WORKS AND SERVICES DEPARTMENT
GOVERNMENT OF SINDH

ADB Asian Development Bank

LOAN NO. 4279-PAK (COL): EMERGENCY FLOOD ASSISTANCE PROJECT (EFAP)

PACKAGE No. 12

NF-4

REHABILITATION OF ROAD FROM KANDIARO LAKHA ROAD AT POINT RAJPAR CHOWDAGI UPTO SAEED KHAN LAKHO ROAD

(Length: 9.980kms, Width: 3.65m)

DESIGN CONSULTANT
ECIL
In association with
AA

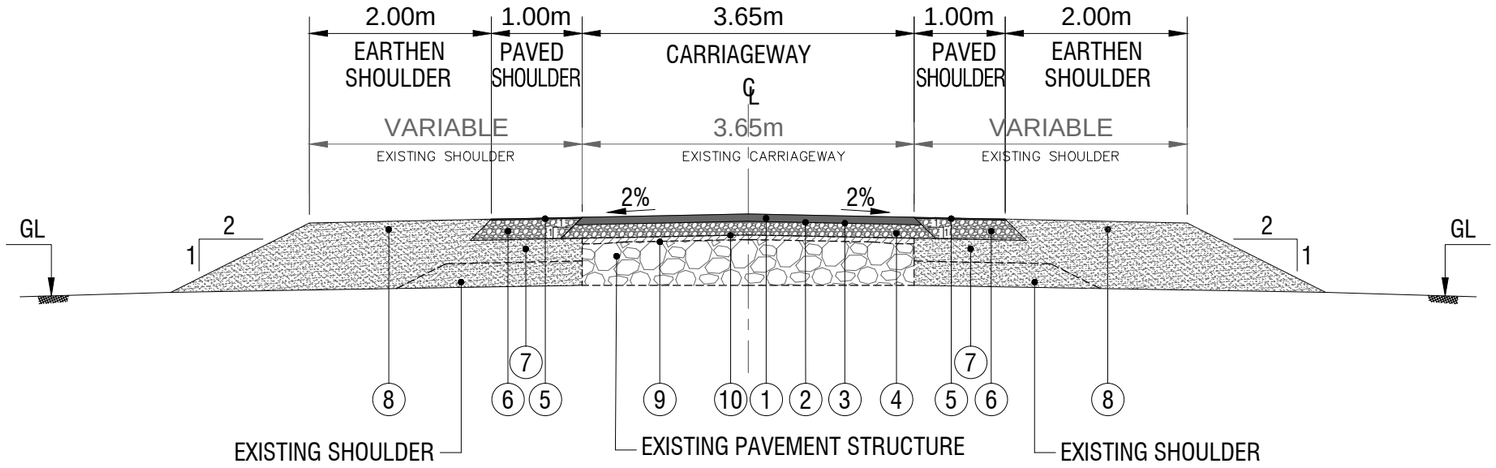
Engineering Consultant Int'l. (Pvt.) Ltd.
A.A.ASSOCAITES

JULY - 2023

TENDER DRAWING

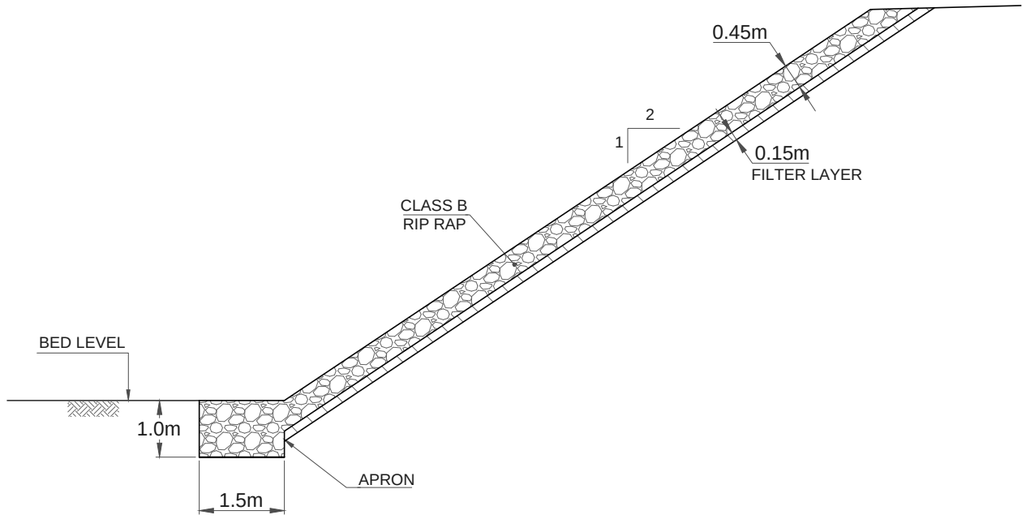
GENERAL DRAWINGS

CLIENT:- ADB Asian Development Bank EXECUTING AGENCY:- WORKS AND SERVICES DEPARTMENT GOVERNMENT OF SINDH	PROJECT:- LOAN NO. 4279 (COL): EMERGENCY FLOOD ASSISTANT PROJECT (EFAP)	DESIGN CONSULTANT ECIL In association with	PROJECT ROAD:- **NF - 4** Rehabilitation of road from Kandiaro Lakha road at point Rajpar Chowdagi upto Saeed Khan Lakho road TITLE:- LOCATION PLAN	ED. NO.	DATE:-	DESCRIPTION	DRAWN: N.S.SIDDIQUI DESIGN: HINA ZEESHAN CHECKED: NAVEED HASSAN DATE: JUNE, 2023	DRAWING NO. NF-4 GEN-02 Scale:- 1:30000 (A1) 1:60000 (A3) Edition:- 0



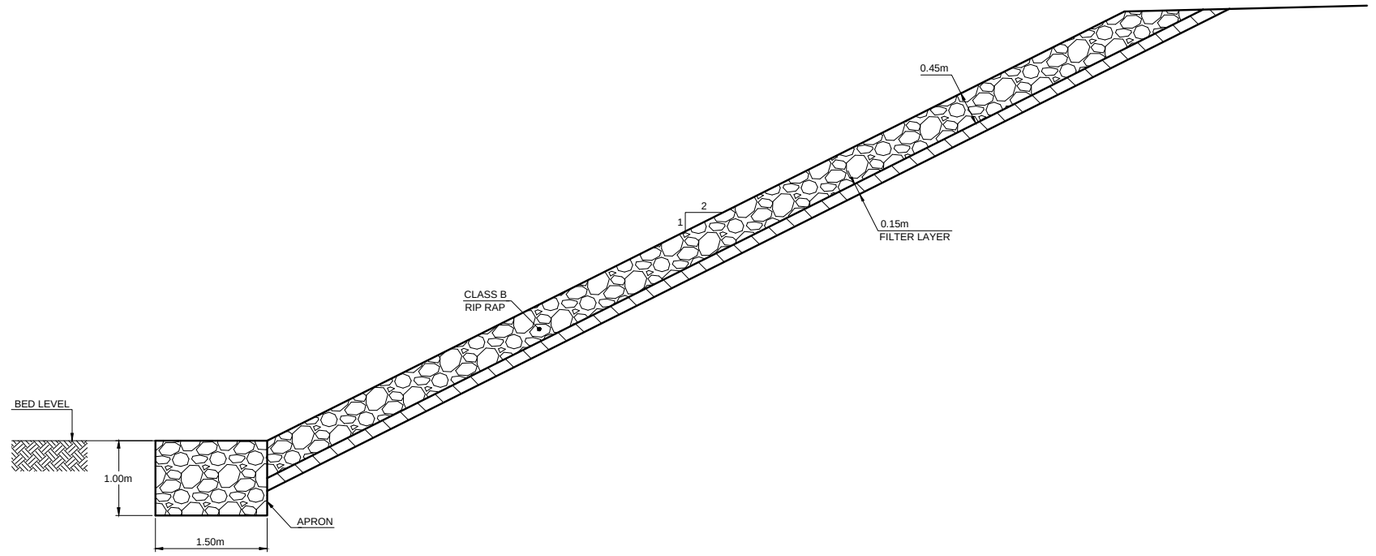
NOTES :-

1. ASPHALT CONCRETE WEARING COURSE (CLASS A) 5cm
2. TACK COAT
3. SINGLE SURFACE TREATMENT
4. WATER BOUND MACADAM 25cm
5. TRIPLE SURFACE TREATMENT
6. WATER BOUND MACADAM ..... 15cm.
7. BORROW SOIL HAVING SOAKED CBR 7% & PI NOT GREATER THAN 6% 30cm
8. EARTHEN SHOULDER.
9. EXISTING ROAD BITUMINOUS SURFACING IS TO BE SCARIFIED AND REMOVED THE EXPOSED SURFACE AFTER SCARIFICATION SHALL BE COMPACTED TO SPECIFIED DENSITY.
10. IN STRETCHES / SEGMENTS WHERE THERE IS NO EXISTING BITUMINOUS SURFACING AS THE SAME HAS BEEN WORN OUT,SKIN PATCHES OF TRANSPORTED CONTAMINATED SOIL IS TO REMOVED FROM SURFACE AND COMPACTED TO SPECIFIED DENSITY.
11. ALL DIMENSIONS ARE IN METER EXCEPT OTHER WISE MENTIONED.



TYPICAL SECTION OF PROTECTION WORKS

CLIENT:- ADB Asian Development Bank EXECUTING AGENCY:- WORKS AND SERVICES DEPARTMENT GOVERNMENT OF SINDH	PROJECT:- LOAN NO. 4279-PAK (COL): EMERGENCY FLOOD ASSISTANCE PROJECT (EFAP)	DESIGN CONSULTANT ECIL In association with AAI	PROJECT ROAD:- **NF - 4** Rehabilitation of road from Kandiaro Lakha road at point Rajpar Chowdagi upto Saeed Khan Lakho road TITLE:- TYIPCAL CROSS SECTION 0+000 TO END REHABILITATION (3.65m)	ED.NO. / DATE / DESCRIPTION	DRAWN: M. NOMAN SIDDIQUI DESIGNED: ANDLEEB CHECKED: BUX ALI ABRO DATE: JULY, 2023	DRAWING NO. NF-4 Scale:- N.T.S. Edition. 0



TYPICAL SECTION OF PROTECTION WORKS

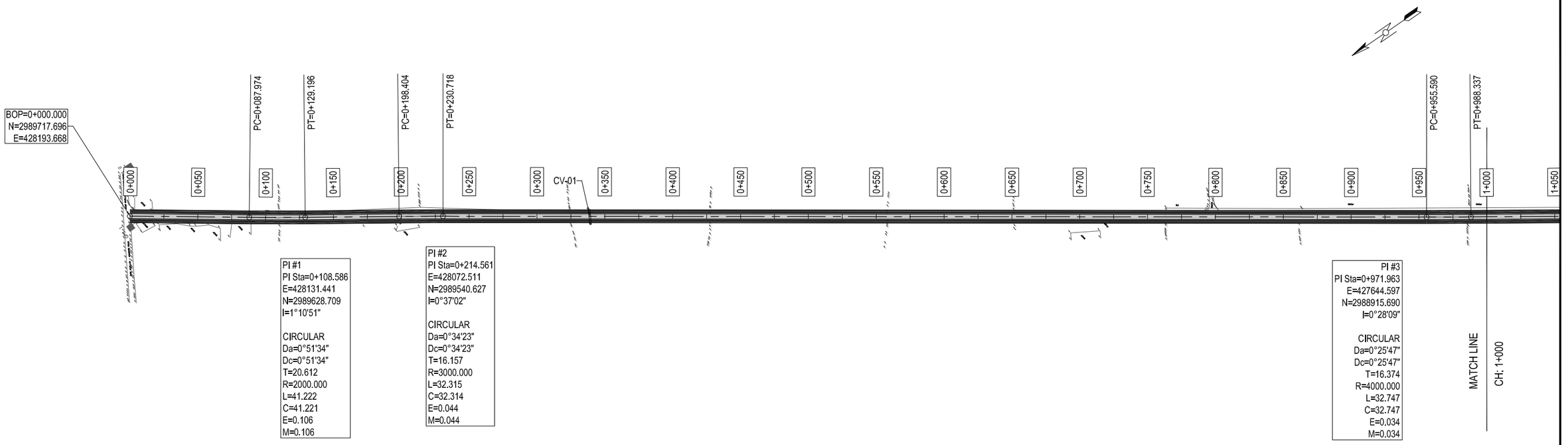
TENTATIVE SCHEDULE			
FROM	TO	SIDE	REMARKS
-	-	-	-

NOTES :-

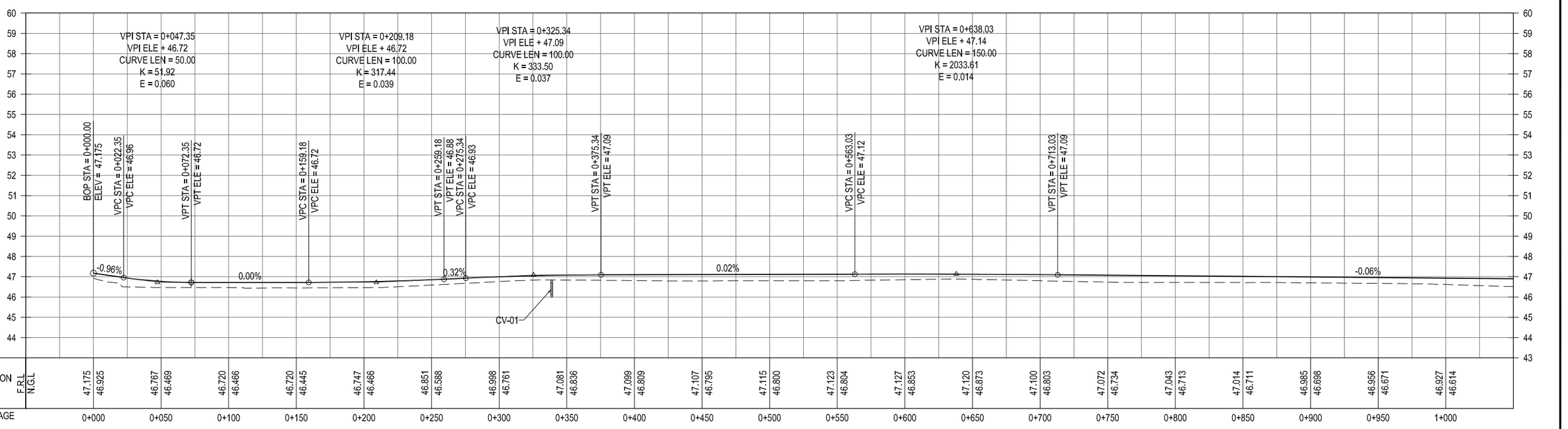
1. PROTECTION WORK SHALL BE APPLICABLE ON REACHES WHICH WILL BE IDENTIFIED IN THE HYDROLOGY REPORT AND AROUND ENTRY AND EXIT OF CULVERT/BRIDGES.
2. ALL DIMENSIONS ARE IN METERS EXCEPT OTHERWISE MENTIONED.

CLIENT:- ADB Asian Development Bank EXECUTING AGENCY:- WORKS AND SERVICES DEPARTMENT GOVERNMENT OF SINDH	PROJECT:- LOAN NO. 4279-PAK (COL): EMERGENCY FLOOD ASSISTANCE PROJECT (EFAP)	DESIGN CONSULTANT ECIL In association with AA	PROJECT ROAD:- **NF - 4** Rehabilitation of road from Kndiaro Lakha road at point Rajpar Chowdagi upto Saeed Khan Lakho road TITLE:- PROTECTION WORK SCHEDULE	ED.NO.	DATE	DESCRIPTION	DRAWN: N. SAQIB SIDDIQUI DESIGNED: HINA ZEESHAN CHECKED: NAVEED HASSAN DATE: JUNE, 2023	DRAWING NO. PW-NF-1 Scale:- N.T.S. Edition. 0

PLAN & PROFILE DRAWINGS



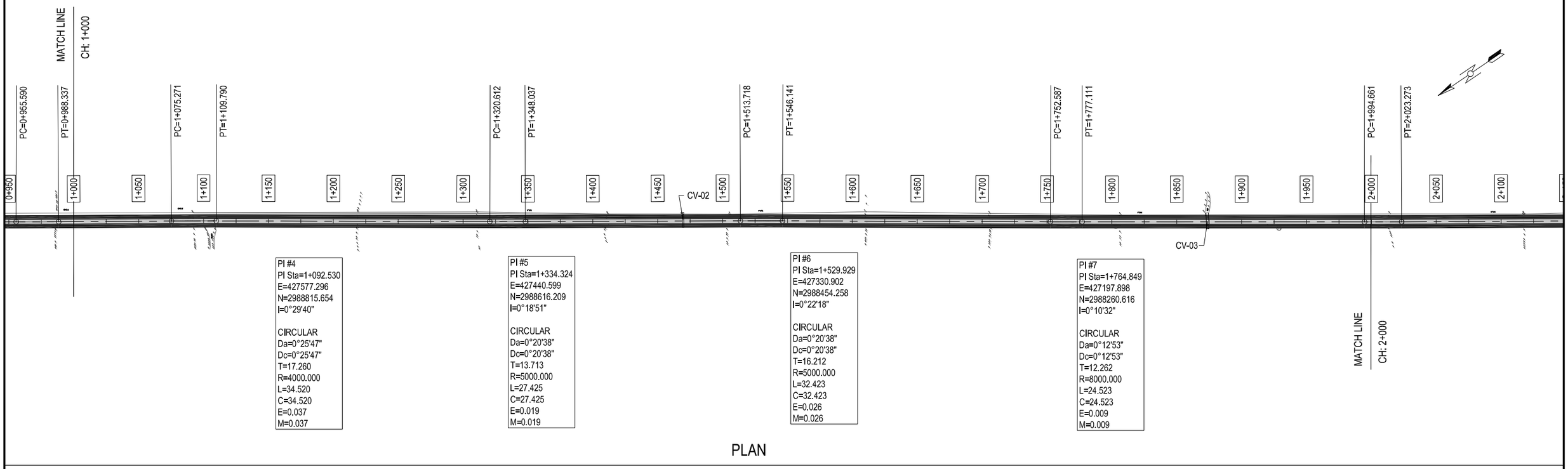
PLAN



PROFILE

CLIENT:- ADB Asian Development Bank EXECUTING AGENCY:- WORKS AND SERVICES DEPARTMENT GOVERNMENT OF SINDH	PROJECT:- LOAN NO. 4279-PAK (COL): EMERGENCY FLOOD ASSISTANCE PROJECT (EFAP)	DESIGN CONSULTANT ECIL In association with AA	PROJECT ROAD:- NF-04 REHABILITATION OF ROAD FROM KANDIARO LAKHA ROAD AT POINT RAJPAR CHOWDAGI UPTO SAEED KHAN LAKHO ROAD TITLE:- PLAN & PROFILE OF NF-04 CH: 0+000 TO 1+000	ED.NO. / DATE / DESCRIPTION 0 / JULY,2023 / ISSUED FOR APPROVAL	DRAWN: JUNAID DESIGNED: HINA ZEESHAN CHECKED: NAVEED HASSAN DATE: MAY, 2023	DRAWING NO. HWY-NF04-PP-01 Scale:- H=1:2000 V=1:20 Edition. 0

Fri, 21 Jul 2023 - 3:53pm
junaidr D:\SINDH ROADS\PLAN & PROFILE\NF-04\ NF-04-PP-01.dwg



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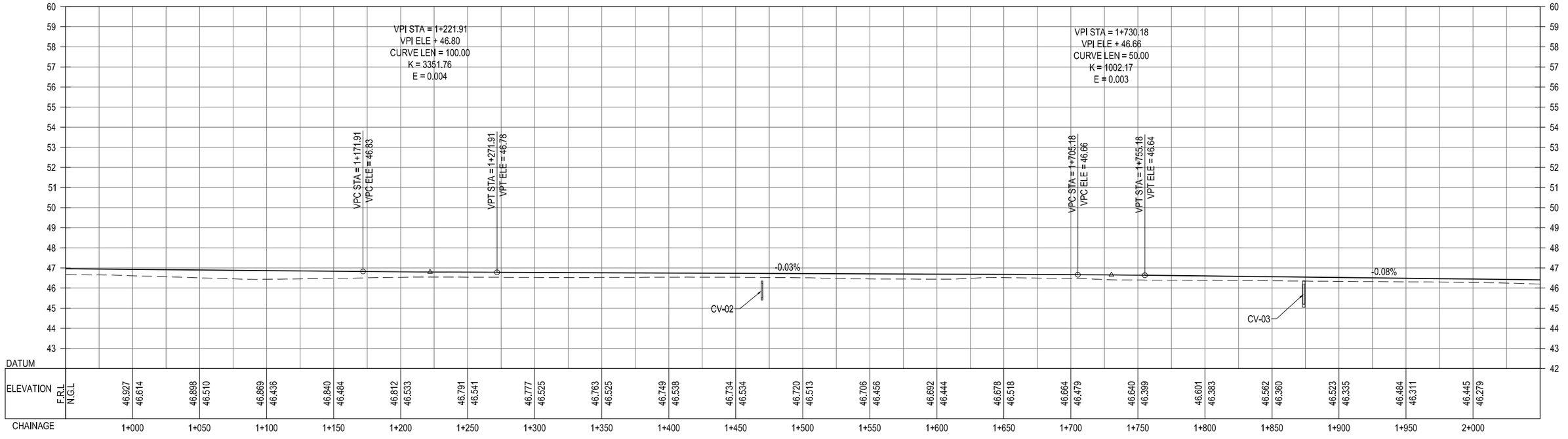

PROFILE

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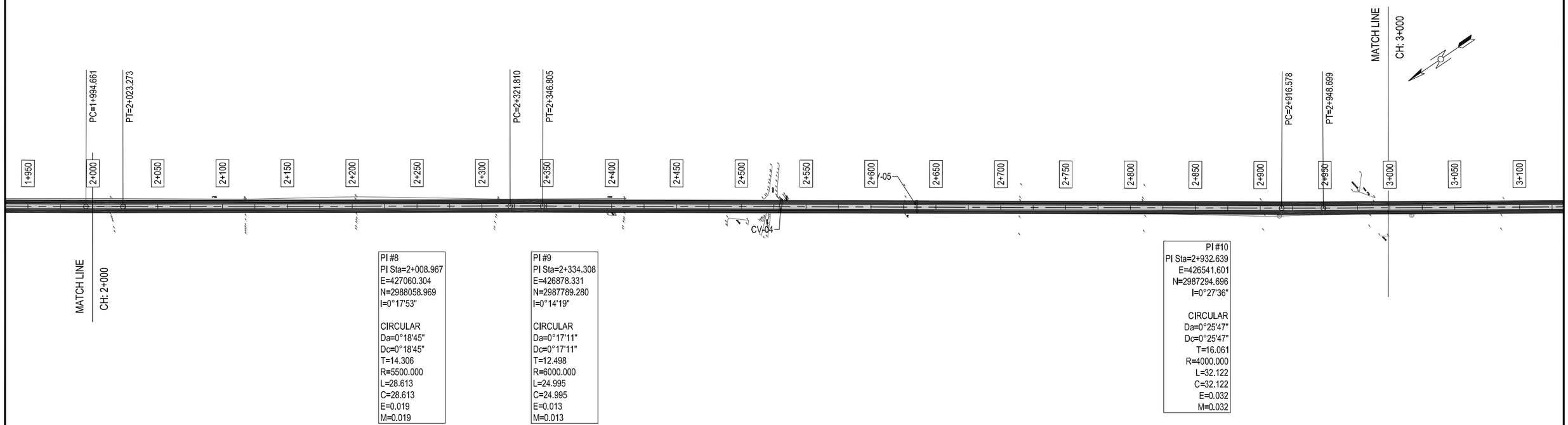
CLIENT:- ADB Asian Development Bank EXECUTING AGENCY:- WORKS AND SERVICES DEPARTMENT GOVERNMENT OF SINDH	PROJECT:- LOAN NO. 4279-PAK (COL): EMERGENCY FLOOD ASSISTANCE PROJECT (EFAP)	DESIGN CONSULTANT ECIL in association with AAI	PROJECT ROAD:- NF-04 REHABILITATION OF ROAD FROM KANDIARO LAKHA ROAD AT POINT RAJPAR CHOWDAGI UPTO SAEED KHAN LAKHO ROAD TITLE:- PLAN & PROFILE OF NF-04 CH: 1+000 TO 2+000	ED.NO. / DATE / DESCRIPTION 0 / JULY,2023 / ISSUED FOR APPROVAL	DRAWN: JUNAID DESIGNED: HINA ZEESHAN CHECKED: NAVEED HASSAN DATE: MAY, 2023	DRAWING NO. HWY-NF04-PP-02 Scale:- H=1:2000 V=1:20 Edition. 0



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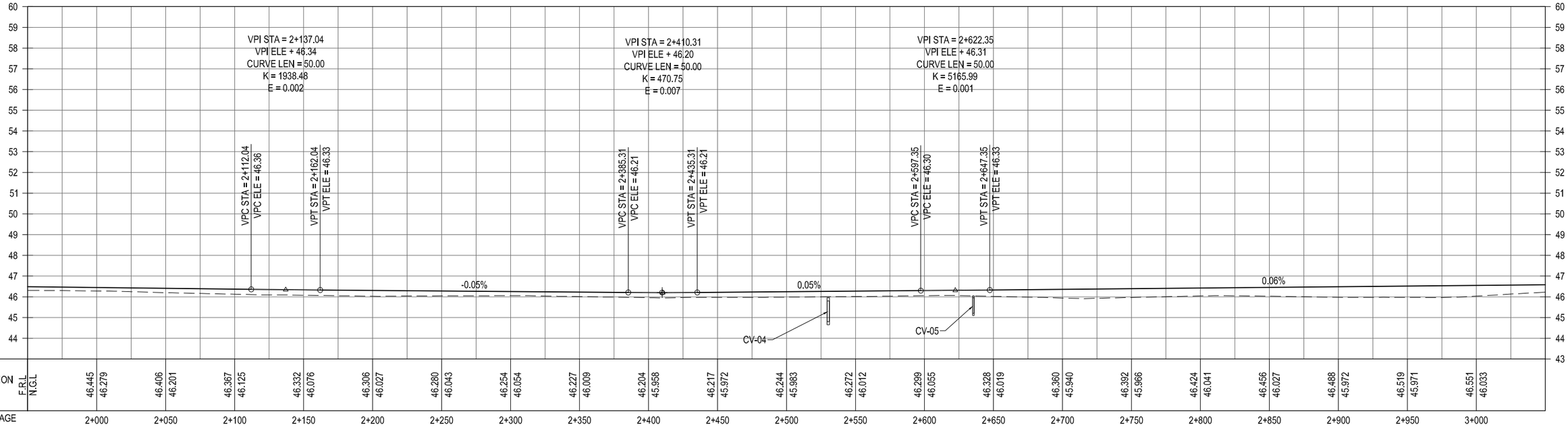

PROFILE

Fri, 21 Jul 2023 - 4:45pm
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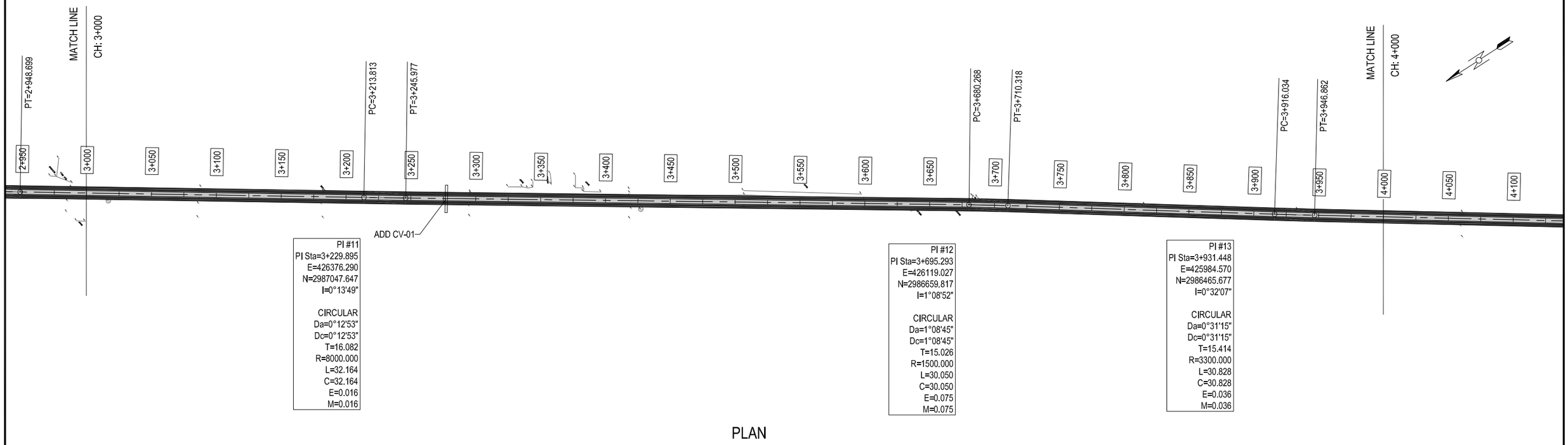
CLIENT:- ADB Asian Development Bank EXECUTING AGENCY:- WORKS AND SERVICES DEPARTMENT GOVERNMENT OF SINDH	PROJECT:- LOAN NO. 4279-PAK (COL): EMERGENCY FLOOD ASSISTANCE PROJECT (EFAP)	DESIGN CONSULTANT ECIL In association with AA	PROJECT ROAD:- NF-04 REHABILITATION OF ROAD FROM KANDIARO LAKHA ROAD AT POINT RAJPAR CHOWDAGI UPTO SAEED KHAN LAKHO ROAD TITLE:- PLAN & PROFILE OF NF-04 CH: 2+000 TO 3+000	ED.NO. / DATE / DESCRIPTION 0 / JULY,2023 / ISSUED FOR APPROVAL	DRAWN: JUNAID DESIGNED: HINA ZEESHAN CHECKED: NAVEED HASSAN DATE: MAY, 2023	DRAWING NO. HWY-NH04-PP-03 Scale:- H=1:2000 V=1:20 Edition. 0



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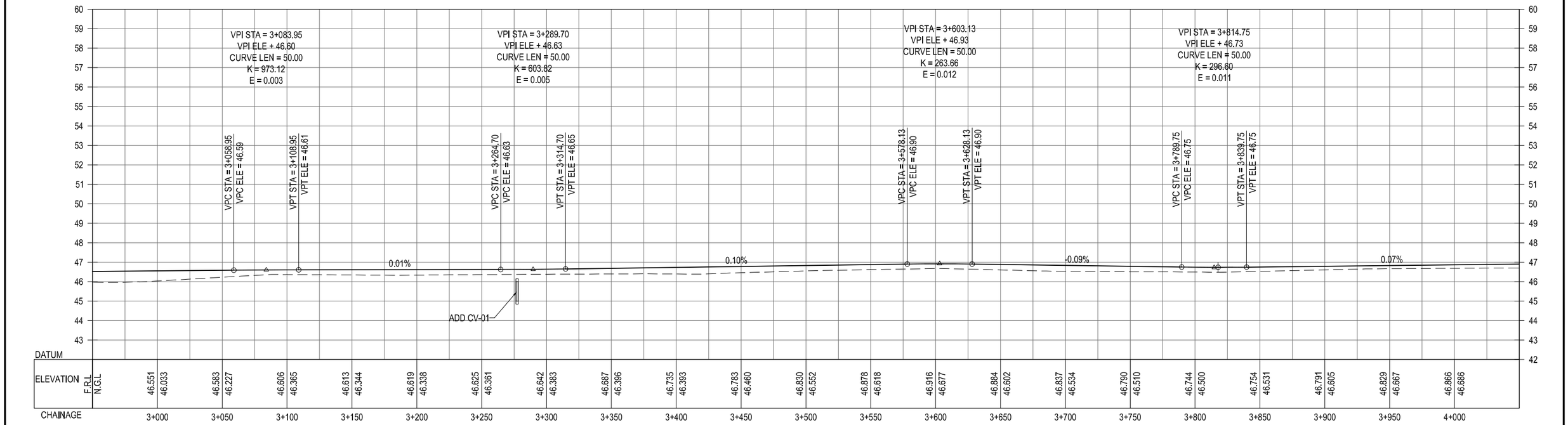

PROFILE

Fri, 21 Jul 2023 – 4:56pm
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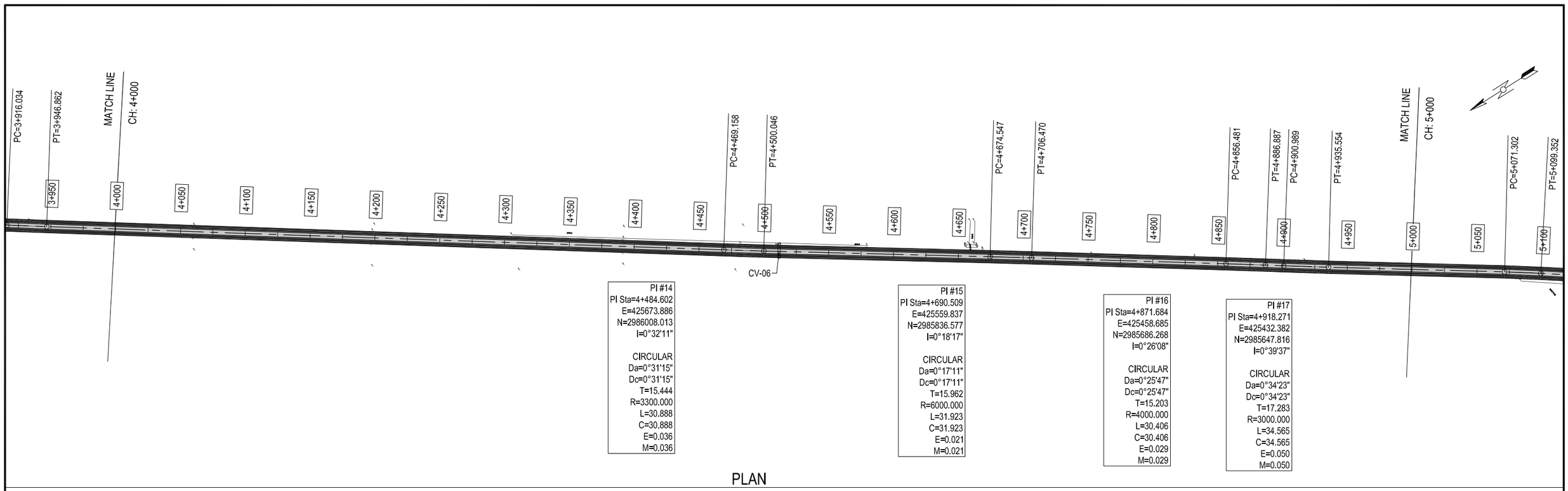
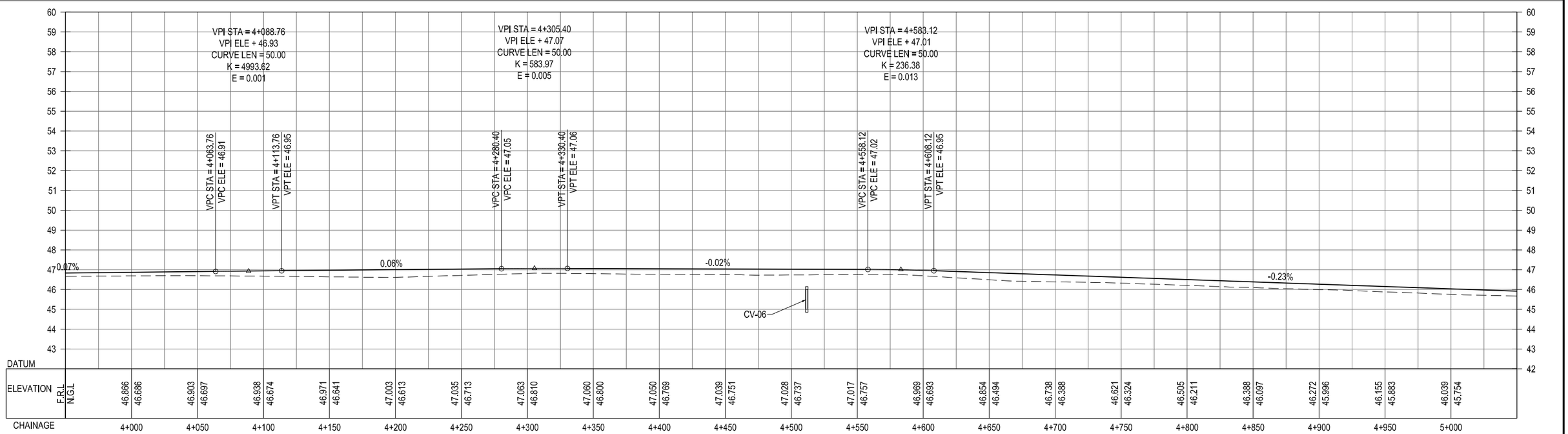
CLIENT:- ADB Asian Development Bank EXECUTING AGENCY:- WORKS AND SERVICES DEPARTMENT GOVERNMENT OF SINDH	PROJECT:- LOAN NO. 4279-PAK (COL): EMERGENCY FLOOD ASSISTANCE PROJECT (EFAP)	DESIGN CONSULTANT ECIL In association with	PROJECT ROAD:- NF-04 REHABILITATION OF ROAD FROM KANDIARO LAKHA ROAD AT POINT RAJPAR CHOWDAGI UPTO SAEED KHAN LAKHO ROAD TITLE:- PLAN & PROFILE OF NF-04 CH: 3+000 TO 4+000	ED.NO. / DATE / DESCRIPTION 0 / JULY,2023 / ISSUED FOR APPROVAL	DRAWN: JUNAID DESIGNED: HINA ZEESHAN CHECKED: NAVEED HASSAN DATE: MAY, 2023	DRAWING NO. HWY-NF04-PP-04 Scale:- H=1:2000 V=1:20 Edition. 0

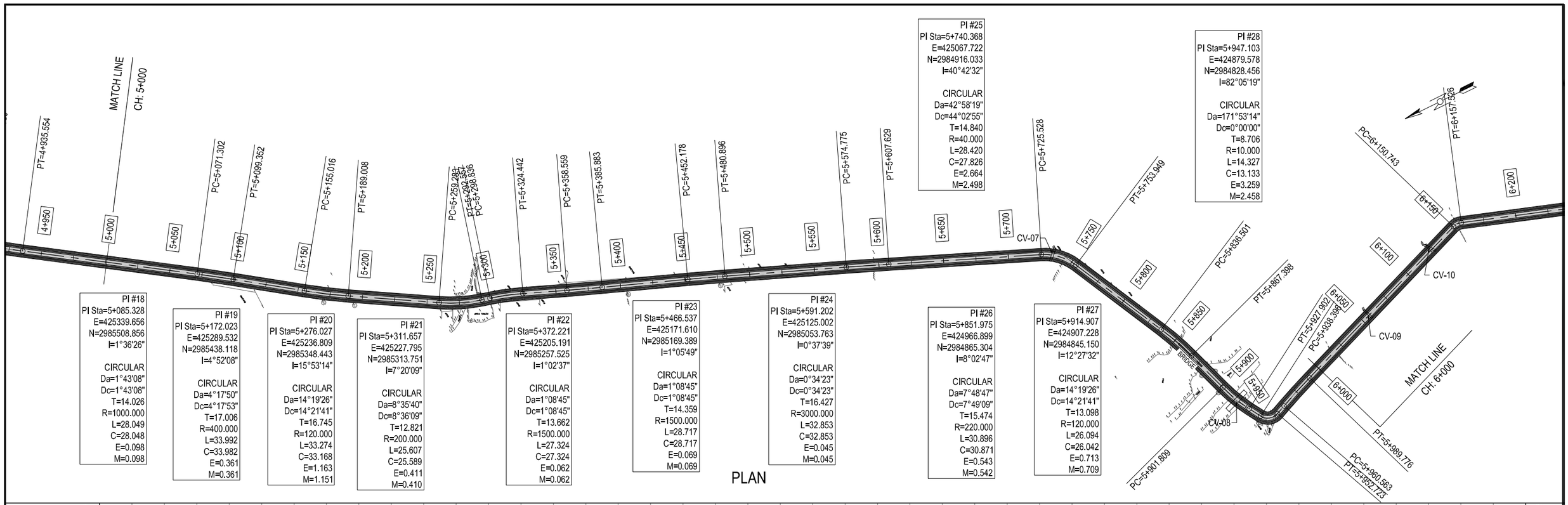


PLAN



PROFILE

CLIENT:- ADB Asian Development Bank EXECUTING AGENCY:- WORKS AND SERVICES DEPARTMENT GOVERNMENT OF SINDH	PROJECT:- LOAN NO. 4279-PAK (COL): EMERGENCY FLOOD ASSISTANCE PROJECT (EFAP)	DESIGN CONSULTANT ECIL in association with AA	PROJECT ROAD:- NF-04 REHABILITATION OF ROAD FROM KANDIARO LAKHA ROAD AT POINT RAJPAR CHOWDAGI UPTO SAEED KHAN LAKHO ROAD TITLE:- PLAN & PROFILE OF NF-04 CH: 4+000 TO 5+000	ED.NO. / DATE / DESCRIPTION 0 / JULY,2023 / ISSUED FOR APPROVAL	DRAWN: JUNAID DESIGNED: HINA ZEESHAN CHECKED: NAVEED HASSAN DATE: MAY, 2023	DRAWING NO. HWY-NF04-PP-05 Scale:- H=1:2000 V=1:20 Edition. 0



Fri, 21 Jul 2023 - 5:23pm
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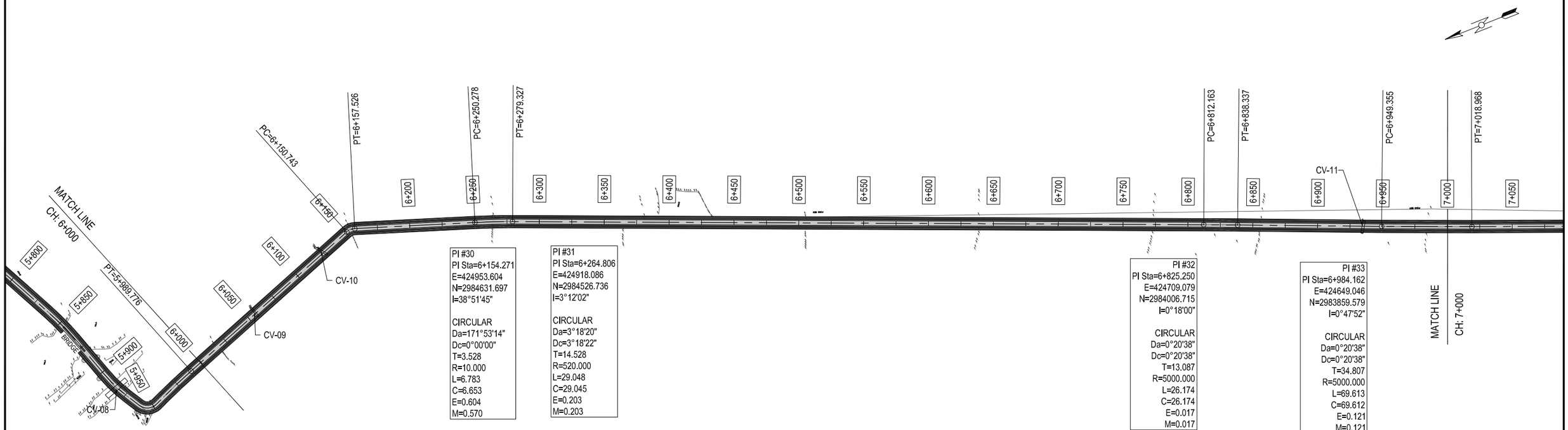
CLIENT:- ADB Asian Development Bank EXECUTING AGENCY:- WORKS AND SERVICES DEPARTMENT GOVERNMENT OF SINDH	PROJECT:- LOAN NO. 4279-PAK (COL): EMERGENCY FLOOD ASSISTANCE PROJECT (EFAP)	DESIGN CONSULTANT FCIL In association with AA	PROJECT ROAD:- NF-04 REHABILITATION OF ROAD FROM KANDIARO LAKHA ROAD AT POINT RAJPAR CHOWDAGI UPTO SAEED KHAN LAKHO ROAD TITLE:- PLAN & PROFILE OF NF-04 CH: 5+000 TO 6+000	ED.NO. / DATE / DESCRIPTION 0 / JULY,2023 / ISSUED FOR APPROVAL	DRAWN: JUNAID DESIGNED: HINA ZEESHAN CHECKED: NAVEED HASSAN DATE: MAY, 2023	DRAWING NO. HWY-NF04-PP-06 Scale:- H=1:2000 V=1:20 Edition. 0



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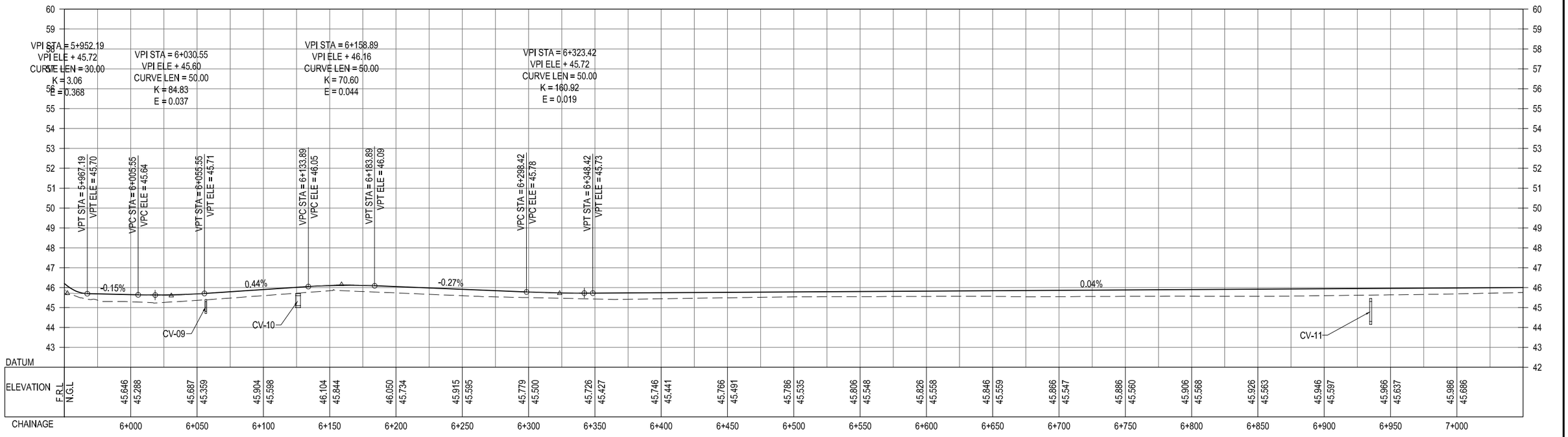

PROFILE

Fri, 21 Jul 2023 – 5:34pm
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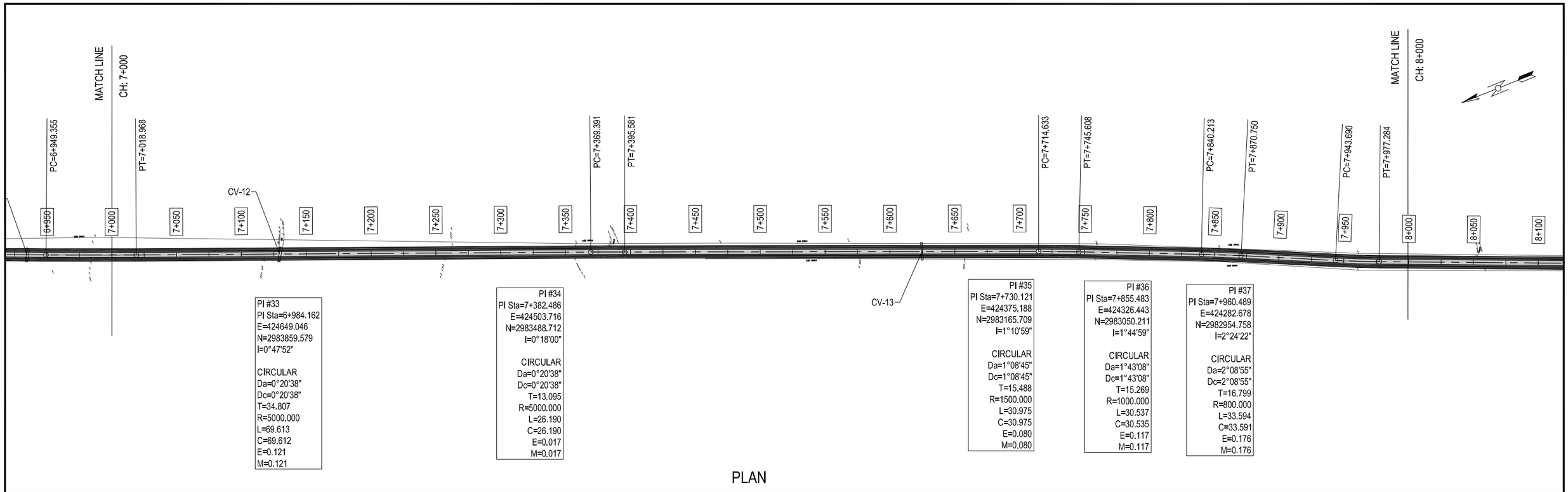
CLIENT:- ADB Asian Development Bank EXECUTING AGENCY:- WORKS AND SERVICES DEPARTMENT GOVERNMENT OF SINDH	PROJECT:- LOAN NO. 4279-PAK (COL): EMERGENCY FLOOD ASSISTANCE PROJECT (EFAP)	DESIGN CONSULTANT FCIL In association with	PROJECT ROAD:- NF-04 REHABILITATION OF ROAD FROM KANDIARO LAKHA ROAD AT POINT RAJPAR CHOWDAGI UPTO SAEED KHAN LAKHO ROAD TITLE:- PLAN & PROFILE OF NF-04 CH: 6+000 TO 7+000	ED.NO. / DATE / DESCRIPTION 0 / JULY,2023 / ISSUED FOR APPROVAL	DRAWN: JUNAID DESIGNED: HINA ZEESHAN CHECKED: NAVEED HASSAN DATE: MAY, 2023	DRAWING NO. HWY-NF04-PP-07 Scale:- H=1:2000 V=1:20 Edition. 0



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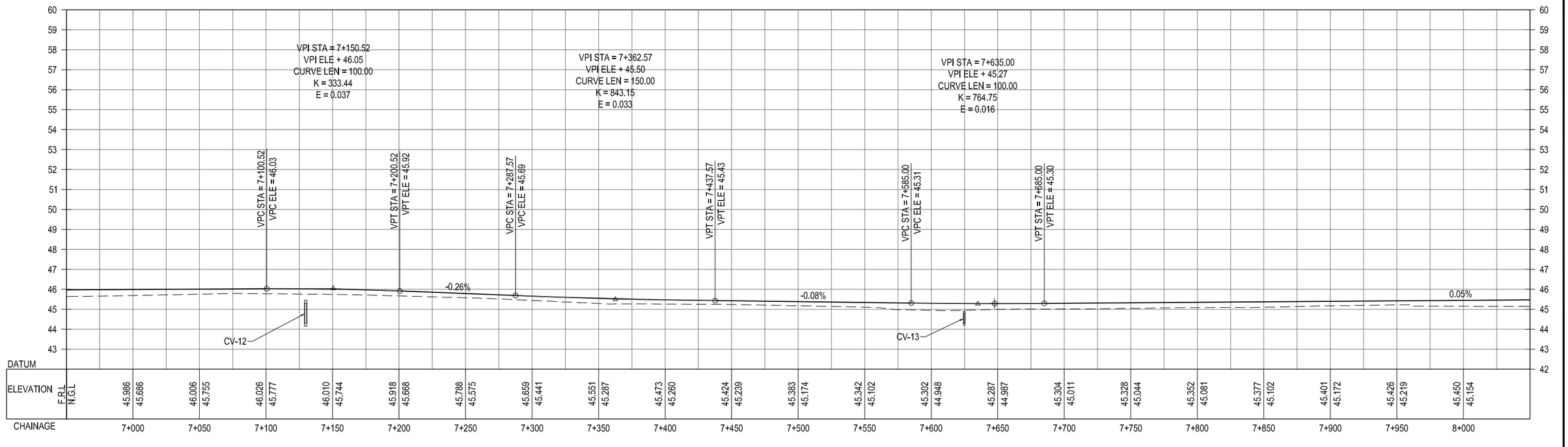

PROFILE

Fri, 21 Jul 2023 – 5:43pm
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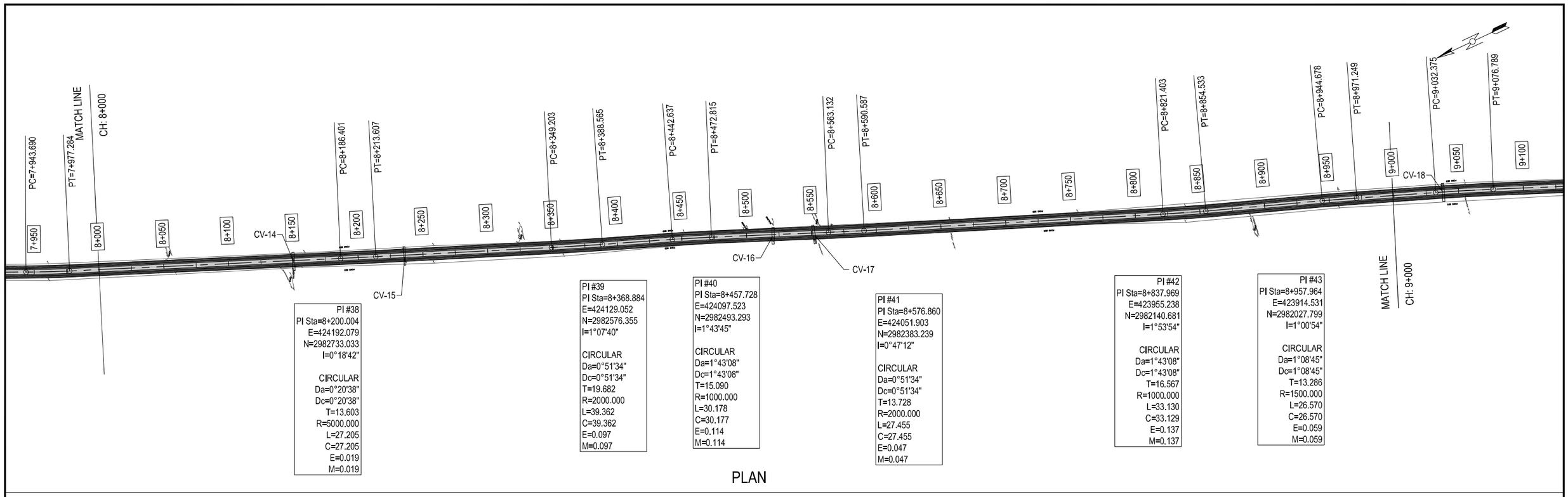
CLIENT:- ADB Asian Development Bank EXECUTING AGENCY:- WORKS AND SERVICES DEPARTMENT GOVERNMENT OF SINDH	PROJECT:- LOAN NO. 4279-PAK (COL): EMERGENCY FLOOD ASSISTANCE PROJECT (EFAP)	DESIGN CONSULTANT ECIL In association with AA	PROJECT ROAD:- NF-04 REHABILITATION OF ROAD FROM KANDIARO LAKHA ROAD AT POINT RAJPAR CHOWDAGI UPTO SAEED KHAN LAKHO ROAD TITLE:- PLAN & PROFILE OF NF-04 CH: 8+000 TO 9+000	ED.NO. / DATE / DESCRIPTION 0 / JULY,2023 / ISSUED FOR APPROVAL	DRAWN: JUNAID DESIGNED: HINA ZEESHAN CHECKED: NAVEED HASSAN DATE: MAY, 2023	DRAWING NO. HWY-NF04-PP-08 Scale:- H=1:2000 V=1:20 Edition. 0



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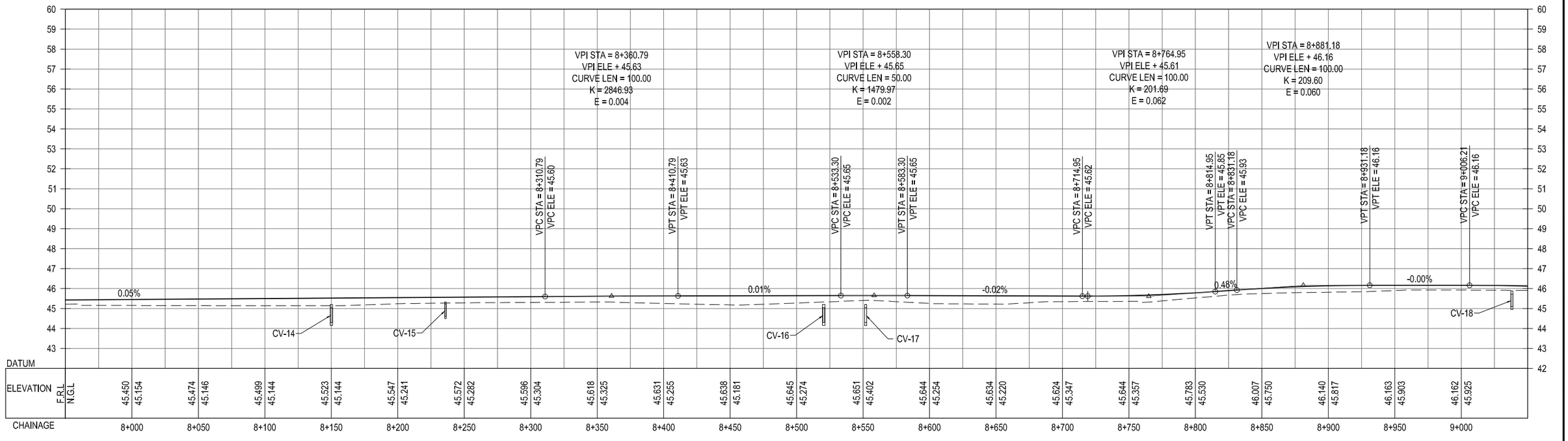
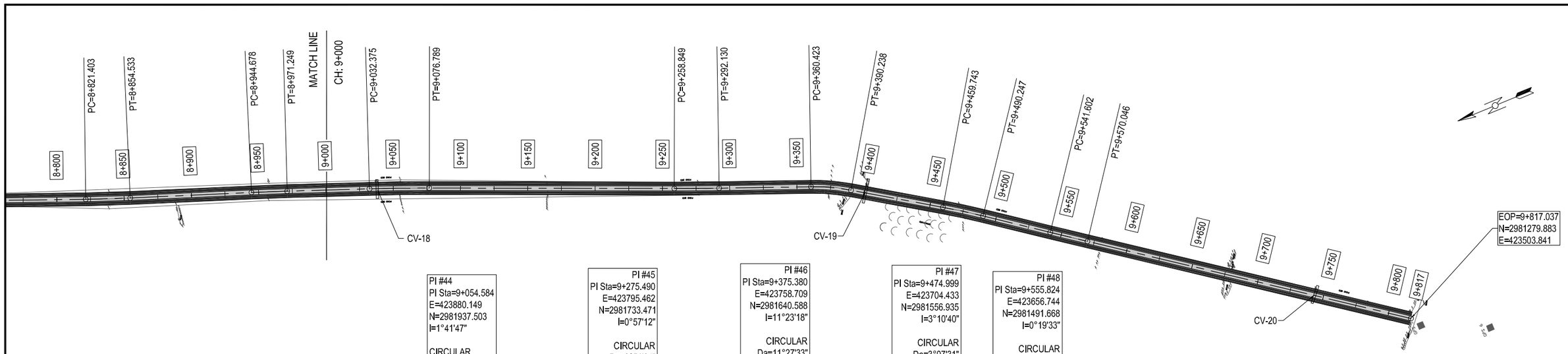


PROFILE

Sat, 22 Jul 2023 – 10:06am
junaidr D:\SINDH ROADS\PLAN & PROFILE\NF-04\ NF-04-PP-09.dwg

CLIENT:- ADB Asian Development Bank EXECUTING AGENCY:- WORKS AND SERVICES DEPARTMENT GOVERNMENT OF SINDH	PROJECT:- LOAN NO. 4279-PAK (COL): EMERGENCY FLOOD ASSISTANCE PROJECT (EFAP)	DESIGN CONSULTANT FCIL In association with AA	PROJECT ROAD:- NF-04 REHABILITATION OF ROAD FROM KANDIARO LAKHA ROAD AT POINT RAJPAR CHOWDAGI UPTO SAEED KHAN LAKHO ROAD TITLE:- PLAN & PROFILE OF NF-04 CH: 8+000 TO 9+000	ED.NO.	DATE	DESCRIPTION	DRAWN: JUNAID DESIGNED: HINA ZEESHAN CHECKED: NAVEED HASSAN DATE: MAY, 2023	DRAWING NO. HWY-NF04-PP-09 Scale:- H=1:2000 V=1:20 Edition. 0
				0	JULY,2023	ISSUED FOR APPROVAL		



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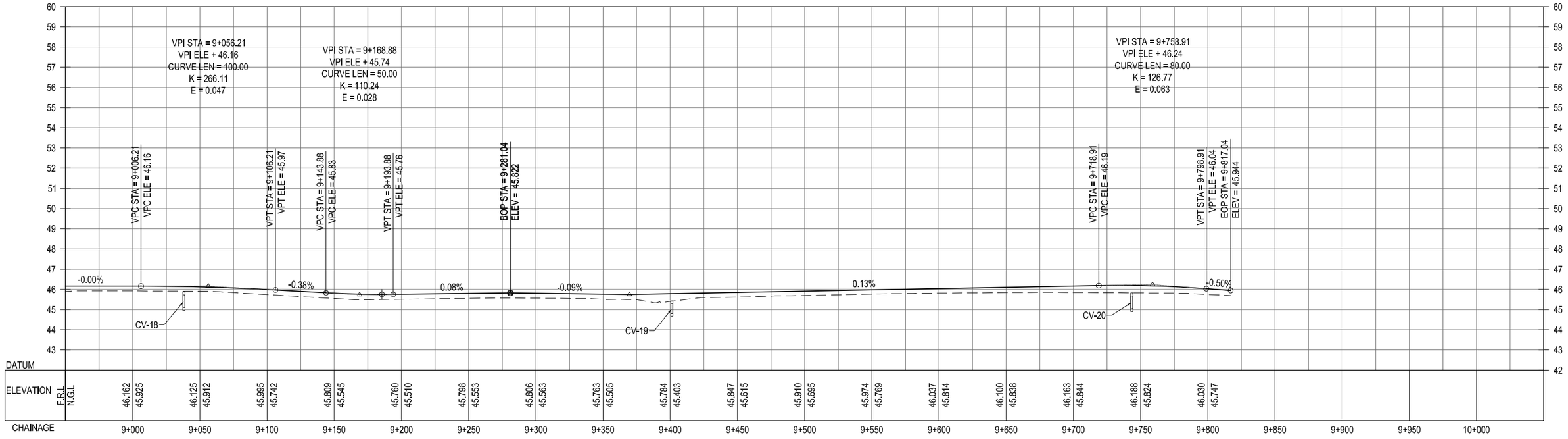


PROFILE

Sat, 22 Jul 2023 - 10:07am
junaidr D:\SINDH ROADS\PLAN & PROFILE\NF-04\ NF-04-PP-10.dwg

CLIENT:- ADB Asian Development Bank EXECUTING AGENCY:- WORKS AND SERVICES DEPARTMENT GOVERNMENT OF SINDH	PROJECT:- LOAN NO. 4279-PAK (COL): EMERGENCY FLOOD ASSISTANCE PROJECT (EFAP)	DESIGN CONSULTANT ECIL In association with AA	PROJECT ROAD:- NF-04 REHABILITATION OF ROAD FROM KANDIARO LAKHA ROAD AT POINT RAJPAR CHOWDAGI UPTO SAEED KHAN LAKHO ROAD TITLE:- PLAN & PROFILE OF NF-04 CH: 9+000 TO 9+817.04	ED.NO. / DATE / DESCRIPTION 0 / JULY,2023 / ISSUED FOR APPROVAL	DRAWN: JUNAID DESIGNED: HINA ZEESHAN CHECKED: NAVEED HASSAN DATE: MAY, 2023	DRAWING NO. HWY-NF04-PP-10 Scale:- H=1:2000 V=1:20 Edition. 0

LIST OF DRAWINGS

S. NO.	DESCRIPTION	DRAWING NO.
1	LIST OF DRAWING	2053-STR-NF04-LD-01
2	GENERAL NOTES	2053-STR-NF04-GN-01
	CULVERTS	
1	SCHEDULE OF CULVERTS	2053-STR-NF04-CU-SCH-01
	BOX CULVERTS	
1	RCC BOX CULVERT - GENERAL ARRANGEMENT	2053-STR-NF04-BC-01
2	RCC BOX CULVERT - DETAILS OF APRON SLAB & WING WALLS	2053-STR-NF04-BC-02
3	RCC BOX CULVERT - REINFORCEMENT DETAILS OF BOX CULVERT	2053-STR-NF04-BC-03
4	RCC BOX CULVERT - REINFORCEMENT DETAILS OF APRON SLAB & WING WALLS (FOR CULVERT HEIGHT ⩽ 2m)	2053-STR-NF04-BC-04
5	REINFORCEMENT DETAILS OF APRON SLAB & WING WALLS FOR CULVERT HEIGHT > 2M	2053-STR-NF04-BC-05
	PIPE CULVERTS	
1	PIPE CULVERT - GENERAL ARRANGEMENT	2053-STR-NF04-PC-01
2	PIPE CULVERT - TYPICAL DETAILS WING WALL & APRON SLAB	2053-STR-NF04-PC-02
3	PIPE CULVERT - REINFORCEMENT DETAILS	2053-STR-NF04-PC-03

CLIENT:- ADB Asian Development Bank

EXECUTING AGENCY:- WORKS AND SERVICES DEPARTMENT GOVERNMENT OF SINDH

PROJECT:- LOAN NO. 4279-PAK (COL): EMERGENCY FLOOD ASSISTANCE PROJECT (EFAP)

DESIGN CONSULTANT ECIL In association with AA

PROJECT ROAD:- DISTRICT : NAUSHEHRO FEROZE - NF-04 REHABILITATION OF ROAD FROM KANDIARO LAKHA ROAD AT POINT RAJPAR CHOWDAGI UPTO SAEED KHAN LAKHO ROAD

TITLE:- LIST OF DRAWINGS

ED.NO.	DATE	DESCRIPTION

DRAWN: F.A.S

DESIGNED: R.I / M.A

CHECKED: S.A

DATE: JUNE 2023

DRAWING NO. 2053-STR-NF04-LD-01

Scale:- 1:1

Edition.

GENERAL NOTES

1. THE STRUCTURES ARE DESIGNED FOR CLASS AA AND CLASS A LOADING SPECIFIED IN GOVERNMENT OF WEST PAKISTAN, HIGHWAY DEPARTMENT CODE OF PRACTICE FOR HIGHWAY BRIDGES, 1967.
2. CONCRETE IN ALL ELEMENTS OF SUBSTRUCTURE BELOW GROUND LINE TO BE MADE FROM ORDINARY PORTLAND CEMENT. IF SUBSOIL INVESTIGATIONS INDICATE THE PRESENCE OF SULPHATES IN BEARING SOIL, THEN SULPHATE RESISTING CEMENT INSTEAD OF ORDINARY PORTLAND CEMENT SHALL BE USED.
3. ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO GENERAL SPECIFICATIONS (1998) AS GIVEN IN CONTRACT DOCUMENTS AND RELEVANT AASHTO STANDARDS UNLESS OTHERWISE STIPULATED. WHEREVER ASTM SPECIFICATIONS ARE REFERRED TO, THEY SHALL BE FOLLOWED. A COPY OF THE STANDARDS SHALL BE SUPPLIED BY THE CONTRACTOR TO THE ENGINEER.
4. DIMENSION ON THE DRAWINGS ARE IN MILLIMETER EXCEPT OTHERWISE NOTED.
5. THE LOAD FACTORS AND LOAD COMBINATIONS ARE BASED ON THE STIPULATION GIVEN IN AASHTO LRFD BRIDGES DESIGN SPECIFICATIONS.
6. ALL BLINDING CONCRETE SHALL BE LEAN CONCRETE.
7. ALL STRUCTURAL CONCRETE SHALL CONFORM TO AASHTO T–22, AASHTO T–23 AND AASHTO T–24 AS SPECIFIED. MINIMUM COMPRESSIVE STRENGTHS AS MEASURED ON CYLINDERS AT 28 DAYS SHALL BE AS FOLLOWS.
   - CLASS A1 (210 kg./sq. cm.) FOR BARRIER, APPROACH SLAB AND ALL OTHER REINFORCED CONCRETE MEMBERS EXCEPT NOTED BELOW.
   - CLASS A3 (280 kg./sq. cm.) FOR TRANSOMS, PILECAPS, ABUTMENTS & RETAINING WALLS, PILES, PIER SHAFTS, DECK SLAB, DIAPHRAGMS & CULVERTS
   - CLASS D2 (425 kg./sq. cm.) FOR PRECAST PRESTRESSED CONCRETE GIRDERS.
8. REINFORCING STEEL INDICATED ON DRAWINGS AS ϕ SHALL BE AS PER AASHTO M31 GRADE 60
9. ALL BAR DIAMETERS ARE IN MILLIMETERS. BARS ARE DESIGNATED BY A CODE CONSISTING OF THREE NUMBERS SEPARATED BY TWO HYPHENS, THE FIRST NUMBER IS THE BAR IDENTIFICATION MARK, THE MIDDLE NUMBER IS ITS DIAMETER IN MILLIMETERS AND THIRD NUMBER IS THE NUMBER OF BARS REQUIRED, FOR EXAMPLE

   126 BAR MARKS — 16 DIAMETER IN MILLIMETER — 24 NUMBERS REQUIRED
10. THE CONTRACTOR SHALL PREPARE ALL BAR BENDING SCHEDULES ETC. AND SUBMIT THEM FOR APPROVAL OF THE ENGINEER PRIOR TO CUTTING, BENDING AND PLACEMENT.
11. ALL REINFORCING STEEL SHALL BE ACCURATELY LOCATED IN THE FORMWORK AND HELD FIRMLY IN PLACE, BEFORE PLACING OF CONCRETE BY MEANS OF 16 GUAGE BLACK ANNEALED WIRE AND ADEQUATELY DESIGNED SPACERS.
12. UNLESS OTHERWISE SHOWN ON THE DRAWING LAPS IN REINFORCING STEEL BARS SHALL BE STAGGERED. MINIMUM LENGTH OF LAP SHALL BE AS PER AASHTO REQUIREMENTS.
13. THE GIRDERS SHALL BE PLACED IN SPANS BY APPROVED MEANS TO ENSURE THEIR PLACEMENT WITHOUT DAMAGE AND ACCIDENT, GIRDERS SHALL BE PLACED AT CORRECT POSITION AS SHOWN ON THE DRAWINGS AND TEMPORARILY BRACED LATERALLY UNTIL DIAPHRAGMS/TRANSOMS AND DECK SLABS ARE CAST. THE ERECTION PROCESS SHALL NOT HINDER NORMAL MOVEMENT OF TRAFFIC.
14. MULTISTRAND PRESTRESSING SYSTEM HAS BEEN USED IN THE DESIGN. FIXTURES AND DETAILS SHALL CONFORM TO ONE OF THE FOLLOWING SYSTEMS:–
   - OVM
   - FREYSSINET
   - VSL
   - STRONGHOLD
15. PRESTRESSING STEEL SHALL CONFORM TO ASTM–416 (GRADE–270) WITH MINIMUM ULTIMATE STRENGTH OF 1860 N/sq.mm.
16. ALL TENDONS SHALL BE STRESSED FROM ONE END ALTERNATELY UNLESS OTHERWISE SHOWN ON DRAWINGS AND SUBSTITUTION OF LIVE ANCHORAGE WITH BLIND ANCHORAGE FOR ONE – END STRESSING IS PERMITTED.
17. IF ANCHORAGE PULL–IN OF STRANDS EXCEEDS 6 mm, THE TENDON SHALL BE DESTRESSED BY APPROVED MEANS AND SHALL BE RESTRESSED USING NEW SET OF GRIPS.
18. TENDONS SHALL BE STESSED AFTER THE CONCRETE HAS ATTAINED A CRUSHING STRENGTH OF 425 Kg/sq.cm. THE EXTENSIONS SHOWN IN DRAWINGS ARE THE TOTAL EXTENSION TO BE ACHIEVED BEFORE LOCKING AND ARE CALCULATED ON THE BASIS OF 200000 N/sq.mm AS MODULUS OF ELASTICITY OF STEEL: FOR OTHER VALUES OF MODULUS OF ELASATICITY, EXTENSIONS SHOULD BE CALCULATED ON PRO–RTA BASIS. TENDONS SHOULD NOT BE LOCKED IF THE ACTUAL EXTENSIONS VARY MORE THAN 10% FROM THE VALUES SHOWN OR CALCULATED AS THE CASE MAY BE AND THE MATTER REPORTED TO ENGINEER WHO SHALL GIVE FURTHER INSTRUCTION.
19. PRESTRESSING TENDONS COMPRISE 0.5 INCHES DIAMETER 7 WIRES STRANDS IN NUMBERS STATED IN THE RESPECTIVE DRAWINGS.
20. THE ORDER OF STRESSING SHALL BE AS STATED IN THE DRAWINGS.
21. ANCHORAGE POCKET SHALL BE FILLED WITH CLASS A1 CONCRETE USING 12 mm DOWN AGGREGATES, AFTER GROUTING AND TRIMMING TENDONS.
22. INTERMEDIATE GROUT VENTS SHALL BE PROVIDED AT ABOUT MID LENGTH OF THE TENDONS WHEN TENDON LENGTH IS MORE THAN 12 METERS.
23. ALL EXPOSED CORNERS OF CONCRETE TO BE CHAMFERED 25 mm x 25 mm EXCEPT OTHER WISE SHOWN.
24. ALL REINFORCED CONCRETE AND PRESTRESSED SHALL BE FAIR–FACED TO BE CAST IN STEEL FORMWORK AND PLATES OF NOT LESS THAN 3 mm THICKHNESS. TIMBER AND STEEL–CLAD TIMBER FORMWORK SHALL NOT BE ALLOWED.
25. THE DESIGN AND THE ENGINEERING OF THE FORMWORK AND FALSEWORK AS WELL AS ITS CONSTRUCTION SHALL BE RESPONSIBILITY OF THE CONTRACTOR, DESIGN OF FORMWORK AND FALSEWORK SHALL COMPLY WITH THE SPECIFICATIONS AND IN GENERAL CONFORM TO ACI 318–95 AND ACI SP–4.
26. CONCRETE IN DECK SLAB SHALL BE PLACED IN FULL WIDTH. NO CONSTRUCTION JOINT SHALL BE PERMITTED EXCEPT AS MENTIONED IN THE DRAWING OF CONSTRUCTION SEQUENCE OF DECK SLAB.
27. ELASTOMERIC BEARING PADS SHALL CONFORM TO SECTION 25, DIVISION 2 OF AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES 1992 AS AMENDED IN 1994, FULLY ENCLOSED IN RUBBER
28. BRIDGE BEARINGS SHALL BE PLACED IN HORIZONTAL POSITIONS. INCLINED OR TAPERED BEARINGS SHALL NOT BE ALLOWED.
29. BEFORE COMMENCEMENT OF CONSTRUCTION OF PERMANENT PILES, TEST PILES SHALL BE CONSTRUCTED, TESTED AND THE LOAD TEST RESULT SHALL BE SUBMITTED TO THE ENGINEER, WHO SHALL APPROVE OR AMMEND THE PILE TIP LEVEL.
30. THE PILES SHALL BE BORED–CAST–IN–PLACE. THE WORKING LOAD AND DIAMETER OF THE PILE ARE STATED ON THE GENERAL ARRANGEMENT DRAWING.
31. THE PILING WORK SHALL BE EXECUTED USING APPROPRIATE PILING EQUIPMENT AND METHODOLOGY TO BE APPROVED IN WRITING BY THE ENGINEER.
32. THE PILE TIP LEVELS ARE TENTATIVE AND TO BE CONFIRMED BY THE ENGINEER UPON COMPLETION OF SUBSOIL INVESTIGATION AND REPORT BY THE GEOTECHNICAL ENGINEER OF THE CONTRACTOR.
33. CLEAR COVER TO REINFORCEMENT TO BE:
   - (a) 25 mm IN DECK SLAB & APPROACH SLAB (BOTTOM REINF.)
     40 mm IN DECK SLAB & APPROACH SLAB (TOP REINF.)
   - (b) 25 mm IN BARRIER.
   - (c) 40 mm IN GIRDERS, TRANSOMS, DIAPHRAGMS (TOP & BOTTOM REINF.).
   - (d) 40 mm IN WALLS.
   - (e) 50 mm IN PILECAP
   - (f) 75 mm IN PILES & PIER SHAFTS UNLESS OTHERWISE SPECIFIED.
34. FOR CORRECT FIXATION OF FINISHED DECK LEVELS OF BRIDGES LOCATED ON CURVES WITH SUPER ELEVATION, REFER TO PLAN AND PROFILE DRAWINGS PRIOR TO CASTING OF DECK SLAB.

LEGEND AND SYMBOLS

	(IN ELEVATION OR SECTION) FINISHED SURFACE ELEVATION
	REINFORCEMENT
E.F.	EACH FACE
EA	EACH
R	RADIUS
DWG.	DRAWING
N.T.S.	NOT TO SCALE
CRS	(ON) CENTRES
I.F	INNER FACES
O.F	OUTER FACES
B.F.	BOTH FACES
EL.	ELEVATION
$N/mm.^2$	NEWTON PER SQUARE MILLIMETER.
T	TOP
℄	CENTRELINE
B	BOTTOM
ALT	ALTERNATELY
E.J.	EXPANSION JOINT
C.J.	CONSTRUCTION JOINT
N.S.I.E	NOT SHOWN IN ELEVATION
N.S.I.P	NOT SHOWN IN PLAN
	GANTRY
	SYMMETRICAL

CLIENT:- ADB Asian Development Bank	PROJECT:- LOAN NO. 4279-PAK (COL): EMERGENCY FLOOD ASSISTANCE PROJECT (EFAP)	DESIGN CONSULTANT ECIL In association with AA	PROJECT ROAD:- DISTRICT : NAUSHEHRO FEROZE - NF-04 REHABILITATION OF ROAD FROM KANDIARO LAKHA ROAD AT POINT RAJPAR CHOWDAGI UPTO SAEED KHAN LAKHO ROAD	ED.NO.	DATE	DESCRIPTION	DRAWN: F.A.S
EXECUTING AGENCY:- WORKS AND SERVICES DEPARTMENT GOVERNMENT OF SINDH			TITLE:- GENERAL NOTES				DESIGNED: R.I / M.A CHECKED: S.A DATE: JUNE 2023

DRAWING NO. 2053-STR-NF04-GN-01
Scale:- 1:1
Edition.

CULVERTS

SCHEDULE OF CULVERTS

CULVERT NO.	LATITUDE	LONGITUDE	EXISTING/ PROPOSED	EXISTING CULVERT				DESIGN STRATEGY	PROPOSED DESIGN				
				NO. OF CELLS	WIDTH/ DIA	HEIGHT	SKEW		TYPE	NO. OF CELLS	WIDTH/ DIA	HEIGHT	SKEW
C1	27.02531	68.27409	EXISTING	1	1	1	0	RETAINED/ REPAIR	-	-	-	-	-
C2	27.01685	68.26770	EXISTING	1	1	1	0	REPLACE WITH NEW	BOX	1	1.5	1	0
C3	27.01380	68.26543	EXISTING	1	1	1	0	REPLACE WITH NEW	BOX	1	1.5	1	0
C4	27.00880	68.26177	EXISTING	1	1	1.5	0	RETAINED/ REPAIR	-	-	-	-	-
C5	27.00811	68.26120	EXISTING	1	1	1	0	REPLACE WITH NEW	BOX	1	1.5	1	0
C6	27.00409	68.25825	EXISTING	1	1	1	0	REPLACE WITH NEW	BOX	1	1.5	1	0
C7	27.00323	68.25764	PROPOSED	-	-	-	-	NEW	PIPE	1	1	-	-
C8	27.00168	68.25662	EXISTING				0	REPLACE WITH NEW	PIPE	1	1	-	-
C9	26.99814	68.25378	EXISTING	1	1	1	0	REPLACE WITH NEW	BOX	1	1	1	0
C10	26.99400	68.25068	EXISTING	1	1	1	0	REPLACE WITH NEW	BOX	1	1.5	1	0
C11	26.98437	68.24484	EXISTING	1	1	1	0	RETAINED/ REPAIR	-	-	-	-	-
C12	26.98354	68.24355	EXISTING	6	25	4.5	0	RETAINED/ REPAIR	-	-	-	-	-
C13	26.98373	68.24314	EXISTING	1	4	2.5	0	REPLACE WITH NEW	BOX	2	2	2.5	0
C14	26.98252	68.24331	EXISTING	1	1	1	0	REPLACE WITH NEW	BOX	1	1.5	1	0
C15	26.97512	68.24089	PROPOSED	-	-	-	-	NEW	BOX	1	1	1	0
C16	26.98191	68.24360	EXISTING	1	1	1	0	REPLACE WITH NEW	BOX	1	1.5	1	0
C17	26.97353	68.24011	EXISTING	1	1	1	0	REPLACE WITH NEW	BOX	1	1.5	1	0
C18	26.96929	68.23842	EXISTING	1	1	1	0	REPLACE WITH NEW	PIPE	1	1	-	-
C19	26.96530	68.23670	EXISTING	1	0.1	0.1	0	REPLACE WITH NEW	BOX	1	1	1	0
C20	26.96421	68.23610	EXISTING	1	1	1	0	RETAINED/ REPAIR	-	-	-	-	-
C21	26.96183	68.23502	EXISTING	1	0.1	0.1	0	REPLACE WITH NEW	BOX	1	1.5	1	0
C22	26.96157	68.23493	EXISTING	1	0.8	0.8	0	RETAINED/ REPAIR	-	-	-	-	-
C23	26.95744	68.23309	EXISTING	1	1	1.5	0	RETAINED/ REPAIR	-	-	-	-	-
C24	26.95443	68.23168	EXISTING	1	1	1	0	REPLACE WITH NEW	BOX	1	1	1	0
C25	26.95191	68.22973	EXISTING	1	1	1	0	REPLACE WITH NEW	BOX	1	1.5	1	0

NOTES:–

1– THIS DRAWING MUST BE READ IN CONJUNCTION WITH RELEVANT HIGHWAY DRAWINGS.

2– ALL LEVELS SHALL BE VERIFIED AT SITE BEFORE EXECUTION.

3– LEVELS, LENGTHS & SKEWS MAY BE ADJUSTED AS PER SITE CONDITIONS DURING LEVELS ADJUSTMENTS, IF FILL HEIGHT VARIES SIGNIFICANTLY FOR WHICH THE STRUCTURE IS DESIGNED, NOTIFY ENGINEER.

CLIENT:- ADB Asian Development Bank

EXECUTING AGENCY:- WORKS AND SERVICES DEPARTMENT GOVERNMENT OF SINDH

PROJECT:- LOAN NO. 4279-PAK (COL): EMERGENCY FLOOD ASSISTANCE PROJECT (EFAP)

DESIGN CONSULTANT: ECIL In association with AA

PROJECT ROAD:- DISTRICT : NAUSHEHRO FEROZE - NF-04 REHABILITATION OF ROAD FROM KANDIARO LAKHA ROAD AT POINT RAJPAR CHOWDAGI UPTO SAEED KHAN LAKHO ROAD

TITLE:- SCHEDULE OF CULVERTS

ED.NO.	DATE	DESCRIPTION

DRAWN: F.A.S

DESIGNED: R.I / M.A

CHECKED: S.A

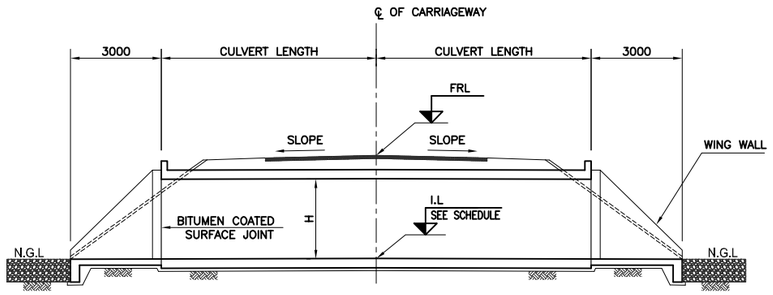
DATE: JUNE 2023

DRAWING NO. 2053-STR-NF04-CU-SCH-01

Scale:- 1:100

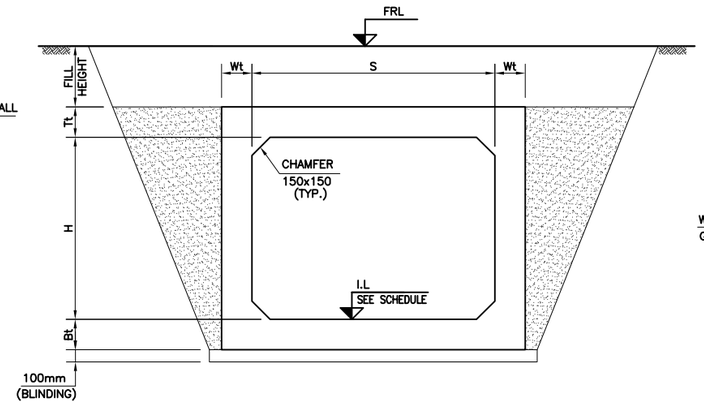
Edition.

BOX CULVERTS



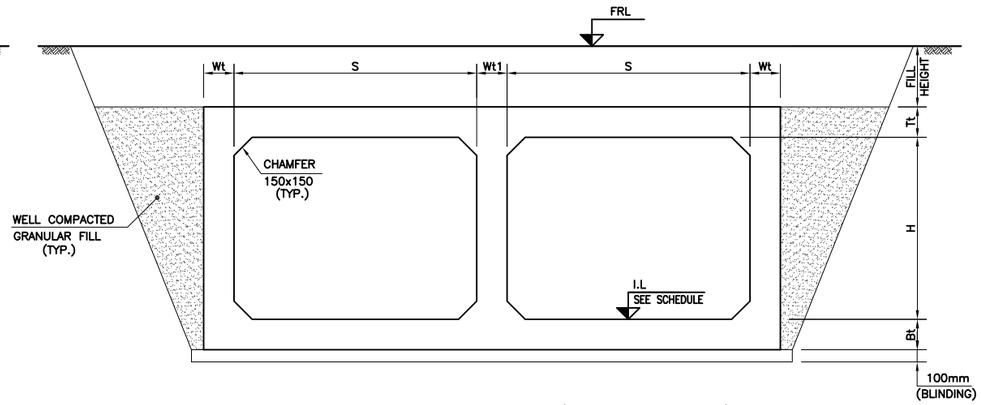
LONGITUDINAL SECTION AT C.L. OF CULVERT

(FOR ROAD X-SECTION REFER RELEVANT ROADWAY DRAWINGS)



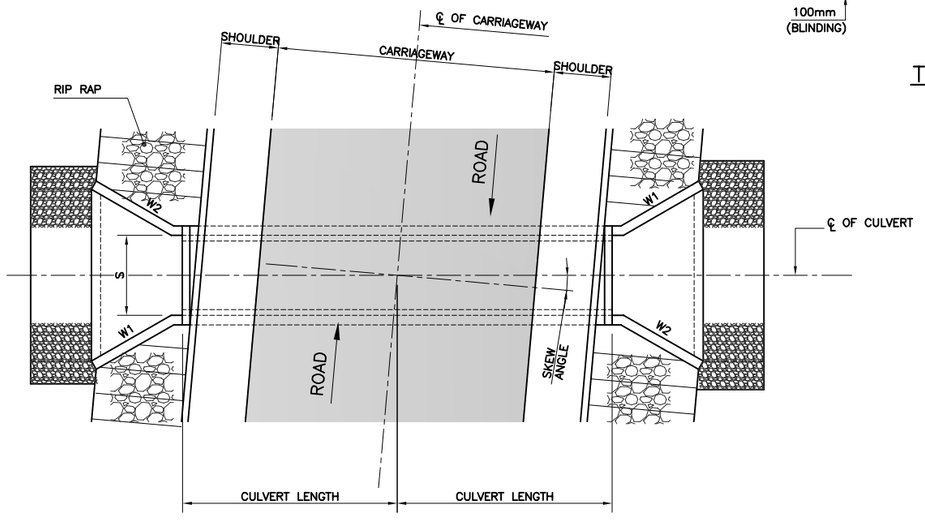
TYP. CROSS SECTION (SINGLE CELL)

SCALE 1:25

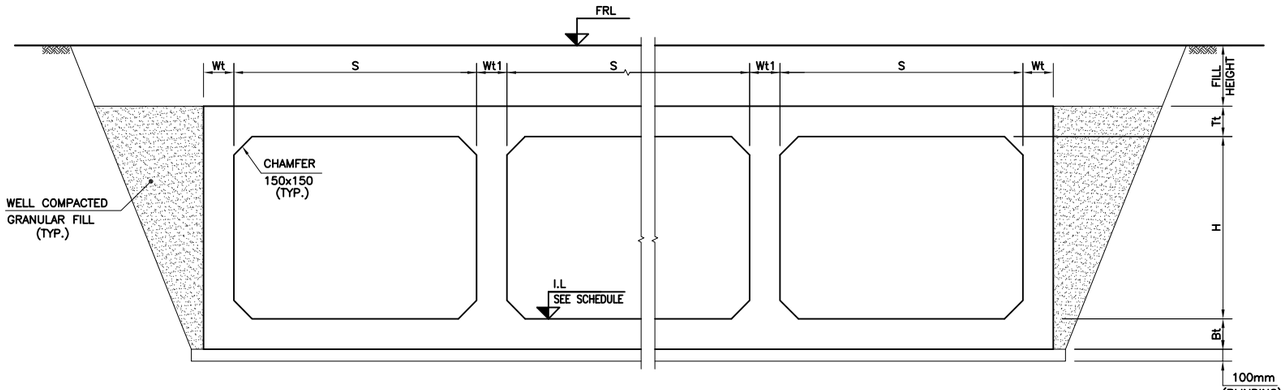


TYP. CROSS SECTION (DOUBLE CELL)

SCALE 1:25

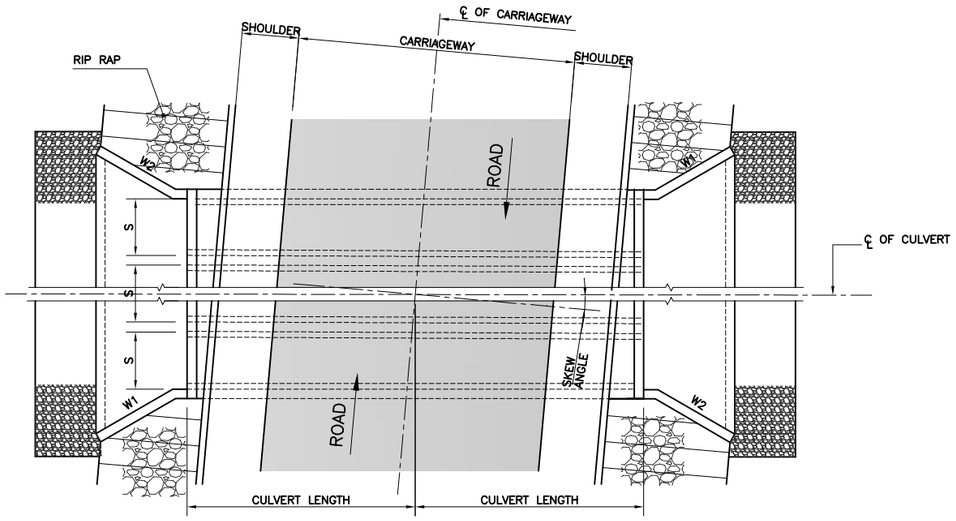


PLAN (SINGLE CELL)

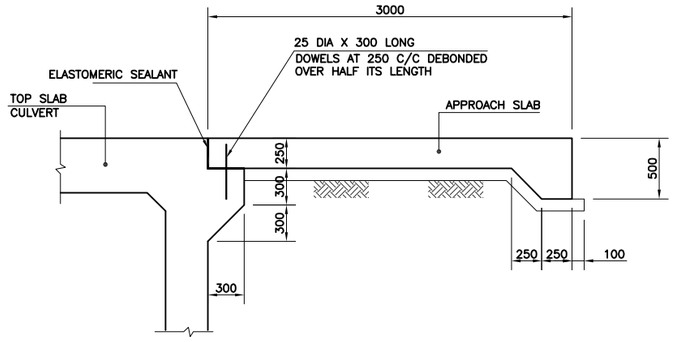


TYP. CROSS SECTION (MULTI CELL)

SCALE 1:25



PLAN (MULTI CELL)



TYP. DETAIL OF APPROACH SLAB

FOR FILL HEIGHT ⩽ 1000mm

SCALE 1:25

NOTES:–

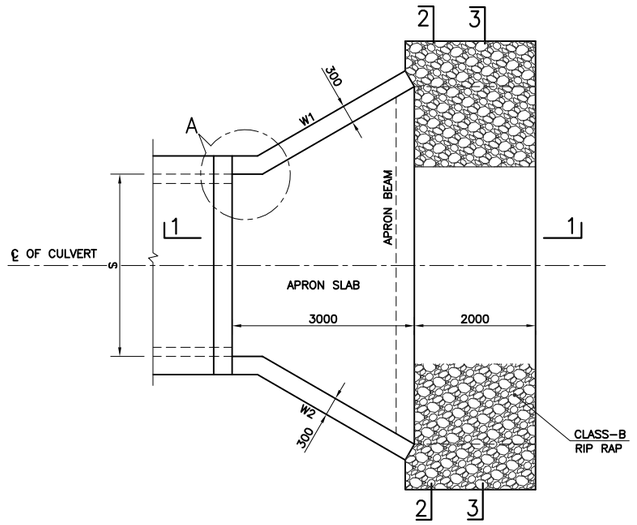
1 – THIS DRAWING SHALL BE READ IN CONJUNCTION WITH RELEVANT HIGHWAY DRAWING.

2 – FOR ROAD X–SECTION AND LOCATION REFER RELEVANT ROADWAY PLAN AND PROFILE DRAWINGS.

3 – LEVELS MAY BE ADJUSTED AS PER SITE CONDITIONS. DURING LEVEL ADJUSTMENTS, IF FILL HEIGHT VARIES SIGNIFICANTLY FOR WHICH THE STRUCTURE IS DESIGNED, NOTIFY ENGINEER.

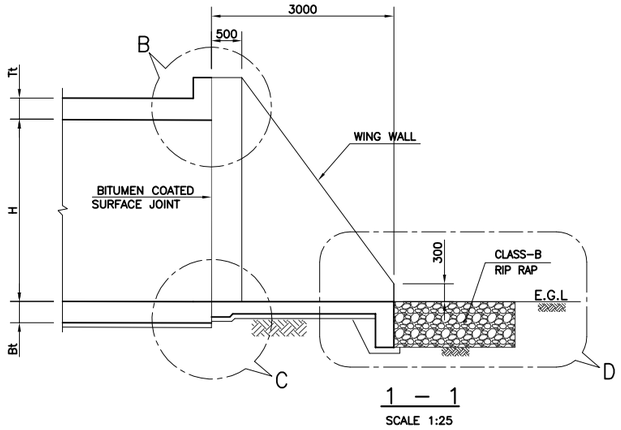
4 – LENGTH OF CULVERT, WINGWALL AND WINGWALL INCLINATION SHALL BE ADJUSTED AS PER SITE REQUIRMENTS.

CLIENT:- ADB Asian Development Bank EXECUTING AGENCY:- WORKS AND SERVICES DEPARTMENT GOVERNMENT OF SINDH	PROJECT:- LOAN NO. 4279-PAK (COL): EMERGENCY FLOOD ASSISTANCE PROJECT (EFAP)	DESIGN CONSULTANT ECIL In association with AA	PROJECT ROAD:- DISTRICT : NAUSHEHRO FEROZE - NF-04 REHABILITATION OF ROAD FROM KANDIARO LAKHA ROAD AT POINT RAJPAR CHOWDAGI UPTO SAEED KHAN LAKHO ROAD TITLE:- RCC BOX CULVERT GENERAL ARRANGEMENT	ED.NO.	DATE	DESCRIPTION	DRAWN: F.A.S DESIGNED: R.I / M.A CHECKED: S.A DATE: JUNE 2023	DRAWING NO. 2053-STR-NF04-BC-01 Scale:- 1:100 Edition.



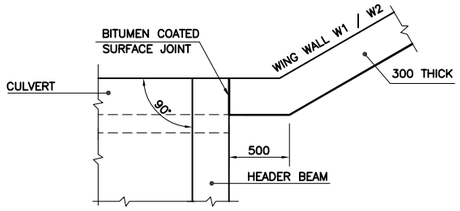
PLAN OF APRON SLAB (SINGLE CELL)

SCALE 1:50



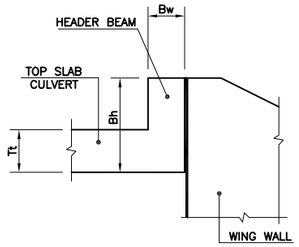
1 – 1

SCALE 1:25



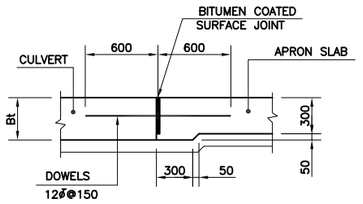
DETAIL A

SCALE 1:25



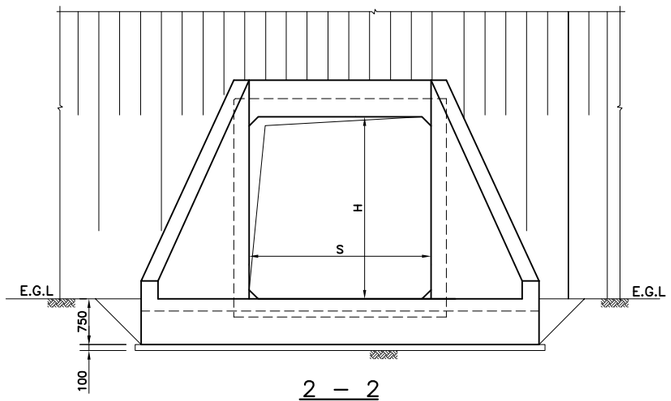
DETAIL B

SCALE 1:25



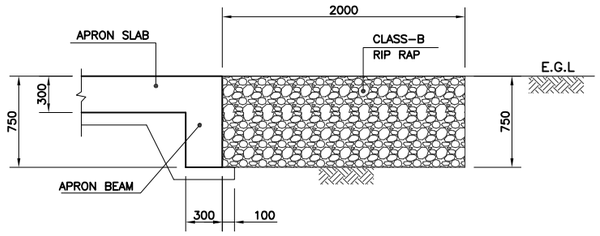
DETAIL C

SCALE 1:25



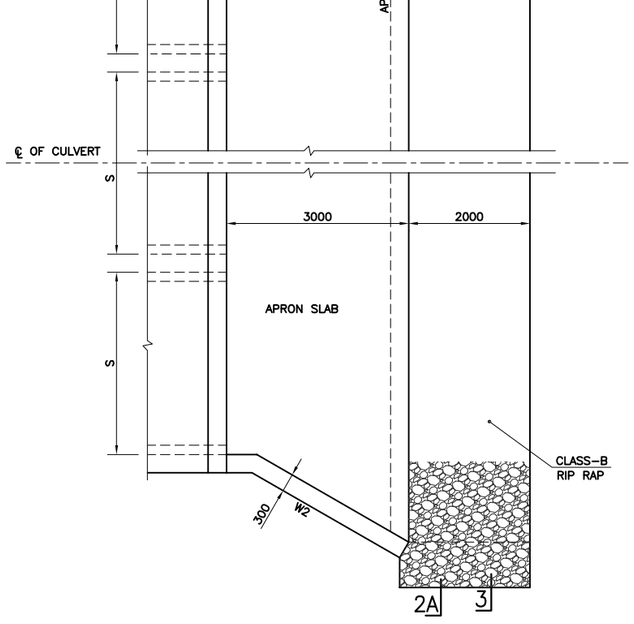
2 – 2

SCALE 1:50



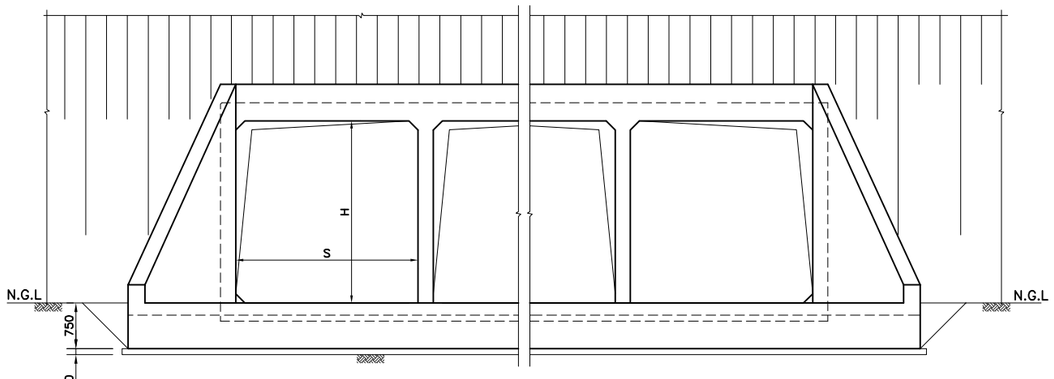
DETAIL D

SCALE 1:25



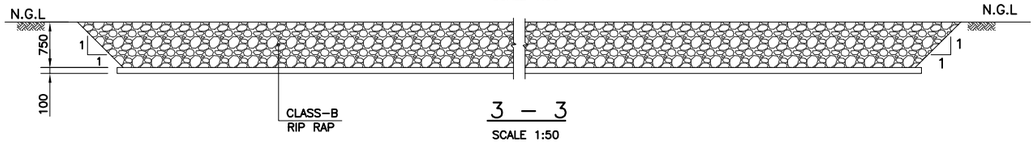
TYP. PLAN OF APRON SLAB (MULTI CELL)

SCALE 1:50



2A – 2A

SCALE 1:50



3 – 3

SCALE 1:50

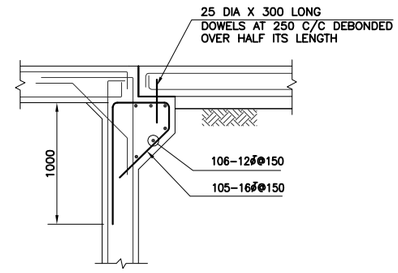
NOTES:–

1– THIS DRAWING MUST BE READ IN CONJUNCTION WITH DWG. NO. 2053–STR–NF04–01–BC–01.

CLIENT:- ADB Asian Development Bank EXECUTING AGENCY:- WORKS AND SERVICES DEPARTMENT GOVERNMENT OF SINDH	PROJECT:- LOAN NO. 4279-PAK (COL): EMERGENCY FLOOD ASSISTANCE PROJECT (EFAP)	DESIGN CONSULTANT ECIL In association with AA	PROJECT ROAD:- DISTRICT : NAUSHEHRO FEROZE - NF-04 REHABILITATION OF ROAD FROM KANDIARO LAKHA ROAD AT POINT RAJPAR CHOWDAGI UPTO SAEED KHAN LAKHO ROAD TITLE:- RCC BOX CULVERT DETAILS OF APRON SLAB & WING WALLS	ED.NO.	DATE	DESCRIPTION	DRAWN: F.A.S DESIGNED: R.I / M.A CHECKED: S.A DATE: JUNE 2023	DRAWING NO. 2053-STR-NF04-BC-02 Scale:- 1:100 Edition.

SINGLE CELL CULVERTS

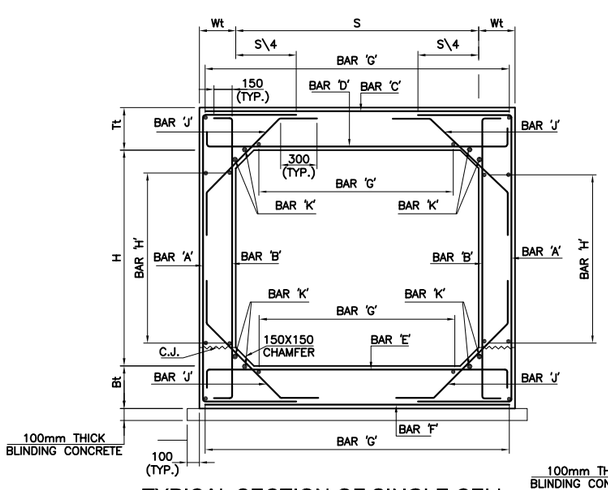
DIMENSIONS							BAR A		BAR B		BAR C (Straight)		BAR D		BAR E		BAR F (Straight)		BAR G (Straight)		BAR H (Straight)		BAR J		BAR K (Straight)	
NO. OF CELLS	S mm	H mm	FILL mm	Wt mm	Bt mm	Tt mm	DIA	SPACING	DIA	SPACING	DIA	SPACING	DIA	SPACING	DIA	SPACING	DIA	SPACING	DIA	SPACING	DIA	SPACING	DIA	SPACING	DIA	NO.OF BAR
1	1000	1000	300–1000	250	250	250	10ø	200	10ø	200	10ø	200	10ø	150	10ø	125	10ø	200	10ø	200	10ø	200	10ø	200	10ø	8
1	1000	1500	300–1000	250	250	250	10ø	200	10ø	200	10ø	200	10ø	125	10ø	125	10ø	200	10ø	200	10ø	200	10ø	200	10ø	8
1	1500	1000	300–1000	250	250	250	10ø	100	10ø	200	10ø	150	12ø	125	12ø	125	10ø	150	10ø	200	10ø	200	10ø	200	10ø	8
1	1500	1500	300–1000	250	250	250	10ø	100	10ø	200	10ø	150	12ø	125	12ø	125	10ø	150	10ø	200	10ø	200	10ø	200	10ø	8
1	1500	2000	300–1000	250	250	250	10ø	100	10ø	200	10ø	150	12ø	125	12ø	125	10ø	150	10ø	200	10ø	200	10ø	200	10ø	8
1	2000	1000	300–1000	300	300	300	12ø	125	10ø	150	12ø	150	12ø	100	12ø	100	12ø	150	10ø	200	10ø	200	10ø	200	10ø	8
1	2000	2500	300–1000	300	300	300	12ø	125	10ø	150	12ø	150	16ø	150	16ø	125	12ø	150	10ø	200	10ø	200	10ø	200	10ø	8
1	2000	1500	300–1000	300	300	300	12ø	125	10ø	150	12ø	150	12ø	100	12ø	100	12ø	150	10ø	200	10ø	200	10ø	200	10ø	8
1	2000	2000	300–1000	300	300	300	12ø	125	10ø	150	12ø	150	12ø	100	12ø	100	12ø	150	10ø	200	10ø	200	10ø	200	10ø	8
1	2500	1000	300–1000	300	325	325	12ø	100	12ø	200	12ø	100	16ø	125	16ø	125	12ø	100	10ø	200	10ø	200	10ø	200	10ø	8
1	2500	1500	300–1000	300	325	325	12ø	100	12ø	200	12ø	100	16ø	125	16ø	125	12ø	100	10ø	200	10ø	200	10ø	200	10ø	8
1	2500	2000	300–1000	300	325	325	12ø	100	12ø	200	12ø	100	16ø	100	16ø	100	12ø	100	10ø	200	10ø	200	10ø	200	10ø	8



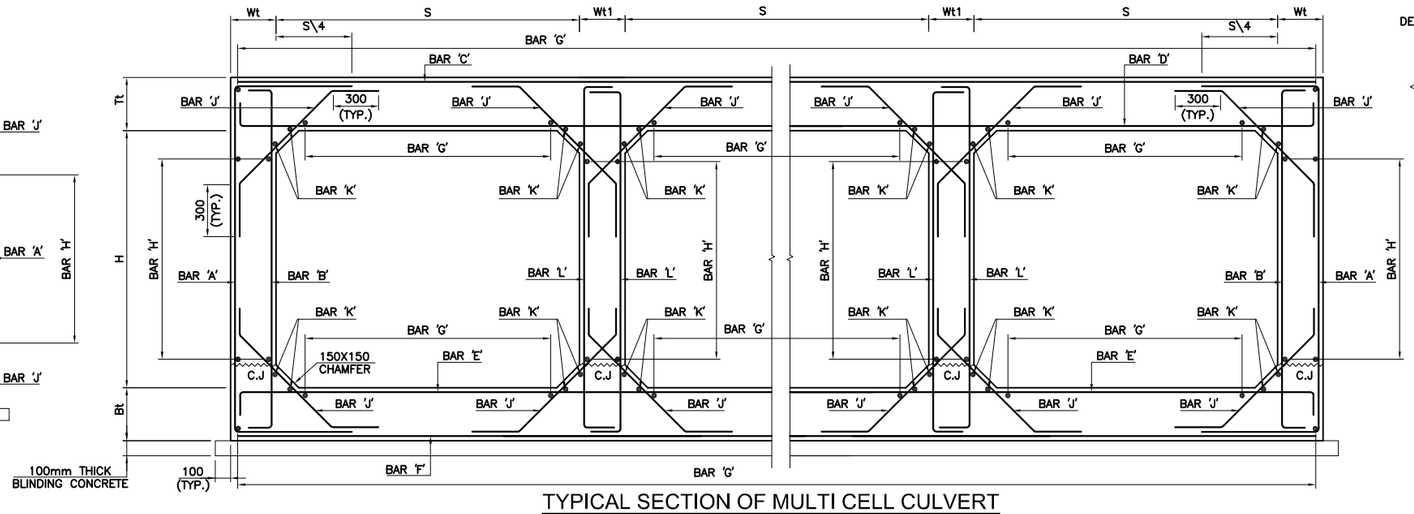
DETAIL–A
SCALE 1:25

MULTI CELL CULVERT

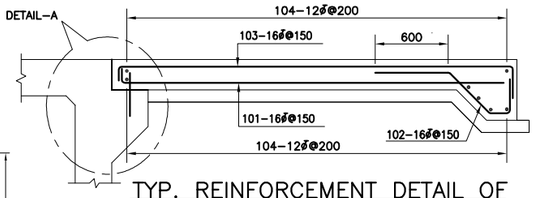
DIMENSIONS								BAR A		BAR B		BAR C (Straight)		BAR D		BAR E		BAR F (Straight)		BAR G (Straight)		BAR H (Straight)		BAR J		BAR K (Straight)		BAR L	
NO. OF CELLS	S mm	H mm	FILL mm	Wt mm	Wt1 mm	Bt mm	Tt mm	DIA	SPACING	DIA	SPACING	DIA	SPACING	DIA	SPACING	DIA	SPACING	DIA	SPACING	DIA	SPACING	DIA	SPACING	DIA	SPACING	DIA	NO.OF BAR	DIA	SPACING
2	1500	1000	300–1000	250	250	250	250	12ø	150	10ø	200	12ø	125	12ø	150	12ø	150	12ø	125	10ø	200	10ø	200	10ø	200	10ø	16	10ø	200
2	1500	1500	300–1000	250	250	250	250	12ø	150	10ø	200	12ø	125	12ø	150	12ø	150	12ø	125	10ø	200	10ø	200	10ø	200	10ø	16	10ø	200
2	2000	1000	300–1000	300	300	300	300	12ø	125	10ø	200	12ø	100	12ø	100	12ø	100	16ø	150	10ø	200	10ø	200	10ø	200	10ø	16	10ø	200
2	2000	1500	300–1000	300	300	300	300	12ø	125	10ø	200	12ø	100	12ø	100	12ø	100	16ø	150	10ø	200	10ø	200	10ø	200	10ø	16	10ø	200
2	2000	2500	300–1000	300	300	300	300	12ø	100	12ø	150	12ø	100	12ø	100	12ø	100	16ø	150	10ø	200	10ø	200	10ø	200	10ø	16	12ø	150
2	2000	3000	300–1000	300	300	300	300	12ø	100	12ø	150	12ø	100	12ø	100	12ø	100	16ø	150	10ø	200	10ø	200	10ø	200	10ø	16	12ø	150
2	2500	1000	300–1000	300	300	325	325	16ø	150	16ø	200	16ø	150	16ø	150	16ø	150	16ø	100	10ø	200	10ø	200	10ø	200	10ø	16	16ø	200
2	3000	1500	300–1000	350	350	400	400	16ø	150	16ø	150	16ø	125	16ø	125	16ø	125	16ø	100	12ø	200	12ø	200	12ø	200	12ø	16	16ø	150
2	3000	3000	300–1000	400	400	450	450	16ø	100	16ø	100	16ø	100	16ø	100	16ø	100	16ø	100	12ø	200	12ø	200	12ø	200	12ø	16	16ø	100
3	3000	1000	300–1000	350	350	400	400	16ø	150	16ø	150	16ø	125	16ø	125	16ø	125	16ø	100	12ø	200	12ø	200	12ø	200	12ø	24	16ø	150
3	3000	2000	300–1000	350	350	400	400	16ø	150	16ø	150	16ø	100	16ø	100	16ø	100	16ø	100	12ø	200	12ø	200	12ø	200	12ø	24	16ø	150
3	3000	2500	300–1000	350	350	400	400	16ø	150	16ø	150	16ø	100	16ø	100	16ø	100	16ø	100	12ø	200	12ø	200	12ø	200	12ø	24	16ø	150



TYPICAL SECTION OF SINGLE CELL
SCALE 1:25



TYPICAL SECTION OF MULTI CELL CULVERT
SCALE 1:20



TYP. REINFORCEMENT DETAIL OF APPROACH SLAB

NOTES:–

1– BAR CUT LENGTH SHALL BE IN ACCORDANCE WITH LENGTH OF CULVERT.
2– ALL STURCTURAL CONCRETE SHALL BE CLASS 'A3' CONCRETE.
3– ALL STURCTURAL REINFORCEMENT SHALL BE GRADE 60 STEEL.
4– MINIMUM COVER TO THE REINFORCEMENT SHALL BE 50mm.
5– OVERLAP LENGTH OF REBAR SHALL BE 48 x DIA OF BARS.
6– FOR CULVERTS WITH SPAN LESS THAN ANY OF THOSE SHOWN IN TABLE, USE REINFORCEMENT AND SPACING FOR NEXT GREATER SIZE SPAN.MARK NECESSARY CHANGES IN BAR LENGTH AND QUANTITIES.
7– EXPANSION JOINTS SHALL BE PROVIDED AT MAX.15m LENGTH IF NECESSARY.
8– ELASTIC ASPHALT BOARD WITH 10mm. THICKNESS AT THE JOINT OF CONCRETE SHALL BE PROVIDED.
9– DO NOT LAP BAR C & F AT SUPPORT OR WALLS & DO NOT LAP BAR D & E AT MID SPAN
10– C.J MEANS CONSTRUCTION JOINT
11– MAXIMUM DESIGN BEARING PRESSURE IS 200 Kpa. WHICH SHELL BE VARIFIED AT SITE BEFORE EXECUTION.

CLIENT:- ADB Asian Development Bank

EXECUTING AGENCY:- WORKS AND SERVICES DEPARTMENT GOVERNMENT OF SINDH

PROJECT:- LOAN NO. 4279-PAK (COL): EMERGENCY FLOOD ASSISTANCE PROJECT (EFAP)

DESIGN CONSULTANT: ECIL in association with AA

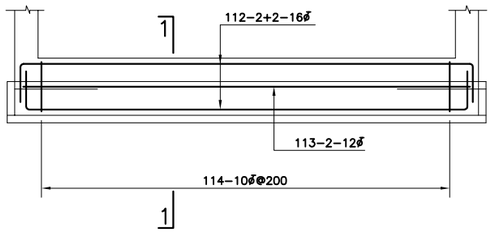
PROJECT ROAD:- DISTRICT : NAUSHEHRO FEROZE - NF-04
REHABILITATION OF ROAD FROM KANDIARO LAKHA ROAD AT POINT RAJPAR CHOWDAGI UPTO SAEED KHAN LAKHO ROAD

TITLE:- RCC BOX CULVERT
REINFORCEMENT DETAILS OF BOX CULVERT

ED.NO.	DATE	DESCRIPTION

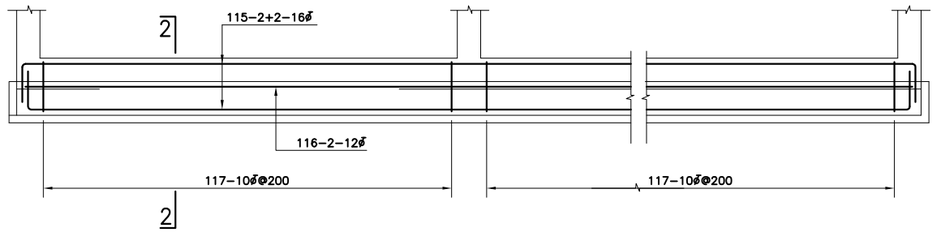
DRAWN: F.A.S
DESIGNED: R.I / M.A
CHECKED: S.A
DATE: JUNE 2023

DRAWING NO. 2053-STR-NF04-BC-03
Scale:- 1:100
Edition.



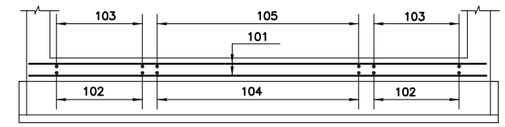
ELEV. OF APRON BEAM (SINGLE CELL)

SCALE 1:50



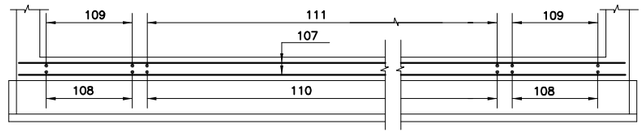
ELEV. OF APRON BEAM (MULTI CELL)

SCALE 1:50



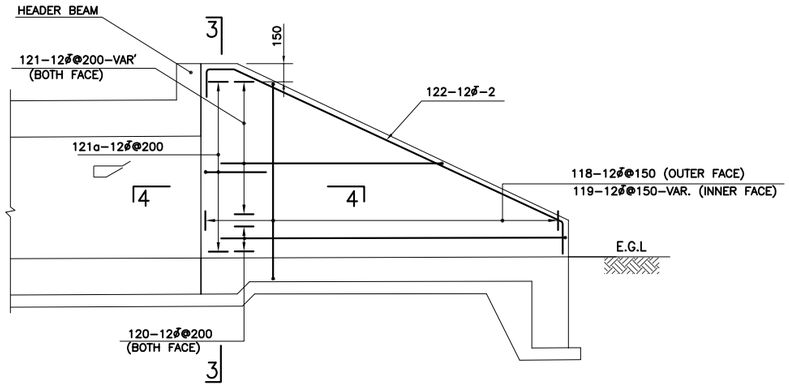
5 – 5

SCALE 1:50



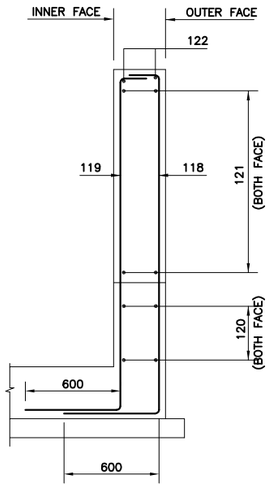
6 – 6

SCALE 1:50



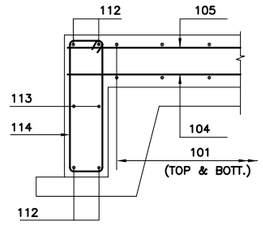
ELEVATION OF WING WALL

SCALE 1:25 (4NOS.)



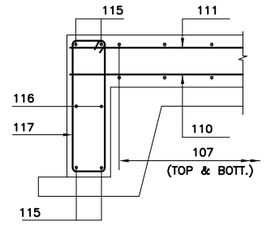
3 –3

SCALE 1:20



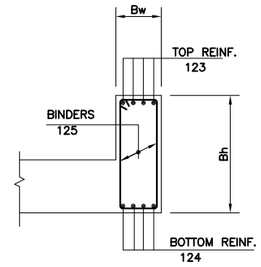
1 – 1

SCALE 1:20



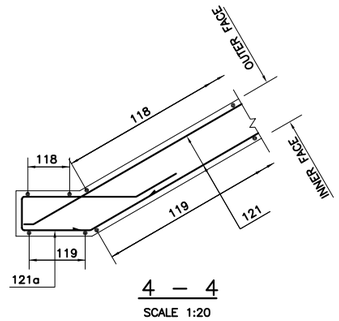
2 – 2

SCALE 1:20



HEADER BEAM

SCALE 1:20

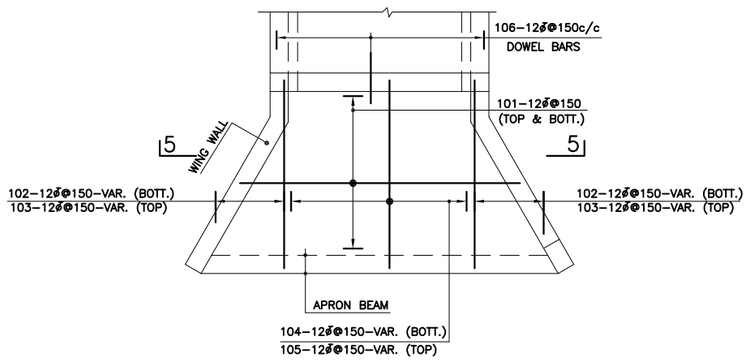


4 – 4

SCALE 1:20

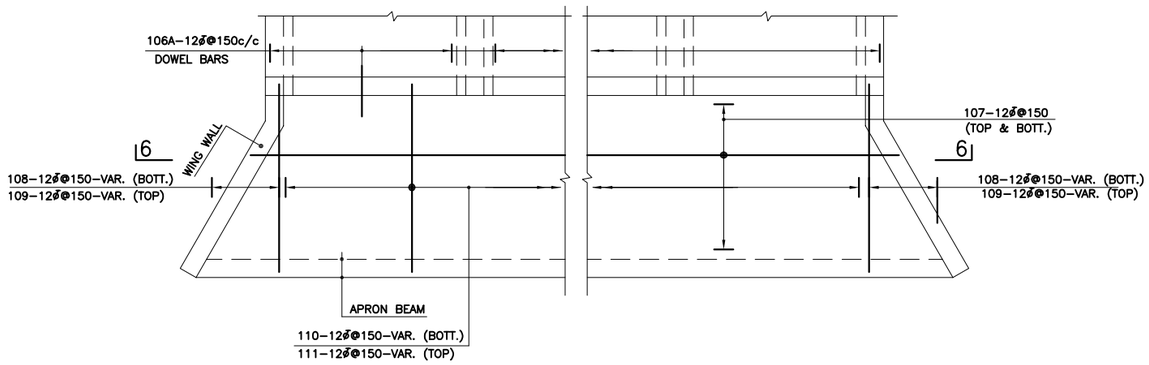
SCHEDULE OF HEADER BEAM

BEAM ID	MAX. BEAM LENGTH 'L'	BEAM SIZE		REINFORCEMENT		
		Bw	Bh	TOP (123)	BOTTOM (124)	BINDERS (125)
B1	2000	250	600	3–16ø	3–16ø	10ø@150
B2	3000	300	600	4–16ø	4–16ø	10ø@150
B3	4000	300	900	6–16ø	6–16ø	10ø@150



TYP. PLAN OF APRON SLAB (SINGLE CELL)

SCALE 1:50 (2NOS.)



TYP. PLAN OF APRON SLAB (MULTI CELL)

SCALE 1:50 (2NOS.)

NOTES:–

1– THIS DRAWING MUST BE READ IN CONJUNCTION WITH DWG. NO. 2053–STR–NF04–BC–01, 02 & 03.

CLIENT:- ADB Asian Development Bank

EXECUTING AGENCY:- WORKS AND SERVICES DEPARTMENT GOVERNMENT OF SINDH

PROJECT:- LOAN NO. 4279-PAK (COL): EMERGENCY FLOOD ASSISTANCE PROJECT (EFAP)

DESIGN CONSULTANT: ECIL In association with AA

PROJECT ROAD:- DISTRICT : NAUSHEHRO FEROZE - NF-04
REHABILITATION OF ROAD FROM KANDIARO LAKHA ROAD AT POINT RAJPAR CHOWDAGI UPTO SAEED KHAN LAKHO ROAD

TITLE:- RCC BOX CULVERT
REINFORCEMENT DETAILS OF APRON SLAB & WING WALLS
(FOR CULVERT HEIGHT ⩽ 2m)

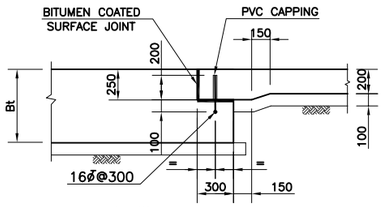
ED.NO.	DATE	DESCRIPTION

DRAWN: F.A.S
DESIGNED: R.I / M.A
CHECKED: S.A
DATE: JUNE 2023

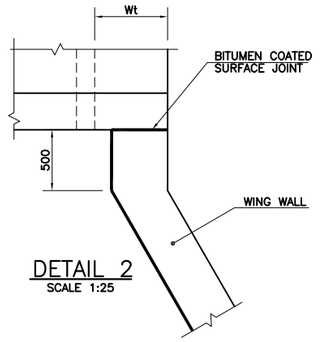
DRAWING NO. 2053-STR-NF04-BC-04
Scale:- 1:100
Edition.

TABLE–01: SCHEDULE OF RCC WING WALL

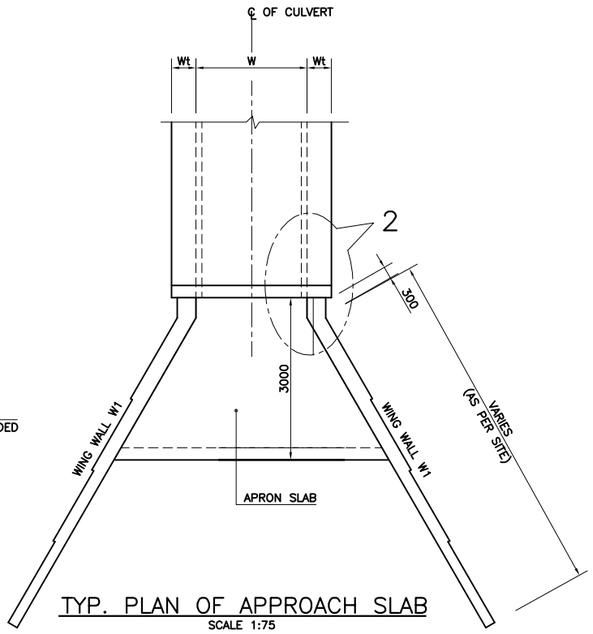
S.NO.	H	F1	F2	F3	Wt1	Ft1	BAR 'A'	BAR 'B'	BAR 'C'	BAR 'D'
1	1500	1200	200	750	250	250	12ø@200	12ø@200	12ø@200	12ø@200
2	2500	1800	300	1250	250	250	16ø@200	12ø@200	12ø@200	16ø@200
3	3000	2000	300	1400	300	300	16ø@200	12ø@200	12ø@200	16ø@200
4	4000	3000	700	1950	350	350	16ø@125	12ø@200	16ø@200	16ø@125
5	4500	3200	850	2000	350	350	16ø@100	12ø@200	16ø@200	16ø@100



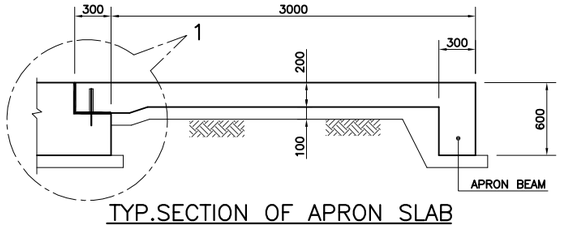
DETAIL 1
SCALE 1:25



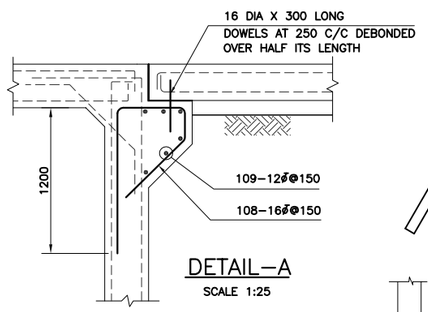
DETAIL 2
SCALE 1:25



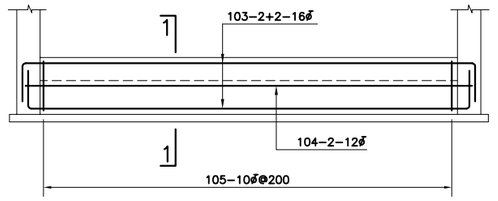
TYP. PLAN OF APPROACH SLAB
SCALE 1:75



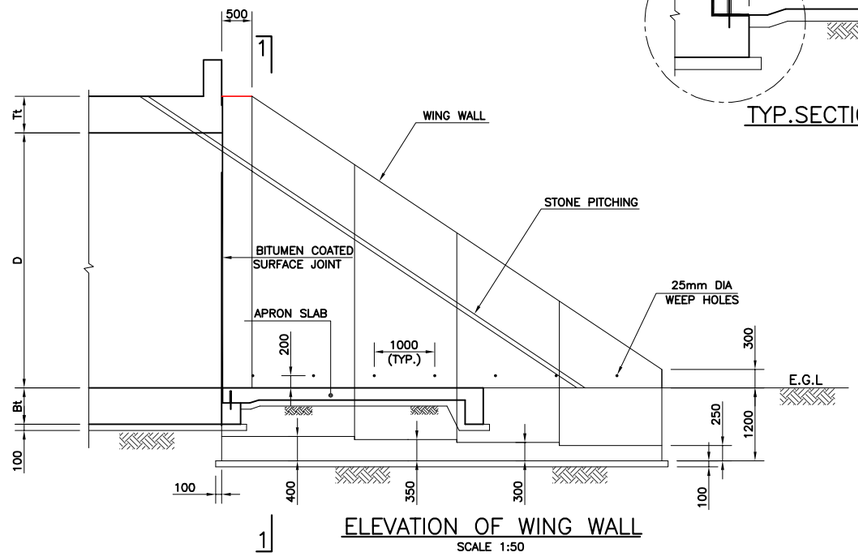
TYP.SECTION OF APRON SLAB
SCALE 1:25



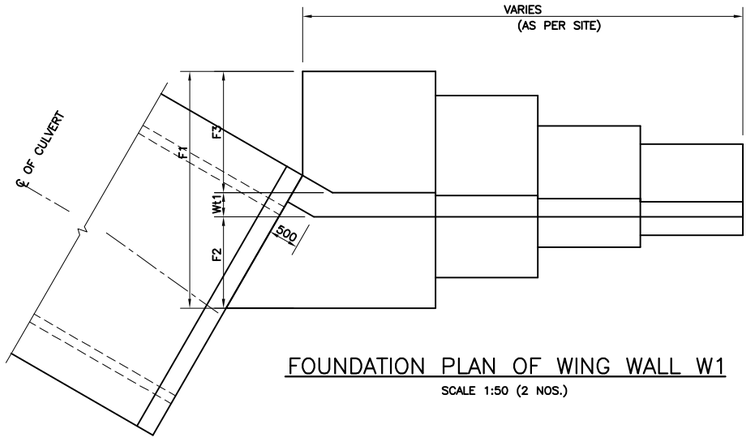
DETAIL–A
SCALE 1:25



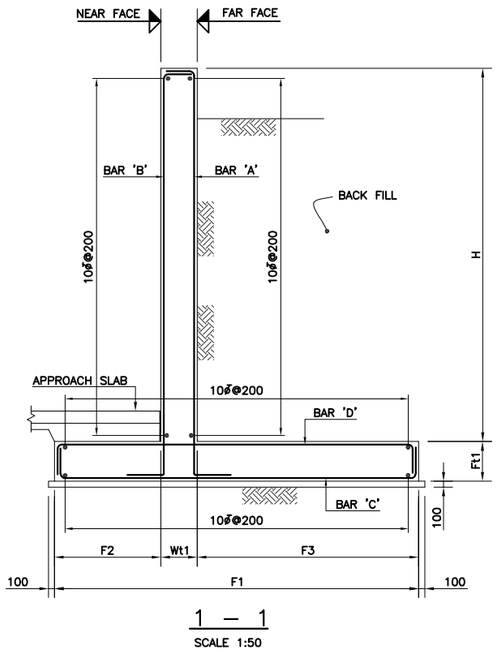
ELEV. OF APRON BEAM
SCALE 1:25



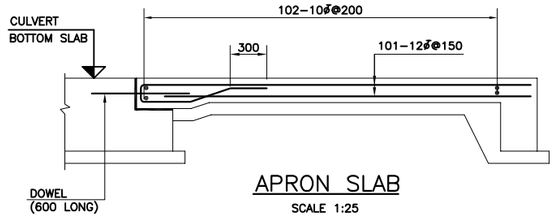
1
ELEVATION OF WING WALL
SCALE 1:50



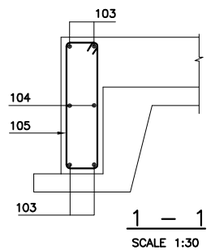
FOUNDATION PLAN OF WING WALL W1
SCALE 1:50 (2 NOS.)



1 – 1
SCALE 1:50



APRON SLAB
SCALE 1:25



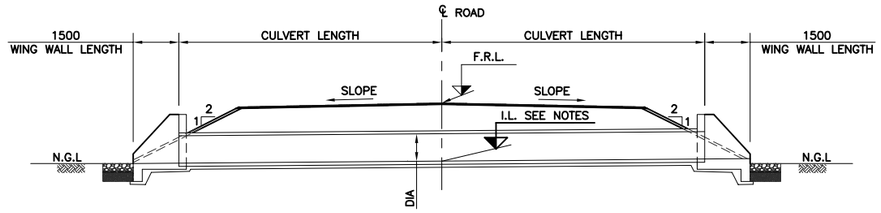
1 – 1
SCALE 1:30

NOTES

1– THIS DRAWING MUST BE READ IN CONJUNCTION WITH DWG. NO. 2053–STR–NF04–BC–01.

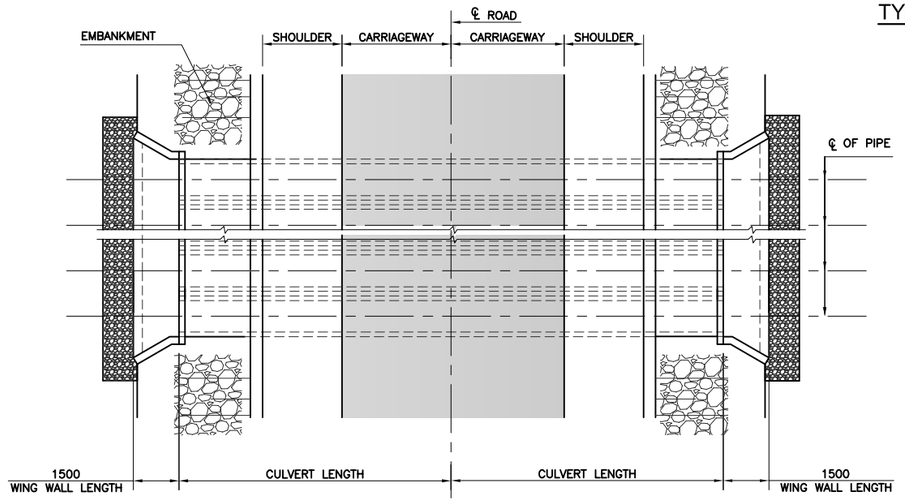
CLIENT:- ADB Asian Development Bank EXECUTING AGENCY:- WORKS AND SERVICES DEPARTMENT GOVERNMENT OF SINDH	PROJECT:- LOAN NO. 4279-PAK (COL): EMERGENCY FLOOD ASSISTANCE PROJECT (EFAP)	DESIGN CONSULTANT ECIL In association with AA	PROJECT ROAD:- DISTRICT : NAUSHEHRO FEROZE - NF-04 REHABILITATION OF ROAD FROM KANDIARO LAKHA ROAD AT POINT RAJPAR CHOWDAGI UPTO SAEED KHAN LAKHO ROAD TITLE:- REINFORCEMENT DETAILS OF APRON SLAB & WING WALLS FOR CULVERT HEIGHT > 2m	ED.NO. / DATE / DESCRIPTION	DRAWN: F.A.S DESIGNED: R.I / M.A CHECKED: S.A DATE: JUNE 2023	DRAWING NO. 2053-STR-NF04-BC-05 Scale:- 1:100 Edition.

PIPE CULVERTS

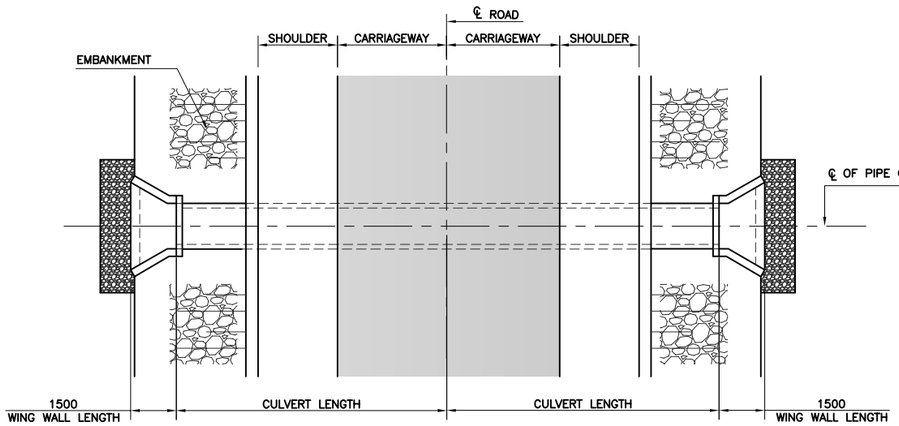


LONGITUDINAL SECTION AT C.L. OF PIPE CULVERT

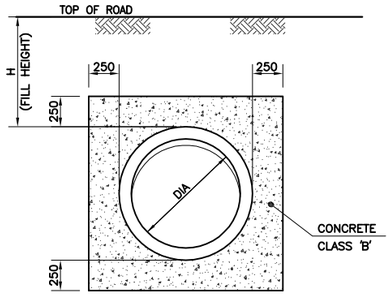
(FOR ROAD X-SECTION REFER RELEVANT HIGHWAY DRAWINGS)



PLAN (MULTI CELL)



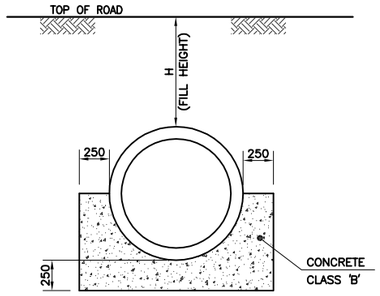
PLAN (SINGLE CELL)



TYPICAL SECTION (H≤1M) (SINGLE CELL)

SCALE 1:25

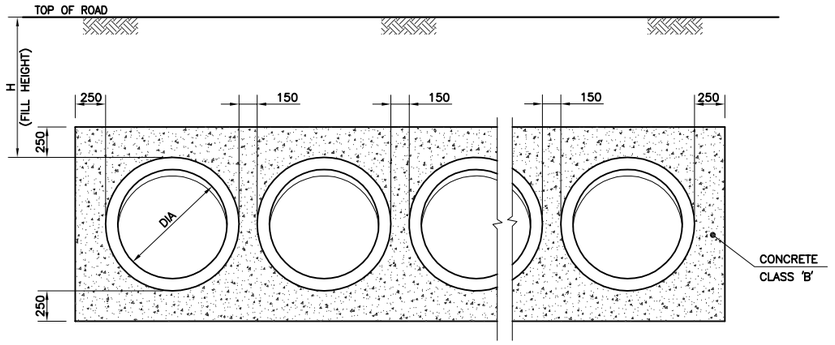
(FOR HEIGHT OF FILL ⩽ 1m)



TYPICAL SECTION (H>1M) (SINGLE CELL)

SCALE 1:25

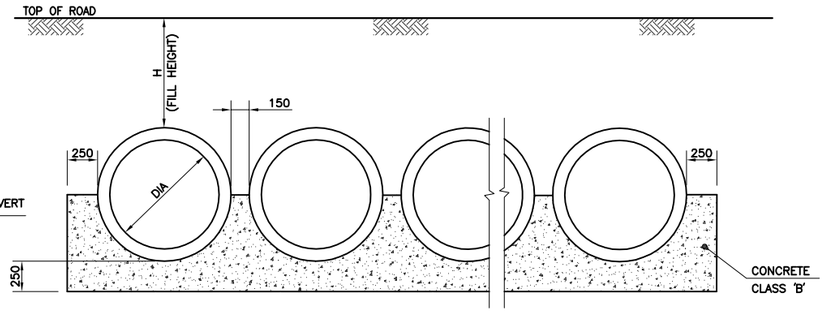
(FOR HEIGHT OF FIL> 1m)



TYPICAL SECTION (H≤1m) (MULTI CELL)

SCALE 1:25

(FOR HEIGHT OF FILL ⩽ 1m)



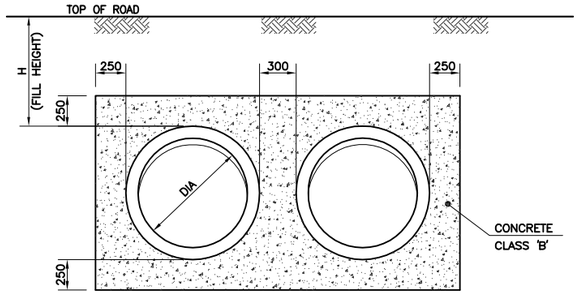
TYPICAL SECTION (H>1m) (MULTI CELL)

SCALE 1:25

(FOR HEIGHT OF FILL > 1m)

GENERAL NOTES:-

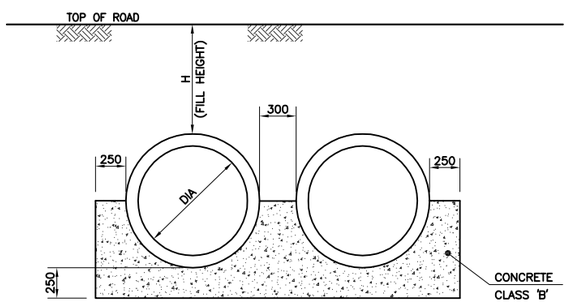
1- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS IN METERS UNLESS STATED OTHERWISE.
2- ALL DRAWINGS TO BE READ IN CONJUNCTION WITH RELEVANT HIGHWAY DRAWINGS.
3- CULVERT LOCATION, LENGTH, FRL & INVERT LEVEL SHALL BE AS PER ROAD/HYDRAULIC REQUIREMENTS.
4- ALL LEVELS SHALL BE VERIFIED AT SITE BEFORE EXECUTION.
5- LEVELS, LENGTHS & SKEWS MAY BE ADJUSTED AS PER SITE CONDITIONS DURING LEVELS ADJUSTMENTS, IF FILL HEIGHT VARIES SIGNIFICANTLY FOR WHICH THE STRUCTURE IS DESIGNED, NOTIFY ENGINEER.
6- ALL SOIL AT FOUNDATION LEVEL SHALL BE COMPACTED TO 95% OF MOD. PROCTOR BEFORE PLACEMENT OF FOUNDATION.
7- GROUND/SUBGRADE IMPROVEMENTS AND BACK FILLING SHALL BE IN ACCORDANCE WITH SPECIFICATION.
8- COMPACTION AROUND CULVERT SHALL BE ACHIEVED BY APPLYING COMPACTOR/ROLLER PASSES ALONG THE LENGTH OF THE CULVERT IN LAYERS (i.e. MAX 150MM THICK.)
9- PROPER CHANNELISATION OF THE DRAINAGE SHOULD BE ENSURED AT BOTH INLET AND OUTLET OF THE CULVERT OR AS DIRECTED BY THE ENGINEER.
10- AS A GENERAL PRINCIPLE, FOR NEW ROAD CONSTRUCTION, EMBANKMENT FILL SHOULD NOT BE LESS THAN 600mm. REDUCTION IN MINIMUM FILL SHOULD BE REVIEWED AS PER SITE CONDITIONS OR AS DIRECTED BY THE ENGINEER.
11- CLEAR COVER TO REINFORCEMENT SHALL NOT BE LESS THEN THE FOLLOWING:
BURIED FACES IN CONTACT WITH SOIL = 75mm
INTERNAL FACES = 50mm
12- ALL STURCTURAL CONCRETE SHALL BE CLASS 'A3' CONCRETE.
13- ALL STURCTURAL REINFORCEMENT SHALL BE GRADE 60 STEEL.
14- REINFOECED CONCRETE PIPE CULVERTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-170.CLASS IV.
15- BEDDING OR ENCASEMENT OF CONCRETE PIPE CULVERTS SHALL CONFORM TO THE REQUIREMENTS OF GENERAL SPECIFICATIONS.
16- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DWG. NO. 2053-STR-NF04-PC-02
17- FOR EMBANKMENT DETAILS, REFER HIGHWAY DWGS.
18- DIAMETER & NO. OF PIPES SHALL BE CONFIRMED FROM HYDROLOGY REPORT BEFORE EXECUTIONS.



TYPICAL SECTION (H≤1m) (DOUBLE CELL)

SCALE 1:25

(FOR HEIGHT OF FILL ⩽ 1m)

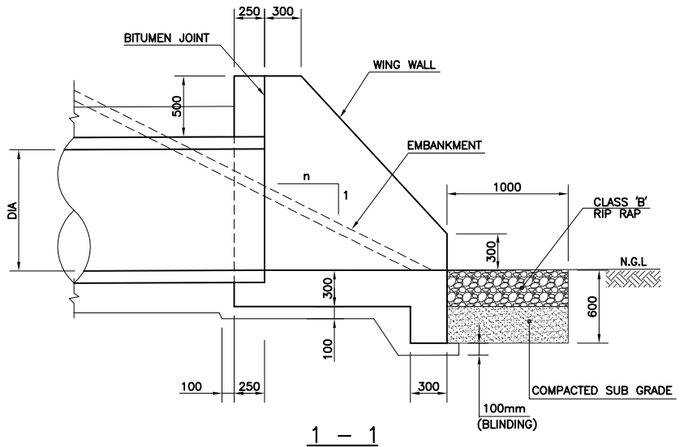


TYPICAL SECTION (H>1m) (DOUBLE CELL)

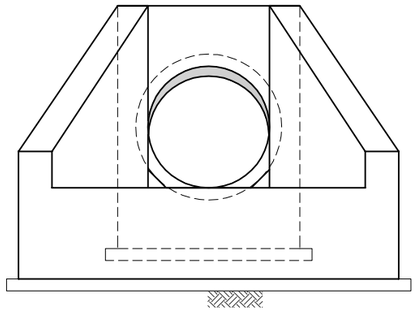
SCALE 1:25

(FOR HEIGHT OF FILL > 1m)

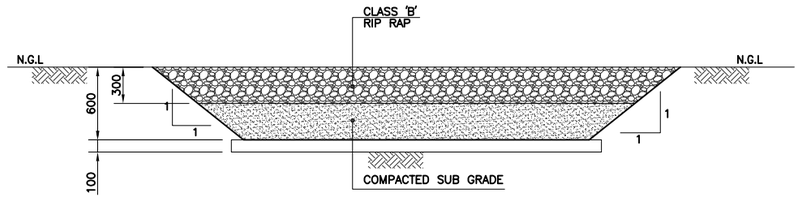
CLIENT:- ADB Asian Development Bank EXECUTING AGENCY:- WORKS AND SERVICES DEPARTMENT GOVERNMENT OF SINDH	PROJECT:- LOAN NO. 4279-PAK (COL): EMERGENCY FLOOD ASSISTANCE PROJECT (EFAP)	DESIGN CONSULTANT ECIL In association with AA	PROJECT ROAD:- DISTRICT : NAUSHEHRO FEROZE - NF-04 REHABILITATION OF ROAD FROM KANDIARO LAKHA ROAD AT POINT RAJPAR CHOWDAGI UPTO SAEED KHAN LAKHO ROAD TITLE:- PIPE CULVERTS GENERAL ARRANGEMENT	ED.NO. / DATE / DESCRIPTION	DRAWN: F.A.S DESIGNED: R.I / M.A CHECKED: S.A DATE: JUNE 2023	DRAWING NO. 2053-STR-NF04-PC-01 Scale:- 1:100 Edition.



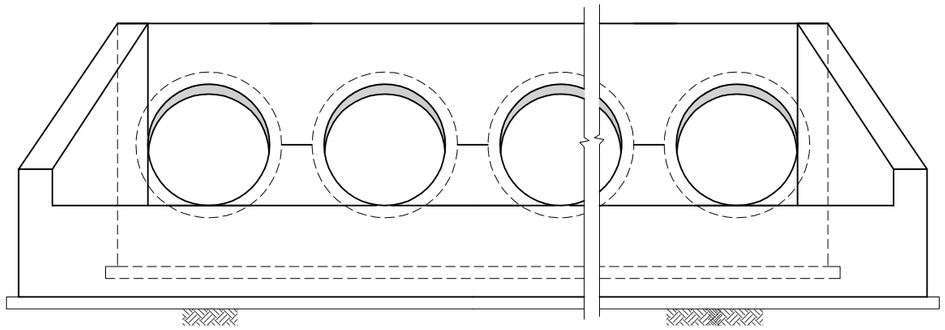
1 – 1
SCALE 1:25



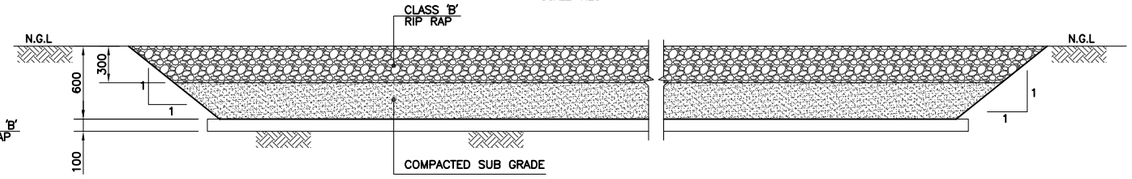
2 – 2
SCALE 1:25



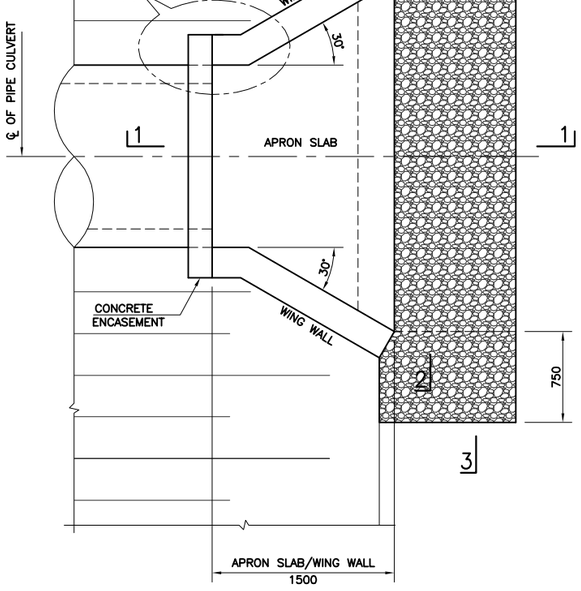
3 – 3
SCALE 1:25



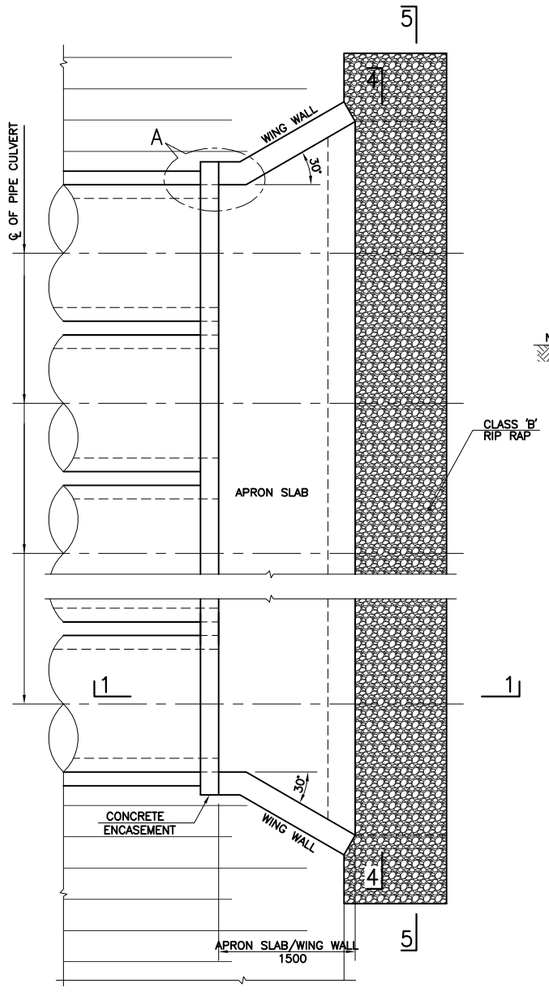
4 – 4
SCALE 1:25



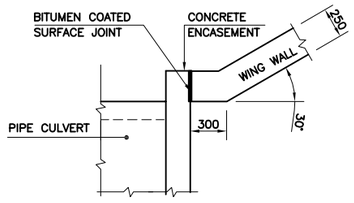
5 – 5
SCALE 1:25



PLAN (SINGLE CELL)
SCALE 1:25



PLAN (MULTI CELL)
SCALE 1:75

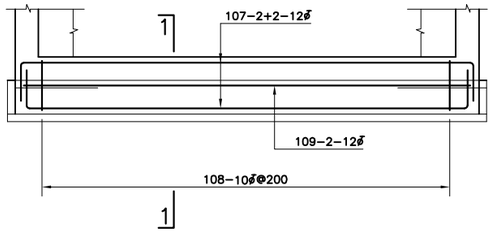


DETAIL A
SCALE 1:25

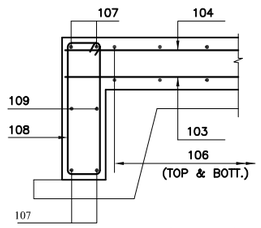
NOTES:–

1– FOR GENERAL NOTES REFER DWG. NO. 2053–STR–NF04–PC–01.
2– THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DWG. NO. 2053–STR–NF04–PC–01.

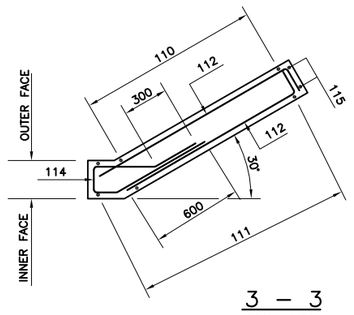
CLIENT:- ADB Asian Development Bank EXECUTING AGENCY:- WORKS AND SERVICES DEPARTMENT GOVERNMENT OF SINDH	PROJECT:- LOAN NO. 4279-PAK (COL): EMERGENCY FLOOD ASSISTANCE PROJECT (EFAP)	DESIGN CONSULTANT ECIL In association with	PROJECT ROAD:- DISTRICT : NAUSHEHRO FEROZE - NF-04 REHABILITATION OF ROAD FROM KANDIARO LAKHA ROAD AT POINT RAJPAR CHOWDAGI UPTO SAEED KHAN LAKHO ROAD TITLE:- PIPE CULVERTS TYPICAL DETAILS WING WALL & APRON SLAB	ED.NO.	DATE	DESCRIPTION	DRAWN: F.A.S DESIGNED: R.I / M.A CHECKED: S.A DATE: JUNE 2023	DRAWING NO. 2053-STR-NF04-PC-02 Scale:- 1:100 Edition.



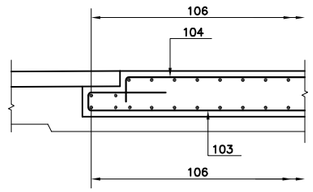
ELEV. OF APRON BEAM
SCALE 1:50



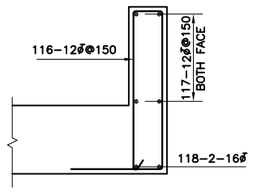
1 – 1
SCALE 1:20



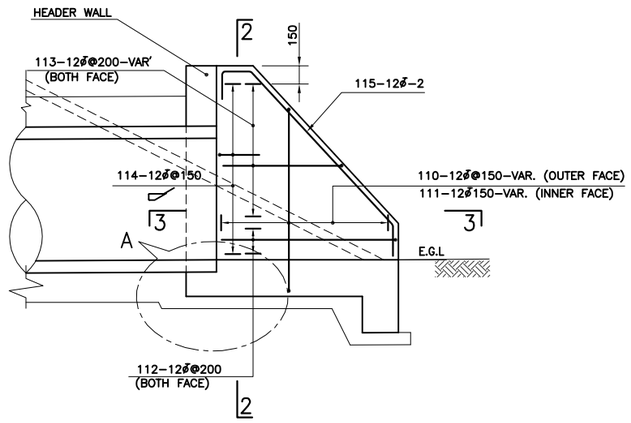
3 – 3
SCALE 1:20



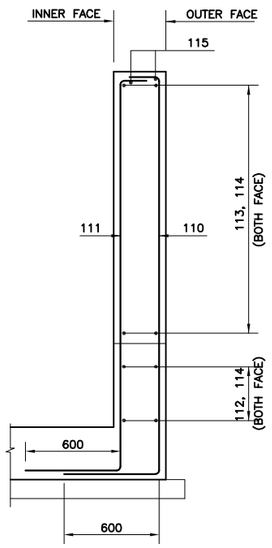
DETAIL A
SCALE 1:20



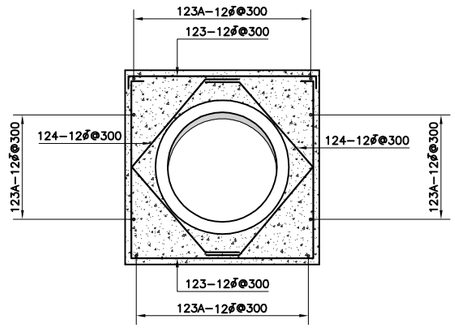
TYP. SEC.OF HEADER WALL
SCALE 1:20



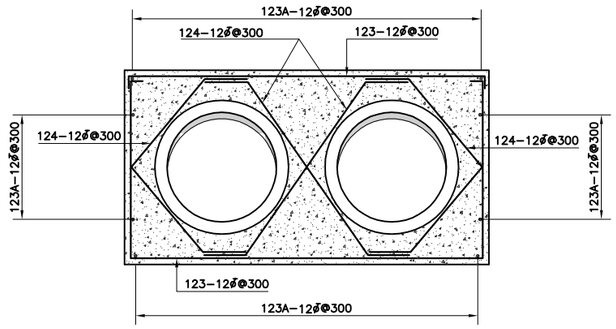
ELEVATION OF WING WALL
SCALE 1:25 (4NOS.)



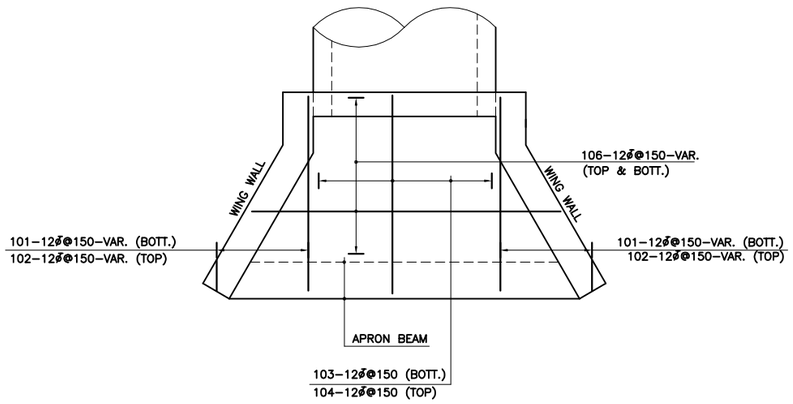
2 – 2
SCALE 1:20



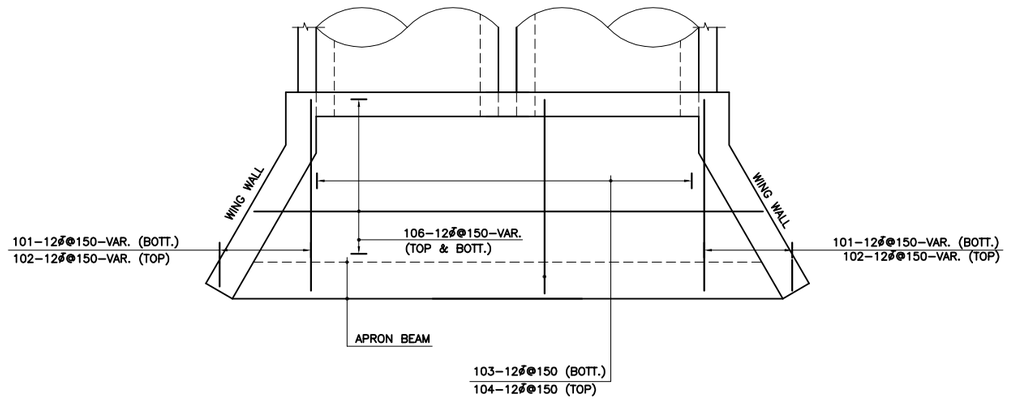
TYPICAL SECTION (H<=1M) (SINGLE CELL)
SCALE 1:25
(FOR HEIGHT OF FILL ⩽ 1m)



TYPICAL SECTION (H<=1M) (DOUBLE CELL)
SCALE 1:25
(FOR HEIGHT OF FILL ⩽ 1m)



TYP. PLAN OF APRON SLAB (SINGLE CELL)
SCALE 1:25 (2NOS.)



TYP. PLAN OF APRON SLAB (DOUBLE CELL)
SCALE 1:25 (2NOS.)

NOTES:–

1– FOR GENERAL NOTES REFER DWG. NO. 2053–STR–NF04–PC–01.
2– THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DWG. NO. 2053–STR–NF04–PC–01 & 02.

CLIENT:- ADB Asian Development Bank EXECUTING AGENCY:- WORKS AND SERVICES DEPARTMENT GOVERNMENT OF SINDH	PROJECT:- LOAN NO. 4279-PAK (COL): EMERGENCY FLOOD ASSISTANCE PROJECT (EFAP)	DESIGN CONSULTANT ECIL In association with AA	PROJECT ROAD:- DISTRICT : NAUSHEHRO FEROZE - NF-04 REHABILITATION OF ROAD FROM KANDIARO LAKHA ROAD AT POINT RAJPAR CHOWDAGI UPTO SAEED KHAN LAKHO ROAD TITLE:- PIPE CULVERTS REINFORCEMENT DETAILS	ED.NO.	DATE	DESCRIPTION	DRAWN: F.A.S DESIGNED: R.I / M.A CHECKED: S.A DATE: JUNE 2023	DRAWING NO. 2053-STR-NF04-PC-03 Scale:- 1:100 Edition.