

**PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT, KHYBER PAKHTUNKHWA**



**ZAKAR KHEL DAM (NORTH WAZIRISTAN)**

**October-2021**

**TENDER DOCUMENTS  
Volume -II (Drawings)**

**RHC** Rehman Habib Consultants Private Limited

160 Airline Society Khayaban- e- Jinnah, near Shaukat Khanum Lahore Pakistan  
Tel: 042 35314993, Fax: 042 35956009



Perfect Engineering & Management Consultants (PEMC)



Cascade Group of Engineering (CGEC)



## ZAKAR KHEL DAM (Tender Drawings)

Sr No	Drawing Name	No of Drawings	Drawing	Sr No	Drawing Name	No of Drawings	Drawing
<b>General</b>				<b>Conduit</b>			
1	General Layout Plan	1	ZKD-TD-GEN-01	21	Outlet Structure detail	1	ZKD-TD-IC-05
2	Topographic Survey Plan	1	ZKD-TD-GEN-02	22	Pedestrain Bridge L-Section	3	ZKD-TD-IC-06(3 Sheets)
3	Reservior Area Plan	1	ZKD-TD-GEN-03	<b>Irrigation</b>			
4	Surface Geological Plan and profile	1	ZKD-TD-GEN-04	23	Irrigation Layout Plan	1	ZKD-TD-IR-01
5	Bore Hole location Plan	1	ZKD-TD-GEN-05	24	Chakbandi Plan	1	ZKD-TD-IR-02
<b>Dam</b>				25	Main Canal Plan and Profile	10	ZKD-TD-IR-03(10 Sheets)
6	Dam Layout Plan	1	ZKD-TD-MD-01	26	Distributaroy Plan and Profile	4	ZKD-TD-IR-04(4 Sheets)
7	Dam Longitudinal Section	1	ZKD-TD-MD-02	27	Irriagion canal Typical Sections	6	ZKD-TD-IR-05(6 Sheets)
8	Dam Typical Cross Section	1	ZKD-TD-MD-03	28	Typical Syphon Strcture	5	ZKD-TD-IR-06(5 Sheets)
9	Dam Cross Sections	3	ZKD-TD-MD-04(3 Sheets)	29	Typical Aqueduct Strcture	11	ZKD-TD-IR-07(11 Sheets)
10	Instrumentation Detail	1	ZKD-TD-MD-05	30	Typical outlet Strcture	1	ZKD-TD-IR-08
11	Main Dam Grouting Plan & Profile	2	ZKD-TD-MD-06(2 Sheets)	31	Typical fall Strcture	1	ZKD-TD-IR-09
<b>Spillway</b>				32	Typical drainage Culvert	1	ZKD-TD-IR-10
12	Spillway Layout Plan	1	ZKD-TD-SP-01	33	Typical Road Culvert	1	ZKD-TD-IR-11
13	Spillway Logitudinal section	3	ZKD-TD-SP-02(3 Sheets)	34	Distributaroy Offtake Structure	1	ZKD-TD-IR-12
14	Spillway Cross Sections	6	ZKD-TD-SP-03(6 Sheets)	35	Access Road Layout Plan	1	ZKD-TD-AR-01
15	Spillway Cross Sections Concrete Outline	4	ZKD-TD-SP-04(4 Sheets)	36	Access Profile and Typical Section	1	ZKD-TD-AR-02
16	Spillway Reinforcement Details	4	ZKD-TD-SP-05(4 Sheets)	37	Water Supply Plan	2	ZKD-TD-WS-01(2 Sheets)
<b>Conduit</b>				38	Surface Water Tank	2	ZKD-TD-WS-02(2 Sheets)
17	Conduit layout plan	1	ZKD-TD-IC-01	39	Water Filtration Tank	2	ZKD-TD-WS-03(2 Sheets)
18	Conduit Cross sections	1	ZKD-TD-IC-02				
19	Intake tower Concrete Outline	2	ZKD-TD-IC-03(2 Sheets)				
20	Intake tower Reinforcement Details	2	ZKD-TD-IC-04(2 Sheets)				

**Total 93 Sheets**

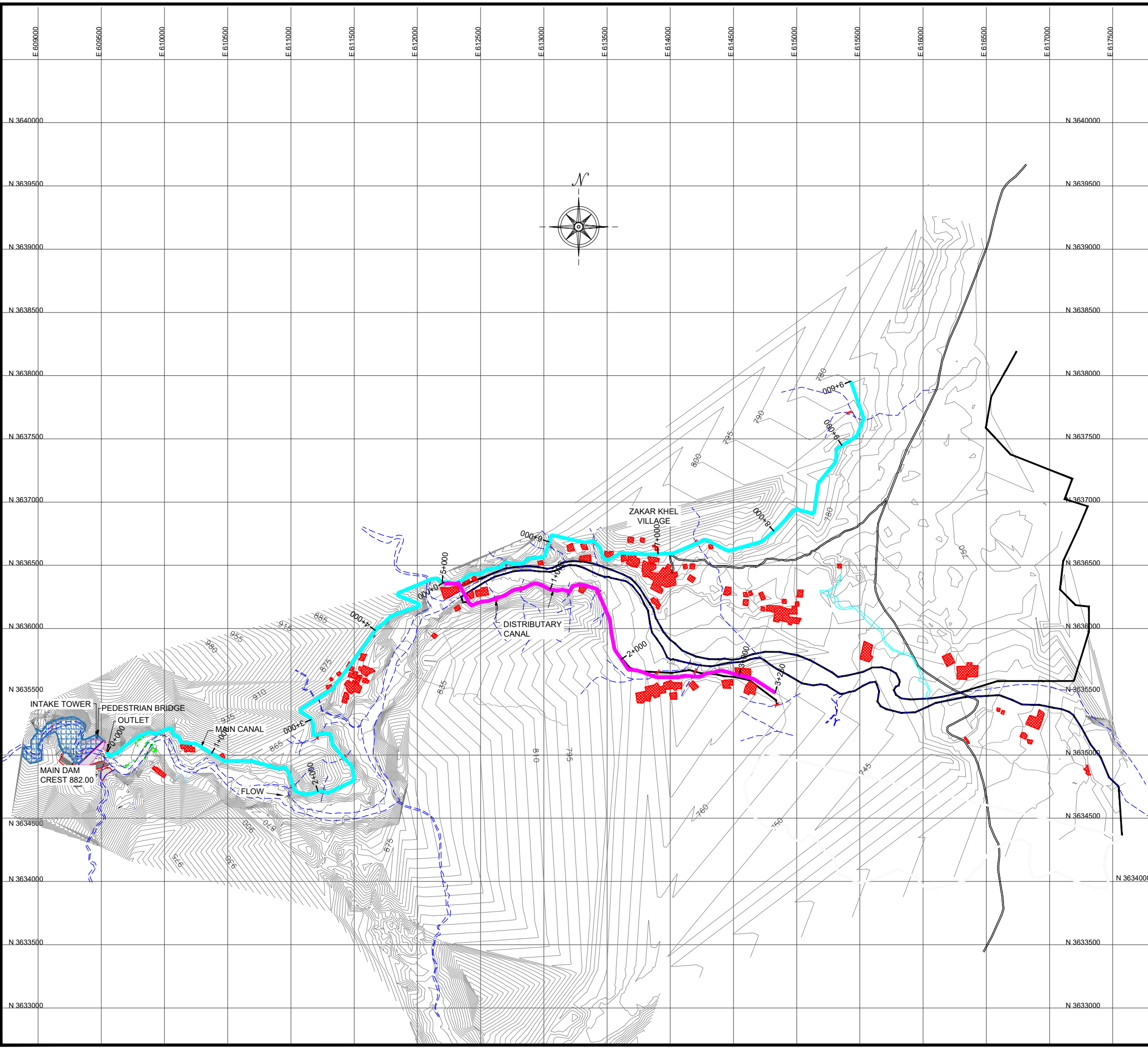




# GENERAL DRAWINGS


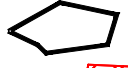






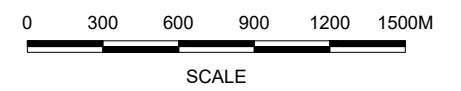
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**NOTES:-**

1. ALL LEVELS AND DIMENSIONS ARE IN METER

- RESERVOIR AREA 
- COMMAND AREA Boundary 
- HOUSES 
- MAIN CANAL 
- DISTRIBUTARY 
- NULLAH BOUNDARY ROAD 



**REFERENCE DRAWINGS :-**

- ZKD-TD-GEN-02    ZKD-TD-GEN-04
- ZKD-TD-GEN-03    ZKD-TD-GEN-05

**DRAWING IS RELEASED**

**FOR TENDER DRAWINGS ONLY**

CLIENT:  
**PSU SMALL DAM SECTION MERGED AREA IRRIGATION DEPARTMENT. KPK.**

CONSULTANTS:                    A J.V OF  
**RHC REHMAN HABIB CONSULTANTS (PVT) LTD.**

 **CASCADE GROUP OF ENGINEERING & CONSULTANTS**

 **PERFECT ENGINEERING & MANAGEMENT CONSULTANTS**

PROJECT:  
**CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAIL DESIGN AND PREPARATION OF PC-1 FOR SALL DAMS IN FATA (PACKAGE - X)**

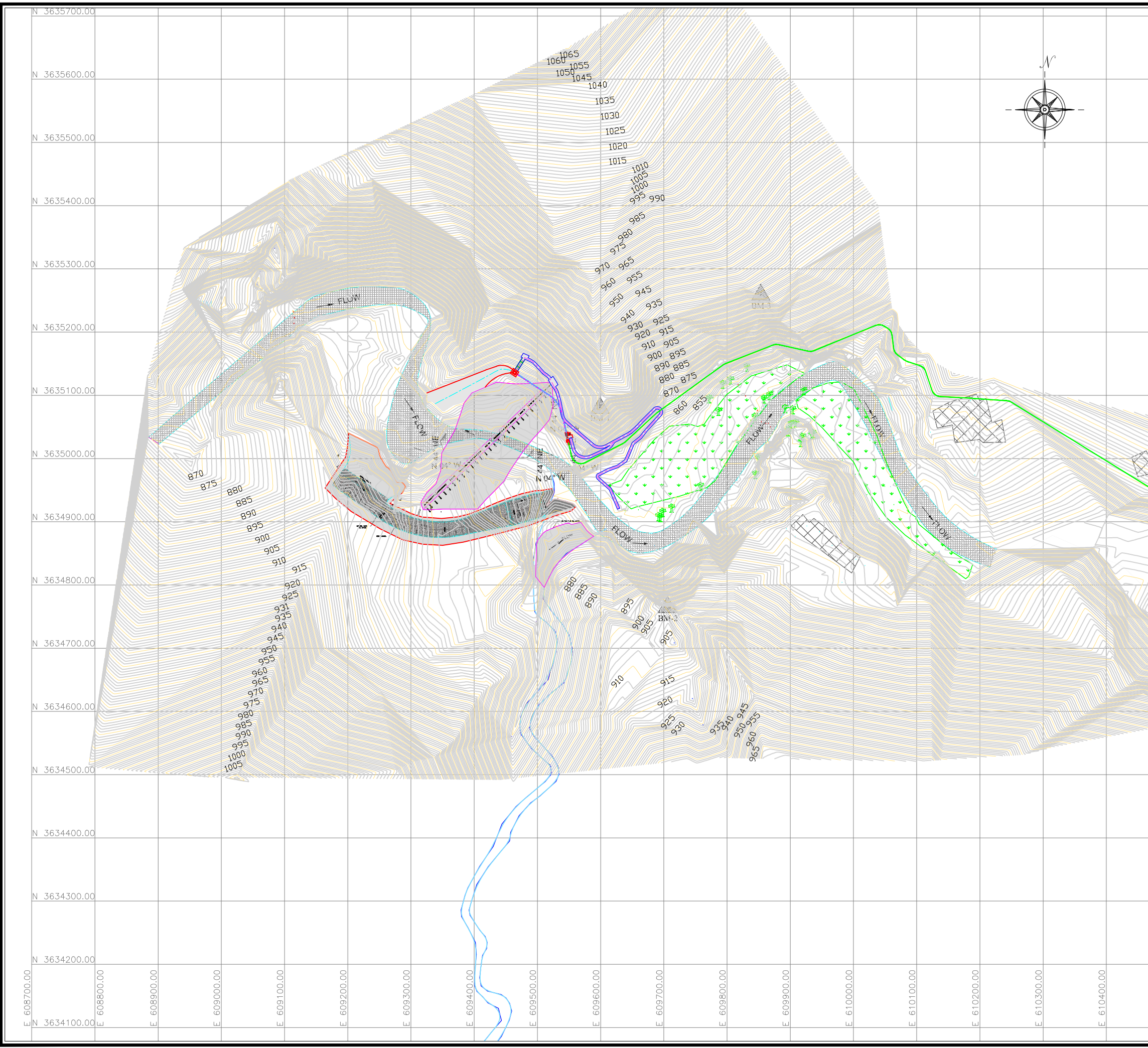
TITLE:  
**ZAKAR KHEL DAM NORTH WAZIRISTAN TENDER DRAWINGS**  
**GENERAL LAYOUT PLAN**

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Showing	June 2021
DRG.No:- ZKD-TD-GEN-01				SHEET:-	
				SUB SH.	





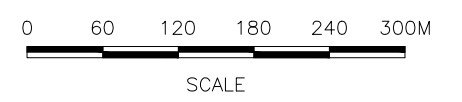
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- NOTES:**
1. ALL DIMENSIONS AND LEVELS ARE IN METERS.
  2. UTM ZONE 42

**BM COORDINATES**

B-M #	EASTING	NORTHING
1	609599.110	3635079.805
2	609705.872	3634764.867
3	609853.289	3635258.396



**LEGEND:-**

- EXISTING PIPE LINE
- BM
- BUILDING
- FIELD
- CONTOUR\_IDX
- CONTOUR
- TREE
- RETAINING WALL

**REFERENCE DRAWINGS :-**

- ZKD-TD-GEN-01 ZKD-TD-GEN-04
- ZKD-TD-GEN-03 ZKD-TD-GEN-05

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MANAGEMENT CONSULTANTS**

PROJECT:  
**CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN AND PREPARATION OF PC-1 FOR  
SMALL DAMS IN FATA (PACKAGE - X)**

TITLE:  
**ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS  
TOPOGRAPHY SURVEY PLAN**

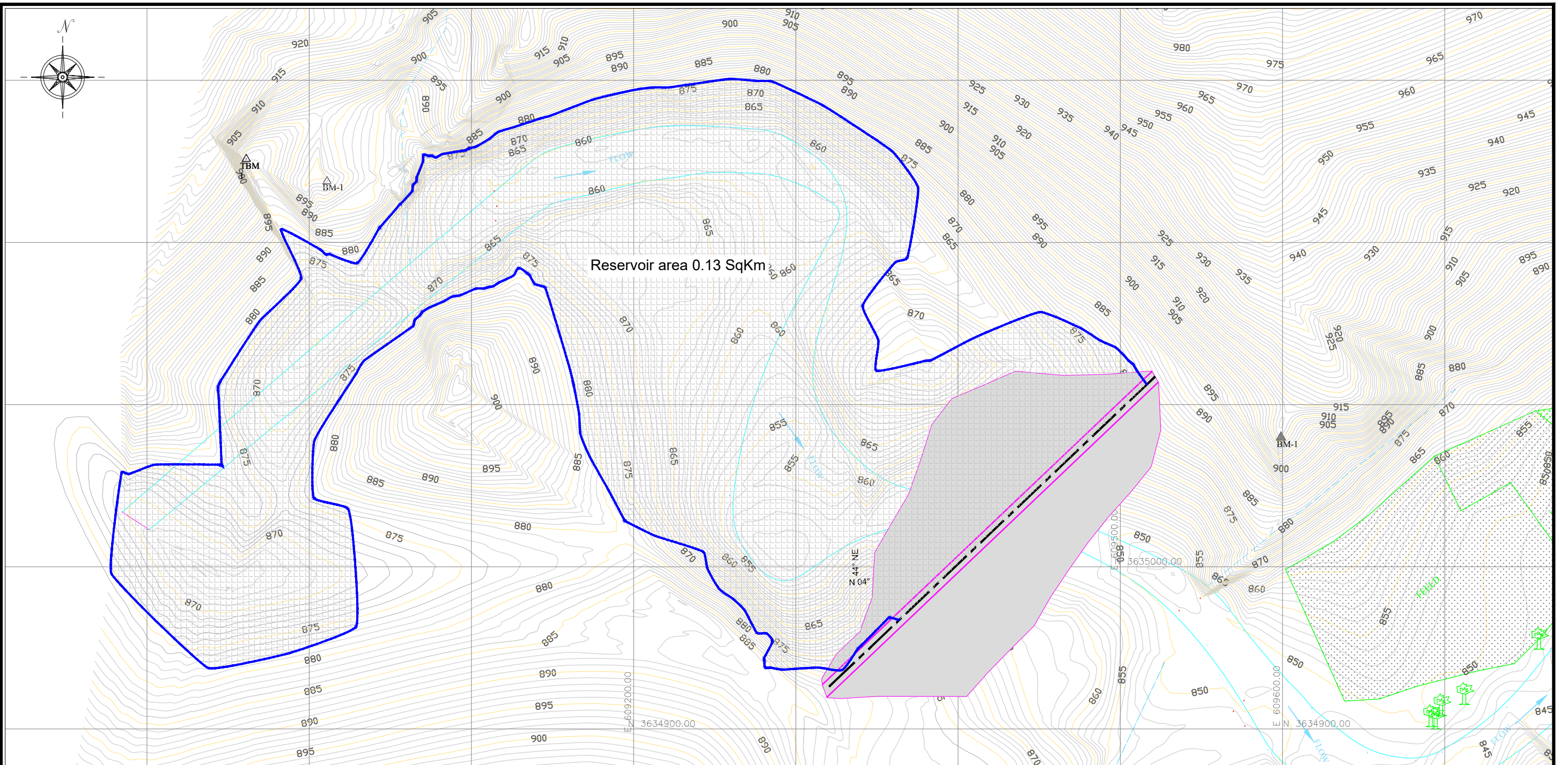
DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Showing	June 2024

DRG.No:- ZKD-TD-GEN-02 SHEET:- SUB SH.





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**LEGEND:-**

- WATER
- RESERVOIR BOUNDARY
- NULLAH EDGE
- CREEK
- BM
- BUILDING
- CONTOUR\_IDX
- CONTOUR
- TREE

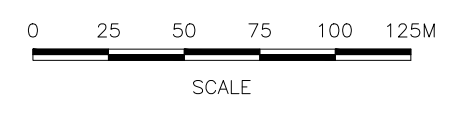
**BM COORDINATES**

B-M #	EASTING	NORTHING
1	609599.110	3635079.805
2	609705.872	3634764.867
3	609853.289	3635258.396

**NOTES:**

1. ALL DIMENSIONS AND LEVELS ARE IN METERS.
2. UTM ZONE 42

FOR DRAFT DETAIL DESIGN ONLY



CLIENT:  
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IRRIGATION DEPARTMENT. KPK.

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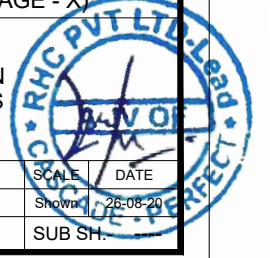
CASCAD GROUP  
OF ENGINEERING & CONSULTANTS

PERFECT ENGINEERING &  
MANAGEMENT CONSULTANTS

PROJECT:  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN AND PREPARATION OF PC-1 FOR  
5 SMALL DAMS IN FATA (PACKAGE - X)

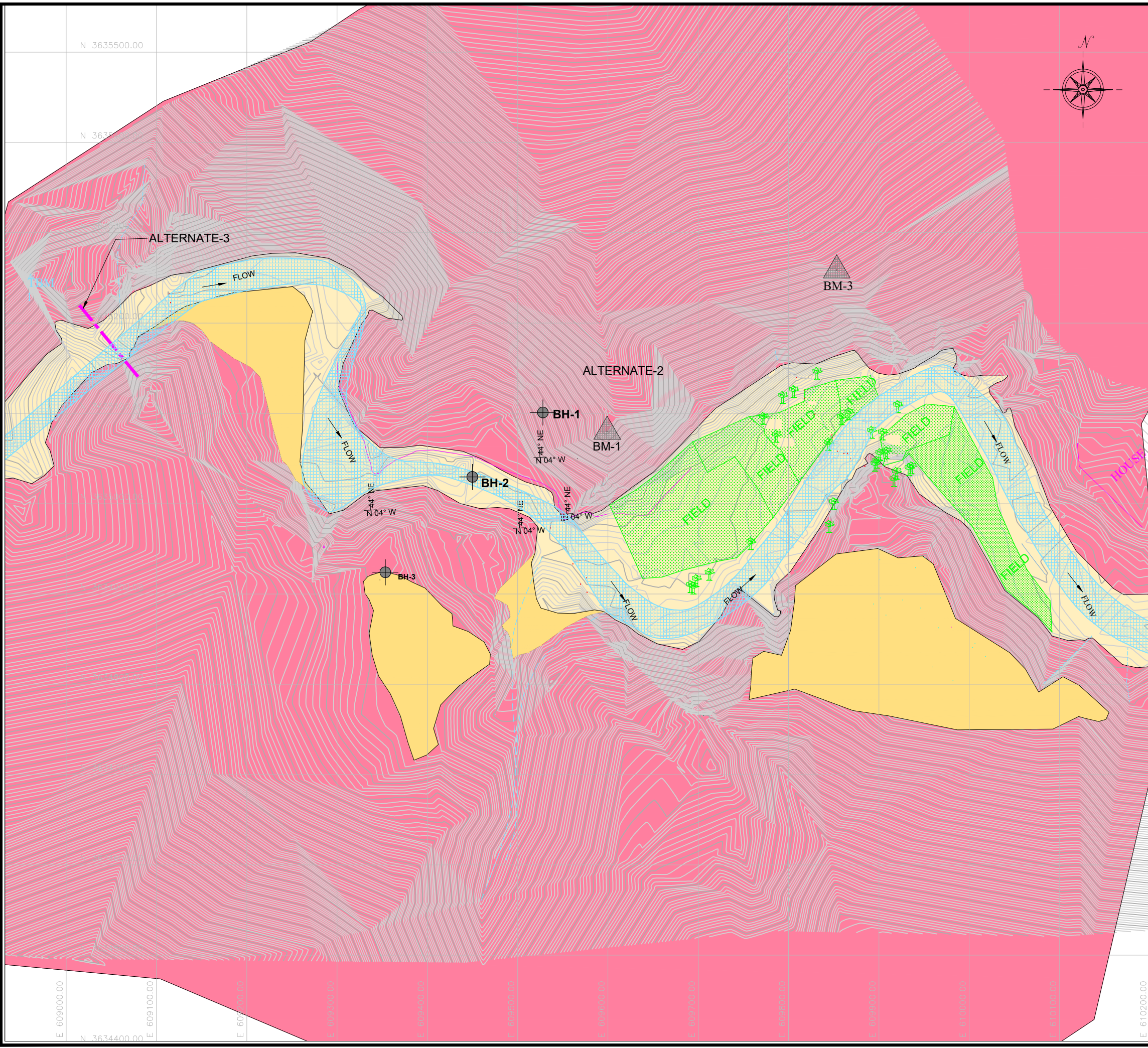
TITLE:  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS  
RESERVOIR AREA

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Ammar N.	Zakair A.	Zeeshan S.	Zafar Iqbal	Shown	26-08-20
DRG.No:- ZKD-TD-GEN-03				SHEET:- SUB SH.	





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**NOTES:**

- ALL DIMENSIONS AND LEVELS ARE IN METERS.
- UTM ZONE 42

**BM COORDINATES**

B-M #	EASTING	NORTHING
1	609599.110	3635079.805
2	609705.872	3634764.867
3	609853.289	3635258.396

0 42 84 126 168 210M

**LEGEND:-** SCALE

EXISTING PIPE LINE

BM

BUILDING

FIELD

CONTOUR\_IDX

CONTOUR

TREE

RETAINING WALL

**GEOLOGICAL LEGEND**

ROCKS FORMATION	{ LIMESTONE INTERBEDDED SHALE	
ALLUVIUM	{ SUBRECENT ALLUVIUM RECENT ALLUVIUM	

EXISTING CHANNAL

DIP AND STRICKE

44° NE  
N 04° W

**REFERENCE DRAWINGS :-**

ZKD-TD-GEN-01 ZKD-TD-GEN-03  
ZKD-TD-GEN-02 ZKD-TD-GEN-05

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CLIENT:  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

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 PERFECT ENGINEERING & MANAGEMENT CONSULTANTS

PROJECT:  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN AND PREPARATION OF PC-1 FOR 5  
SMALL DAMS IN FATA (PACKAGE - X)

ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS

TITLE:  
**SURFACE GEOLOGICAL PLAN**

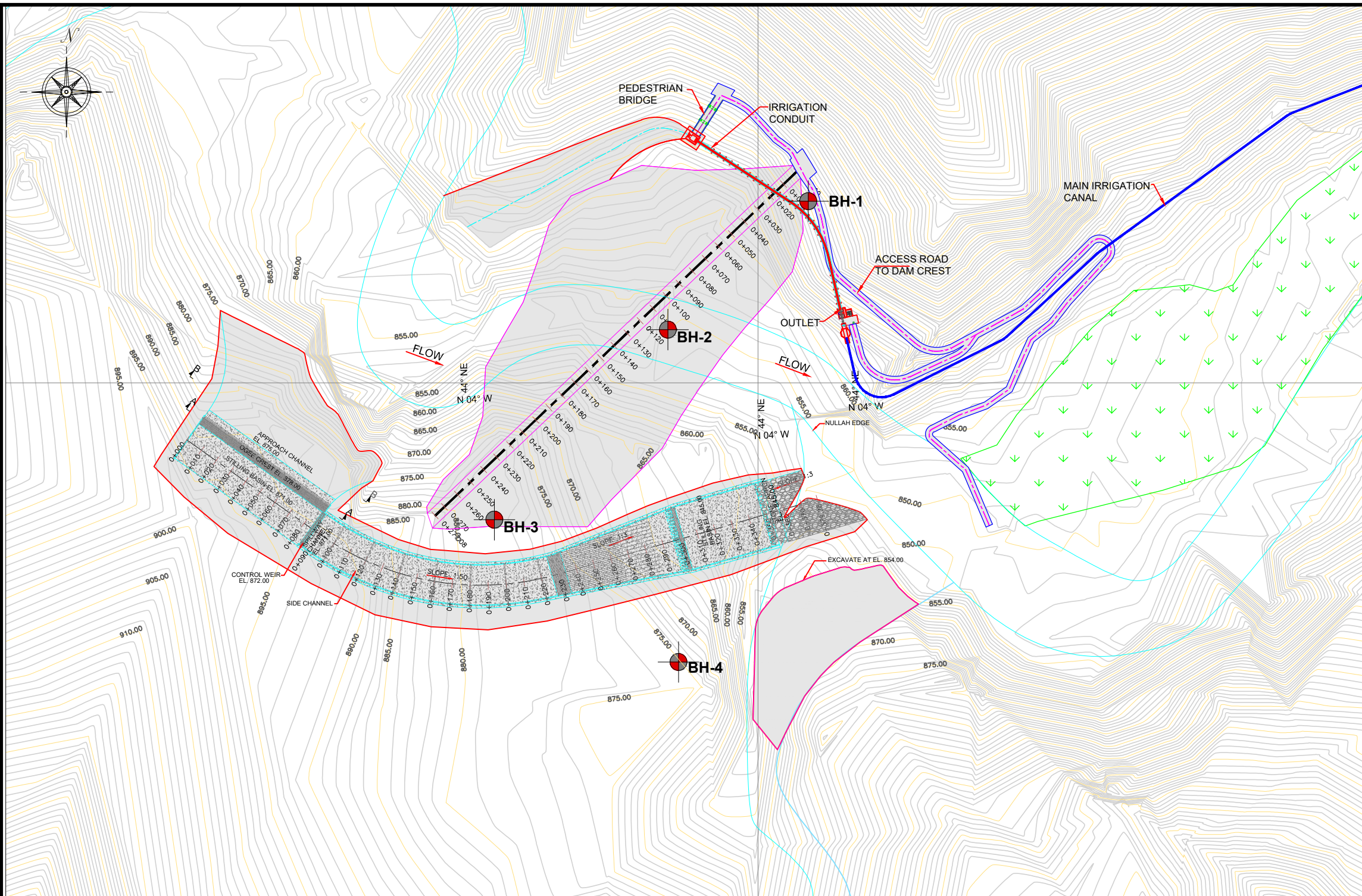
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Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	1:1	June 2024

DRG.No:ZKD-TD-GEN-04 SHEET:- SUB SH.





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2. UTM ZONE 42

**REFERENCE DRAWINGS :-**

- ZKD-TD-GEN-01 ZKD-TD-GEN-03
- ZKD-TD-GEN-02 ZKD-TD-GEN-04

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**CASCADE GROUP OF ENGINEERING & CONSULTANTS**  
**PERFECT ENGINEERING & MANAGEMENT CONSULTANTS**

**PROJECT:**  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN AND PREPARATION OF PC-1 FOR 5  
SMALL DAMS IN FATA (PACKAGE - X)

**TITLE:**  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS  
BOREHOLE LOCATION PLAN

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2024
DRG.No:- ZKD-TD-GEN-05			SHEET:-		SUB SH.

**LEGEND:-**

- WATER
- RESERVOIR BOUNDARY
- NULLAH EDGE
- CREEK
- BM
- BUILDING
- CONTOUR\_IDX
- CONTOUR
- TREE
- FIELD

**BOREHOLE COORDINATES**

BH. #	EASTING	NORTHING
BH-1	609527.939	3635100.868
BH-2	609449.932	3635029.528
BH-3	609353.555	3634923.960
BH-4	609455.797	3634844.942

**BM COORDINATES**

B-M #	EASTING	NORTHING
1	609599.110	3635079.805
2	609705.872	3634764.867
3	609853.289	3635258.396

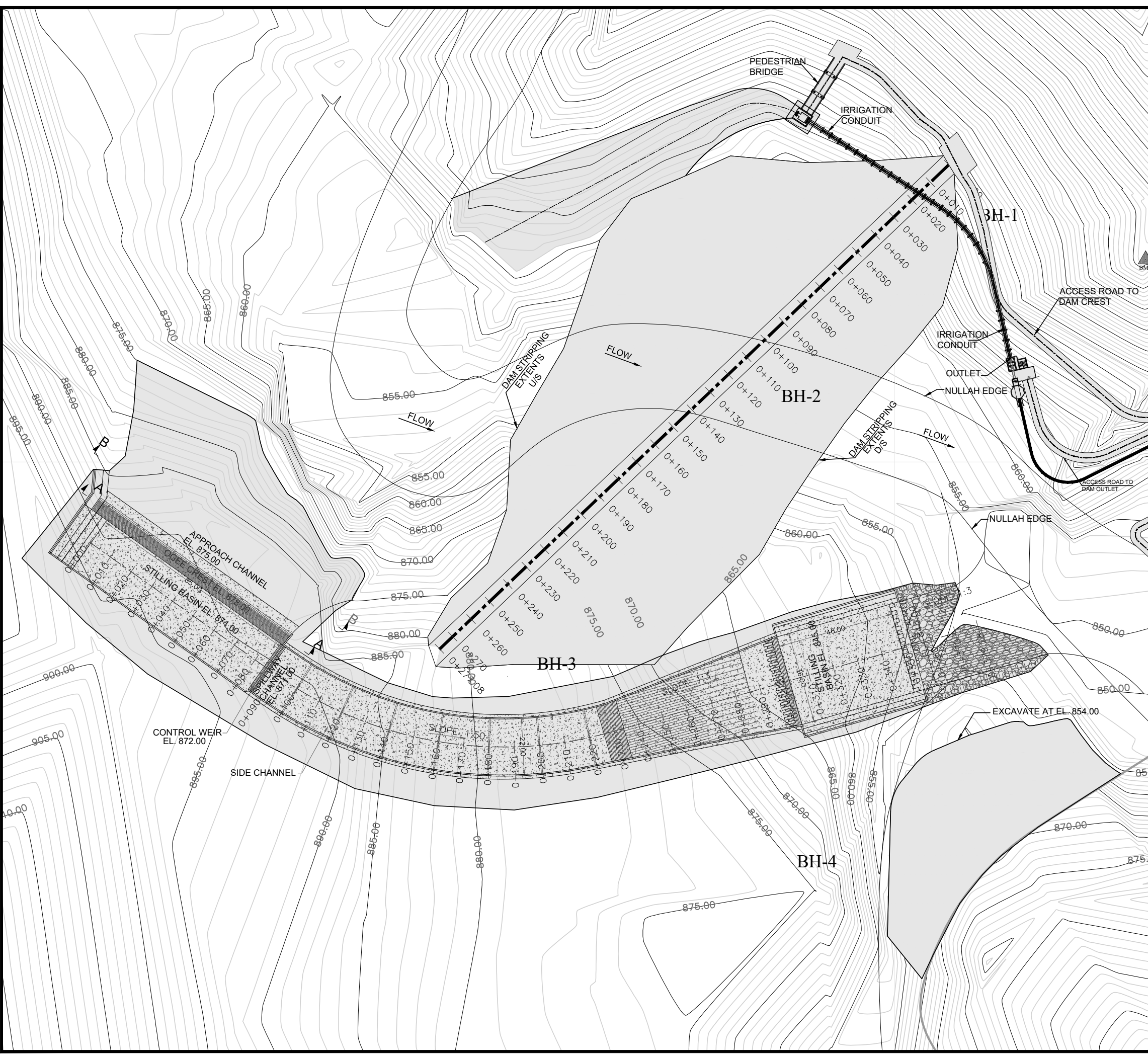




# MAIN DAM



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**NOTES:**

1. ALL DIMENSIONS AND LEVELS ARE IN METERS.

**DAM CENTER LINE COORDINATES**

RD	EASTING	NORTHING
0+000	609521.438	3635117.201
0+020	609506.945	3635103.419
0+040	609492.451	3635089.637
0+060	609477.957	3635075.856
0+080	609463.464	3635062.074
0+100	609448.970	3635048.292
0+120	609434.477	3635034.511
0+140	609419.983	3635020.729
0+160	609405.489	3635006.947
0+180	609390.996	3634993.166
0+200	609376.502	3634979.384
0+220	609362.009	3634965.602
0+240	609347.515	3634951.820
0+260	609333.021	3634938.039
0+277	609320.642	3634926.267



**REFERENCE DRAWINGS :-**

ZKD-TD-MD-02 ZKD-TD-MD-04 (1 to 3) ZKD-TD-MD-06 (1 to 2)  
 ZKD-TD-MD-03 ZKD-TD-MD-05

DRAWING IS RELEASED

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CLIENT:  
 PSU SMALL DAM SECTION MERGED AREA  
 IRRIGATION DEPARTMENT. KPK.

CONSULTANTS: A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.

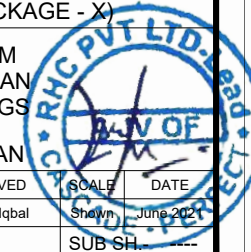
**CASCAD** CASCADE GROUP  
 OF ENGINEERING & CONSULTANTS

**PEMG** PERFECT ENGINEERING &  
 MANAGEMENT CONSULTANTS

PROJECT:  
 CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
 DETAIL DESIGN AND PREPARATION OF PC-1 FOR 5  
 SMALL DAMS IN FATA (PACKAGE - X)

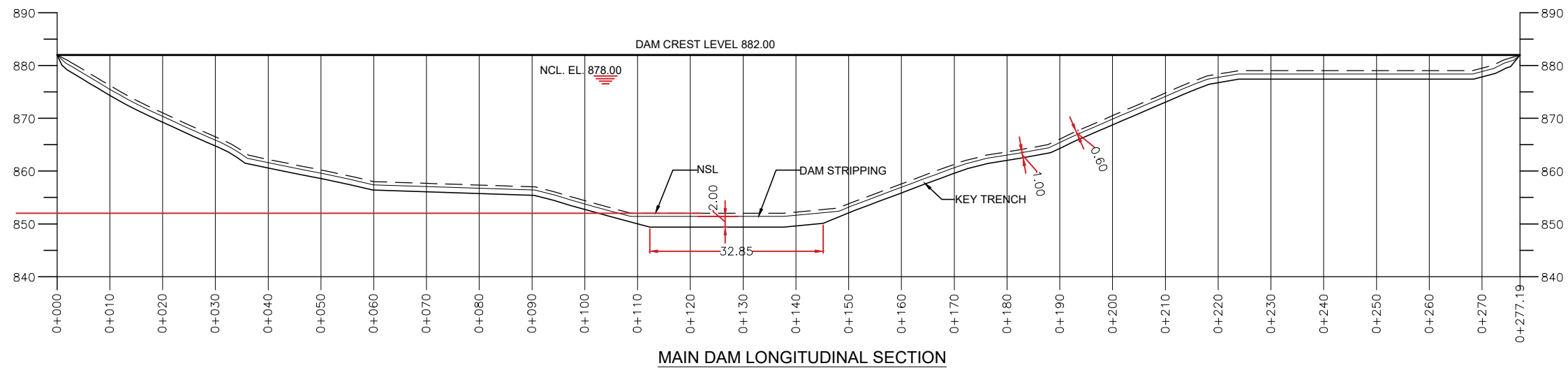
TITLE:  
 ZAKAR KHEL DAM  
 NORTH WAZIRISTAN  
 TENDER DRAWINGS  
 DAM LAYOUT PLAN

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021
DRG.No:- ZKD-TD-MD-01			SHEET:-		SUB SH.---



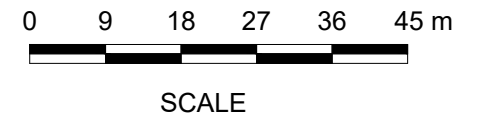


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**NOTES:**

1. ALL DIMENSIONS AND LEVELS ARE IN METERS.



**REFERENCE DRAWINGS :-**

ZKD-TD-MD-01 ZKD-TD-MD-04 (1 to 3) ZKD-TD-MD-06 (1 to 2)  
 ZKD-TD-MD-03 ZKD-TD-MD-05

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**CLIENT:**  
 PSU SMALL DAM SECTION MERGED AREA  
 IRRIGATION DEPARTMENT. KPK.

**CONSULTANTS:** A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.

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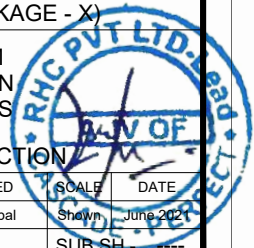
**PEMC** PERFECT ENGINEERING &  
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 DETAIL DESIGN AND PREPARATION OF PC-1 FOR 5  
 SMALL DAMS IN FATA (PACKAGE - X)

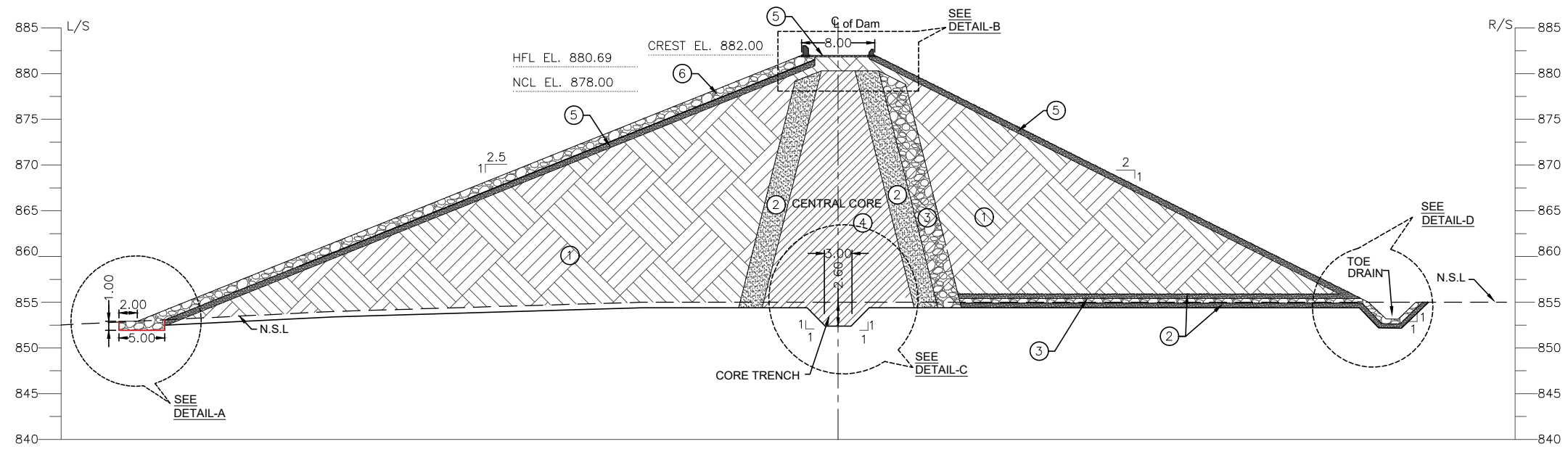
**TITLE:**  
 ZAKAR KHEL DAM  
 NORTH WAZIRISTAN  
 TENDER DRAWINGS  
 DAM LONGITUDINAL SECTION

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021

DRG.No:- ZKD-TD-MD-02 SHEET:- SUB SH.---



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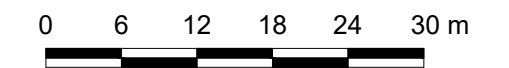
MAIN DAM TYPICAL CROSS SECTION

**NOTES:**

1. ALL DIMENSIONS AND LEVELS ARE IN METERS UNLESS OTHERWISE MENTIONED.
2. EARTHFILL TO BE COMPACTED AT 95% OF MAXIMUM DRY DENSITY DETERMINED THROUGH MODIFIED AASHTO COMPACTION T-180.
3. THE GRADATION CURVE FOR COMPACTED EARTHFILL WILL BE PREPARED ON THE BASIS OF LABORATORY TEST RESULTS OBTAINED FROM TEST PITS OF BORROW AREAS.
4. THE GRADATION ENVELOP FOR FINE FILTER & COARSE FILTER WILL BE PREPARED ON THE BASIS OF LABORATORY TEST RESULTS OBTAINED FROM TEST PITS OF BORROW AREAS.
5. THE RIP RAP MATERIAL TO WITHSTAND VERY SEVERE ACTION FROM WAVES AND DESTRUCTIVE FORCES ASSOCIATED WITH FREEZING AND THAWING, WETTING & DRYING. CLAY STONE / SILTSTONE SHALL NOT BE USED. MAXIMUM SIZE OF ROCK FRAGMENTS UPTO 600MM IS ALLOWED.

**MATERIAL TYPES:-**

- ① SHELL MATERIAL
- ② FINE FILTER
- ③ COARSE FILTER
- ④ CENTRAL CORE
- ⑤ SHINGLE GRAVEL / ROCK SPAWL
- ⑥ STONE PITCHING



SCALE

**REFERENCE DRAWINGS :-**

- ZKD-TD-MD-01 ZKD-TD-MD-04 (1 to 3) ZKD-TD-MD-06 (1 to 2)
- ZKD-TD-MD-02 ZKD-TD-MD-05

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CLIENT:  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

CONSULTANTS: A J.V OF  
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OF ENGINEERING & CONSULTANTS

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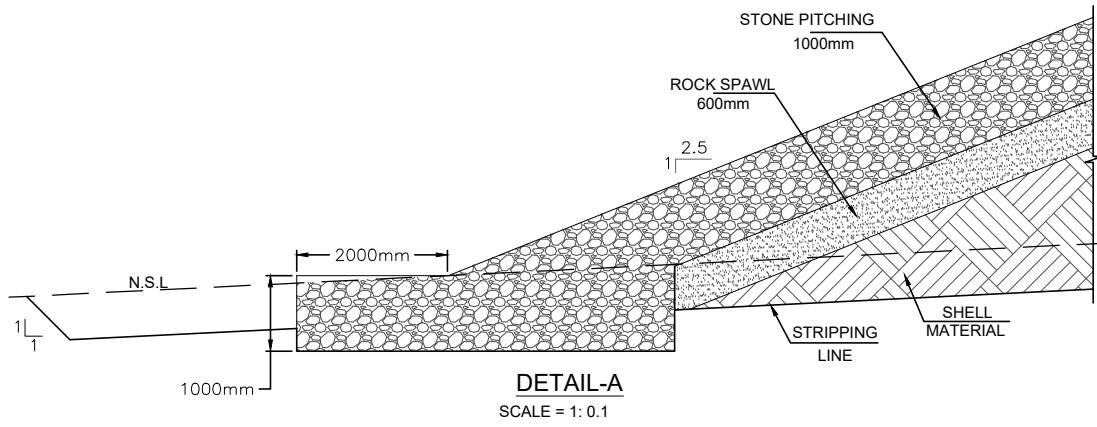
PROJECT:  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN AND PREPARATION OF PC-1 FOR 5  
SMALL DAMS IN FATA (PACKAGE - X)

TITLE:  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS

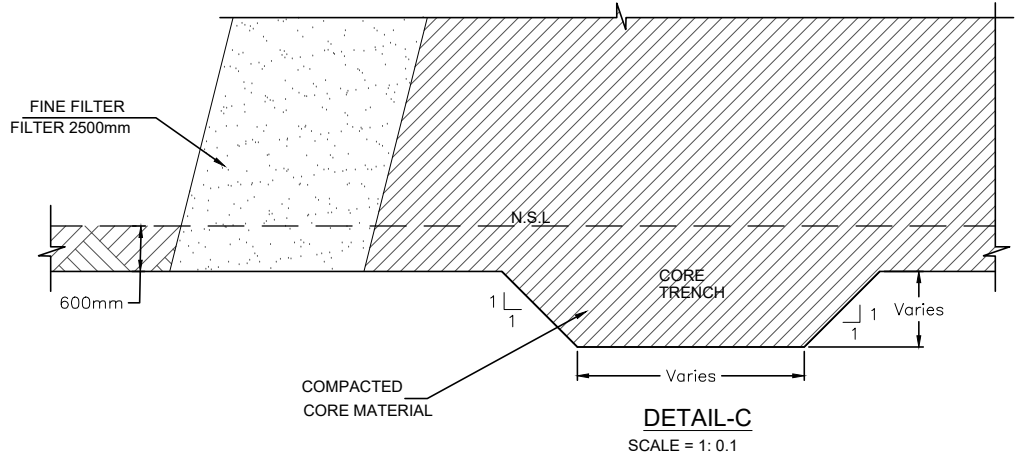
MAIN DAM TYPICAL SECTION

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	1:0.13	June 2021

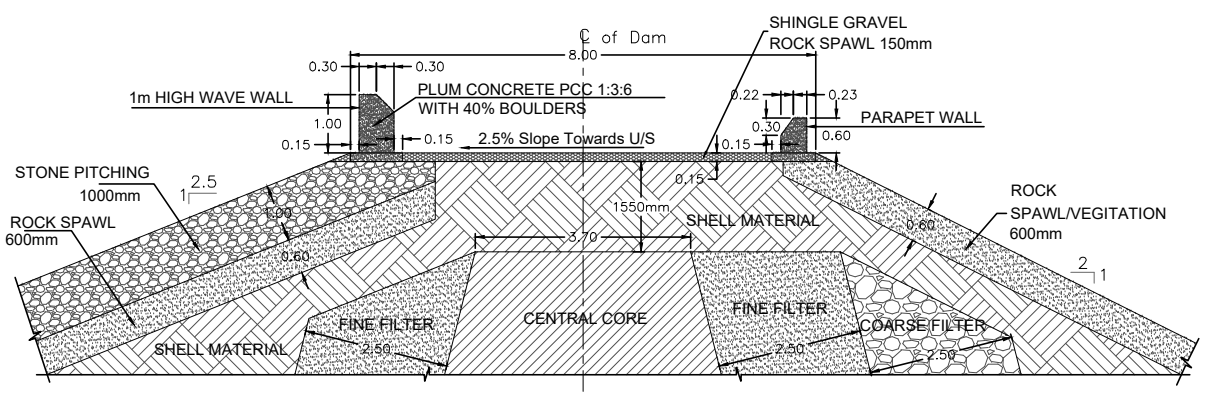
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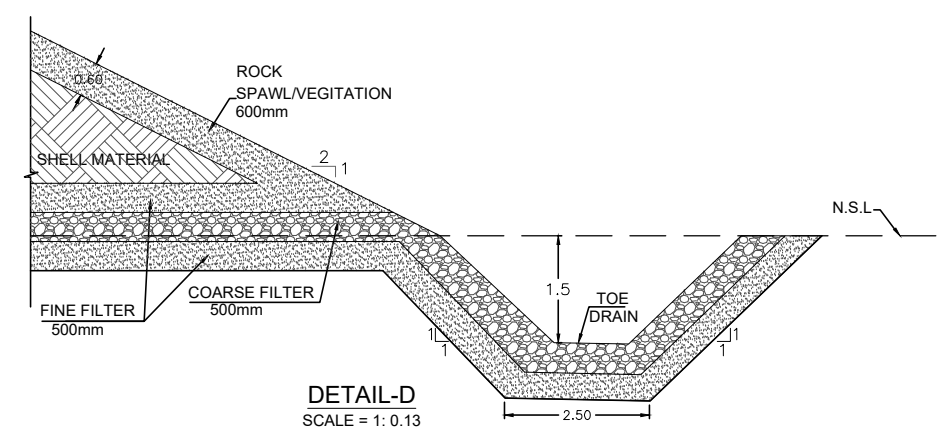
DETAIL-A  
SCALE = 1: 0.1



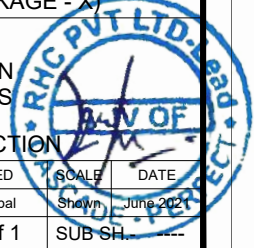
DETAIL-C  
SCALE = 1: 0.1



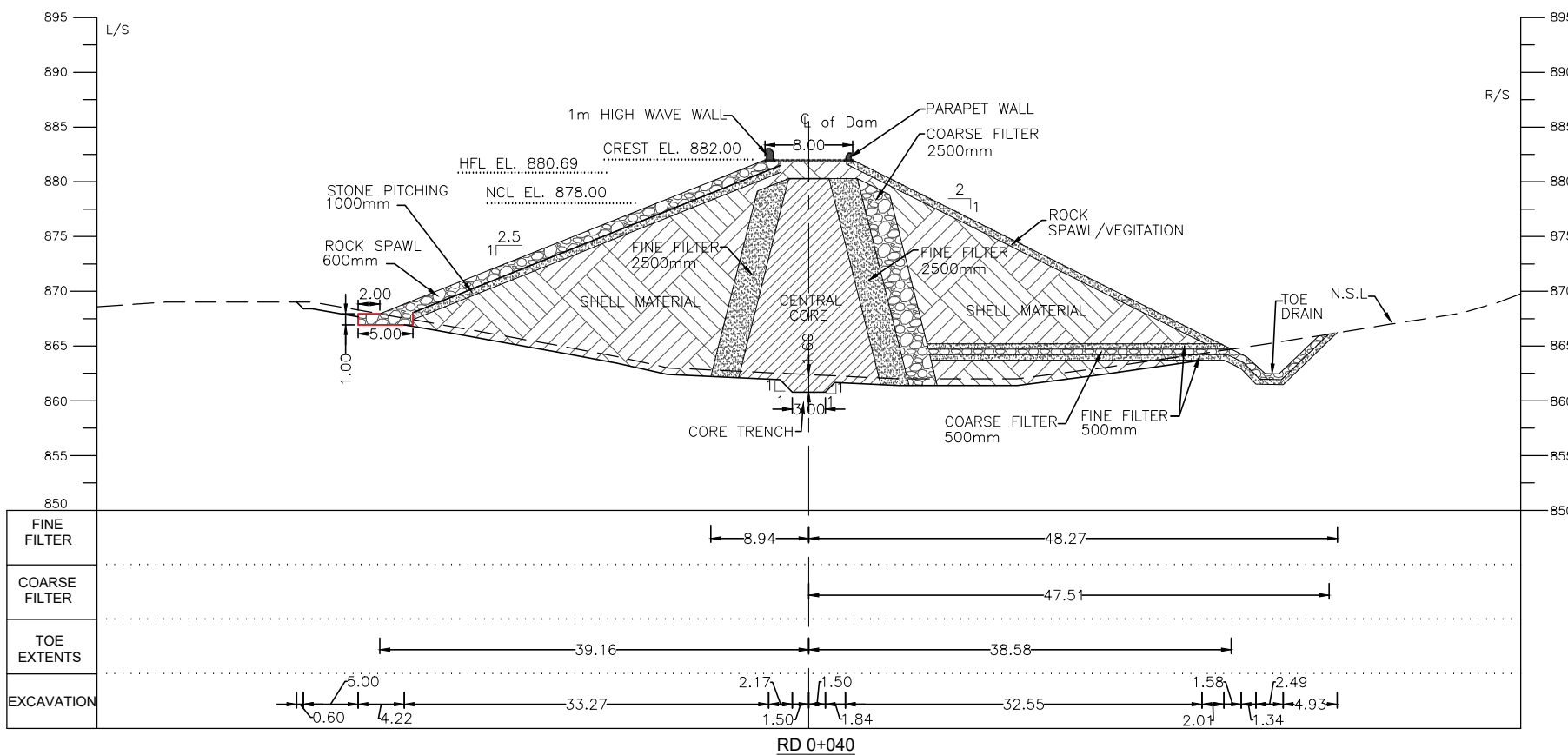
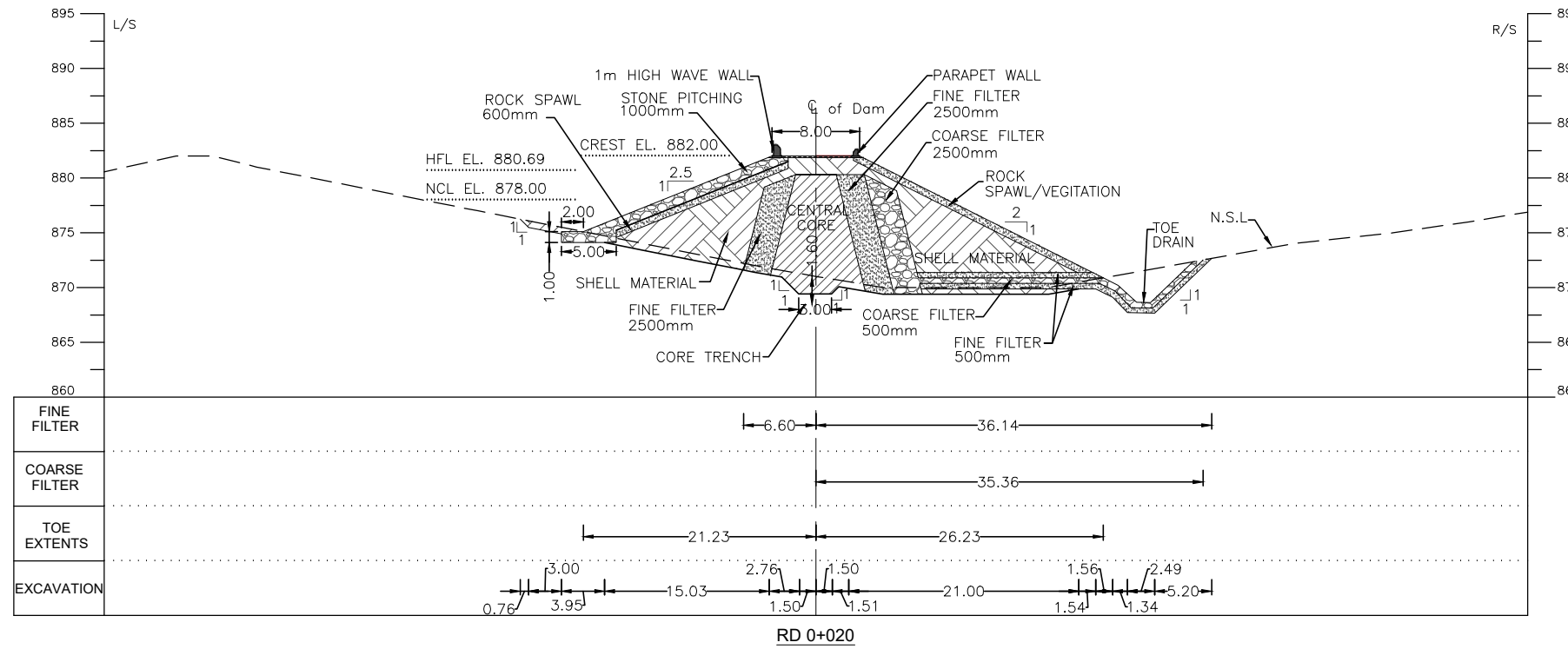
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SCALE = 1: 0.13



DETAIL-D  
SCALE = 1: 0.13

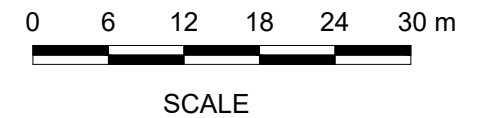


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**NOTES:**

1. ALL DIMENSIONS AND LEVELS ARE IN METERS UNLESS OTHERWISE MENTIONED.
2. EARTHFILL TO BE COMPACTED AT 95% OF MAXIMUM DRY DENSITY DETERMINED THROUGH MODIFIED AASHTO COMPACTION T-180.
3. THE GRADATION CURVE FOR COMPACTED EARTHFILL WILL BE PREPARED ON THE BASIS OF LABORATORY TEST RESULTS OBTAINED FROM TEST PITS OF BORROW AREAS.
4. THE GRADATION ENVELOPE FOR FINE FILTER WILL BE PREPARED ON THE BASIS OF LABORATORY TEST RESULTS OBTAINED FROM TEST PITS OF BORROW AREAS.
5. THE GRADATION ENVELOPE FOR COARSE FILTER WILL BE PREPARED ON THE BASIS OF LABORATORY TEST RESULTS OBTAINED FROM TEST PITS OF BORROW AREAS.
6. THE RIP RAP MATERIAL TO WITHSTAND VERY SEVERE ACTION FROM WAVES AND DESTRUCTIVE FORCES ASSOCIATED WITH FREEZING AND THAWING, WETTING & DRYING. CLAY STONE / SILTSTONE SHALL NOT BE USED. MAXIMUM SIZE OF ROCK FRAGMENTS UPTO 600MM IS ALLOWED.



**REFERENCE DRAWINGS :-**

ZKD-TD-MD-01 ZKD-TD-MD-03 ZKD-TD-MD-06 ( 1 to 2 )  
 ZKD-TD-MD-02 ZKD-TD-MD-05

**DRAWING IS RELEASED**

**FOR TENDER DRAWINGS ONLY**

CLIENT:  
**PSU SMALL DAM SECTION MERGED AREA  
 IRRIGATION DEPARTMENT. KPK.**

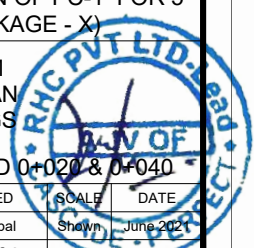
CONSULTANTS: A J.V OF  
**RHC REHMAN HABIB CONSULTANTS (PVT) LTD.**  
**CASCADE GROUP OF ENGINEERING & CONSULTANTS**  
**PERFECT ENGINEERING & MANAGEMENT CONSULTANTS**

PROJECT:  
**CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
 DETAIL DESIGN AND PREPARATION OF PC-1 FOR 5  
 SMALL DAMS IN FATA (PACKAGE - X)**

**ZAKAR KHEL DAM  
 NORTH WAZIRISTAN  
 TENDER DRAWINGS**

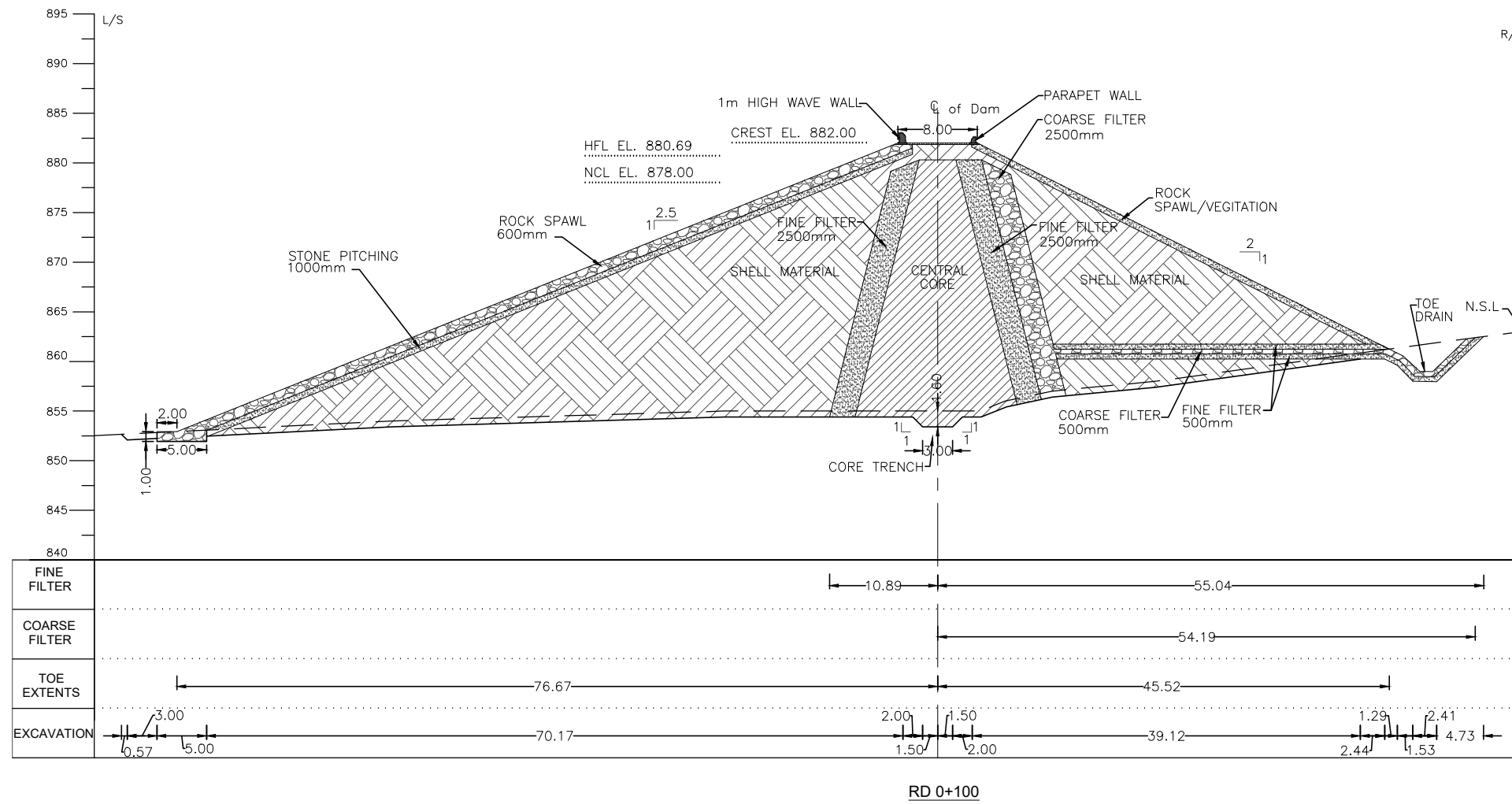
TITLE:  
**MAIN DAM CROSS SECTION AT RD 0+020 & 0+040**

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021
DRG.No:-ZKD-TD-MD-04			SHEET:-1 of 3	SUB SH.	





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RD 0+100

**NOTES:**

1. ALL DIMENSIONS AND LEVELS ARE IN METERS UNLESS OTHERWISE MENTIONED.
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0 6 12 18 24 30 m

SCALE

**REFERENCE DRAWINGS :-**

ZKD-TD-MD-01 ZKD-TD-MD-03 ZKD-TD-MD-06 ( 1 to 2 )  
ZKD-TD-MD-02 ZKD-TD-MD-05

DRAWING IS RELEASED

FOR TENDER DRAWINGS ONLY

CLIENT:  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

CONSULTANTS: A J.V OF  
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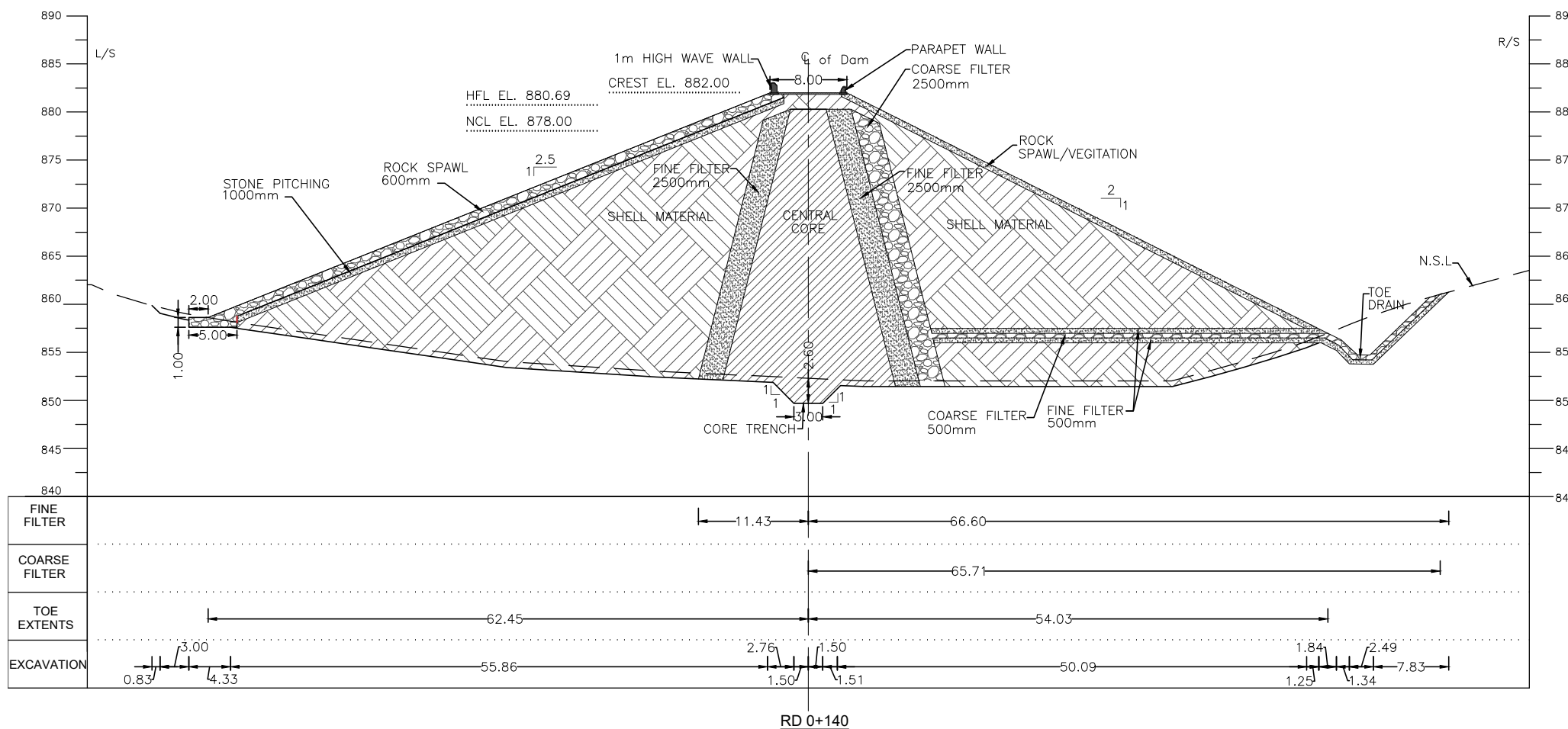
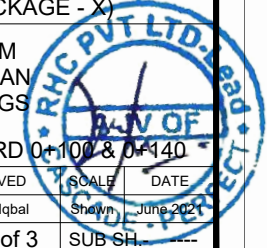
PROJECT:  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN AND PREPARATION OF PC-1 FOR 5  
SMALL DAMS IN FATA (PACKAGE - X)

ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS

TITLE:  
MAIN DAM CROSS SECTION AT RD 0+100 & 0+140

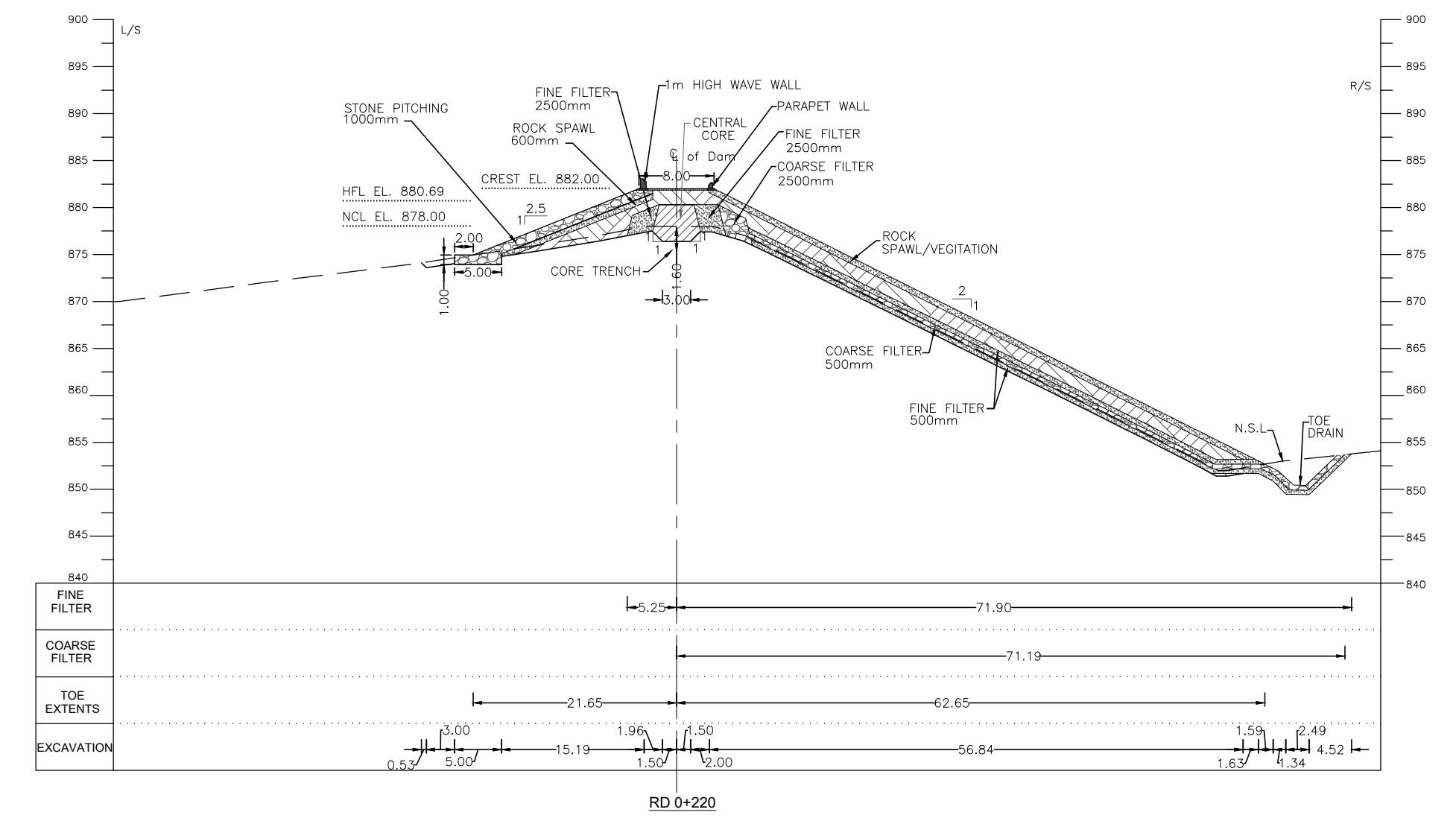
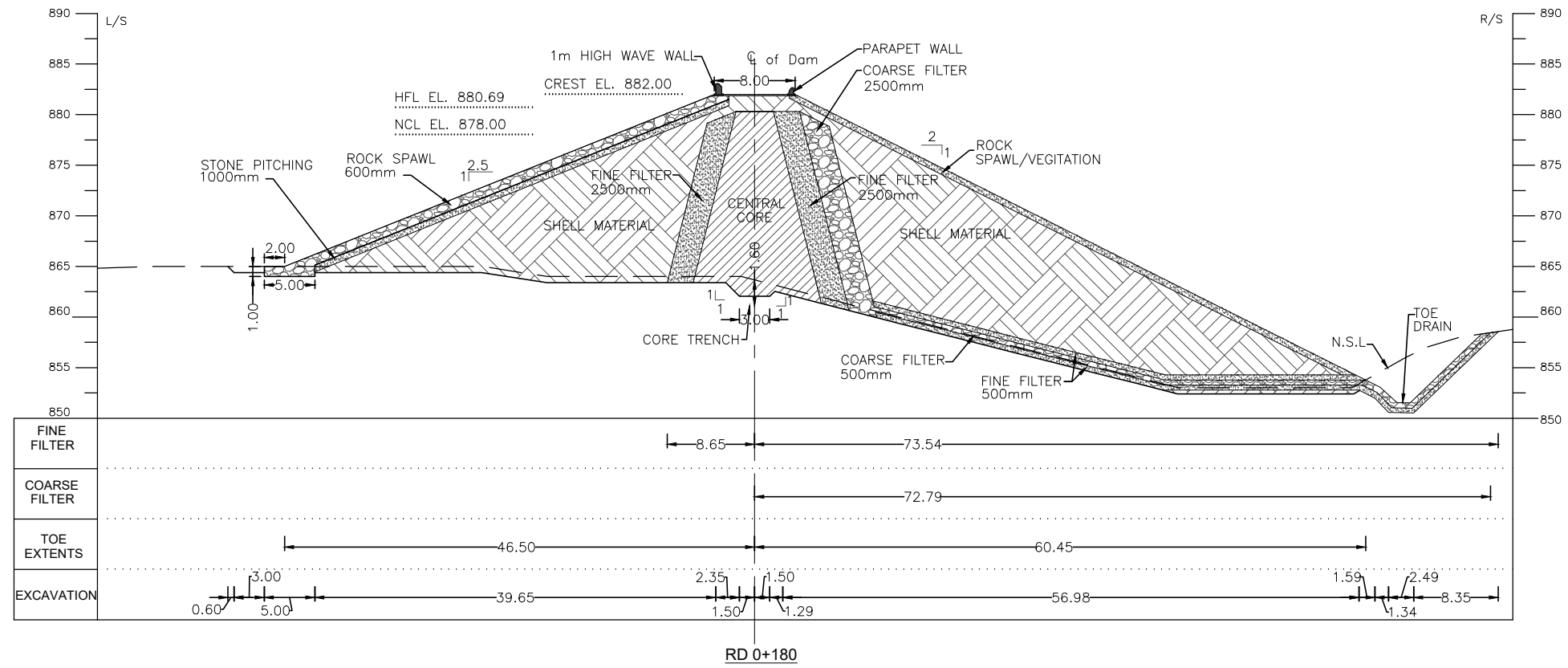
DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shawn	June 2021

DRG.No:- ZKD-TD-MD-04 SHEET:-2 of 3 SUB SH. ---



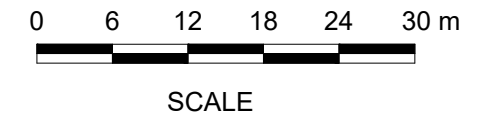
RD 0+140

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**REFERENCE DRAWINGS :-**

ZKD-TD-MD-01 ZKD-TD-MD-03 ZKD-TD-MD-06 ( 1 to 2 )  
 ZKD-TD-MD-02 ZKD-TD-MD-05

DRAWING IS RELEASED

FOR TENDER DRAWINGS ONLY

CLIENT:  
 PSU SMALL DAM SECTION MERGED AREA  
 IRRIGATION DEPARTMENT. KPK.

CONSULTANTS: A J.V OF  
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**PEMC** PERFECT ENGINEERING &  
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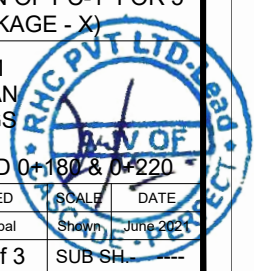
PROJECT:  
 CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
 DETAIL DESIGN AND PREPARATION OF PC-1 FOR 5  
 SMALL DAMS IN FATA (PACKAGE - X)

ZAKAR KHEL DAM  
 NORTH WAZIRISTAN  
 TENDER DRAWINGS

TITLE:  
 MAIN DAM CROSS SECTION AT RD 0+180 & 0+220

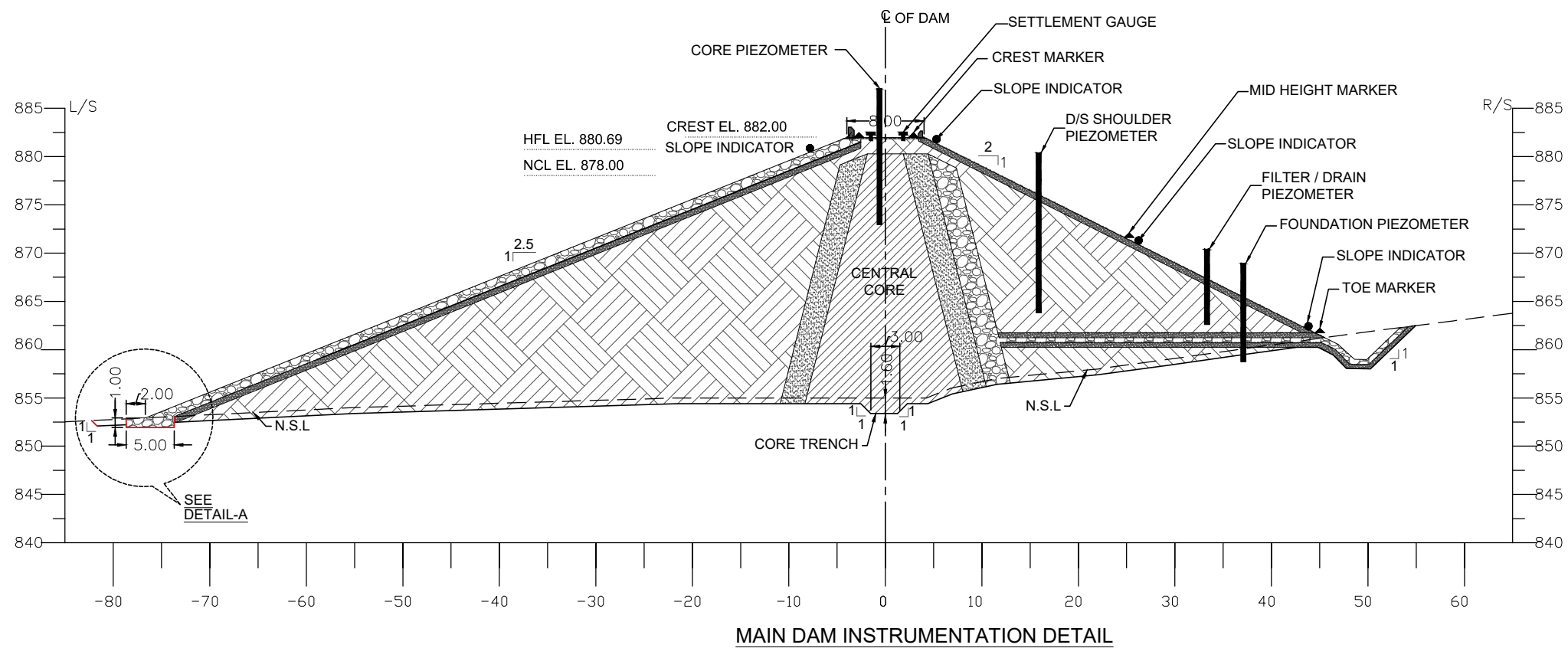
DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021

DRG.No:- ZKD-TD-MD-04 SHEET:-3 of 3 SUB SH.





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**NOTES:-**  
1. ALL LEVELS AND DIMENSIONS ARE IN METER

**LEGEND**

SYMBOL	DESCRIPTION	PURPOSE
▲	MARKER	TO OBSERVE HORIZONTAL & VERTICAL MOVEMENTS
I	PIEZOMETER	TO OBSERVE PORE WATER PRESSURE
●	SLOPE INDICATOR	TO OBSERVE LATERAL MOVEMENT IN FILL
T	SETTLEMENT GAUGE	TO OBSERVE SETTLEMENT OF FOUNDATION & CONSOLIDATION OF FILL



**REFERENCE DRAWINGS :-**  
ZKD-TD-MD-01 ZKD-TD-MD-03 ZKD-TD-MD-06 ( 1 to 2 )  
ZKD-TD-MD-02 ZKD-TD-MD-04(1 to 3)

**DRAWING IS RELEASED**  
 FOR TENDER DRAWINGS ONLY

**CLIENT:**  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

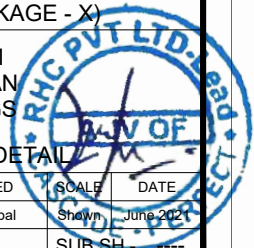
**CONSULTANTS:** A J.V OF  
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**CASCADE GROUP OF ENGINEERING & CONSULTANTS**  
**PERFECT ENGINEERING & MANAGEMENT CONSULTANTS**

**PROJECT:**  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN AND PREPARATION OF PC-1 FOR 5  
SMALL DAMS IN FATA (PACKAGE - X)

**TITLE:**  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS  
INSTRUMENTATION DETAIL

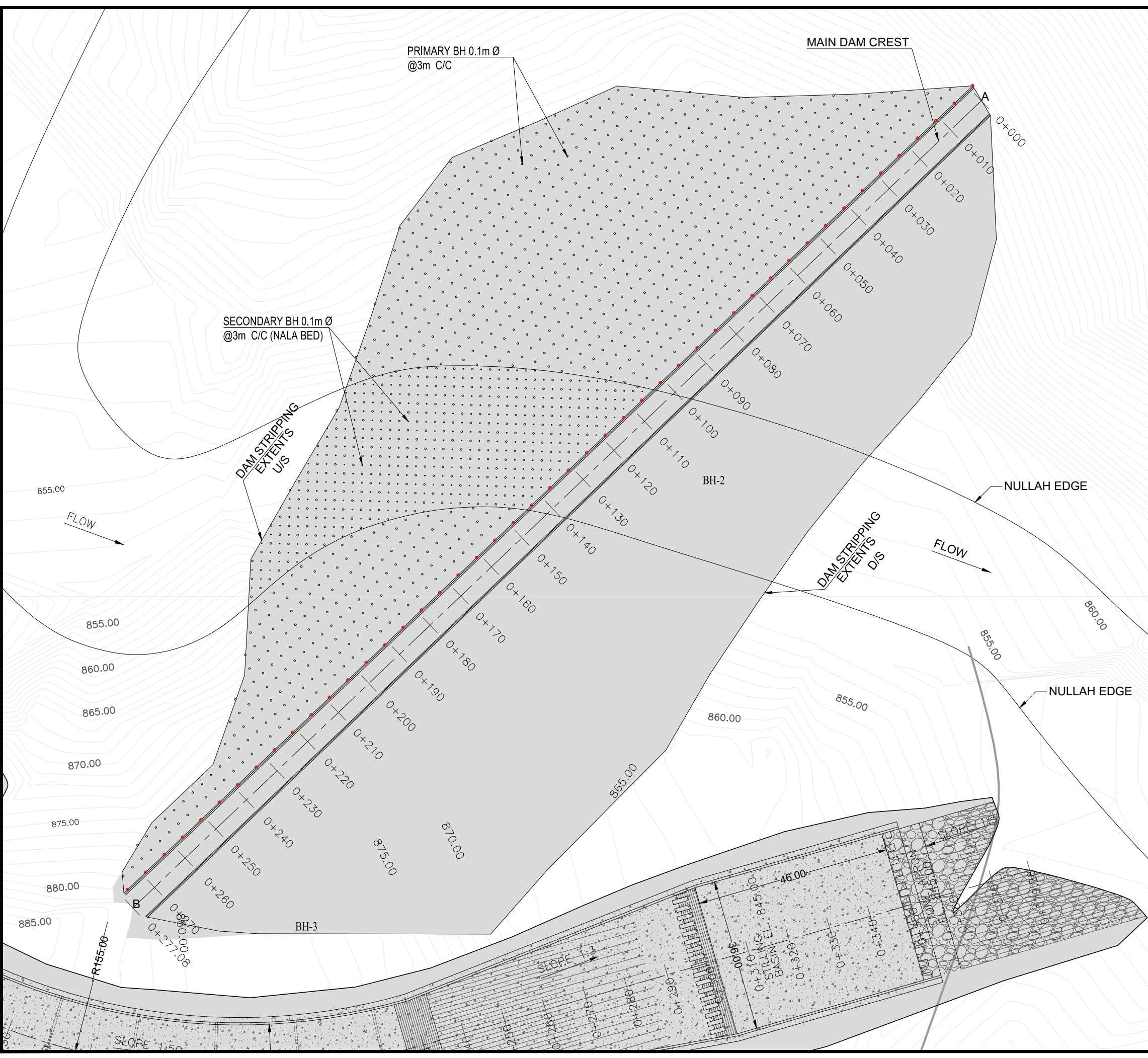
DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021

DRG.No:- ZKD-TD-MD-05 SHEET:- SUB SH. ---





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**NOTES:-**  
 1. ALL LEVELS AND DIMENSIONS ARE IN METER

**LEGEND**

- PRIMARY CONSOLIDATION GROUT
- SECONDARY CONSOLIDATION GROUT
- CURTAIN GROUT

**SCALE**

**REFERENCE DRAWINGS :-**  
 ZKD-TD-MD-01    ZKD-TD-MD-03    ZKD-TD-MD-05  
 ZKD-TD-MD-02    ZKD-TD-MD-04(1 to 3)

**DRAWING IS RELEASED**

FOR TENDER DRAWINGS ONLY

**CLIENT:**  
 PSU SMALL DAM SECTION MERGED AREA  
 IRRIGATION DEPARTMENT. KPK.

**CONSULTANTS:**    A J.V OF  
**REHMAN HABIB CONSULTANTS (PVT) LTD.**  
**CASCADE GROUP OF ENGINEERING & CONSULTANTS**  
**PERFECT ENGINEERING & MANAGEMENT CONSULTANTS**

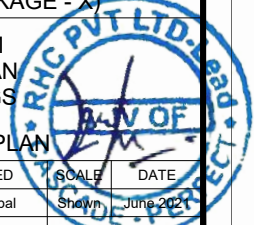
**PROJECT:**  
 CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
 DETAIL DESIGN AND PREPARATION OF PC-1 FOR 5  
 SMALL DAMS IN FATA (PACKAGE - X)

**TITLE:**  
 ZAKAR KHEL DAM  
 NORTH WAZIRISTAN  
 TENDER DRAWINGS

**MAIN DAM GROUTING PLAN**

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021

DRG.No:- ZKD-TD-MD-06    SHEET:- 1 OF 2    SUB SH.





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**PIRMARY BORHE HOLES AND DEPTH FOR GROUTING**

**CURTAIN GROUTING HOLES = 47**  
**TOTAL DRILLING (RUNNING METER) = 470 M**

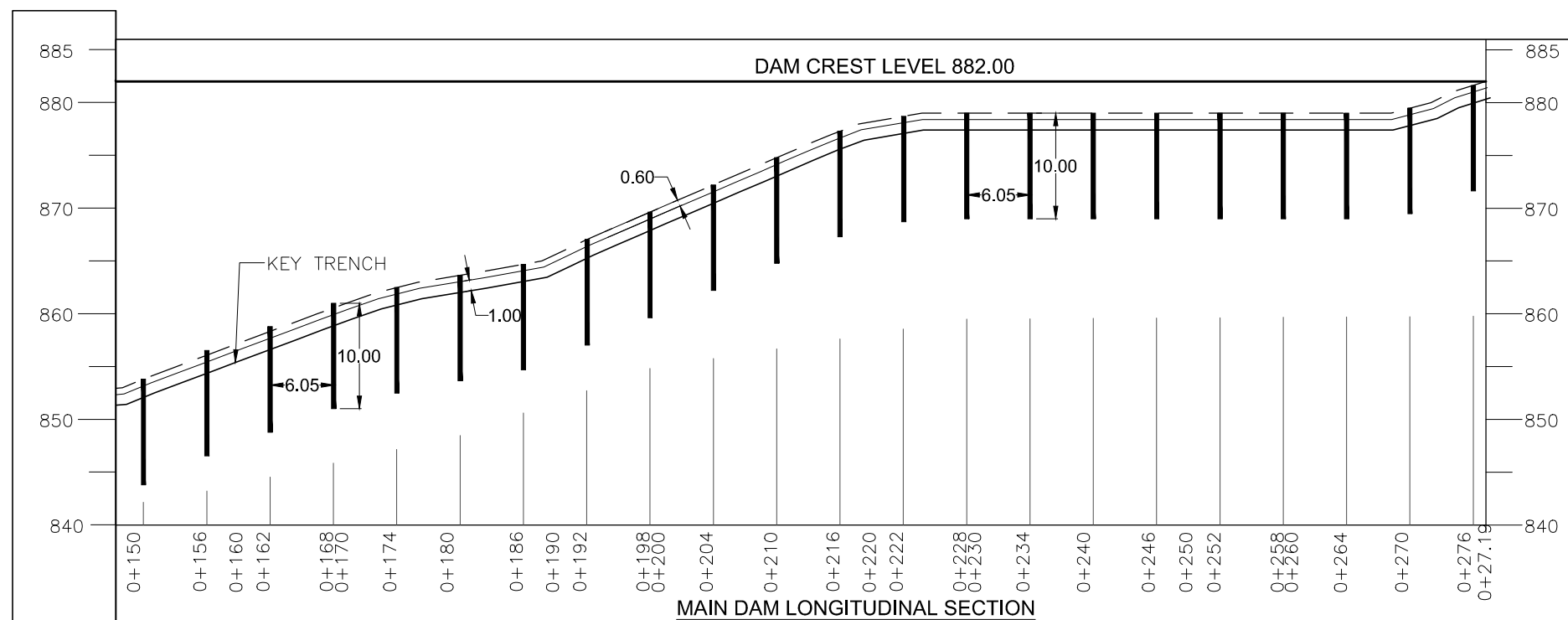
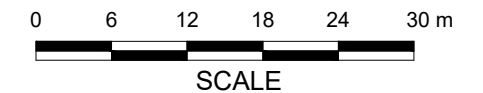
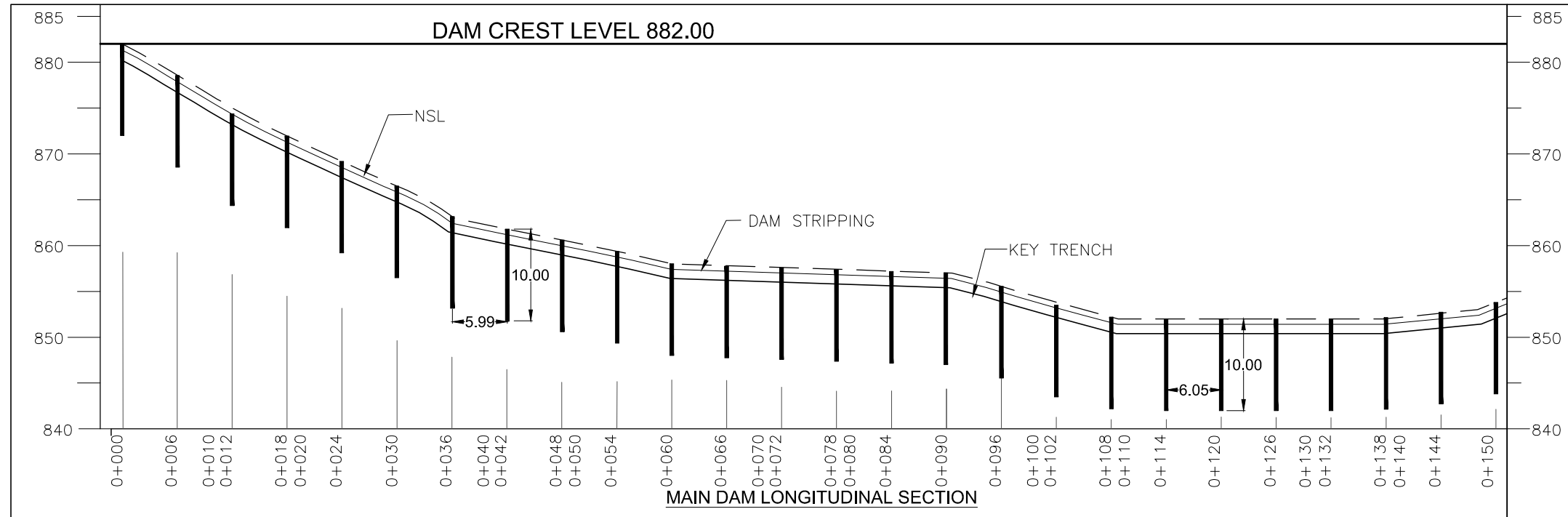
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Depth (m)	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Dam C/L RD	0	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126	132	138	144	150	156	162	168	174	180	186	192	198	204	210	216	222	228	234	240	246	252	258	264	270	276	

**NOTE:-**

- 1) THE INTERVALS OF PRIMARY HOLES ARE ON 3 METER DISTANCES. AND ALSO GROUTING WILL PERFORMED ON EACH 3 METER DEPTH.
- 2) SECONDARY HOLES ARE OFFSET ON 1.5 METER REPECTIVELY IN THE RIVER BED.
- 3) IF THE LOGION VALVE WILL NOT COM UNDER 9 AFTER GROUTING ON ABUTMENTS, ON THAT SPESIFICE RDS SECONDARY HOLES WILL DICIDED TO DRILLED AS PER SITE.
- 4) THE GROUTING IN SECONDARY HOLES WILL BE AFTER 6 METER INTEVELS.

**LEGEND**

PRIMARY CONSOLIDATION GROUT



**REFERENCE DRAWINGS :-**

ZKD-TD-MD-01 ZKD-TD-MD-03 ZKD-TD-MD-05  
 ZKD-TD-MD-02 ZKD-TD-MD-04(1 to 3)

DRAWING IS RELEASED

FOR TENDER DRAWINGS ONLY

CLIENT:  
 PSU SMALL DAM SECTION MERGED AREA  
 IRRIGATION DEPARTMENT. KPK.

CONSULTANTS: A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.

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 OF ENGINEERING & CONSULTANTS

**PERFECT ENGINEERING & MANAGEMENT CONSULTANTS**

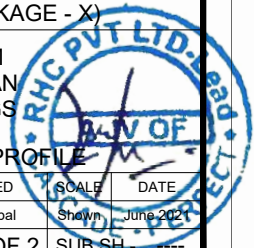
PROJECT:  
 CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
 DETAIL DESIGN AND PREPARATION OF PC-1 FOR 5  
 SMALL DAMS IN FATA (PACKAGE - X)

ZAKAR KHEL DAM  
 NORTH WAZIRISTAN  
 TENDER DRAWINGS

TITLE:  
 MAIN DAM GROUTING PROFILE

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	1:1	Shym June 2021

DRG.No:- ZKD-TD-MD-06 SHEET:-2 OF 2 SUB SH.

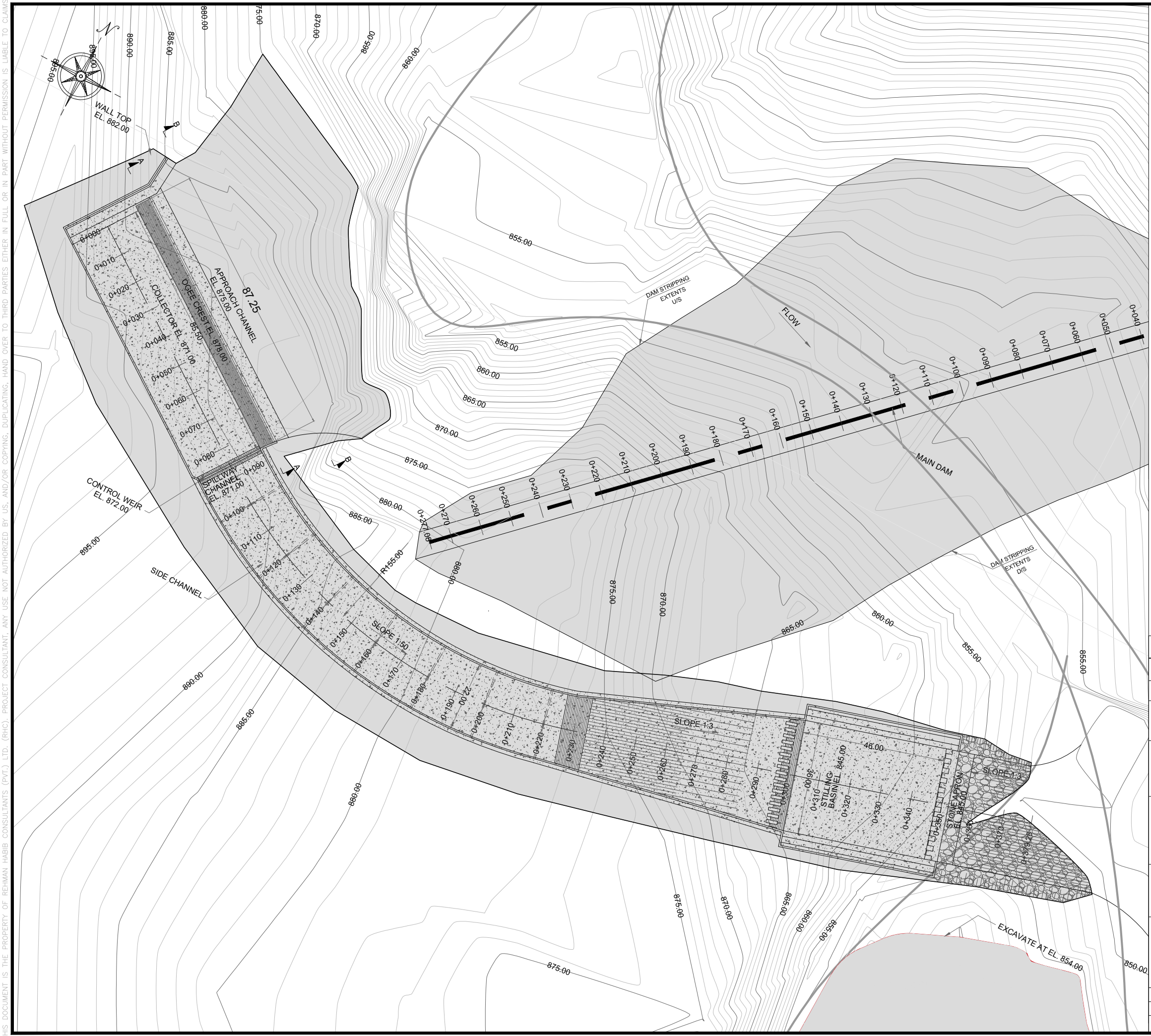




# SPILLWAY

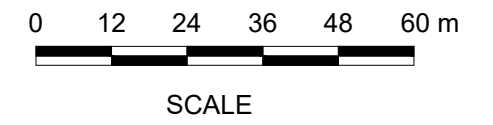






**NOTES:**

1. ALL DIMENSIONS AND LEVELS ARE IN METERS UNLESS OTHERWISE MENTIONED.



**REFERENCE DRAWINGS :-**

ZKD-TD-SP-01  
ZKD-TD-SP-03 (1 to 7)

**DRAWING IS RELEASED**

FOR TENDER DRAWINGS ONLY

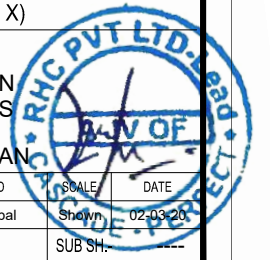
CLIENT:  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

CONSULTANTS:  
A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.  
**CGE** CASCADE GROUP OF ENGINEERING & CONSULTANTS  
**PEM** PERFECT ENGINEERING & MANAGEMENT CONSULTANTS

PROJECT:  
CONSULTANCY SERVICES FOR DRAFT TENDER DRAWINGS,  
DETAIL DESIGN & SUPERVISION PC-1 FOR 5 SMALL  
DAMS IN FATA (PACKAGE - X)

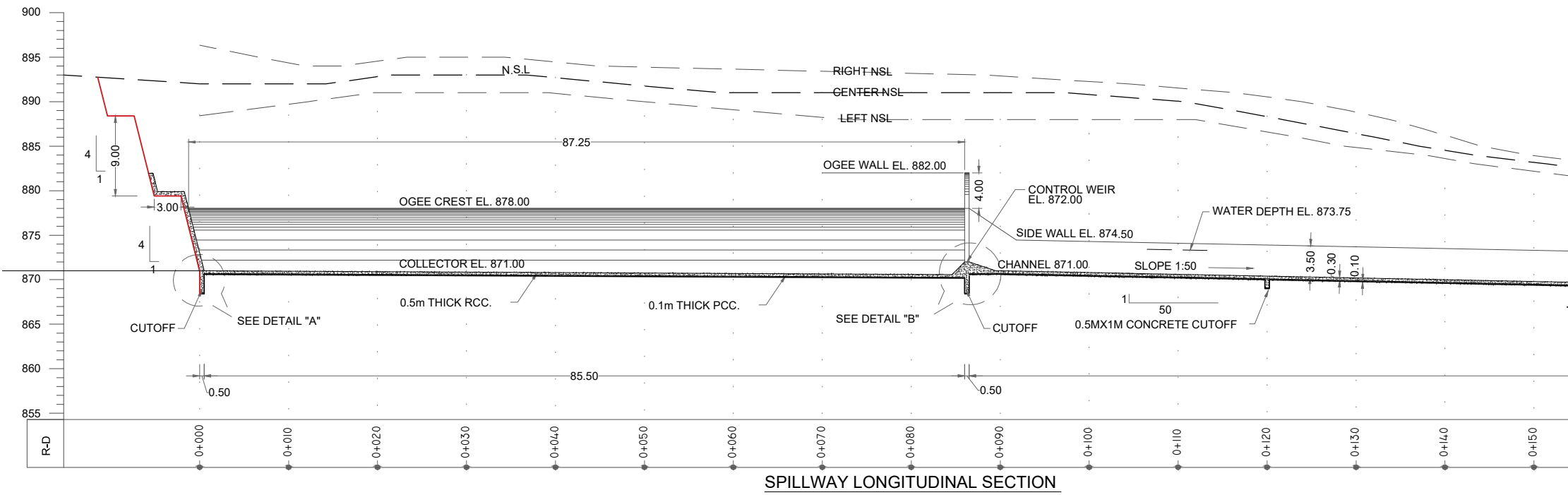
TITLE:  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS  
SPILLWAY LAYOUT PLAN

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Ammar N.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	02-03-20
DRG.No:- ZKD-TD-SP-01	SHEET:- ---		SUB SH.		

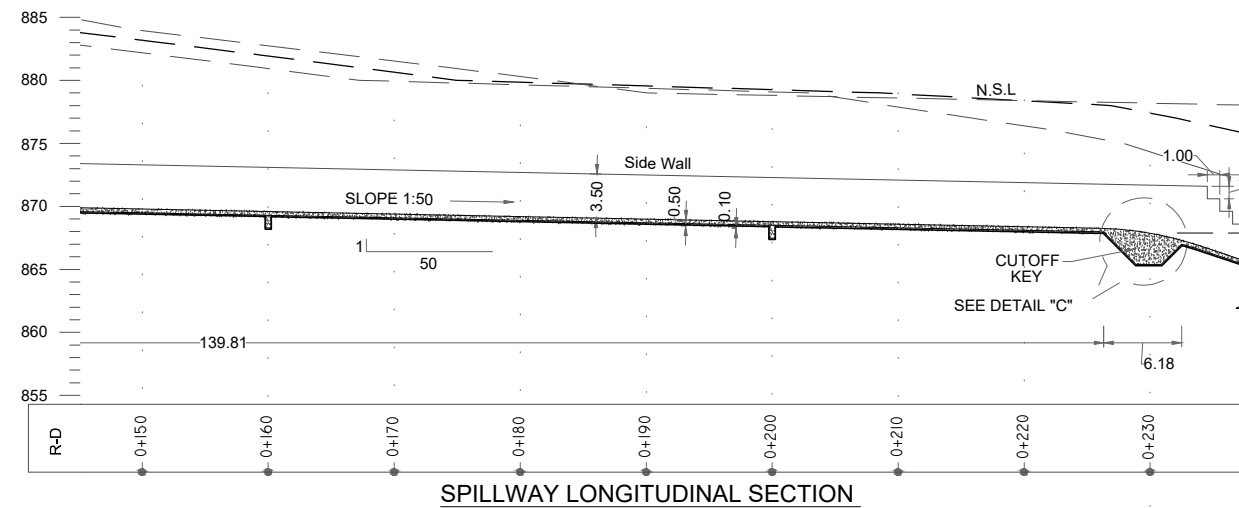


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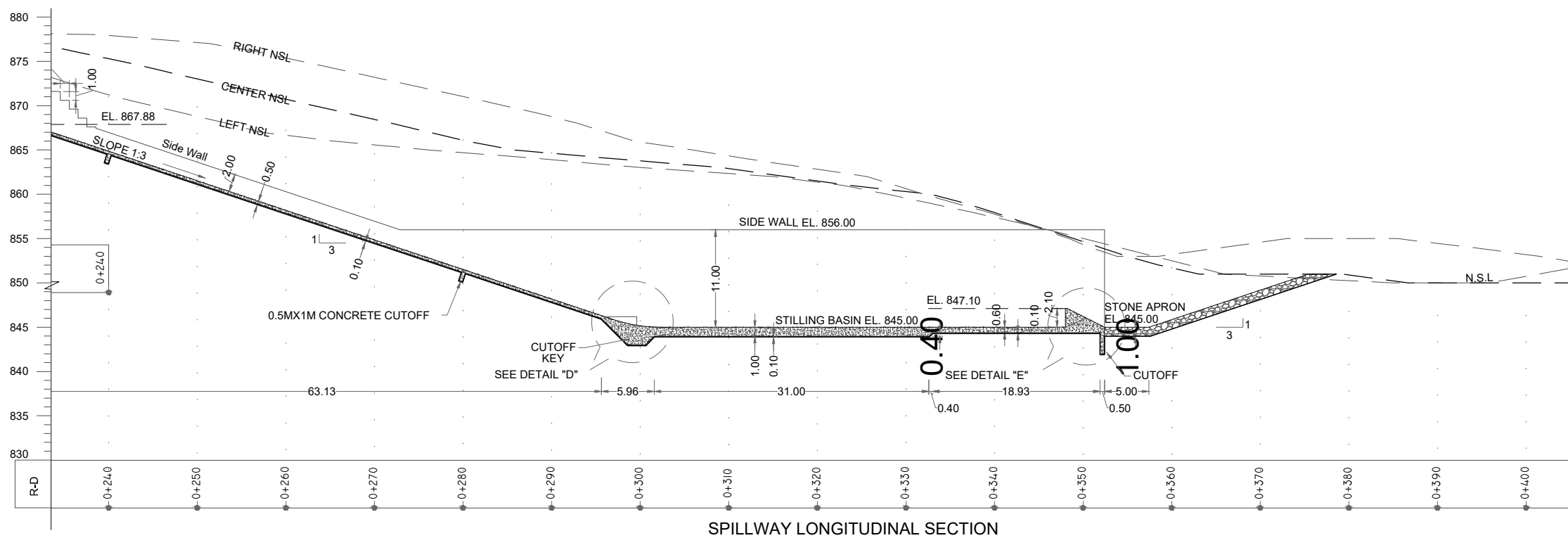
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SPILLWAY LONGITUDINAL SECTION



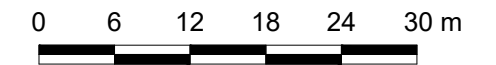
SPILLWAY LONGITUDINAL SECTION



SPILLWAY LONGITUDINAL SECTION

**NOTES:**

1. ALL DIMENSIONS AND LEVELS ARE IN METERS UNLESS OTHERWISE MENTIONED.



SCALE

**REFERENCE DRAWINGS :-**

ZKD-TD-SP-01  
ZKD-TD-SP-03 (1 to 7)

**DRAWING IS RELEASED**

**FOR TENDER DRAWINGS ONLY**

CLIENT:  
PSU SMALL DAM SECTION MERGED AREA

IRRIGATION DEPARTMENT. KPK.

CONSULTANTS:  
A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.  
**CGE** CASCADE GROUP OF ENGINEERING & CONSULTANTS  
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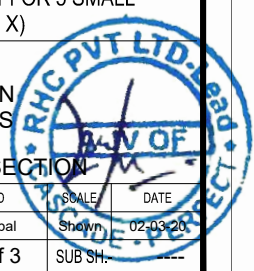
PROJECT:  
CONSULTANCY SERVICES FOR DRAFT TENDER DRAWINGS,  
DETAIL DESIGN & SUPERVISION PC-1 FOR 5 SMALL  
DAMS IN FATA (PACKAGE - X)

TITLE:  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS

SPILLWAY LONGITUDINAL SECTION

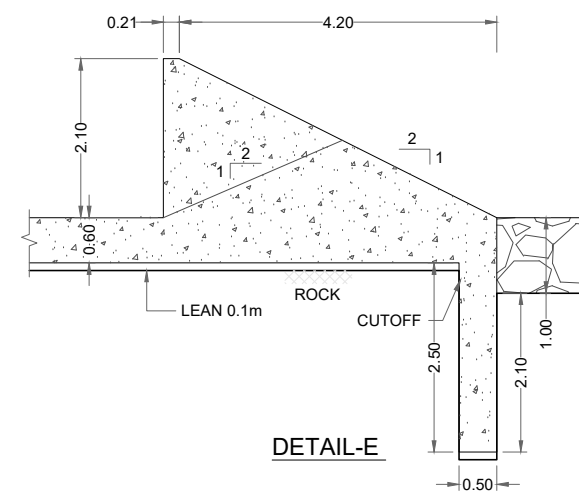
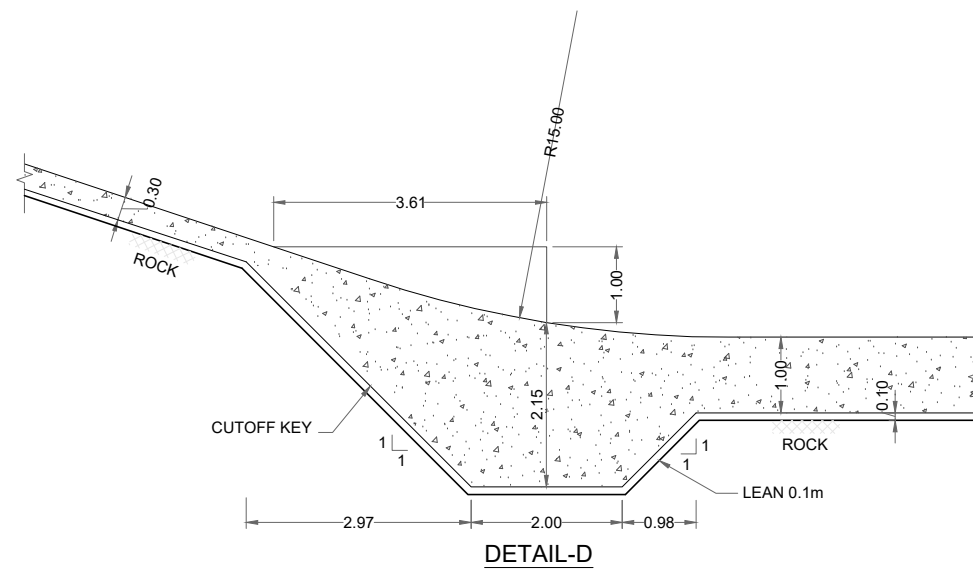
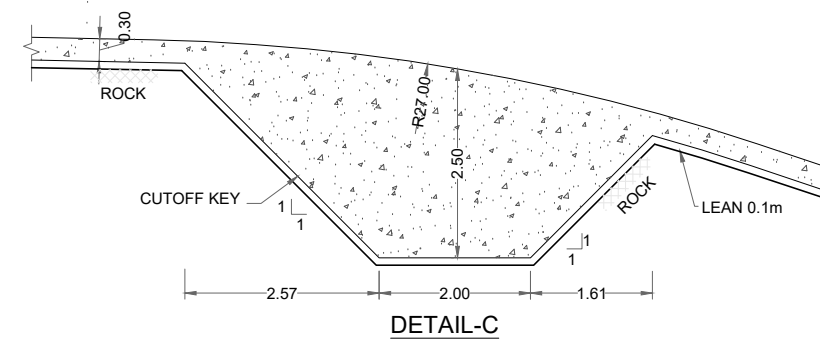
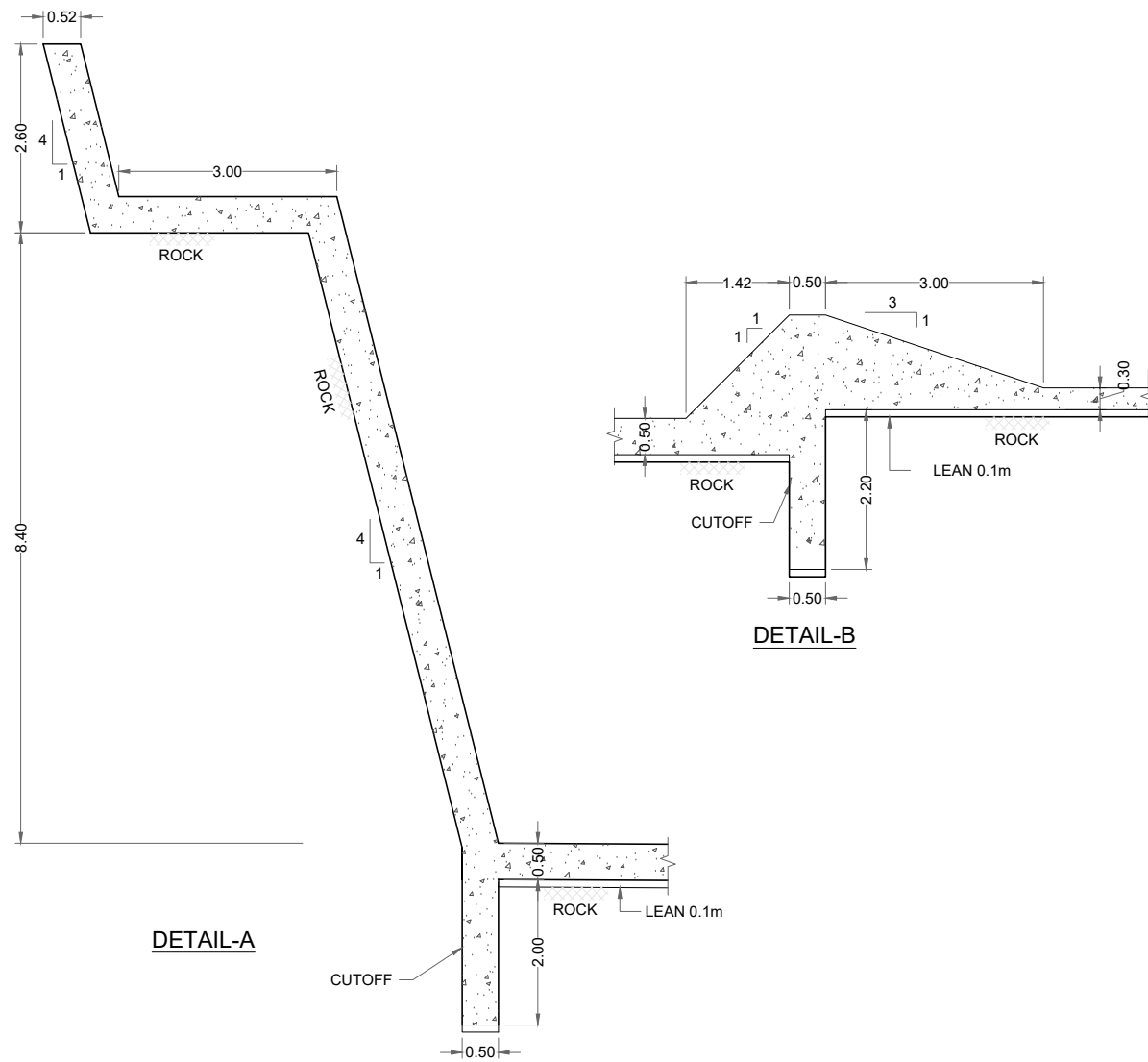
DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Ammar N.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	02-03-20

DRG.No:- ZKD-TD-SP-02 SHEET:- 1 of 3 SUB SH.





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SCALE

REFERENCE DRAWINGS :-

ZKD-TD-SP-01  
ZKD-TD-SP-03 (1 to 7)

DRAWING IS RELEASED

FOR TENDER DRAWINGS ONLY

CLIENT:  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

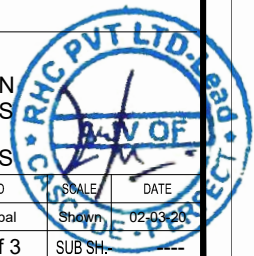
CONSULTANTS: A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.  
**CASCADE** CASCADE GROUP OF ENGINEERING & CONSULTANTS  
**PERFECT** PERFECT ENGINEERING & MANAGEMENT CONSULTANTS

PROJECT:  
CONSULTANCY SERVICES FOR DRAFT TENDER DRAWINGS,

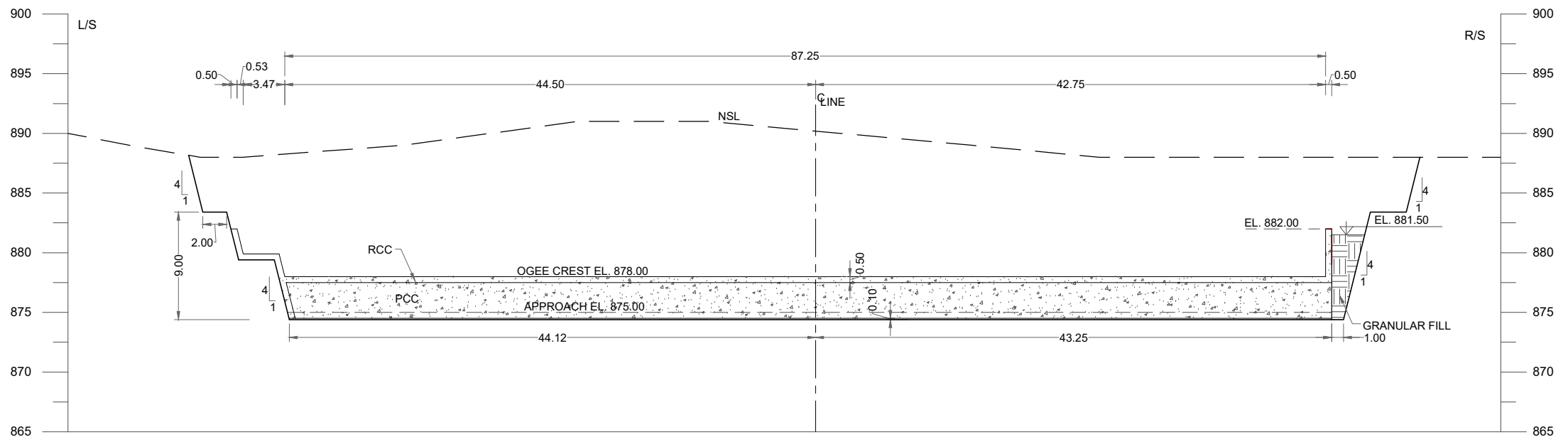
TITLE:  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS  
SECTION & DETAILS

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Ammar N.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	02-03-20

DRG.No:- ZKD-TD-SP-02 SHEET:- 2 of 3 SUB SH.



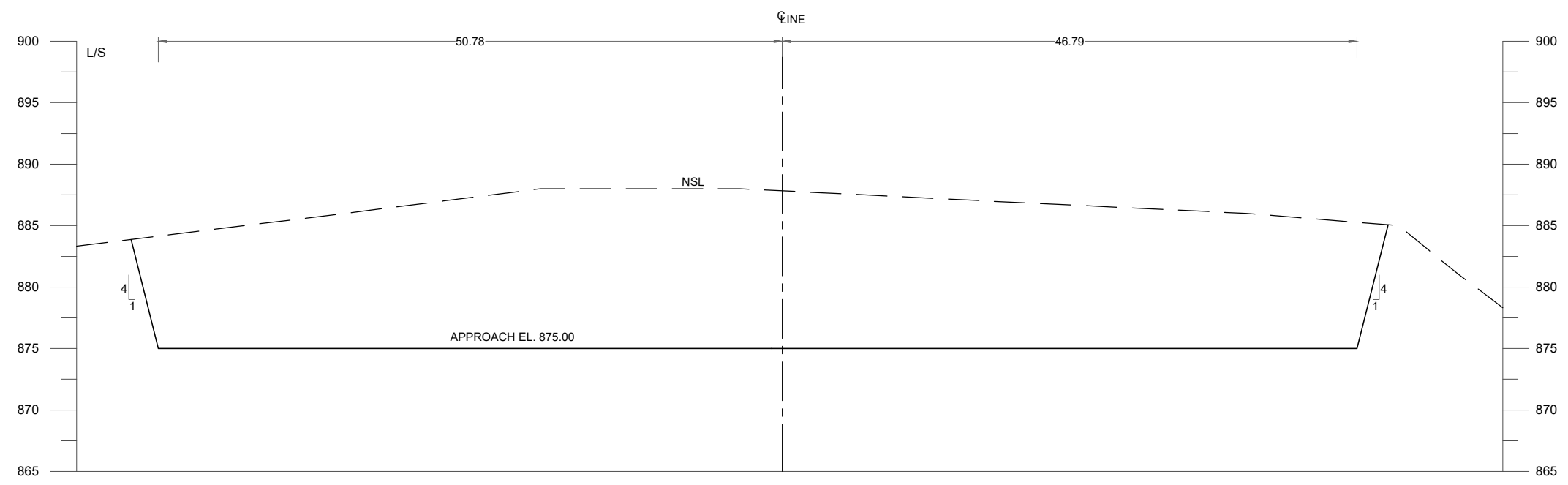
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SECTION A-A



SCALE



SECTION B-B

REFERENCE DRAWINGS :-

ZKD-TD-SP-01  
ZKD-TD-SP-02 (1 to 2)

DRAWING IS RELEASED

FOR TENDER DRAWINGS ONLY

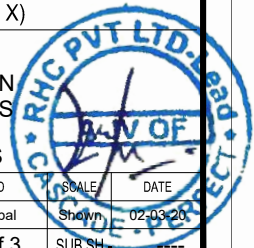
CLIENT:  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

CONSULTANTS:  
A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.  
**AG** CASCADE GROUP OF ENGINEERING & CONSULTANTS  
**PE** PERFECT ENGINEERING & MANAGEMENT CONSULTANTS

PROJECT:  
CONSULTANCY SERVICES FOR DRAFT TENDER DRAWINGS,  
DETAIL DESIGN & SUPERVISION PC-1 FOR 5 SMALL  
DAMS IN FATA (PACKAGE - X)

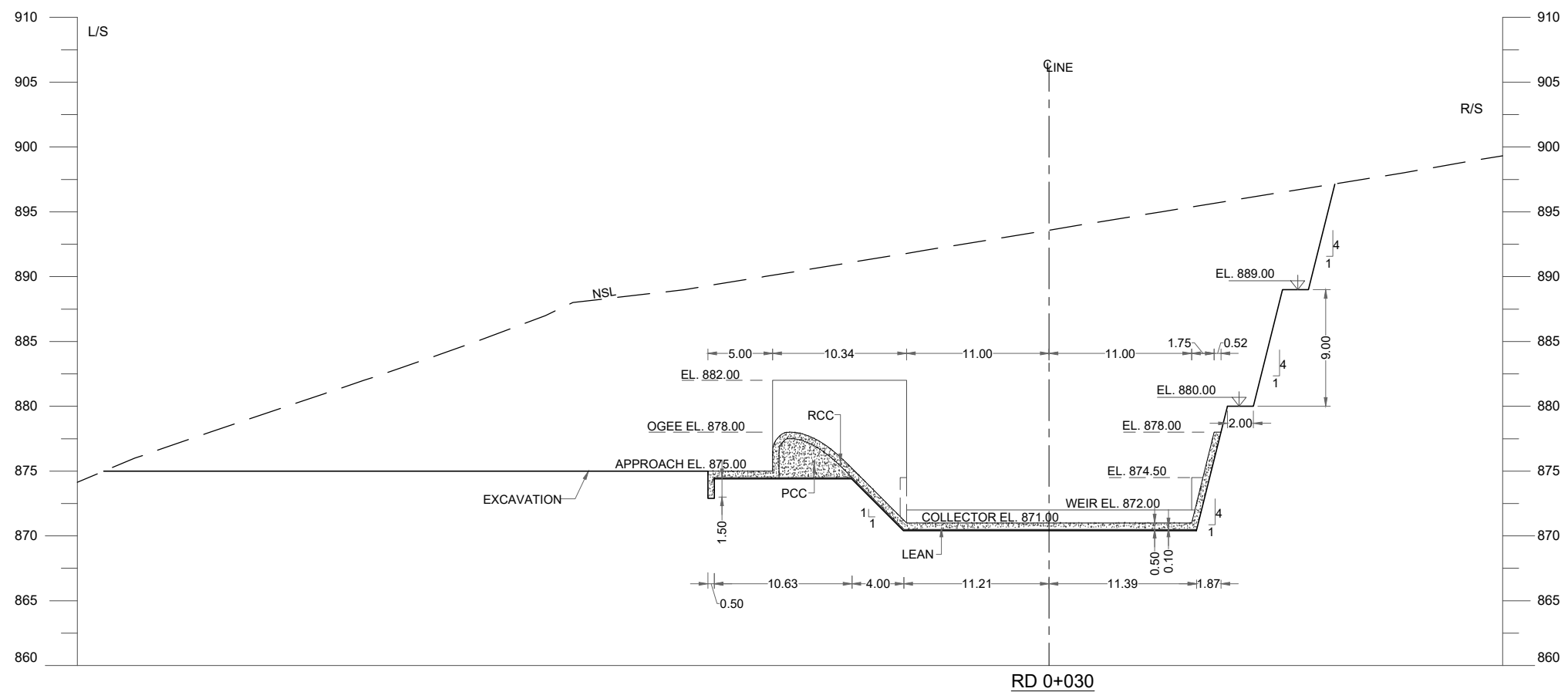
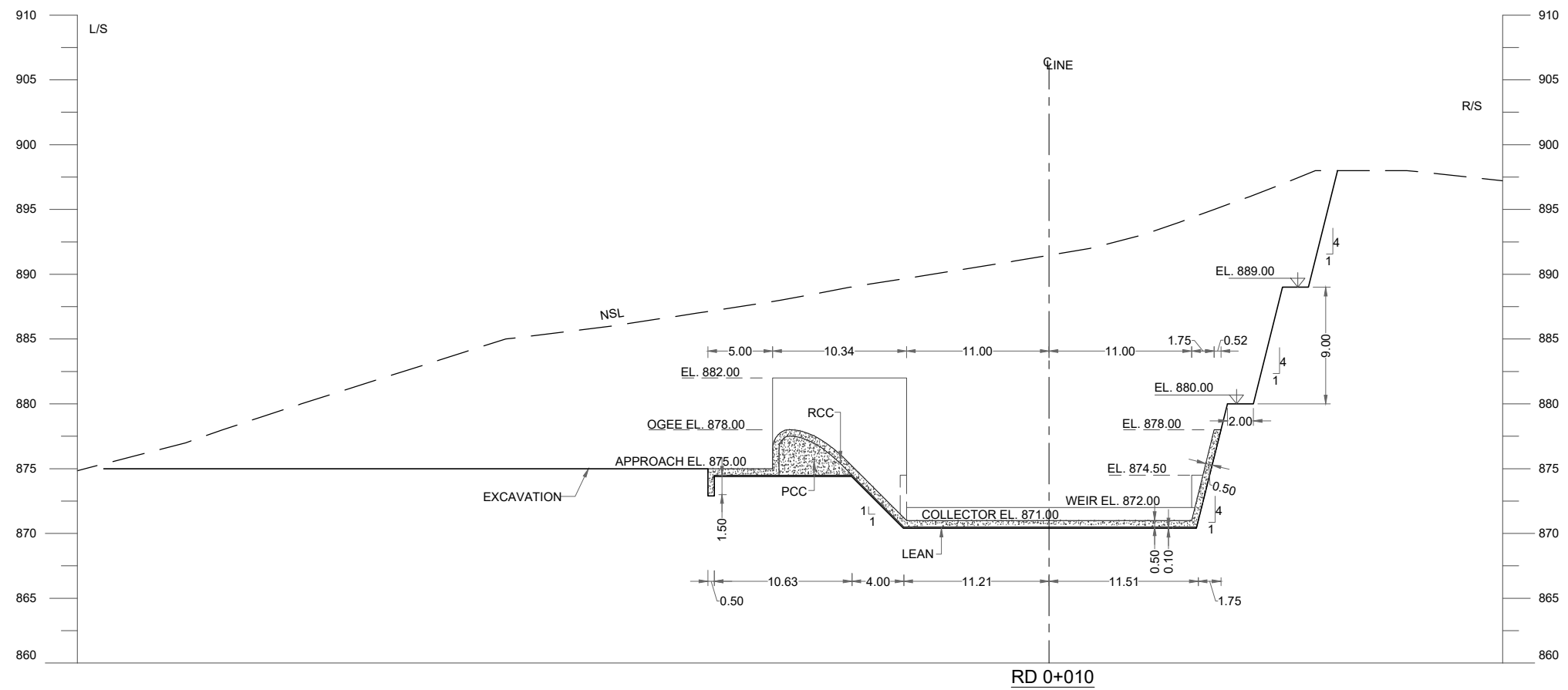
TITLE:  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS  
CROSS SECTIONS

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Ammar N.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	02-03-20
DRG.No:- ZKD-TD-SP-02		SHEET:- 3 of 3		SUB SH.	



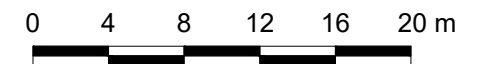


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**NOTES:**

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SCALE

**REFERENCE DRAWINGS :-**

ZKD-TD-SP-01  
ZKD-TD-SP-02 (1 to 2)

**DRAWING IS RELEASED**

**FOR TENDER DRAWINGS ONLY**

CLIENT:  
**PSU SMALL DAM SECTION MERGED AREA**  
**IRRIGATION DEPARTMENT. KPK.**

CONSULTANTS:  
A J.V OF  
**RHC REHMAN HABIB CONSULTANTS (PVT) LTD.**  
**CASCADE GROUP OF ENGINEERING & CONSULTANTS**  
**PERFECT ENGINEERING & MANAGEMENT CONSULTANTS**

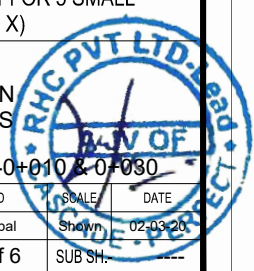
PROJECT:  
**CONSULTANCY SERVICES FOR DRAFT TENDER DRAWINGS,**  
**DETAIL DESIGN & SUPERVISION PC-1 FOR 5 SMALL**  
**DAMS IN FATA (PACKAGE - X)**

TITLE:  
**ZAKAR KHEL DAM**  
**NORTH WAZIRISTAN**  
**TENDER DRAWINGS**

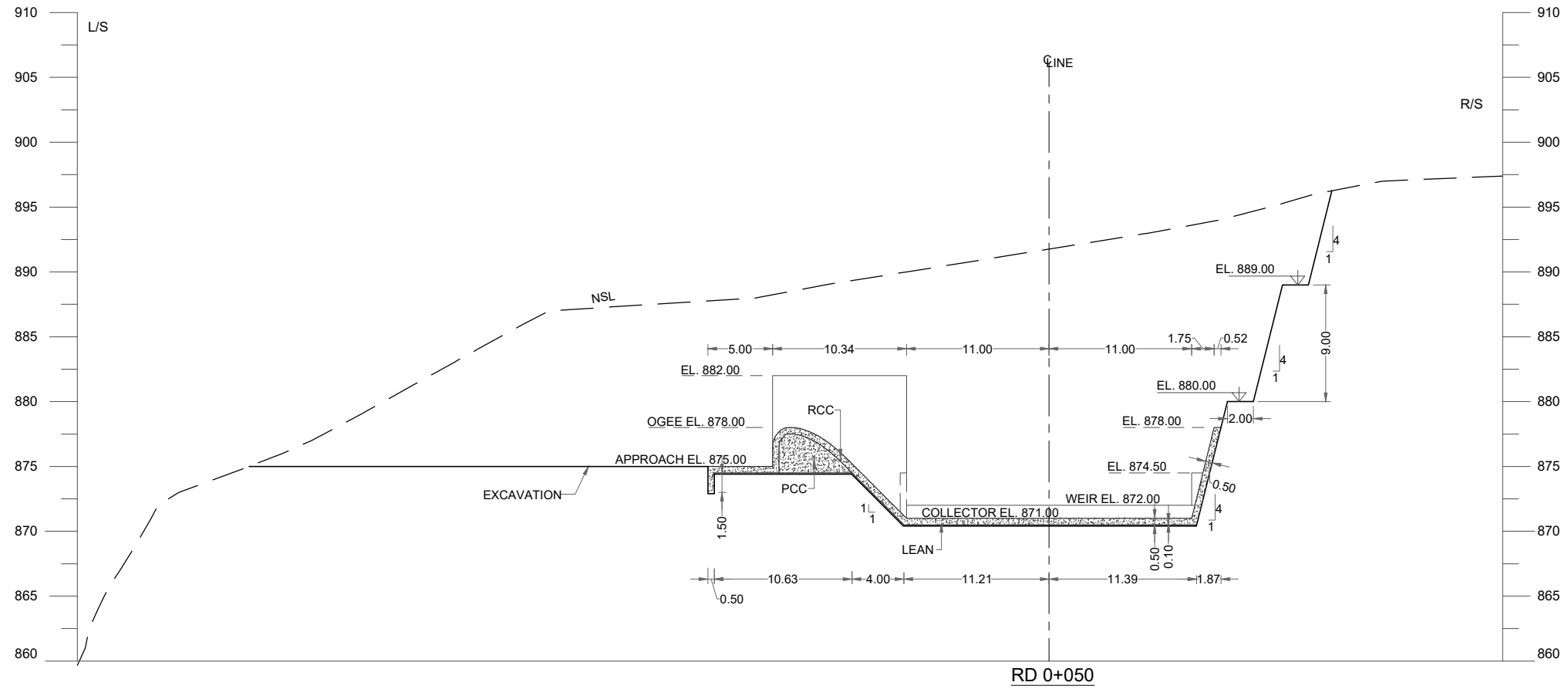
**SPILLWAY CROSS SECTION RD-0+010 & 0+030**

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Ammar N.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	02-03-20

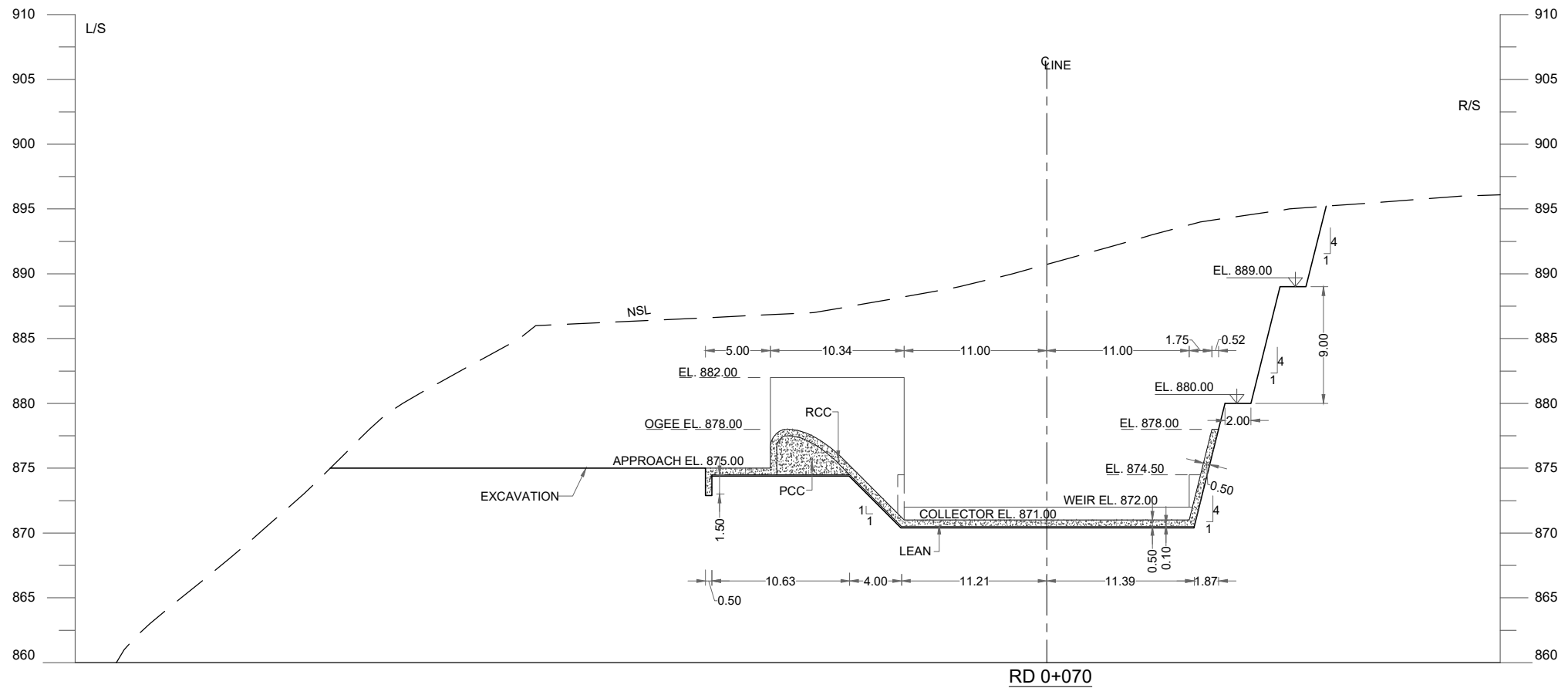
DRG.No:- ZKD-TD-SP-03      SHEET:- 1 of 6      SUB SH.



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RD 0+050



RD 0+070



SCALE

REFERENCE DRAWINGS :-

ZKD-TD-SP-01  
ZKD-TD-SP-02 (1 to 2)

DRAWING IS RELEASED

FOR TENDER DRAWINGS ONLY

CLIENT:  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

CONSULTANTS:  
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**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.  
**CGE** CASCADE GROUP OF ENGINEERING & CONSULTANTS  
**PEM** PERFECT ENGINEERING & MANAGEMENT CONSULTANTS

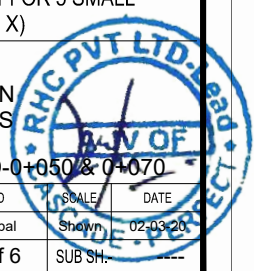
PROJECT:  
CONSULTANCY SERVICES FOR DRAFT TENDER DRAWINGS,  
DETAIL DESIGN & SUPERVISION PC-1 FOR 5 SMALL  
DAMS IN FATA (PACKAGE - X)

TITLE:  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS

SPILLWAY CROSS SECTION RD-0+050 & 0+070

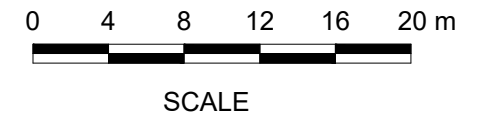
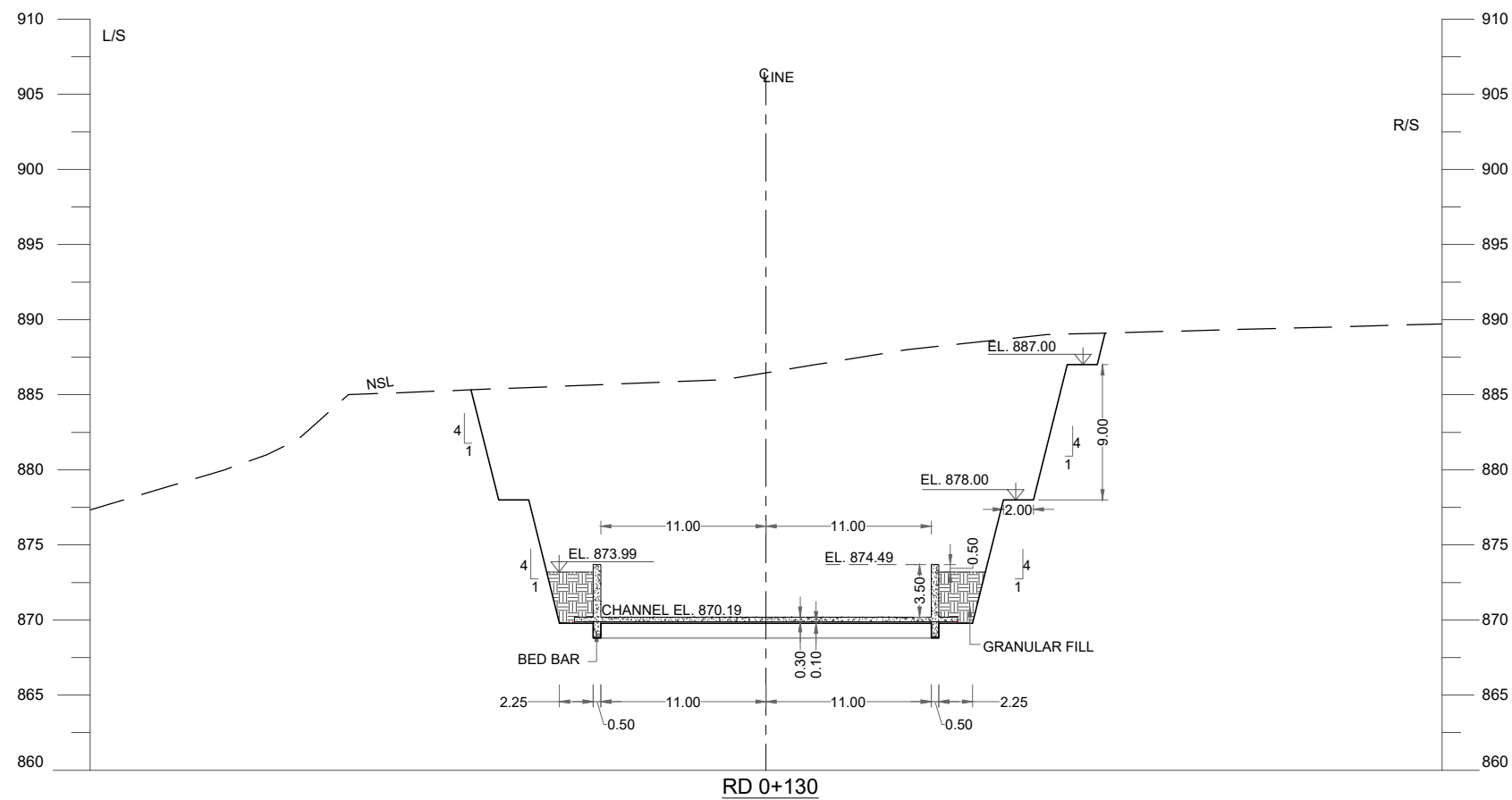
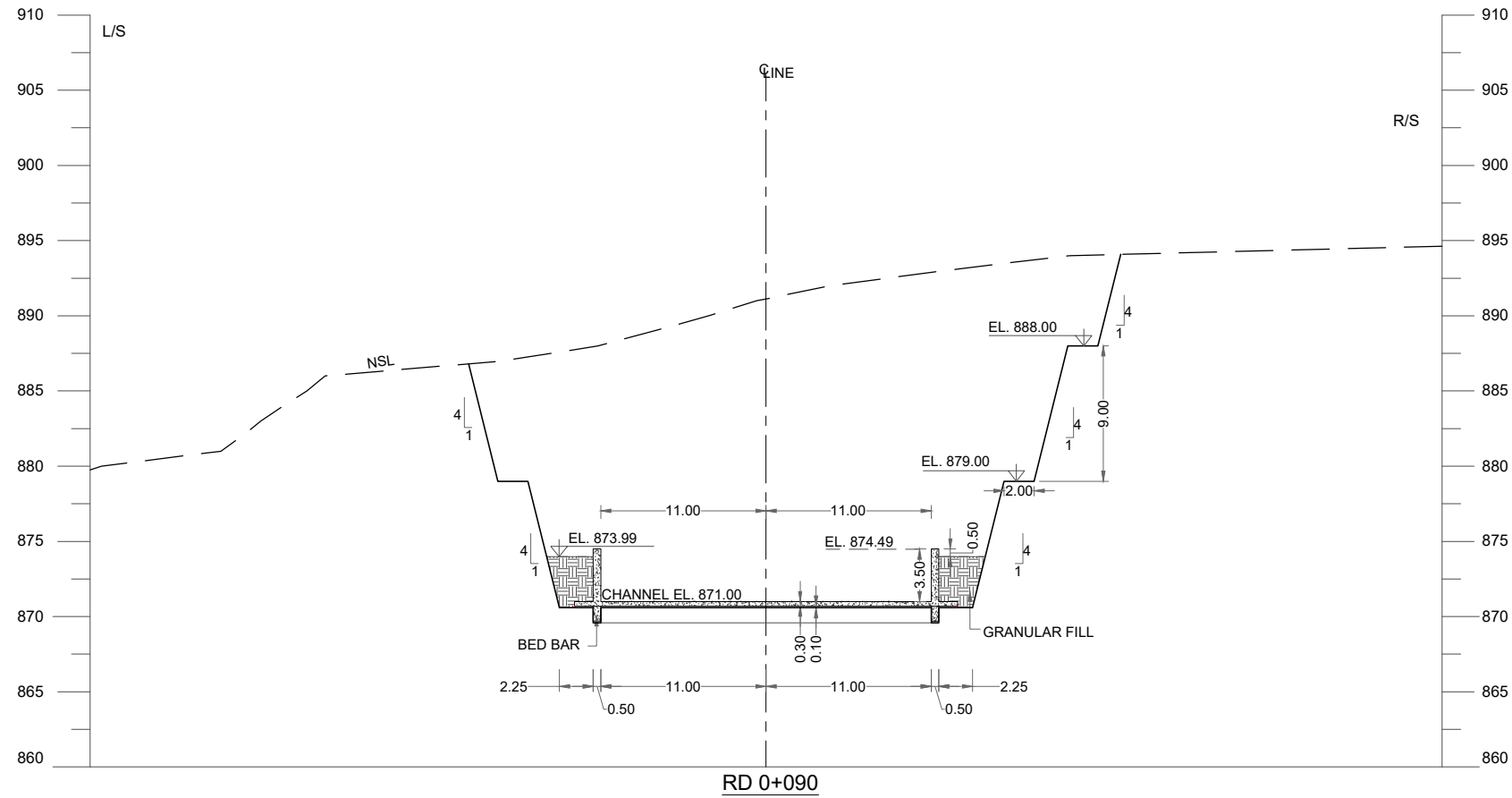
DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Ammar N.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	02-03-20

DRG.No:- ZKD-TD-SP-03 SHEET:- 2 of 6 SUB SH.

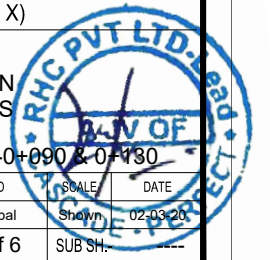




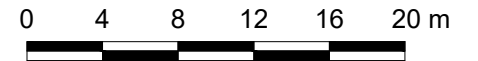
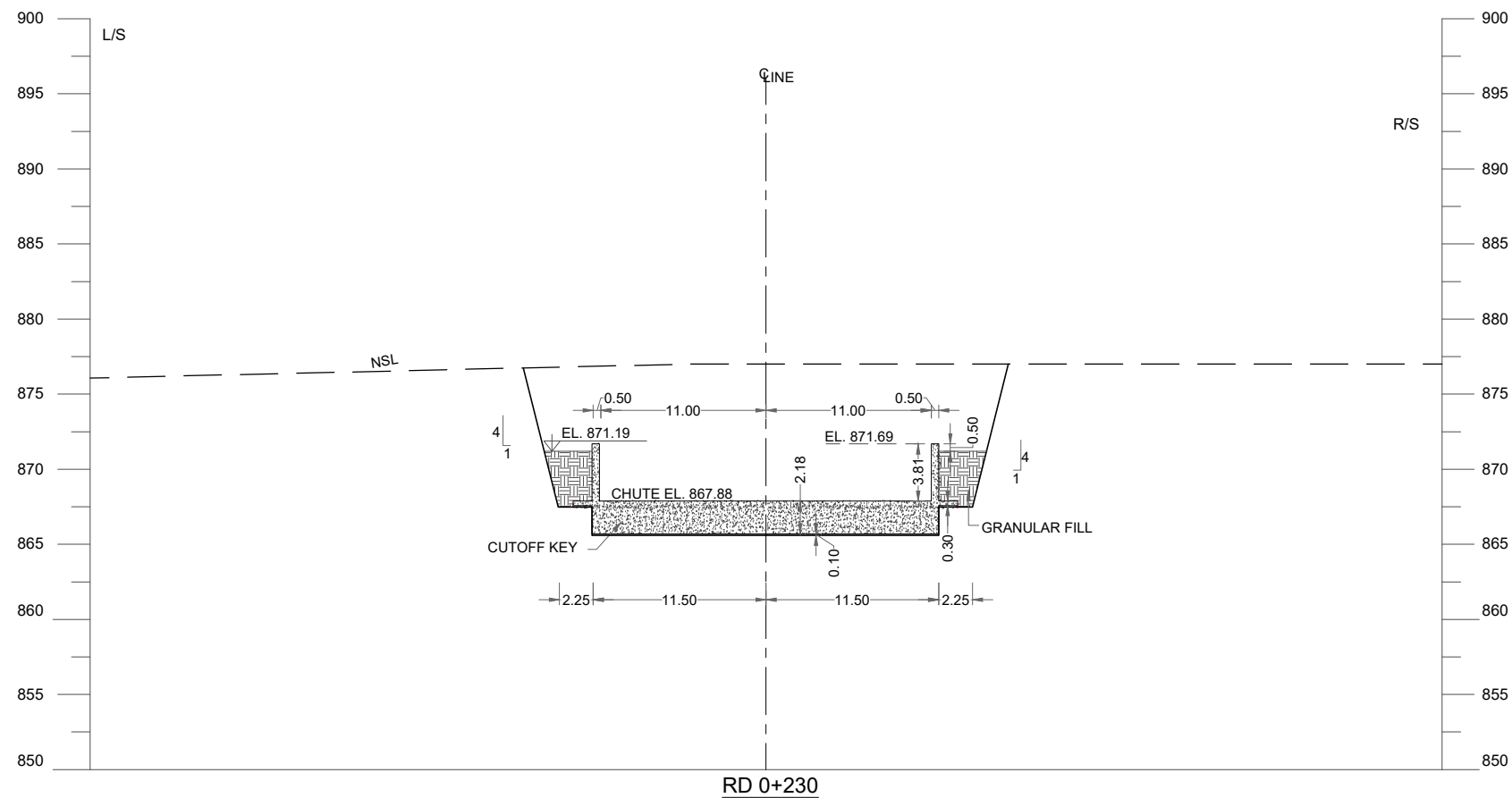
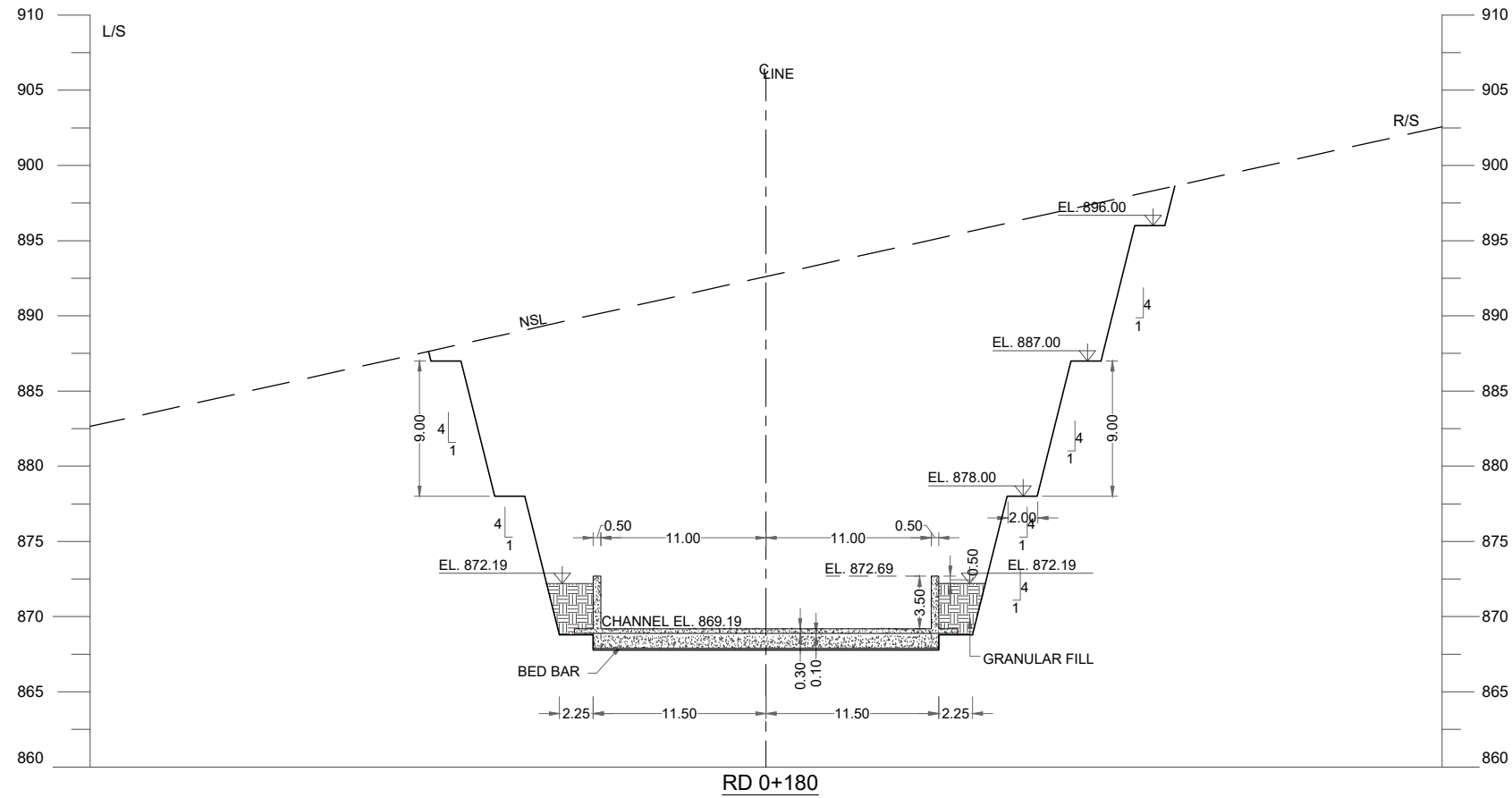
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REFERENCE DRAWINGS :-					
ZKD-TD-SP-01 ZKD-TD-SP-02 (1 to 2)					
DRAWING IS RELEASED					
<input checked="" type="checkbox"/> FOR TENDER DRAWINGS ONLY					
CLIENT: PSU SMALL DAM SECTION MERGED AREA IRRIGATION DEPARTMENT, KPK.					
CONSULTANTS: A J.V. OF <b>RHC</b> REHMAN HABIB CONSULTANTS (PVT) LTD. <b>CGE</b> CASCADE GROUP OF ENGINEERING & CONSULTANTS <b>PEM</b> PERFECT ENGINEERING & MANAGEMENT CONSULTANTS					
PROJECT: CONSULTANCY SERVICES FOR DRAFT TENDER DRAWINGS, DETAIL DESIGN & SUPERVISION PC-1 FOR 5 SMALL DAMS IN FATA (PACKAGE - X)					
TITLE: ZAKAR KHEL DAM NORTH WAZIRISTAN TENDER DRAWINGS					
SPILLWAY CROSS SECTION RD-0+090 & 0+130					
DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Ammar N.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	02-03-20
DRG.No:- ZKD-TD-SP-03		SHEET:- 3 of 6		SUB SH.	



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SCALE

REFERENCE DRAWINGS :-

- ZKD-TD-SP-01
- ZKD-TD-SP-02 (1 to 2)

DRAWING IS RELEASED

FOR TENDER DRAWINGS ONLY

CLIENT:  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT, KPK.

CONSULTANTS:  
A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.  
**CGE** CASCADE GROUP OF ENGINEERING & CONSULTANTS  
**PEM** PERFECT ENGINEERING & MANAGEMENT CONSULTANTS

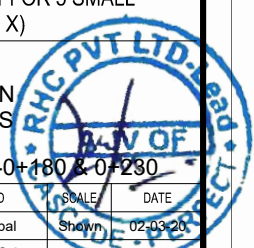
PROJECT:  
CONSULTANCY SERVICES FOR DRAFT TENDER DRAWINGS,  
DETAIL DESIGN & SUPERVISION PC-1 FOR 5 SMALL  
DAMS IN FATA (PACKAGE - X)

TITLE:  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS

SPILLWAY CROSS SECTION RD-0+180 & 0+230

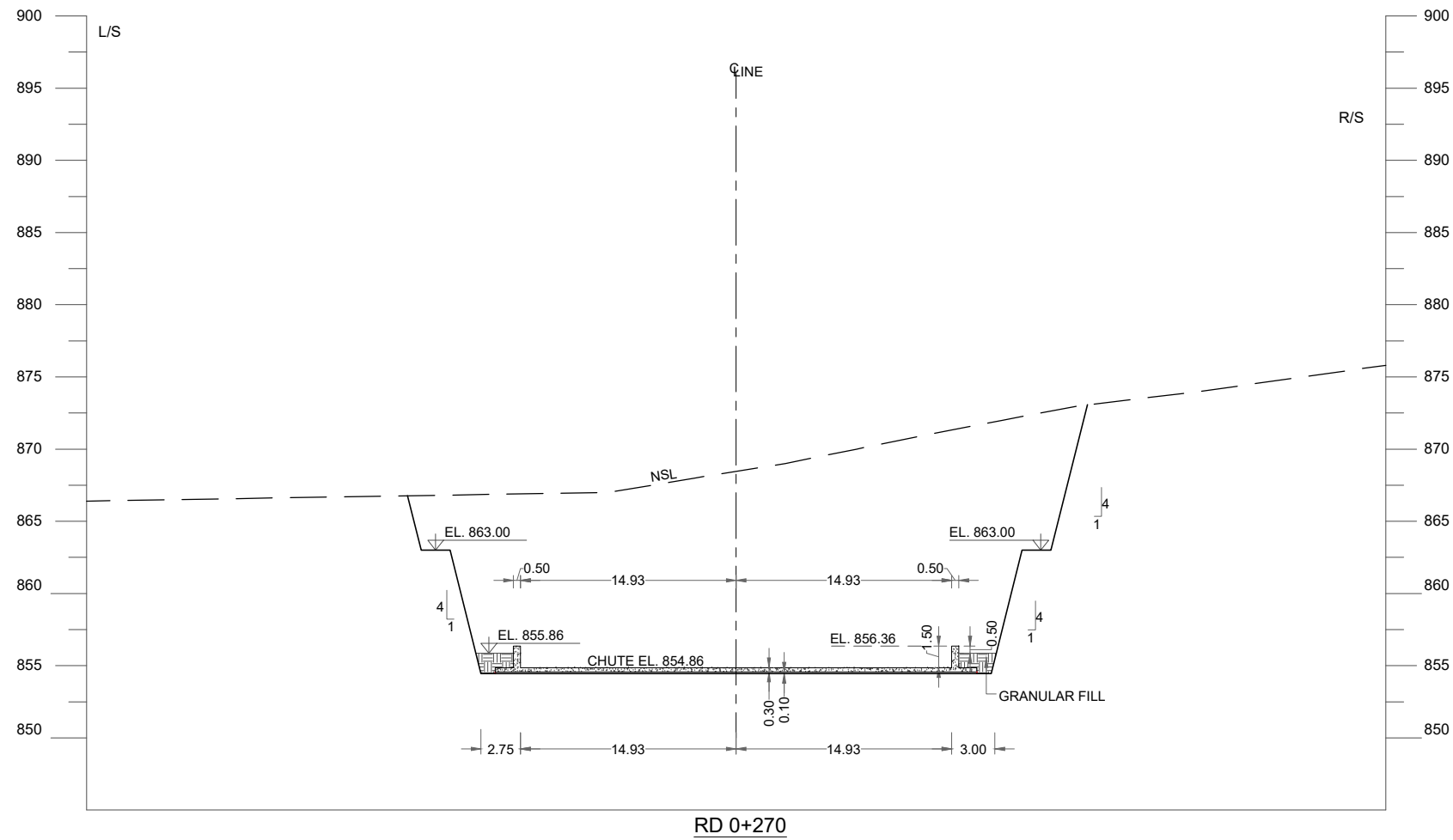
DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Ammar N.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	02-03-20

DRG.No:- ZKD-TD-SP-03      SHEET:- 4 of 6      SUB SH.

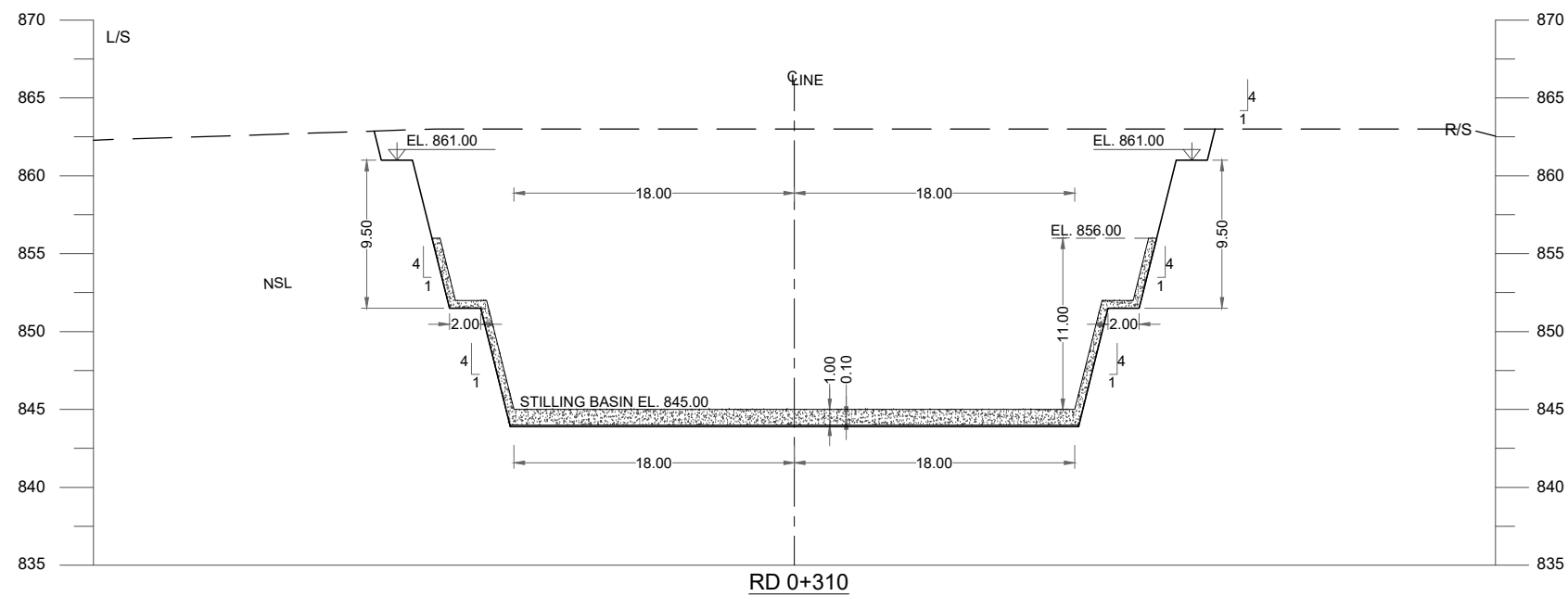




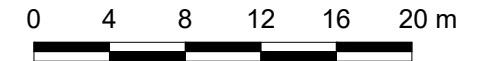
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RD 0+270



RD 0+310



SCALE

REFERENCE DRAWINGS :-

ZKD-TD-SP-01  
ZKD-TD-SP-02 (1 to 2)

DRAWING IS RELEASED

FOR TENDER DRAWINGS ONLY

CLIENT:  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

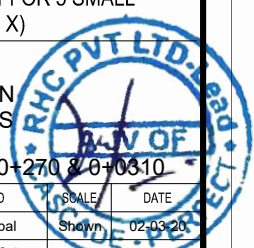
CONSULTANTS:  
A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.  
**CGE** CASCADE GROUP OF ENGINEERING & CONSULTANTS  
**PEM** PERFECT ENGINEERING & MANAGEMENT CONSULTANTS

PROJECT:  
CONSULTANCY SERVICES FOR DRAFT TENDER DRAWINGS,  
DETAIL DESIGN & SUPERVISION PC-1 FOR 5 SMALL  
DAMS IN FATA (PACKAGE - X)

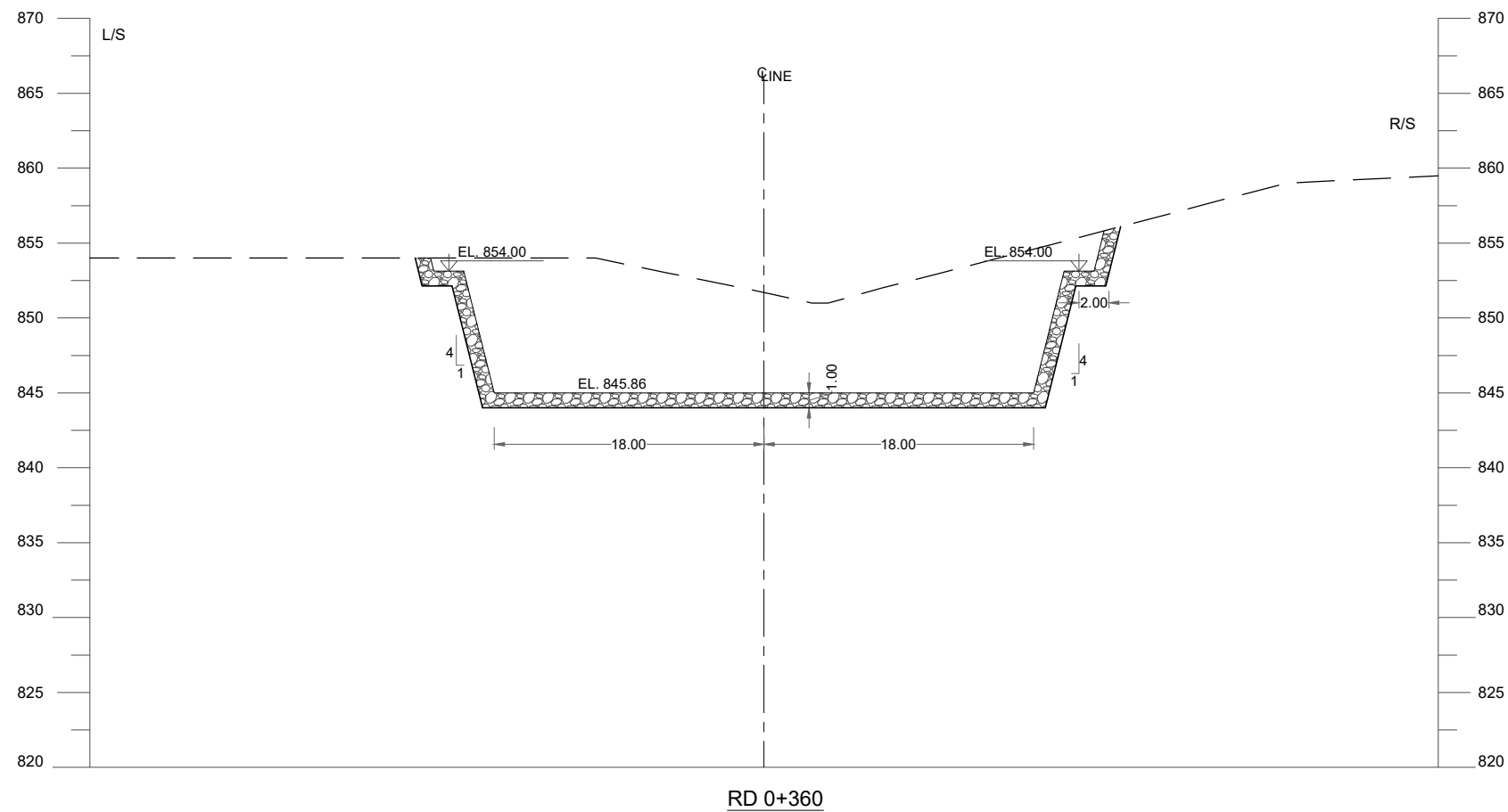
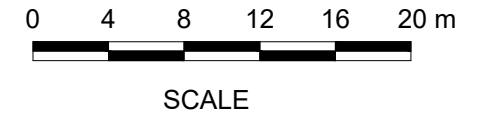
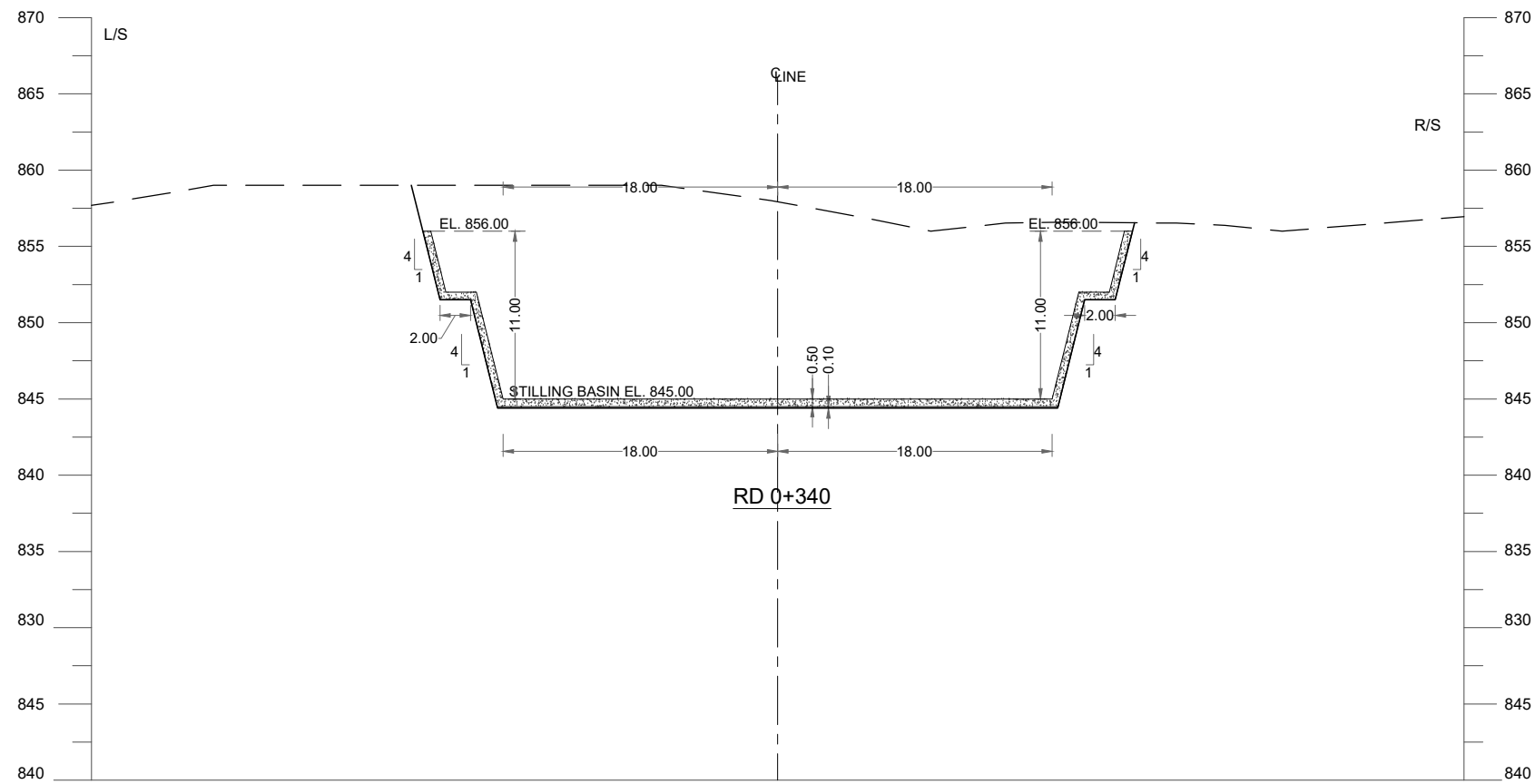
TITLE:  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS  
SPILLWAY CROSS SECTION RD-0+270 & 0+310

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Ammar N.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	02-03-20

DRG.No:- ZKD-TD-SP-03 SHEET:- 5 of 6 SUB SH.



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**REFERENCE DRAWINGS :-**

ZKD-TD-SP-01  
ZKD-TD-SP-02 (1 to 2)

**DRAWING IS RELEASED**

FOR TENDER DRAWINGS ONLY

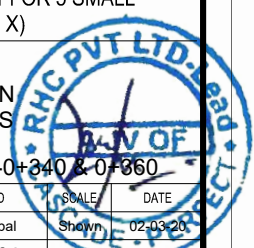
CLIENT:  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

CONSULTANTS:  
A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.  
**CGE** CASCADE GROUP OF ENGINEERING & CONSULTANTS  
**PEM** PERFECT ENGINEERING & MANAGEMENT CONSULTANTS

PROJECT:  
CONSULTANCY SERVICES FOR DRAFT TENDER DRAWINGS,  
DETAIL DESIGN & SUPERVISION PC-1 FOR 5 SMALL  
DAMS IN FATA (PACKAGE - X)

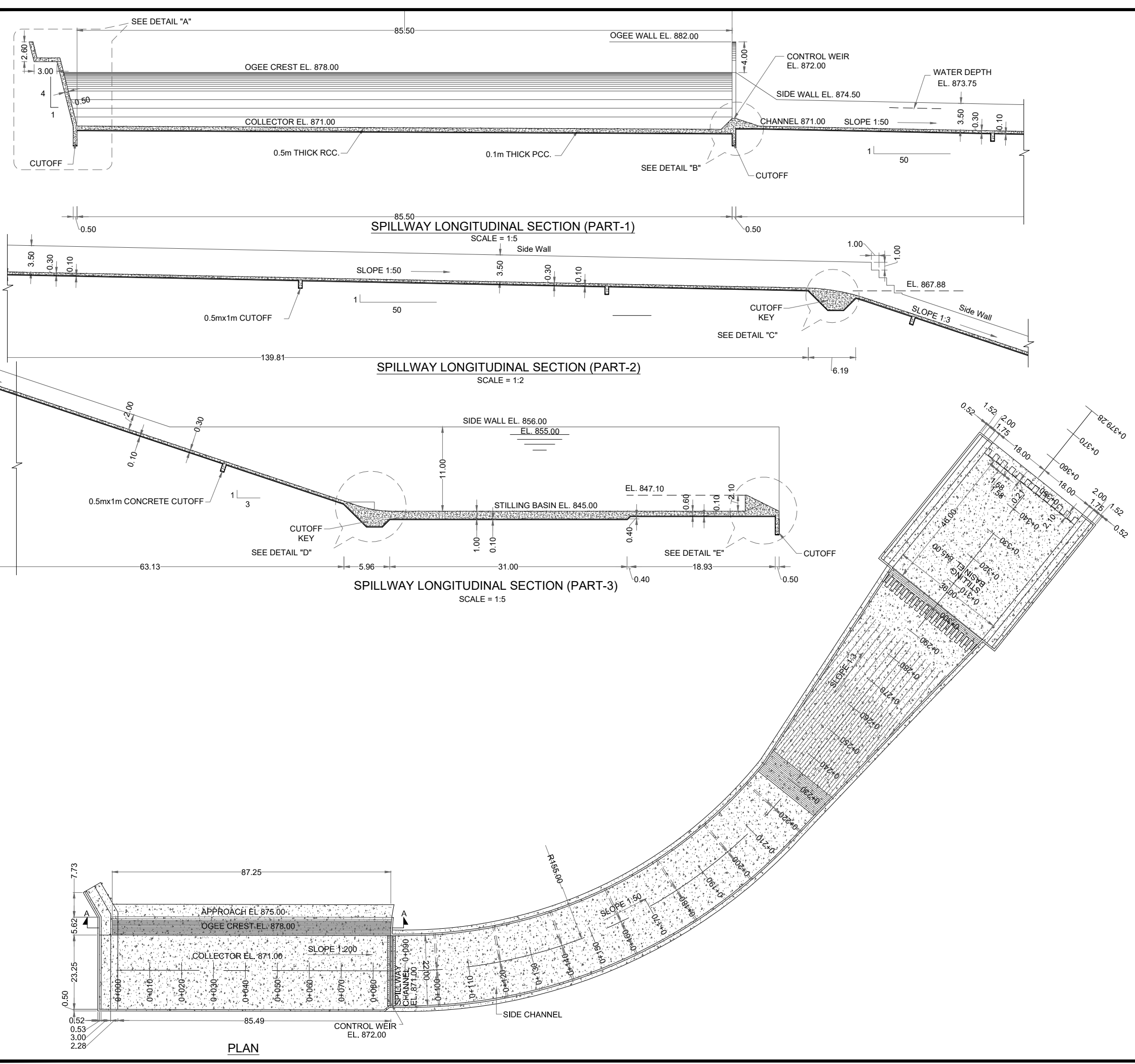
TITLE:  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS  
SPILLWAY CROSS SECTION RD-0+340 & 0+360

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Ammar N.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	02-03-20
DRG.No:- ZKD-TD-SP-03		SHEET:- 6 of 6		SUB SH.	





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**NOTES:**

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**REFERENCE DRAWINGS :-**

ZKD-TD-SP-01  
ZKD-TD-SP-03 (1 to 7)

**DRAWING IS RELEASED**

**FOR TENDER DRAWINGS ONLY**

CLIENT:  
**PSU SMALL DAM SECTION MERGED AREA**  
**IRRIGATION DEPARTMENT. KPK.**

CONSULTANTS:  
A J.V OF  
**RHC REHMAN HABIB CONSULTANTS (PVT) LTD.**  
**CASCADE GROUP OF ENGINEERING & CONSULTANTS**  
**PERFECT ENGINEERING & MANAGEMENT CONSULTANTS**

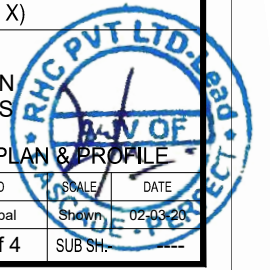
PROJECT:  
**CONSULTANCY SERVICES FOR DRAFT TENDER DRAWINGS, DETAIL DESIGN & SUPERVISION PC-1 FOR 5 SMALL DAMS IN FATA (PACKAGE - X)**

**ZAKAR KHEL DAM**  
**NORTH WAZIRISTAN**  
**TENDER DRAWINGS**

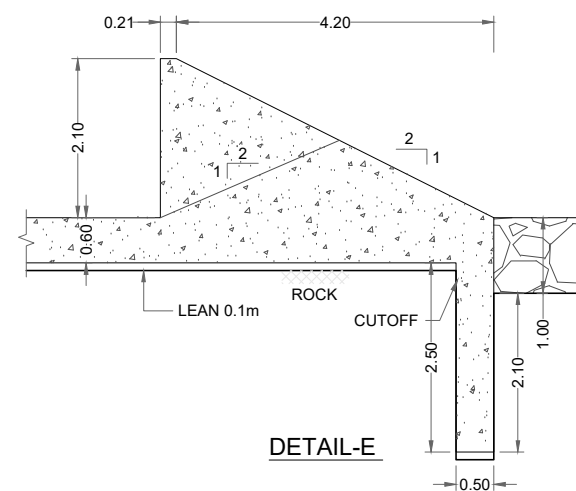
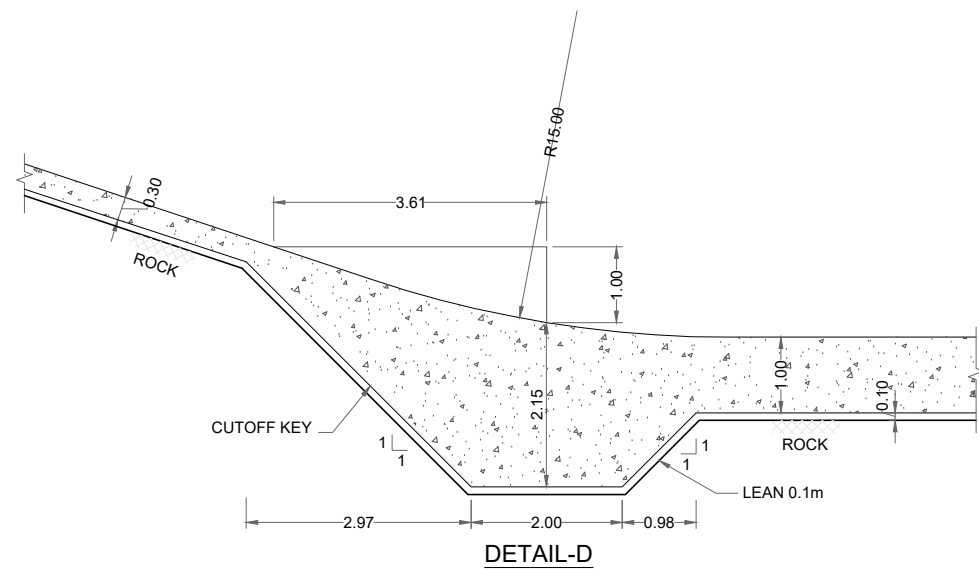
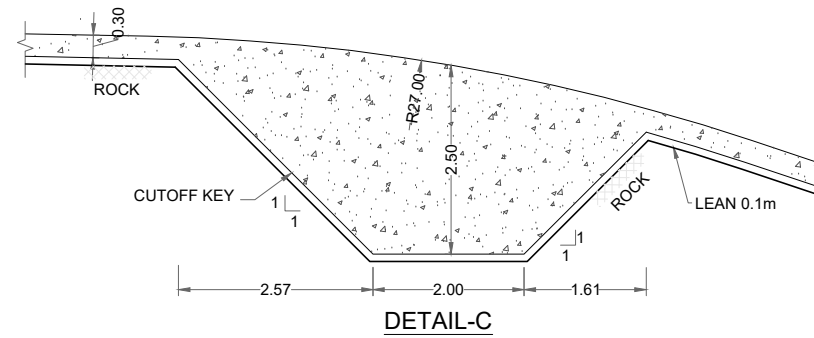
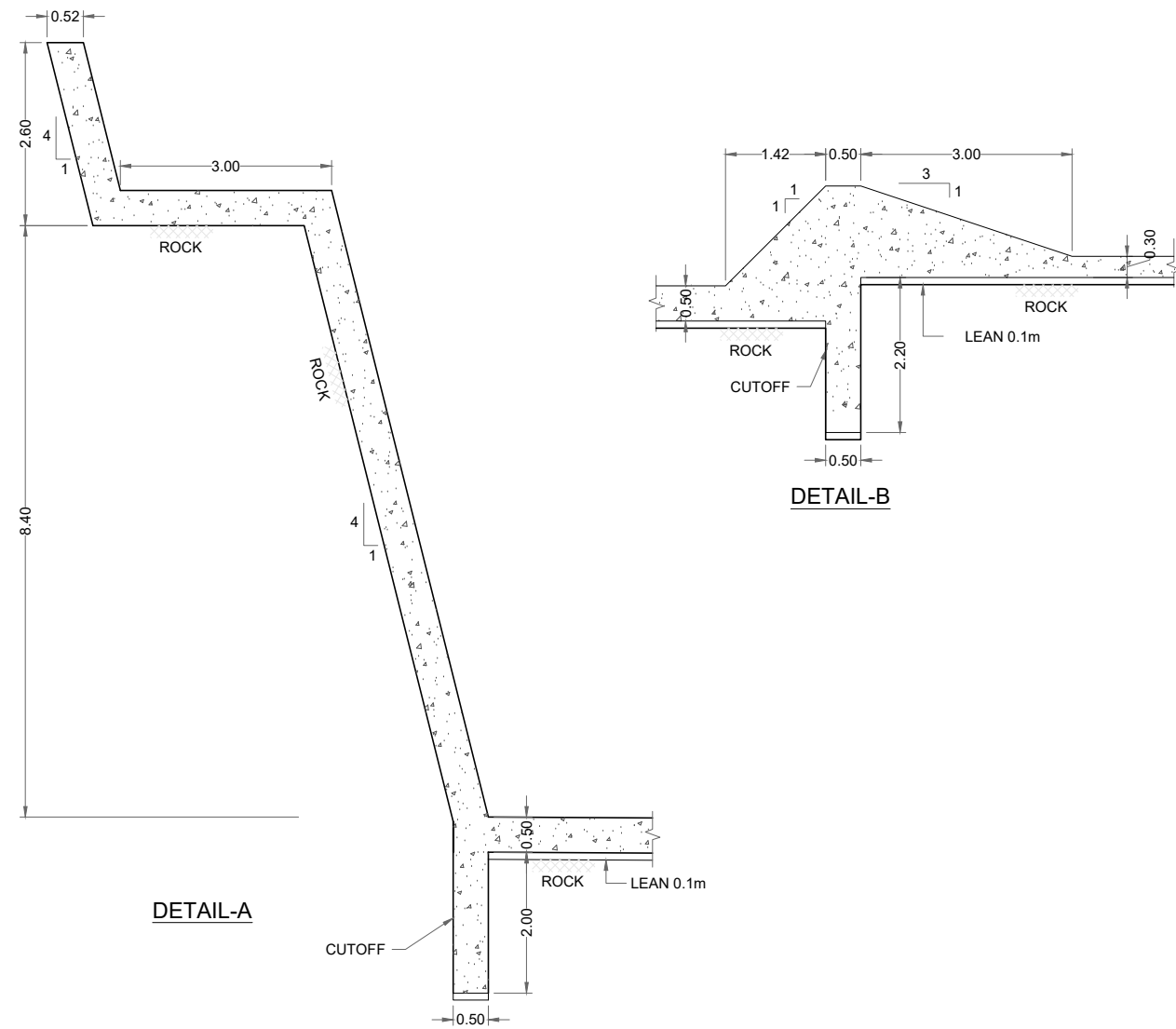
**TITLE:**  
**CONCRETE OUTLINE OF SPILLWAY PLAN & PROFILE**

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Ammar N.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	02-03-20

DRG.No:- ZKD-TD-SP-04      SHEET:- 1 of 4      SUB SH.



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**NOTES:**

1. ALL DIMENSIONS AND LEVELS ARE IN METERS UNLESS OTHERWISE MENTIONED.



SCALE

**REFERENCE DRAWINGS :-**

ZKD-TD-SP-01  
ZKD-TD-SP-03 (1 to 7)

DRAWING IS RELEASED

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CLIENT:  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

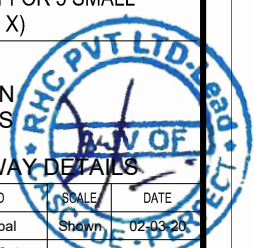
CONSULTANTS: A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.  
**CGE** CASCADE GROUP OF ENGINEERING & CONSULTANTS  
**PEM** PERFECT ENGINEERING & MANAGEMENT CONSULTANTS

PROJECT:  
CONSULTANCY SERVICES FOR DRAFT TENDER DRAWINGS,  
DETAIL DESIGN & SUPERVISION PC-1 FOR 5 SMALL  
DAMS IN FATA (PACKAGE - X)

TITLE:  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS  
CONCRETE OUTLINE OF SPILLWAY DETAILS

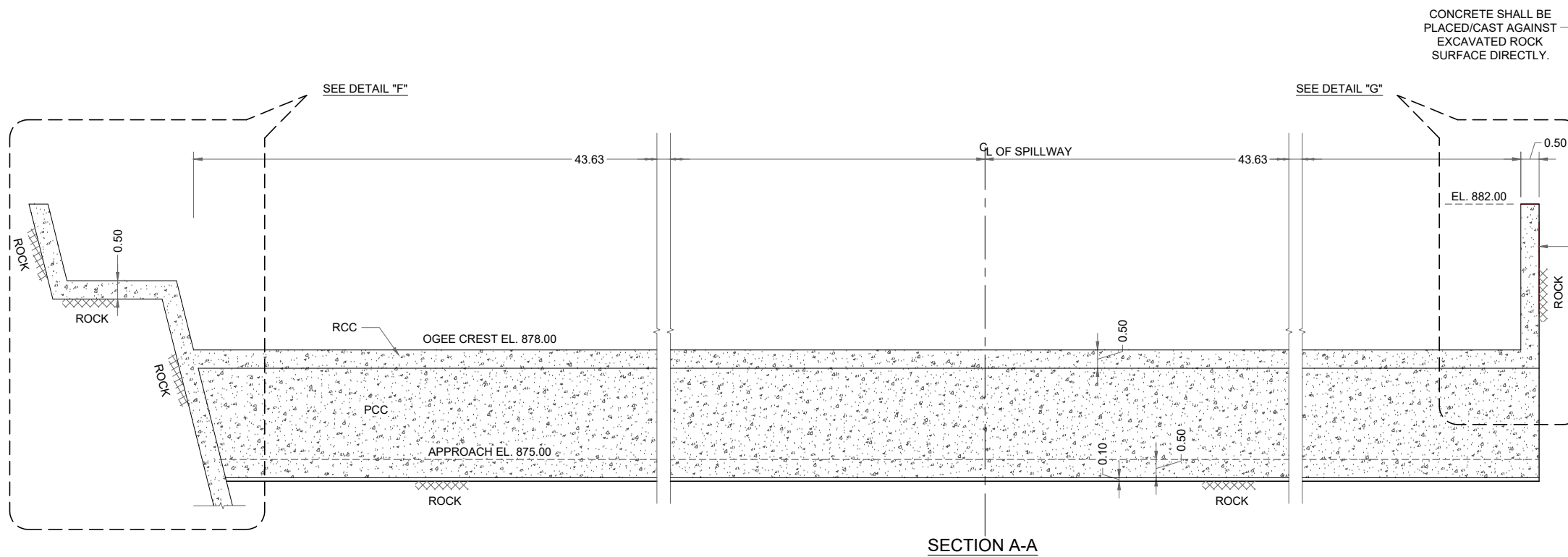
DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Ammar N.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	02-03-20

DRG.No:- ZKD-TD-SP-04 SHEET:- 2 of 4 SUB SH.

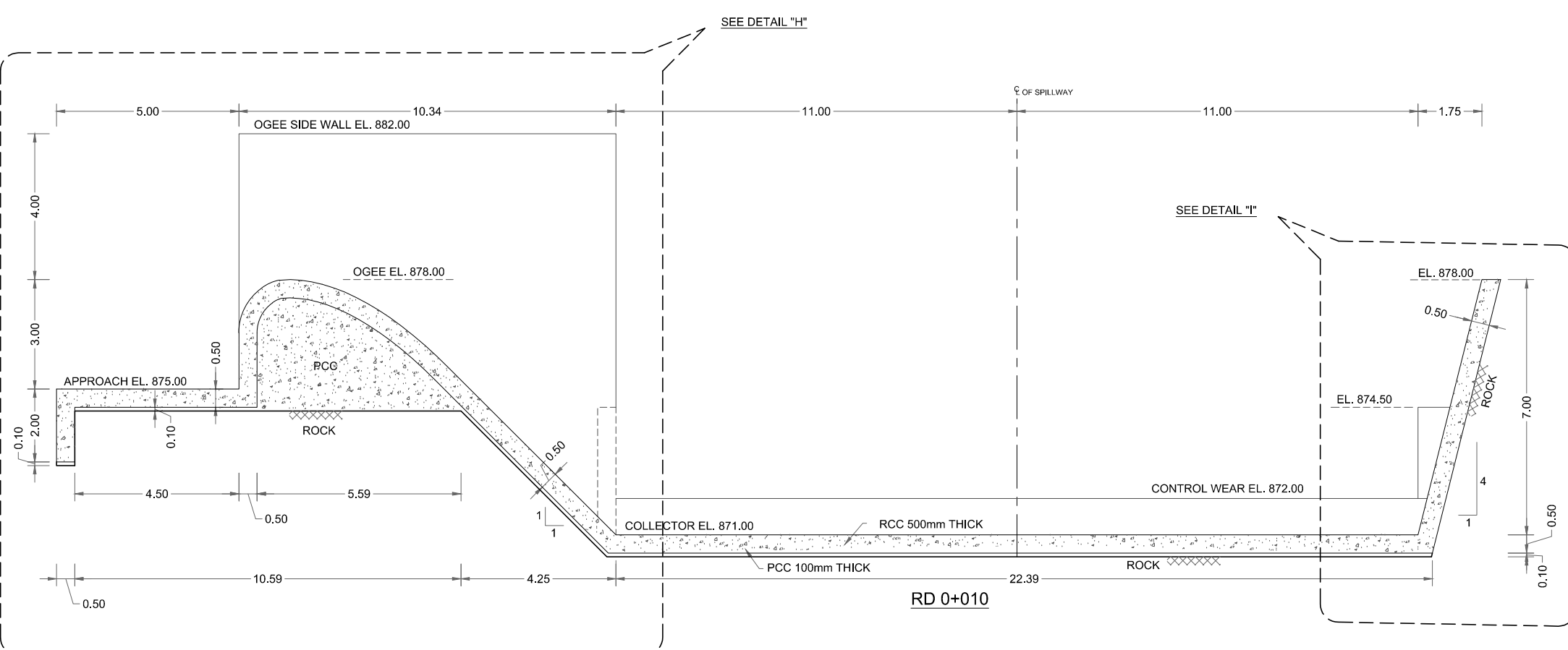




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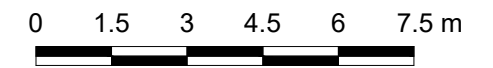


CONCRETE SHALL BE PLACED/CAST AGAINST EXCAVATED ROCK SURFACE DIRECTLY.



**NOTES:**

1. ALL DIMENSIONS AND LEVELS ARE IN METERS UNLESS OTHERWISE MENTIONED.



SCALE

**REFERENCE DRAWINGS :-**

- ZKD-TD-SP-01
- ZKD-TD-SP-02 (1 to 2)

**DRAWING IS RELEASED**

FOR TENDER DRAWINGS ONLY

CLIENT:  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

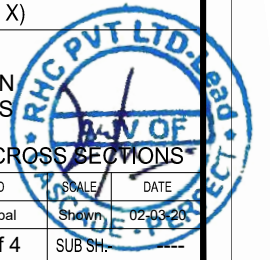
CONSULTANTS:  
A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.  
**CGE** CASCADE GROUP OF ENGINEERING & CONSULTANTS  
**PEM** PERFECT ENGINEERING & MANAGEMENT CONSULTANTS

PROJECT:  
CONSULTANCY SERVICES FOR DRAFT TENDER DRAWINGS,  
DETAIL DESIGN & SUPERVISION PC-1 FOR 5 SMALL  
DAMS IN FATA (PACKAGE - X)

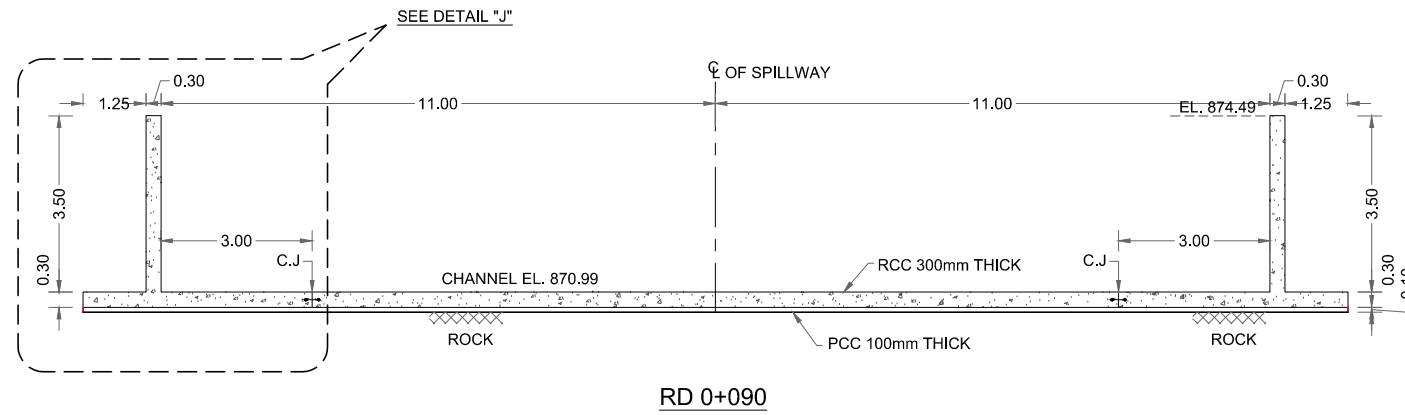
TITLE:  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS

**CONCRETE OUTLINE OF SPILLWAY CROSS SECTIONS**

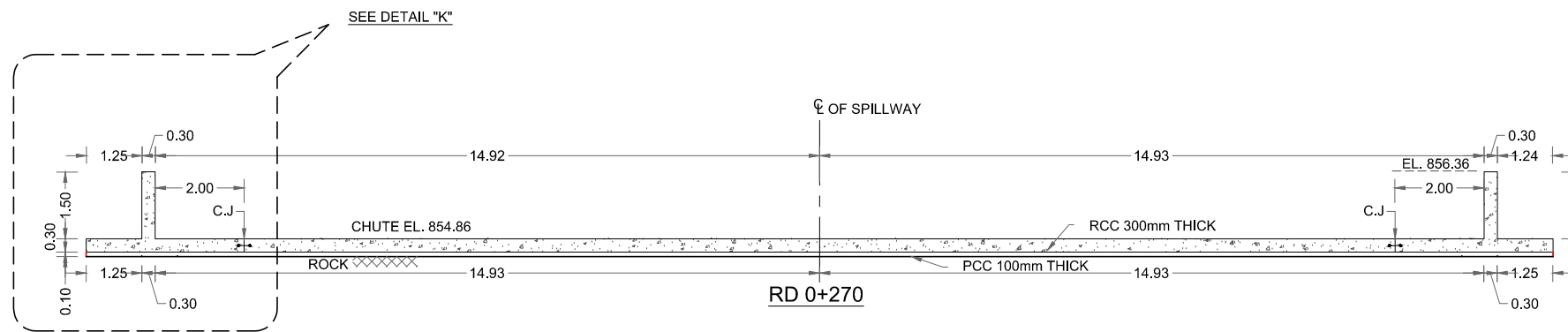
DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Ammar N.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	02-03-20
DRG.No:- ZKD-TD-SP-04		SHEET:- 3 of 4		SUB SH.	



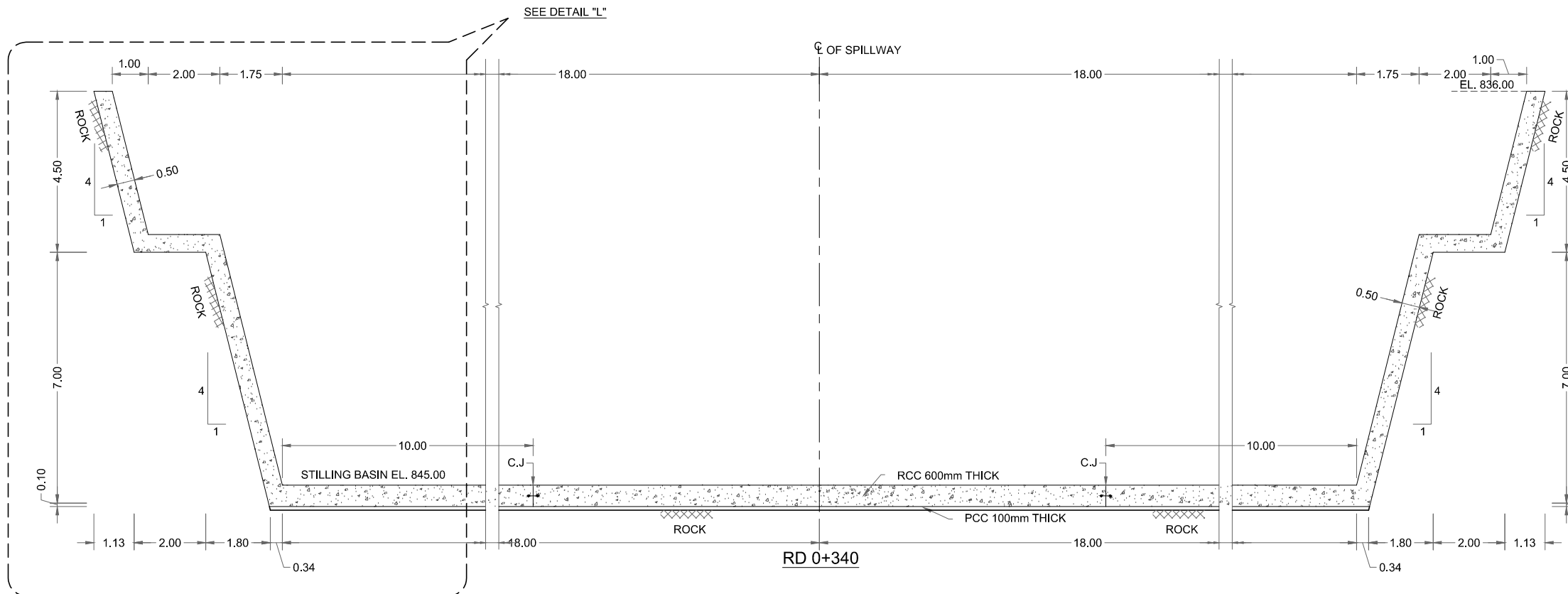
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RD 0+090



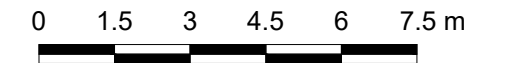
RD 0+270



RD 0+340

**NOTES:**

1. ALL DIMENSIONS AND LEVELS ARE IN METERS UNLESS OTHERWISE MENTIONED.



SCALE

**REFERENCE DRAWINGS :-**

ZKD-TD-SP-01  
ZKD-TD-SP-02 (1 to 2)

**DRAWING IS RELEASED**

**FOR TENDER DRAWINGS ONLY**

CLIENT:  
**PSU SMALL DAM SECTION MERGED AREA**  
**IRRIGATION DEPARTMENT. KPK.**

CONSULTANTS:  
A J.V OF  
**RHC REHMAN HABIB CONSULTANTS (PVT) LTD.**  
**CASCADE GROUP OF ENGINEERING & CONSULTANTS**  
**PERFECT ENGINEERING & MANAGEMENT CONSULTANTS**

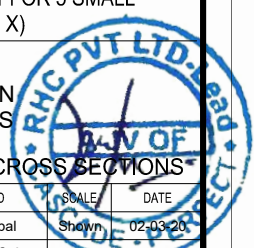
PROJECT:  
**CONSULTANCY SERVICES FOR DRAFT TENDER DRAWINGS,**  
**DETAIL DESIGN & SUPERVISION PC-1 FOR 5 SMALL**  
**DAMS IN FATA (PACKAGE - X)**

**ZAKAR KHEL DAM**  
**NORTH WAZIRISTAN**  
**TENDER DRAWINGS**

TITLE:  
**CONCRETE OUTLINE OF SPILLWAY CROSS SECTIONS**

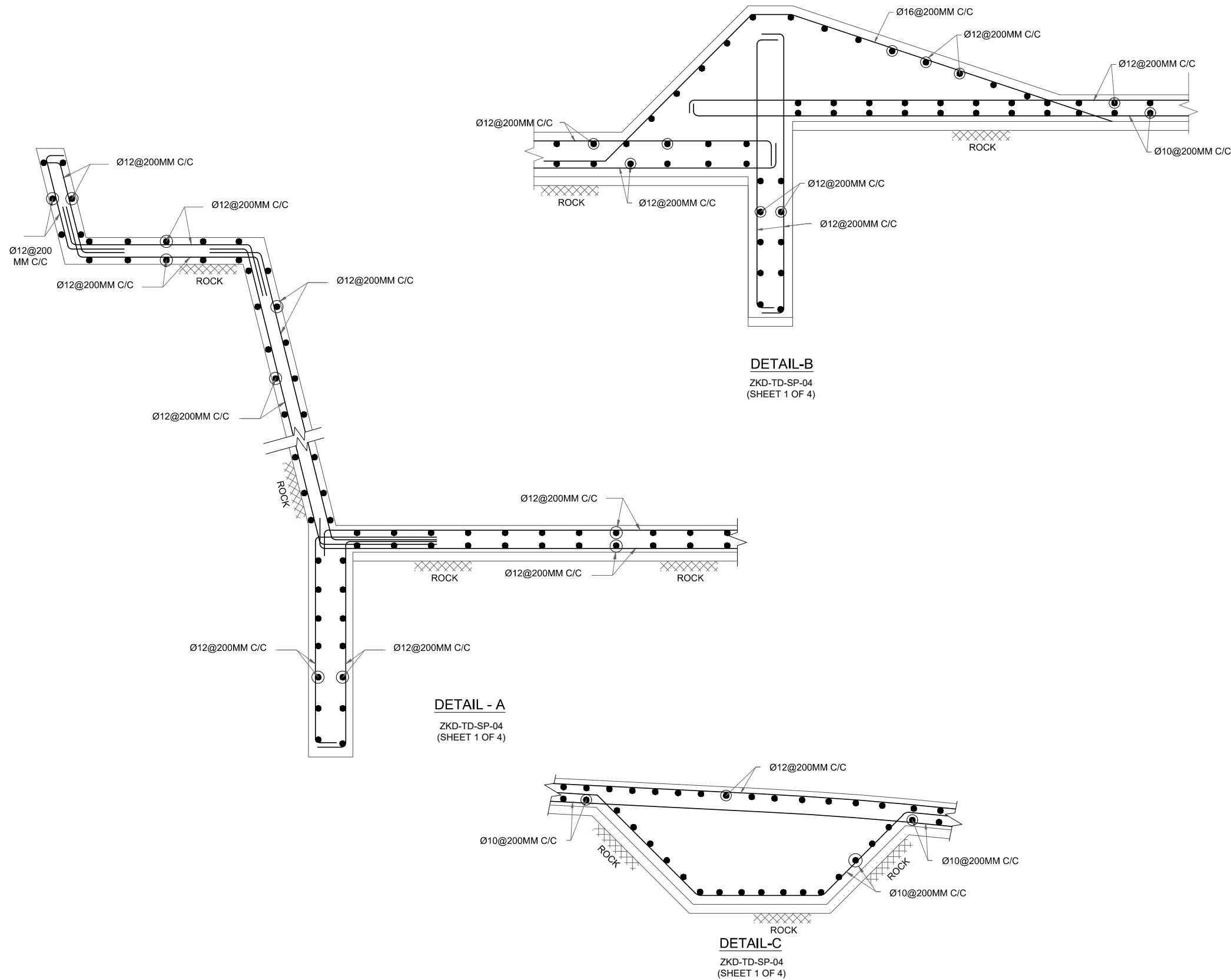
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DRG.No:- ZKD-TD-SP-04 SHEET:- 4 of 4 SUB SH.





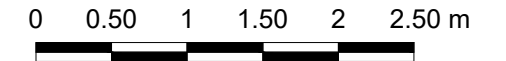
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**NOTES:**

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS INDICATED OTHERWISE.
2. CONCRETE STRENGTH 28 DAYS 3750 (PSI)
3. REINFORCED STEEL SHALL BE AS PER ASTM A615 HAVING YIELD STRENGTH 60000 (PSI)
4. BARS SHALL BE PROVIDED AS PER TABLE BELOW,

BAR DESIGNATED IN SI SYSTEM JUST FOR READING	ACTUAL BARS TO BE PROVIDED
Ø10	#3
Ø12 OR Ø13	#4
Ø16	#5
Ø19 OR Ø20	#6
Ø22	#7
Ø25	#8
Ø28 OR Ø29	#9



SCALE

**REFERENCE DRAWINGS :-**

ZKD-TD-SP-01  
ZKD-TD-SP-04 (1 to 4)

**DRAWING IS RELEASED**

**FOR TENDER DRAWINGS ONLY**

CLIENT:  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

CONSULTANTS: A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.  
**CGE** CASCADE GROUP OF ENGINEERING & CONSULTANTS  
**PEM** PERFECT ENGINEERING & MANAGEMENT CONSULTANTS

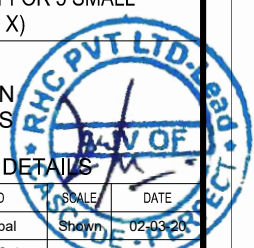
PROJECT:  
CONSULTANCY SERVICES FOR DRAFT TENDER DRAWINGS,  
DETAIL DESIGN & SUPERVISION PC-1 FOR 5 SMALL DAMS IN FATA (PACKAGE - X)

TITLE:  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS

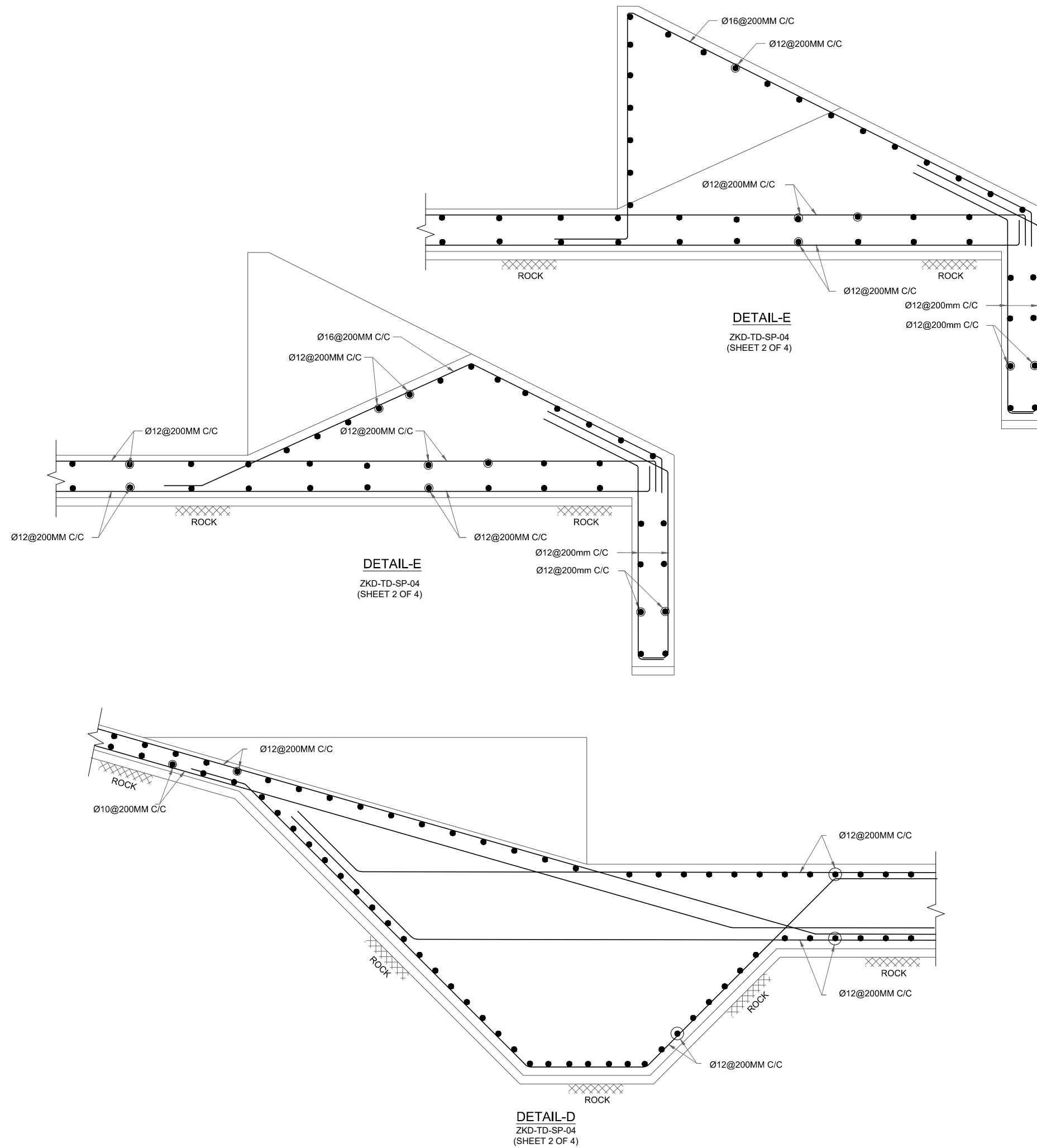
SPILLWAY REINFORCEMENT DETAILS

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	02-03-20

DRG.No:- ZKD-TD-SP-05 SHEET:- 1 of 4 SUB SH.



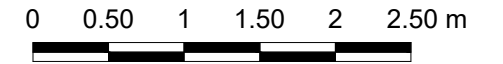
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**NOTES:**

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3. REINFORCED STEEL SHALL BE AS PER ASTM A615 HAVING YIELD STRENGTH 60000 (PSI)
4. BARS SHALL BE PROVIDED AS PER TABLE BELOW,

BAR DESIGNATED IN SI SYSTEM JUST FOR READING	ACTUAL BARS TO BE PROVIDED
Ø10	#3
Ø12 OR Ø13	#4
Ø16	#5
Ø19 OR Ø20	#6
Ø22	#7
Ø25	#8
Ø28 OR Ø29	#9



SCALE

**REFERENCE DRAWINGS :-**

ZKD-TD-SP-01  
ZKD-TD-SP-04 (1 to 4)

**DRAWING IS RELEASED**

**FOR TENDER DRAWINGS ONLY**

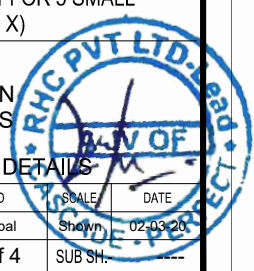
CLIENT:  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

CONSULTANTS: A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.  
**AG** CASCADE GROUP OF ENGINEERING & CONSULTANTS  
**PE** PERFECT ENGINEERING & MANAGEMENT CONSULTANTS

PROJECT:  
CONSULTANCY SERVICES FOR DRAFT TENDER DRAWINGS,  
DETAIL DESIGN & SUPERVISION PC-1 FOR 5 SMALL  
DAMS IN FATA (PACKAGE - X)

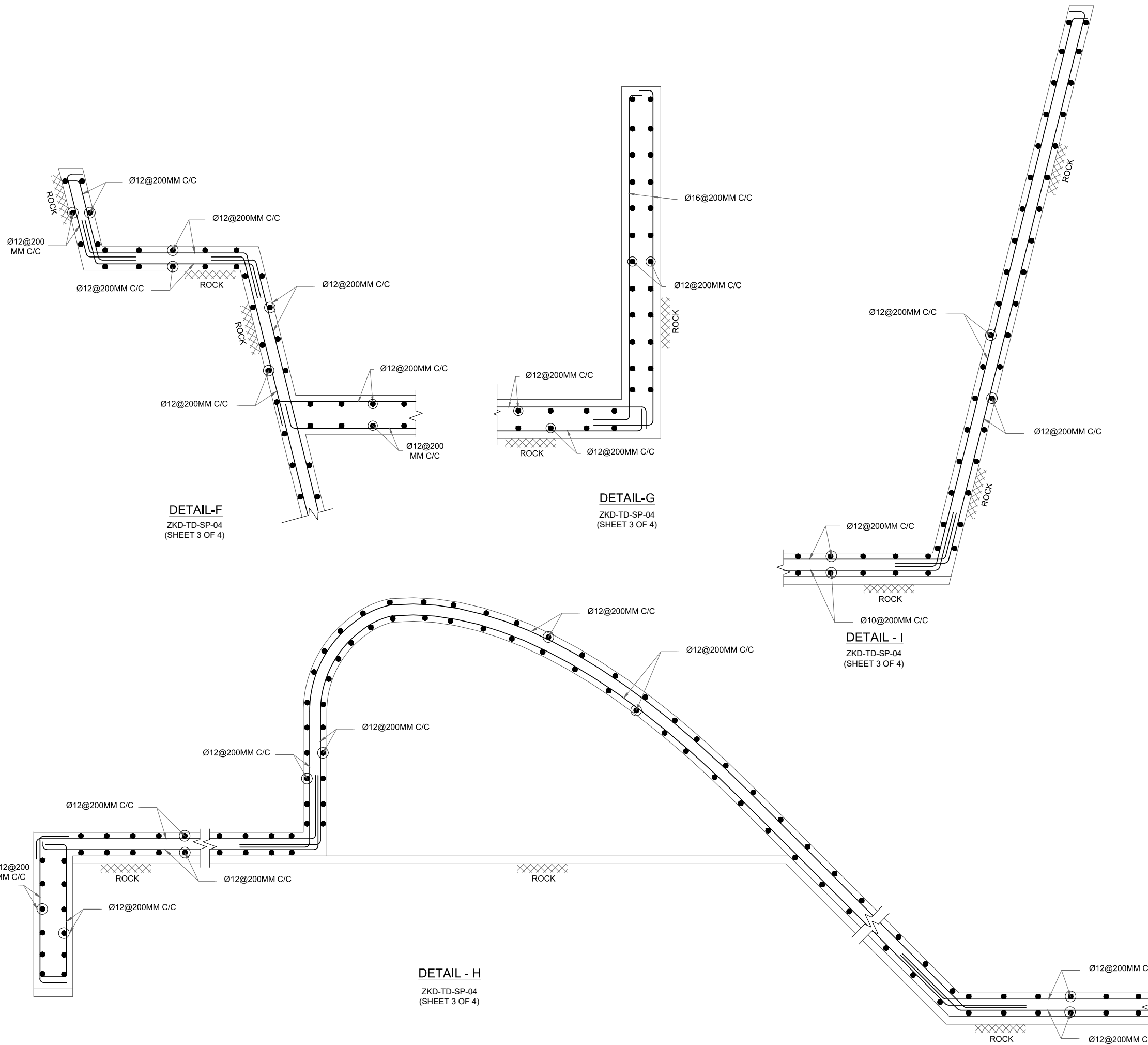
TITLE:  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS  
SPILLWAY REINFORCEMENT DETAILS

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	02-03-20
DRG.No:- ZKD-TD-SP-05		SHEET:- 2 of 4		SUB SH.	





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**DETAIL-F**  
ZKD-TD-SP-04  
(SHEET 3 OF 4)

**DETAIL-G**  
ZKD-TD-SP-04  
(SHEET 3 OF 4)

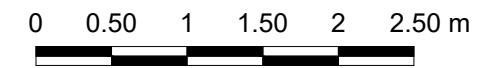
**DETAIL - I**  
ZKD-TD-SP-04  
(SHEET 3 OF 4)

**DETAIL - H**  
ZKD-TD-SP-04  
(SHEET 3 OF 4)

**NOTES:**

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS INDICATED OTHERWISE.
2. CONCRETE STRENGTH 28 DAYS 3750 (PSI)
3. REINFORCED STEEL SHALL BE AS PER ASTM A615 HAVING YIELD STRENGTH 60000 (PSI)
4. BARS SHALL BE PROVIDED AS PER TABLE BELOW,

BAR DESIGNATED IN SI SYSTEM JUST FOR READING	ACTUAL BARS TO BE PROVIDED
Ø10	#3
Ø12 OR Ø13	#4
Ø16	#5
Ø19 OR Ø20	#6
Ø22	#7
Ø25	#8
Ø28 OR Ø29	#9



SCALE

**REFERENCE DRAWINGS :-**

ZKD-TD-SP-01  
ZKD-TD-SP-04 (1 to 4)

**DRAWING IS RELEASED**

FOR TENDER DRAWINGS ONLY

CLIENT:  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

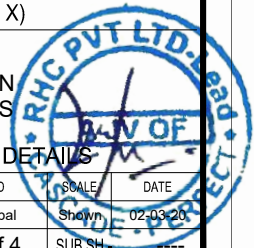
CONSULTANTS:  
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**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.  
**CGE** CASCADE GROUP OF ENGINEERING & CONSULTANTS  
**PEM** PERFECT ENGINEERING & MANAGEMENT CONSULTANTS

PROJECT:  
CONSULTANCY SERVICES FOR DRAFT TENDER DRAWINGS,  
DETAIL DESIGN & SUPERVISION PC-1 FOR 5 SMALL  
DAMS IN FATA (PACKAGE - X)

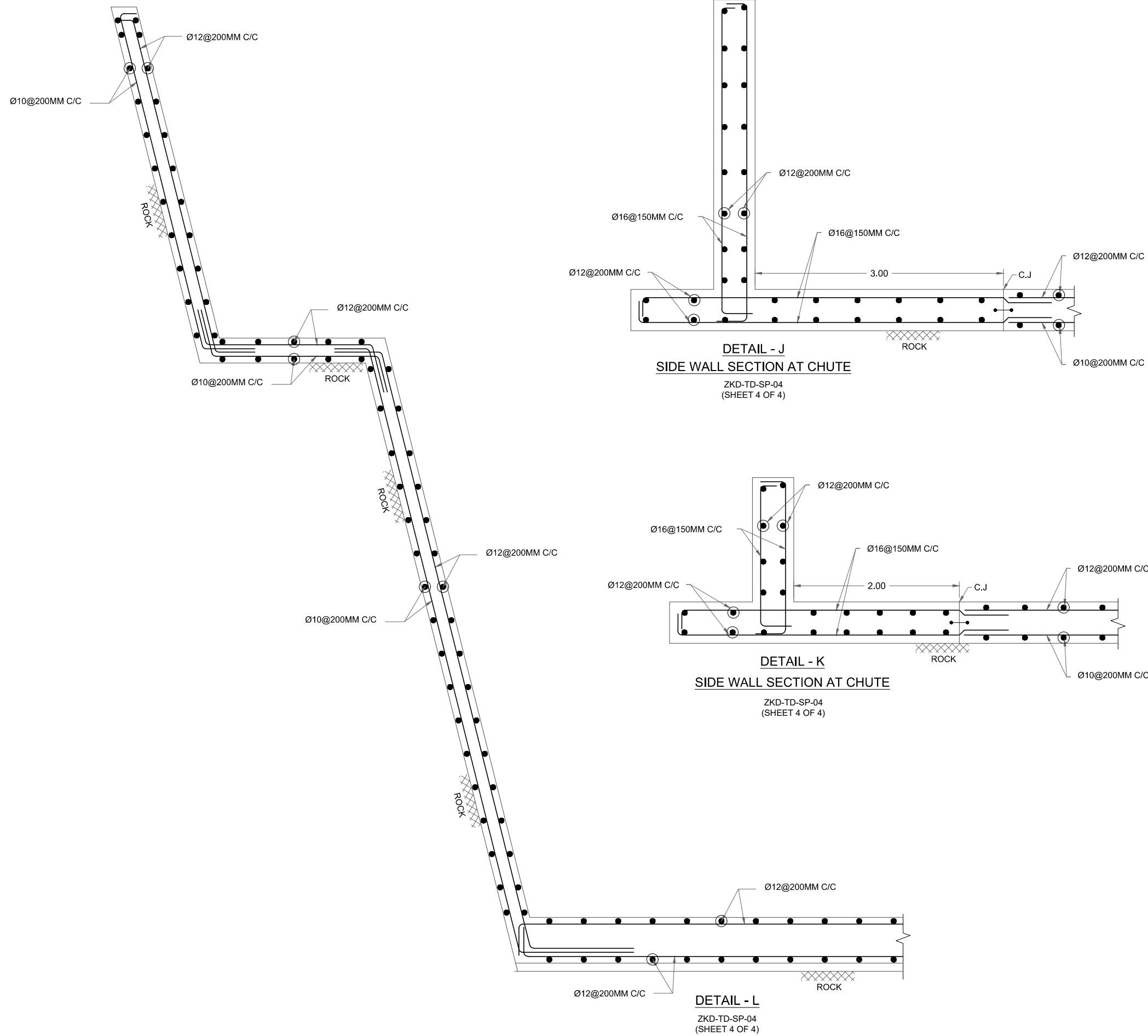
TITLE:  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS

SPILLWAY REINFORCEMENT DETAILS

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	02-03-20
DRG.No:-	ZKD-TD-SP-05	SHEET:-	3 of 4	SUB SH.	



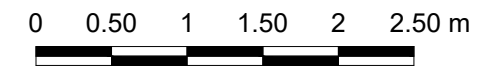
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Ø19 OR Ø20	#6
Ø22	#7
Ø25	#8
Ø28 OR Ø29	#9



SCALE

**REFERENCE DRAWINGS :-**

ZKD-TD-SP-01  
ZKD-TD-SP-04 (1 to 4)

**DRAWING IS RELEASED**

FOR TENDER DRAWINGS ONLY

CLIENT:  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

CONSULTANTS:  
A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.  
**CGE** CASCADE GROUP OF ENGINEERING & CONSULTANTS  
**PEM** PERFECT ENGINEERING & MANAGEMENT CONSULTANTS

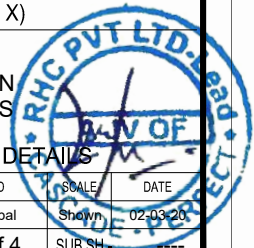
PROJECT:  
CONSULTANCY SERVICES FOR DRAFT TENDER DRAWINGS,  
DETAIL DESIGN & SUPERVISION PC-1 FOR 5 SMALL DAMS IN FATA (PACKAGE - X)

ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS

TITLE:  
SPILLWAY REINFORCEMENT DETAILS

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	02-03-20

DRG.No:- ZKD-TD-SP-05 SHEET:- 4 of 4 SUB SH.

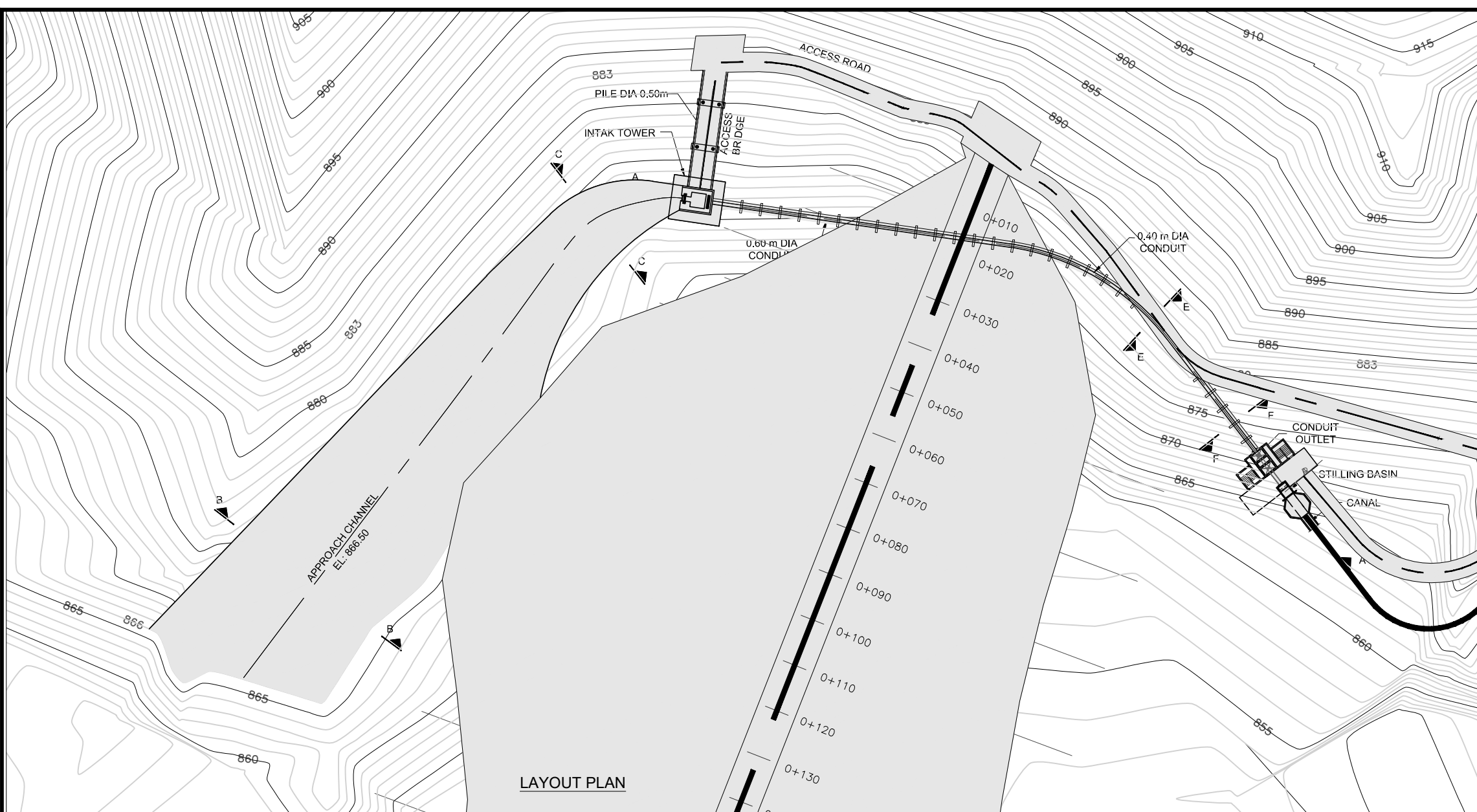




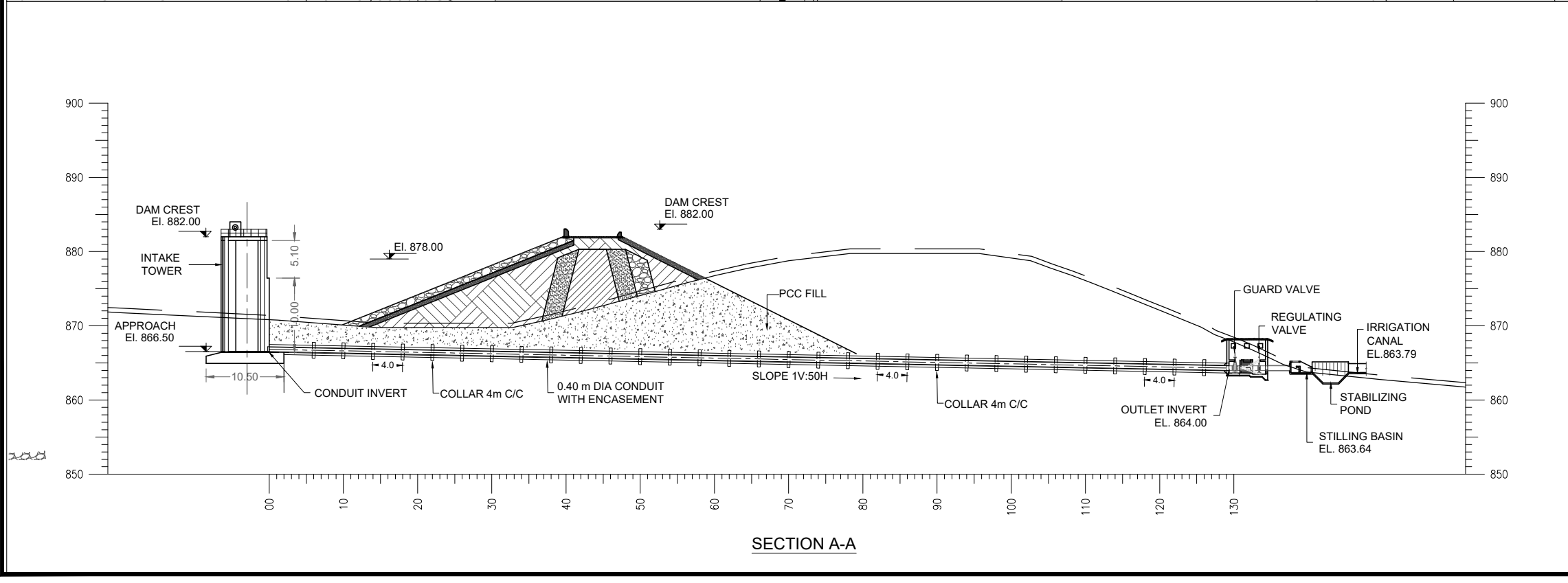
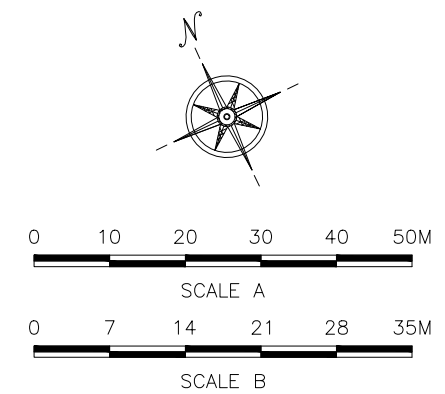
# CONDUIT



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- NOTES:-**
1. ALL DIMENSIONS AND LEVELS ARE IN METERS.
  2. SIDE SLOPES FOR ALL EXCAVATIONS IN OVERBURDEN STRATA ARE SPECIFIED AS 1V:1H AND SIDE SLOPES FOR ALL EXCAVATIONS IN ROCK ARE SPECIFIED AS 4V:1H.
  3. NSL DATA IS FROM TOPOGRAPHICAL SURVEY AND MAY VARY AS PER SITE CONDITIONS.
  4. BACK FILLING SHALL BE DONE BY SUITABLE COARSE GRANULAR EXCAVATED MATERIAL COMPACTED AS PER SPECIFICATIONS.
  5. CONCRETE CYLINDER STRENGTH 4000PSI.
  6. REINFORCEMENT AS PER ASTM A615 GRADE 60.



**REFERENCE DRAWINGS :-**

ZKD-TD-IC-02 ZKD-TD-IC-04  
ZKD-TD-IC-03 ZKD-TD-IC-05 (1 to 3)

**DRAWING IS RELEASED**

FOR TENDER DRAWINGS ONLY

**CLIENT:**  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

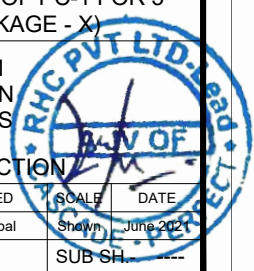
**CONSULTANTS:** A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.  
**CASCAD** CASCADE GROUP OF ENGINEERING & CONSULTANTS  
**PEMG** PERFECT ENGINEERING & MANAGEMENT CONSULTANTS

**PROJECT:**  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1 FOR 5  
SMALL DAMS IN FATA (PACKAGE - X)

**TITLE:**  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS  
CONDUIT PLAN AND SECTION

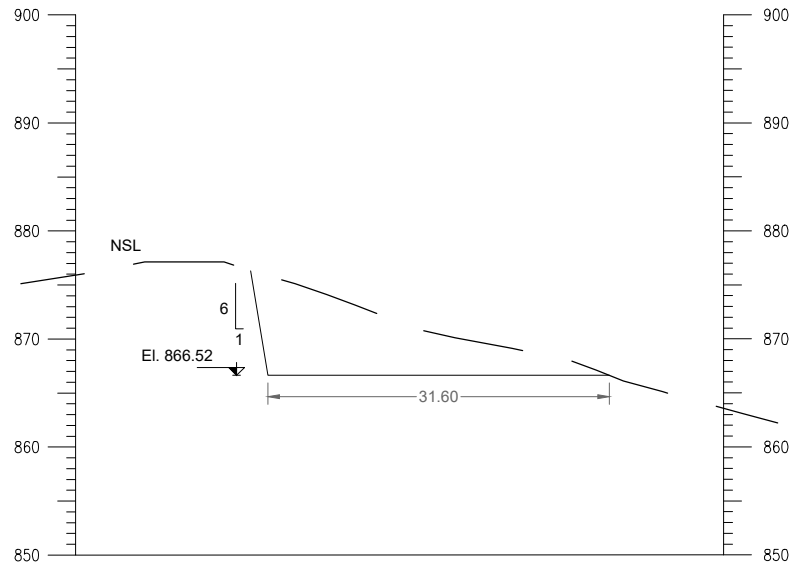
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Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021

DRG.No:- ZKD-TD-IC-01 SHEET:- SUB SH. ---

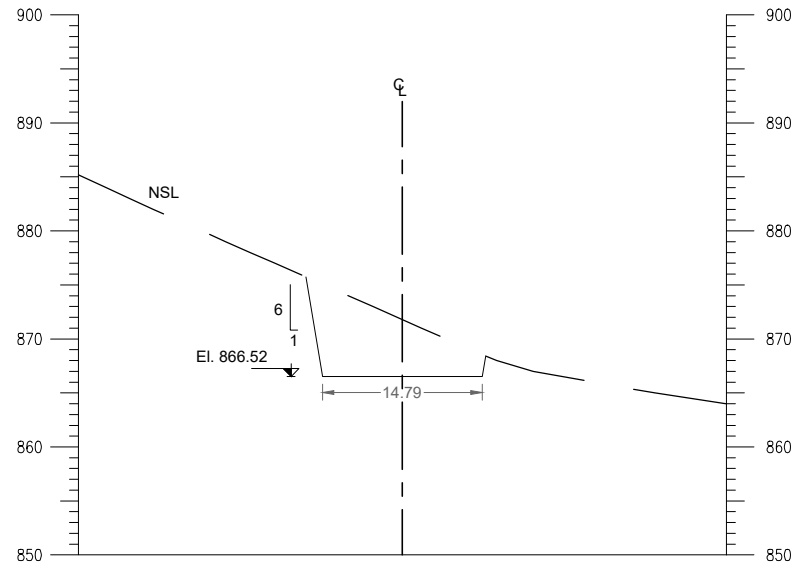




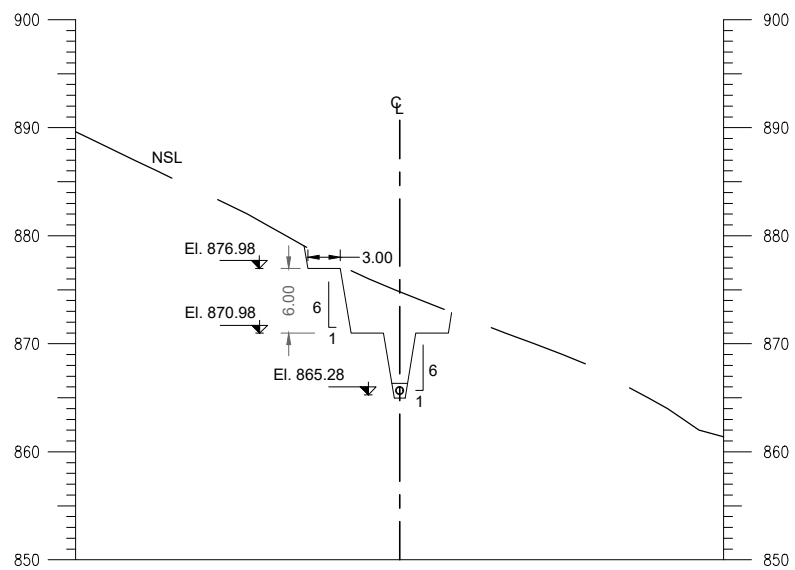
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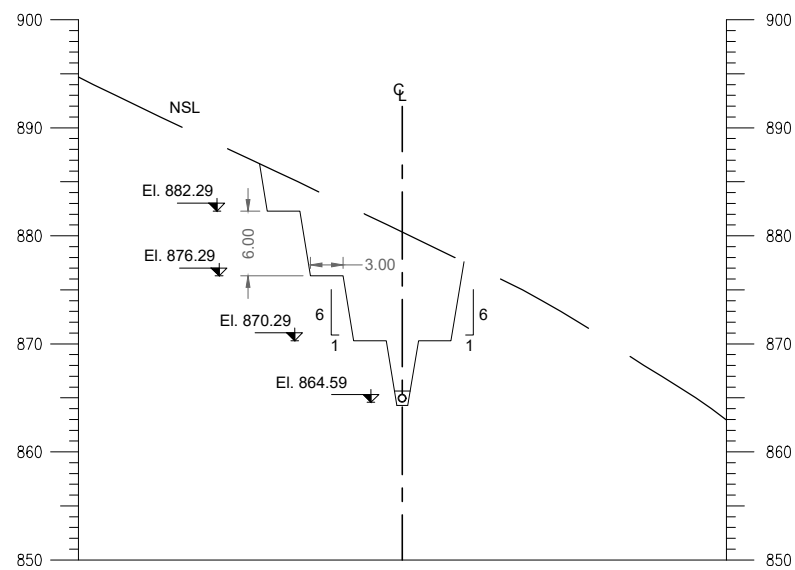
SECTION B-B



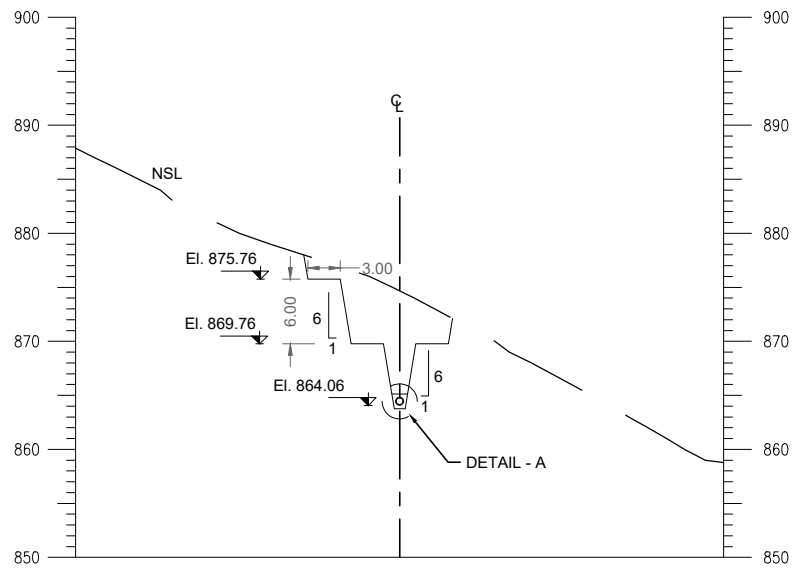
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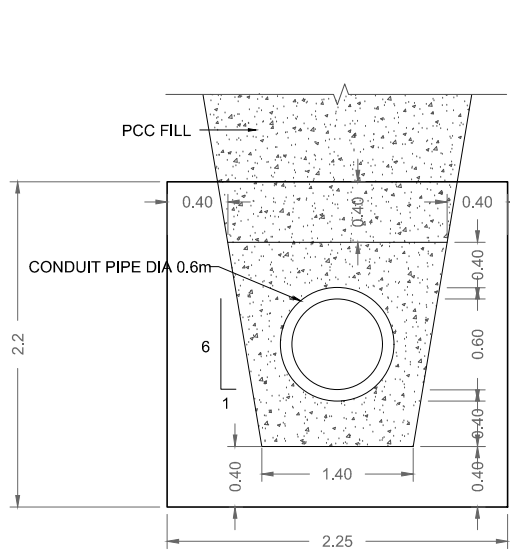
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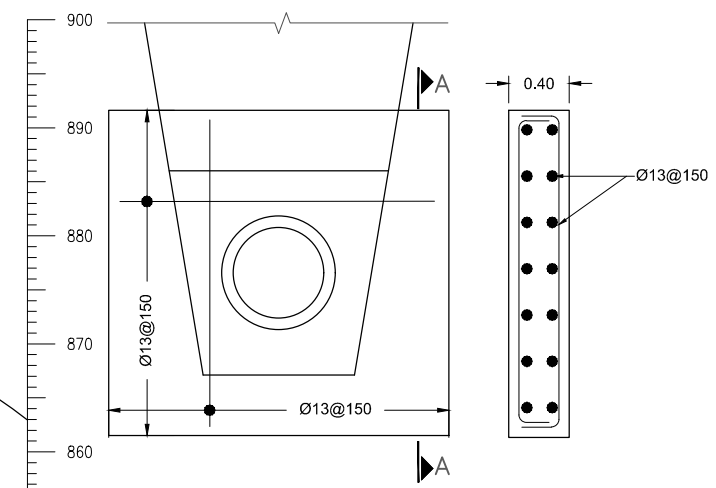
SECTION E-E



SECTION F-F

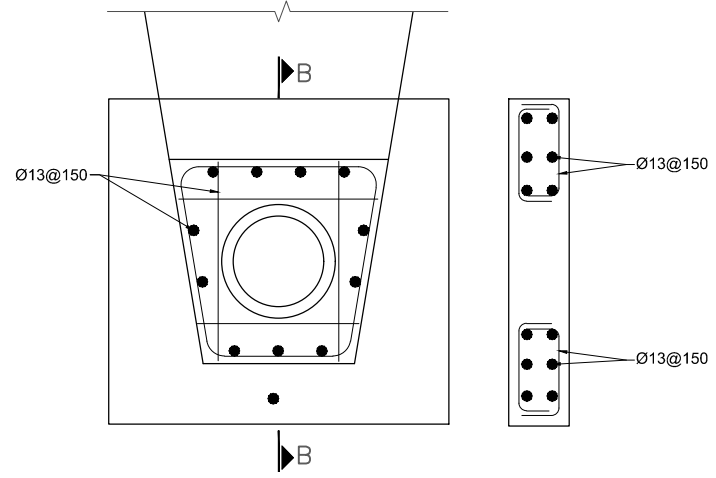


CONDUIT PIPE  
DETAIL - A



CONDUIT PIPE  
REINFORCEMENT

SECTION A-A



CONDUIT PIPE  
REINFORCEMENT

SECTION B-B

**NOTES:-**

1. ALL DIMENSIONS AND LEVELS ARE IN METERS.
2. SIDE SLOPES FOR ALL EXCAVATIONS IN OVERBURDEN STRATA ARE SPECIFIED AS 1V:1H AND SIDE SLOPES FOR ALL EXCAVATIONS IN ROCK ARE SPECIFIED AS 4V:1H.
3. NSL DATA IS FROM TOPOGRAPHICAL SURVEY AND MAY VARY AS PER SITE CONDITIONS.
4. BACK FILLING SHALL BE DONE BY SUITABLE COARSE GRANULAR EXCAVATED MATERIAL COMPACTED AS PER SPECIFICATIONS.
5. CONCRETE CYLINDER STRENGTH 4000PSI.
6. REINFORCEMENT AS PER ASTM A615 GRADE 60.



**REFERENCE DRAWINGS :-**

- ZKD-TD-IC-01 ZKD-TD-IC-04
- ZKD-TD-IC-03 ZKD-TD-IC-05 (1 to 3)

DRAWING IS RELEASED

FOR TENDER DRAWINGS ONLY

CLIENT:  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

CONSULTANTS: A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.

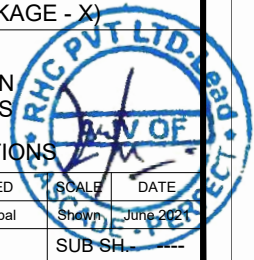
**CASCADE GROUP**  
OF ENGINEERING & CONSULTANTS

**PERFECT ENGINEERING & MANAGEMENT CONSULTANTS**

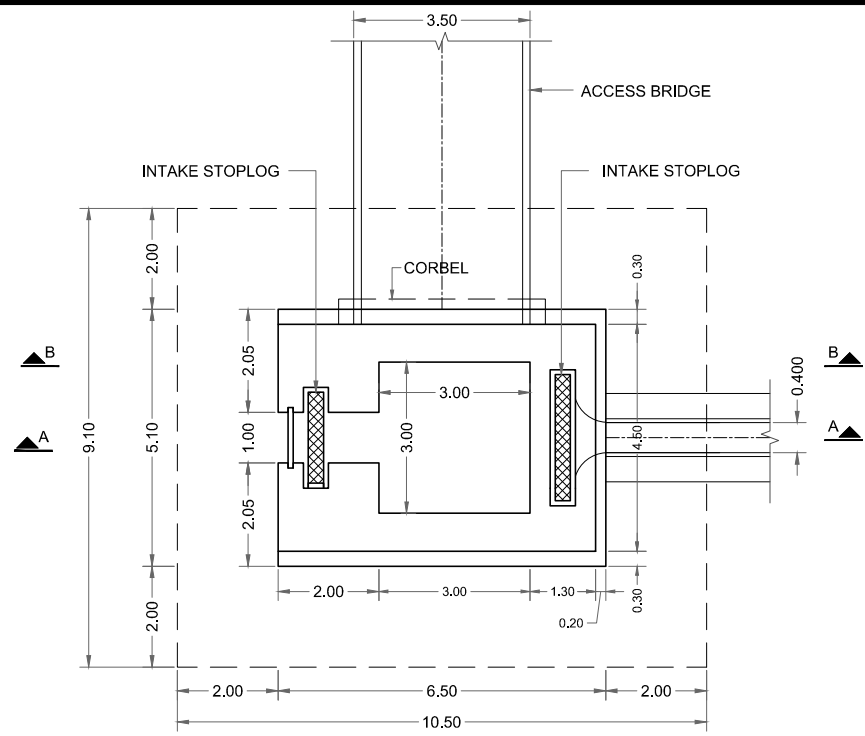
PROJECT:  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1 FOR 5  
SMALL DAMS IN FATA (PACKAGE - X)

TITLE:  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS  
CONDUIT CROSS SECTIONS

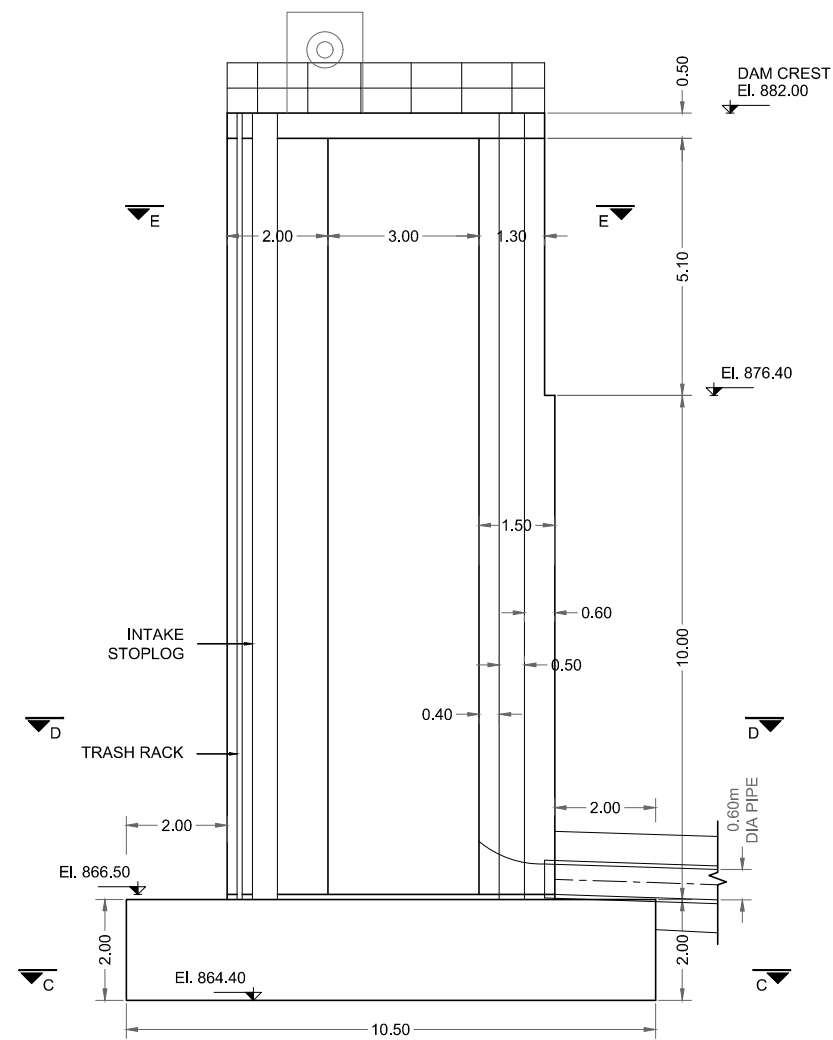
DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021
DRG.No:- ZKD-TD-IC-02			SHEET:-		SUB SH.



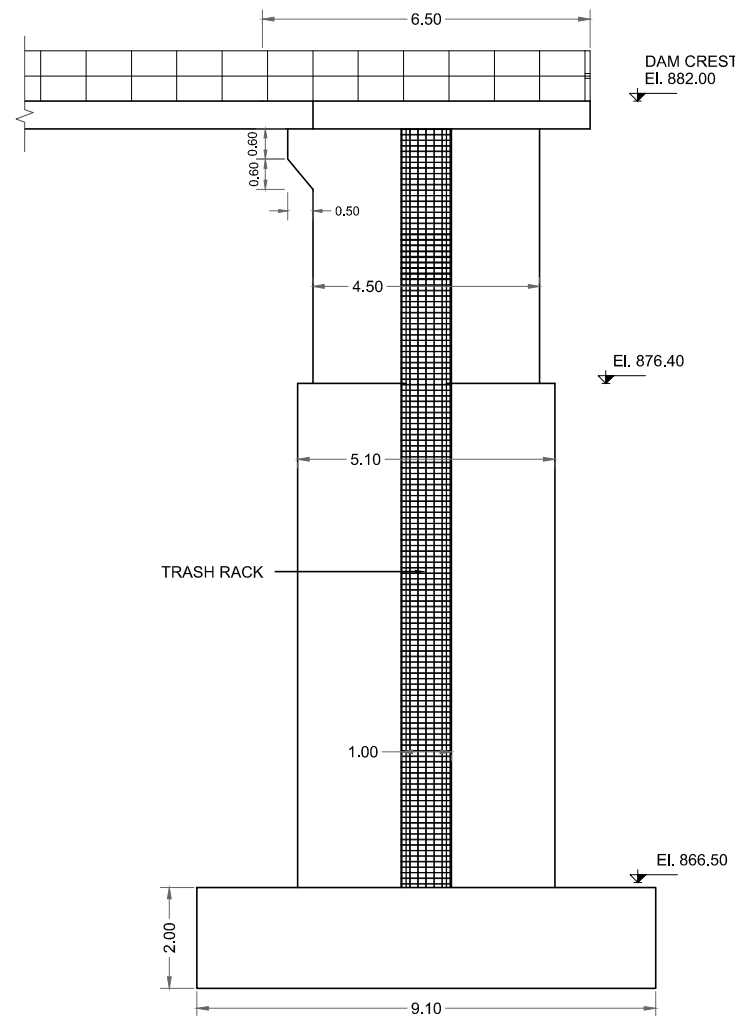
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**INTAKE TOWER PLAN**



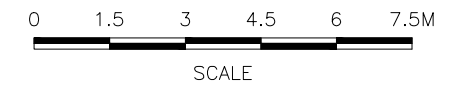
**SECTION A-A**



**FRONT VIEW**

**NOTES:-**

1. ALL DIMENSIONS AND LEVELS ARE IN METERS.
2. NSL DATA IS FROM TOPOGRAPHICAL SURVEY AND MAY VARY AS PER SITE CONDITIONS.
3. BACK FILLING SHALL BE DONE BY SUITABLE COARSE GRANULAR EXCAVATED MATERIAL COMPACTED AS PER SPECIFICATIONS.
4. CONCRETE CYLINDER STRENGTH 4000PSI.
5. REINFORCEMENT AS PER ASTM A615 GRADE 60.



**REFERENCE DRAWINGS :-**

ZKD-TD-IC-01 ZKD-TD-IC-04  
ZKD-TD-IC-02 ZKD-TD-IC-05 (1 to 3)

**DRAWING IS RELEASED**

**FOR TENDER DRAWINGS ONLY**

CLIENT:  
**PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.**

CONSULTANTS: A J.V OF  
**RHC REHMAN HABIB CONSULTANTS (PVT) LTD.**

**CASCADE GROUP  
OF ENGINEERING & CONSULTANTS**

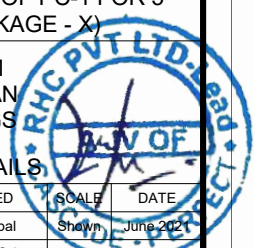
**PERFECT ENGINEERING &  
MANAGEMENT CONSULTANTS**

PROJECT:  
**CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1 FOR 5  
SMALL DAMS IN FATA (PACKAGE - X)**

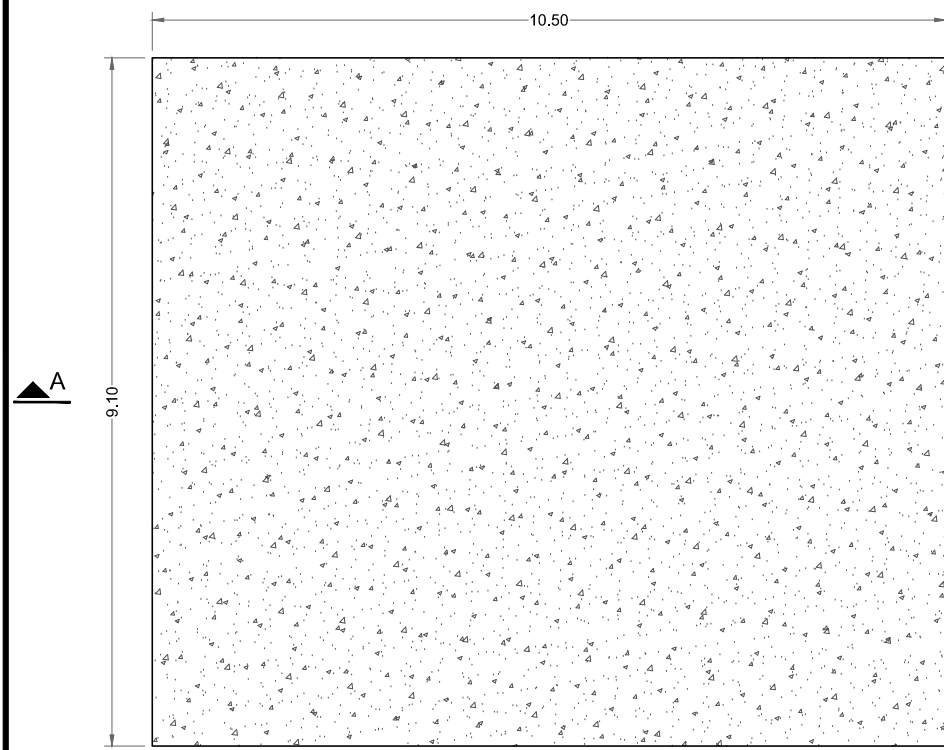
TITLE:  
**ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS**  
**INTAKE TOWER DETAILS**

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	1:1	June 2021

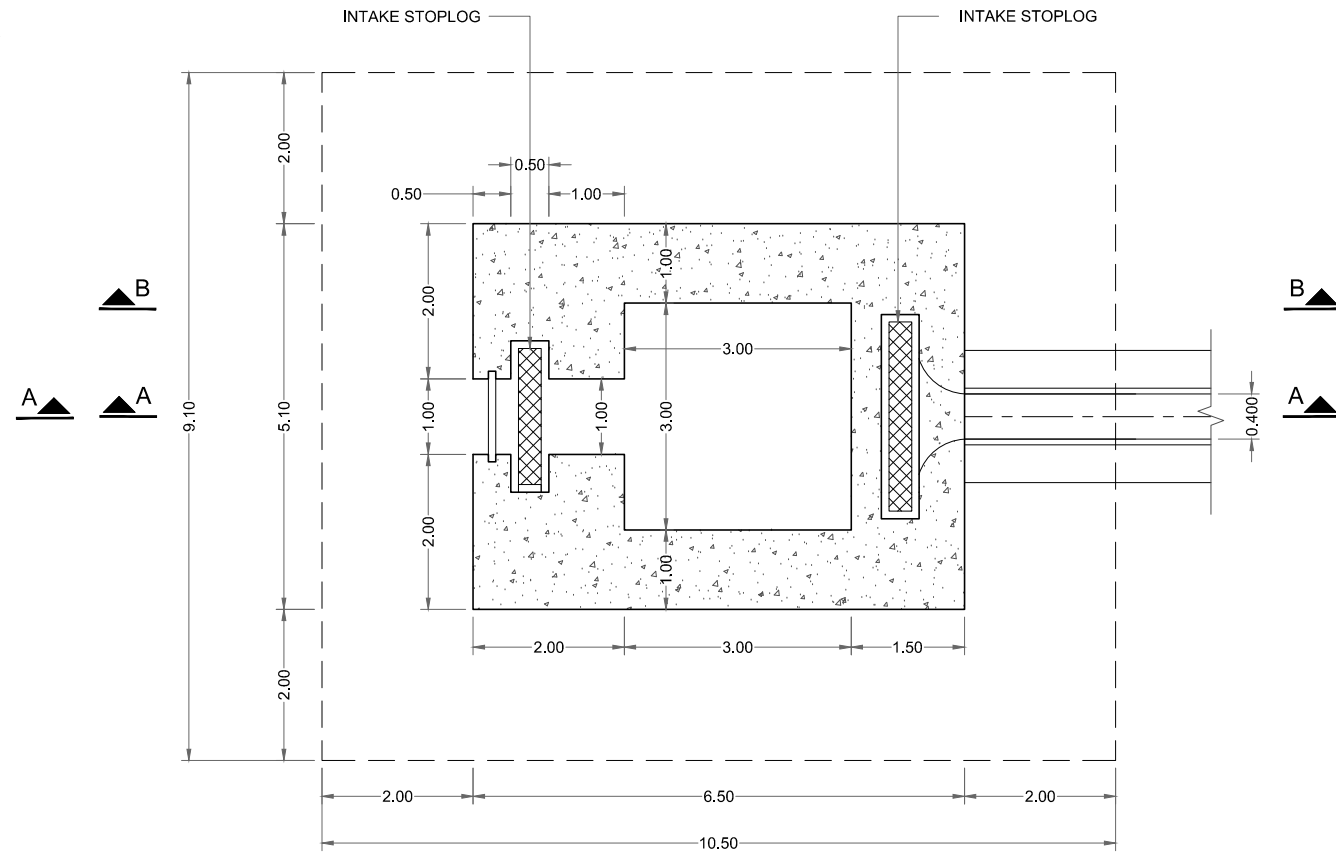
DRG.No:- ZKD-TD-IC-03 SHEET:-1 of 2 SUB SH.



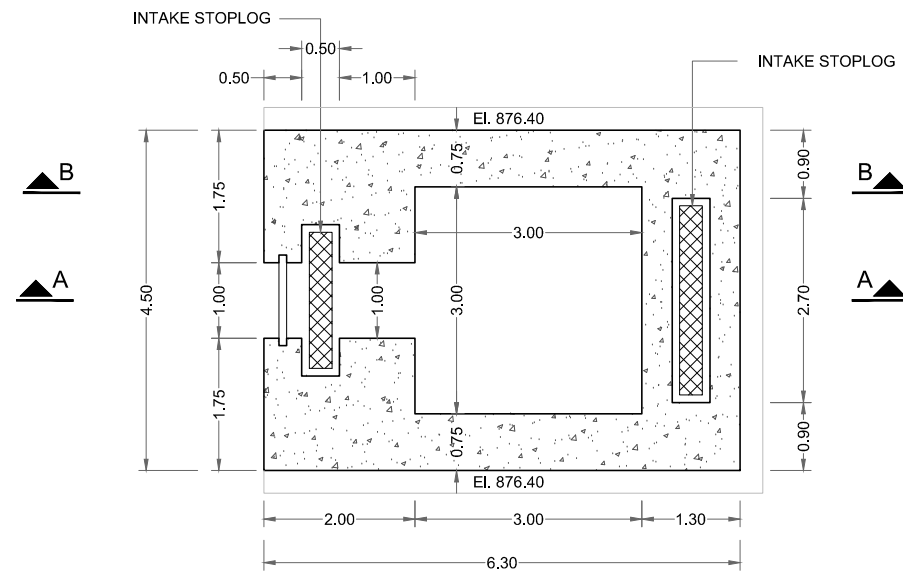
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SECTION B-B  
AT EL.865.00



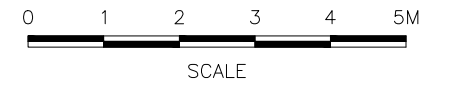
SECTION C-C  
AT EL.870.00



SECTION D-D  
AT EL.880.00

**NOTES:-**

1. ALL DIMENSIONS AND LEVELS ARE IN METERS.
2. NSL DATA IS FROM TOPOGRAPHICAL SURVEY AND MAY VARY AS PER SITE CONDITIONS.
3. BACK FILLING SHALL BE DONE BY SUITABLE COARSE GRANULAR EXCAVATED MATERIAL COMPACTED AS PER SPECIFICATIONS.
4. CONCRETE CYLINDER STRENGTH 4000PSI.
5. REINFORCEMENT AS PER ASTM A615 GRADE 60.



**REFERENCE DRAWINGS :-**

ZKD-TD-IC-01 ZKD-TD-IC-04  
ZKD-TD-IC-02 ZKD-TD-IC-05 (1 to 3)

DRAWING IS RELEASED

FOR TENDER DRAWINGS ONLY

CLIENT:  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

CONSULTANTS: A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.

**CASCAD** CASCADE GROUP  
OF ENGINEERING & CONSULTANTS

**PEMC** PERFECT ENGINEERING &  
MANAGEMENT CONSULTANTS

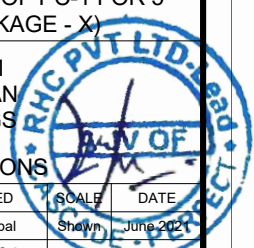
PROJECT:  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1 FOR 5  
SMALL DAMS IN FATA (PACKAGE - X)

TITLE:  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS

INTAKE TOWER SECTIONS

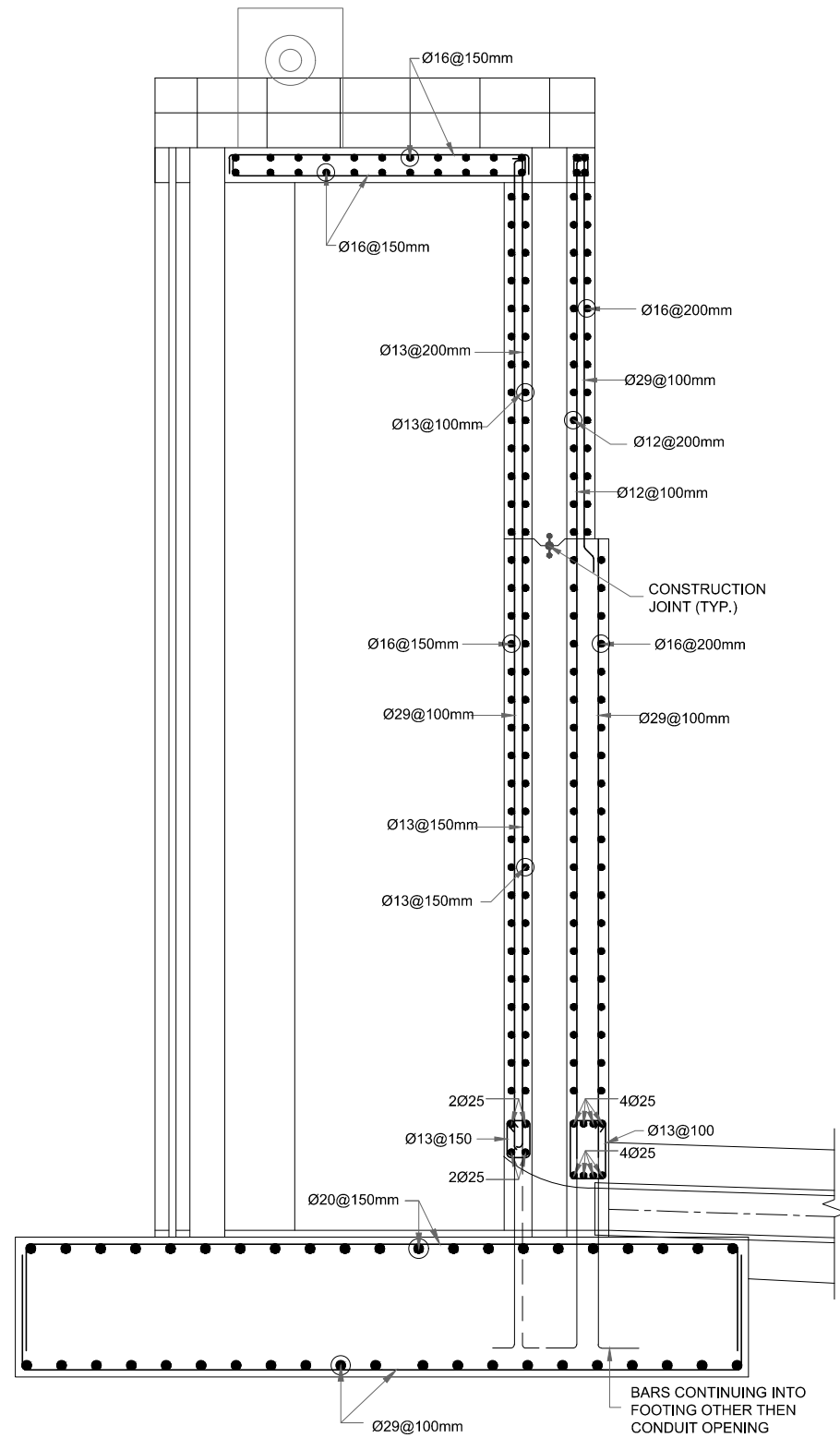
DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021

DRG.No:- ZKD-TD-IC-03 SHEET:-2 of 2 SUB SH. ---

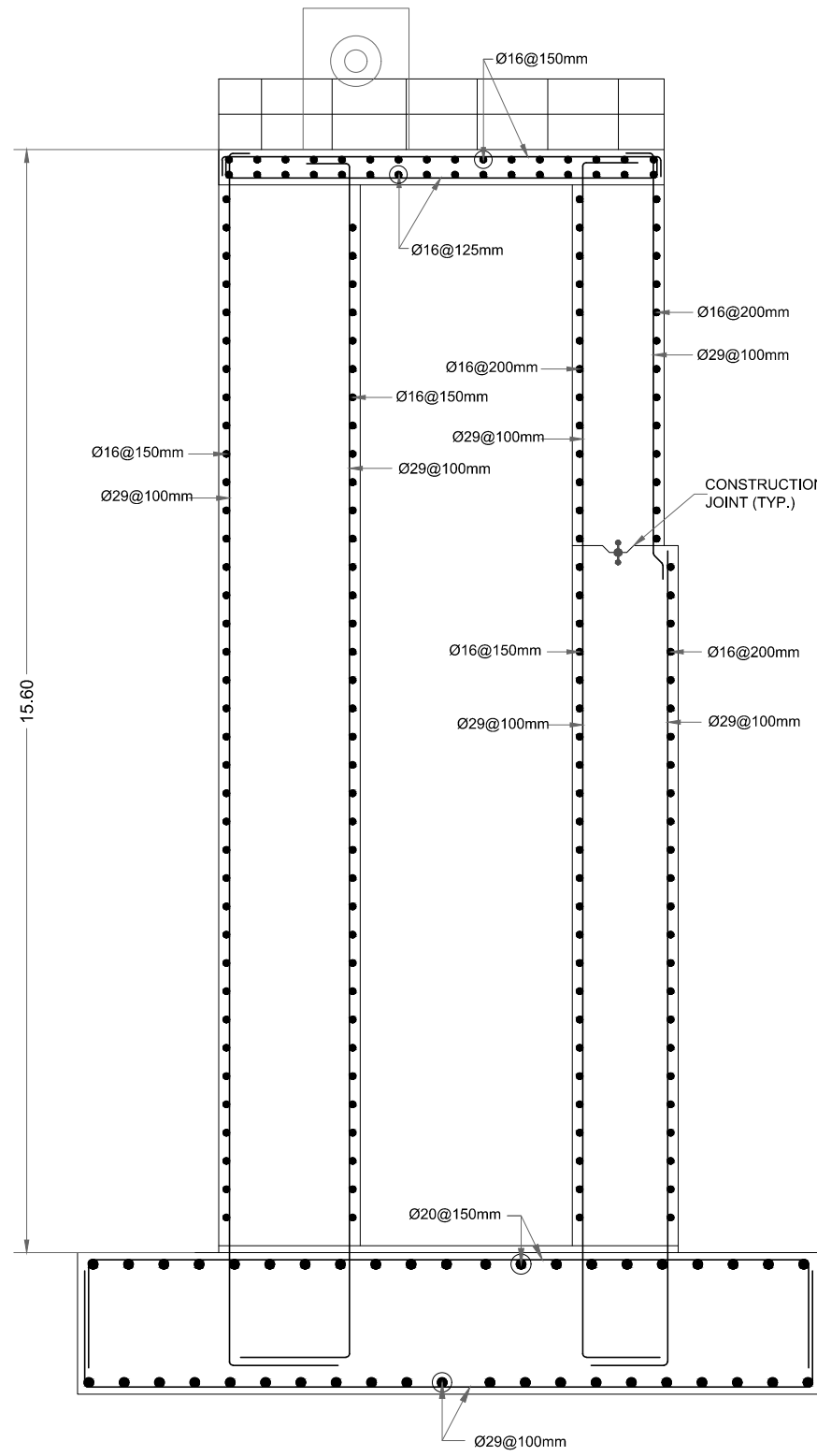




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SECTION A-A



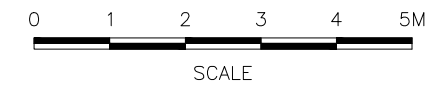
SECTION B-B

**NOTES:-**

1. ALL DIMENSIONS AND LEVELS ARE IN METERS.
2. NSL DATA IS FROM TOPOGRAPHICAL SURVEY AND MAY VARY AS PER SITE CONDITIONS.
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4. CONCRETE CYLINDER STRENGTH 4000PSI.
5. REINFORCEMENT AS PER ASTM A615 GRADE 60.

ASTM A615		
Deformed Bar Designation Numbers, Nominal Weights (Masses), Nominal Dimensions		
Bar Designation No.	Nominal Weight, lb/ft (Nominal Mass, Kg/m)	Diameter, in. (mm)
3(10)	0.376 (0.560)	0.375 (9.5)
4(13)	0.668 (0.994)	0.500 (12.7)
5(16)	1.043 (1.552)	0.625 (15.9)
6(19)	1.502 (2.235)	0.750 (19.1)
7(22)	2.044 (3.042)	0.875 (22.2)
8(25)	2.670 (3.973)	1.000 (25.4)
9(29)	3.400 (5.060)	1.128 (28.7)
10(32)	4.303 (6.404)	1.270 (32.3)
11(36)	5.313 (7.907)	1.410 (35.8)
14(43)	7.650 (11.38)	1.693 (43.0)
18(57)	13.60 (20.24)	2.257 (57.3)

N.B BARS ARE TO BE PROVIDED AS #3, #4, #5, AND #18 AS PER ASTM A615 WHICH ARE FRACTION OF INCHES.



**REFERENCE DRAWINGS :-**

ZKD-TD-IC-01 ZKD-TD-IC-04  
ZKD-TD-IC-02 ZKD-TD-IC-05 (1 to 3)

DRAWING IS RELEASED

FOR TENDER DRAWINGS ONLY

CLIENT:  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

CONSULTANTS: A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.

**CASCAD** CASCADE GROUP OF ENGINEERING & CONSULTANTS

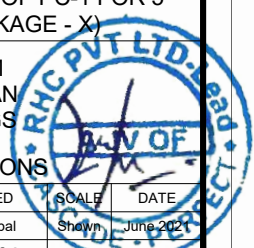
**PEMG** PERFECT ENGINEERING & MANAGEMENT CONSULTANTS

PROJECT:  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1 FOR 5  
SMALL DAMS IN FATA (PACKAGE - X)

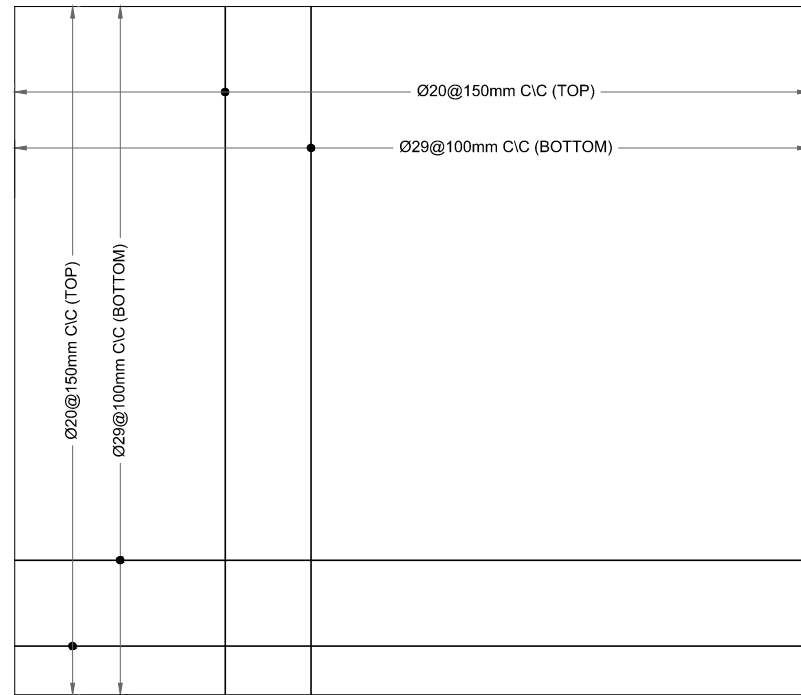
TITLE:  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS  
INTAKE TOWER SECTIONS

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021

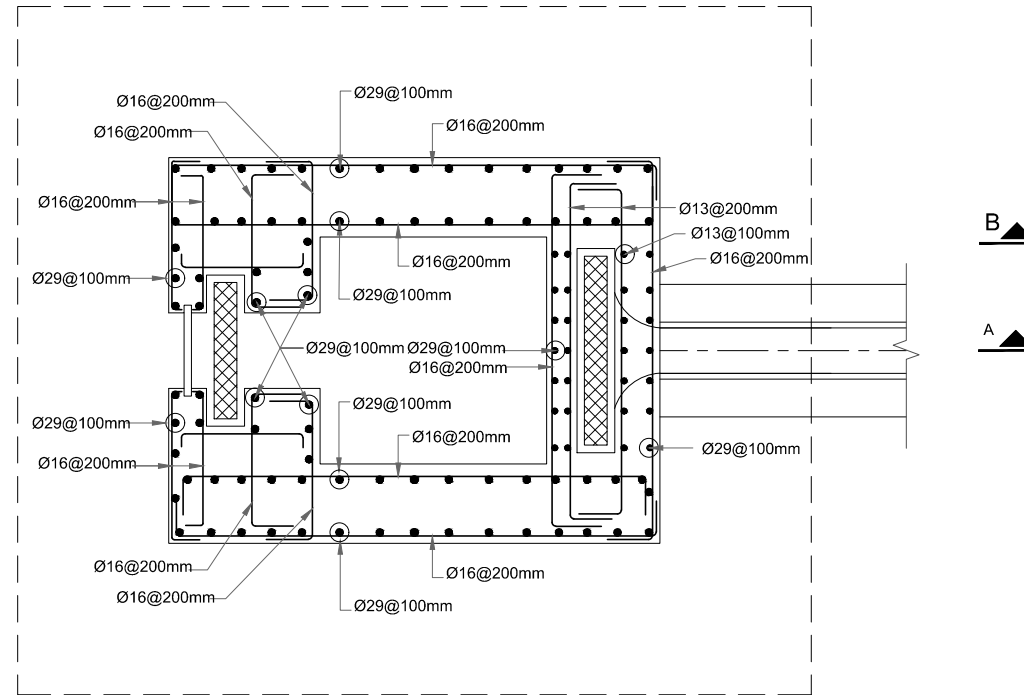
DRG.No:- ZKD-TD-IC-04 SHEET:-1 of 2 SUB SH. ---



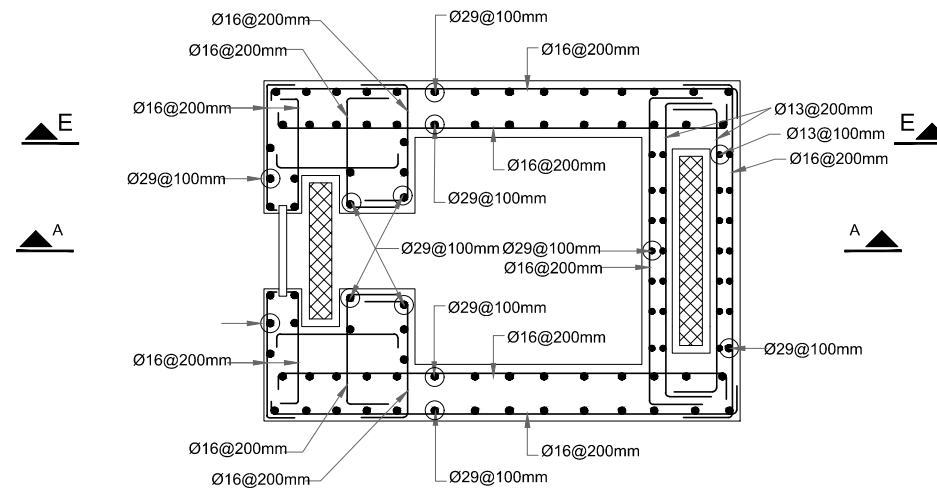
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SECTION C-C  
AT EL.865.00



SECTION D-D  
AT EL.870.00



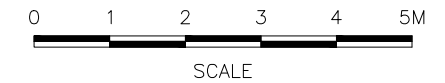
SECTION E-E  
AT EL.880.00

**NOTES:-**

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5. REINFORCEMENT AS PER ASTM A615 GRADE 60.

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N.B BARS ARE TO BE PROVIDED AS #3, #4, #5, AND #18 AS PER ASTM A615 WHICH ARE FRACTION OF INCHES.



**REFERENCE DRAWINGS :-**

- ZKD-TD-IC-01 ZKD-TD-IC-04
- ZKD-TD-IC-02 ZKD-TD-IC-05 (1 to 3)

DRAWING IS RELEASED

FOR TENDER DRAWINGS ONLY

CLIENT:  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

CONSULTANTS: A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.

**CASCADE GROUP**  
OF ENGINEERING & CONSULTANTS

**PERFECT ENGINEERING & MANAGEMENT CONSULTANTS**

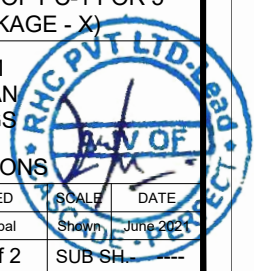
PROJECT:  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1 FOR 5  
SMALL DAMS IN FATA (PACKAGE - X)

TITLE:  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS

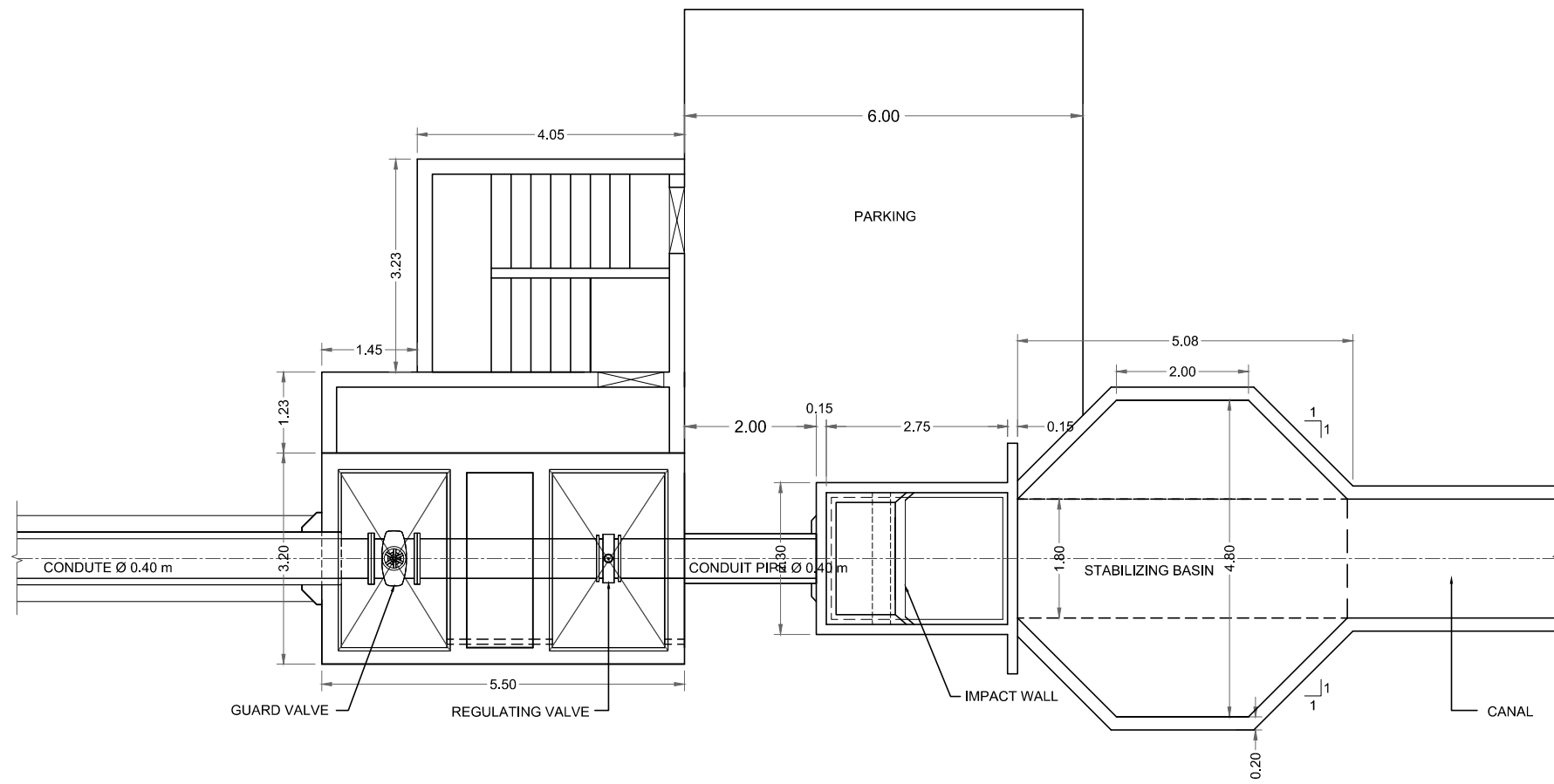
INTAKE TOWER SECTIONS

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021

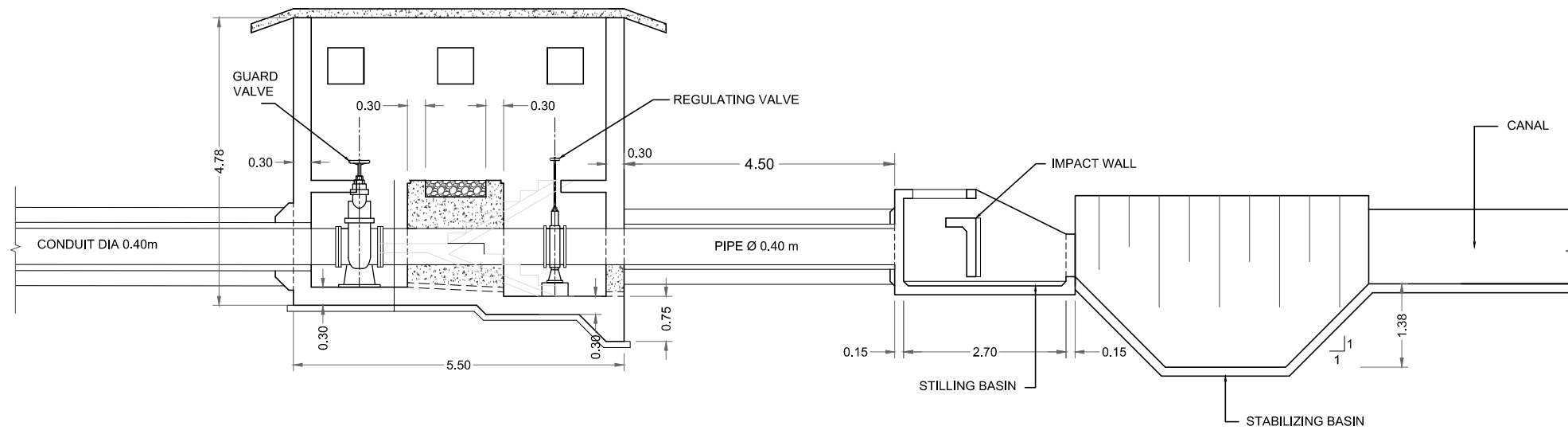
DRG.No:- ZKD-TD-IC-04 SHEET:-2 of 2 SUB SH. ---



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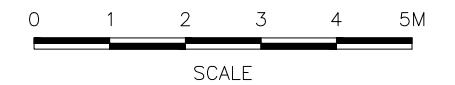
OUTLET STRUCTURE PLAN



OUTLET STRUCTURE SECTION

**NOTES:-**

1. ALL DIMENSIONS AND LEVELS ARE IN METERS.
2. SIDE SLOPES FOR ALL EXCAVATIONS IN OVERBURDEN STRATA ARE SPECIFIED AS 1V:1H AND SIDE SLOPES FOR ALL EXCAVATIONS IN ROCK ARE SPECIFIED AS 4V:1H.
3. NSL DATA IS FROM TOPOGRAPHICAL SURVEY AND MAY VARY AS PER SITE CONDITIONS.
4. BACK FILLING SHALL BE DONE BY SUITABLE COARSE GRANULAR EXCAVATED MATERIAL COMPACTED AS PER SPECIFICATIONS.
5. CONCRETE CYLINDER STRENGTH 4000PSI.
6. REINFORCEMENT AS PER ASTM A615 GRADE 60.
7. MECHANICAL VENDER ARRANGED BY CONTRACTOR IS OBLIGED TO SUBMIT THE DESIGN AND SPECIFICATION FULFILL THE HYDRAULIC REQUIREMENTS SUBJECT TO APPROVAL OF THE ENGINEER.



**REFERENCE DRAWINGS :-**

ZKD-TD-IC-01 ZKD-TD-IC-03  
ZKD-TD-IC-02 ZKD-TD-IC-05 (1 to 3)

DRAWING IS RELEASED

FOR TENDER DRAWINGS ONLY

CLIENT:  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

CONSULTANTS: A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.

**CASCADE GROUP**  
OF ENGINEERING & CONSULTANTS

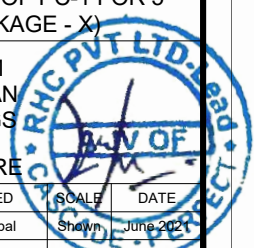
**PERFECT ENGINEERING & MANAGEMENT CONSULTANTS**

PROJECT:  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1 FOR 5  
SMALL DAMS IN FATA (PACKAGE - X)

TITLE:  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS  
OUTLET STRUCTURE

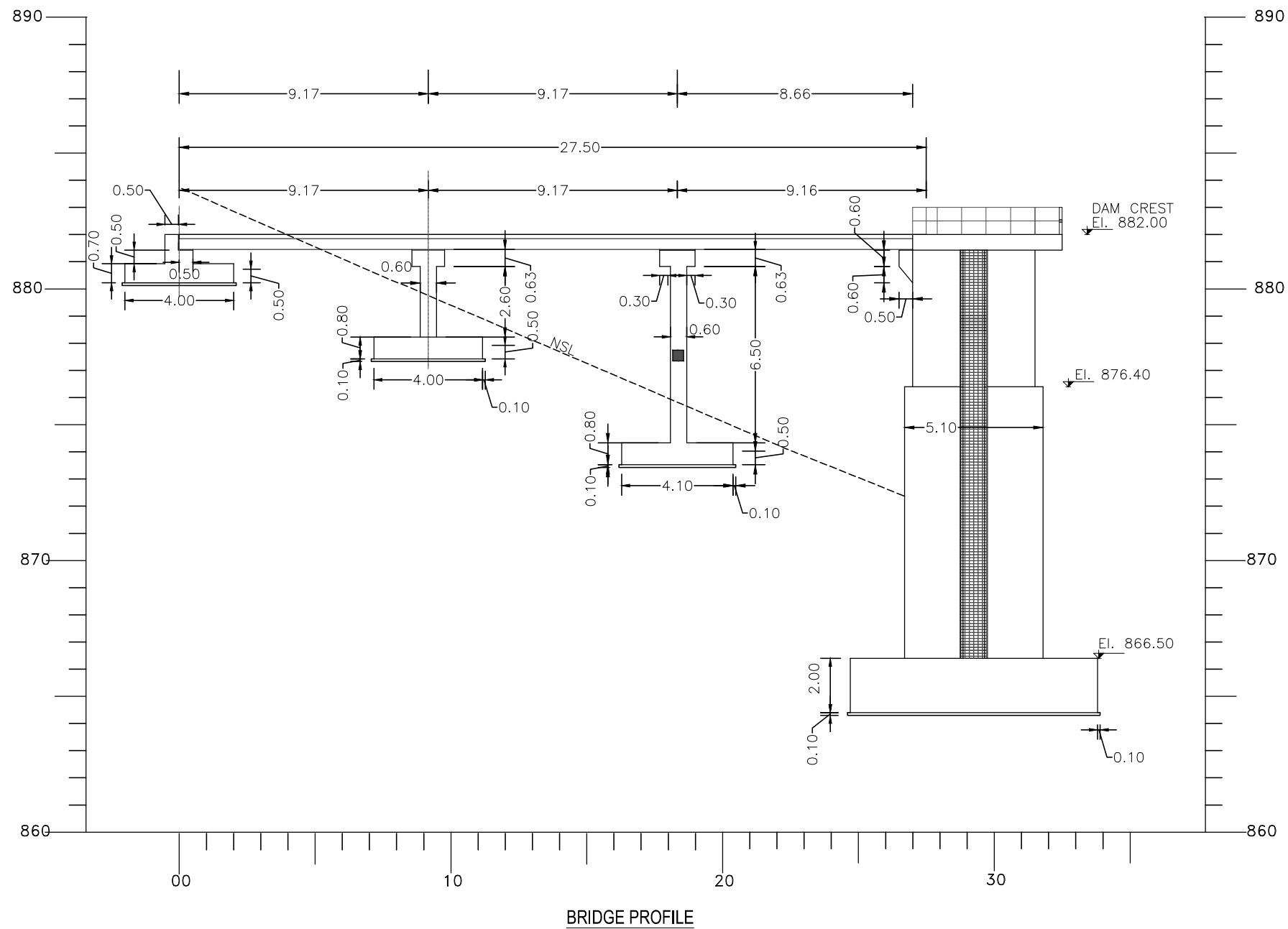
DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021

DRG.No:- ZKD-TD-IC-05 SHEET:- SUB SH





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**NOTES:-**

1. ALL DIMENSIONS AND LEVELS ARE IN METERS.
2. SIDE SLOPES FOR ALL EXCAVATIONS IN OVERBURDEN STRATA ARE SPECIFIED AS 1V:1H AND SIDE SLOPES FOR ALL EXCAVATIONS IN ROCK ARE SPECIFIED AS 4V:1H.
3. NSL DATA IS FROM TOPOGRAPHICAL SURVEY AND MAY VARY AS PER SITE CONDITIONS.
4. BACK FILLING SHALL BE DONE BY SUITABLE COARSE GRANULAR EXCAVATED MATERIAL COMPACTED AS PER SPECIFICATIONS.
5. CONCRETE CYLINDER STRENGTH 28 DAYS=4000 PSI.
6. LEAN CONCRETE CYLINDER STRENGTH 28 DAYS=1500PSI.
7. REINFORCEMENT AS PER ASTM A615.



**REFERENCE DRAWINGS :-**

ZKD-TD-IC-01 ZKD-TD-IC-03  
ZKD-TD-IC-02 ZKD-TD-IC-04

**DRAWING IS RELEASED**

**FOR TENDER DRAWINGS ONLY**

CLIENT:  
**PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.**

CONSULTANTS: A J.V OF  
**RHC REHMAN HABIB CONSULTANTS (PVT) LTD.**

 **CASCADE GROUP  
OF ENGINEERING & CONSULTANTS**

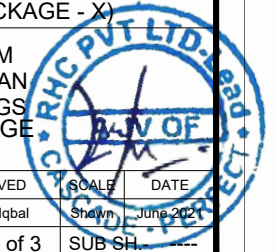
 **PERFECT ENGINEERING &  
MANAGEMENT CONSULTANTS**

PROJECT:  
**CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1 FOR 5  
SMALL DAMS IN FATA (PACKAGE - X)**

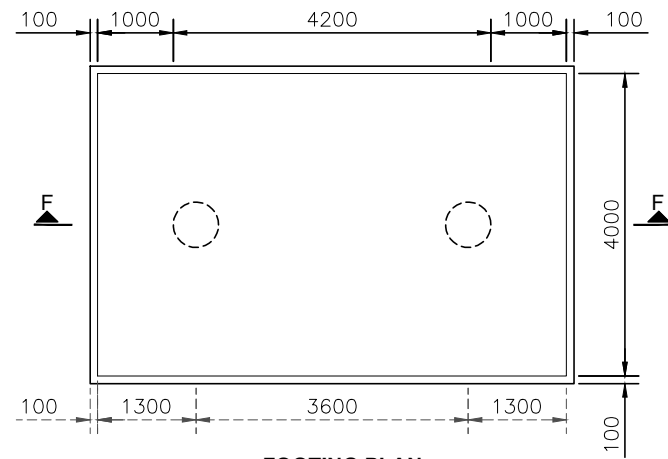
TITLE:  
**ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS  
PEDESTRIAN BRIDGE  
L-SECTION**

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021

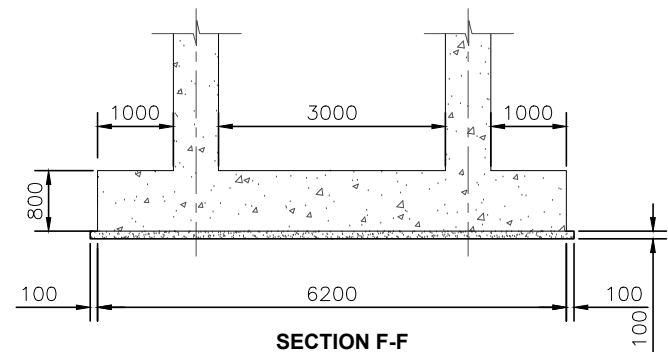
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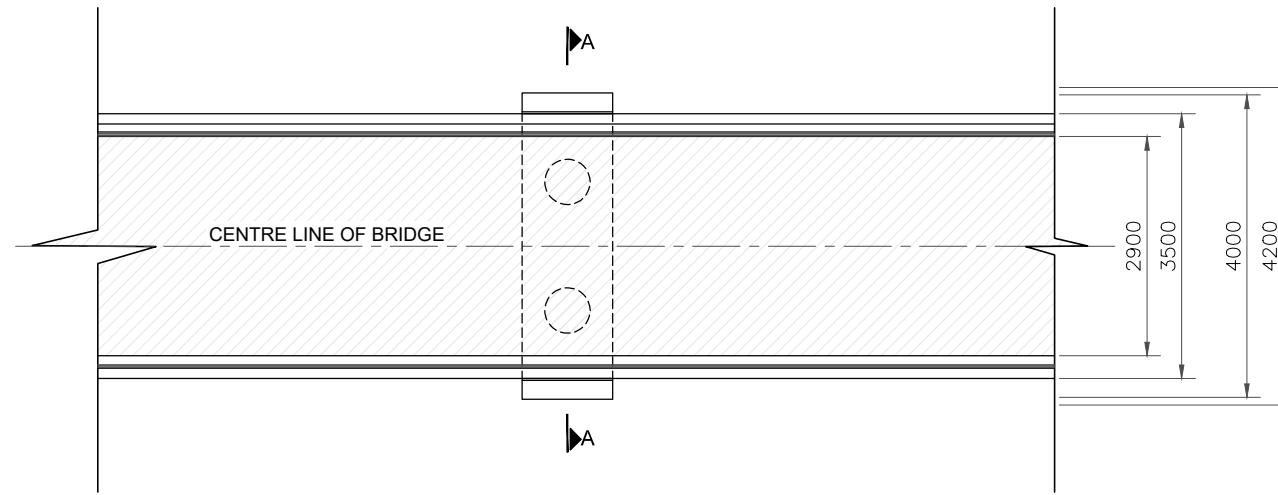
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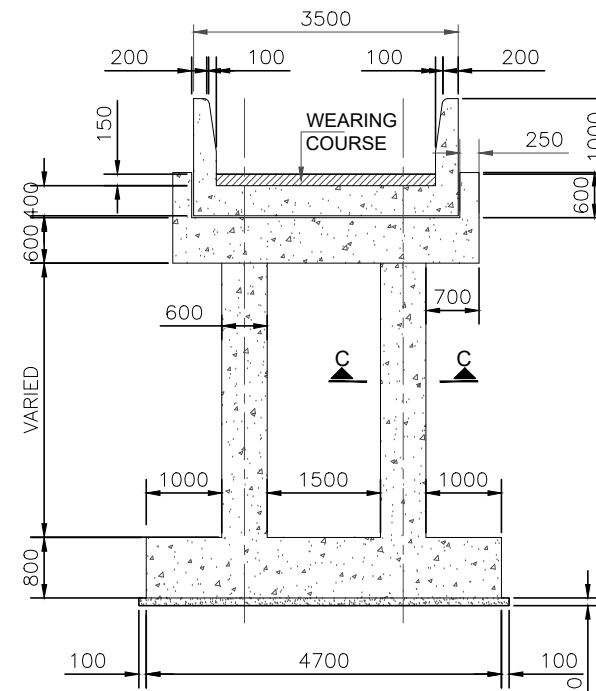
**FOOTING PLAN**  
SCALE. 1:100



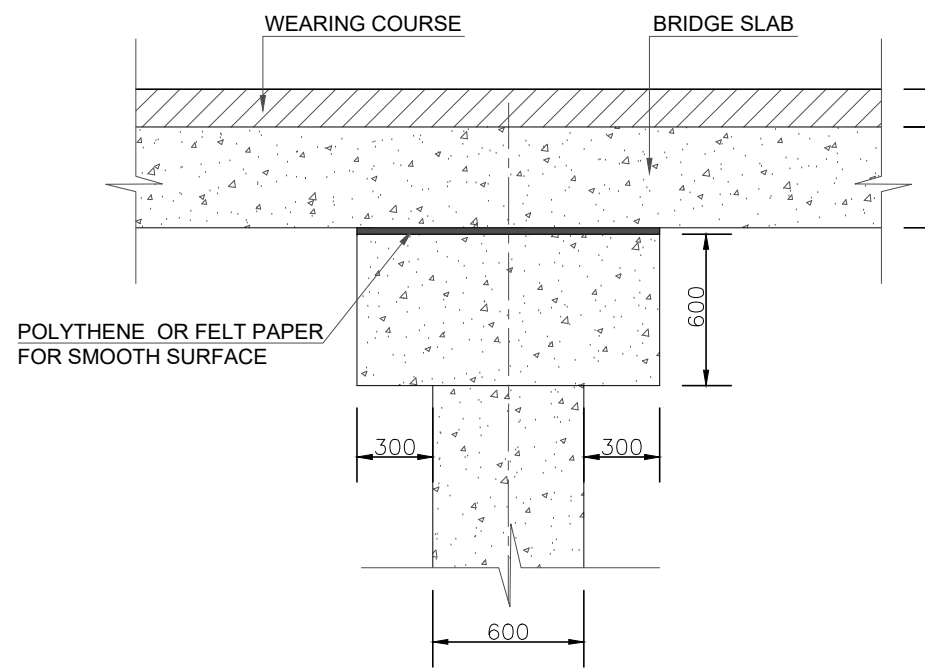
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SCALE. 1:100



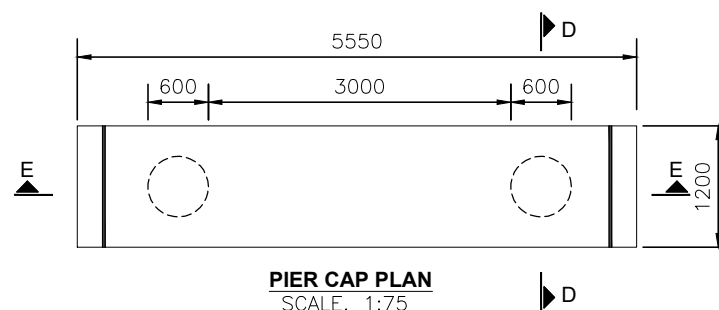
**BRIDGE TOP PLAN**  
SCALE. 1:100



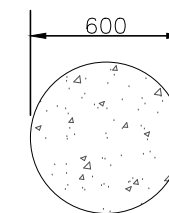
**SECTION A-A**  
SCALE. 1:100



**SECTION D-D**  
SCALE. 1:30



**PIER CAP PLAN**  
SCALE. 1:75



**SECTION C-C**  
SCALE. 1:30

**NOTES:-**

1. ALL DIMENSIONS & LEVELS ARE IN MILI METERS UNLESS OTHER WISE SPECIFIED.
2. CONCRETE CYLINDER STRENGTH 28 DAYS=4000 PSI.
3. LEAN CONCRETE CYLINDER STRENGTH 28 DAYS=1500PSI.
4. REINFORCEMENT AS PER ASTM A615.

**REFERENCE DRAWINGS :-**

ZKD-TD-IC-01 ZKD-TD-IC-03  
ZKD-TD-IC-02 ZKD-TD-IC-04

**DRAWING IS RELEASED**

**FOR TENDER DRAWINGS ONLY**

CLIENT:

**PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.**

CONSULTANTS:

A J.V OF  
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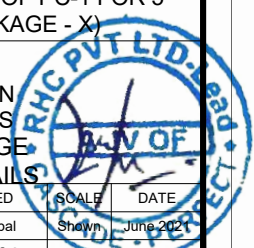
PROJECT:  
**CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1 FOR 5  
SMALL DAMS IN FATA (PACKAGE - X)**

TITLE:

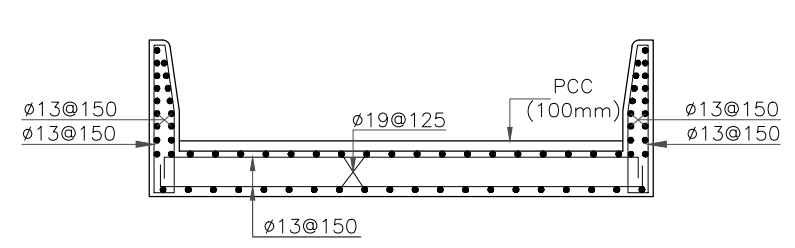
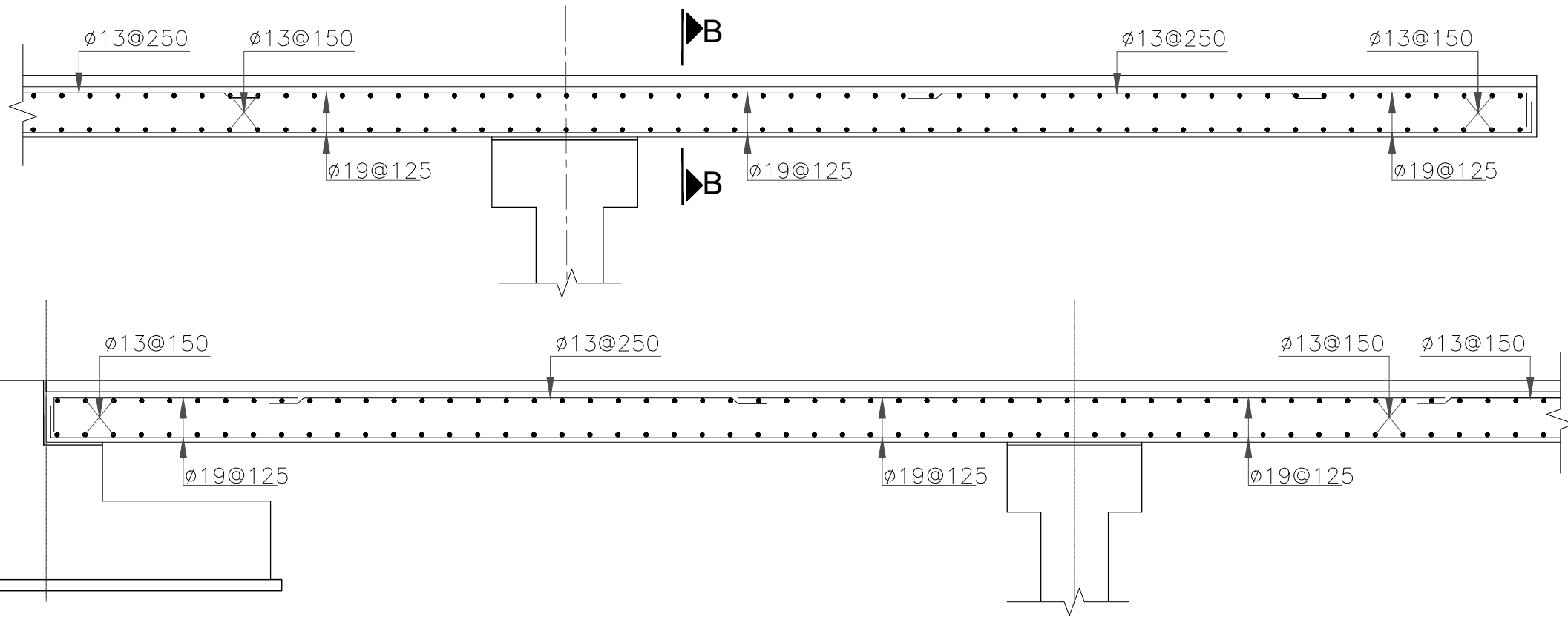
**ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS  
PEDESTRIAN BRIDGE  
SECTIONS AND DETAILS**

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021

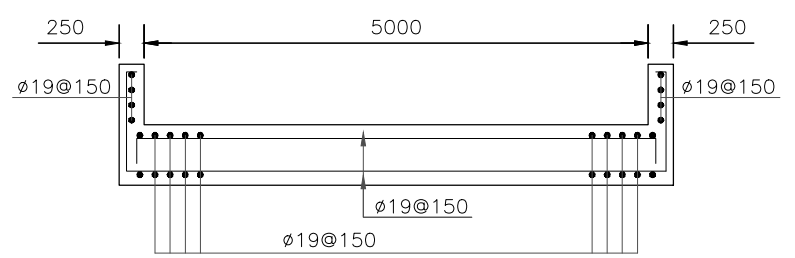
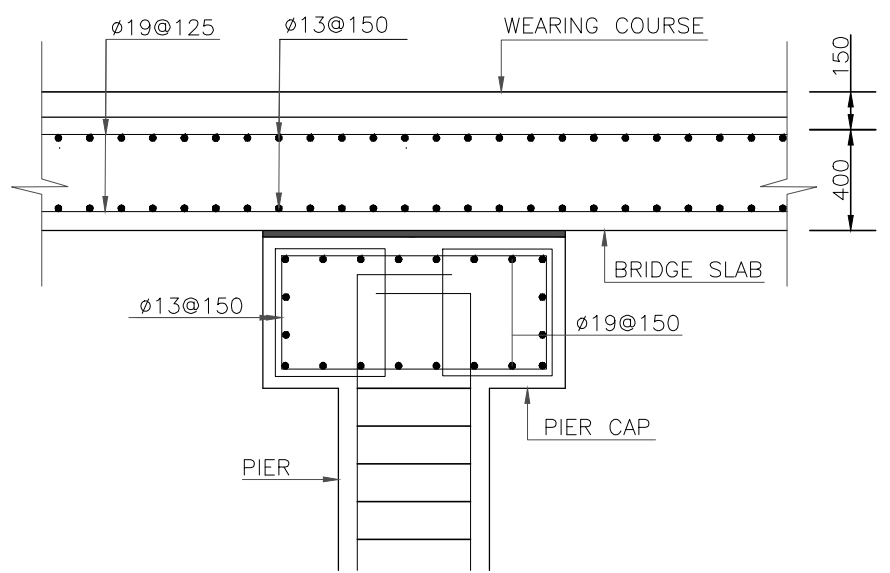
DRG.No:- ZKD-TD-IC-06 SHEET:-2 of 3 SUB SH. ---



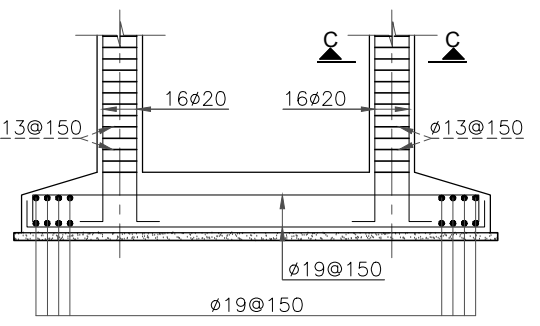
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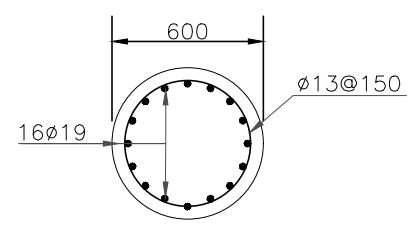
**SECTION B-B**  
SCALE: 1:75



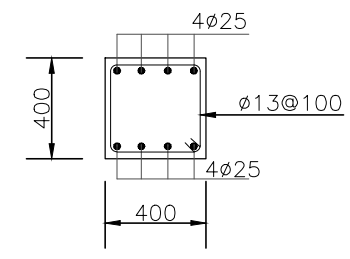
**SECTION E-E**  
SCALE: 1:75



**SECTION F-F**  
SCALE: 1:100



**SECTION C-C**  
SCALE: 1:30



**TIE BEAM**

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**REFERENCE DRAWINGS :-**

- ZKD-TD-IC-01 ZKD-TD-IC-03
- ZKD-TD-IC-02 ZKD-TD-IC-04

**DRAWING IS RELEASED**

**FOR TENDER DRAWINGS ONLY**

**CLIENT:**  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

**CONSULTANTS:** A J.V OF  
**RHC REHMAN HABIB CONSULTANTS (PVT) LTD.**

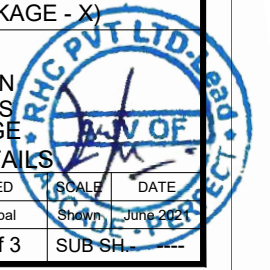
**CASCADE GROUP OF ENGINEERING & CONSULTANTS**

**PERFECT ENGINEERING & MANAGEMENT CONSULTANTS**

**PROJECT:**  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1 FOR 5  
SMALL DAMS IN FATA (PACKAGE - X)

**TITLE:**  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS  
PEDESTRIAN BRIDGE  
REINFORCEMENT DETAILS

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021
DRG.No:- ZKD-TD-IC-06			SHEET:-3 of 3		SUB SH.

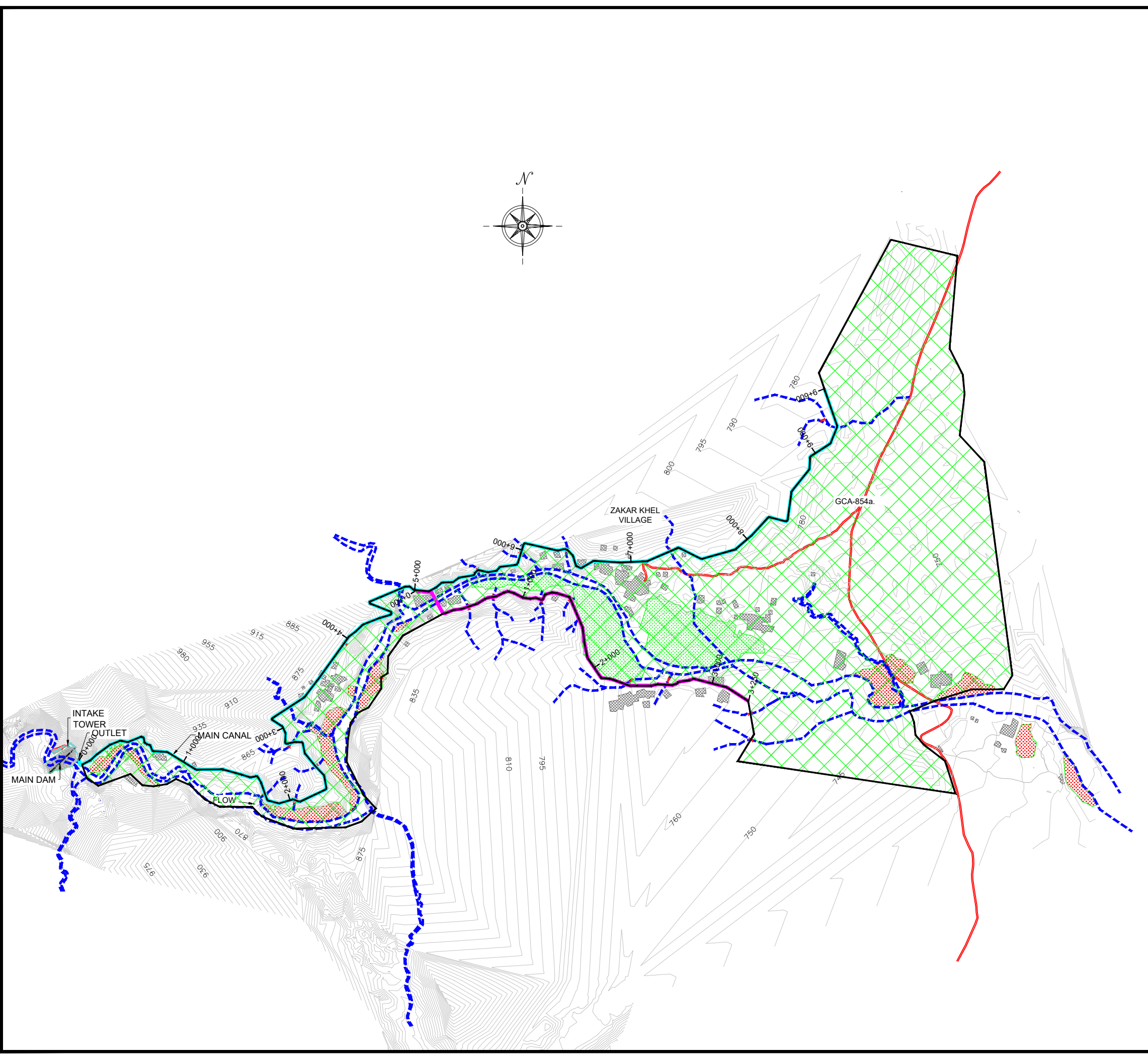




# IRRIGATION



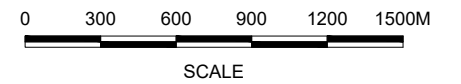
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**NOTES:-**

1. ALL LEVELS AND DIMENSIONS ARE IN METER

- TOTAL COMMAND AREA
- EXISTING COMMAND AREA
- VILLAGE
- MAIN CANAL
- DISTRIBUTARY
- NULLAH BOUNDARY
- ROAD



**REFERENCE DRAWINGS :-**

- ZKD-TD-IR-02                      ZKD-TD-IR-04 (1 to 4)
- ZKD-TD-IR-03 (1 to 11)      ZKD-TD-IR-05-06-07-08-09-10-11

**DRAWING IS RELEASED**

**FOR TENDER DRAWINGS ONLY**

CLIENT:  
**PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.**

CONSULTANTS:                      A J.V OF  
**RHC REHMAN HABIB CONSULTANTS (PVT) LTD.**

**CASCADE GROUP  
OF ENGINEERING & CONSULTANTS**

**PERFECT ENGINEERING &  
MANAGEMENT CONSULTANTS**

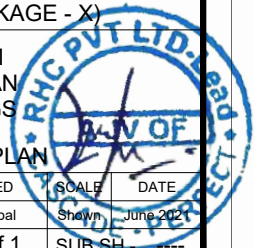
PROJECT:  
**CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1 FOR 5  
SMALL DAMS IN FATA (PACKAGE - X)**

TITLE:  
**ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS**

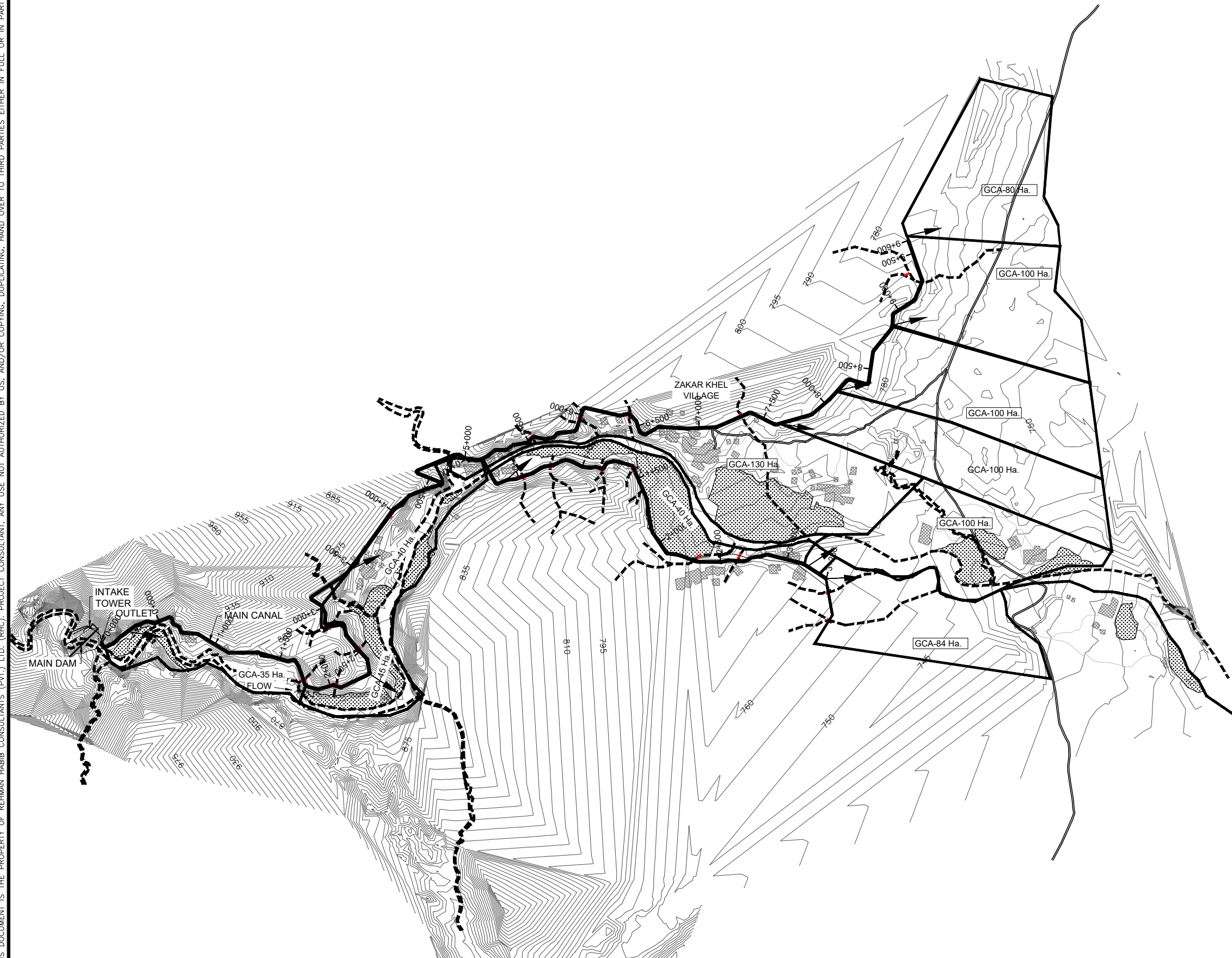
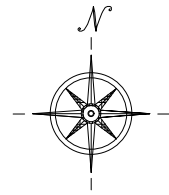
**IRRIGATION LAYOUT PLAN**

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021

DRG.No:- ZKD-TD-IR-01                      SHEET:-1 of 1                      SUB SH. ---



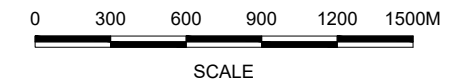
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**NOTES:-**

1. ALL LEVELS AND DIMENSIONS ARE IN METER

- COMMAND AREA BOUNDARY
- EXISTING COMMAND AREA
- VILLAGE
- MAIN CANAL
- DISTRIBUTARY
- NULLAH BOUNDARY
- ROAD
- OUTLET



**REFERENCE DRAWINGS :-**

- ZKD-TD-IR-01      ZKD-TD-IR-04 (1 to 4)
- ZKD-TD-IR-03 (1 to 10)      ZKD-TD-IR-05

DRAWING IS RELEASED

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CLIENT:  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

CONSULTANTS: A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.

CASCAD GROUP  
OF ENGINEERING & CONSULTANTS

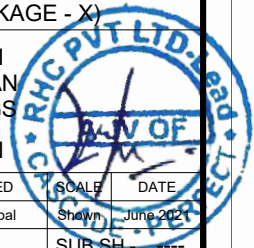
PERFECT ENGINEERING &  
MANAGEMENT CONSULTANTS

PROJECT:  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1 FOR 5  
SMALL DAMS IN FATA (PACKAGE - X)

TITLE:  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS  
CHAKBANDI PLAN

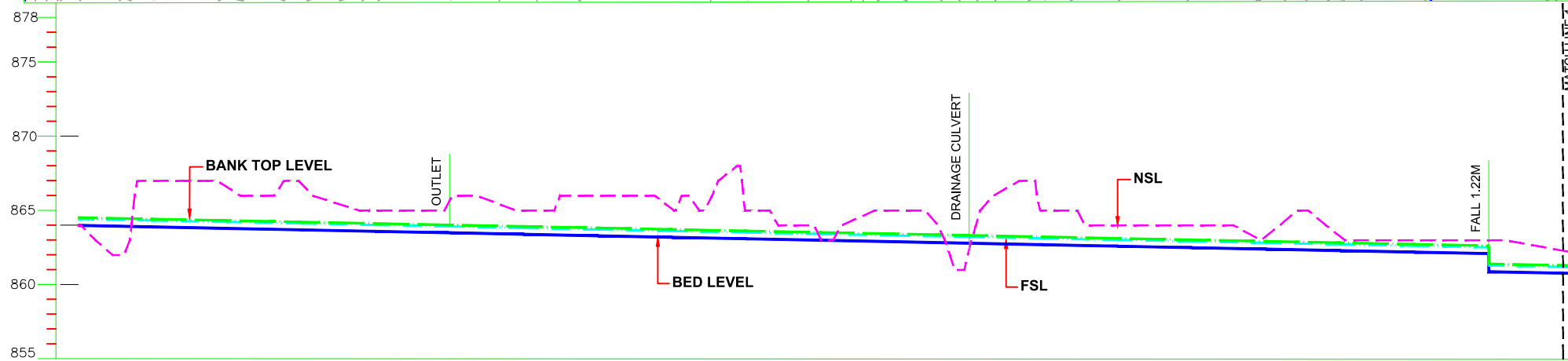
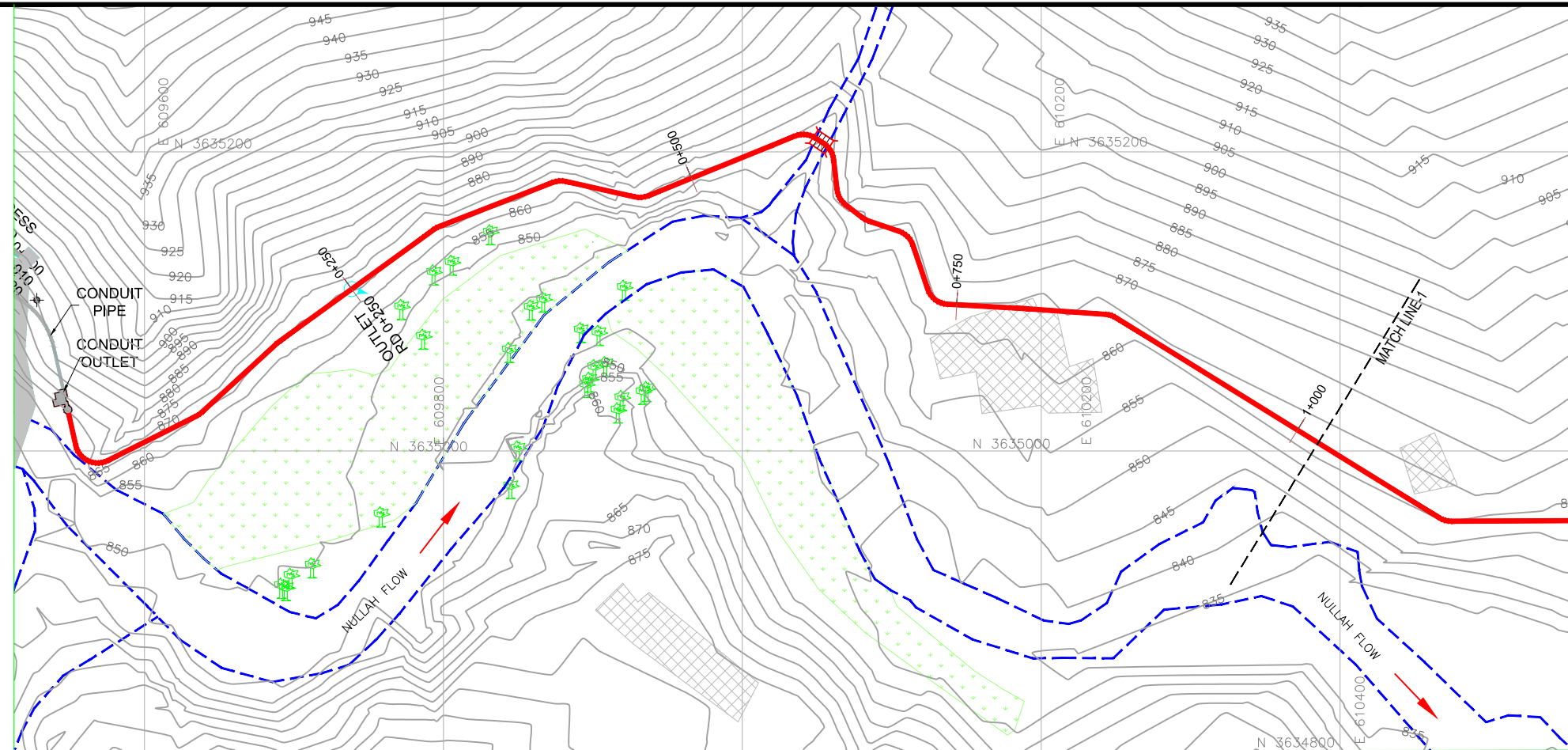
DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021

DRG.No:- ZKD-TD-IR-02      SHEET:-      SUB SH.:-





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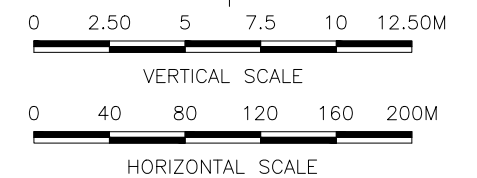
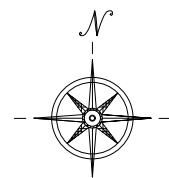


**NOTES:-**

1. ALL LEVELS AND DIMENSIONS ARE IN METER

**LEGEND**

- AQUEDUCT
- MAIN CANAL
- DISTRIBUTARY
- ROAD
- VILLAGES/HOUSES
- EXISTING COMMAND AREA
- CONTOUR
- OUTLET
- DRAINAGE CULVERT
- NULLAH
- BANK
- FSL
- BED
- NSL



**REFERENCE DRAWINGS :-**

- ZKD-TD-IR-01      ZKD-TD-IR-04 (1 to 4)
- ZKD-TD-IR-02      ZKD-TD-IR-05

DRAWING IS RELEASED

FOR TENDER DRAWINGS ONLY

CLIENT: PSU SMALL DAM SECTION MERGED AREA IRRIGATION DEPARTMENT. KPK.

CONSULTANTS: A J.V OF RHC REHMAN HABIB CONSULTANTS (PVT) LTD.

CASCADE GROUP OF ENGINEERING & CONSULTANTS

PERFECT ENGINEERING & MANAGEMENT CONSULTANTS

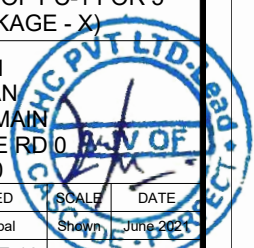
PROJECT: CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAIL DESIGN & PREPARATION OF PC-1 FOR 5 SMALL DAMS IN FATA (PACKAGE - X)

TITLE: ZAKAR KHEL DAM NORTH WAZIRISTAN TENDER DRAWINGS MAIN CANAL PLAN & PROFILE RD 0 +000 TO RD 1+000

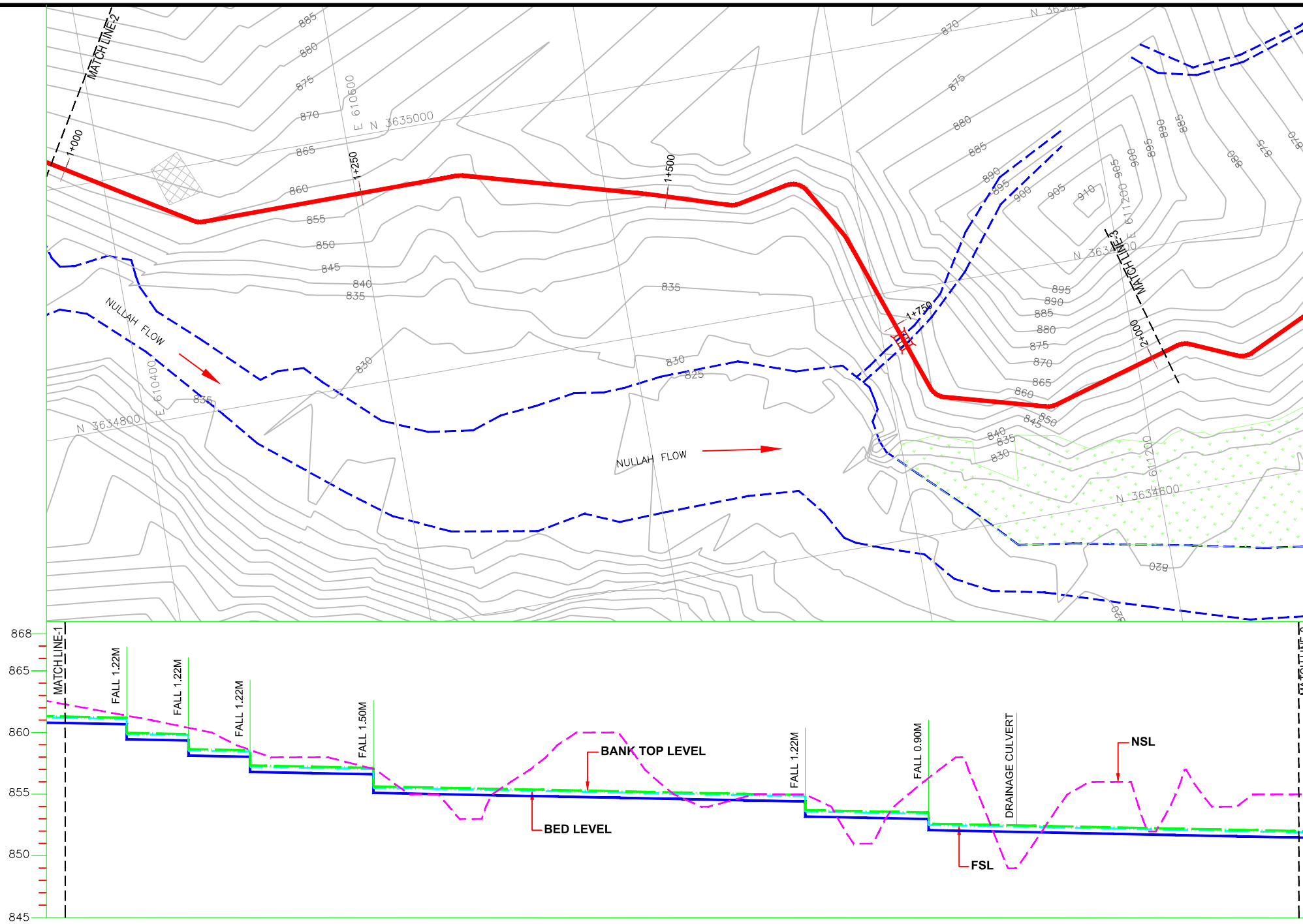
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	DISCHARGE (Cumec)	0.194										0.185										
	FSD (m)	0.429										0.420										
	TOP WIDTH (m)	0.76										0.76										
	BANK TOP LEVEL (BTL)	864.53	864.43	864.33	864.23	864.13	864.08	863.93	863.83	863.73	863.63	863.53	863.43	863.33	863.23	863.13	863.03	862.93	862.83	862.73	862.63	861.41
DESIGN FSL	864.43	864.33	864.23	864.13	864.03	863.93	863.82	863.72	863.62	863.52	863.42	863.32	863.22	863.12	863.02	862.92	862.82	862.72	862.62	862.52	861.30	861.20
DESIGN BED LEVEL (DBL)	864.00	863.90	863.80	863.70	863.60	863.50	863.40	863.30	863.20	863.10	863.00	862.90	862.80	862.70	862.60	862.50	862.40	862.30	862.20	862.10	860.88	860.78
NSL	864.00	867.00	867.00	867.00	865.00	865.00	865.00	866.00	866.00	865.00	864.00	865.00	862.00	865.00	864.00	864.00	863.00	864.00	863.00	862.00	863.00	863.00
R.D	0	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021

DRG.No:- ZKD-TD-IR-03 SHEET:-1 OF 10 SUB SH.



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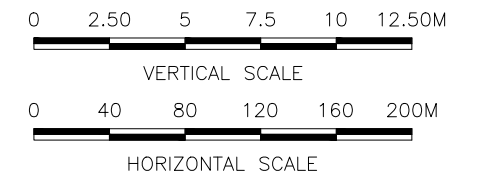
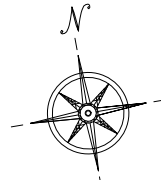


**NOTES:-**

1. ALL LEVELS AND DIMENSIONS ARE IN METER

**LEGEND**

- AQUEDUCT
- MAIN CANAL
- DISTRIBUTARY
- ROAD
- VILLAGES/HOUSES
- EXISTING COMMAND AREA
- CONTOUR
- OUTLET
- DRAINAGE CULVERT
- NULLAH
- BANK
- FSL
- BED
- NSL



**REFERENCE DRAWINGS :-**

ZKD-TD-IR-01      ZKD-TD-IR-04 (1 to 4)  
ZKD-TD-IR-02      ZKD-TD-IR-05

DRAWING IS RELEASED

FOR TENDER DRAWINGS ONLY

CLIENT:  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

CONSULTANTS: A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.

**CASCAD** CASCADE GROUP  
OF ENGINEERING & CONSULTANTS

**PEMC** PERFECT ENGINEERING &  
MANAGEMENT CONSULTANTS

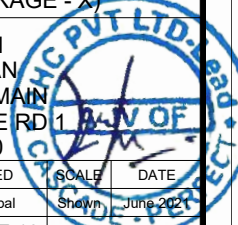
PROJECT:  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1 FOR 5  
SMALL DAMS IN FATA (PACKAGE - X)

TITLE:  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS MAIN  
CANAL PLAN & PROFILE RD 1  
+000 TO RD 2+000

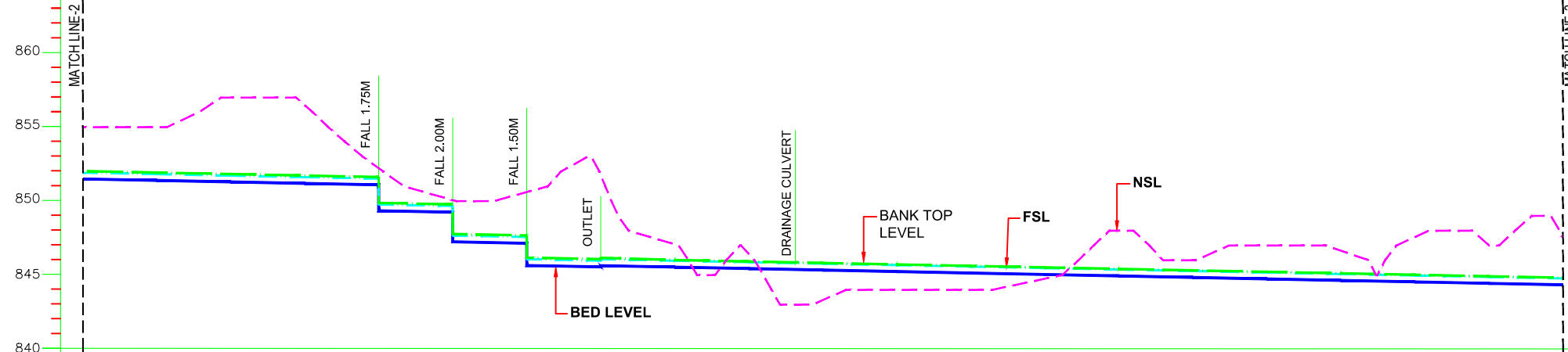
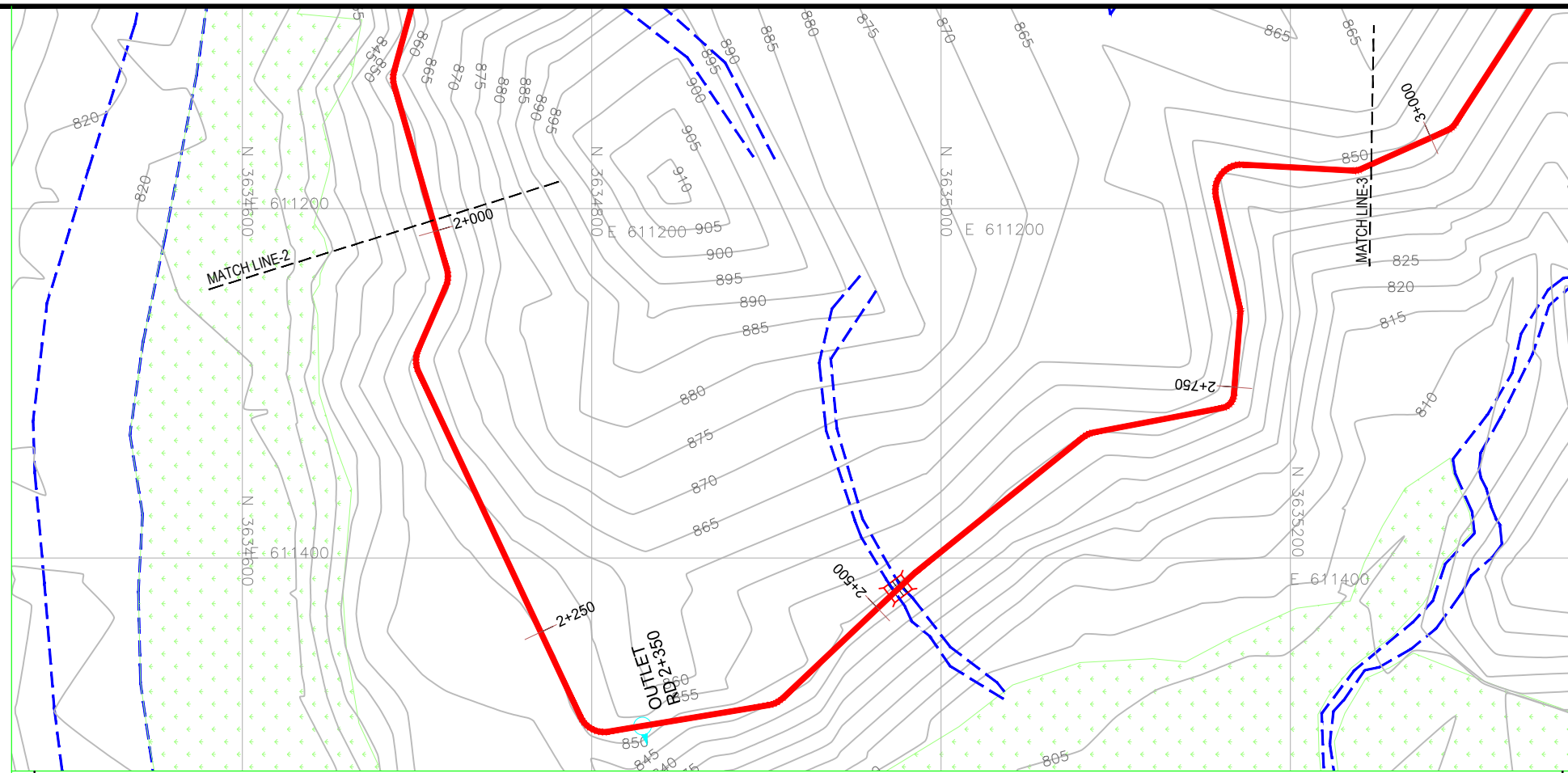
DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021

DRG.No:- ZKD-TD-IR-03      SHEET:2 OF 10      SUB SH.

DESIGN DATA																																								
VELOCITY (m/sec)	0.972																																							
MANNING'S n / TYPE	0.014																																							
DISCHARGE (Cumecc)	0.185																																							
FSD (m)	0.420																																							
TOP WIDTH (m)	0.76																																							
BANK TOP LEVEL (BTL)	861.31	861.21	859.99	859.89	858.67	858.57	857.35	857.25	857.15	855.65	855.55	855.45	855.35	855.25	855.15	855.05	854.95	853.73	853.63	852.63	852.43	852.33	852.23	852.13	852.03															
DESIGN FSL	861.20	861.10	859.88	859.78	858.56	858.46	857.24	857.14	857.04	855.54	855.44	855.34	855.24	855.14	855.04	854.94	854.84	853.62	853.52	852.52	852.42	852.32	852.22	852.12	852.02	851.92														
DESIGN BED LEVEL (DBL)	860.78	860.68	859.46	859.36	858.14	858.04	856.82	856.72	856.62	855.12	855.02	854.92	854.82	854.72	854.62	854.52	854.42	853.20	853.10	852.10	852.00	851.90	851.80	851.70	851.60	851.50														
NSL	863.00	862.00	862.00	861.00	861.00	859.00	859.00	858.00	858.00	855.00	855.00	855.00	854.00	854.00	855.00	855.00	855.00	853.00	853.00	856.00	853.00	853.00	856.00	854.00	854.00	855.00														
R.D	1000	1050	1050	1100	1100	1150	1150	1200	1200	1250	1250	1300	1300	1350	1350	1400	1400	1450	1450	1500	1500	1550	1550	1600	1600	1650	1650	1700	1700	1750	1750	1800	1800	1850	1850	1900	1900	1950	1950	2000



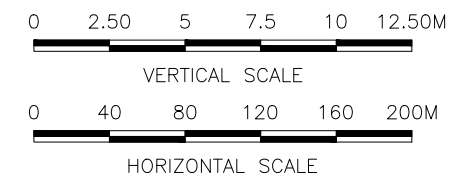
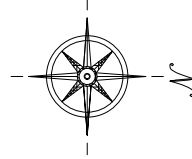
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**NOTES:-**  
1. ALL LEVELS AND DIMENSIONS ARE IN METER

**LEGEND**

AQUEDUCT	
MAIN CANAL	
DISTRIBUTARY	
ROAD	
VILLAGES/HOUSES	
EXISTING COMMAND AREA	
CONTOUR	
OUTLET	
DRAINAGE CULVERT	
NULLAH	
BANK	
FSL	
BED	
NSL	



**REFERENCE DRAWINGS :-**  
 ZKD-TD-IR-01      ZKD-TD-IR-04 (1 to 4)  
 ZKD-TD-IR-02      ZKD-TD-IR-05

**DRAWING IS RELEASED**

FOR TENDER DRAWINGS ONLY

<b>DESIGN DATA</b>	VELOCITY (m/sec)	0.972																				0.957									
	MANNING'S n / TYPE	0.014																				0.014									
	DISCHARGE (Cumec)	0.185																				0.176									
	FSD (m)	0.420																				0.426									
	TOP WIDTH (m)	0.76																				0.675									
	BANK TOP LEVEL (BTL)	852.03	851.93	851.83	851.73	851.63	849.88	849.78	847.78	847.68	846.18	846.08	846.17	846.02	845.92	845.82	845.72	845.67	845.72	845.62	845.52	845.42	845.32	845.22	845.12	845.02	844.92	844.82			
	DESIGN FSL	851.92	851.82	851.72	851.62	851.52	849.77	849.67	847.67	847.57	846.07	845.97	846.07	845.97	845.87	845.77	845.67	845.67	845.57	845.47	845.37	845.27	845.17	845.07	844.97	844.87	844.77				
	DESIGN BED LEVEL (DBL)	851.50	851.40	851.30	851.20	851.10	849.35	849.25	847.25	847.15	845.65	845.55	845.64	845.54	845.44	845.34	845.24	845.24	845.14	845.04	844.94	844.84	844.74	844.64	844.54	844.44	844.34				
	NSL	855.00	855.00	857.00	857.00	853.00	853.00	851.00	851.00	850.00	850.00	852.00	852.00	848.00	847.00	843.00	844.00	844.00	844.00	844.00	844.00	846.00	847.00	847.00	847.00	848.00	848.00				
	R.D	2000	2050	2100	2150	2200	2200	2250	2250	2300	2300	2350	2350	2400	2450	2500	2550	2565	2600	2650	2700	2750	2800	2850	2900	2950	3000				

**CLIENT:**  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

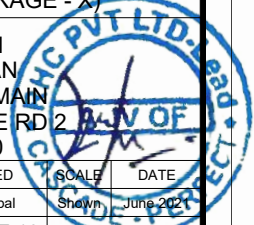
**CONSULTANTS:** A J.V OF  
 REHMAN HABIB CONSULTANTS (PVT) LTD.  
 CASCADE GROUP OF ENGINEERING & CONSULTANTS  
 PERFECT ENGINEERING & MANAGEMENT CONSULTANTS

**PROJECT:**  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1 FOR 5  
SMALL DAMS IN FATA (PACKAGE - X)

**TITLE:**  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS MAIN  
CANAL PLAN & PROFILE RD 2  
+000 TO RD 3+000

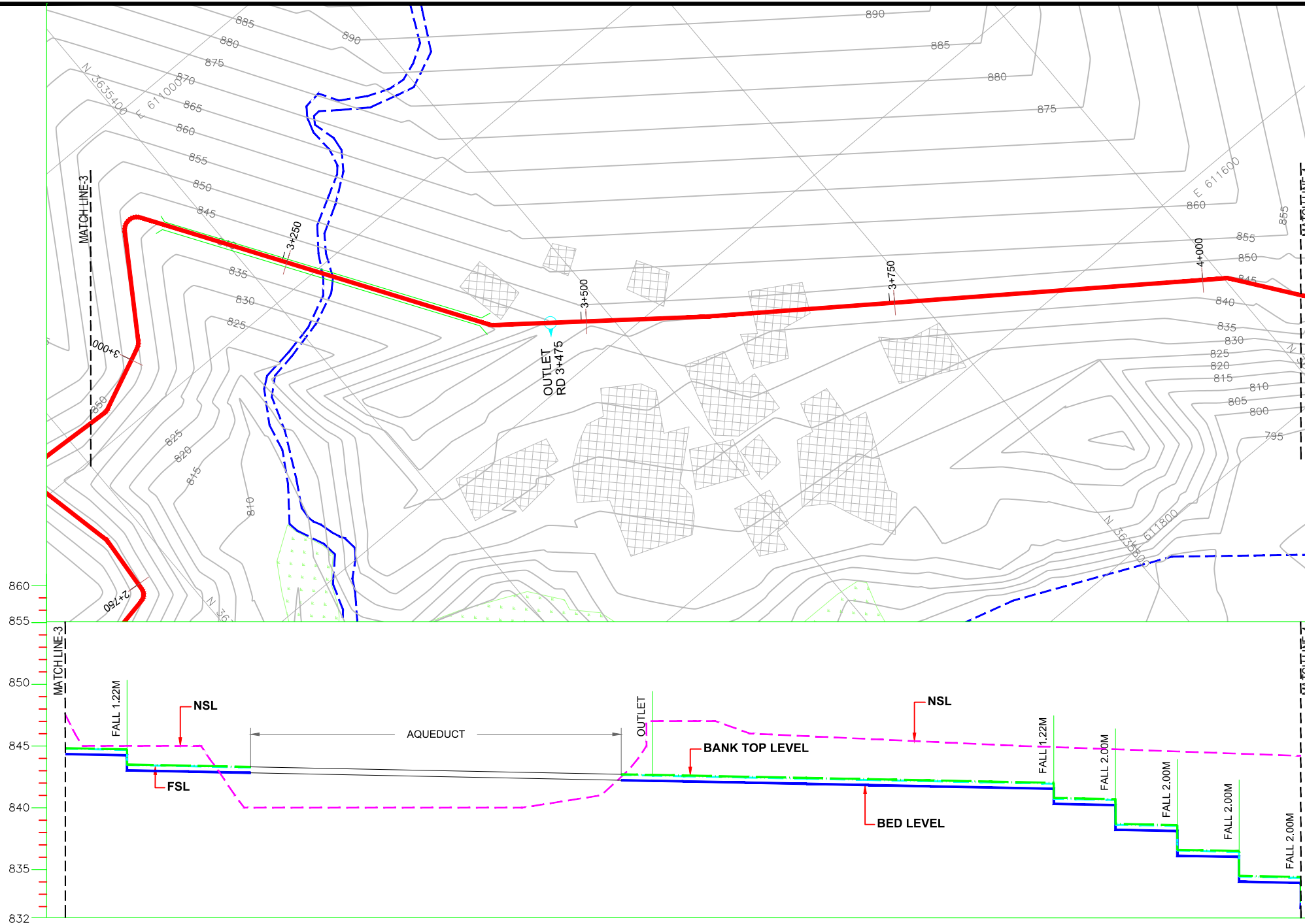
DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021

DRG.No:- ZKD-TD-IR-03      SHEET:3 OF 10      SUB SH.





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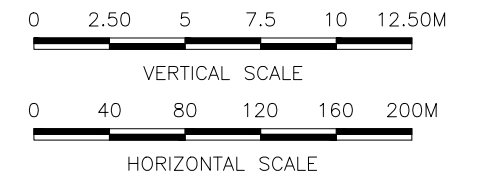
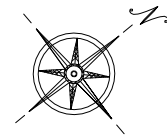


**NOTES:-**

1. ALL LEVELS AND DIMENSIONS ARE IN METER

**LEGEND**

- AQUEDUCT
- MAIN CANAL
- DISTRIBUTARY
- ROAD
- VILLAGES/HOUSES
- EXISTING COMMAND AREA
- CONTOUR
- OUTLET
- DRAINAGE CULVERT
- NULLAH
- BANK
- FSL
- BED
- NSL



**REFERENCE DRAWINGS :-**

- ZKD-TD-IR-01
- ZKD-TD-IR-02
- ZKD-TD-IR-04 (1 to 4)
- ZKD-TD-IR-05

DRAWING IS RELEASED

FOR TENDER DRAWINGS ONLY

CLIENT:  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

CONSULTANTS: A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.

**CASCADE GROUP**  
OF ENGINEERING & CONSULTANTS

**PEMC** PERFECT ENGINEERING &  
MANAGEMENT CONSULTANTS

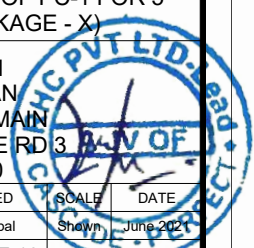
PROJECT:  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1 FOR 5  
SMALL DAMS IN FATA (PACKAGE - X)

TITLE:  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS MAIN  
CANAL PLAN & PROFILE RD 3  
+000 TO RD 4+000

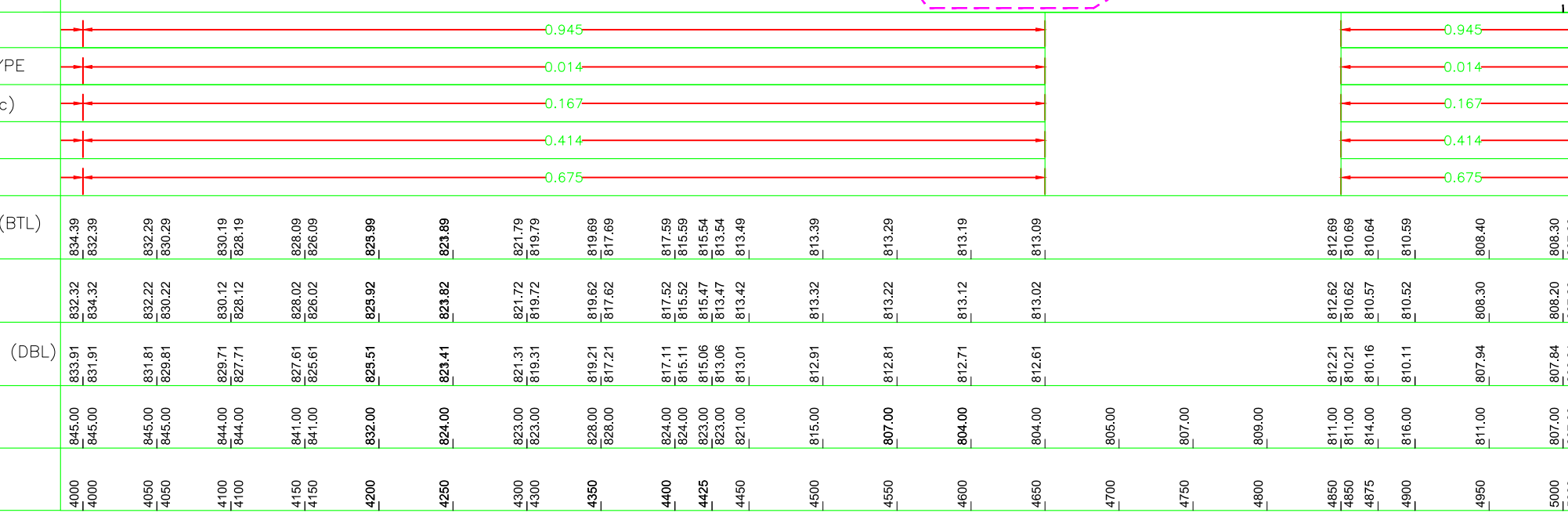
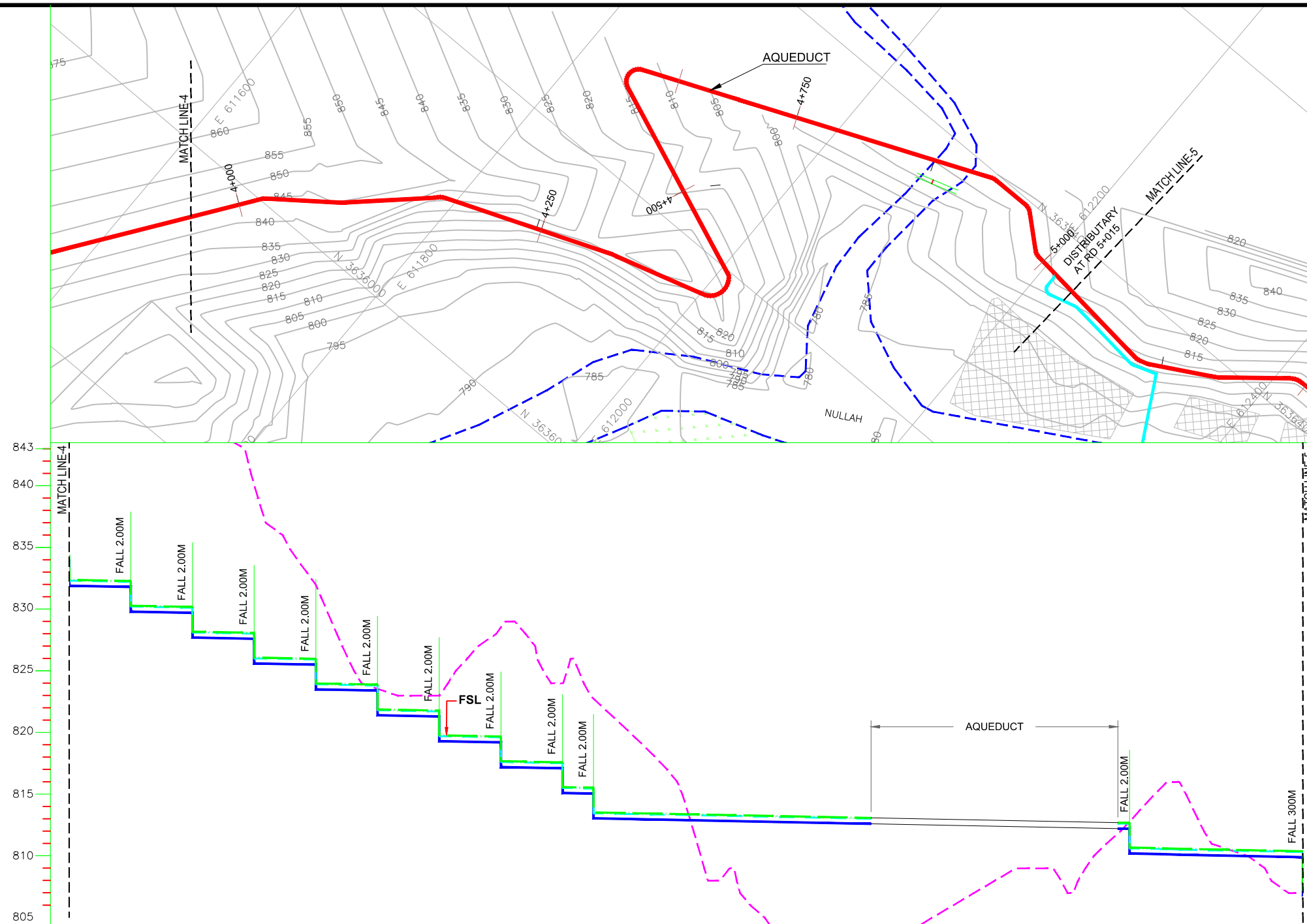
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MANNING'S n / TYPE	0.014				0.014																						
DISCHARGE (Cumec)	0.176				0.167																						
FSD (m)	0.426				0.414																						
TOP WIDTH (m)	0.675				0.675																						
BANK TOP LEVEL (BTL)	844.82	844.72	843.50	843.40	842.86	842.61	842.51	842.41	842.31	842.21	842.11	842.01	840.72	840.79	840.74	840.69	838.69	838.59	836.49	834.49	834.39	832.39					
DESIGN FSL	844.77	844.67	843.45	843.35	842.69	842.54	842.44	842.34	842.24	842.14	842.04	840.72	841.94	840.67	840.62	838.62	838.52	836.42	834.42	832.32	834.32	832.32					
DESIGN BED LEVEL (DBL)	844.34	844.24	843.02	842.92	842.18	842.13	842.03	841.93	841.83	841.73	841.63	841.53	840.31	840.26	840.21	838.21	838.11	836.01	834.01	831.91	833.91	831.91	831.91				
NSL	848.00	845.00	845.00	845.00	845.00	848.00	847.00	846.00	846.00	846.00	846.00	845.00	845.00	845.00	845.00	845.00	845.00	845.00	845.00	845.00	845.00	845.00	845.00				
R.D	3000	3050	3050	3100	3150	3250	3300	3350	3400	3450	3475	3500	3550	3600	3650	3700	3750	3800	3800	3825	3850	3850	3900	3950	3950	4000	4000

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021

DRG.No:- ZKD-TD-IR-03 SHEET:4 OF 10 SUB SH.



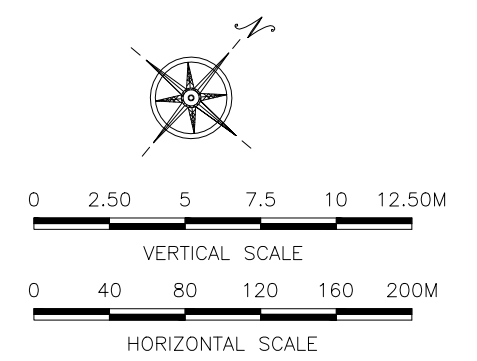
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**NOTES:-**  
1. ALL LEVELS AND DIMENSIONS ARE IN METER

**LEGEND**

AQUEDUCT	
MAIN CANAL	
DISTRIBUTARY	
ROAD	
VILLAGES/HOUSES	
EXISTING COMMAND AREA	
CONTOUR	
OUTLET	
DRAINAGE CULVERT	
NULLAH	
BANK	
FSL	
BED	
NSL	



**REFERENCE DRAWINGS :-**  
 ZKD-TD-IR-01      ZKD-TD-IR-04 (1 to 4)  
 ZKD-TD-IR-02      ZKD-TD-IR-05

**DRAWING IS RELEASED**

**FOR TENDER DRAWINGS ONLY**

<b>DESIGN DATA</b>	VELOCITY (m/sec)	0.945															0.945																
	MANNING'S n / TYPE	0.014															0.014																
	DISCHARGE (Cumec)	0.167															0.167																
	FSD (m)	0.414															0.414																
	TOP WIDTH (m)	0.675															0.675																
	BANK TOP LEVEL (BTL)	834.39	832.39	832.29	830.29	830.19	828.19	828.09	826.09	825.99	823.89	821.79	819.79	819.69	817.69	817.59	815.59	815.47	813.54	813.49	813.39	813.29	813.19	813.09	812.69	810.69	810.64	810.59	808.40	808.30	807.30		
DESIGN FSL	832.32	834.32	832.22	830.22	830.12	828.12	828.02	826.02	825.92	823.82	821.72	819.72	819.62	817.62	817.52	815.52	815.47	813.47	813.42	813.32	813.22	813.12	813.02	812.62	810.62	810.57	810.52	808.30	808.20	807.20			
DESIGN BED LEVEL (DBL)	833.91	831.91	831.81	829.81	829.71	827.71	827.61	825.61	825.51	823.41	821.31	819.31	819.21	817.21	817.11	815.11	815.06	813.06	813.01	812.91	812.81	812.71	812.61	812.21	810.21	810.16	810.11	807.94	807.84	806.84			
NSL	845.00	845.00	845.00	845.00	844.00	844.00	841.00	841.00	832.00	824.00	823.00	823.00	828.00	828.00	824.00	824.00	823.00	823.00	821.00	815.00	807.00	804.00	804.00	805.00	807.00	809.00	811.00	811.00	814.00	816.00	811.00	807.00	807.00
R.D	4000	4000	4050	4050	4100	4100	4150	4150	4200	4250	4300	4300	4350	4400	4425	4450	4500	4550	4600	4650	4700	4750	4800	4850	4850	4875	4900	4950	5000	5000			

**CLIENT:**  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

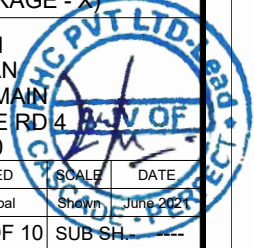
**CONSULTANTS:**  
A J.V OF  
**REHMAN HABIB CONSULTANTS (PVT) LTD.**  
**CASCADE GROUP OF ENGINEERING & CONSULTANTS**  
**PERFECT ENGINEERING & MANAGEMENT CONSULTANTS**

**PROJECT:**  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1 FOR 5  
SMALL DAMS IN FATA (PACKAGE - X)

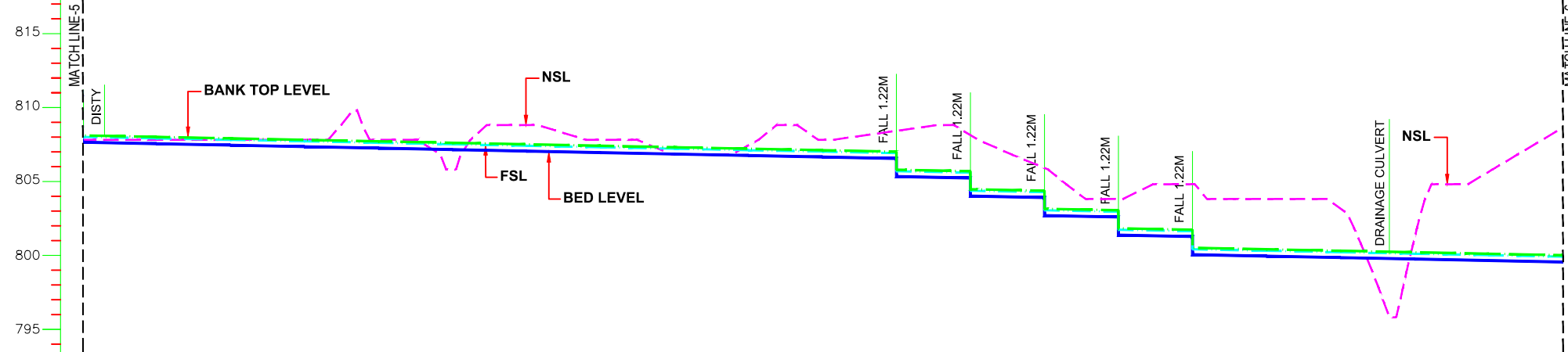
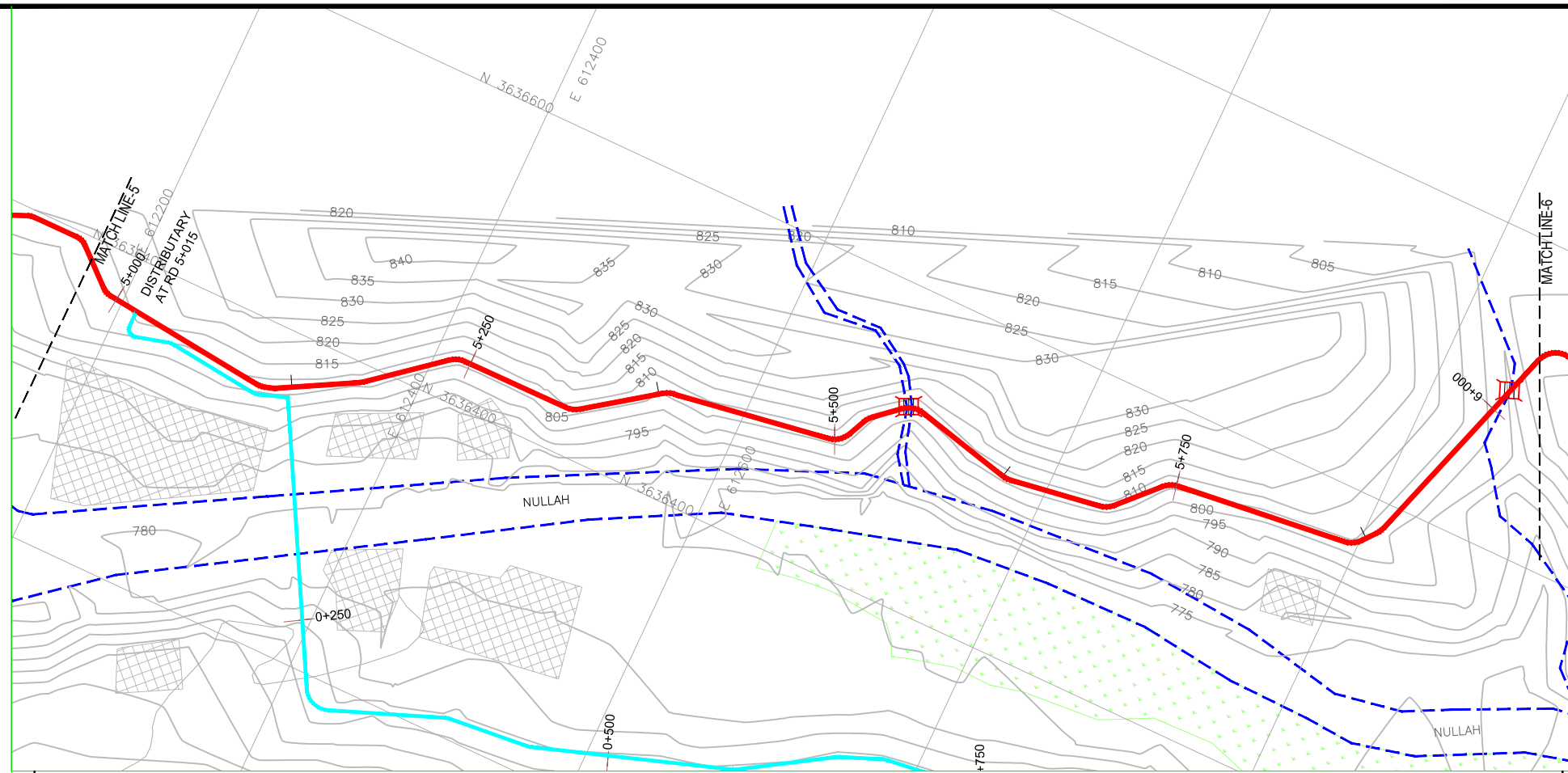
**TITLE:**  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS MAIN  
CANAL PLAN & PROFILE RD 4  
+000 TO RD 5+000

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021

DRG.No:- ZKD-TD-IR-03      SHEET:-5 OF 10      SUB SH.



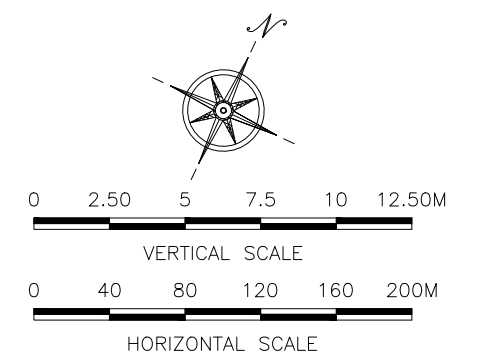
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**NOTES:-**  
1. ALL LEVELS AND DIMENSIONS ARE IN METER

**LEGEND**

AQUEDUCT	
MAIN CANAL	
DISTRIBUTARY	
ROAD	
VILLAGES/HOUSES	
EXISTING COMMAND AREA	
CONTOUR	
OUTLET	
DRAINAGE CULVERT	
NULLAH	
BANK	
FSL	
BED	
NSL	



**REFERENCE DRAWINGS :-**  
 ZKD-TD-IR-01      ZKD-TD-IR-04 (1 to 4)  
 ZKD-TD-IR-02      ZKD-TD-IR-05

**DRAWING IS RELEASED**

FOR TENDER DRAWINGS ONLY

<b>DESIGN DATA</b>	VELOCITY (m/sec)	0.862																														
	MANNING'S n / TYPE	0.014																														
	DISCHARGE (Cumec)	0.116																														
	FSD (m)	0.356																														
	TOP WIDTH (m)	0.640																														
	BANK TOP LEVEL (BTL)	808.30	807.30	807.30	807.20	807.10	807.00	806.90	806.80	806.70	806.60	806.50	806.40	806.30	806.20	806.10	806.20	804.98	804.88	804.78	803.66	803.56	802.34	802.24	801.02	799.70	800.92	799.60	799.50	799.40	799.30	799.20
DESIGN FSL	808.20	807.20	807.20	807.10	807.00	806.90	806.80	806.70	806.60	806.50	806.40	806.30	806.20	806.10	806.20	804.88	804.78	804.42	803.56	803.46	802.24	802.14	800.92	800.82	800.46	799.60	799.50	799.40	799.30	799.20	799.10	
DESIGN BED LEVEL (DBL)	807.84	806.84	806.84	806.74	806.64	806.54	806.44	806.34	806.24	806.14	806.04	805.94	805.84	805.74	805.52	804.42	804.20	803.10	801.88	801.78	800.56	800.46	799.24	799.14	799.04	798.94	798.84	798.74				
NSL	807.00	807.00	807.00	807.00	807.00	807.00	807.00	805.00	808.00	807.00	806.00	806.00	806.00	807.00	807.00	808.00	803.00	808.00	806.00	806.00	803.00	803.00	804.00	804.00	803.00	800.00	804.00	804.00	807.00			
R.D	5000	5000	5015	5050	5100	5150	5200	5250	5300	5350	5400	5425	5450	5500	5550	5550	5600	5600	5650	5650	5700	5700	5750	5750	5800	5850	5900	5950	6000			

**CLIENT:**  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

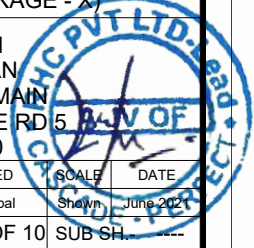
**CONSULTANTS:**  
A J.V OF  
 REHMAN HABIB CONSULTANTS (PVT) LTD.  
 CASCADE GROUP OF ENGINEERING & CONSULTANTS  
 PERFECT ENGINEERING & MANAGEMENT CONSULTANTS

**PROJECT:**  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1 FOR 5  
SMALL DAMS IN FATA (PACKAGE - X)

**TITLE:**  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS MAIN  
CANAL PLAN & PROFILE RD 5  
+000 TO RD 6+000

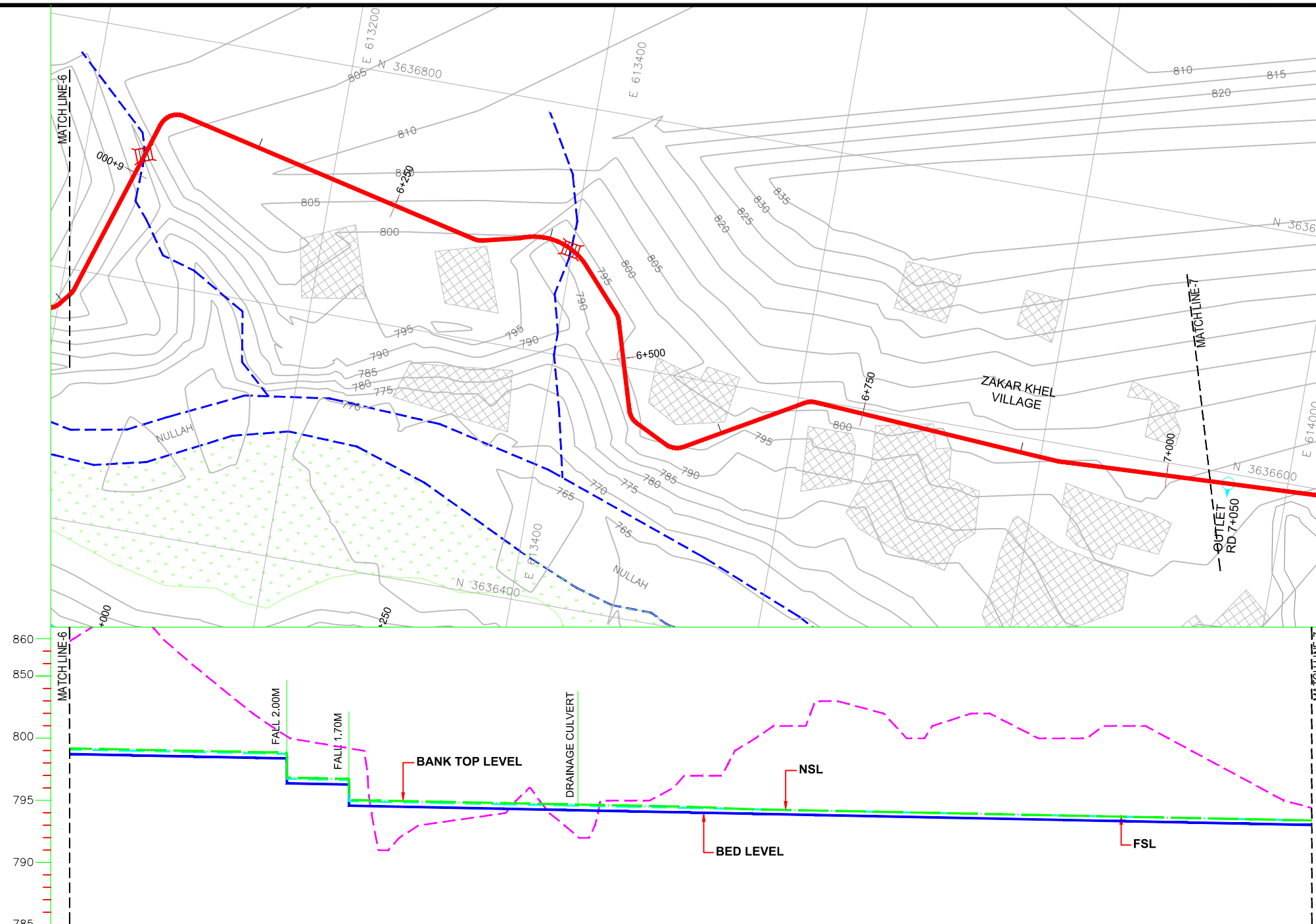
DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021

DRG.No:- ZKD-TD-IR-03      SHEET:-6 OF 10      SUB SH.





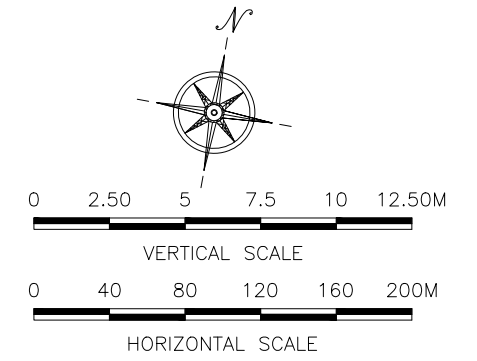
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**NOTES:-**  
1. ALL LEVELS AND DIMENSIONS ARE IN METER

**LEGEND**

AQUEDUCT	
MAIN CANAL	
DISTRIBUTARY	
ROAD	
VILLAGES/HOUSES	
EXISTING COMMAND AREA	
CONTOUR	
OUTLET	
DRAINAGE CULVERT	
NULLAH	
BANK	
FSL	
BED	
NSL	



**REFERENCE DRAWINGS :-**  
ZKD-TD-IR-01      ZKD-TD-IR-04 (1 to 4)  
ZKD-TD-IR-02      ZKD-TD-IR-05

**DRAWING IS RELEASED**  
 FOR TENDER DRAWINGS ONLY

**CLIENT:**  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

**CONSULTANTS:** A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.

**CASCADE GROUP**  
OF ENGINEERING & CONSULTANTS

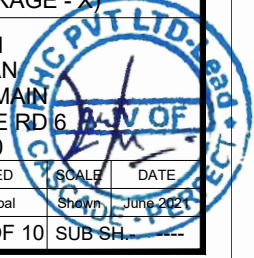
**PEMC** PERFECT ENGINEERING &  
MANAGEMENT CONSULTANTS

**PROJECT:**  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1 FOR 5  
SMALL DAMS IN FATA (PACKAGE - X)

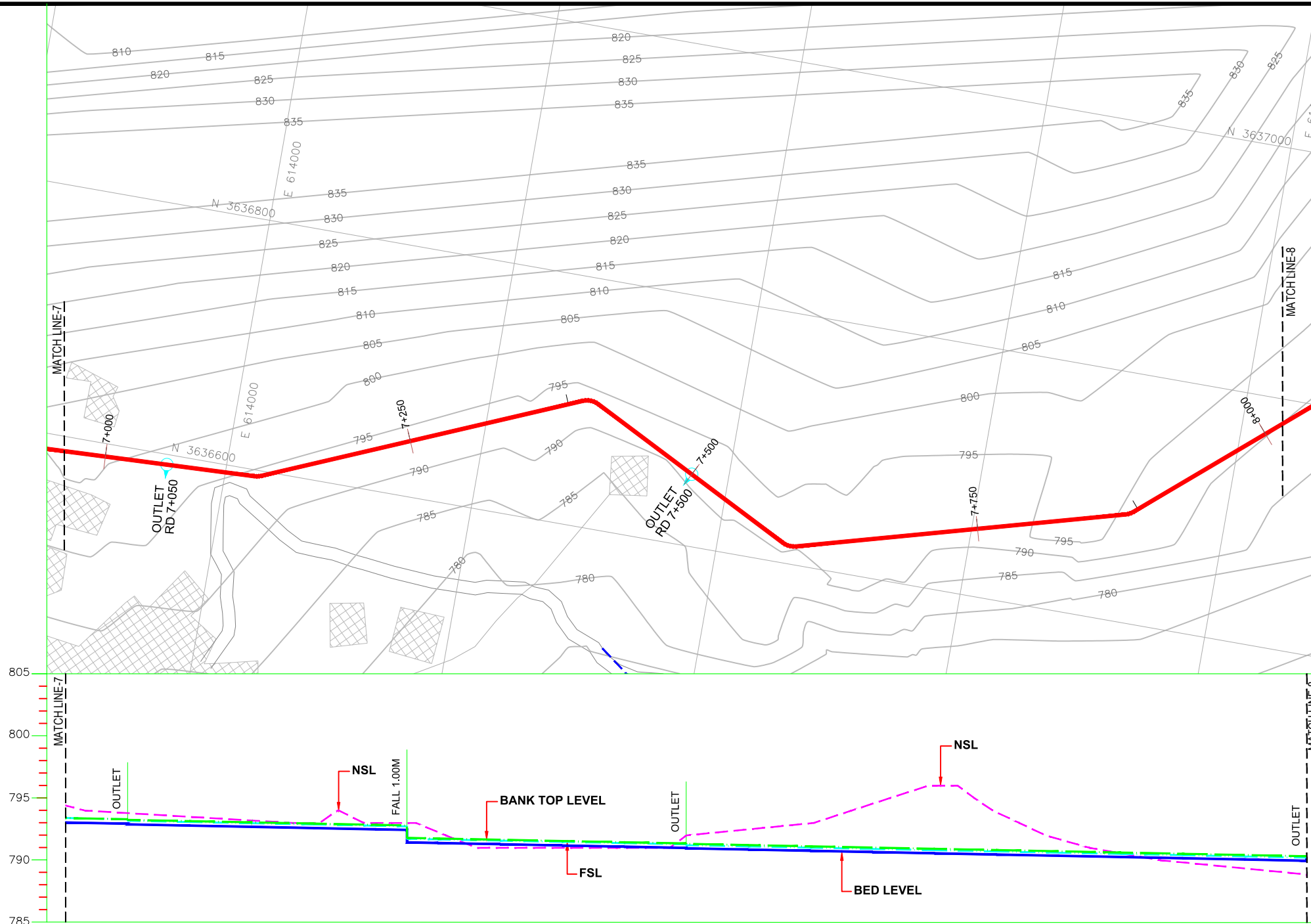
**TITLE:**  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS MAIN  
CANAL PLAN & PROFILE RD 6  
+000 TO RD 7+000

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021

<b>DESIGN DATA</b>	VELOCITY (m/sec)	0.862																									
	MANNING'S n / TYPE	0.014																									
	DISCHARGE (Cumec)	0.116																									
	FSD (m)	0.356																									
	TOP WIDTH (m)	0.640																									
	BANK TOP LEVEL (BTL)	799.20	799.10	799.00	798.90	798.85	798.80	796.80	796.34	796.65	796.29	794.59	794.90	794.44	794.80	794.70	794.60	794.50	794.30	794.20	794.10	794.00	793.90	793.80	793.70	793.60	793.50
DESIGN FSL	799.10	799.00	798.90	798.80	798.75	796.70	796.34	796.65	794.95	794.59	794.90	794.44	794.80	794.70	794.60	794.50	794.30	794.20	794.10	794.00	793.90	793.80	793.70	793.60	793.50	793.40	
DESIGN BED LEVEL (DBL)	798.74	798.64	798.54	798.44	798.39	796.34	796.34	796.65	794.59	794.54	794.54	794.44	794.34	794.24	794.14	794.04	793.94	793.84	793.74	793.64	793.54	793.44	793.34	793.24	793.14	793.04	
NSL	807.00	810.00	806.00	802.00	801.00	800.00	800.00	800.00	800.00	791.00	794.54	794.44	793.00	793.00	795.00	797.00	799.00	802.00	803.00	801.00	802.00	800.00	801.00	800.00	797.00	795.00	
R.D	6000	6050	6100	6150	6175	6200	6225	6225	6225	6250	6300	6350	6400	6450	6500	6550	6600	6650	6700	6750	6800	6850	6900	6950	7000		



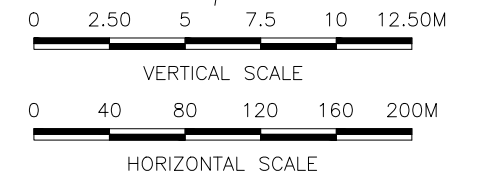
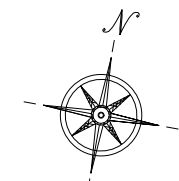
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**NOTES:-**  
1. ALL LEVELS AND DIMENSIONS ARE IN METER

**LEGEND**

AQUEDUCT	
MAIN CANAL	
DISTRIBUTARY	
ROAD	
VILLAGES/HOUSES	
EXISTING COMMAND AREA	
CONTOUR	
OUTLET	
DRAINAGE CULVERT	
NULLAH	
BANK	
FSL	
BED	
NSL	



**REFERENCE DRAWINGS :-**

ZKD-TD-IR-01	ZKD-TD-IR-04 (1 to 4)
ZKD-TD-IR-02	ZKD-TD-IR-05

**DRAWING IS RELEASED**  
 FOR TENDER DRAWINGS ONLY

DESIGN DATA	VELOCITY (m/sec)	0.862	0.816	0.749																						
	MANNING'S n / TYPE	0.014	0.014	0.014																						
	DISCHARGE (Cumec)	0.116	0.086	0.063																						
	FSD (m)	0.356	0.289	0.249																						
	TOP WIDTH (m)	0.640	0.600	0.600																						
	BANK TOP LEVEL (BTL)	793.40	793.30	793.25	793.15	793.05	792.95	792.85	792.80	791.80	791.75	791.65	791.55	791.45	791.38	791.22	791.12	791.02	790.92	790.82	790.72	790.62	790.52	790.42	790.37	790.32
	DESIGN FSL	793.40	793.30	793.18	793.08	792.98	792.88	792.78	792.73	791.73	791.68	791.58	791.48	791.38	791.28	791.11	791.01	790.91	790.81	790.71	790.61	790.51	790.41	790.31	790.24	790.21
	DESIGN BED LEVEL (DBL)	793.04	792.94	792.89	792.79	792.69	792.59	792.49	792.44	791.44	791.39	791.29	791.19	791.09	790.98	790.86	790.76	790.66	790.56	790.46	790.36	790.26	790.16	790.06	790.01	789.96
	NSL	795.00	794.00	794.00	794.00	794.00	793.00	793.00	793.00	791.73	791.68	791.58	791.48	791.38	791.28	791.11	791.01	790.91	790.81	790.71	790.61	790.51	790.41	790.31	790.00	790.00
	R.D	7000	7050	7050	7100	7150	7200	7250	7275	7275	7300	7350	7400	7450	7500	7550	7600	7650	7700	7750	7800	7850	7900	7950	8000	8000

CLIENT: PSU SMALL DAM SECTION MERGED AREA IRRIGATION DEPARTMENT. KPK.

CONSULTANTS: A J.V OF RHC REHMAN HABIB CONSULTANTS (PVT) LTD.

CASCADE GROUP OF ENGINEERING & CONSULTANTS

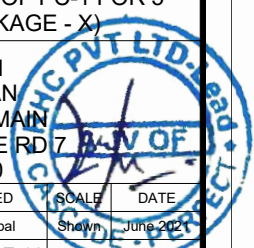
PERFECT ENGINEERING & MANAGEMENT CONSULTANTS

PROJECT: CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAIL DESIGN & PREPARATION OF PC-1 FOR 5 SMALL DAMS IN FATA (PACKAGE - X)

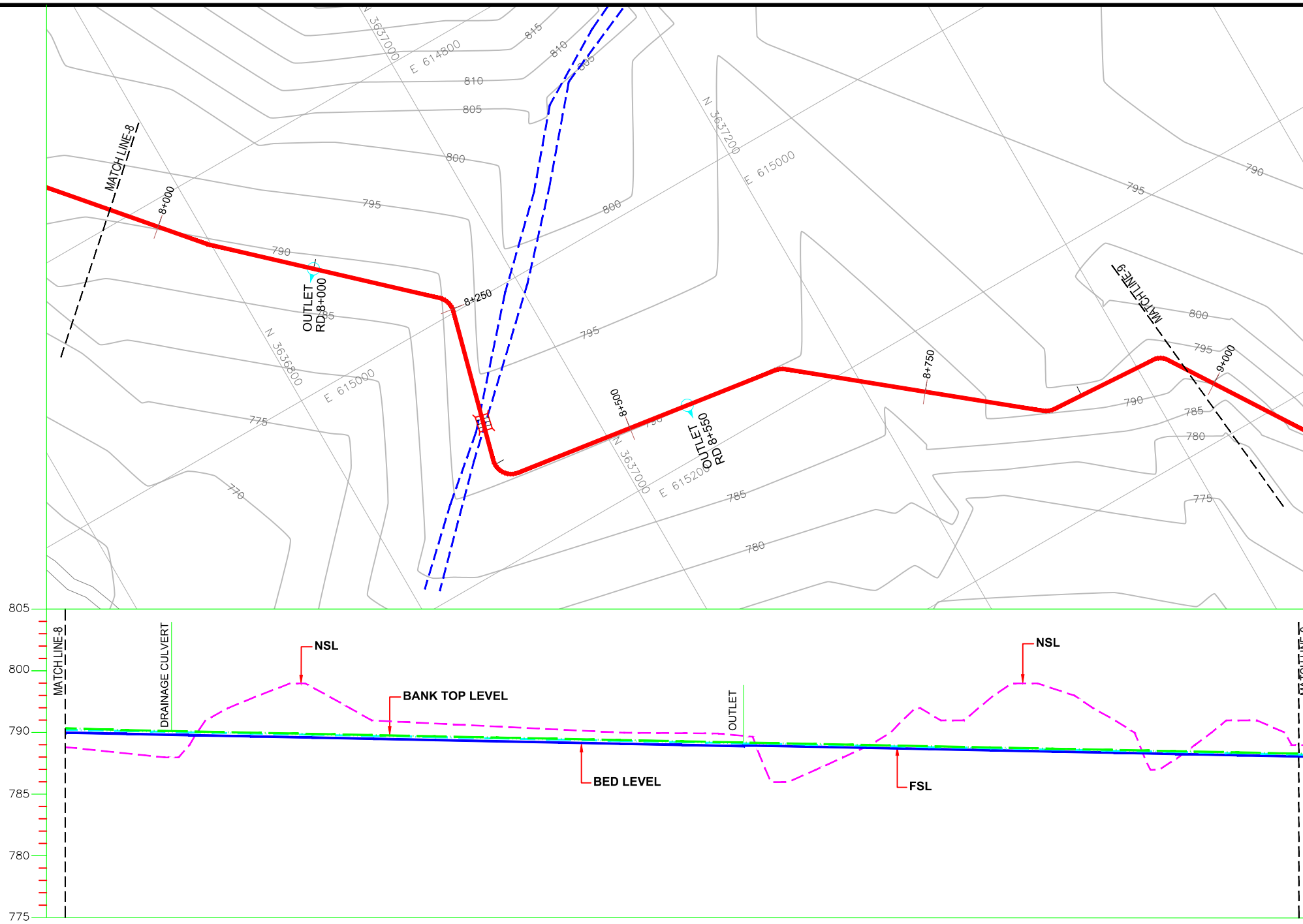
TITLE: ZAKAR KHEL DAM NORTH WAZIRISTAN TENDER DRAWINGS MAIN CANAL PLAN & PROFILE RD 7 +000 TO RD 8+000

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021

DRG.No:- ZKD-TD-IR-03 SHEET:-8 OF 10 SUB SH.



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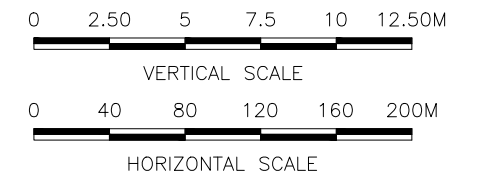
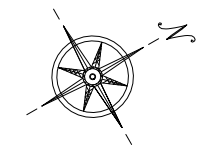


**NOTES:-**

1. ALL LEVELS AND DIMENSIONS ARE IN METER

**LEGEND**

- AQUEDUCT
- MAIN CANAL
- DISTRIBUTARY
- ROAD
- VILLAGES/HOUSES
- EXISTING COMMAND AREA
- CONTOUR
- OUTLET
- DRAINAGE CULVERT
- NULLAH
- BANK
- FSL
- BED
- NSL



**REFERENCE DRAWINGS :-**

- ZKD-TD-IR-01      ZKD-TD-IR-04 (1 to 4)
- ZKD-TD-IR-02      ZKD-TD-IR-05

**DRAWING IS RELEASED**

**FOR TENDER DRAWINGS ONLY**

CLIENT: PSU SMALL DAM SECTION MERGED AREA IRRIGATION DEPARTMENT. KPK.

CONSULTANTS: A J.V OF **RHC REHMAN HABIB CONSULTANTS (PVT) LTD.**

**CASCADE GROUP OF ENGINEERING & CONSULTANTS**

**PERFECT ENGINEERING & MANAGEMENT CONSULTANTS**

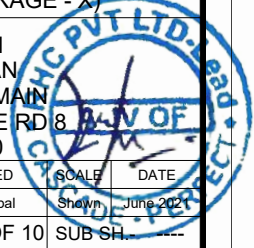
PROJECT: CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAIL DESIGN & PREPARATION OF PC-1 FOR 5 SMALL DAMS IN FATA (PACKAGE - X)

TITLE: ZAKAR KHEL DAM NORTH WAZIRISTAN TENDER DRAWINGS MAIN CANAL PLAN & PROFILE RD 8 +000 TO RD 9+000

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021

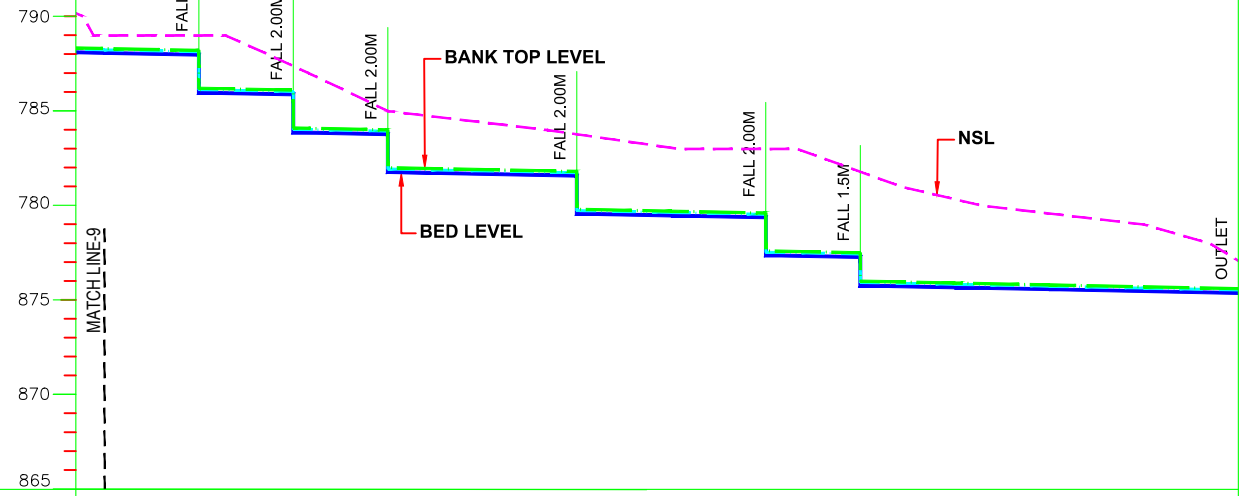
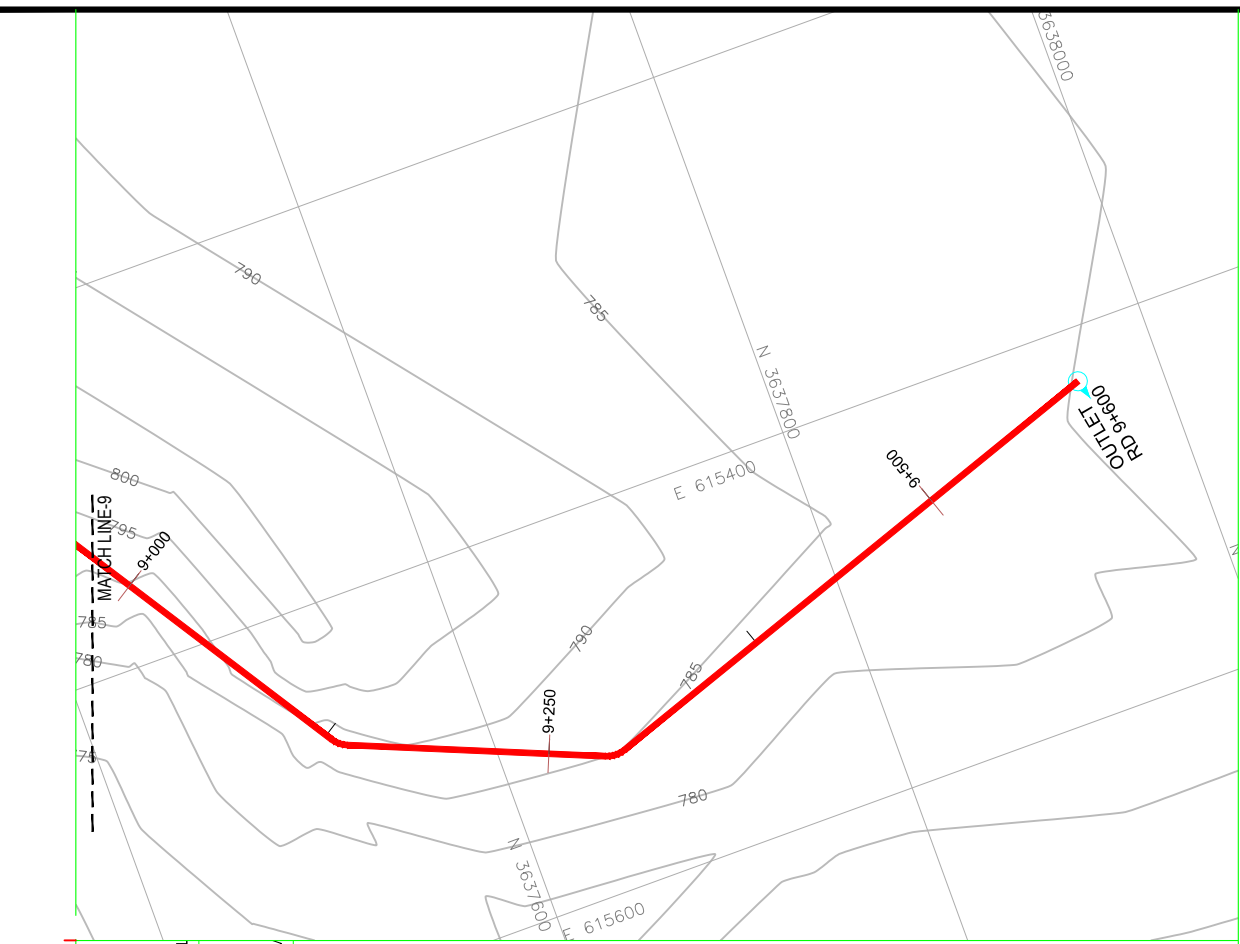
DRG.No:- ZKD-TD-IR-03      SHEET:-9 OF 10      SUB SH. ---

DESIGN DATA	VELOCITY (m/sec)		MANNING'S n / TYPE		DISCHARGE (Cumec)		FSD (m)		TOP WIDTH (m)	
	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right
VELOCITY (m/sec)	0.667	0.466	0.014	0.014	0.041	0.018	0.231	0.164	0.457	0.360
MANNING'S n / TYPE	0.014	0.014	0.014	0.014	0.041	0.018	0.231	0.164	0.457	0.360
DISCHARGE (Cumec)	0.041	0.018	0.014	0.014	0.041	0.018	0.231	0.164	0.457	0.360
FSD (m)	0.231	0.164	0.014	0.014	0.041	0.018	0.231	0.164	0.457	0.360
TOP WIDTH (m)	0.457	0.360	0.014	0.014	0.041	0.018	0.231	0.164	0.457	0.360
BANK TOP LEVEL (BTL)	790.32	788.31	790.21	789.51	790.11	789.01	790.01	788.81	789.91	788.71
DESIGN FSL	790.24	788.24	790.14	789.44	790.04	788.94	790.04	788.84	789.94	788.74
DESIGN BED LEVEL (DBL)	789.96	788.96	789.91	789.21	789.81	788.71	789.81	788.68	789.71	788.68
NSL	790.00	788.00	789.00	788.00	790.00	788.00	790.00	788.00	790.00	788.00
R.D	8000	8050	8100	8150	8200	8250	8300	8350	8400	8450





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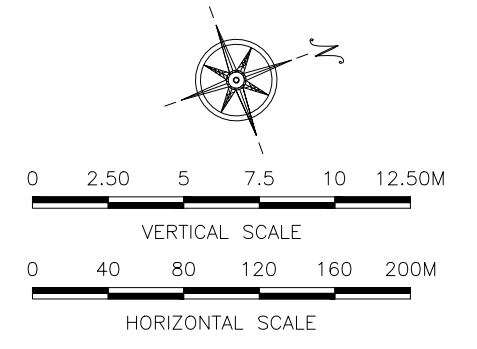


DESIGN DATA	STATIONING																
	9000	9050	9100	9150	9250	9300	9350	9400	9450	9500	9550	9600					
VELOCITY (m/sec)	0.466																
MANNING'S n / TYPE	0.014																
DISCHARGE (Cumec)	0.018																
FSD (m)	0.164																
TOP WIDTH (m)	0.360																
BANK TOP LEVEL (BTL)	788.31	788.21	786.11	784.11	784.01	782.01	781.81	779.81	779.71	779.61	777.61	777.51	776.01	775.91	775.81	775.71	775.61
DESIGN FSL	788.24	788.14	786.04	784.04	783.94	781.94	781.74	779.74	779.64	779.54	777.54	777.44	775.94	775.84	775.74	775.64	775.54
DESIGN BED LEVEL (DBL)	788.08	788.98	785.88	783.88	783.78	781.78	781.58	779.58	779.48	779.38	777.38	777.28	775.78	775.68	775.58	775.48	775.38
NSL	789.00	789.00	788.00	788.00	786.00	786.00	784.00	784.00	784.00	783.00	783.00	782.00	782.00	781.00	780.00	780.00	778.00
R.D	9000	9050	9100	9150	9250	9300	9350	9400	9450	9500	9550	9600					

**NOTES:-**  
1. ALL LEVELS AND DIMENSIONS ARE IN METER

**LEGEND**

AQUEDUCT	
MAIN CANAL	
DISTRIBUTARY	
ROAD	
VILLAGES/HOUSES	
EXISTING COMMAND AREA	
CONTOUR	
OUTLET	
DRAINAGE CULVERT	
NULLAH	
BANK	
FSL	
BED	
NSL	



**REFERENCE DRAWINGS :-**  
ZKD-TD-IR-01 ZKD-TD-IR-04 (1 to 4)  
ZKD-TD-IR-02 ZKD-TD-IR-05

**DRAWING IS RELEASED**

FOR TENDER DRAWINGS ONLY

**CLIENT:**  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

**CONSULTANTS:** A J.V OF  
 REHMAN HABIB CONSULTANTS (PVT) LTD.  
 CASCADE GROUP OF ENGINEERING & CONSULTANTS  
 PERFECT ENGINEERING & MANAGEMENT CONSULTANTS

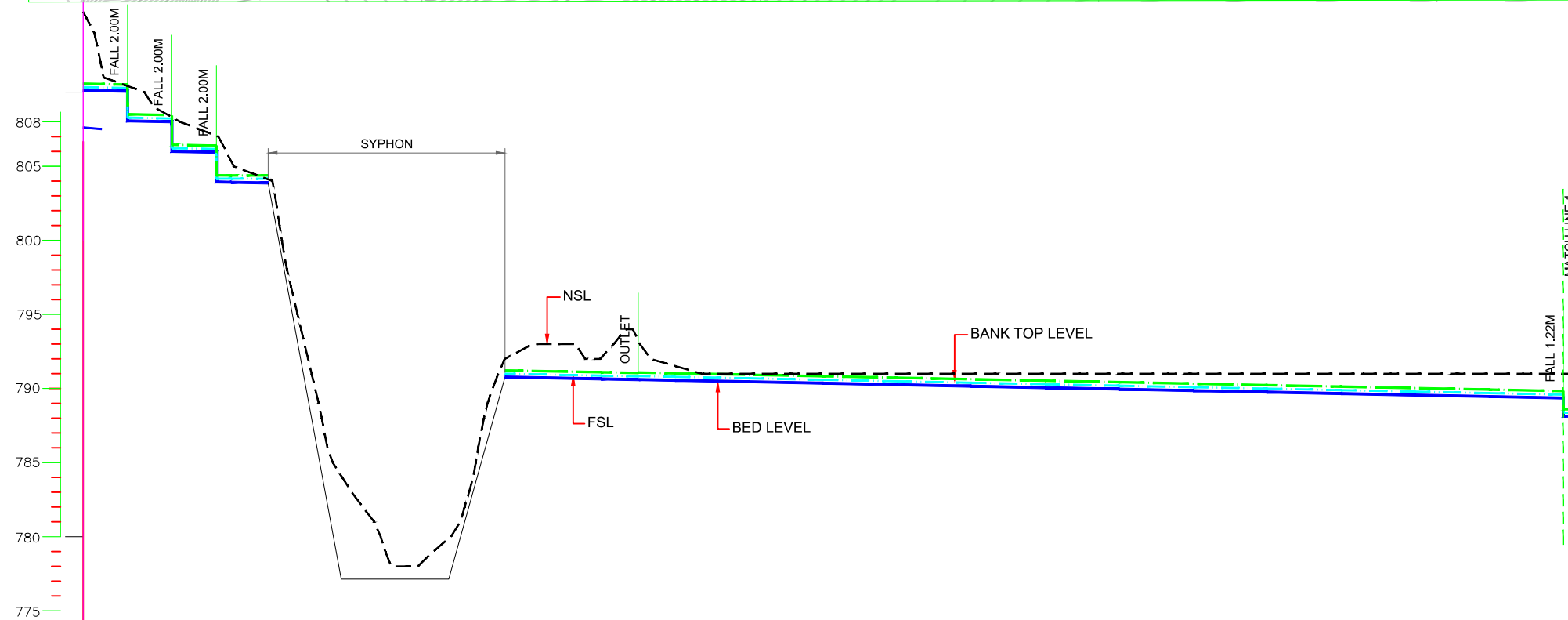
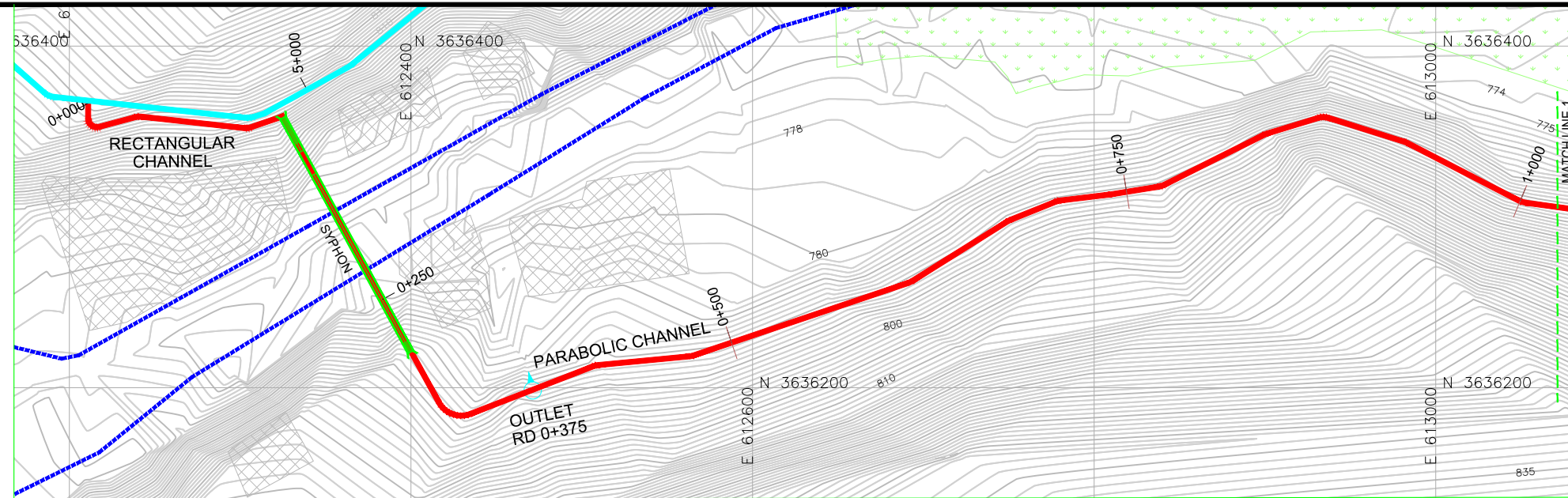
**PROJECT:**  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1 FOR 5  
SMALL DAMS IN FATA (PACKAGE - X)

**TITLE:**  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS MAIN  
CANAL PLAN & PROFILE RD 9  
+000 TO RD 9+600

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	1:1000	June 2021

DRG.No:- ZKD-TD-IR-03 SHEET:10 OF 10 SUB:SH. PER

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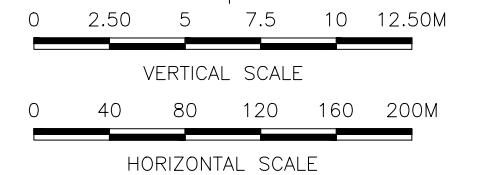
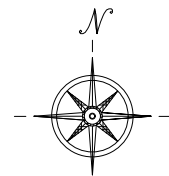


**NOTES:-**

1. ALL LEVELS AND DIMENSIONS ARE IN METER

**LEGEND**

- AQUEDUCT
- MAIN CANAL
- DISTRIBUTARY
- ROAD
- VILLAGES/HOUSES
- EXISTING COMMAND AREA
- CONTOUR
- OUTLET
- DRAINAGE CULVERT
- NULLAH
- TOL
- FSL
- BED
- NSL



**REFERENCE DRAWINGS :-**

- ZKD-TD-IR-01      ZKD-TD-IR-03 (1 to 11)
- ZKD-TD-IR-02      ZKD-TD-IR-05

**DRAWING IS RELEASED**

**FOR TENDER DRAWINGS ONLY**

**CLIENT:**  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

**CONSULTANTS:** A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.

**CASCADE GROUP**  
OF ENGINEERING & CONSULTANTS

**PEMC** PERFECT ENGINEERING &  
MANAGEMENT CONSULTANTS

**PROJECT:**  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1 FOR 5  
SMALL DAMS IN FATA (PACKAGE - X)

**TITLE:**  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS  
DISTRIBUTORY PLAN & PROFILE  
RD 0+000 TO RD 1+000

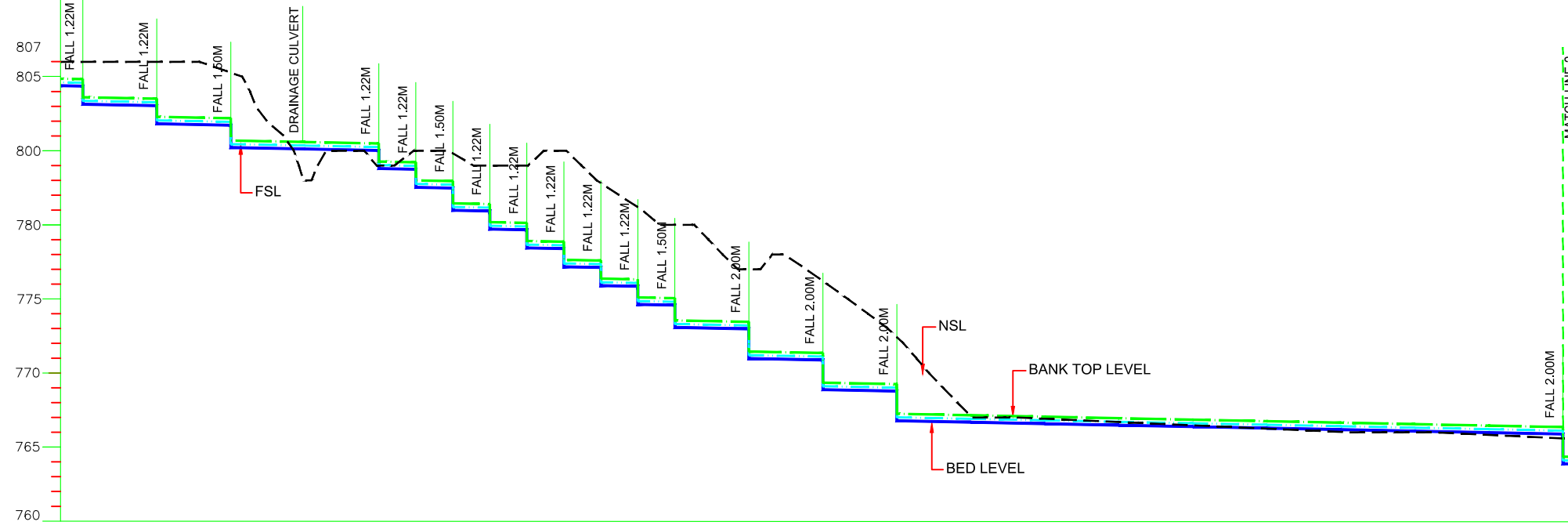
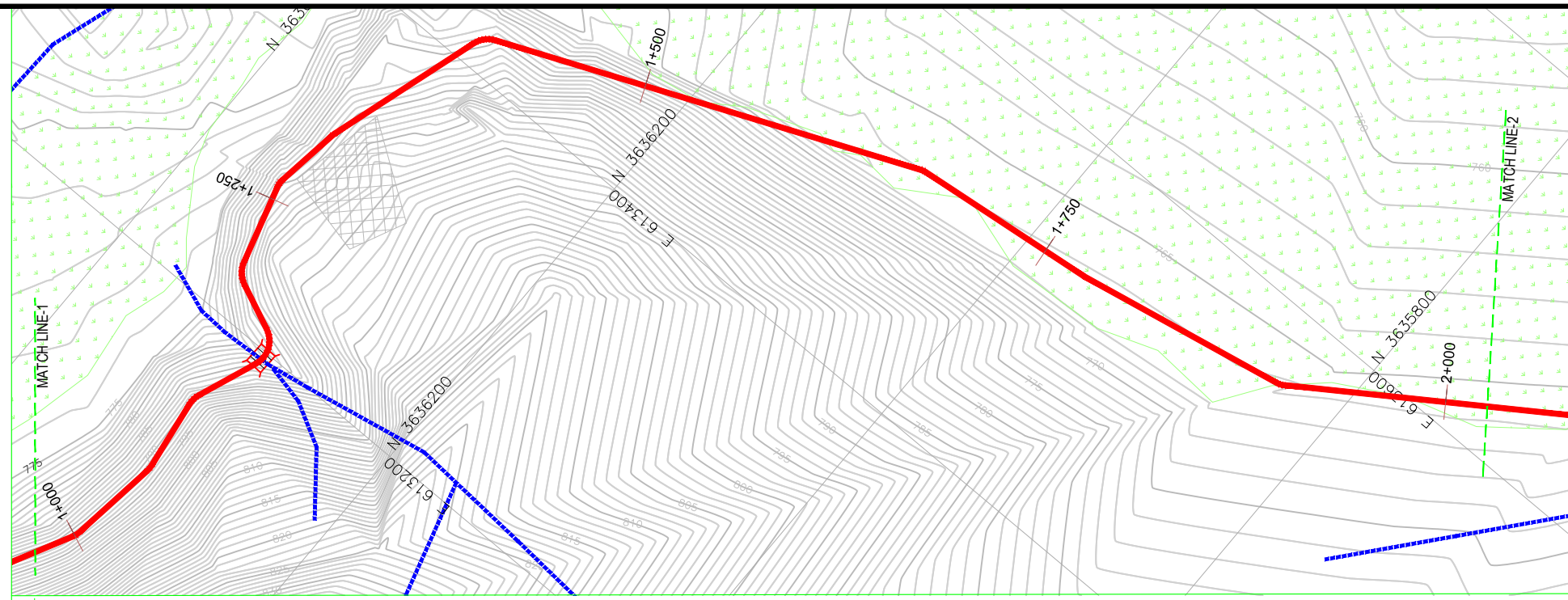
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VELOCITY (m/sec)		0.710								0.710			0.674																	
MANNING'S n / TYPE		0.016								0.014			0.014																	
DISCHARGE (Cumec)		0.0509								0.0509			0.0419																	
FSD (m)		0.223								0.223			0.235																	
TOP/BED WIDTH (m)		0.40								0.60			0.457																	
TOP OF LINING (TOL)	810.57	810.51	808.51	808.45	806.45	804.39	804.38	804.38		791.22	791.10	791.05	791.08	791.03		790.93	790.83	790.73		790.63	790.53	790.43	790.33	790.23	790.13	790.03	789.93	789.83	788.61	
DESIGN FSL	810.34	810.28	808.28	808.22	806.22	804.16	804.16	804.16		791.00	790.87	790.82	790.84	790.79		790.69	790.59	790.49		790.39	790.29	790.19	790.09	789.99	789.89	789.79	789.69	789.59	788.37	
DESIGN BED LEVEL (DBL)	810.12	810.06	808.06	808.00	806.00	803.94	803.92	803.87		790.78	790.65	790.60	790.61	790.56		790.46	790.36	790.26		790.16	790.06	789.96	789.86	789.76	789.66	789.56	789.46	789.36	788.14	
NSL	815.41	811.00	811.00	809.00	809.00	808.00	806.00	805.00	793.00	781.00	780.00	792.00	794.00	792.00	791.00	791.00	791.00	791.00	791.00	791.00	791.00	791.00	791.00	791.00	791.00	791.00	791.00	791.00	791.00	791.00
R.D	0	30	30	60	90	100	125	150	200	250	285	350	375	400	450	500	550	600	650	700	750	800	850	900	950	1000	1000			

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021

DRG.No:- ZKD-TD-IR-04      SHEET:-1 OF 4      SUB SH. ---



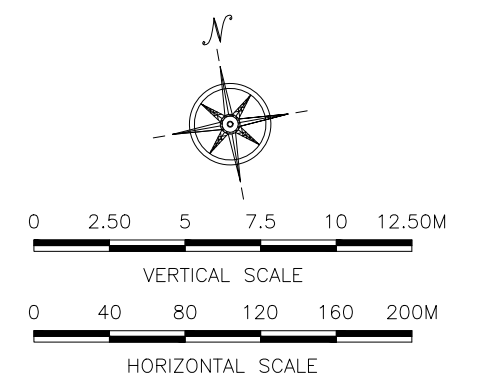
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**NOTES:-**  
1. ALL LEVELS AND DIMENSIONS ARE IN METER

**LEGEND**

AQUEDUCT	
MAIN CANAL	
DISTRIBUTARY	
ROAD	
VILLAGES/HOUSES	
EXISTING COMMAND AREA	
CONTOUR	
OUTLET	
DRAINAGE CULVERT	
NULLAH	
TOL	
FSL	
BED	
NSL	



**REFERENCE DRAWINGS :-**

ZKD-TD-IR-01	ZKD-TD-IR-03 (1 to 11)
ZKD-TD-IR-02	ZKD-TD-IR-05

**DRAWING IS RELEASED**  
 FOR TENDER DRAWINGS ONLY

**CLIENT:**  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

**CONSULTANTS:** A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.

**CASCADE GROUP**  
OF ENGINEERING & CONSULTANTS

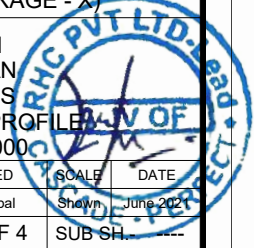
**PEMG** PERFECT ENGINEERING &  
MANAGEMENT CONSULTANTS

**PROJECT:**  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1 FOR 5  
SMALL DAMS IN FATA (PACKAGE - X)

**TITLE:**  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS  
DISTRIBUTORY PLAN & PROFILE  
RD 1+000 TO RD 2+000

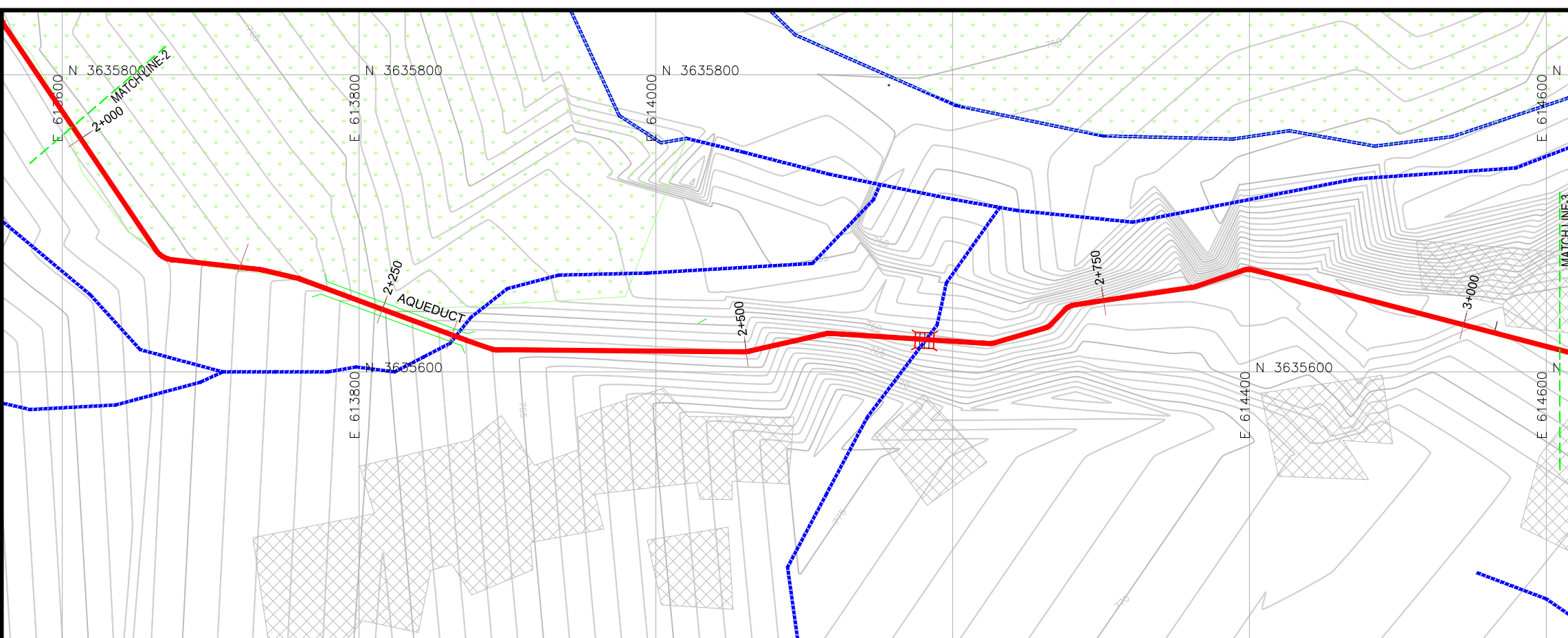
DESIGN DATA	VELOCITY (m/sec)		MANNING'S n / TYPE		DISCHARGE (Cumec)		FSD (m)		TOP/BED WIDTH (m)	
	Value	Color	Value	Color	Value	Color	Value	Color	Value	Color
TOP OF LINING (TOL)	789.83	Green	788.61	Green	789.59	Red	788.37	Red	789.36	Green
DESIGN FSL	789.59	Red	788.37	Red	789.59	Red	788.37	Red	789.36	Green
DESIGN BED LEVEL (DBL)	789.36	Green	788.14	Green	789.59	Red	788.37	Red	789.36	Green
NSL	791.00	Black	791.00	Black	789.59	Red	788.37	Red	789.36	Green
R.D	1000	Green	1000	Green	789.59	Red	788.37	Red	789.36	Green

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021
DRG.No:- ZKD-TD-IR-04			SHEET:2 OF 4		SUB SH.





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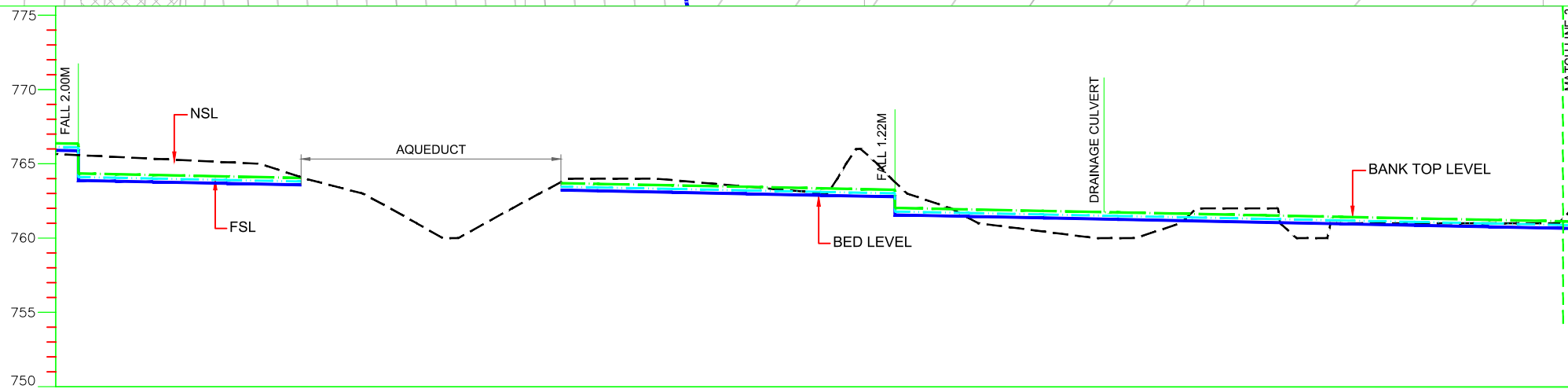
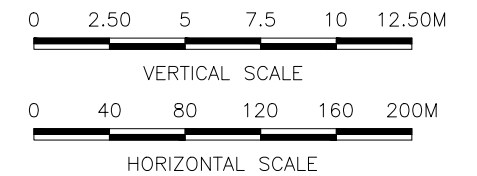
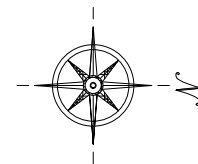


**NOTES:-**

1. ALL LEVELS AND DIMENSIONS ARE IN METER

**LEGEND**

- AQUEDUCT
- MAIN CANAL
- DISTRIBUTARY
- ROAD
- VILLAGES/HOUSES
- EXISTING COMMAND AREA
- CONTOUR
- OUTLET
- DRAINAGE CULVERT
- NULLAH
- TOL
- FSL
- BED
- NSL



**REFERENCE DRAWINGS :-**

- ZKD-TD-IR-01      ZKD-TD-IR-03 (1 to 11)
- ZKD-TD-IR-02      ZKD-TD-IR-05

DRAWING IS RELEASED

FOR TENDER DRAWINGS ONLY

CLIENT:  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

CONSULTANTS: A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.

**CASCADE GROUP**  
OF ENGINEERING & CONSULTANTS

**PERFECT ENGINEERING & MANAGEMENT CONSULTANTS**

PROJECT:  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1 FOR 5  
SMALL DAMS IN FATA (PACKAGE - X)

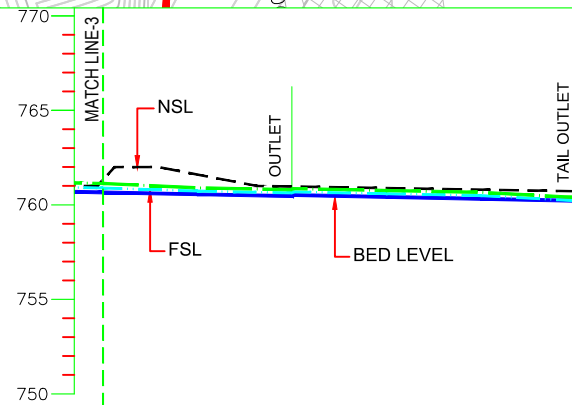
TITLE:  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS  
DISTRIBUTORY PLAN & PROFILE  
RD 2+000 TO RD 3+000

DESIGN DATA	AQUEDUCT	
	Value	Stationing
VELOCITY (m/sec)	0.674	2000 - 3000
MANNING'S n / TYPE	0.014	2000 - 3000
DISCHARGE (Cumec)	0.0419	2000 - 3000
FSD (m)	0.235	2000 - 3000
TOP/BED WIDTH (m)	0.457	2000 - 3000
TOP OF LINING (TOL)	766.35, 764.35, 764.30, 764.25, 764.15, 764.05	2000, 2000, 2005, 2050, 2100, 2150
DESIGN FSL	766.11, 764.11, 764.06, 764.01, 763.91, 763.81	2000, 2000, 2005, 2050, 2100, 2150
DESIGN BED LEVEL (DBL)	765.88, 763.88, 763.83, 763.78, 763.68, 763.58	2000, 2000, 2005, 2050, 2100, 2150
NSL	766.00, 766.00, 766.00, 766.00, 765.00, 763.00, 760.00	2000, 2000, 2005, 2050, 2100, 2150, 2200, 2250, 2300, 2325, 2350, 2400, 2450, 2500, 2550, 2600, 2650, 2700, 2750, 2800, 2850, 2900, 2950, 3000
R.D		2000, 2000, 2005, 2050, 2100, 2150, 2200, 2250, 2300, 2325, 2350, 2400, 2450, 2500, 2550, 2600, 2650, 2700, 2750, 2800, 2850, 2900, 2950, 3000

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021
DRG.No:- ZKD-TD-IR-04			SHEET:3 OF 4		SUB SH.



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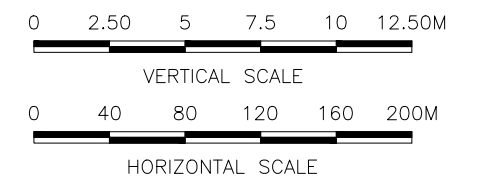
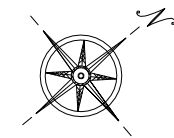
DESIGN DATA	VELOCITY (m/sec)		MANNING'S n / TYPE		DISCHARGE (Cumec)		FSD (m)		TOP/BED WIDTH (m)	
	3000	3050	3100	3150	3200	3250	3000	3050	3100	3150
VELOCITY (m/sec)	0.674	0.674	0.554	0.554	0.0419	0.0192	0.235	0.170	0.457	0.457
MANNING'S n / TYPE	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014
DISCHARGE (Cumec)	0.0419	0.0419	0.0192	0.0192	0.0419	0.0192	0.235	0.170	0.457	0.457
FSD (m)	761.13	760.90	760.88	760.76	760.66	760.39	761.13	760.90	760.88	760.76
TOP/BED WIDTH (m)	761.13	760.90	760.88	760.76	760.66	760.39	761.13	760.90	760.88	760.76
TOP OF LINING (TOL)	760.89	760.73	760.69	760.59	760.49	760.22	760.89	760.73	760.69	760.59
DESIGN FSL	760.66	760.56	760.68	760.42	760.32	760.22	760.66	760.56	760.68	760.42
DESIGN BED LEVEL (DBL)	761.00	762.00	761.00	761.00	761.00	761.00	761.00	762.00	761.00	761.00
NSL	761.00	762.00	761.00	761.00	761.00	761.00	761.00	762.00	761.00	761.00
R.D	3000	3050	3100	3150	3200	3250	3000	3050	3100	3150

**NOTES:-**

1. ALL LEVELS AND DIMENSIONS ARE IN METER

**LEGEND**

AQUEDUCT	
MAIN CANAL	
DISTRIBUTARY	
ROAD	
VILLAGES/HOUSES	
EXISTING COMMAND AREA	
CONTOUR	
OUTLET	
DRAINAGE CULVERT	
NULLAH	
TOL	
FSL	
BED	
NSL	



**REFERENCE DRAWINGS :-**

ZKD-TD-IR-01	ZKD-TD-IR-03 (1 to 11)
ZKD-TD-IR-02	ZKD-TD-IR-05

DRAWING IS RELEASED

FOR TENDER DRAWINGS ONLY

CLIENT:  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

CONSULTANTS: A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.

**CASCADE GROUP**  
OF ENGINEERING & CONSULTANTS

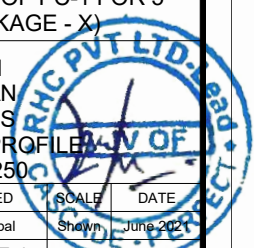
**PERM** PERFECT ENGINEERING &  
MANAGEMENT CONSULTANTS

PROJECT:  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1 FOR 5  
SMALL DAMS IN FATA (PACKAGE - X)

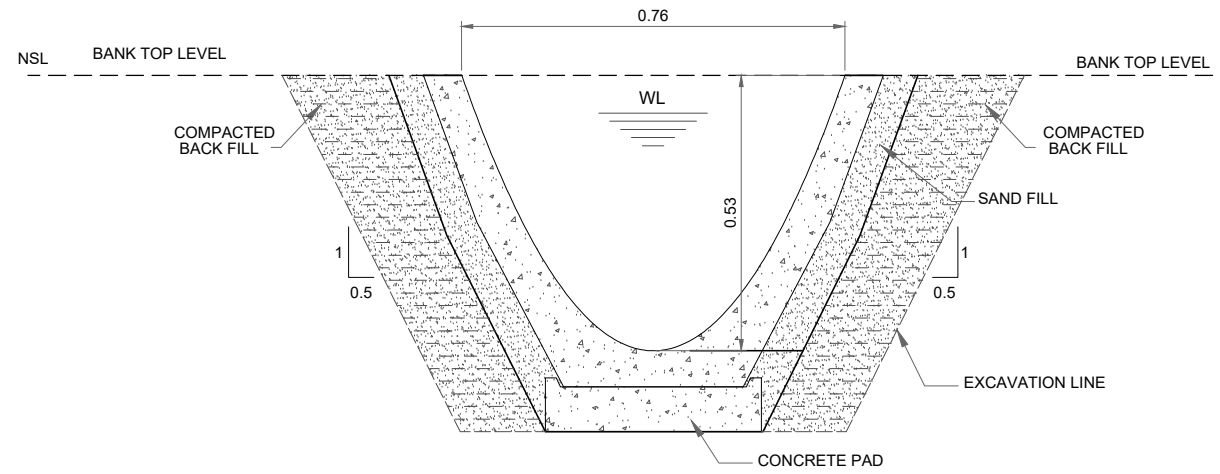
TITLE:  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS  
DISTRIBUTORY PLAN & PROFILE  
RD 3+000 TO RD 3+250

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	1:1	June 2021

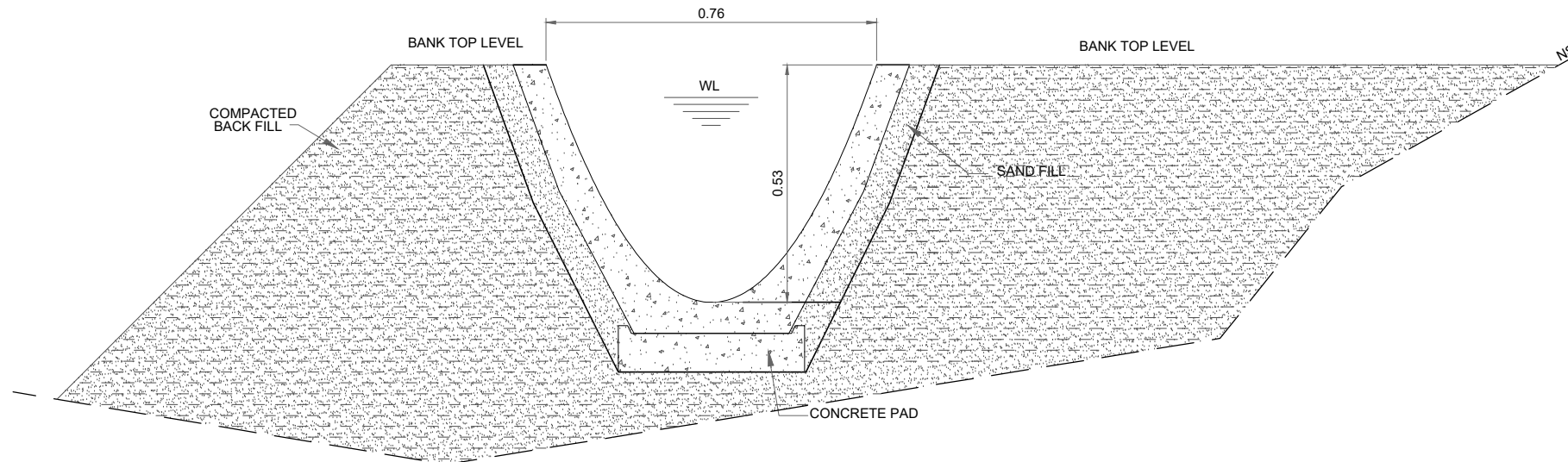
DRG.No:- ZKD-TD-IR-04 SHEET:4 OF 4 SUB SH.



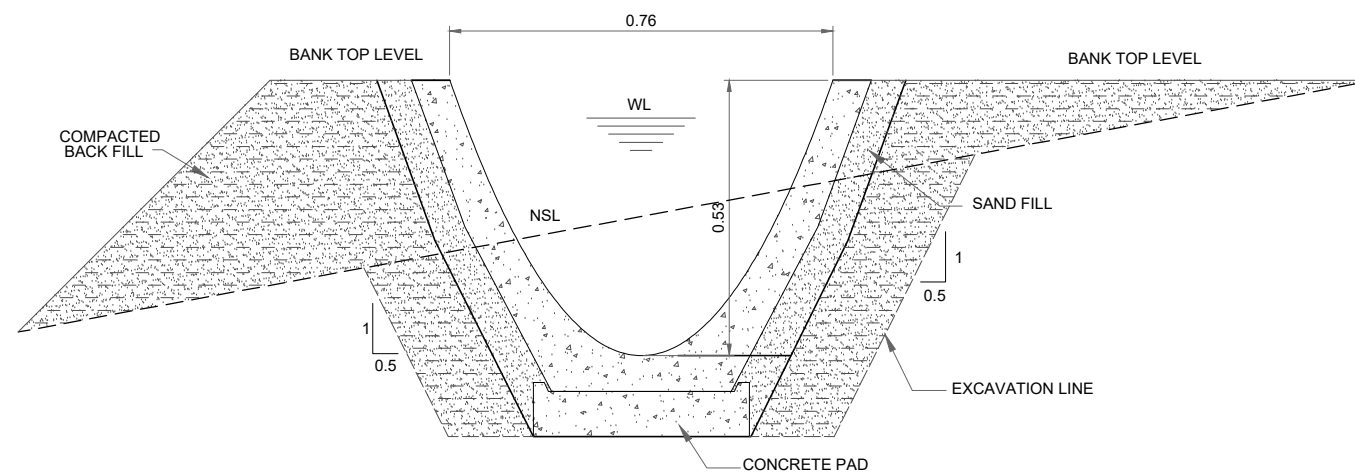
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**CROSS SECTION IN CUTTING**



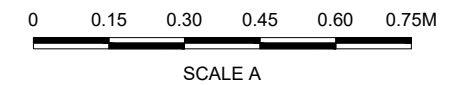
**CROSS SECTION IN FILLING**



**CROSS SECTION IN CUTTING & FILLING**

**NOTES:-**

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS INDICATED OTHERWISE.



**REFERENCE DRAWINGS :-**

- ZKD-TD-IR-01 ZKD-TD-IR-03 (1 to 10)
- ZKD-TD-IR-02 ZKD-TD-IR-04 (1 to 4)

DRAWING IS RELEASED

FOR TENDER DRAWINGS ONLY

CLIENT:  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

CONSULTANTS: A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.

**CASCADE** GROUP  
OF ENGINEERING & CONSULTANTS

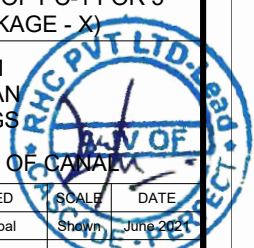
**PEMG** PERFECT ENGINEERING &  
MANAGEMENT CONSULTANTS

PROJECT:  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1 FOR 5  
SMALL DAMS IN FATA (PACKAGE - X)

TITLE:  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS  
TYPICAL CROSS SECTIONS OF CANAL

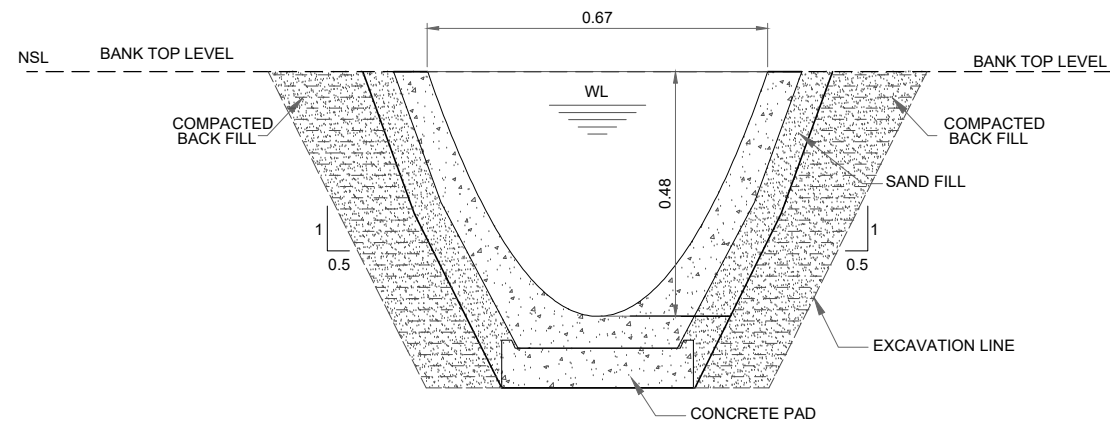
DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021

DRG.No:- ZKD-TD-IR-05 SHEET:- 1 OF 6 SUB SH. ---

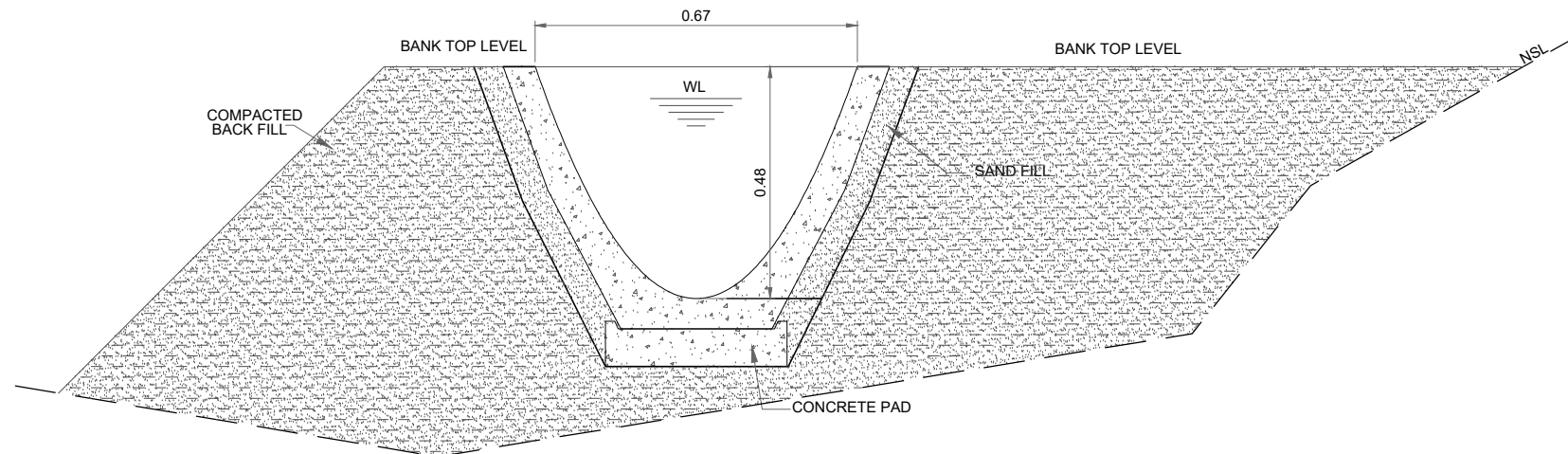




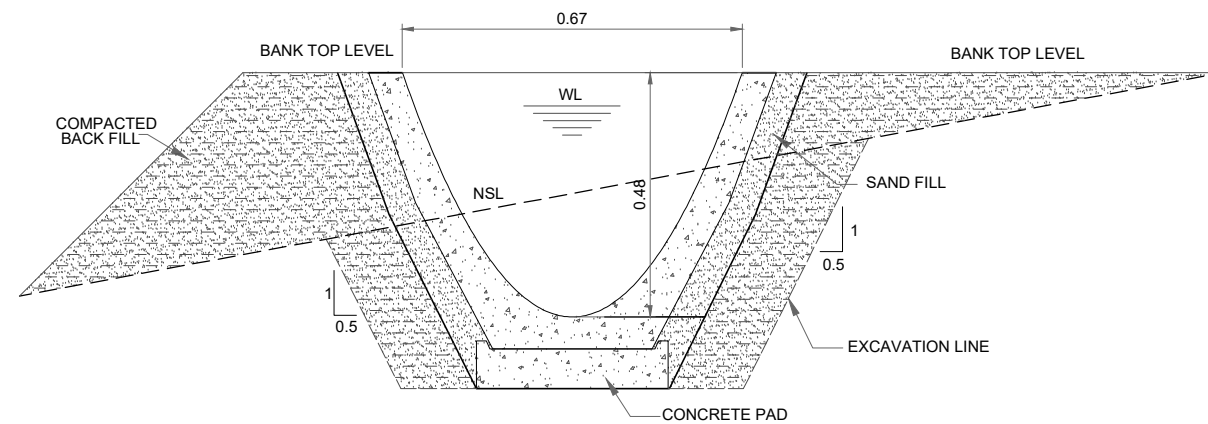
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**CROSS SECTION IN CUTTING**



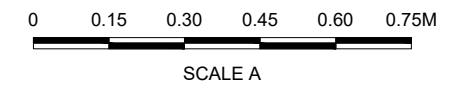
**CROSS SECTION IN FILLING**



**CROSS SECTION IN CUTTING & FILLING**

**NOTES:-**

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS INDICATED OTHERWISE.



**REFERENCE DRAWINGS :-**

- ZKD-TD-IR-01 ZKD-TD-IR-03 (1 to 10)
- ZKD-TD-IR-02 ZKD-TD-IR-04 (1 to 4)

DRAWING IS RELEASED

FOR TENDER DRAWINGS ONLY

CLIENT:  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

CONSULTANTS: A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.

**CASCADE** GROUP OF ENGINEERING & CONSULTANTS

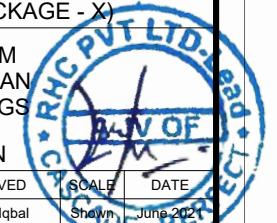
**PEMG** PERFECT ENGINEERING & MANAGEMENT CONSULTANTS

PROJECT:  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1 FOR 5  
SMALL DAMS IN FATA (PACKAGE - X)

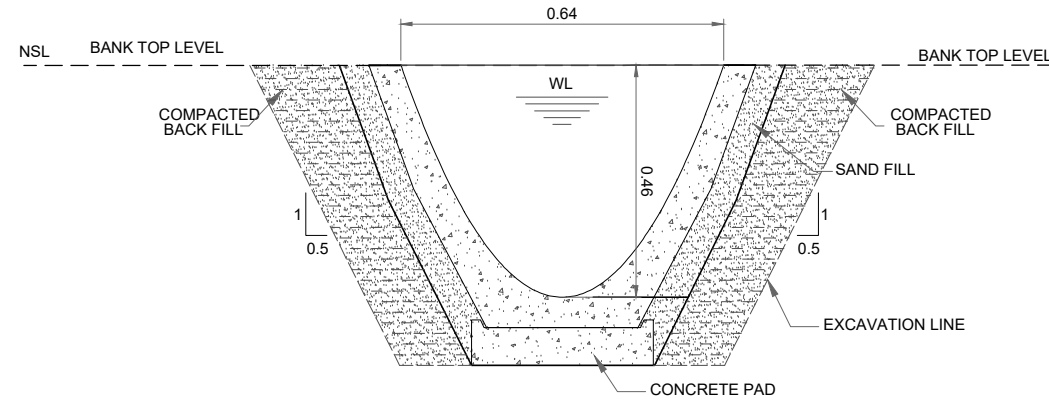
TITLE:  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS  
CANAL SYPHON

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021

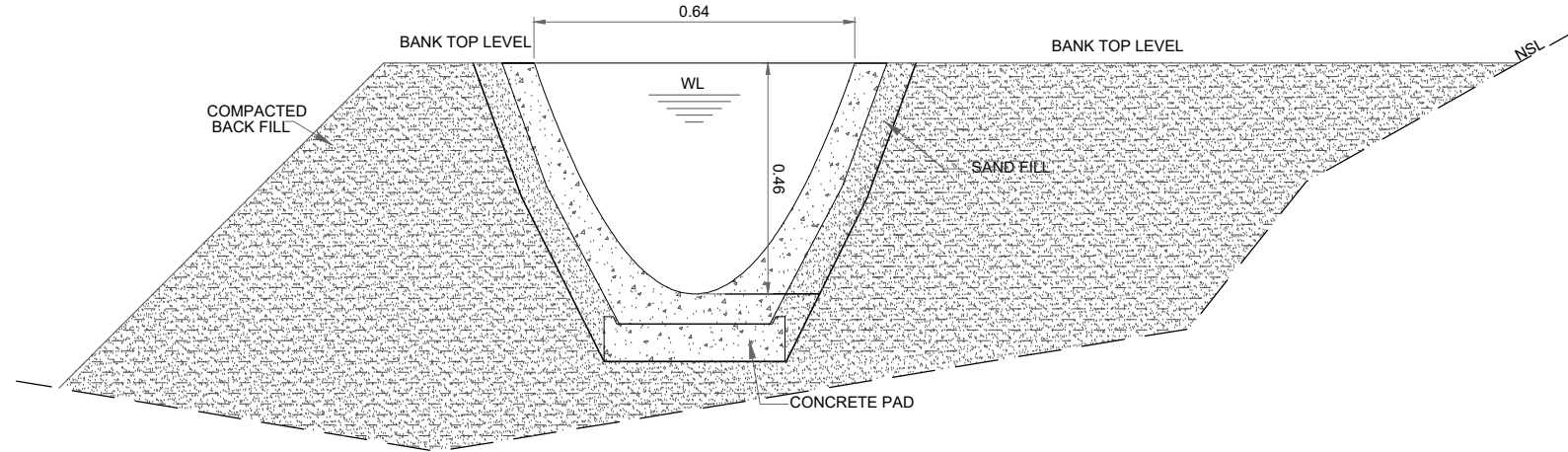
DRG.No:- ZKD-TD-IR-05 SHEET:- 2 OF 6 SUB SH. ---



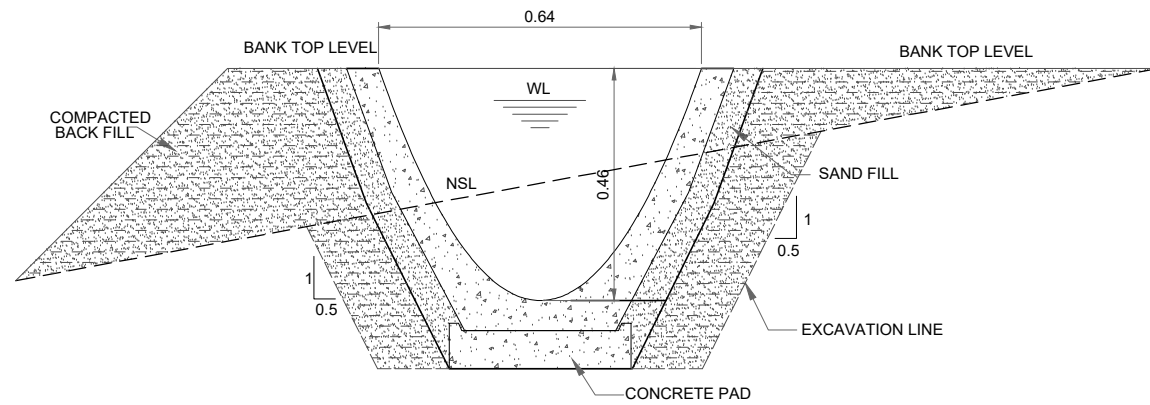
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**CROSS SECTION IN CUTTING**



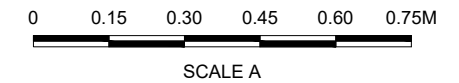
**CROSS SECTION IN FILLING**



**CROSS SECTION IN CUTTING & FILLING**

**NOTES:-**

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS INDICATED OTHERWISE.



**REFERENCE DRAWINGS :-**

- ZKD-TD-IR-01 ZKD-TD-IR-03 (1 to 10)
- ZKD-TD-IR-02 ZKD-TD-IR-04 (1 to 4)

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CLIENT:  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

CONSULTANTS: A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.

**CASCADE GROUP**  
OF ENGINEERING & CONSULTANTS

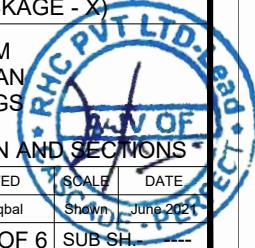
**PERFECT ENGINEERING & MANAGEMENT CONSULTANTS**

PROJECT:  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1 FOR 5  
SMALL DAMS IN FATA (PACKAGE - X)

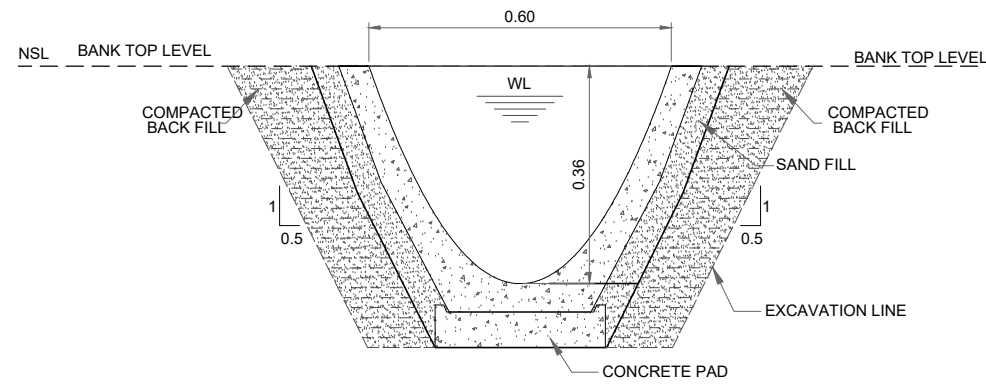
TITLE:  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021

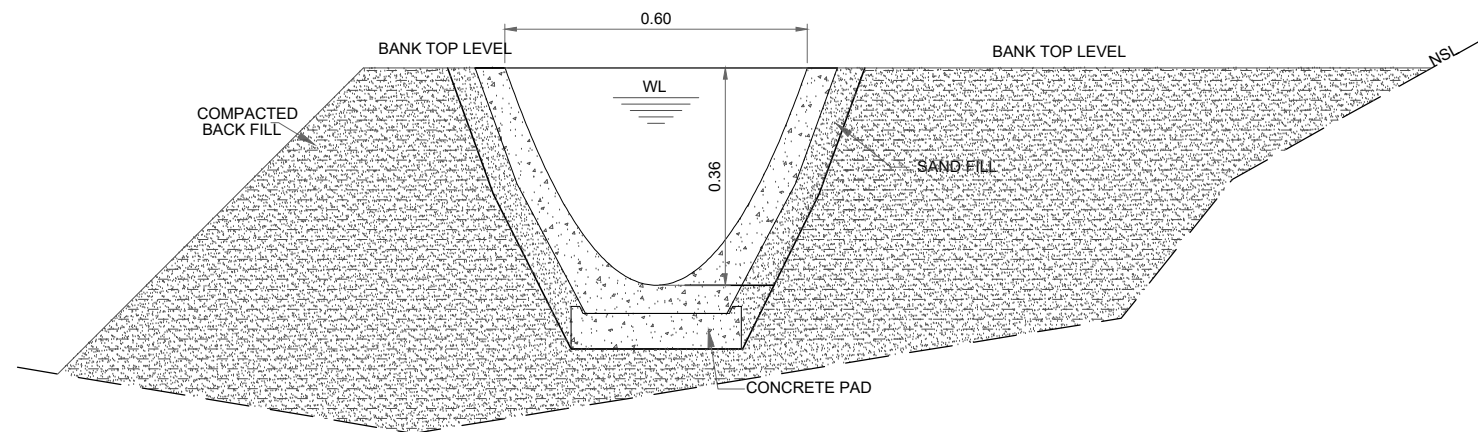
DRG.No:- ZKD-TD-IR-05 SHEET:- 3 OF 6 SUB SH. ---



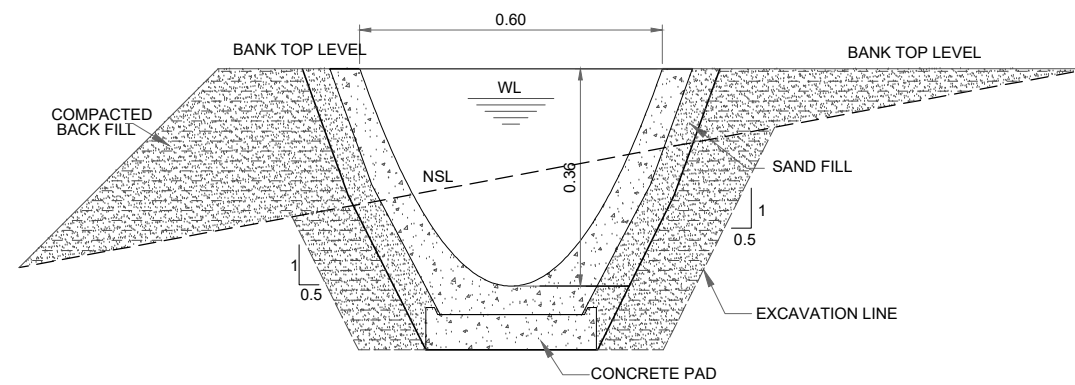
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**CROSS SECTION IN CUTTING**



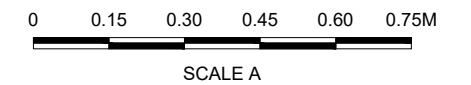
**CROSS SECTION IN FILLING**



**CROSS SECTION IN CUTTING & FILLING**

**NOTES:-**

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS INDICATED OTHERWISE.



**REFERENCE DRAWINGS :-**

- ZKD-TD-IR-01 ZKD-TD-IR-03 (1 to 10)
- ZKD-TD-IR-02 ZKD-TD-IR-04 (1 to 4)

DRAWING IS RELEASED

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CLIENT:  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

CONSULTANTS: A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.

**CASCADE GROUP**  
OF ENGINEERING & CONSULTANTS

**PERFECT ENGINEERING & MANAGEMENT CONSULTANTS**

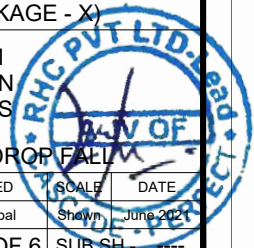
PROJECT:  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1 FOR 5  
SMALL DAMS IN FATA (PACKAGE - X)

TITLE:  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS

TYPICAL CANAL VERTICAL DROP FALL

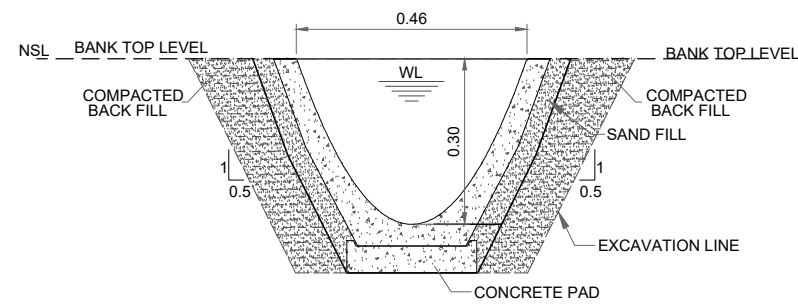
DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021

DRG.No:- ZKD-TD-IR-05 SHEET:- 4 OF 6 SUB SH. ---

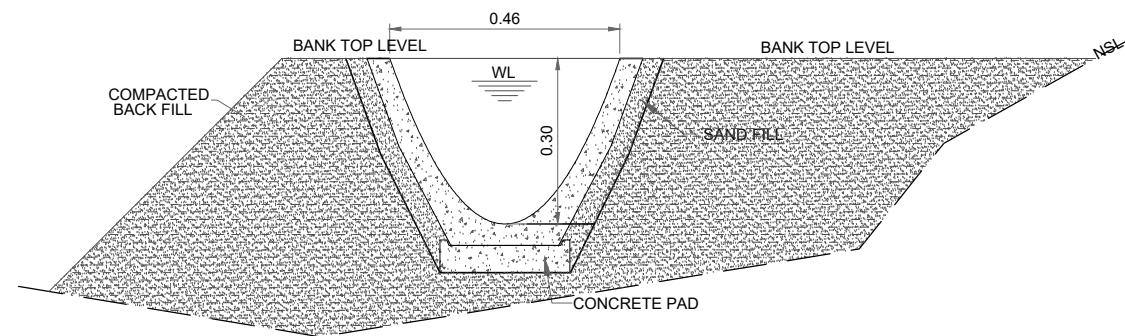




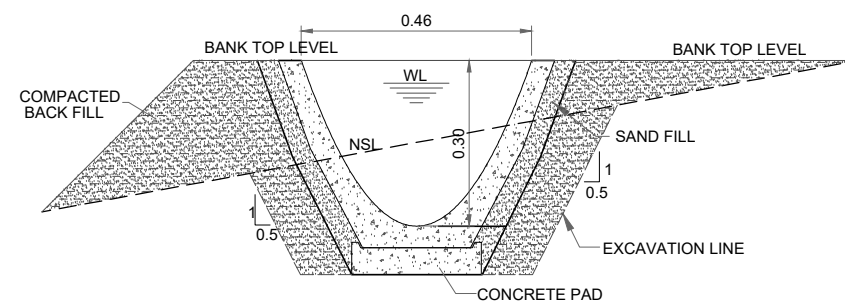
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**CROSS SECTION IN CUTTING**



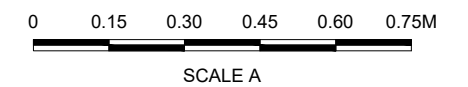
**CROSS SECTION IN FILLING**



**CROSS SECTION IN CUTTING & FILLING**

**NOTES:-**

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS INDICATED OTHERWISE.



**REFERENCE DRAWINGS :-**

- ZKD-TD-IR-01 ZKD-TD-IR-03 (1 to 10)
- ZKD-TD-IR-02 ZKD-TD-IR-04 (1 to 4)

**DRAWING IS RELEASED**

**FOR TENDER DRAWINGS ONLY**

**CLIENT:**  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

**CONSULTANTS:** A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.

**CASCADE GROUP**  
OF ENGINEERING & CONSULTANTS

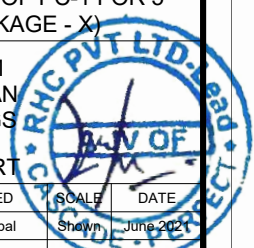
**PERFECT ENGINEERING &**  
MANAGEMENT CONSULTANTS

**PROJECT:**  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1 FOR 5  
SMALL DAMS IN FATA (PACKAGE - X)

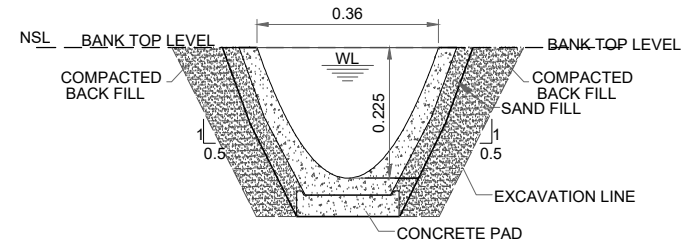
**TITLE:**  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS  
DRAINAGE CULVERT

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021

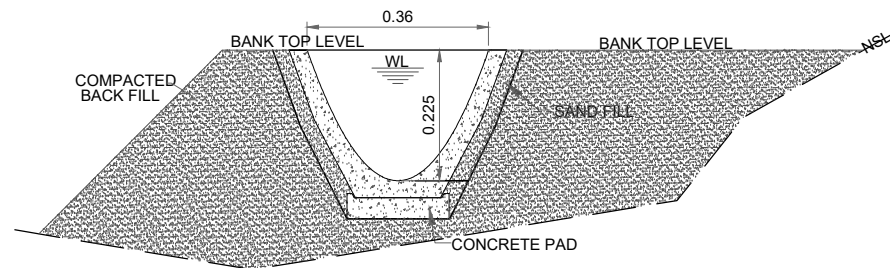
DRG.No:- ZKD-TD-IR-05 SHEET:- 5 OF 6 SUB SH. ---



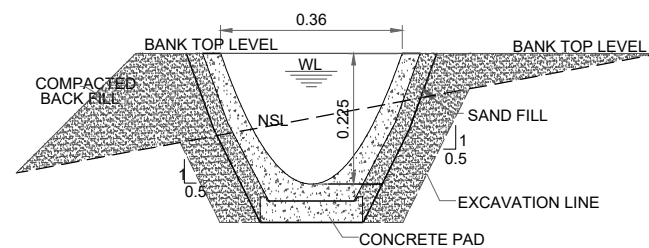
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**CROSS SECTION IN CUTTING**



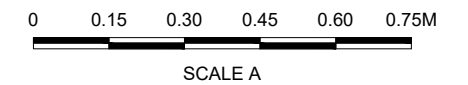
**CROSS SECTION IN FILLING**



**CROSS SECTION IN CUTTING & FILLING**

**NOTES:-**

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS INDICATED OTHERWISE.



**REFERENCE DRAWINGS :-**

- ZKD-TD-IR-01 ZKD-TD-IR-03 (1 to 10)
- ZKD-TD-IR-02 ZKD-TD-IR-04 (1 to 4)

**DRAWING IS RELEASED**

**FOR TENDER DRAWINGS ONLY**

**CLIENT:**  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

**CONSULTANTS:** A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.

**CASCADE GROUP**  
OF ENGINEERING & CONSULTANTS

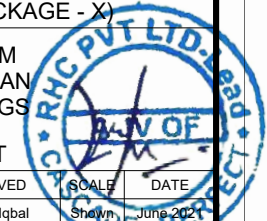
**PERFECT ENGINEERING & MANAGEMENT CONSULTANTS**

**PROJECT:**  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1 FOR 5  
SMALL DAMS IN FATA (PACKAGE - X)

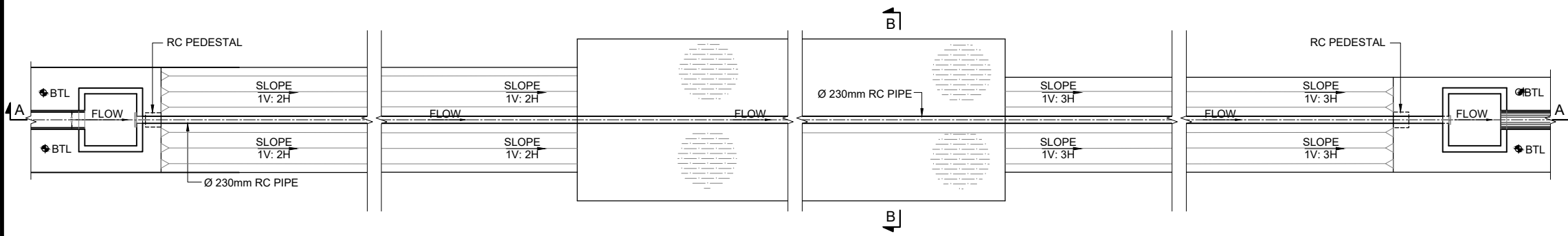
**TITLE:**  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS  
ROAD CULVERT

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021

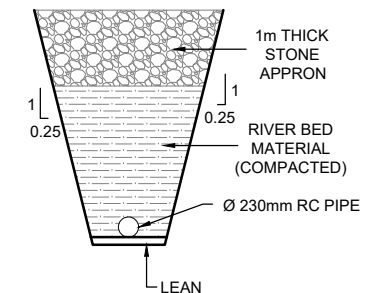
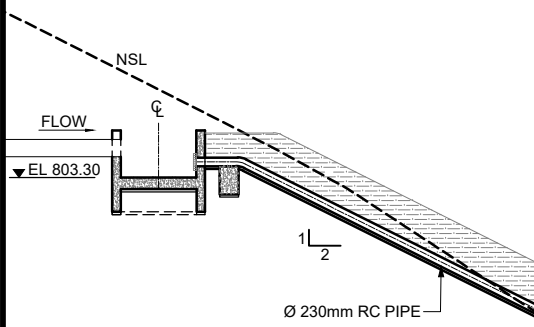
DRG.No:- ZKD-TD-IR-05 SHEET:- 6 OF 6 SUB SH. ---



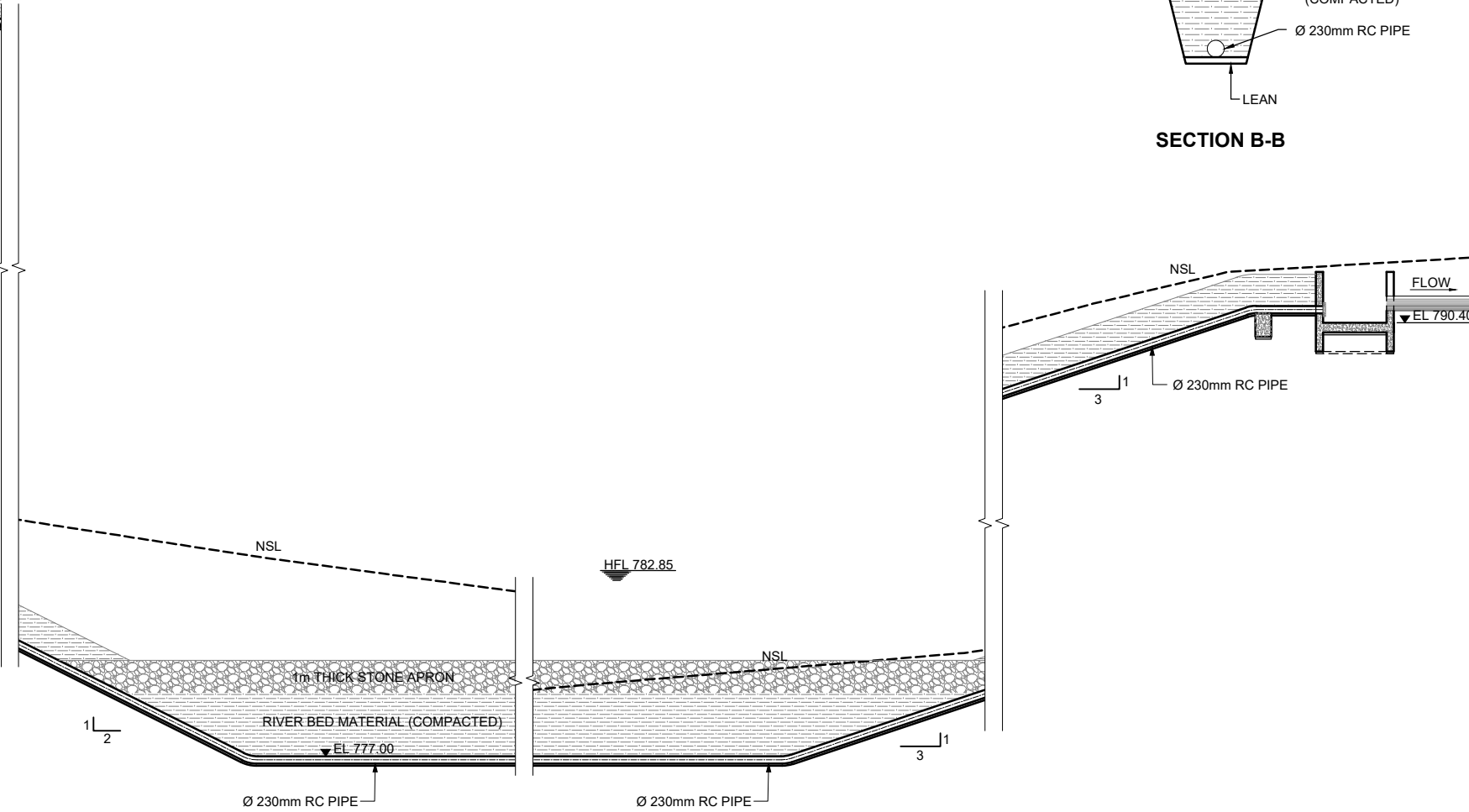
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PLAN



SECTION B-B



SECTION A-A PROFILE

**NOTES:**  
 1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS INDICATED OTHERWISE.

**REFERENCE DRAWINGS :-**

ZKD-TD-IR-01	ZKD-TD-IR-04 (1 to 4)
ZKD-TD-IR-03 (1 to 10)	ZKD-TD-IR-05

**DRAWING IS RELEASED**

FOR TENDER DRAWINGS ONLY

CLIENT:  
 PSU SMALL DAM SECTION MERGED AREA IRRIGATION DEPARTMENT. KPK.

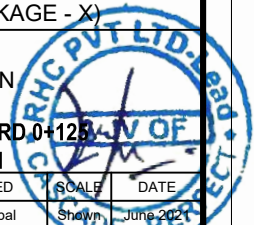
CONSULTANTS:  
 A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.  
**CEGIC** CASCADE GROUP OF ENGINEERING & CONSULTANTS  
**PEMC** PERFECT ENGINEERING & MANAGEMENT CONSULTANTS

PROJECT:  
 CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAIL DESIGN & PREPARATION OF PC-1 FOR 5 SMALL DAMS IN FATA (PACKAGE - X)

TITLE:  
 ZAKAR KHEL DAM NORTH WAZIRISTAN  
 TENDER DRAWINGS  
 DISTRIBUTARY SYPHON AT RD.0+128  
 PLAN AND SECTION

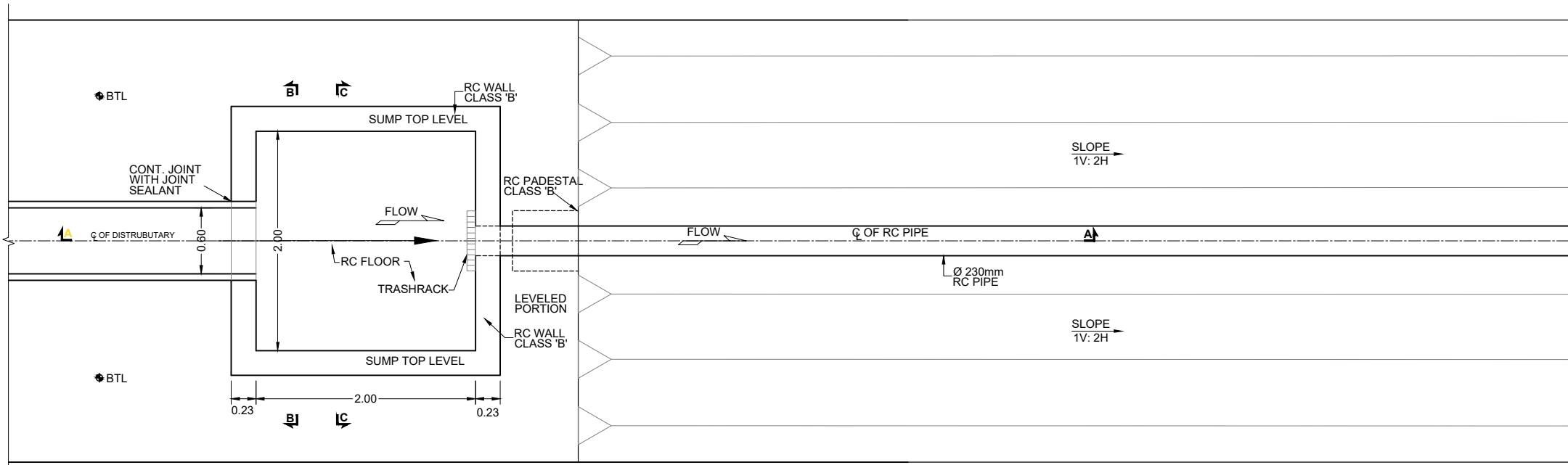
DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021

DRG.No:- ZKD-TD-IR-06 SHEET:- 1 OF 5 SUB SH. ---

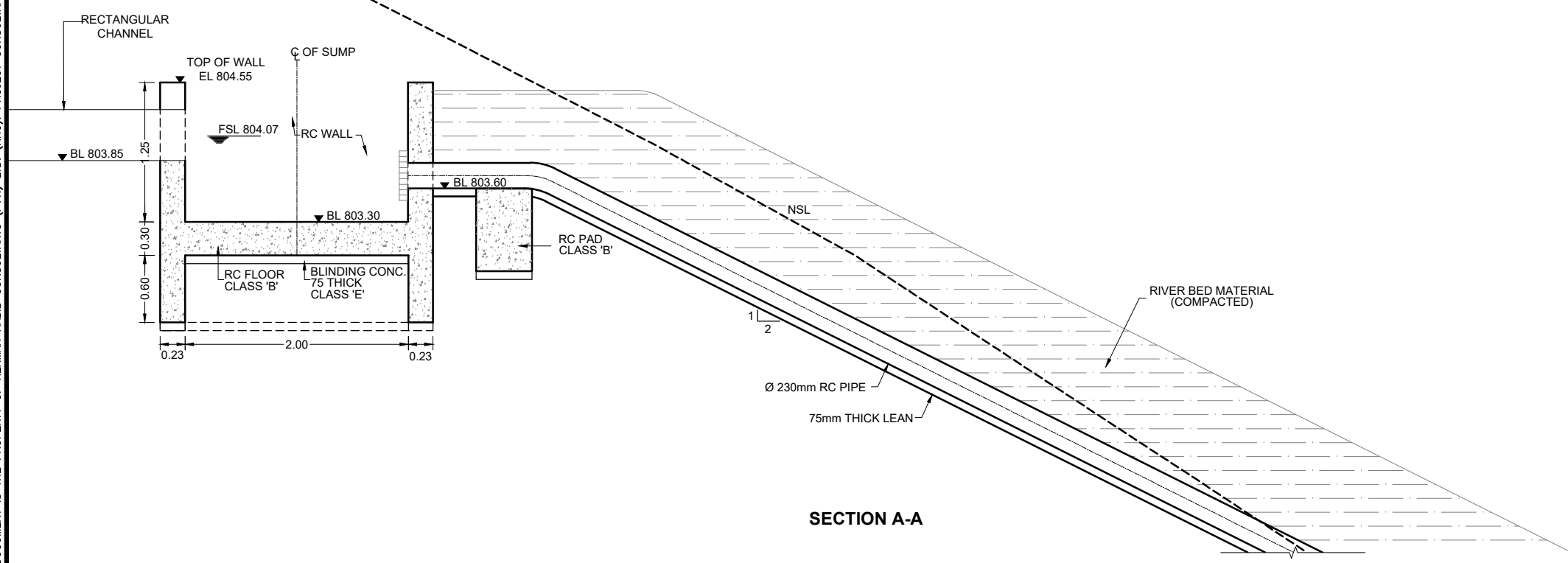




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**U/S PART PLAN**



**SECTION A-A**

**NOTES:**

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS INDICATED OTHERWISE.

**REFERENCE DRAWINGS :-**

ZKD-TD-IR-01	ZKD-TD-IR-04 (1 to 4)
ZKD-TD-IR-03 (1 to 10)	ZKD-TD-IR-05

**DRAWING IS RELEASED**

**FOR TENDER DRAWINGS ONLY**

**CLIENT:**  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT. KPK.

**CONSULTANTS:** A J.V OF  
**RHC REHMAN HABIB CONSULTANTS (PVT) LTD.**

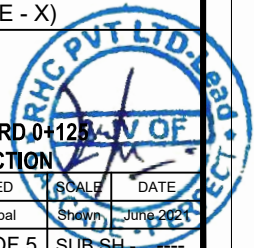
**CASCADE GROUP OF ENGINEERING & CONSULTANTS**

**PERFECT ENGINEERING & MANAGEMENT CONSULTANTS**

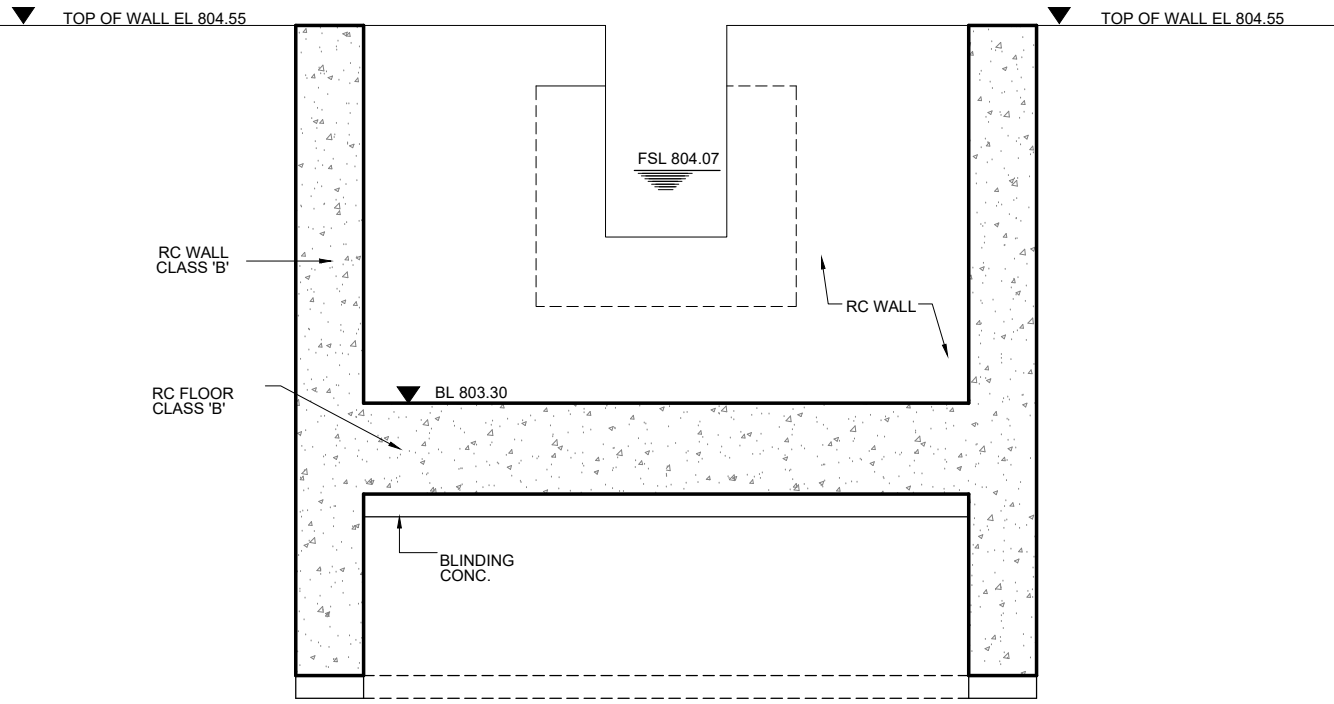
**PROJECT:**  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & SUPERVISION PC-1 FOR 5 SMALL  
DAMS IN FATA (PACKAGE - X)

**TITLE:**  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS  
DISTRIBUTARY SYPHON AT RD.0+128  
**U/S PART PLAN AND SECTION**

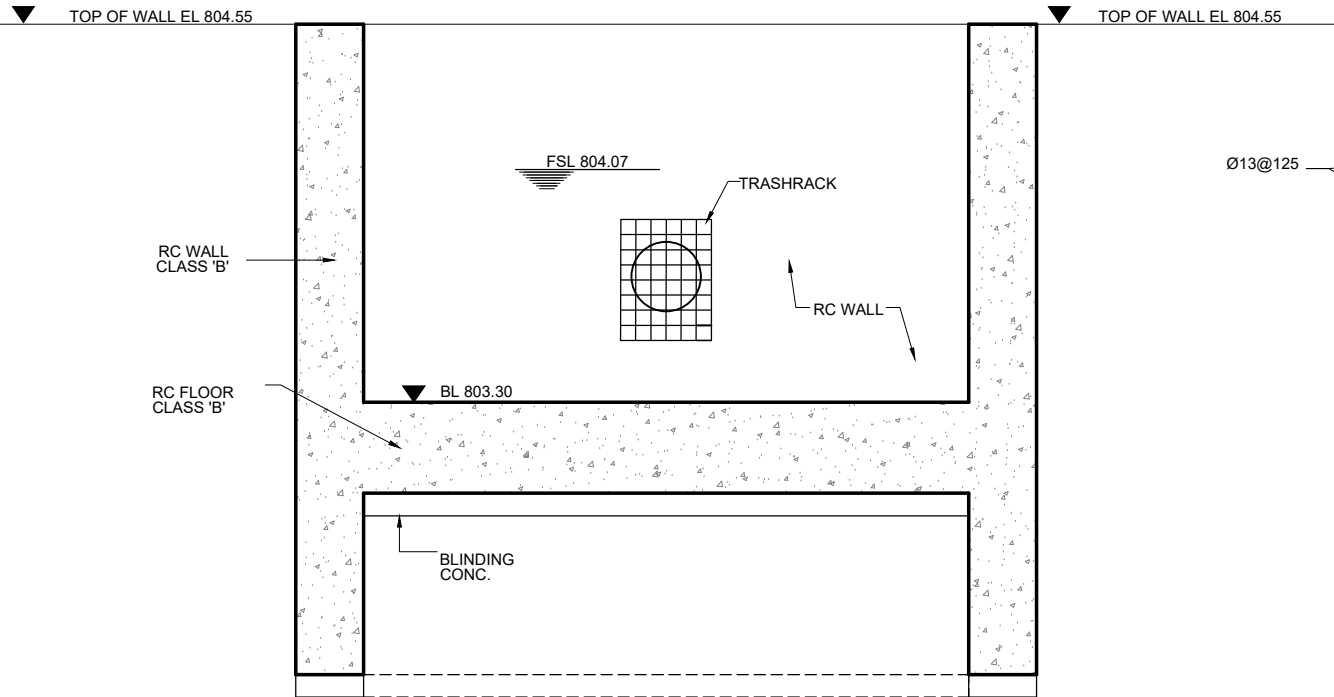
DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021
DRG.No:-	ZKD-TD-IR-06	SHEET:- 2 OF 5	SUB SH.		



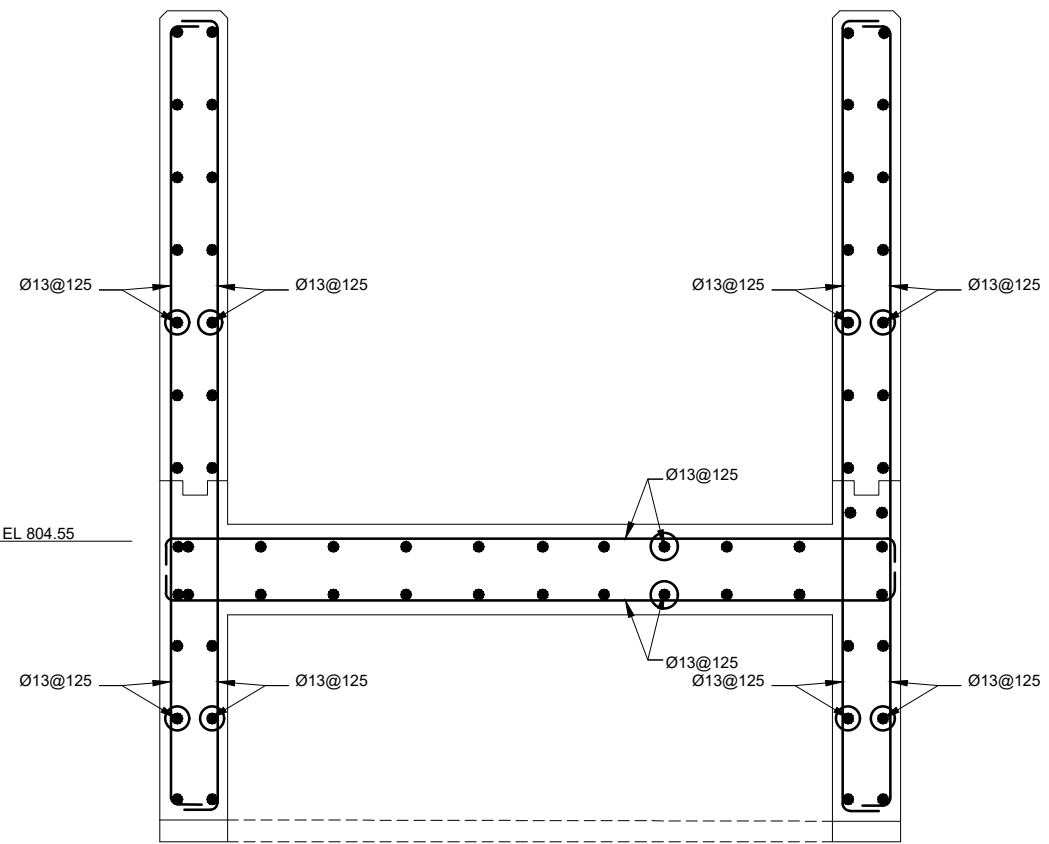
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SECTION B-B



SECTION C-C



REINFORCEMENT FOR SECTION B-B & C-C

**NOTES:**

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS INDICATED OTHERWISE.
2. CONCRETE CYLINDER STRENGTH 28 DAYS=4000 PSI.
3. LEAN CONCRETE CYLINDER STRENGTH 28 DAYS=1500PSI.
4. REINFORCEMENT AS PER ASTM A615. GRADE 60.

ASTM A615		
Deformed Bar Designation Numbers, Nominal Weights (Masses), Nominal Dimensions		
Bar Designation No.	Nominal Weight, lb/ft (Nominal Mass, Kg/m)	Diameter, in. (mm)
3(10)	0.376 (0.560)	0.375 (9.5)
4(13)	0.668 (0.994)	0.500 (12.7)
5(16)	1.043 (1.552)	0.625 (15.9)
6(19)	1.502 (2.235)	0.750 (19.1)
7(22)	2.044 (3.042)	0.875 (22.2)
8(25)	2.670 (3.973)	1.000 (25.4)
9(29)	3.400 (5.060)	1.128 (28.7)
10(32)	4.303 (6.404)	1.270 (32.3)
11(36)	5.313 (7.907)	1.410 (35.8)
14(43)	7.650 (11.38)	1.693 (43.0)
18(57)	13.60 (20.24)	2.257 (57.3)

N.B BARS ARE TO BE PROVIDED AS #3, #4, #5, AND #18 AS PER ASTM A615 WHICH ARE FRACTION OF INCHES.




**REFERENCE DRAWINGS :-**

- ZKD-TD-IR-01
- ZKD-TD-IR-03 (1 to 10)
- ZKD-TD-IR-04 (1 to 4)
- ZKD-TD-IR-05

**DRAWING IS RELEASED**

**FOR TENDER DRAWINGS ONLY**

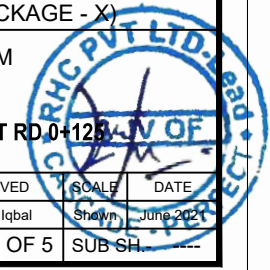
CLIENT:  
**PSU SMALL DAM SECTION MERGED AREA IRRIGATION DEPARTMENT. KPK.**

CONSULTANTS: A J.V OF  
 **REHMAN HABIB CONSULTANTS (PVT) LTD.**  
 **CASCADE GROUP OF ENGINEERING & CONSULTANTS**  
 **PERFECT ENGINEERING & MANAGEMENT CONSULTANTS**

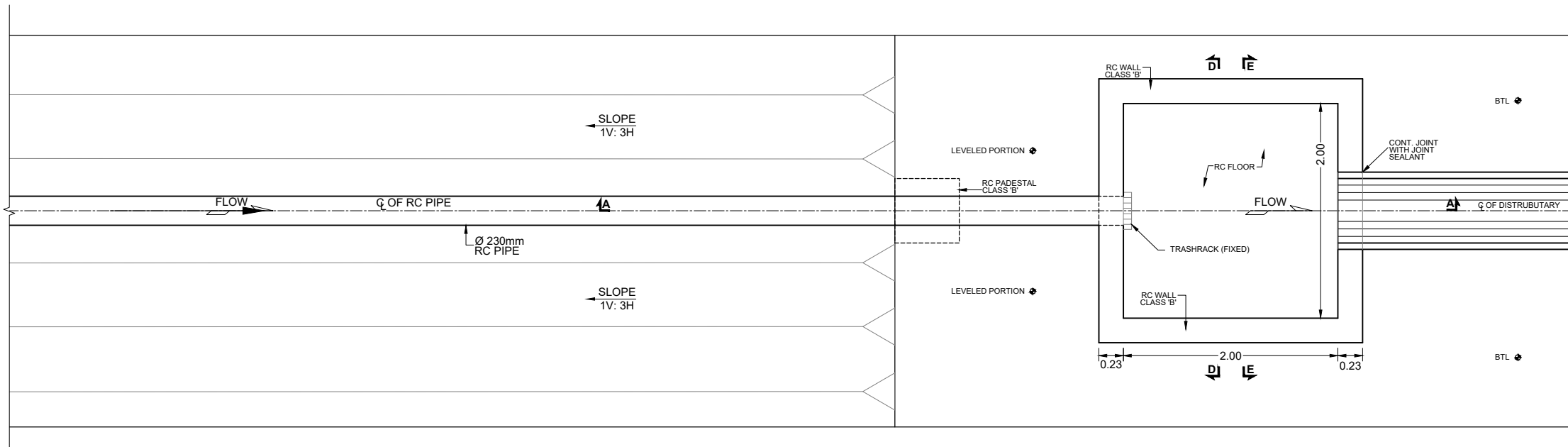
PROJECT:  
**CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAIL DESIGN & PREPARATION OF PC-1 FOR 5 SMALL DAMS IN FATA (PACKAGE - X)**

TITLE:  
**ZAKAR KHEL DAM NORTH WAZIRISTAN TENDER DRAWINGS DISTRIBUTARY SYPHON AT RD.0+128 SECTIONS**

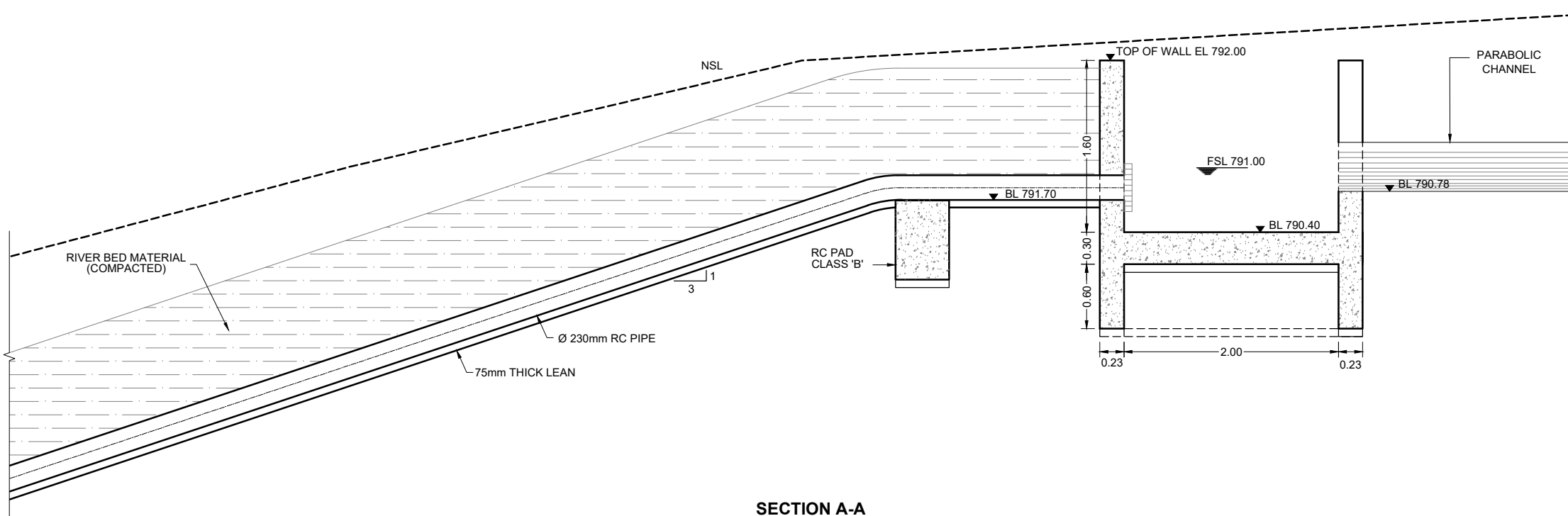
DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021
DRG.No:-	ZKD-TD-IR-06	SHEET:- 3 OF 5		SUB SH.	



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D/S PART PLAN



SECTION A-A

**NOTES:**

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS INDICATED OTHERWISE.

**REFERENCE DRAWINGS :-**

- ZKD-TD-IR-01
- ZKD-TD-IR-03 (1 to 10)
- ZKD-TD-IR-04 (1 to 4)
- ZKD-TD-IR-05

**DRAWING IS RELEASED**

FOR TENDER DRAWINGS ONLY

**CLIENT:**

PSU SMALL DAM SECTION MERGED AREA IRRIGATION DEPARTMENT. KPK.

**CONSULTANTS:**

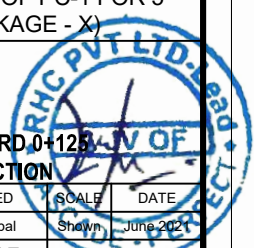
- A J.V OF **RHC REHMAN HABIB CONSULTANTS (PVT) LTD.**
- CASCADE GROUP OF ENGINEERING & CONSULTANTS**
- PERFECT ENGINEERING & MANAGEMENT CONSULTANTS**

**PROJECT:**  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAIL DESIGN & PREPARATION OF PC-1 FOR 5 SMALL DAMS IN FATA (PACKAGE - X)

**TITLE:**  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS  
DISTRIBUTARY SYPHON AT RD.0+128  
D/S PART PLAN AND SECTION

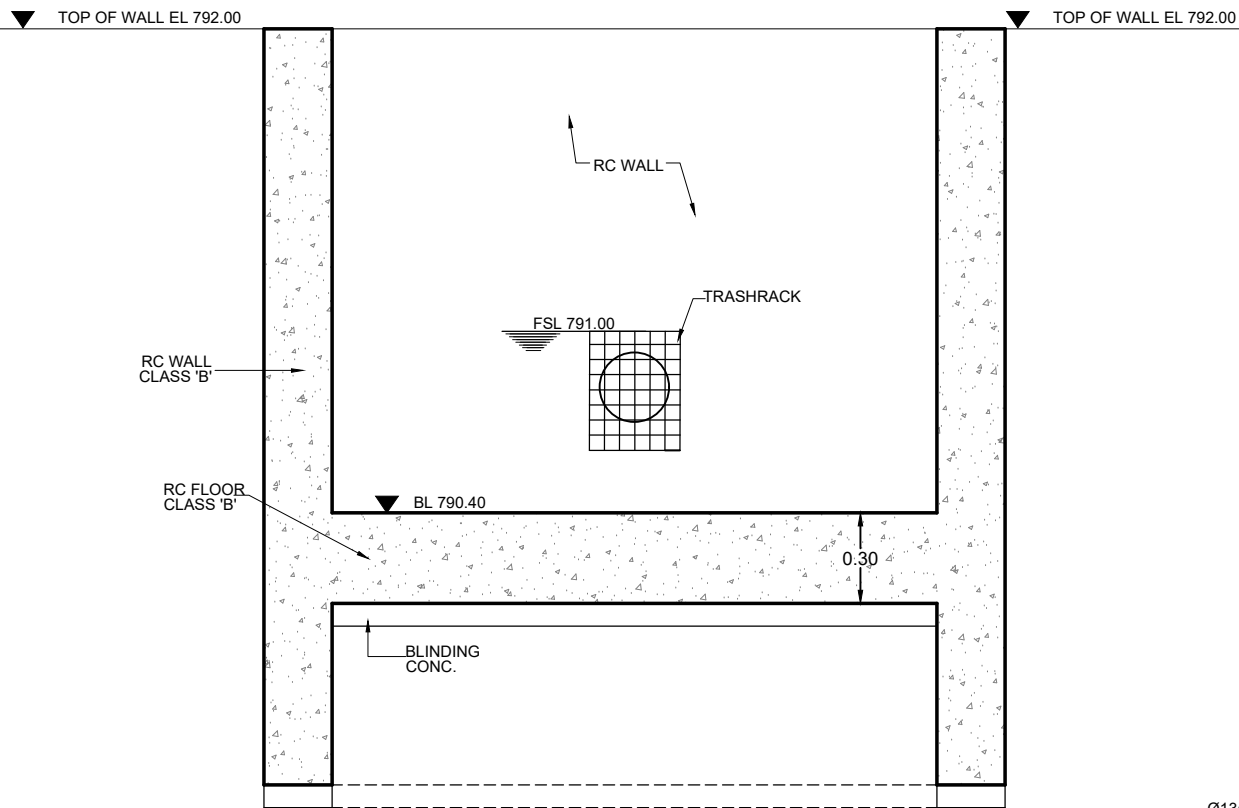
DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021

DRG.No:- ZKD-TD-IR-06 SHEET:- 4 OF 5 SUB SH. ---

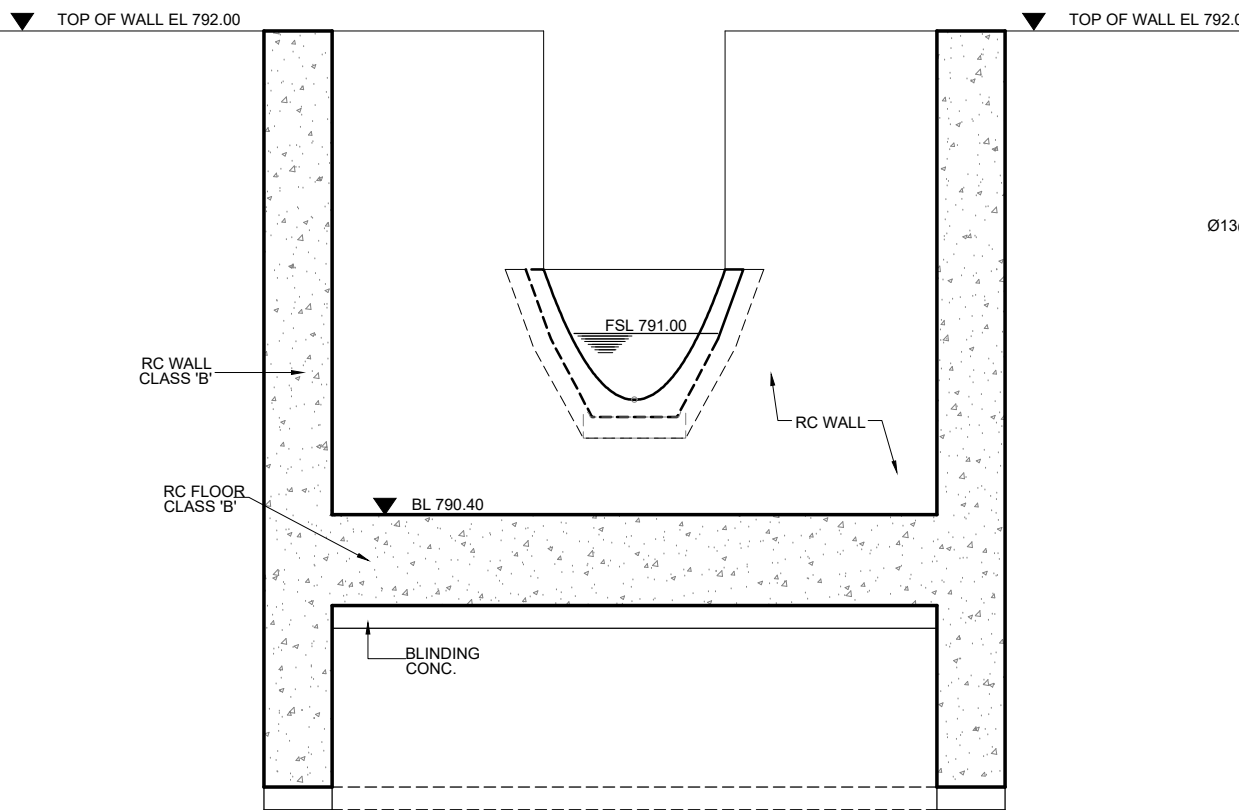




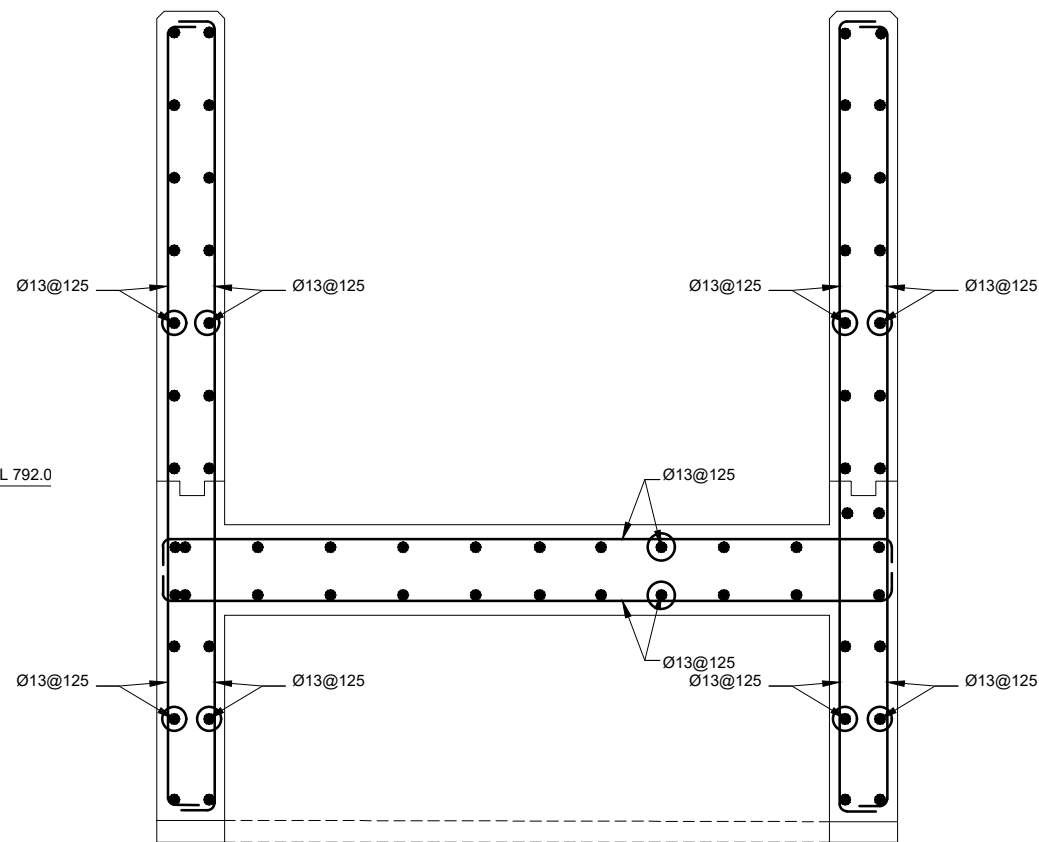
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SECTION D-D



SECTION E-E



REINFORCEMENT FOR SECTION D-D & E-E

**NOTES:**

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS INDICATED OTHERWISE.
2. CONCRETE CYLINDER STRENGTH 28 DAYS=4000 PSI.
3. LEAN CONCRETE CYLINDER STRENGTH 28 DAYS=1500PSI.
4. REINFORCEMENT AS PER ASTM A615. GRADE 60.

ASTM A615		
Deformed Bar Designation Numbers, Nominal Weights (Masses), Nominal Dimensions		
Bar Designation No.	Nominal Weight, lb/ft (Nominal Mass, Kg/m)	Diameter, in. (mm)
3(10)	0.376 (0.560)	0.375 (9.5)
4(13)	0.668 (0.994)	0.500 (12.7)
5(16)	1.043 (1.552)	0.625 (15.9)
6(19)	1.502 (2.235)	0.750 (19.1)
7(22)	2.044 (3.042)	0.875 (22.2)
8(25)	2.670 (3.973)	1.000 (25.4)
9(29)	3.400 (5.060)	1.128 (28.7)
10(32)	4.303 (6.404)	1.270 (32.3)
11(36)	5.313 (7.907)	1.410 (35.8)
14(43)	7.650 (11.38)	1.693 (43.0)
18(57)	13.60 (20.24)	2.257 (57.3)

N.B BARS ARE TO BE PROVIDED AS #3, #4, #5, AND #18 AS PER ASTM A615 WHICH ARE FRACTION OF INCHES.

**REFERENCE DRAWINGS :-**

- ZKD-TD-IR-01
- ZKD-TD-IR-03 (1 to 10)
- ZKD-TD-IR-04 (1 to 4)
- ZKD-TD-IR-05

**DRAWING IS RELEASED**

FOR TENDER DRAWINGS ONLY

**CLIENT:**

PSU SMALL DAM SECTION MERGED AREA IRRIGATION DEPARTMENT. KPK.

**CONSULTANTS:**

- A J.V OF RHC REHMAN HABIB CONSULTANTS (PVT) LTD.
- CASCADE GROUP OF ENGINEERING & CONSULTANTS
- PERFECT ENGINEERING & MANAGEMENT CONSULTANTS

**PROJECT:**

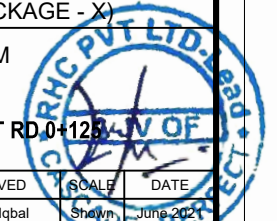
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAIL DESIGN & PREPARATION OF PC-1 FOR 5 SMALL DAMS IN FATA (PACKAGE - X)

**TITLE:**

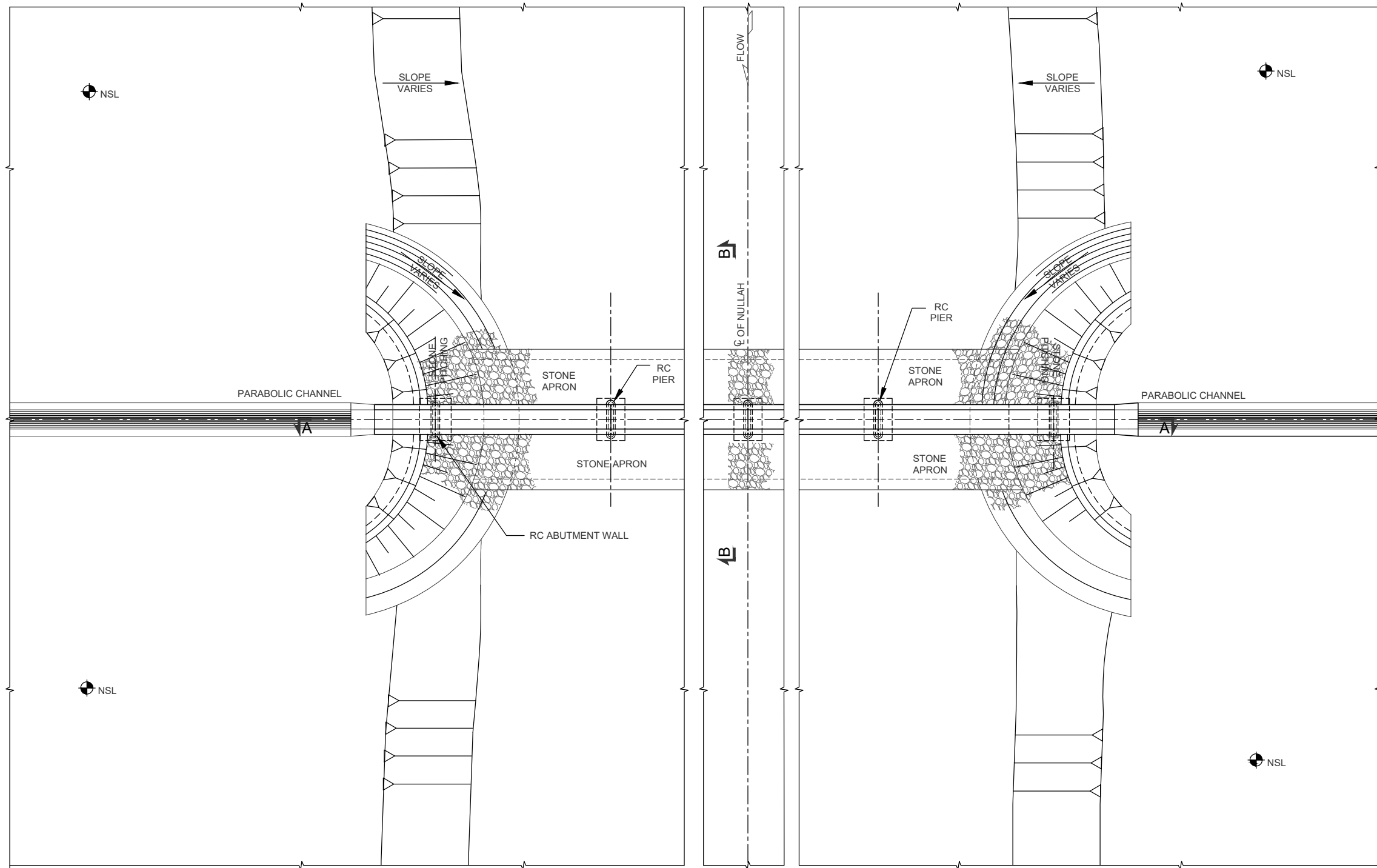
ZAKAR KHEL DAM NORTH WAZIRISTAN TENDER DRAWINGS DISTRIBUTARY SYPHON AT RD.0+128 SECTIONS

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Zakir A.	Zeeshan S.	Zafar Iqbal	Shown	June 2021

DRG.No:- ZKD-TD-IR-06 SHEET:- 5 OF 5 SUB SH. ---

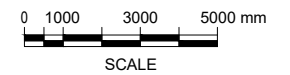


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**NOTES:**

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS.
2. FOR GENERAL NOTES REFER DRAWING.....
3. ALL STRUCTURAL CONCRETE SHALL BE RCC/PC CLASS-B AND THE USE OF ORDINARY PORTLAND CEMENT/SULPHATE RESISTING CEMENT(OPC/SRC) TO BE DECIDED BY THE ENGINEER AT SITE .
4. ALL CONSTRUCTION JOINT SURFACES SHALL BE ROUGHENED TO REMOVE LATINATE, EXPOSE THE AGGREGATE SURFACE AND BE THOROUGHLY CLEANED AND WETTED BEFORE THE NEW CONCRETE IS PLACED.
5. ALL REINFORCED CONCRETE SURFACES IN CONTACT WITH EARTH SHALL BE PROVIDED WITH HOT BITUMEN COATING AS DIRECTED BY THE SITE ENGINEER.
6. ALL STONE TO BE USED IN MASONRY WORKS SHALL BE OF STANDARD SIZE AND SHALL CONFORM TO THE SPECIFICATIONS.
7. ALL STONE MASONRY SHALL BE LAID WITH C/S MORTAR (RATIO 1:3).
8. ALL EXPOSED SURFACES OF STONE MASONRY SHALL BE PROVIDED WITH C/S POINTING (1:3).
9. THE FOUNDATION SHALL NOT BE PLACED ON LOOSE SOIL.
10. THE EXCAVATION LINES ARE SUBJECT TO SOIL CONDITIONS AT SITE.
11. PROVIDE WELL COMPACTED BACK FILL MATERIAL IN EXCAVATED PORTION AROUND STRUCTURE. THE COMPACTION SHALL NOT BE LESS THAN 95% OF MAX. DRY DENSITY AS DETERMINED BY MODIFIED AASHTO, DESIGNATION; T180-93.
12. MASONRY WORKS FOR ABUTMENT & WING WALLS SHALL BE CARRIED OUT SIMULTANEOUSLY AND WITHOUT VERTICAL JOINT AT THEIR JUNCTION



**REFERENCE DRAWINGS :-**

- ZKD-TD-IR-01
- ZKD-TD-IR-03 (1 to 10)
- ZKD-TD-IR-04 (1 to 4)
- ZKD-TD-IR-05

**DRAWING IS RELEASED**

**FOR TENDER ONLY**

CLIENT:

**PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT, KPK.**

CONSULTANTS:

**A J.V OF  
RHC REHMAN HABIB CONSULTANTS (PVT) LTD.  
CASCADE GROUP  
OF ENGINEERING & CONSULTANTS  
PERFECT ENGINEERING &  
MANAGEMENT CONSULTANTS**

PROJECT:

**CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1  
FOR 5 SMALL DAMS IN FATA (PACKAGE - X)**

**ZAKAR KHEL DAM**

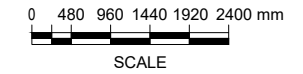
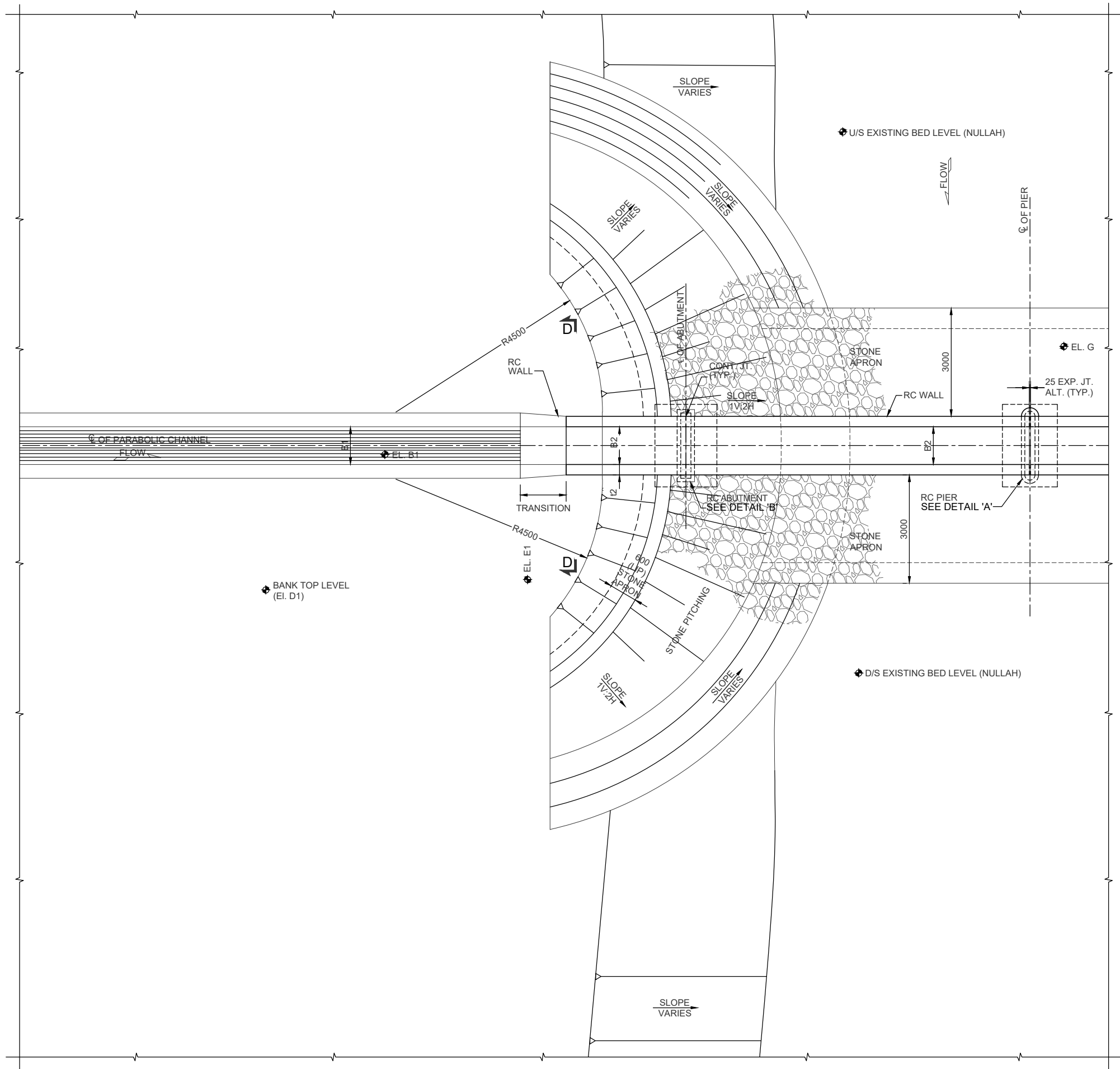
TITLE:

**TYPICAL AQUEDUCT  
LAYOUT PLAN**

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Usman R.	Zeeshan S.	Zafar Iqbal	1:1000	Oct 2021

DRG.No:- ZKD-TD-IR-07 SHEET:- 1 OF 11 SUB SH:- ---

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**NOTES:**

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ELEVATIONS ARE IN METERS UNLESS INDICATED OTHERWISE.

**REFERENCE DRAWINGS :-**

- ZKD-TD-IR-01                      ZKD-TD-IR-04 (1 to 4)
- ZKD-TD-IR-03 (1 to 10)        ZKD-TD-IR-05

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CLIENT:

PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT, KPK.

CONSULTANTS:

A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.  
CASCADE GROUP  
OF ENGINEERING & CONSULTANTS  
PERFECT ENGINEERING &  
MANAGEMENT CONSULTANTS

PROJECT:

CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1  
FOR 5 SMALL DAMS IN FATA (PACKAGE 'X')

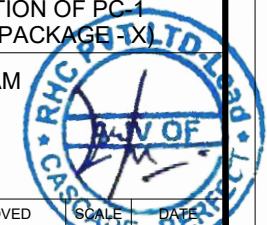
ZAKAR KHEL DAM

TITLE:

**PART PLAN-A**

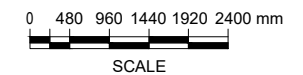
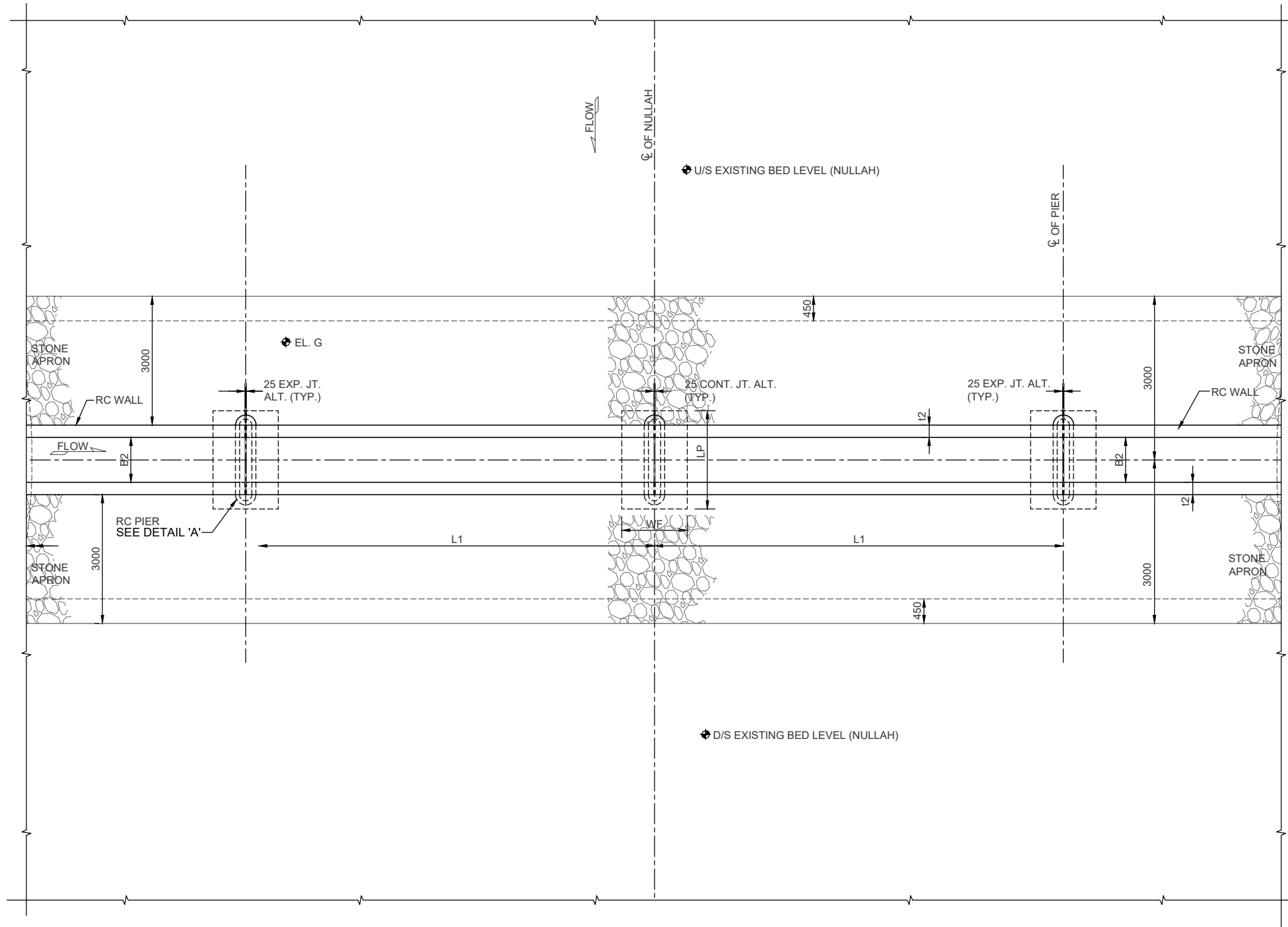
DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	Oct. 2021

DRG.No:- ZKD-TD-IR-07 SHEET:- 2 OF 11 SUB SH.- ----





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**NOTES:**

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ELEVATIONS ARE IN METERS UNLESS INDICATED OTHERWISE.

**REFERENCE DRAWINGS :-**

ZKD-TD-IR-01	ZKD-TD-IR-04 (1 to 4)
ZKD-TD-IR-03 (1 to 10)	ZKD-TD-IR-05

**DRAWING IS RELEASED**

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**CLIENT:**

PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT, KPK.

**CONSULTANTS:**

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**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.  
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OF ENGINEERING & CONSULTANTS  
PERFECT ENGINEERING &  
MANAGEMENT CONSULTANTS

**PROJECT:**

CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1  
FOR 5 SMALL DAMS IN FATA (PACKAGE- XI)

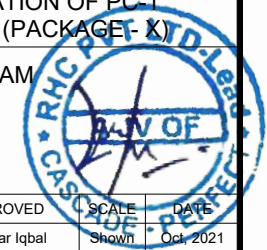
ZAKAR KHEL DAM

**TITLE:**

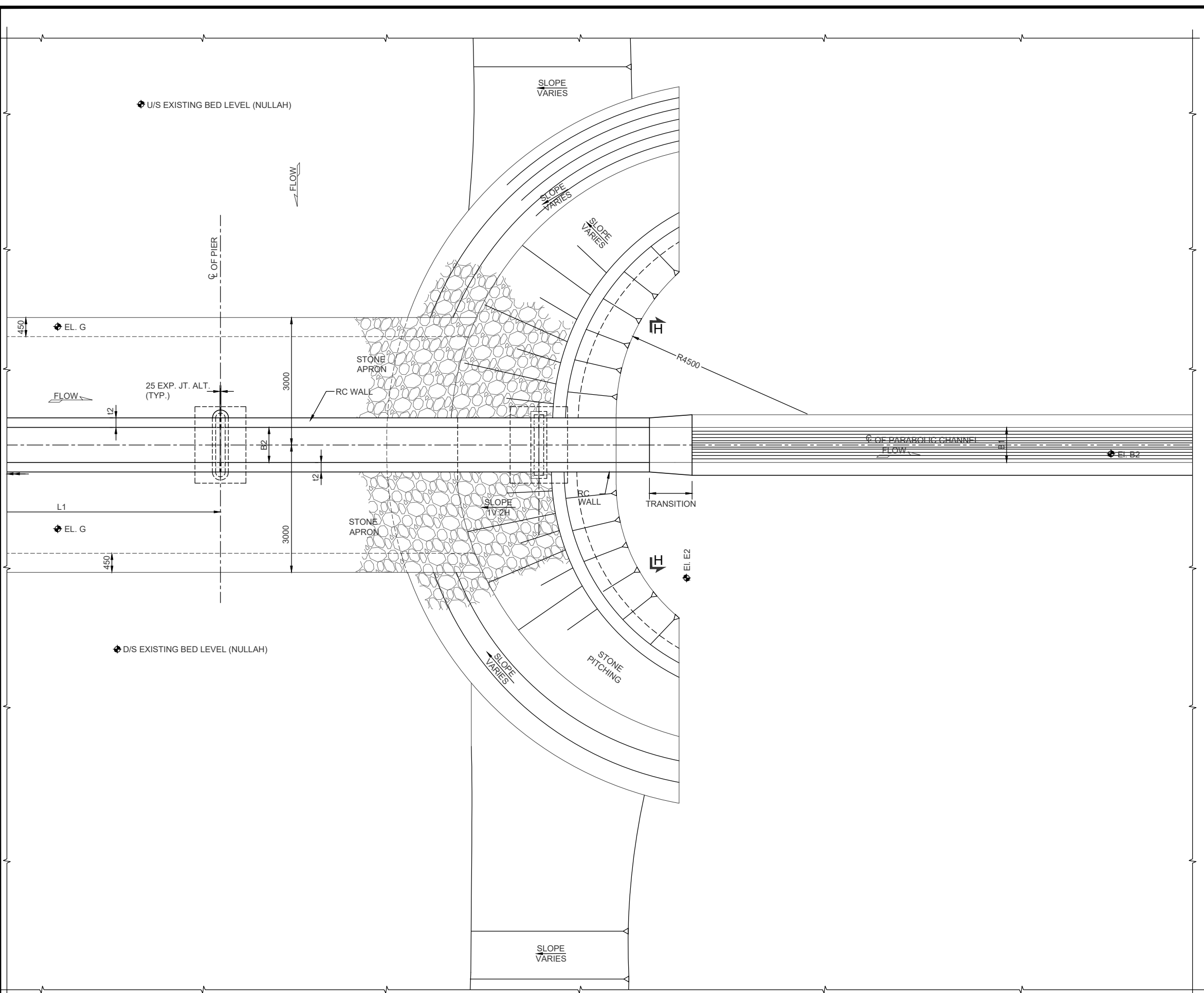
**PART PLAN-B**

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	Oct, 2021

DRG.No:- ZKD-TD-IR-07 SHEET:- 3 OF 11 SUB SH.- ----

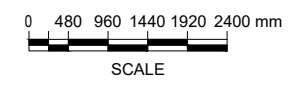


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**NOTES:**

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ELEVATIONS ARE IN METERS UNLESS INDICATED OTHERWISE.



**REFERENCE DRAWINGS :-**

ZKD-TD-IR-01	ZKD-TD-IR-04 (1 to 4)
ZKD-TD-IR-03 (1 to 10)	ZKD-TD-IR-05

**DRAWING IS RELEASED**

FOR TENDER ONLY

CLIENT:  
PSU SMALL DAM SECTION MERGED AREA IRRIGATION DEPARTMENT, KPK.

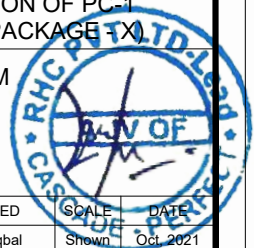
CONSULTANTS: A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.  
CASCADE GROUP OF ENGINEERING & CONSULTANTS  
PERFECT ENGINEERING & MANAGEMENT CONSULTANTS

PROJECT:  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAIL DESIGN & PREPARATION OF PC-1 FOR 5 SMALL DAMS IN FATA (PACKAGE X)

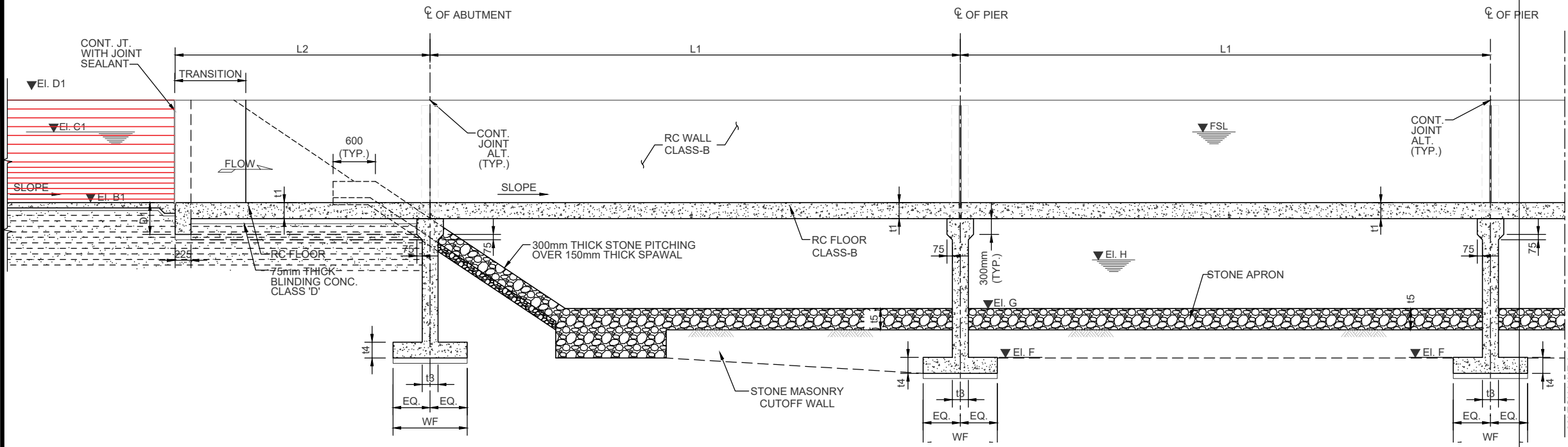
ZAKAR KHEL DAM

TITLE:  
**PART PLAN-C**

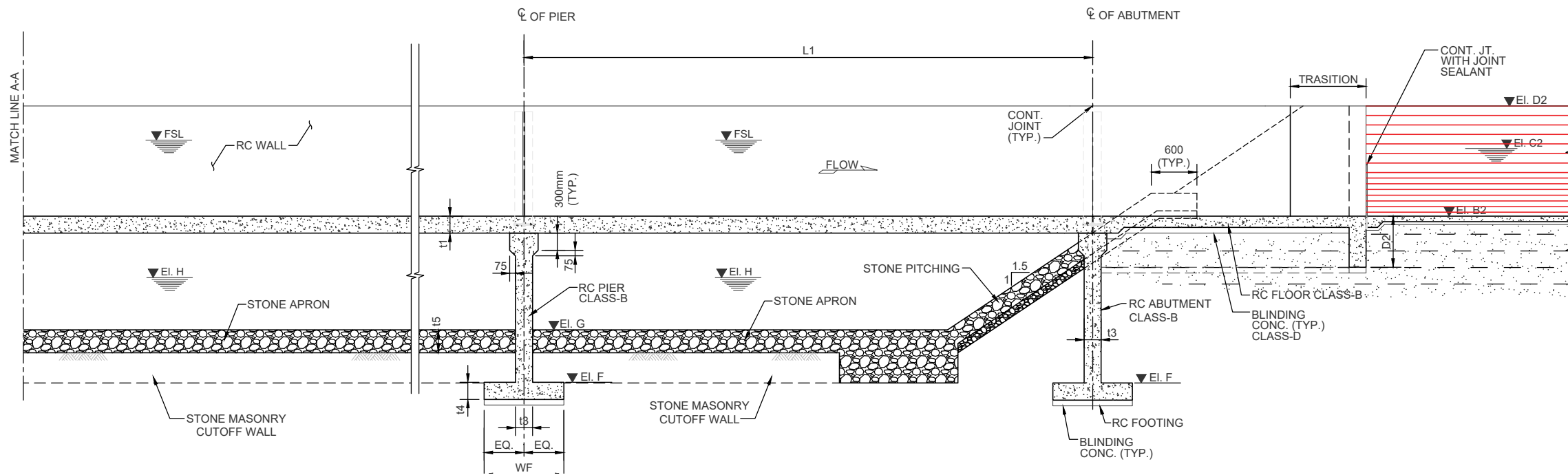
DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	Oct. 2021
DRG.No:-	ZKD-TD-IR-07	SHEET:-	4 OF 11	SUB SH.-	----



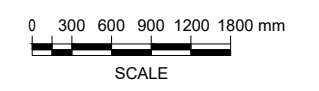
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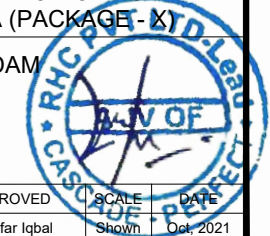
SECTION A-A



**NOTES:**  
 1. ALL DIMENSIONS ARE IN MILLIMETERS AND ELEVATIONS ARE IN METERS UNLESS INDICATED OTHERWISE.

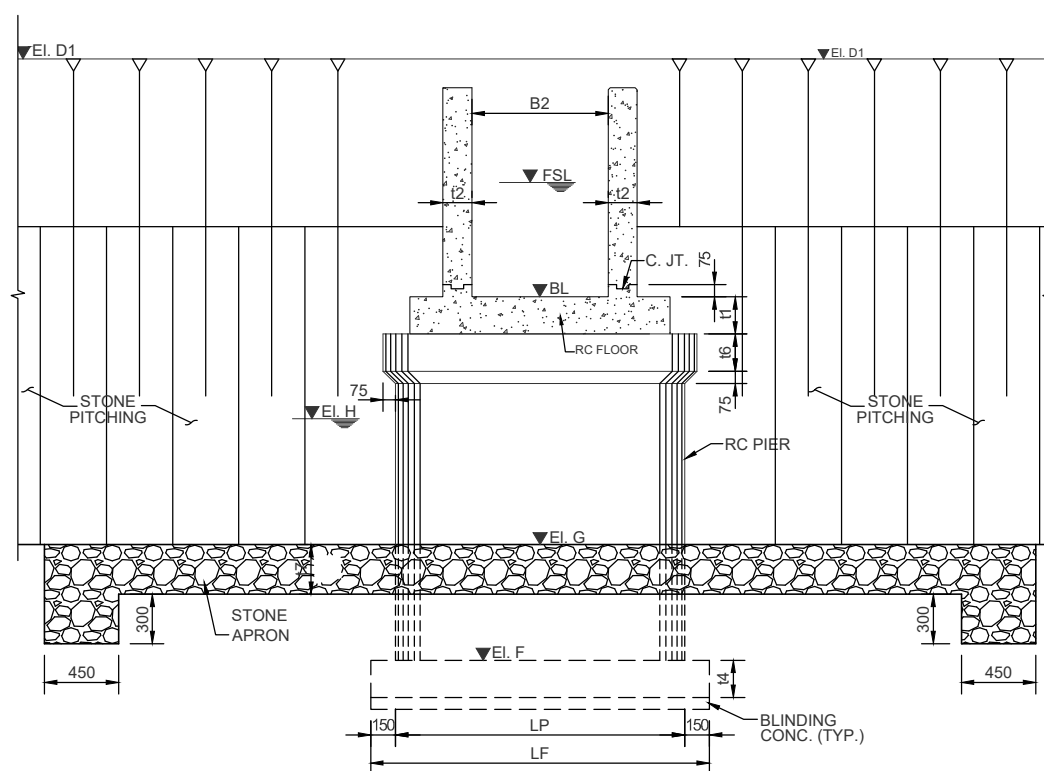


<b>REFERENCE DRAWINGS :-</b>					
ZKD-TD-IR-01	ZKD-TD-IR-04 (1 to 4)				
ZKD-TD-IR-03 (1 to 10)	ZKD-TD-IR-05				
<b>DRAWING IS RELEASED</b>					
<input checked="" type="checkbox"/> <b>FOR TENDER ONLY</b>					
<b>CLIENT:</b> PSU SMALL DAM SECTION MERGED AREA IRRIGATION DEPARTMENT, KPK.					
<b>CONSULTANTS:</b> A J.V OF <b>RHC</b> REHMAN HABIB CONSULTANTS (PVT) LTD. CASCADE GROUP OF ENGINEERING & CONSULTANTS PERFECT ENGINEERING & MANAGEMENT CONSULTANTS					
<b>PROJECT:</b> CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAIL DESIGN & PREPARATION OF PG-1 FOR 5 SMALL DAMS IN FATA (PACKAGE - KYD)					
<b>TITLE:</b> ZAKAR KHEL DAM					
<b>SECTION</b>					
DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	Oct, 2021
DRG.No:- ZKD-TD-IR-07		SHEET:- 5 OF 11		SUB SH.- ----	





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SECTION B-B

**NOTES:**

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ELEVATIONS ARE IN METERS UNLESS INDICATED OTHERWISE.



**REFERENCE DRAWINGS :-**

- |                        |                       |
|------------------------|-----------------------|
| ZKD-TD-IR-01           | ZKD-TD-IR-04 (1 to 4) |
| ZKD-TD-IR-03 (1 to 10) | ZKD-TD-IR-05          |

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**CLIENT:**

PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT, KPK.

**CONSULTANTS:**

A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.  
CASCADE GROUP  
OF ENGINEERING & CONSULTANTS  
PERFECT ENGINEERING &  
MANAGEMENT CONSULTANTS

**PROJECT:**  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1  
FOR 5 SMALL DAMS IN FATA (PACKAGE - KT)

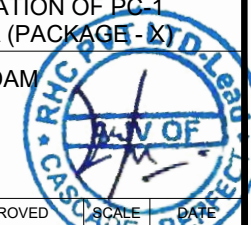
ZAKAR KHEL DAM

**TITLE:**

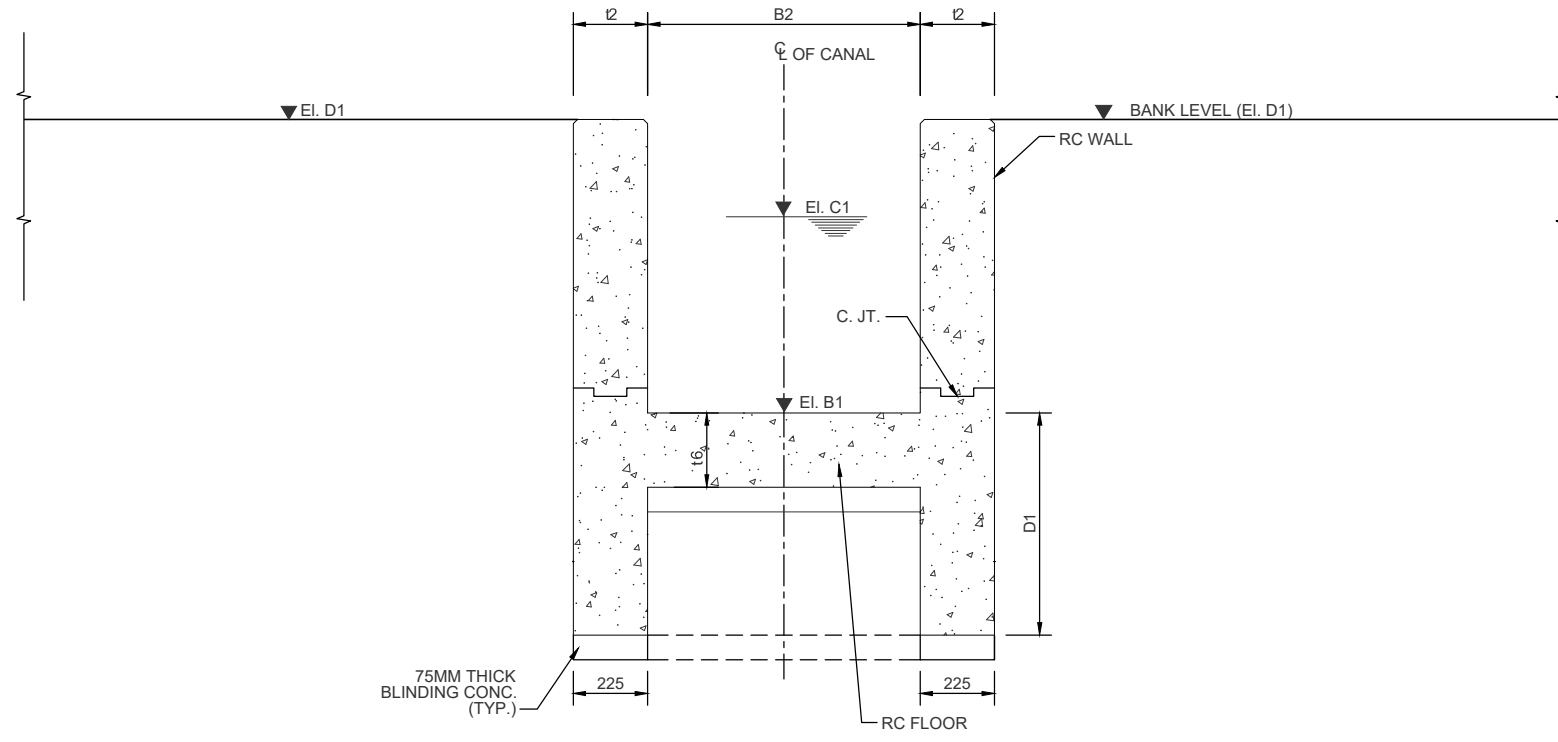
**SECTION**

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	Oct, 2021

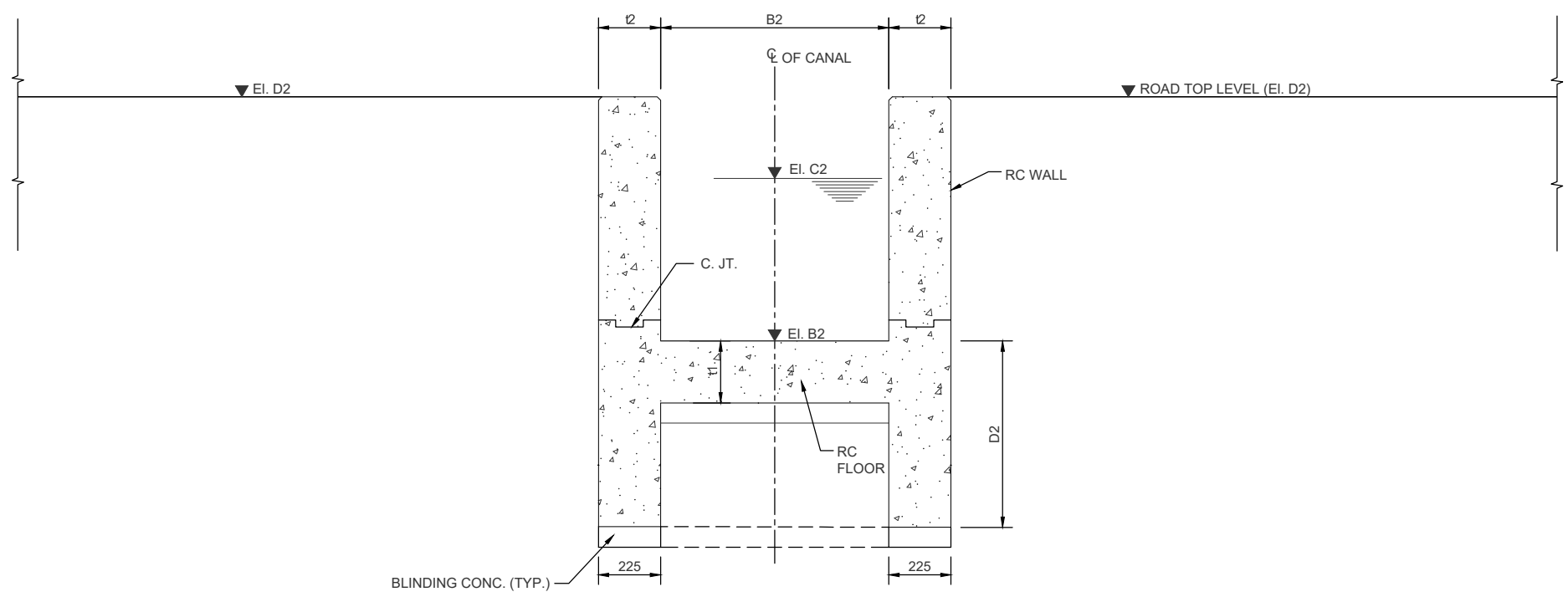
DRG.No:- ZKD-TD-IR-07 SHEET:- 6 OF 11 SUB SH.- ----



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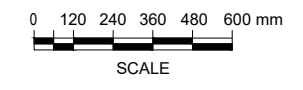
SECTION D-D



SECTION H-H

**NOTES:**

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ELEVATIONS ARE IN METERS UNLESS INDICATED OTHERWISE.



**REFERENCE DRAWINGS :-**

ZKD-TD-IR-01	ZKD-TD-IR-04 (1 to 4)
ZKD-TD-IR-03 (1 to 10)	ZKD-TD-IR-05

**DRAWING IS RELEASED**

FOR TENDER ONLY

**CLIENT:**  
PSU SMALL DAM SECTION MERGED AREA IRRIGATION DEPARTMENT, KPK.

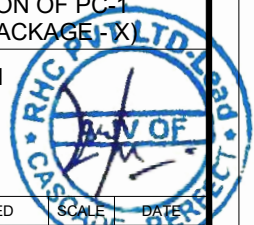
**CONSULTANTS:** A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.  
CASCADE GROUP OF ENGINEERING & CONSULTANTS  
PERFECT ENGINEERING & MANAGEMENT CONSULTANTS

**PROJECT:**  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAIL DESIGN & PREPARATION OF PC-1 FOR 5 SMALL DAMS IN FATA (PACKAGE-X)

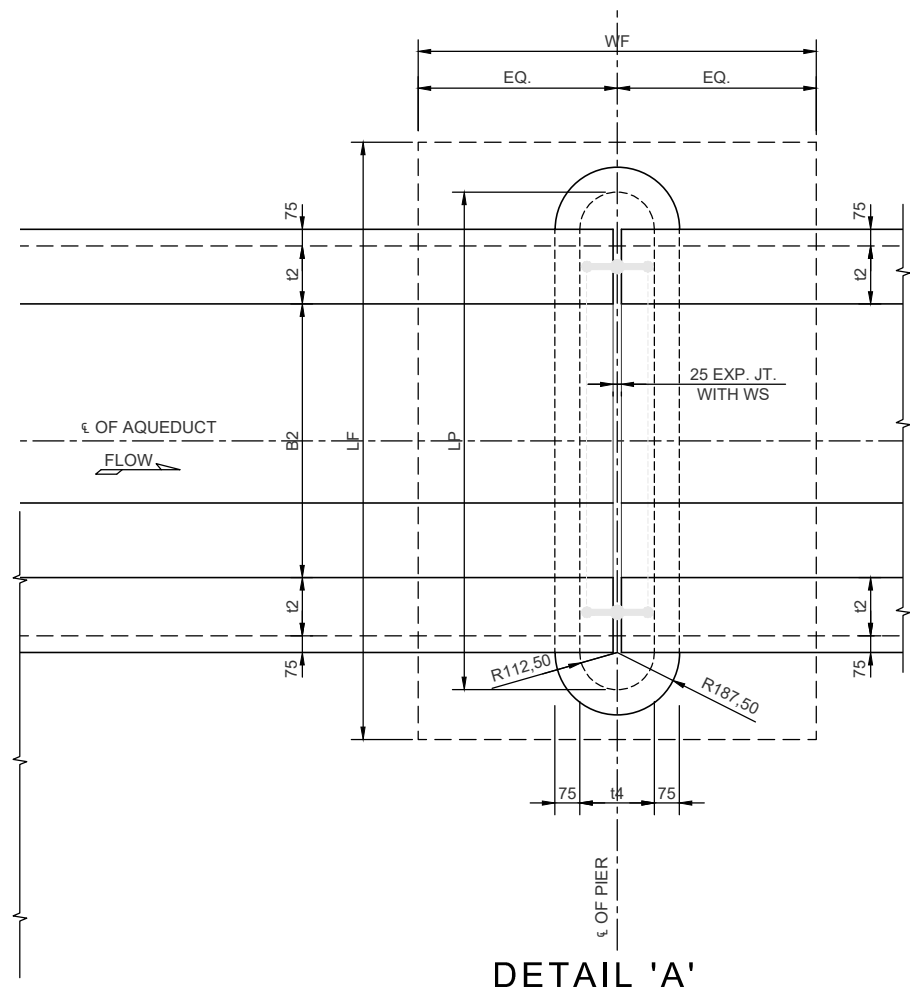
**TITLE:**  
ZAKAR KHEL DAM

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	Oct. 2021

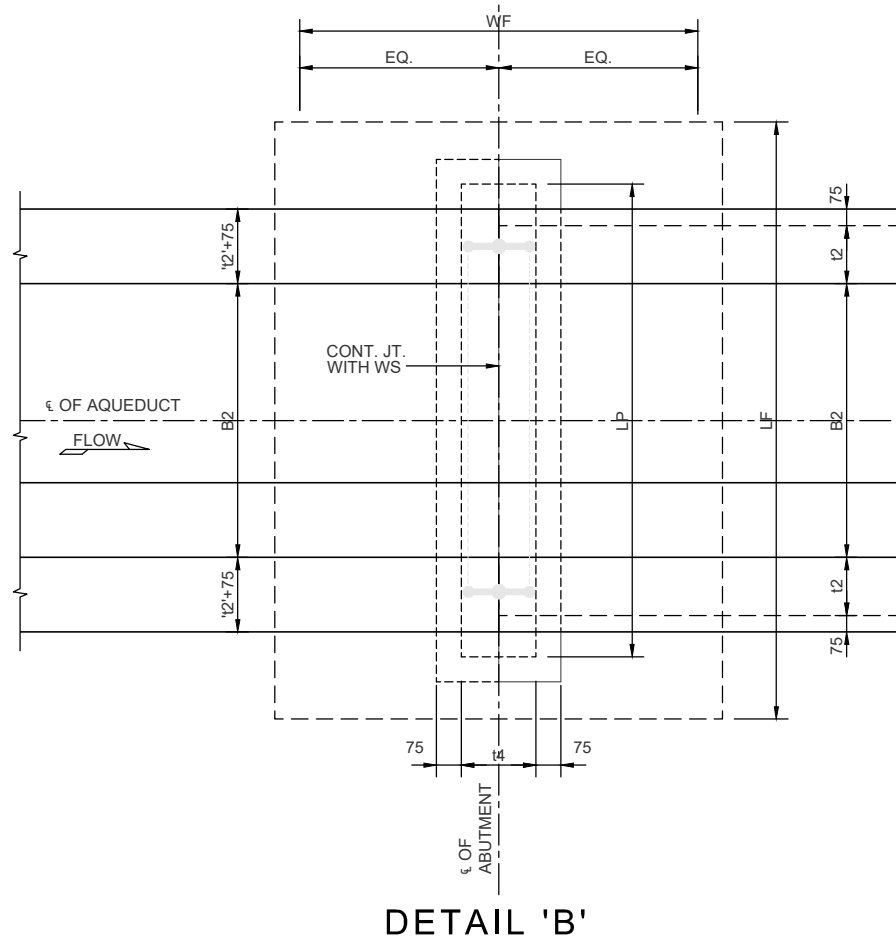
DRG.No:- ZKD-TD-IR-07 SHEET:- 7 OF 11 SUB SH.- ----



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DETAIL 'A'



DETAIL 'B'

**NOTES:**

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ELEVATIONS ARE IN METERS UNLESS INDICATED OTHERWISE.

**REFERENCE DRAWINGS :-**

ZKD-TD-IR-01	ZKD-TD-IR-04 (1 to 4)
ZKD-TD-IR-03 (1 to 10)	ZKD-TD-IR-05

DRAWING IS RELEASED

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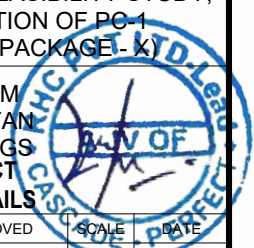
CLIENT:  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT, KPK.

CONSULTANTS: A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.  
CASCADE GROUP  
OF ENGINEERING & CONSULTANTS  
PERFECT ENGINEERING &  
MANAGEMENT CONSULTANTS

PROJECT:  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1  
FOR 5 SMALL DAMS IN FATA (PACKAGE - K)

TITLE:  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS  
TYPICAL AQUEDUCT  
SECTIONS AND DETAILS

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	Oct, 2021
DRG.No:- ZKD-TD-IR-07		SHEET:- 8 OF 11		SUB SH.- ----	





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**AQUEDUCT STRUCTURE  
TABLE OF ELEVATION AND DIMENSIONS**

Sr.No.	Canal	RD (m)	Discharge (m3/s)	EI. A1 (m)	EI. A2 (m)	EI. B1 (m)	EI. B2 (m)	EI. C1 (m)	EI. C2 (m)	EI. D1 (m)	EI. D2 (m)	EI. E1 (m)	EI. E2 (m)	EI. F (m)	EI. G (m)	EI. H (m)	D1 (mm)	D2 (mm)	B1 (mm)	FB (mm)
1	Main Canal	3+150	0.176	841.0	839.0	842.900	842.350	843.330	842.780	843.500	842.950	843.500	842.950	838.0	840.0	840.4	400	400	675	76
2	Main Canal	4+640	0.167	813.0	811.0	812.630	812.080	810.840	810.290	813.230	812.680	813.230	812.680	802.0	804.0	804.5	300	400	675	76
3	Disty	2+160	0.042	813.0	811.0	763.560	763.210	763.790	763.440	764.060	763.710	764.060	763.710	758.0	760.0	760.6	300	400	457	76
Sr.No.	Canal	RD (m)	Discharge (m3/s)	B2 (mm)	WF (mm)	B (mm)	S (mm)	N (-)	L1 (mm)	L2 (mm)	L3 (mm)	LF (mm)	LP (mm)	T (mm)	t1 (mm)	t2 (mm)	t3 (mm)	t4 (mm)	t5 (mm)	
1	Main Canal	3+150	0.18	600	1800	1250	1 IN 500	27	10000	5000	5000	2000	1350	600	250	300	500	500	300	
2	Main Canal	4+640	0.17	600	1800	1250.000	1 IN 500	27	10000	5000	5000	2000	1350	600	250	300	500	500	300	
3	Disty	2+160	0.04	300	1800	1250.000	1 IN 500	16	10000	5000	5000	1500	1050	300	250	300	500	500	300	

ELEVATIONS		DIMENSIONS	
EI. A1	NSL U/S	D1	U/S CUT OFF WALL DEPTH
EI. A2	NSL D/S	D2	D/S CUT OFF WALL DEPTH
EI. B1	U/S BED LEVEL OF CANAL/AQUEDUCT	B1	CANAL TOP WIDTH
EI. B2	D/S BED LEVEL OF CANAL/AQUEDUCT	B2	CLEAR WIDTH OF AQUEDUCT TROUGH
EI. C1	U/S FULL SUPPLY LEVEL	FB	AQUEDUCT/CHANNEL FREE BOARD
EI. C2	D/S FULL SUPPLY LEVEL	WF	WIDTH OF PIER FOOTING
EI. D1	U/S BANK LEVEL OF CANAL	B	WIDTH OF WING WALL FOOTING
EI. D2	D/S BANK LEVEL OF CANAL	T	TOP WIDTH OF CANAL
EI. E1	U/S TOP LEVEL OF AQUEDUCT	S	LONGITUDINAL SLOPE OF AQUEDUCT
EI. E2	D/S TOP LEVEL OF AQUEDUCT	N	NO. OF SPANS
EI. F	TOP OF PIER FOOTING	L1	SPAN LENGTH OF AQUEDUCT (TROUGH OVER NULLAH)
EI. G	NULLAH BED LEVEL AT CL OF STRUCTURE	L2	U/S LENGTH OF AQUEDUCT SUPPORTED ON EARTH
EL. H	H.L.F. OF NULLAH AT CL OF STRUCTURE	L3	D/S LENGTH OF AQUEDUCT SUPPORTED ON EARTH
		LF	LENGTH OF PIER FOOTING
		LP	LENGTH OF PIER
		t1	THICKNESS OF AQUEDUCT BASE SLAB
		t2	THICKNESS OF AQUEDUCT WALL
		t3	THICKNESS OF PIER
		t4	THICKNESS OF FOOTING
		t5	THICKNESS OF STONE APRON

**NOTES:**

- ALL DIMENSIONS ARE IN MILLIMETERS AND ELEVATIONS ARE IN METERS UNLESS INDICATED OTHERWISE.

**REFERENCE DRAWINGS :-**

ZKD-TD-IR-01	ZKD-TD-IR-04 (1 to 4)
ZKD-TD-IR-03 (1 to 10)	ZKD-TD-IR-05

**DRAWING IS RELEASED**

**FOR TENDER ONLY**

CLIENT:

PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT, KPK.

CONSULTANTS:

A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.

CASCADE GROUP  
OF ENGINEERING & CONSULTANTS

PERFECT ENGINEERING &  
MANAGEMENT CONSULTANTS

PROJECT:

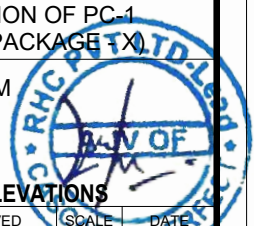
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1  
FOR 5 SMALL DAMS IN FATA (PACKAGE X)

ZAKAR KHEL DAM

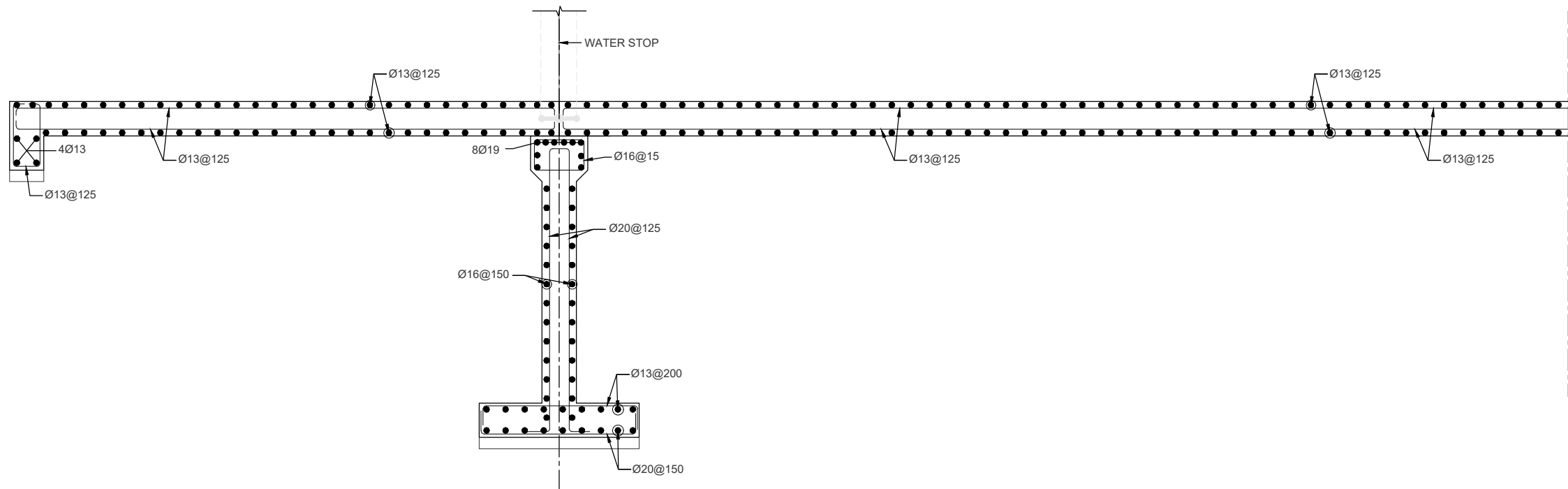
TITLE:

**TABLE OF DIMENSIONS & ELEVATIONS**

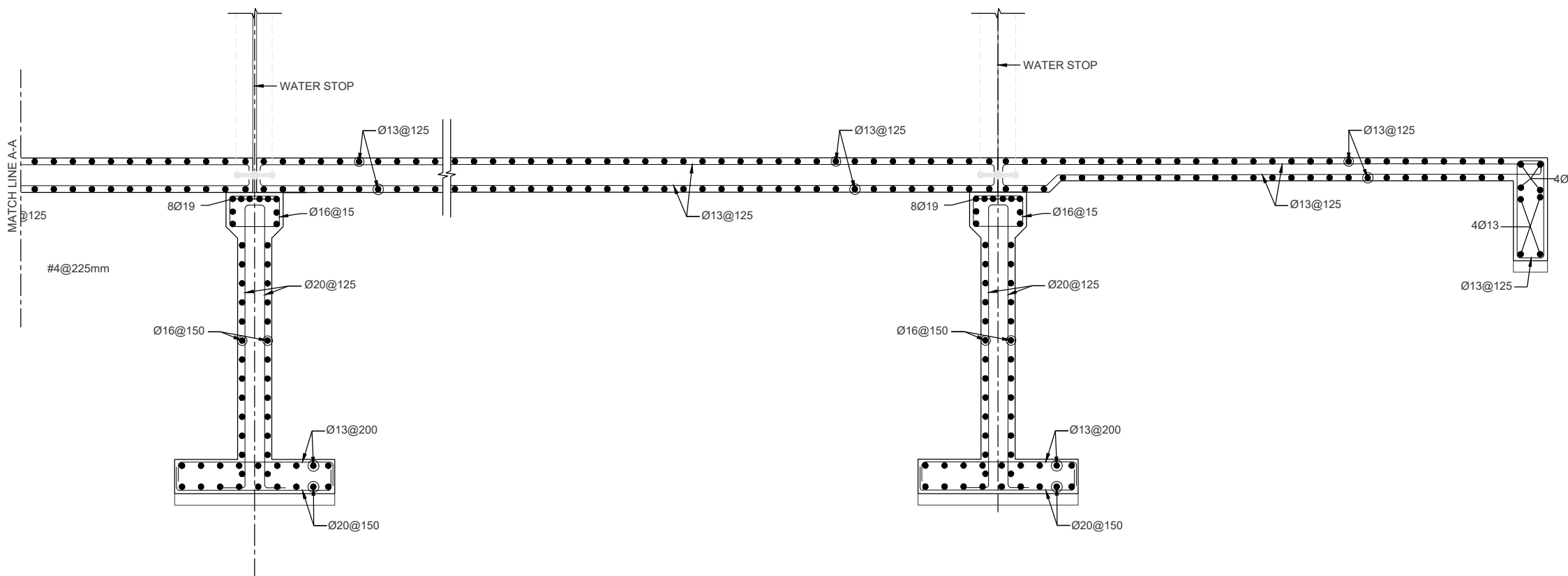
DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	Oct. 2021
DRG.No:-	ZKD-TD-IR-07	SHEET:-	9 OF 11	SUB SH.-	----



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SECTION A-A



SECTION A-A

**NOTES:**

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ELEVATIONS ARE IN METERS UNLESS INDICATED OTHERWISE.
2. CONCRETE CYLINDER STRENGTH 28 DAYS=4000 PSI.
3. LEAN CONCRETE CYLINDER STRENGTH 28 DAYS=1500PSI.
4. REINFORCEMENT AS PER ASTM A615. GRADE 60.

ASTM A615		
Deformed Bar Designation Numbers, Nominal Weights (Masses), Nominal Dimensions		
Bar Designation No.	Nominal Weight, lb/ft (Nominal Mass, Kg/m)	Diameter, in. (mm)
3(10)	0.376 (0.560)	0.375 (9.5)
4(13)	0.668 (0.994)	0.500 (12.7)
5(16)	1.043 (1.552)	0.625 (15.9)
6(19)	1.502 (2.235)	0.750 (19.1)
7(22)	2.044 (3.042)	0.875 (22.2)
8(25)	2.670 (3.973)	1.000 (25.4)
9(29)	3.400 (5.060)	1.128 (28.7)
10(32)	4.303 (6.404)	1.270 (32.3)
11(36)	5.313 (7.907)	1.410 (35.8)
14(43)	7.650 (11.38)	1.693 (43.0)
18(57)	13.60 (20.24)	2.257 (57.3)

N.B BARS ARE TO BE PROVIDED AS #3, #4, #5, AND #18 AS PER ASTM A615 WHICH ARE FRACTION OF INCHES.

**REFERENCE DRAWINGS :-**

- ZKD-TD-IR-01
- ZKD-TD-IR-03 (1 to 10)
- ZKD-TD-IR-04 (1 to 4)
- ZKD-TD-IR-05

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**CLIENT:**

PSU SMALL DAM SECTION MERGED AREA IRRIGATION DEPARTMENT, KPK.

**CONSULTANTS:**

A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.  
 CASCADE GROUP OF ENGINEERING & CONSULTANTS  
 PERFECT ENGINEERING & MANAGEMENT CONSULTANTS

**PROJECT:**

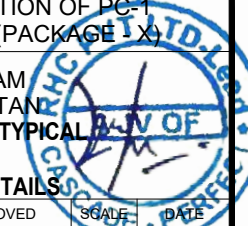
CONSULTANCY SERVICES FOR FEASIBILITY STUDY, DETAIL DESIGN & PREPARATION OF PC-1 FOR 5 SMALL DAMS IN FATA (PACKAGE 1 X)

**TITLE:**

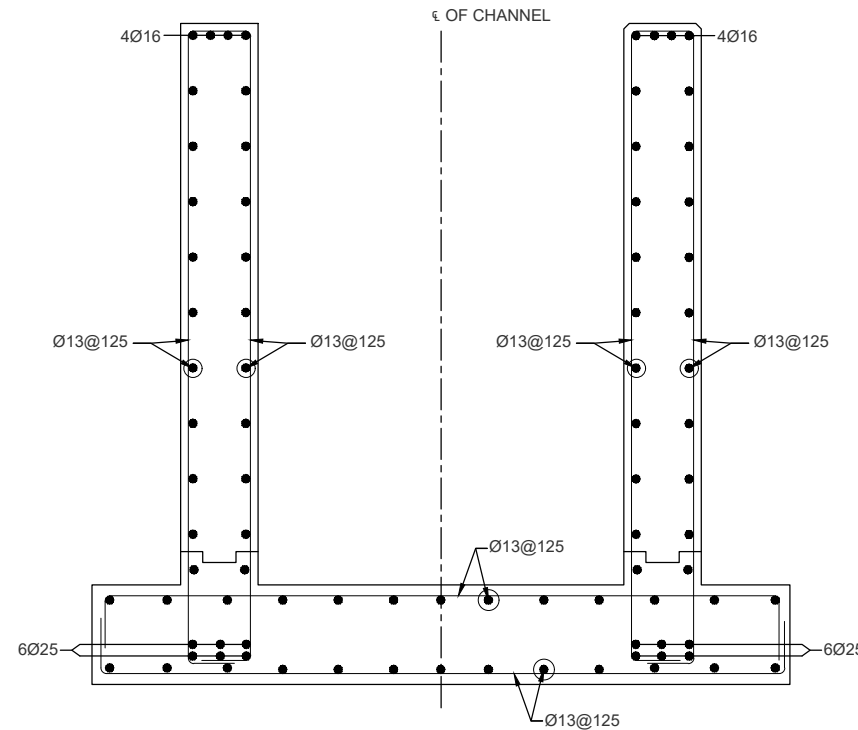
ZAKAR KHEL DAM NORTH WAZIRISTAN TENDER DRAWINGS TYPICAL AQUEDUCT REINFORCEMENT DETAILS

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	Oct. 2021

DRG.No:- ZKD-TD-IR-07 SHEET:- 10 OF 11 SUB SH.- ----

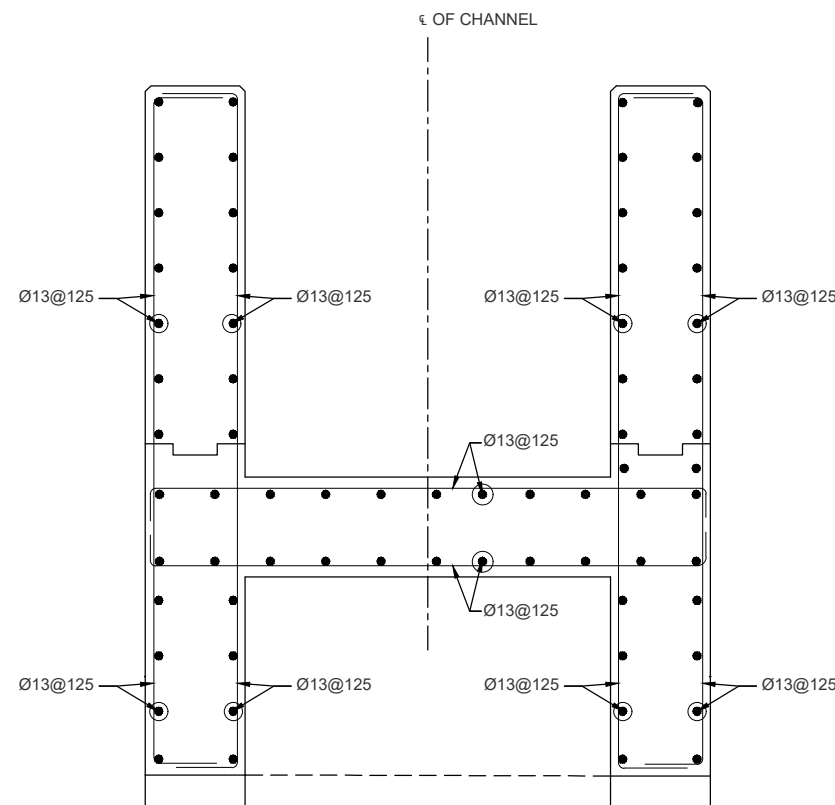


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**SECTION B-B**

\* FRAMEWORK SHALL NOT BE REMOVED FROM THE BOTTOM OF THE SLAB UNTIL FULL STRENGTH ACHIEVED AT 28 DAYS



**SECTION D-D & H-H**

**NOTES:**

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ELEVATIONS ARE IN METERS UNLESS INDICATED OTHERWISE.
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3. LEAN CONCRETE CYLINDER STRENGTH 28 DAYS=1500PSI.
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Deformed Bar Designation Numbers, Nominal Weights (Masses), Nominal Dimensions		
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N.B BARS ARE TO BE PROVIDED AS #3, #4, #5, AND #18 AS PER ASTM A615 WHICH ARE FRACTION OF INCHES.

**REFERENCE DRAWINGS :-**

ZKD-TD-IR-01                      ZKD-TD-IR-04 (1 to 4)  
 ZKD-TD-IR-03 (1 to 10)        ZKD-TD-IR-05

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**CLIENT:**

PSU SMALL DAM SECTION MERGED AREA  
 IRRIGATION DEPARTMENT, KPK.

**CONSULTANTS:**

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**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.  
 CASCADE GROUP  
 OF ENGINEERING & CONSULTANTS  
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 MANAGEMENT CONSULTANTS

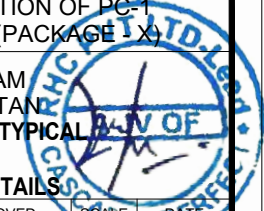
**PROJECT:**

CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
 DETAIL DESIGN & PREPARATION OF PC-1  
 FOR 5 SMALL DAMS IN FATA (PACKAGE 1 X)

**TITLE:**

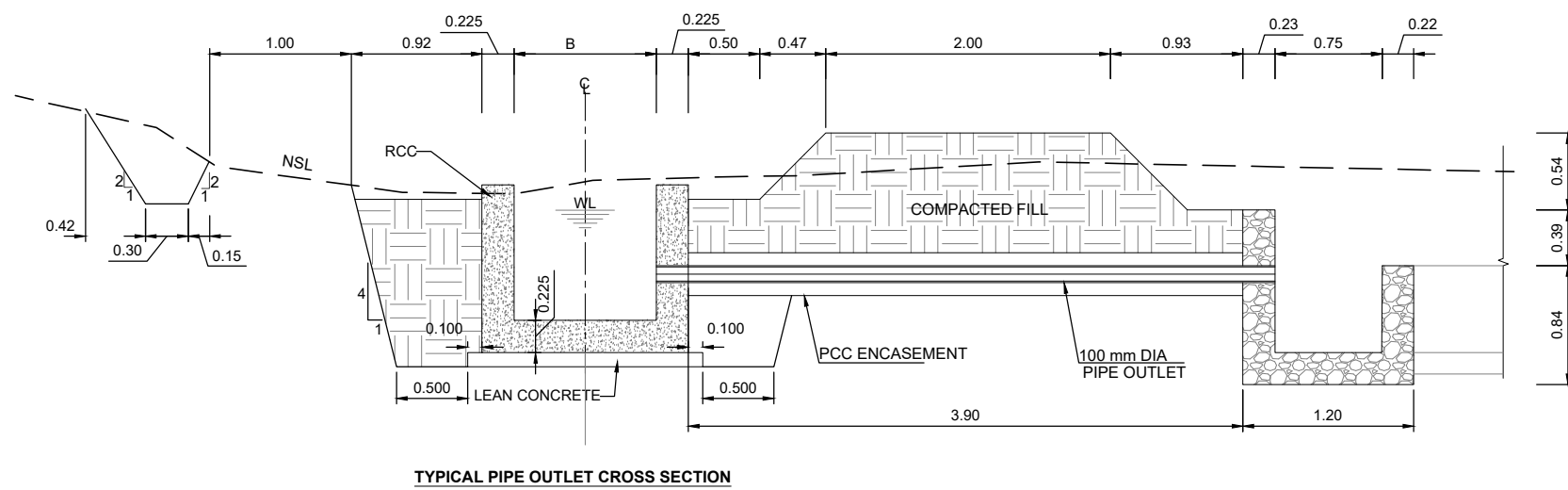
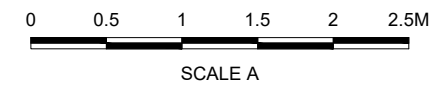
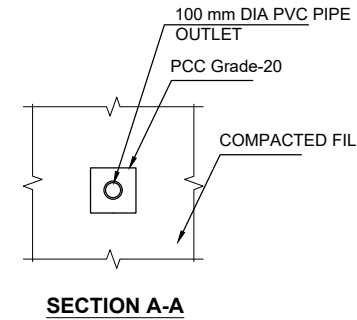
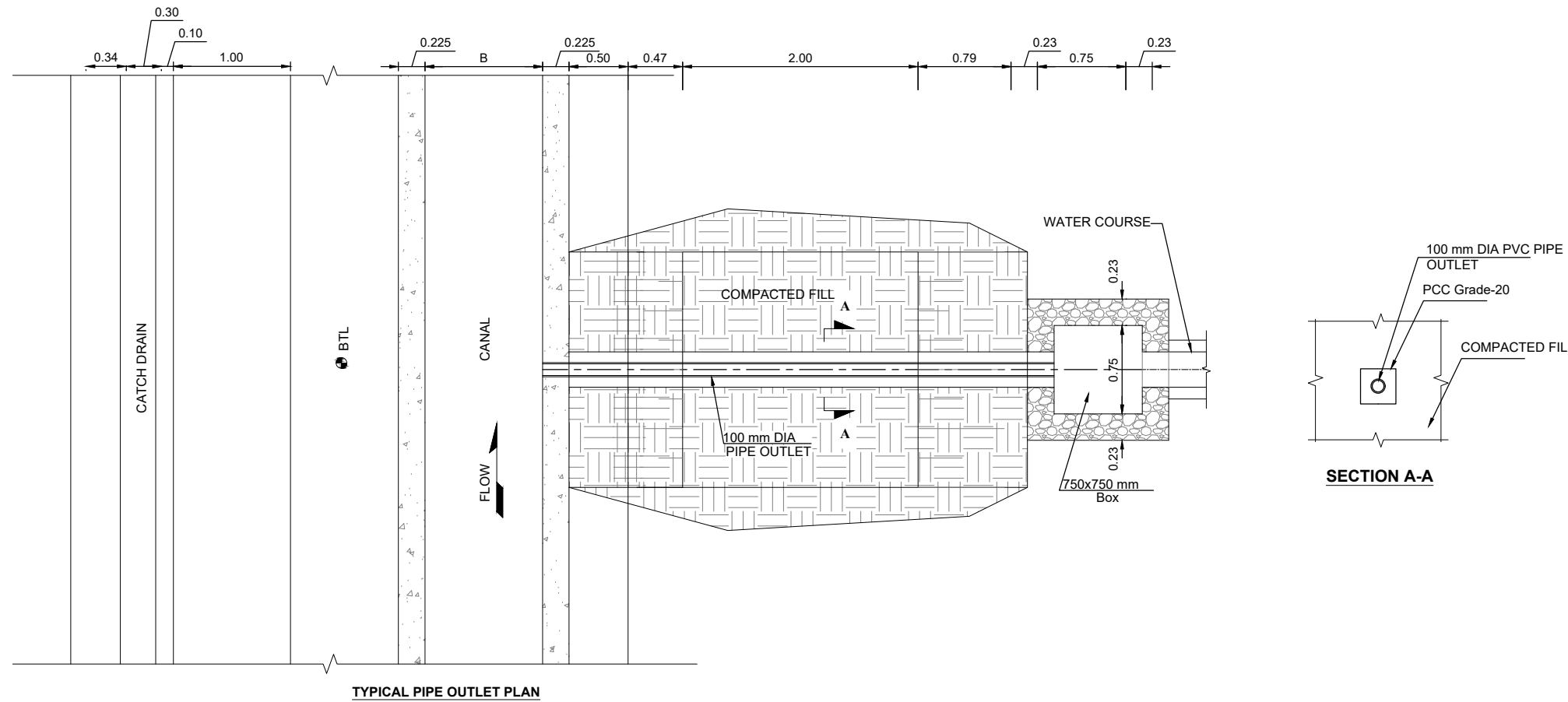
ZAKAR KHEL DAM  
 NORTH WAZIRISTAN  
 TENDER DRAWINGS TYPICAL  
**AQUEDUCT**  
**REINFORCEMENT DETAILS**

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	Oct. 2021
DRG.No:- ZKD-TD-IR-07		SHEET:- 11 OF 11		SUB SH.- ----	





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**NOTES:-**  
 1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS INDICATED OTHERWISE.

**REFERENCE DRAWINGS :-**  
 ZKD-TD-IR-01 ZKD-TD-IR-03 (1 to 11)  
 ZKD-TD-IR-02 ZKD-TD-IR-04 (1 to 4)

**DRAWING IS RELEASED**

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**CLIENT:**  
 PSU SMALL DAM SECTION MERGED AREA  
 IRRIGATION DEPARTMENT, KPK.

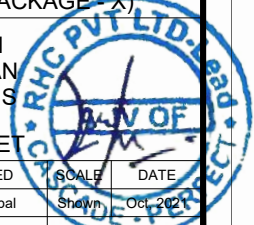
**CONSULTANTS:** A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.  
**CASCAD** CASCADE GROUP OF ENGINEERING & CONSULTANTS  
**PEMC** PERFECT ENGINEERING & MANAGEMENT CONSULTANTS

**PROJECT:**  
 CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
 DETAIL DESIGN & PREPARATION OF PC-1  
 FOR 5 SMALL DAMS IN FATA (PACKAGE X)

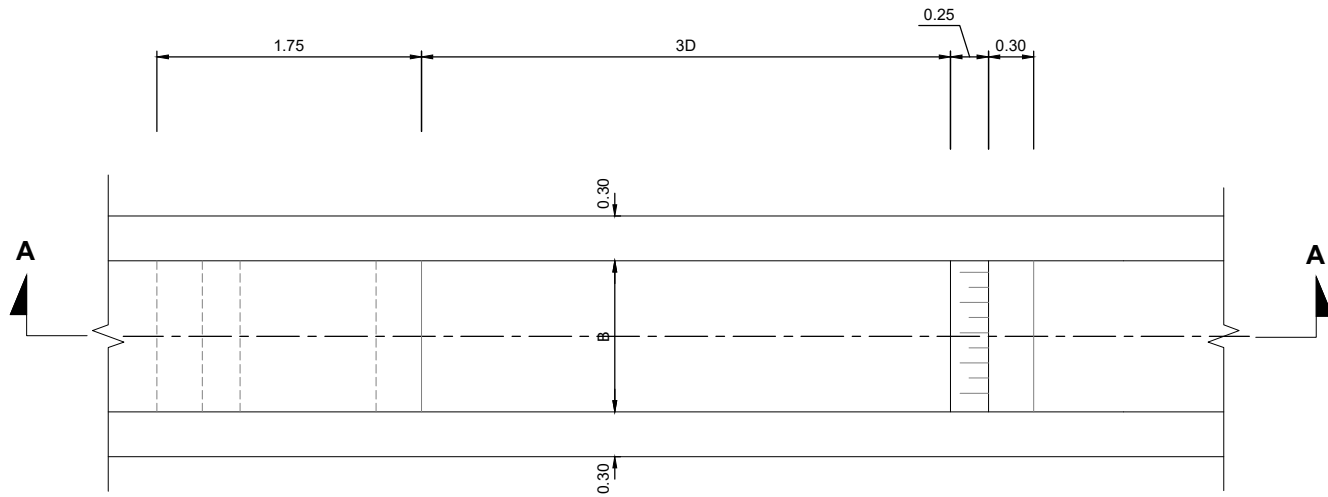
**TITLE:**  
 ZAKAR KHEL DAM  
 NORTH WAZIRISTAN  
 TENDER DRAWINGS  
 TYPICAL PIPE OUTLET

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	Oct 2021

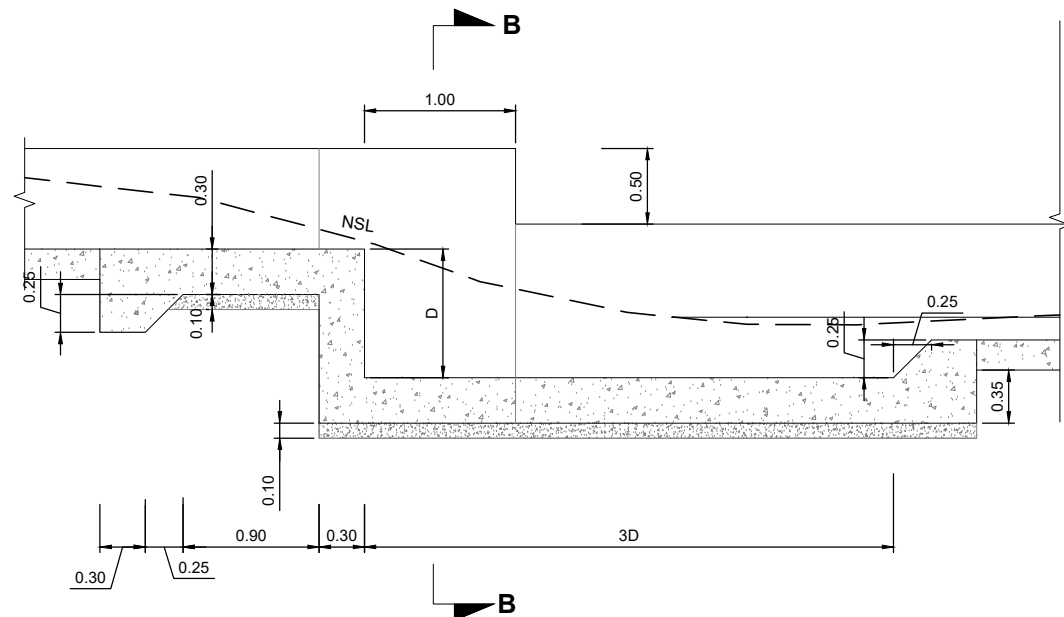
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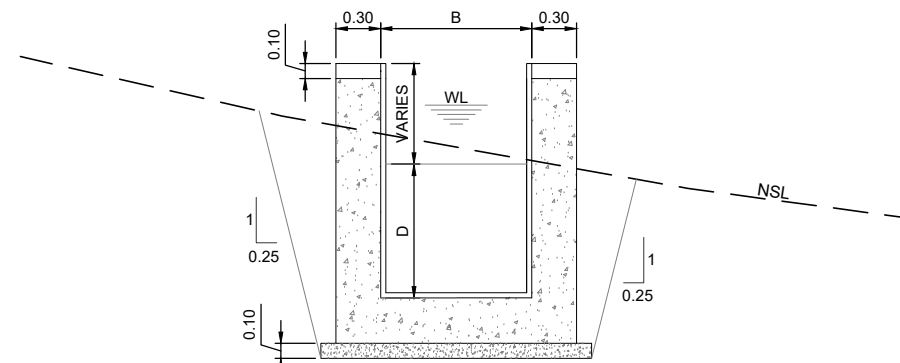
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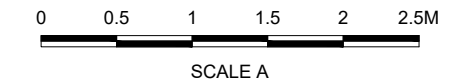
**TYPICAL CANAL FALL PLAN**



**CANAL FALL LONGITUDINAL SECTION A-A**



**CANAL FALL CROSS SECTION B-B**



**NOTES:-**

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS INDICATED OTHERWISE.

**REFERENCE DRAWINGS :-**

- ZKD-TD-IR-01 ZKD-TD-IR-03 (1 to 11)
- ZKD-TD-IR-02 ZKD-TD-IR-04 (1 to 4)

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CLIENT:

PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT, KPK.

CONSULTANTS:

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**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.

**CASCADE GROUP**  
OF ENGINEERING & CONSULTANTS

**PERM** PERFECT ENGINEERING &  
MANAGEMENT CONSULTANTS

PROJECT:  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1  
FOR 5 SMALL DAMS IN FATA (PACKAGE X)

TITLE:

ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS

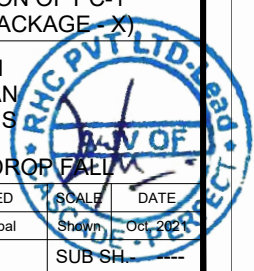
TYPICAL CANAL VERTICAL DROP FALL

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	Oct 2021

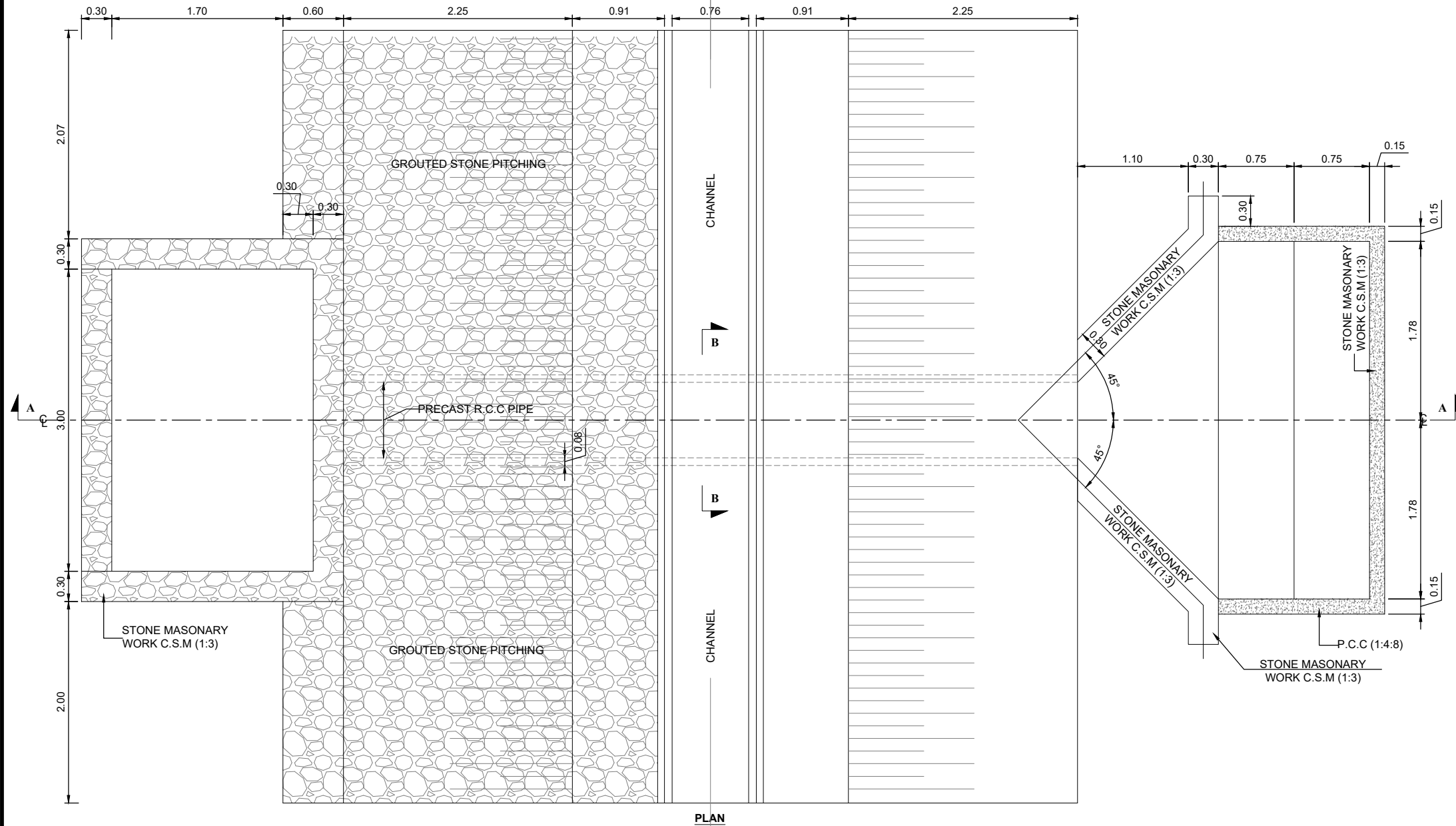
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SHEET:-

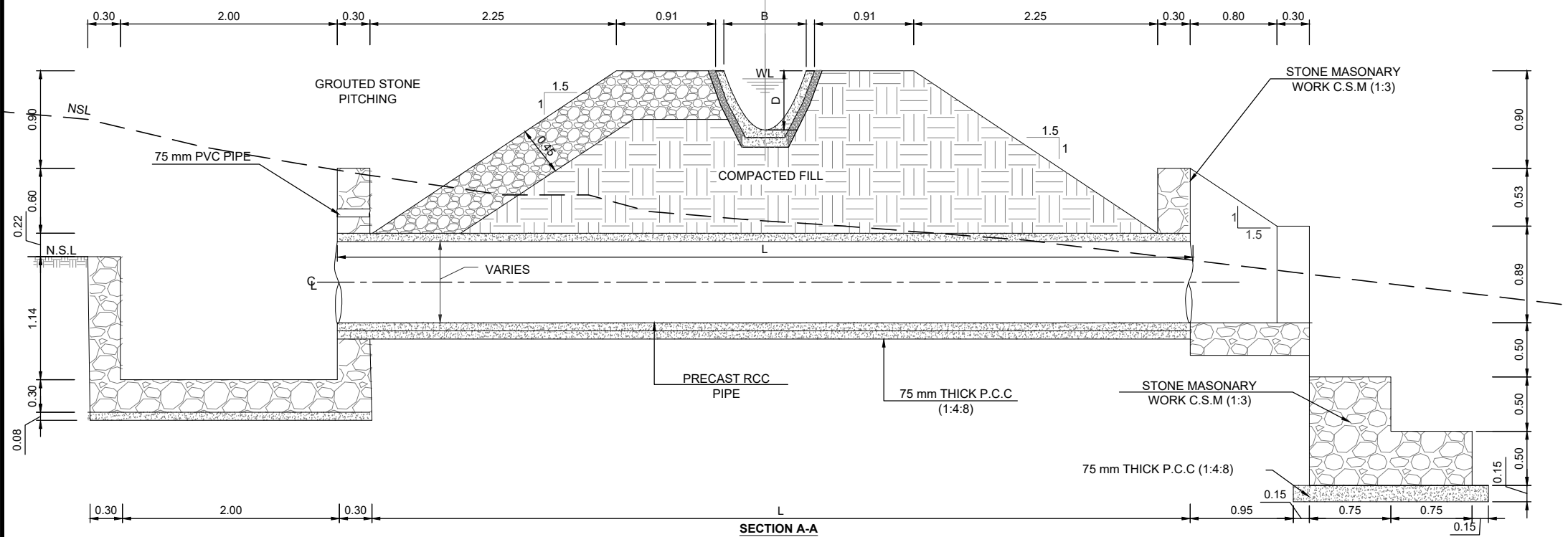
SUB SH. ---



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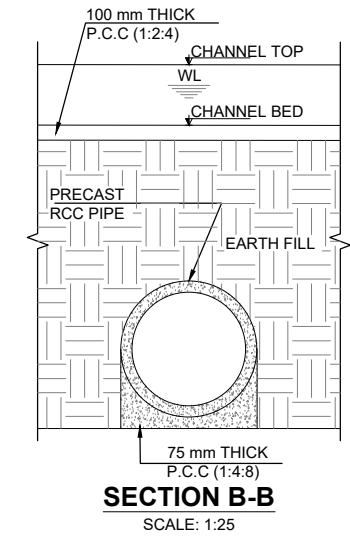
PLAN



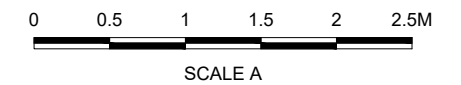
SECTION A-A

**NOTES:-**

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS INDICATED OTHERWISE.



SECTION B-B  
SCALE: 1:25



**REFERENCE DRAWINGS :-**

- ZKD-TD-IR-01 ZKD-TD-IR-03 (1 to 11)
- ZKD-TD-IR-02 ZKD-TD-IR-04 (1 to 4)

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CLIENT:  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT, KPK.

CONSULTANTS: A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.

**CASCAD** CASCADE GROUP  
OF ENGINEERING & CONSULTANTS

**PEMG** PERFECT ENGINEERING &  
MANAGEMENT CONSULTANTS

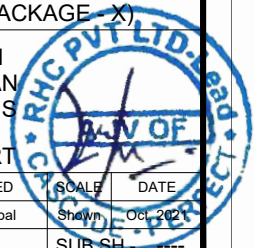
PROJECT:  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1  
FOR 5 SMALL DAMS IN FATA (PACKAGE X)

TITLE:  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS

DRAINAGE CULVERT

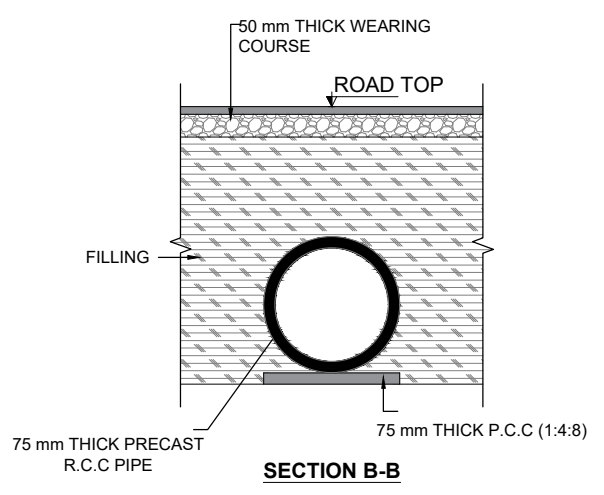
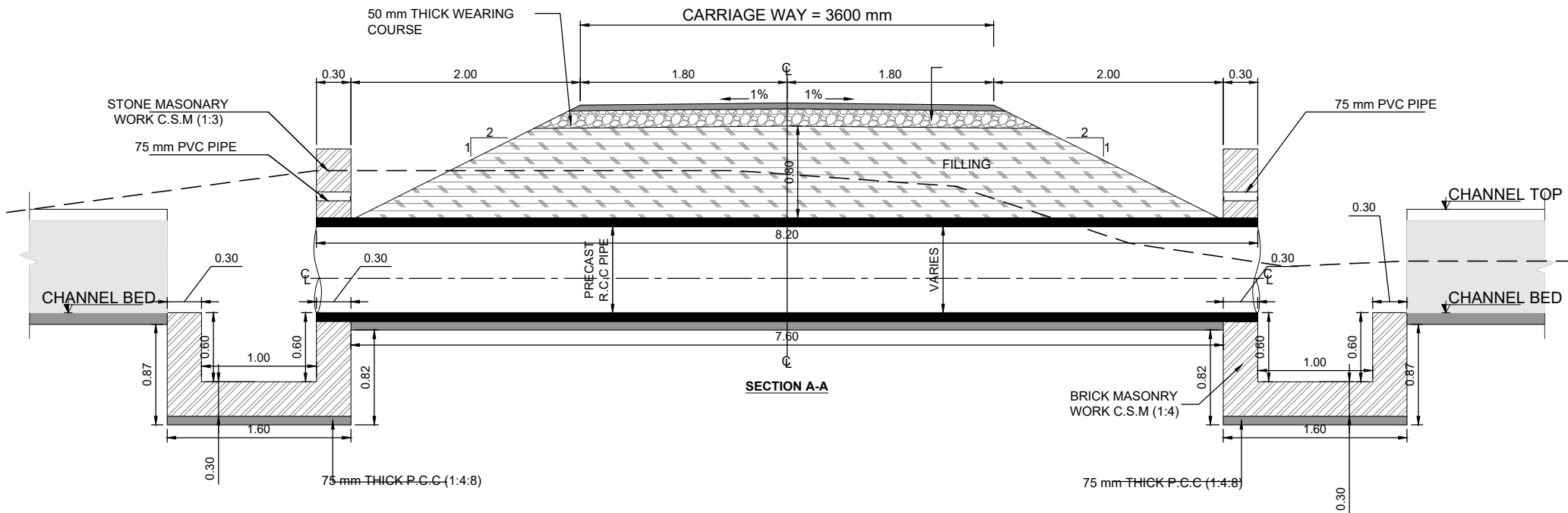
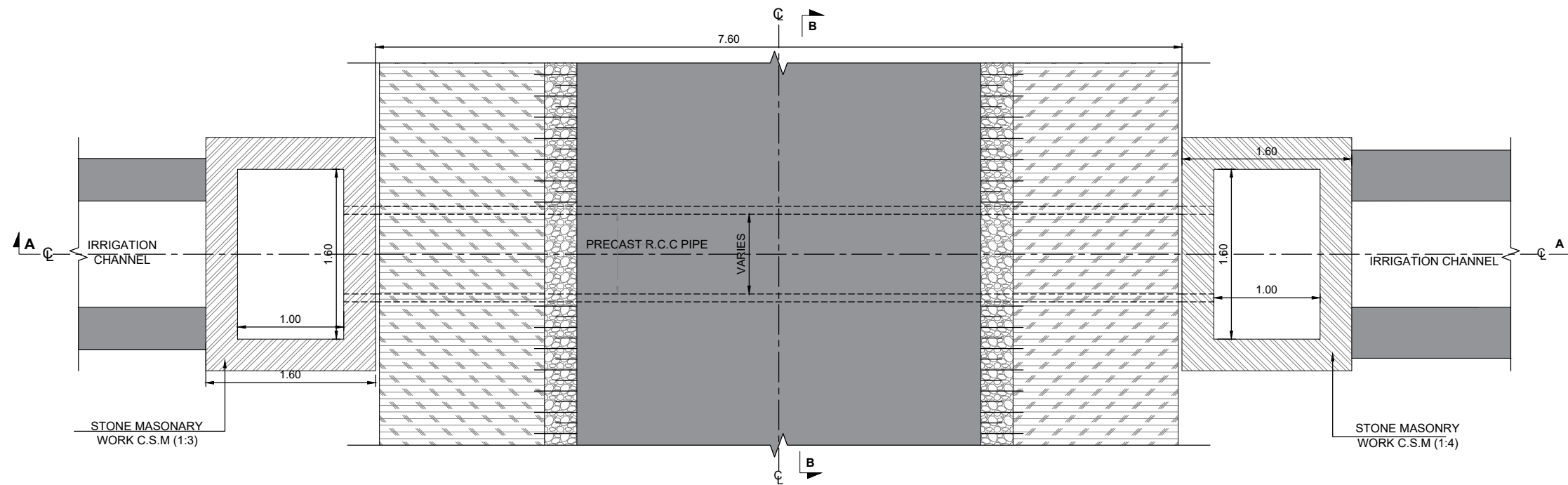
DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	Oct 2021

DRG.No:- ZKD-TD-IR-10 SHEET:- SUB SH.





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**NOTES:-**  
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**REFERENCE DRAWINGS**

ZKD-TD-IR-01 ZKD-TD-IR-03 (1 to 11)  
 ZKD-TD-IR-02 ZKD-TD-IR-04 (1 to 4)

**DRAWING IS RELEASED**

**FOR TENDER ONLY**

**CLIENT:**  
 PSU SMALL DAM SECTION MERGED AREA  
 IRRIGATION DEPARTMENT, KPK.

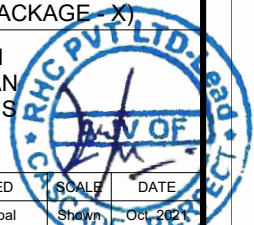
**CONSULTANTS:** A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.  
**CASCADE GROUP** OF ENGINEERING & CONSULTANTS  
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**PROJECT:**  
 CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
 DETAIL DESIGN & PREPARATION OF PC-1  
 FOR 5 SMALL DAMS IN FATA (PACKAGE X)

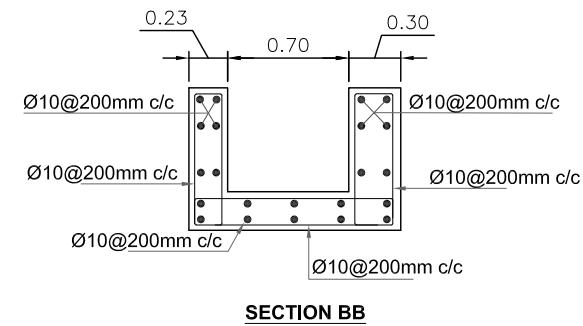
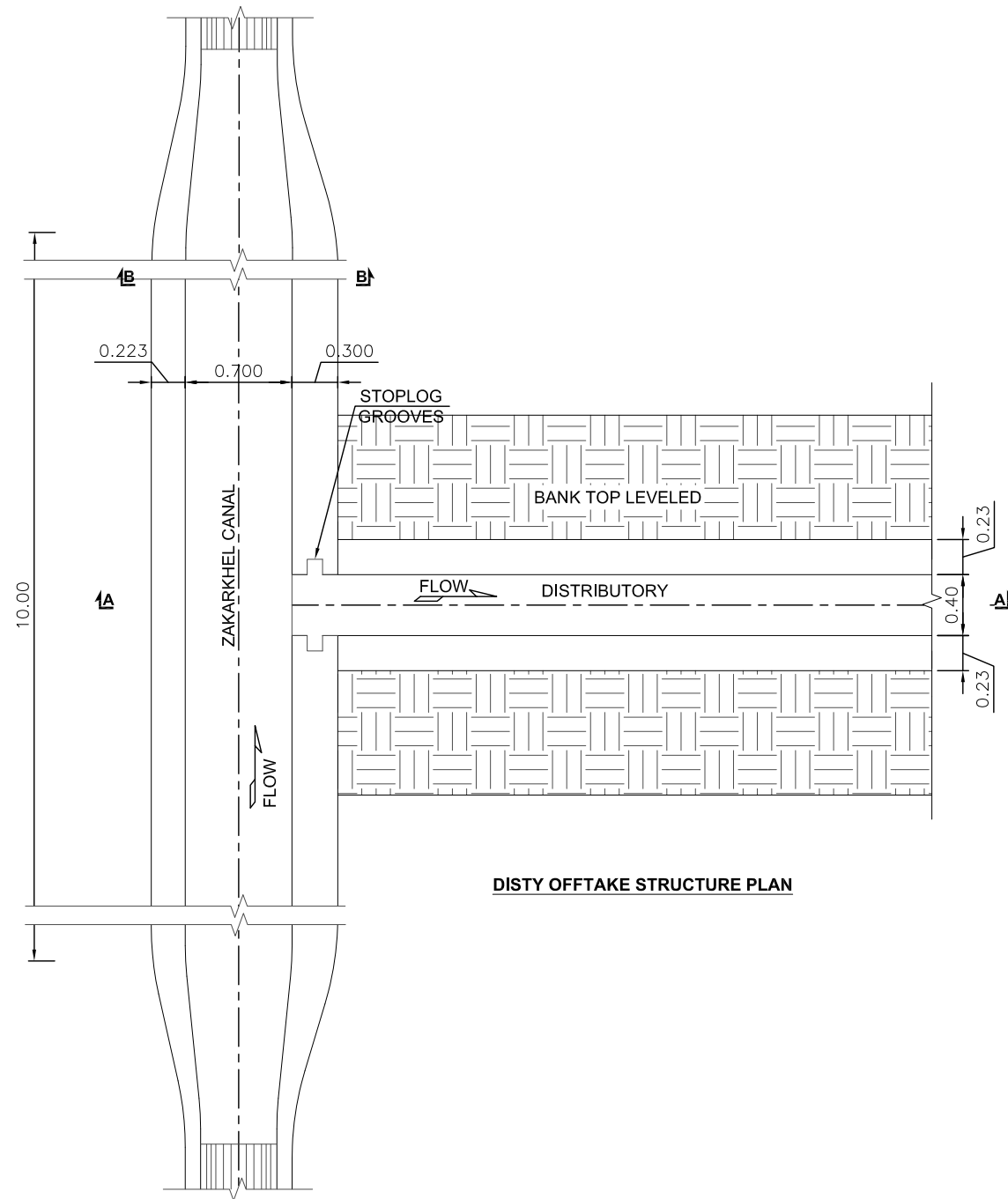
**TITLE:**  
 ZAKAR KHEL DAM  
 NORTH WAZIRISTAN  
 TENDER DRAWINGS  
 ROAD CULVERT

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	Oct 2021

DRG.No:- ZKD-TD-IR-11 SHEET:- SUB SH

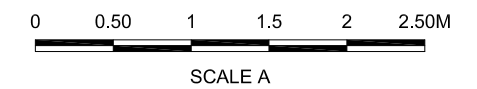


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**DRAWING IS RELEASED**

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**CLIENT:**

PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT, KPK.

**CONSULTANTS:**

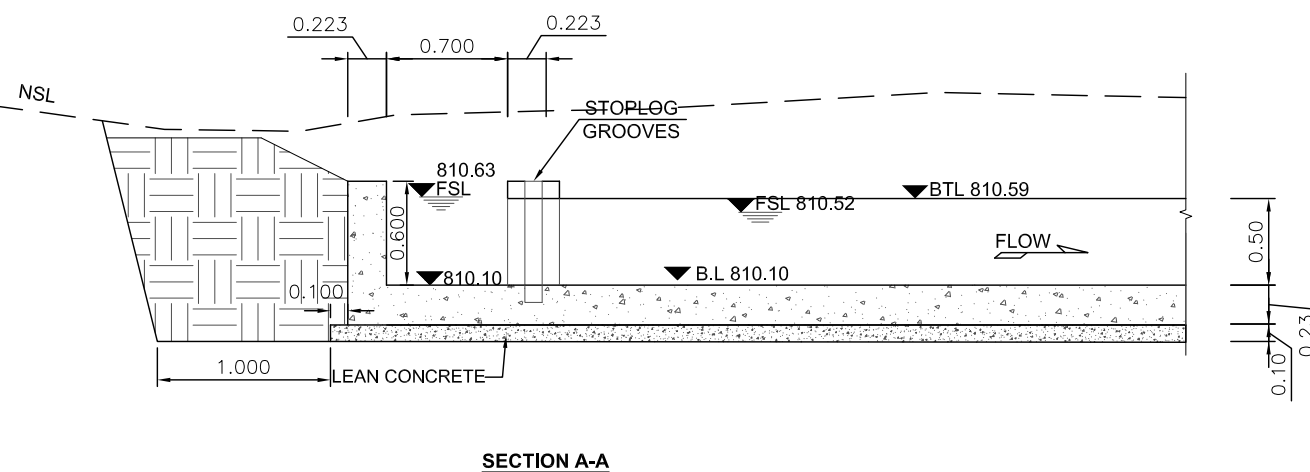
- A J.V OF  
**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.
- CASCADE GROUP**  
OF ENGINEERING & CONSULTANTS
- PEMC** PERFECT ENGINEERING &  
MANAGEMENT CONSULTANTS

**PROJECT:**

CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PG-1  
FOR 5 SMALL DAMS IN FATA (PACKAGE X)

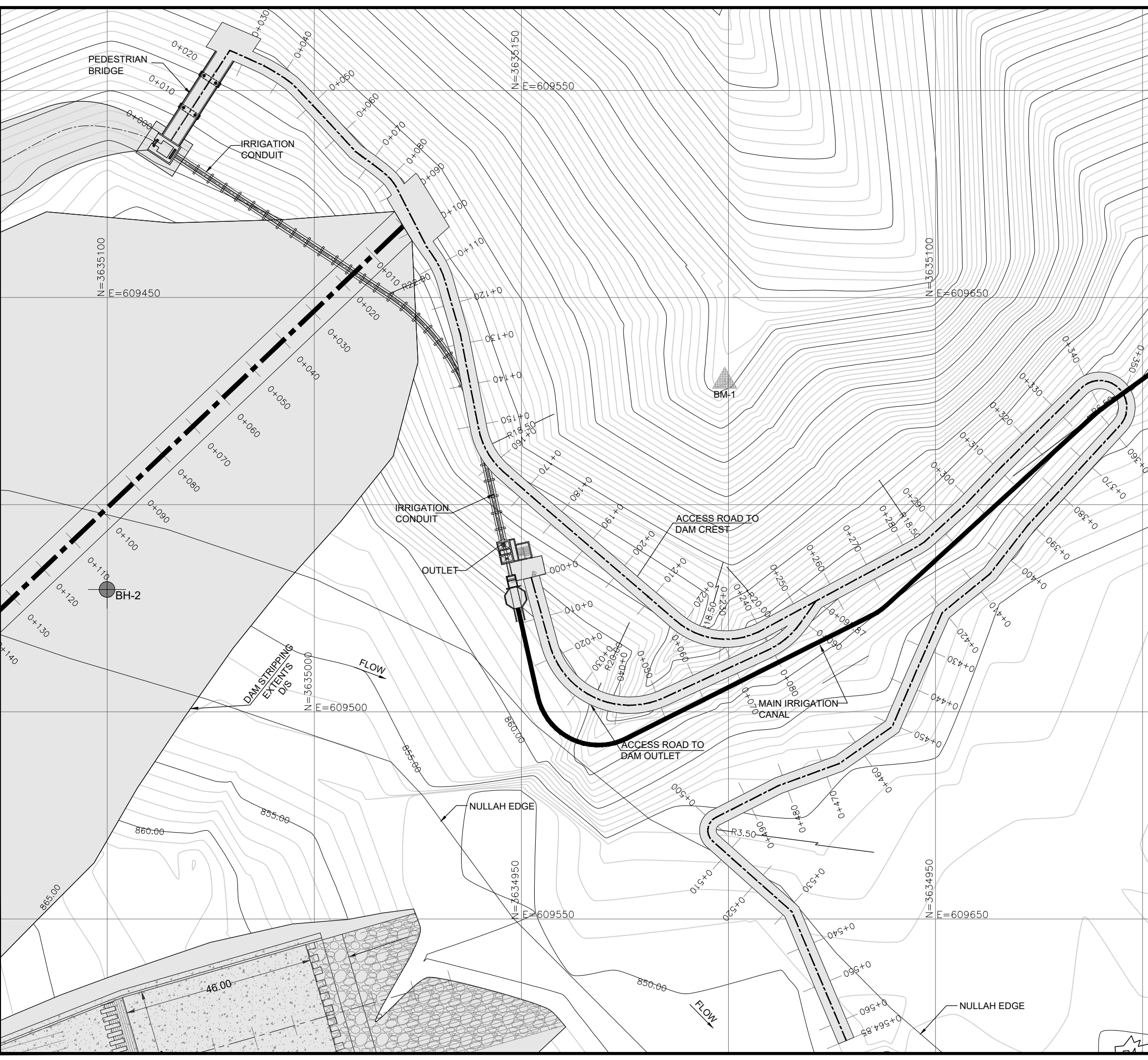
**TITLE:**

ZAKAR KHEL DAM  
TRIBAL SUB-DIVISION BANNU  
TENDER DRAWINGS  
DISTY OFFTAKE STRUCTURE



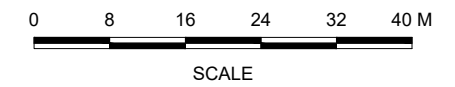
DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	Oct, 2021
DRG.No:- ZKD-TD-IR-12			SHEET:-		SUB SH.- ----

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**NOTES:-**

1. ALL LEVELS AND DIMENSIONS ARE IN METER



**REFERENCE DRAWINGS :-**

ZKD-TD-AR-02

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CLIENT:

PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT, KPK.

CONSULTANTS:

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**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.

**CASCADE** GROUP  
OF ENGINEERING & CONSULTANTS

**PEMG** PERFECT ENGINEERING &  
MANAGEMENT CONSULTANTS

PROJECT:  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1  
FOR 5 SMALL DAMS IN FATA (PACKAGE X)

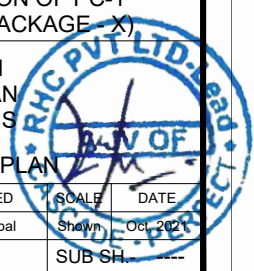
TITLE:  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS  
ACCESS ROAD LAYOUT PLAN

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	Oct 2021

DRG.No:- ZKD-TD-AR-01

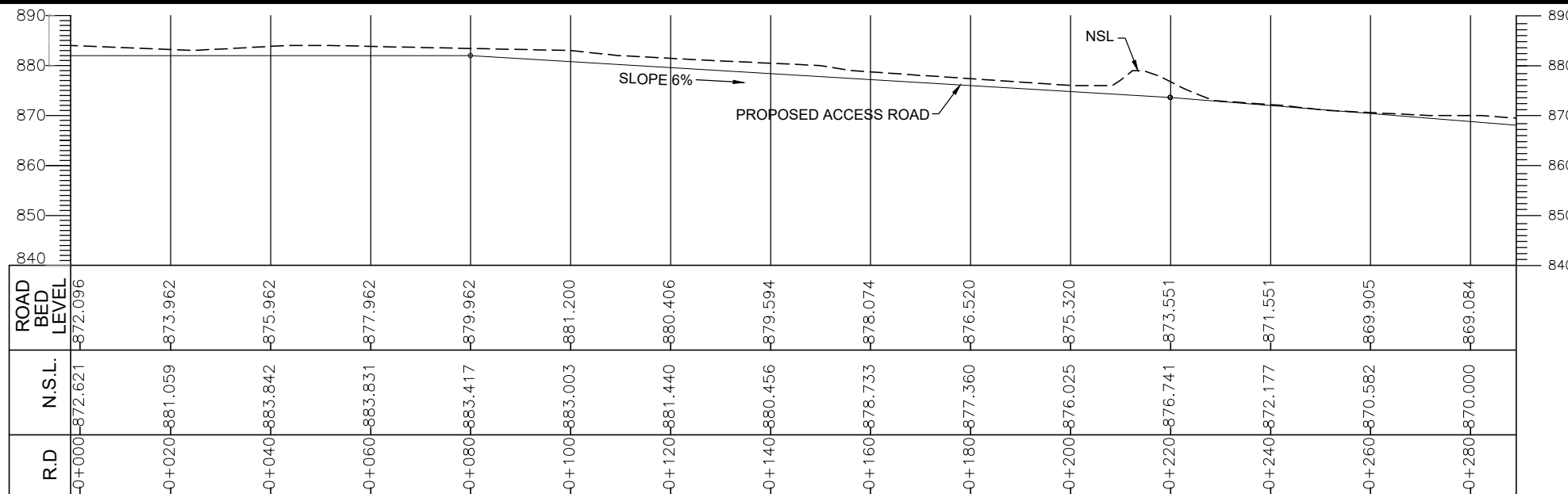
SHEET:-

SUB SH.

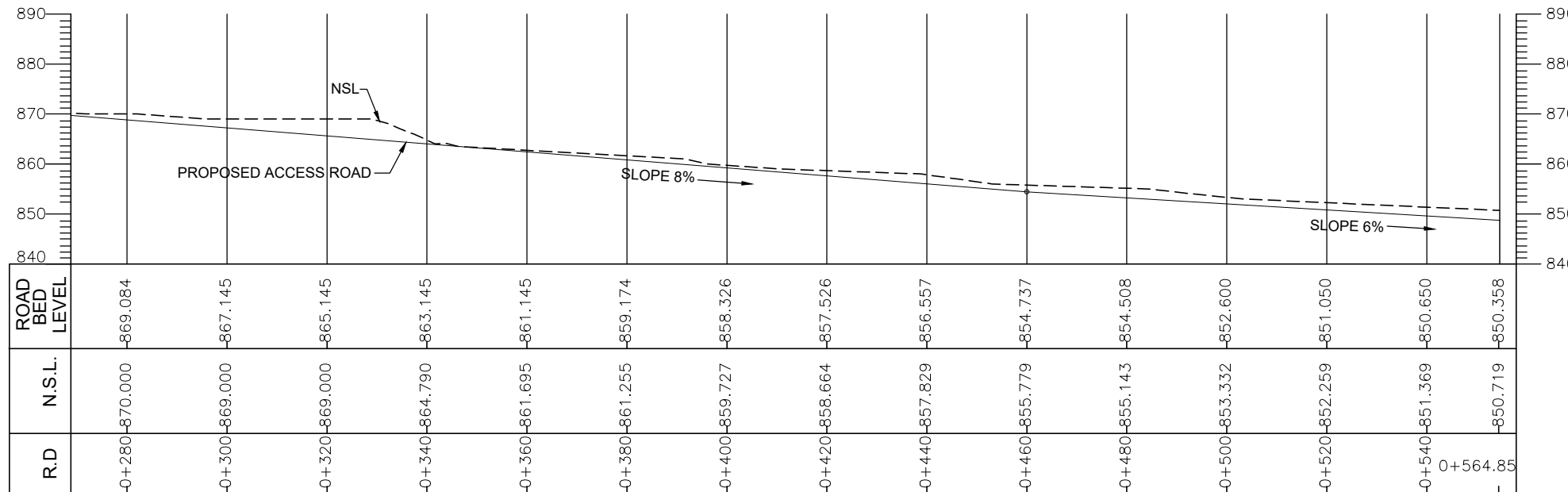




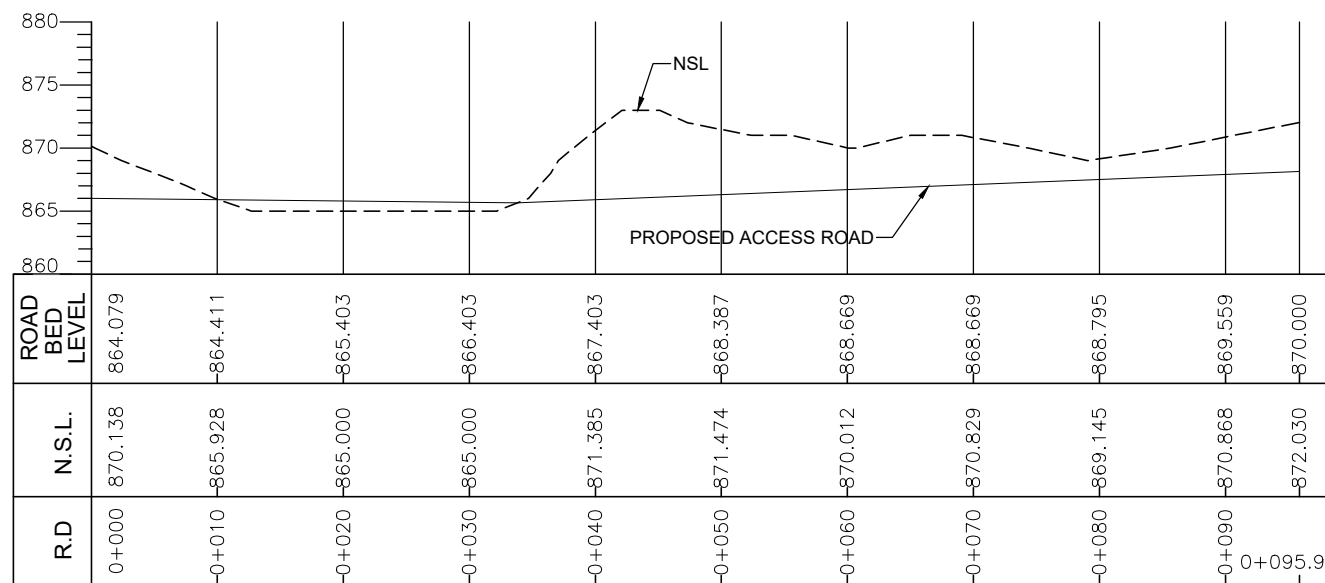
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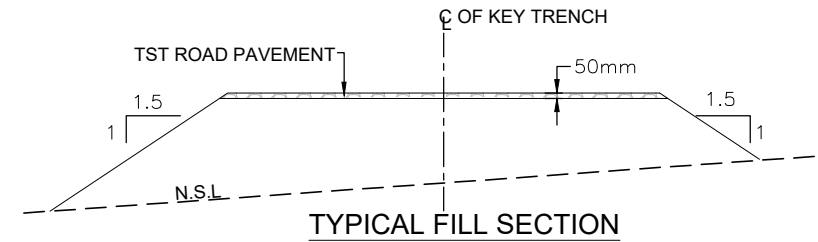
LONGITUDINAL CROSS SECTION OF ACCESS ROAD TO DAM CREST



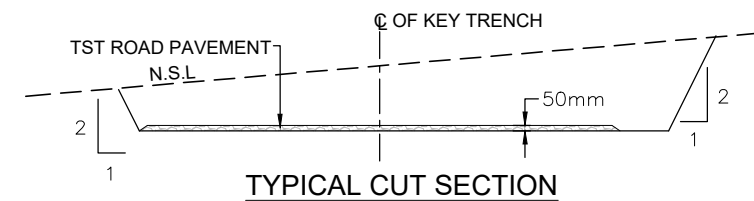
LONGITUDINAL CROSS SECTION OF ACCESS ROAD TO DAM CREST



LONGITUDINAL CROSS SECTION FOR OUTLET ROAD



TYPICAL FILL SECTION



TYPICAL CUT SECTION

NOTES:-  
1. ALL LEVELS AND DIMENSIONS ARE IN METER

REFERENCE DRAWINGS :-

ZKD-TD-AR-01

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CLIENT:

PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT, KPK.

CONSULTANTS:

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**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.

**CASCADE GROUP**  
OF ENGINEERING & CONSULTANTS

**PERFECT ENGINEERING & MANAGEMENT CONSULTANTS**

PROJECT:

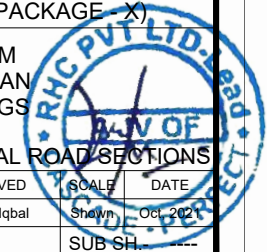
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1  
FOR 5 SMALL DAMS IN FATA (PACKAGE - X)

TITLE:

ACCESS ROAD PROFILES & TYPICAL ROAD SECTIONS

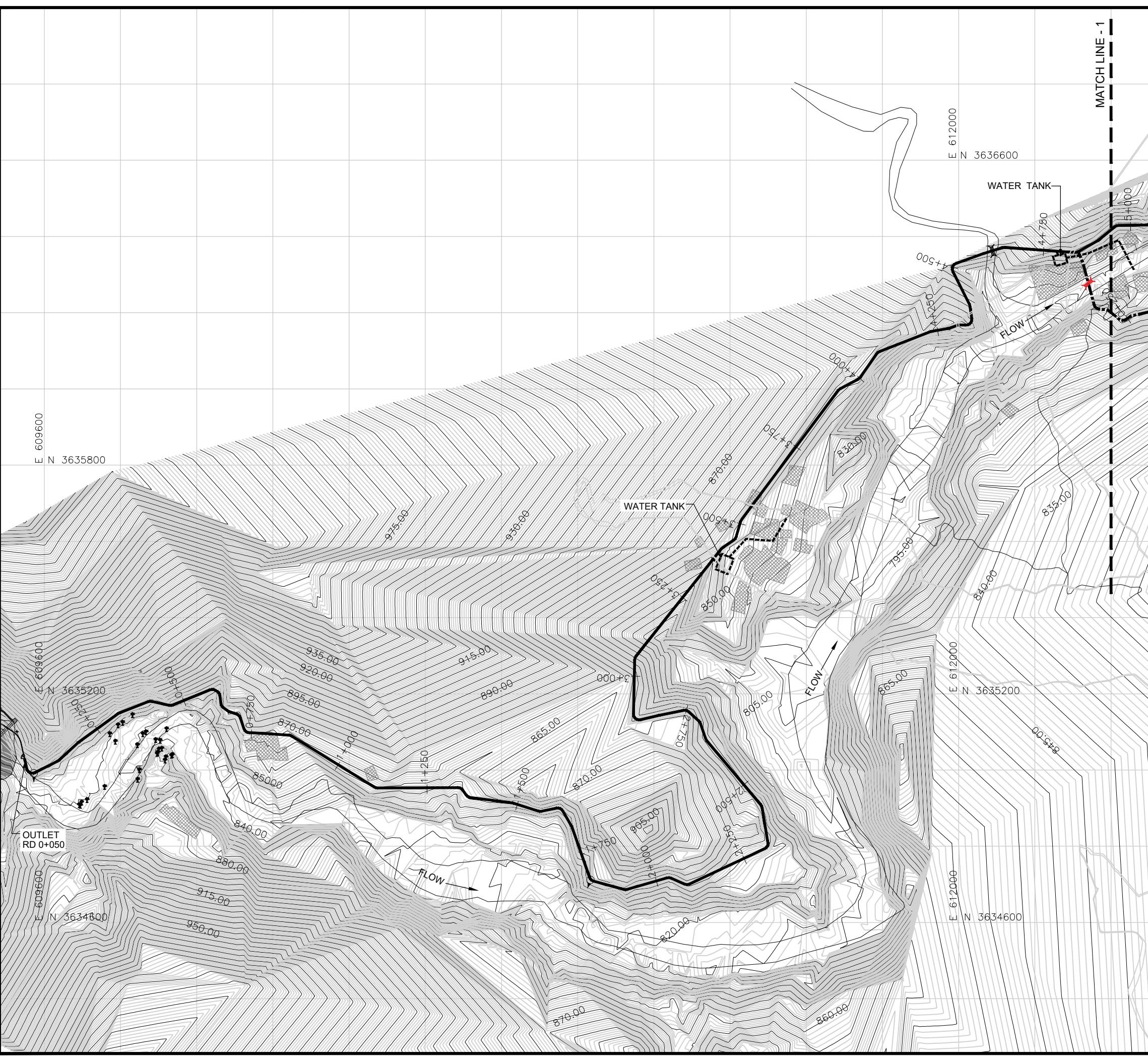
DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	Oct 2021

DRG.No:- ZKD-TD-AR-02 SHEET:- SUB SH. ---





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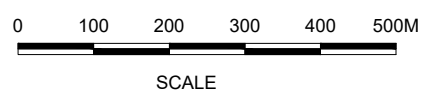
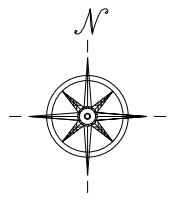


**NOTES:-**

1. ALL LEVELS AND DIMENSIONS ARE IN METER

**LEGEND**

- AQUEDUCT
- MAIN CANAL
- DISTRIBUTARY
- ROAD
- VILLAGES/HOUSES
- COMMAND AREA
- CONTOUR
- OUTLET
- DRAINAGE CULVERT
- WATER TANK
- WATER SUPPLY PIPE



**REFERENCE DRAWINGS :-**

ZKD-TD-WS-02

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CLIENT:  
PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT, KPK.

CONSULTANTS: A J.V OF  
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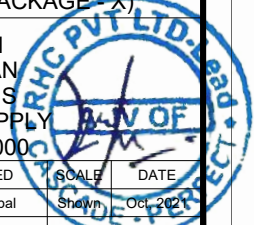
PERFECT ENGINEERING &  
MANAGEMENT CONSULTANTS

PROJECT:  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1  
FOR 5 SMALL DAMS IN FATA (PACKAGE X)

TITLE:  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS  
DRINKING WATER SUPPLY  
RD 0+000 TO RD 5+000

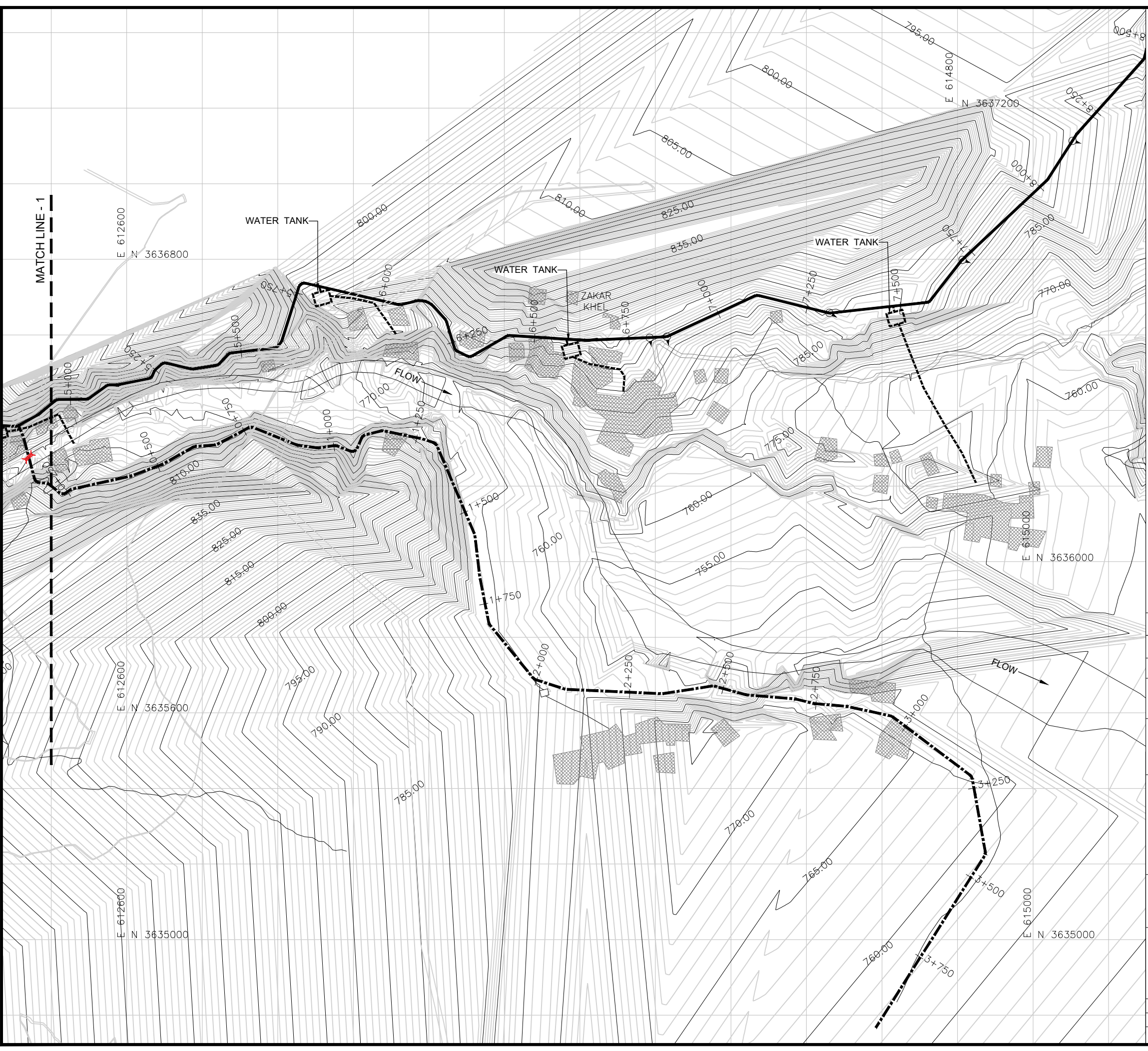
DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
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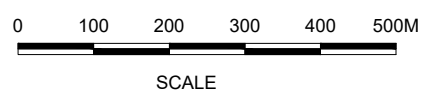
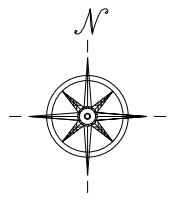


**NOTES:-**

1. ALL LEVELS AND DIMENSIONS ARE IN METER

**LEGEND**

- AQUEDUCT
- MAIN CANAL
- DISTRIBUTARY
- ROAD
- VILLAGES/HOUSES
- COMMAND AREA
- CONTOUR
- OUTLET
- DRAINAGE CULVERT
- WATER TANK
- WATER SUPPLY PIPE



**REFERENCE DRAWINGS :-**

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IRRIGATION DEPARTMENT, KPK.

CONSULTANTS: A J.V OF  
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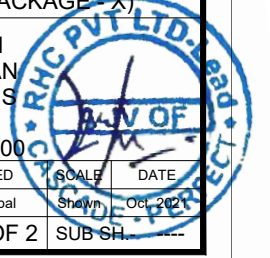
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MANAGEMENT CONSULTANTS

PROJECT:  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1  
FOR 5 SMALL DAMS IN FATA (PACKAGE X)

TITLE:  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS  
RD 5+000 TO RD 8+500

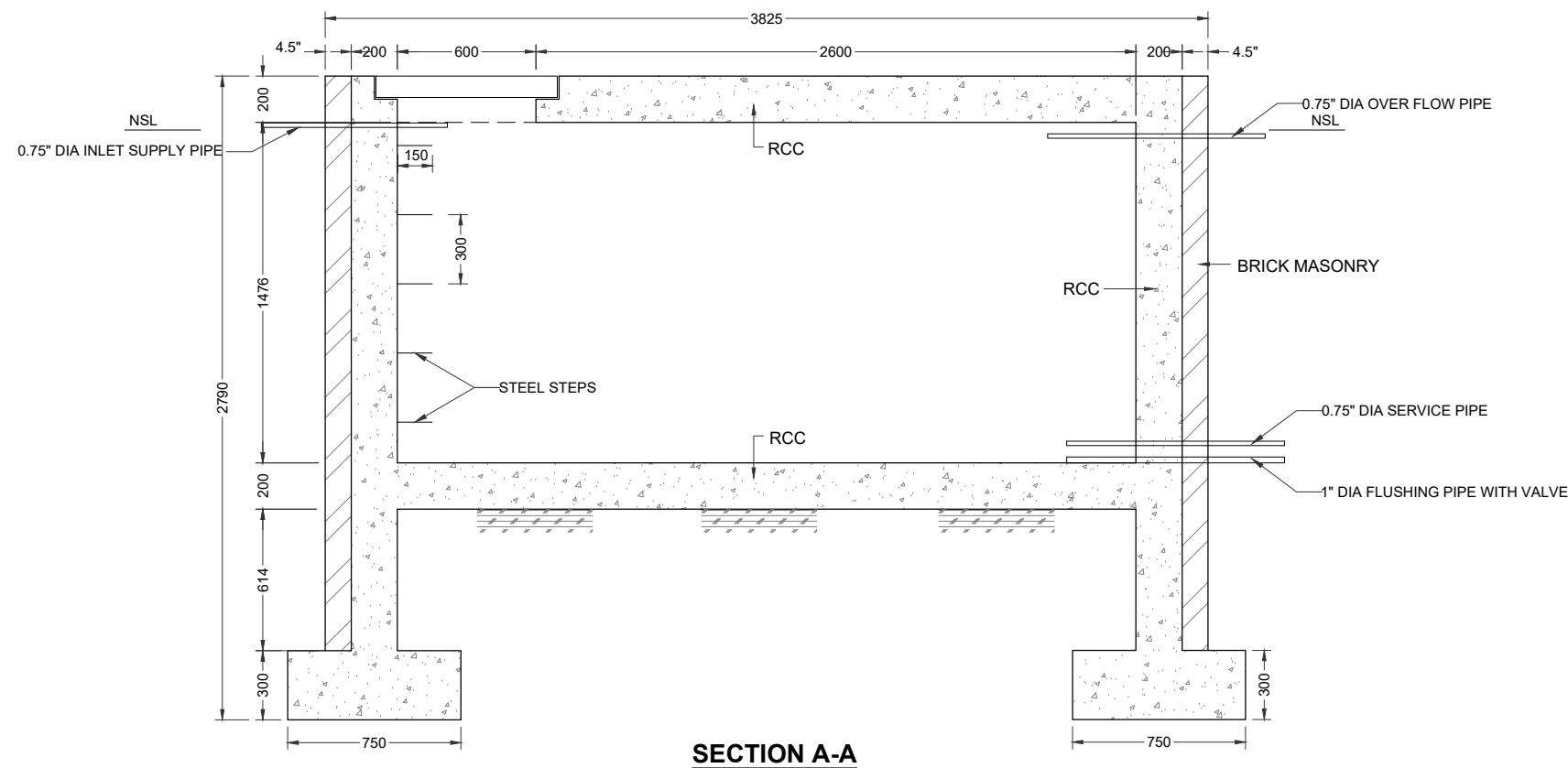
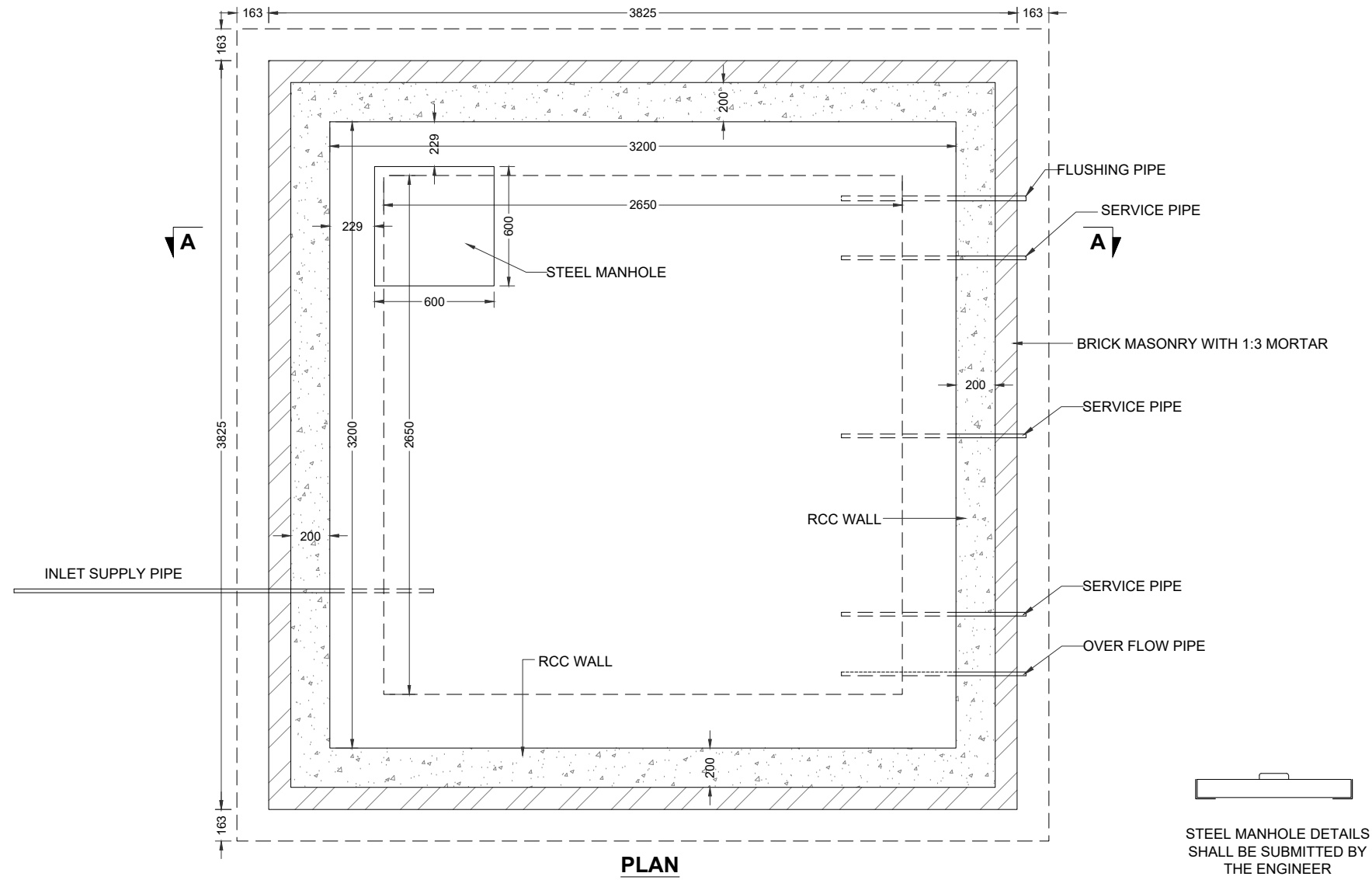
DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	Oct 2021

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**NOTES:**

1. ALL DIMENSIONS & LEVELS ARE IN MILI METERS UNLESS OTHER WISE SPECIFIED.
2. CONCRETE CYLINDER STRENGTH 28 DAYS=4000 PSI. FOR SURFACE WATER TANK.
3. LEAN CONCRETE CYLINDER STRENGTH 28 DAYS=1500PSI.
4. REINFORCEMENT AS PER ASTM A615. GRADE 60.

**REFERENCE DRAWINGS :-**

ZKD-DD-WS-01  
ZKD-DD-WS-03

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CLIENT:  
**PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT, KPK.**

CONSULTANTS: A J.V OF  
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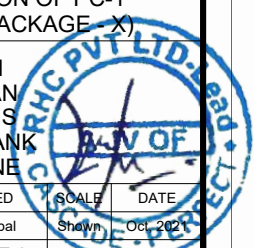
**PERFECT ENGINEERING &  
MANAGEMENT CONSULTANTS**

PROJECT:  
**CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1  
FOR 5 SMALL DAMS IN FATA (PACKAGE X)**

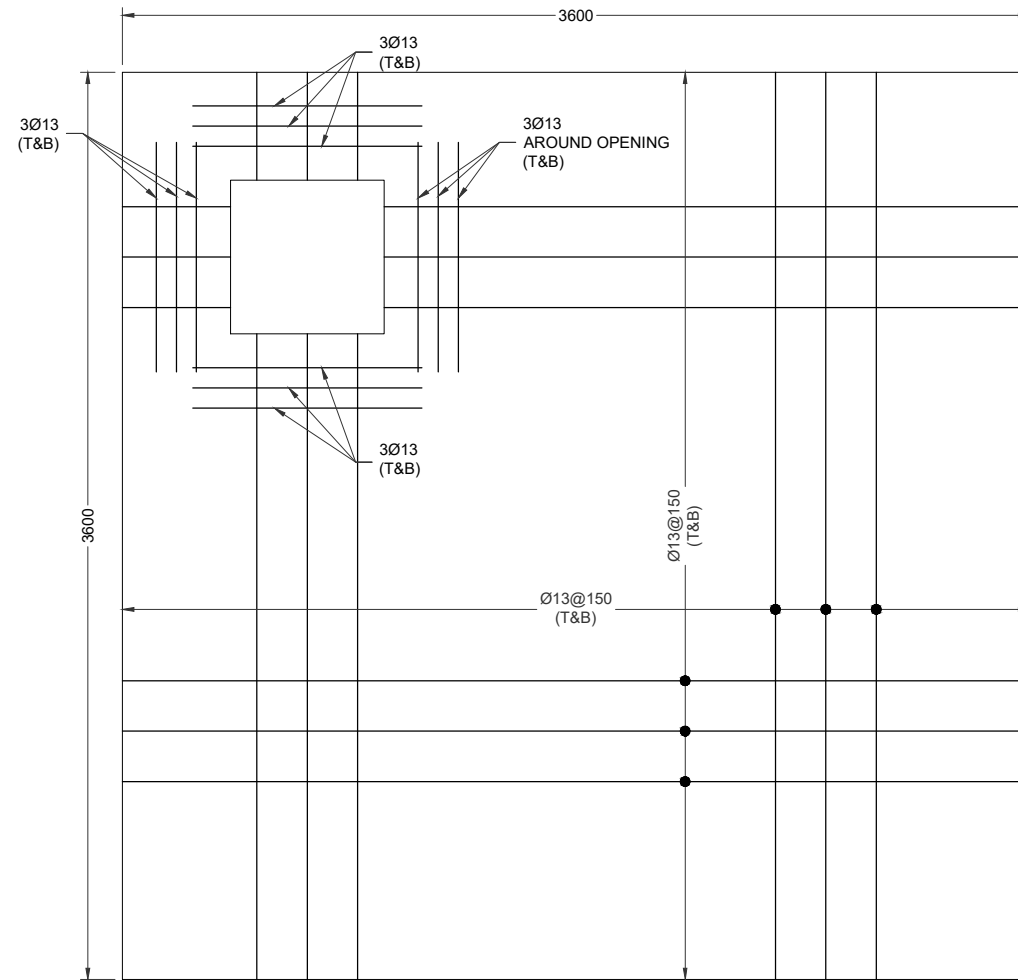
TITLE:  
**ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS  
SURFACE WATER TANK  
CONCRETE OUTLINE**

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	Oct 2021

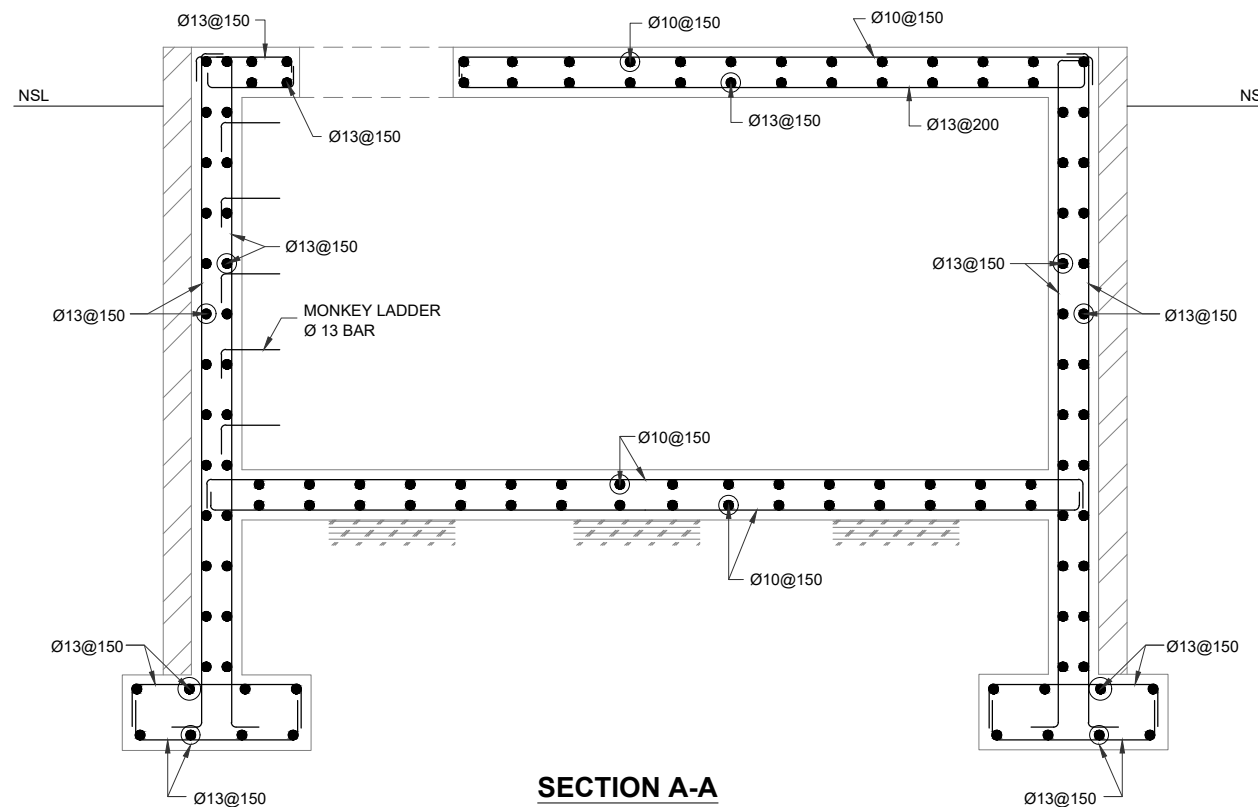
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**ROOF SLAB**  
200mm THICK



**SECTION A-A**

**NOTES:**

1. ALL DIMENSIONS & LEVELS ARE IN MILI METERS UNLESS OTHER WISE SPECIFIED.
2. CONCRETE CYLINDER STRENGTH 28 DAYS=4000 PSI. FOR WATER RETAINING TANK.
3. LEAN CONCRETE CYLINDER STRENGTH 28 DAYS=1500PSI.
4. REINFORCEMENT AS PER ASTM A615. GRADE 60.

ASTM A615		
Deformed Bar Designation Numbers, Nominal Weights (Masses), Nominal Dimensions		
Bar Designation No.	Nominal Weight, lb/ft (Nominal Mass, Kg/m)	Diameter, in. (mm)
3(10)	0.376 (0.560)	0.375 (9.5)
4(13)	0.668 (0.994)	0.500 (12.7)
5(16)	1.043 (1.552)	0.625 (15.9)
6(19)	1.502 (2.235)	0.750 (19.1)
7(22)	2.044 (3.042)	0.875 (22.2)
8(25)	2.670 (3.973)	1.000 (25.4)
9(29)	3.400 (5.060)	1.128 (28.7)
10(32)	4.303 (6.404)	1.270 (32.3)
11(36)	5.313 (7.907)	1.410 (35.8)
14(43)	7.650 (11.38)	1.693 (43.0)
18(57)	13.60 (20.24)	2.257 (57.3)

N.B BARS ARE TO BE PROVIDED AS #3, #4, #5, AND #18 AS PER ASTM A615 WHICH ARE FRACTION OF INCHES.

**REFERENCE DRAWINGS :-**

ZKD-DD-WS-01  
ZKD-DD-WS-03

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CLIENT:

PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT, KPK.

CONSULTANTS:

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**PERFECT ENGINEERING & MANAGEMENT CONSULTANTS**

PROJECT:  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1  
FOR 5 SMALL DAMS IN FATA (PACKAGE X)

TITLE:

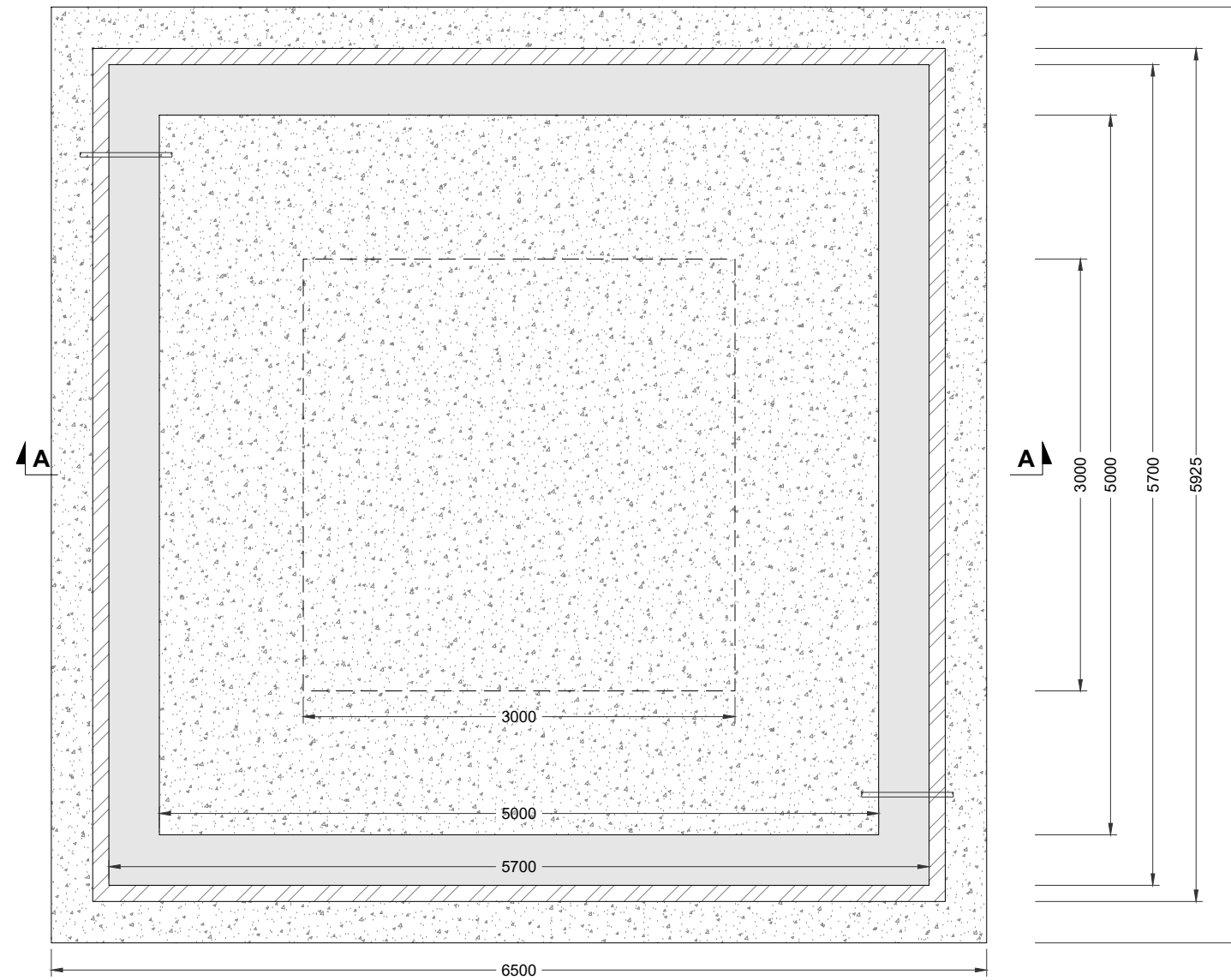
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS  
SURFACE WATER TANK  
REINFORCEMENT

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	Oct 2021

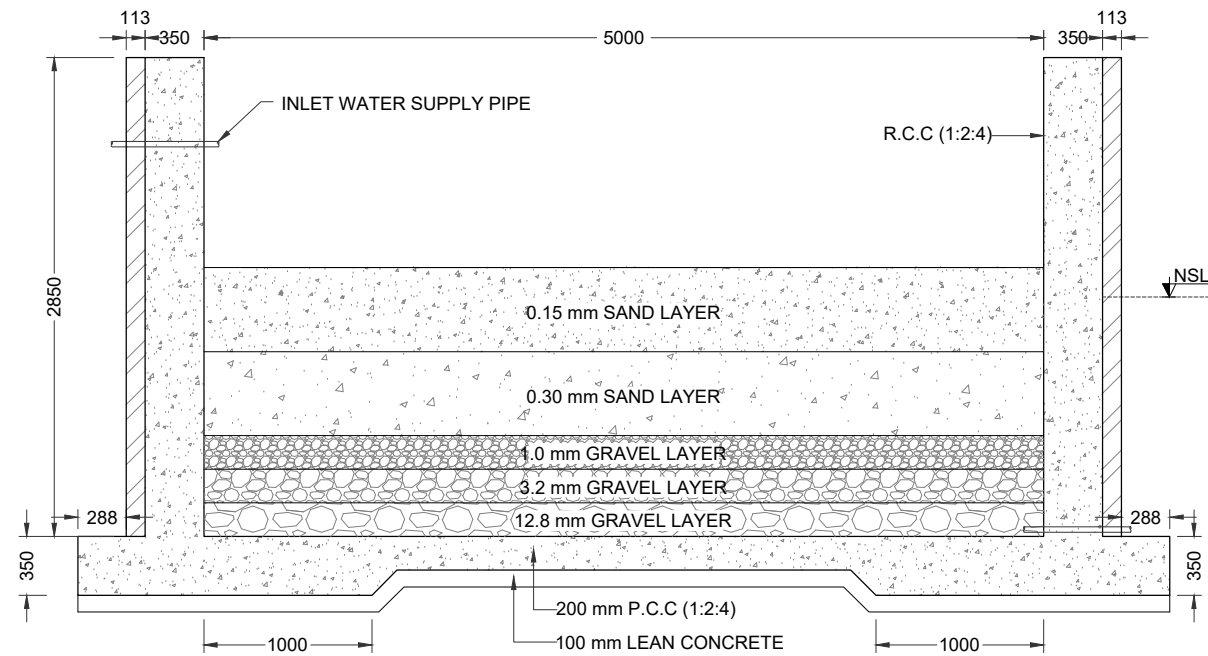
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**PLAN**



**SECTION A-A**

**NOTES:**

1. ALL DIMENSIONS & LEVELS ARE IN MILI METERS UNLESS OTHER WISE SPECIFIED.
2. CONCRETE CYLINDER STRENGTH 28 DAYS=4000 PSI.
3. LEAN CONCRETE CYLINDER STRENGTH 28 DAYS=1500PSI.
4. REINFORCEMENT AS PER ASTM A615.

**REFERENCE DRAWINGS :-**

ZKD-DD-WS-01  
ZKD-DD-WS-02

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CLIENT:

PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT, KPK.

CONSULTANTS:

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**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.

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PROJECT:

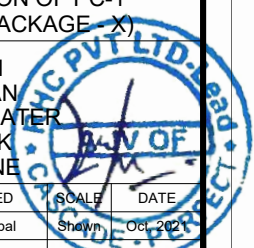
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1  
FOR 5 SMALL DAMS IN FATA (PACKAGE X)

TITLE:

ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS WATER  
FILTRATION TANK  
CONCRETE OUTLINE

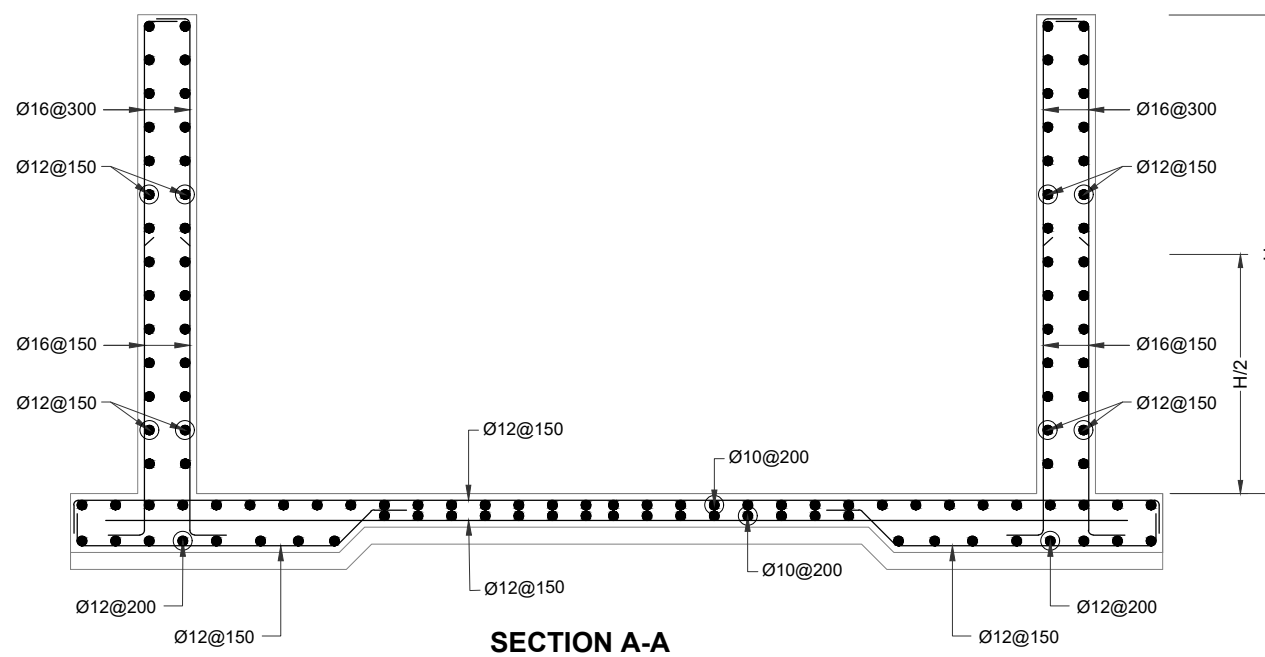
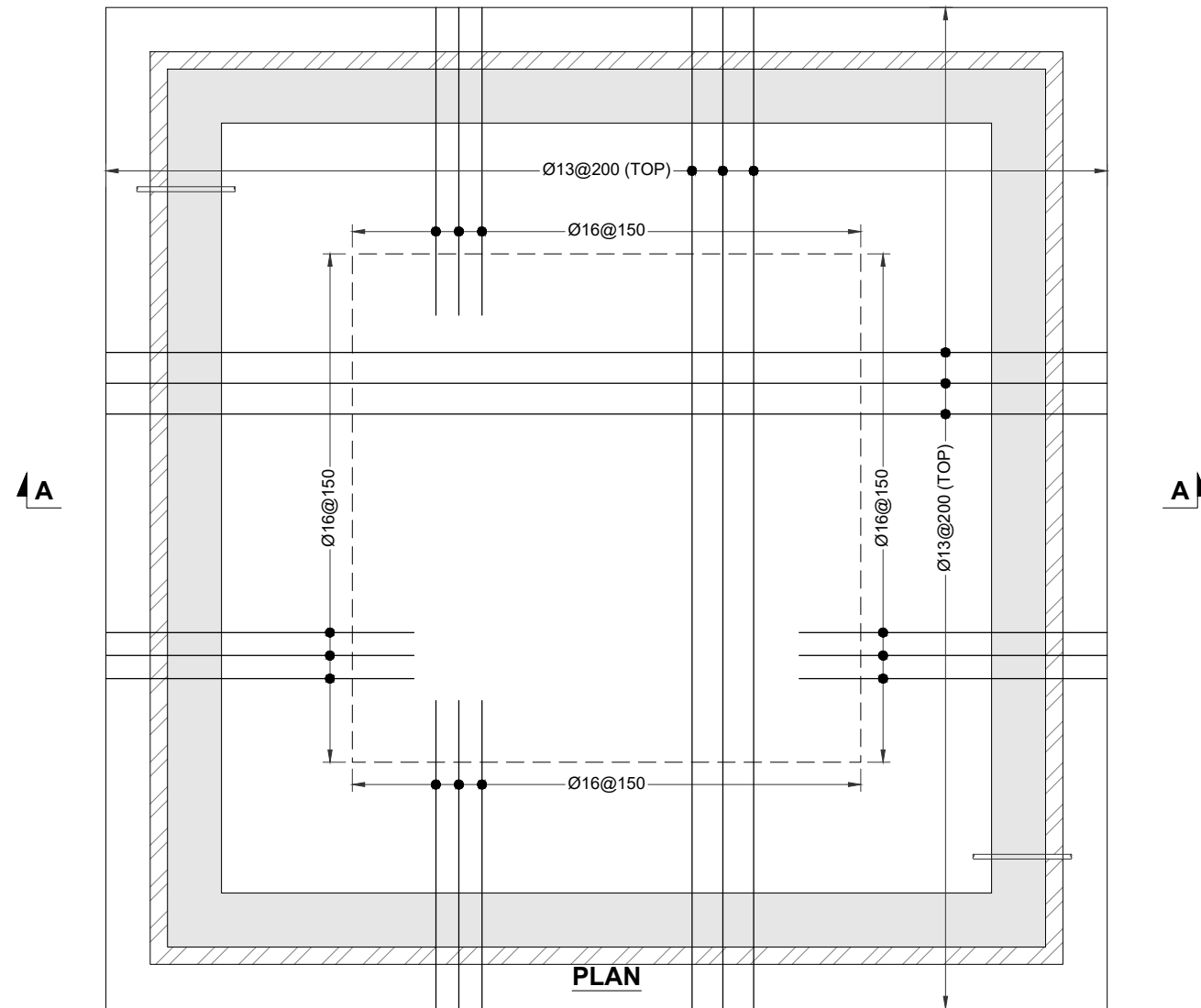
DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	Oct 2021

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4. REINFORCEMENT AS PER ASTM A615.

ASTM A615		
Deformed Bar Designation Numbers, Nominal Weights (Masses), Nominal Dimensions		
Bar Designation No.	Nominal Weight, lb/ft (Nominal Mass, Kg/m)	Diameter, in. (mm)
3(10)	0.376 (0.560)	0.375 (9.5)
4(13)	0.668 (0.994)	0.500 (12.7)
5(16)	1.043 (1.552)	0.625 (15.9)
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9(29)	3.400 (5.060)	1.128 (28.7)
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18(57)	13.60 (20.24)	2.257 (57.3)

N.B BARS ARE TO BE PROVIDED AS #3, #4, #5, AND #18 AS PER ASTM A615 WHICH ARE FRACTION OF INCHES.

**REFERENCE DRAWINGS :-**

ZKD-DD-WS-01  
ZKD-DD-WS-02

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CLIENT:

PSU SMALL DAM SECTION MERGED AREA  
IRRIGATION DEPARTMENT, KPK.

CONSULTANTS:

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**RHC** REHMAN HABIB CONSULTANTS (PVT) LTD.

**CASCAD** CASCADE GROUP  
OF ENGINEERING & CONSULTANTS

**PEMG** PERFECT ENGINEERING &  
MANAGEMENT CONSULTANTS

PROJECT:  
CONSULTANCY SERVICES FOR FEASIBILITY STUDY,  
DETAIL DESIGN & PREPARATION OF PC-1  
FOR 5 SMALL DAMS IN FATA (PACKAGE X)

TITLE:  
ZAKAR KHEL DAM  
NORTH WAZIRISTAN  
TENDER DRAWINGS WATER  
FILTRATION TANK  
REINFORCEMENT DETAILS

DRAWN	DESIGNED	CHECKED	APPROVED	SCALE	DATE
Usman Y.	Usman R.	Zeeshan S.	Zafar Iqbal	Shown	Oct 2021

DRG.No:- ZKD-DD-WS-03 SHEET:- 2 OF 2 SUB SH. ---

