN-19

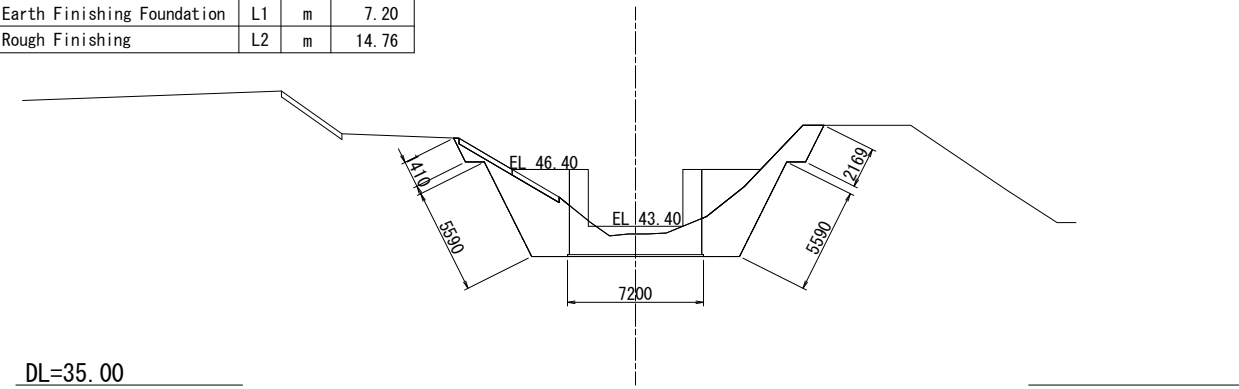
Item	Unit	Quantity
Excavation	C1	m2 36.10
Excavation	C2	m2 9.41
Backfilling	R	m2 21.63
Embankment	B0	m2 -
Embankment	BL	m2 2.05
Embankment	BR	m2 1.85
Earth Finishing Foundation	L1	m 9.00
Rough Finishing	L2	m 16.41

153.3 (+)



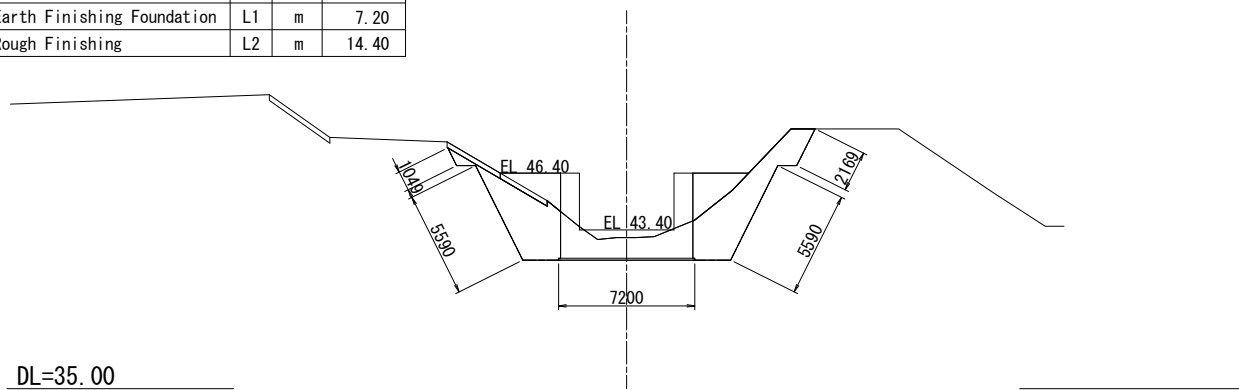
Item	Unit	Quantity
Excavation	C1	m2 36.00
Excavation	C2	m2 -
Backfilling	R	m2 25.43
Embankment	B0	m2 -
Embankment	BL	m2 3.45
Embankment	BR	m2 4.43
Earth Finishing Foundation	L1	m 7.20
Rough Finishing	L2	m 14.76

140.0 (+)



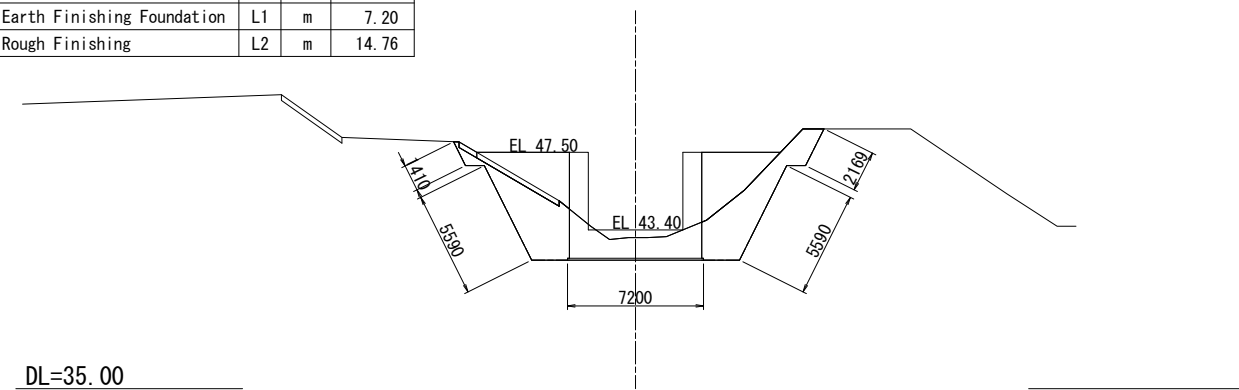
Item	Unit	Quantity
Excavation	C1	m2 36.10
Excavation	C2	m2 9.41
Backfilling	R	m2 25.62
Embankment	B0	m2 -
Embankment	BL	m2 3.77
Embankment	BR	m2 4.01
Earth Finishing Foundation	L1	m 7.20
Rough Finishing	L2	m 14.40

153.3 (-)



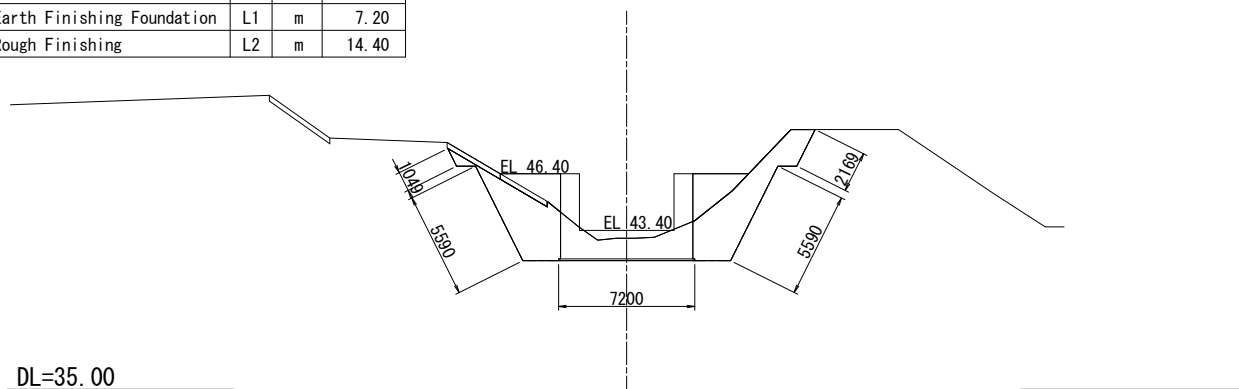
Item	Unit	Quantity
Excavation	C1	m2 36.00
Excavation	C2	m2 -
Backfilling	R	m2 25.43
Embankment	B0	m2 -
Embankment	BL	m2 8.36
Embankment	BR	m2 8.44
Earth Finishing Foundation	L1	m 7.20
Rough Finishing	L2	m 14.76

140.0 (-)



Item	Unit	Quantity
Excavation	C1	m2 36.10
Excavation	C2	m2 -
Backfilling	R	m2 25.62
Embankment	B0	m2 -
Embankment	BL	m2 3.77
Embankment	BR	m2 4.01
Earth Finishing Foundation	L1	m 7.20
Rough Finishing	L2	m 14.40

152.3



Arab Republic of Egypt  
Ministry of Water Resources and Irrigation  
Reservoir and Grand Barrages Sector

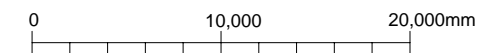
Detailed Design Study on the Project for  
Construction of the New Dirout Group of Regulators

Badraman Regulator (Badraman)  
Cross section of earth works (2)

DRW. NO.  
CN-20

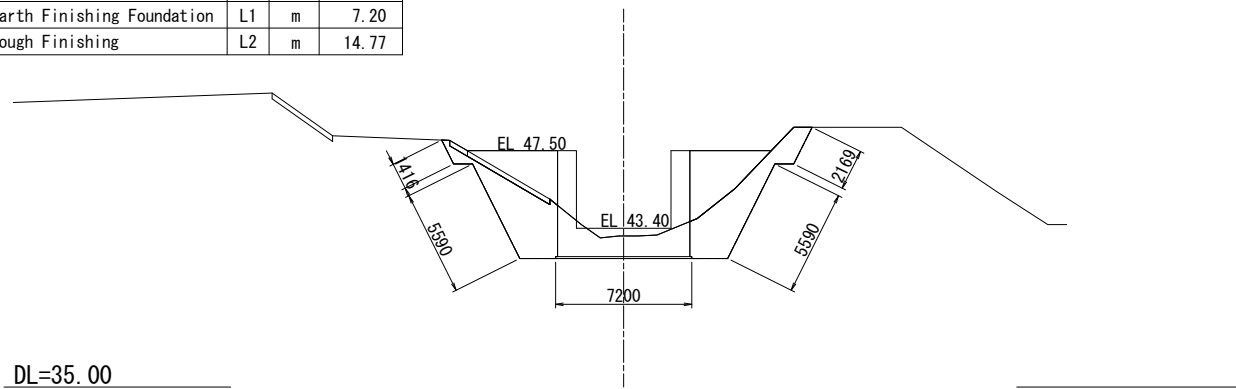
SANYU CONSULTANTS INC.

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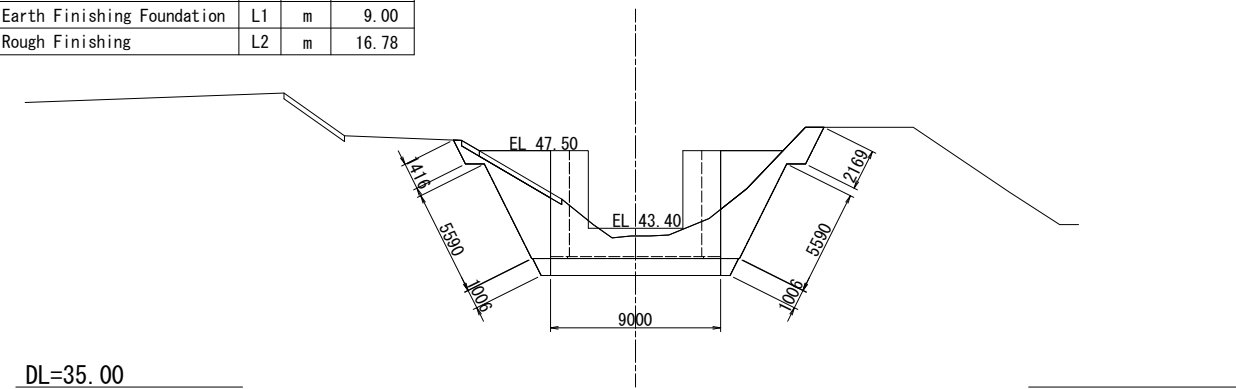
Item	Unit	Quantity
Excavation	C1	m2 35.91
Excavation	C2	m2 -
Backfilling	R	m2 25.23
Embankment	B0	m2 -
Embankment	BL	m2 7.96
Embankment	BR	m2 8.95
Earth Finishing Foundation	L1	m 7.20
Rough Finishing	L2	m 14.77

128.1



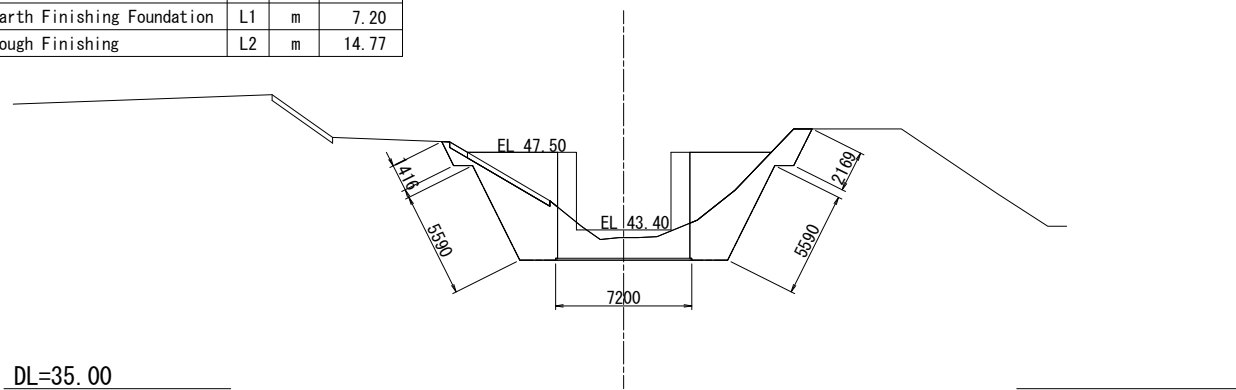
Item	Unit	Quantity
Excavation	C1	m2 35.91
Excavation	C2	m2 9.41
Backfilling	R	m2 21.33
Embankment	B0	m2 -
Embankment	BL	m2 5.26
Embankment	BR	m2 5.47
Earth Finishing Foundation	L1	m 9.00
Rough Finishing	L2	m 16.78

127.1 (-)



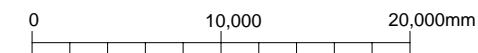
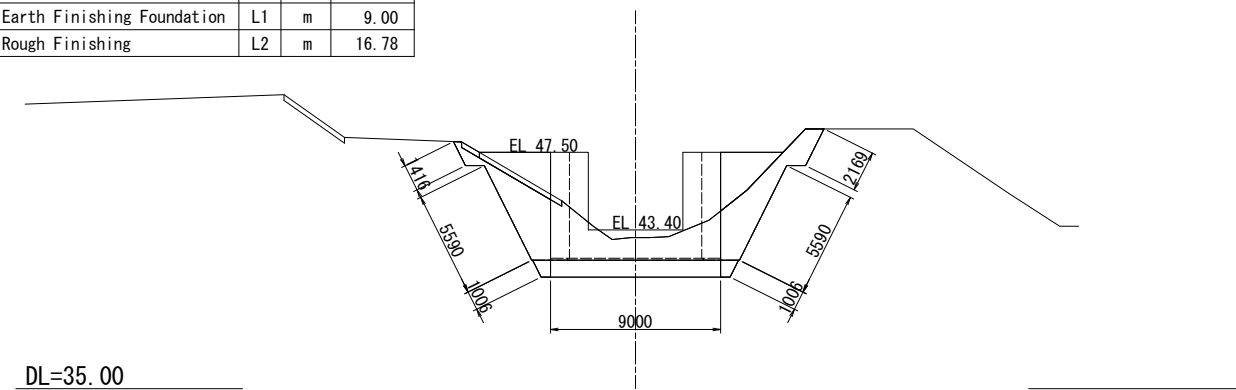
Item	Unit	Quantity
Excavation	C1	m2 35.91
Excavation	C2	m2 9.41
Backfilling	R	m2 25.23
Embankment	B0	m2 -
Embankment	BL	m2 7.96
Embankment	BR	m2 8.95
Earth Finishing Foundation	L1	m 7.20
Rough Finishing	L2	m 14.77

127.1 (+)



Item	Unit	Quantity
Excavation	C1	m2 35.91
Excavation	C2	m2 9.41
Backfilling	R	m2 21.33
Embankment	B0	m2 -
Embankment	BL	m2 5.26
Embankment	BR	m2 5.47
Earth Finishing Foundation	L1	m 9.00
Rough Finishing	L2	m 16.78

126.1



Arab Republic of Egypt  
Ministry of Water Resources and Irrigation  
Reservoir and Grand Barrages Sector

Detailed Design Study on the Project for  
Construction of the New Dirout Group of Regulators

Badraman Regulator (Badraman)  
Cross section of earth works (3)

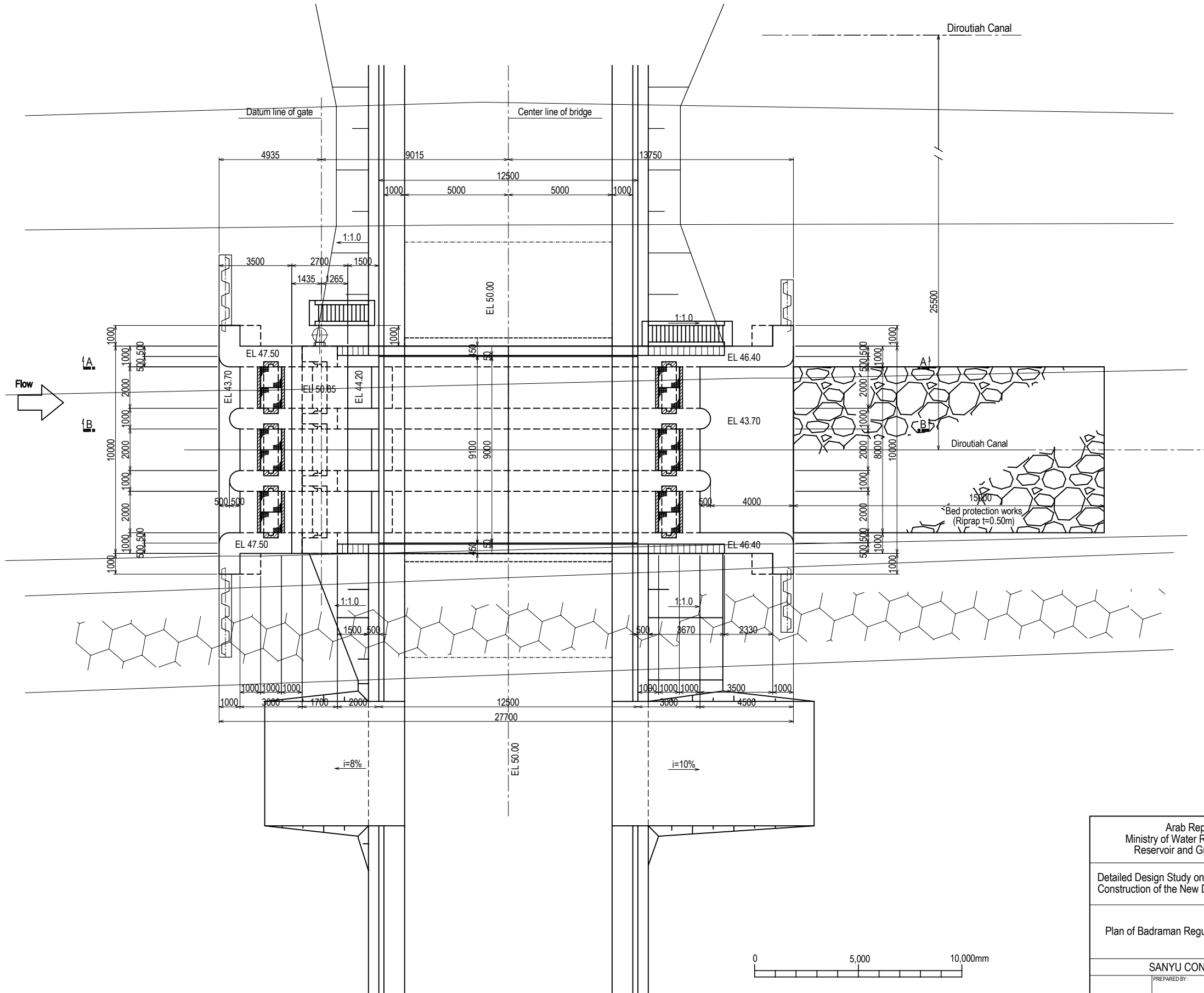
DRW. NO.  
CN-21

SANYU CONSULTANTS INC.

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DATE :	DATE :	DATE :

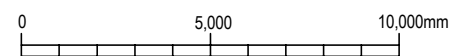
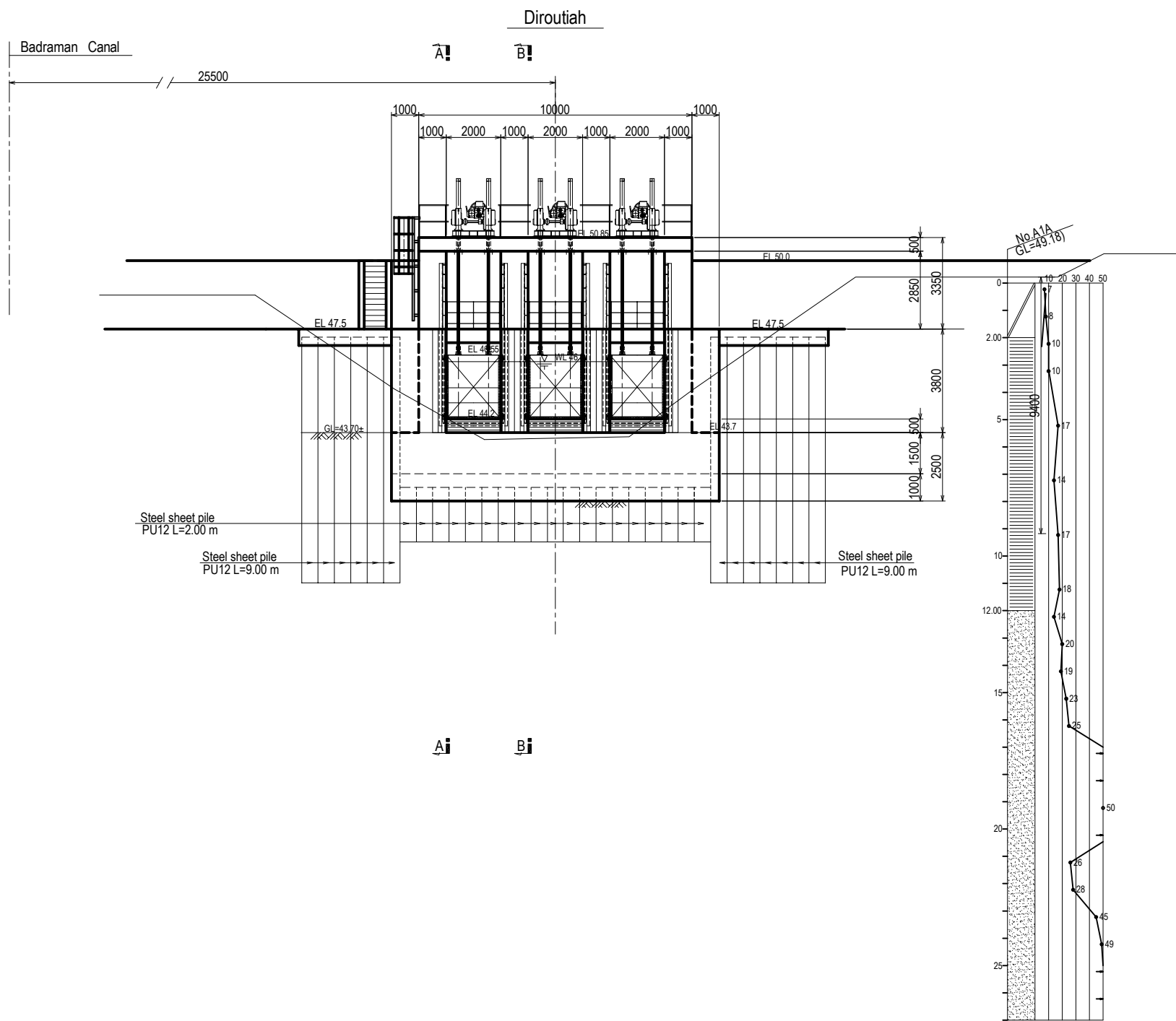


# Plan of Badraman Regulator (Diroutiah)



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Plan of Badraman Regulator (Diroutiah)		<b>DRW. NO.</b> CD-1
SANYU CONSULTANTS INC.		
PREPARED BY: DATE:	CHECKED BY: DATE:	APPROVED BY: DATE:

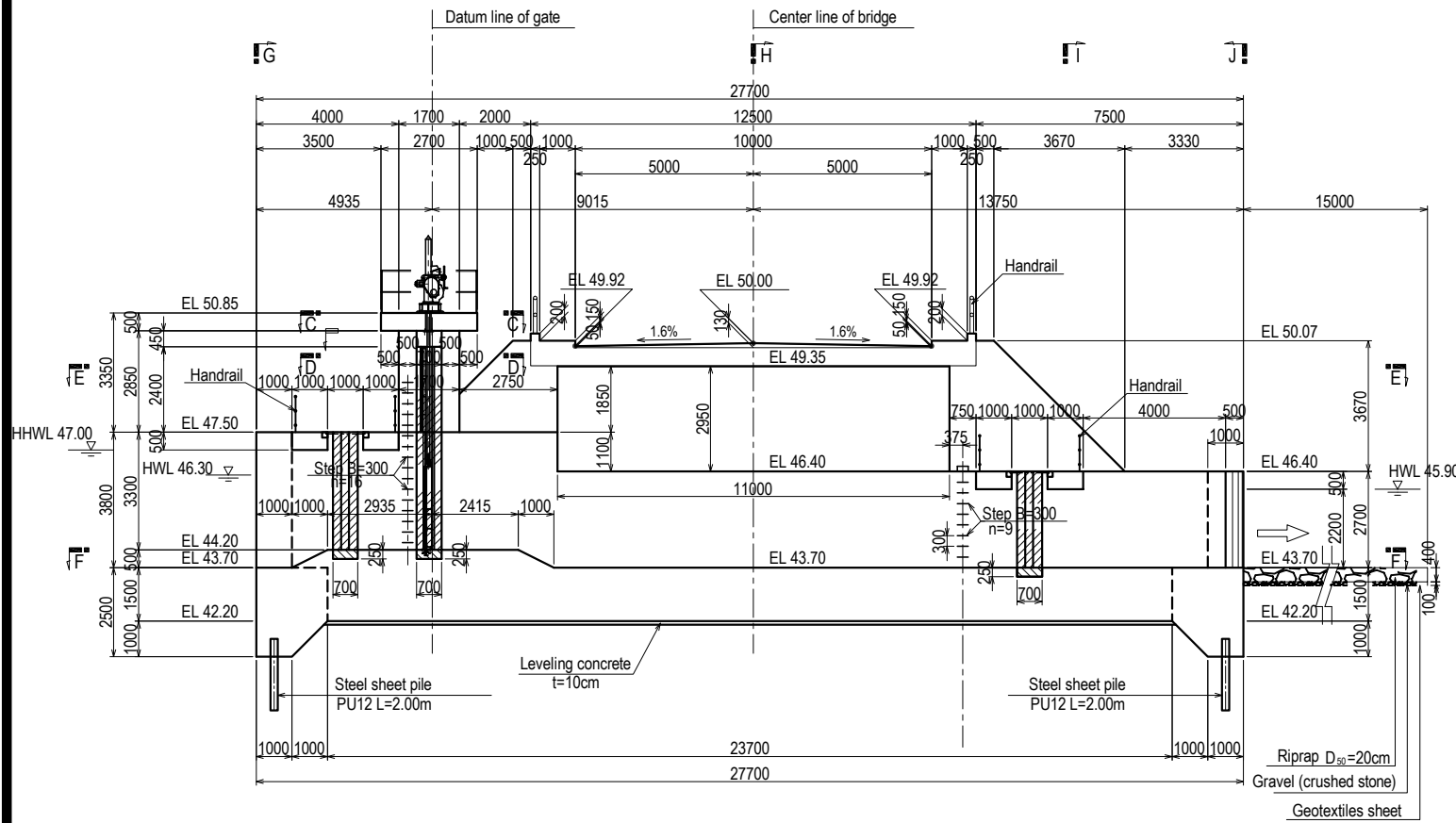
# Elevation of Badraman Regulator (Diroutiah)



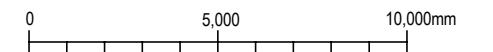
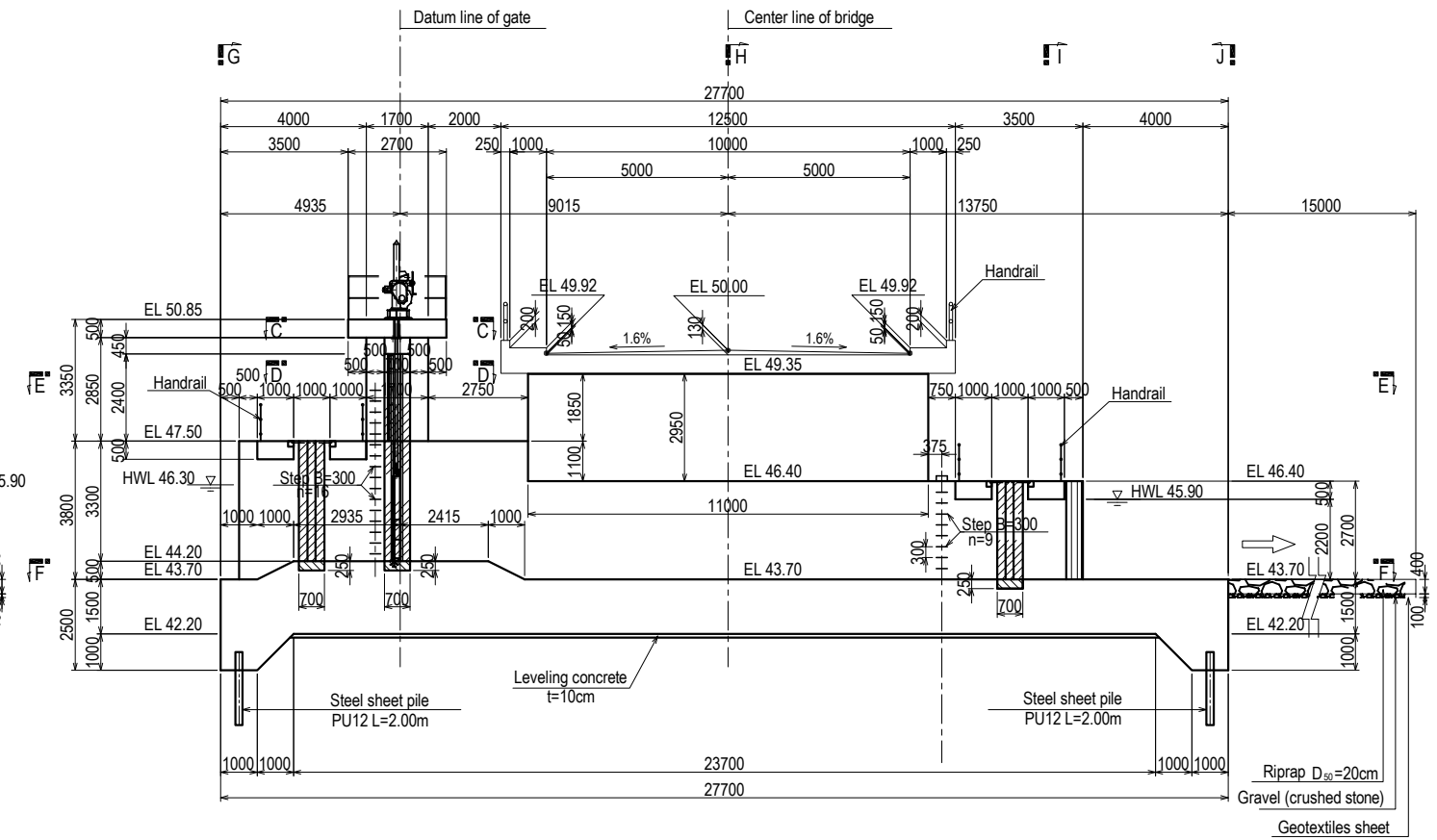
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Badraman Regulator (Diroutiah) Elevation			<b>DRW. NO.</b> CD-2
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	DATE:

# Longitudinal Section of Badraman Regulator (Diroutiah)

## Section A—A



## Section B—B

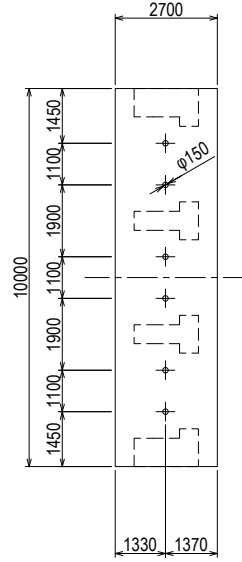


Note:  
 Shaded area indicates the range of second stage concrete to be placed with steel materials.

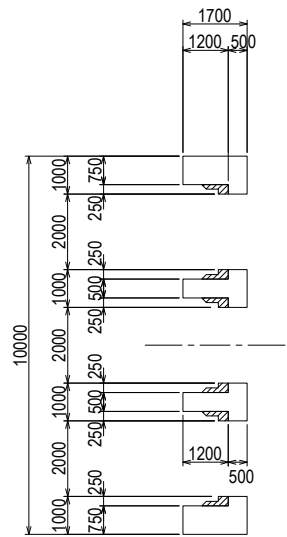
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Badraman Regulator (Diroutiah) Longitudinal section			<b>DRW. NO.</b> CD-3
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Section of Badraman Regulator (Diroutiah) (1/2)

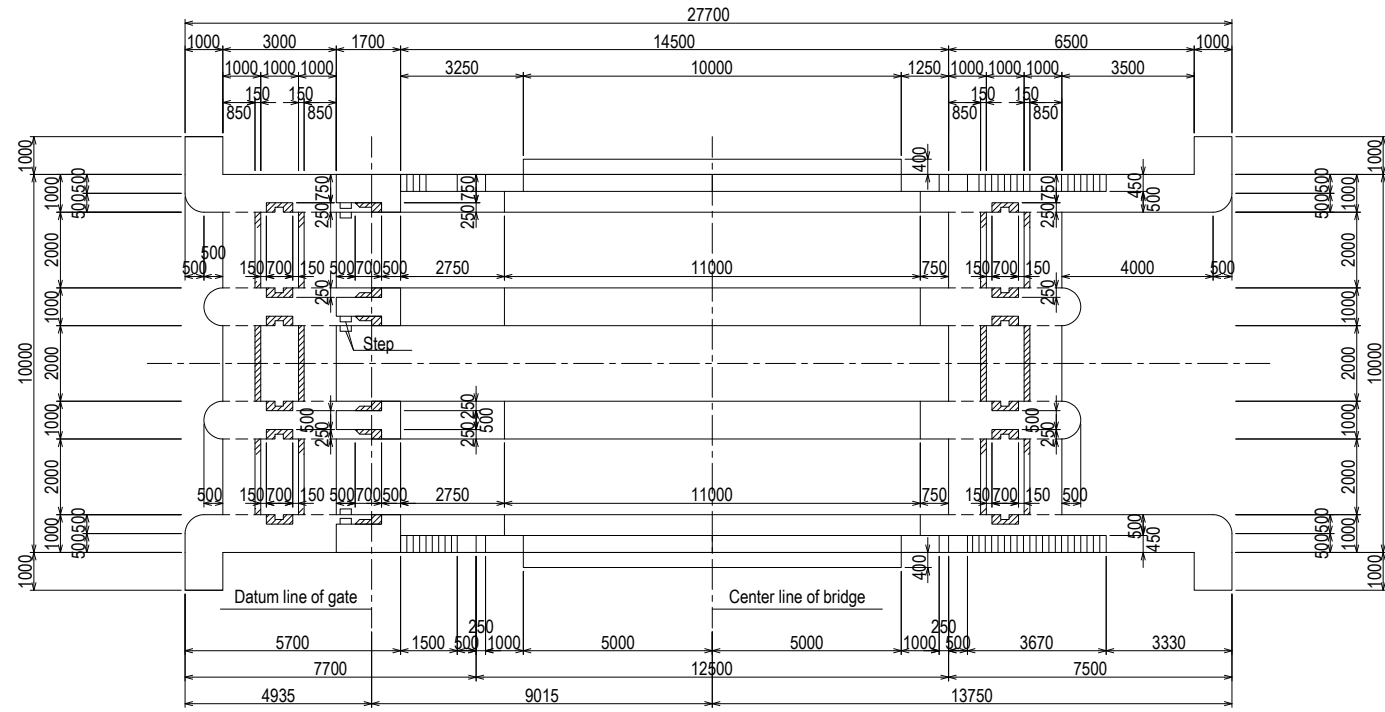
**Section C—C**



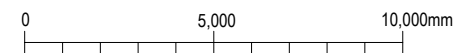
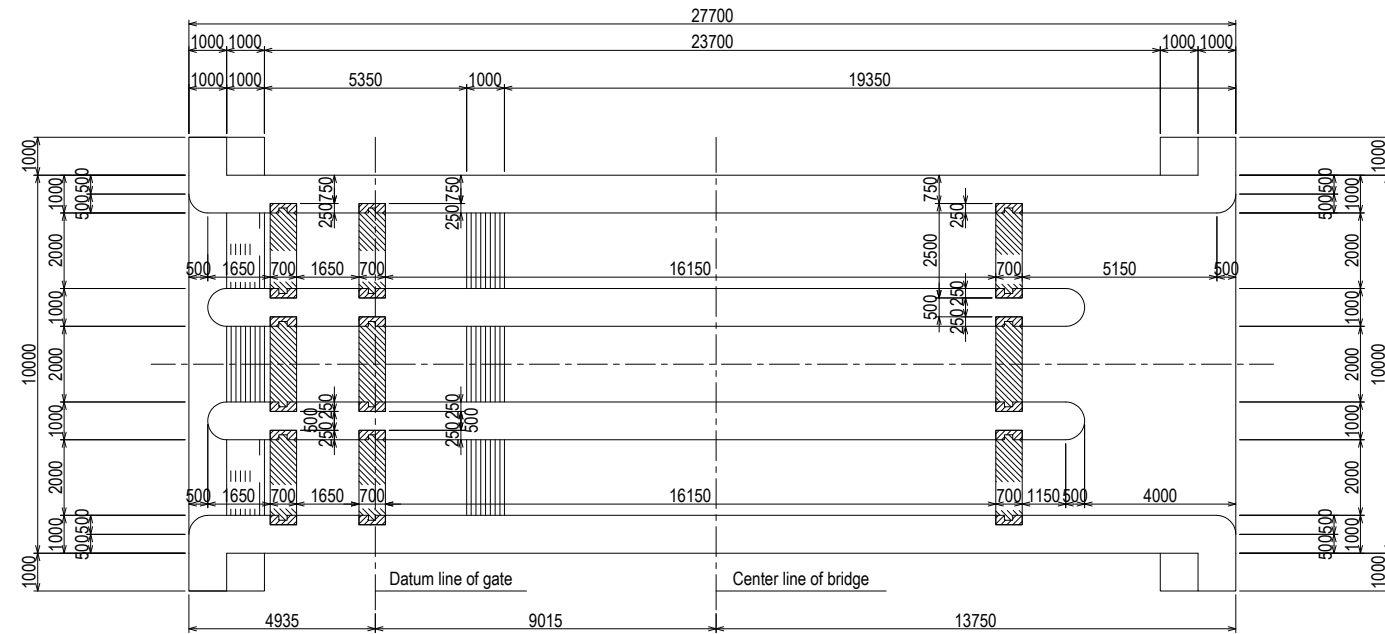
**Section D—D**



**Section E—E**



**Section F—F**



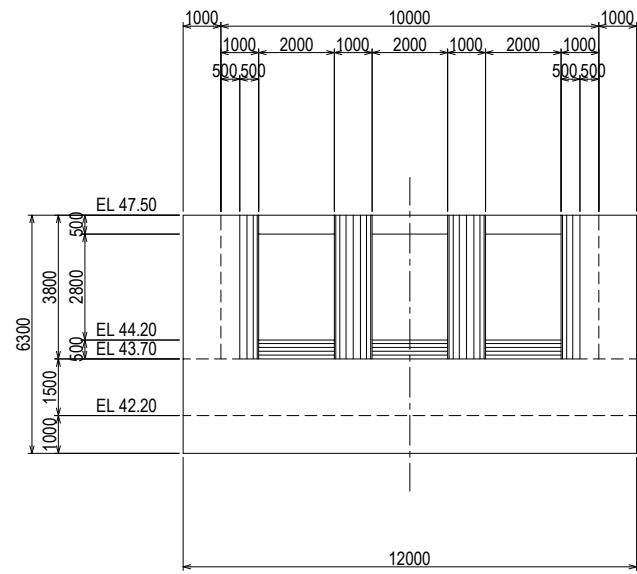
Note:

Shaded area indicates the range of second stage concrete to be placed with steel materials.

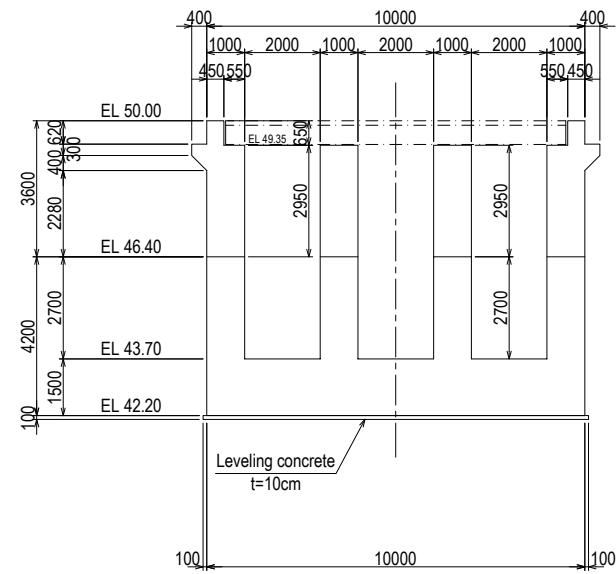
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Badraman Regulator (Diroutiah) Sections (1)			<b>DRW. NO.</b> CD-4
SANYU CONSULTANTS INC.			
PREPARED BY :	CHECKED BY :	APPROVED BY :	
DATE :	DATE :	DATE :	DATE :

# Section of Badraman Regulator (Diroutiah) (2/2)

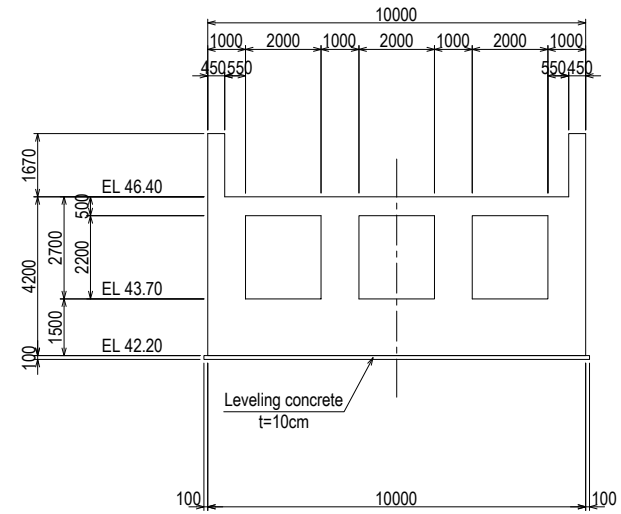
Section G—G



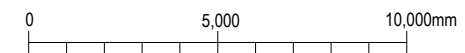
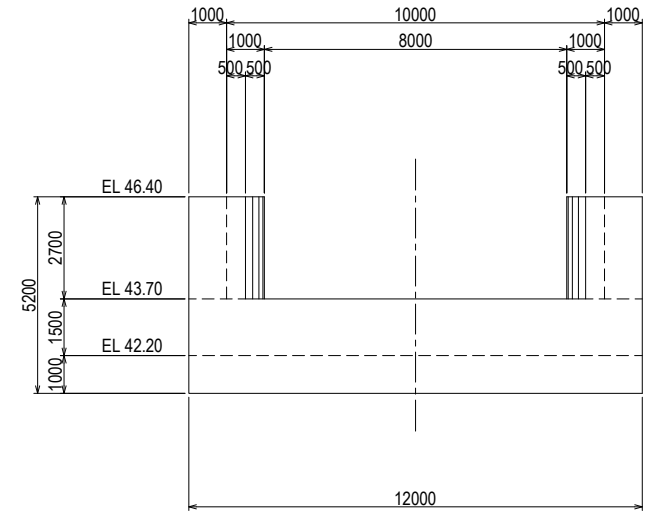
Section H—H



Section I—I



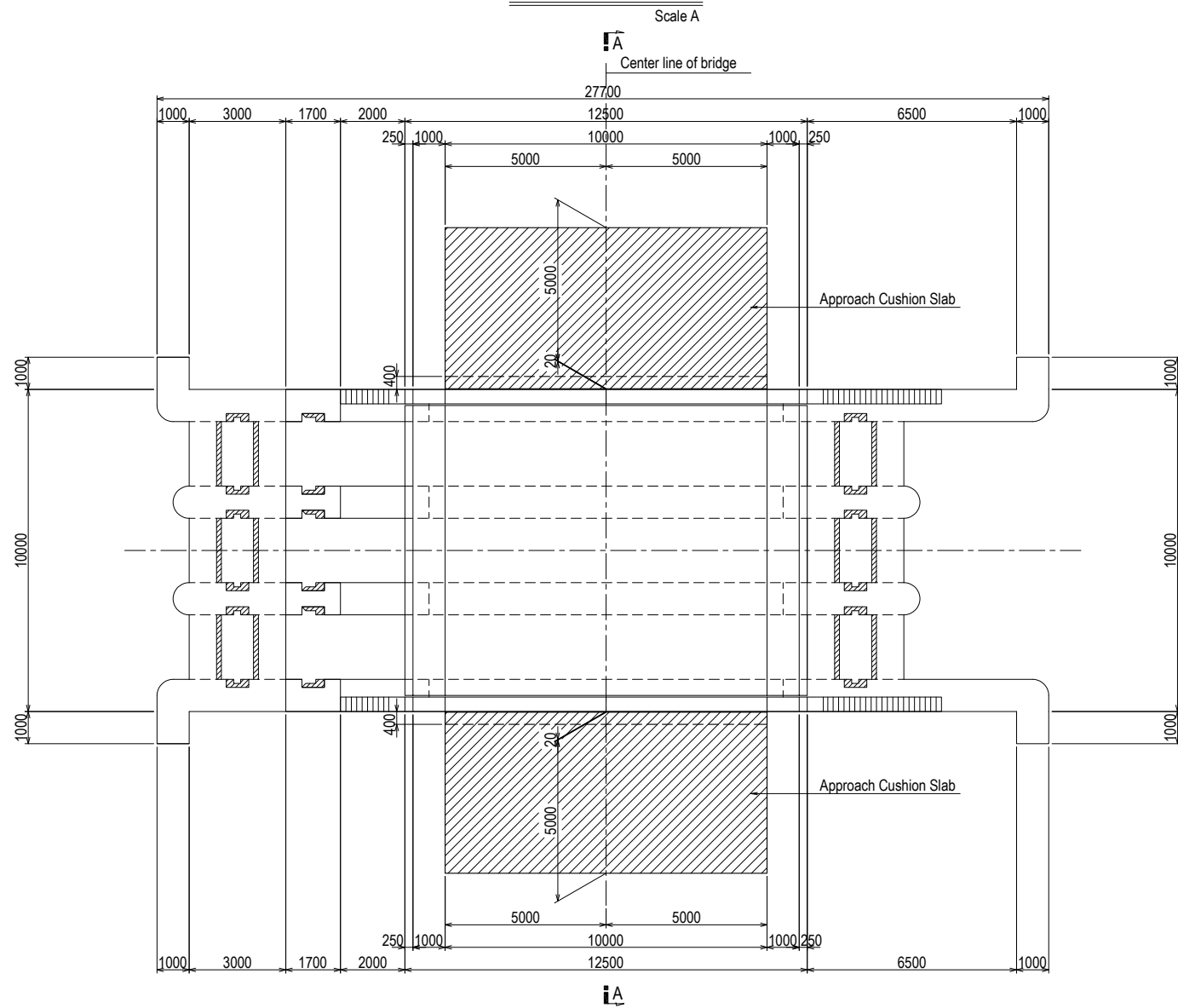
Section J—J



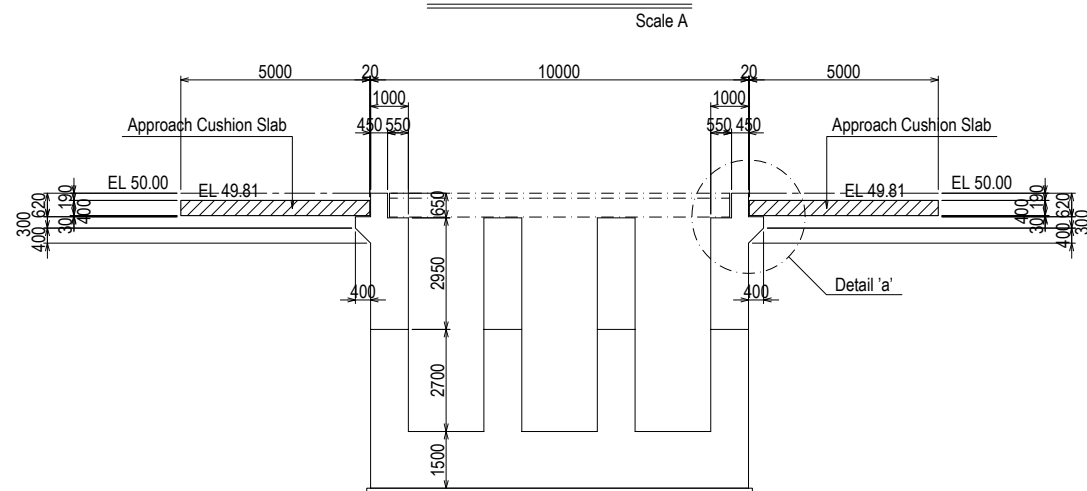
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Badraman Regulator (Diroutiah) Sections (2)			<b>DRW. NO.</b> CD-5
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	DATE:
DATE:	DATE:	DATE:	DATE:

# Approach Cushion Slab of Badraman Regulator (Diroutiah)

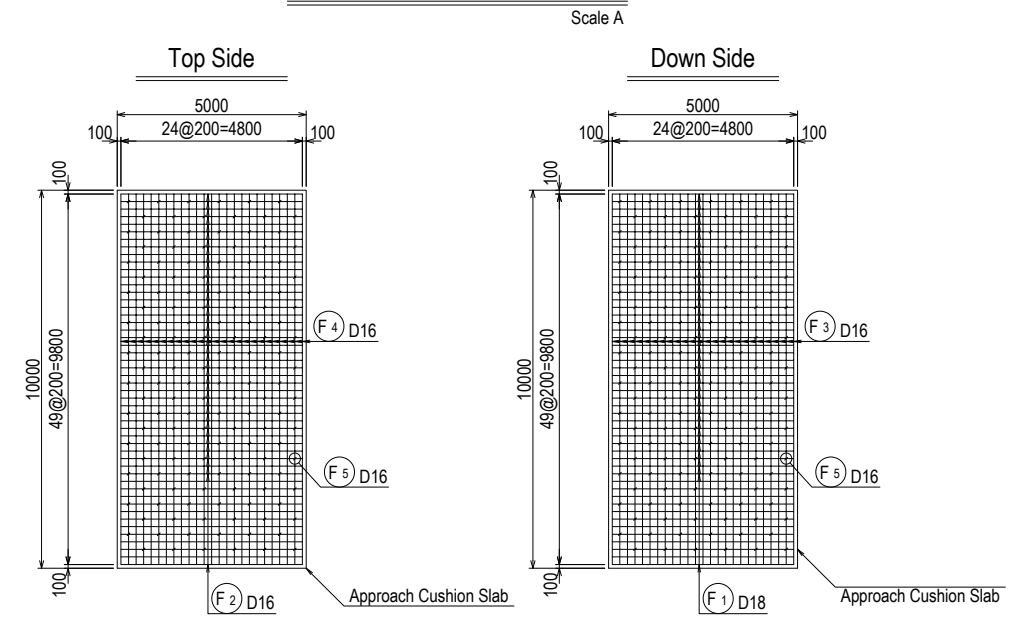
Plan



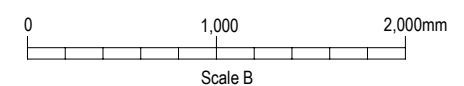
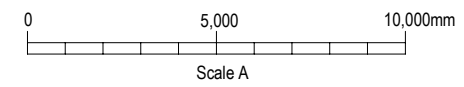
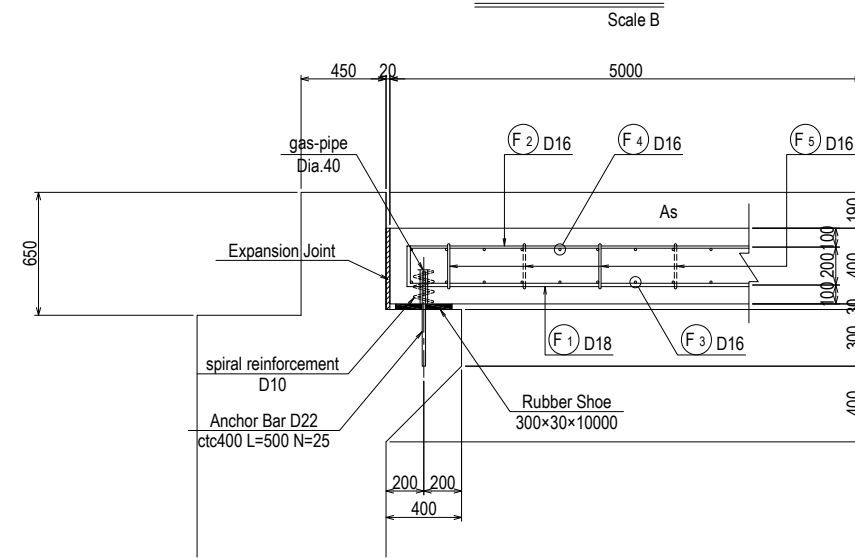
Section A—A



Reinforcement Plan



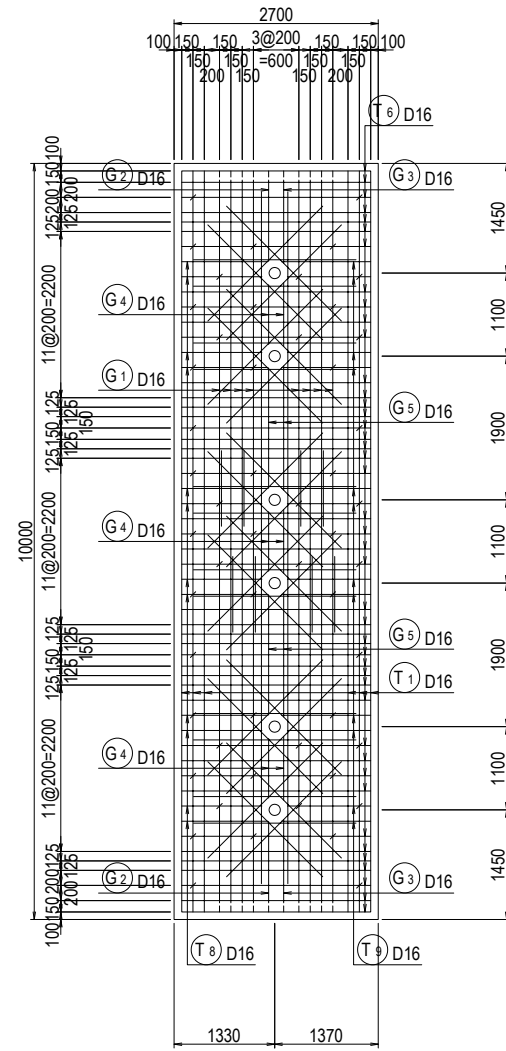
Detail 'a'



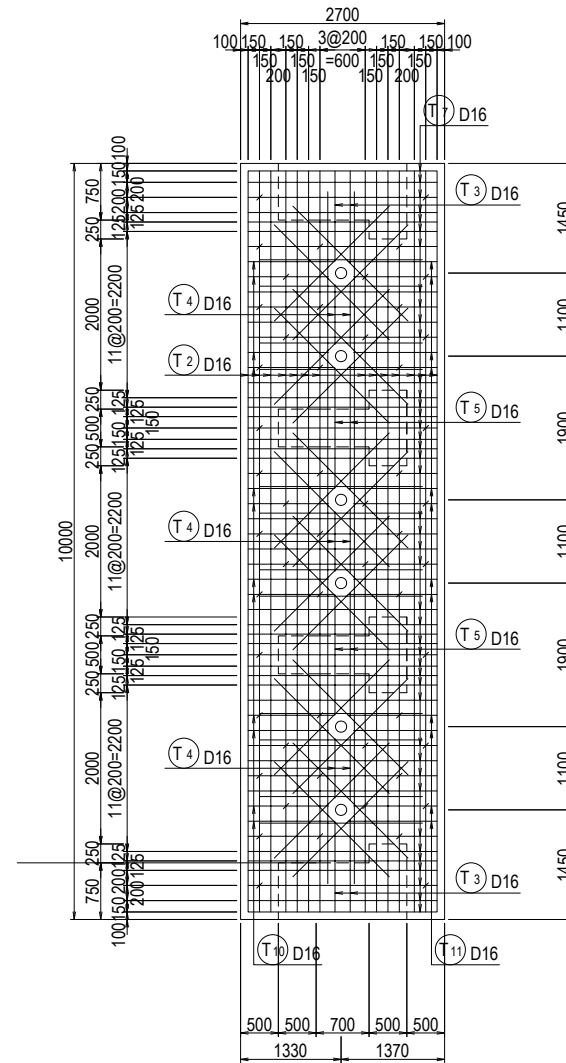
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Badraman Regulator (Diroutiah) Approach Cushion Slab			DRW. NO. CD-6
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Detail of Gate Abutment and Pier of Badraman Regulator (Diroutiah)

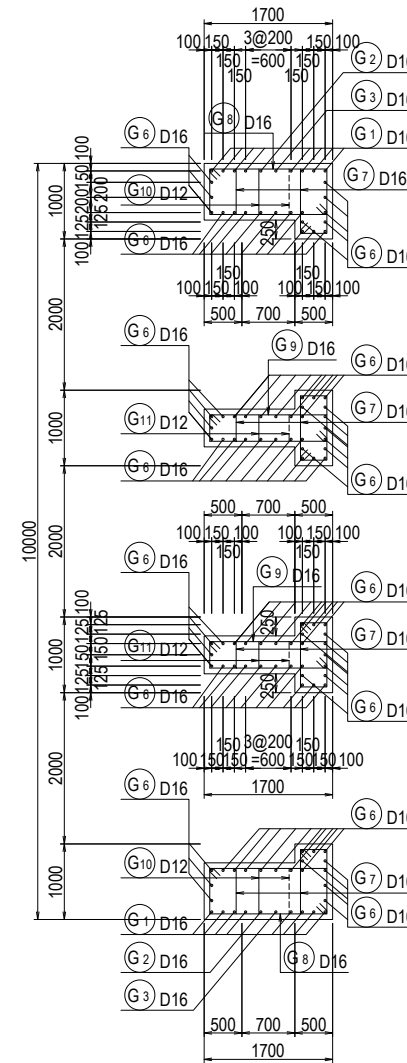
Section A—A



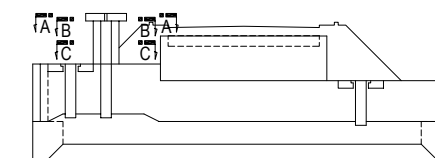
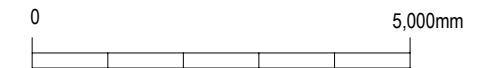
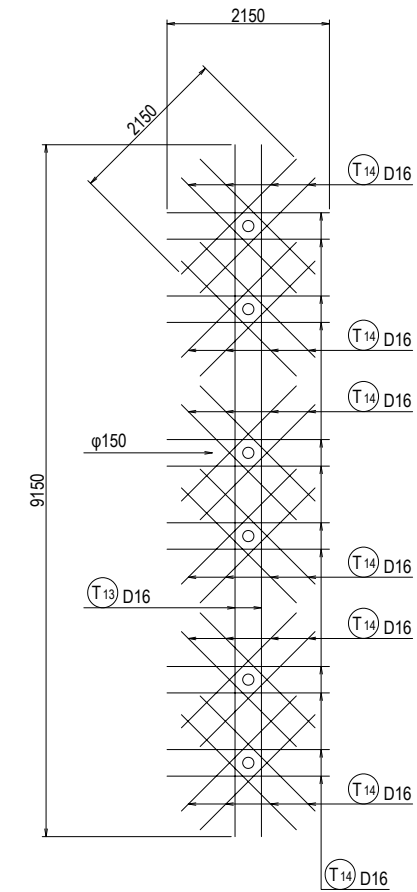
Section B—B



Section C—C



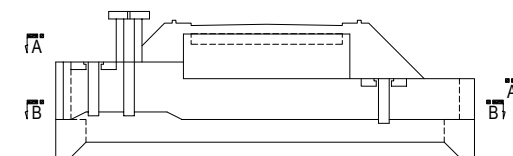
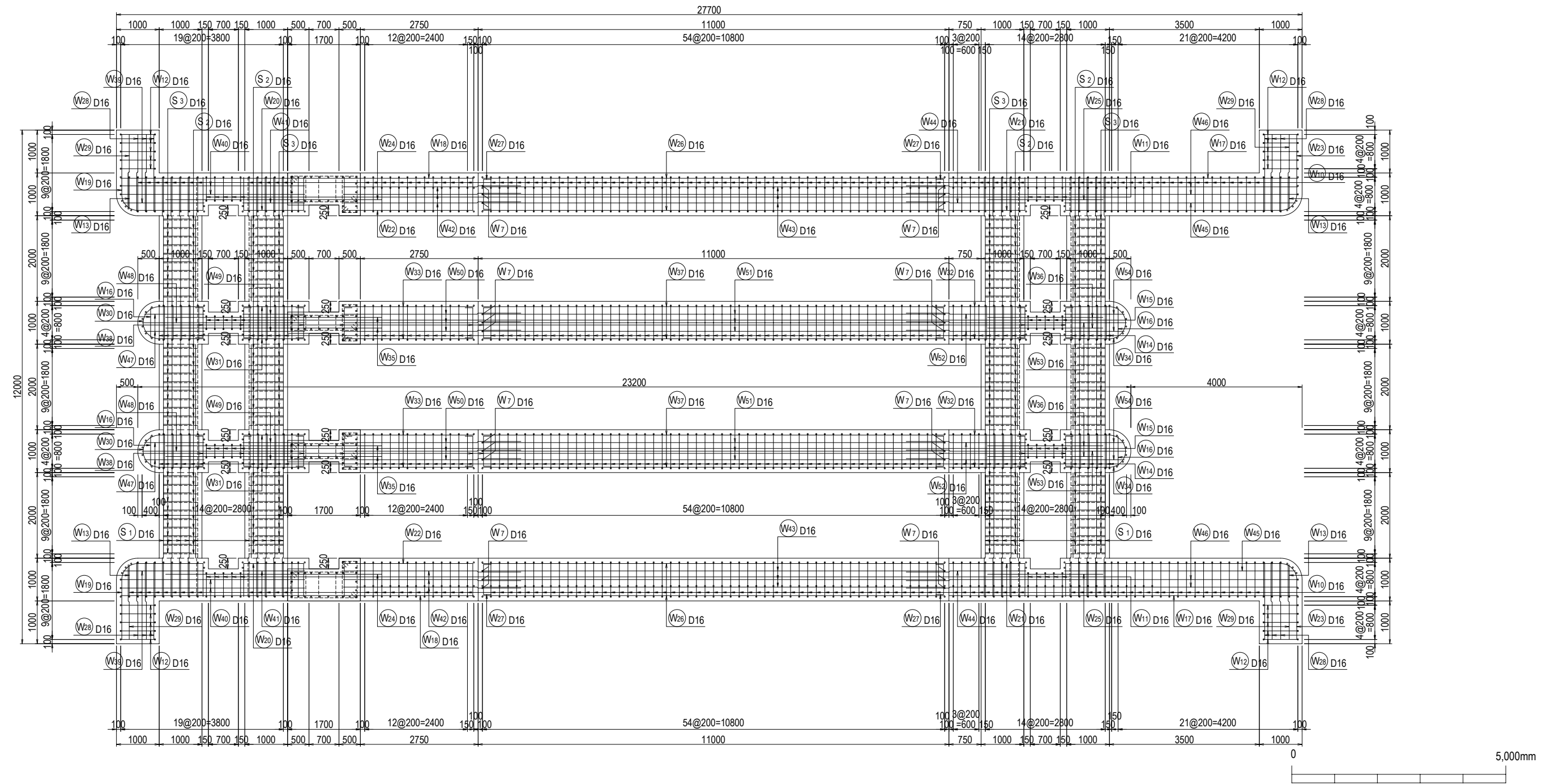
Detail of reinforcement for slab openings



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Badraman Regulator (Diroutiah) Bar arrangement of pier (1)			<b>DRW. NO.</b> CD-7
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	DATE:
DATE:	DATE:	DATE:	DATE:

# Plan of Gate Abutment and Pier of Badraman Regulator (Diroutiah) (1/2)

## Section A—A



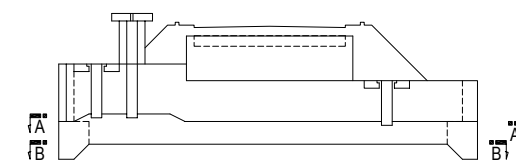
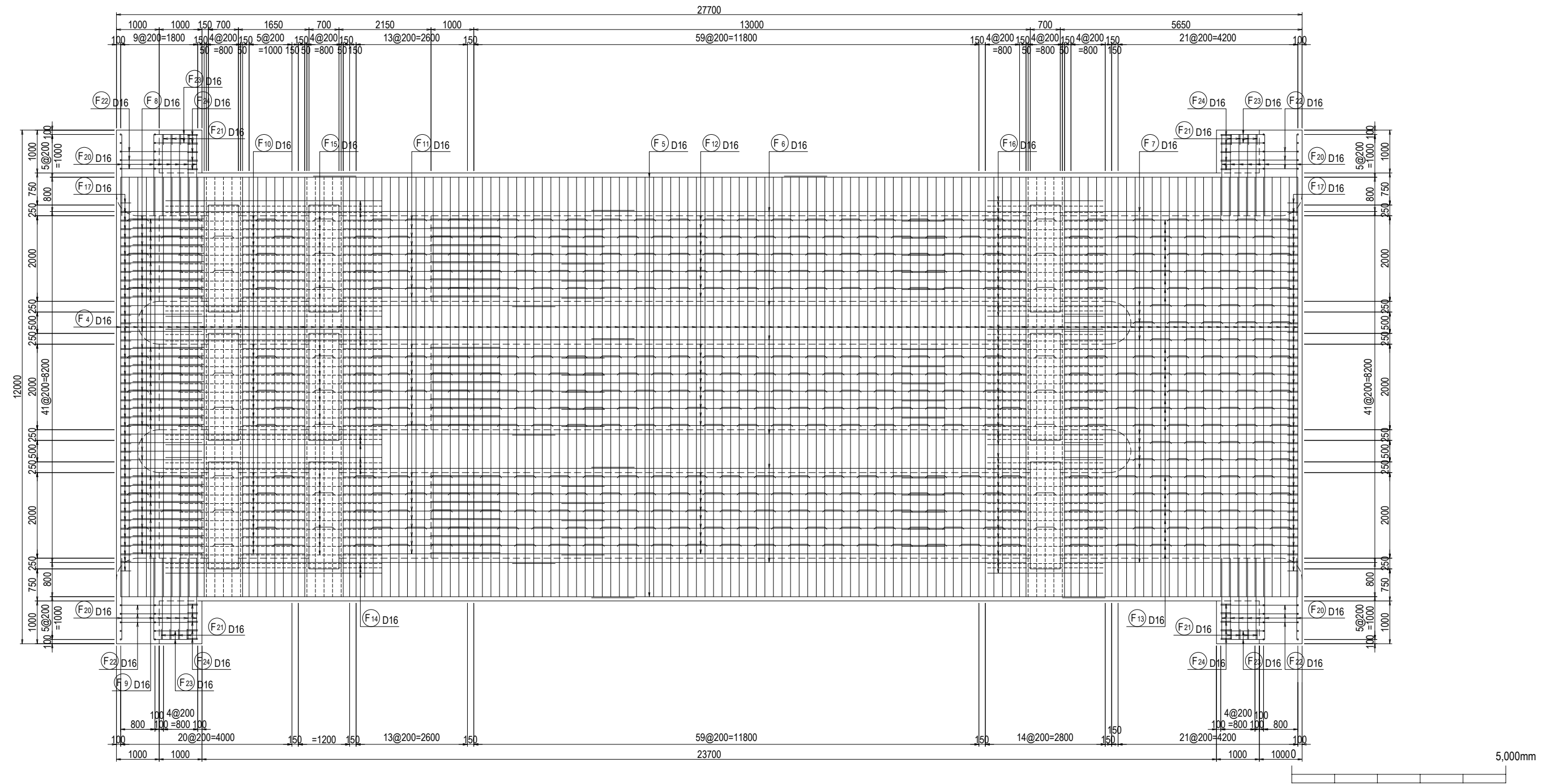
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Badraman Regulator (Diroutiah) Bar arrangement of pier (2)			DRW. NO. CD-8
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:





# Plan of Upstream Apron of Badraman Regulator (Diroutiah) (1/2)

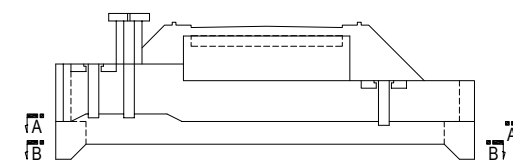
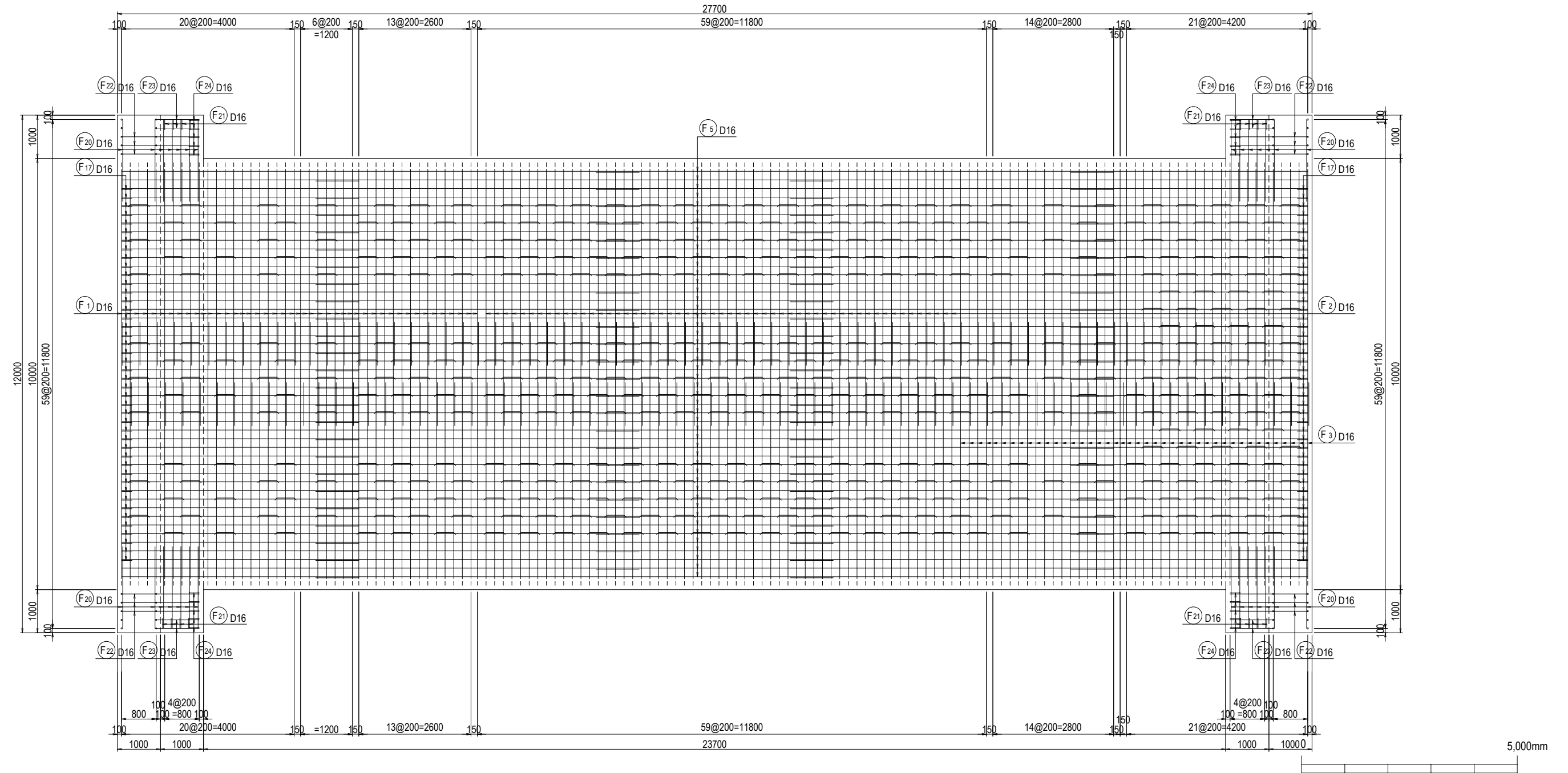
## Section A—A



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Badraman Regulator (Diroutiah) Bar arrangement of pier (4)			DRW. NO. CD-10
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Plan of Upstream Apron of Badraman Regulator (Diroutiah) (2/2)

## Section B—B



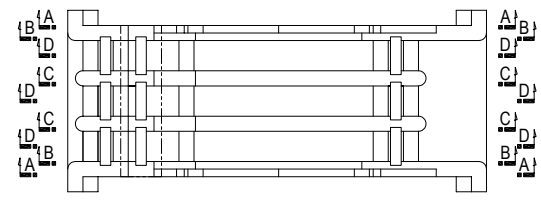
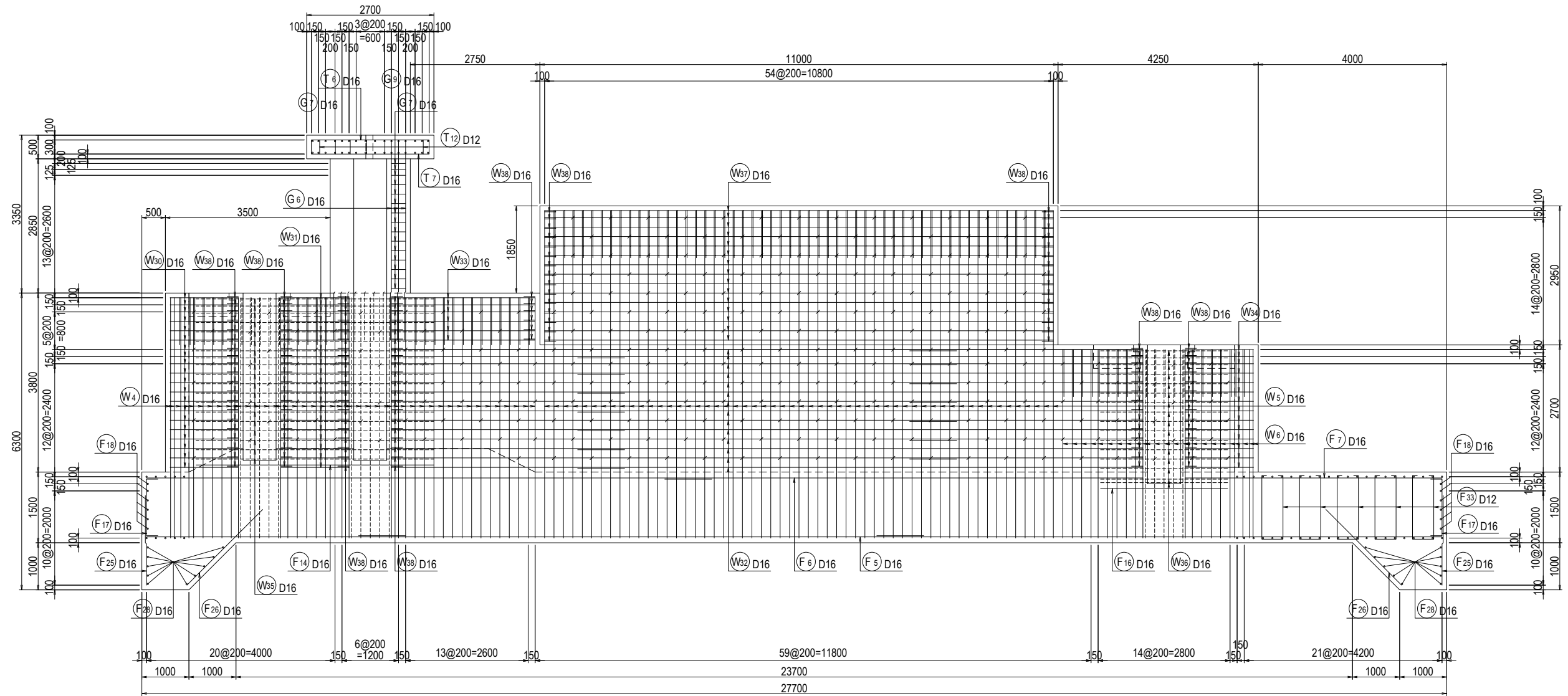
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Badraman Regulator (Diroutiah) Bar arrangement of pier (5)			DRW. NO. CD-11
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:





# Longitudinal Section of Gate Abutment and Pier of Badraman Regulator (Diroutiah) (3/4)

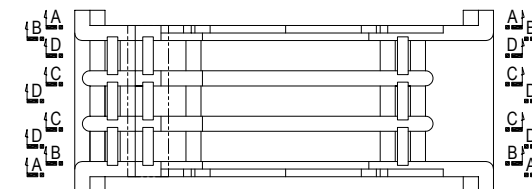
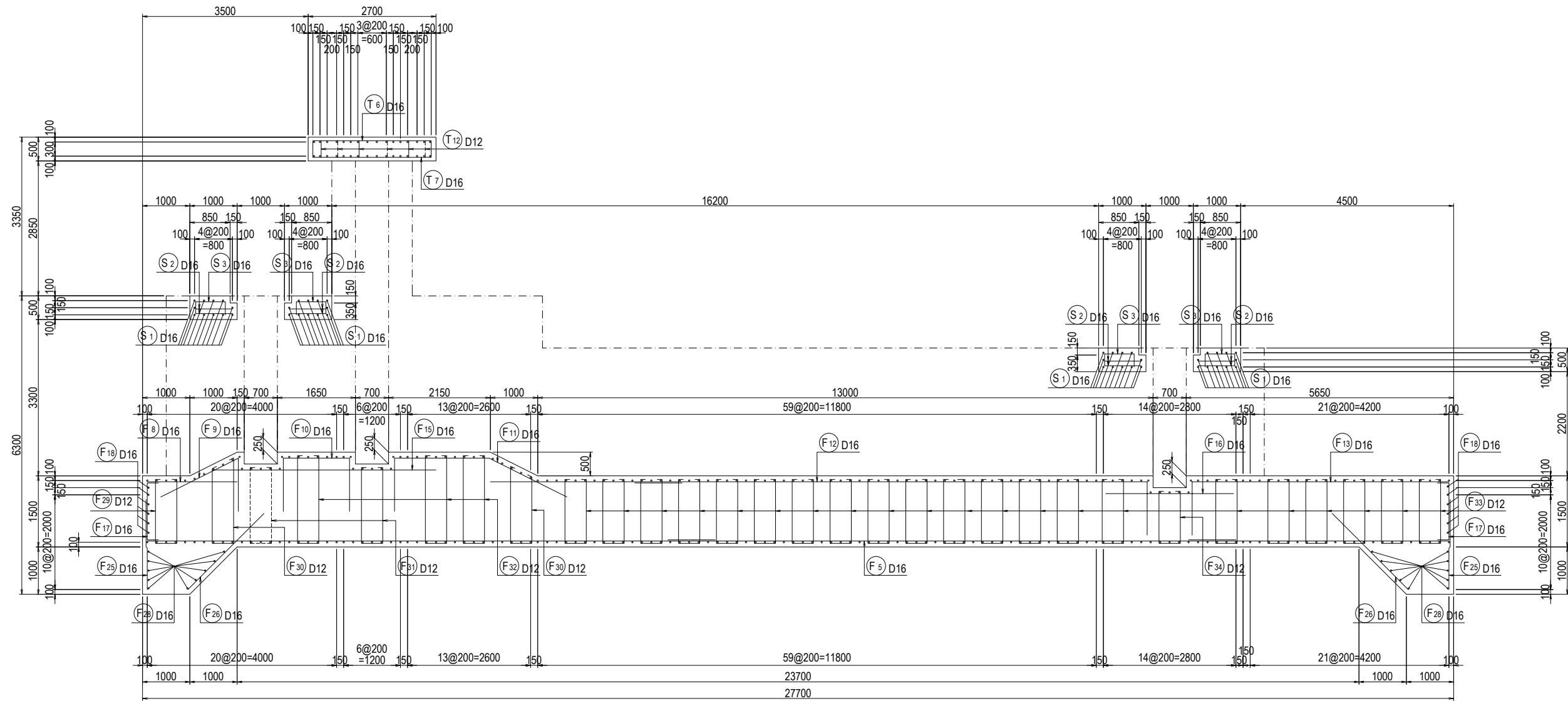
## Section C—C



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Badraman Regulator (Diroutiah) Bar arrangement of pier (8)			DRW. NO. CD-14
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

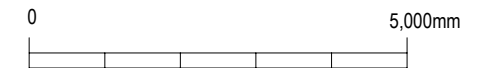
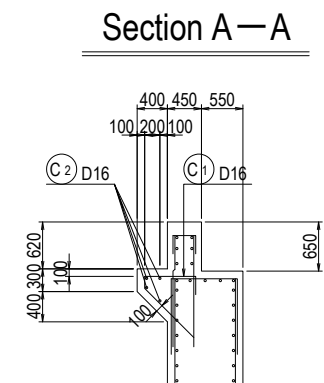
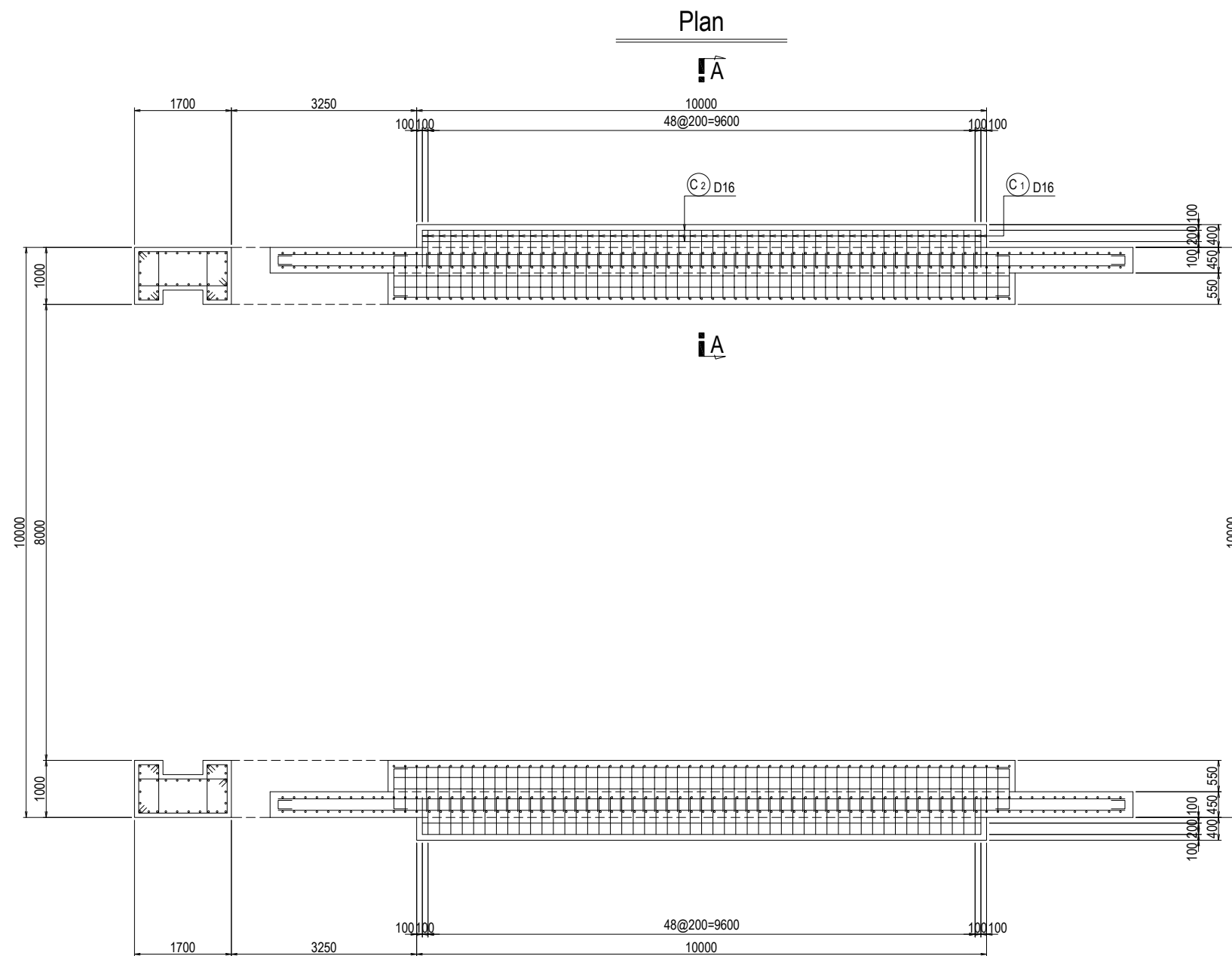
# Longitudinal Section of Gate Abutment and Pier of Badraman Regulator (Diroutiah) (4/4)

## Section D—D



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Badraman Regulator (Diroutiah) Bar arrangement of pier (9)			DRW. NO. CD-15
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Detail of Cradle of Badraman Regulator (Diroutiah)

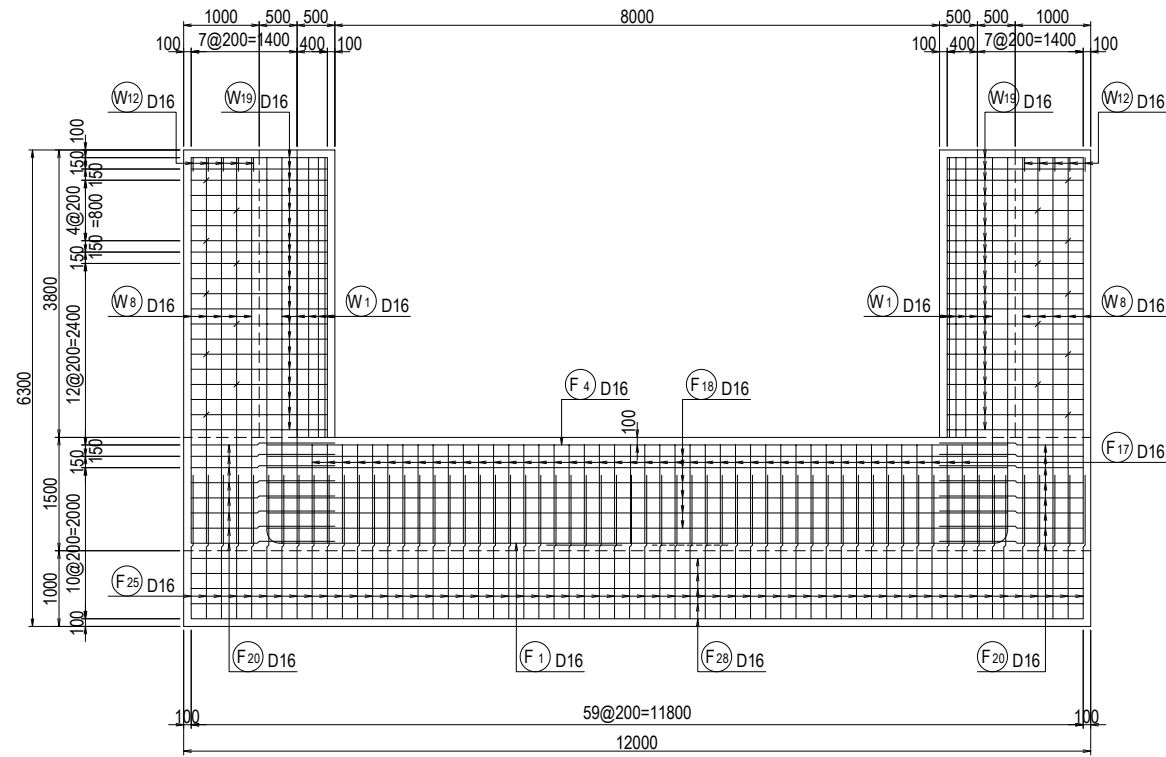


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Badraman Regulator (Diroutiah) Bar arrangement of pier (10)			DRW. NO CD-16
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	DATE:
DATE:	DATE:	DATE:	DATE:

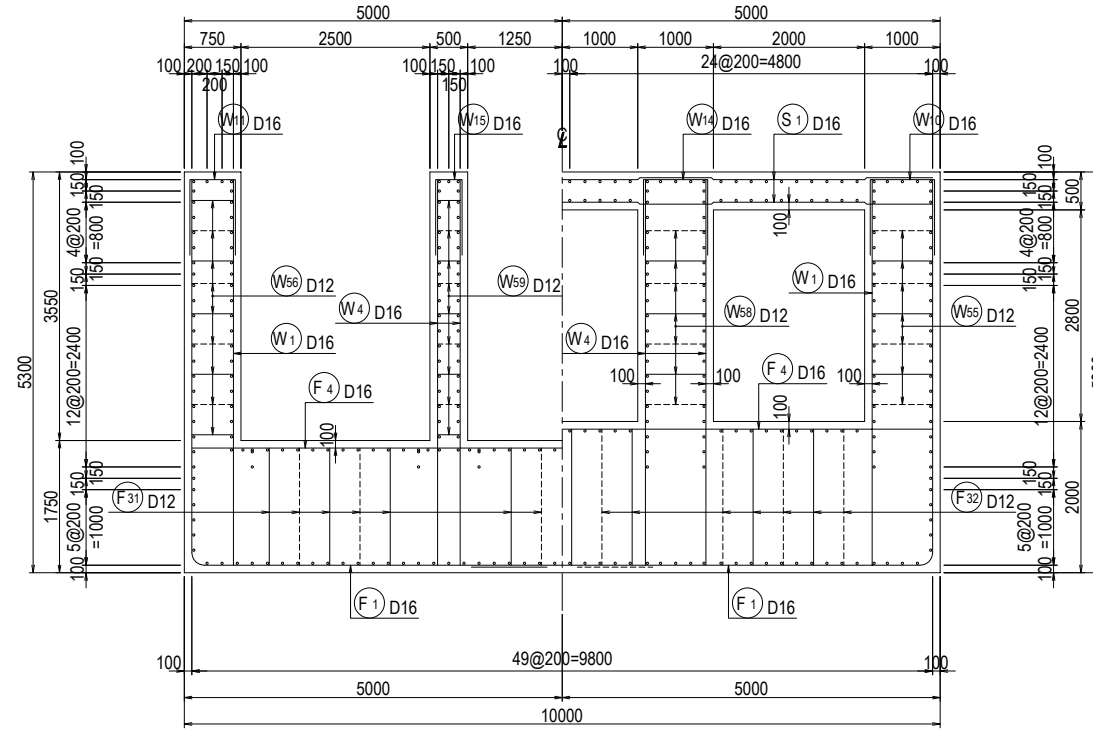


# Section of Gate Abutment and Pier of Badraman Regulator (Diroutiah) (1/3)

## Section A—A

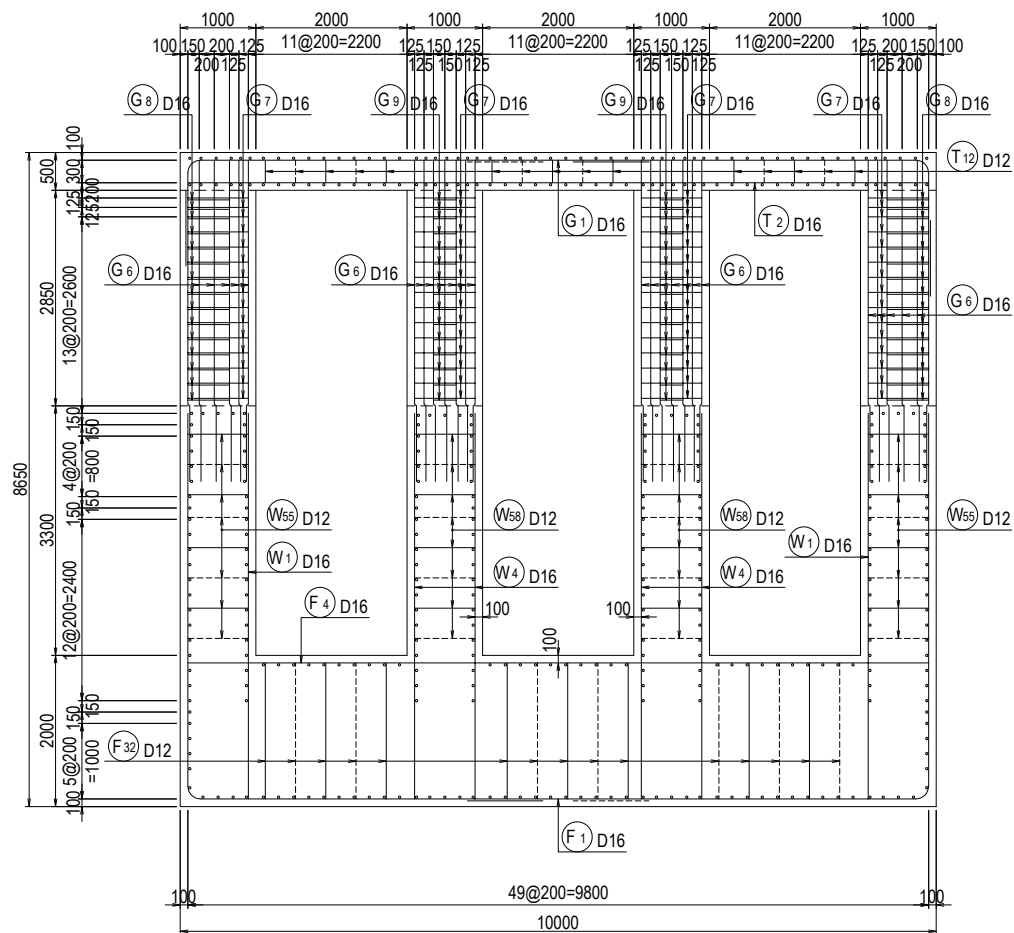


## Section B—B

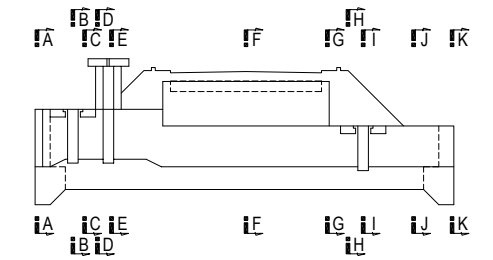
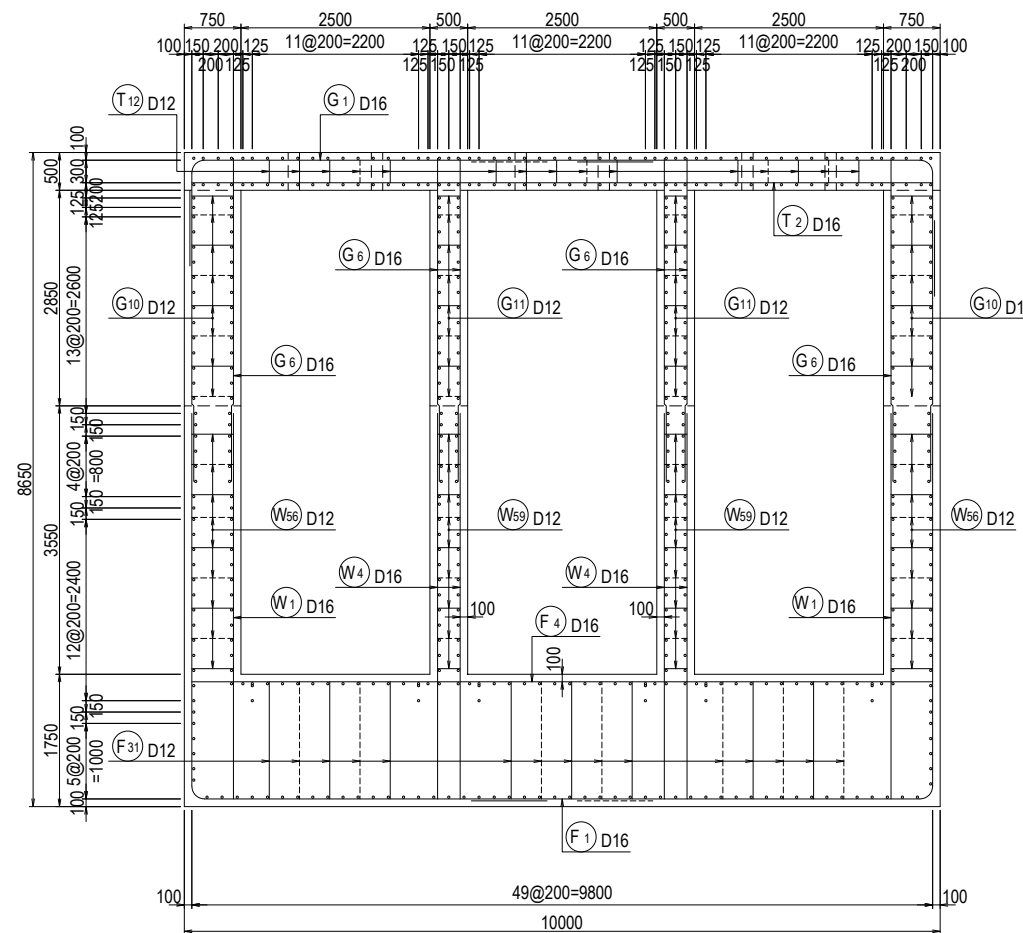


## Section C—C

## Section D—D

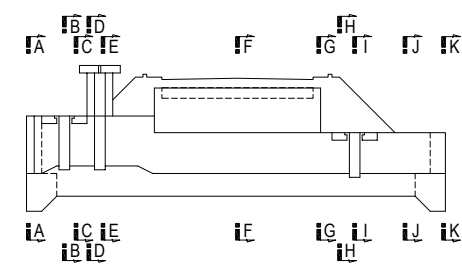
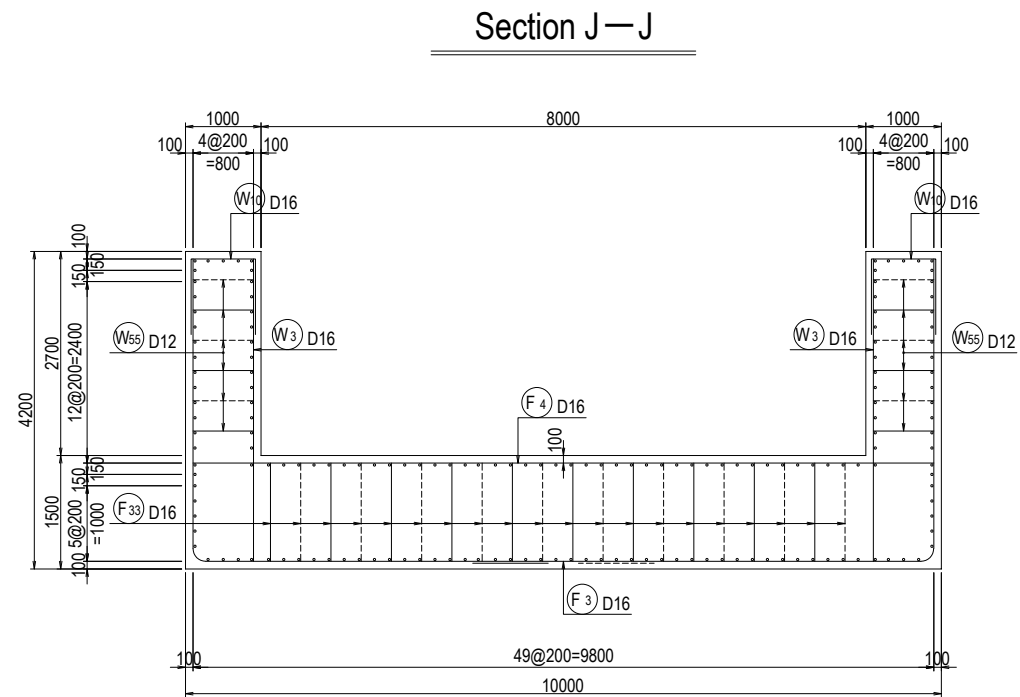
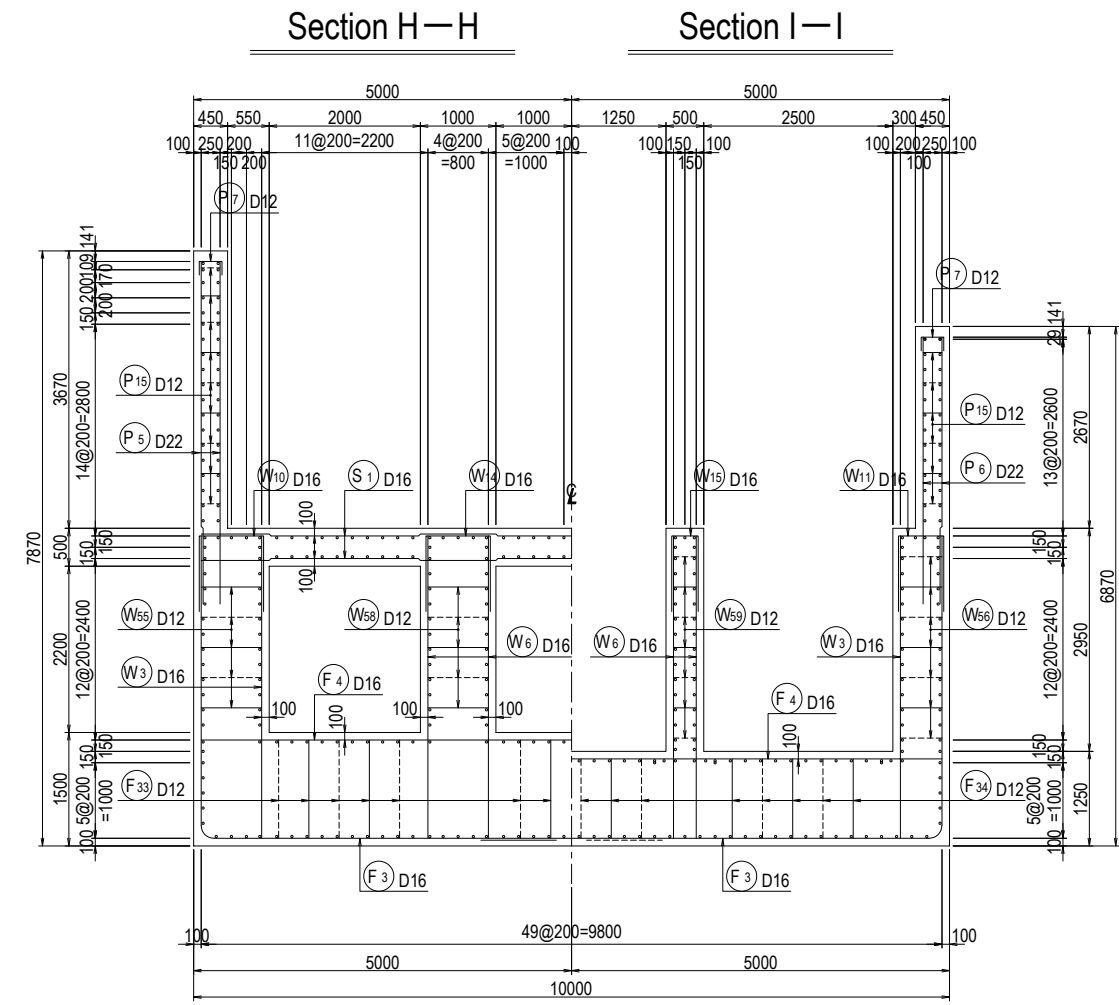
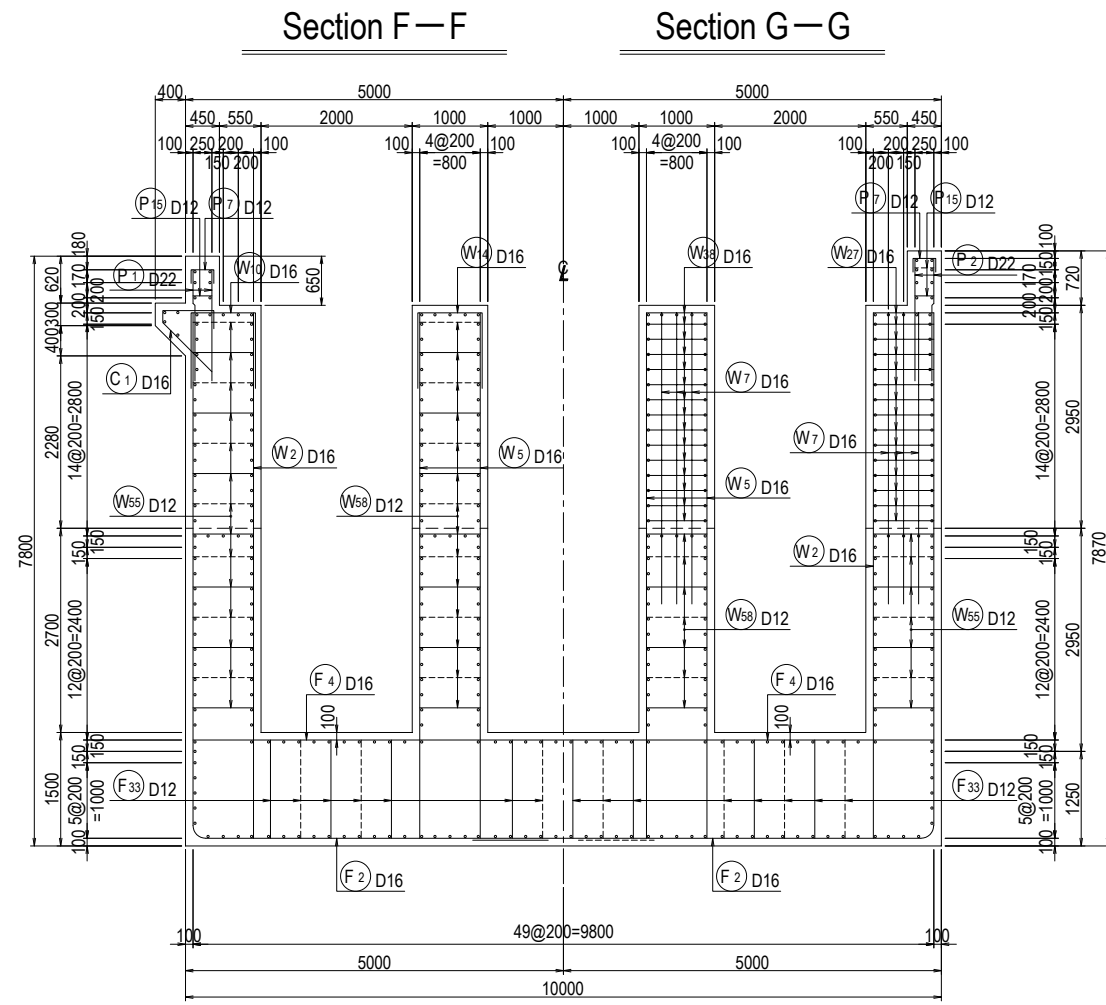


## Section E—E



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Badraman Regulator (Diroutiah) Bar arrangement of pier (11)			<b>DRW. NO.</b> CD-17
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

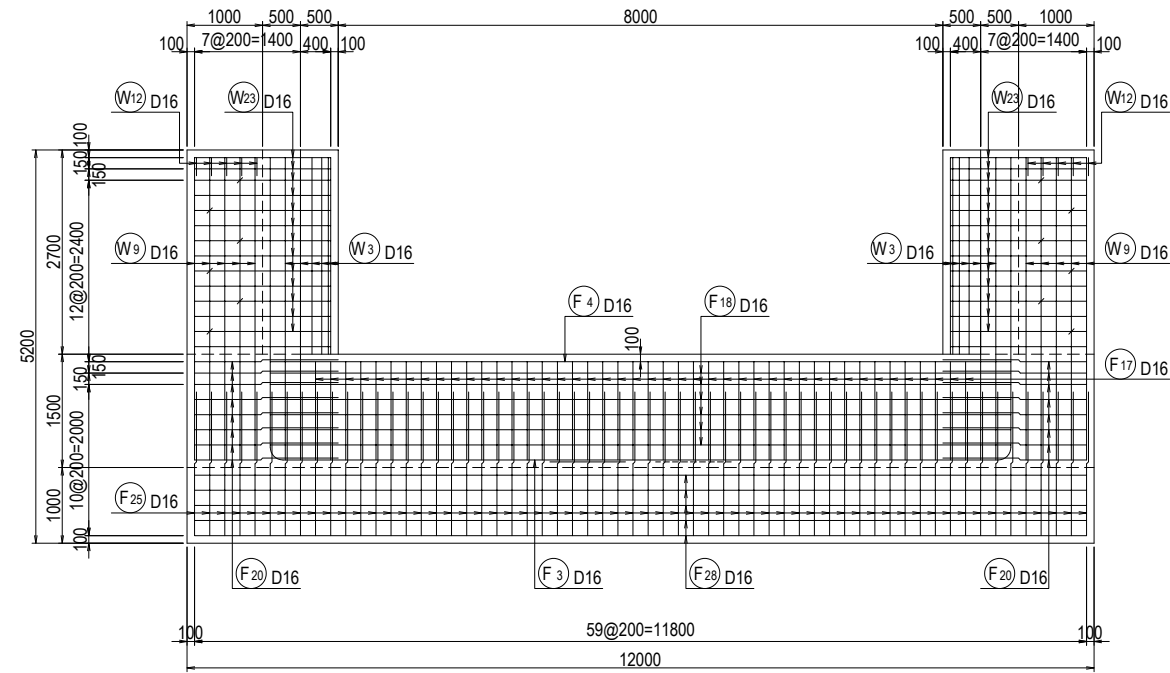
# Section of Gate Abutment and Pier of Badraman Regulator (Diroutiah) (2/3)



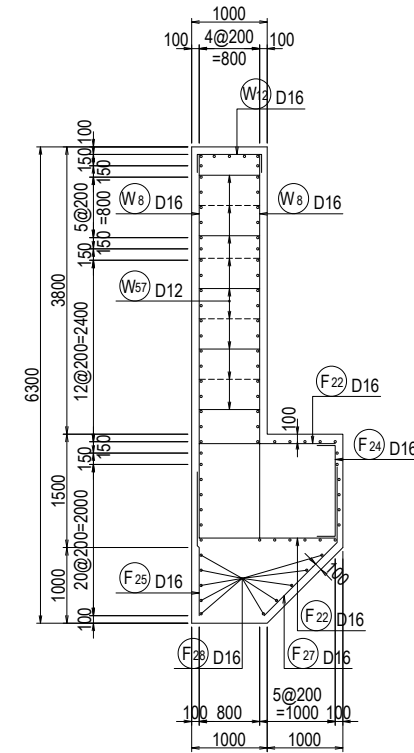
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Badraman Regulator (Diroutiah) Bar arrangement of pier (12)			<b>DRW. NO.</b> CD-18
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Section of Gate Abutment and Pier of Badraman Regulator (Diroutiah) (3/3)

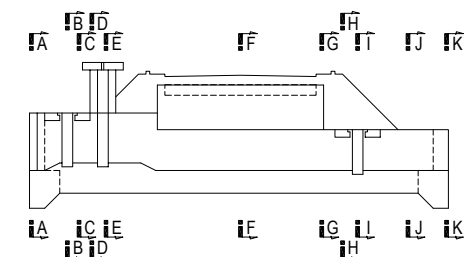
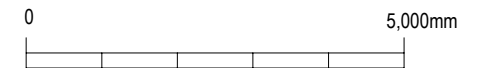
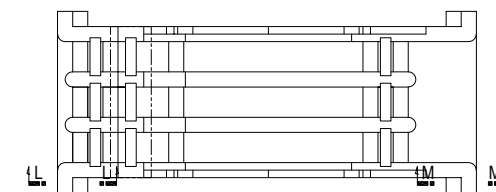
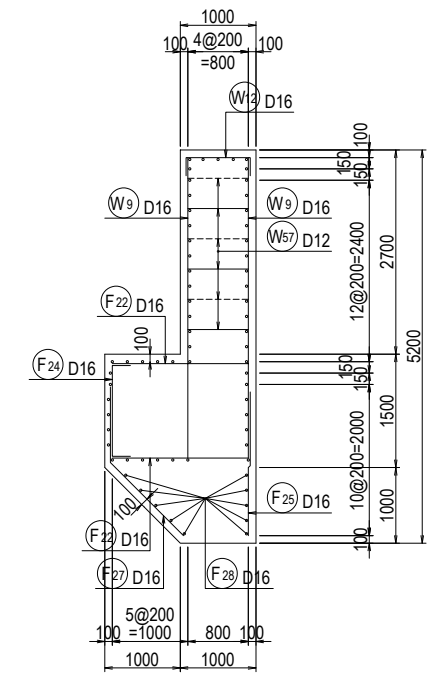
Section K—K



Section L—L

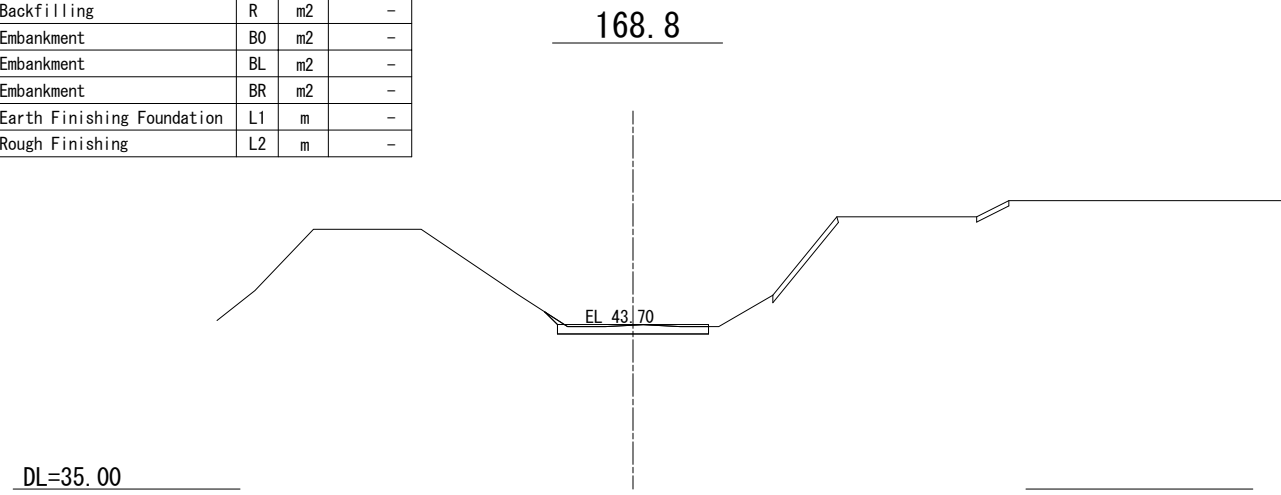


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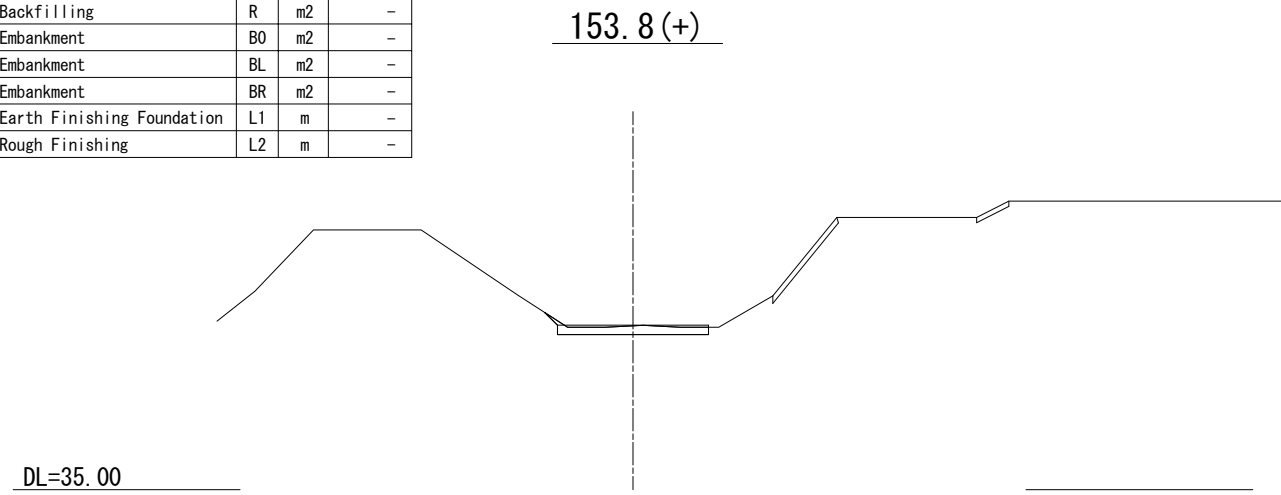


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Badraman Regulator (Diroutiah) Bar arrangement of pier (13)	<b>DRW. NO.</b> CD-19	
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

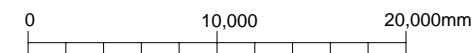
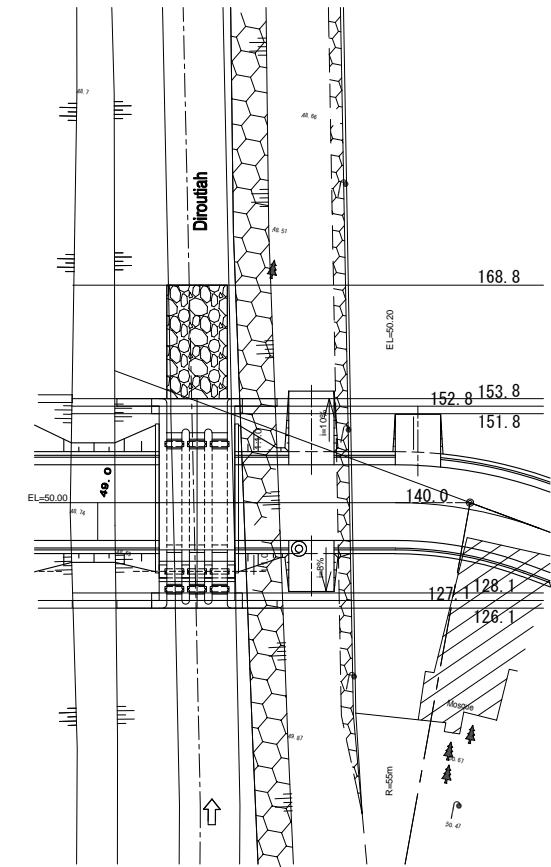
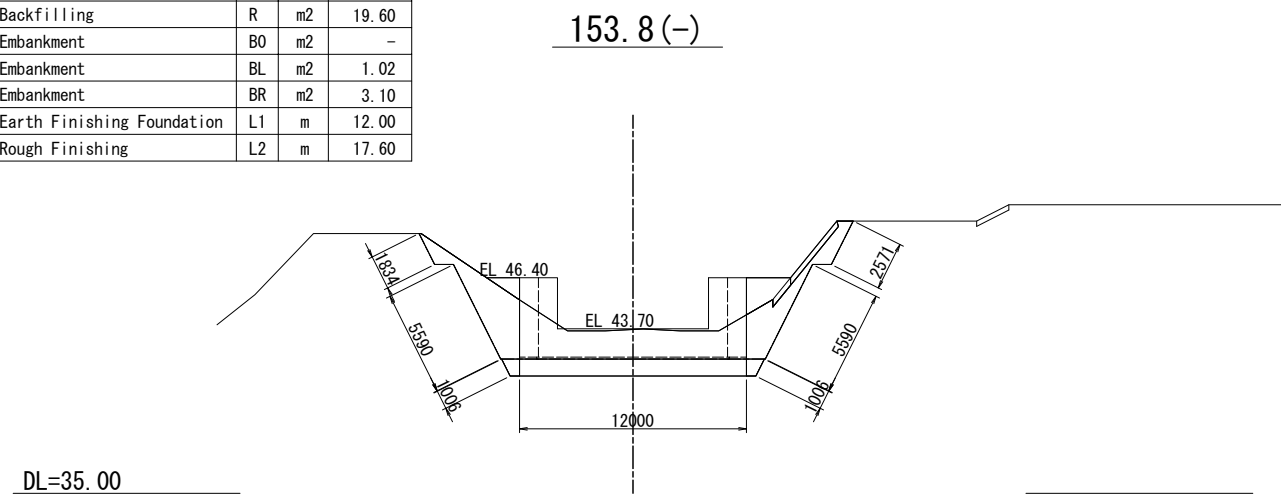
Item	Unit	Quantity
Excavation	C1	m2 3.49
Excavation	C2	m2 -
Backfilling	R	m2 -
Embankment	B0	m2 -
Embankment	BL	m2 -
Embankment	BR	m2 -
Earth Finishing Foundation	L1	m -
Rough Finishing	L2	m -



Item	Unit	Quantity
Excavation	C1	m2 3.49
Excavation	C2	m2 -
Backfilling	R	m2 -
Embankment	B0	m2 -
Embankment	BL	m2 -
Embankment	BR	m2 -
Earth Finishing Foundation	L1	m -
Rough Finishing	L2	m -



Item	Unit	Quantity
Excavation	C1	m2 39.07
Excavation	C2	m2 12.11
Backfilling	R	m2 19.60
Embankment	B0	m2 -
Embankment	BL	m2 1.02
Embankment	BR	m2 3.10
Earth Finishing Foundation	L1	m 12.00
Rough Finishing	L2	m 17.60



Arab Republic of Egypt  
Ministry of Water Resources and Irrigation  
Reservoir and Grand Barrages Sector

Detailed Design Study on the Project for  
Construction of the New Dirout Group of Regulators

Badraman Regulator (Diroutiah)  
Cross section of earth works (1)

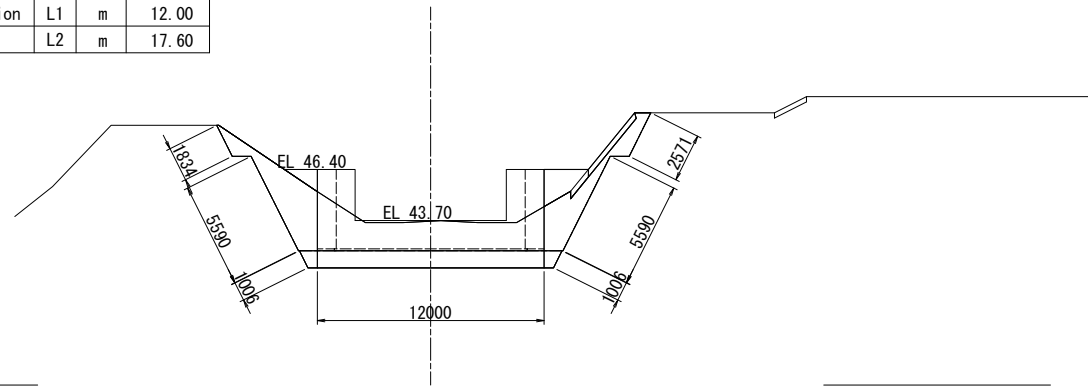
DRW. NO.  
CD-20

SANYU CONSULTANTS INC.

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DATE :	DATE :	DATE :

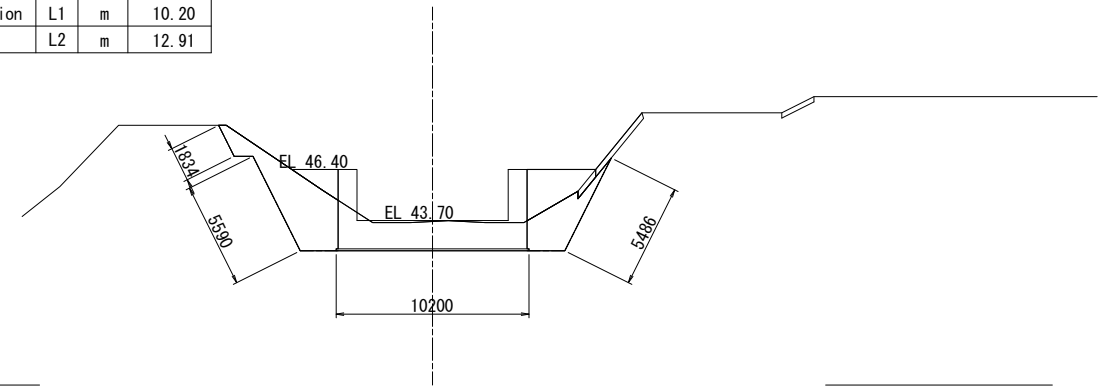
Item	Unit	Quantity
Excavation	C1	m2 39.07
Excavation	C2	m2 12.11
Backfilling	R	m2 19.60
Embankment	B0	m2 -
Embankment	BL	m2 1.02
Embankment	BR	m2 3.10
Earth Finishing Foundation	L1	m 12.00
Rough Finishing	L2	m 17.60

152.8(+)



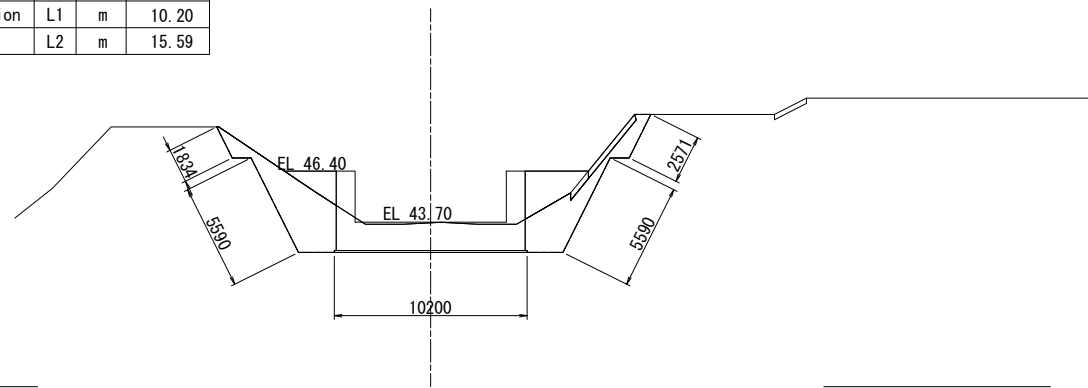
Item	Unit	Quantity
Excavation	C1	m2 37.43
Excavation	C2	m2 -
Backfilling	R	m2 21.22
Embankment	B0	m2 -
Embankment	BL	m2 2.01
Embankment	BR	m2 6.12
Earth Finishing Foundation	L1	m 10.20
Rough Finishing	L2	m 12.91

140.0(+)



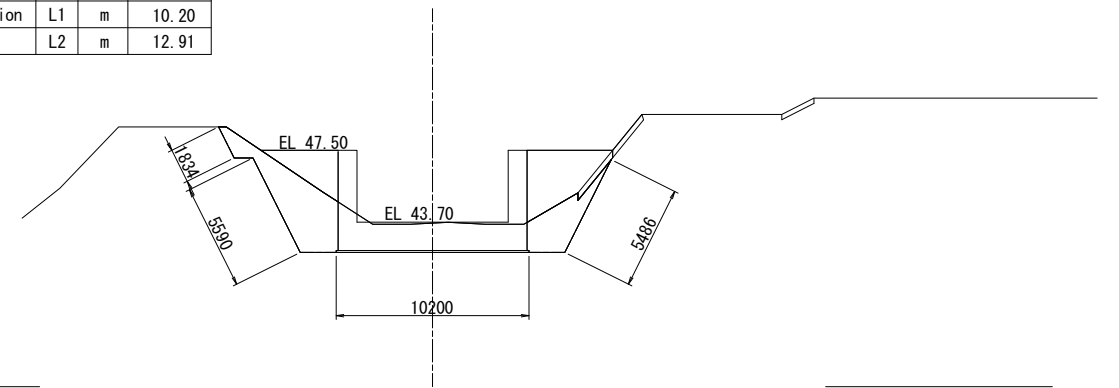
Item	Unit	Quantity
Excavation	C1	m2 39.07
Excavation	C2	m2 12.11
Backfilling	R	m2 23.12
Embankment	B0	m2 -
Embankment	BL	m2 2.52
Embankment	BR	m2 5.35
Earth Finishing Foundation	L1	m 10.20
Rough Finishing	L2	m 15.59

152.8(-)



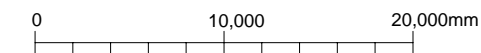
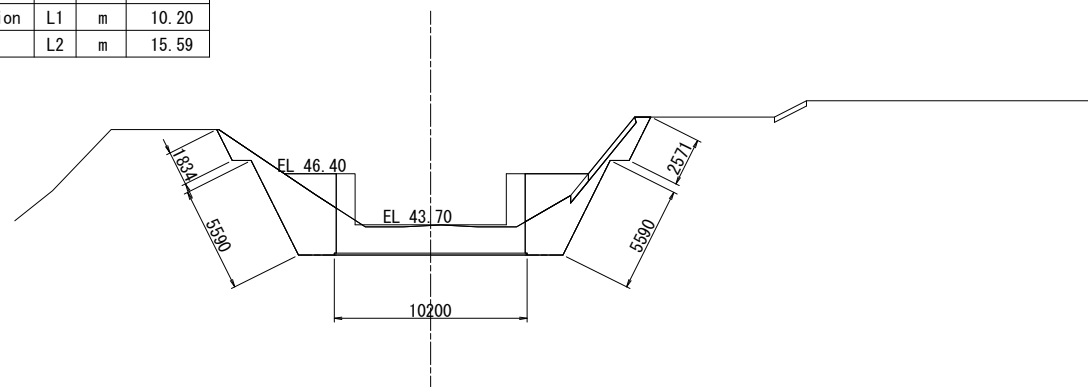
Item	Unit	Quantity
Excavation	C1	m2 37.43
Excavation	C2	m2 -
Backfilling	R	m2 21.22
Embankment	B0	m2 -
Embankment	BL	m2 5.60
Embankment	BR	m2 10.97
Earth Finishing Foundation	L1	m 10.20
Rough Finishing	L2	m 12.91

140.0(-)



Item	Unit	Quantity
Excavation	C1	m2 39.07
Excavation	C2	m2 -
Backfilling	R	m2 23.12
Embankment	B0	m2 -
Embankment	BL	m2 2.52
Embankment	BR	m2 5.35
Earth Finishing Foundation	L1	m 10.20
Rough Finishing	L2	m 15.59

151.8



Arab Republic of Egypt  
Ministry of Water Resources and Irrigation  
Reservoir and Grand Barrages Sector

Detailed Design Study on the Project for  
Construction of the New Dirout Group of Regulators

Badraman Regulator (Diroutiah)  
Cross section of earth works (2)

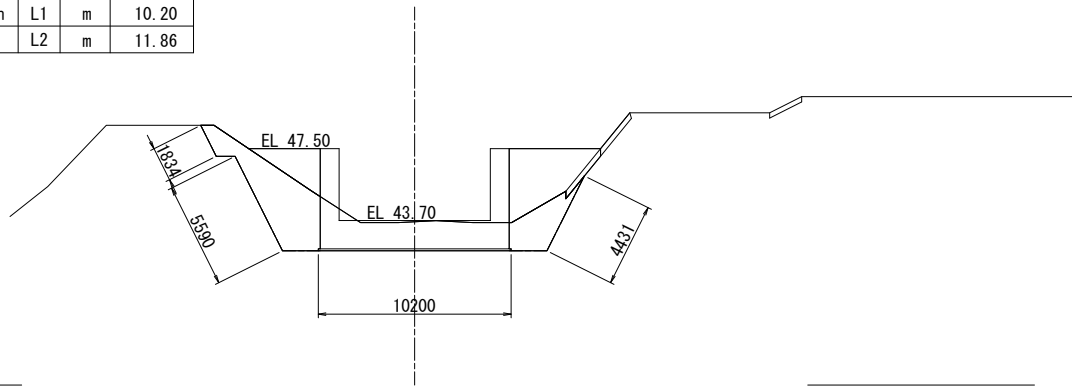
DRW. NO.  
CD-21

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DATE	PREPARED BY	CHECKED BY	APPROVED BY

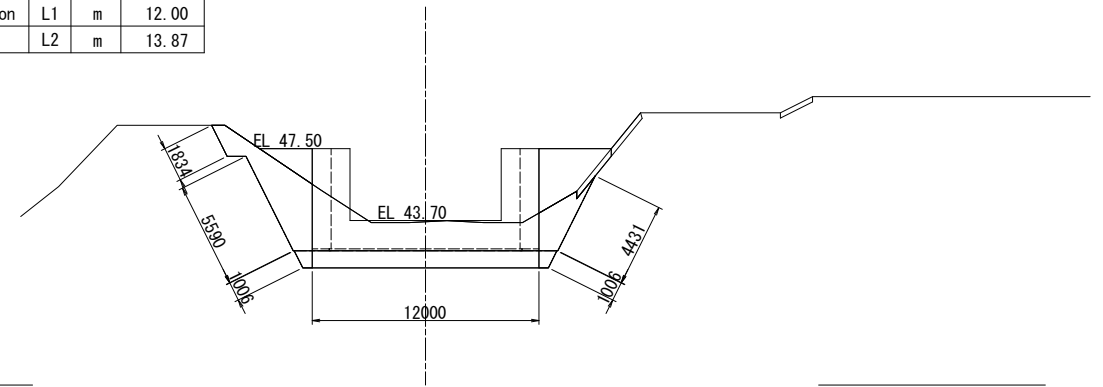
Item	Unit	Quantity
Excavation	C1	m2 38.09
Excavation	C2	m2 -
Backfilling	R	m2 21.51
Embankment	B0	m2 -
Embankment	BL	m2 4.82
Embankment	BR	m2 12.13
Earth Finishing Foundation	L1	m 10.20
Rough Finishing	L2	m 11.86

128.1



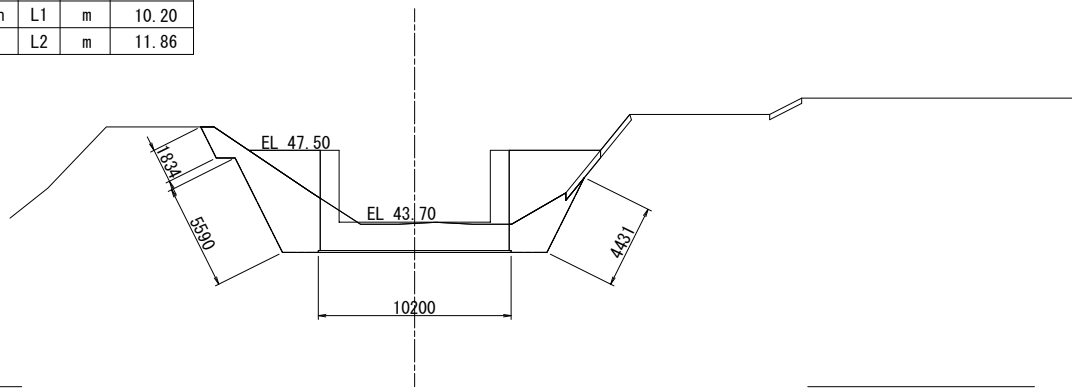
Item	Unit	Quantity
Excavation	C1	m2 38.09
Excavation	C2	m2 12.11
Backfilling	R	m2 17.93
Embankment	B0	m2 -
Embankment	BL	m2 2.61
Embankment	BR	m2 8.43
Earth Finishing Foundation	L1	m 12.00
Rough Finishing	L2	m 13.87

127.1 (-)



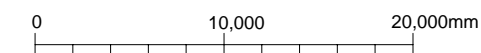
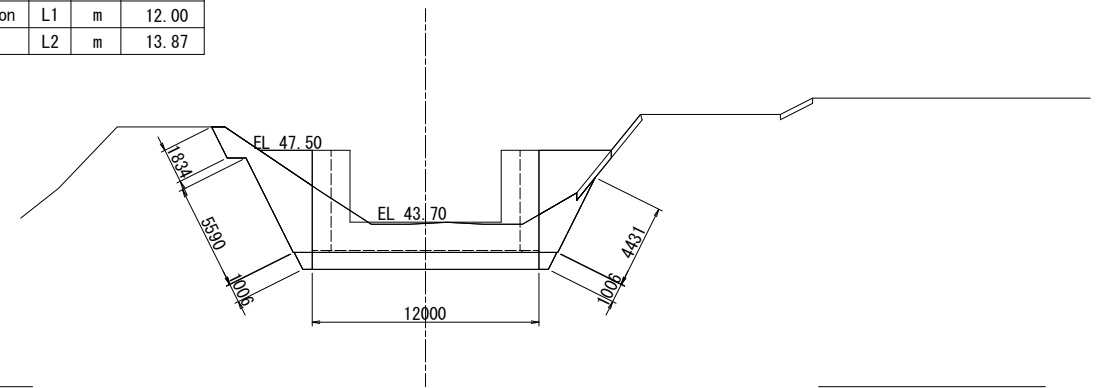
Item	Unit	Quantity
Excavation	C1	m2 38.09
Excavation	C2	m2 12.11
Backfilling	R	m2 21.51
Embankment	B0	m2 -
Embankment	BL	m2 4.82
Embankment	BR	m2 12.13
Earth Finishing Foundation	L1	m 10.20
Rough Finishing	L2	m 11.86

127.1 (+)



Item	Unit	Quantity
Excavation	C1	m2 38.09
Excavation	C2	m2 12.11
Backfilling	R	m2 17.93
Embankment	B0	m2 -
Embankment	BL	m2 2.61
Embankment	BR	m2 8.43
Earth Finishing Foundation	L1	m 12.00
Rough Finishing	L2	m 13.87

126.1



Arab Republic of Egypt  
Ministry of Water Resources and Irrigation  
Reservoir and Grand Barrages Sector

Detailed Design Study on the Project for  
Construction of the New Dirout Group of Regulators

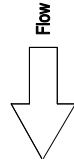
Badraman Regulator (Diroutiah)  
Cross section of earth works (3)

DRW. NO.  
CD-22

SANYU CONSULTANTS INC.

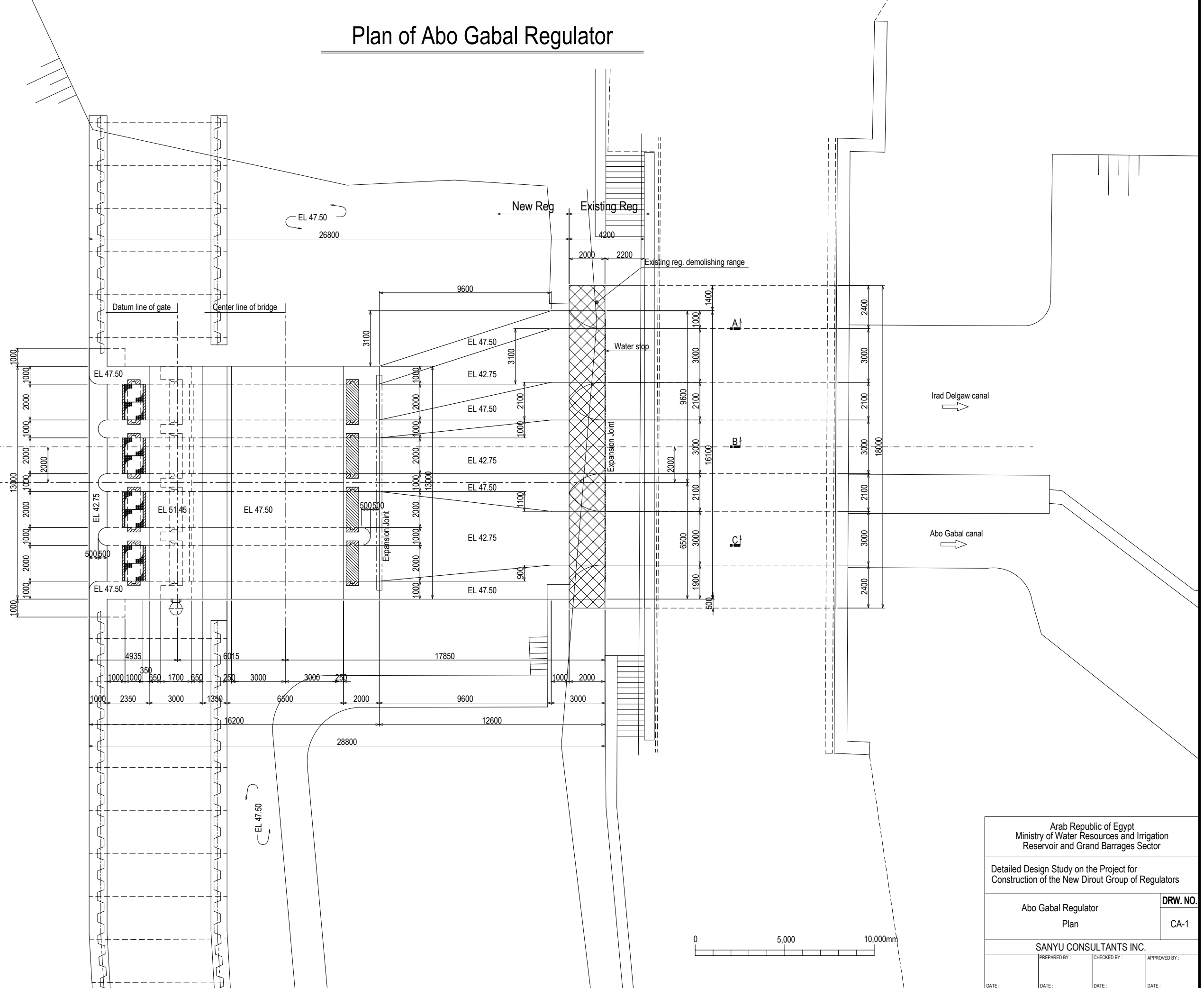
PREPARED BY :	CHECKED BY :	APPROVED BY :
DATE :	DATE :	DATE :

# Plan of Abo Gabal Regulator



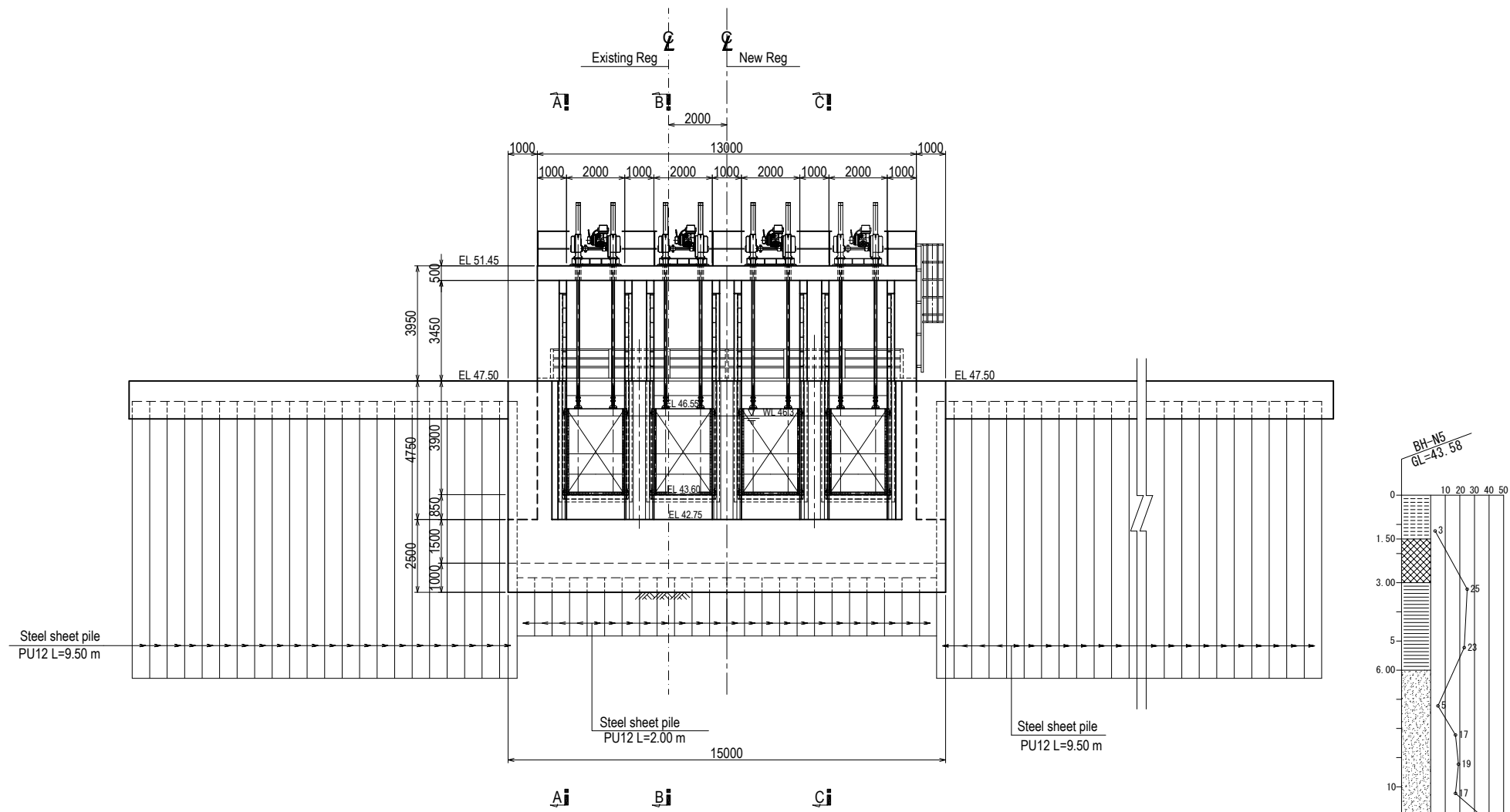
A  
B  
C

Existing Reg  
New Reg



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Abo Gabal Regulator Plan			DRW. NO. CA-1
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Elevation of Abo Gabal Regulator

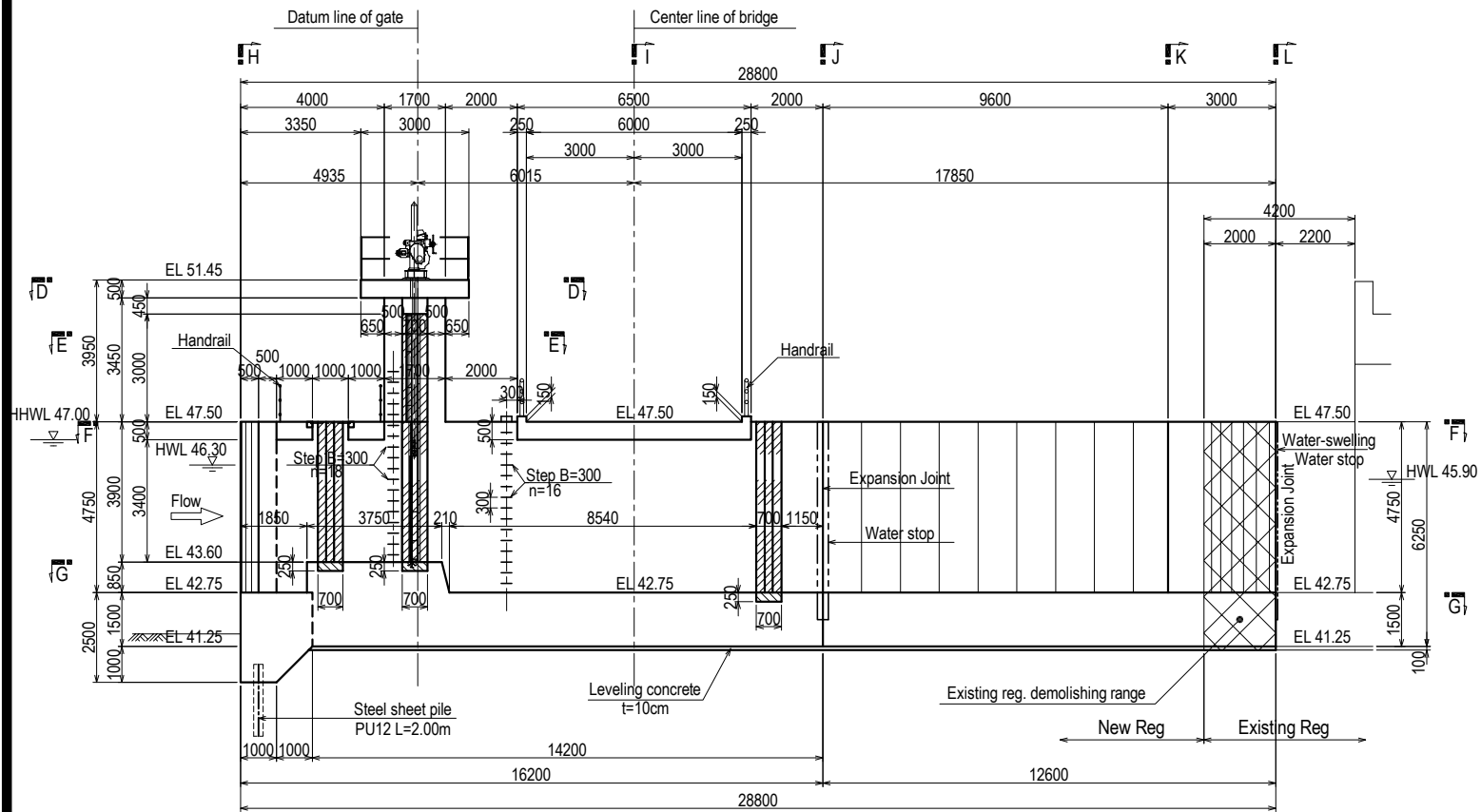


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Abo Gabal Regulator Elevation			DRW. NO. CA-2
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

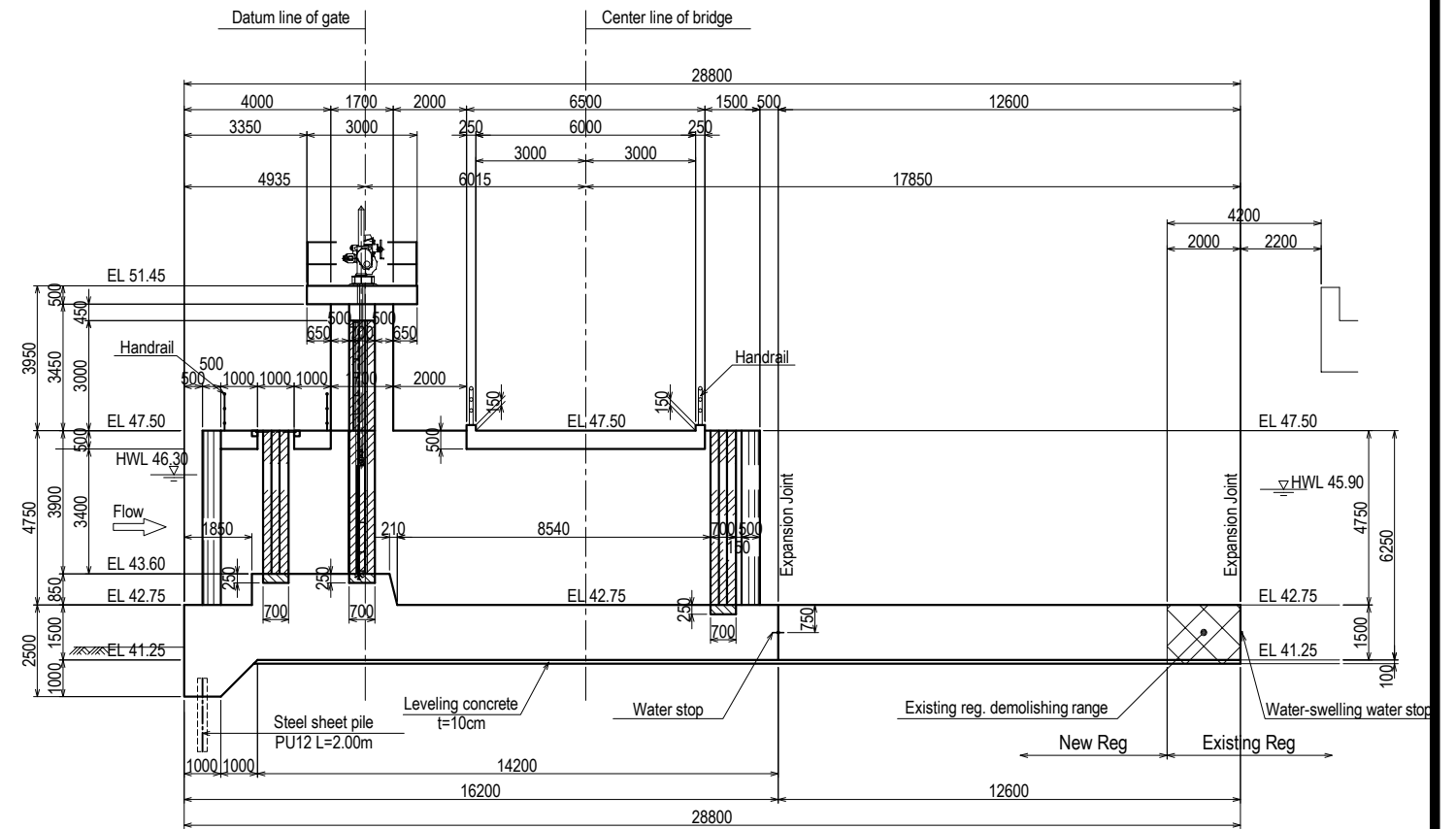


# Longitudinal Section of Abo Gabal Regulator

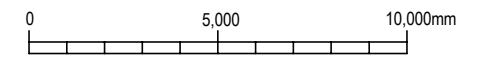
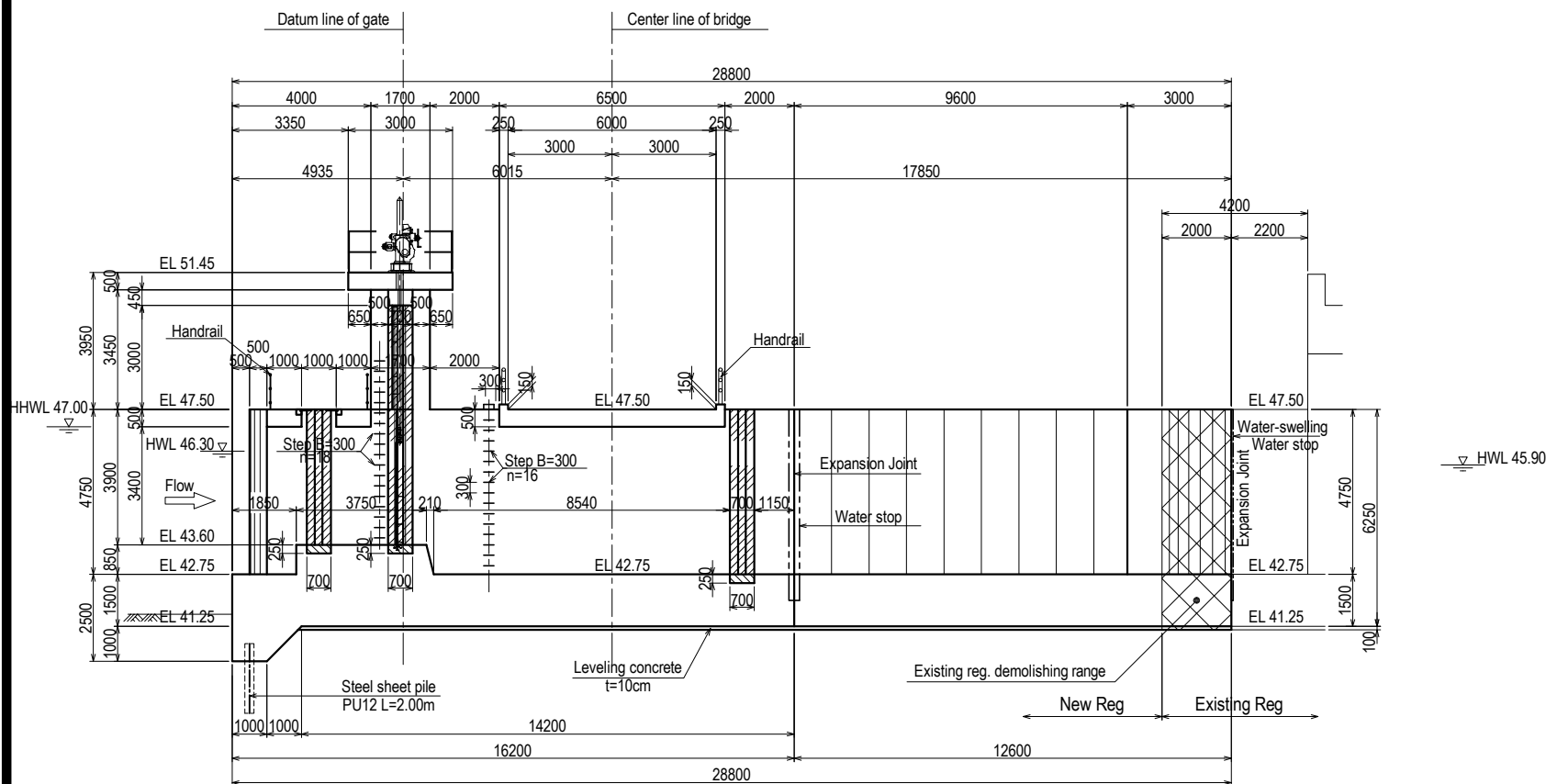
## Section A—A



## Section C—C



## Section B—B



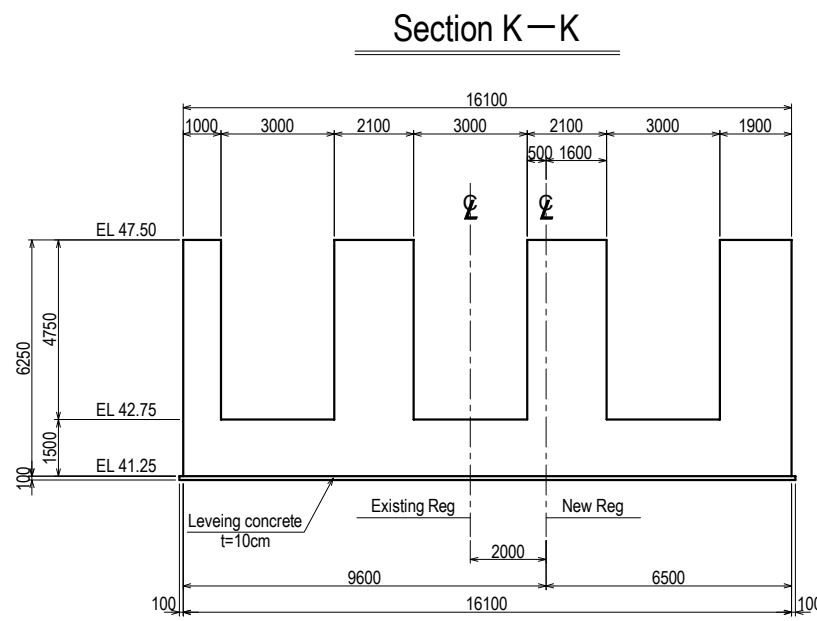
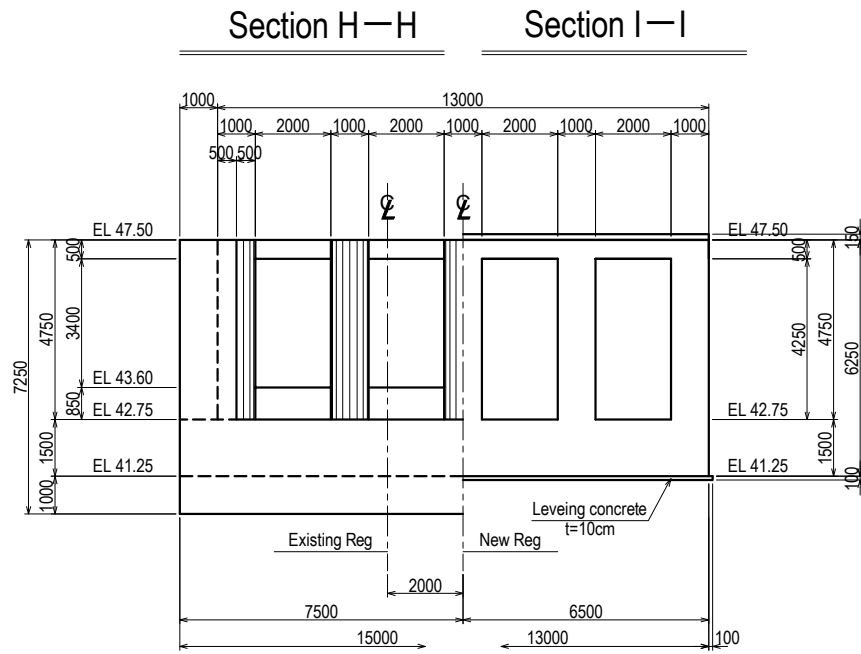
Note:  
 Shaded area indicates the range of second stage concrete to be placed with steel materials.

Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Abo Gabal Regulator Longitudinal section	DRW. NO. CA-3	
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:



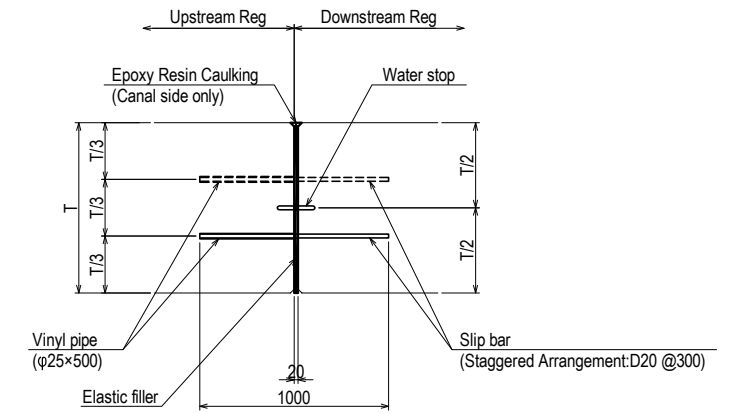
# Section of Abo Gabal Regulator (2/2)

Scale A

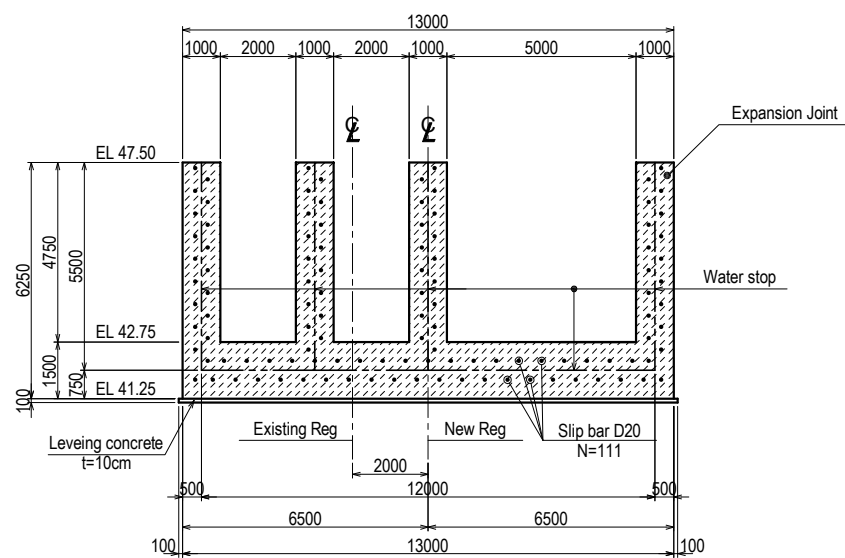


## Typical of Expansion Joint

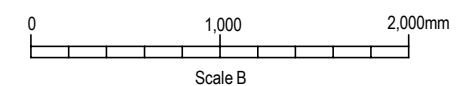
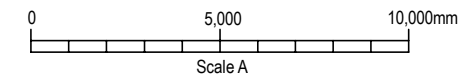
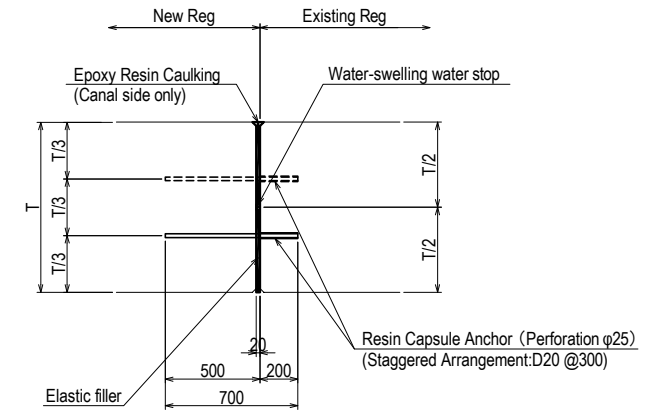
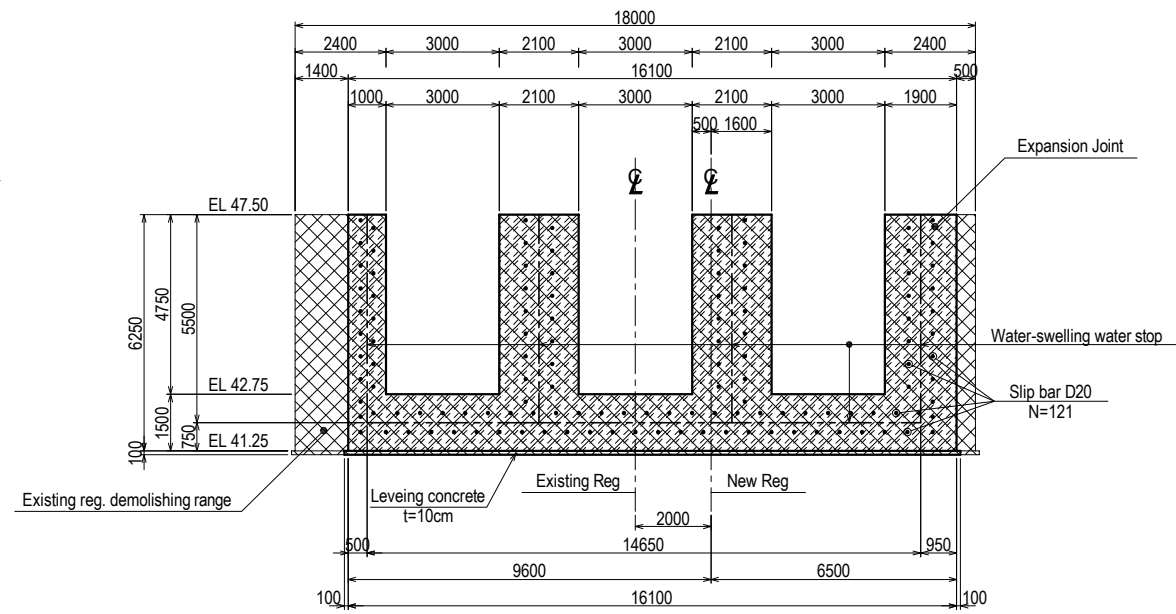
Scale B



## Section J-J



## Section L-L

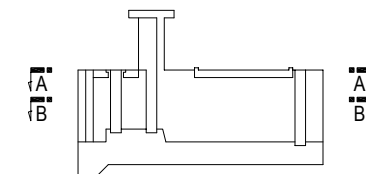
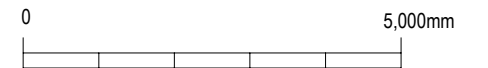
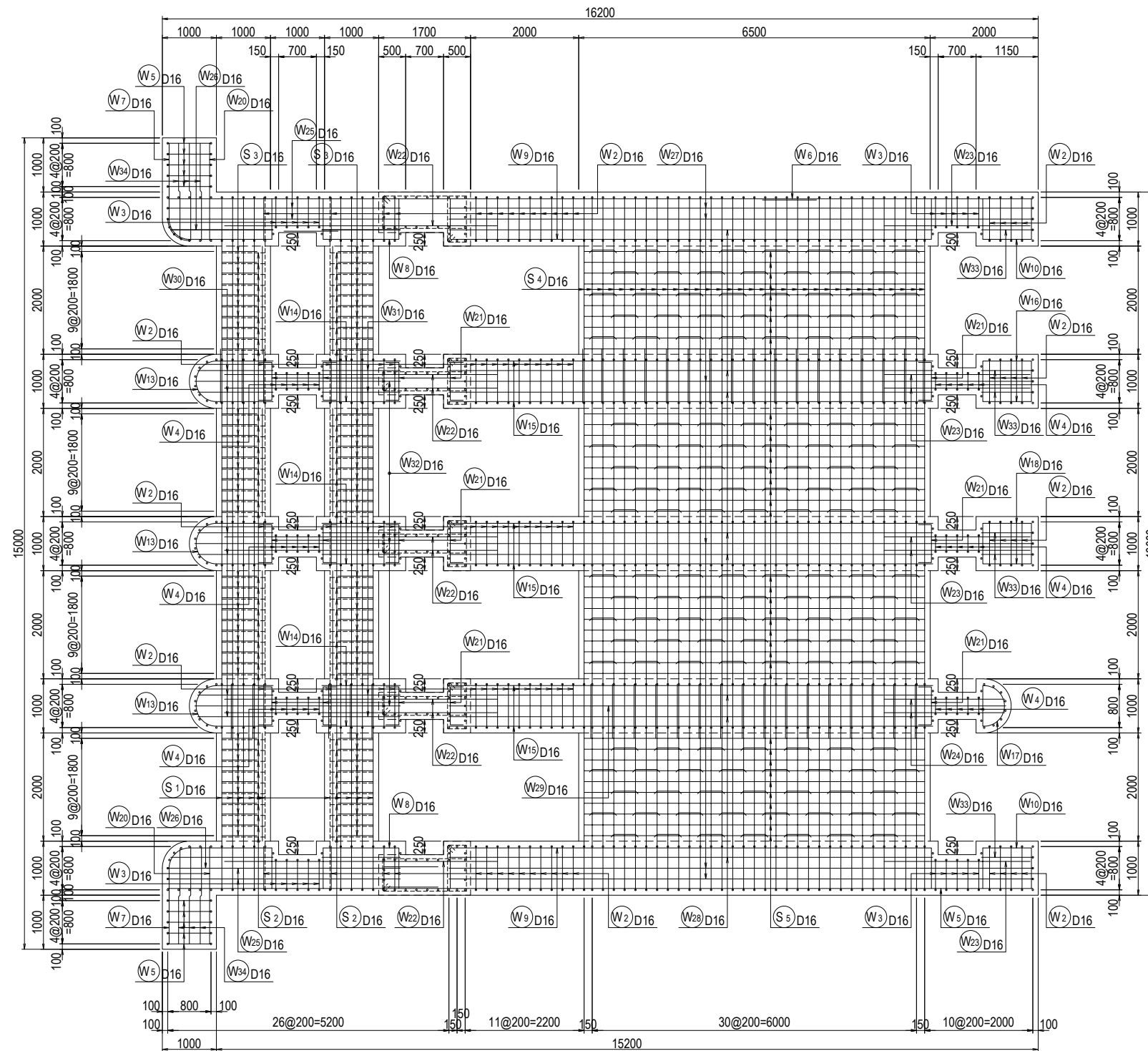


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Abo Gabal Regulator Sections (2)		DRW. NO. CA-5
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:



# Plan of Upstream Gate Abutment and Pier of Abo Gabal Regulator (1/2)

## Section A—A

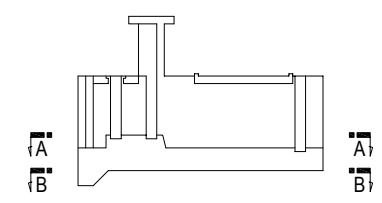
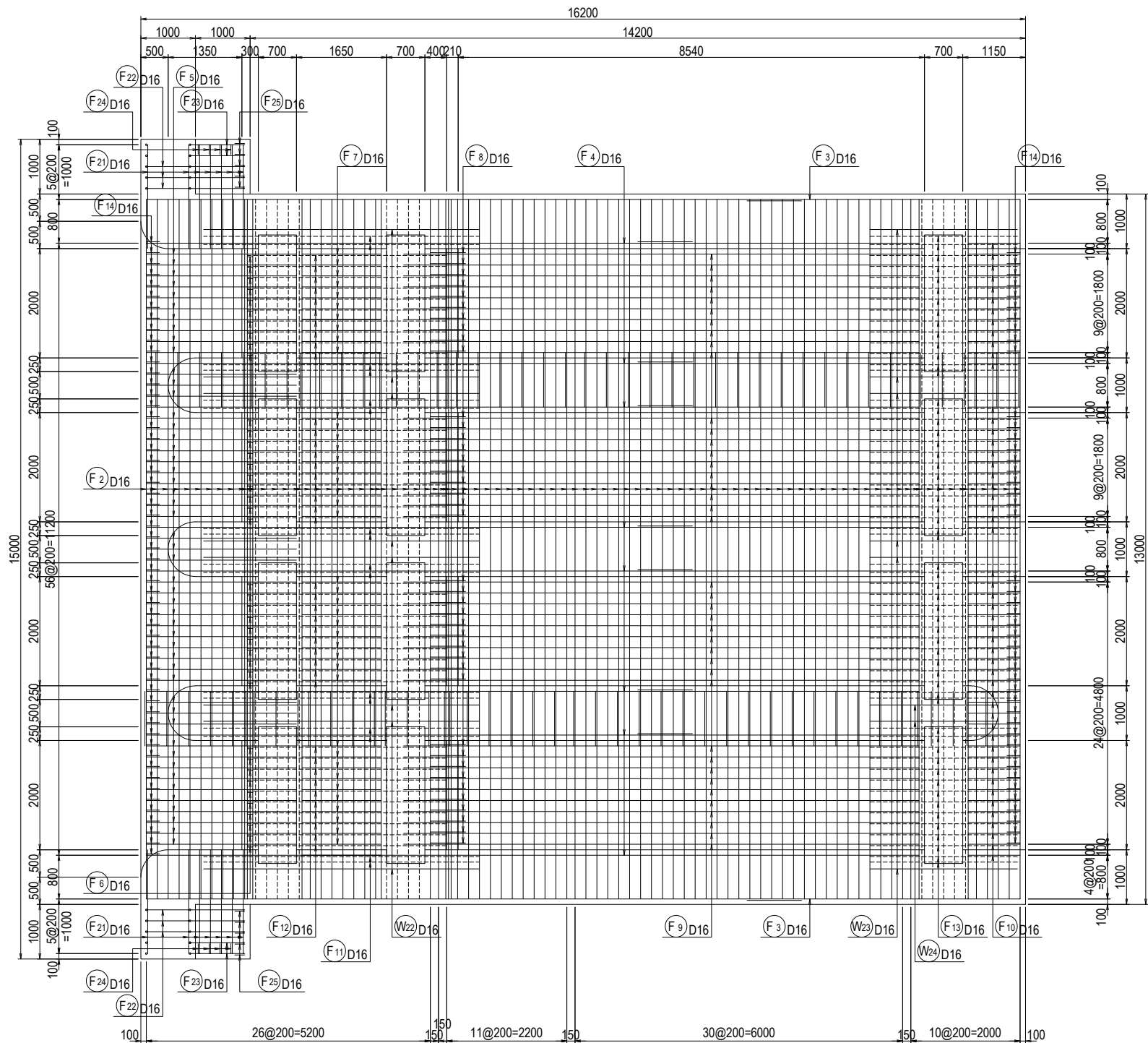


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Abo Gabal Regulator Bar arrangement of pier (2)			DRW. NO. CA-7
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:



# Plan of Upstream Apron of Abo Gabal Regulator (1/2)

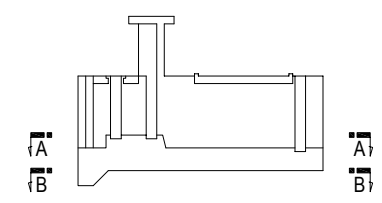
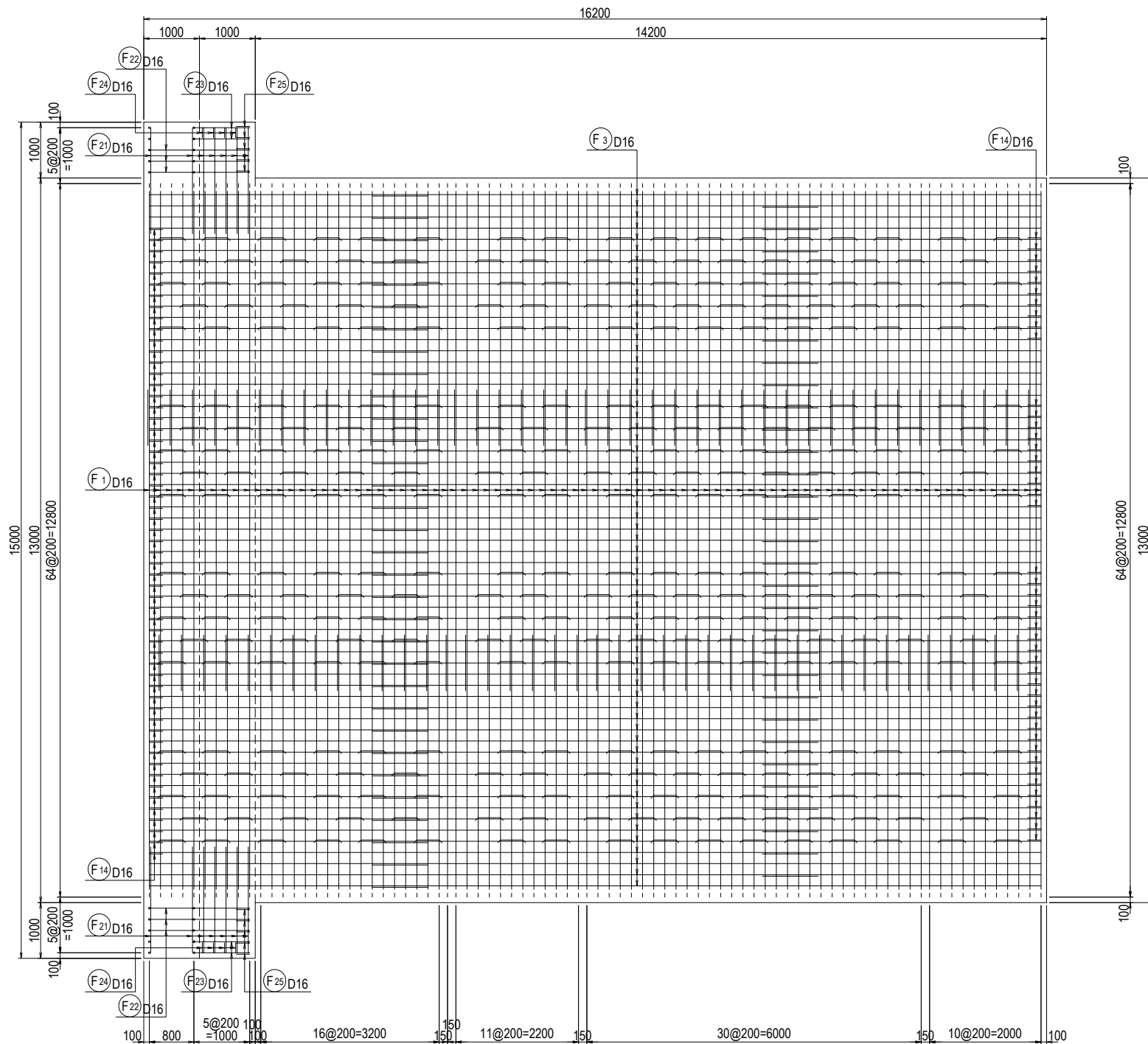
## Section A—A



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Abo Gabal Regulator Bar arrangement of pier (4)	DRW. NO. CA-9	
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

# Plan of Upstream Apron of Abo Gabal Regulator (2/2)

## Section B—B

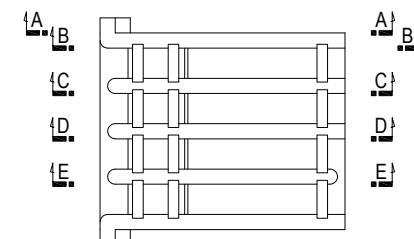
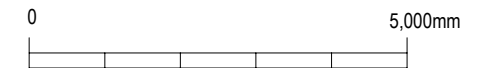
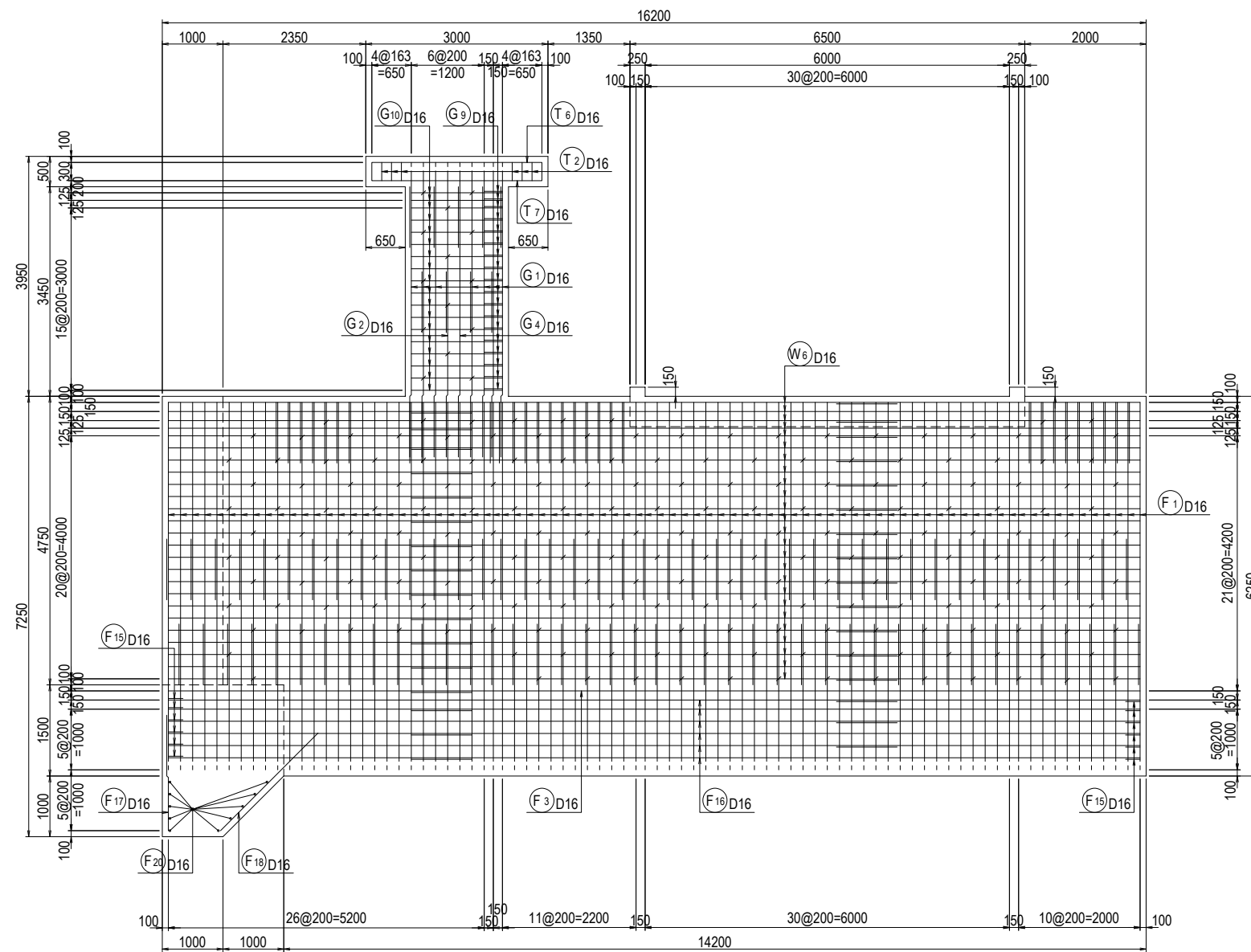


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Abo Gabal Regulator Bar arrangement of pier (5)			DRW. NO. CA-10
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:



# Longitudinal Section of Upstream Gate Abutment and Pier of Abo Gabal Regulator (1/5)

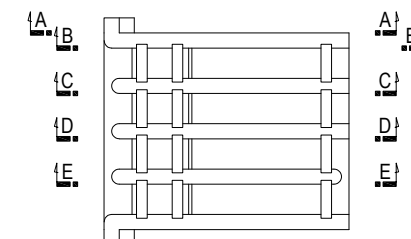
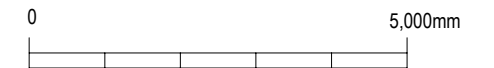
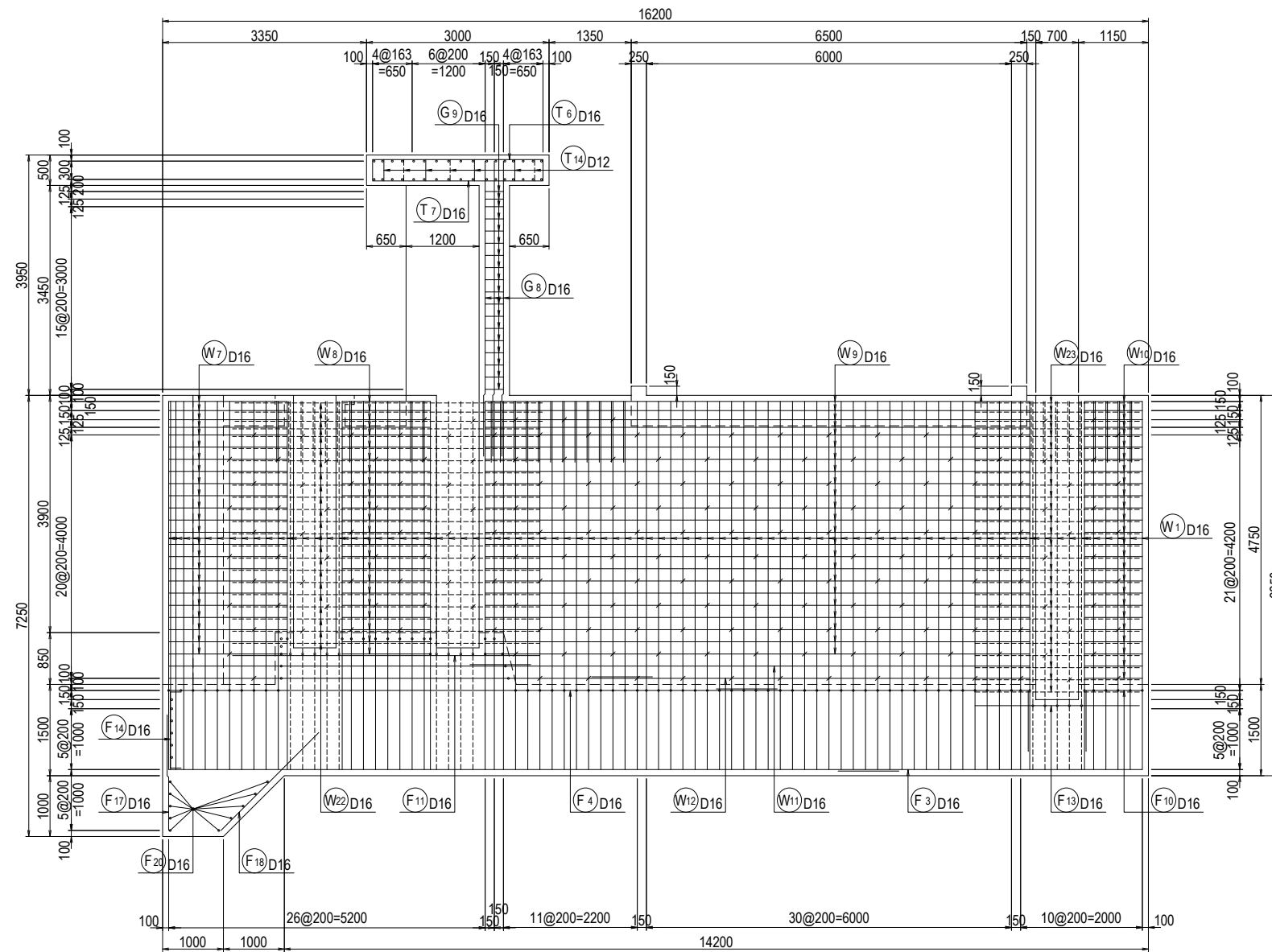
## Section A—A



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Abo Gabal Regulator Bar arrangement of pier (6)			<b>DRW. NO.</b> CA-11
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Longitudinal Section of Upstream Gate Abutment and Pier of Abo Gabal Regulator (2/5)

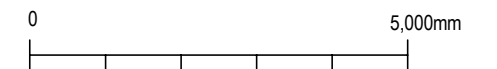
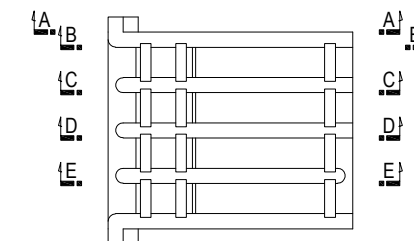
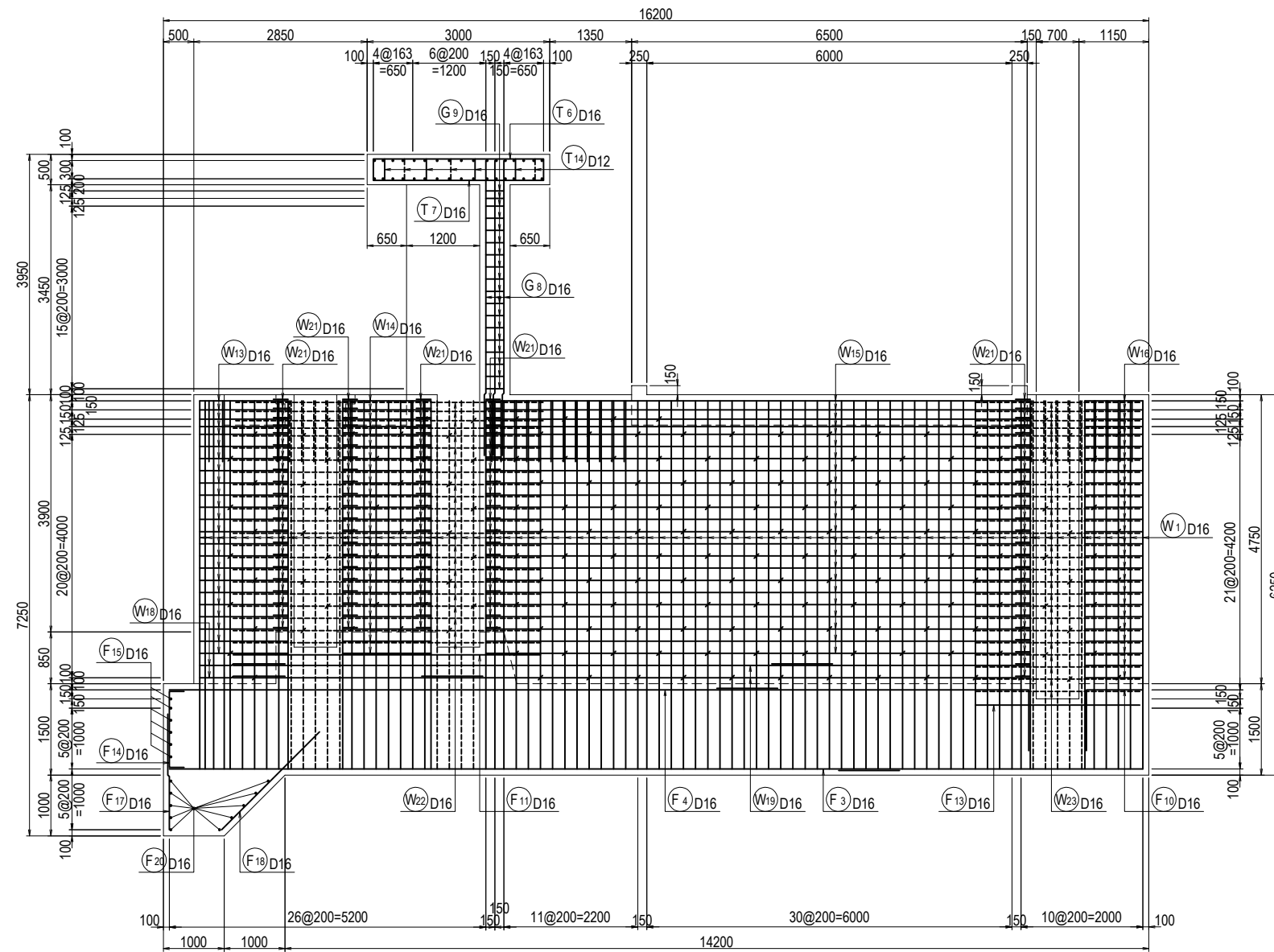
## Section B—B



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Abo Gabal Regulator Bar arrangement of pier (7)			DRW. NO. CA-12
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Longitudinal Section of Upstream Gate Abutment and Pier of Abo Gabal Regulator (3/5)

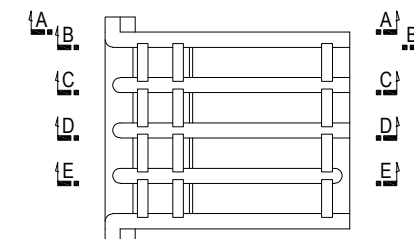
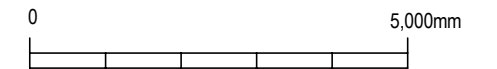
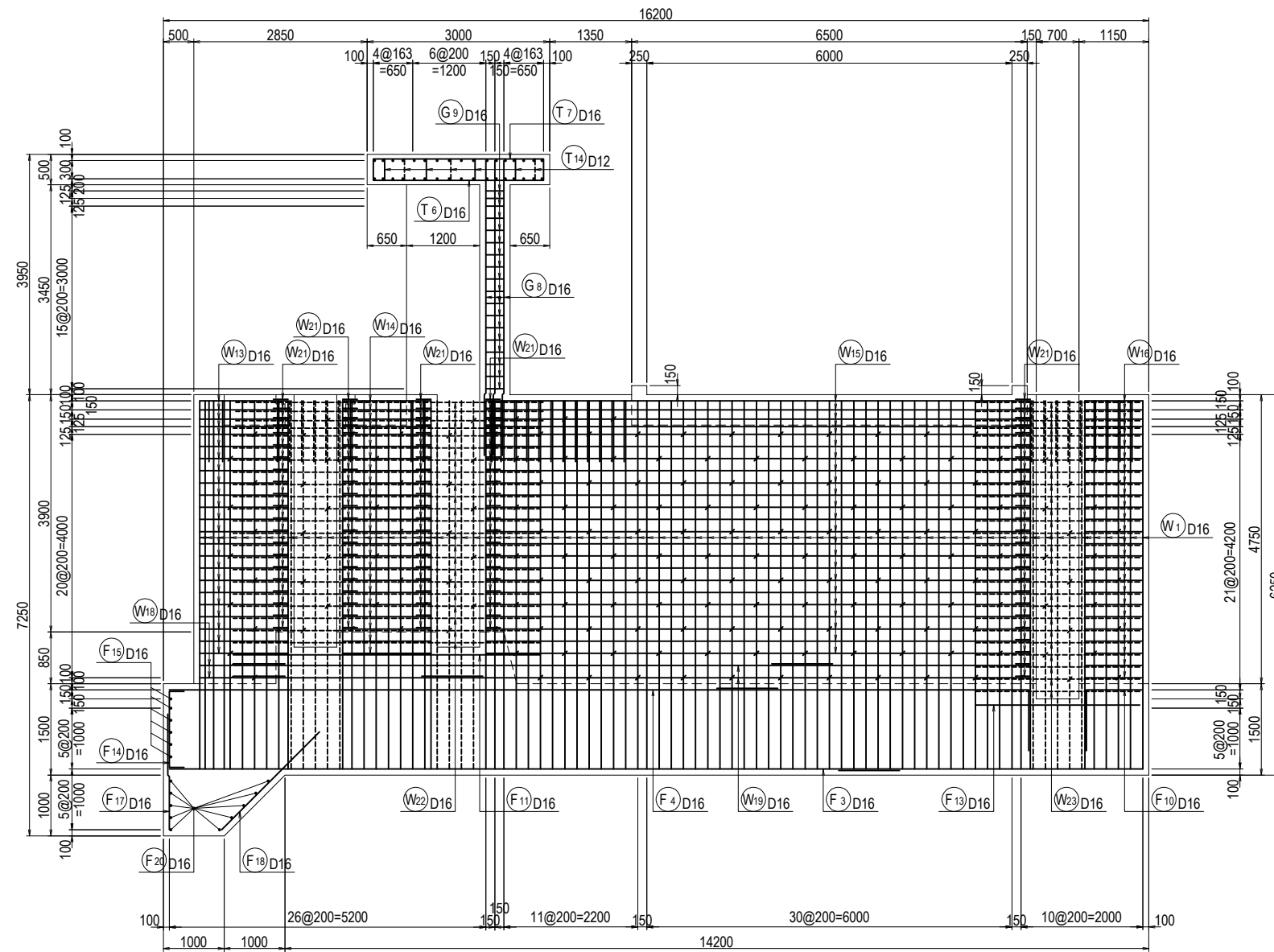
## Section C—C



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Abo Gabal Regulator Bar arrangement of pier (8)			DRW. NO. CA-13
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Longitudinal Section of Upstream Gate Abutment and Pier of Abo Gabal Regulator (4/5)

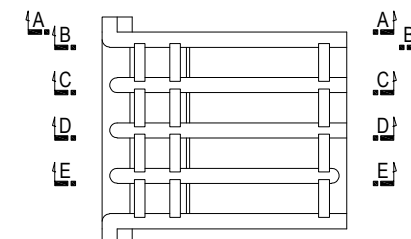
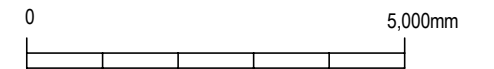
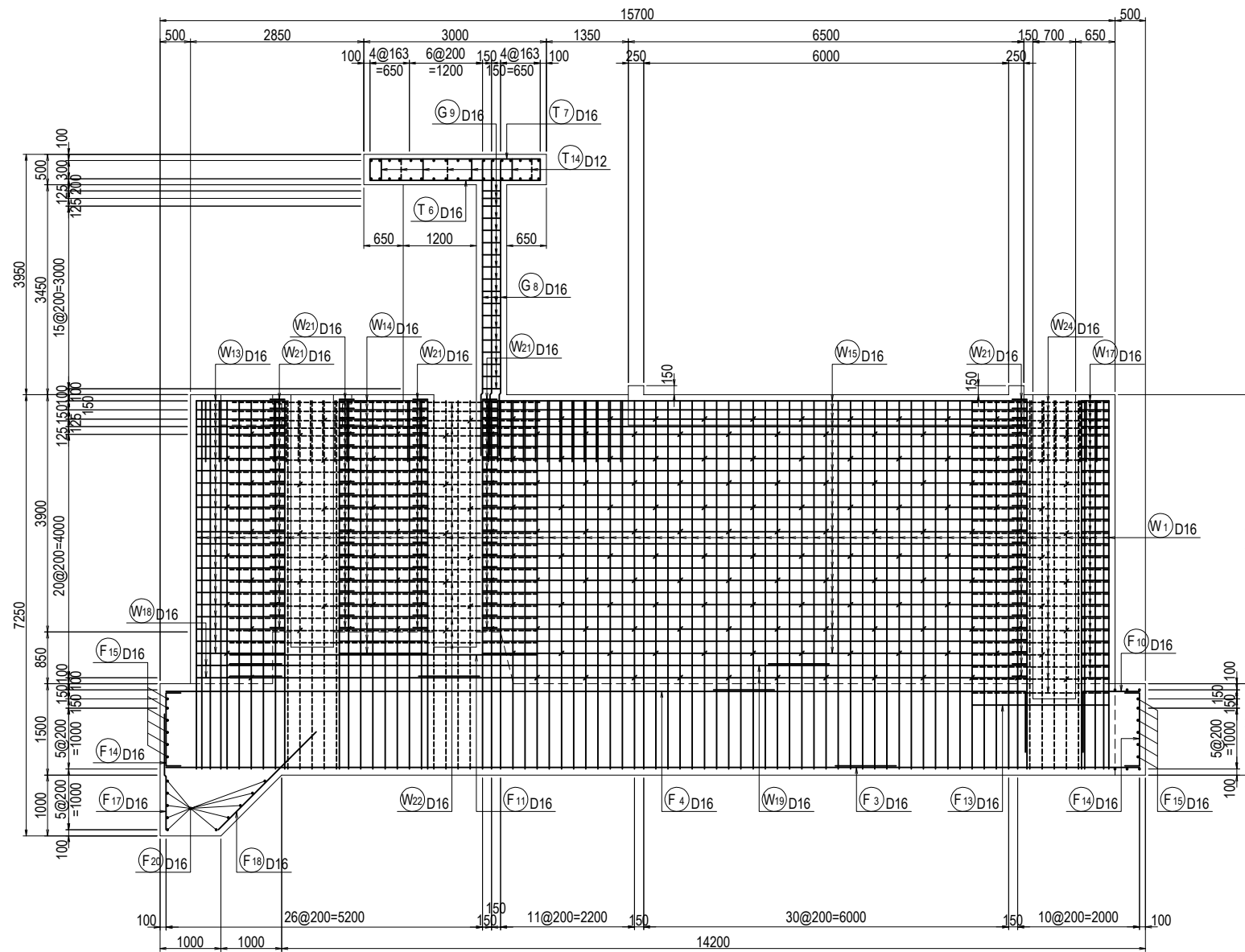
Section D—D



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Abo Gabal Regulator Bar arrangement of pier (9)			DRW. NO. CA-14
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Longitudinal Section of Upstream Gate Abutment and Pier of Abo Gabal Regulator (5/5)

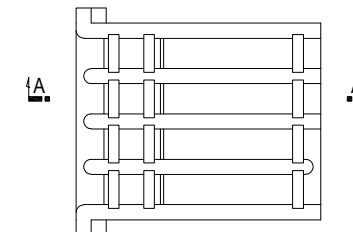
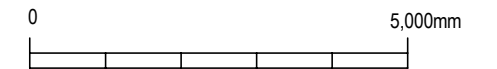
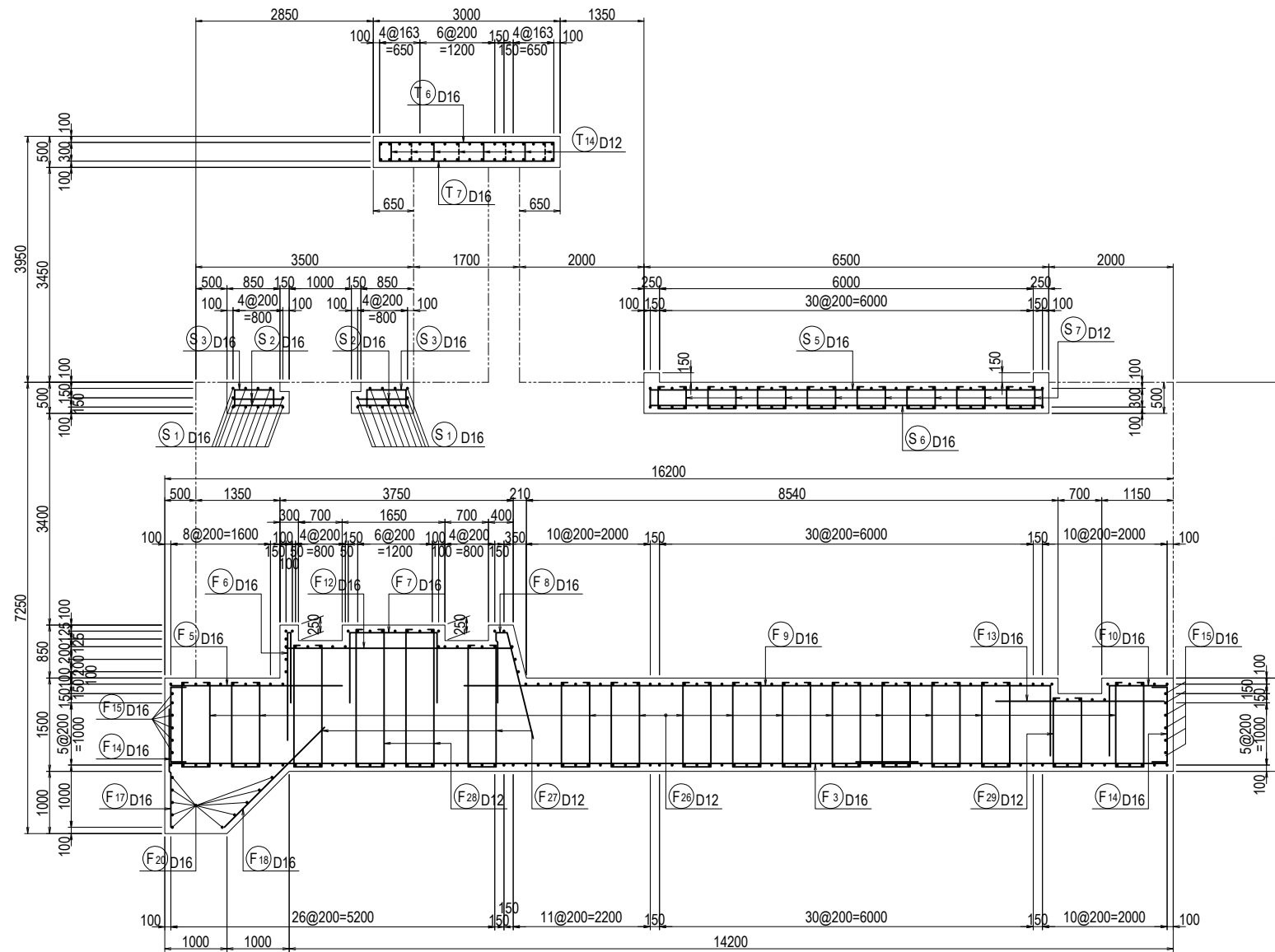
## Section E—E



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Abo Gabal Regulator Bar arrangement of pier (10)			DRW. NO. CA-15
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Longitudinal Section of Upstream Apron of Abo Gabal Regulator

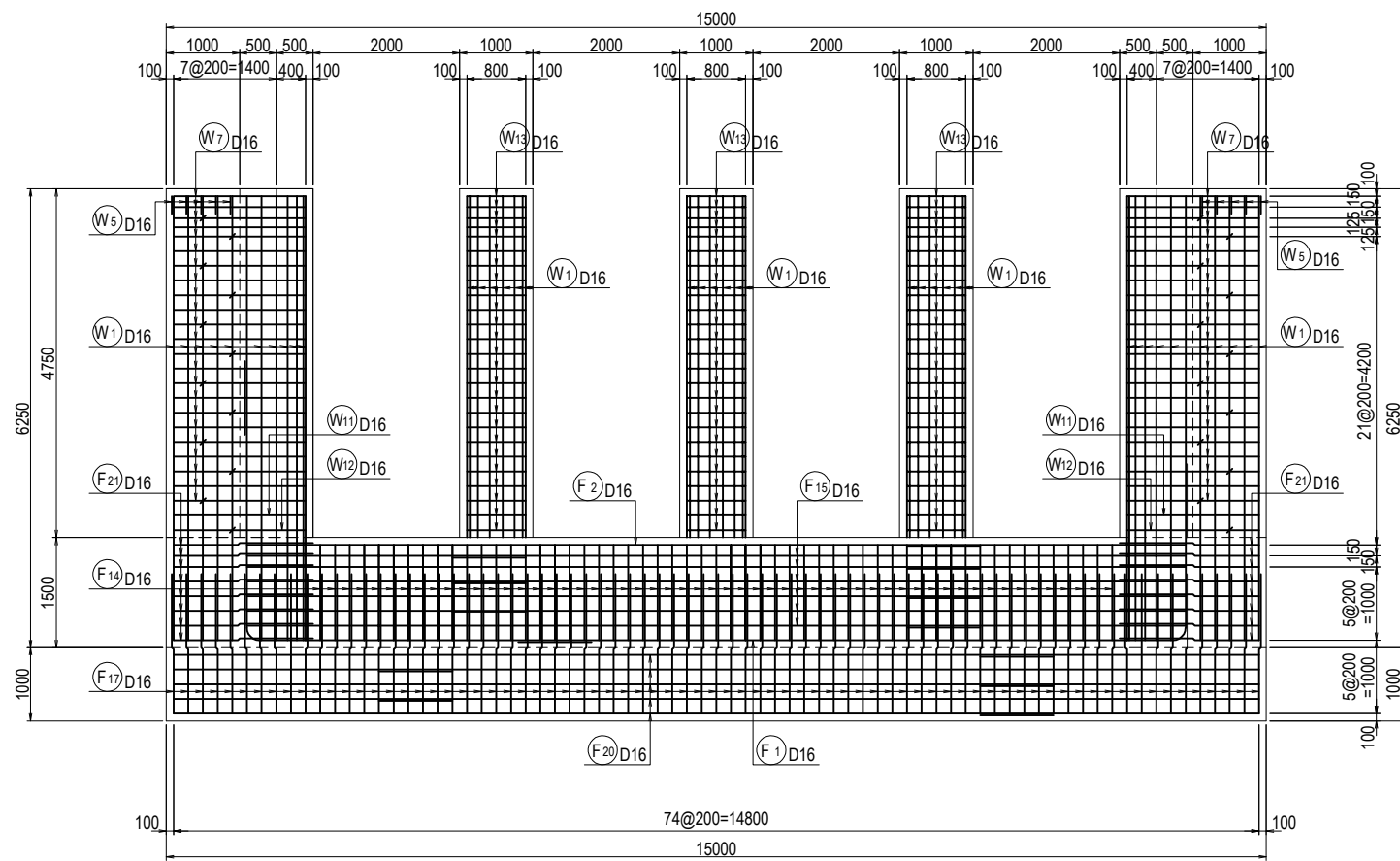
## Section A—A



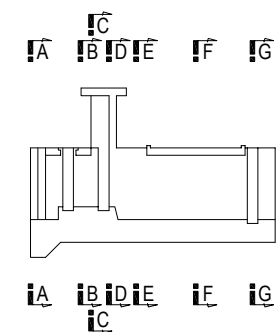
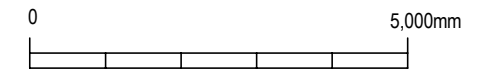
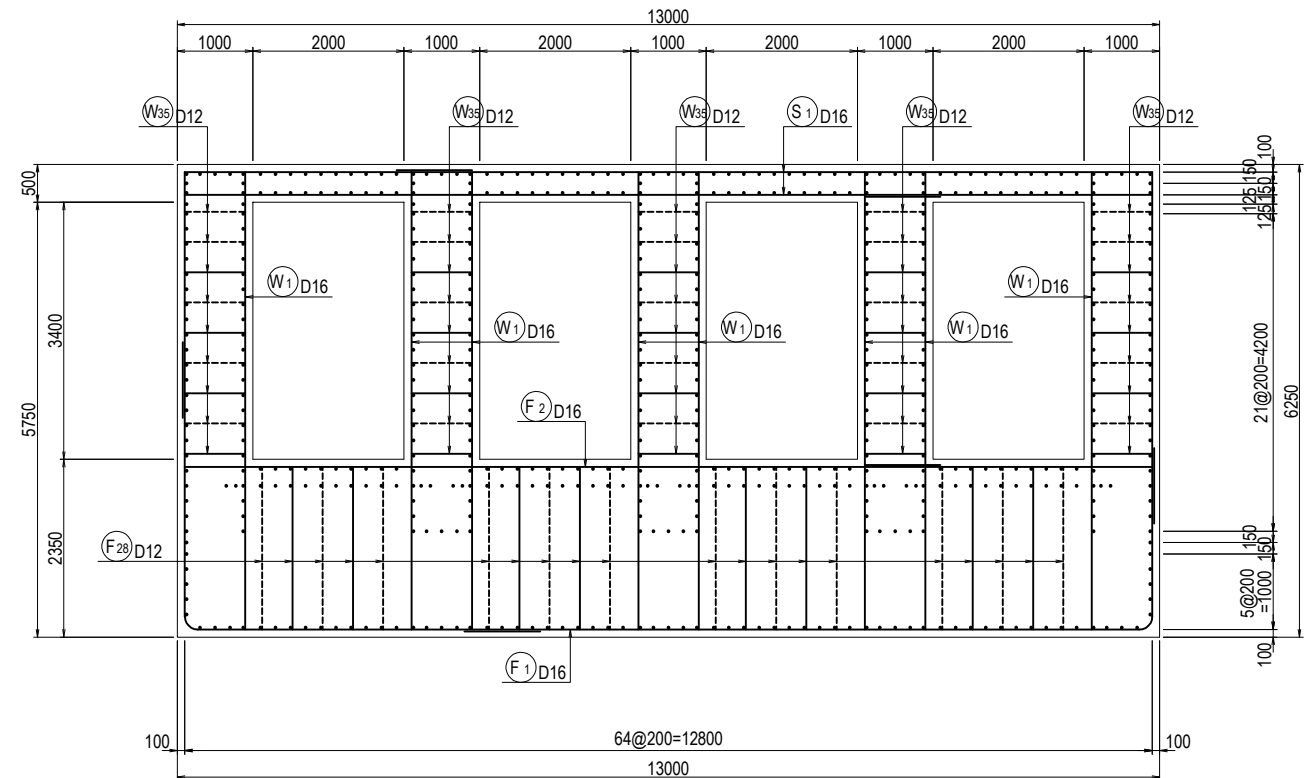
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Abo Gabal Regulator Bar arrangement of pier (11)			DRW. NO. CA-16
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	DATE:
DATE:	DATE:	DATE:	DATE:

# Section of Upstream Gate Abutment and Pier of Abo Gabal Regulator (1/3)

Section A—A



Section B—B

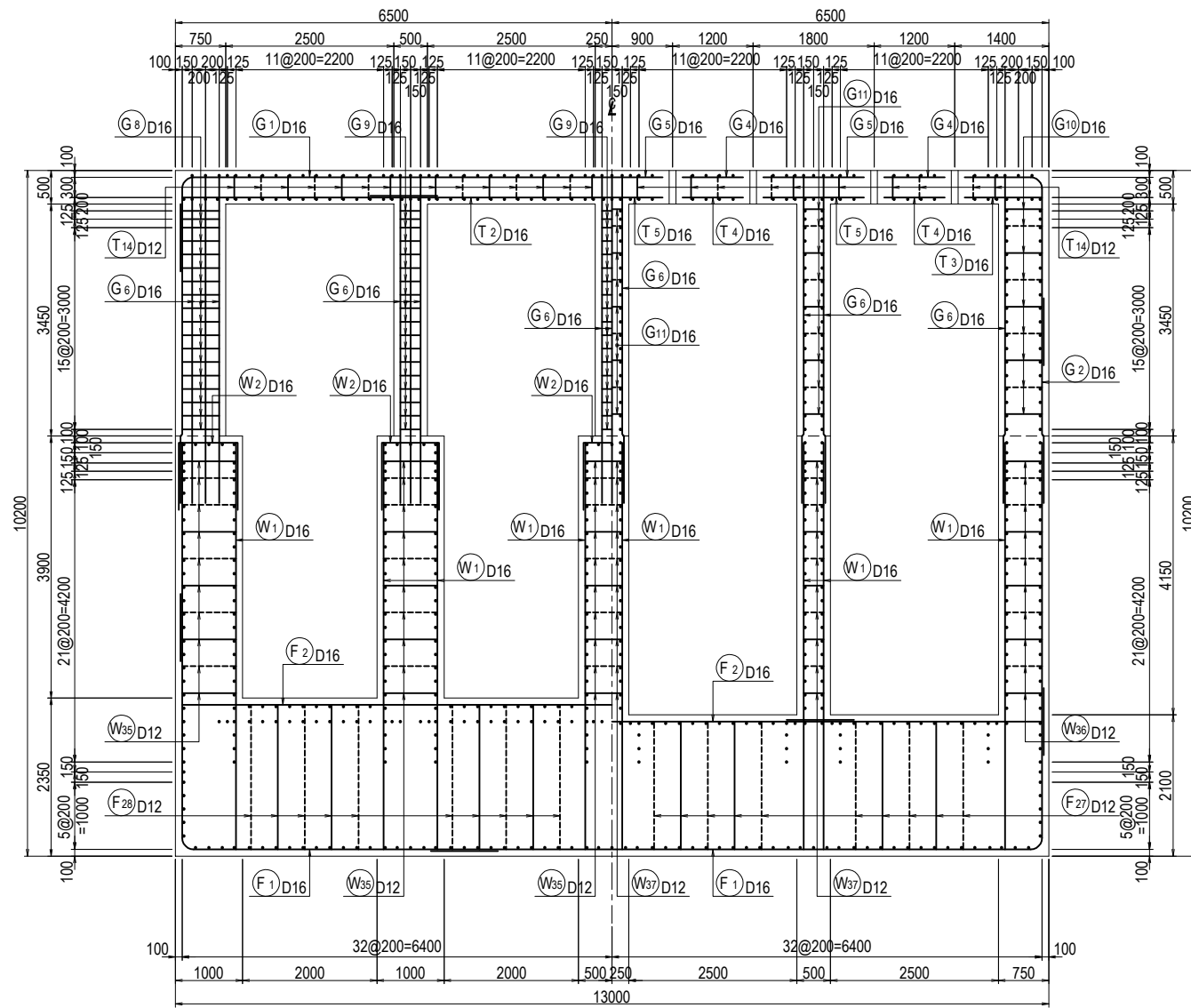


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Abo Gabal Regulator Bar arrangement of pier (12)			<b>DRW. NO.</b> CA-17
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	DATE:

# Section of Upstream Gate Abutment and Pier of Abo Gabal Regulator (2/3)

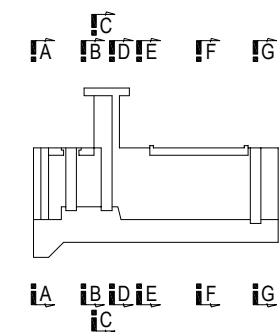
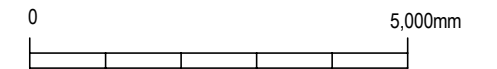
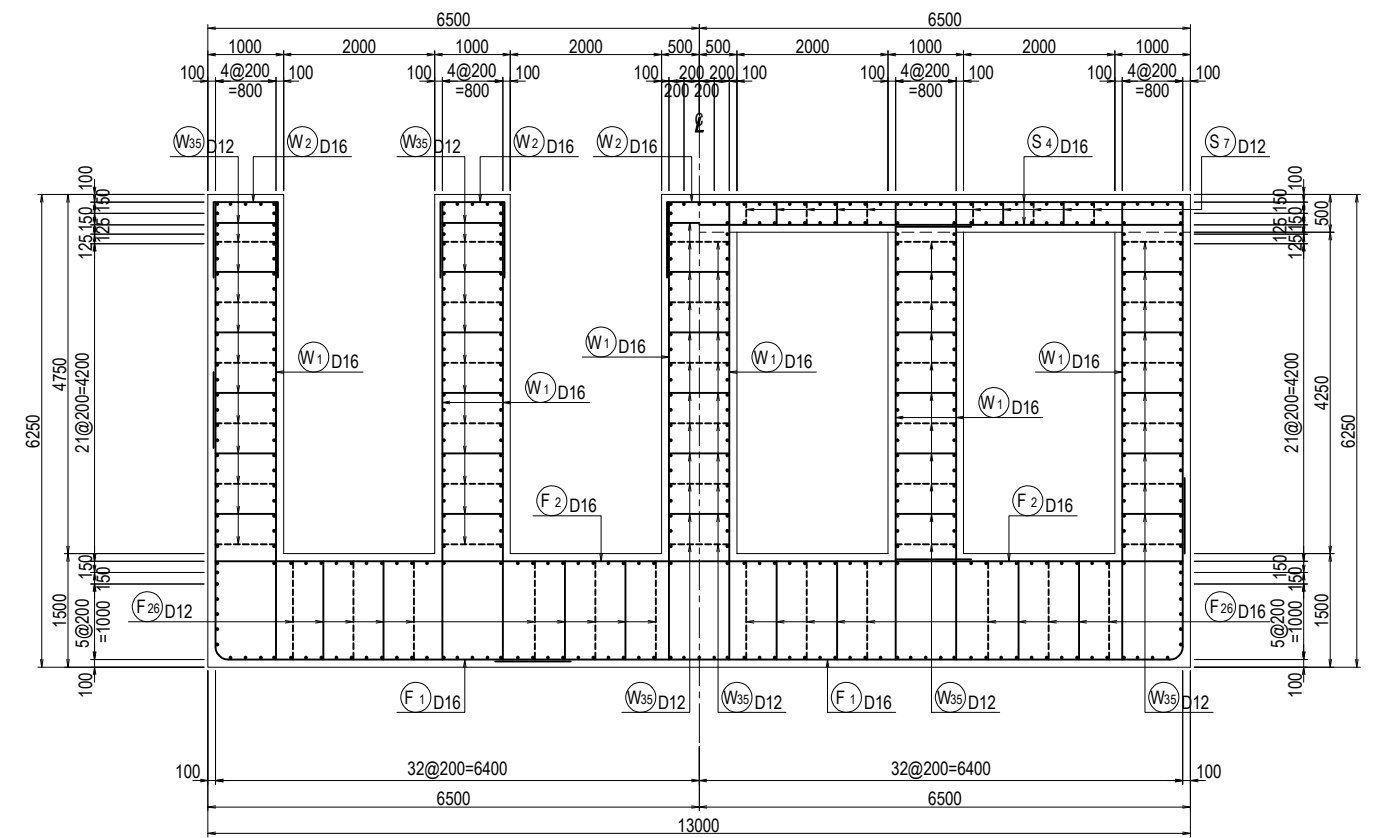
Section C—C

Section D—D



Section E—E

Section F—F

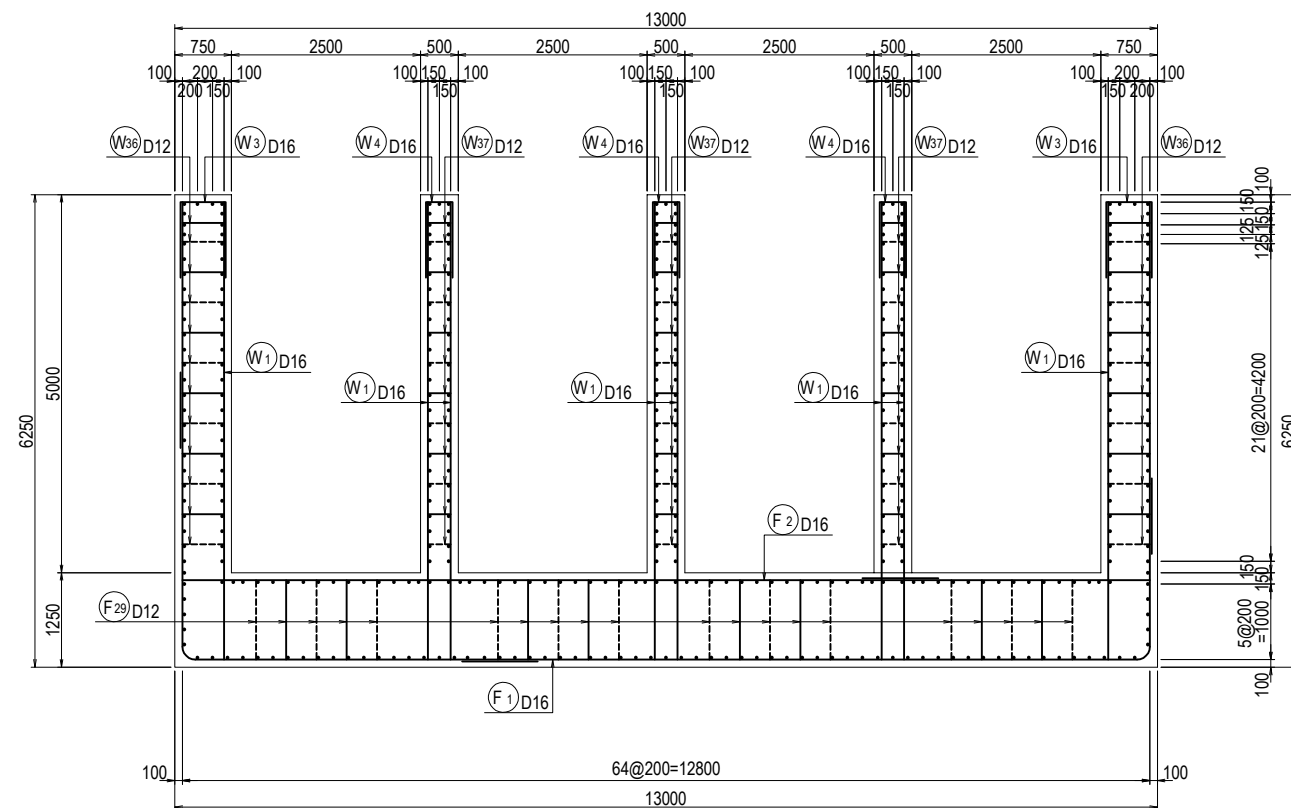


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Abo Gabal Regulator Bar arrangement of pier (13)		<b>DRW. NO.</b> CA-18
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

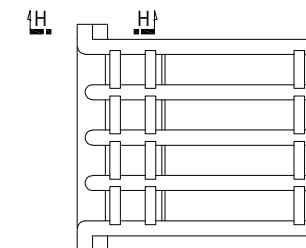
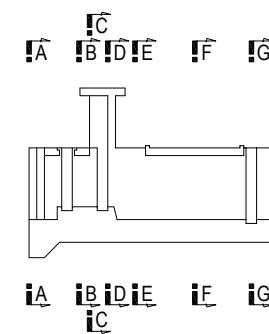
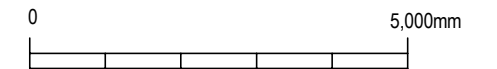
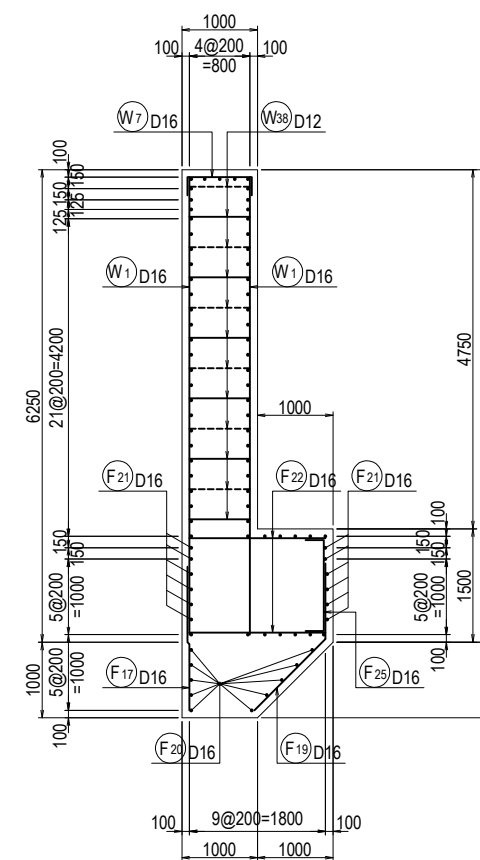


# Section of Upstream Gate Abutment and Pier of Abo Gabal Regulator (3/3)

Section G—G



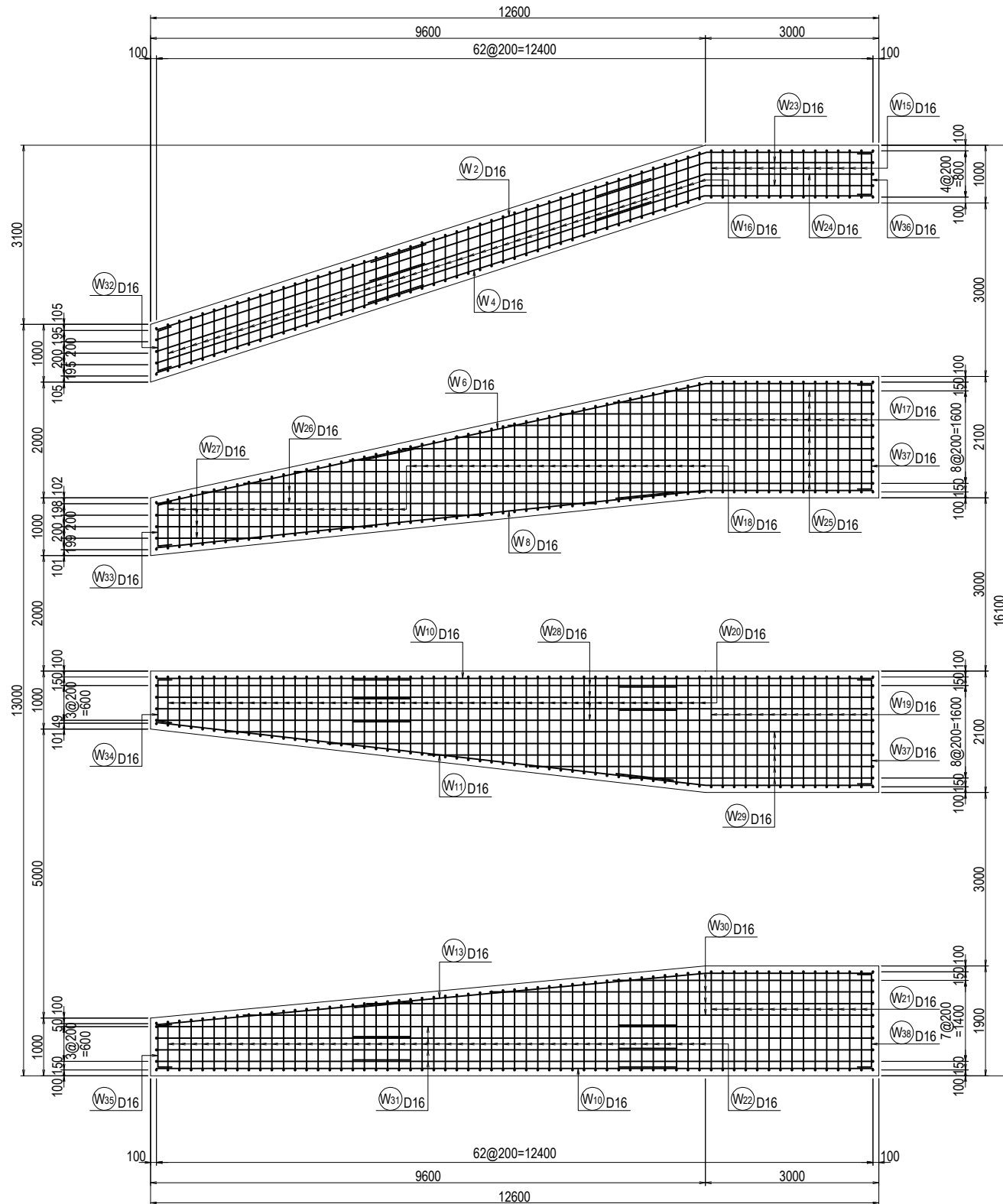
Section H—H



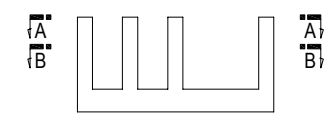
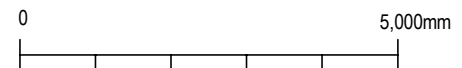
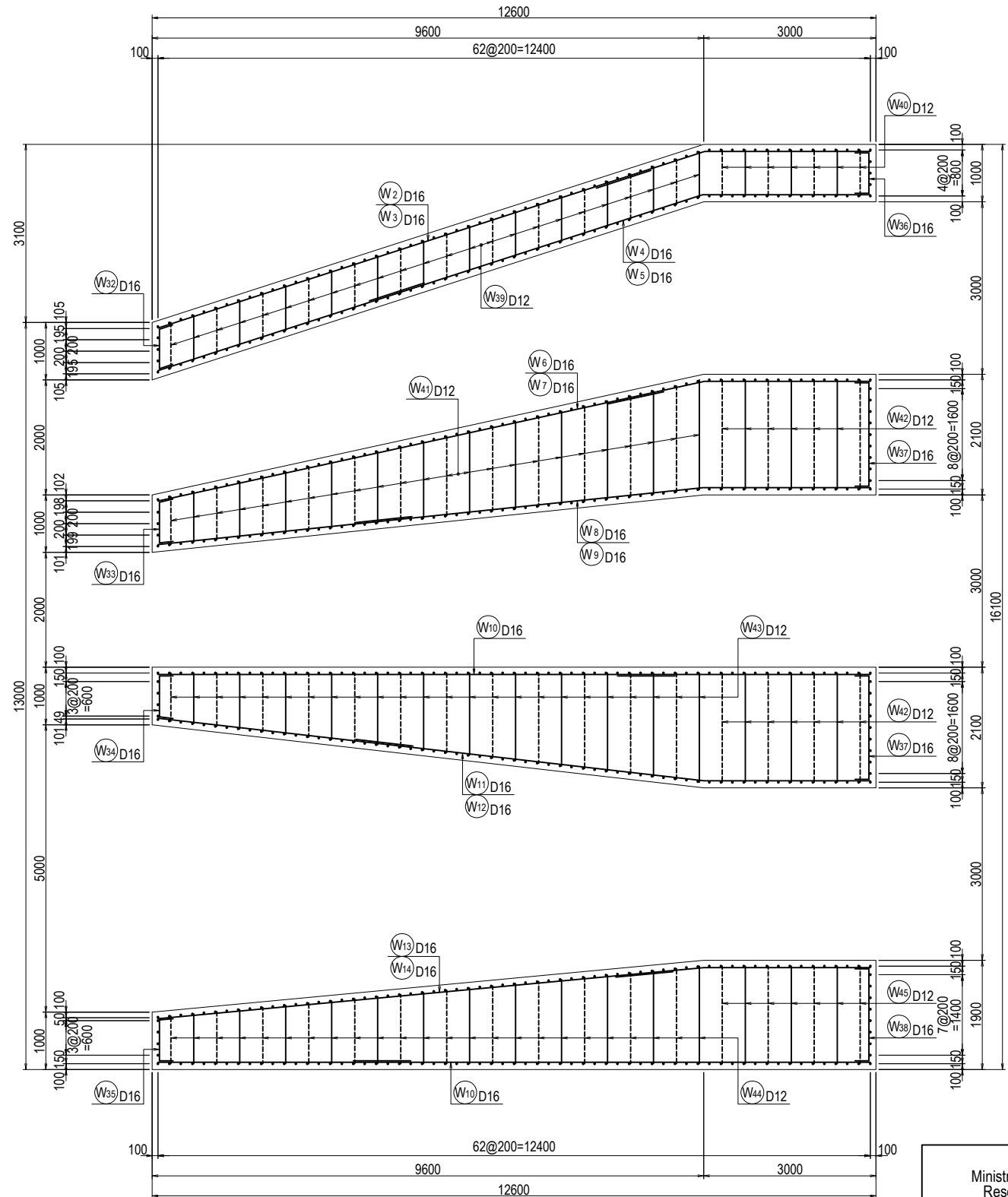
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Abo Gabal Regulator Bar arrangement of pier (14)			<b>DRW. NO.</b> CA-19
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	DATE:
DATE:	DATE:	DATE:	DATE:

# Detail of Down Stream Apron for Abo Gabal Regulator (1/4)

Section A—A



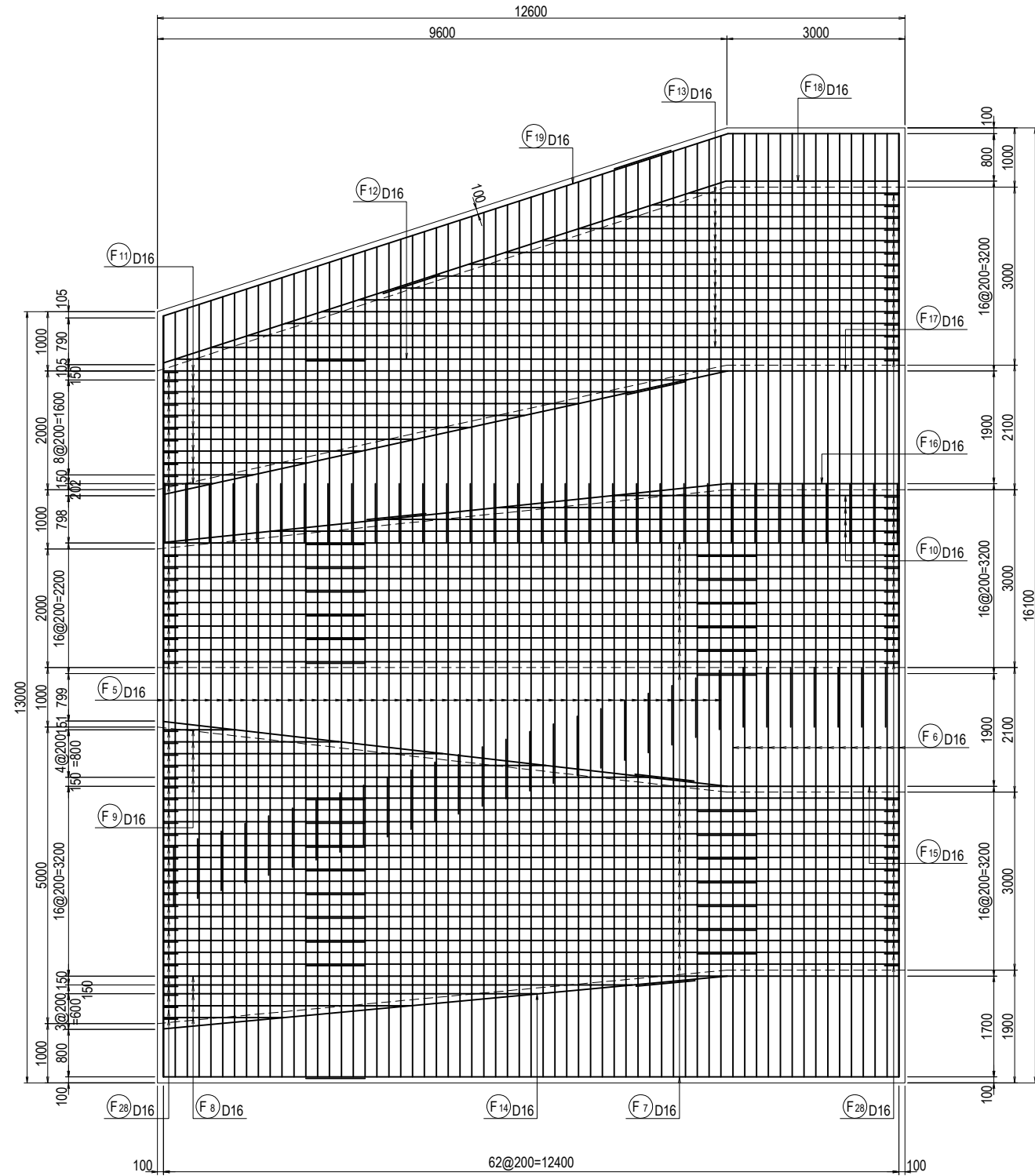
Section B—B



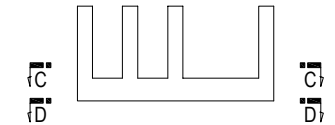
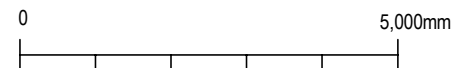
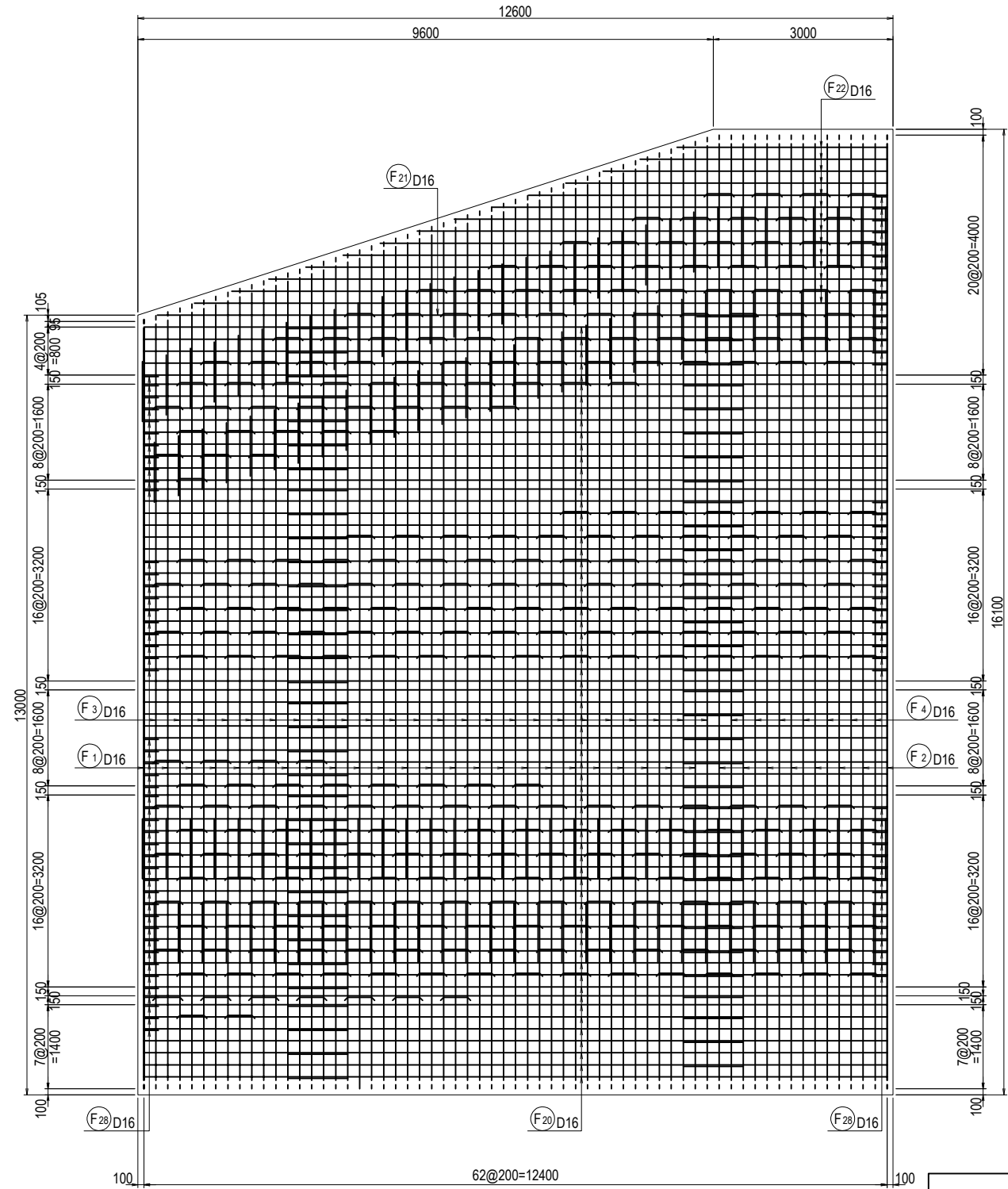
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Abo Gabal Regulator Bar arrangement of pier (15)	DRW. NO. CA-20	
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

# Detail of Down Stream Apron for Abo Gabal Regulator (2/4)

## Section C—C



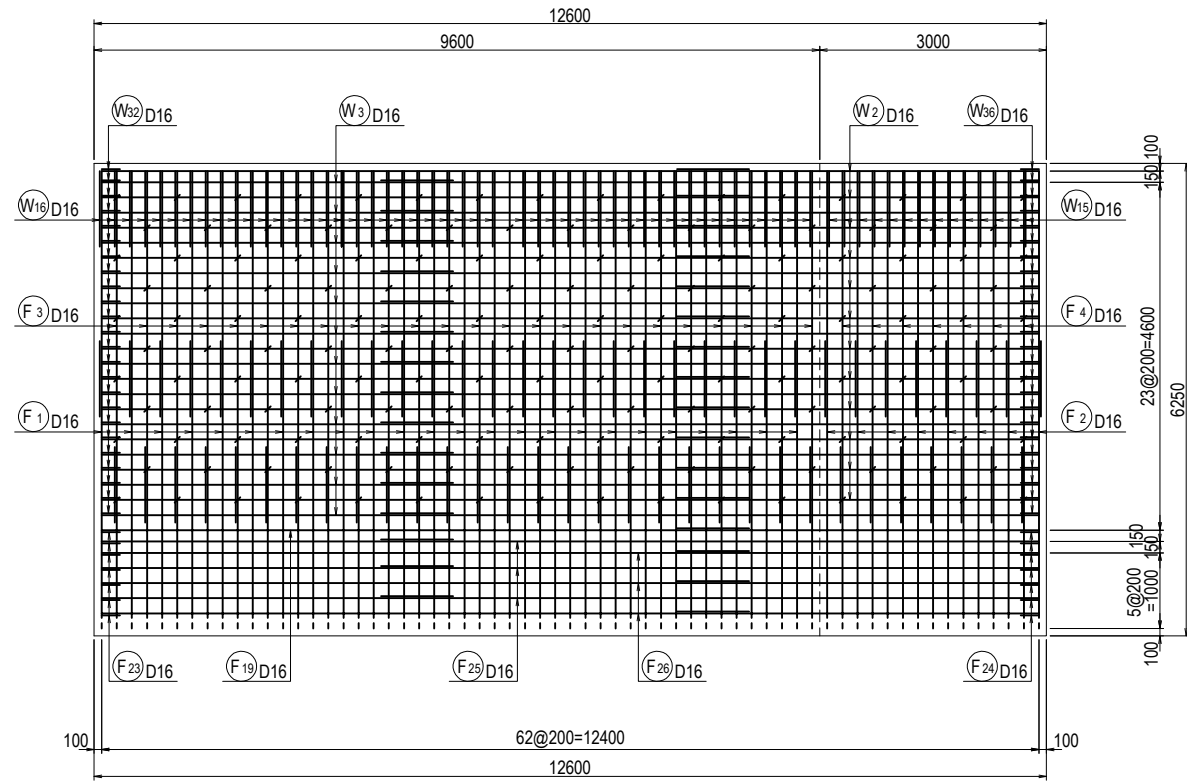
## Section D—D



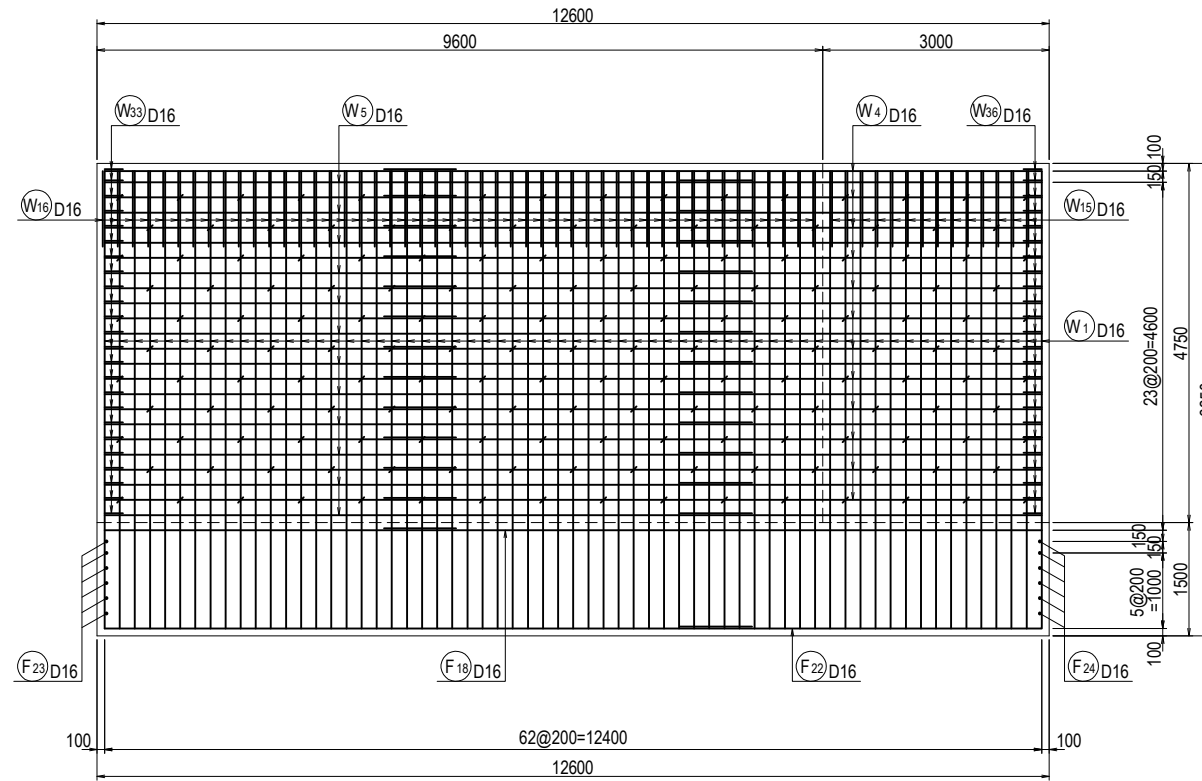
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Abo Gabal Regulator Bar arrangement of pier (16)	DRW. NO. CA-21	
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

# Detail of Down Stream Apron for Abo Gabal Regulator (3/4)

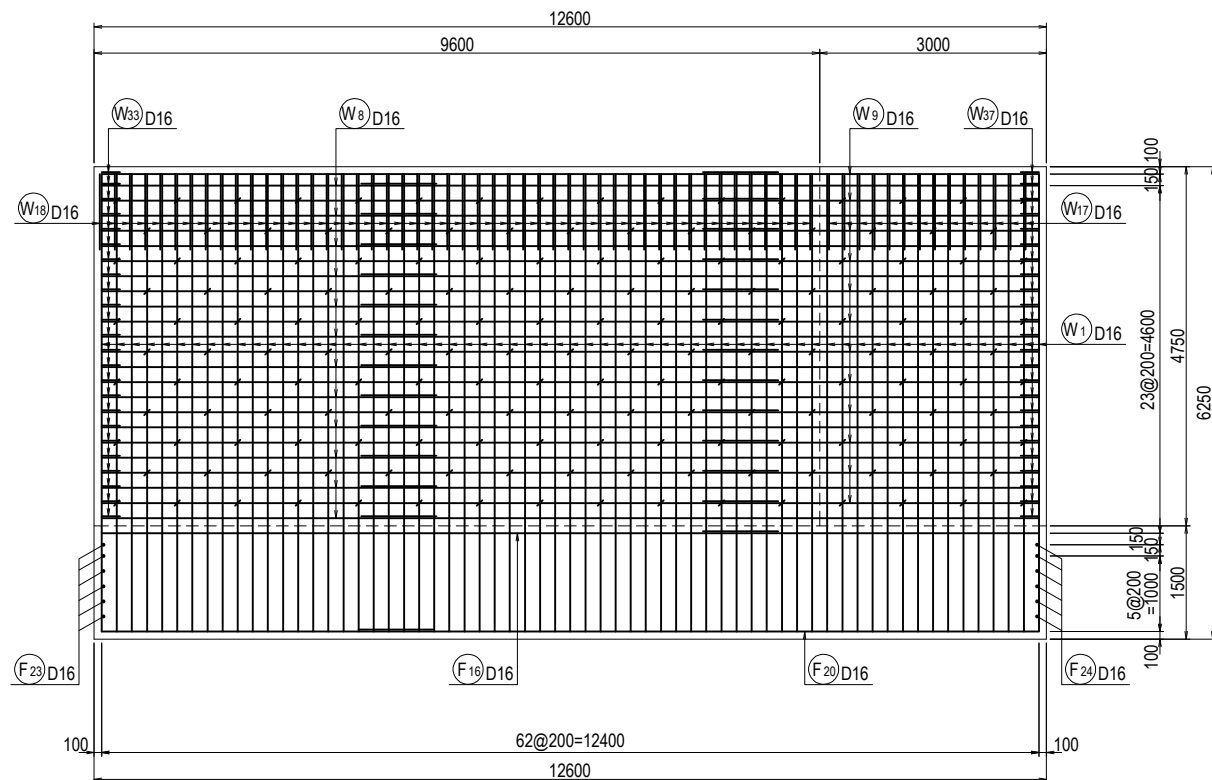
## Section E—E



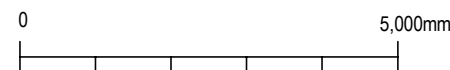
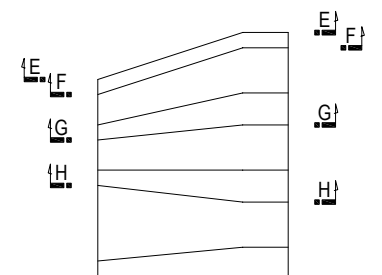
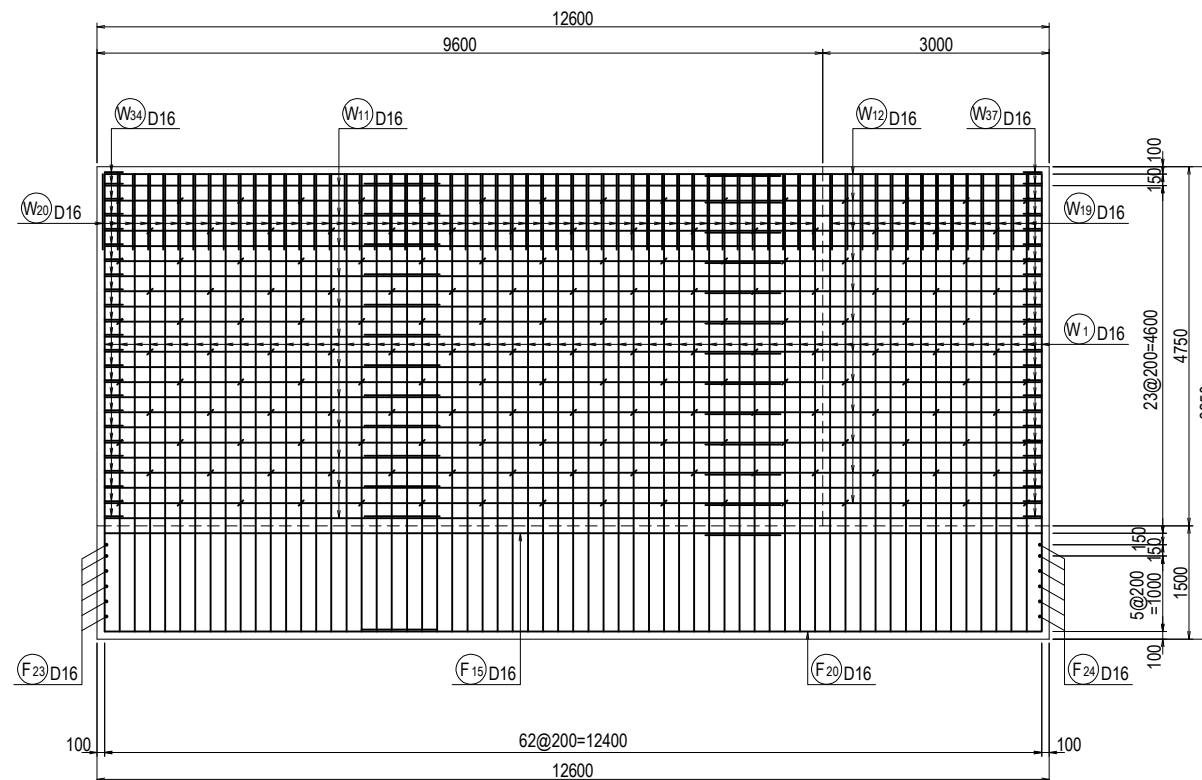
## Section F—F



## Section G—G



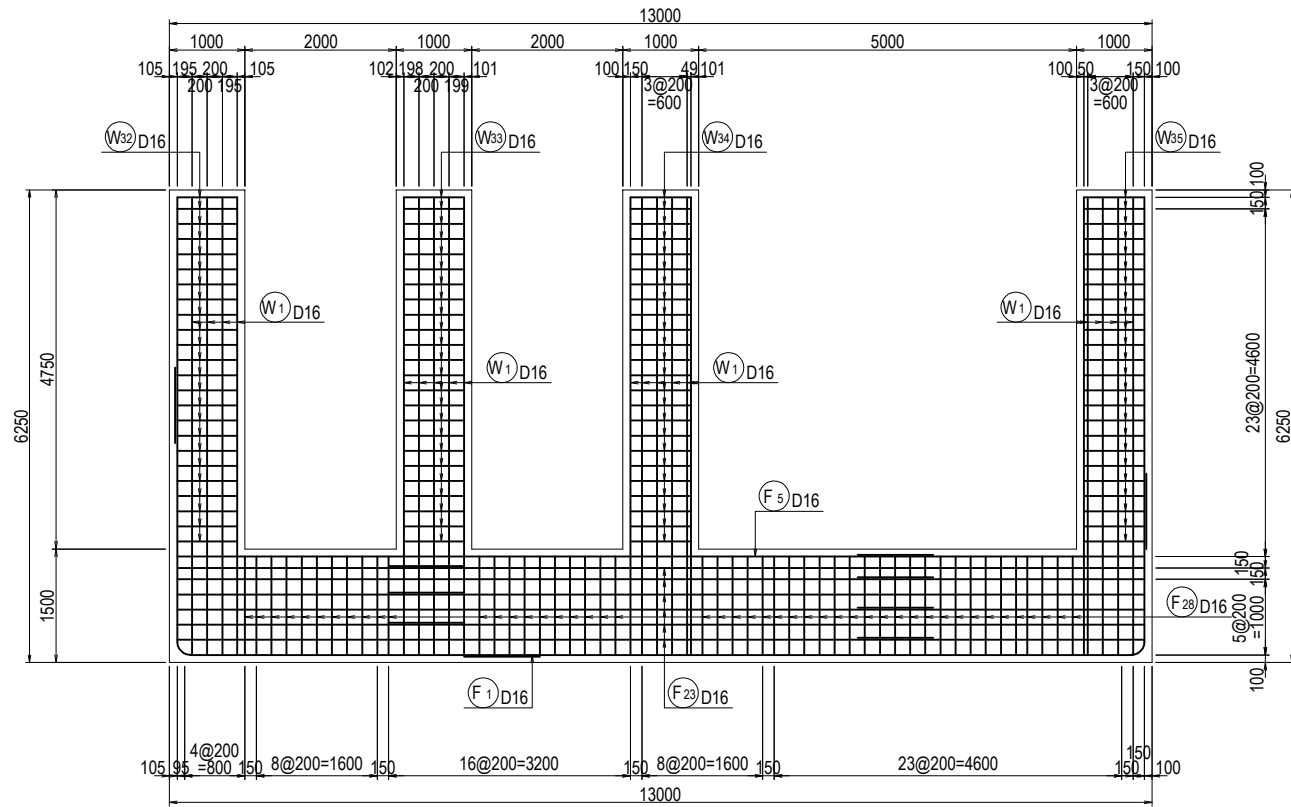
## Section H—H



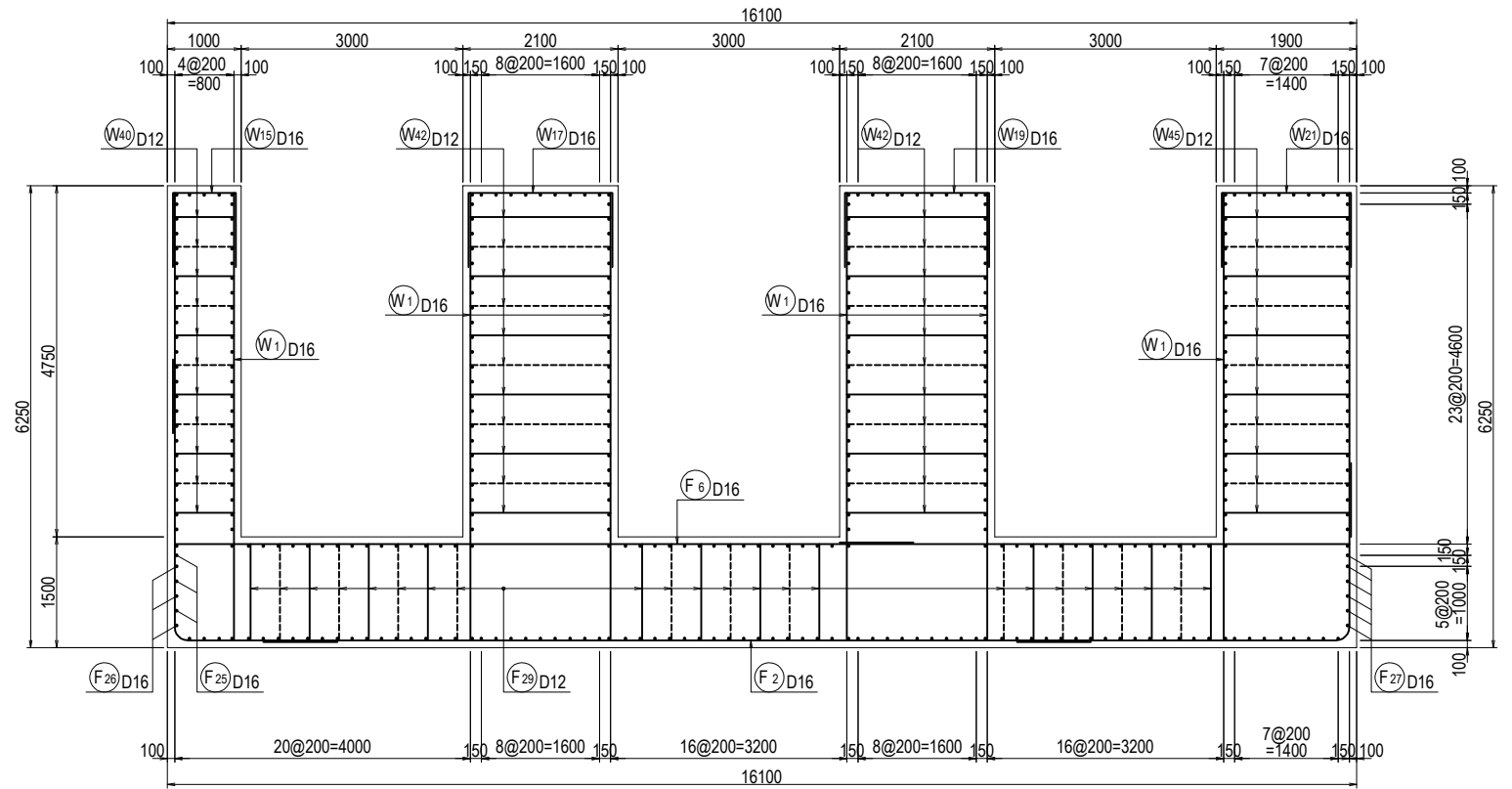
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Abo Gabal Regulator Bar arrangement of pier (17)			DRW. NO. CA-22
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	DATE:

# Detail of Down Stream Apron for Abo Gabal Regulator (4/4)

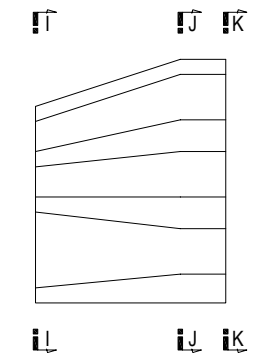
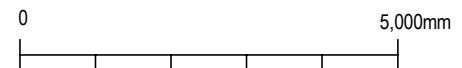
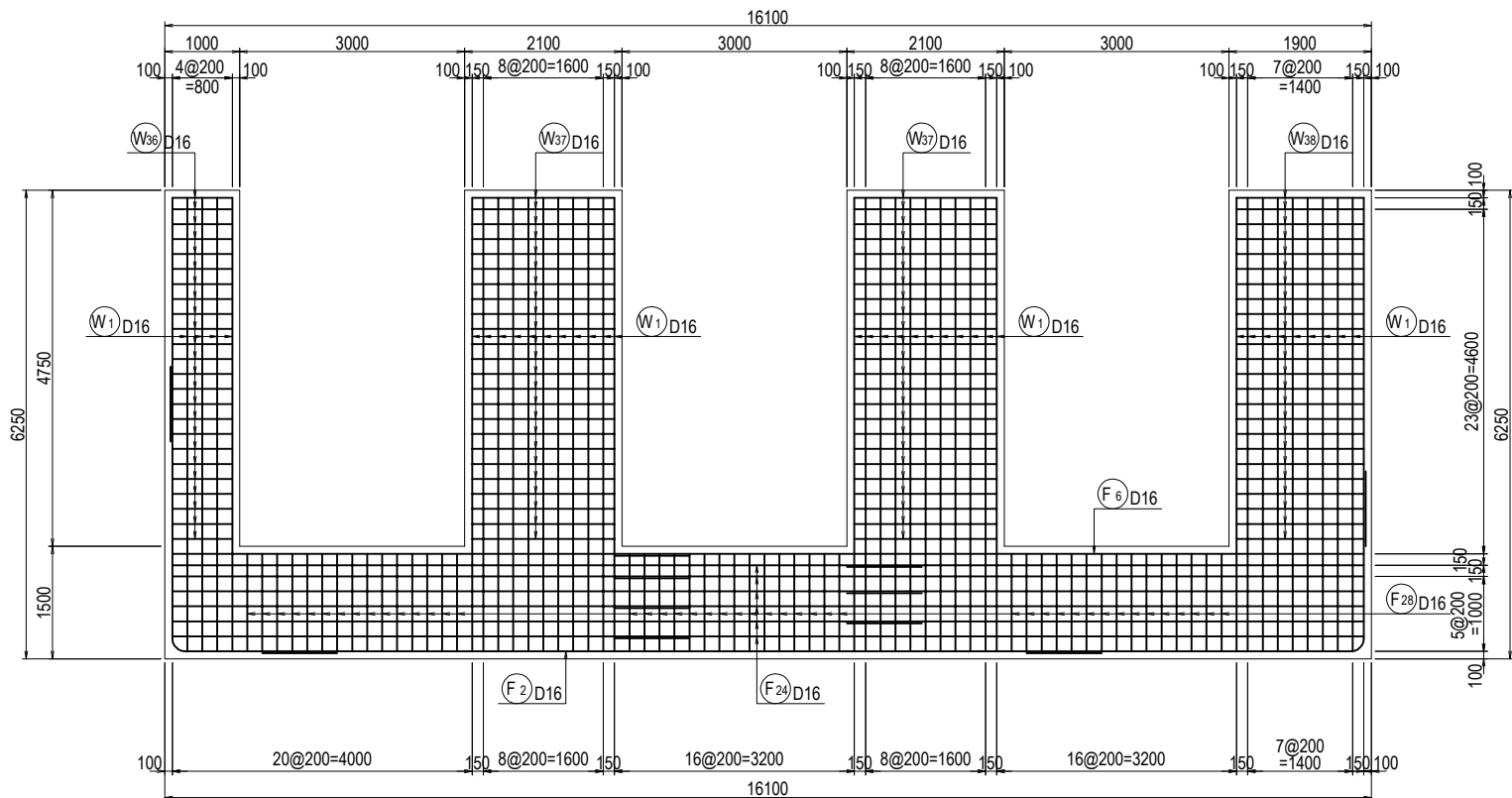
Section I—I



Section J—J



Section K—K



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Abo Gabal Regulator Bar arrangement of pier (18)			DRW. NO. CA-23
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

Item	Unit	Quantity
Excavation	C1	m2 104.05
Excavation	C2	m2 -
Backfilling	R	m2 33.99
Embankment	B0	m2 -
Embankment	BL	m2 13.80
Embankment	BR	m2 8.40
Earth Finishing Foundation	L1	m 16.30
Rough Finishing	L2	m 9.26

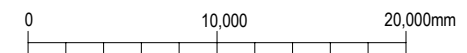
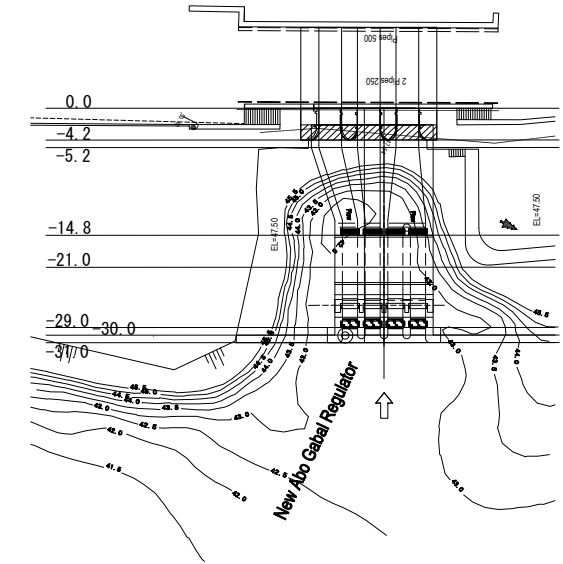
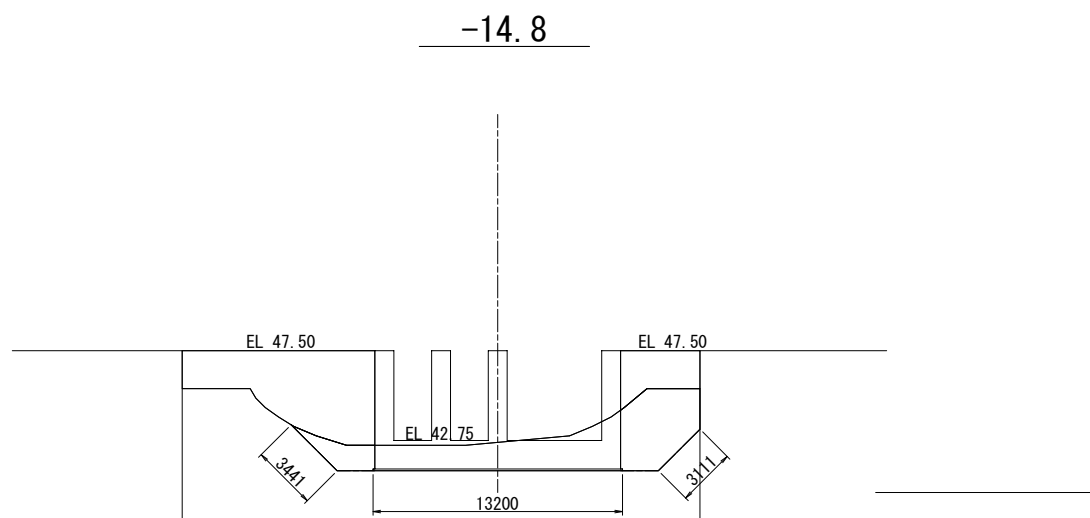
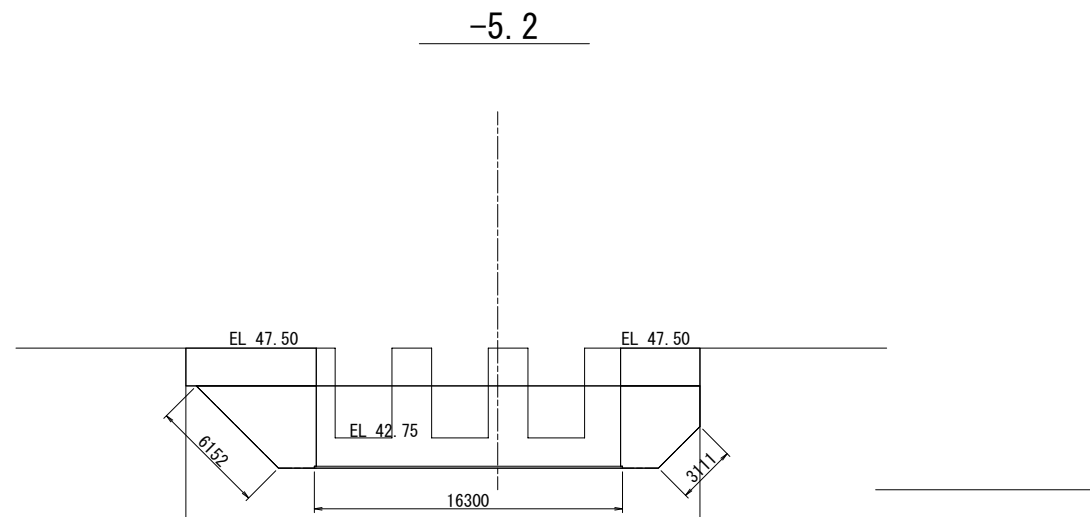
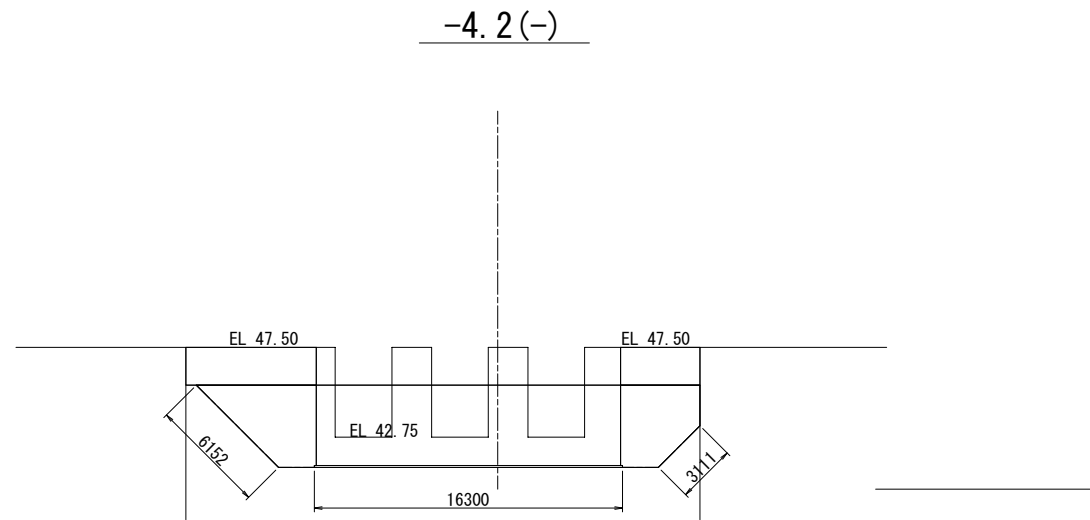
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Item	Unit	Quantity
Excavation	C1	m2 104.05
Excavation	C2	m2 -
Backfilling	R	m2 33.99
Embankment	B0	m2 -
Embankment	BL	m2 13.80
Embankment	BR	m2 8.40
Earth Finishing Foundation	L1	m 16.30
Rough Finishing	L2	m 9.26

DL=40.00

Item	Unit	Quantity
Excavation	C1	m2 41.41
Excavation	C2	m2 -
Backfilling	R	m2 19.48
Embankment	B0	m2 -
Embankment	BL	m2 34.73
Embankment	BR	m2 9.21
Earth Finishing Foundation	L1	m 13.20
Rough Finishing	L2	m 6.55

DL=40.00



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Abo Gabal Regulator Cross section of earth works (1)			DRW. NO. CA-24
SANYU CONSULTANTS INC.			
PREPARED BY :	CHECKED BY :	APPROVED BY :	
DATE :	DATE :	DATE :	DATE :

Item		Unit	Quantity
Excavation	C1	m2	41.47
Excavation	C2	m2	-
Backfilling	R	m2	17.00
Embankment	B0	m2	-
Embankment	BL	m2	34.95
Embankment	BR	m2	13.27
Earth Finishing Foundation	L1	m	13.20
Rough Finishing	L2	m	6.93

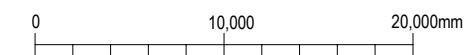
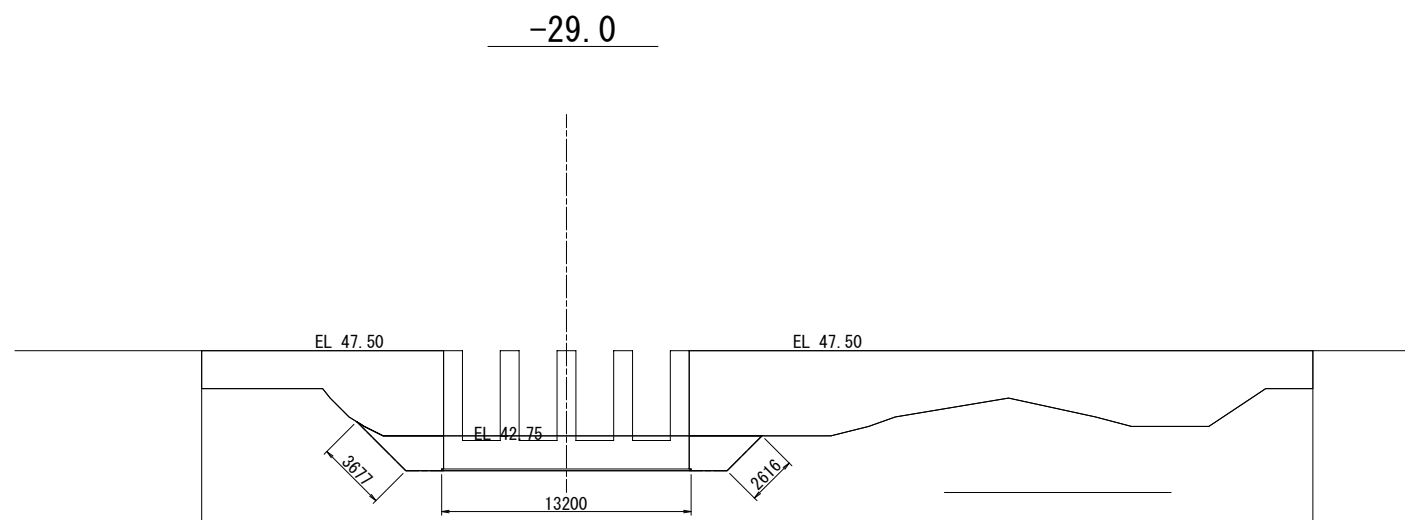
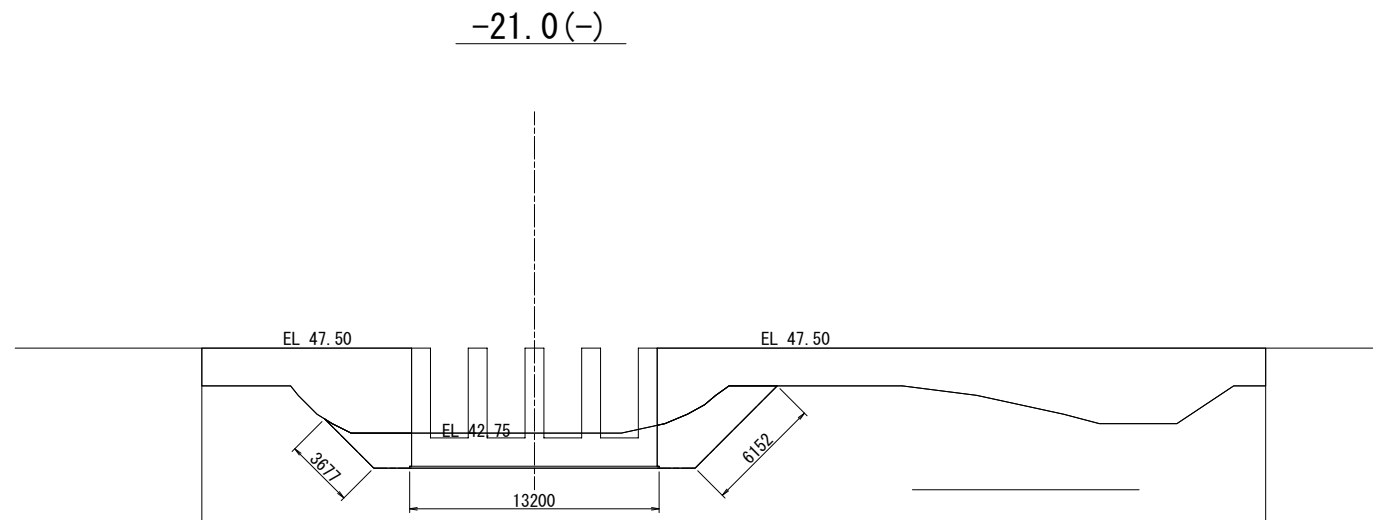
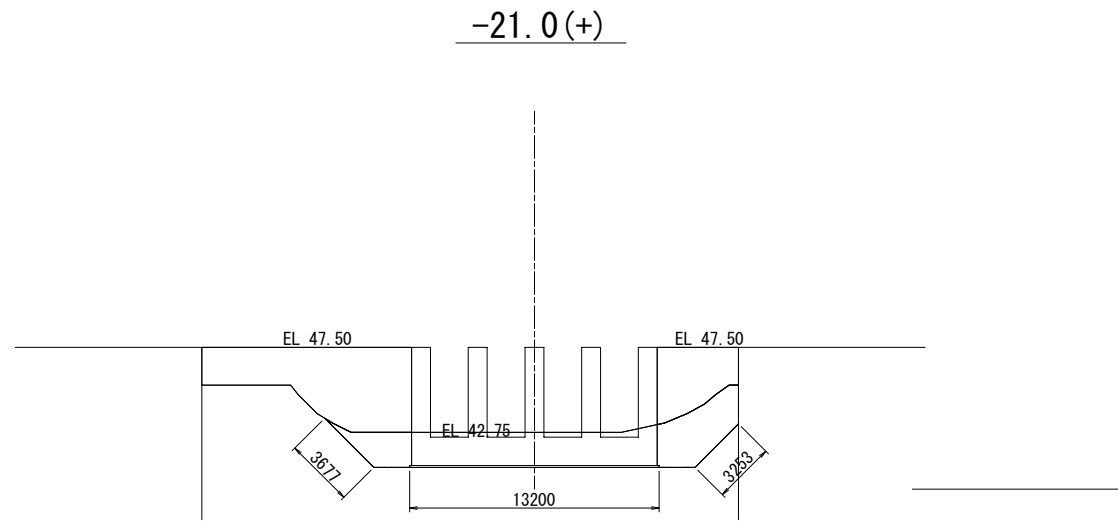
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Item		Unit	Quantity
Excavation	C1	m2	43.57
Excavation	C2	m2	-
Backfilling	R	m2	19.10
Embankment	B0	m2	-
Embankment	BL	m2	34.95
Embankment	BR	m2	89.18
Earth Finishing Foundation	L1	m	13.20
Rough Finishing	L2	m	9.83

DL=40.00

Item		Unit	Quantity
Excavation	C1	m2	35.09
Excavation	C2	m2	-
Backfilling	R	m2	11.02
Embankment	B0	m2	-
Embankment	BL	m2	38.35
Embankment	BR	m2	116.83
Earth Finishing Foundation	L1	m	13.20
Rough Finishing	L2	m	6.29

DL=40.00



Arab Republic of Egypt  
Ministry of Water Resources and Irrigation  
Reservoir and Grand Barrages Sector

Detailed Design Study on the Project for  
Construction of the New Dirout Group of Regulators

Abo Gabal Regulator  
Cross section of earth works (2)

DRW. NO.  
CA-25

SANYU CONSULTANTS INC.

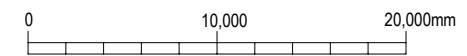
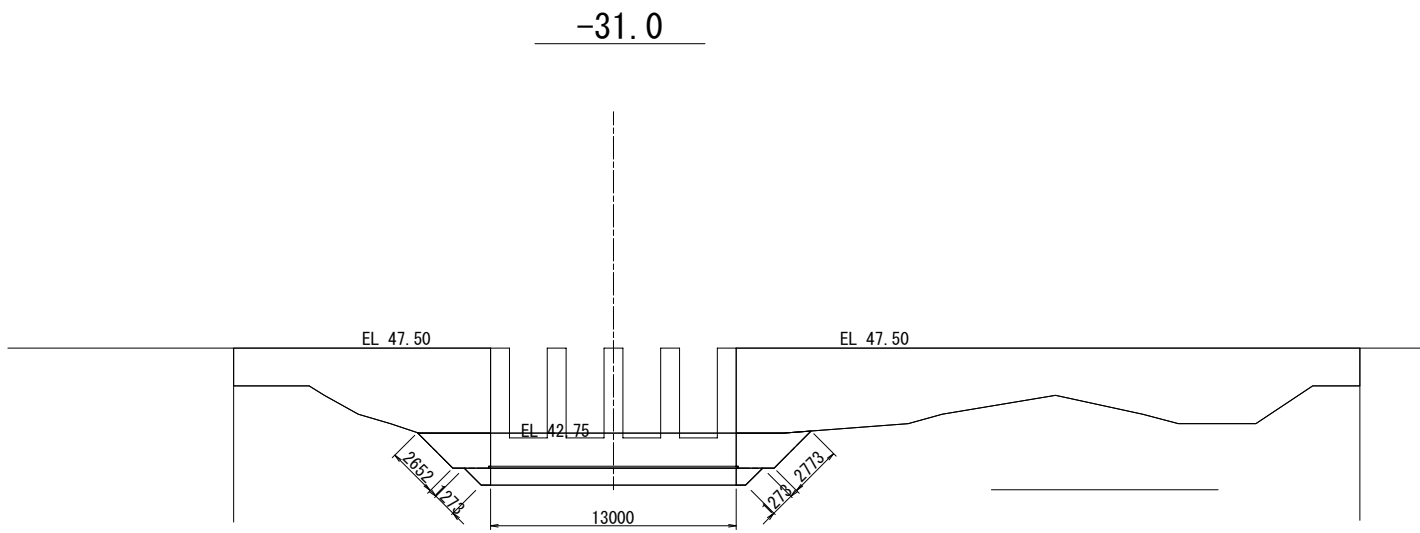
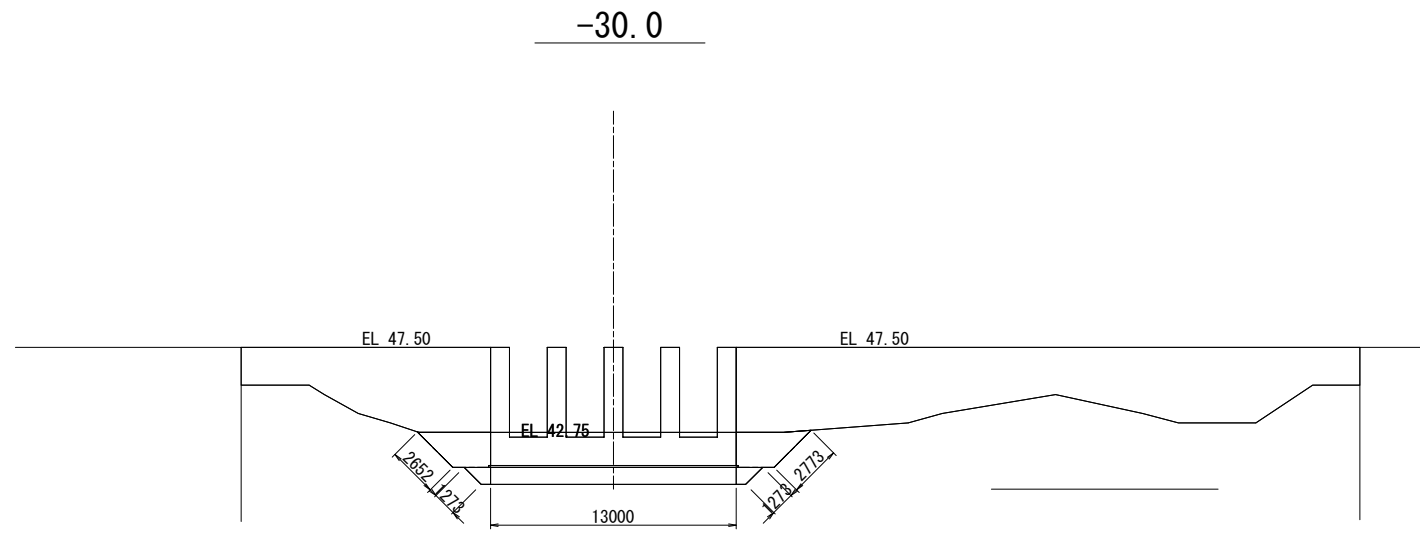
PREPARED BY :	CHECKED BY :	APPROVED BY :
DATE :	DATE :	DATE :

Item	Unit	Quantity
Excavation	C1	m2 34.95
Excavation	C2	m2 13.41
Backfilling	R	m2 12.59
Embankment	B0	m2 -
Embankment	BL	m2 44.25
Embankment	BR	m2 115.38
Earth Finishing Foundation	L1	m 13.00
Rough Finishing	L2	m 7.97

DL=40.00

Item	Unit	Quantity
Excavation	C1	m2 34.95
Excavation	C2	m2 13.41
Backfilling	R	m2 12.59
Embankment	B0	m2 -
Embankment	BL	m2 45.05
Embankment	BR	m2 115.38
Earth Finishing Foundation	L1	m 13.00
Rough Finishing	L2	m 7.97

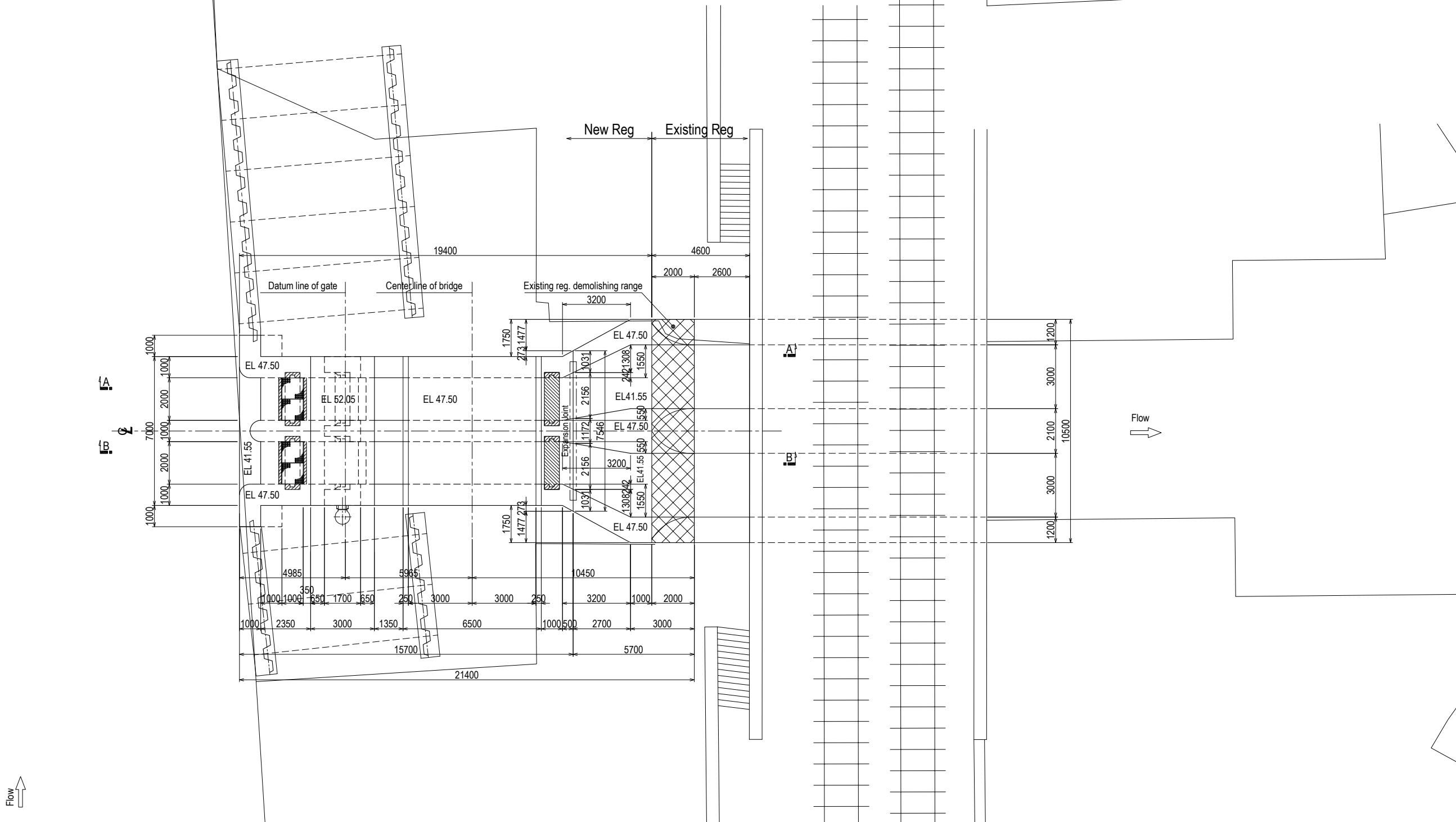
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Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Abo Gabal Regulator Cross section of earth works (3)			DRW. NO. CA-26
SANYU CONSULTANTS INC.			
PREPARED BY :	CHECKED BY :	APPROVED BY :	
DATE :	DATE :	DATE :	DATE :

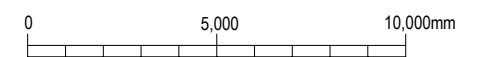


# Plan of Sahelyia Regulator



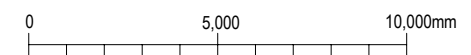
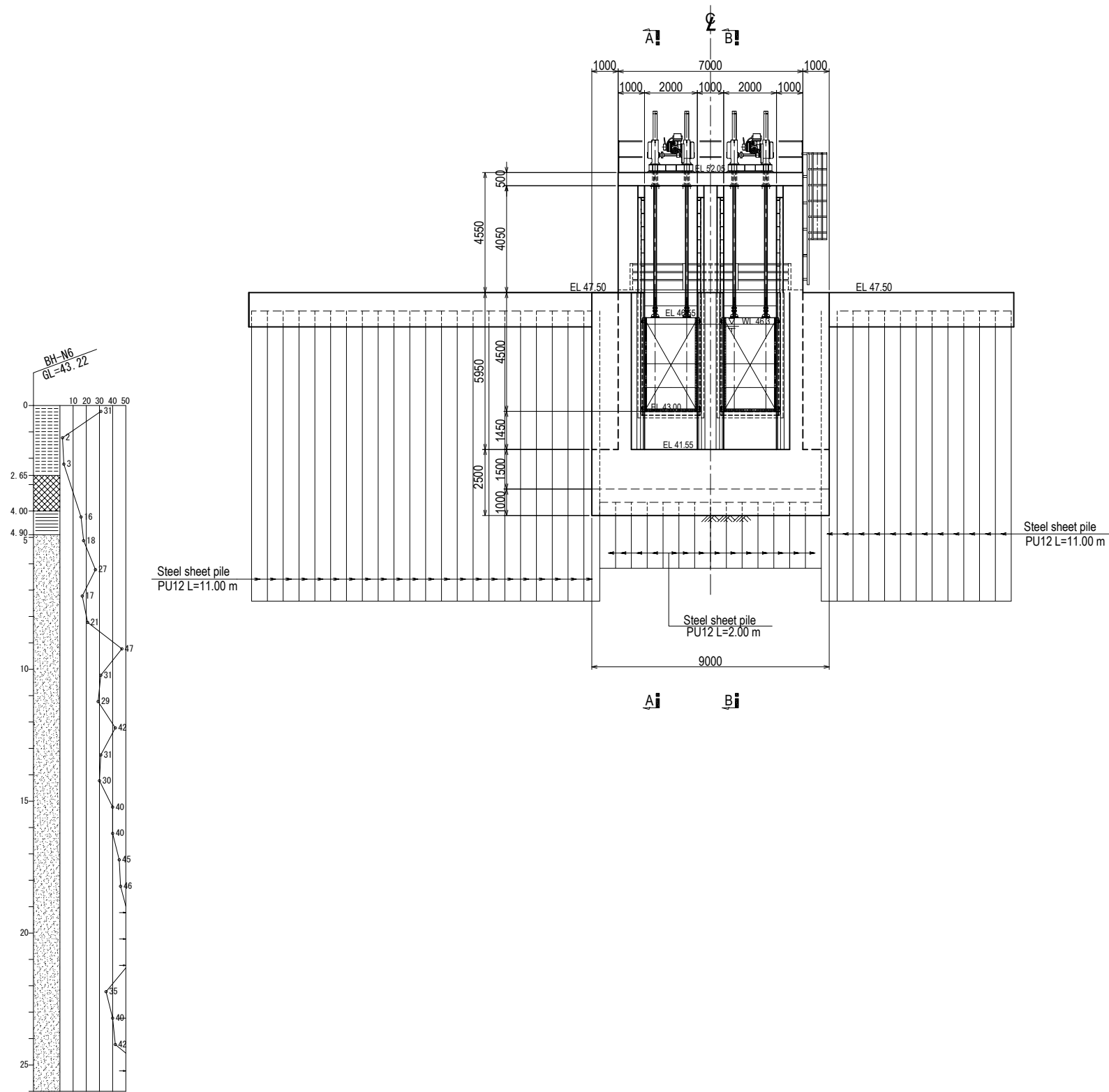
Flow →

Flow →



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Sahelyia Regulator Plan			DRW. NO. CS-1
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

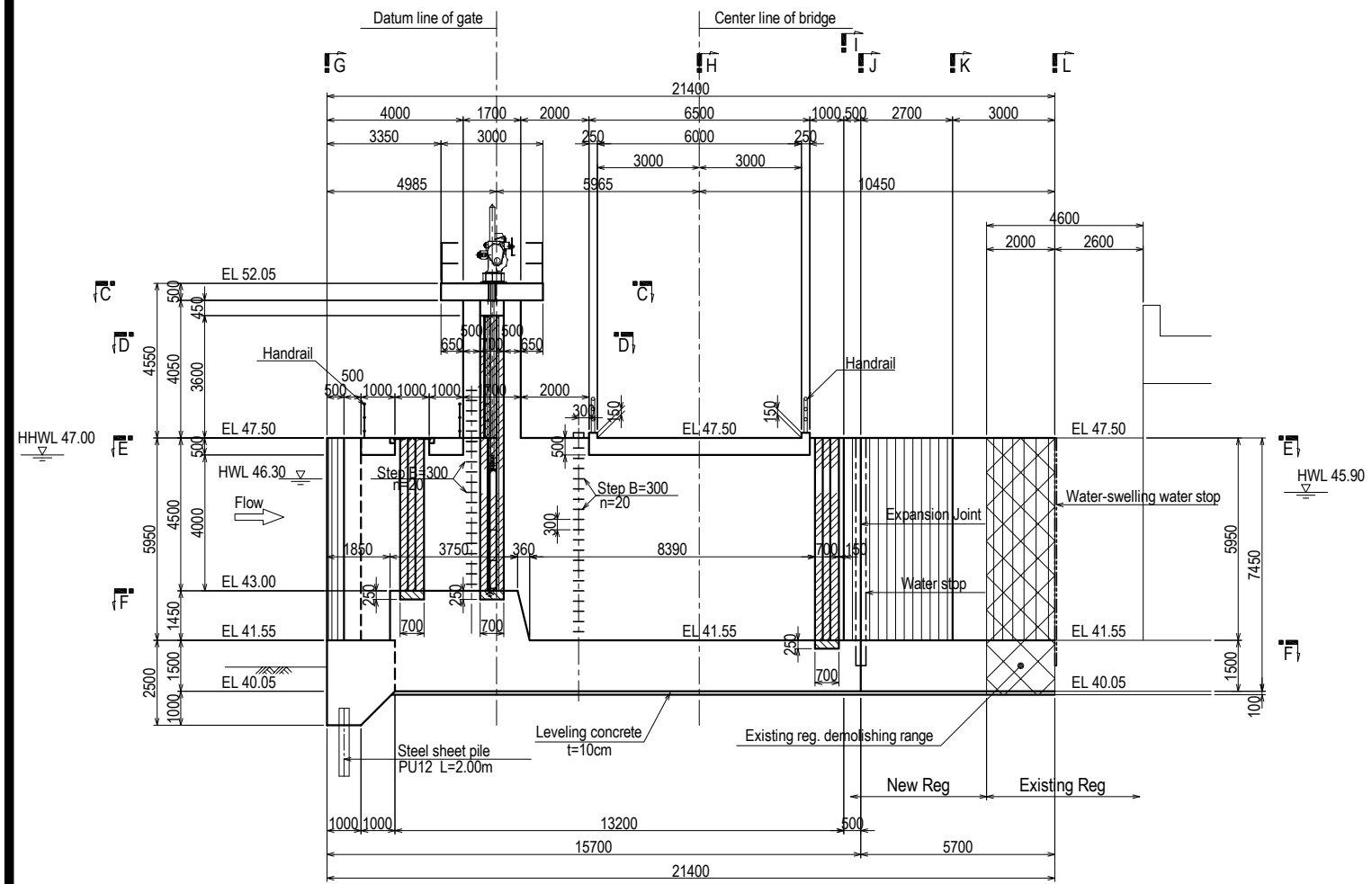
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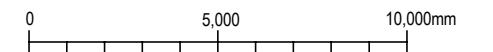
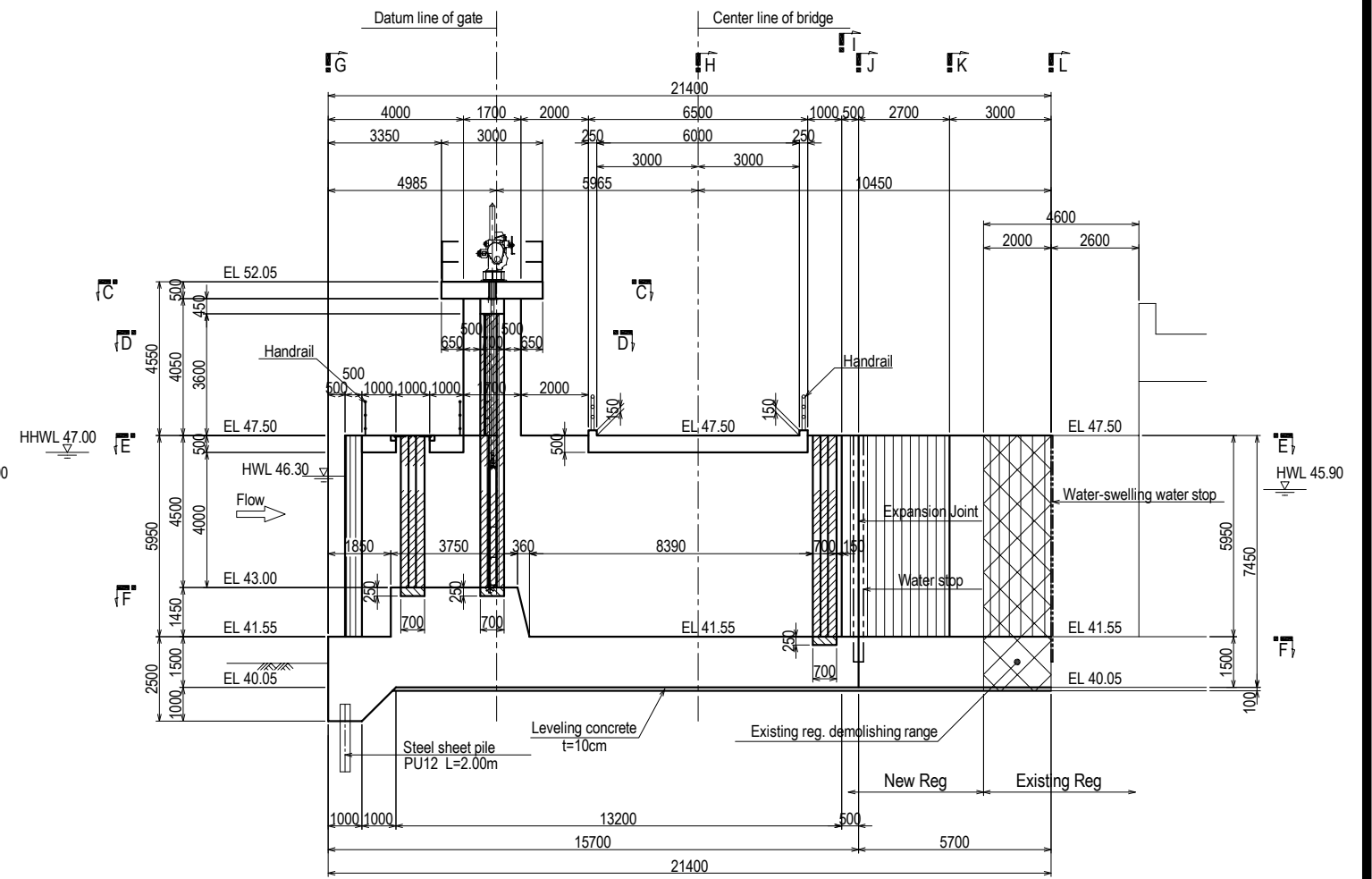
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Sahelyia Regulator Elevation			<b>DRW. NO.</b> CS-2
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Longitudinal Section of Sahelyia Regulator


## Section A—A



## Section B—B



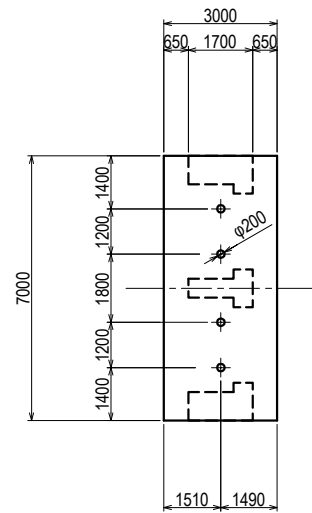
Note:

 Shaded area indicates the range of second stage concrete to be placed with steel materials.

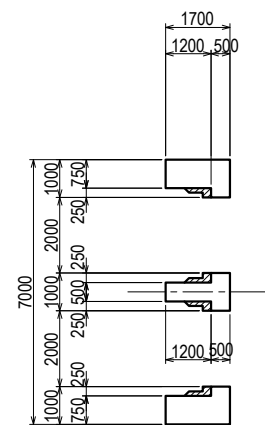
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Sahelyia Regulator Longitudinal section		DRW. NO. CS-3
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

# Section of Sahelyia Regulator (1/2)

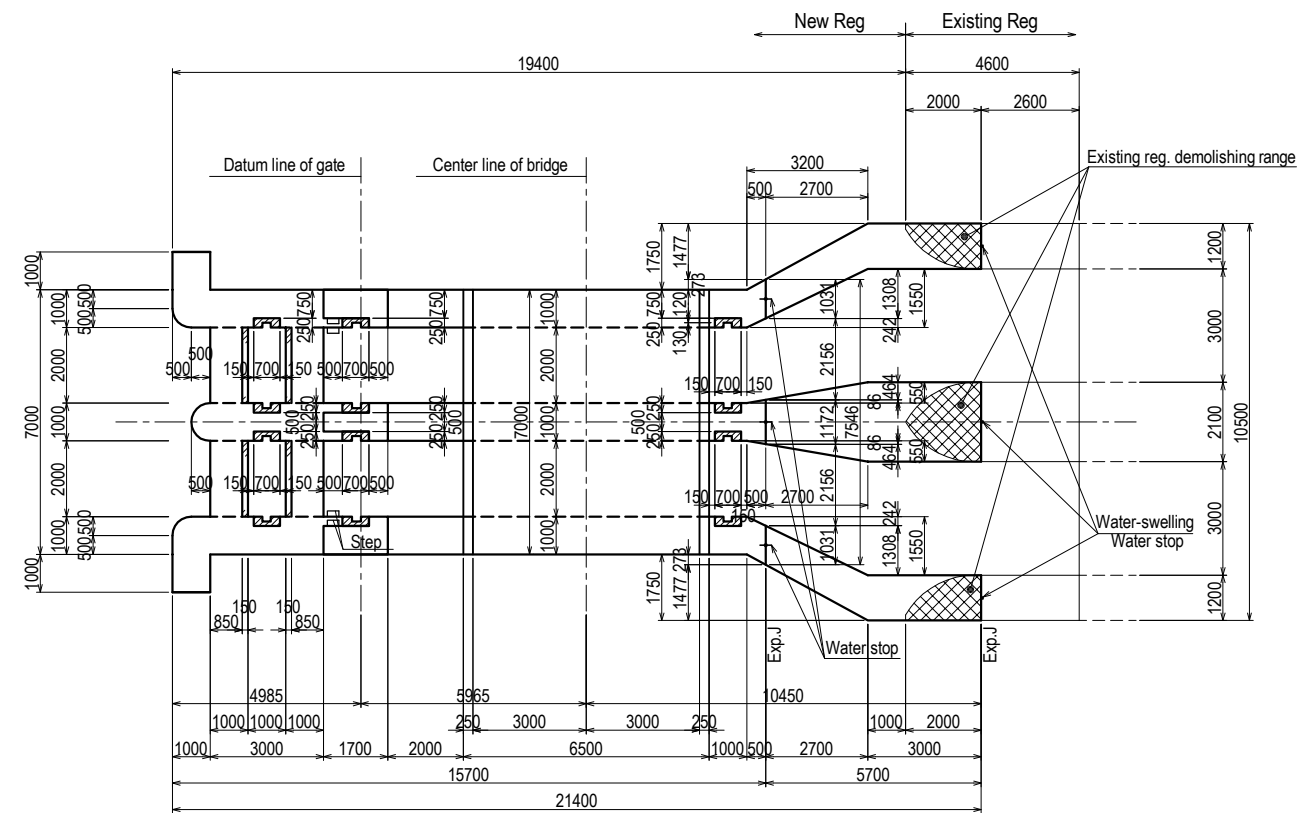
Section C—C



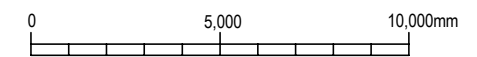
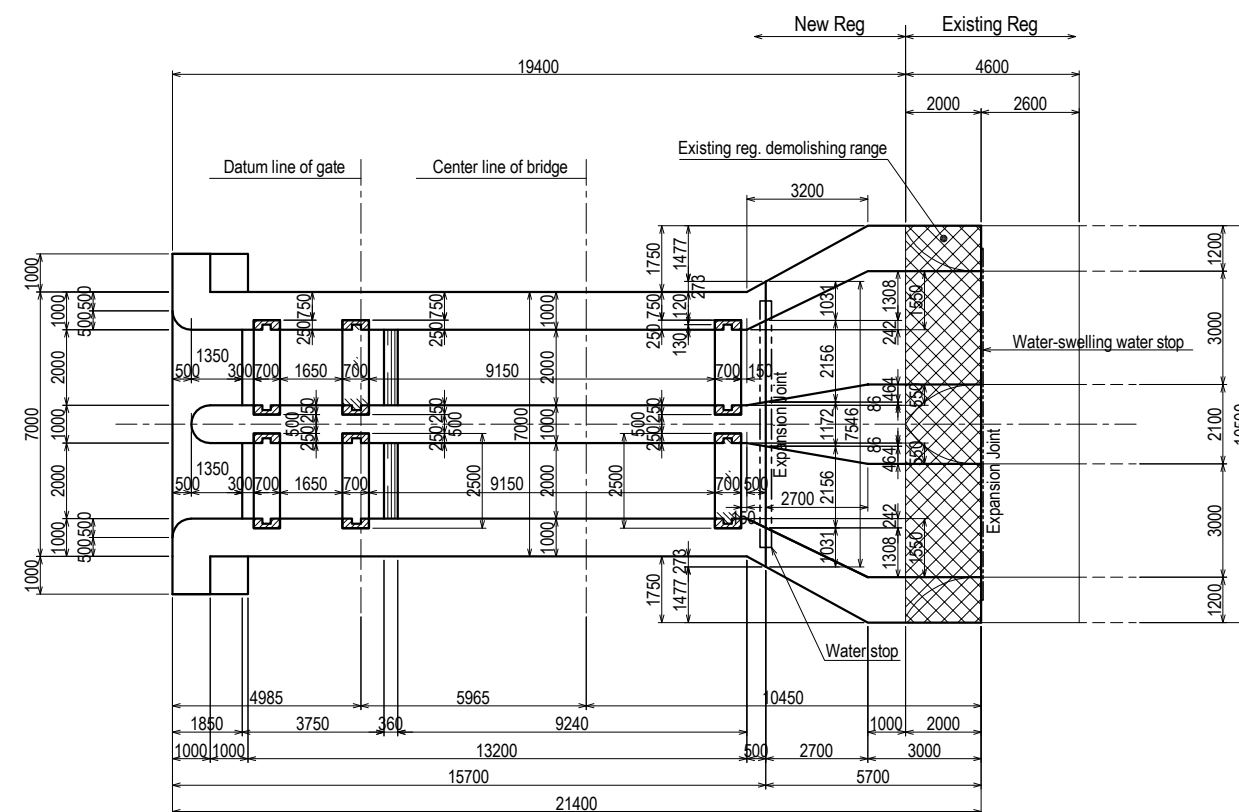
Section D—D



Section E—E



Section F—F



Note;

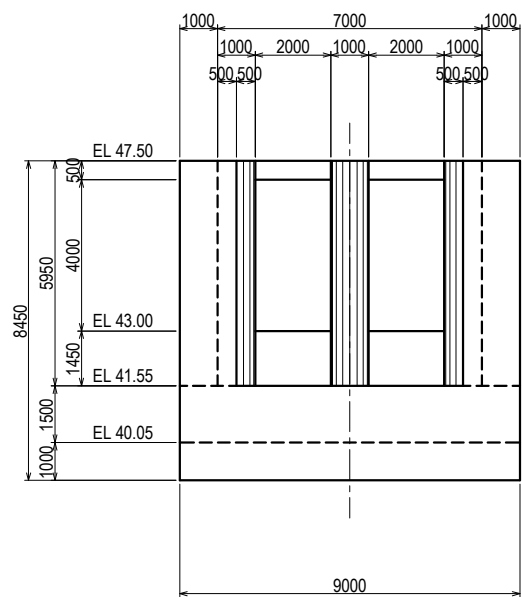
Shaded area indicates the range of second stage concrete to be placed with steel materials.

Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Sahelyia Regulator Sections (1)		<b>DRW. NO.</b> CS-4
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

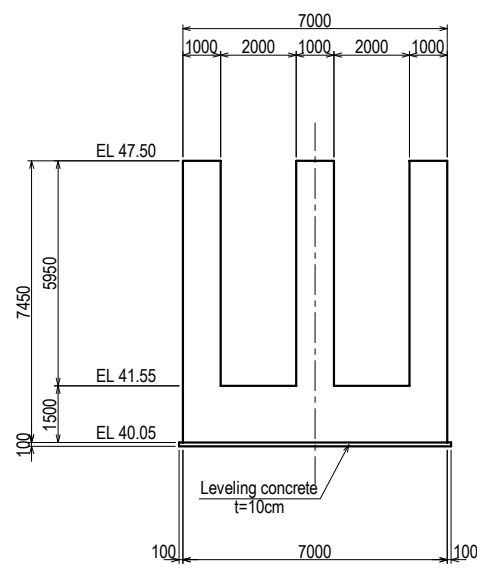
# Section of Sahelyia Regulator (2/2)

Scale A

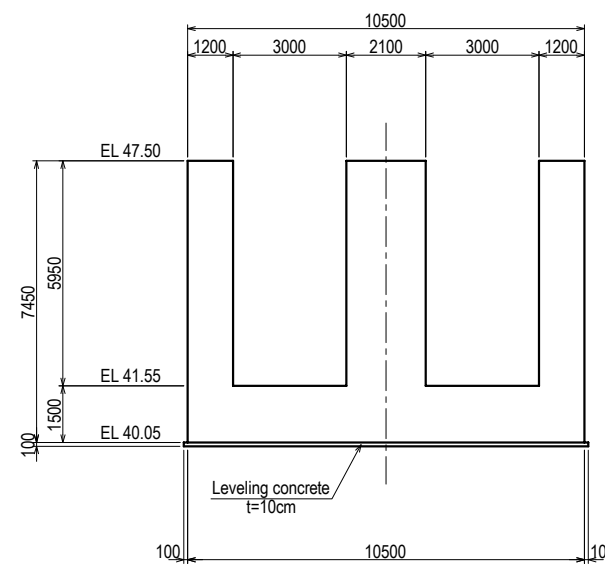
Section G—G



Section I—I

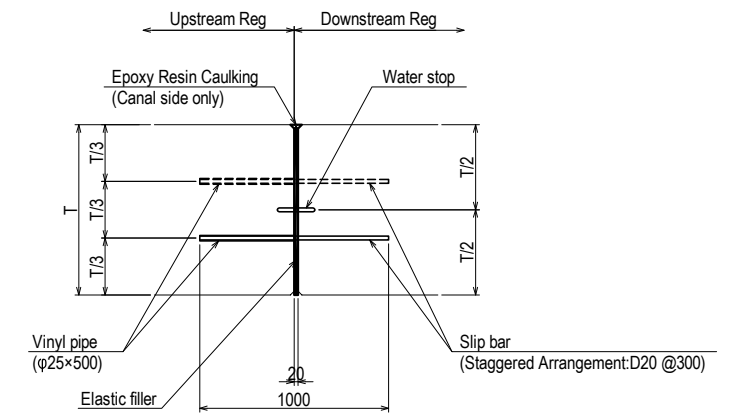


Section K—K

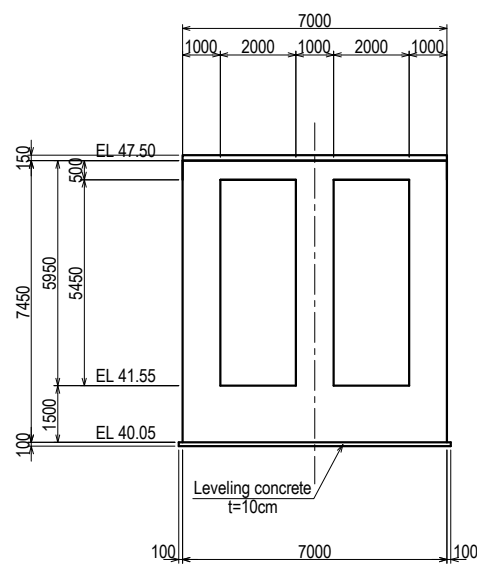


Typical of Expansion Joint

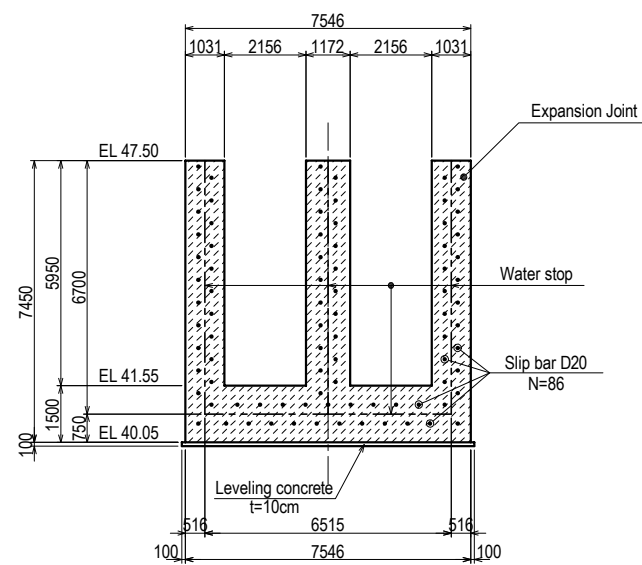
Scale B



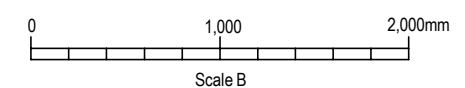
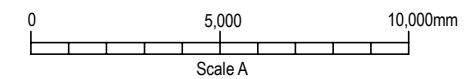
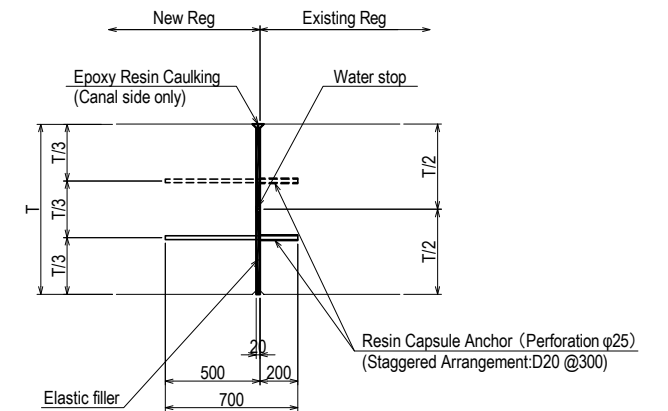
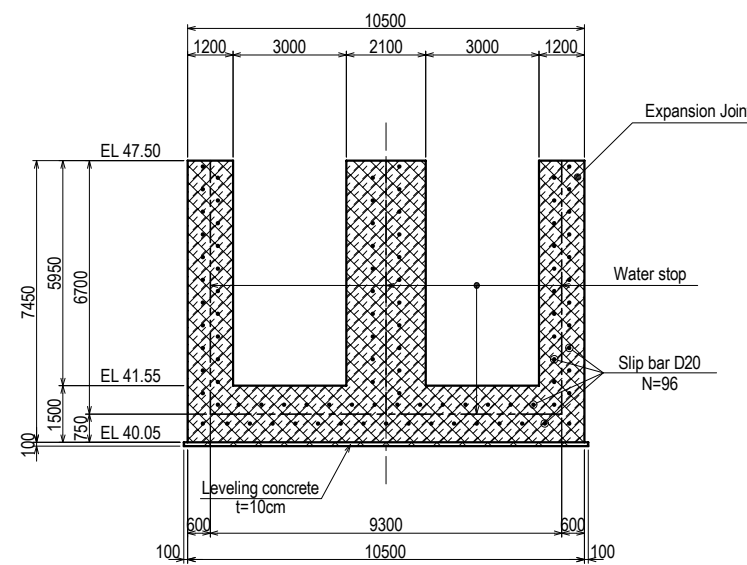
Section H—H



Section J—J

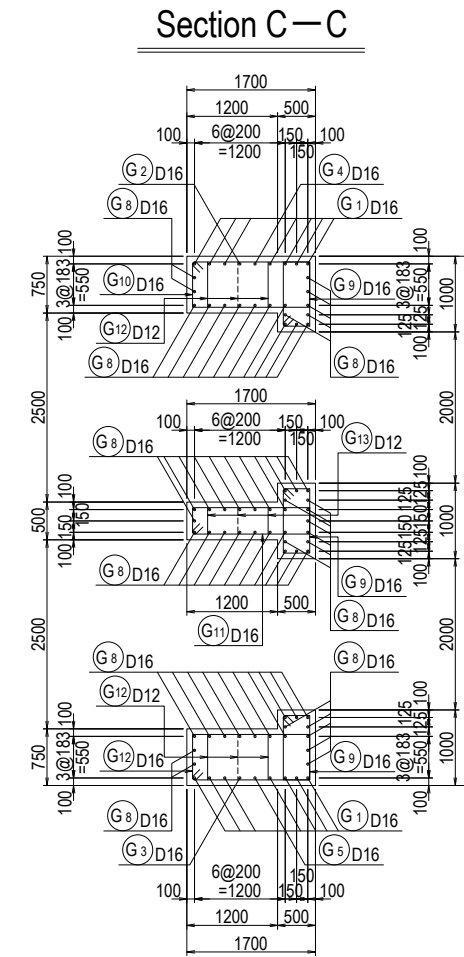
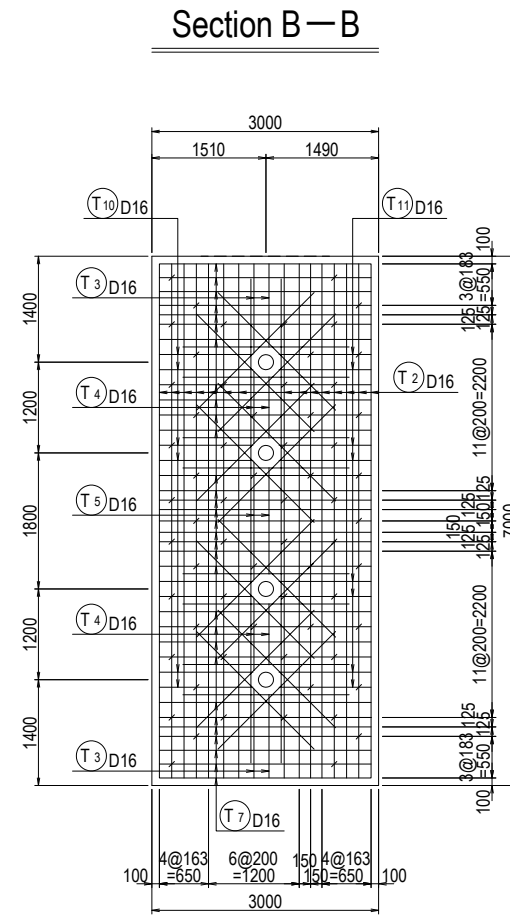
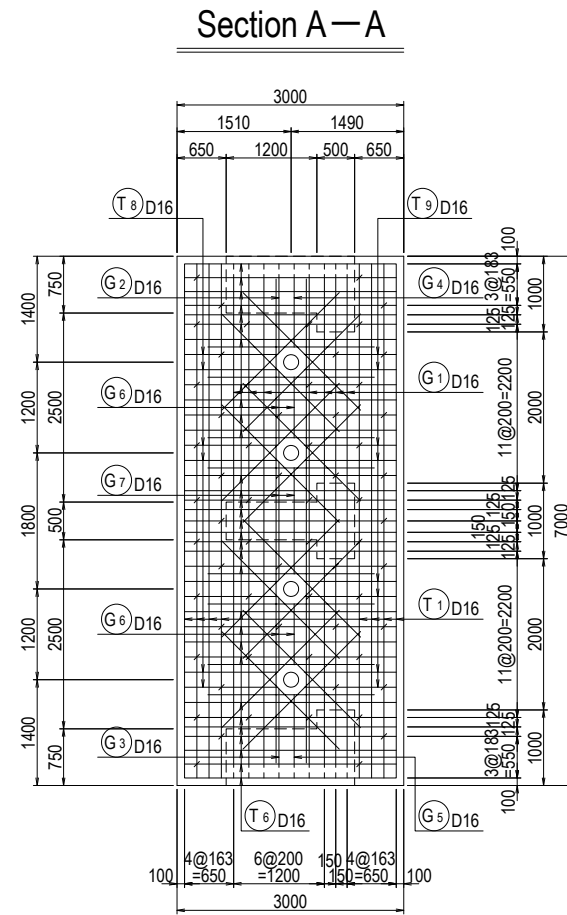


Section L—L

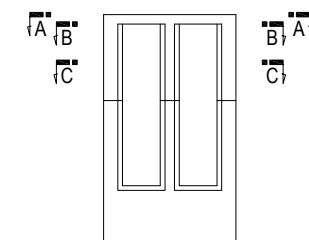
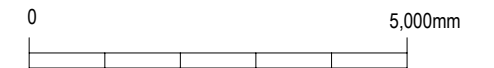
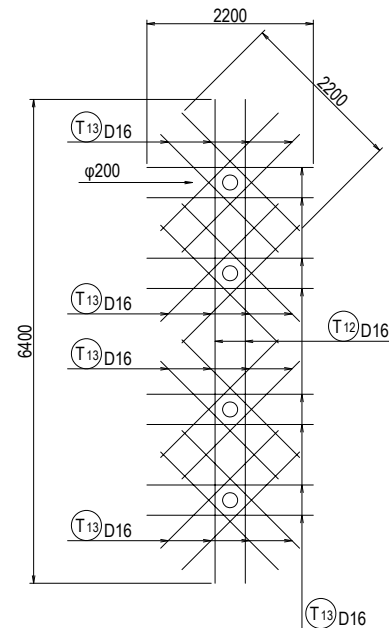


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Sahelyia Regulator Sections (2)	<b>DRW. NO.</b> CS-5	
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

# Detail of Upstream Gate Abutment and Pier of Sahelyial Regulator



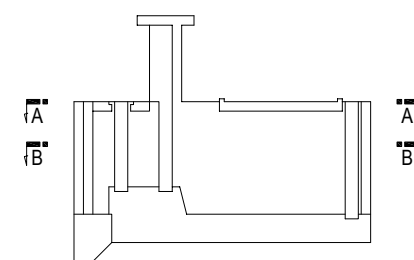
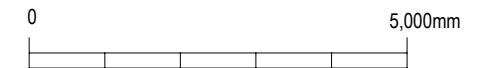
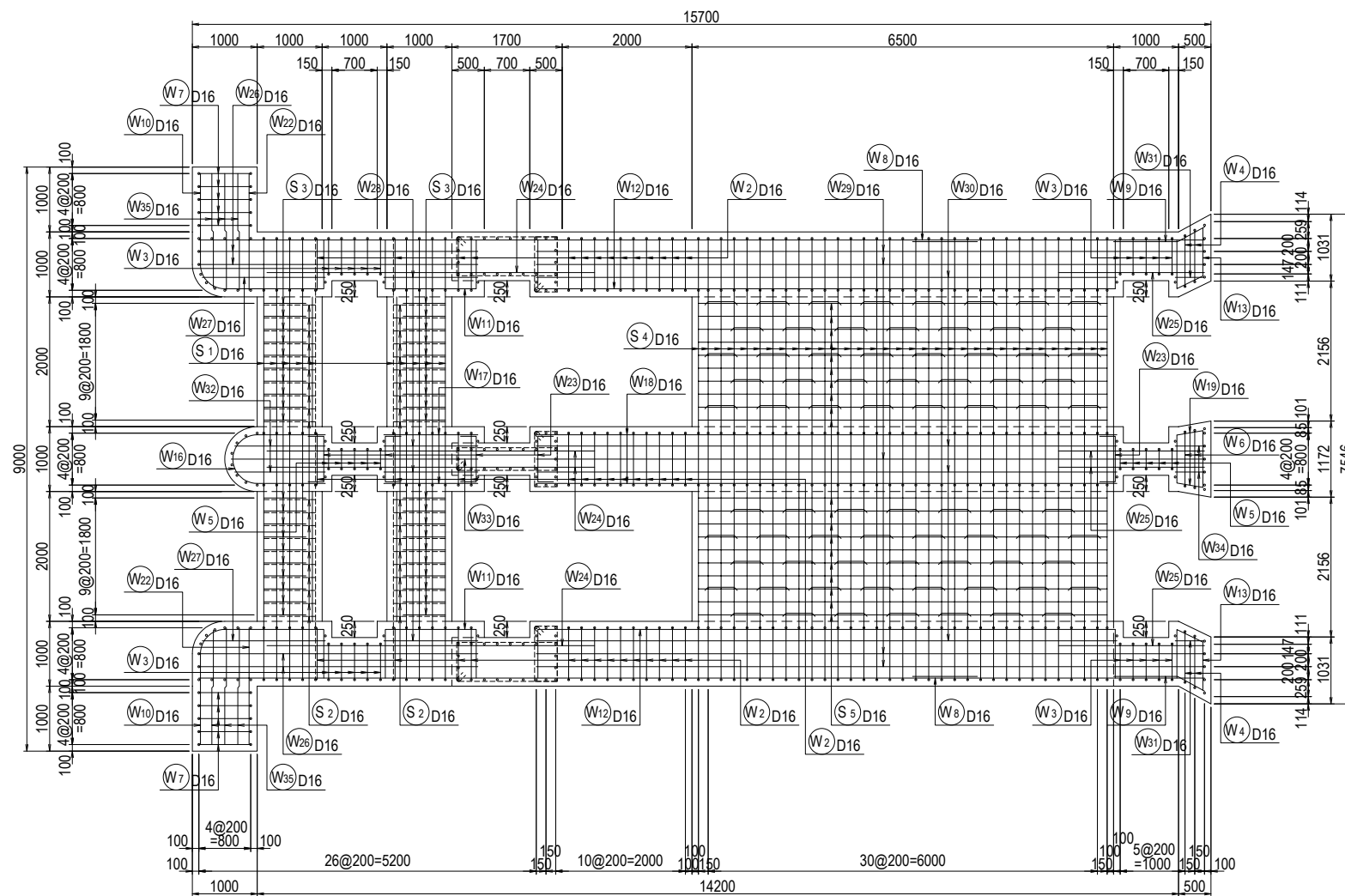
**Detail of reinforcement for slab openings**



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Sahelyia Regulator Bar arrangement of pier (1)			<b>DRW. NO.</b> CS-6
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Plan of Upstream Gate Abutment and Pier of Sahelyia Regulator (1/2)

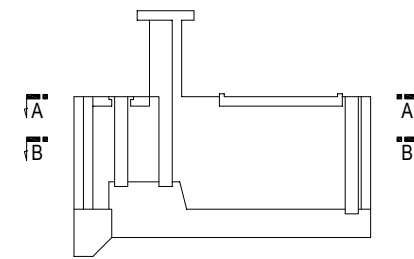
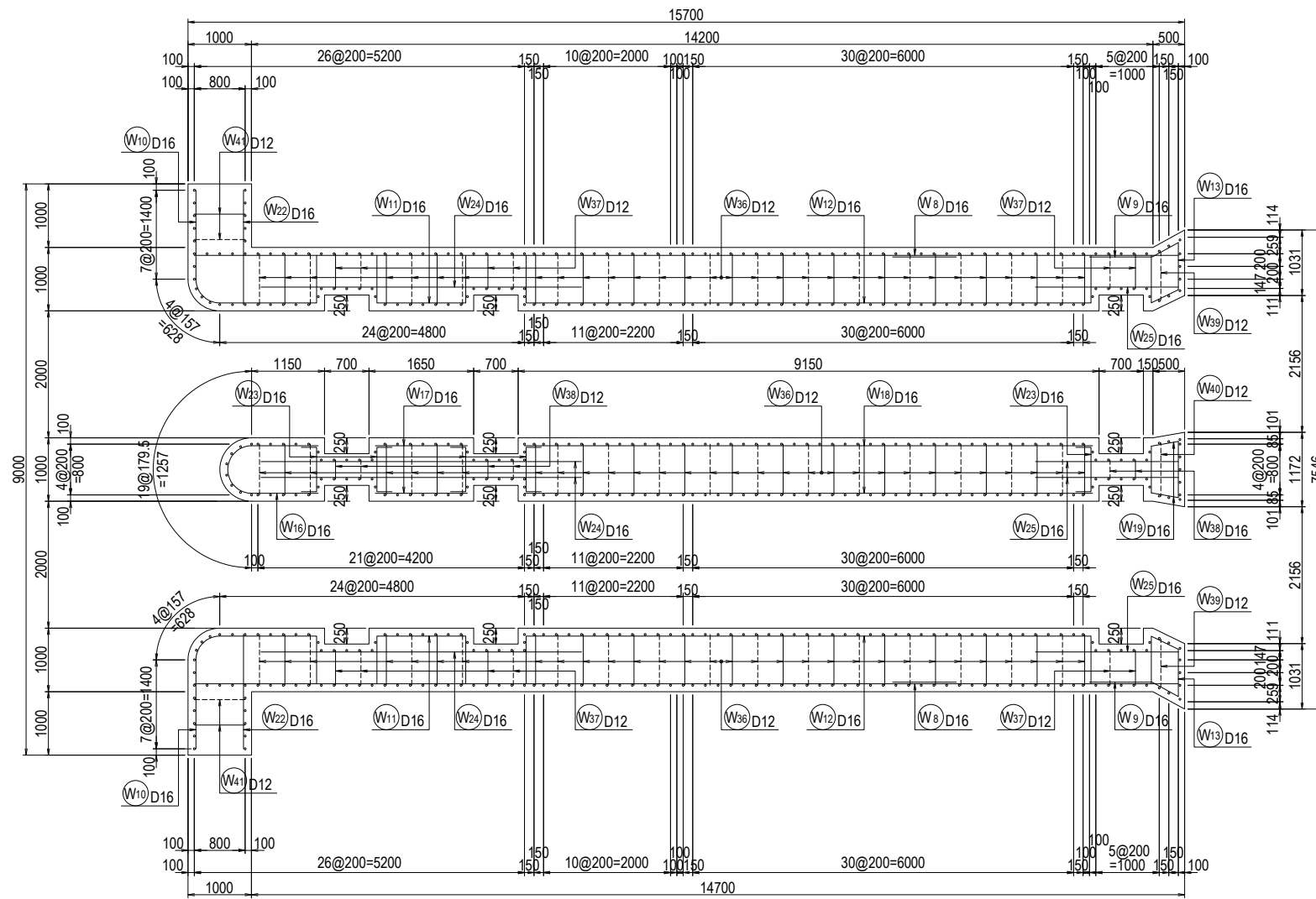
## Section A—A



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Sahelyia Regulator Bar arrangement of pier (2)			<b>DRW. NO.</b> CS-7
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Plan of Gate Abutment and Pier of Sahelyial Regulator (2/2)

## Section B—B

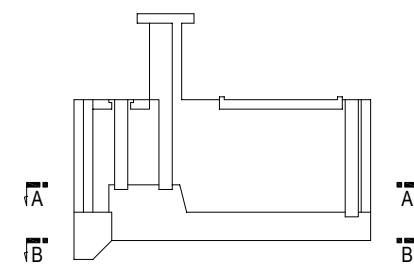
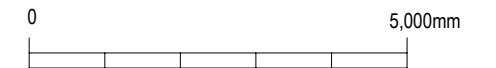
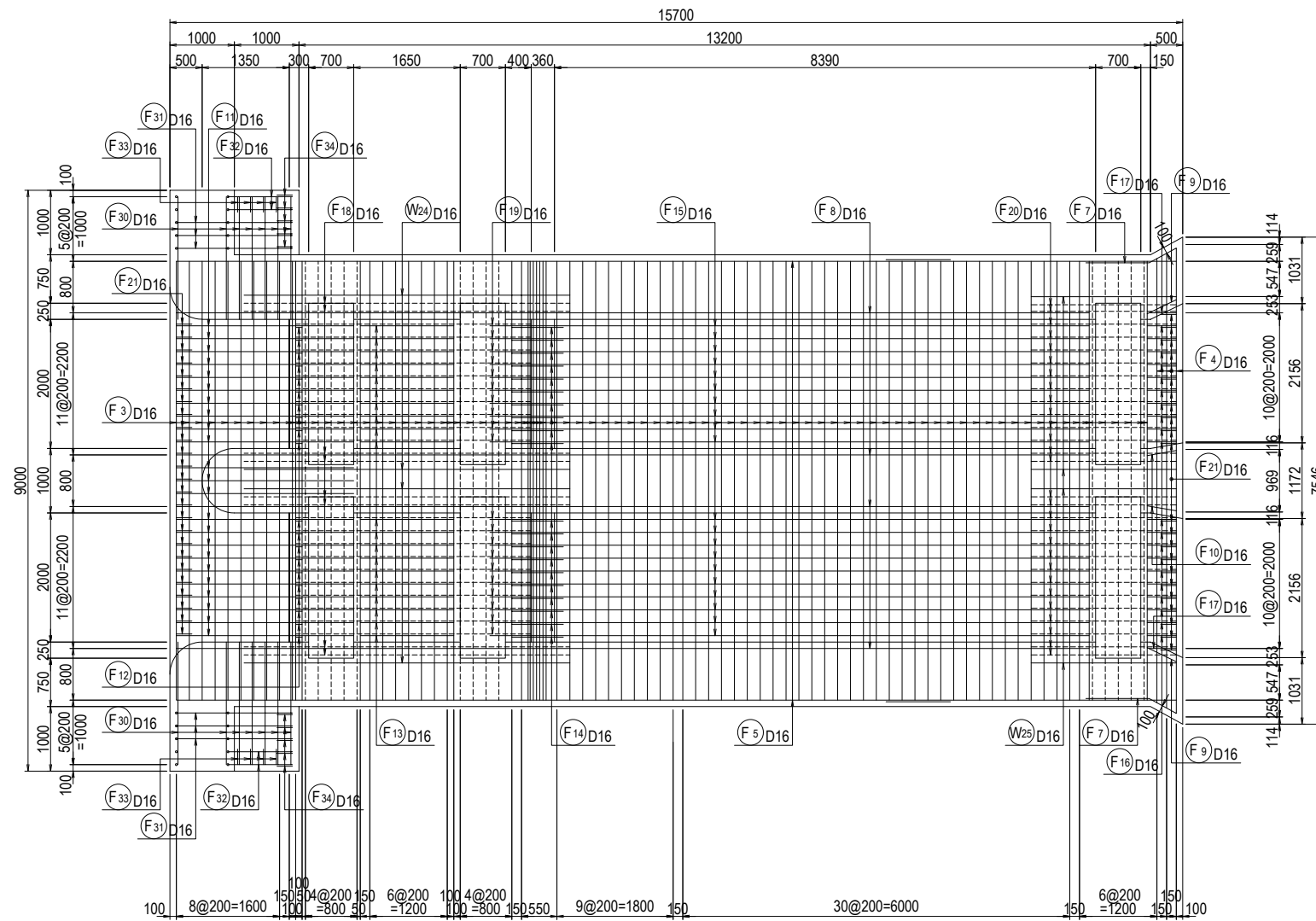


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Sahelyia Regulator Bar arrangement of pier (3)			DRW. NO. CS-8
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:



# Plan of Upstream Apron of Sahelyial Regulator (1/2)

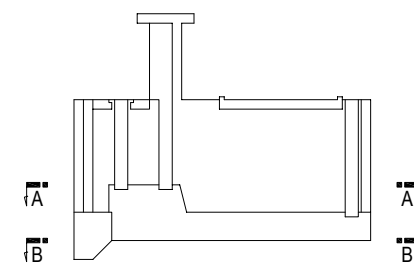
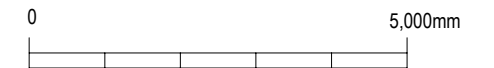
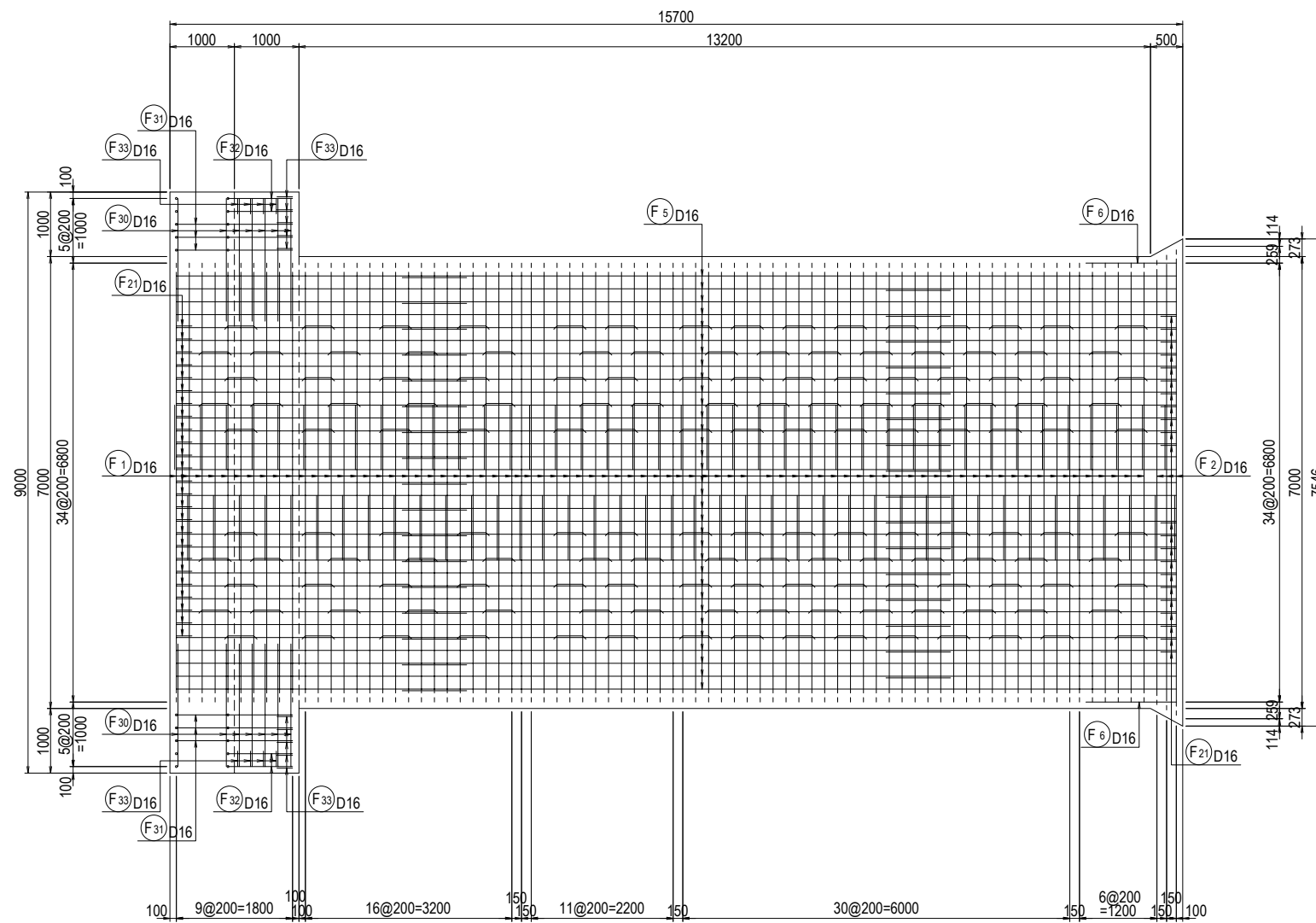
## Section A—A



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Sahelyia Regulator Bar arrangement of pier (4)			DRW. NO. CS-9
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Plan of Upstream Apron of Sahelyial Regulator (2/2)

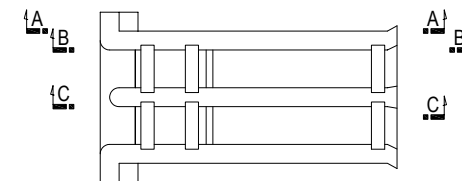
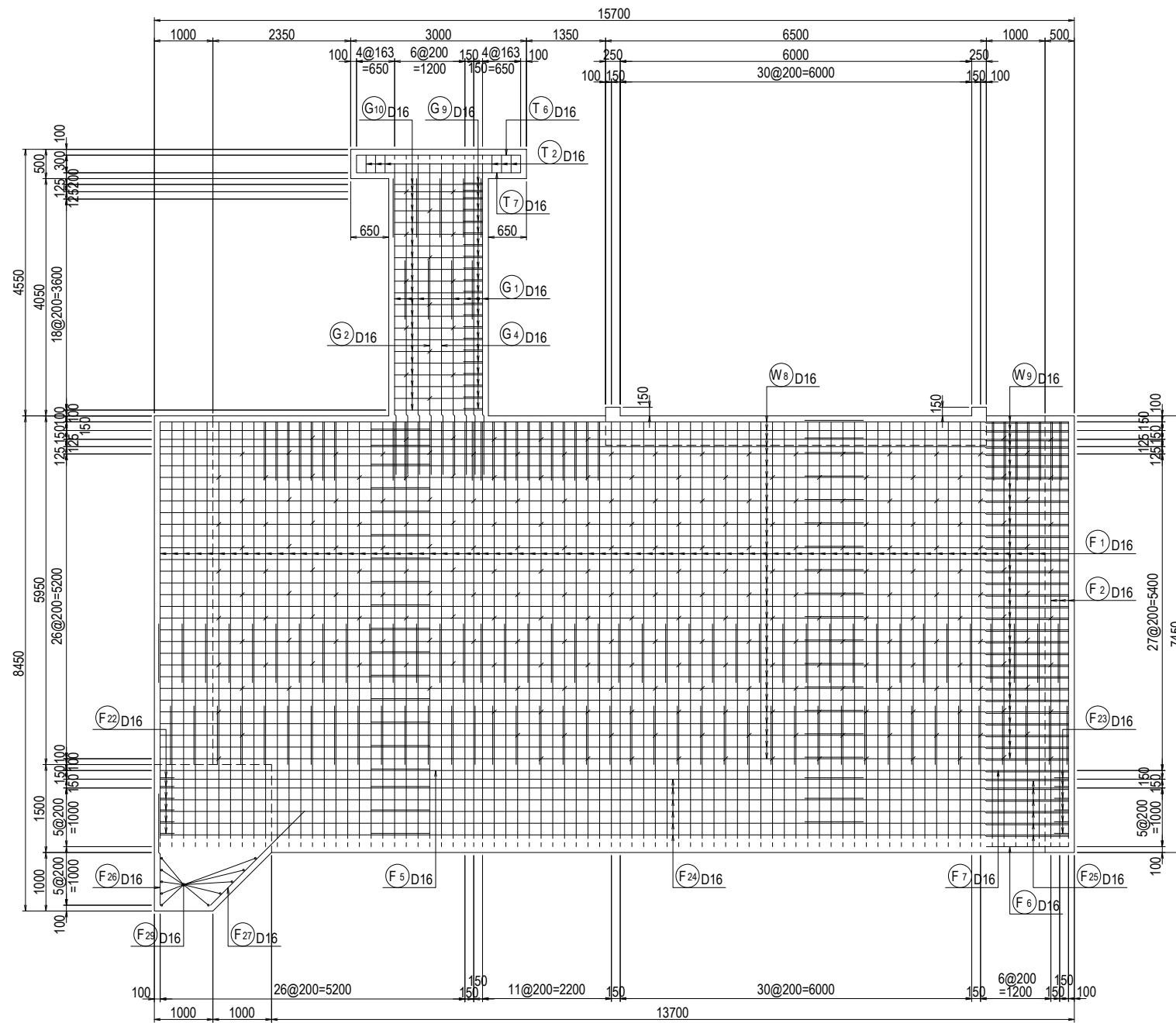
## Section B—B



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Sahelyia Regulator Bar arrangement of pier (5)			DRW. NO. CS-10
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Longitudinal Section of Upstream Gate Abutment and Pier of Sahelyial Regulator (1/3)

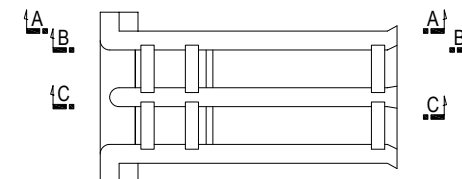
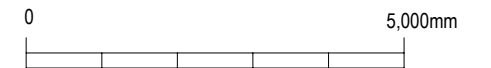
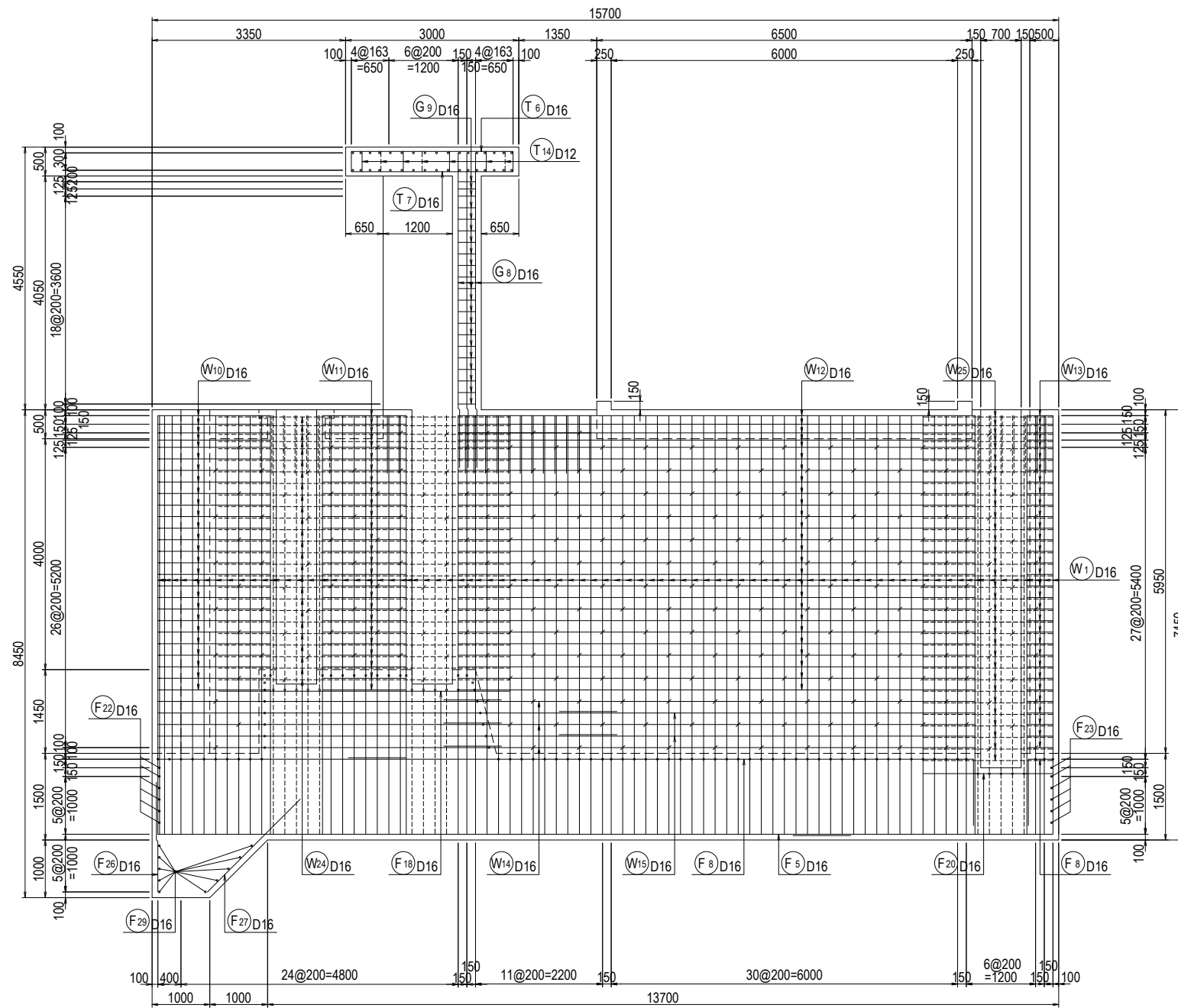
## Section A—A



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Sahelyia Regulator Bar arrangement of pier (6)			DRW. NO. CS-11
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Longitudinal Section of Upstream Gate Abutment and Pier of Sahelyial Regulator (2/3)

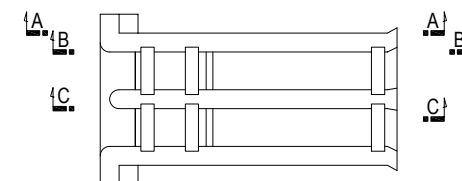
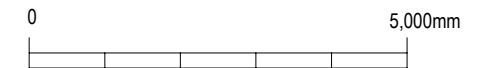
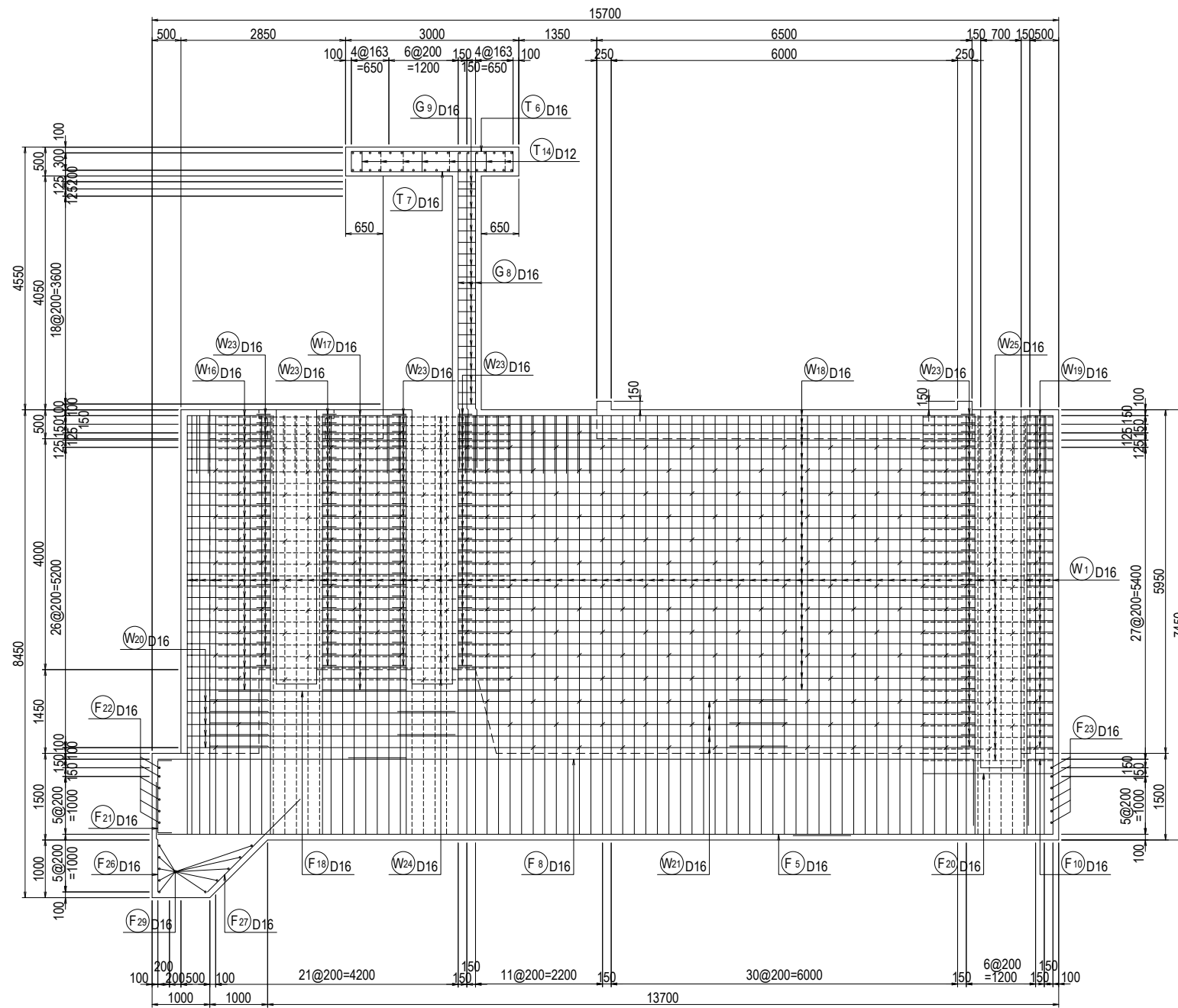
## Section B—B



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Sahelyia Regulator Bar arrangement of pier (7)			DRW. NO. CS-12
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Longitudinal Section of Upstream Gate Abutment and Pier of Sahelyial Regulator (3/3)

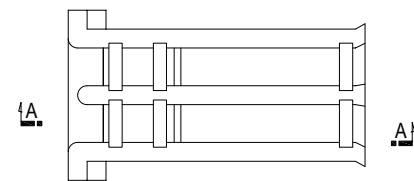
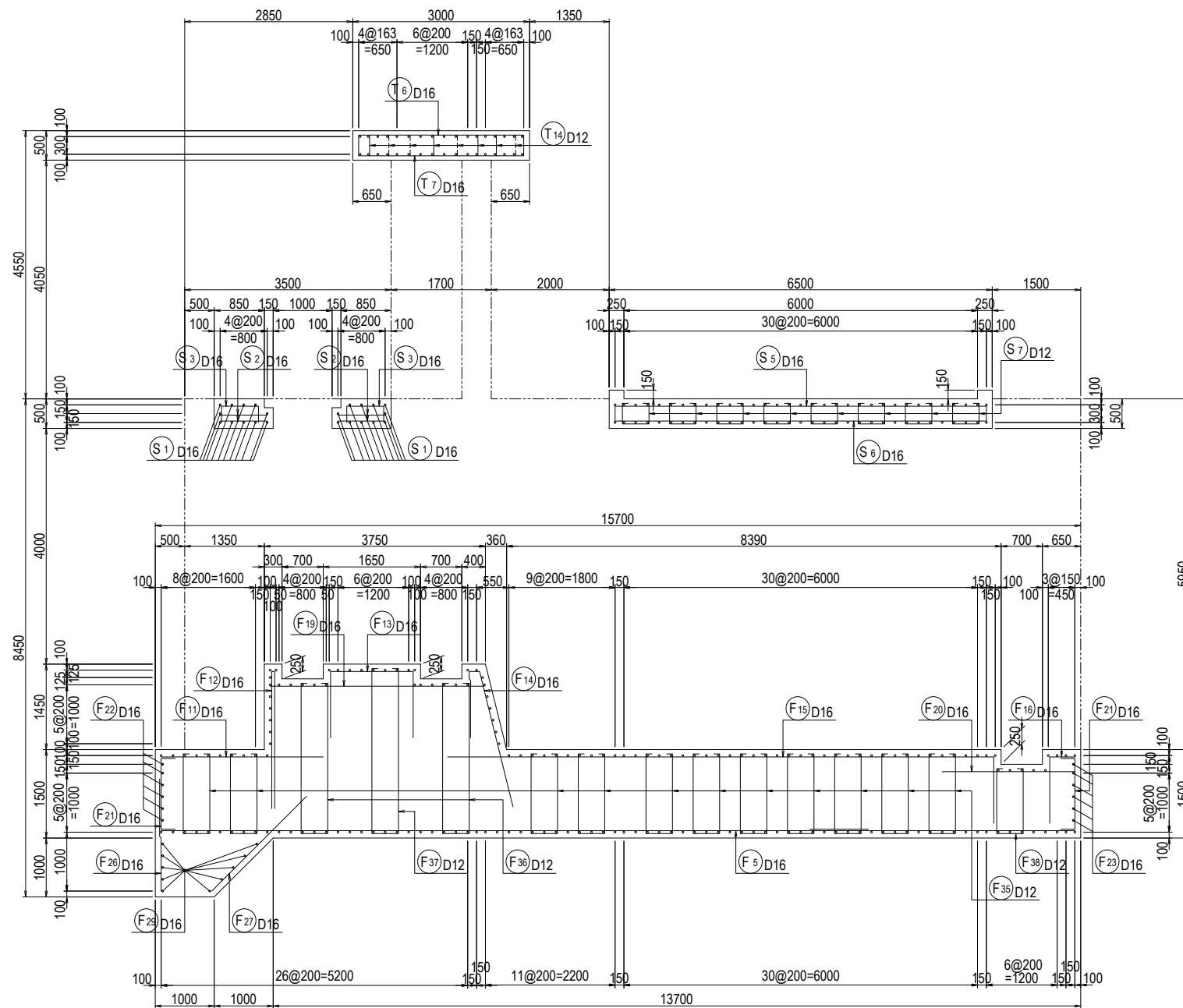
## Section C—C



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Sahelyia Regulator Bar arrangement of pier (8)			<b>DRW. NO.</b> CS-13
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	DATE:
DATE:	DATE:	DATE:	DATE:

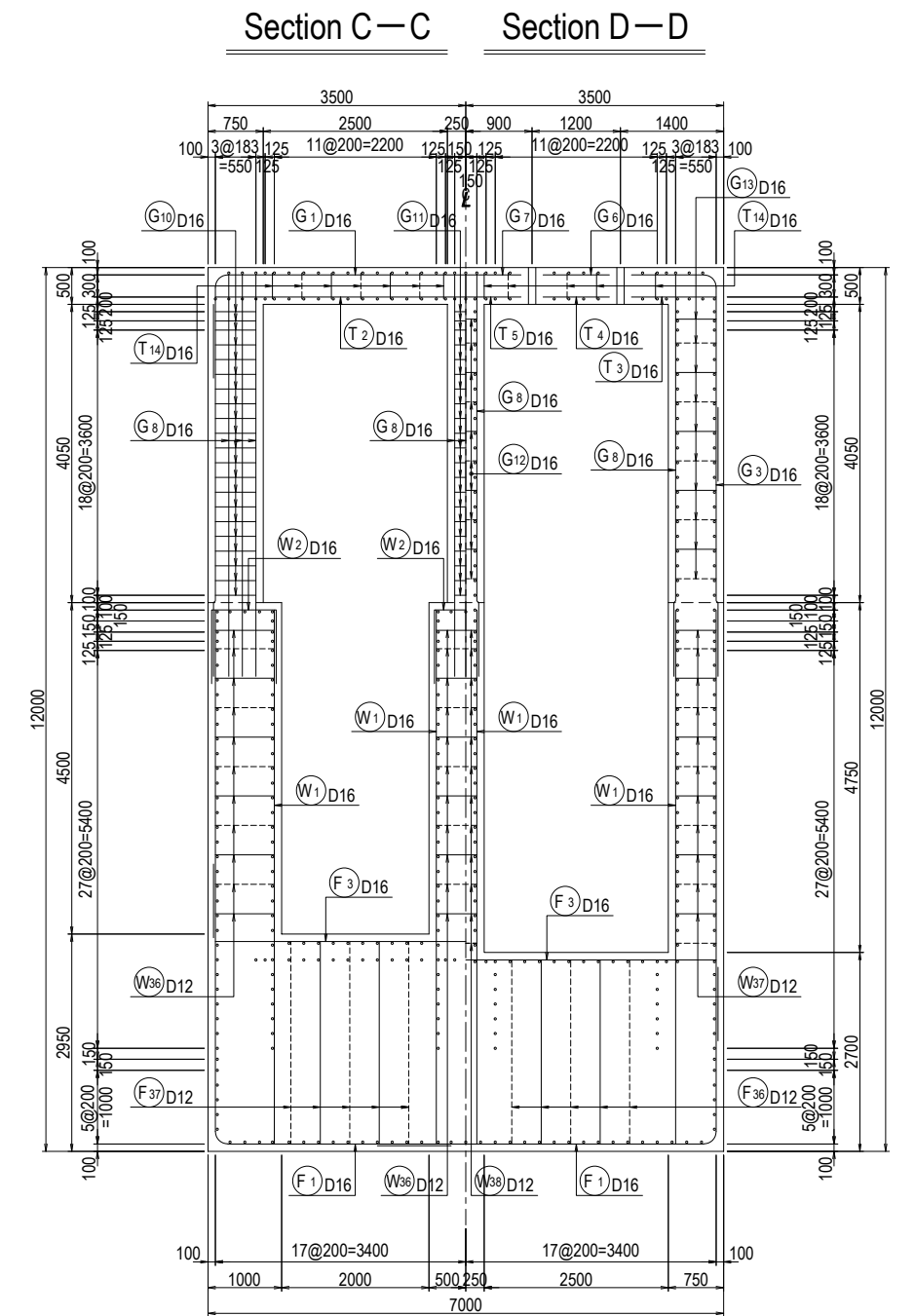
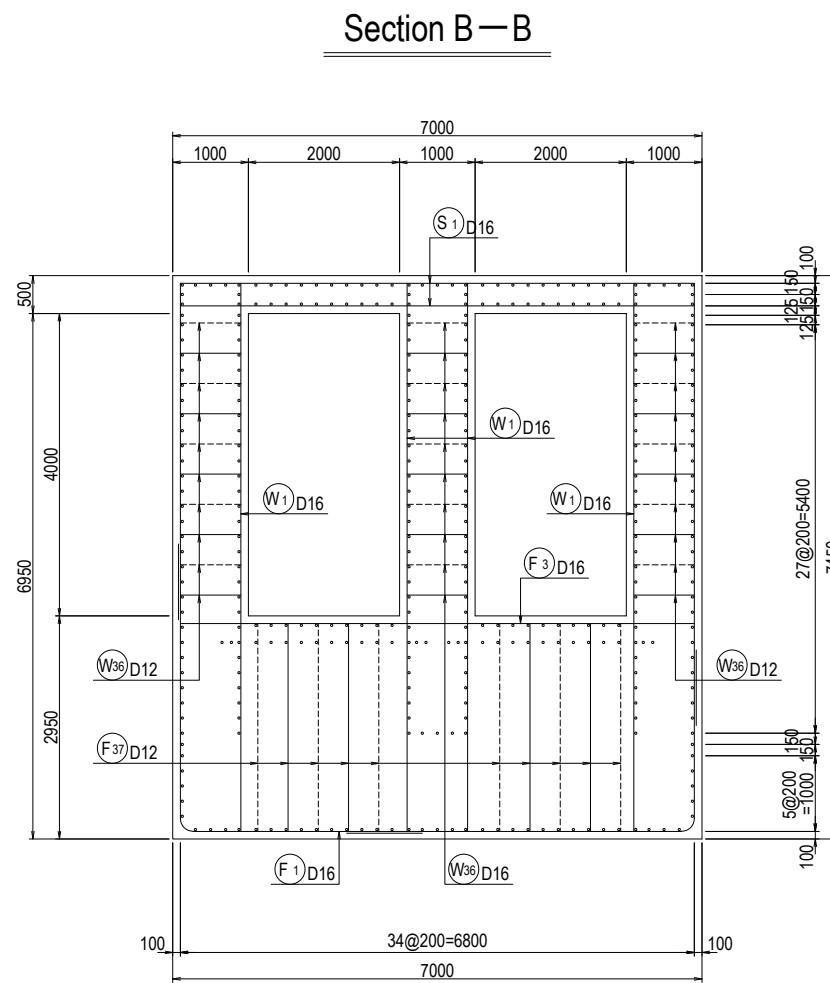
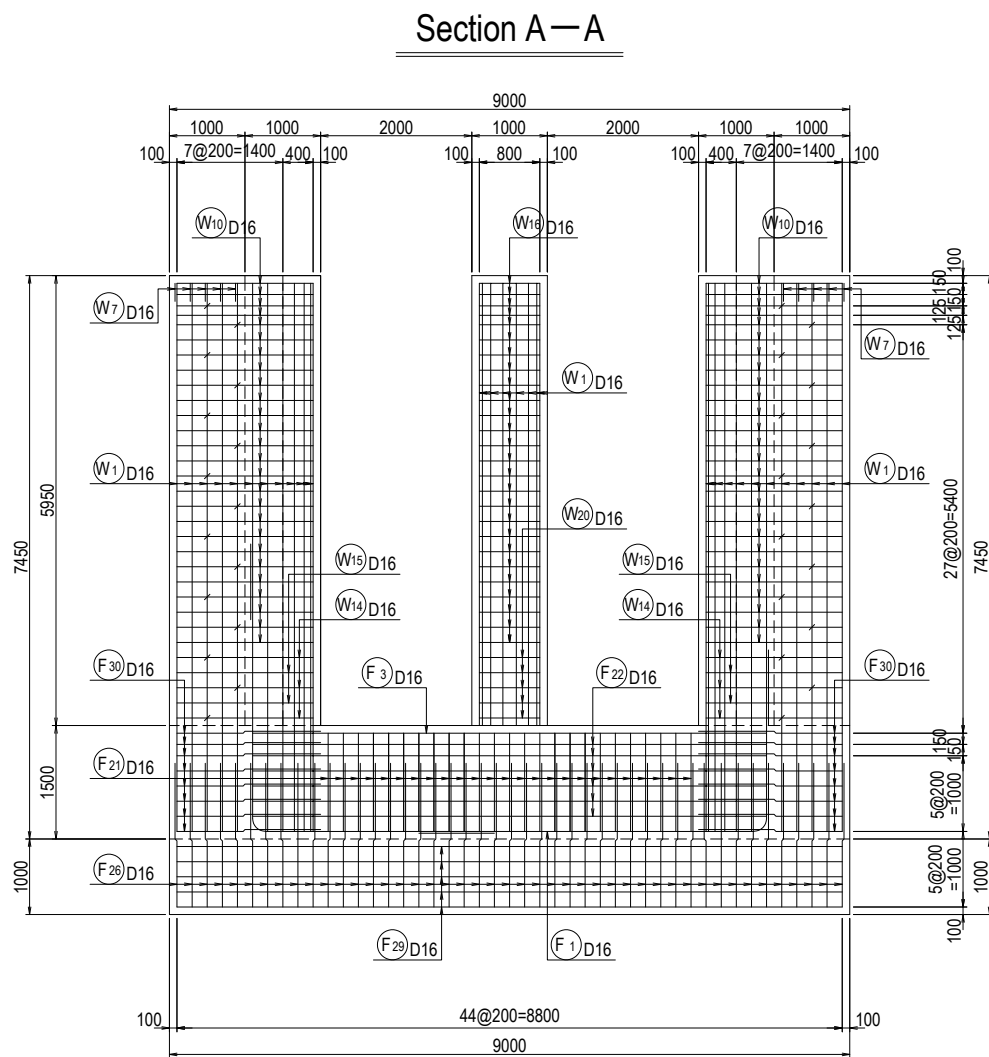
# Longitudinal Section of Upstream Apron of Sahelyial Regulator

## Section A—A



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Sahelyia Regulator Bar arrangement of pier (9)			DRW. NO. CS-14
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Section of Upstream Gate Abutment and Pier of Sahelyial Regulator (1/2)



0 5,000mm

Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Sahelyia Regulator Bar arrangement of pier (10)			<b>DRW. NO.</b> CS-15
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

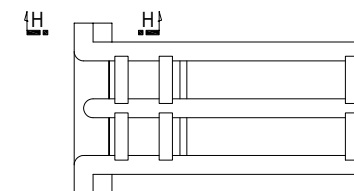
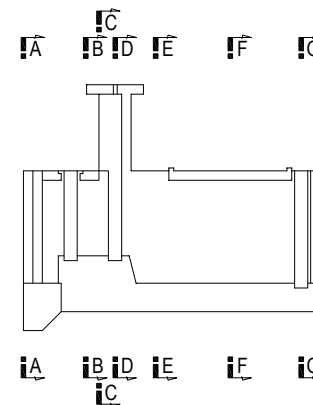
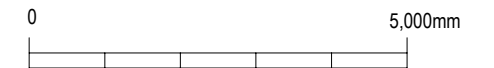
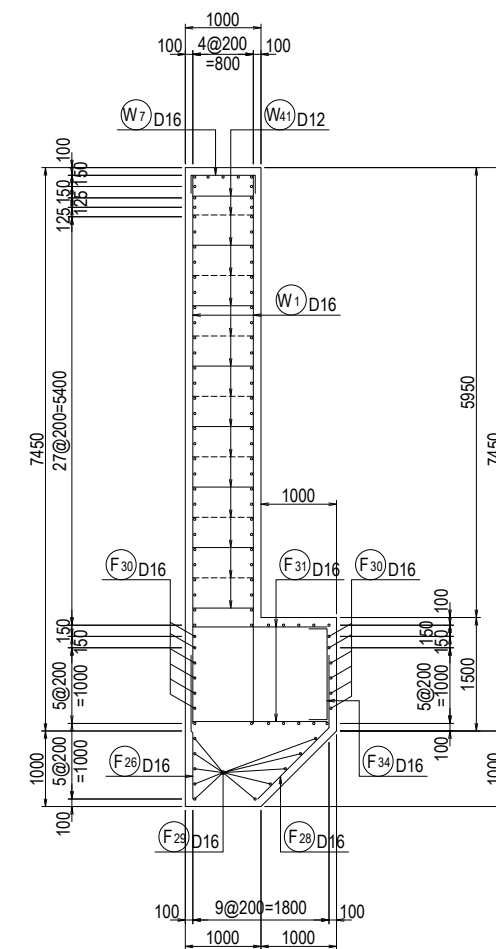
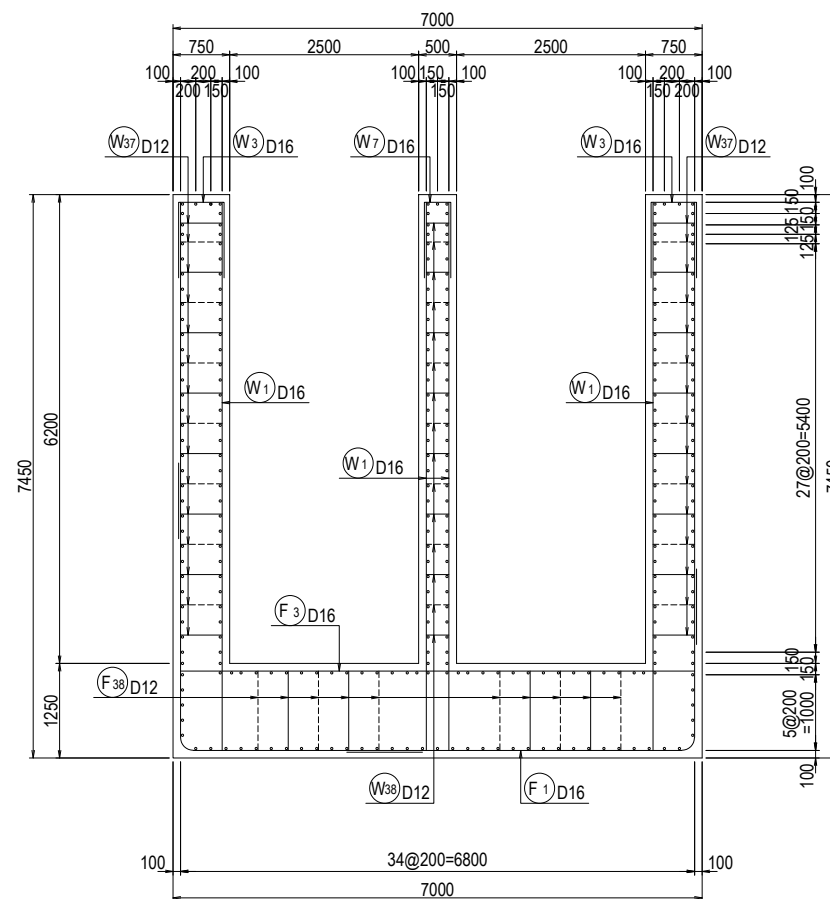
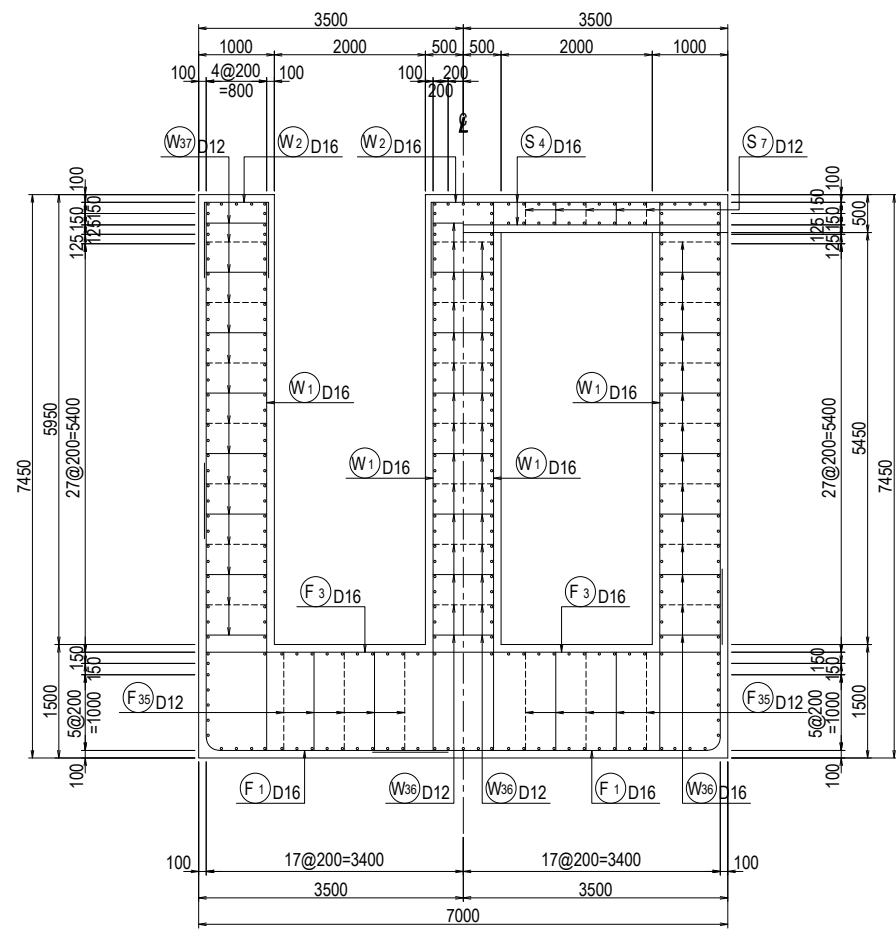
# Section of Upstream Gate Abutment and Pier of Sahelyial Regulator (2/2)

**Section E—E**

**Section F—F**

**Section G—G**

**Section H—H**

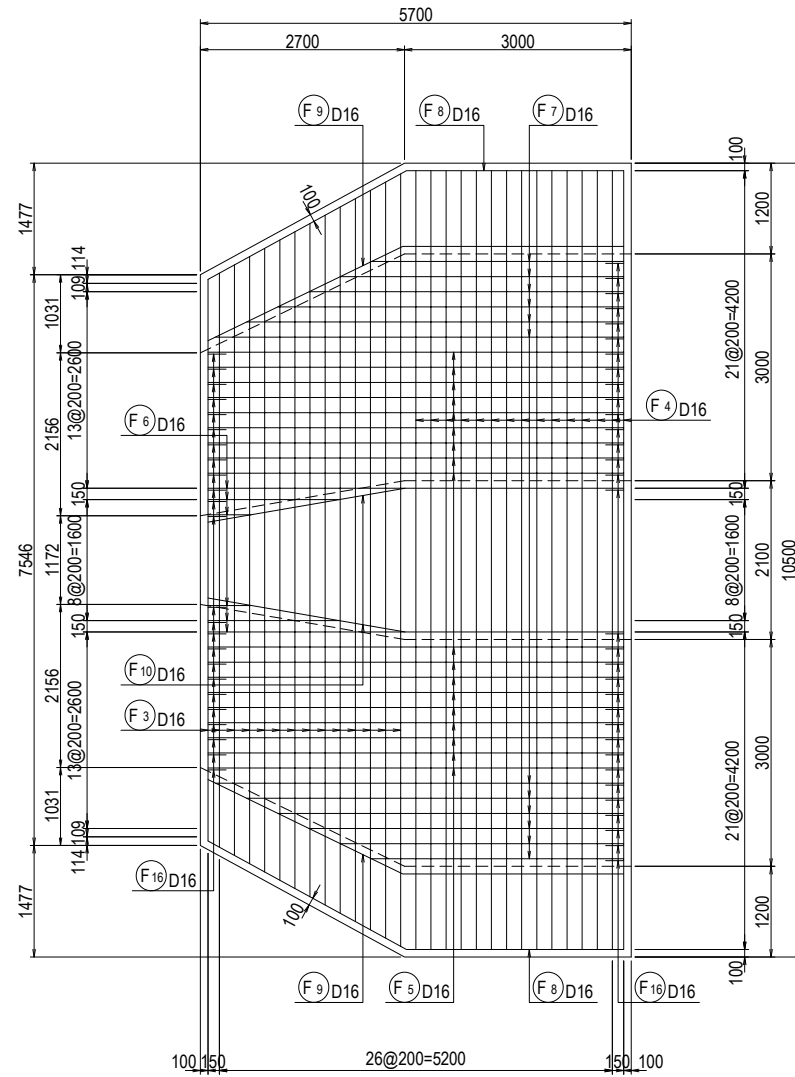


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Sahelyia Regulator Bar arrangement of pier (11)			<b>DRW. NO.</b> CS-16
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

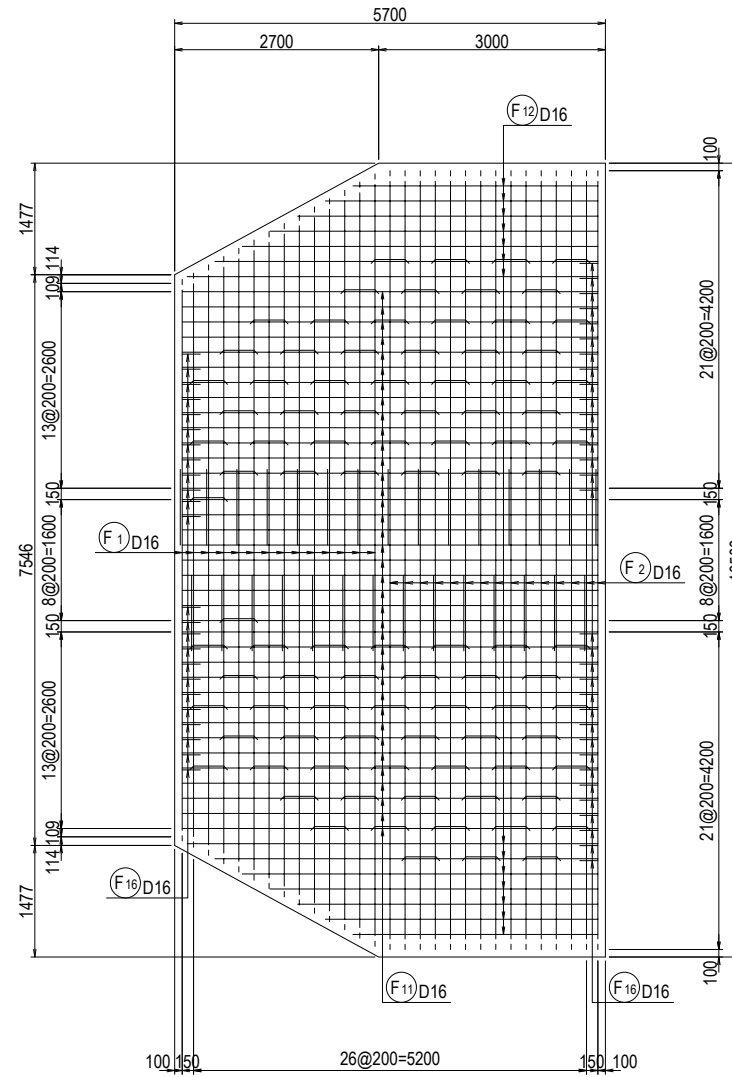


# Detail of Down Stream Apron for Sahelyjal Regulator (1/3)

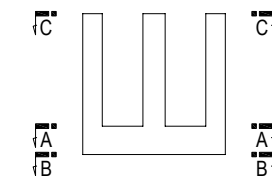
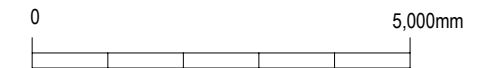
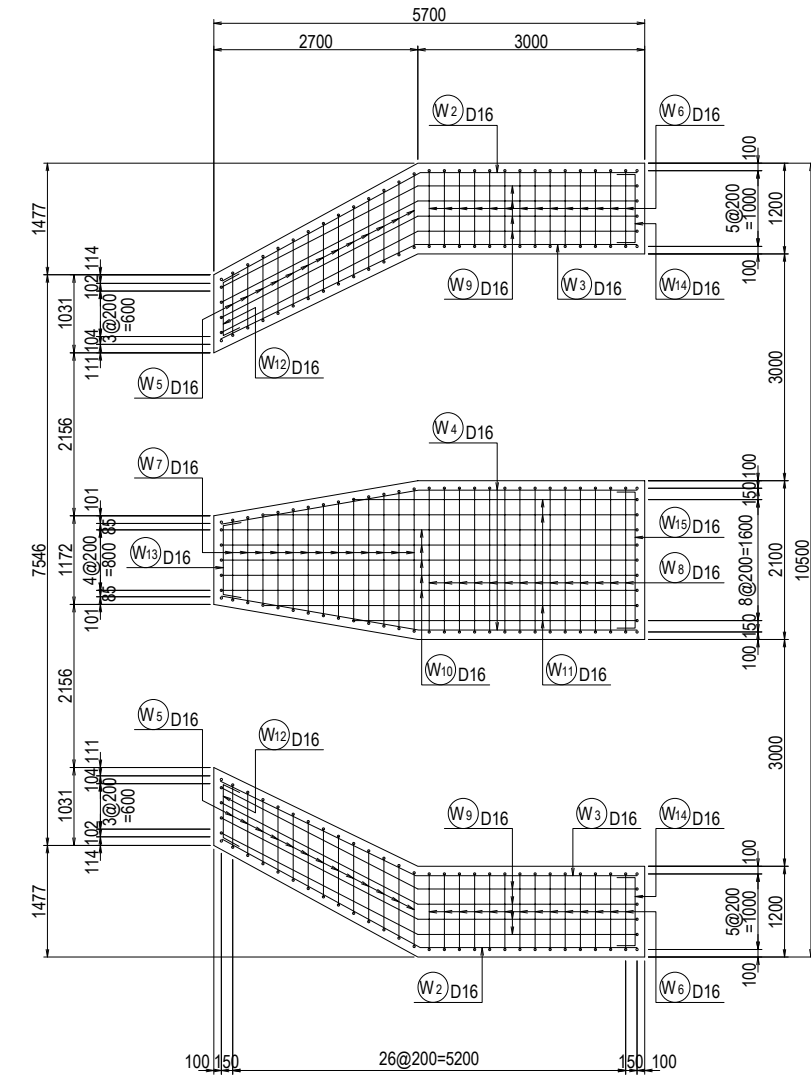
Section A—A



Section B—B



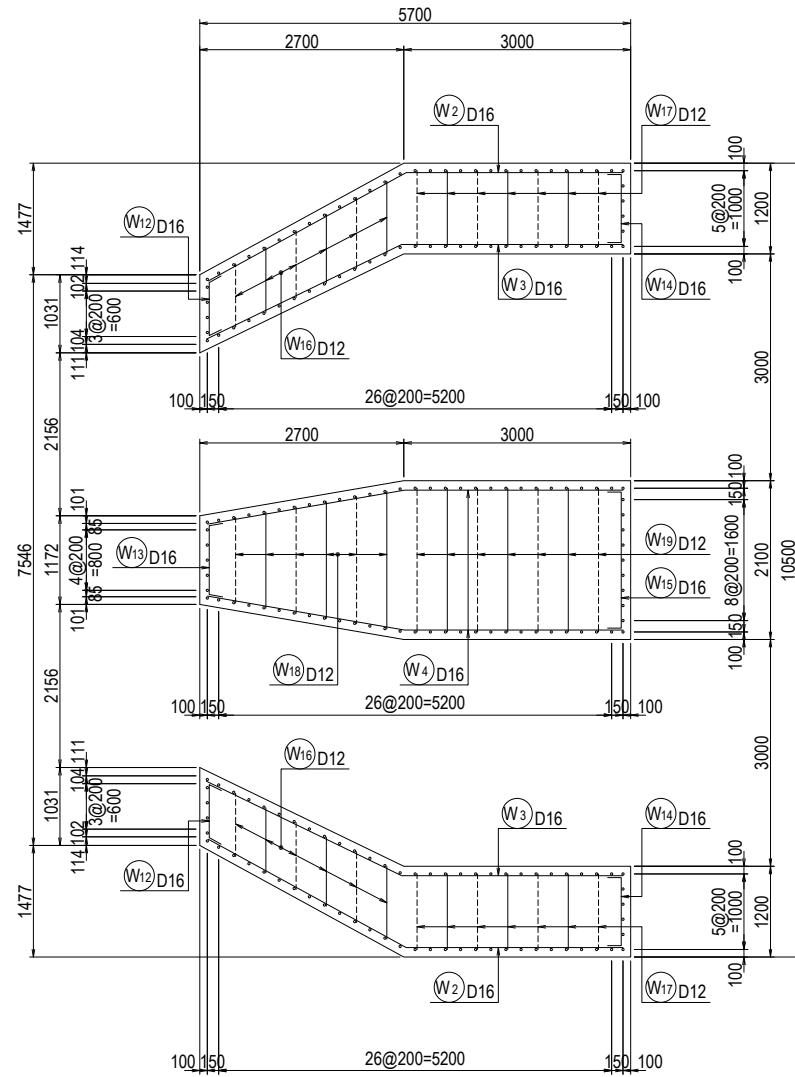
Section C—C



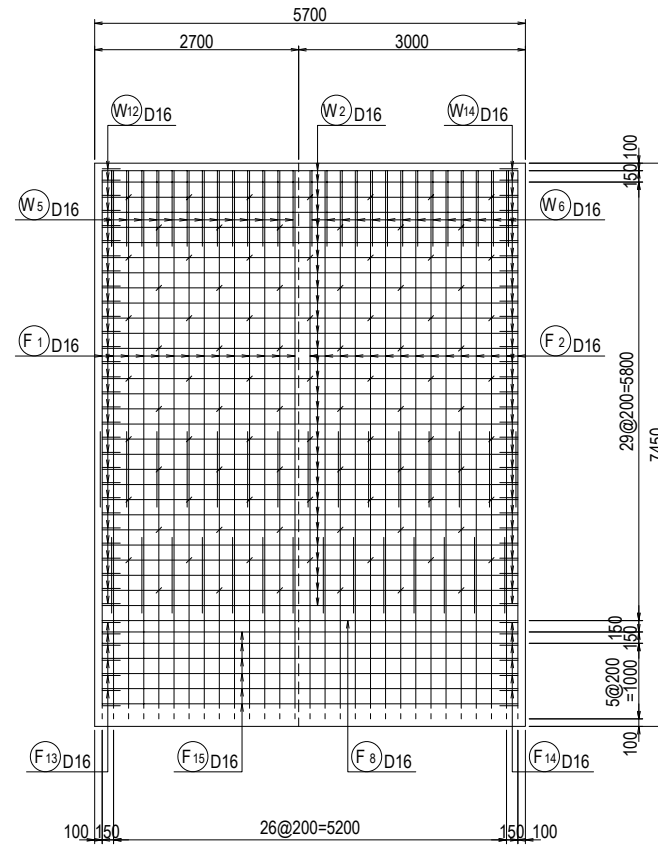
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Sahelyja Regulator Bar arrangement of pier (12)		DRW. NO. CS-17
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

# Detail of Down Stream Apron for Sahelyjal Regulator (2/3)

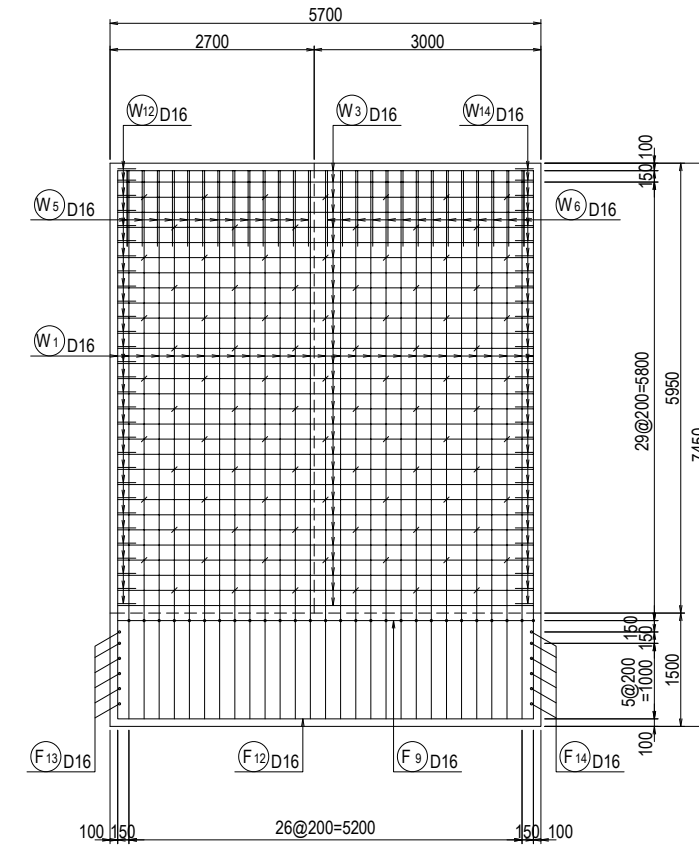
**Section D—D**



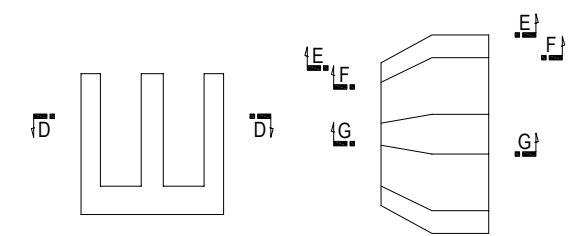
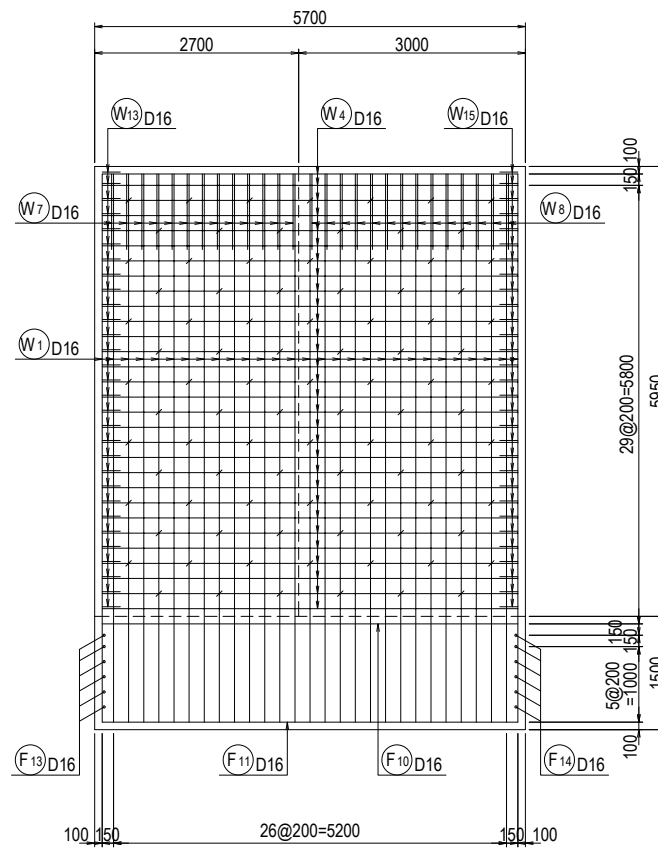
**Section E—E**



**Section F—F**



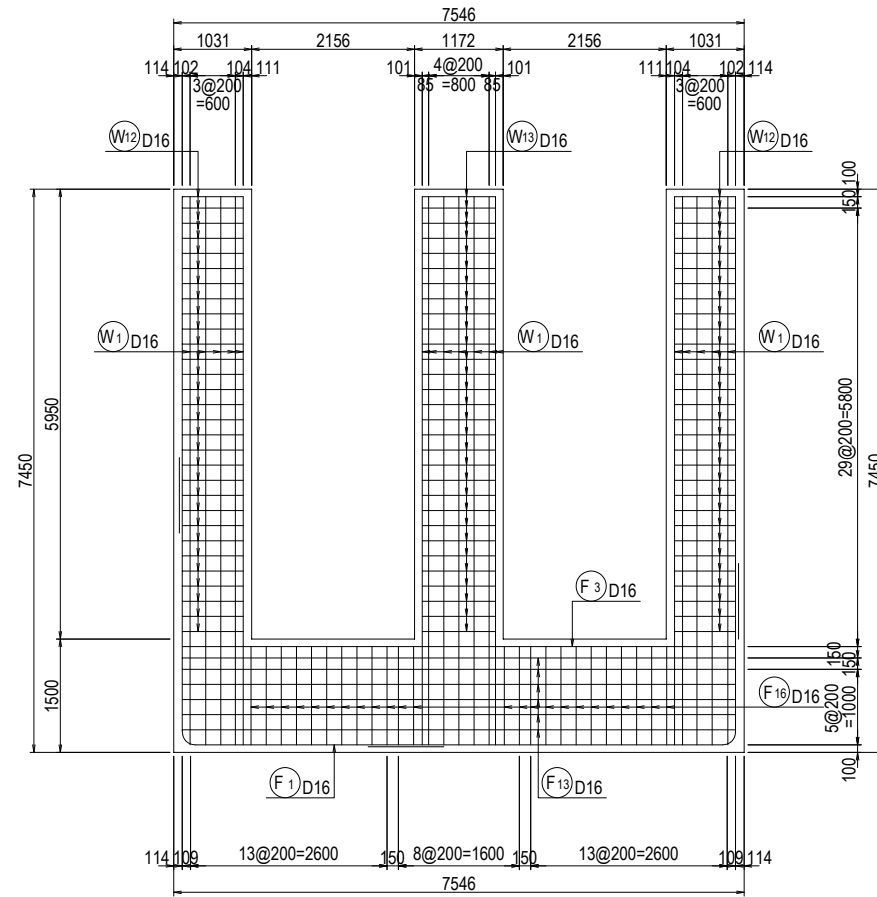
**Section G—G**



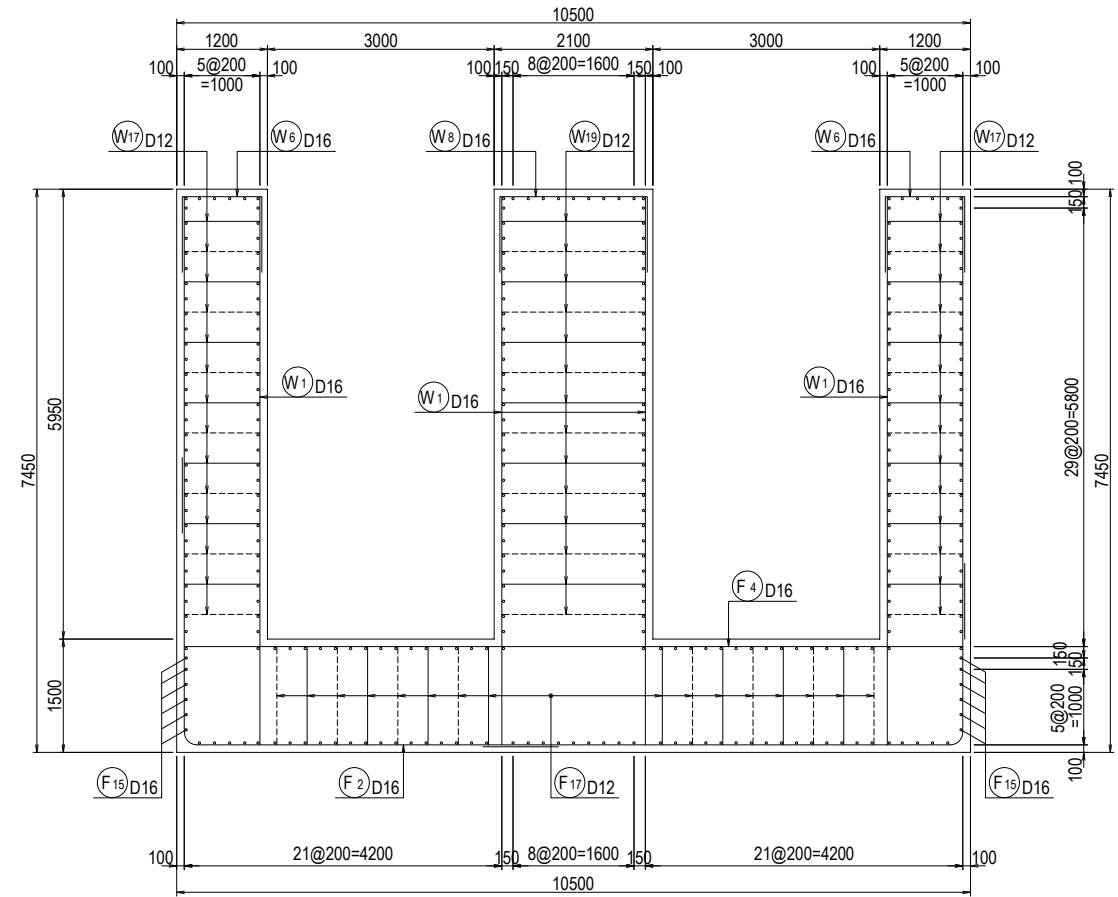
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Sahelyja Regulator Bar arrangement of pier (13)			<b>DRW. NO.</b> CS-18
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Detail of Down Stream Apron for Sahelyial Regulator (3/3)

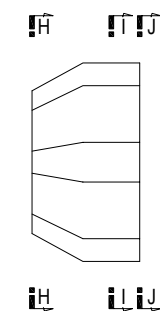
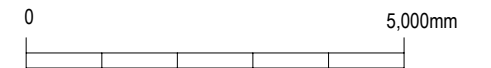
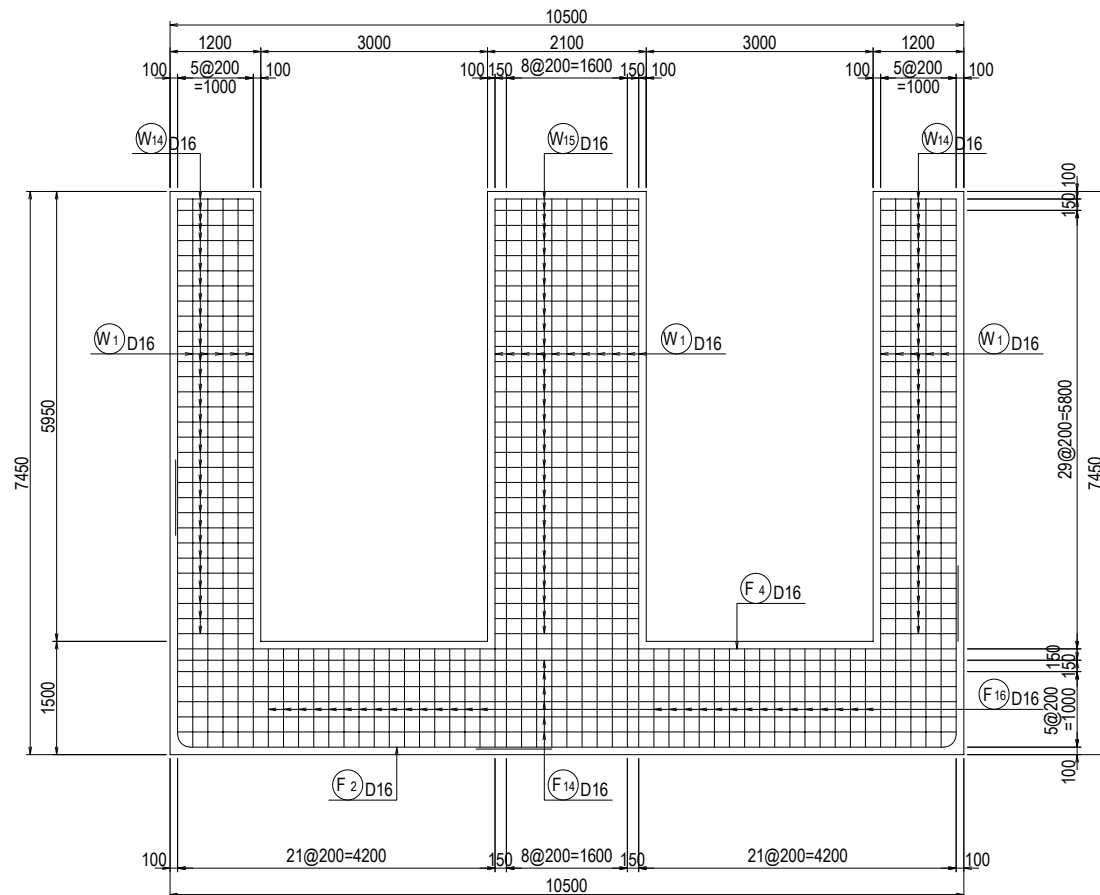
Section H—H



Section I—I



Section J—J



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Sahelyia Regulator Bar arrangement of pier (14)	DRW. NO. CS-19	
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

Item	Unit	Quantity
Excavation	C1	m2 21.00
Excavation	C2	m2 -
Backfilling	R	m2 -
Embankment	B0	m2 -
Embankment	BL	m2 -
Embankment	BR	m2 -
Earth Finishing Foundation	L1	m 10.50
Rough Finishing	L2	m -

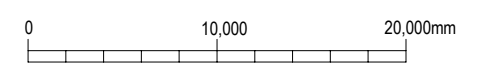
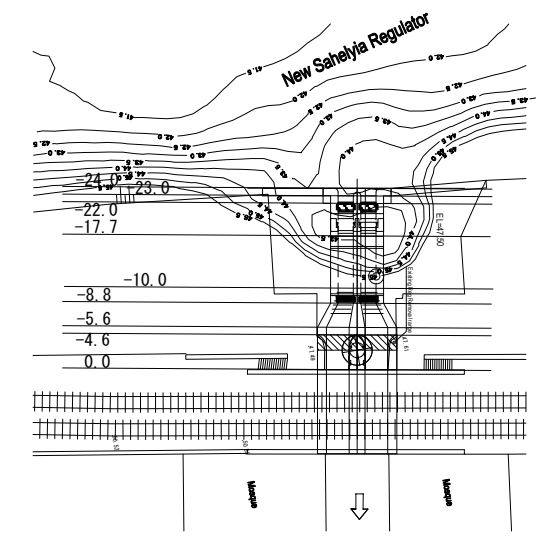
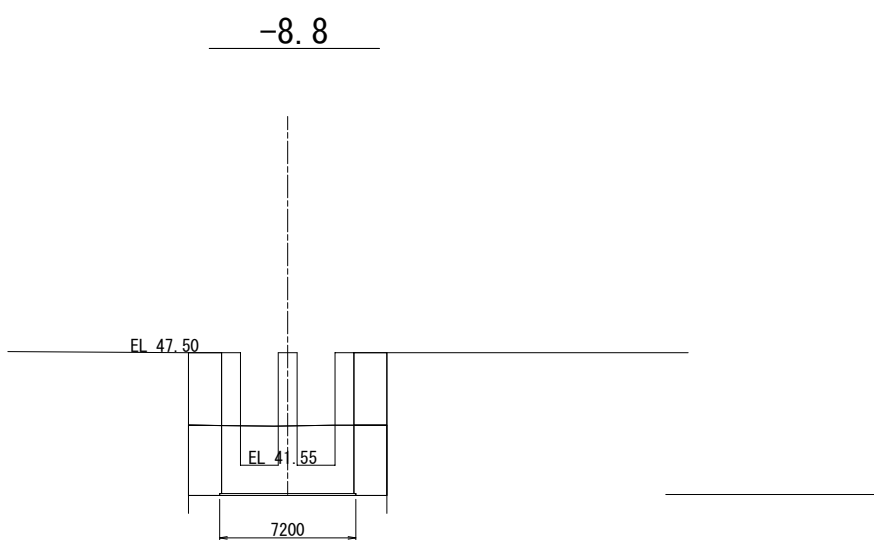
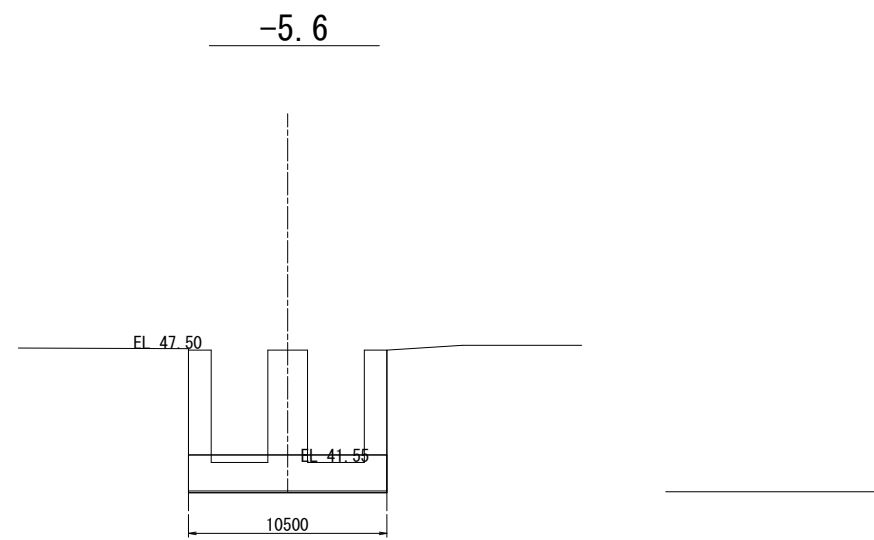
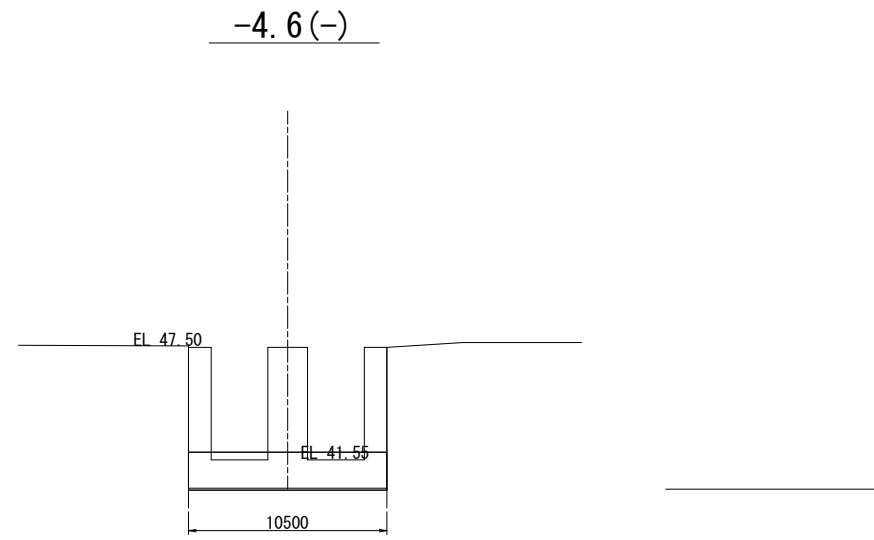
DL=40.00

Item	Unit	Quantity
Excavation	C1	m2 21.00
Excavation	C2	m2 -
Backfilling	R	m2 -
Embankment	B0	m2 -
Embankment	BL	m2 -
Embankment	BR	m2 -
Earth Finishing Foundation	L1	m 10.50
Rough Finishing	L2	m -

DL=40.00

Item	Unit	Quantity
Excavation	C1	m2 38.87
Excavation	C2	m2 -
Backfilling	R	m2 12.98
Embankment	B0	m2 -
Embankment	BL	m2 6.72
Embankment	BR	m2 6.70
Earth Finishing Foundation	L1	m 7.20
Rough Finishing	L2	m -

DL=40.00



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Sahelyia Regulator Cross section of earth works (1)			DRW. NO. CS-20
SANYU CONSULTANTS INC.			
PREPARED BY :	CHECKED BY :	APPROVED BY :	
DATE :	DATE :	DATE :	DATE :

Item	Unit	Quantity
Excavation	C1	m2 38.87
Excavation	C2	m2 -
Backfilling	R	m2 12.98
Embankment	B0	m2 -
Embankment	BL	m2 6.72
Embankment	BR	m2 6.70
Earth Finishing Foundation	L1	m 7.20
Rough Finishing	L2	m -

DL=40.00

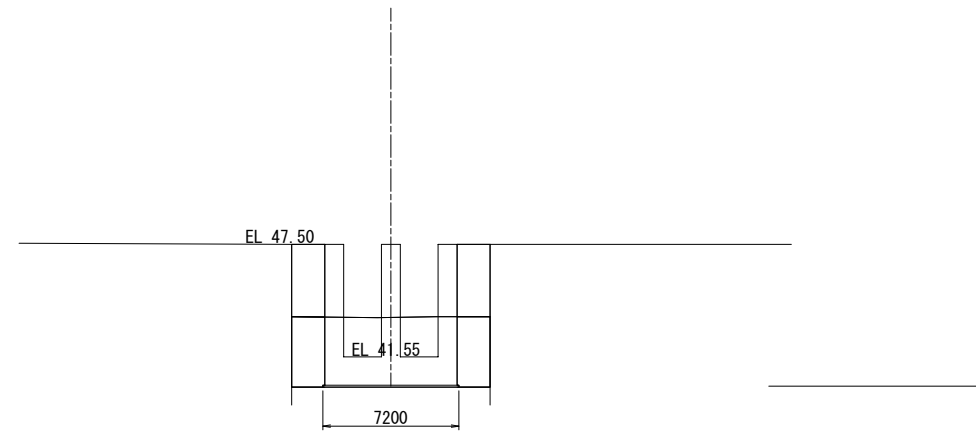
Item	Unit	Quantity
Excavation	C1	m2 54.39
Excavation	C2	m2 -
Backfilling	R	m2 28.53
Embankment	B0	m2 -
Embankment	BL	m2 41.16
Embankment	BR	m2 28.73
Earth Finishing Foundation	L1	m 7.20
Rough Finishing	L2	m 10.50

DL=40.00

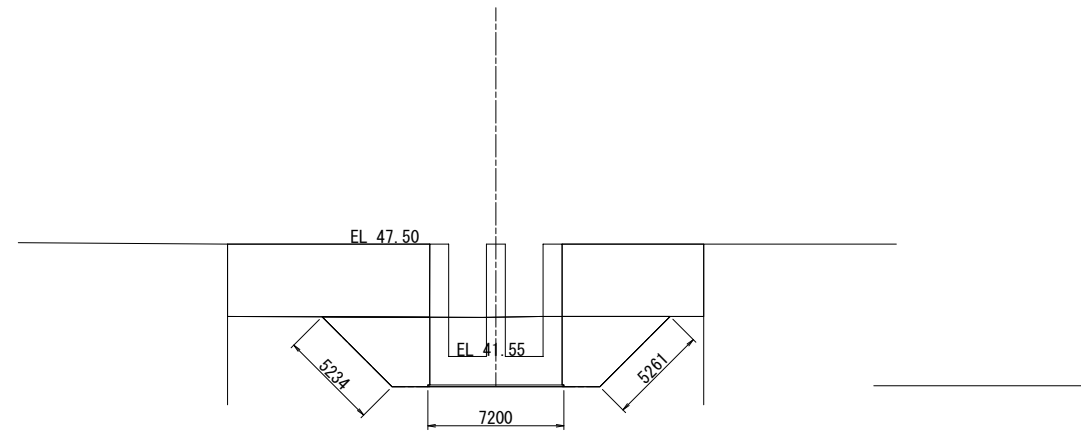
Item	Unit	Quantity
Excavation	C1	m2 60.68
Excavation	C2	m2 -
Backfilling	R	m2 35.79
Embankment	B0	m2 -
Embankment	BL	m2 29.10
Embankment	BR	m2 24.29
Earth Finishing Foundation	L1	m 7.20
Rough Finishing	L2	m 15.70

DL=40.00

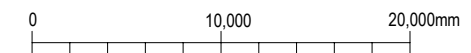
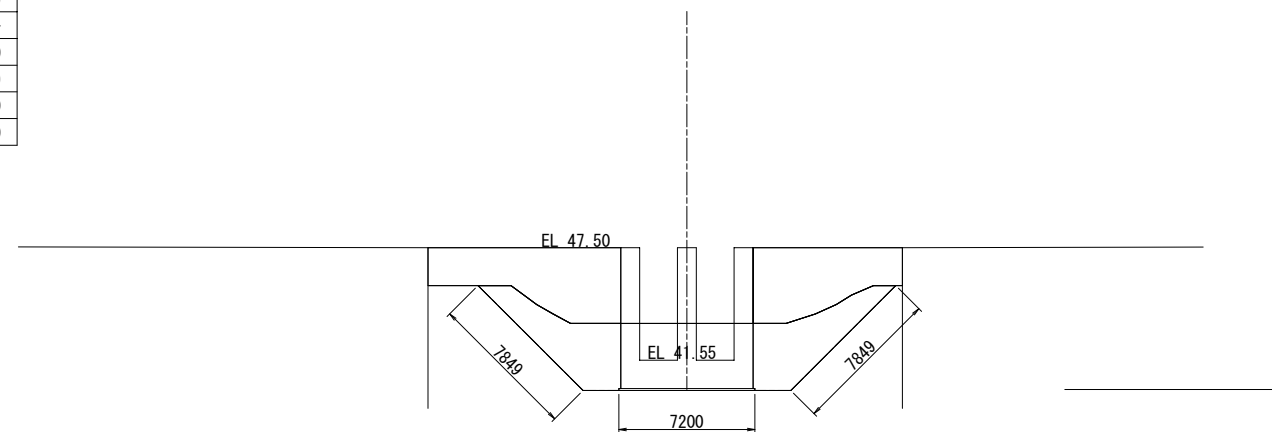
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-10.0(-)



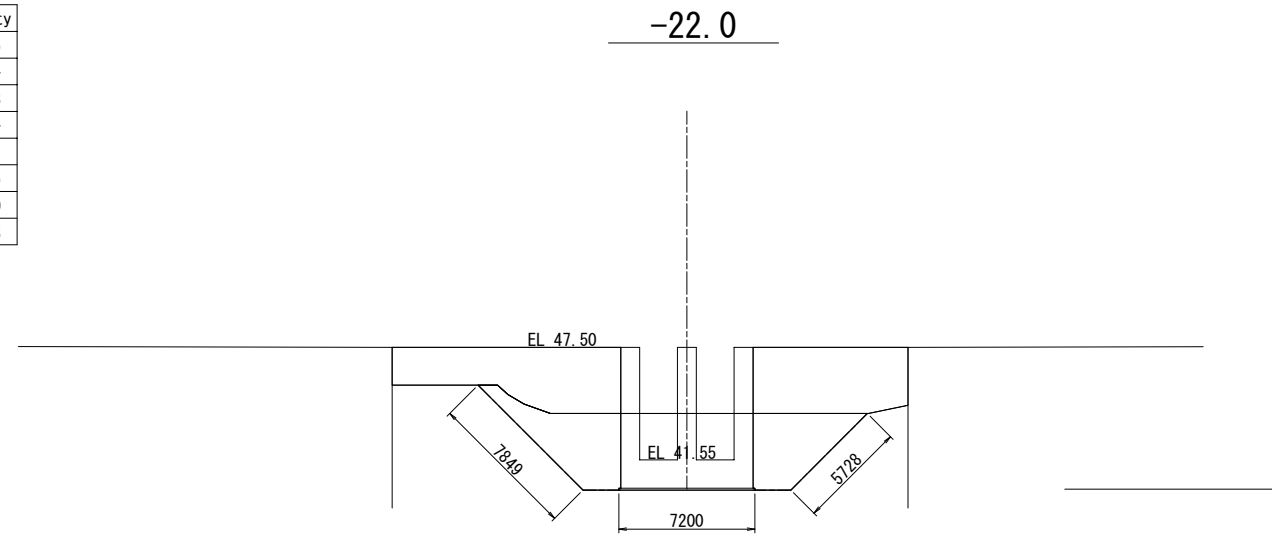
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Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Sahelyia Regulator Cross section of earth works (2)			DRW. NO. CS-21
SANYU CONSULTANTS INC.			
PREPARED BY :	CHECKED BY :	APPROVED BY :	
DATE :	DATE :	DATE :	DATE :

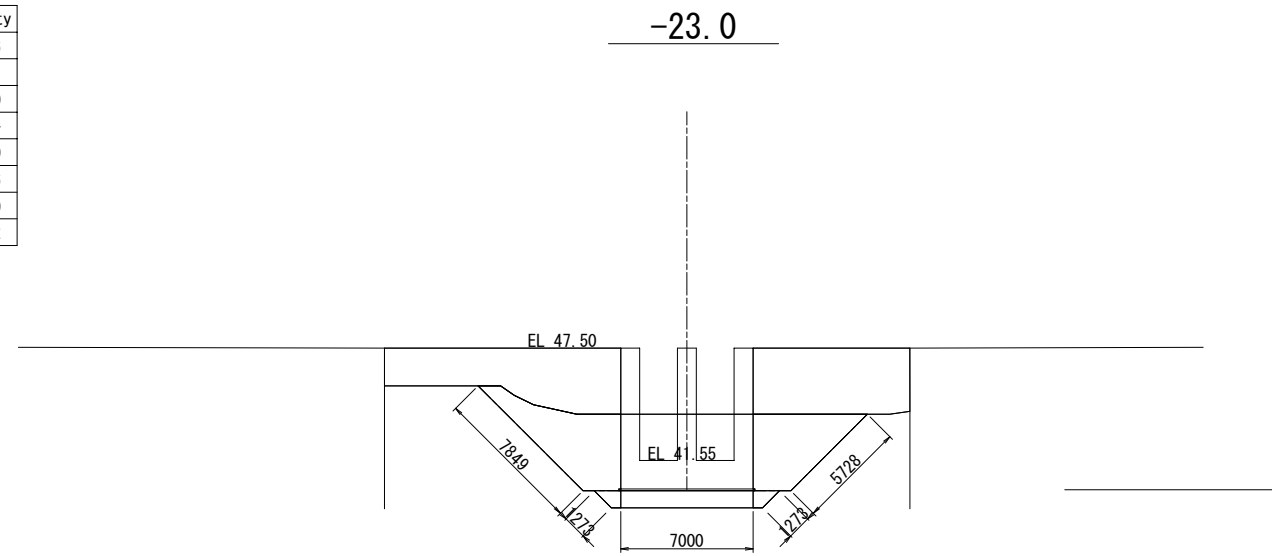
Item	Unit	Quantity
Excavation	C1	m2 63.05
Excavation	C2	m2 -
Backfilling	R	m2 34.68
Embankment	B0	m2 -
Embankment	BL	m2 32.31
Embankment	BR	m2 28.25
Earth Finishing Foundation	L1	m 7.20
Rough Finishing	L2	m 13.58

DL=40.00



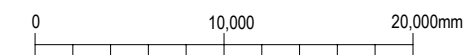
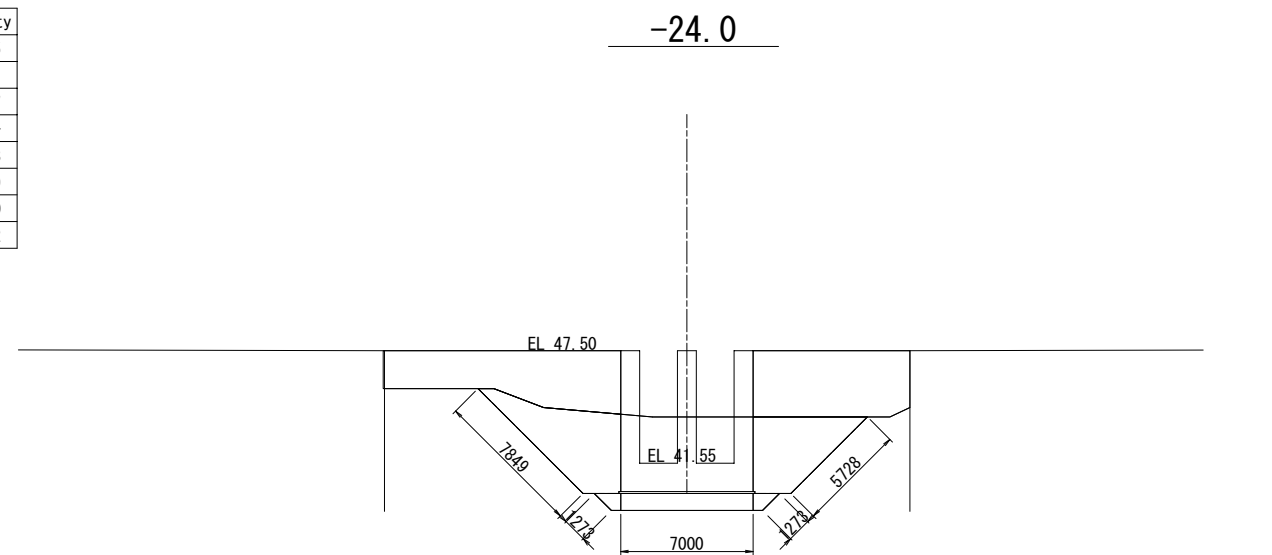
Item	Unit	Quantity
Excavation	C1	m2 63.86
Excavation	C2	m2 8.01
Backfilling	R	m2 37.20
Embankment	B0	m2 -
Embankment	BL	m2 32.30
Embankment	BR	m2 28.96
Earth Finishing Foundation	L1	m 7.00
Rough Finishing	L2	m 16.12

DL=40.00



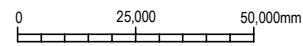
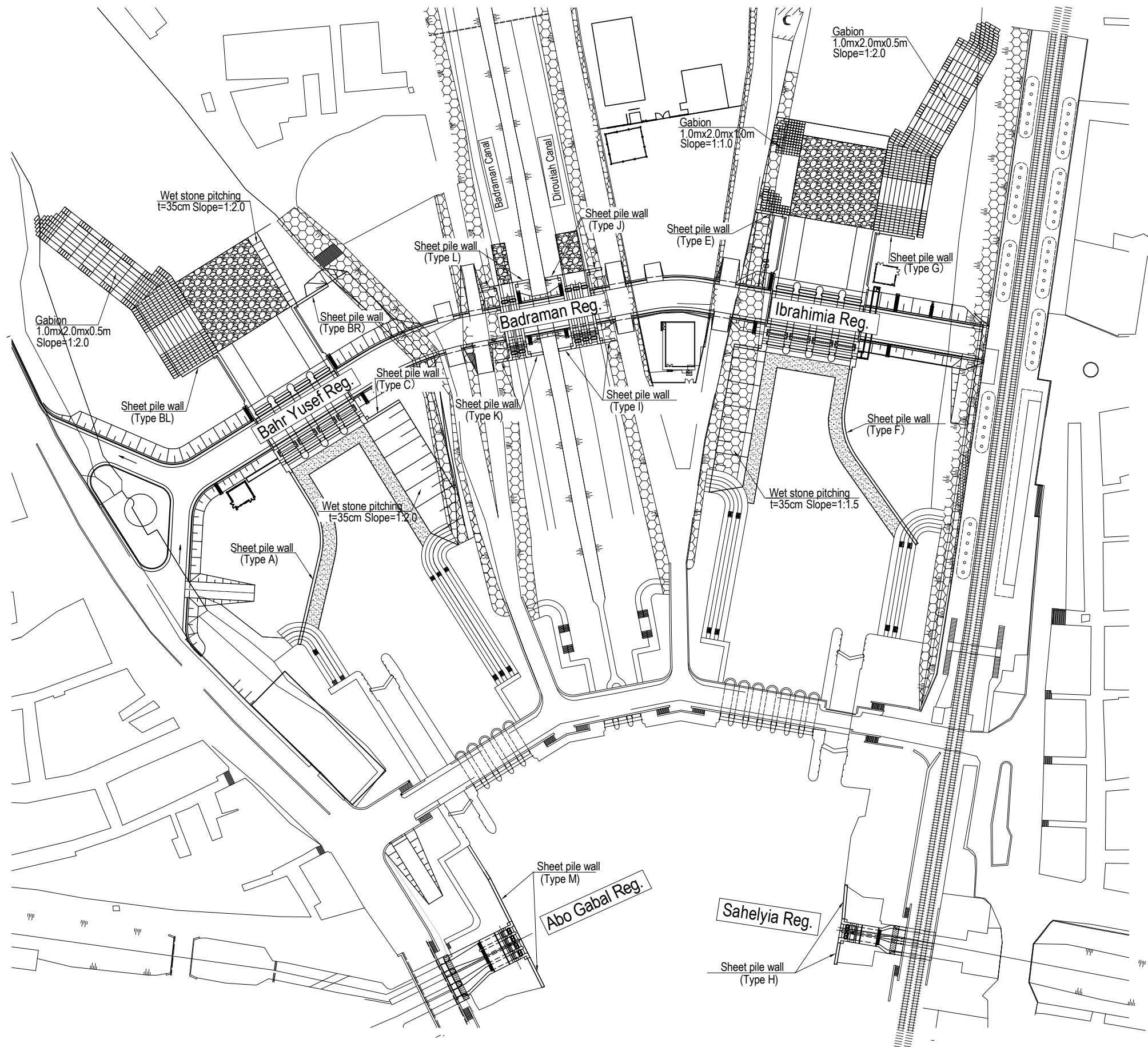
Item	Unit	Quantity
Excavation	C1	m2 65.15
Excavation	C2	m2 8.01
Backfilling	R	m2 38.37
Embankment	B0	m2 -
Embankment	BL	m2 31.28
Embankment	BR	m2 28.79
Earth Finishing Foundation	L1	m 7.00
Rough Finishing	L2	m 16.12

DL=40.00



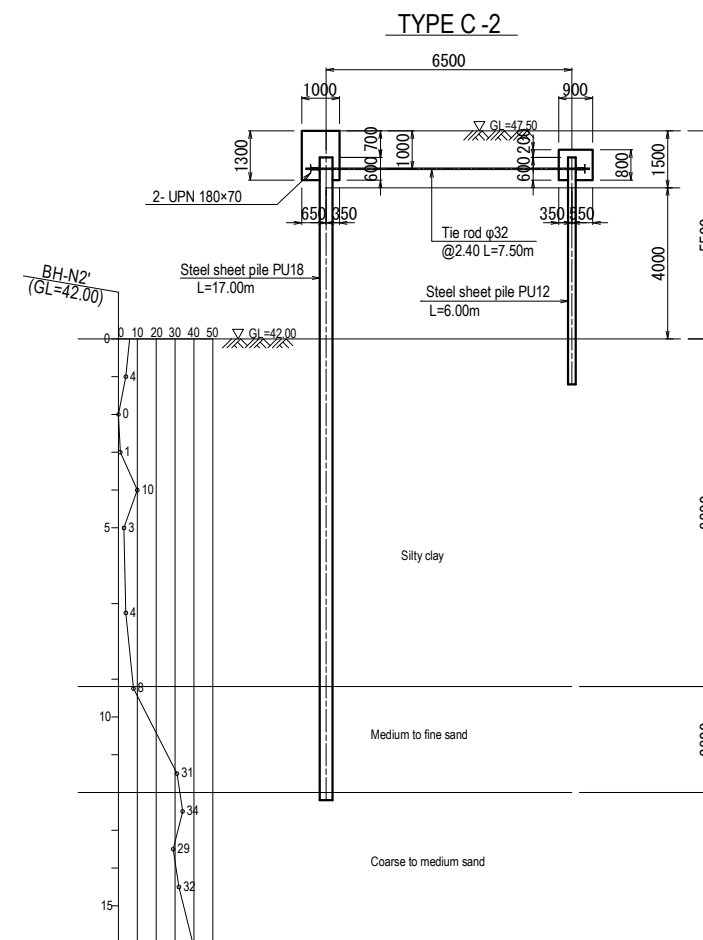
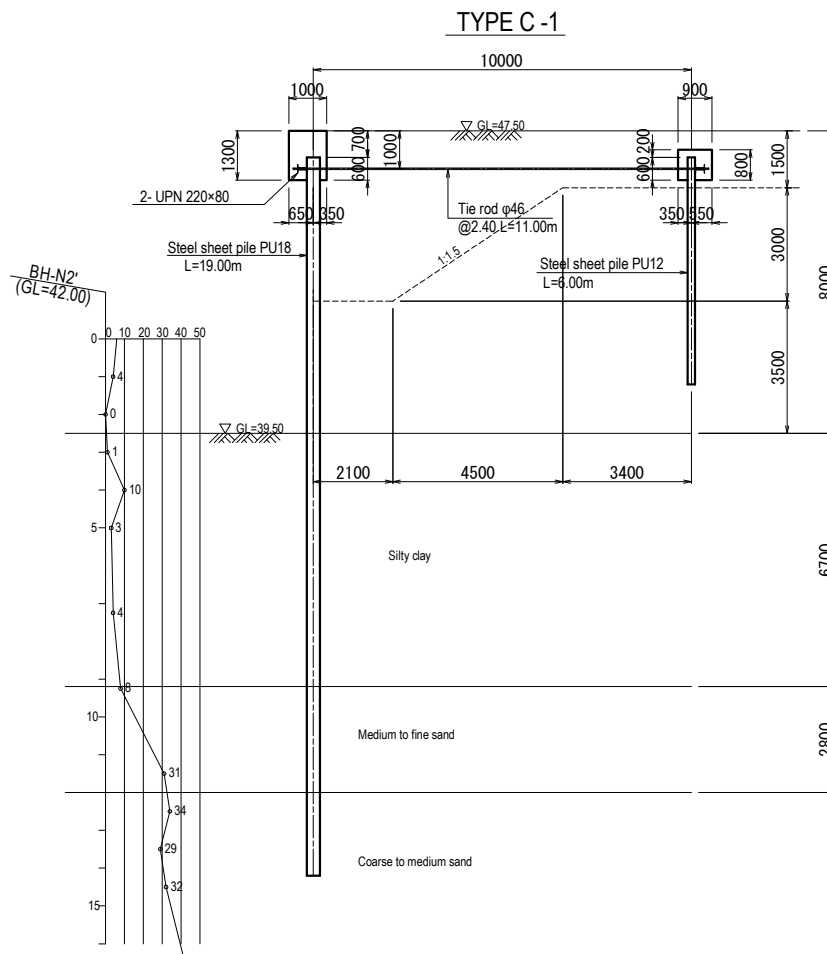
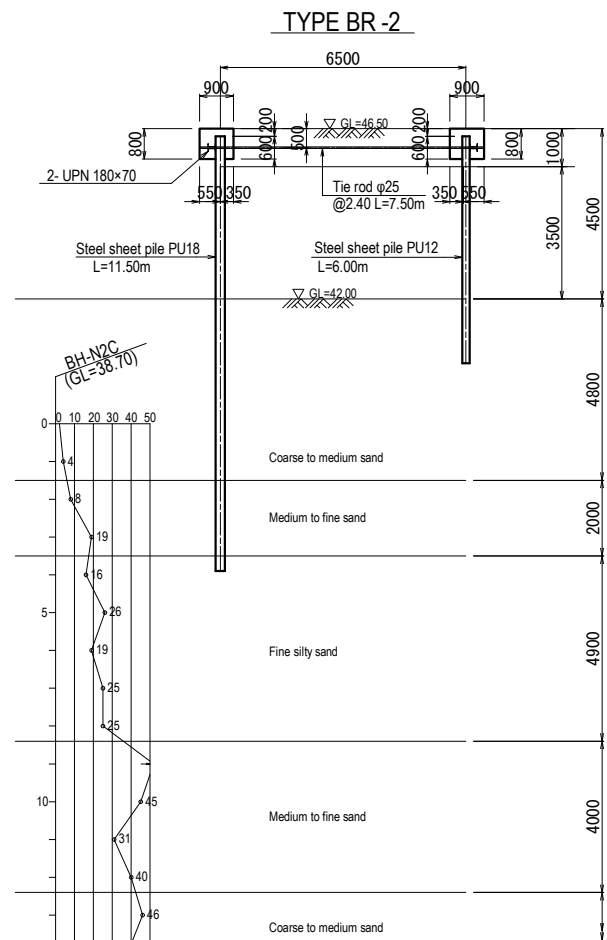
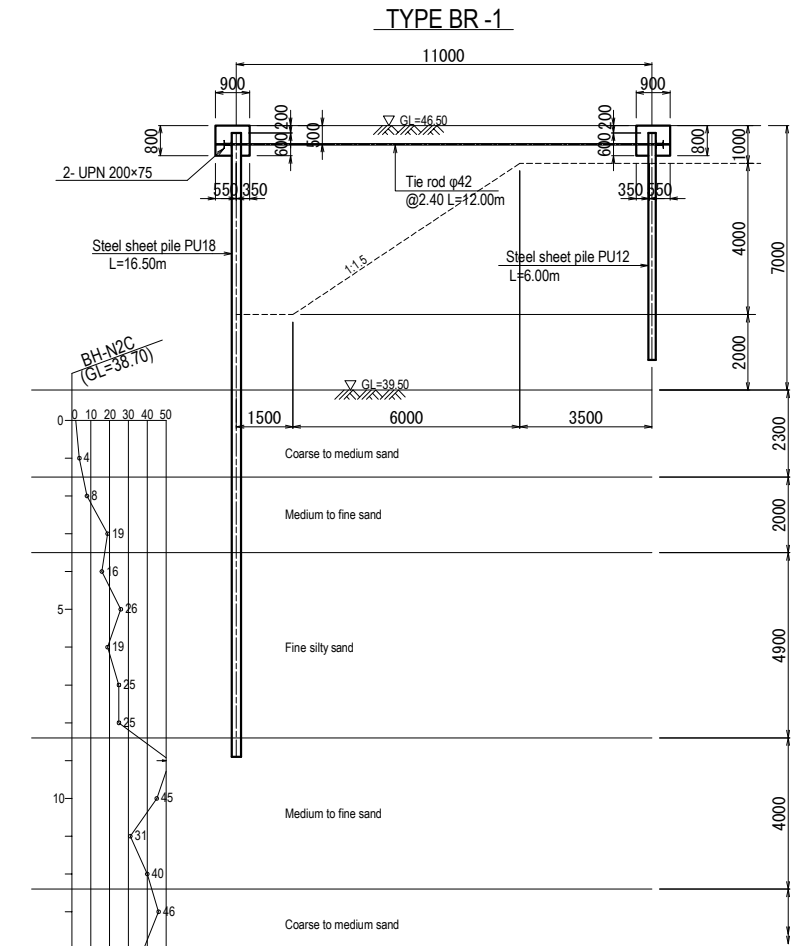
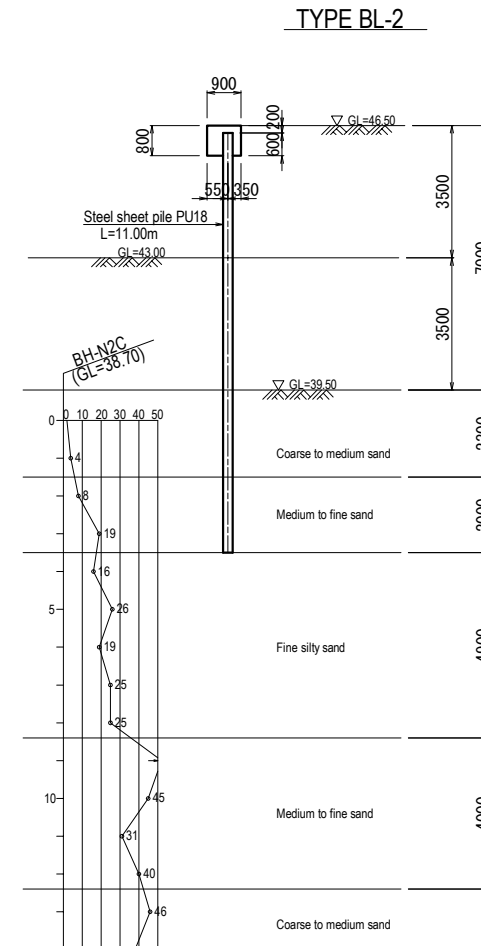
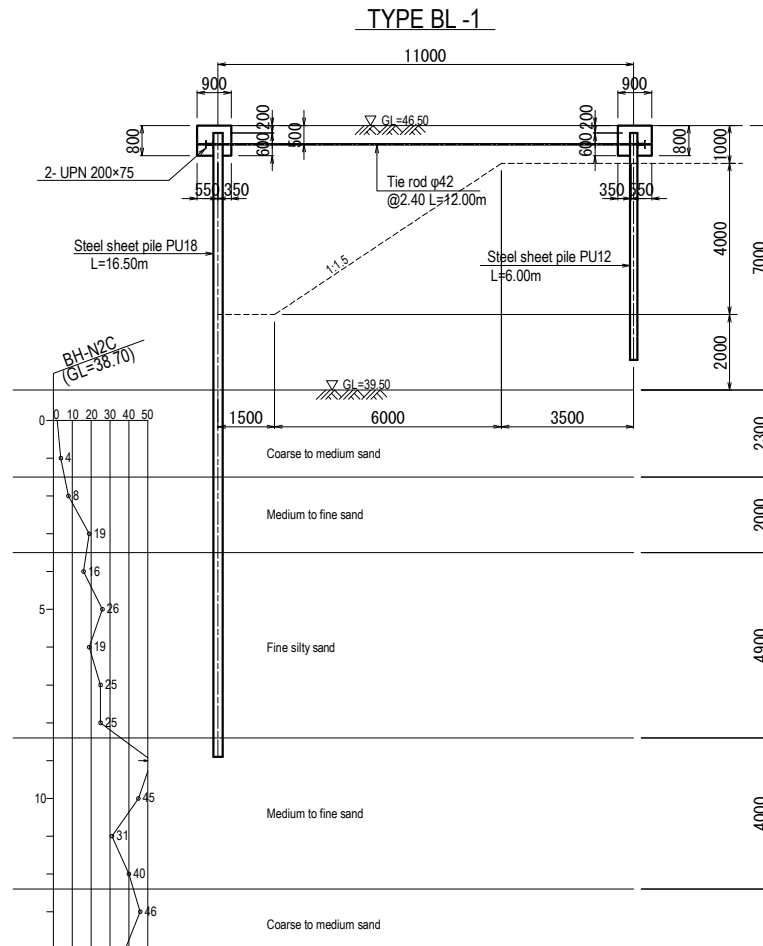
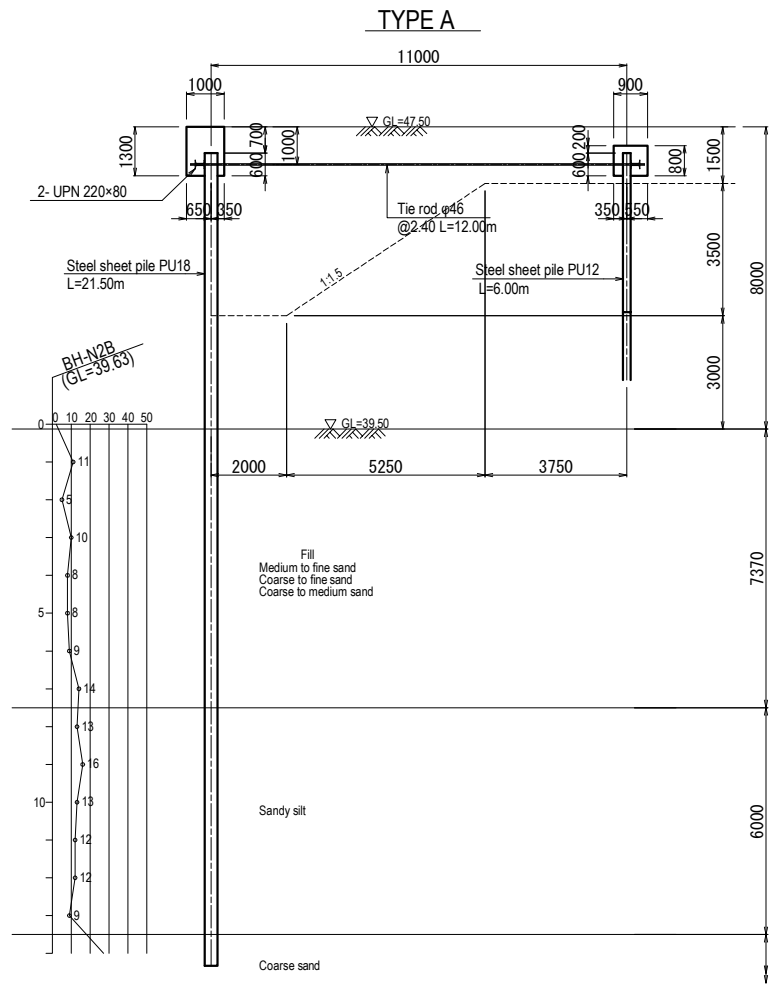
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Sahelyia Regulator Cross section of earth works (3)			DRW. NO. CS-22
SANYU CONSULTANTS INC.			
PREPARED BY :	CHECKED BY :	APPROVED BY :	
DATE :	DATE :	DATE :	DATE :

# General layout of bank protection works

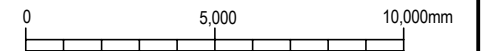


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
General layout of bank protection works		DRW. NO. CP-1
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

# Cross Section of Bank Protection Works(Steel Sheet Pile) (1/3)



- Note: Painting works of the anti-corrosion
- Free-standing cantilever type  
The anti-corrosion should be painted on the both side and entire length of the sheet pile.
  - Tie-rod steel pile type  
Main sheet pile : The anti-corrosion should be painted on the both side excluding the part deeper than 1 meter from the design ground level.  
Bracing sheet pile : The anti-corrosion should be painted on the both side and entire length of the sheet pile.

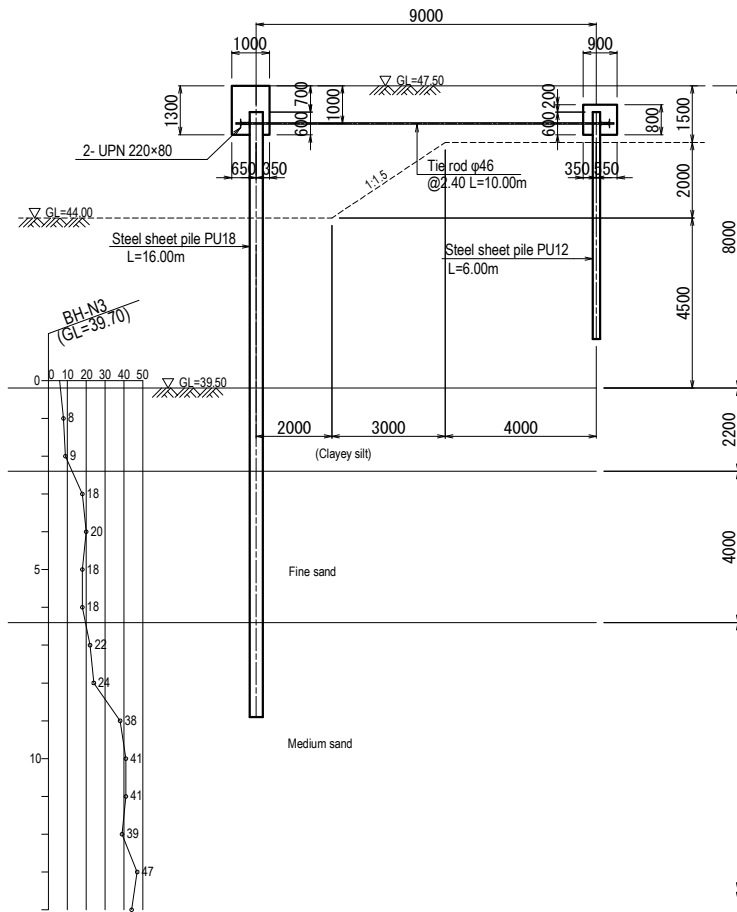


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Cross Section of Bank Protection Works (1) (Steel Sheet Pile)		DRW. NO. CP-2
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

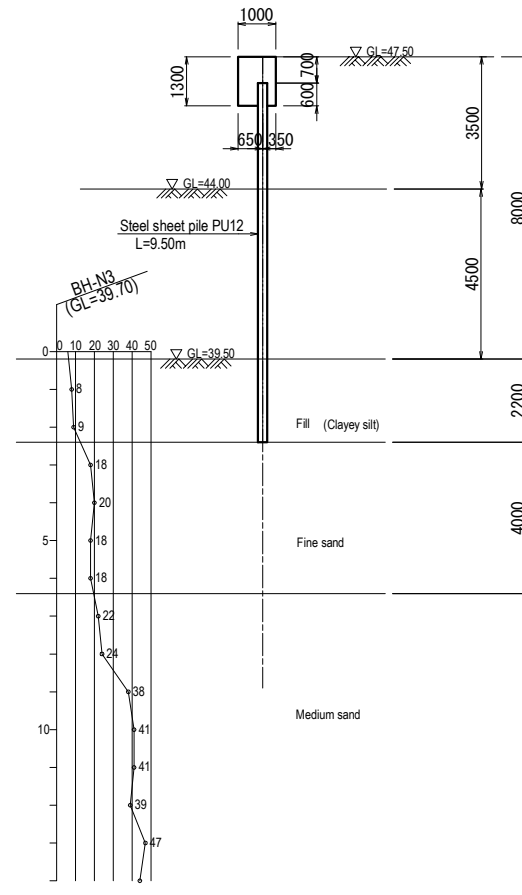


# Cross Section of Bank Protection Works(Steel Sheet Pile) (2/3)

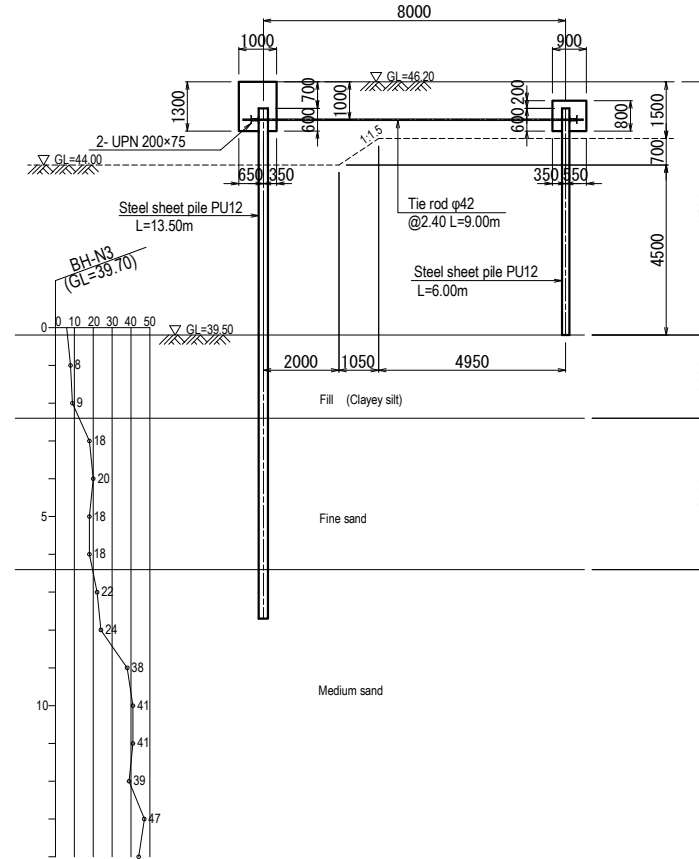
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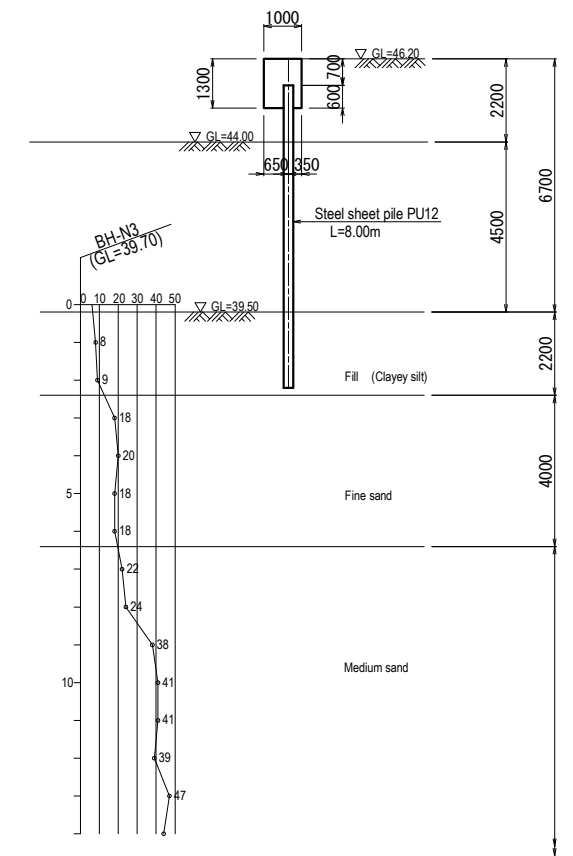
TYPE D-2



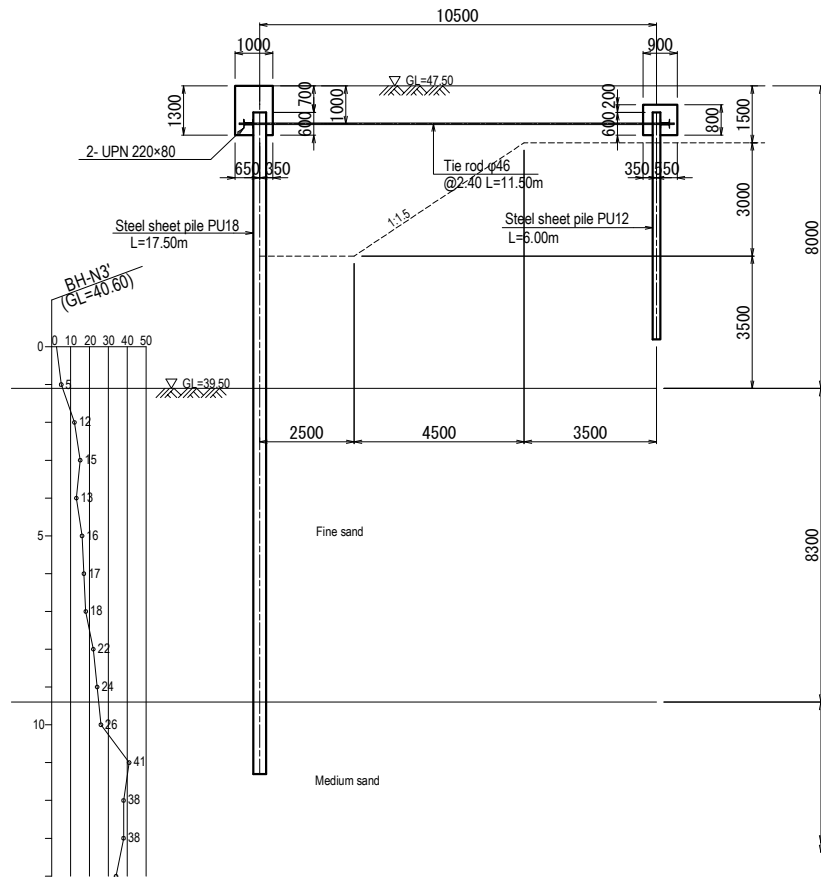
TYPE E-1



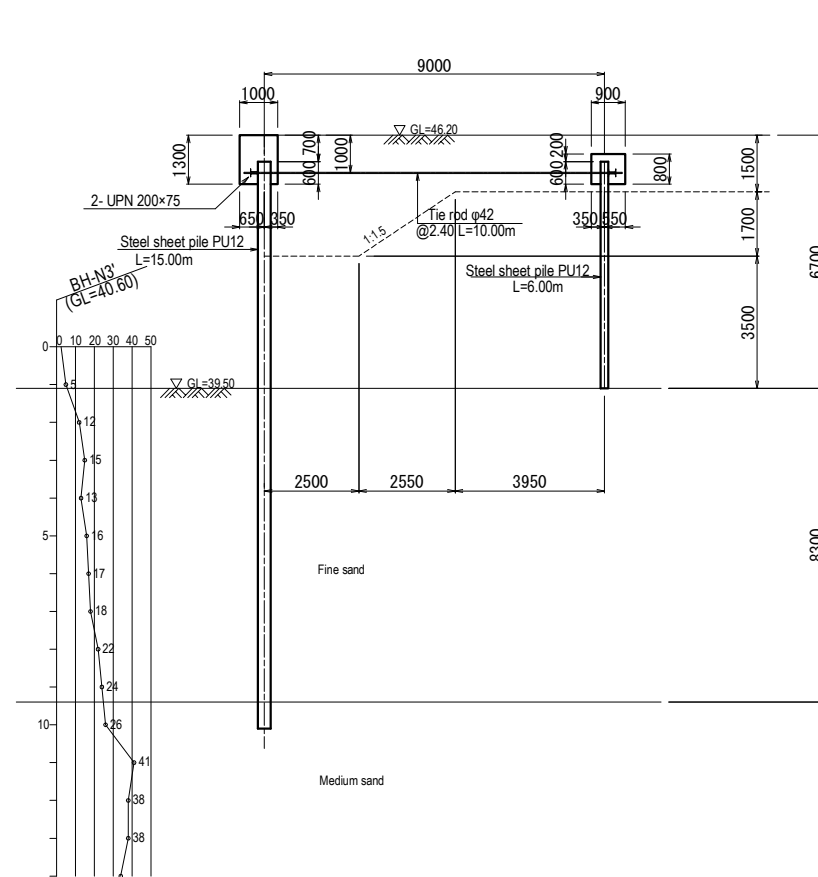
TYPE E-2



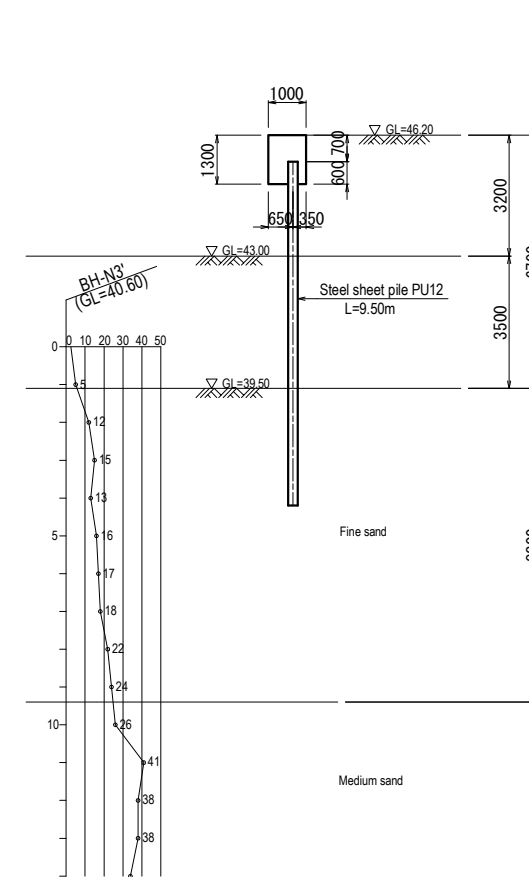
TYPE F



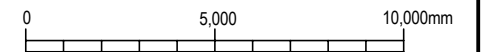
TYPE G-1



TYPE G-2



- Note: Painting works of the anti-corrosion
- Free-standing cantilever type  
The anti-corrosion should be painted on the both side and entire length of the sheet pile.
  - Tie-rod steel pile type  
Main sheet pile : The anti-corrosion should be painted on the both side excluding the part deeper than 1 meter from the design ground level.  
Bracing sheet pile : The anti-corrosion should be painted on the both side and entire length of the sheet pile.

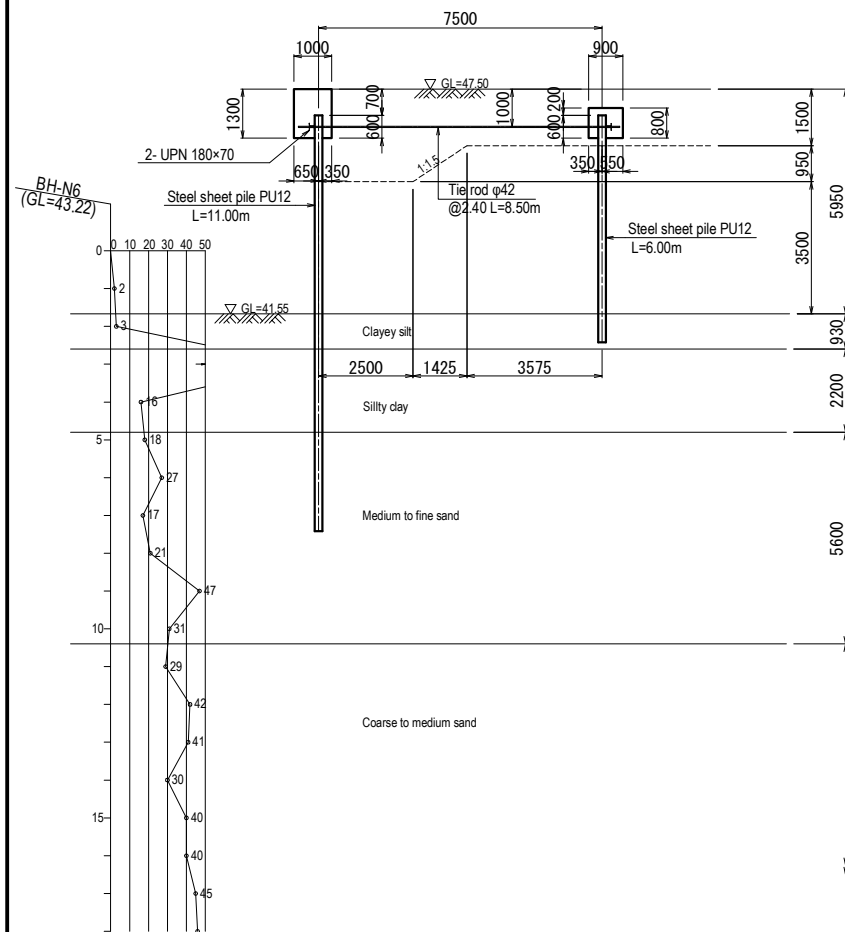


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Cross Section of Bank Protection Works (2) (Steel Sheet Pile)		DRW. NO. CP-3
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

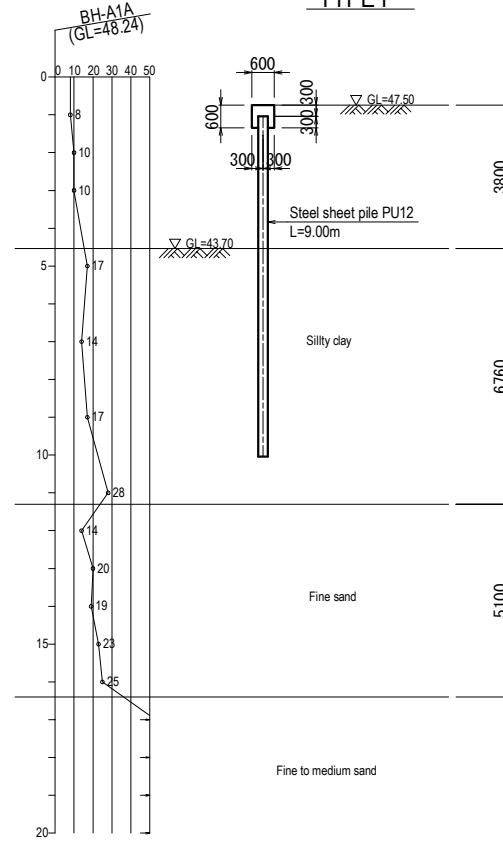
# Cross Section of Bank Protection Works(Steel Sheet Pile) (3/3)

Scale A

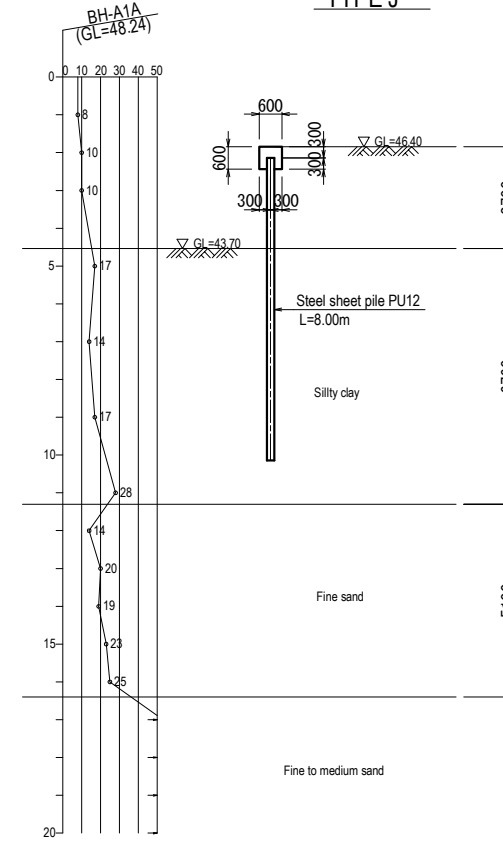
TYPE H



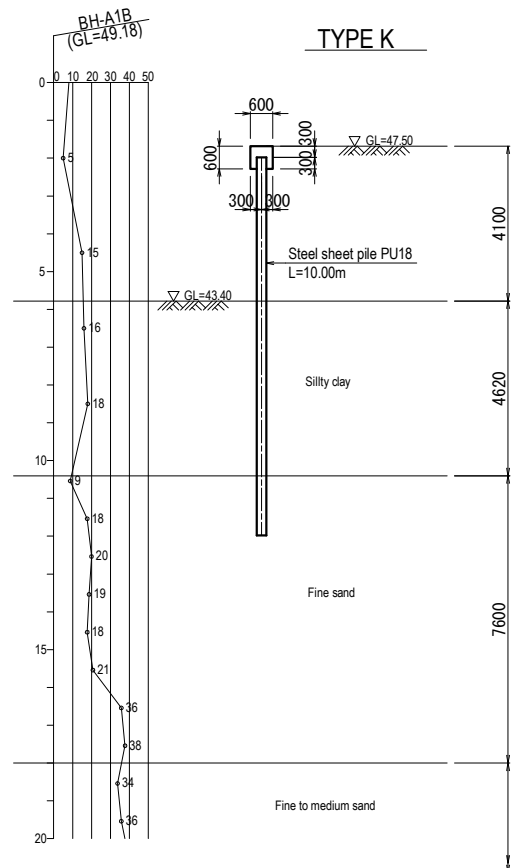
TYPE I



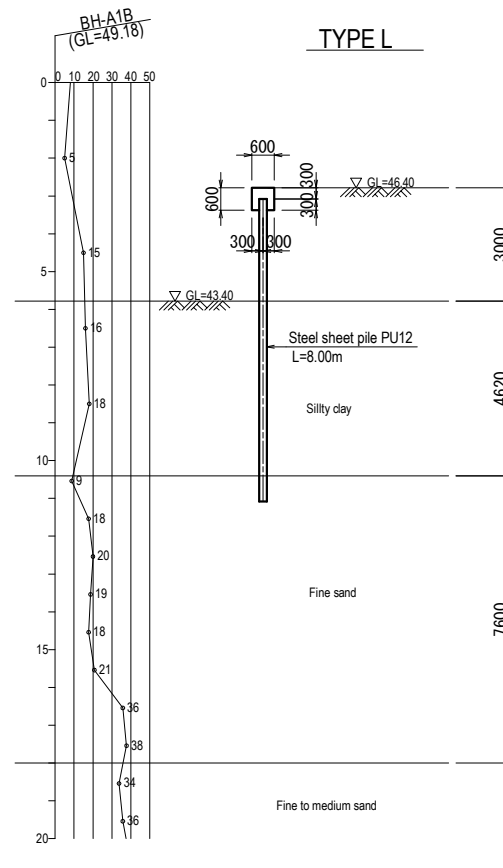
TYPE J



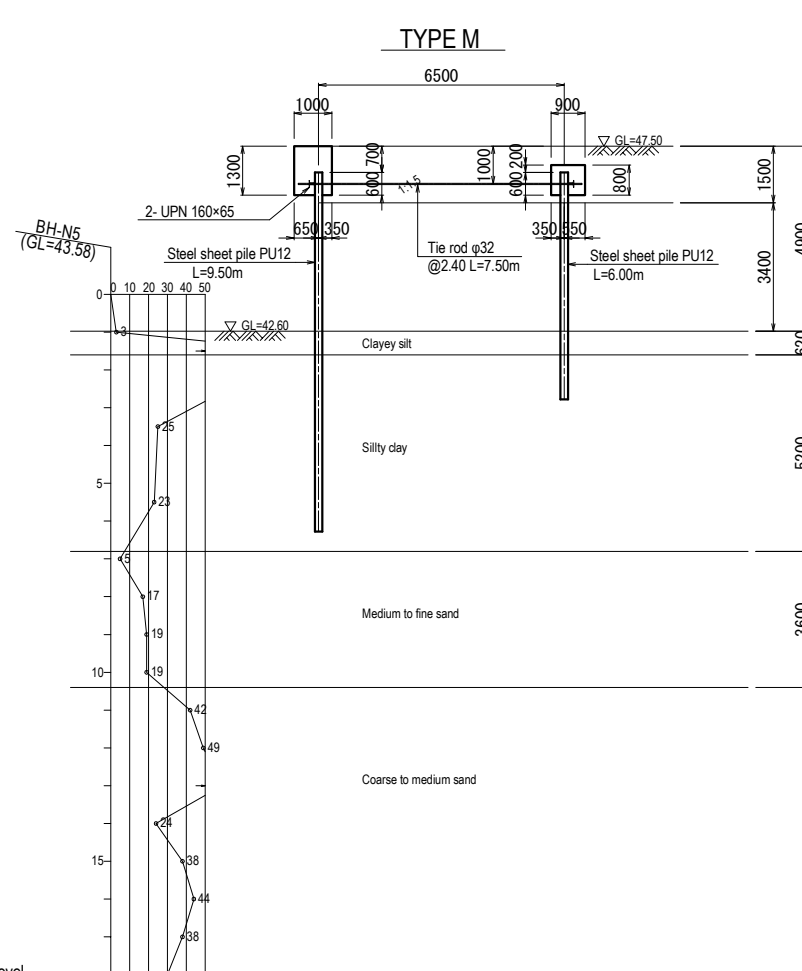
TYPE K



TYPE L

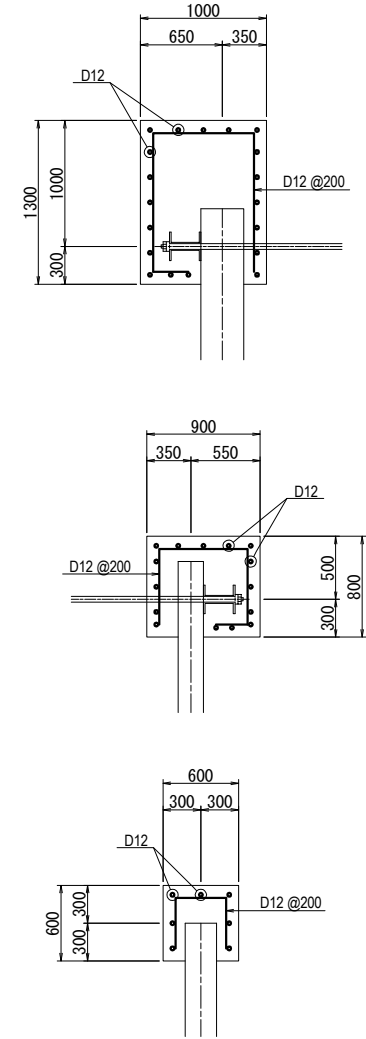


TYPE M

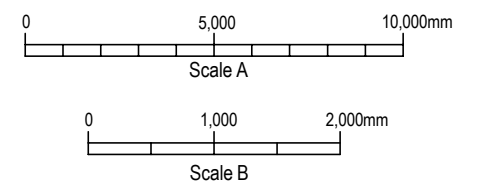


DETAIL OF COPING CONCRETE

Scale B



Note:  
Expansion joint should be provided on the coping concrete at an interval of about 10m.



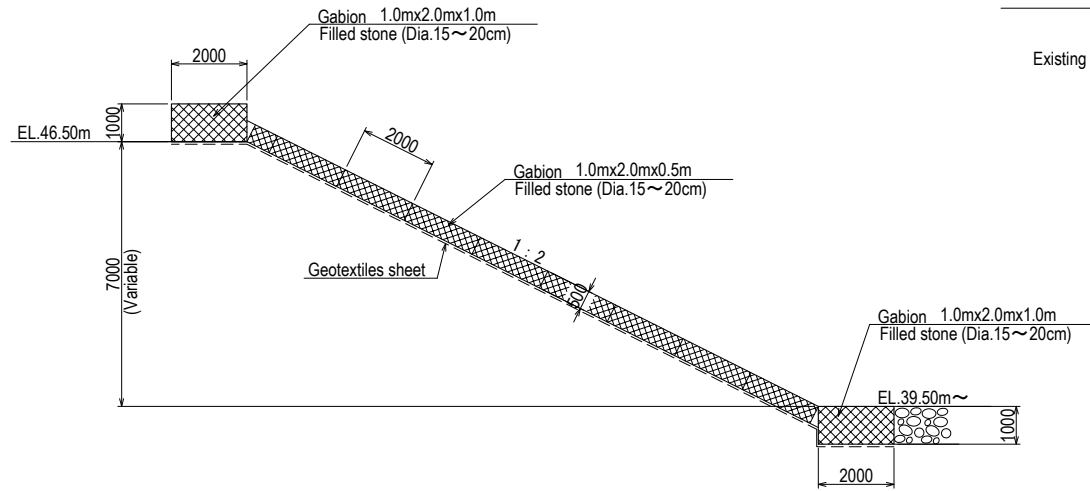
- Note: Painting works of the anti-corrosion
- Free-standing cantilever type  
The anti-corrosion should be painted on the both side and entire length of the sheet pile.
  - Tie-rod steel pile type  
Main sheet pile : The anti-corrosion should be painted on the both side excluding the part deeper than 1 meter from the design ground level.  
Bracing sheet pile : The anti-corrosion should be painted on the both side and entire length of the sheet pile.

Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Cross Section of Bank Protection Works(3) (Steel Sheet Pile)		<b>DRW. NO.</b> CP-4
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

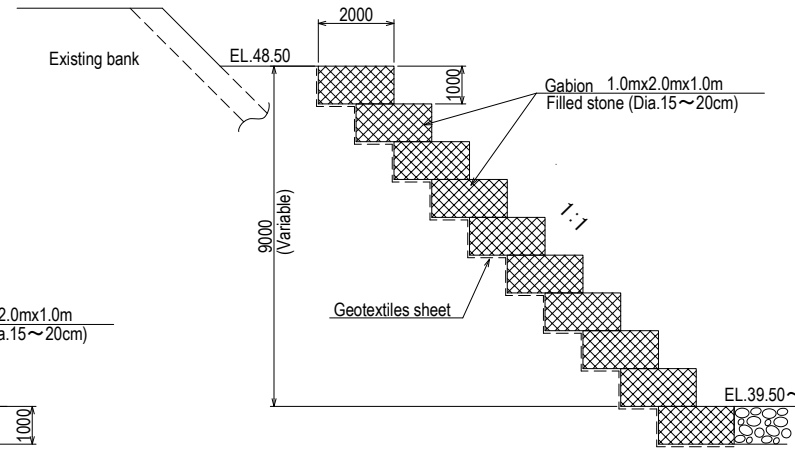
# Standard section of bank protection works

## Gabion works

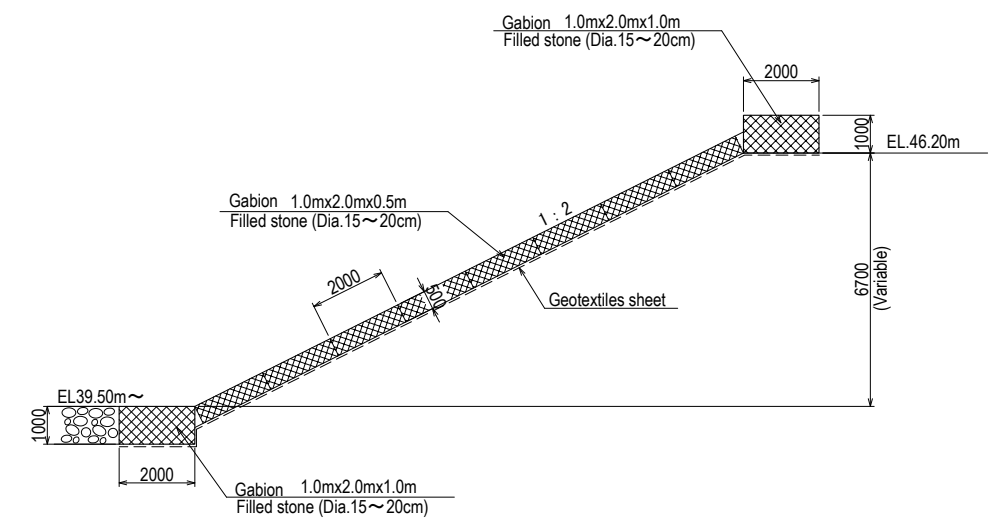
**Bahr Yusef**  
(D/S left bank) Scale A



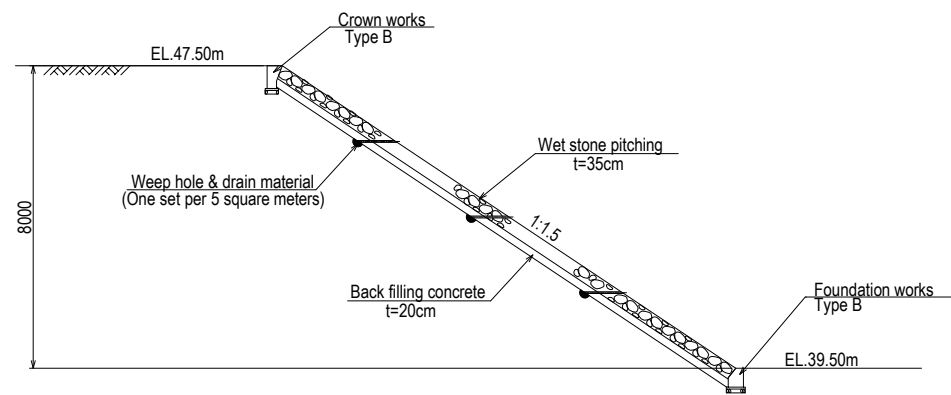
**Ibrahimia**  
(D/S left bank) Scale A



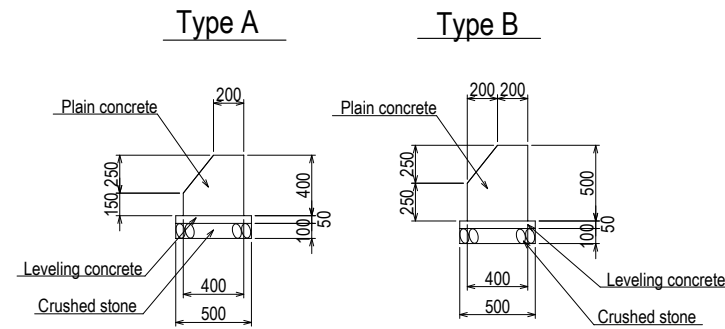
**Ibrahimia**  
(D/S right bank) Scale A



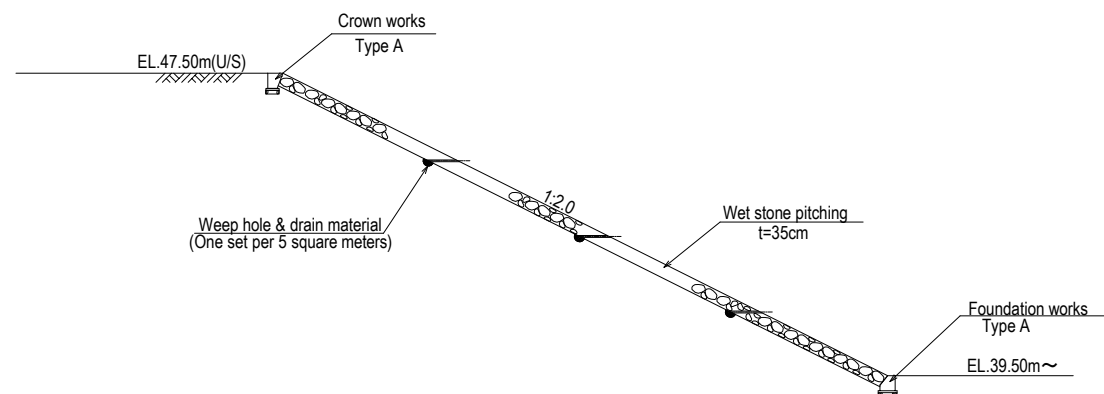
**Wet stone pitching**  
(U/S of Ibrahimia) Scale A



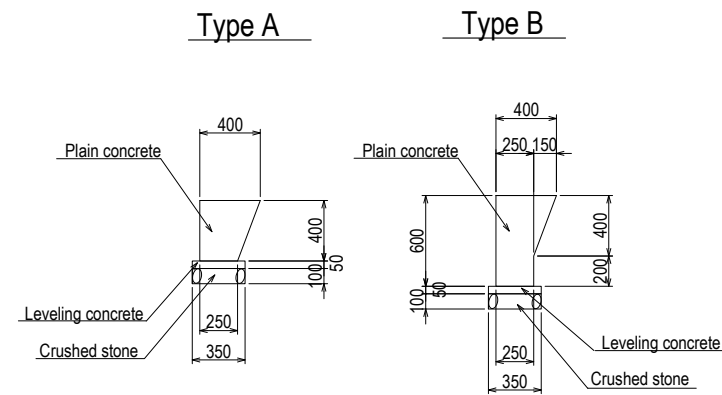
**Foundation works**  
Scale B



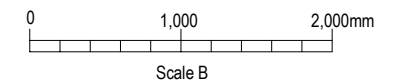
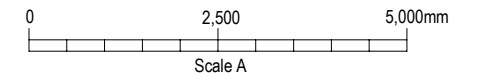
**Wet stone pitching**  
(U/S & D/S of Bahr Yusef) Scale A



**Crown works**  
Scale B



Note  
1. Expansion joint should be provided on the wet stone pitching works at an interval of 10m.

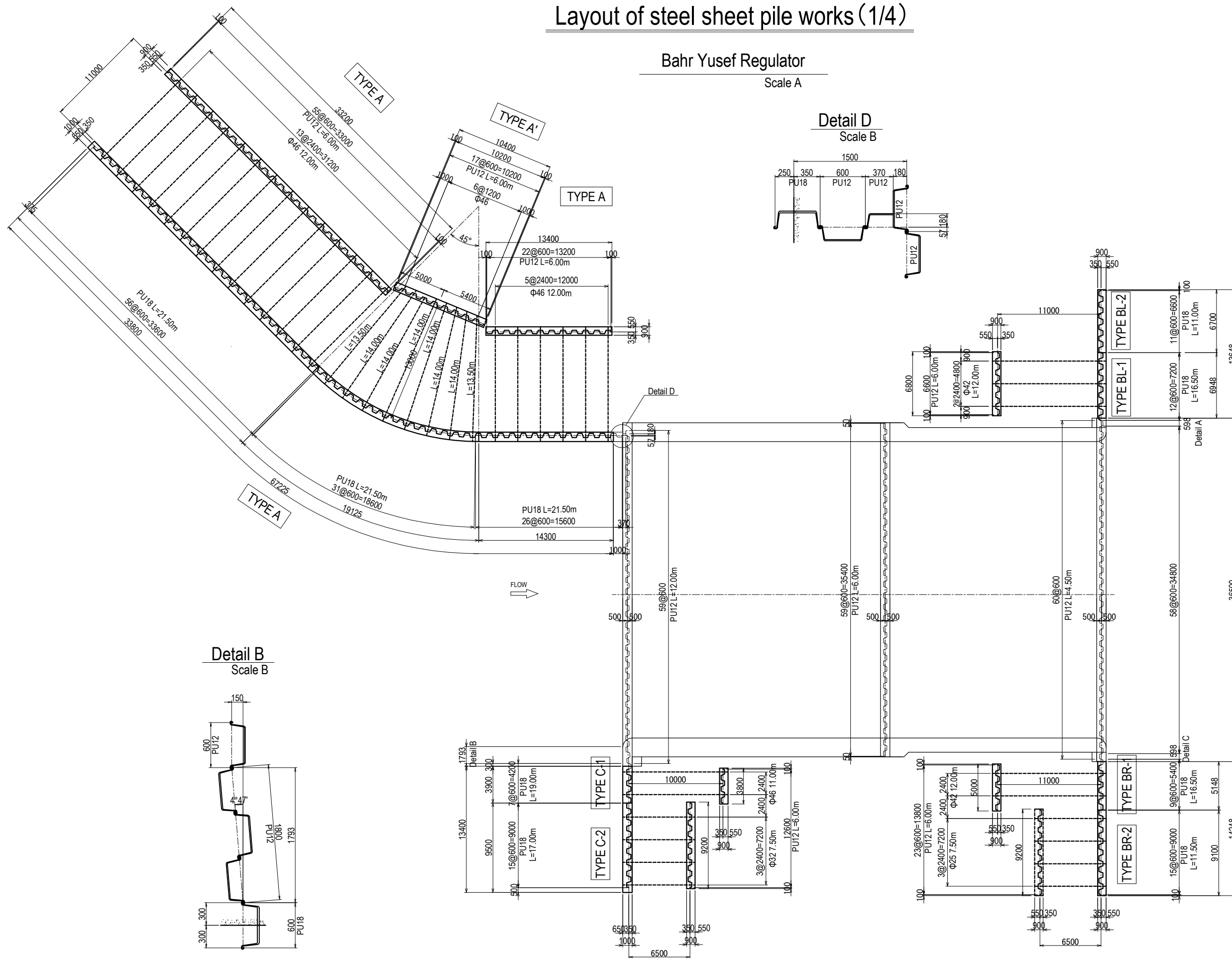


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Standard section of bank protection works			DRW. NO. CP-5
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

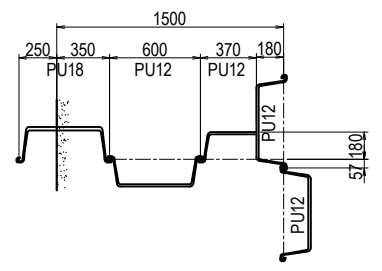
# Layout of steel sheet pile works (1/4)

Bahr Yusef Regulator

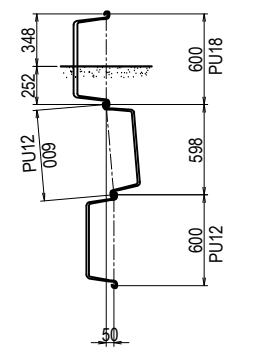
Scale A



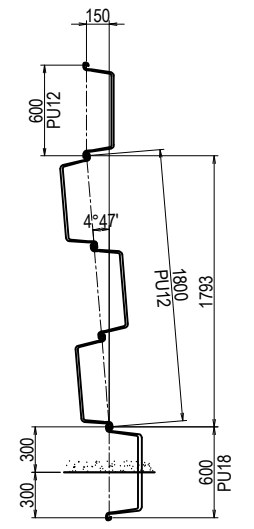
Detail D  
Scale B



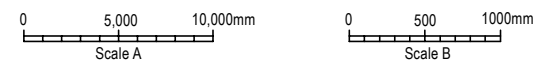
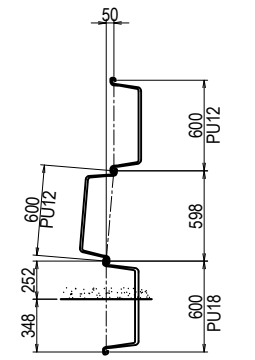
Detail A  
Scale B



Detail B  
Scale B



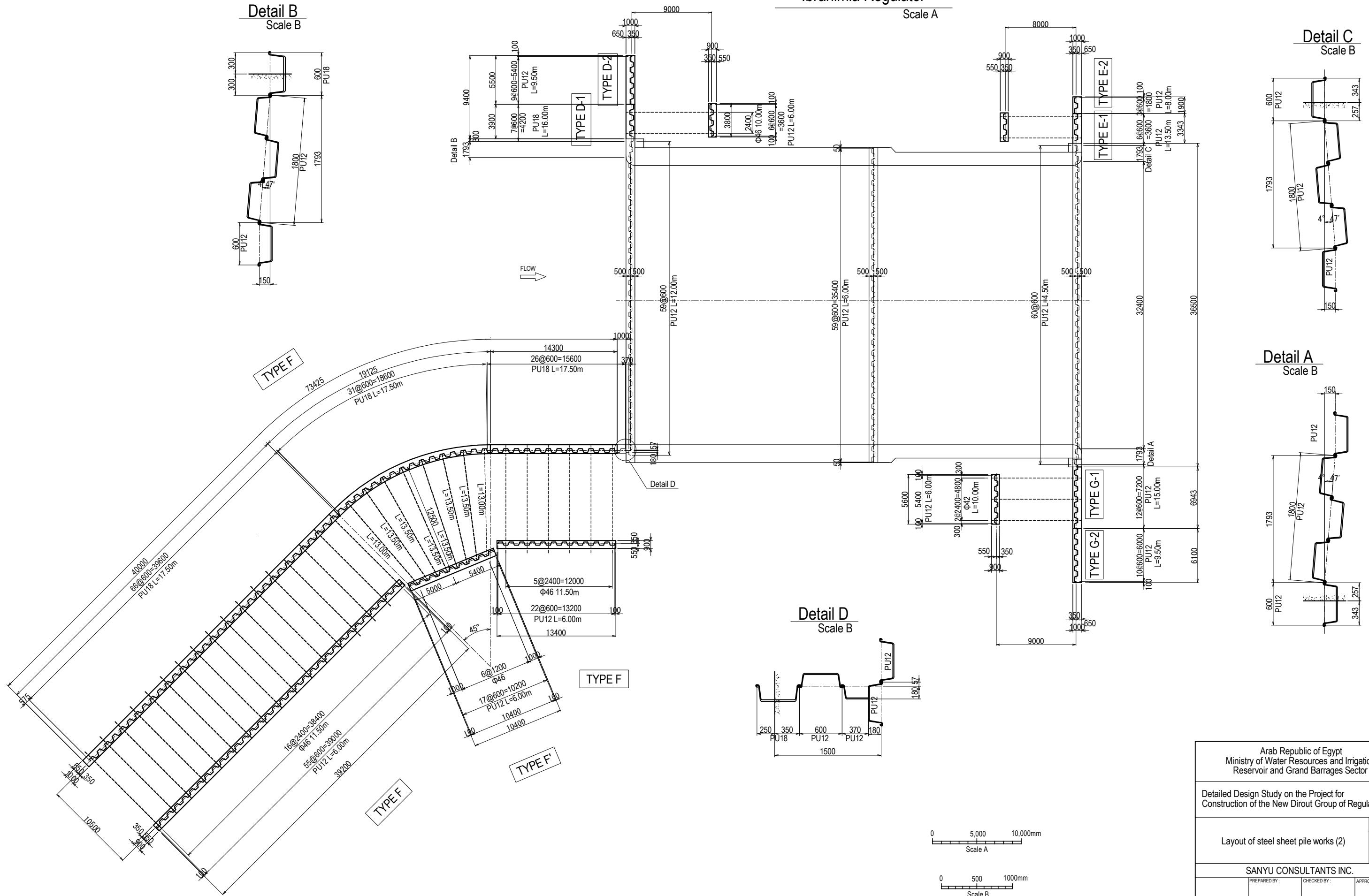
Detail C  
Scale B



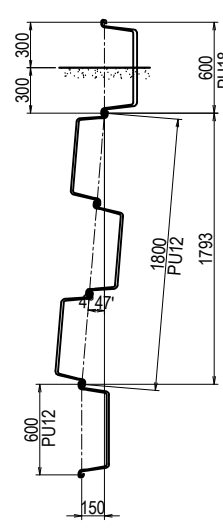
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Layout of steel sheet pile works (1)		DRW. NO. CP-6
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

# Layout of steel sheet pile works (2/4)

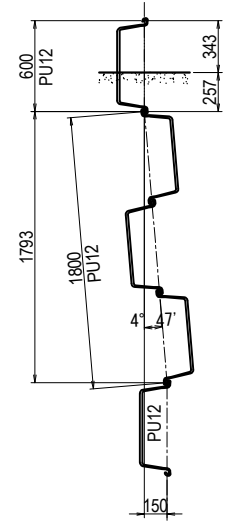
## Ibrahimia Regulator



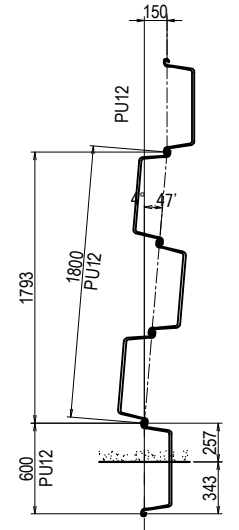
**Detail B**  
Scale B



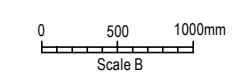
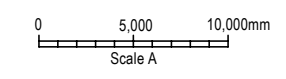
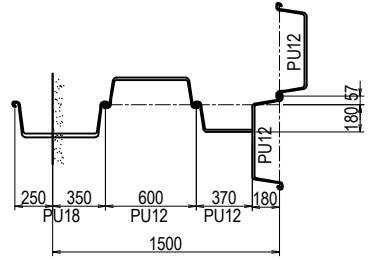
**Detail C**  
Scale B



**Detail A**  
Scale B



**Detail D**  
Scale B



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Layout of steel sheet pile works (2)		<b>DRW. NO.</b> CP-7
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

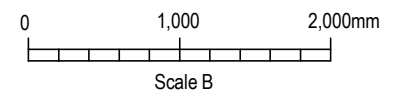
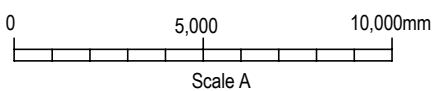
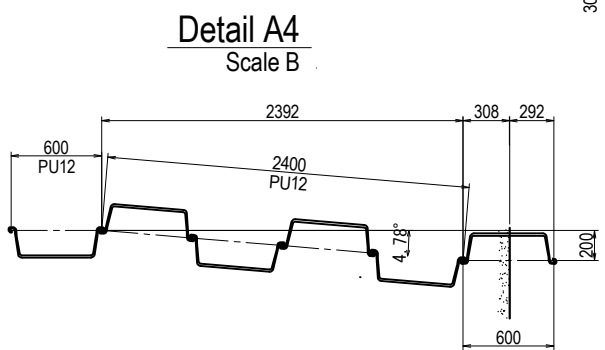
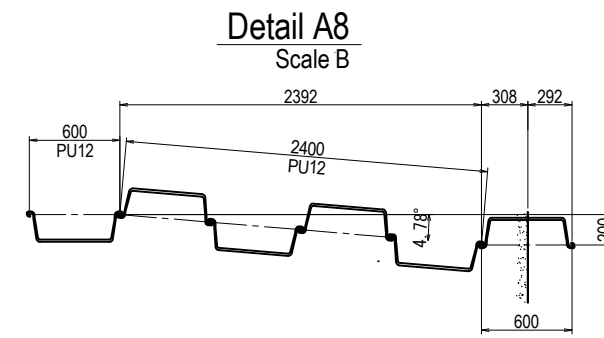
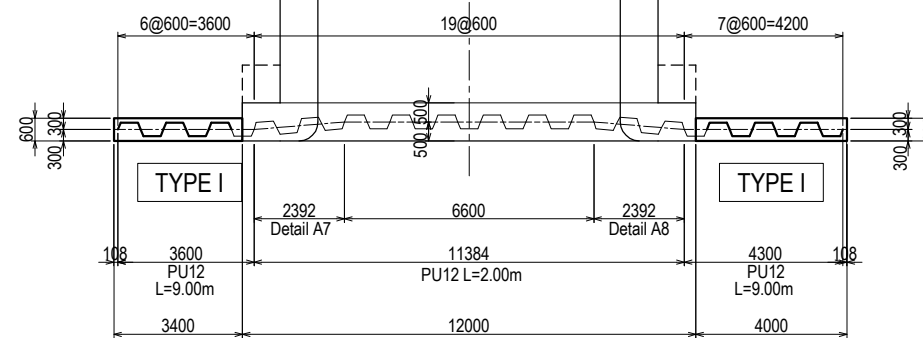
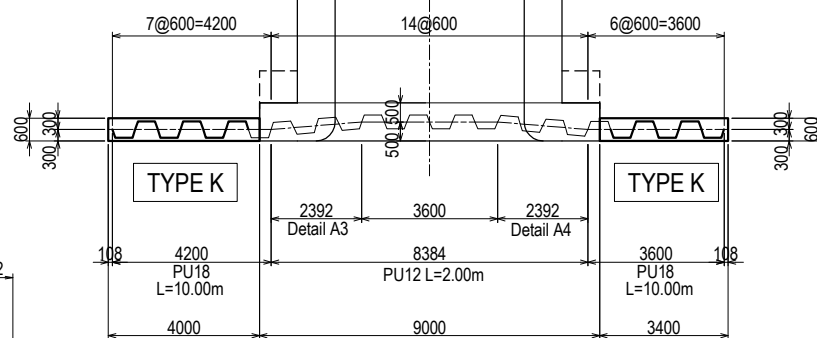
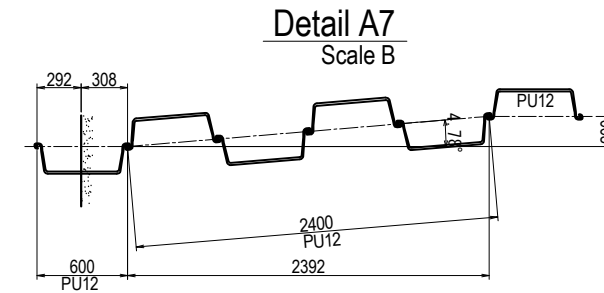
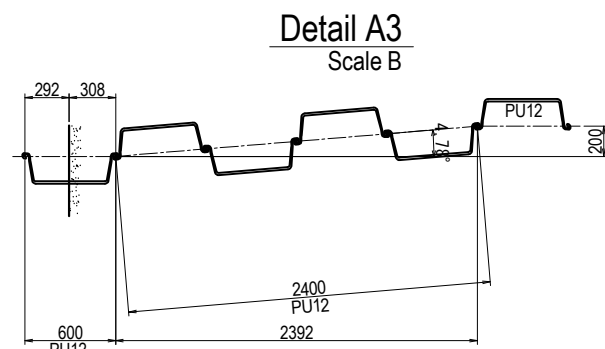
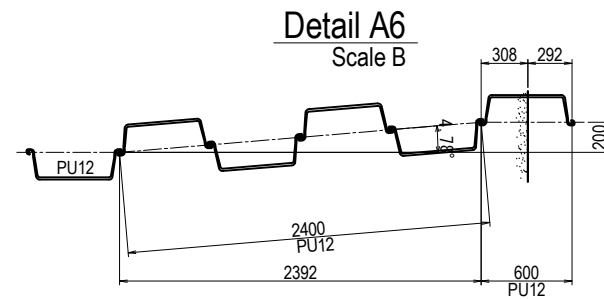
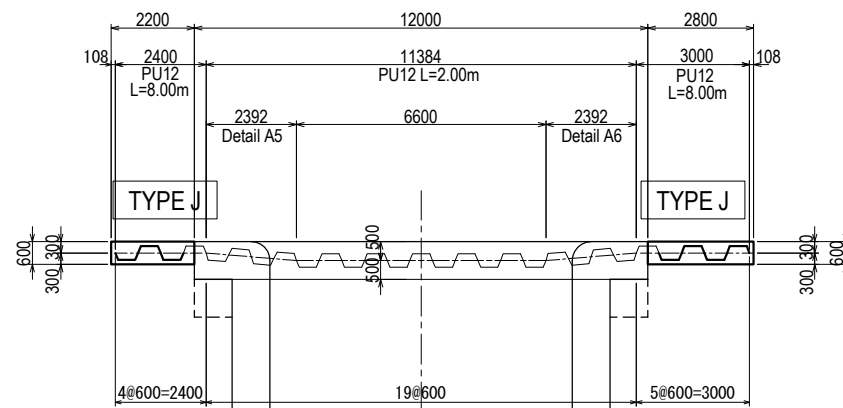
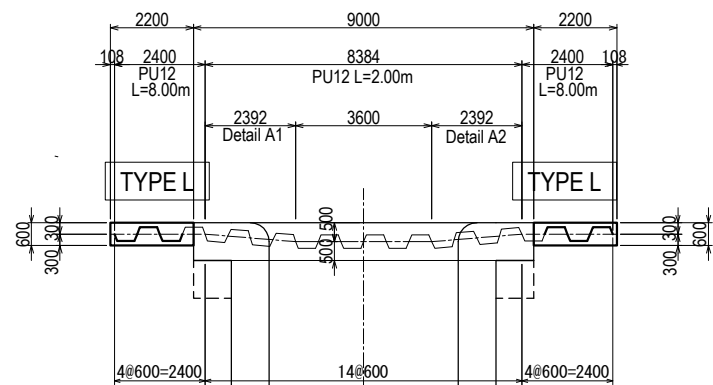
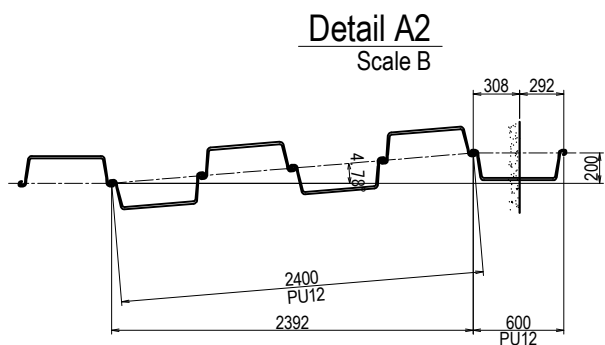
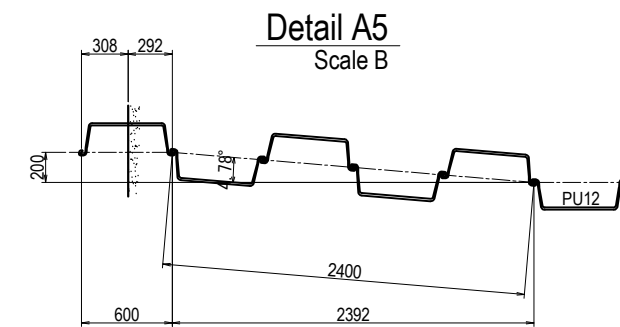
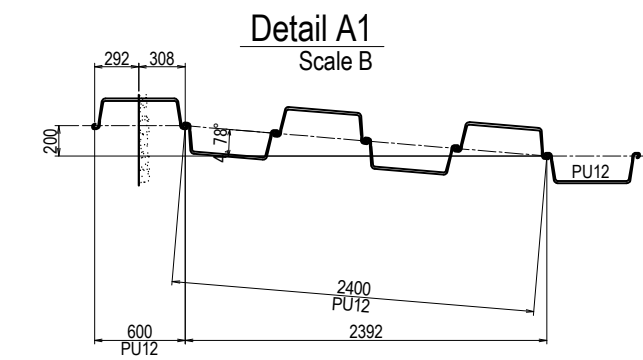
# Layout of steel sheet pile works (3/4)

Scale A

## Badraman Regulator

### Badraman Canal

### Diroutiah Canal



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Layout of steel sheet pile works (3)		DRW. NO. CP-8
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

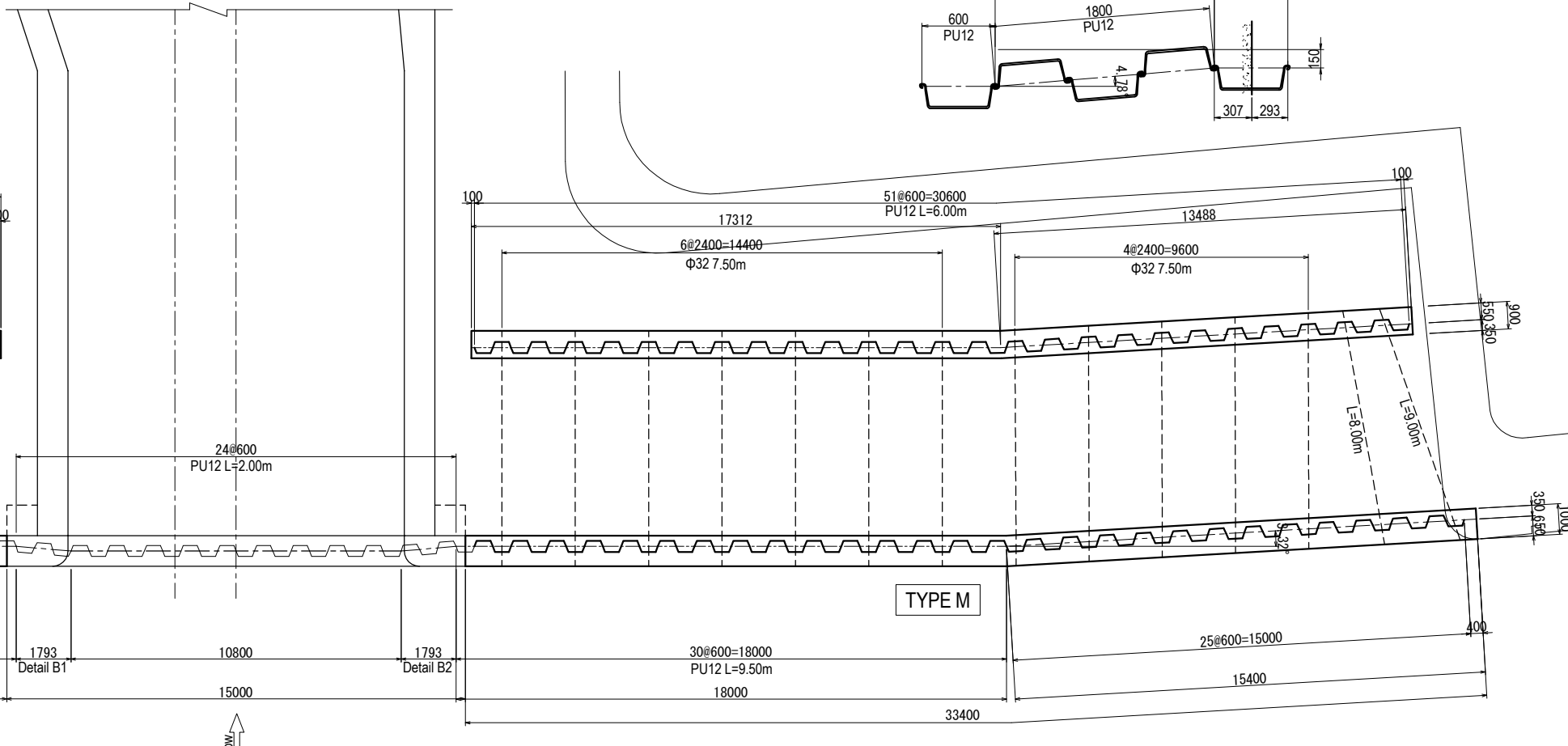
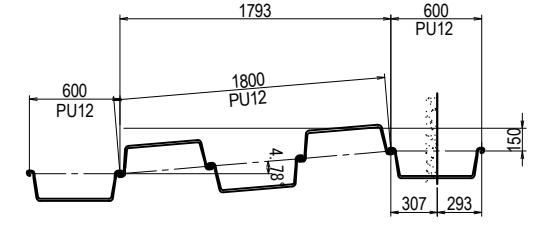
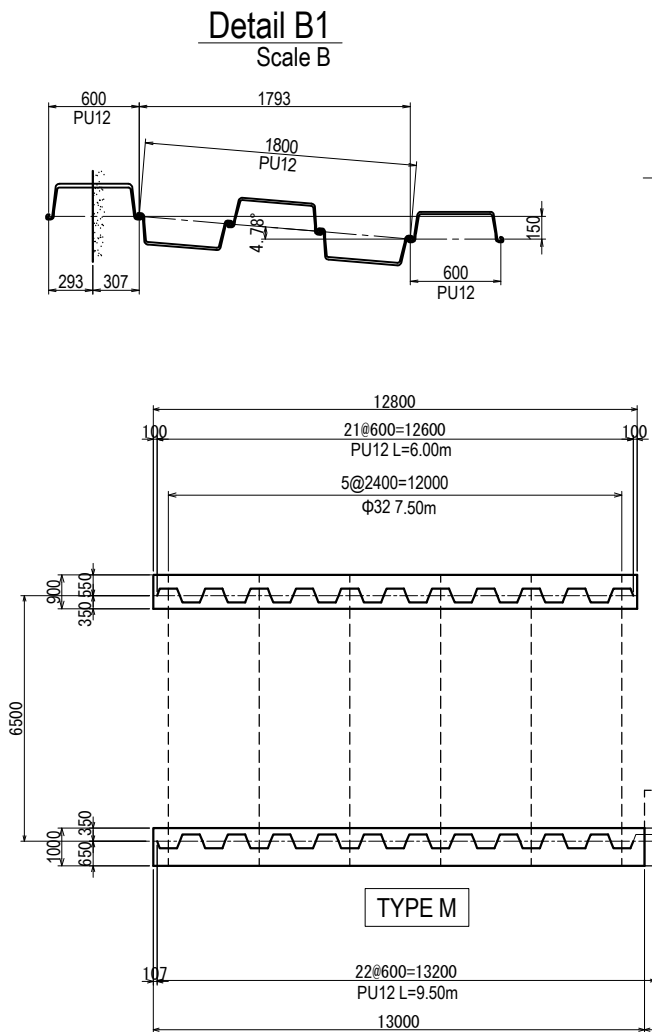
# Layout of steel sheet pile works (4/4)

## Abo Gabal Regulator

Scale A

## Detail B2

Scale B

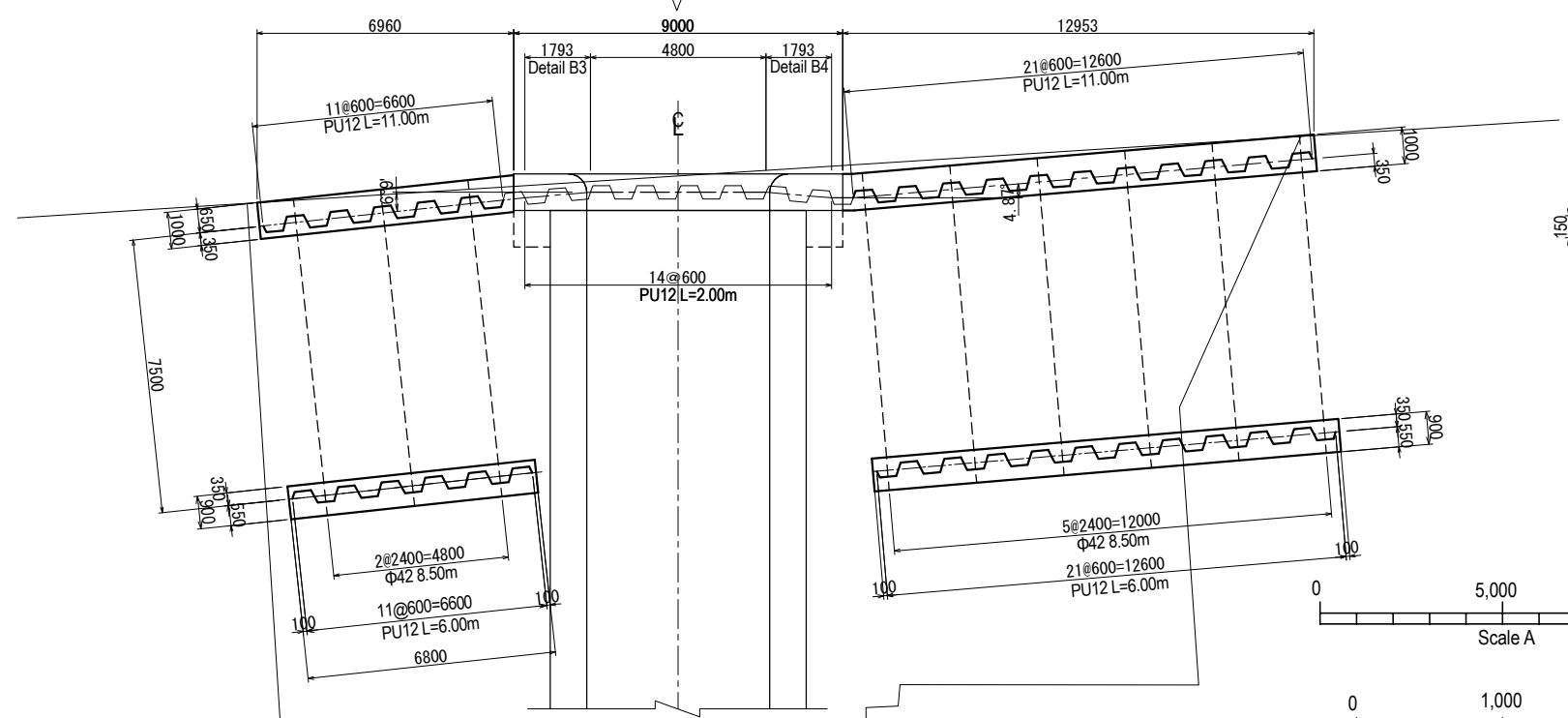
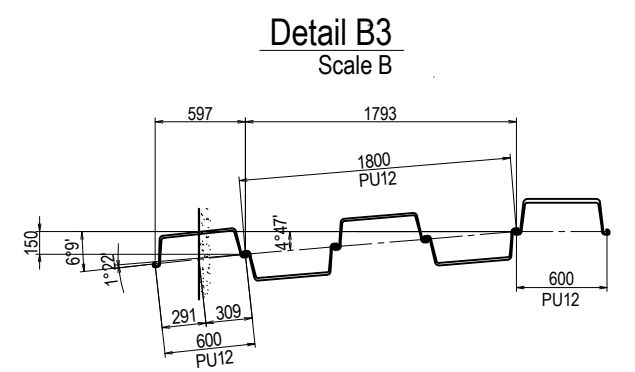


## Sahelyia Regulator

Flow ↓

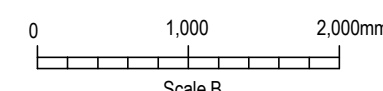
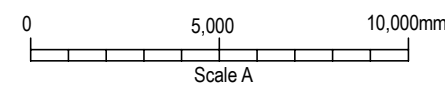
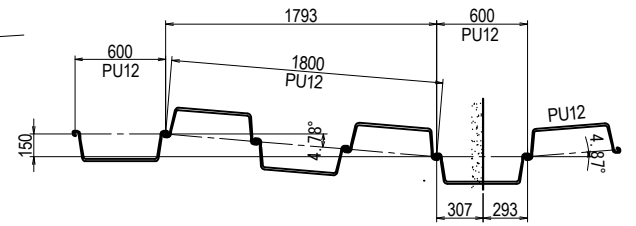
TYPE H

TYPE H



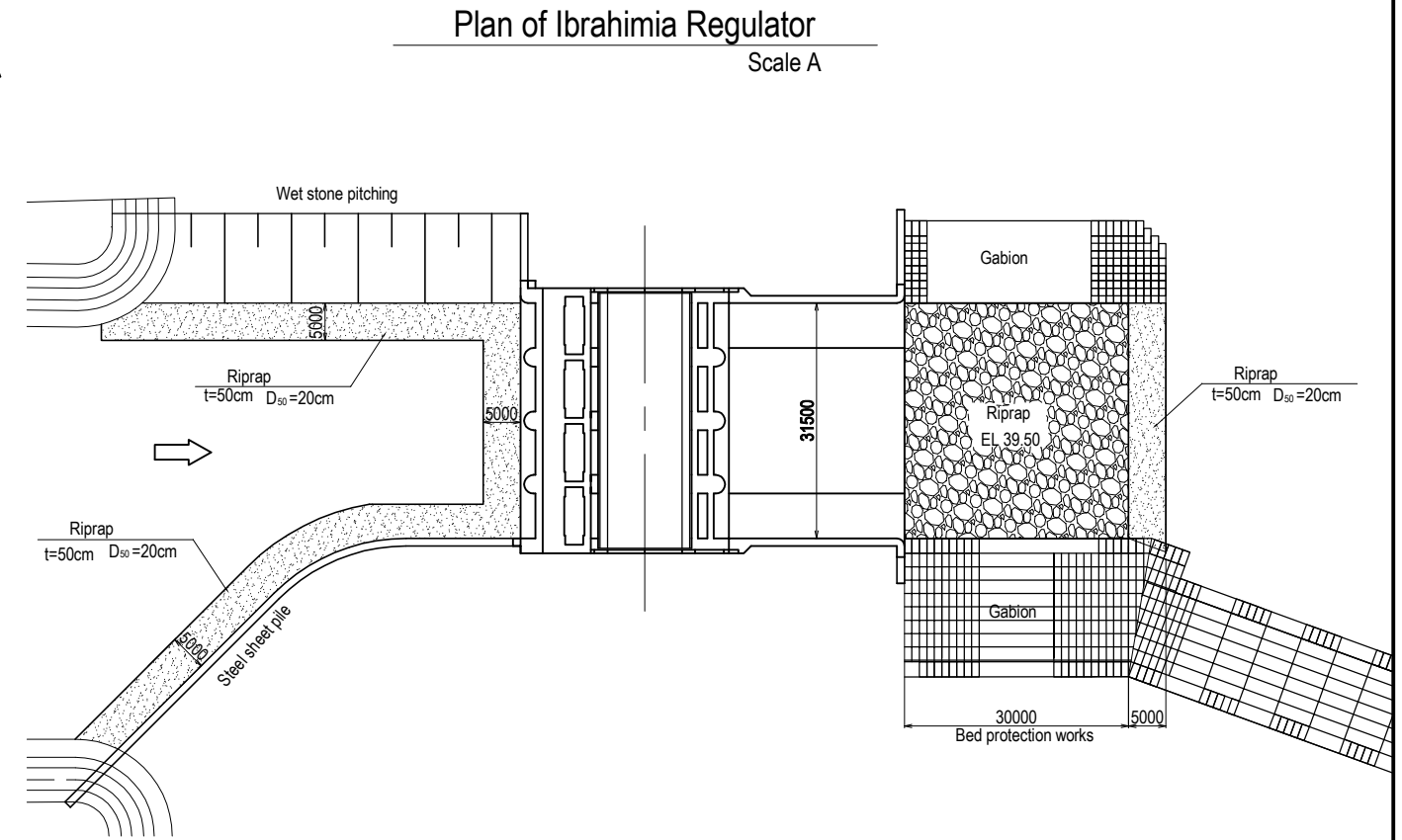
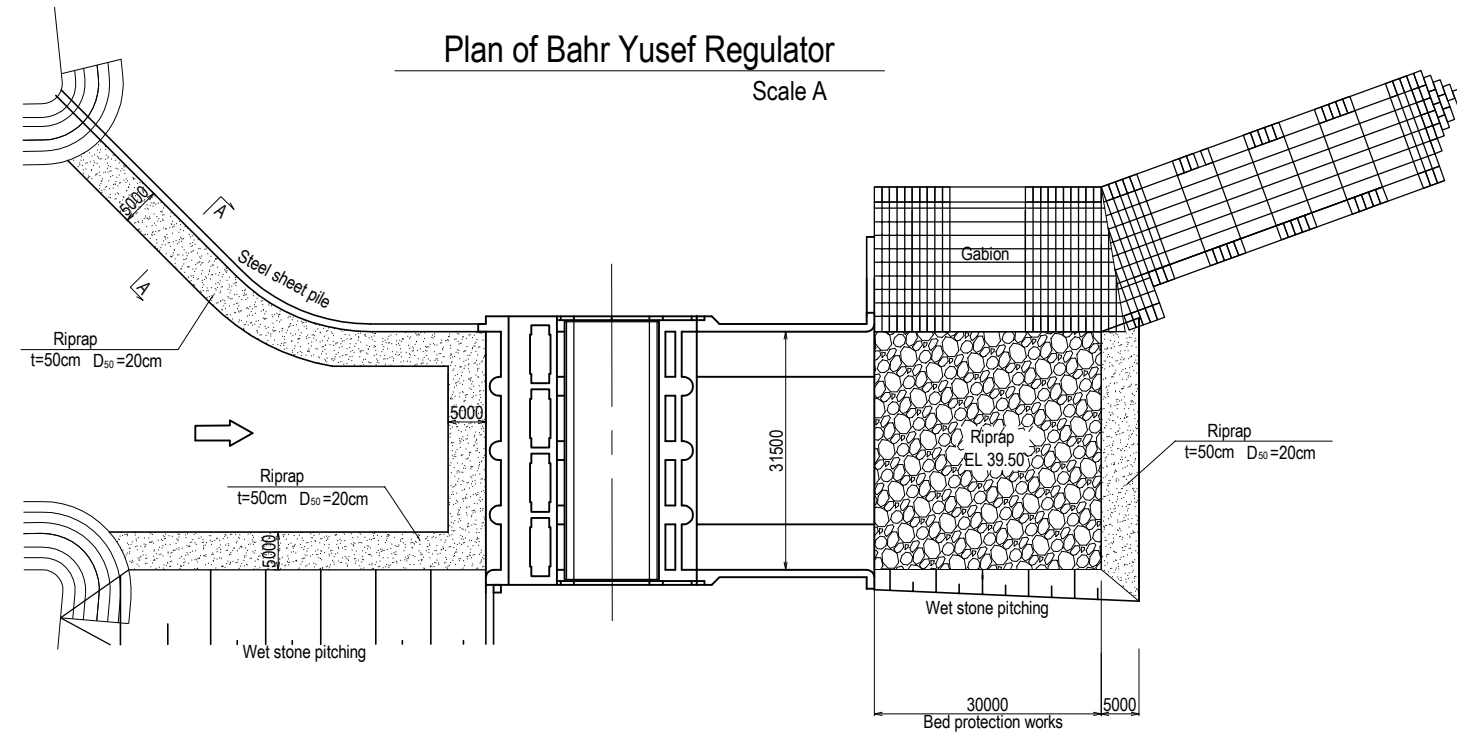
## Detail B4

Scale B

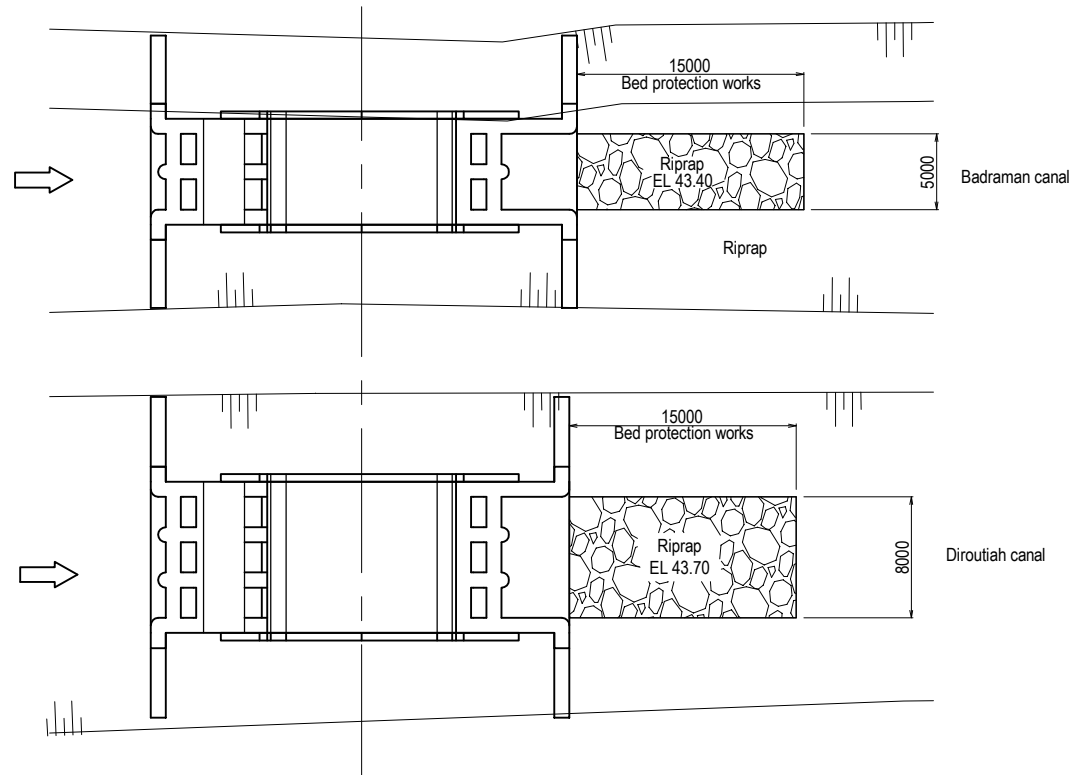


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Layout of steel sheet pile works (4)			<b>DRW. NO.</b> CP-9
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

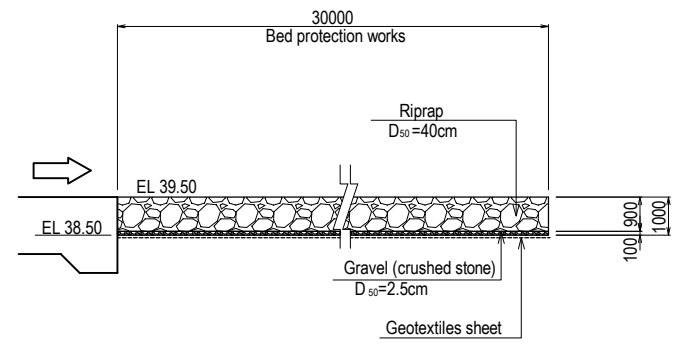
# Bed Protection Works



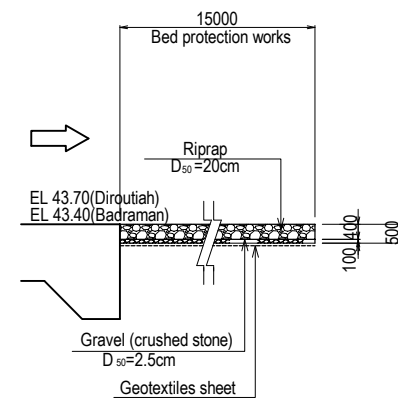
**Plan of Badraman Regulator**  
Scale B



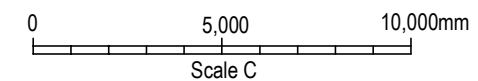
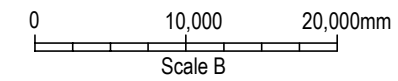
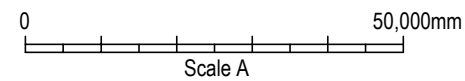
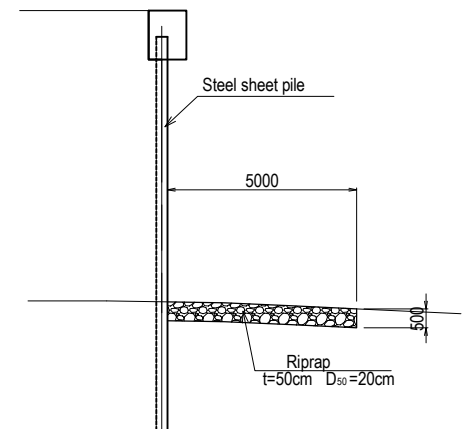
**Bahr Yusef and Ibrahimia regulator**  
Scale C



**Badraman regulator**  
Scale C



**Foot protection (Section A-A)**  
Scale C



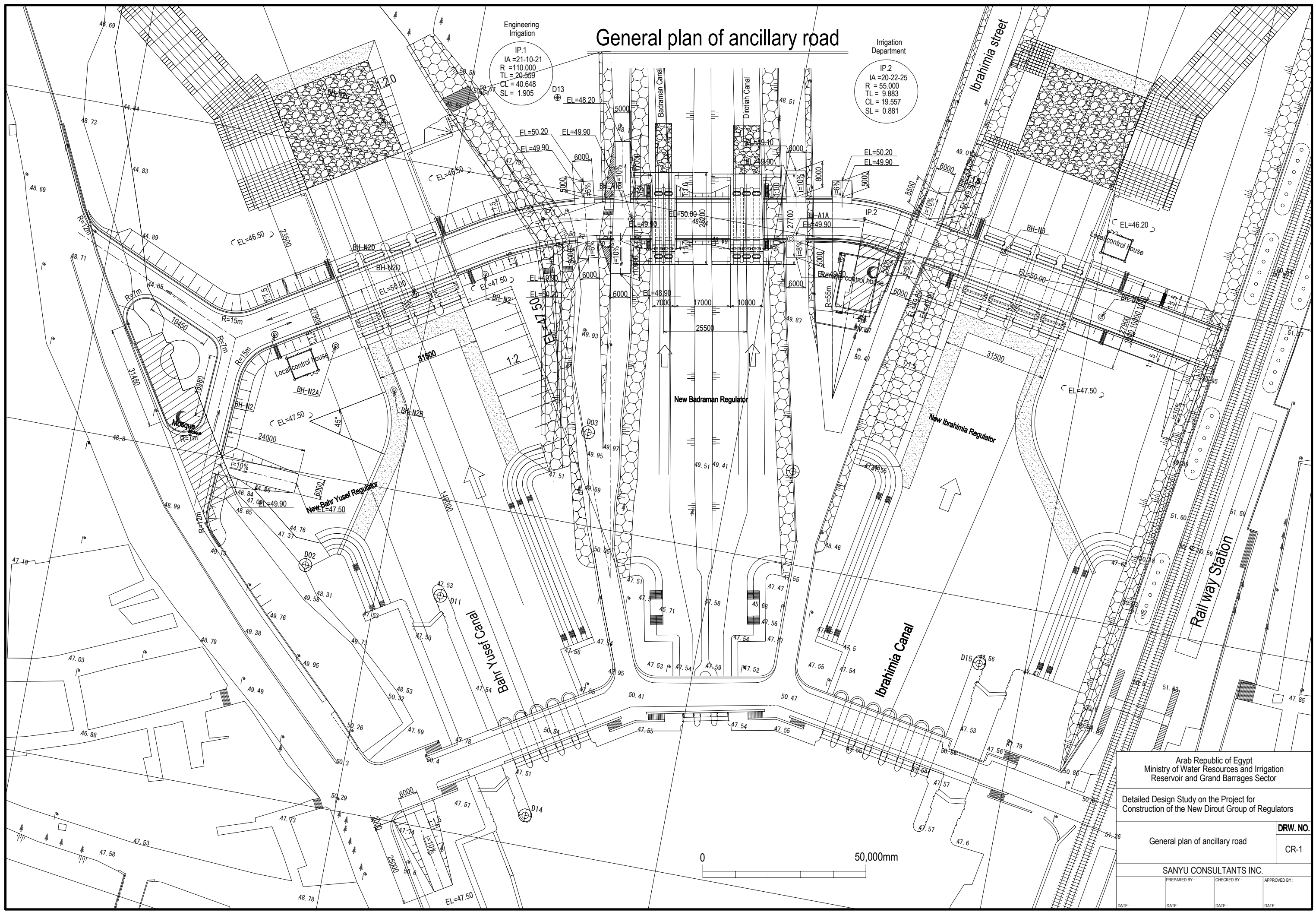
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Detail of canal bed protection works		<b>DRW. NO.</b> CP-10
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:



# General plan of ancillary road

Engineering Irrigation  
 IP.1  
 IA = 21-10-21  
 R = 110.000  
 TL = 20.559  
 CL = 40.648  
 SL = 1.905

Irrigation Department  
 IP.2  
 IA = 20-22-25  
 R = 55.000  
 TL = 9.883  
 CL = 19.557  
 SL = 0.881

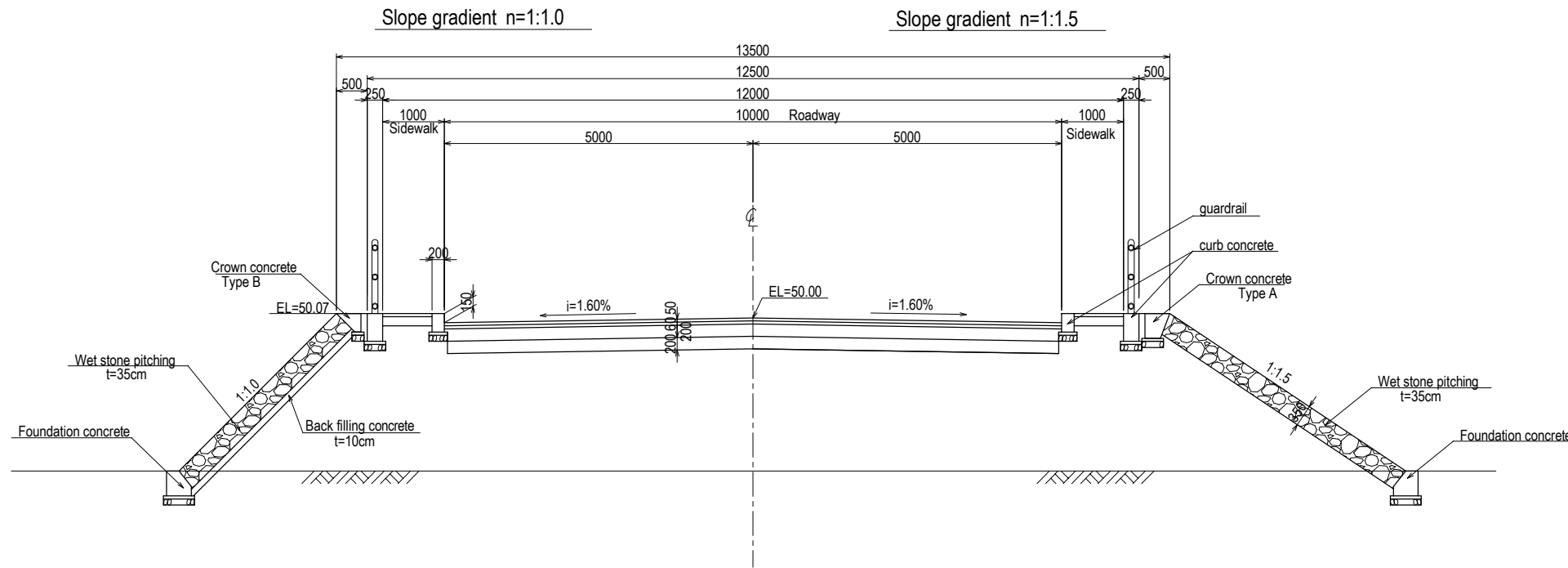


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
General plan of ancillary road		DRW. NO. CR-1
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

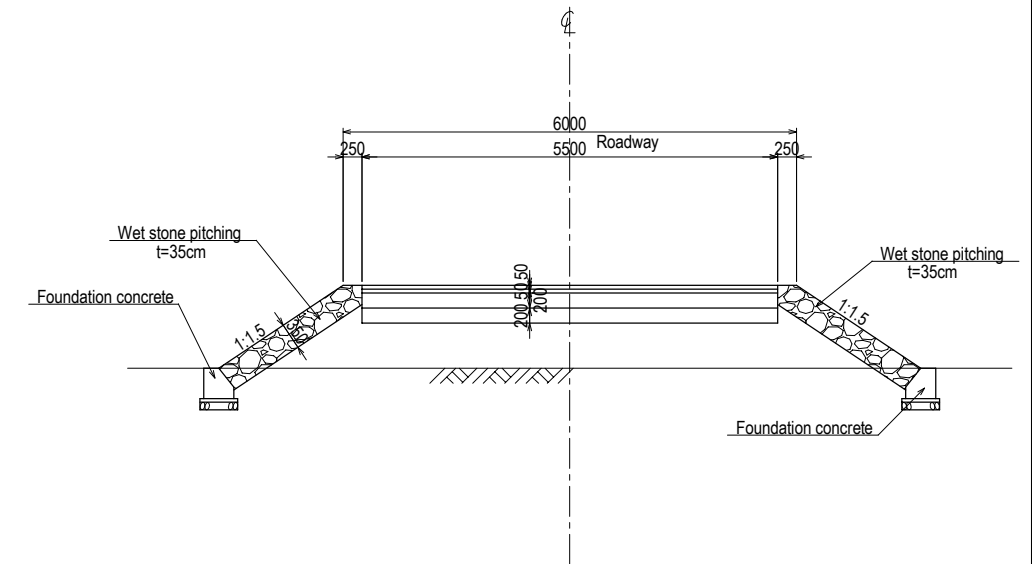
# Standard section of ancillary road

Scale A

## Standard section of ancillary road



## Standard section of approach road



### Curb concrete

Scale B

### Crown concrete

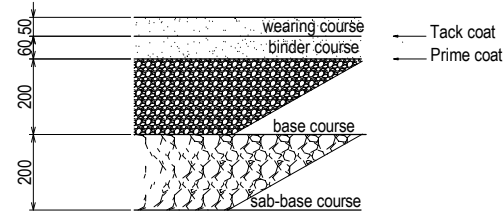
Scale B

### Foundation concrete

Scale B

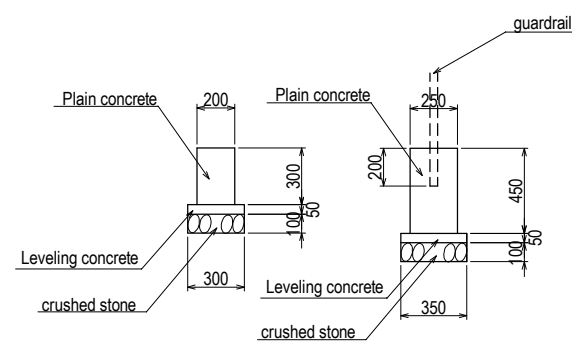
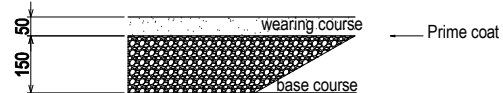
### Road way

Scale C

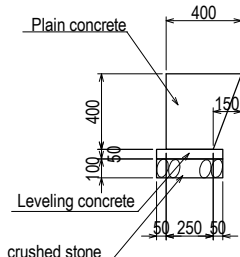


### Side walk

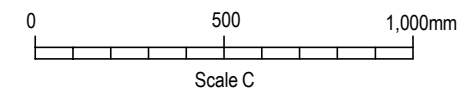
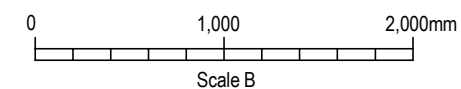
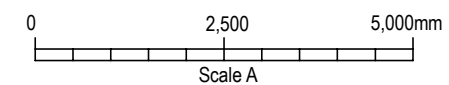
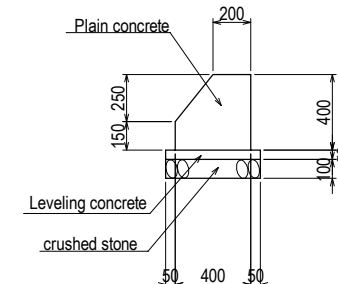
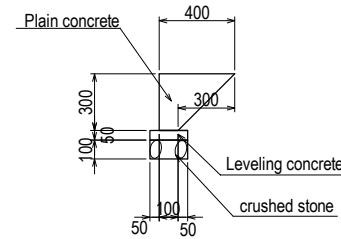
Scale C



### Type A



### Type B

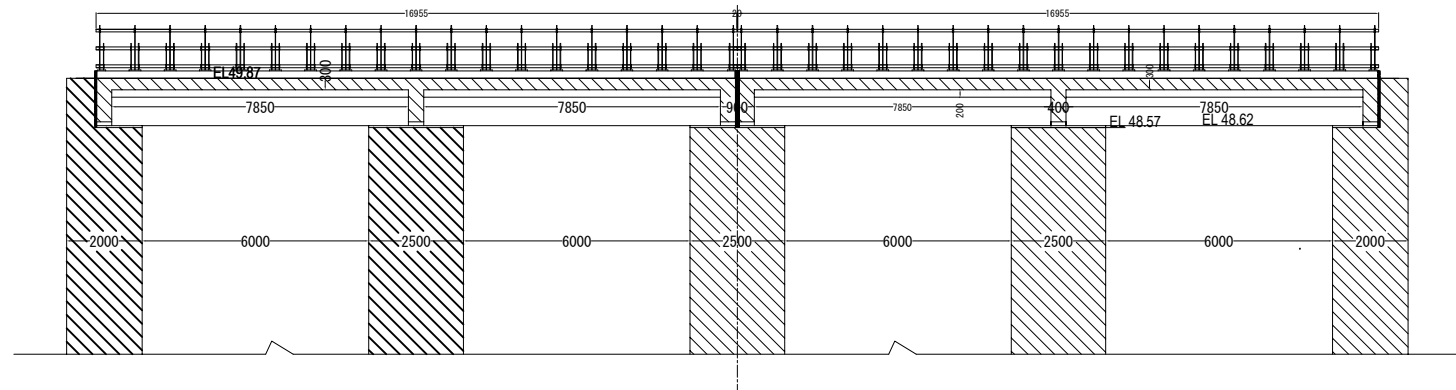


Note: Expansion joint should be provided on the wet stone pitching works at an interval of 10m.

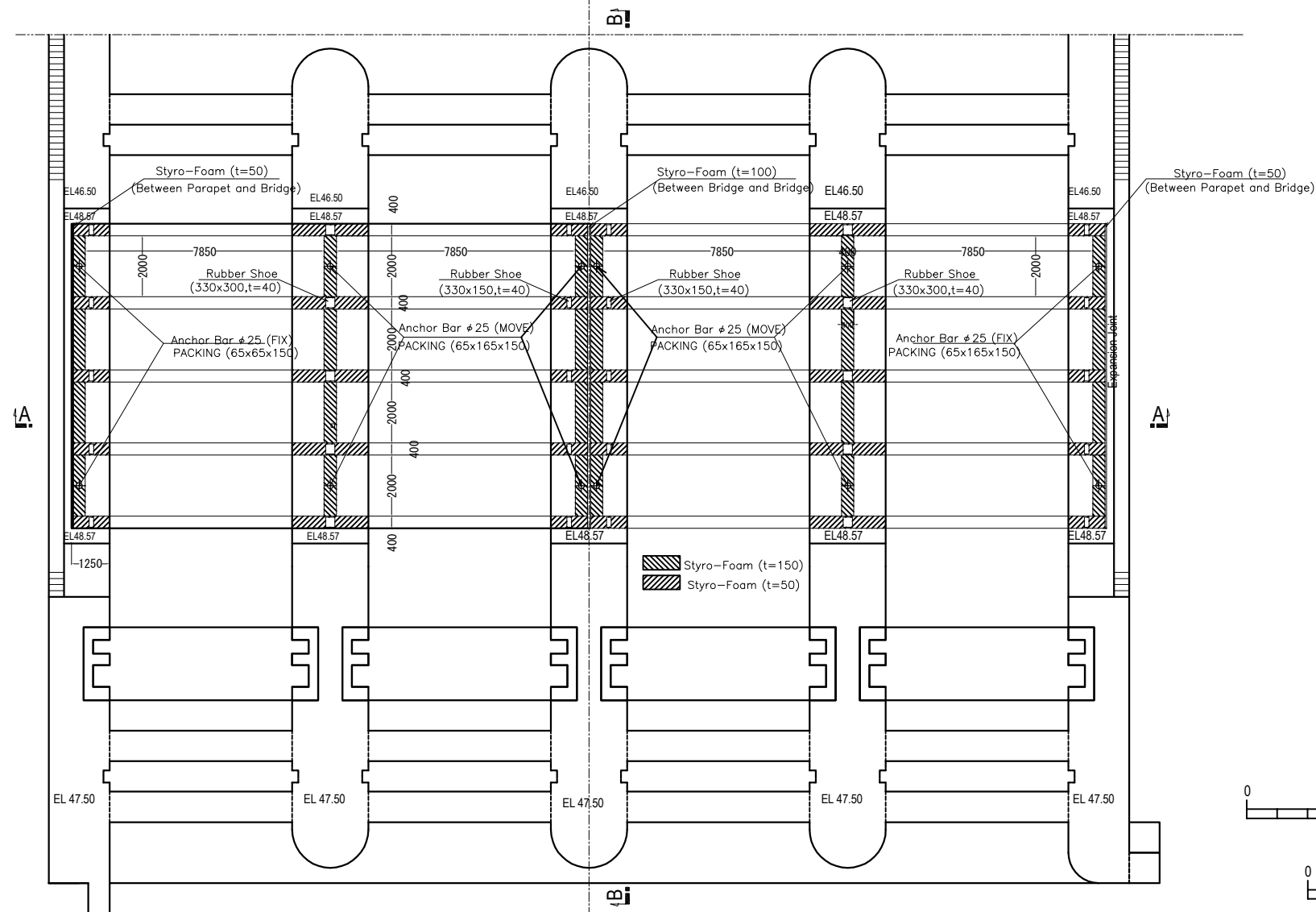
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Standard section of ancillary road		DRW. NO. CR-2
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:



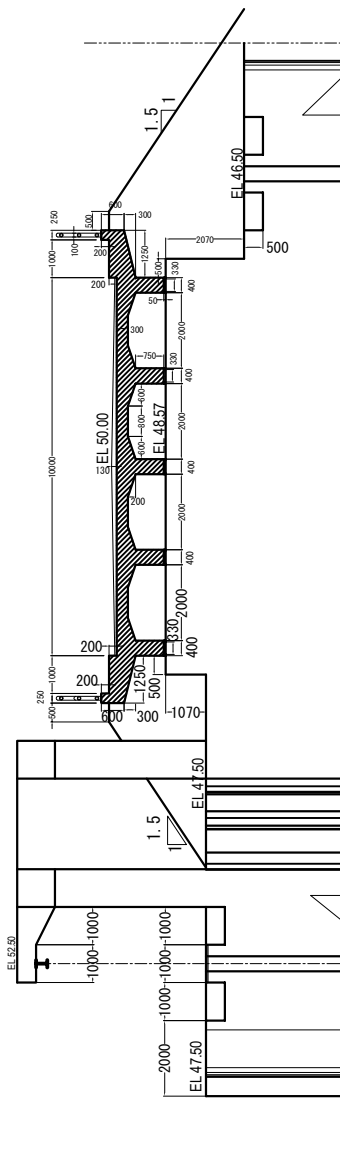
Sectional (A-A)  
Scale A



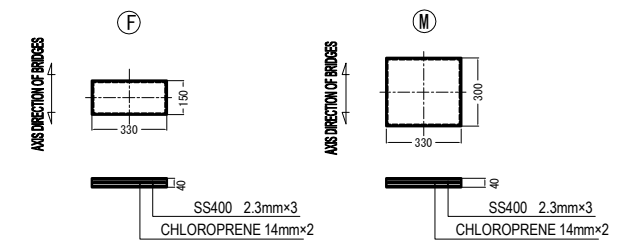
Plan View  
Scale A



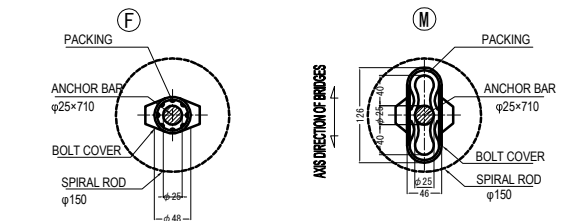
Sectional Side View (B-B)



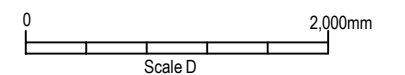
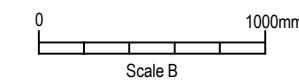
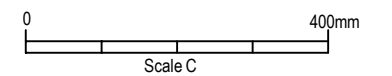
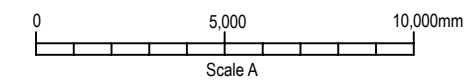
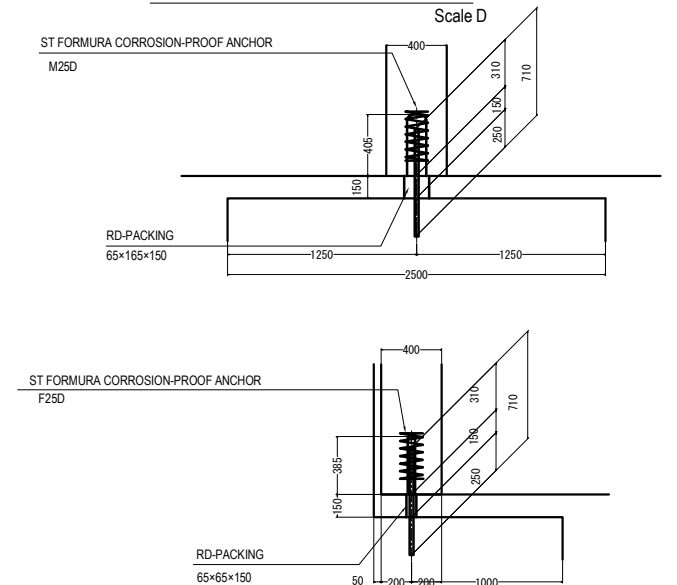
RUBBER BEARINGS  
Scale B



ST FORMULA CORROSION-PROOF ANCHOR  
Scale C



ST FORMULA CORROSION-PROOF ANCHOR  
Scale D



PARTS LIST

NAME	SIZE	MATERIAL	A1(F)	P1(M)	P2(M)	P3(M)	A2(F)	TOTAL	REMARKS
RUBBER BEARINGS	330x150x40	CHLOROPRENE	5 NOS		10 NOS		5 NOS	20 NOS	
//	330x300x40	SS400		5 NOS		5 NOS		10 NOS	
ST FORMULA CORROSION-PROOF ANCHOR	F25Dx710	SS400 POLYETHYLENE	2 SET				2 SET	4 SET	
//	M25Dx710	SYNTHETIC RUBBER SR235		2 SET	4 SET	2 SET		8 SET	
RD-PACKINGS	150x65x65	SYNTHETIC RUBBER	2 NOS				2 NOS	4 NOS	
//	150x65x165		2 NOS	4 NOS	2 NOS		8 NOS		

Arab Republic of Egypt  
Ministry of Water Resources and Irrigation  
Reservoir and Grand Barrages Sector

Detailed Design Study on the Project for  
Construction of the New Dirout Group of Regulators

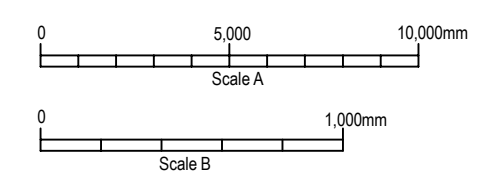
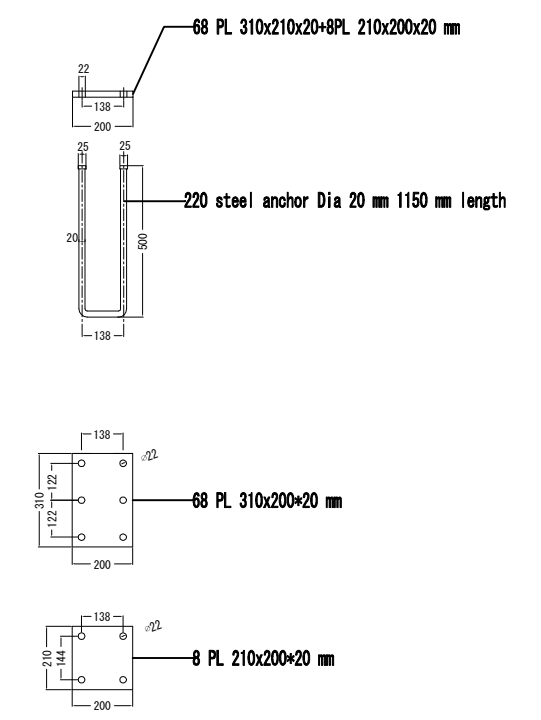
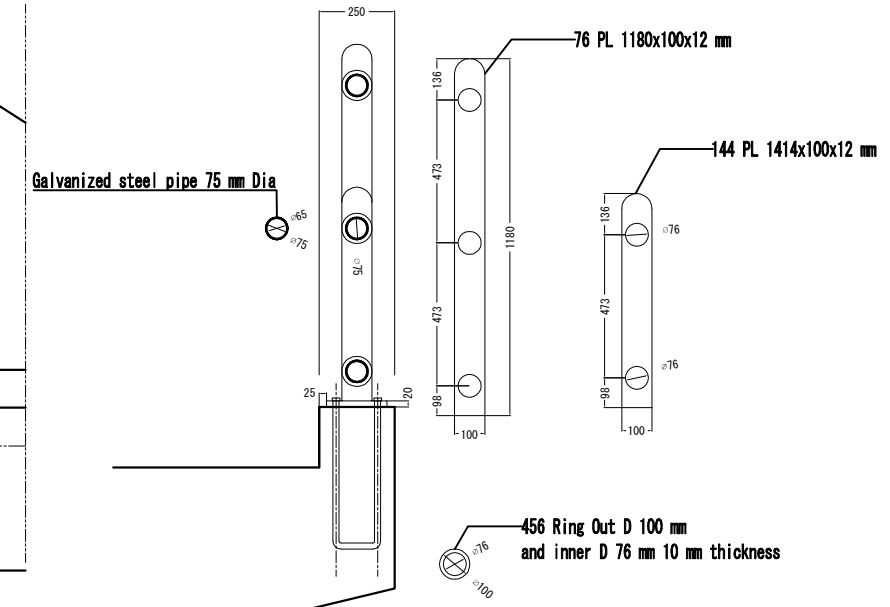
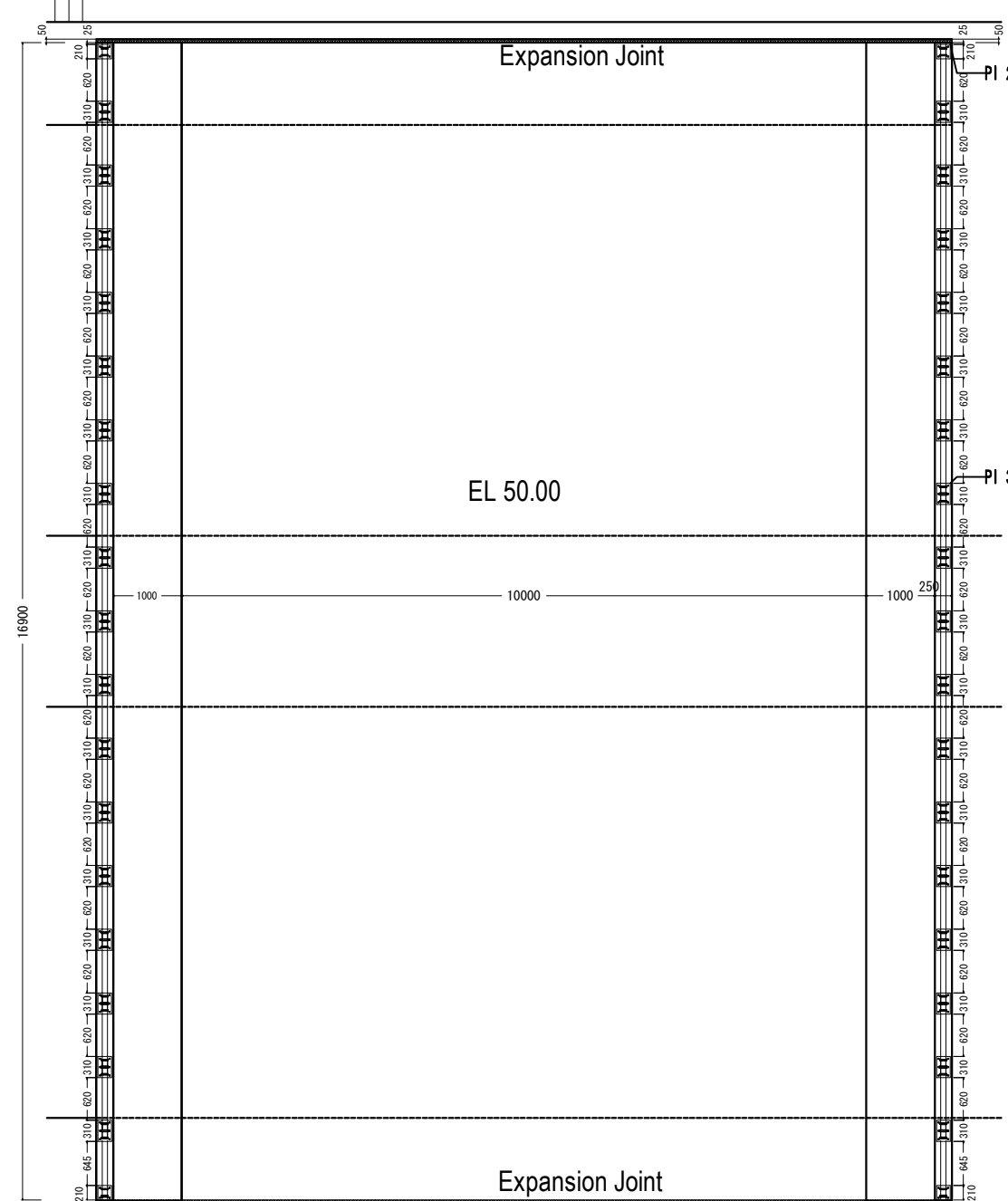
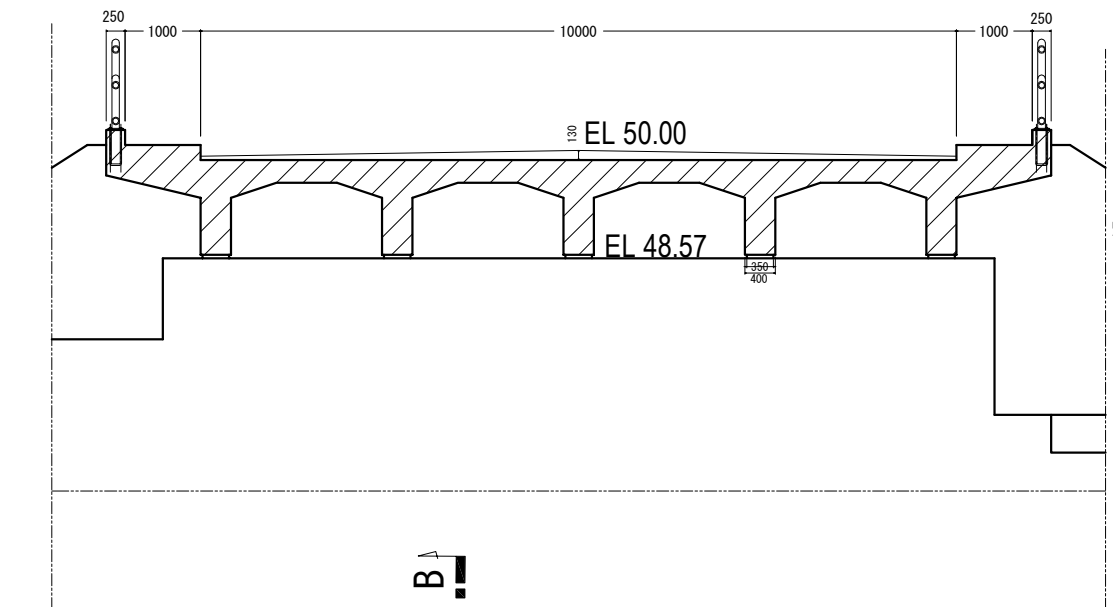
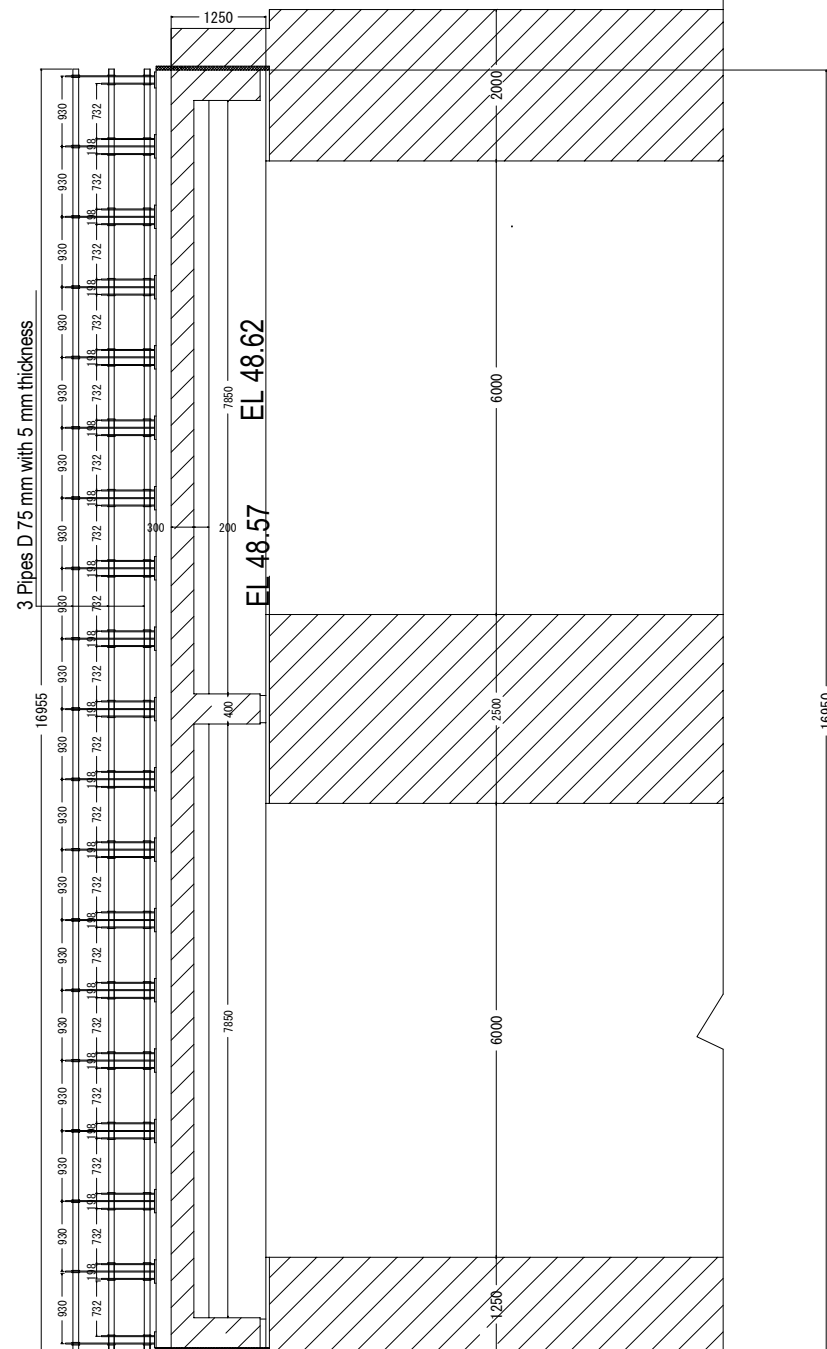
General drawing of ancillary bridge  
for Bahr Yusef & Ibrahimia regulator (2/4)

SANYU CONSULTANTS INC.

PREPARED BY: CHECKED BY: APPROVED BY:

DATE: DATE: DATE: DATE:

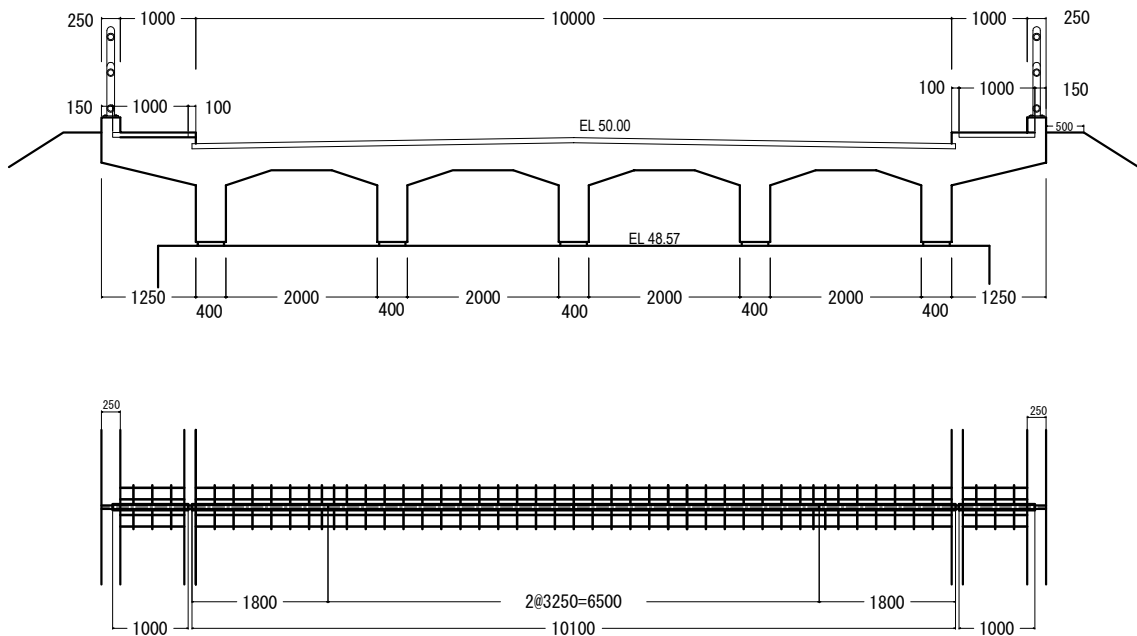
DRW. NO.  
CR-4



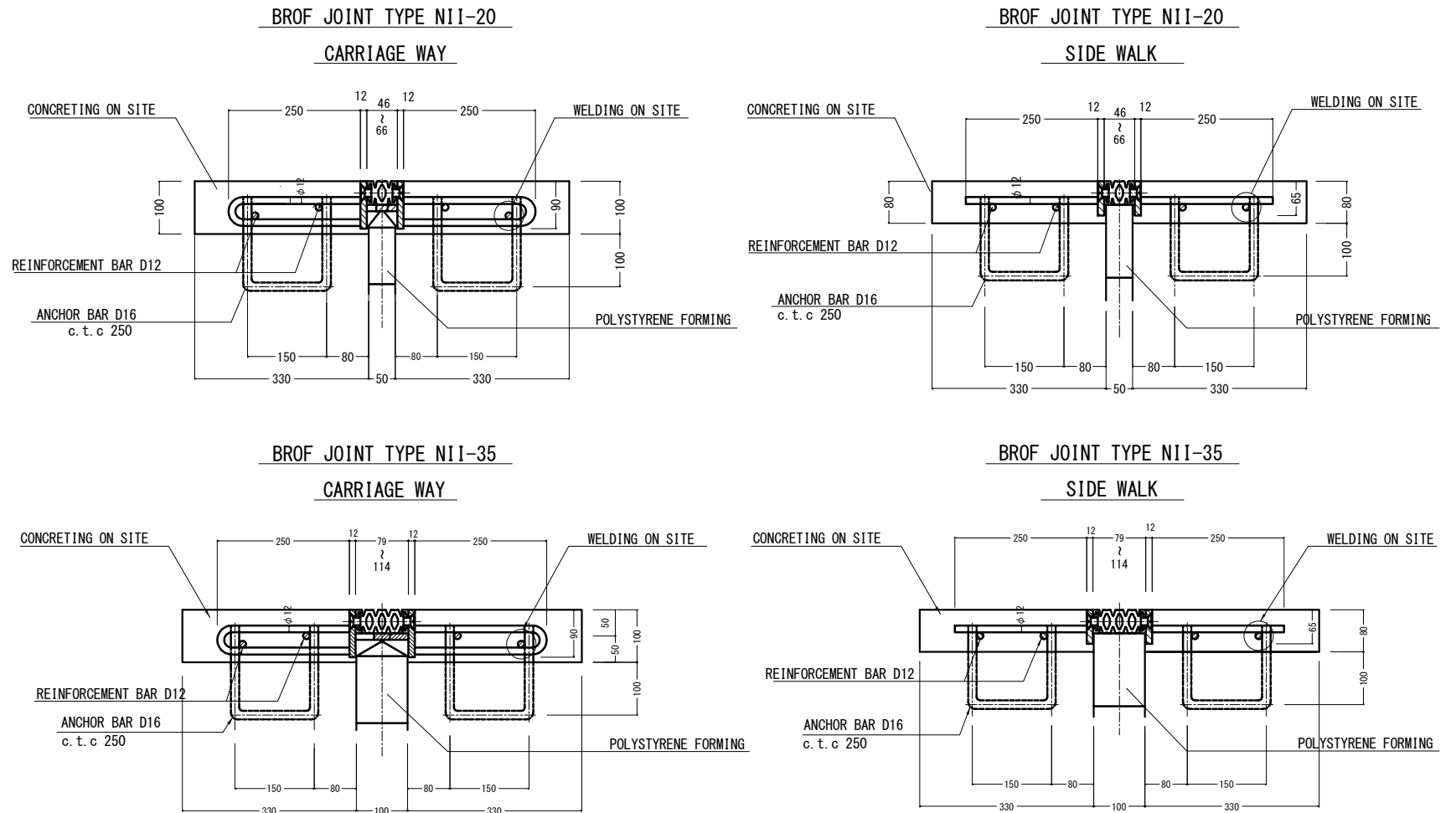
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
General drawing of ancillary bridge for Bahr Yusef & Ibrahimia regulator (3/4)		DRW. NO. CR-5
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

# DETAIL OF EXPANSION JOINT

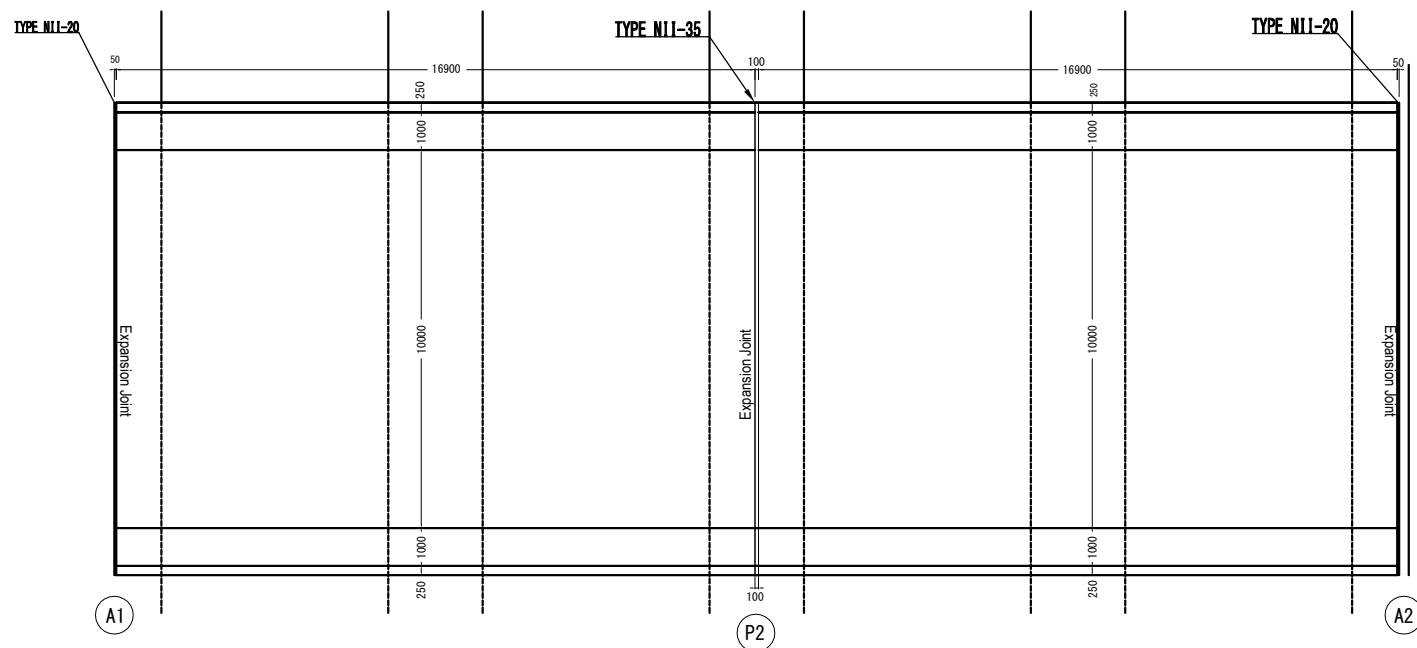
**SECTION**  
Scale A



**SECTION OF EXPANSION JOINT**  
Scale B

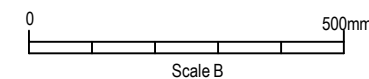
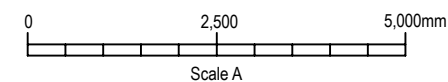


**LOCATION**



**LIST OF EXPANSION JOINT**

N A M E	MATERIAL	A1	P2	A2	TOTAL	REMARKS
BROF JOINT TYPE N -20 II	SS400 SYNTHETIC RUBBER SR235 SD295	10.10 m		10.10 m	20.20 m	CARRIGE WAY
BROF JOINT TYPE N -35 II	"		10.10 m		10.10 m	CARRIGE WAY
BROF JOINT TYPE N -20 II	"	2.00 m		2.00 m	4.00 m	FOOT WAY
BROF JOINT TYPE N -35 II	"		2.00 m		2.00 m	FOOT WAY



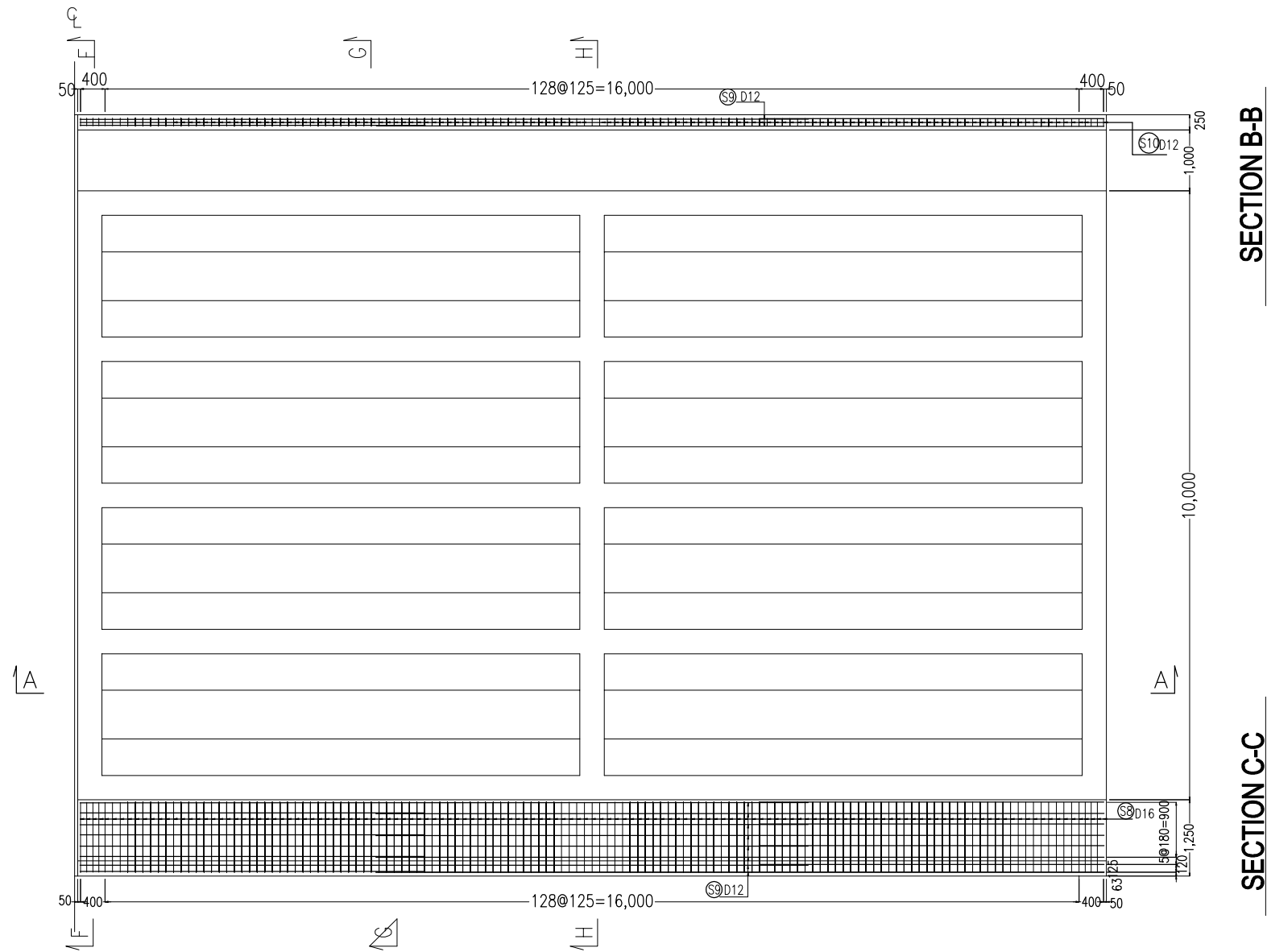
Arab Republic of Egypt  
Ministry of Water Resources and Irrigation  
Reservoir and Grand Barrages Sector

Detailed Design Study on the Project for  
Construction of the New Dirout Group of Regulators

General drawing of ancillary bridge for Bahr Yusef & Ibrahimia regulator (4/4)	<b>DRW. NO.</b> CR-6
SANYU CONSULTANTS INC.	
PREPARED BY:	CHECKED BY:
DATE:	DATE:
APPROVED BY:	DATE:

# REBAR ARRANGEMENT OF ANCILLARY BRIDGE (1)

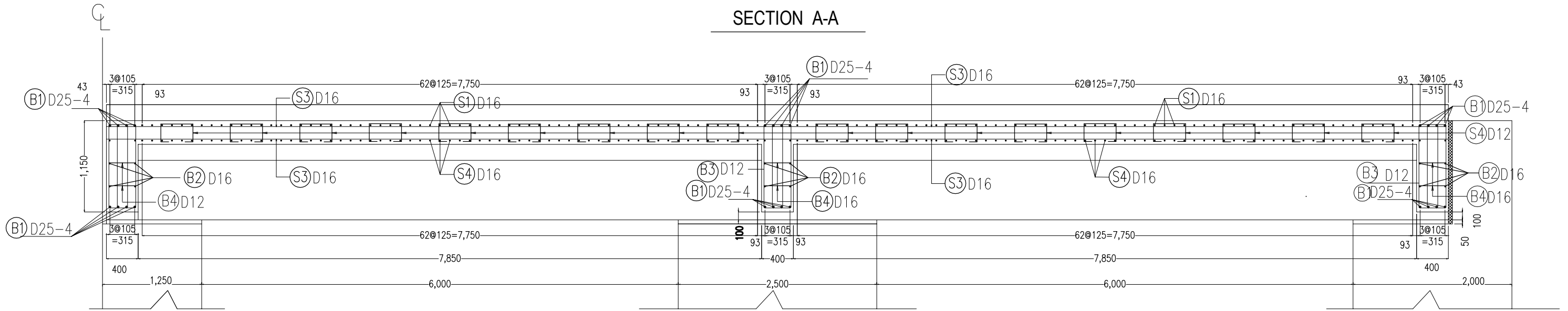
## Slab Rebar Arrangement for SECTION A-A



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Rebar arrangement of ancillary bridge for Bahr Yusef & Ibrahimia regulator (1)			<b>DRW. NO.</b> CR-7
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

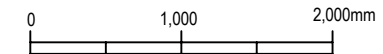
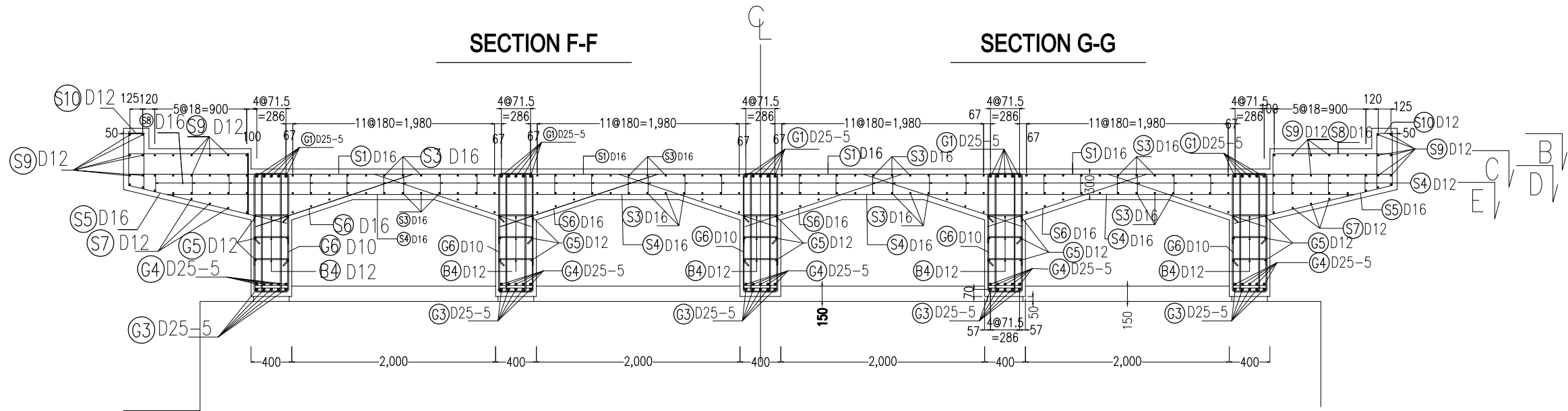
# REBAR ARRANGEMENT OF ANCILLARY BRIDGE (2)

## SECTION A-A



## SECTION F-F

## SECTION G-G



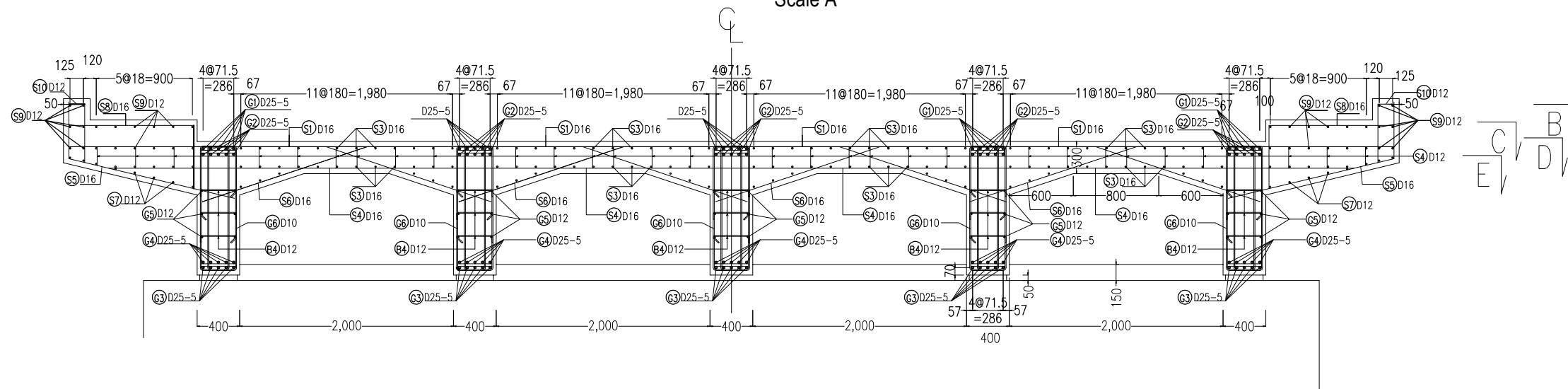
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Rebar arrangement of ancillary bridge for Bahr Yusef & Ibrahimia regulator (2)			<b>DRW. NO.</b> CR-8
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:



# REBAR ARRANGEMENT OF ANCILLARY BRIDGE (3)

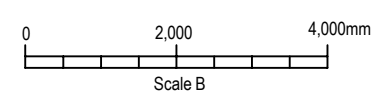
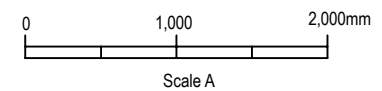
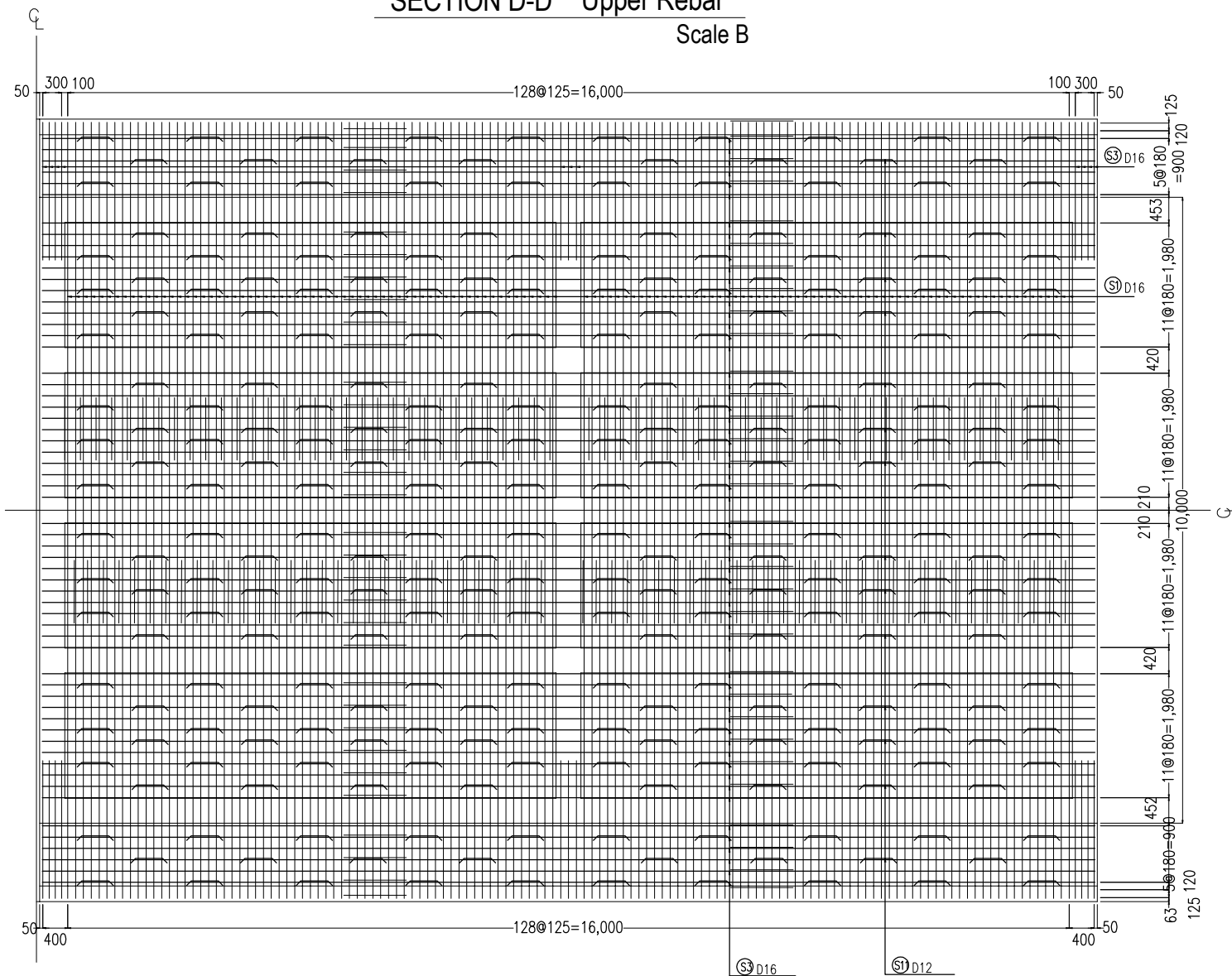
## SECTION H-H

Scale A



## SECTION D-D Upper Rebar

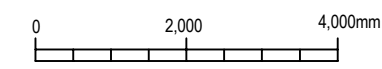
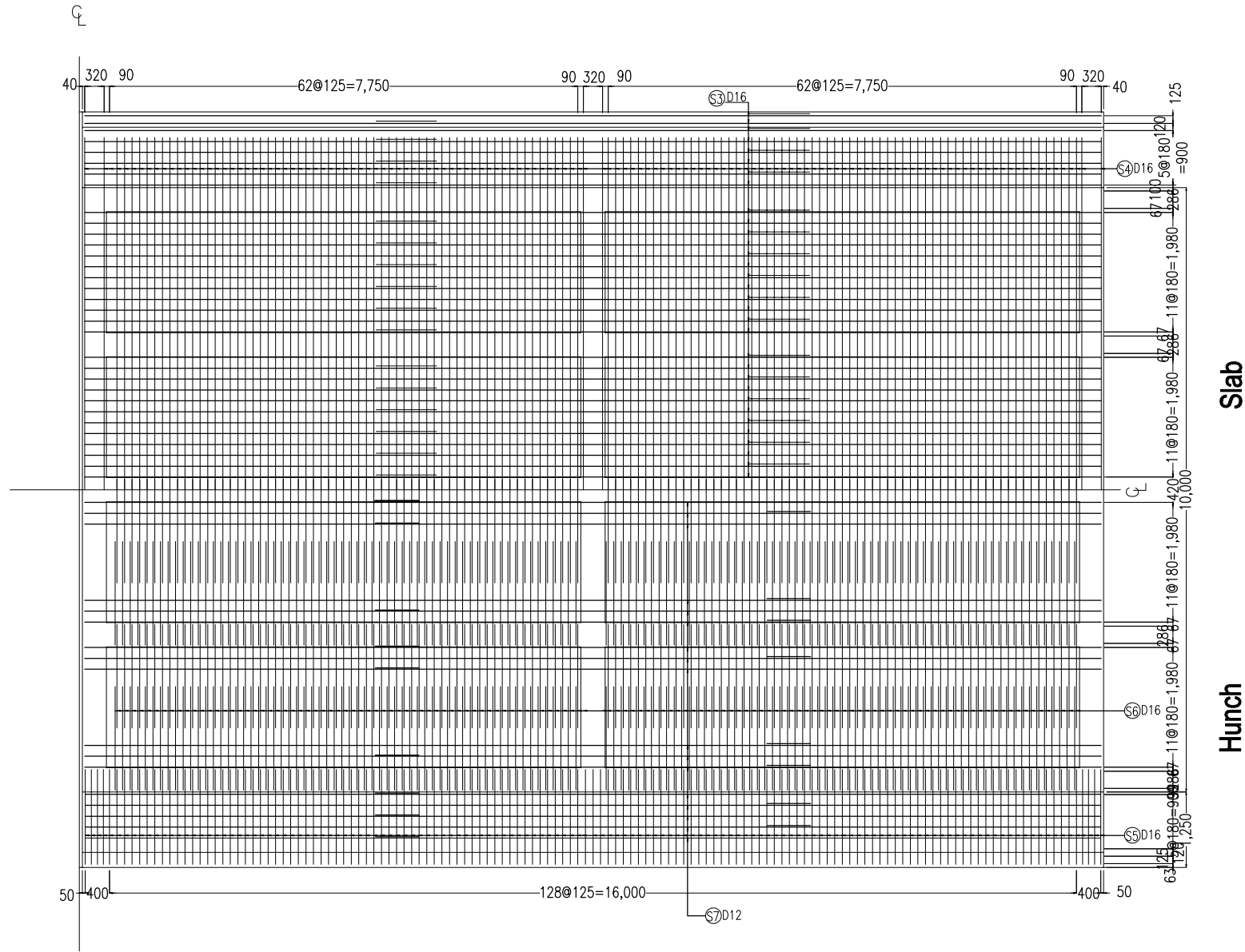
Scale B



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Rebar arrangement of ancillary bridge for Bahr Yusef & Ibrahimia regulator (3)			<b>DRW. NO.</b> CR-9
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

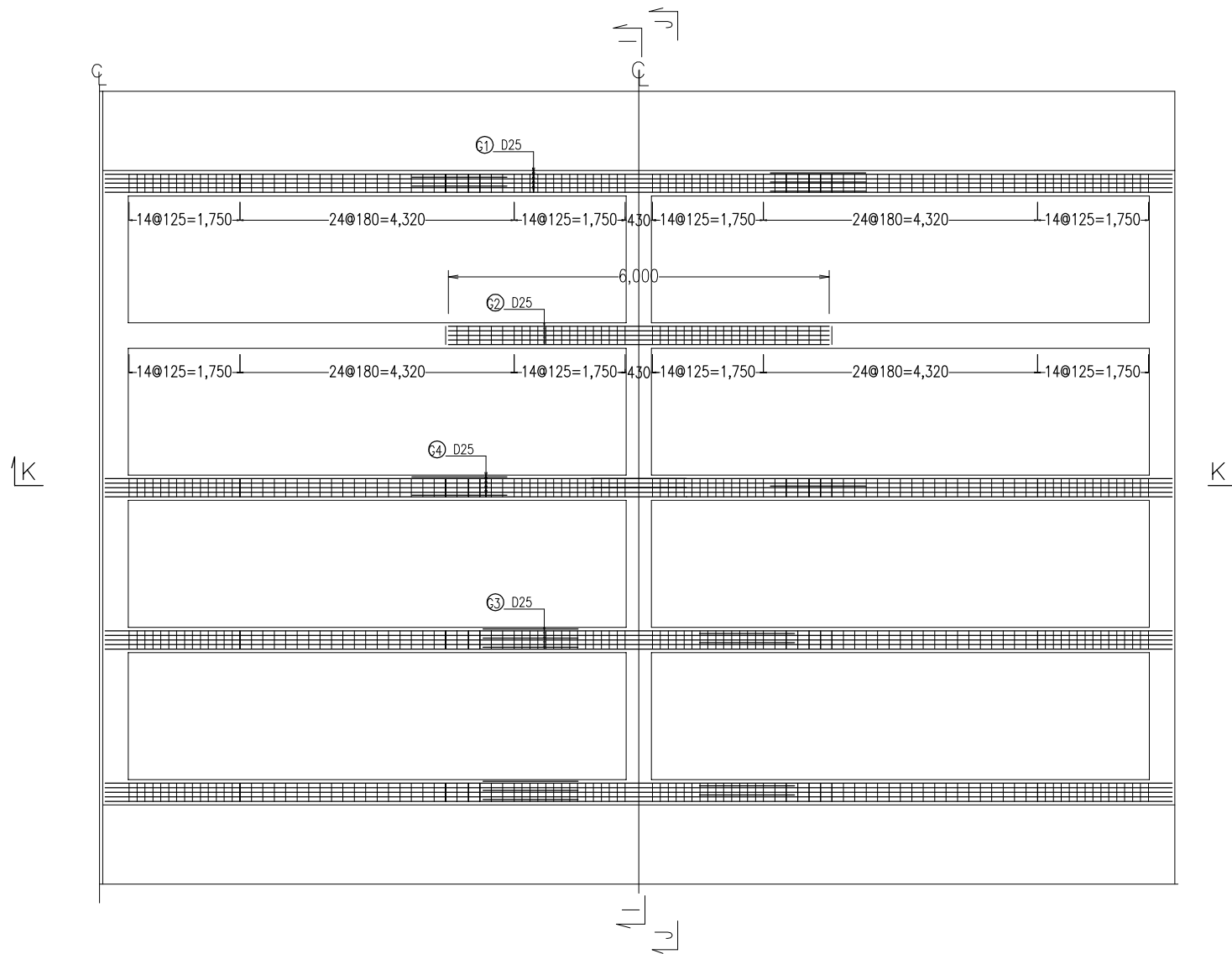
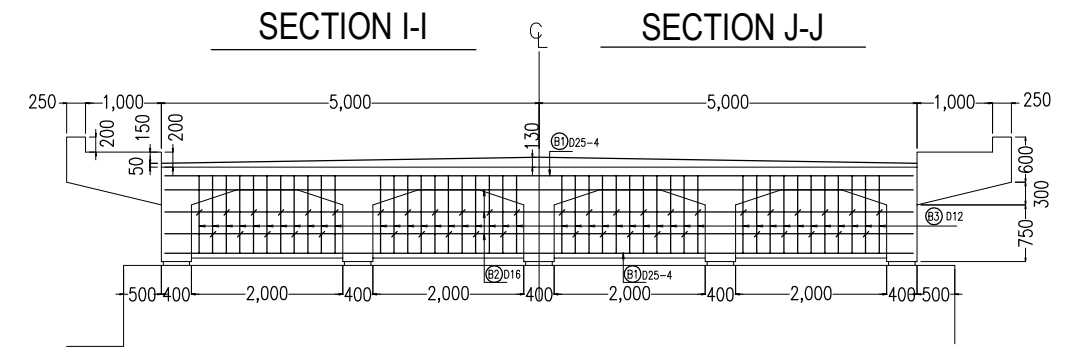
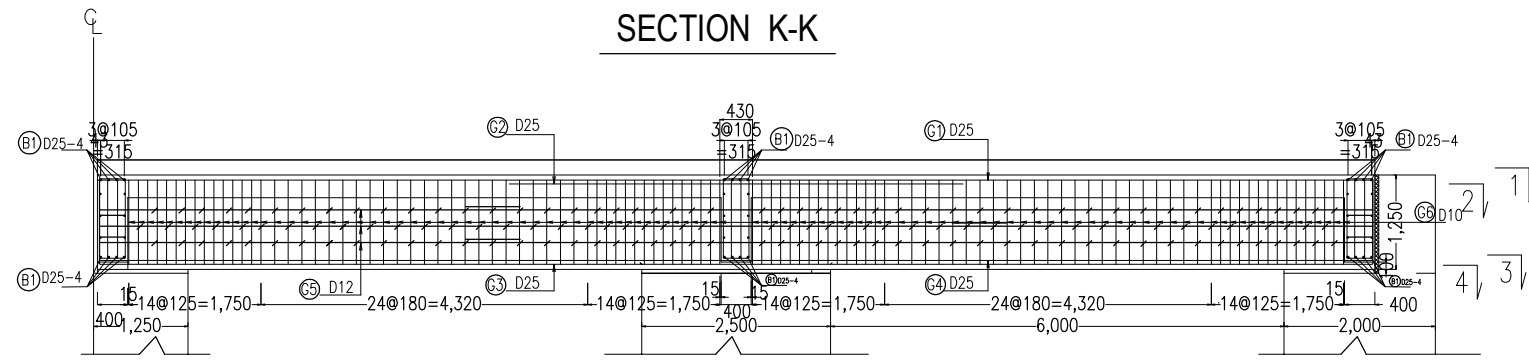
# REBAR ARRANGEMENT OF ANCILLARY BRIDGE (4)

## SECTION E-E Lower Rebar



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Rebar arrangement of ancillary bridge for Bahr Yusef & Ibrahimia regulator (4)			<b>DRW. NO.</b> CR-10
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# REBAR ARRANGEMENT OF ANCILLARY BRIDGE (5)

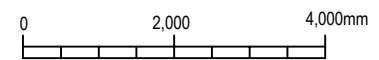


SECTION 1-1

SECTION 2-2

SECTION 3-3

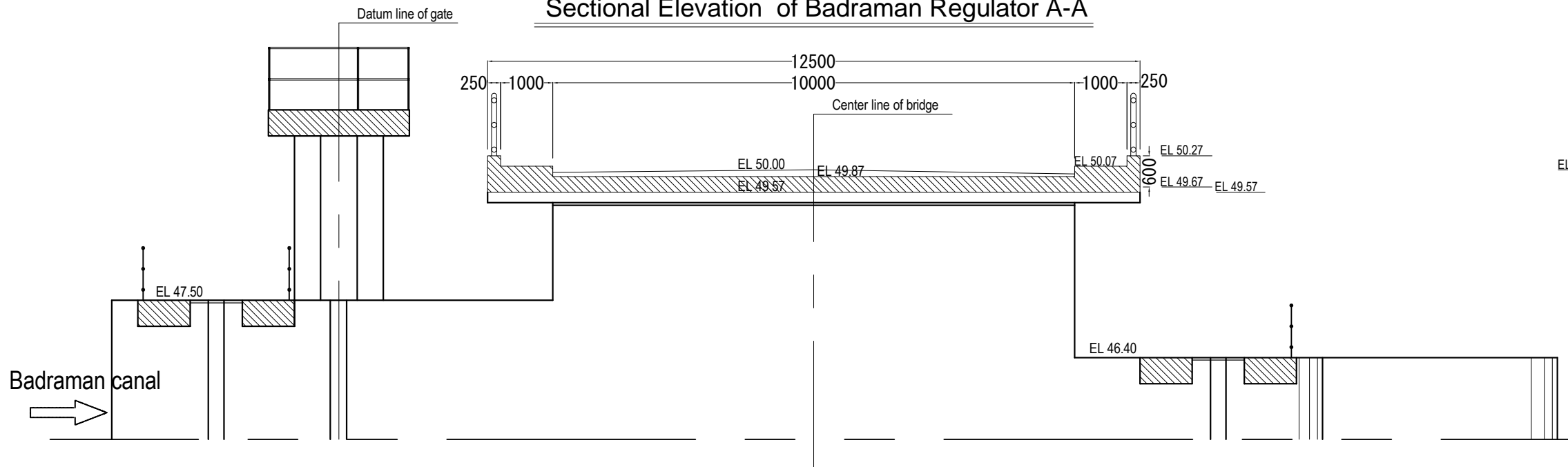
SECTION 4-4



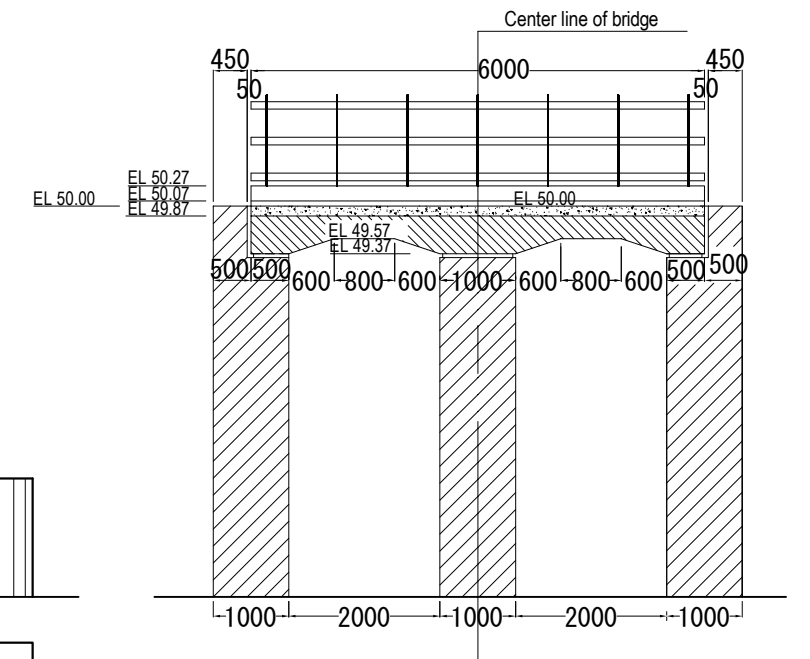
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Rebar arrangement of ancillary bridge for Bahr Yusef & Ibrahimia regulator (5)			DRW. NO. CR-11
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Badraman Regulator (Badraman)

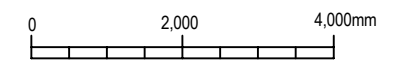
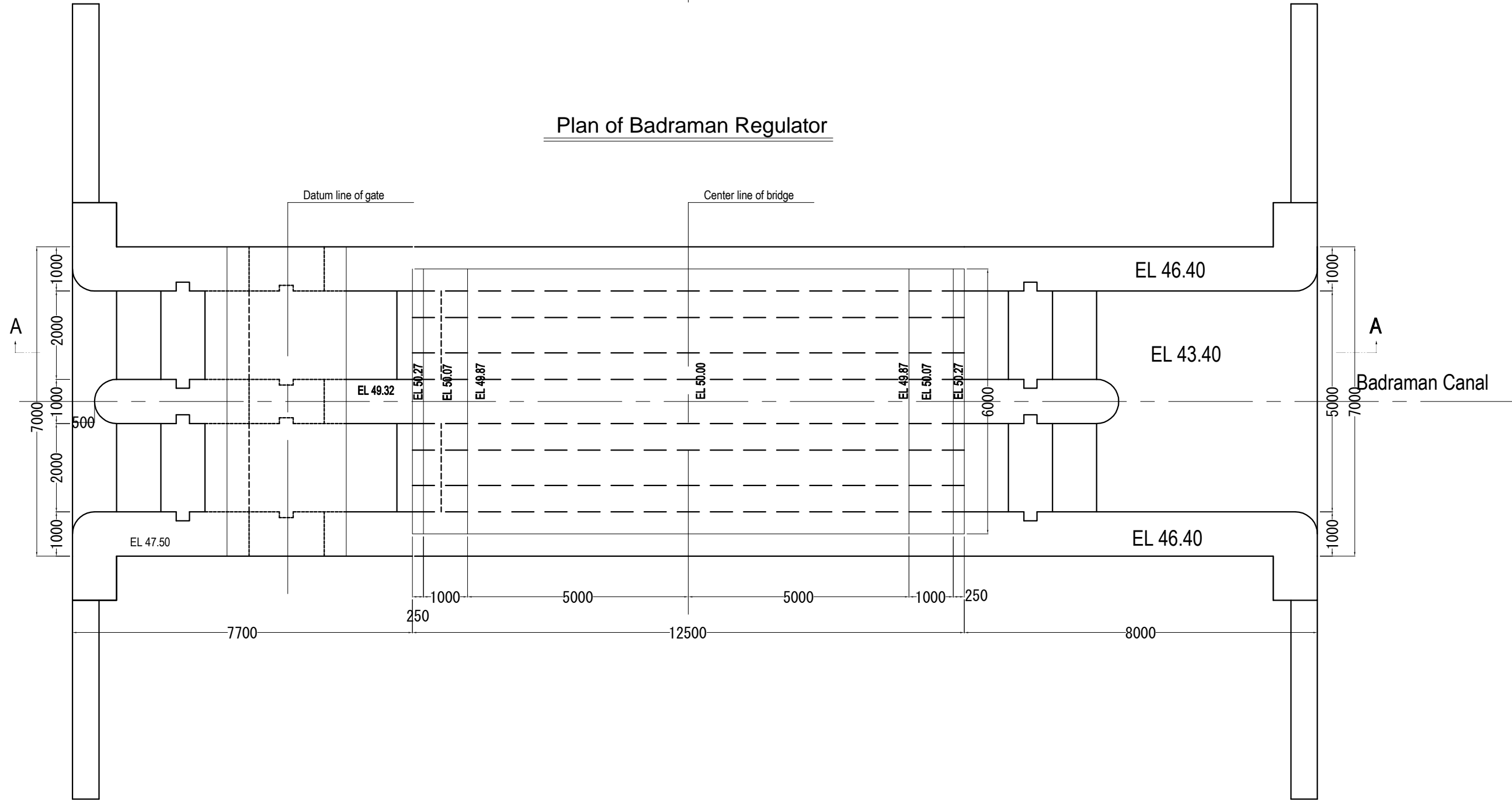
## Sectional Elevation of Badraman Regulator A-A



## Sectional Side View of Badraman Regulator B-B



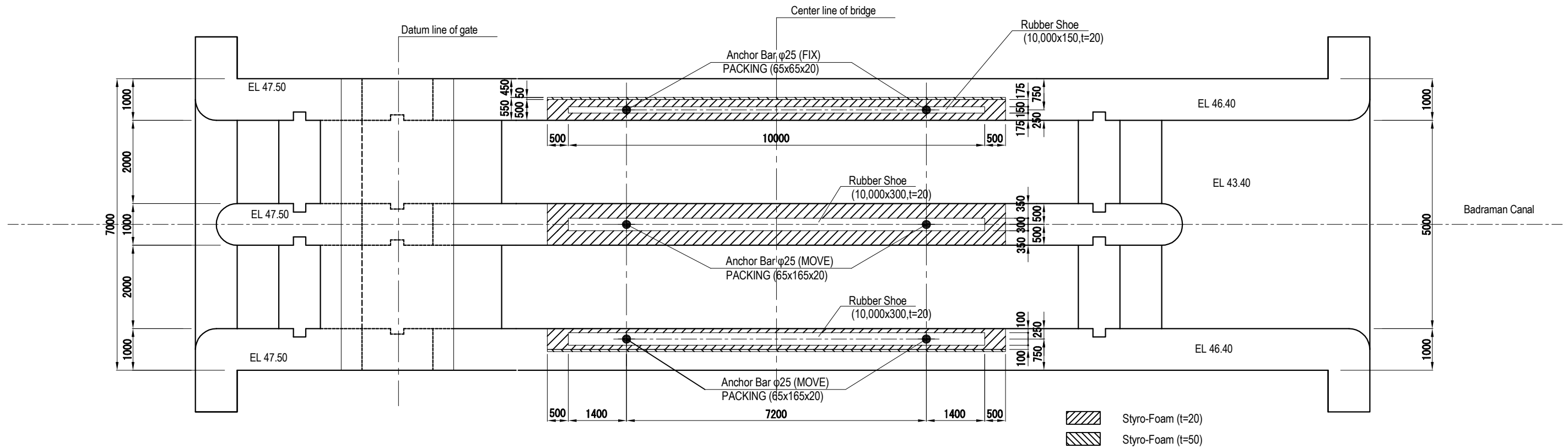
## Plan of Badraman Regulator



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
General drawing of ancillary bridge for Badraman regulator (Badraman) (1/3)			<b>DRW. NO.</b> CR-12
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

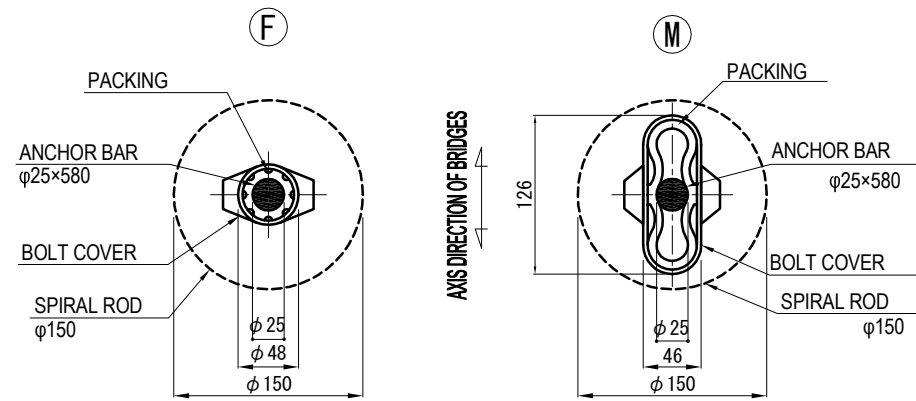
# Arrangement Plan of Shoe

Scale A

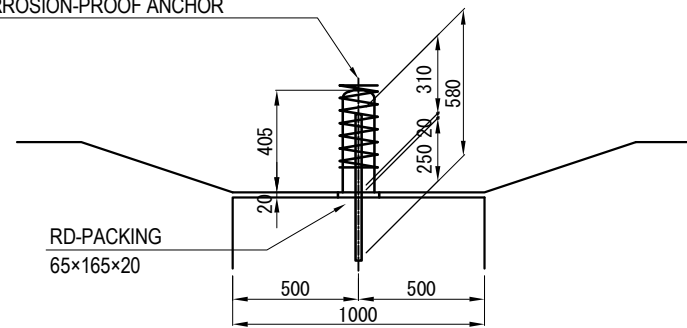


## ST FORMULA CORROSION-PROOF ANCHOR

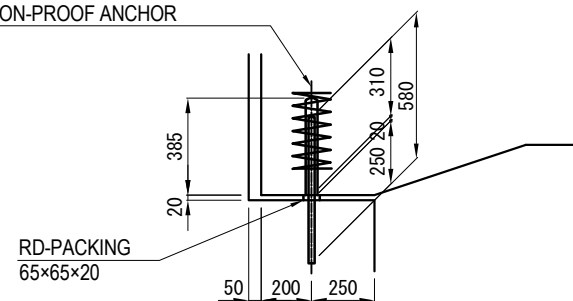
Scale B



## ST FORMULA CORROSION-PROOF ANCHOR M25D

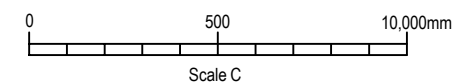
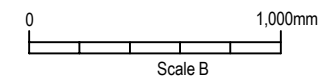
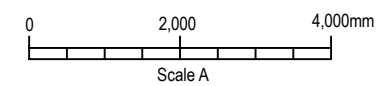
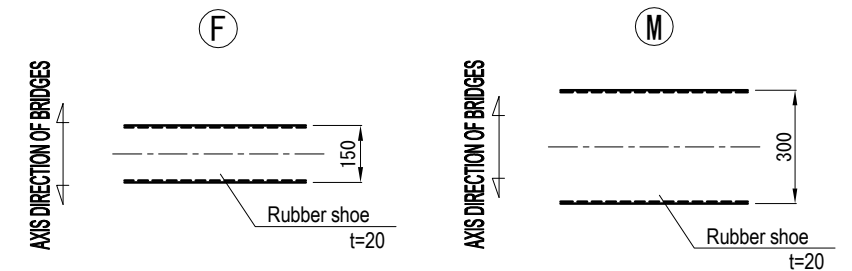


## ST FORMULA CORROSION-PROOF ANCHOR F25D



## RUBBER BEARINGS

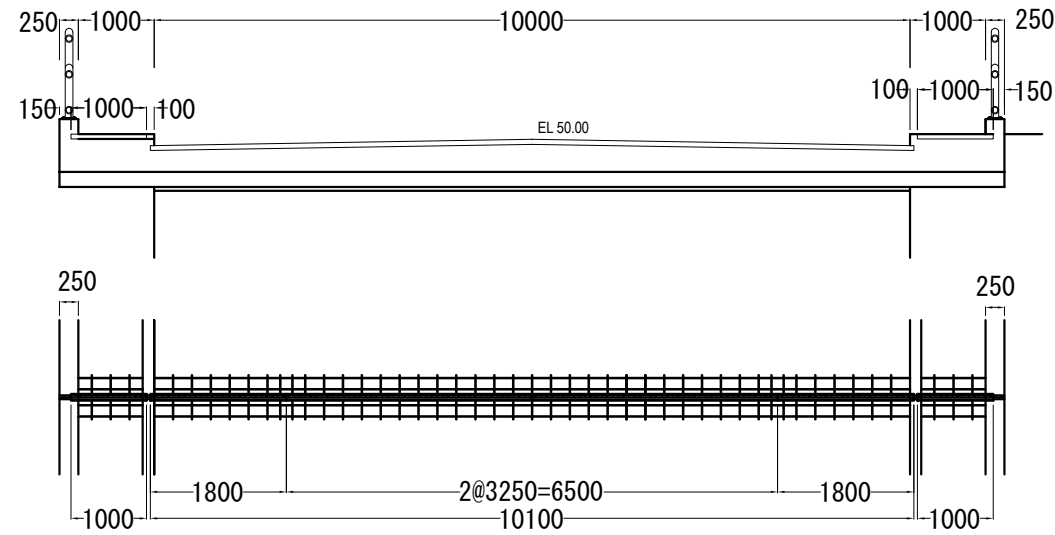
Scale C



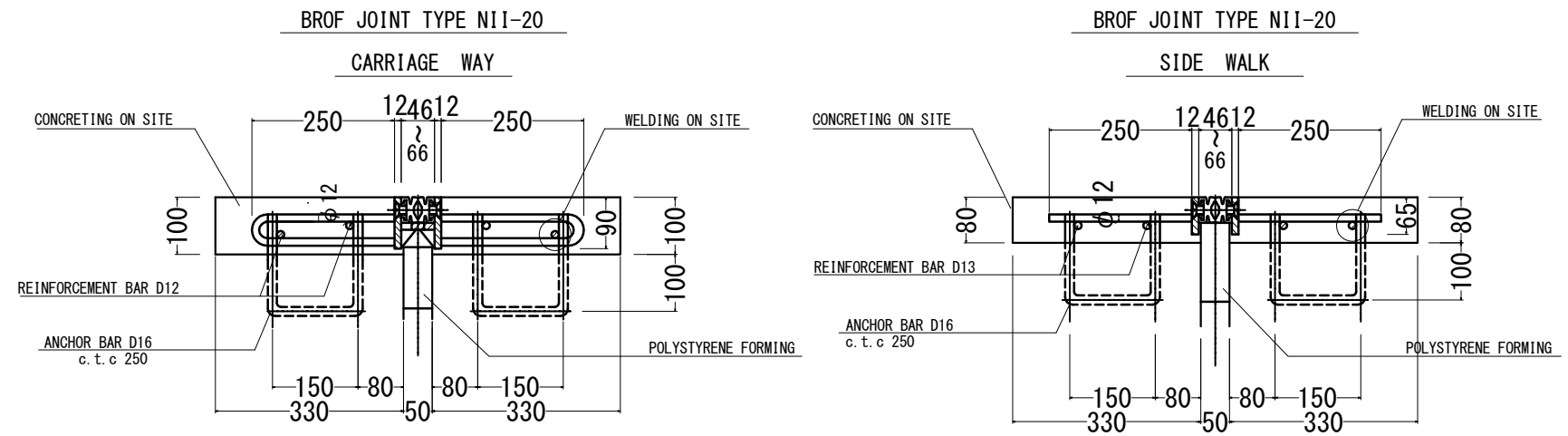
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
General drawing of ancillary bridge for Badraman regulator (Badraman) (2/3)			<b>DRW. NO.</b> CR-13
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# DETAIL OF EXPANSION JOINT

SECTION  
Scale A



SECTION OF EXPANSION JOINT  
Scale B

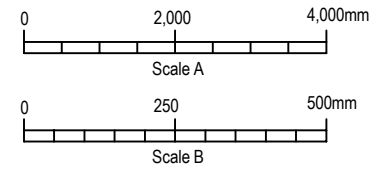
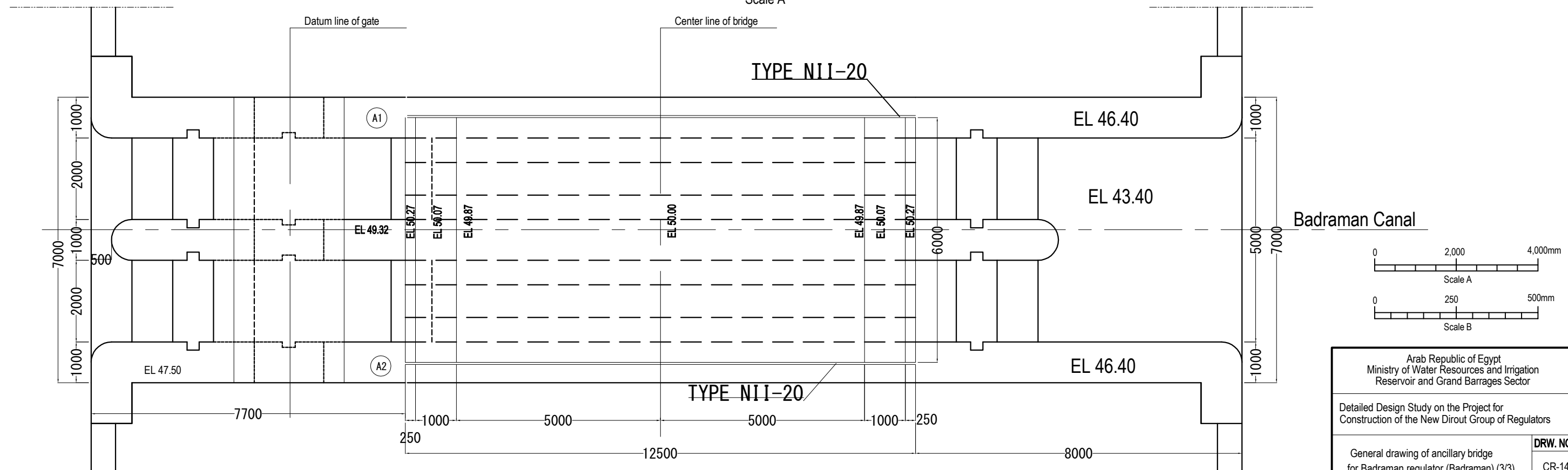


LIST OF EXPANSION JOINT

N A M E	MATERIAL	A1	A2	TOTAL	REMARKS
BROF JOINT TYPE N -20 II	SS400 SYNTHETIC RUBBER SR235 SD295	10.10 m	10.10 m	20.20 m	CARRIGE WAY
BROF JOINT TYPE N -20 II	"	2.00 m	2.00 m	4.00 m	FOOT WAY

Plan of Badraman Regulator

Scale A

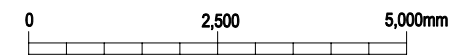
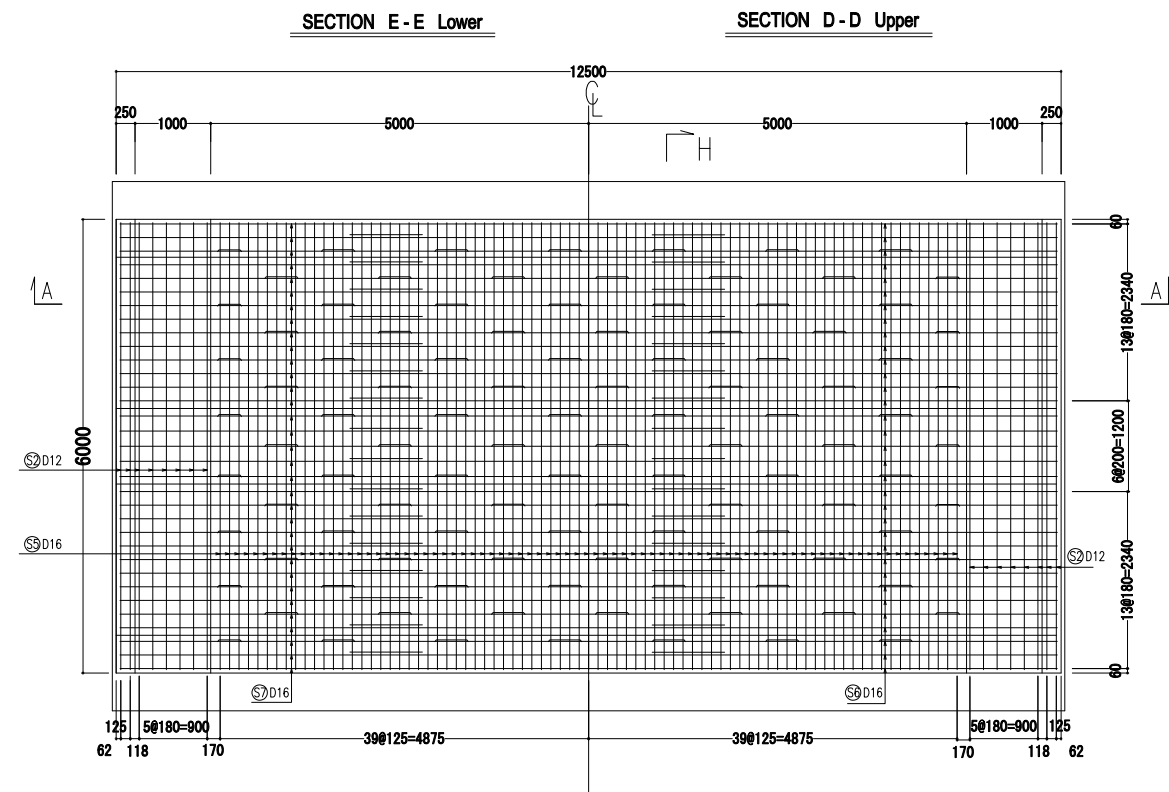
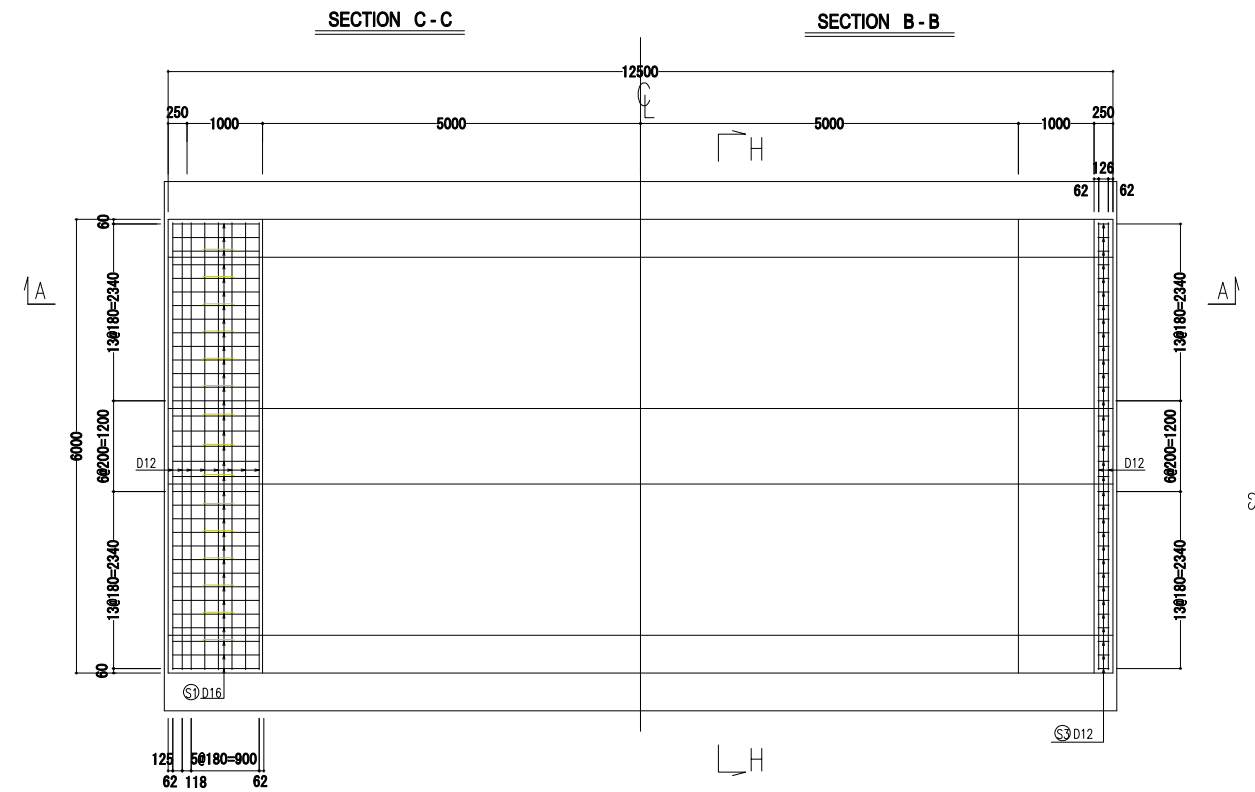
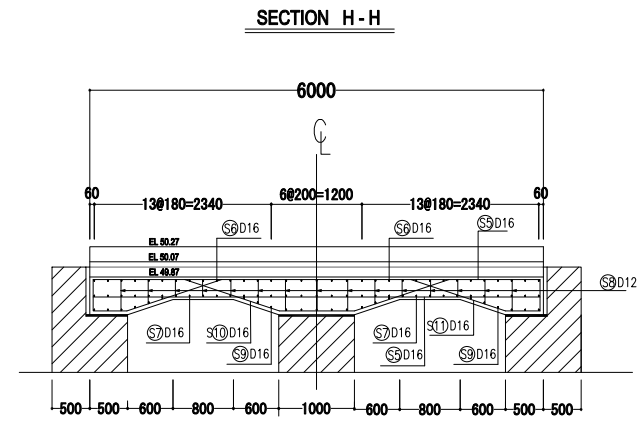
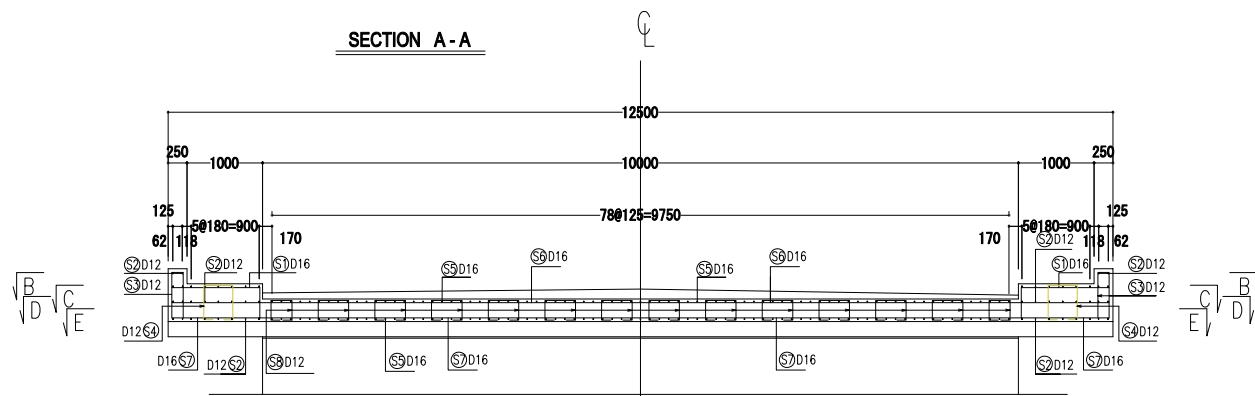


Arab Republic of Egypt  
Ministry of Water Resources and Irrigation  
Reservoir and Grand Barrages Sector

Detailed Design Study on the Project for  
Construction of the New Dirout Group of Regulators

General drawing of ancillary bridge for Badraman regulator (Badraman) (3/3)	<b>DRW. NO.</b> CR-14
SANYU CONSULTANTS INC.	
PREPARED BY:	CHECKED BY:
DATE:	DATE:
APPROVED BY:	DATE:

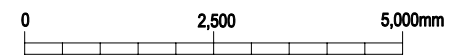
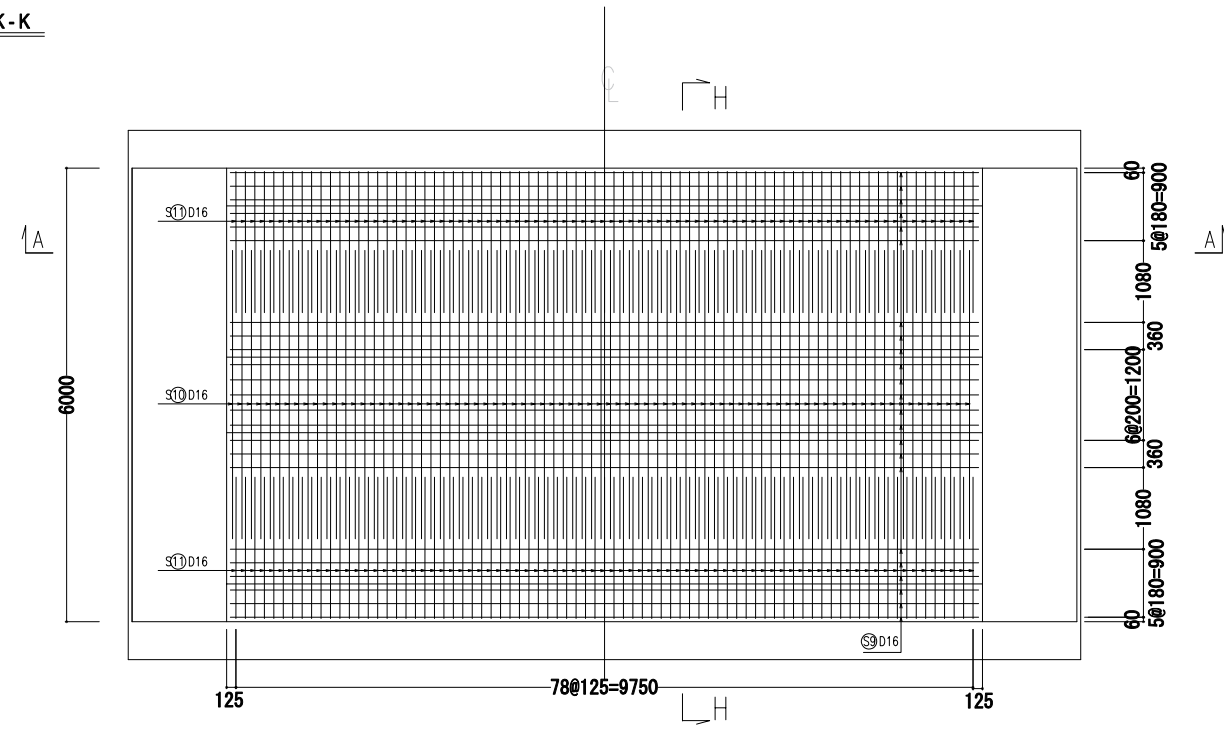
# Badraman Regulator (Badraman) Rebar Arrangement (1/2)



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Rebar arrangement of ancillary bridge for Badraman regulator (Badraman) (1/2)			DRW. NO. CR-15
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Badraman Regulator (Badraman) Rebar Arrangement (2/2)

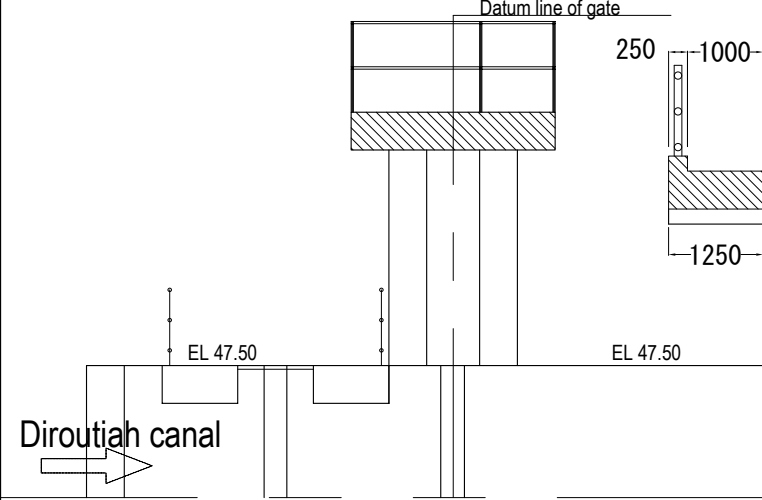
SECTION K-K



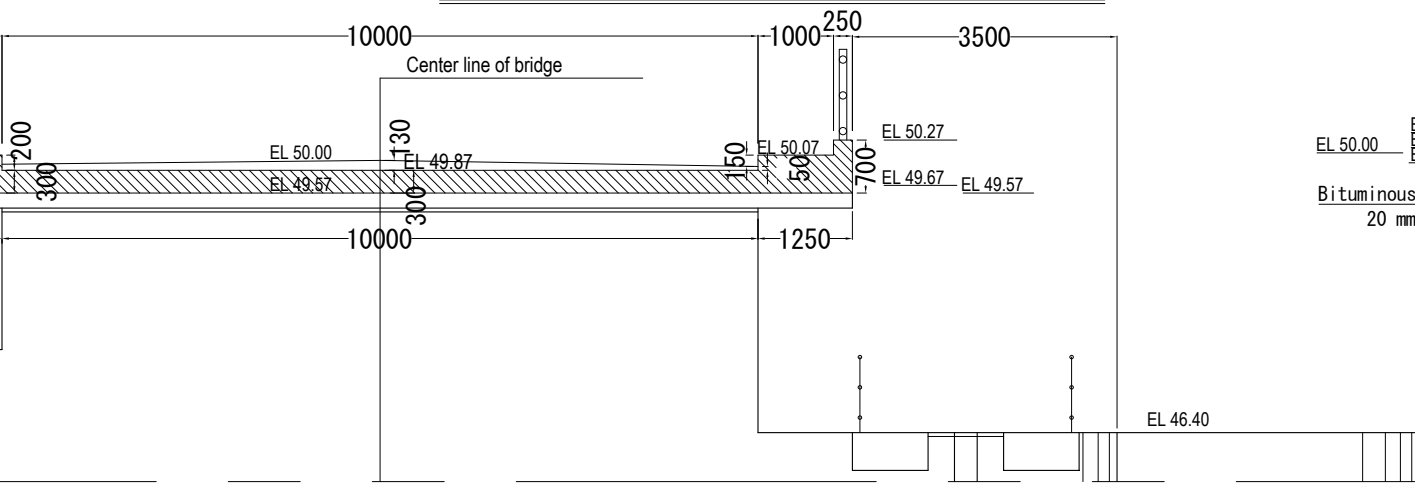
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Rebar arrangement of ancillary bridge for Badraman regulator (Badraman) (2/2)			DRW. NO. CR-16
SANYU CONSULTANTS INC.			
PREPARED BY: _____ DATE:	CHECKED BY: _____ DATE:	APPROVED BY: _____ DATE:	_____ DATE:



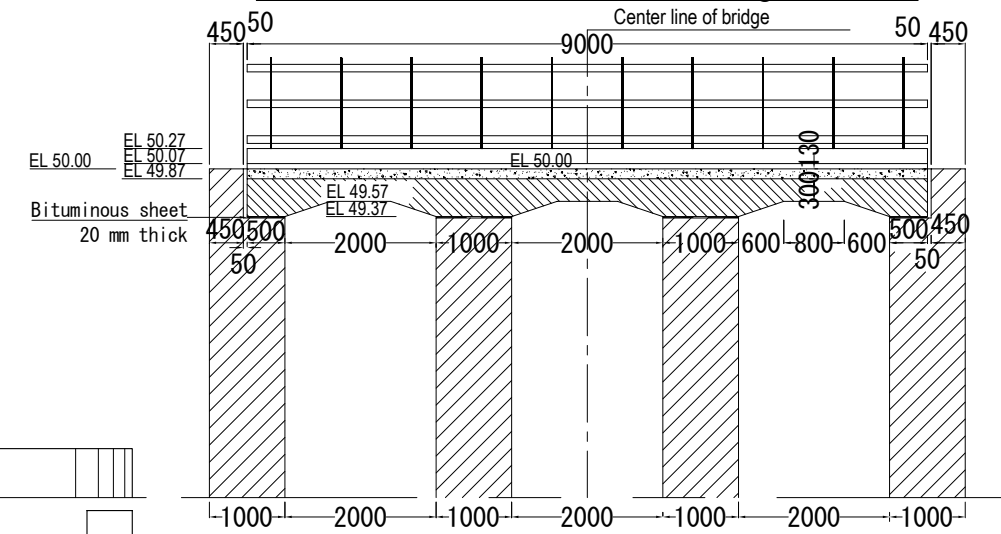
Sectional Elevation of Diroutiah Regulator A-A



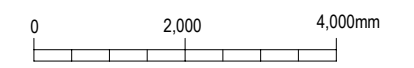
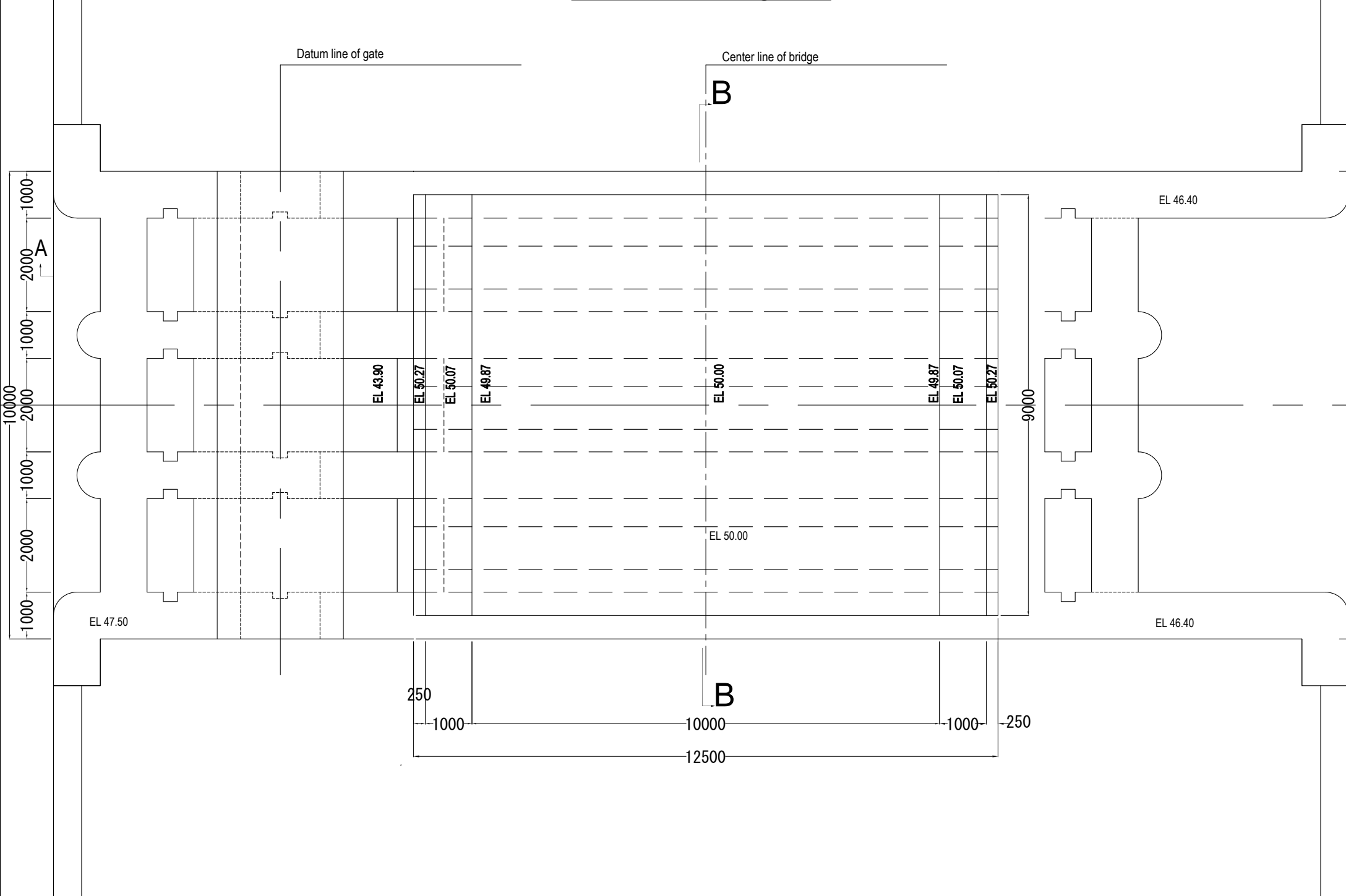
Badraman Regulator (Diroutiah)



Sectional Side View of Diroutiah Regulator B-B



Plan of Diroutiah Regulator

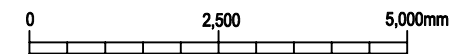
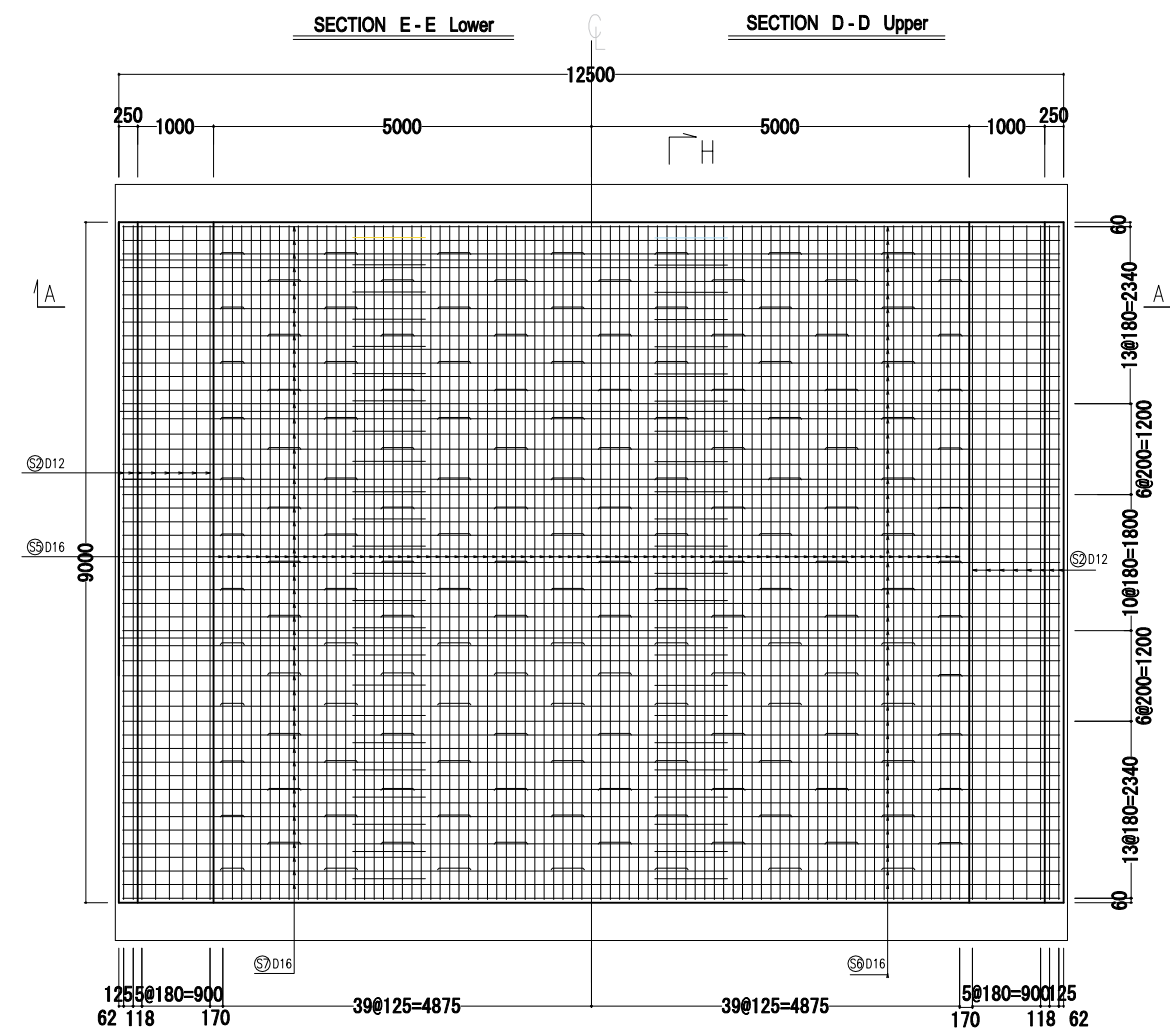
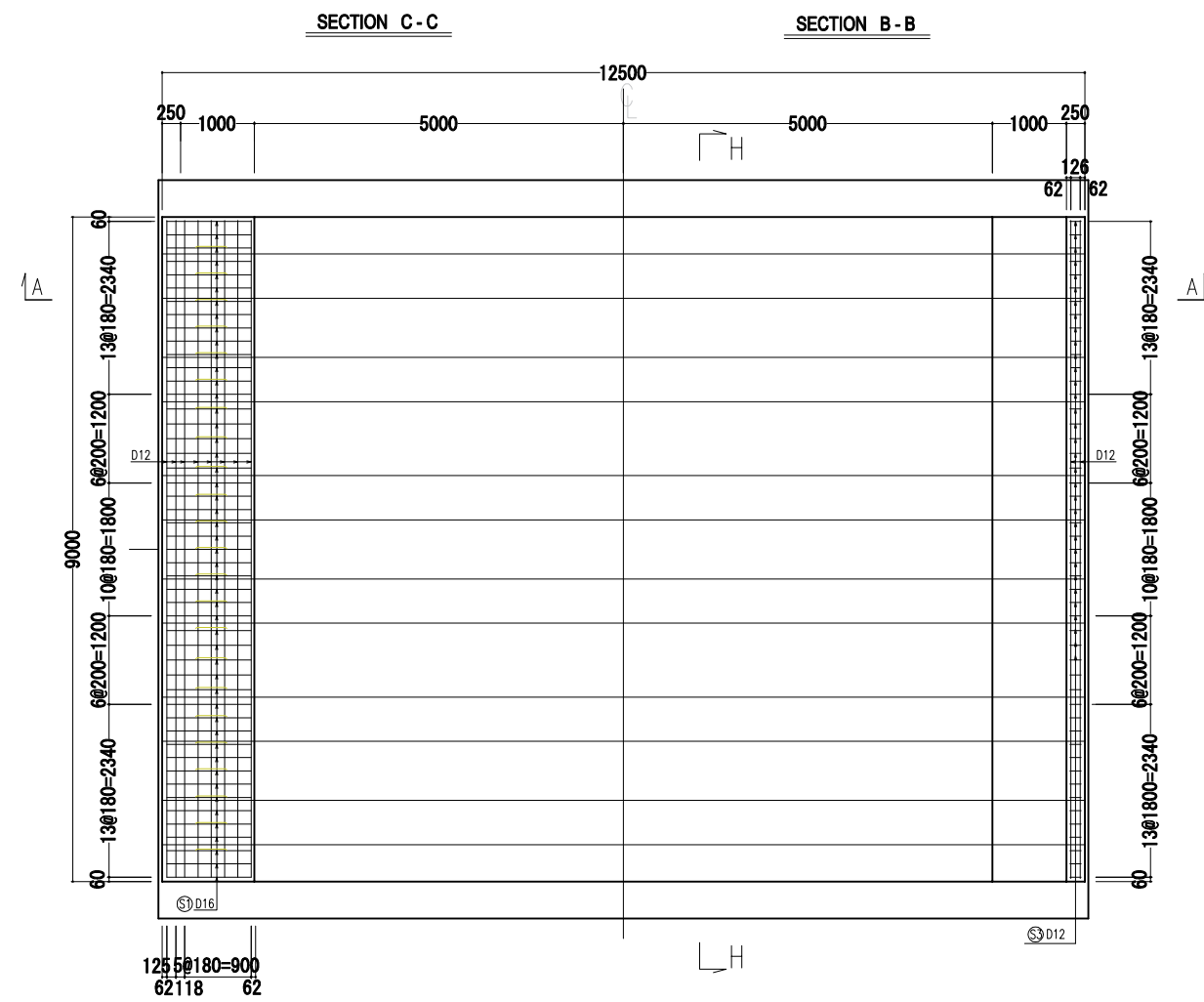
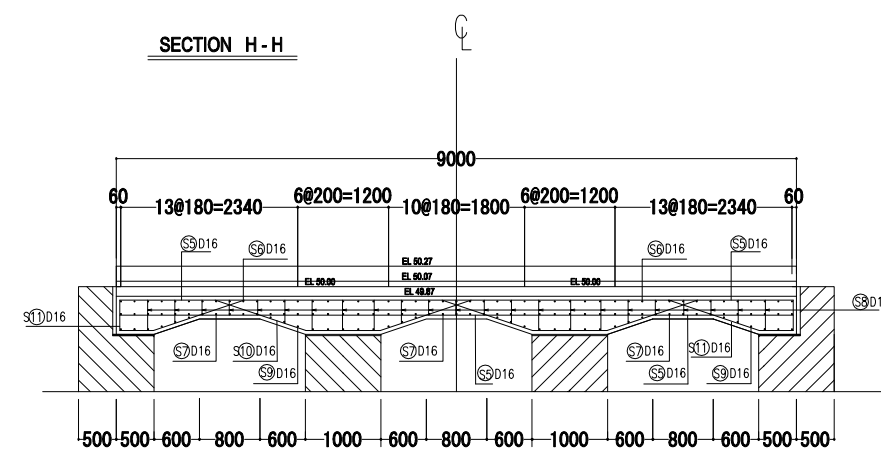
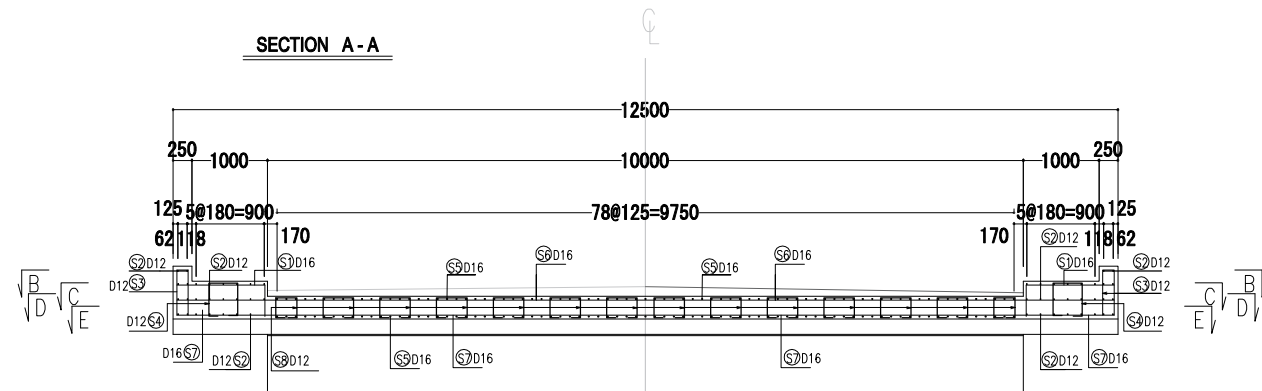


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
General drawing of ancillary bridge for Badraman regulator (Diroutiah) (1/3)			DRW. NO. CR-17
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:



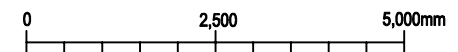
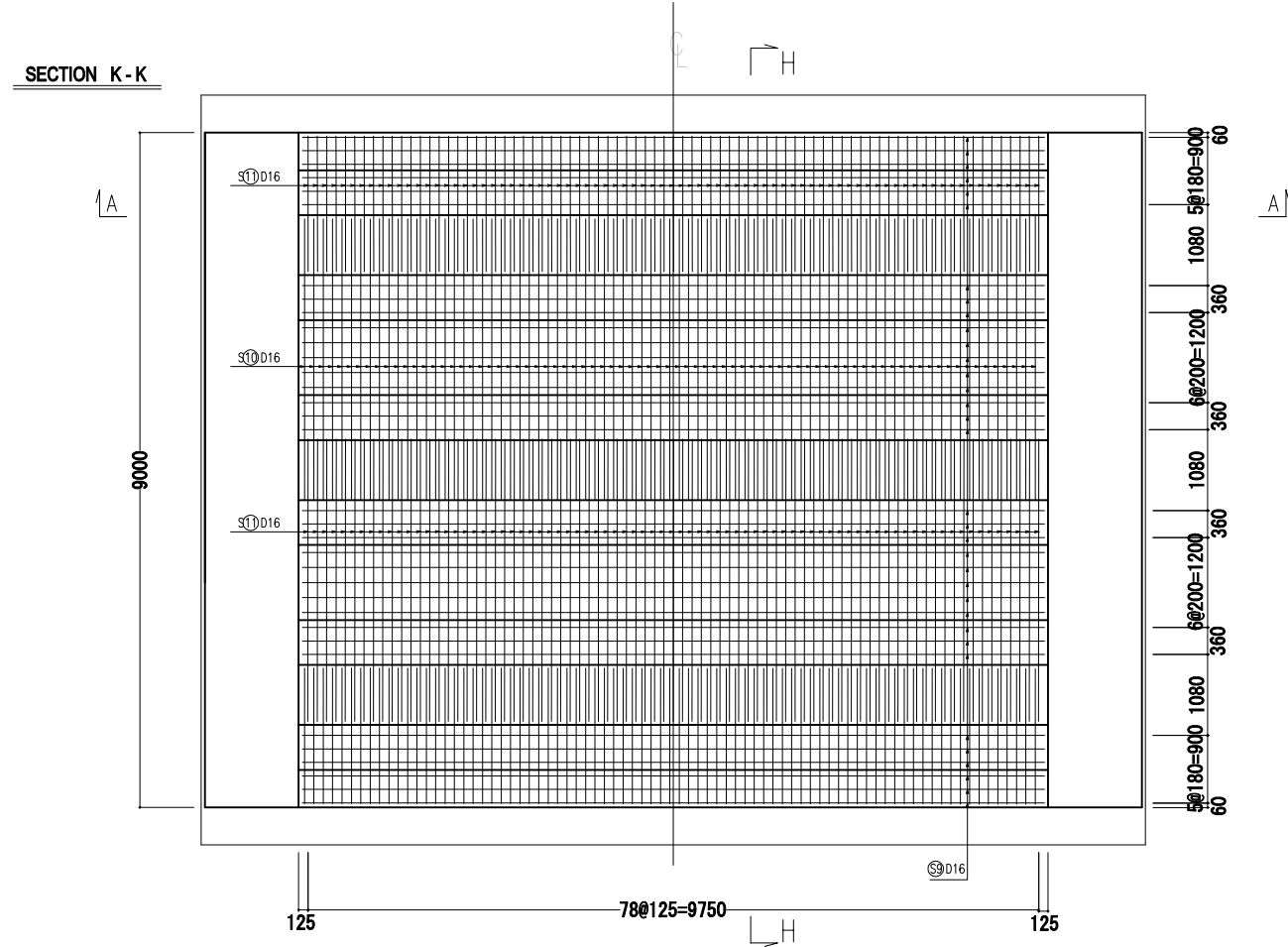


# Badraman Regulator (Diroutiah) Rebar Arrangement (1/2)



Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Rebar arrangement of ancillary bridge for Badraman regulator (Diroutiah) (1/2)			DRW. NO. CR-20
SANYU CONSULTANTS INC.			
PREPARED BY: DATE:	CHECKED BY: DATE:	APPROVED BY: DATE:	DATE:

# Badraman Regulator (Diroutiah) Rebar Arrangement (2/2)

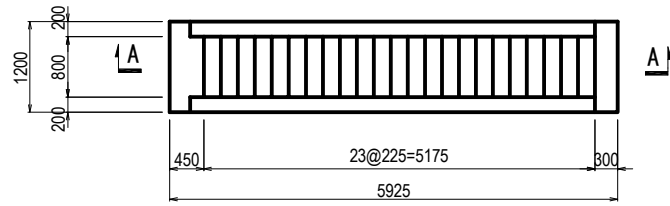


Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector			
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Rebar arrangement of ancillary bridge for Badraman regulator (Diroutiah) (2/2)			DRW. NO. CR-21
SANYU CONSULTANTS INC.			
PREPARED BY: DATE:	CHECKED BY: DATE:	APPROVED BY: DATE:	DATE:

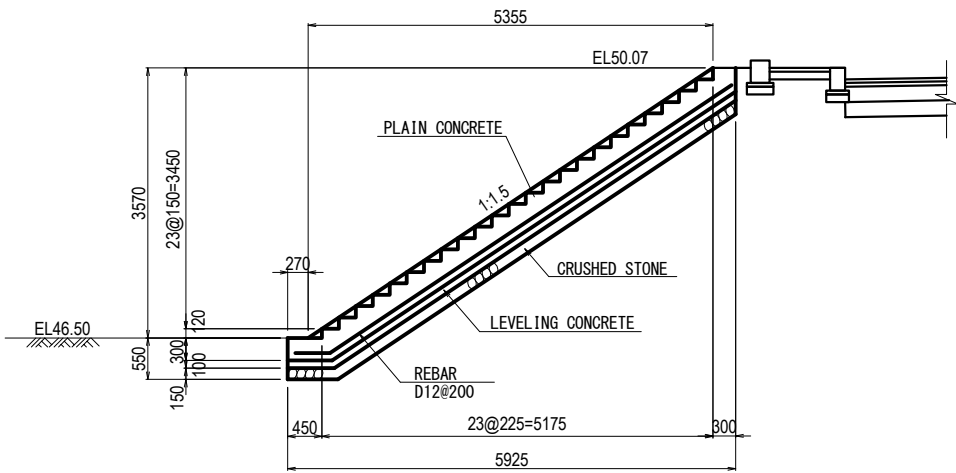
**DETAIL OF STEP**

Type A

PLAN

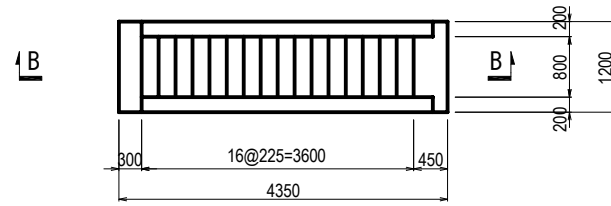


SECTION A-A

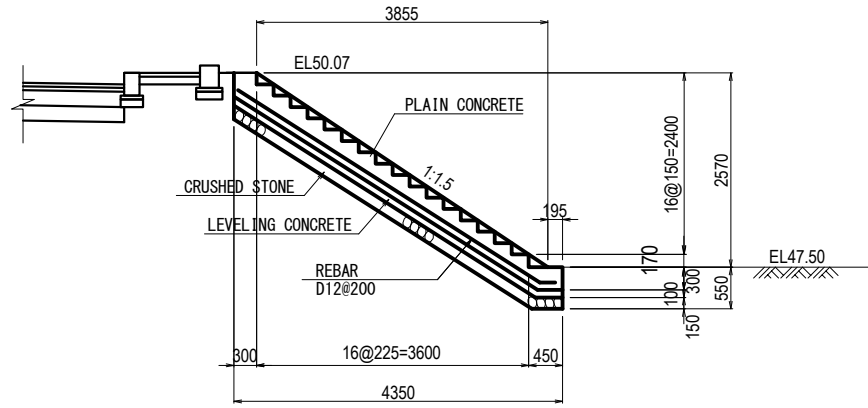


Type B

PLAN

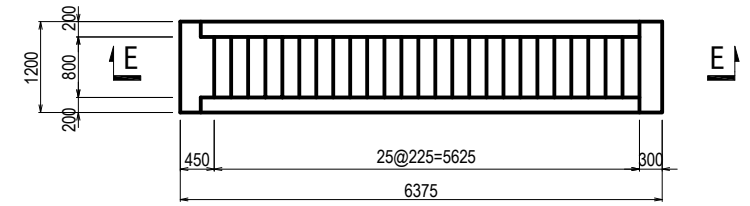


SECTION B-B

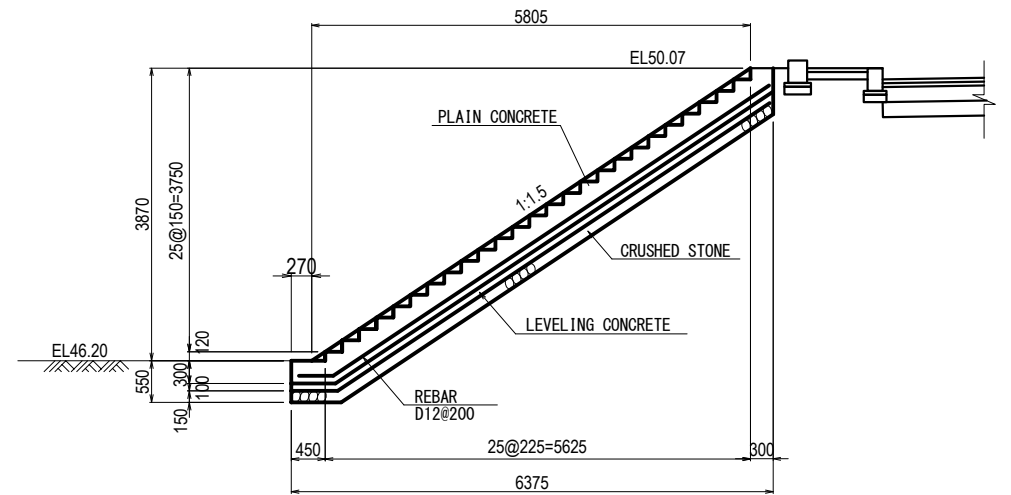


Type E

PLAN

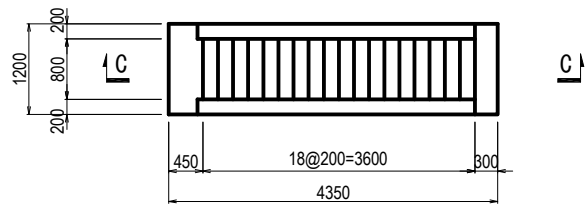


SECTION E-E

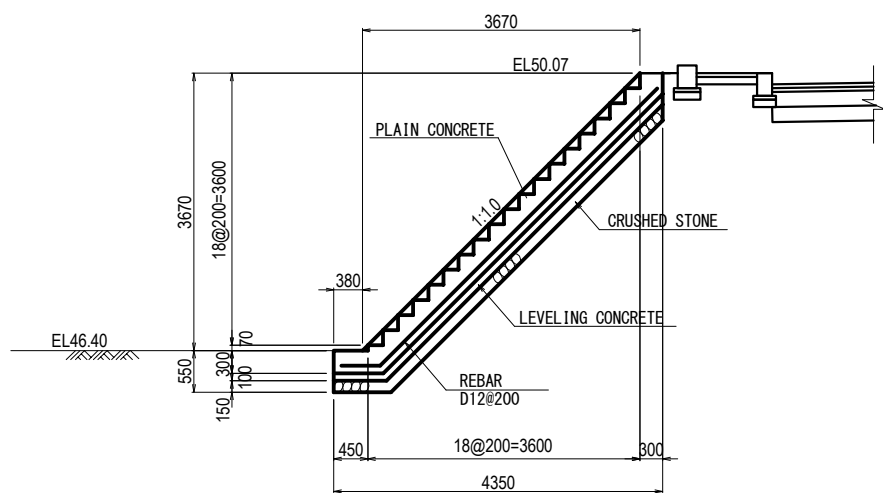


Type C

PLAN

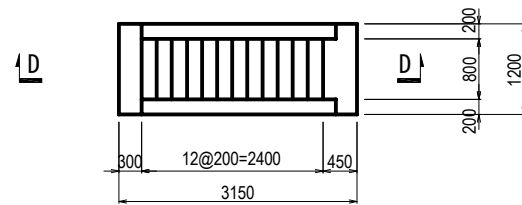


SECTION C-C

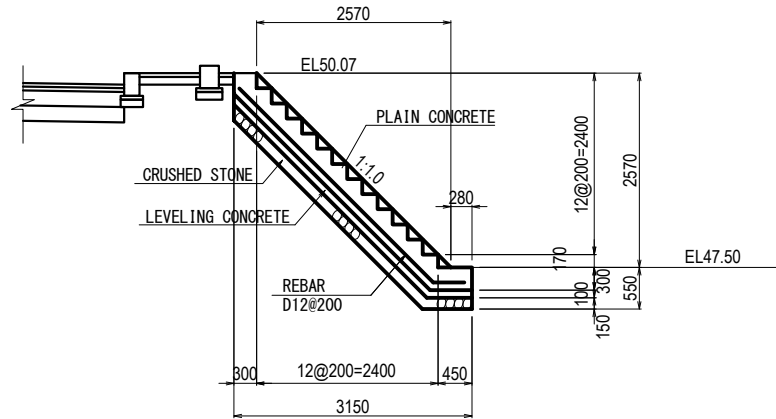


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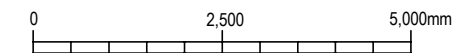
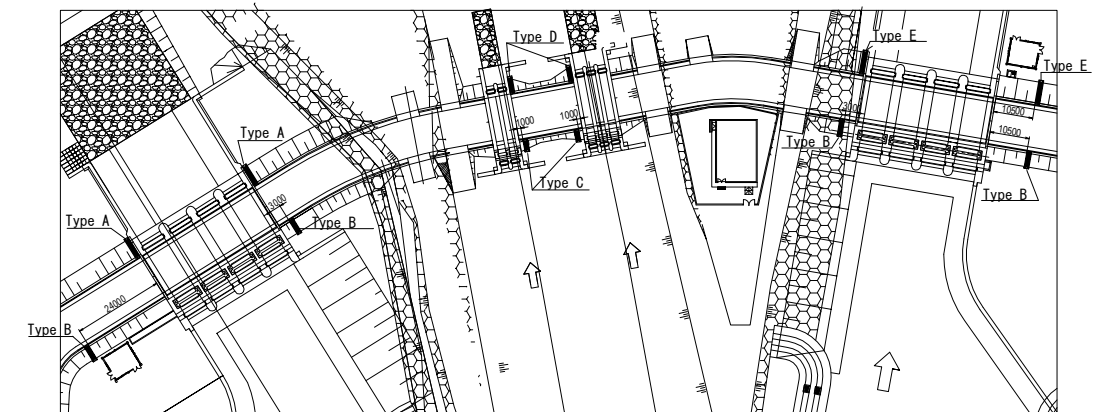
PLAN



SECTION D-D



KEY PLAN



Arab Republic of Egypt  
Ministry of Water Resources and Irrigation  
Reservoir and Grand Barrages Sector

Detailed Design Study on the Project for  
Construction of the New Dirout Group of Regulators

Detail of steps

DRW. NO.

CM-1

SANYU CONSULTANTS INC.

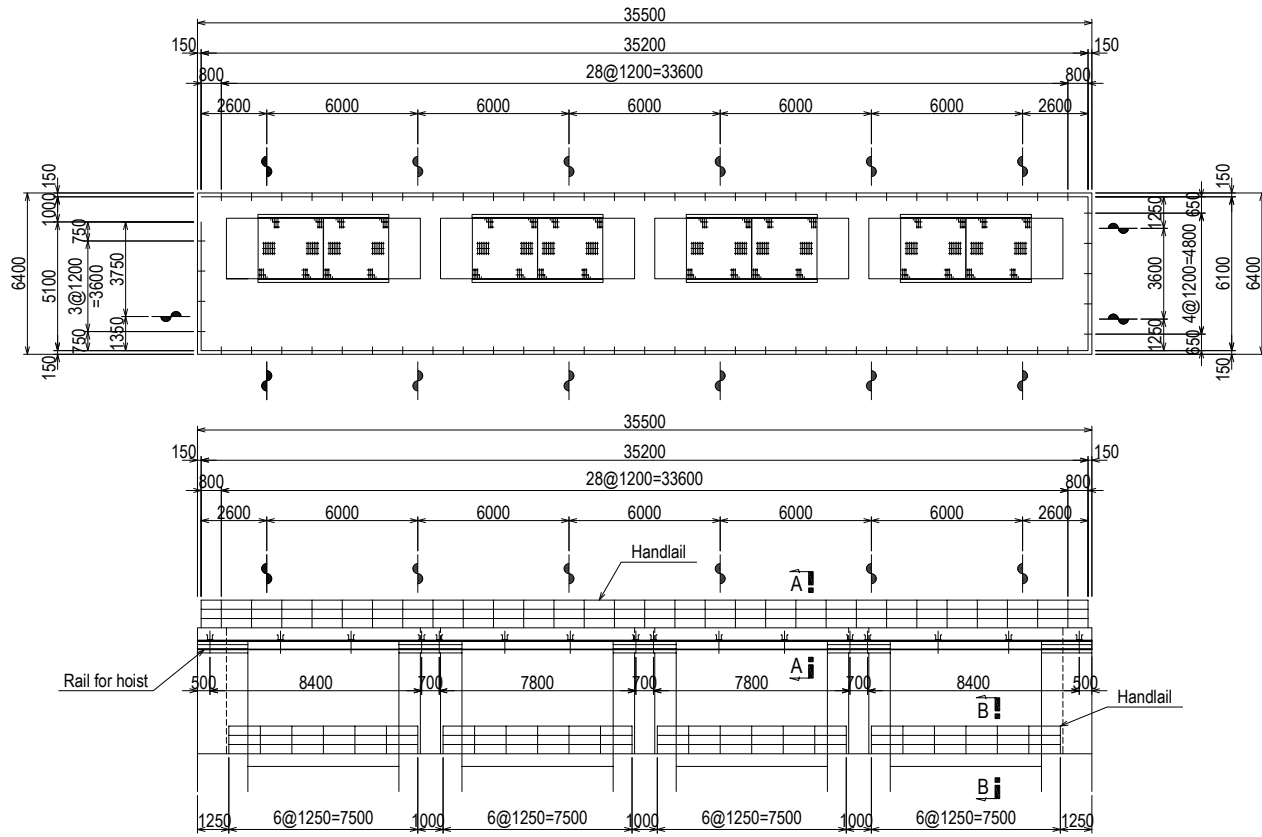
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

# Handrail Assembling

## Handrail Assembling Drawing

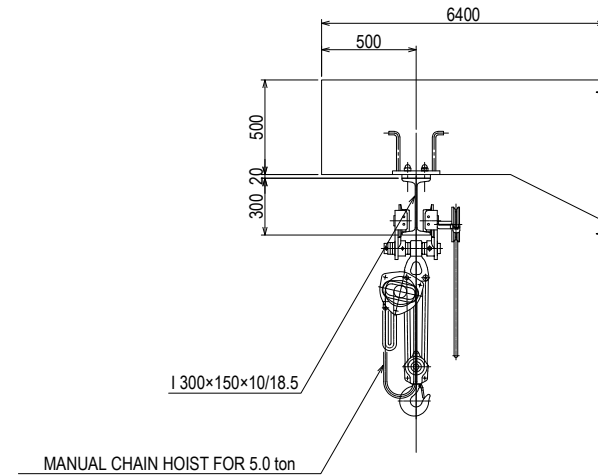
Scale A

### Bahr-Yusef Reg and Ibrahimia Reg



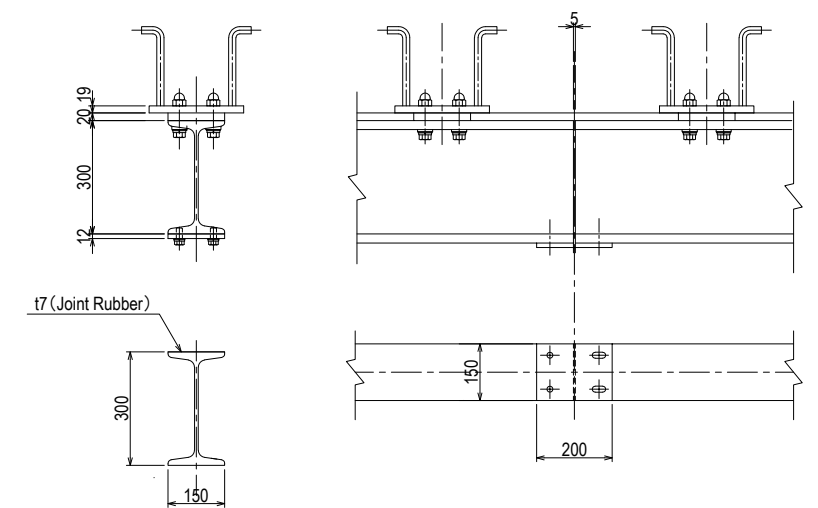
## Section A—A

Scale B



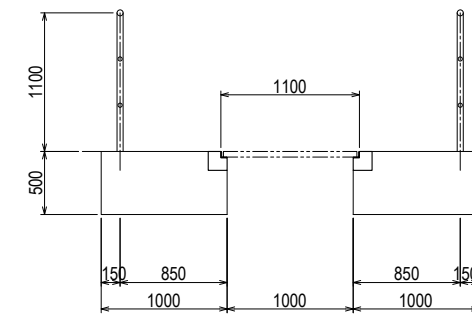
## Detail of Rail Joint

Scale C



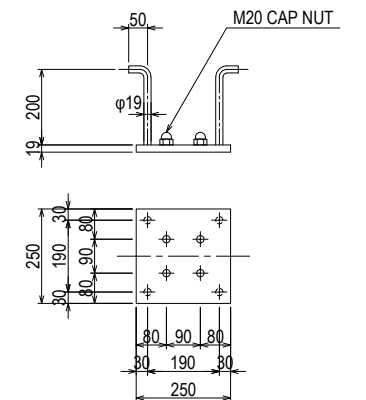
## Section B—B

Scale D



## Detail of Anchor for Hoist

Scale C



### Badraman Reg

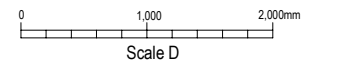
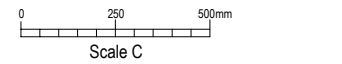
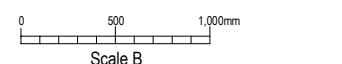
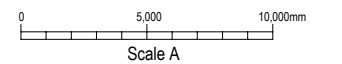
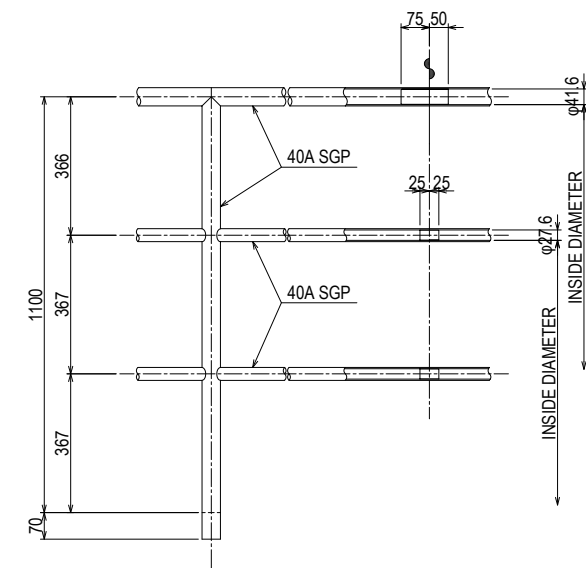
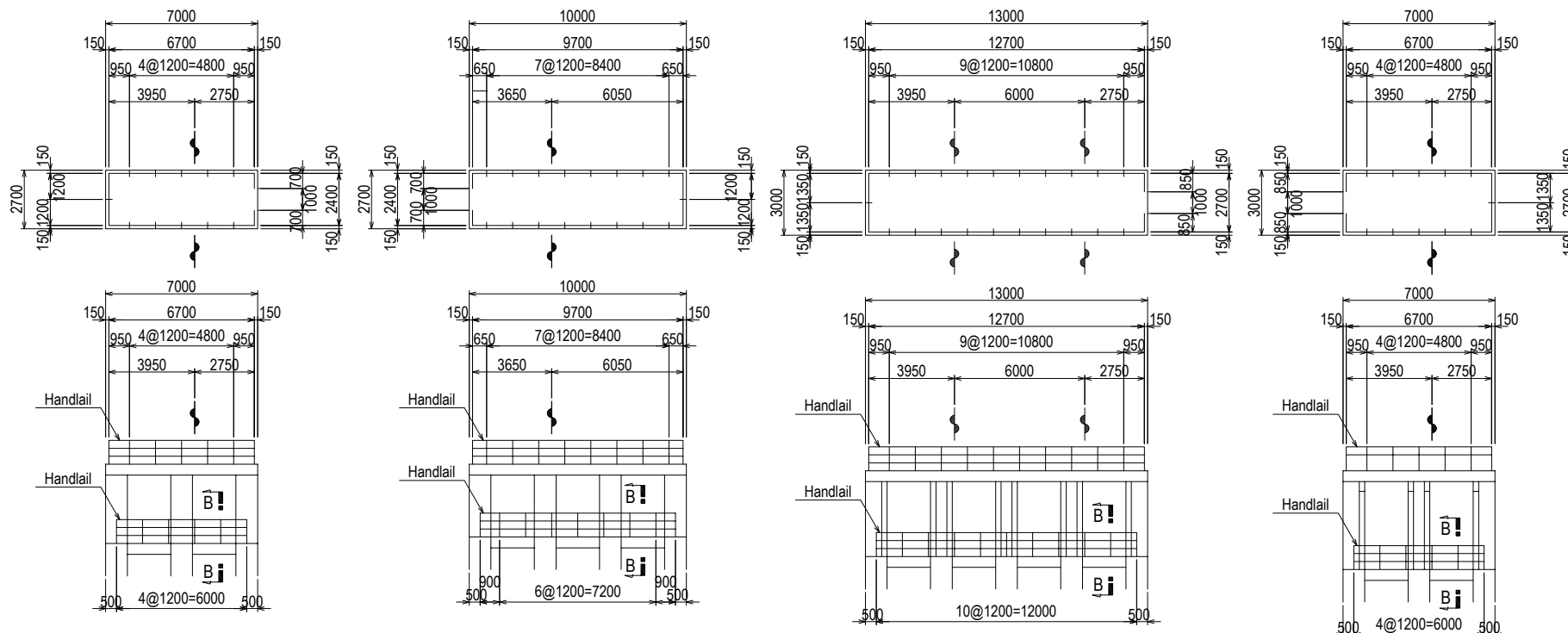
### Dirautiah Reg

### Abo Gabal Reg

### Sahelyia Reg

## Detail of Handrail Base plate and Joint

Scale C

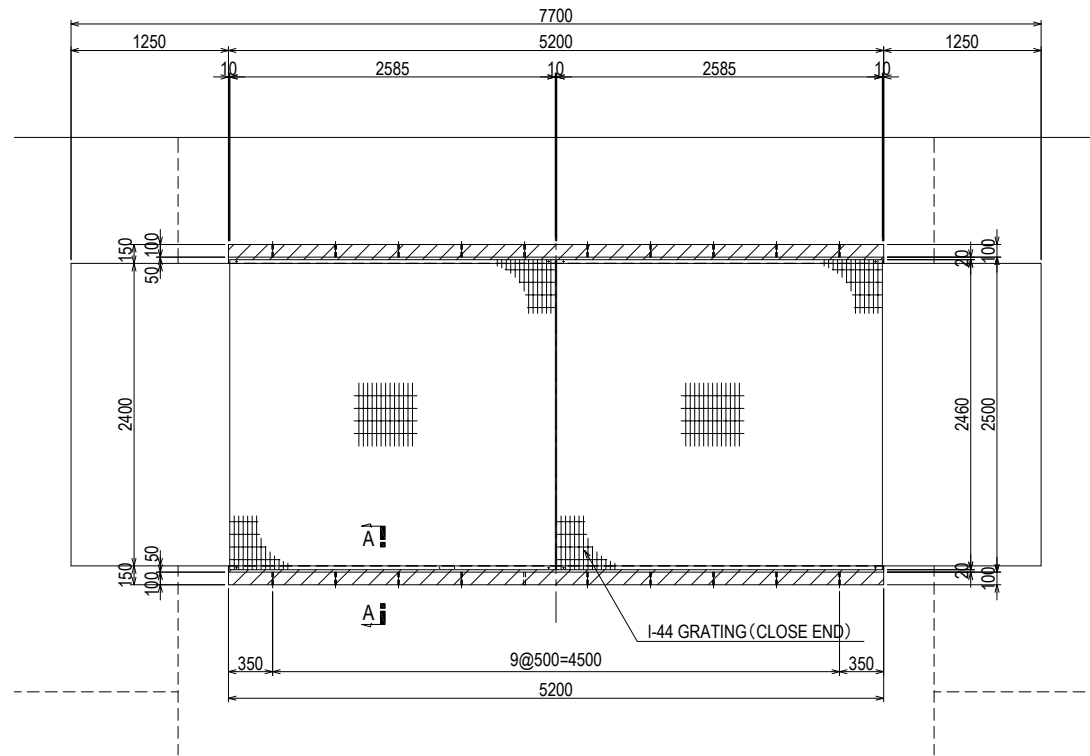


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Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Detail of handrail			DRW. NO. CM-2
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE:

# Grating Assembling Drawing

Bahr-Yusef Reg and Ibrahimia Reg Gate Pier

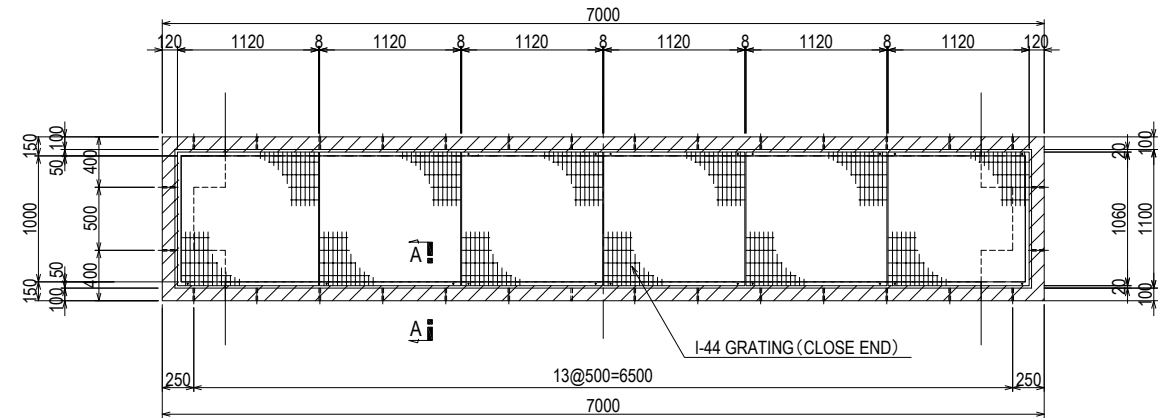
Scale A



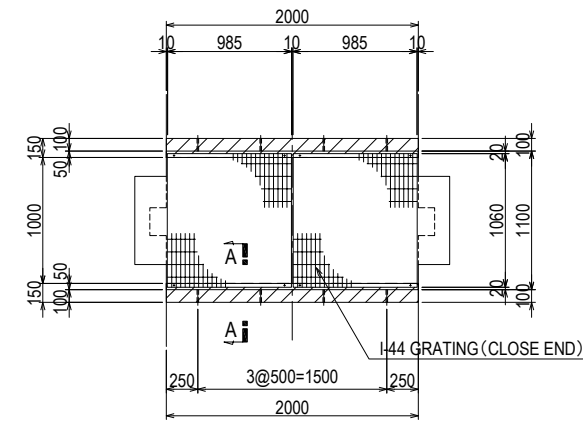
Passageway Part

Scale A

Bahr-Yusef Reg and Ibrahimia Reg (Stop log groove)

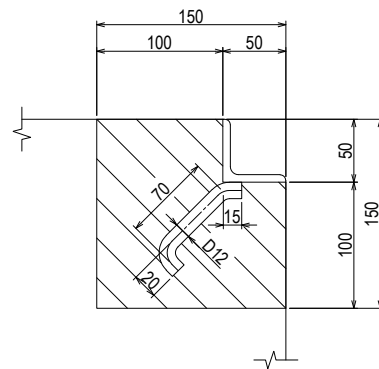


Badraman Reg and Abo Gabal Reg and Sahelyial Reg (Stop log groove)



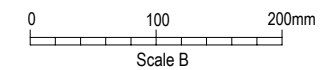
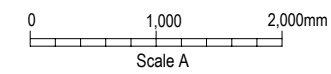
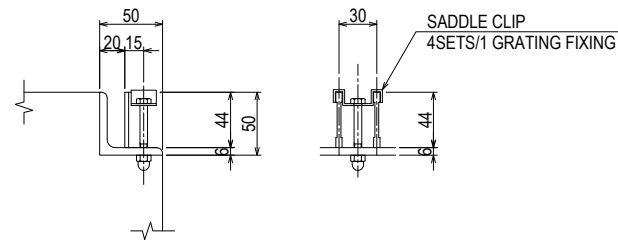
Section A—A

Scale B



Detail of Fixing Grating

Scale B

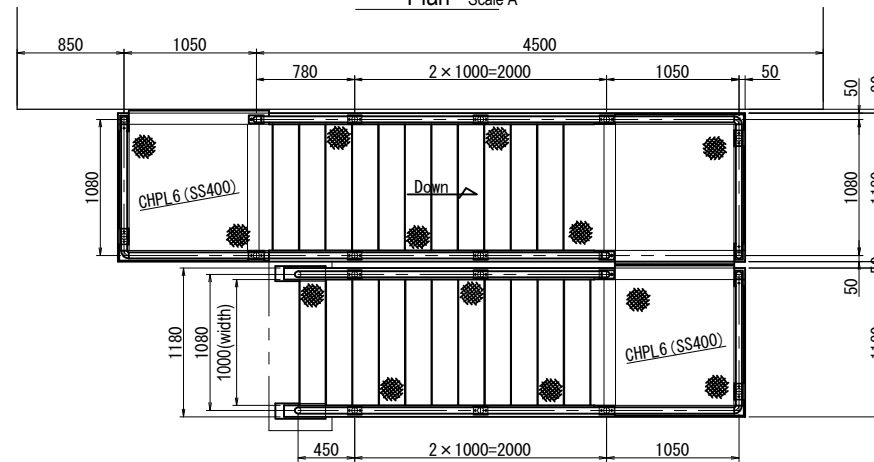


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Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Grating assembling drawing			DRW. NO. CM-3
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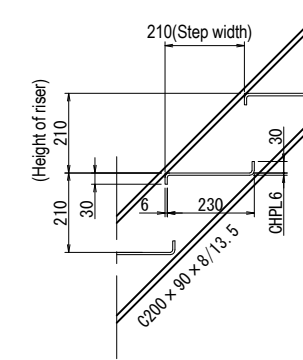


# Stairs Assembling

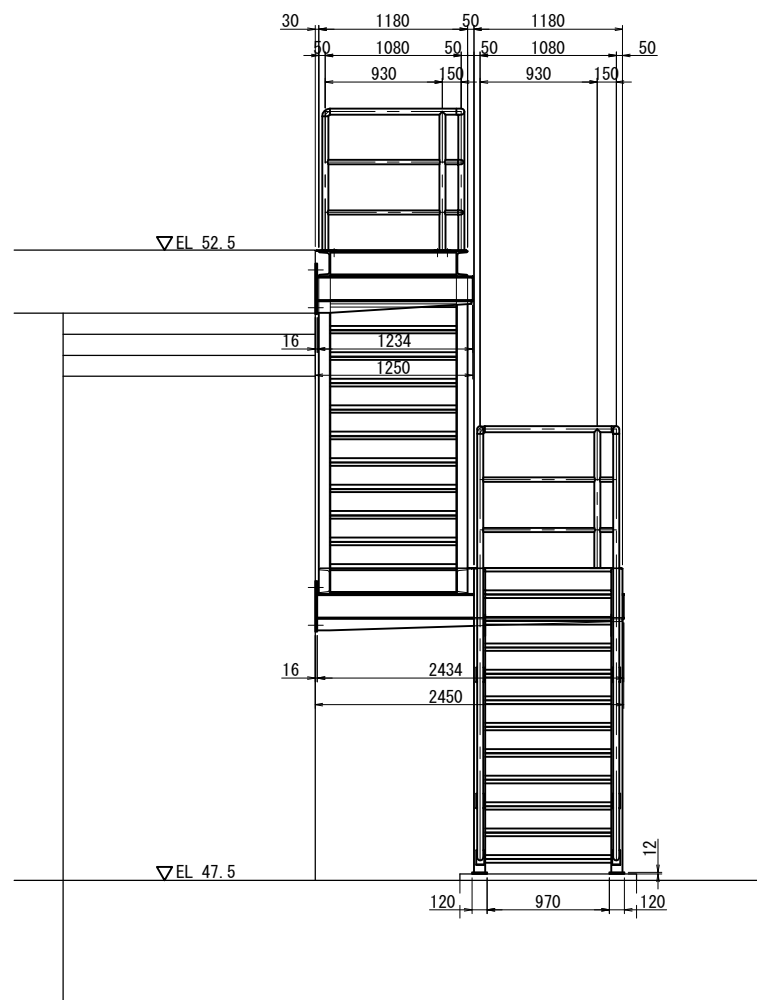
Plan Scale A



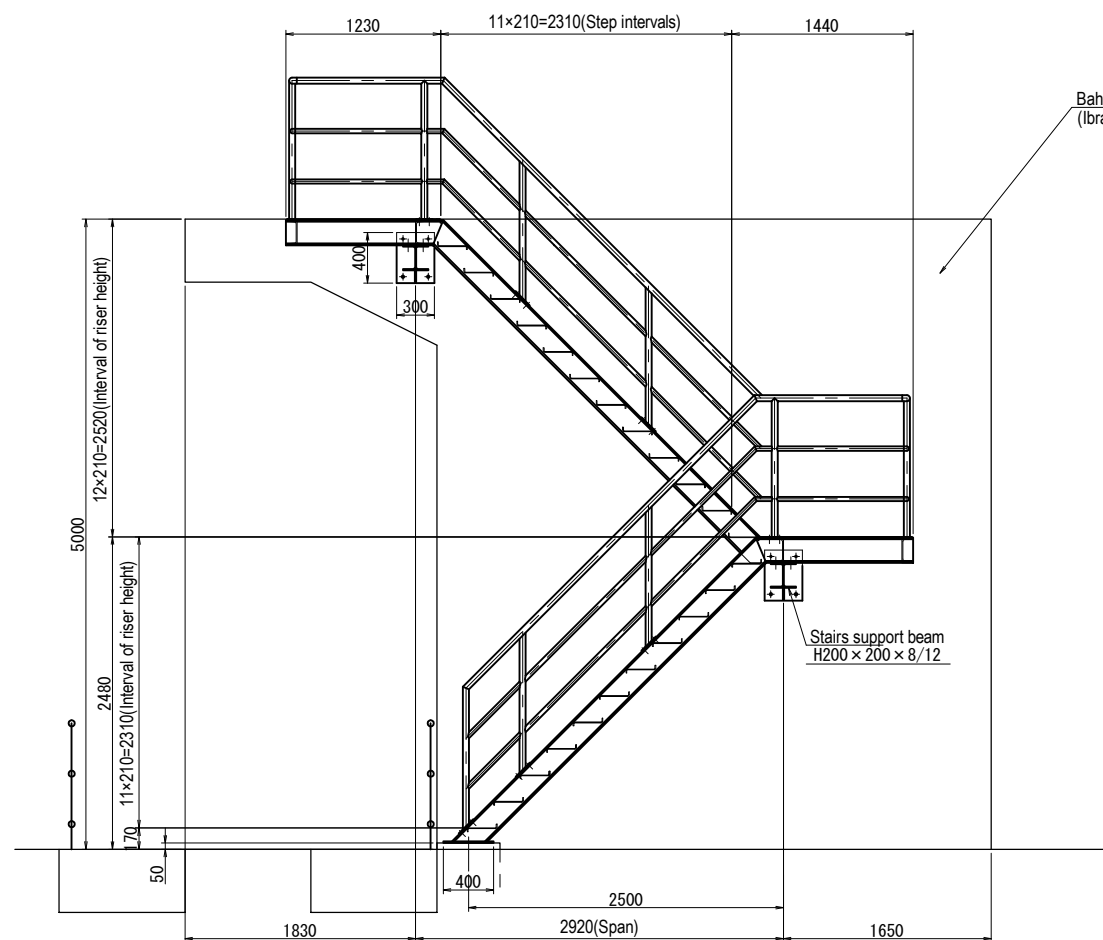
Detail of step Scale B



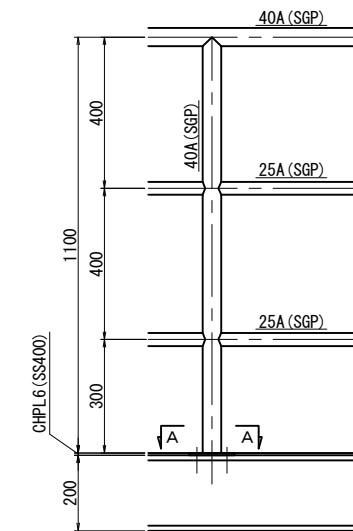
Side view Scale A



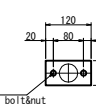
Front view Scale A



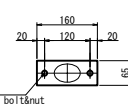
Detail of handrail Scale B



A-A S=1/6

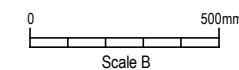
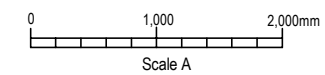


Slope part S=1/6



**Note**

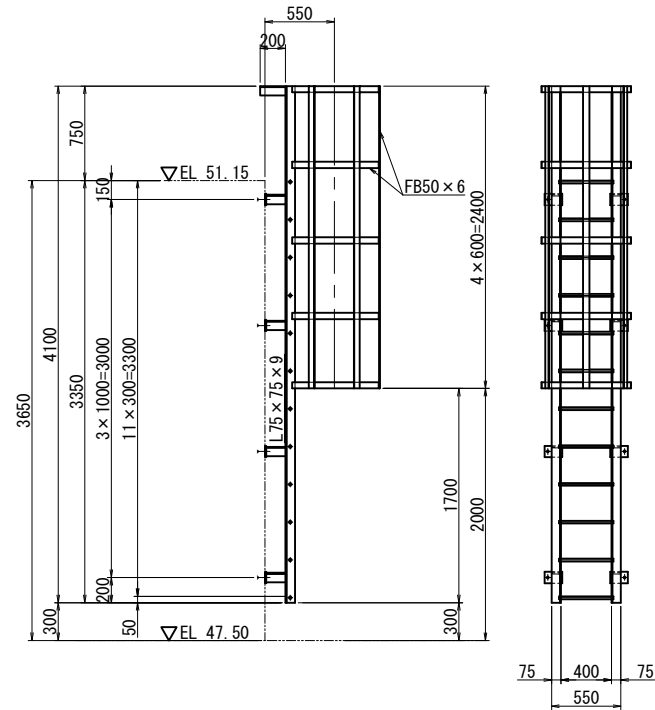
- Material is SS400 if not otherwise specified.
- This equipment shall be hot-dip galvanized.
- Stairs for Ibrahimia Regulator shall be in a symmetrical position with this drawing.



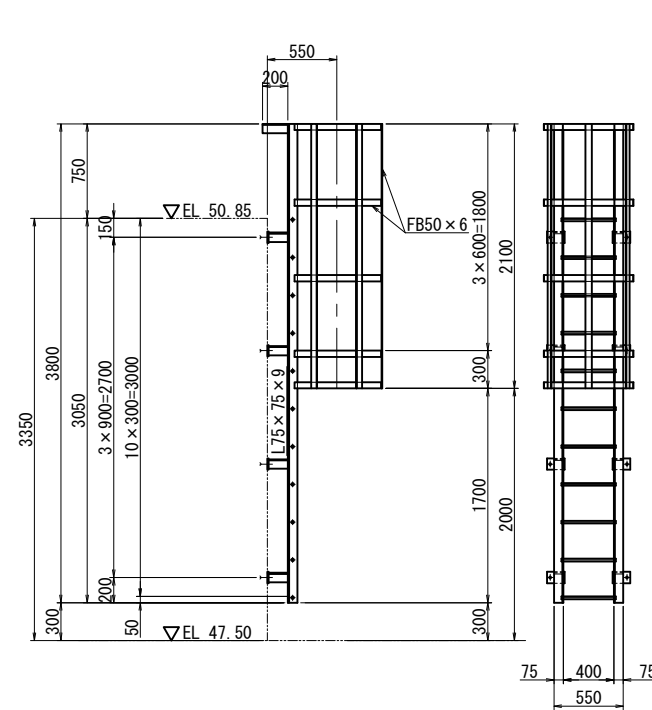
Arab Republic of Egypt Ministry of Water Resources and Irrigation Reservoir and Grand Barrages Sector		
Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators		
Stairs assembling		DRW. NO CM-4
SANYU CONSULTANTS INC.		
PREPARED BY:	CHECKED BY:	APPROVED BY:
DATE:	DATE:	DATE:

# Detail of ladders

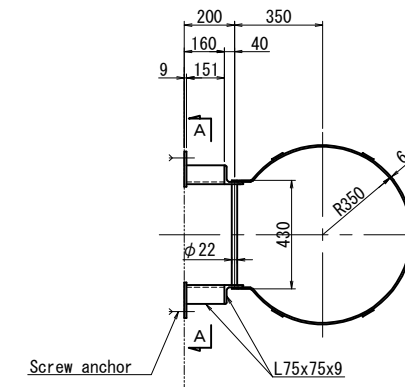
Badraman



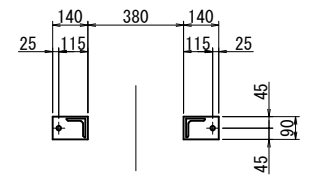
Diroutiah



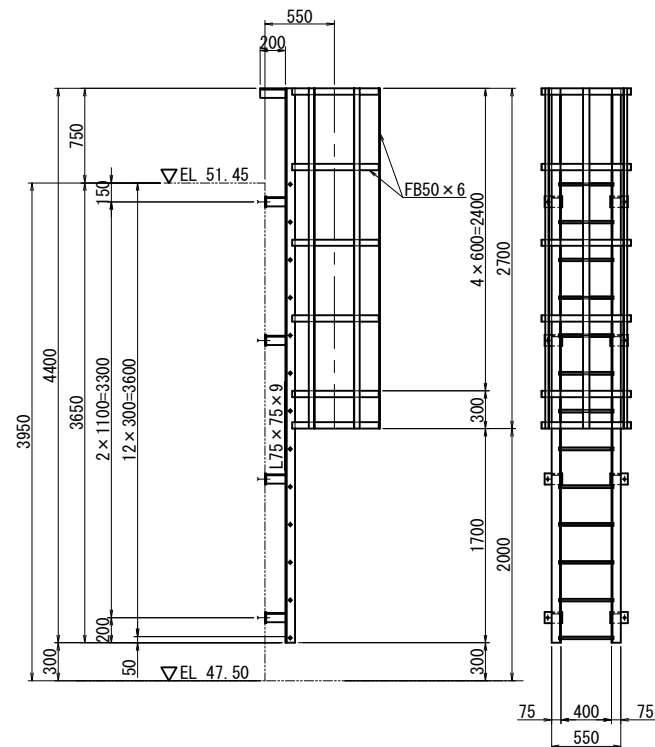
Plan



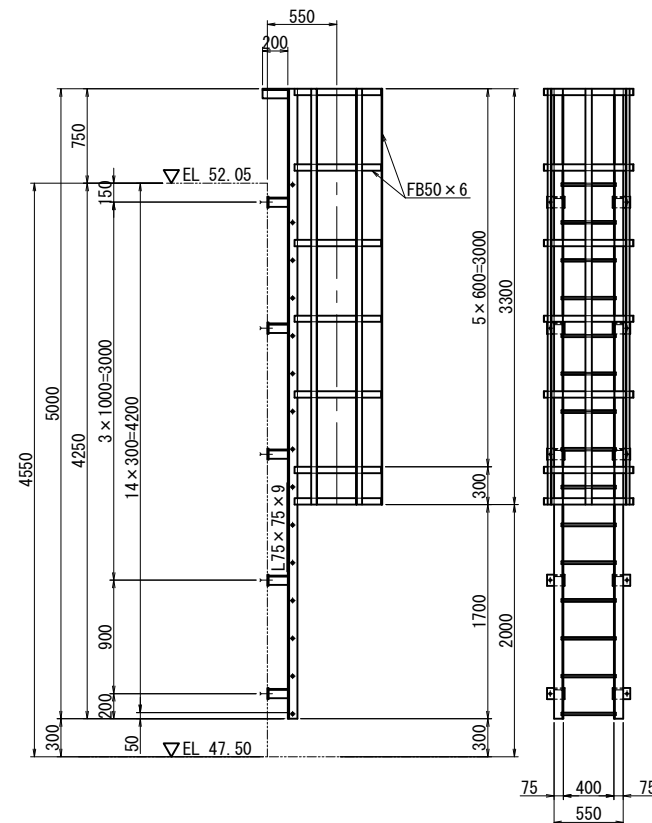
A - A



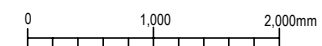
Abo Gabal



Sahelyia



Note  
 • Material is SS400 if not otherwise specified.  
 • This equipment shall be hot-dip galvanized.



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Detailed Design Study on the Project for Construction of the New Dirout Group of Regulators			
Ladders assembling			DRW. NO CM-5
SANYU CONSULTANTS INC.			
PREPARED BY:	CHECKED BY:	APPROVED BY:	
DATE:	DATE:	DATE:	DATE: