



MINISTRY OF ENERGY AND WATER

HELMAND RIVER BASIN

HELMAND RIVER MIDDEL SUB BASIN

REHABILITATION WORKS FOR (BAGAT SUFLA CANAL) PROJECT

CONSTRUCTION DRAWINGS

DATE: October 2019

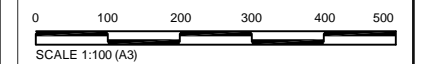
**MEW DEPARTMENT
(HELMAND) PROVINCE
TEL :**

**PCU/IRDP - IN (KANDAHAR) REGION OF
AFGHANISTAN(KANDAHAR) PROVINCE
TEL:**

LIST OF DRAWINGS

DISCRIPTION	DRAWING NO.
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Notes:



Rev	By	Chkd	Apprd	Date	Description

Client:
ISLAMIC REPUBLIC OF AFGHANISTAN
MINISTRY OF ENERGY AND WATER



Basin: Helmand River Basin
Helmand River Middle Sub Basin

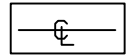
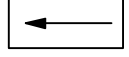



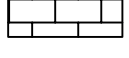
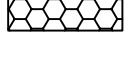

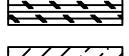
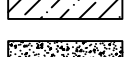

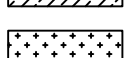
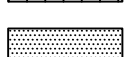

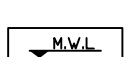
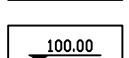
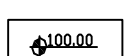


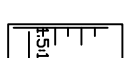



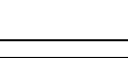
Project: Bagat Sulfa Canal
District : Khanishin
Province : Helmand

Drawing:
LIST OF DRAWINGS

Surveyed by: PCU Survey Team
Designed by:
Drawn by: Eng. Sameem
Checked by: Eng. Mohammad Anwar Zahin
Approved by:

Drawing No: Bagat Sulfa / 001	Revision
Drawing Scale: As shown	Date: Oct 2019

LEGEND:-

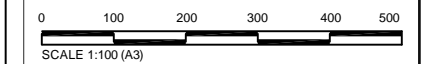
	Center Line
	Direction of flow
	Dry Stone Pitching/Section
	Grouted Stone Masonry/Pitching Section
	Brick Masonry
	P.C.C Block
	Gabion
	Gabion Section
	Wash/River Bed Material
	Geotextile Mattress
	Plain Cement Concrete
	Reinforced Cement Concrete
	Bank Protection
	Compacted Soil
	Hill
	H.F.L / M.W.L
	Elevation of the point is 100 m
	Elevation of the point (100m) in Plan view
	Traverse Station
	Bench Mark
	Lined Slope
	Earthen Slope
	Ground Level
	Stone Pitching/Rip Rap

ABBREVIATION:-

Av	AVERAGE	ST	STATION
BM	BENCH MARK	THK	THICKNESS
B	WIDTH	TYP	TYPICAL
C/C	CENTER TO CENTER	HFL	HIGH FLOOD LEVEL
D	DEPTH OF WATER	U/S	UPSTREAM
DRG	DRAWING	YRS	YEARS
DIA , ϕ	DIAMETER	Q	DESIGN DISCHARGE
D.W.L	DESIGN WATER LEVEL	W.L	WATER LEVEL
D/S	DOWNSTREAM		
EL.	ELEVATION		
F.B	FREE BOARD		
HFL	HIGH FLOOD LEVEL		
HT.	HEIGHT		
H.G.L	HYDRAULIC GRADE LINE		
KM , km	KILOMETERE		
M ,m	METRE		
Chkd	CHECKED		
Apprvd	APPROVED		
M , W .L	MAXIMUM WATER LEVEL		
MIN	MINIMUM		
No(s)	NUMBER(S)		
N.G.L	NATURAL GROUND LEVEL		
P.C.C	PLAIN CEMENT CONCRETE		
R.C.C	REINFORCED CEMENT CONCRETE		

Notes:

1. All dimensions are in cm or as specified on drawing.
2. For concrete class and stone masonry type refer to Contract Specifications.
3. All cut-offs to be constructed against undisturbed soil.
4. Location of the structure, setting out and elevations to be confirmed by the Engineer before construction.
5. Coordinates and elevation of structure are: N 00.0000, E 00.0000 and 0000m respectively.
6. Site survey including setting out, longitudinal profile and cross-sections of the site for proposed structure to be carried out prior to construction. This survey to be agreed with the Engineer in writing.
7. The contractor shall construct and maintain all necessary channels, diversions and other temporary works necessary to ensure that irrigation water supplies are not interrupted during construction works.
8. Recommended section for wooden stop logs is : width (10cm) x depth (12cm).
9. Contraction joint in concrete coping at wall top shall be provided at 1.5m centers.
10. Contraction joint in concrete base slab shall be provided at 3m centers.
11. Minimum concrete cover to steel reinforcement shall be 50mm.
12. Steel reinforcement shall have a minimum yield stress of 250 N/mm².
13. For retaining walls more than 45m in length, expansion joint shall be provided at (15-20) m centers.
14. Size of gabion basket and mattress shall be as shown on the drawings.
15. Stones filled in gabions shall be hard, durable and approved by Engineer before filling in gabions.
16. For size of stones, gabion diaphragms and horizontal wires refer to Contract Specifications.
17. Abbreviations used:
 GI stands for galvanized iron
 EW stands for each way
 EF stands for each face
 FB stands for free board
 Dia stands for diameter



Rev.	By	Chkd	Apprvd	Date	Description

Client:
 ISLAMIC REPUBLIC OF AFGHANISTAN
 MINISTRY OF ENERGY AND WATER



Basin: Helmand River Basin
 Helmand River Middle Sub Basin

Project: Bagat Sufia Canal
 District : Khanishin
 Province : Helmand

Drawing: Legend and Abbreviations

Surveyed by: PCU Survey Team

Designed by:

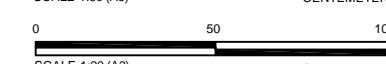
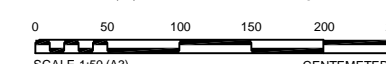
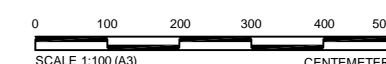
Drawn by:

Checked by: Eng. Mohammad Anwar Zahin

Approved by:

Drawing No: Bagat Sufia / 002 **Revision**

Drawing Scale: As shown **Date:** Oct 2019



BRIEF TECHNICAL SPECIFICATIONS

CONCRETE WORKS:

- 1 - All air - entraining plain cement concrete should be M-200 by weight or be as specified on the drawings.
- 2 - All PCC under footings to have cement, sand and aggregate as specified on the drawings.
- 3 - Concrete design should be based on a compressive strength of $f_c = 200\text{kg/cm}^2$ or as specified on the drawings.
- 4 - Weight per unit volume of concrete $W=2400\text{kg/m}^3$.
- 5 - Sand or fine aggregate shall be free from salt, Alkali, Calcium sulphate or Vegetation and it shall not contain more than 0.5 percent by weight clay.
- 6 - Aggregate:- Coarse aggregate shall consist of crushed gravel with the maximum size of 20mm.
- 7 - The maximum slump for concrete should be between (5 - 7.5)cm. (For different concrete type refer to general specification).
- 8 - To increase the workability of the concrete provide the chemical admixture (Super plasticizer, If required).
- 9 - Water used for concrete mixture and concrete curing shall be from a source approved by the Engineer and at the time of use shall be free from contaminants.
- 10- Concrete compaction should be done by using concrete vibrator at the time of pouring in such a way to form a solid compact concrete.
- 11- Concrete curing should be continued for 14 days.
- 12- During cold weather concreting should be stopped or the contractor has to consider cold weather concreting procedure as accepted by the Engineer. (Or refer to general specification).
- 13- Concrete shuttering / formwork should be of steel/wood type as per instruction of design, CS and QA engineer.
- 14- Concrete shuttering can be removed as per below minimum duration:
Side of beams, Walls, Columns (16 - 24 Hours).
Forms from beneath the slabs (Spanning up to 6m.) 14 Days.
Forms from beneath the slabs (Spanning above 6m.) 21 Days
- 15- All air entrained concrete with 4.5% - 7% of air volumes should be used instead of normal concrete works by adding approved admixture.
- 16- All RCC should be M-250 (by weight).
- 17- All blinding PCC shall be M-100 (by weight).
- 18- Reinforcement yield strength f_y shall not be less than (2500kg/cm^2).

MASONRY WORKS:

- 1 - Plum / Mass air - entraining concrete shall contain a maximum of 40% stone with a maximum stone size as 20cm.
The concrete ratio shall be M-200
- 2 - Stone for mass concrete, Stone masonry, Gabion and grouted stone pitching should be of good quality and approved by Engineer.
- 3 - All grouted stone pitching in stilling basin and foundations should be with ratio of (1:3).
- 4 - All masonry cutoff wall shall be with (1:4) Cement sand mortar or as specified on the drawing.

EARTH WORKS:

- 1 - Backfilling material should be properly tested and selected to be suitable as per standard practice.
- 2 - For backfilling maximum thickness of each loose soil layer should not more than 15cm. According to general specification.
- 3 - Standard compaction tests should be carried out for the backfilling.
- 4 - The percentage of compaction should be not less than 95% of the maximum dry density of selected material by the Engineer.

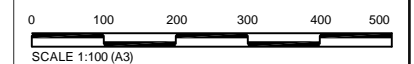
GABION WORKS:

- 1 - Stone size for gabion shall range from (20 - 30cm) dia. According to general specification.
- 2 - Galvanized iron wire of specified thickness (3mm) Should be properly woven and knotted together to form the required mesh in hexagonal / rectangular shape of size (6 - 8cm) for gabion basket and (10 - 12cm) for gabion mattress to fabricate gabion boxes to the satisfaction of the Engineer.
- 3 - Principal wire along the gabion edges (Selvedges) for gabion boxes should be of galvanized iron having minimum thickness of (4mm).
- 4 - Gabion galvanized iron wire tensile strength should be (350 - 575 N / mm^2).

OTHERS:

- 1 - Bitumen coating should be used in all contraction / Expansion joints.
- 2 - All quality control field tests should be carried out by the contractor in a specified laboratory as accepted by the client.
- 3 - Construction joints for PCC and masonry walls should be provided as (15 - 20m) center to center.
- 4- All diversions and flood protection works is contractor responsibility, According to general item of bill of quantity (Part B, Item 3).

Notes:



Rev	By	Chkd	Appvd	Date	Description

Client:
ISLAMIC REPUBLIC OF AFGHANISTAN
MINISTRY OF ENERGY AND WATER

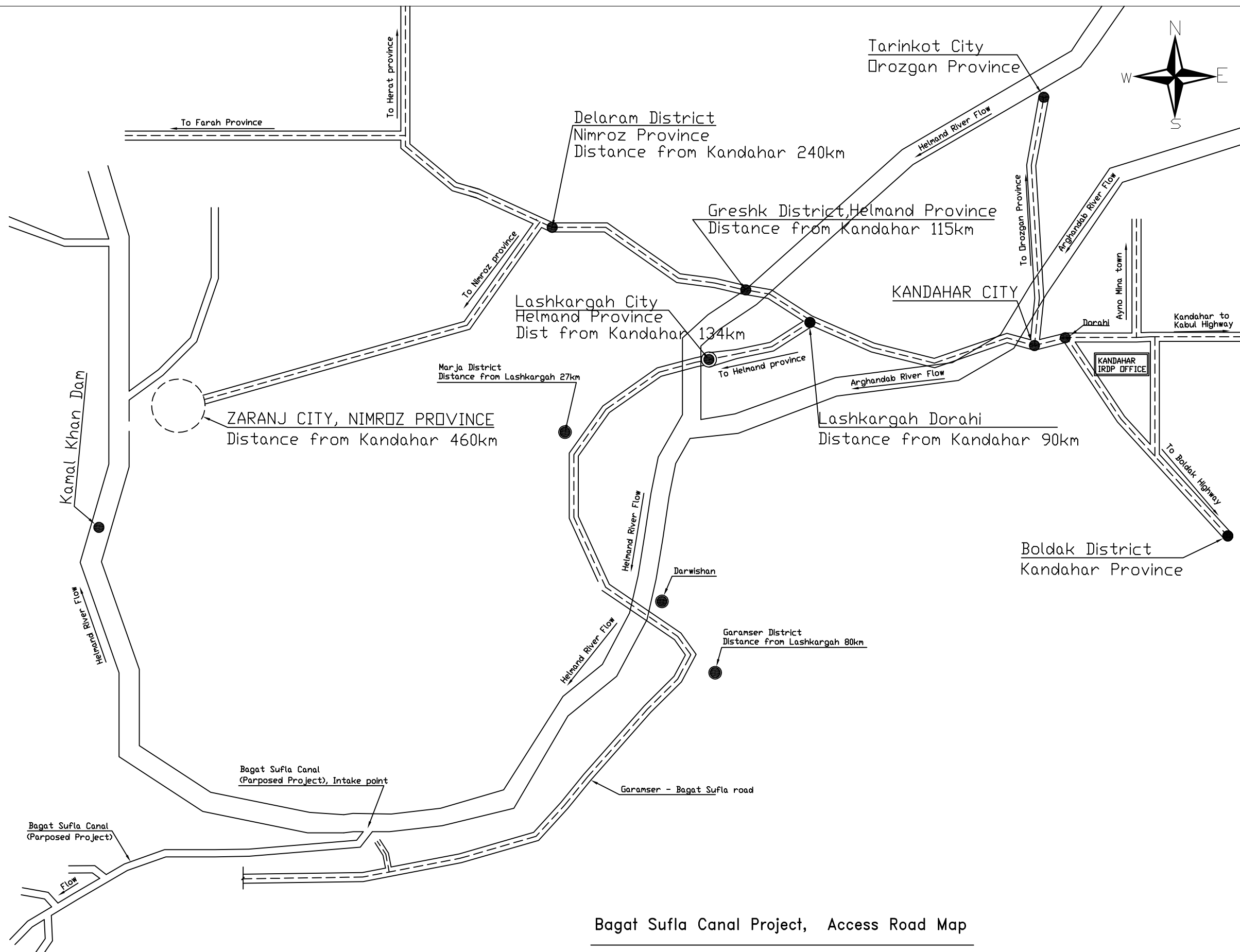


Basin: Helmand River Basin
Helmand River Middle Sub Basin

Project: Bagat Sulfa Canal
District : Khanishin
Province : Helmand

Drawing:
Technical Specification

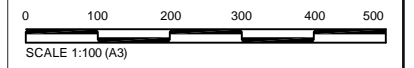
Surveyed by: PCU Survey Team	
Designed by:	
Drawn by:	
Checked by: Eng. Mohammad Anwar Zahin	
Approved by:	
Drawing No: Bagat Sulfa / 003	Revision
Drawing Scale: As shown	Date: Oct 2019



Bagat Sufla Canal Project, Access Road Map

Scale NTS

Notes:



Rev	By	Chkd	Apvtd	Date	Description

Client:
ISLAMIC REPUBLIC OF AFGHANISTAN
MINISTRY OF ENERGY AND WATER



Basin: Helmand River Basin
Helmand River Middle Sub Basin

Project: Bagat Sufla Canal
District : Khanishin
Province : Helmand

Drawing:
ACCESS ROAD MAP

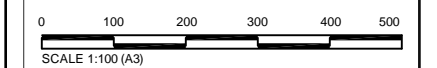
Surveyed by: PCU Survey Team
Designed by:
Drawn by: Eng. Sameem
Checked by: Eng. Mohammad Anwar Zahin
Approved by:

Drawing No:	Revision
Bagat Sufla / 004	

Drawing Scale: As shown Date: Oct 2019

Notes:

List of Benchmarks					
Ref.	BM No	Km	N	E	Elevation (m)
1	BM 1	(0+000)	30.560190°	63.962320°	645.00
2	BM 2	(2+500)	30.543290°	63.947010°	630.00
3	BM 3	(11+000)	30.519516°	63.878610°	618.00
4	BM 4	(14+500)	30.505770°	63.849410°	611.00



Rev.	By	Chkd	Aprvd	Date	Description
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Client:
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MINISTRY OF ENERGY AND WATER



Basin: Helmand River Basin
Helmand River Middle Sub Basin

Project: Bagat Sulfa Canal
District : Khanishin
Province : Helmand

Drawing:
List of Benchmarks

Surveyed by: PCU Survey Team

Designed by:

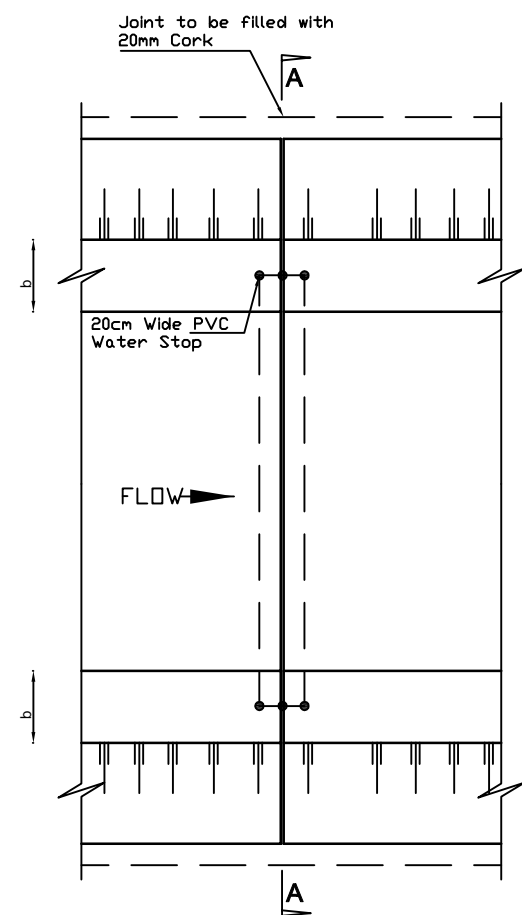
Drawn by: Eng. Sameem

Checked by: Eng. Mohammad Anwar Zahin

Approved by:

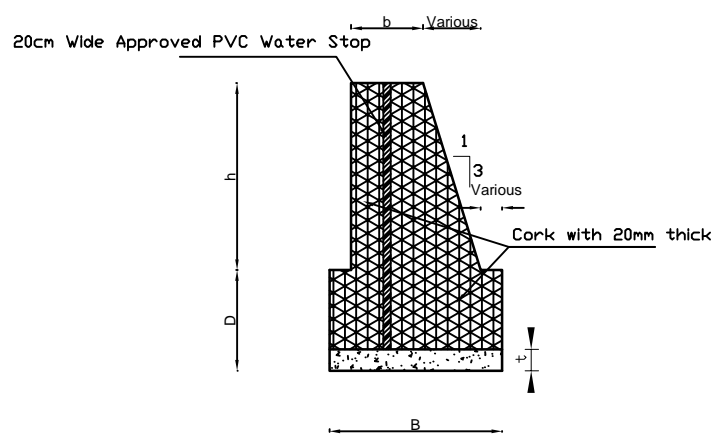
Drawing No: Bagat Sulfa / 005 **Revision**

Drawing Scale: As shown **Date:** Oct 2019

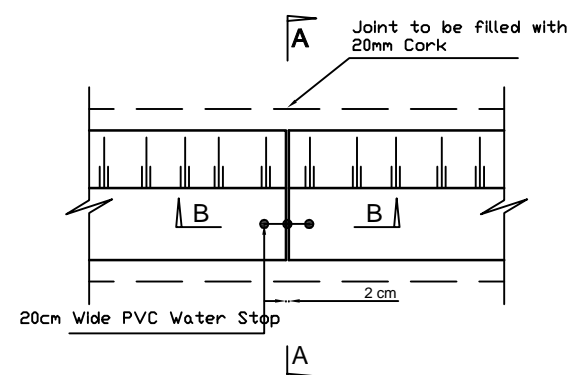


PLAN OF EXPANSION JOINT FOR COVERED

SECTION
Scale: 1:50

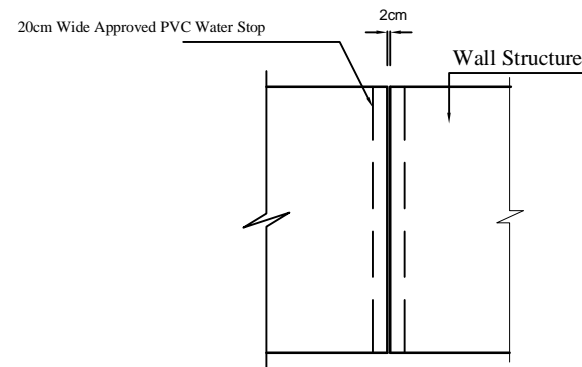


SECTION A-A
Scale: 1:50



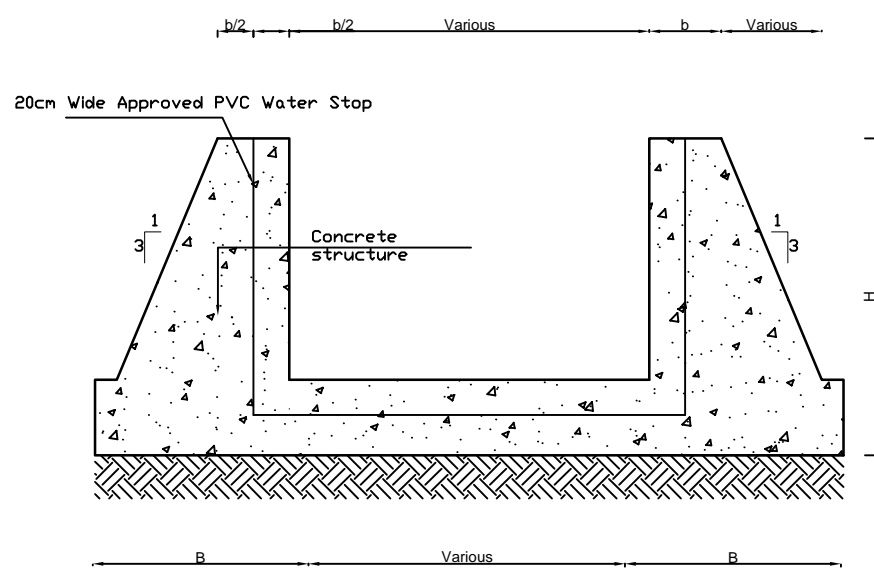
PLAN OF EXPANSION JOINT

Scale: 1:50



SECTION B-B

Scale: 1:50



SECTION A-A

Scale: 1:50

Notes:



Rev.	By	Chkd	Apprd	Date	Description

Client:
ISLAMIC REPUBLIC OF AFGHANISTAN
MINISTRY OF ENERGY AND WATER

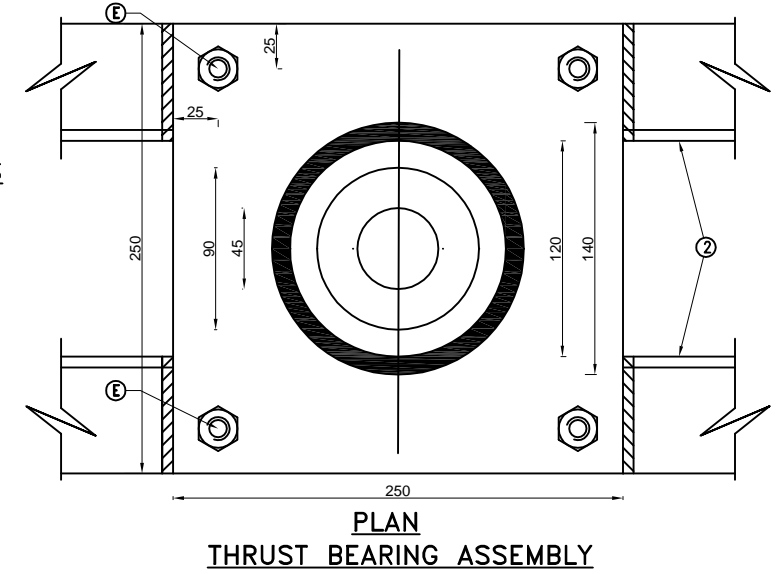
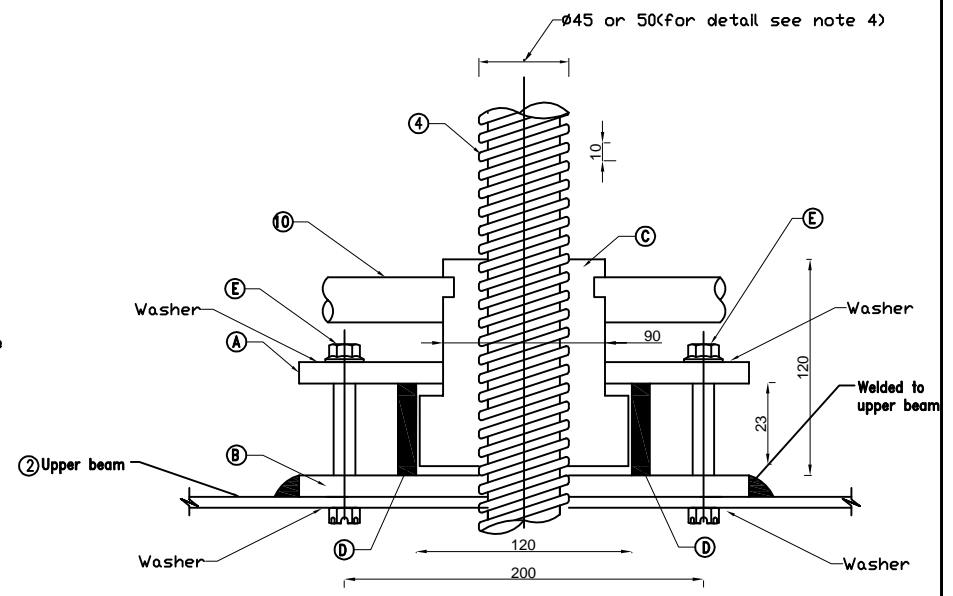
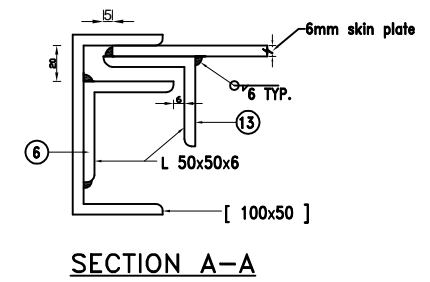
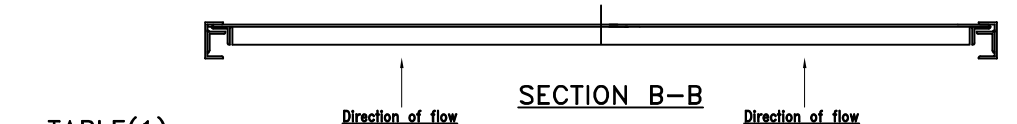
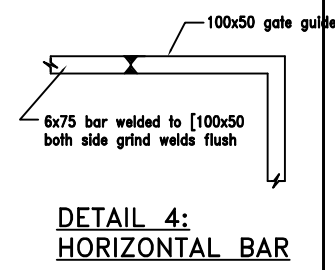
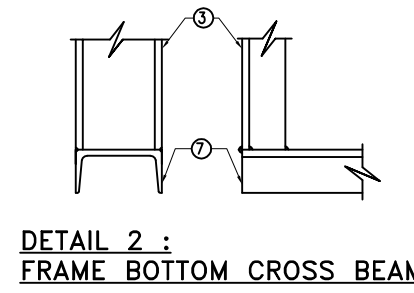
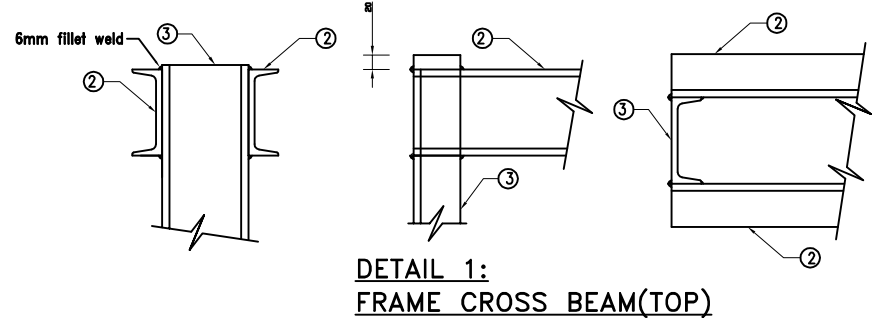
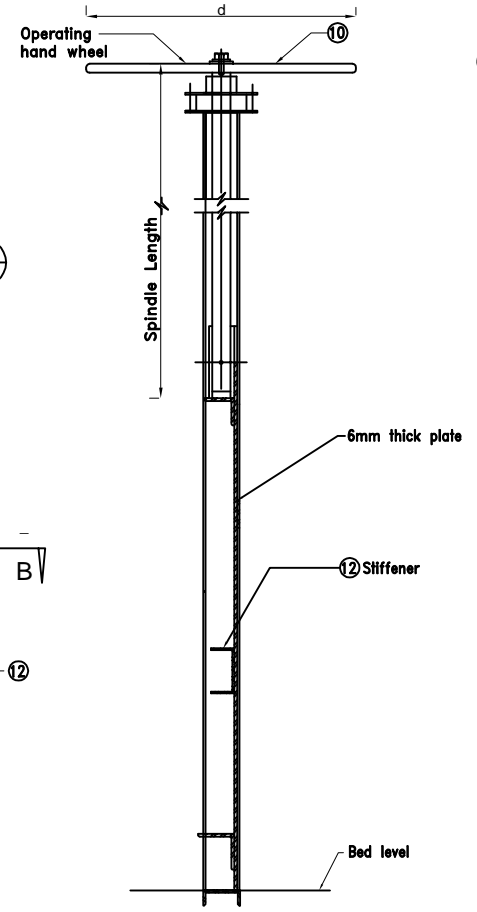
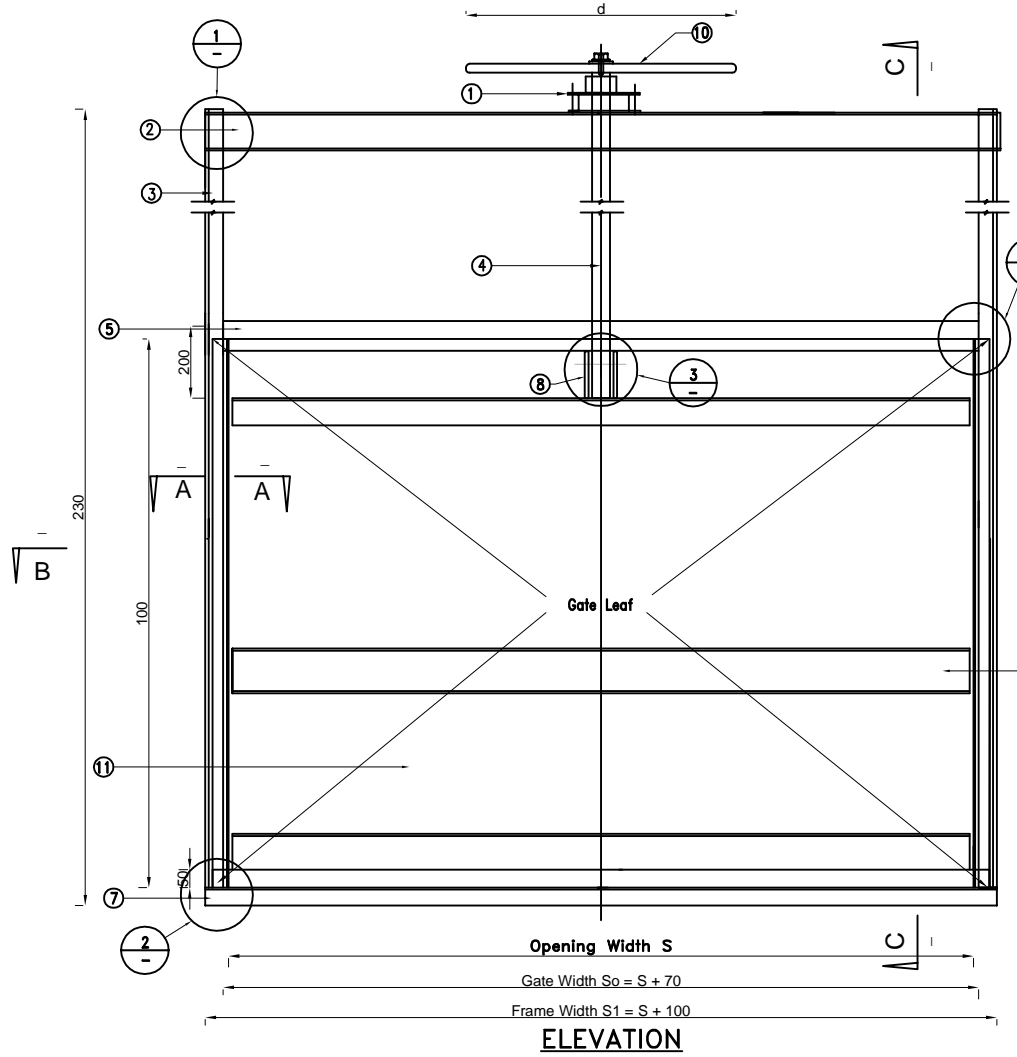


Basin: Helmand River Basin
Helmand River Middle Sub Basin

Project: Bagat Sulfa Canal
District : Khanishin
Province : Helmand

Drawing:
EXPANSION JOINT & WALL COPING DETAIL

Surveyed by:	PCU Survey Team
Designed by:	
Drawn by:	
Checked by:	Eng. Mohammad Anwar Zahin
Approved by:	
Drawing No:	Bagat Sulfa / 006
Drawing Scale:	As shown
Revision	
Date:	Oct 2019



TABLE(1)
GATE COMPONENT

Item	Description
1	Thrust bearing/nut assembly
2	[125 x 65 Channel (Upper beam)]
3	[100 x 50 Channel]
4	Spindle ϕ 45 or 50 (see note 4)
5	6x75 bar
6	Guide rail L50x50
7	[100x50 lower beam]
8	L 50 X 50 X 6 lifting brackets
9	M20 Bolt & Nut
10	Hand Wheel (refer note 8 for wheel diameter)
11	Skin plate 6mm
12	Stiffener channel 100x50
13	L 50x50x6

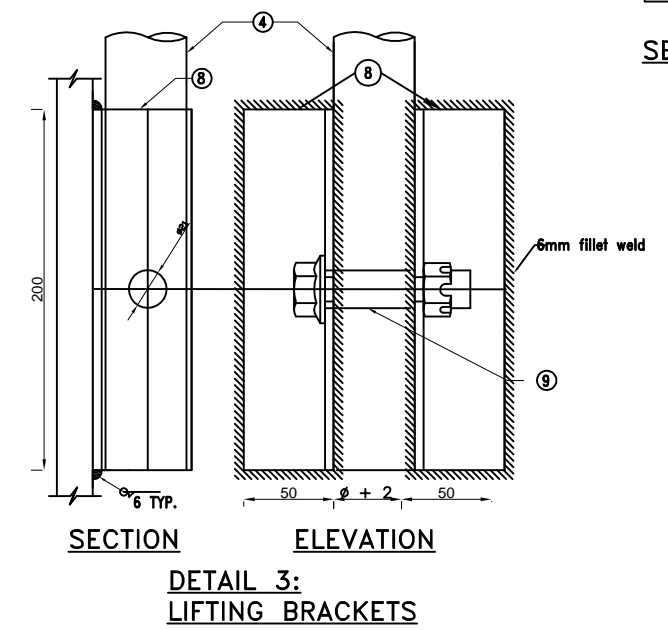


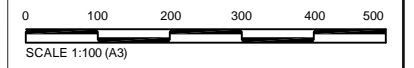
TABLE (2)
THRUST BEARING
ASSEMBLY COMPONENTS

Item	Description
A	Upper plate 12mm thick
B	Lower plate 12mm thick
C	Bearing nut
D	Spacer
E	Four M12 bolts with nuts + washer

Notes:

- 1-ALL DIMENSIONS IN MILLMETRES .
- 2-ALL WELDING TO BE 6MM CONTINUOUS FILLET UNLESS OTHER WISE.
- 3-THREAD PITCH ON SPINDLE TO GIVE 10MM RISE IN GATE FOR ONE TURN OF HANDWHEEL.
- 4- SPINDLE ϕ 45 FOR LENGTH LESS THAN 2M, SPINDLE ϕ 50 FOR LENGTH 2M OR MORE.
- 5- STEEL PLATE, BEAMS & ANGLES SHALL BE MANUFACTURE FROM STEEL GRADE 43.
- 6- HAND WHEEL DIAMETER

AREA(A) OF GATE LEAF(M2)	DIAMETER(d) OF HAND WHEEL (MM)
A < 1.0	450
1 < A \leq 1.5	600
1.5 < A \leq 2.5	750
2.5 < A	900



Rev	By	Chkd	Apprd	Date	Description

Client:
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MINISTRY OF ENERGY AND WATER

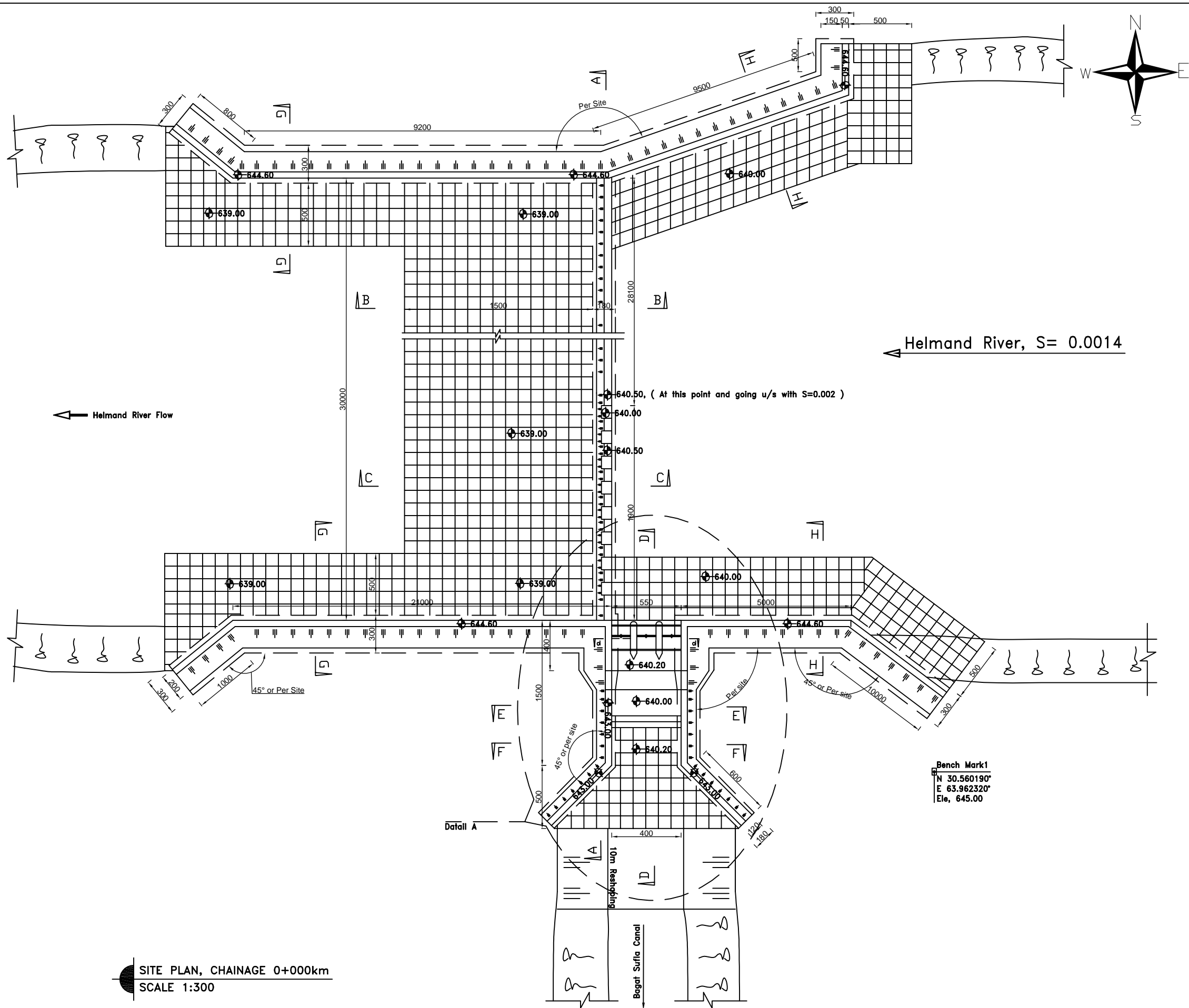


Basin: Helmand River Basin
Helmand River Middle Sub Basin

Project: Bagat Sufia Canal
District : Khanishin
Province : Helmand

Drawing: Steel Control Gate Detail

Surveyed by: PCU Survey Team
Designed by:
Drawn by:
Checked by: Eng. Mohammad Anwar Zahin
Approved by:
Drawing No: Bagat Sufia / 007
Revision
Drawing Scale: As shown
Date: Oct 2019

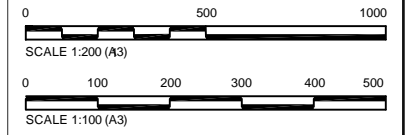


SITE PLAN, CHAINAGE 0+000km
SCALE 1:300

Notes:

- If There is no any BM in the site, in this case, The Bed of Bagat Sulfa or bagat Ulya canal will be used as Base point.
- All horizontal angles will be adjusted by site or as shown on drawings.
- All kind of concrete are Air-Entrained concrete.
- Length of walls can be changed as per site, but the total length of that will not increase from the total one which is shown on drawings.
- Long slope of walls will be adjusted by long slope of river and canals in u/s and d/s.
- Contraction or Construction joints will be used at (4x4) m for plat PCC.
- Expansion joints will be adjusted as follows:

For Plum concrete walls at 15 - 20 m c/c
For RCC walls at 30 m c/c
- The longitudinal alignment of walls in u/s and d/s , will be implemented as per site or parallel to the alignments of River.



Rev	By	Chkd	Aprvd	Date	Description

Client:
ISLAMIC REPUBLIC OF AFGHANISTAN
MINISTRY OF ENERGY AND WATER

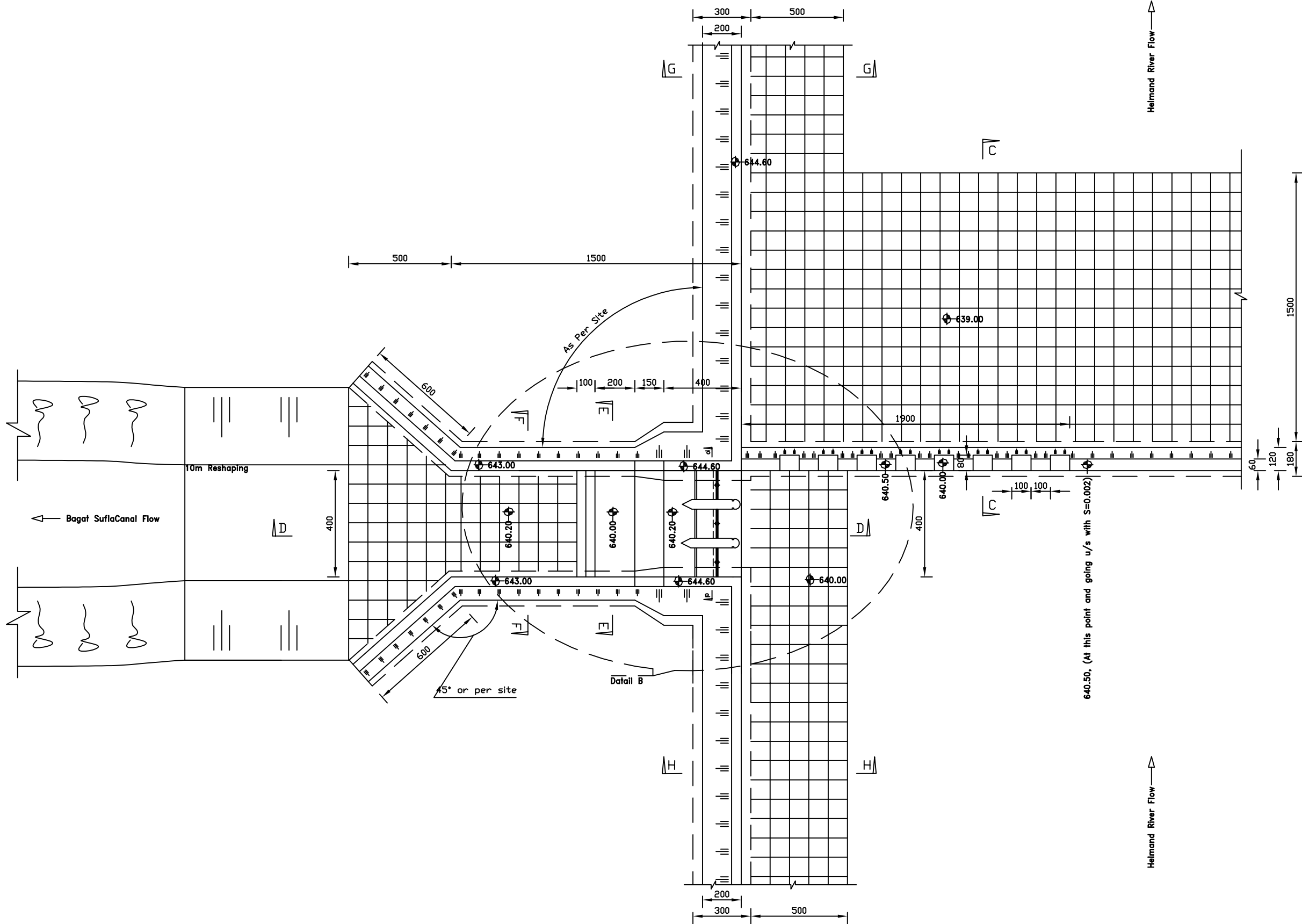


Basin: Helmand River Basin
Helmand River Middle Sub Basin

Project: Bagat Sulfa Canal
District : Khanishin
Province : Helmand

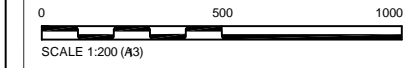
Drawing:
SITE PLAN, SITE #1
CHAINAGE 0+000

Surveyed by: PCU Survey Team	Revision
Designed by:	
Drawn by: Eng. Sameem	
Checked by: Eng. Mohammad Anwar Zahin	
Approved by:	Revision
Drawing No: Bagat Sulfa / 008	
Drawing Scale: As shown	Date: Oct 2019



DETAIL A
SCALE 1:200

Notes:



Rev	By	Chkd	Apprd	Date	Description

Client:
ISLAMIC REPUBLIC OF AFGHANISTAN
MINISTRY OF ENERGY AND WATER



Basin: Helmand River Basin
Helmand River Middle Sub Basin

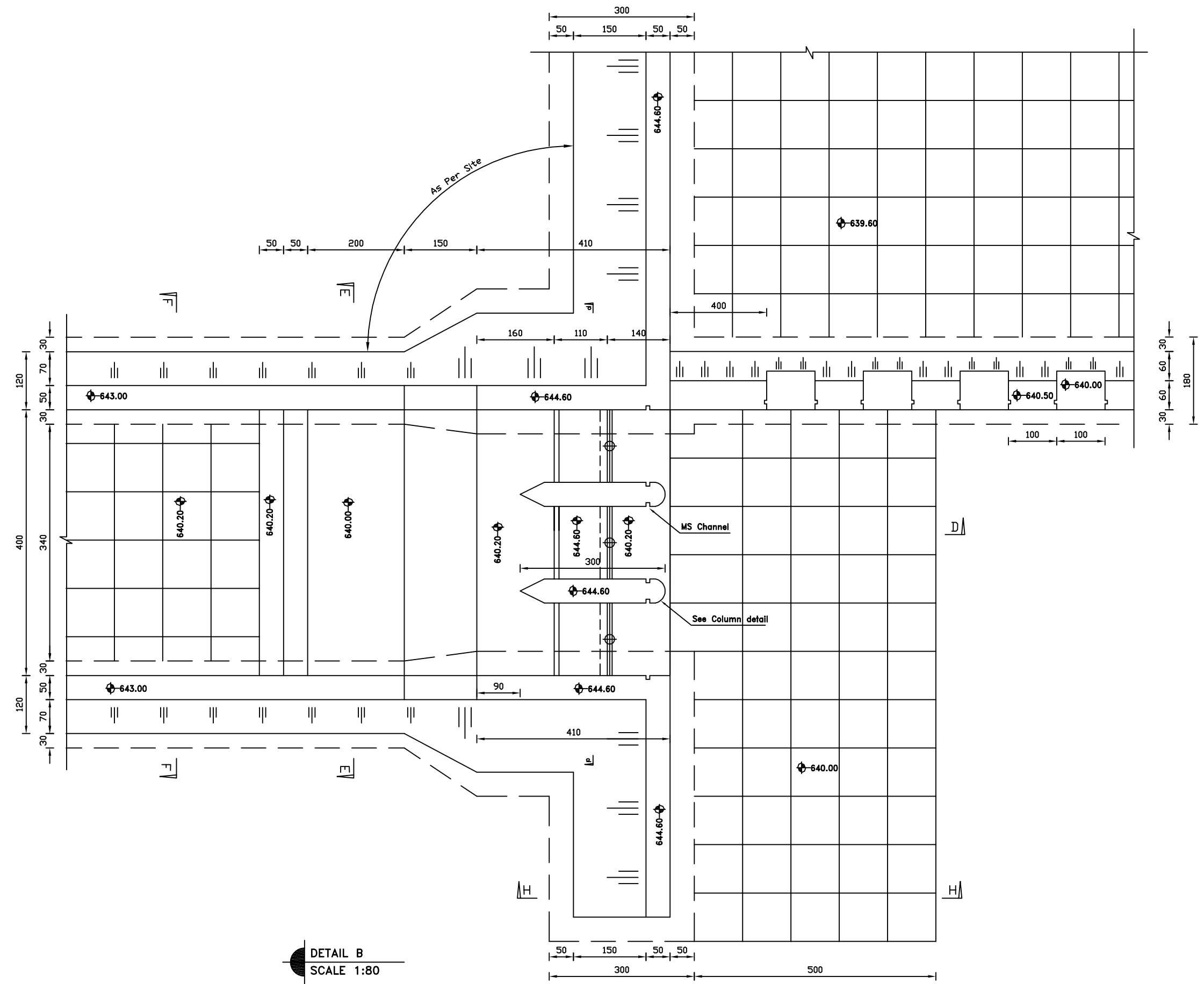
Project: Bagat Sulfa Canal
District : Khanishin
Province : Helmand

Drawing: DETAIL A

Surveyed by: PCU Survey Team
Designed by:
Drawn by: Eng. Sameem
Checked by: Eng. Mohammad Anwar Zahin
Approved by:

Drawing No:	Revision
Bagat Sulfa / 009	
Drawing Scale: As shown	Date: Oct 2019

Notes:



Rev.	By	Chkd	Apprd	Date	Description

Client:
ISLAMIC REPUBLIC OF AFGHANISTAN
MINISTRY OF ENERGY AND WATER



Basin: Helmand River Basin
Helmand River Middle Sub Basin

Project: Bagat Sulfa Canal
District : Khanishin
Province : Helmand

Drawing:
DETAIL B

Surveyed by: PCU Survey Team

Designed by:

Drawn by: Eng. Sameem

Checked by: Eng. Mohammad Anwar Zahin

Approved by:

Drawing No: Bagat Sulfa / 010

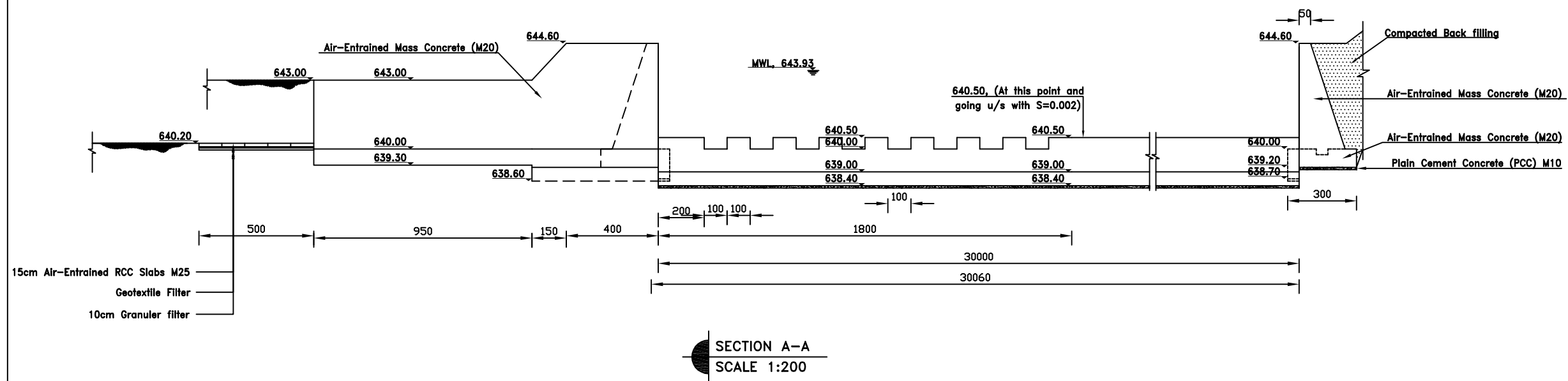
Revision

Drawing Scale: As shown

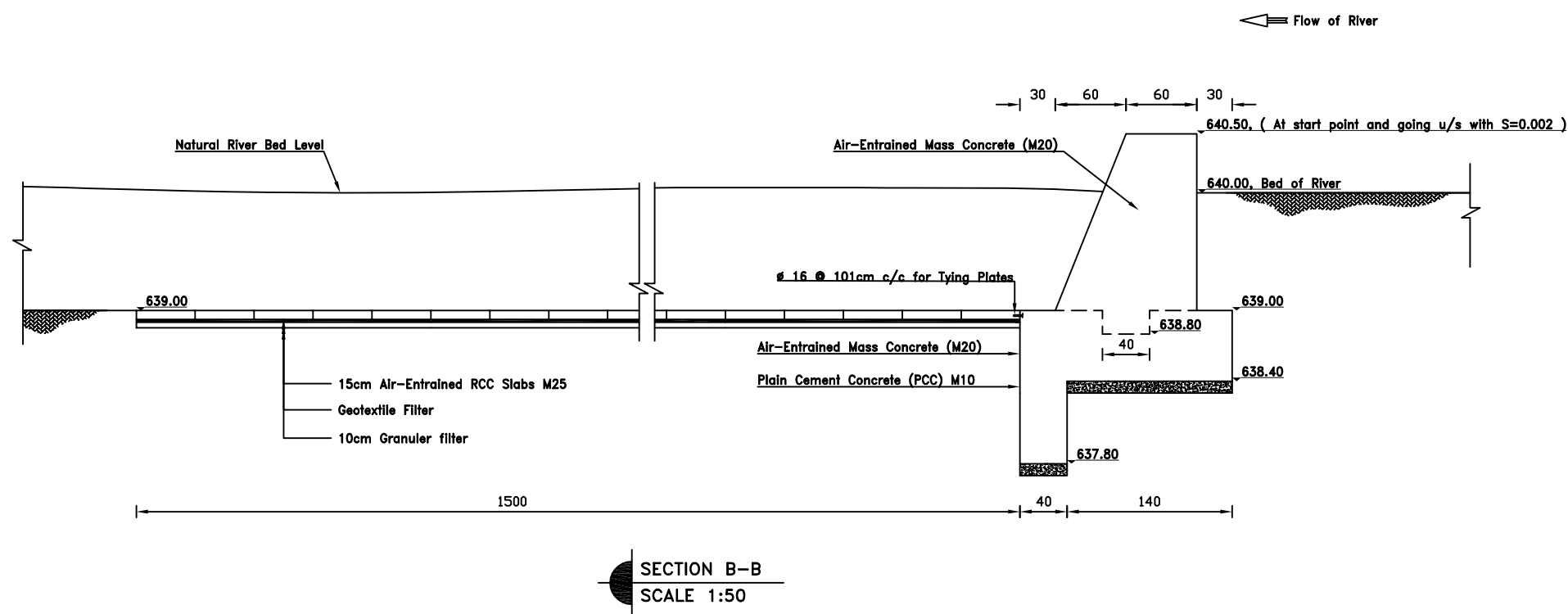
Date: Oct 2019

Notes:

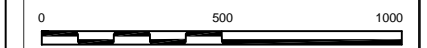
All kind of concrete are Air-Entrained concrete.



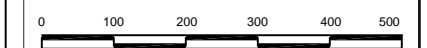
SECTION A-A
SCALE 1:200



SECTION B-B
SCALE 1:50



SCALE 1:200 (A3)



SCALE 1:100 (A3)

Rev.	By	Chkd	Apprd	Date	Description

Client:
ISLAMIC REPUBLIC OF AFGHANISTAN
MINISTRY OF ENERGY AND WATER

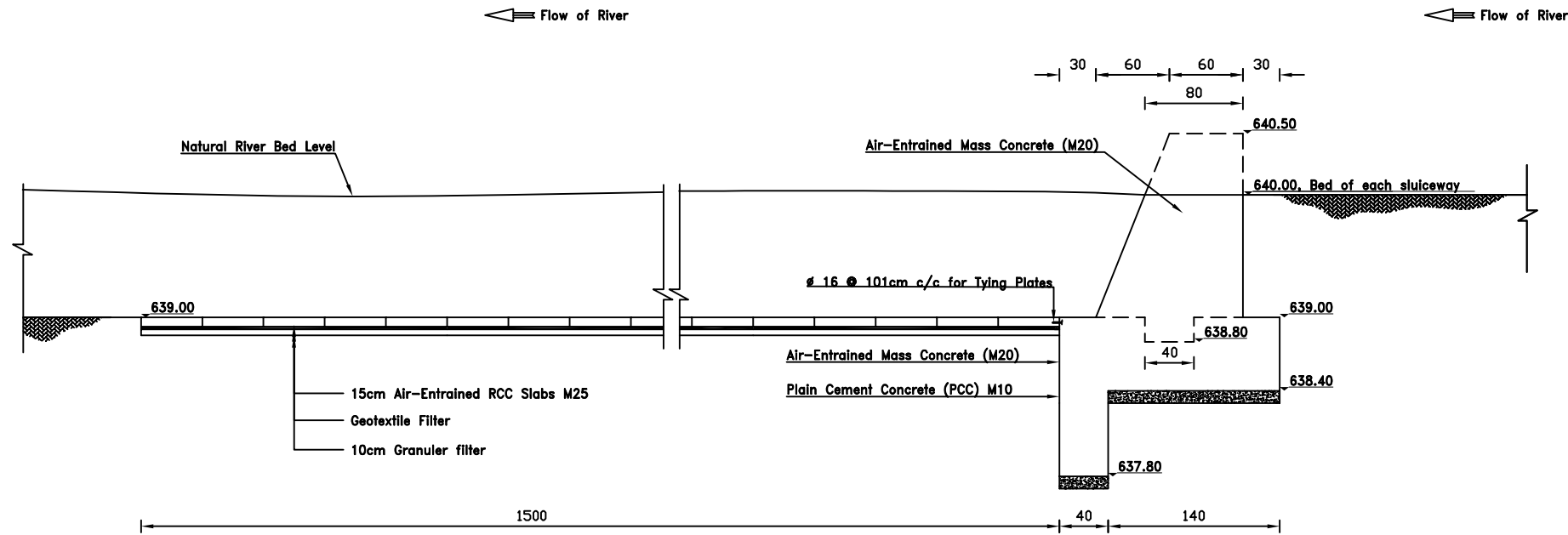


Basin: Helmand River Basin
Helmand River Middle Sub Basin

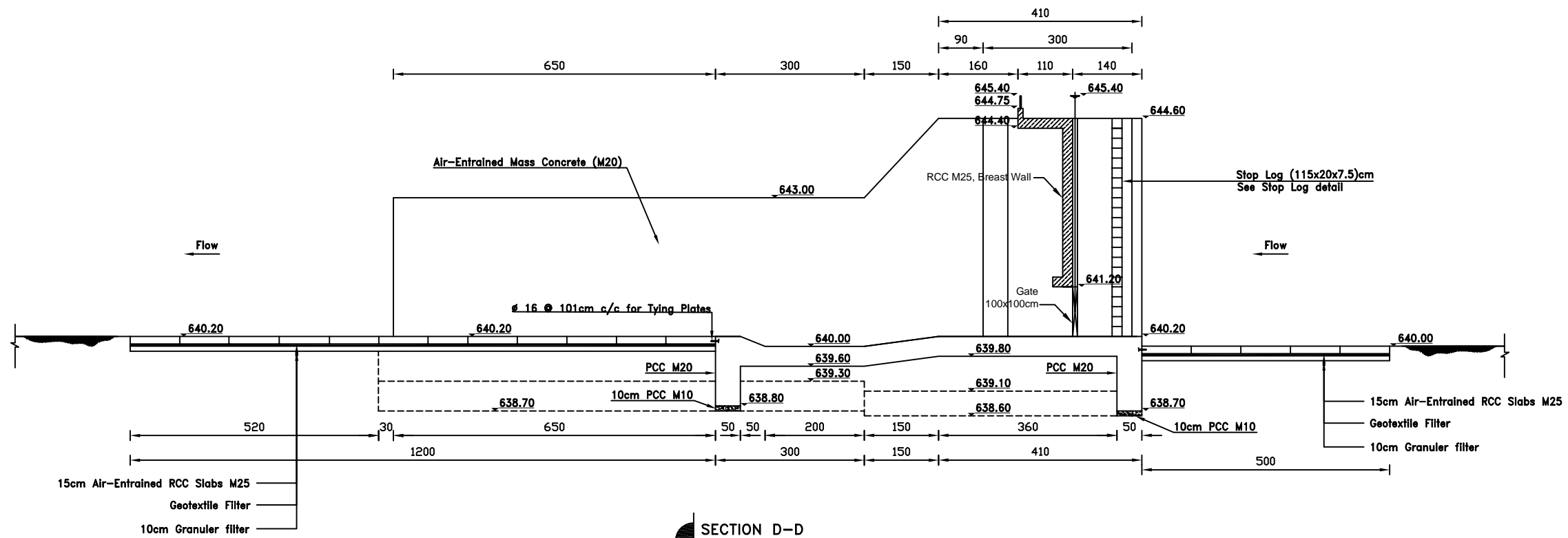
Project: Bagat Sulfa Canal
District : Khanishin
Province : Helmand

Drawing: SECTION A-A and B-B

Surveyed by:	PCU Survey Team
Designed by:	
Drawn by:	Eng. Sameem
Checked by:	Eng. Mohammad Anwar Zahin
Approved by:	
Drawing No:	Bagat Sulfa / 011
Drawing Scale:	As shown
Revision:	
Date:	Oct 2019



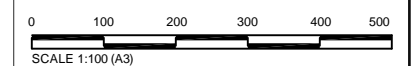
SECTION C-C
SCALE 1:50



SECTION D-D
SCALE 1:100

Notes:

All kind of concrete are Air-Entrained concrete.



Rev.	By	Chkd	Apprd	Date	Description

Client:
ISLAMIC REPUBLIC OF AFGHANISTAN
MINISTRY OF ENERGY AND WATER



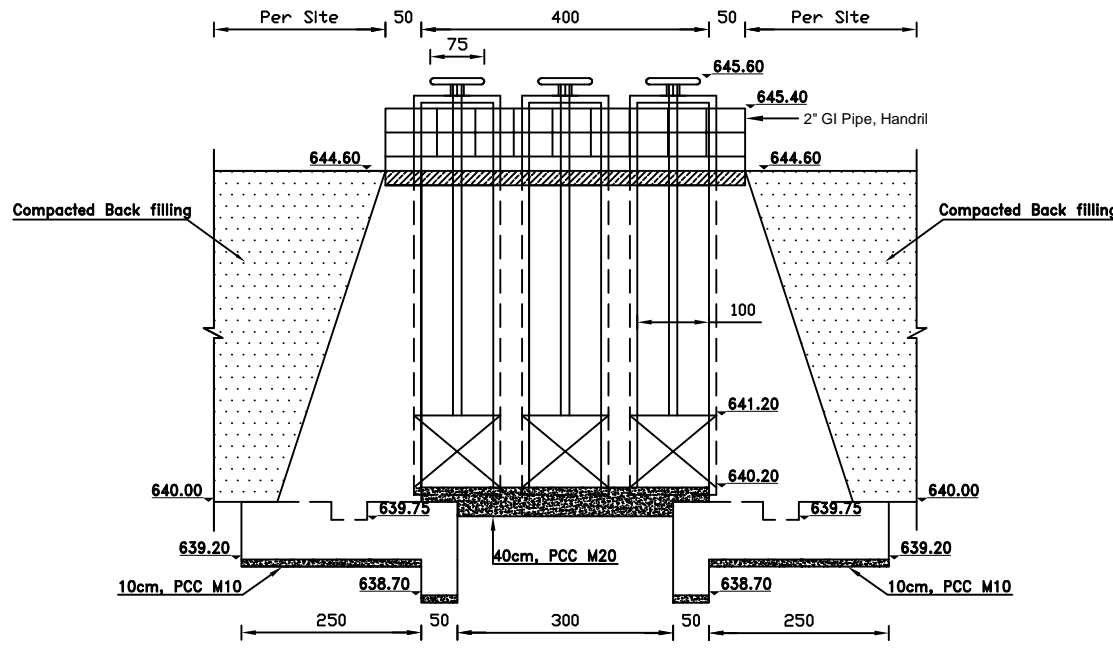
Basin: Helmand River Basin
Helmand River Middle Sub Basin

Project: Bagat Sulfa Canal
District : Khanishin
Province : Helmand

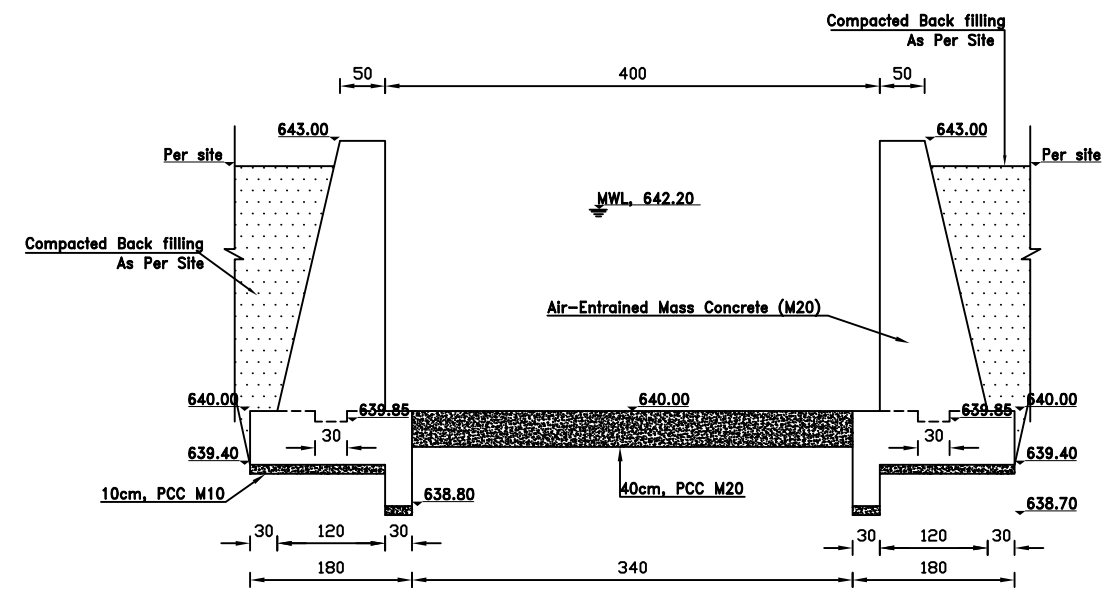
Drawing: SECTION C-C and D-D

Surveyed by: PCU Survey Team
Designed by:
Drawn by: Eng. Sameem
Checked by: Eng. Mohammad Anwar Zahin
Approved by:

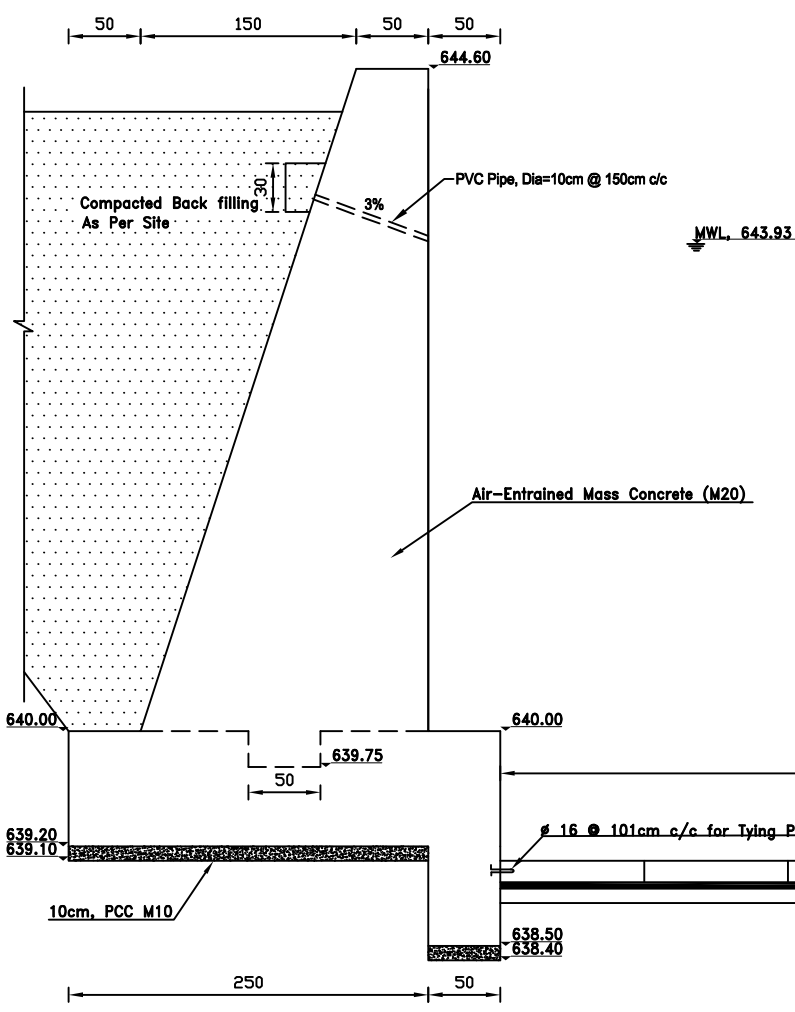
Drawing No:	Revision
Bagat Sulfa / 012	
Drawing Scale: As shown	Date: Oct 2019



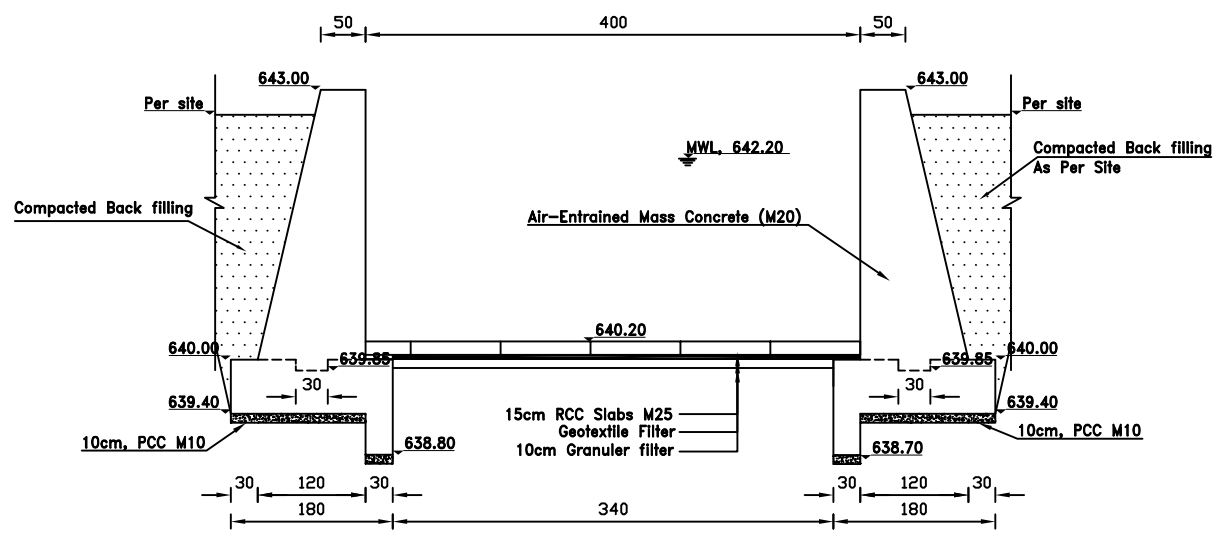
SECTION d-d
SCALE 1:100



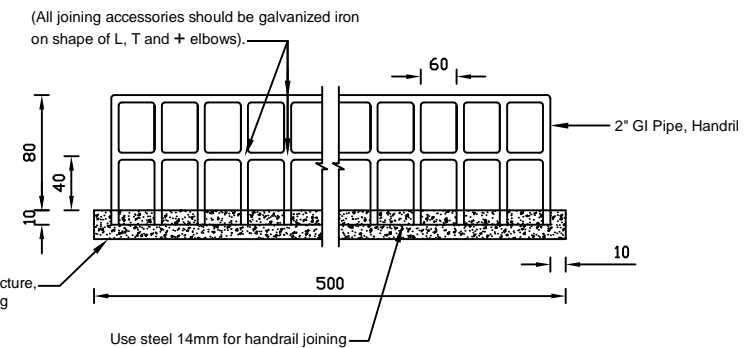
SECTION E-E
SCALE 1:80



SECTION G-G
SCALE 1:50



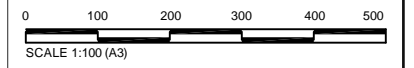
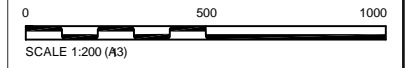
SECTION F-F
SCALE 1:80



Handrail Detail
Scale: 1:50

Notes:

All kind of concrete are Air-Entrained concrete.



Rev	By	Chkd	Aprvd	Date	Description

Client:
ISLAMIC REPUBLIC OF AFGHANISTAN
MINISTRY OF ENERGY AND WATER

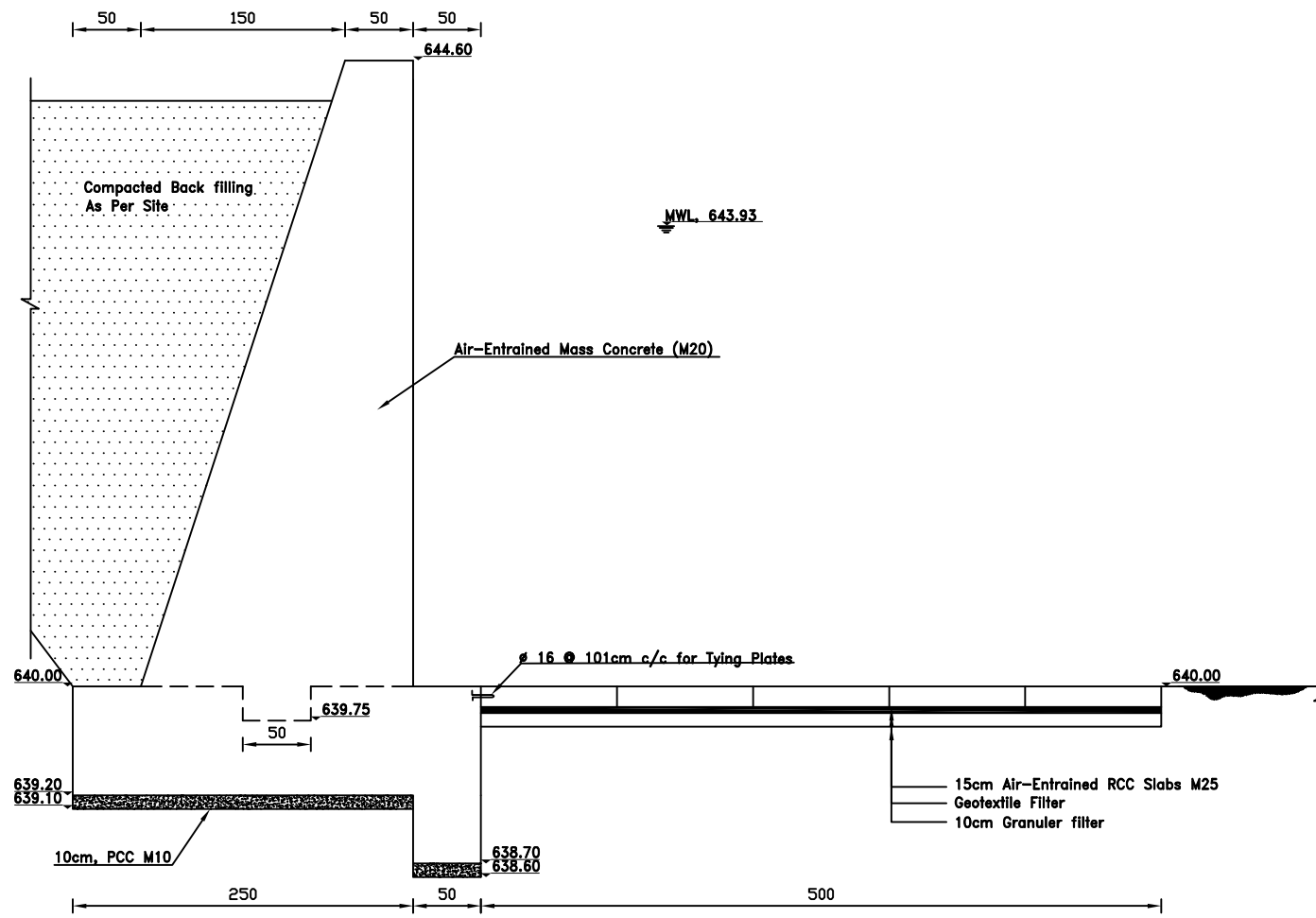


Basin: Helmand River Basin
Helmand River Middle Sub Basin

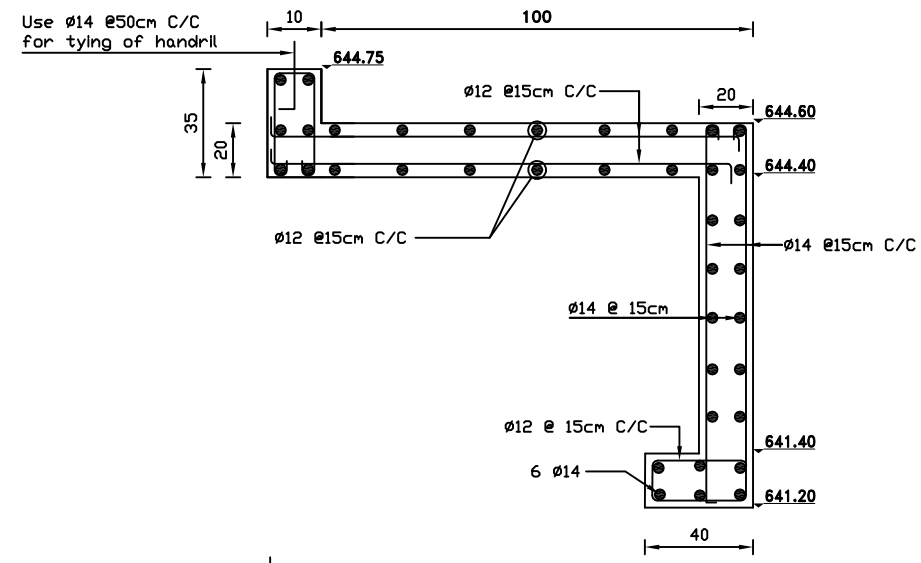
Project: Bagat Sulfa Canal
District : Khanishin
Province : Helmand

Drawing: SECTION E-E, F-F and G-G

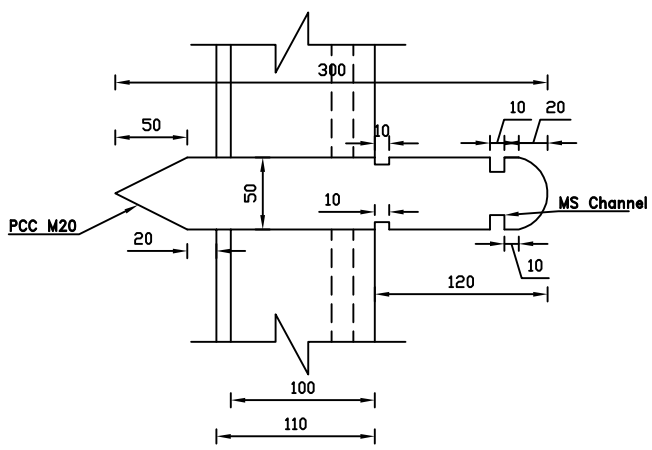
Surveyed by:	PCU Survey Team
Designed by:	
Drawn by:	Eng. Sameem
Checked by:	Eng. Mohammad Anwar Zahin
Approved by:	
Drawing No:	Bagat Sulfa / 013
Drawing Scale:	As shown
Revision:	
Date:	Oct 2019



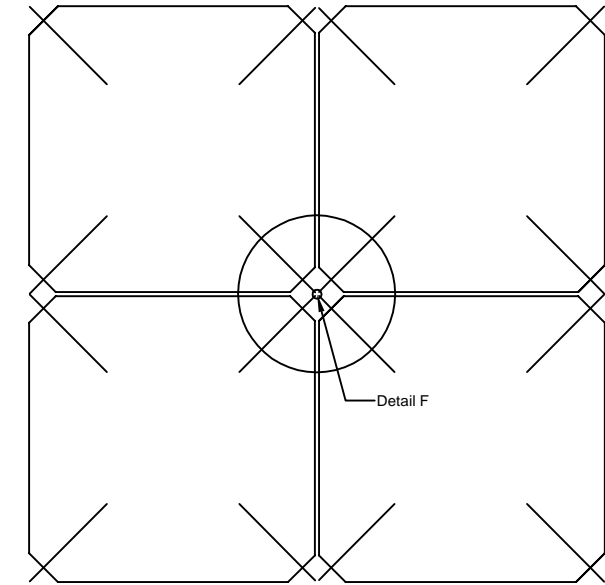
SECTION H-H
SCALE 1:50



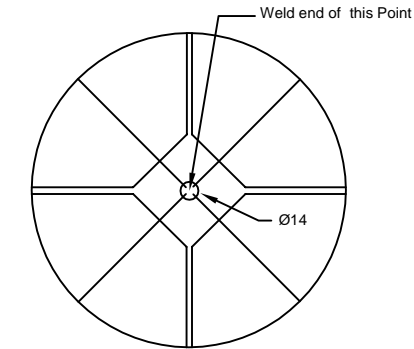
RCC slab with Brest Wall
SCALE 1:20



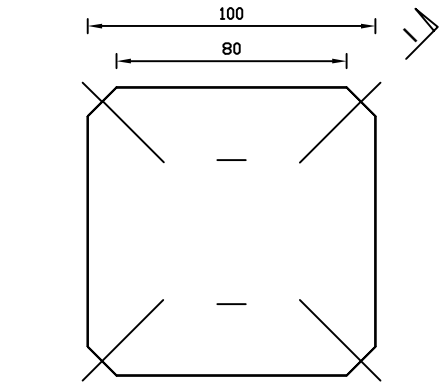
Column detail for gates
SCALE 1:50



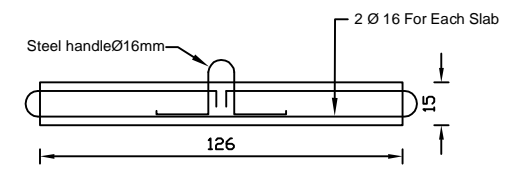
DETAIL OF 100 x 100 x 15 cm RCC SLAB



DETAIL F
Scale 1:12



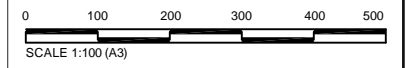
RCC PLATE PLAN
Scale 1:25



SECTION I-I
Scale 1:25

Notes:

All kind of concrete are Air-Entrained concrete.



Rev.	By	Chkd	Apprd	Date	Description

Client:
ISLAMIC REPUBLIC OF AFGHANISTAN
MINISTRY OF ENERGY AND WATER



Basin: Helmand River Basin
Helmand River Middle Sub Basin

Project: Bagat Sulfa Canal
District : Khanishin
Province : Helmand

Drawing:
SECTION H-H With RCC DETAIL

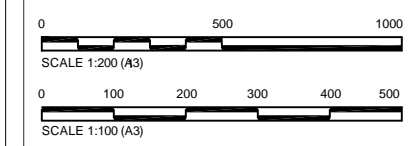
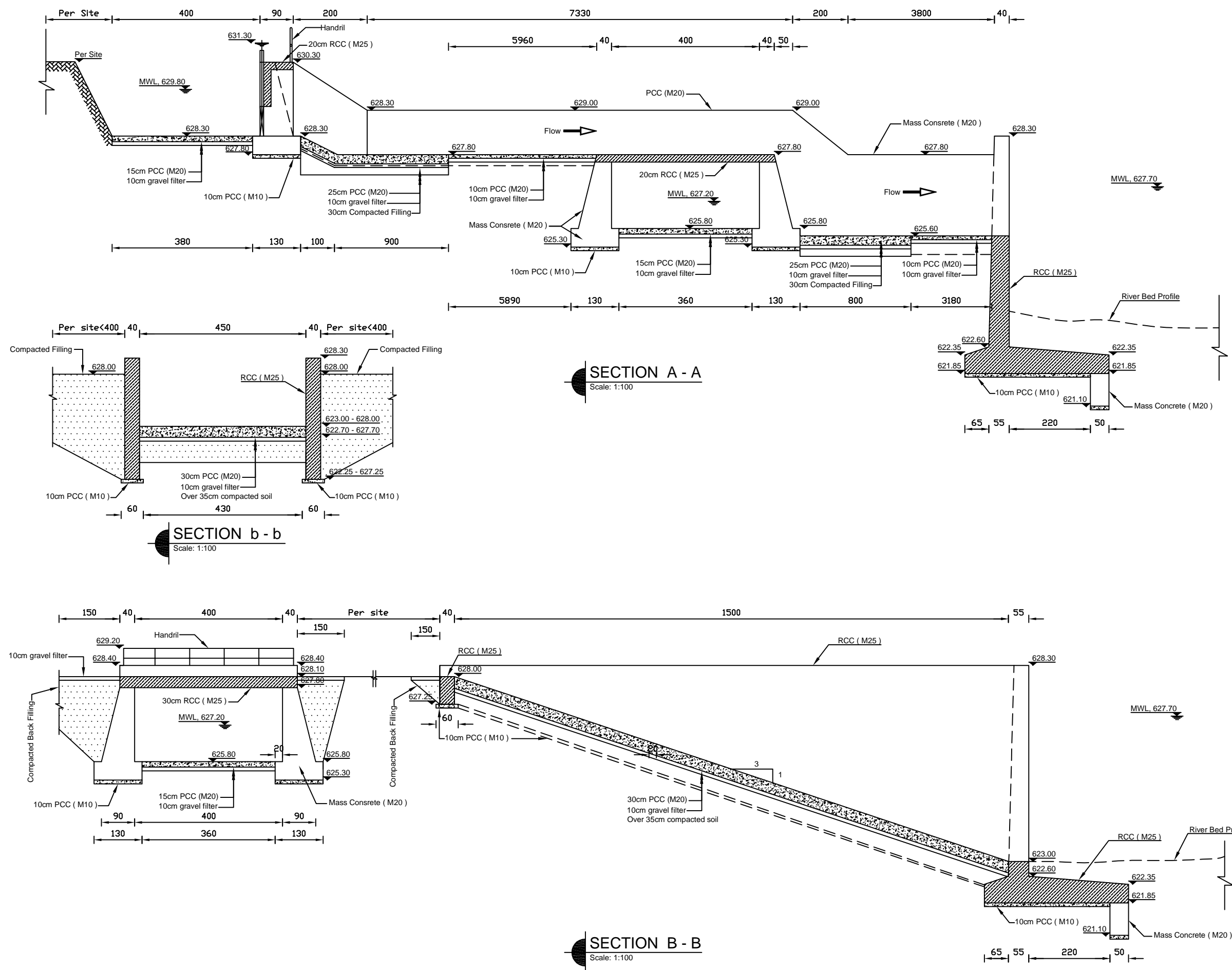
Surveyed by: PCU Survey Team
Designed by:
Drawn by: Eng. Sameem
Checked by: Eng. Mohammad Anwar Zahin
Approved by:

Drawing No:	Revision
Bagat Sulfa / 014	

Drawing Scale: As shown Date: Oct 2019

Notes:

All kind of concrete are Air-Entrained concrete.



Rev	By	Chkd	Apprd	Date	Description

Client:
ISLAMIC REPUBLIC OF AFGHANISTAN
MINISTRY OF ENERGY AND WATER



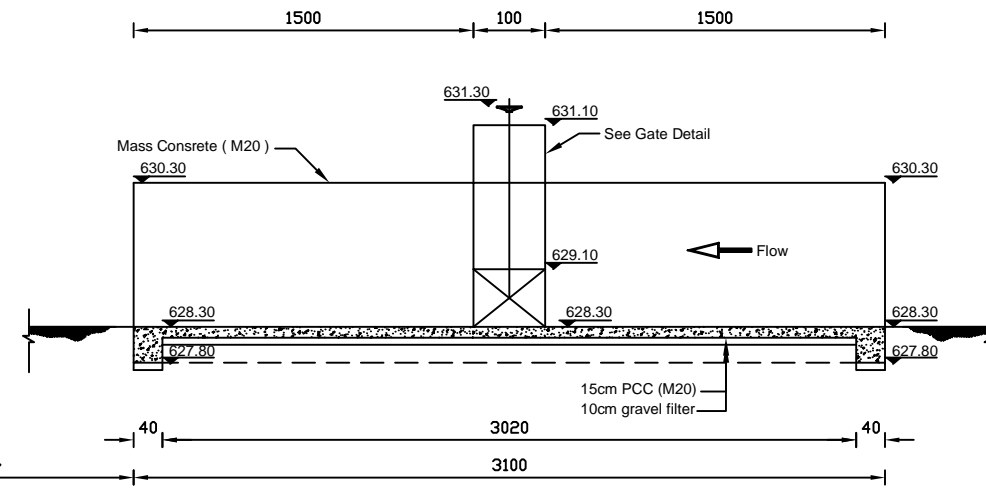
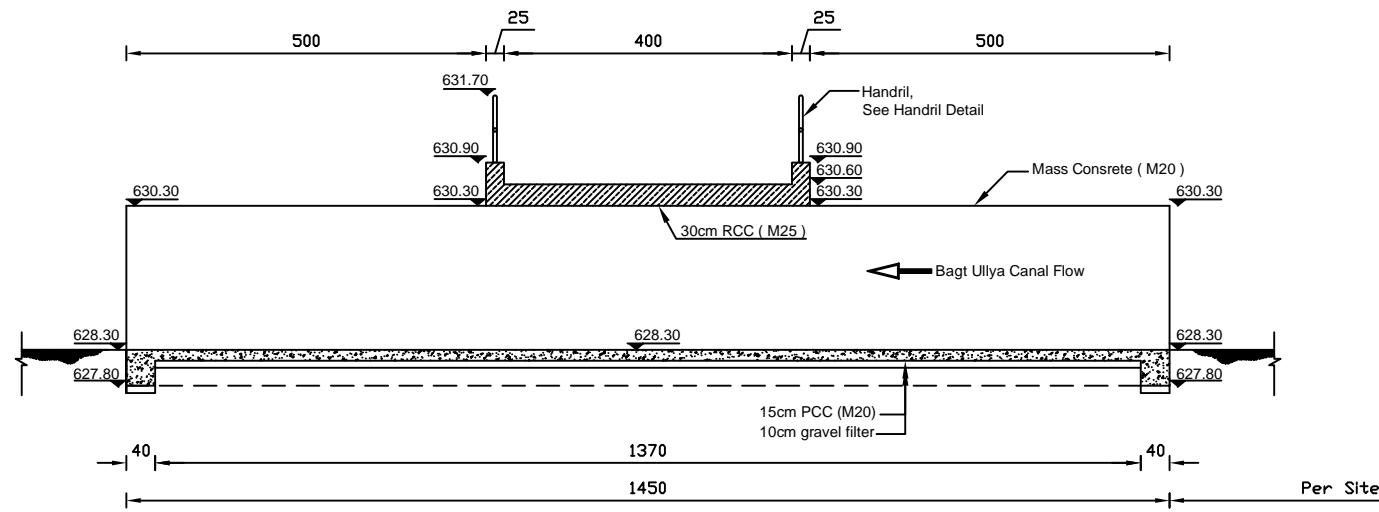
Basin: Helmand River Basin
Helmand River Middle Sub Basin

Project: Bagat Sufia Canal
District : Khanishin
Province : Helmand

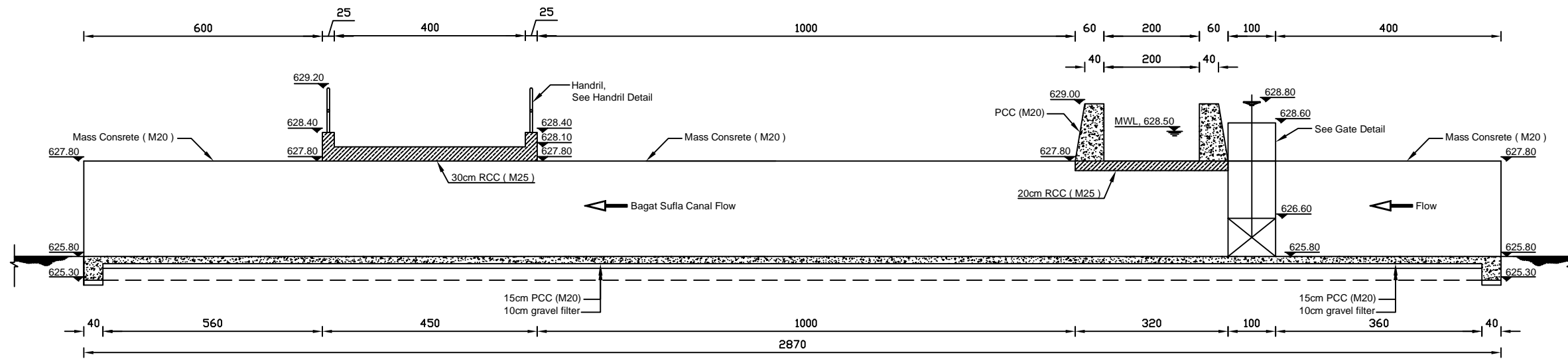
Drawing:
SSECTION A-A and B-B

Surveyed by: PCU Survey Team
Designed by:
Drawn by: Eng. Sameem
Checked by: Eng. Mohammad Anwar Zahin
Approved by:

Drawing No: Bagat Sufia / 016	Revision
Drawing Scale: As shown	Date: Oct 2019



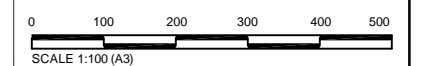
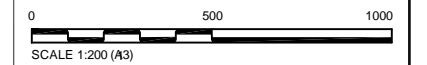
SECTION C - C
Scale: 1:100



SECTION D - D
Scale: 1:100

Notes:

All kind of concrete are Air-Entrained concrete.



Rev.	By	Chkd	Apprvd	Date	Description

Client:
ISLAMIC REPUBLIC OF AFGHANISTAN
MINISTRY OF ENERGY AND WATER

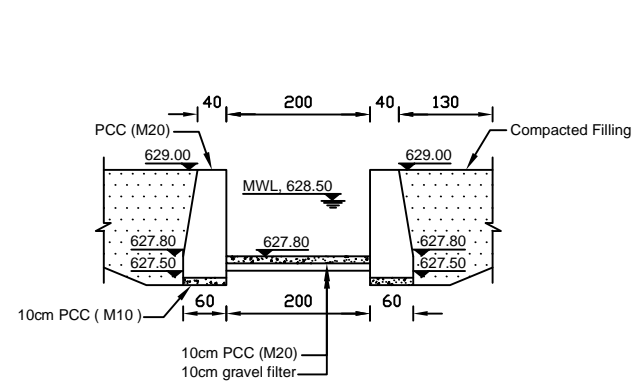


Basin: Helmand River Basin
Helmand River Middle Sub Basin

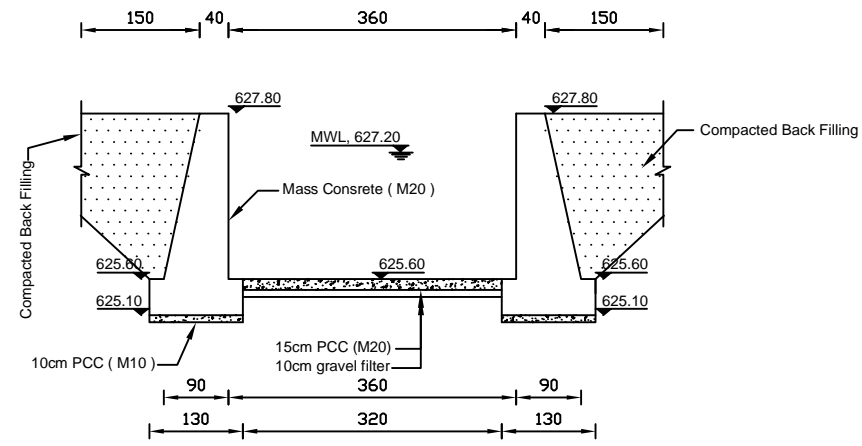
Project: Bagat Sulfa Canal
District : Khanishin
Province : Helmand

Drawing:
SSECTION C-C and D-D

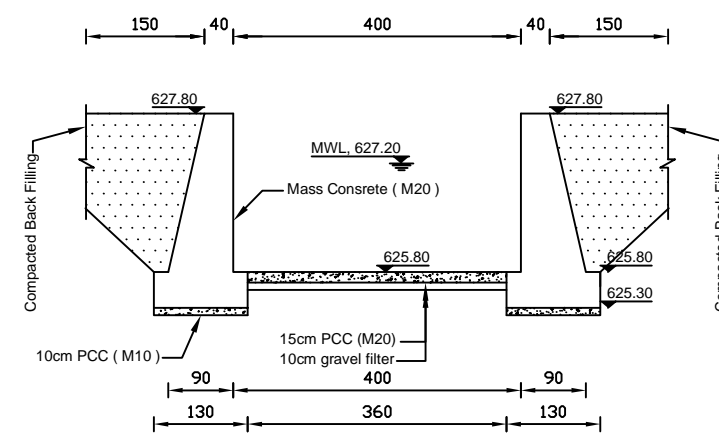
Surveyed by: PCU Survey Team	Revision
Designed by:	
Drawn by: Eng. Sameem	
Checked by: Eng. Mohammad Anwar Zahin	
Approved by:	
Drawing No: Bagat Sulfa / 017	Revision
Drawing Scale: As shown	Date: Oct 2019



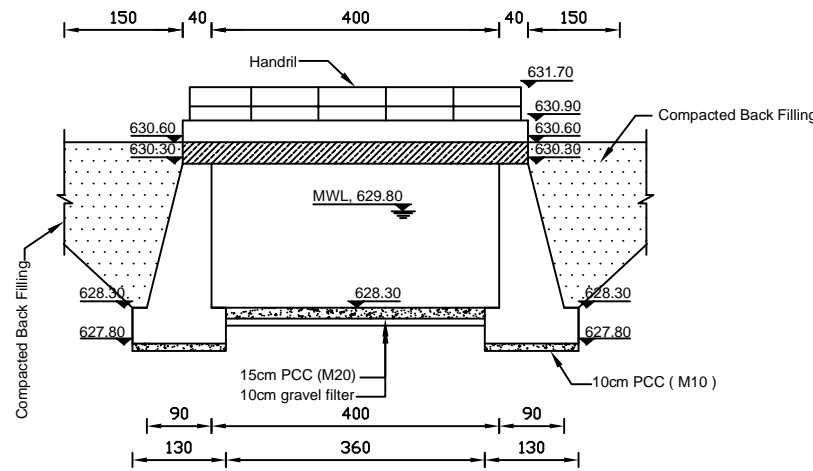
SECTION E - E
Scale: 1:100



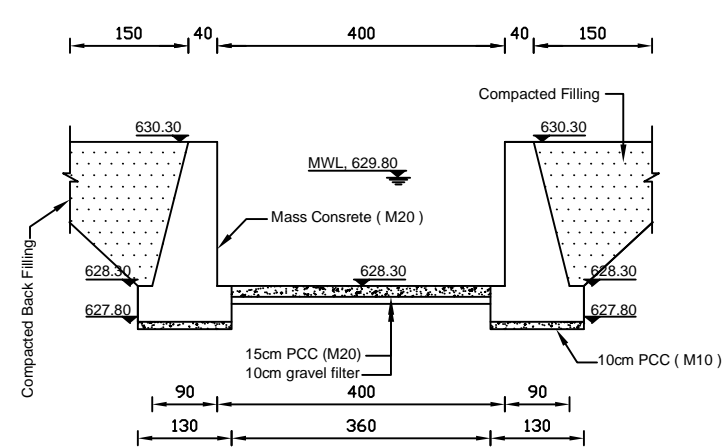
SECTION F - F
Scale: 1:100



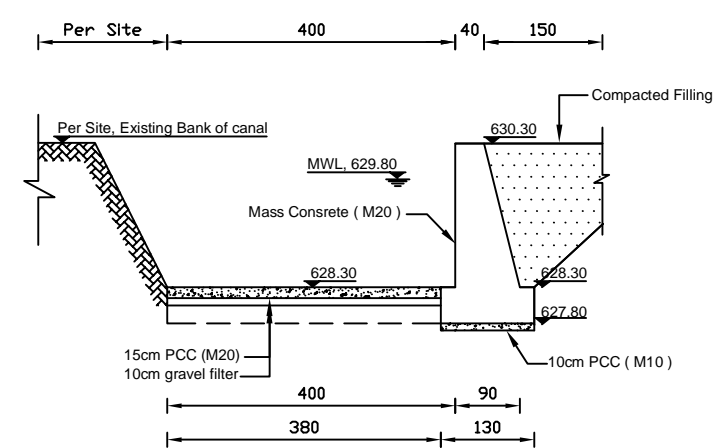
SECTION G - G
Scale: 1:100



SECTION H - H
Scale: 1:100



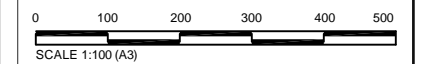
SECTION I - I
Scale: 1:100



SECTION J - J
Scale: 1:100

Notes:

All kind of concrete are Air-Entrained concrete.



Rev	By	Chkd	Apvtd	Date	Description

Client:
ISLAMIC REPUBLIC OF AFGHANISTAN
MINISTRY OF ENERGY AND WATER

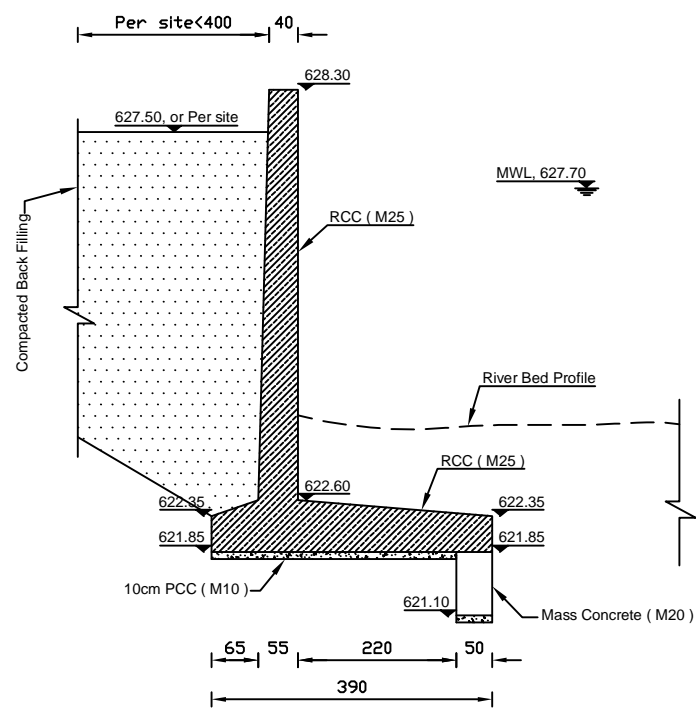


Basin: Helmand River Basin
Helmand River Middle Sub Basin

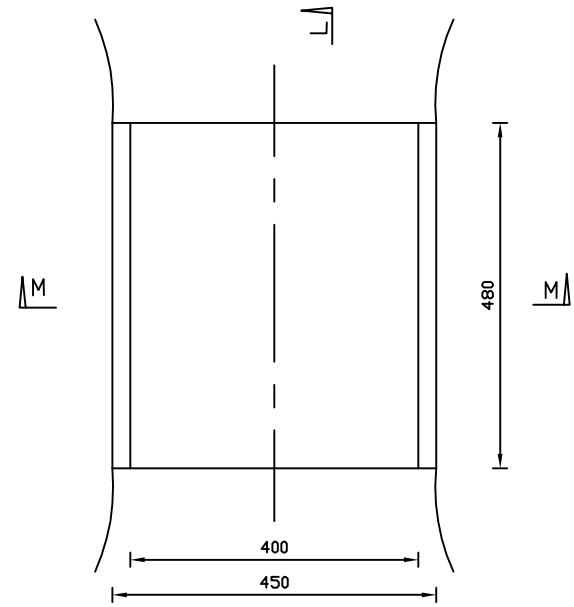
Project: Bagat Sulfa Canal
District : Khanishin
Province : Helmand

Drawing:
SSECTION
E-E, F-F, G-G, H-H, I-I and J-J

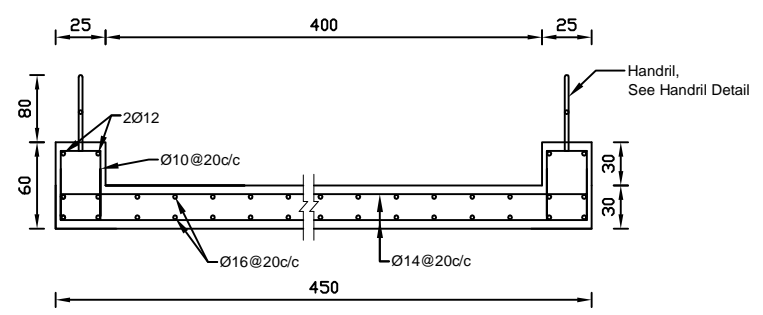
Surveyed by: PCU Survey Team	Revision
Designed by:	
Drawn by: Eng. Sameem	
Checked by: Eng. Mohammad Anwar Zahin	
Approved by:	
Drawing No: Bagat Sulfa / 018	Date: Oct 2019



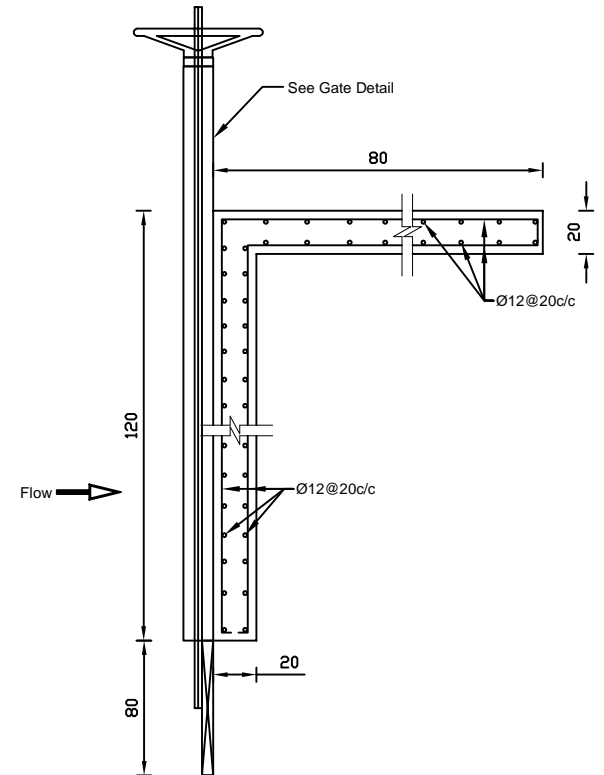
SECTION K - K
Scale: 1:100



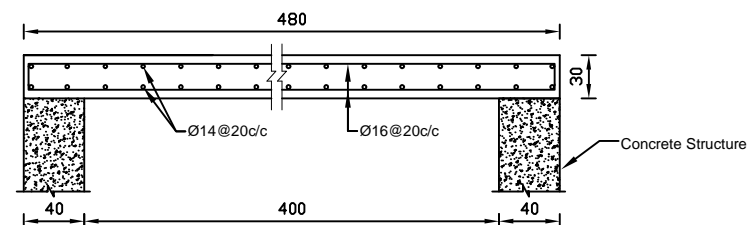
RCC Slab plan
Scale: 1:100



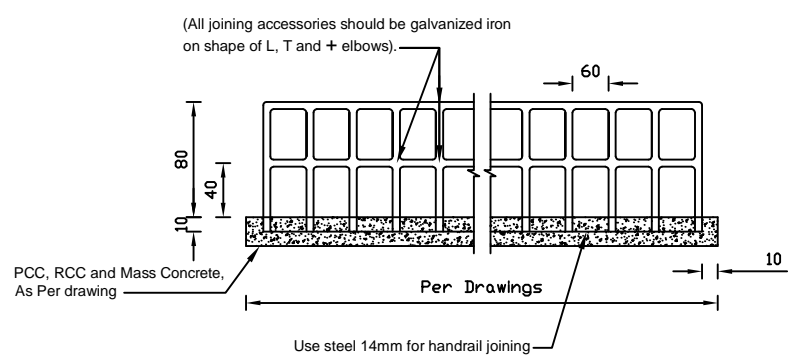
Section M-M Reinforcement Detail



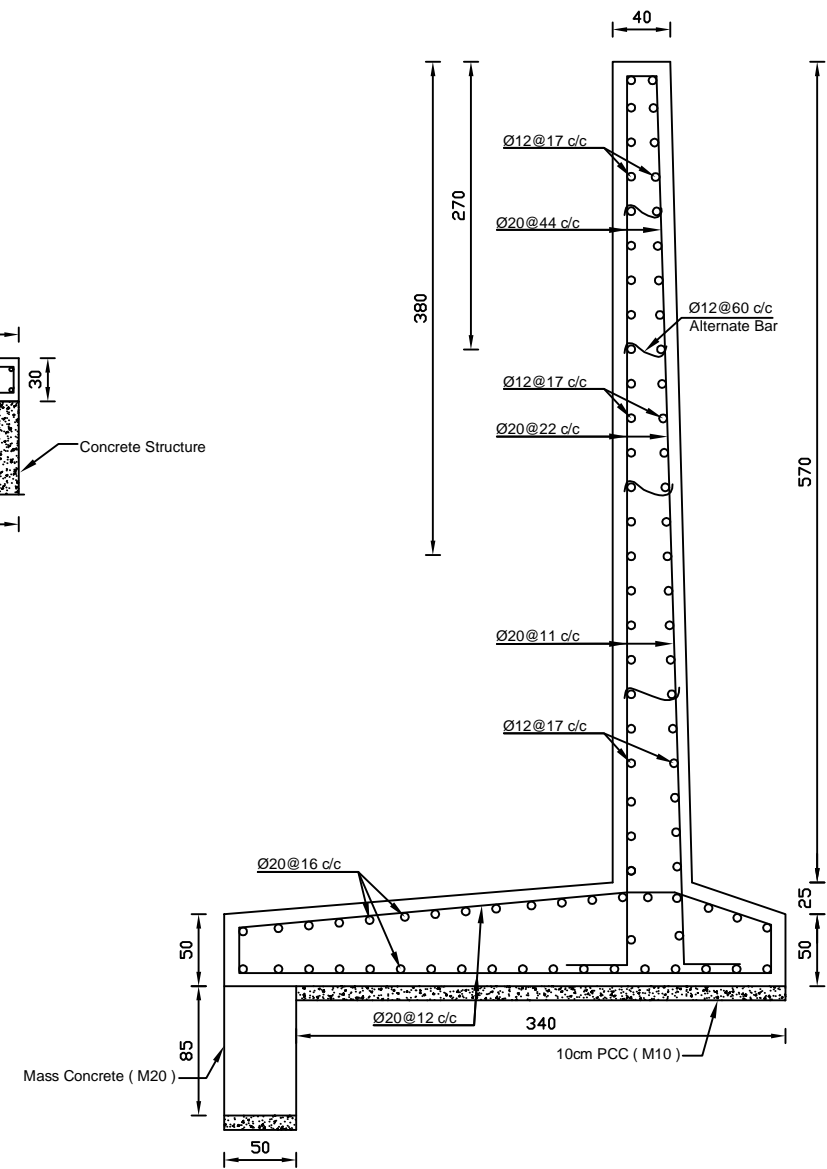
SLAB AND BRAEST WALL REINFORCEMENT



Section L-L Reinforcement Detail



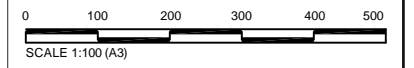
Handrail Detail
Scale: 1:50



CANTILEVER WALL FOR SECTION K-K REINFORCEMENT

Notes:

All kind of concrete are Air-Entrained concrete.



Rev.	By	Chkd	Apprvd	Date	Description

Client:
ISLAMIC REPUBLIC OF AFGHANISTAN
MINISTRY OF ENERGY AND WATER

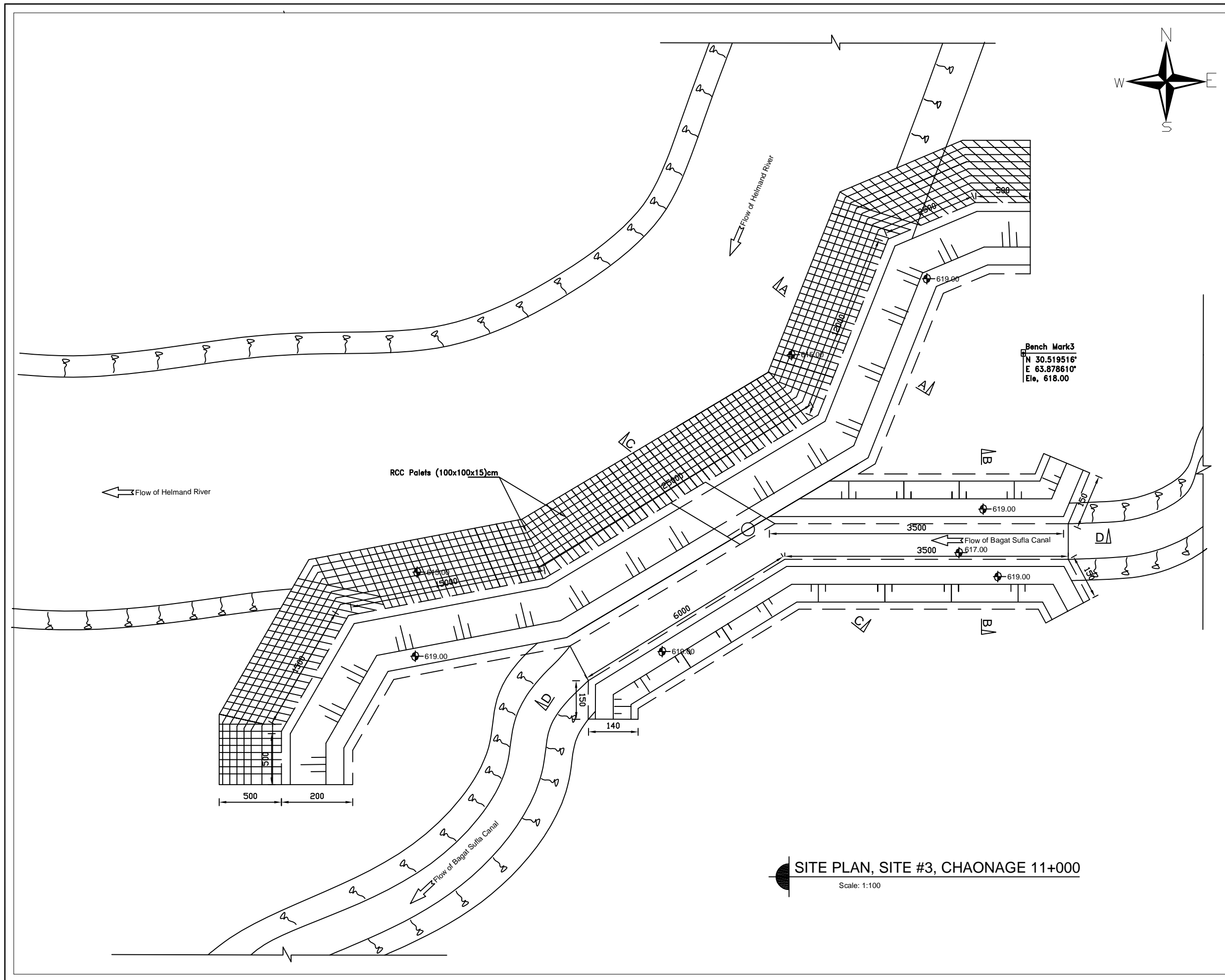


Basin: Helmand River Basin
Helmand River Middle Sub Basin

Project: Bagat Sulfa Canal
District : Khanishin
Province : Helmand

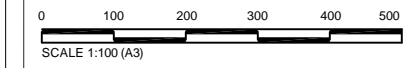
Drawing:
SSECTION K-K With Reinforcement Detail

Surveyed by: PCU Survey Team	Revision
Designed by:	
Drawn by: Eng. Sameem	
Checked by: Eng. Mohammad Anwar Zahin	
Approved by:	
Drawing No: Bagat Sulfa / 019	
Drawing Scale: As shown	Date: Oct 2019



Notes:

- * Long slope of walls will be adjusted by long slope of canal in u/s & d/s with S=0.0014
- * All horizontal Angles will be adjusted by site.
- * Expansion joints will be adjusted as follows:
For Plum concrete walls at 15 - 20 m c/c
For RCC walls at 30 m c/c
For PCC lining or flat PCC at 3 m c/c.
- * The longitudinal alignment of walls in u/s and d/s , will be implemented as per site or parallel to the alignments of River.



Rev	By	Chkd	Aprvd	Date	Description

Client:
ISLAMIC REPUBLIC OF AFGHANISTAN
MINISTRY OF ENERGY AND WATER



Basin: Helmand River Basin
Helmand River Middle Sub Basin

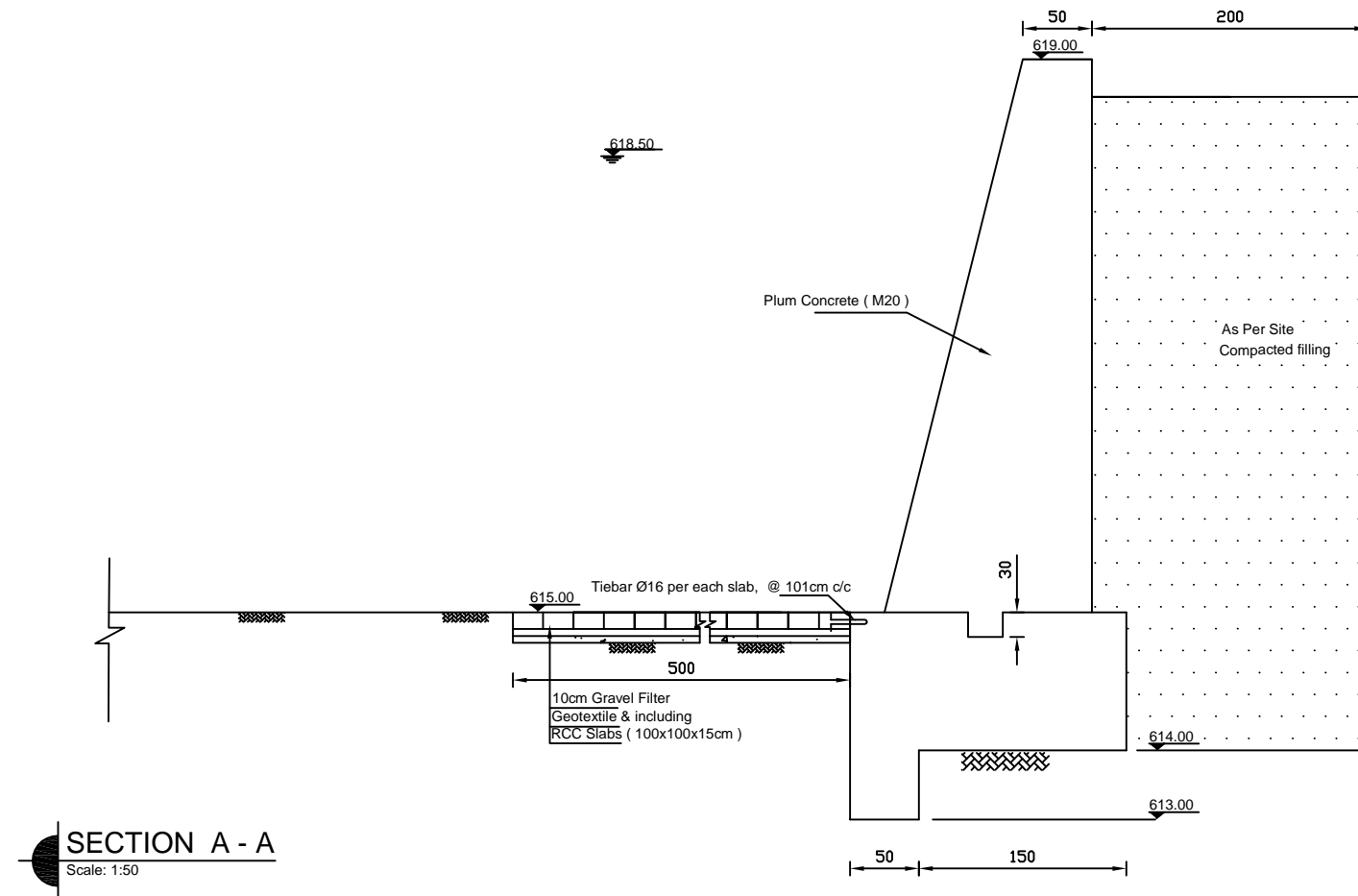
Project: Bagat Sufia Canal
District : Khanishin
Province : Helmand

Drawing:
SITE PLAN, SITE #3
CHAINAGE 11+000

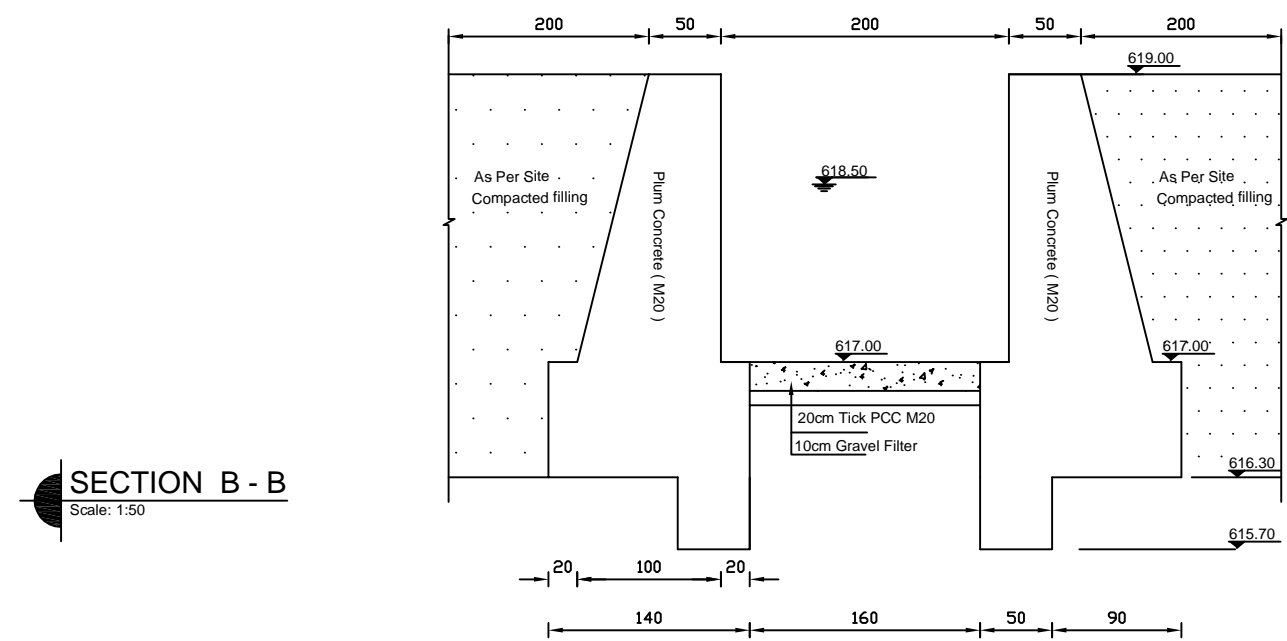
Surveyed by: PCU Survey Team
Designed by:
Drawn by: Eng. Esmatullah Waziri
Checked by: Eng. Mohammad Anwar Zahin
Approved by:

Drawing No:	Revision
Bagat Sufia / 020	
Drawing Scale: As shown	Date: Oct 2019

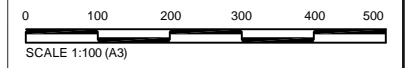
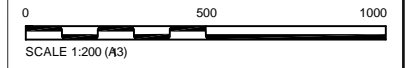
Notes:



SECTION A - A
Scale: 1:50



SECTION B - B
Scale: 1:50



Rev.	By	Chkd	Apprd	Date	Description

Client:
ISLAMIC REPUBLIC OF AFGHANISTAN
MINISTRY OF ENERGY AND WATER



Basin: Helmand River Basin
Helmand River Middle Sub Basin

Project: Bagat Sulfa Canal
District : Khanishin
Province : Helmand

Drawing: SECTION A-A and B-B

Surveyed by: PCU Survey Team

Designed by:

Drawn by: Eng. Esmatullah Waziri

Checked by: Eng. Mohammad Anwar Zahin

Approved by:

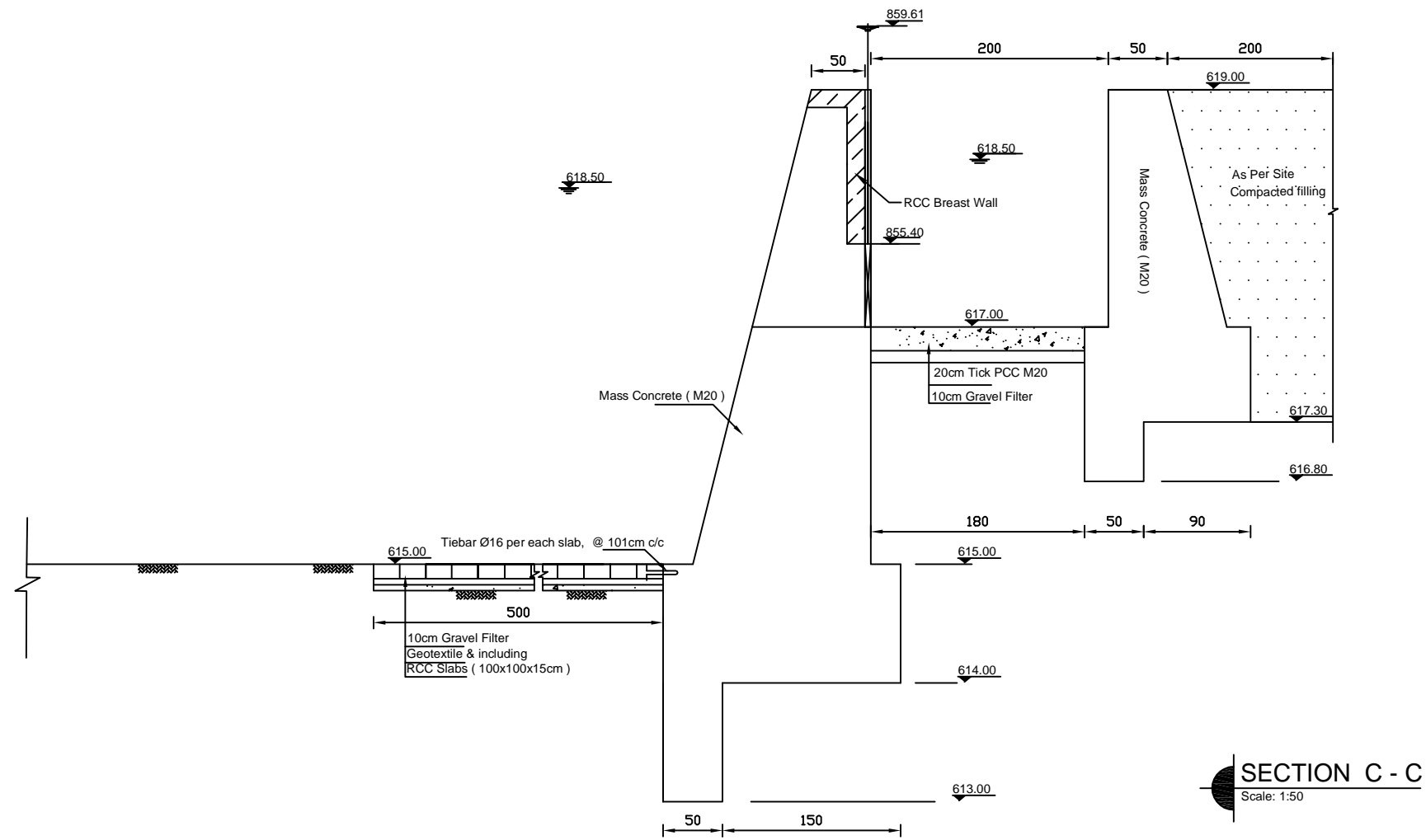
Drawing No: Bagat Sulfa / 021

Revision

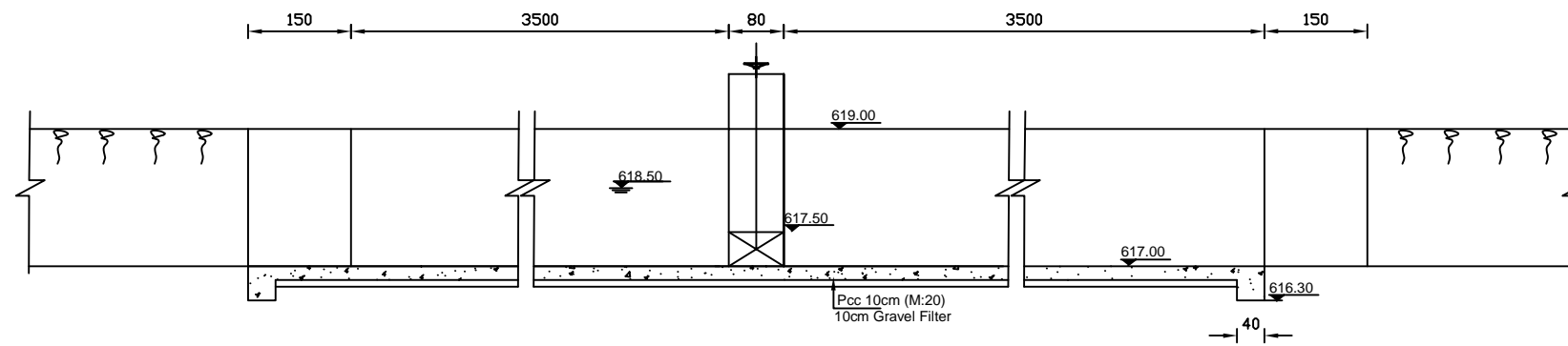
Drawing Scale: As shown

Date: Oct 2019

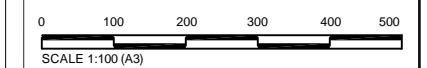
Notes:



SECTION C - C
Scale: 1:50



SECTION D - D
Scale: 1:50



Rev.	By	Chkd	Apprd	Date	Description

Client:
ISLAMIC REPUBLIC OF AFGHANISTAN
MINISTRY OF ENERGY AND WATER



Basin: Helmand River Basin
Helmand River Middle Sub Basin

Project: Bagat Sulfa Canal
District : Khanishin
Province : Helmand

Drawing: SECTION C-C and D-D

Surveyed by: PCU Survey Team

Designed by:

Drawn by: Eng. Esmatullah Waziri

Checked by: Eng. Mohammad Anwar Zahin

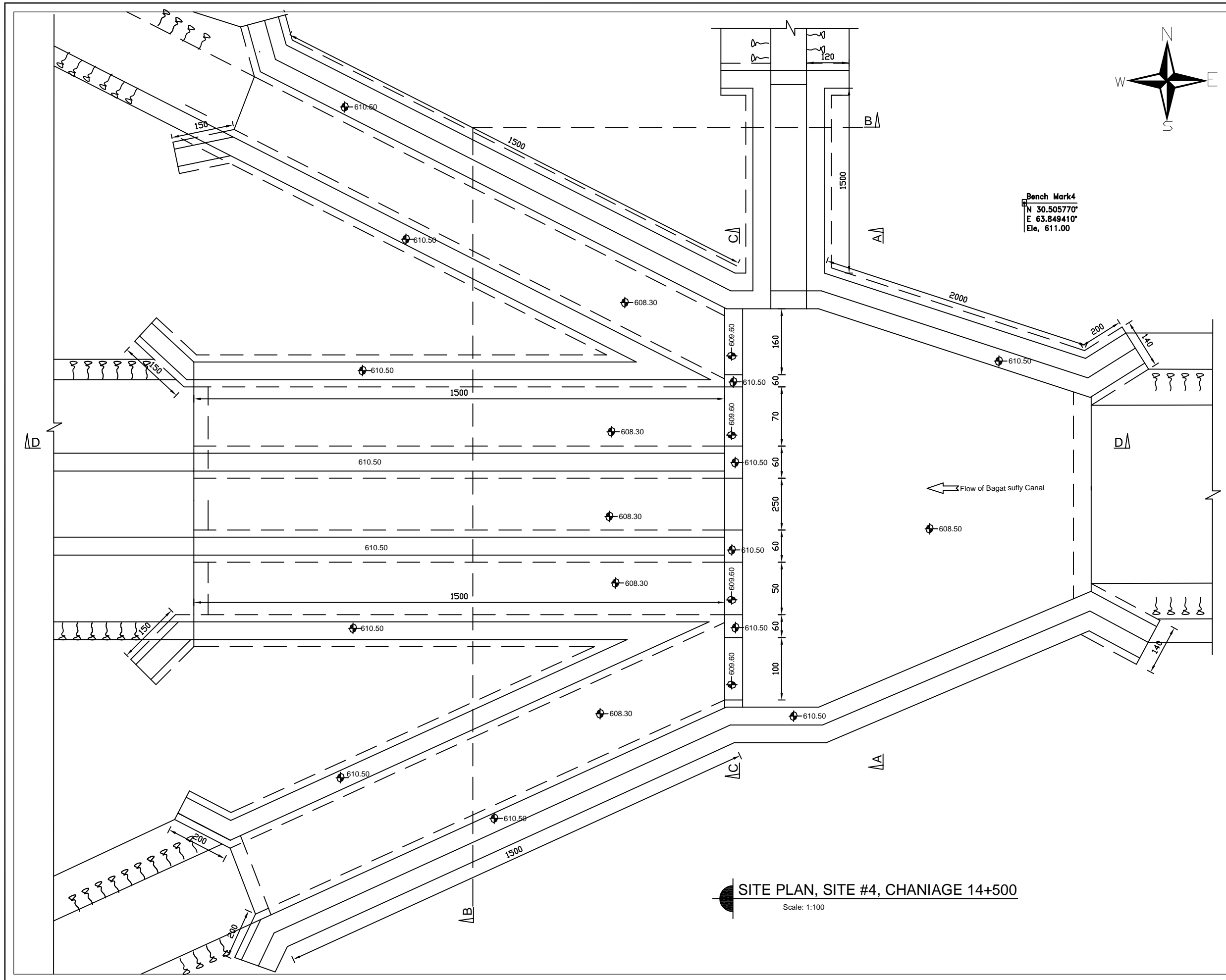
Approved by:

Drawing No: Bagat Sulfa / 022

Revision

Drawing Scale: As shown

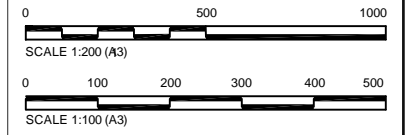
Date: Oct 2019



SITE PLAN, SITE #4, CHANIAGE 14+500
Scale: 1:100

Notes:

- * Long slope of walls will be adjusted by long slope of canal in u/s & d/s with S=0.0014
- * All horizontal Angles will be adjusted by site.
- * Expansion joints will be adjusted as follows:
For Plum concrete walls at 15 - 20 m c/c
For RCC walls at 30 m c/c
For PCC lining or flat PCC at 3 m c/c.
- * The longitudinal alignment of walls in u/s and d/s , will be implemented as per site or parallel to the alignments of canal.
- * The dimension of existing water division structure will not change.



Rev.	By	Chkd	Apprd	Date	Description

Client:
ISLAMIC REPUBLIC OF AFGHANISTAN
MINISTRY OF ENERGY AND WATER



Basin: Helmand River Basin
Helmand River Middle Sub Basin

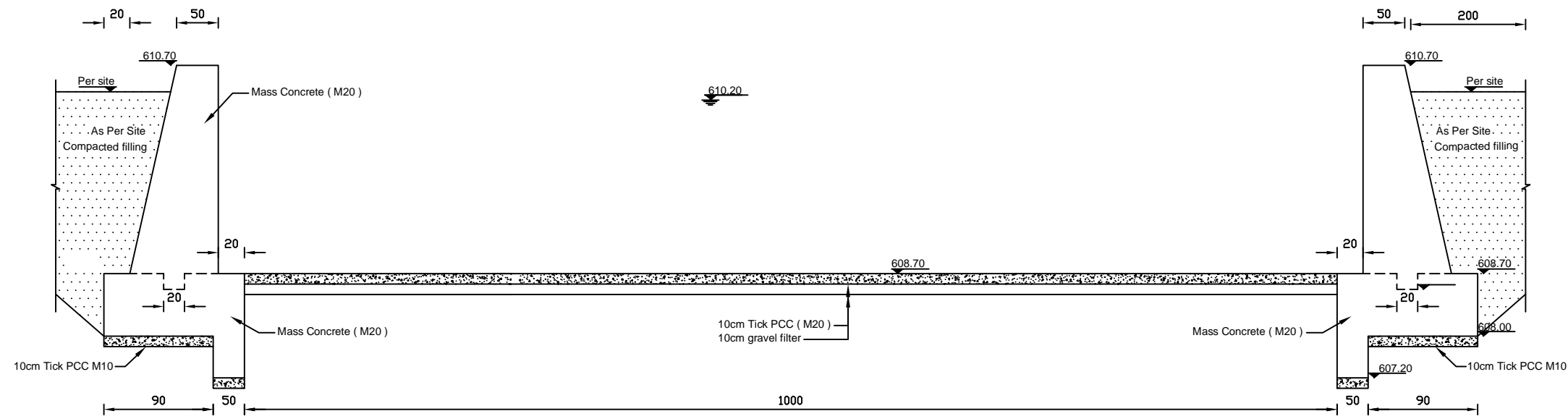
Project: Bagat Suffa Canal
District : Khanishin
Province : Helmand

Drawing:
SITE PLAN, SITE #4
CHAINAGE 14+500

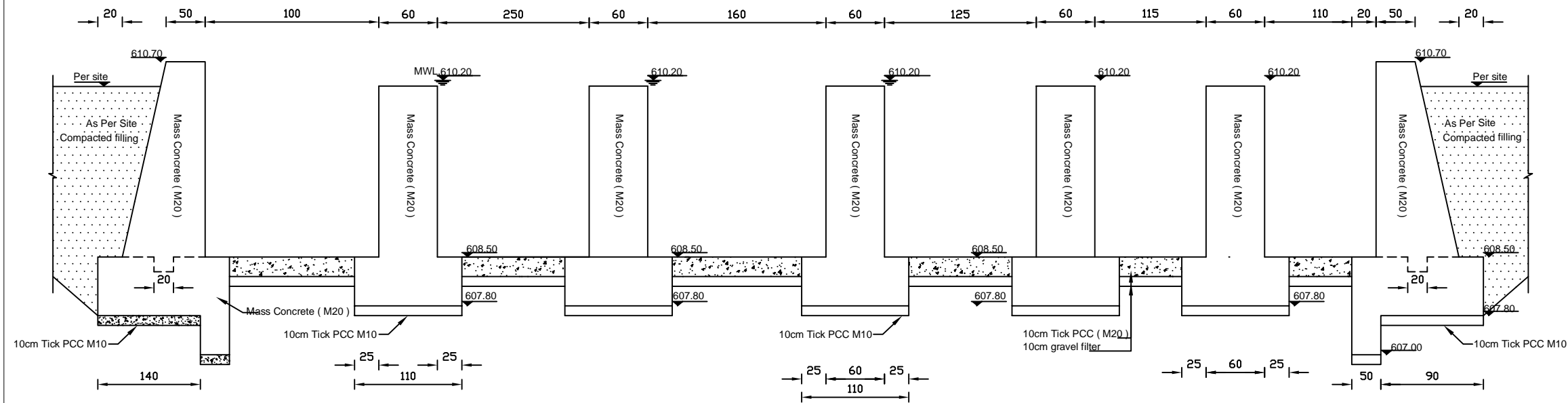
Surveyed by: PCU Survey Team	Revision
Designed by:	
Drawn by: Eng. Esmatullah Waziri	
Checked by: Eng. Mohammad Anwar Zahin	
Approved by:	
Drawing No: Bagat Suffa / 023	Revision
Drawing Scale: As shown	Date: Oct 2019

Notes:

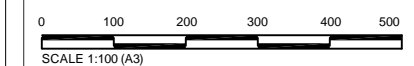
All kind of concrete are Air-Entrained concrete



SECTION A - A
Scale: 1:50



SECTION B - B
Scale: 1:50



Rev.	By	Chkd	Aprvd	Date	Description

Client:
ISLAMIC REPUBLIC OF AFGHANISTAN
MINISTRY OF ENERGY AND WATER



Basin: Helmand River Basin
Helmand River Middle Sub Basin

Project: Bagat Sulfa Canal
District : Khanishin
Province : Helmand

Drawing:
SECTION A-A and B-B

Surveyed by: PCU Survey Team

Designed by:

Drawn by: Eng. Esmatullah Waziri

Checked by: Eng. Mohammad Anwar Zahin

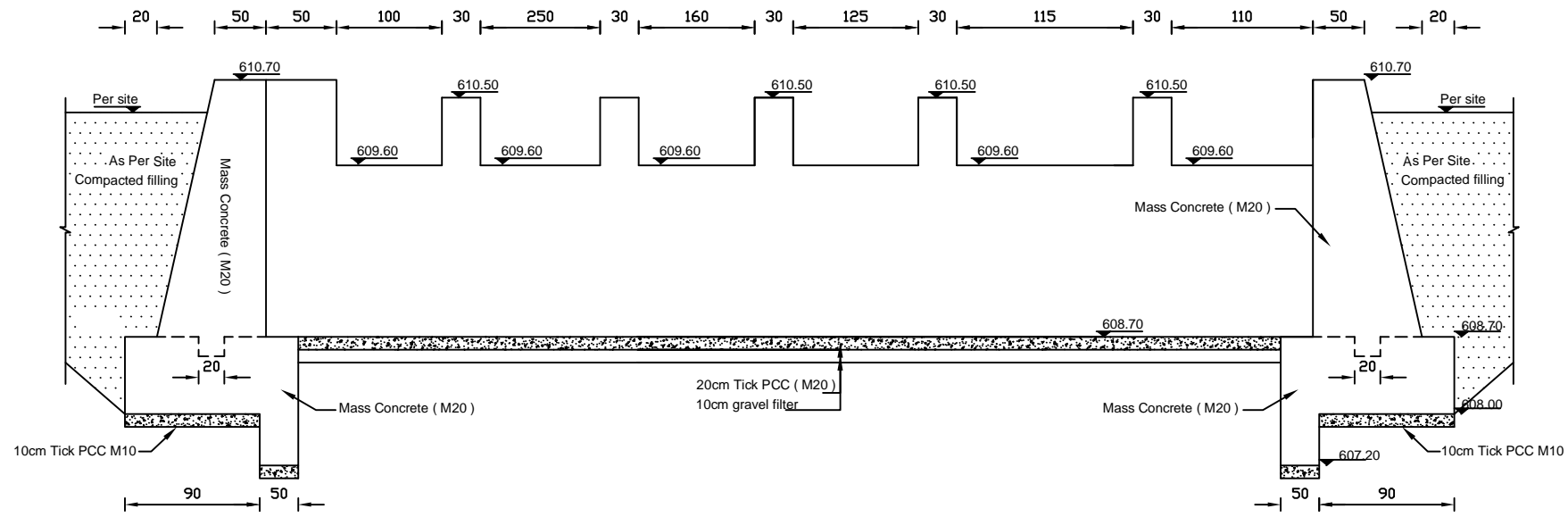
Approved by:

Drawing No: Bagat Sulfa / 024

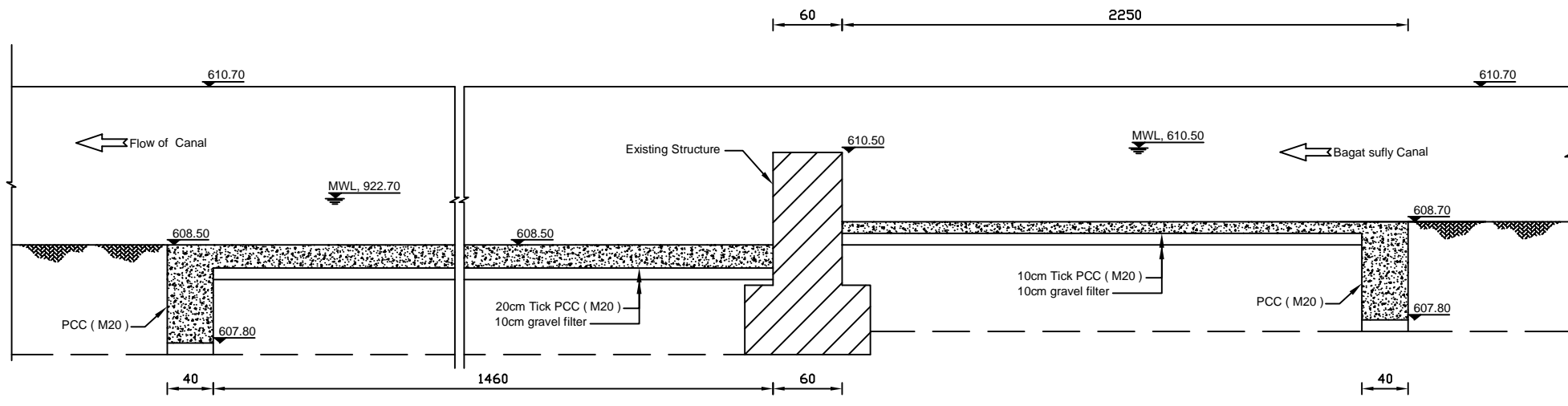
Revision

Drawing Scale: As shown

Date: Oct 2019



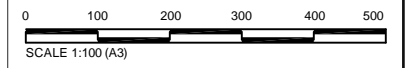
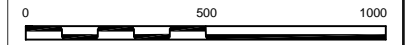
SECTION C - C
Scale: 1:50



SECTION D - D
Scale: 1:50

Notes:

All kind of concrete are Air-Entrained concrete



Rev.	By	Chkd	Aprvd	Date	Description

Client:
ISLAMIC REPUBLIC OF AFGHANISTAN
MINISTRY OF ENERGY AND WATER



Basin: Helmand River Basin
Helmand River Middle Sub Basin

Project: Bagat Sufli Canal
District : Khanishin
Province : Helmand

Drawing:
SECTION C-C and D-D

Surveyed by: PCU Survey Team	Revision
Designed by:	
Drawn by: Eng. Esmatullah Waziri	
Checked by: Eng. Mohammad Anwar Zahin	
Approved by:	
Drawing No: Bagat Sufli / 025	Revision
Drawing Scale: As shown	Date: Oct 2019