

STRUCTURE DRAWINGS
(CULVERTS)
SOHABATPUR ROAD
DERA ALLA YAR TO HAIRDEEN(38KM)
LOT-1
RD: 16+550 TILL 38+000

PREPARATION OF ASSESSMENT
STUDY, PREPARATION OF DETAILED DESIGNS,
PROCUREMENT ASSISTANCE, AND SUPERVISION OF
WORKS (C&W) (PK-PIU-IFRAP-CIR-441964-CS-QCBS)

LEAD CONSULTANT:



ZEERUK INTERNATIONAL Pvt. Ltd

CLIENT:



Project Implementation Unit (PIU)
Integrated Flood Resilience and
Adaptation Project (IFRAP)
Component I

SINGLE CELL BOX CULVERT

IFRAP PROPOSED BOX CULVERTS						
Sr. No.	CHAINAGE (Km)	STRUCTURE TYPE	WIDTH (m)	HEIGHT (m)	CELL	SKEW (Degree)
1	22+240	Box Culvert	2	2	1	0

- 1.CULVERT FOUNDATION IS DESIGNED ON AN ALLOWABLE BEARING CAPACITY OF 1.25 TSF (≈130 KPA).
- 2.REMOVE ALL SOFT, LOOSE, ORGANIC, OR UNSUITABLE MATERIAL FROM FOUNDATION BED PRIOR TO CONSTRUCTION.
- 3.COMPACT EXISTING GROUND TO MINIMUM 95% MDD (MODIFIED PROCTOR)AS PER ASTM D 1557 / AASHTO T 180.
- 4.PROVIDE 6–INCH (150 MM) THICK SAND CUSHION, COMPACTED TO 95% MDD, IN LAYERS NOT EXCEEDING 150 MM LOOSE THICKNESS.
- 5.PROVIDE 50 MM PLAIN CEMENT CONCRETE(PCC)BLINDING OVER COMPACTED SAND LAYER FORCLEAN AND LEVEL BEDDING.
- 6.CONTRACTOR SHALL PERFORM FIELD DENSITY TESTS AS PER ASTM D 1556 / AASHTO T 191TO VERIFY 95% MDD COMPACTION FOR SUBGRADE AND SAND CUSHION.
- 7.ANY SOFT POCKETS ENCOUNTERED DURING PROOF–ROLLING SHALL BE REMOVED AND REPLACED WITH APPROVED ENGINEERED FILL COMPACTED TO 95% MD.
- 8.IN WATER–LOGGED SOIL CONDITIONS, PERFORM PLATE LOAD TEST (ASTM D1194)TO 3 TIMES THE DESIGN LOADTO VERIFY ALLOWABLE BEARING CAPACITY BEFORE PLACING BLINDING CONCRETE.
- 9.BLINDING MUST BE UNIFORM, LEVEL AND FREE FROM HONEYCOMBING, SEGREGATION OR STANDING WATER.
- 10.CULVERT UNITS SHALL NOT BE PLACED UNTIL THE ENGINEER APPROVES THE FOUNDATION PREPARATION AND COMPACTION TEST RESULTS.

NOTES

1. CLEAR COVER TO REINFORCEMENT IS 50mm.

2. THE CLEAR CONC. COVER TO SURFACES HAVING CONTACT WITH THE SOIL IS 75mm.

3. ALL BARS ARE (H.Y.S) HIGH YIELD DEFORMED STEEL WITH fy=410 N/mm (60KSI).

4. CONCRETE SHALL HAVE A MINIMUM 28 DAYS CYLINDER STRENGTH OF 4000 psi.

5. LEAN CONCRETE SHALL HAVE A MINIMUM 28 DAYS CYLINDER STRENGTH OF 100 Kg/CM.

6. UNLESS OTHERWISE SHOWN ON THE DRAWINGS LAPS IN REINFORCING STEEL BARS SHALL BE STAGGERED, MINIMUM LENGTH OF LAP SHALL BE 48 TIMES THE SMALLER BAR DIAMETER SPLICED.

7. ALL CONCRETE FACES BURIED IN SOIL BE PAINTED WITH TWO COATS OF HOT BITUMEN.

8. ALL DIMENSION ARE IN MILLIMETERS.

9. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.

10. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH OTHER RELEVANT DRAWING.

11. EXPANSION JOINT SHOULD BE PROVIDED. AFTER EVERY FOUR CELL (TRANSVERSELY).

12. CONTRACTION JOINT SHOULD BE PROVIDED FOR CULVERT LENGTH MORE THAN 12.00 M.

13. THE CLEAR CONC. COVER TO SURFACES HAVING CONTACT WITH THE SOIL IS 75mm.

14. DEPTH OF GRANULAR AND SELECT BACKFILL SHALL BE PROVIDED IF REQUIRED AS PER SITE CONDITIONS (EXAMPLE: IN WATER LOGGED AREA), OR IF DECIDED BY THE ENGINEER.

REV

DATE

DESCRIPTION

SIGN

AMENDMENTS

CLIENT:



Project Implementation Unit (PIU)
Integrated Flood Resilience and
Adaptation Project (IFRAP)
Component I

PROJECT:



Consulting Services For
Design, Procurement Assistance, Contract
Administration and Construction Supervision
(Road Infrastructure Sub-Component)

LEAD CONSULTANT:



ZEERUK INTERNATIONAL (PVT)LTD
3rd Floor, Aura Square Plaza,
F-11 Markaz, Islamabad
Ph: 051-2224215-16, FAX: 051-2224217

KASIB CONSULTANTS
PVT. LTD

TITLE:

SINGLE CELL BOX CULVERT
LIST OF STRUCTURE

STATUS:

ISSUED FOR CONSTRUCTION

DRAWN:

SAIF

APPROVED:

INAM MINHAS

DESIGNED:

AHMED

SCALE:

AS SHOWN

SHEET:

CHECKED:

ANAS

DATE:

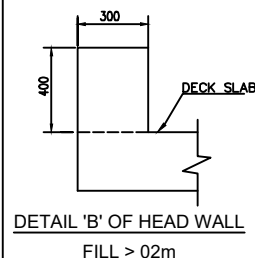
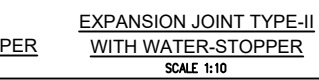
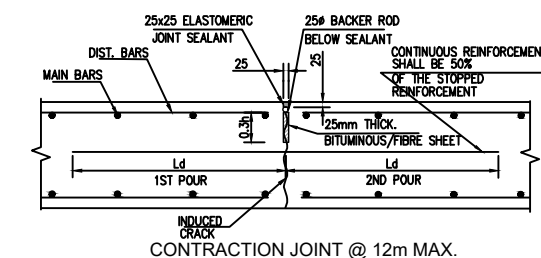
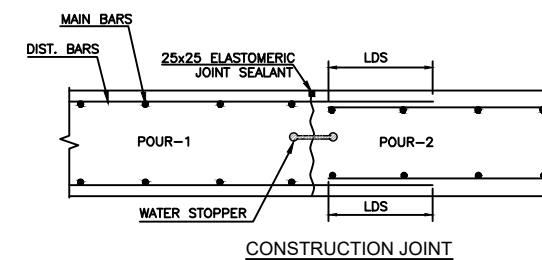
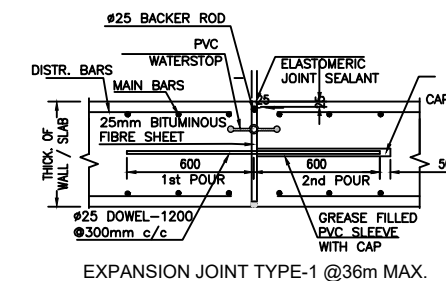
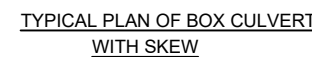
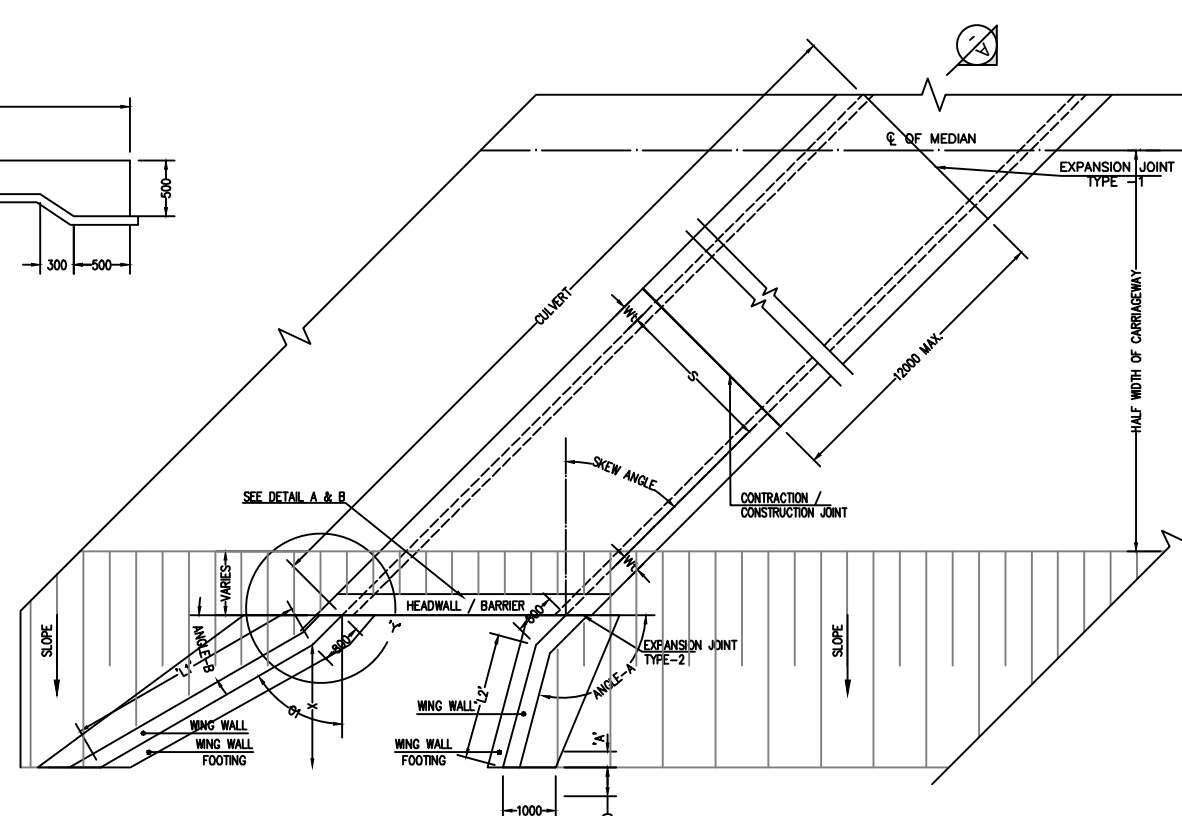
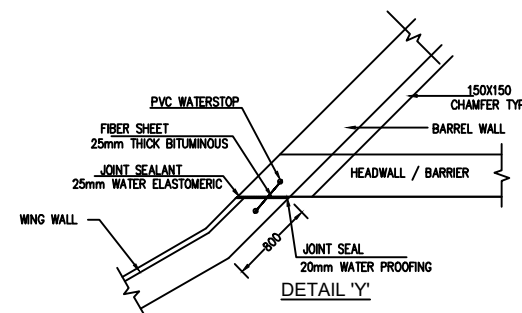
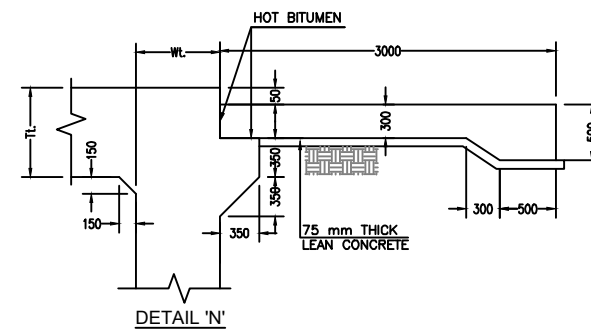
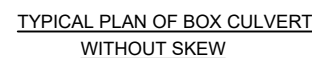
NOV, 2025

DRAWING NO.

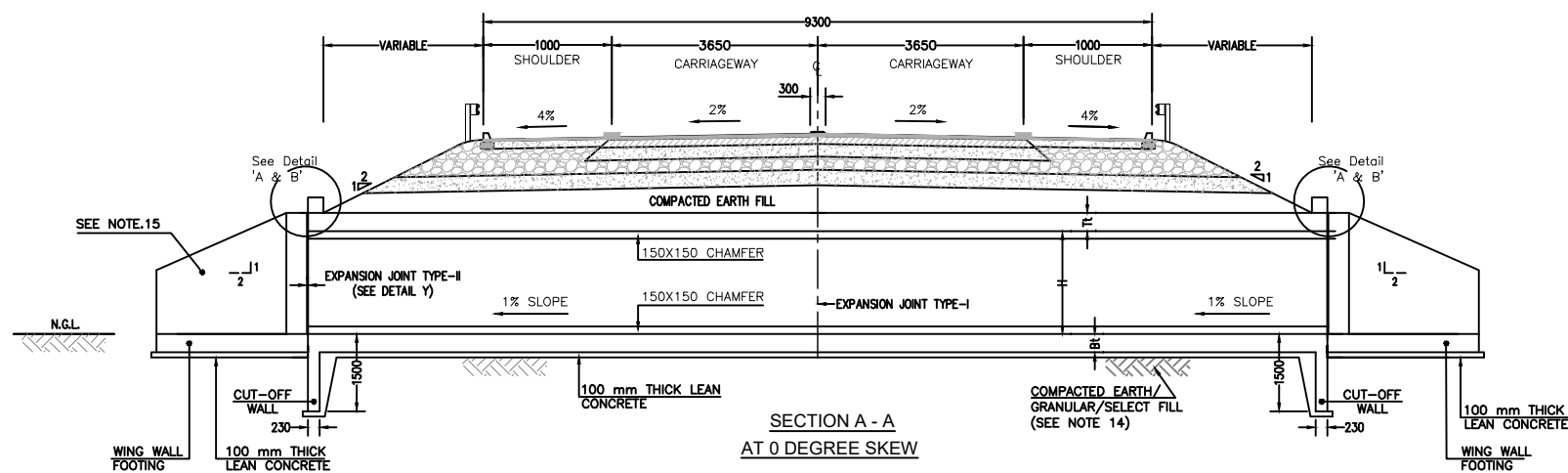
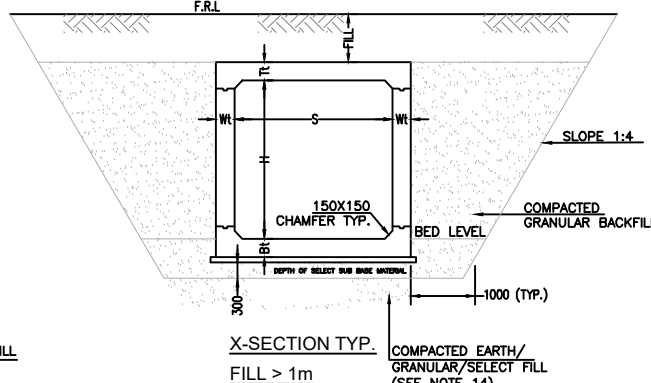
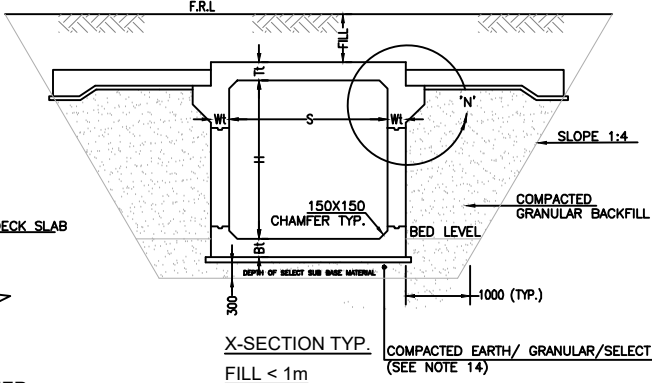
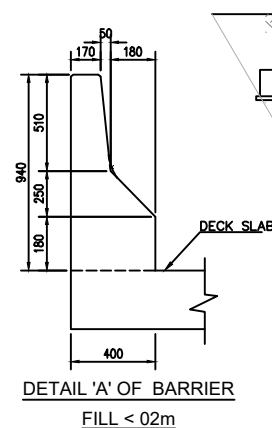
ZI/IFRAP/STR/SBC-01

REV NO.

0



CULVERT SKEW	ANGLE A	ANGLE B
0°	60°	60°
0°-5°	65°	55°
5°-10°	70°	50°
10°-15°	75°	45°
15°-20°	80°	45°
20°-25°	85°	45°
25°-30°	90°	45°
30°-35°	95°	40°
35°-40°	100°	35°
40°-45°	105°	30°



- NOTES**

 1. CLEAR COVER TO REINFORCEMENT IS 50mm.
 2. THE CLEAR CONC. COVER TO SURFACES HAVING CONTACT WITH THE SOIL IS 75mm.
 3. ALL BARS ARE (H.Y.S) HIGH YIELD DEFORMED STEEL WITH $f_y=410$ N/mm (60KSI).
 4. CONCRETE SHALL HAVE A MINIMUM 28 DAYS CYLINDER STRENGTH OF 4000 psi.
 5. LEAN CONCRETE SHALL HAVE A MINIMUM 28 DAYS CYLINDER STRENGTH OF 100 Kg/CM.
 6. UNLESS OTHERWISE SHOWN ON THE DRAWINGS LAPS IN REINFORCING STEEL BARS SHALL BE STAGGERED, MINIMUM LENGTH OF LAP SHALL BE 48 TIMES THE SMALLER BAR DIAMETER SPLICED.
 7. ALL CONCRETE FACES BURIED IN SOIL BE PAINTED WITH TWO COATS OF HOT BITUMEN.
 8. ALL DIMENSION ARE IN MILLIMETERS.
 9. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.
 10. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH OTHER RELEVANT DRAWING.
 11. EXPANSION JOINT SHOULD BE PROVIDED. AFTER EVERY FOUR CELL (TRANSVERSELY).
 12. CONTRACTION JOINT SHOULD BE PROVIDED FOR CULVERT LENGTH MORE THAN 12.00 M.
 13. THE CLEAR CONC. COVER TO SURFACES HAVING CONTACT WITH THE SOIL IS 75mm.
 14. DEPTH OF GRANULAR AND SELECT BACKFILL SHALL BE PROVIDED IF REQUIRED AS PER SITE CONDITIONS (EXAMPLE: IN WATER LOGGED AREA), OR IF DECIDED BY THE ENGINEER.
 15. FOR TYPICAL WING WALL DETAILS REFER TO DRG.NO. ZI/IFRAP/STR/SBC-05

REV	DATE	DESCRIPTION	SIGN

AMENDMENTS	
CLIENT:	 Project Implementation Unit (PIU) Integrated Flood Resilience and Adaptation Project (IFRAP) Component I

PROJECT:	 Consulting Services For Design, Procurement Assistance, Contract Administration and Construction Supervision (Road Infrastructure Sub-Component)
----------	---

LEAD CONSULTANT:

 **ZEERUK INTERNATIONAL (PVT) LTD**
3rd Floor, Aura Square Plaza,
F-11 Markaz, Islamabad
Ph: 051-2224215-16, FAX: 051-2224217

 **KASIB CONSULTANTS
PVT. LTD**

TITLE:

SINGLE CELL BOX CULVERT
GENERAL ARRANGEMENT PLAN &
ELEVATION

STATUS:	ISSUED FOR CONSTRUCTION
---------	-------------------------

DRAWN:	SAIF	APPROVED:	INAM MINHAS
DESIGNED:	AHMED	SCALE:	SHEET:
CHECKED:	ANAS	AS SHOWN	
		DATE:	NOV, 2025

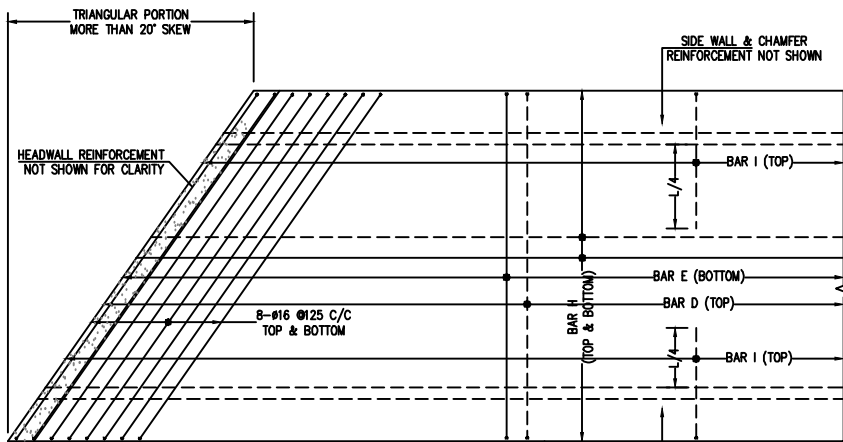
DRAWING NO.	REV NO.
ZI/IFRAP/STR/SBC-02	0

SINGLE CELL BOX CULVERT																		
S No	Fill upto (m)	No of cells	Span (m)	Height (m)	Tt (m)	Bt (m)	Wt (m)	Bar Mark A	Bar Mark B	Bar Mark C	Bar Mark D	Bar Mark E	Bar Mark F	Bar Mark G	Bar Mark H	Bar Mark I	Bar Mark J	Bar Mark K
1	0-1	1	2	2	0.25	0.25	0.25	12@150	12@175		12@150	16@175	16@175	12@150	12@250	12@150	12@250	12@175
2	1-3	1	2	2	0.25	0.25	0.25	12@150	12@150		12@150	12@150	12@150	12@150	12@250	12@150	12@250	12@300
3	3-5	1	2	2	0.25	0.25	0.25	16@200	12@150		16@200	16@150	16@150	16@200	12@250	16@200	12@250	12@300

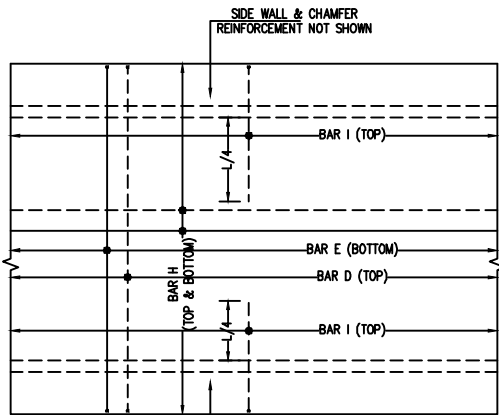
TABLE NO. 3

- * THE DESIGN IS ONLY VALID FOR THE FILL HEIGHTS GIVEN IN TABLE NO. 3.
- * THE DRAWINGS NEED TO BE READ IN CONJUNCTION WITH RELEVANT HIGHWAY DRAWINGS (PLAN AND PROFILE) BEFORE START OF CONSTRUCTION.
- * CONTRACTOR TO ACHIEVE 95% MAX. DRY DENSITY (MDD) AS PER NHA SPECIFICATIONS 104, CLAUSE 104.2 (THE COMPACTION OF NATURAL GROUND BELOW FOUNDATION OF STRUCTURE SHALL BE 95% OF MAX DRY DENSITY CONDUCTED AND CHECKED AGAINST AASHTO T-180-D).
- * IF 95% MDD DOES NOT COMPLY, CONTRACTOR TO NOTIFY THE GEOTECH ENGINEER

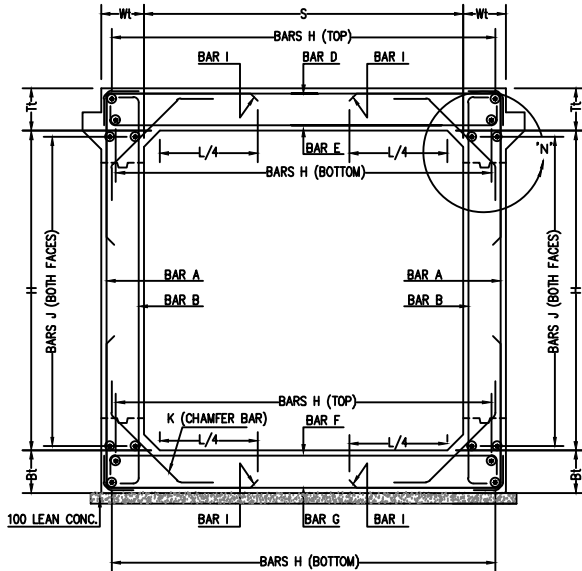
- NOTES
1. CLEAR COVER TO REINFORCEMENT IS 50mm.
 2. THE CLEAR CONC. COVER TO SURFACES HAVING CONTACT WITH THE SOIL IS 75mm.
 3. ALL BARS ARE (H.Y.S) HIGH YIELD DEFORMED STEEL WITH $f_y=410$ N/mm (60KSI).
 4. CONCRETE SHALL HAVE A MINIMUM 28 DAYS CYLINDER STRENGTH OF 4000 psi.
 5. LEAN CONCRETE SHALL HAVE A MINIMUM 28 DAYS CYLINDER STRENGTH OF 100 Kg/cm.
 6. UNLESS OTHERWISE SHOWN ON THE DRAWINGS LAPS IN REINFORCING STEEL BARS SHALL BE STAGGERED, MINIMUM LENGTH OF LAP SHALL BE 48 TIMES THE SMALLER BAR DIAMETER SPLICED.
 7. ALL CONCRETE FACES BURIED IN SOIL BE PAINTED WITH TWO COATS OF HOT BITUMEN.
 8. ALL DIMENSION ARE IN MILLIMETERS.
 9. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.
 10. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH OTHER RELEVANT DRAWING.
 11. EXPANSION JOINT SHOULD BE PROVIDED. AFTER EVERY FOUR CELL (TRANSVERSELY).
 12. CONTRACTION JOINT SHOULD BE PROVIDED FOR CULVERT LENGTH MORE THAN 12.00 M.
 13. THE CLEAR CONC. COVER TO SURFACES HAVING CONTACT WITH THE SOIL IS 75mm.



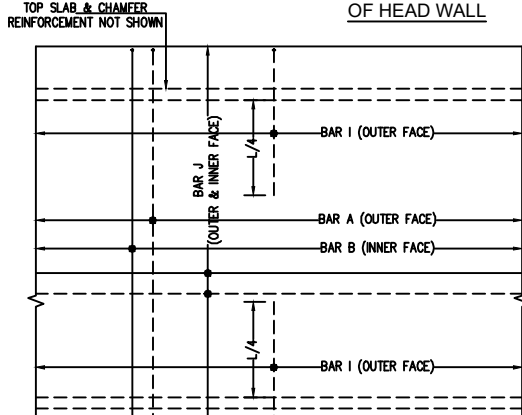
TYPICAL R.C.C BOX CULVERT TOP SLAB
AT SKEW
(FOR REINFORCEMENT DETAILS REFER SHEET 03/TABLE NO. 3)



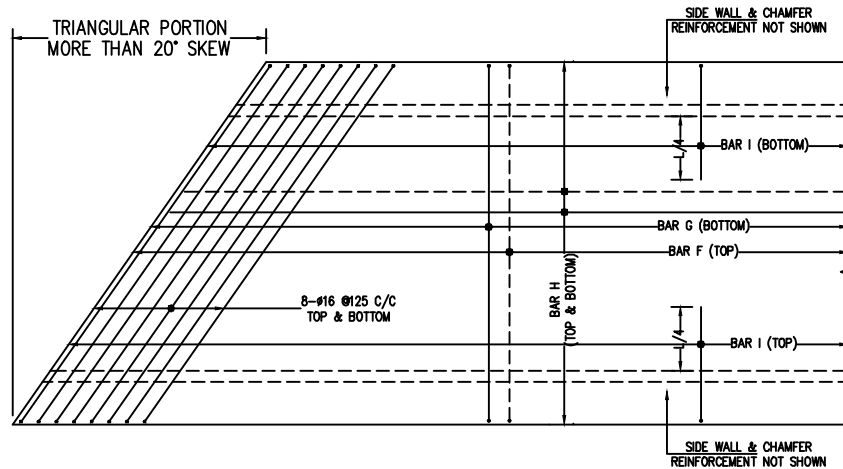
TYPICAL R.C.C BOX CULVERT
TOP SLAB PLAN



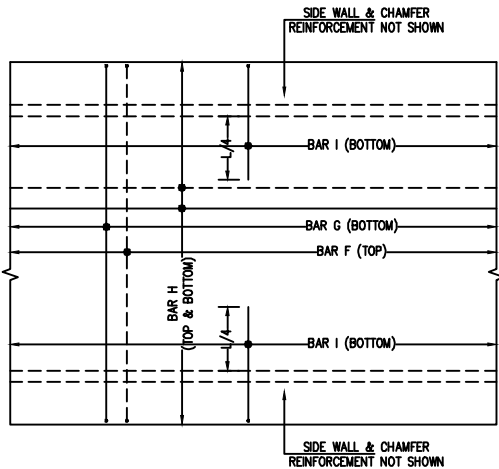
TYPICAL REINF. BOX SECTION



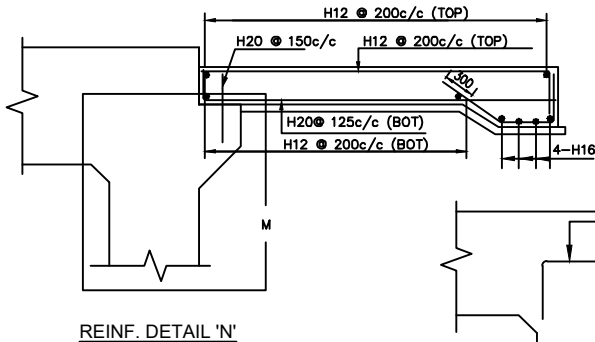
TYPICAL R.C.C BOX CULVERT
SIDE WALL



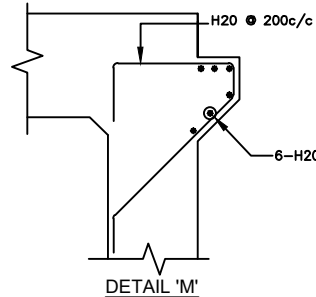
TYPICAL R.C.C BOX CULVERT BOTTOM SLAB
AT SKEW



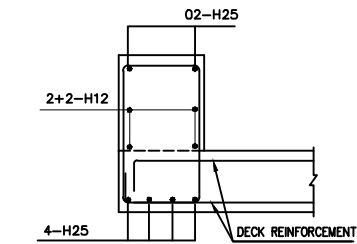
TYPICAL R.C.C BOX CULVERT
BOTTOM SLAB PLAN



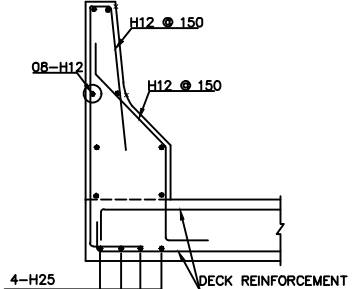
REINF. DETAIL 'N'



DETAIL 'M'

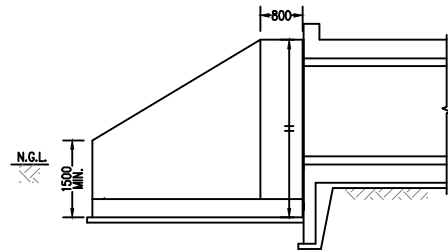


REINFORCEMENT DETAIL
OF HEAD WALL

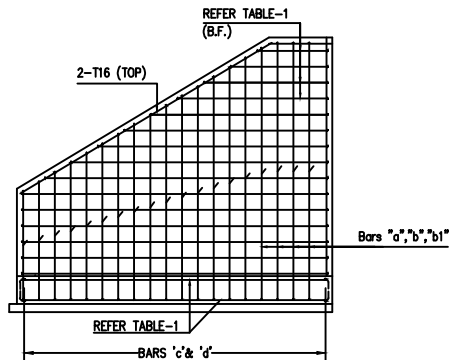


REINFORCEMENT DETAIL
OF BARRIER

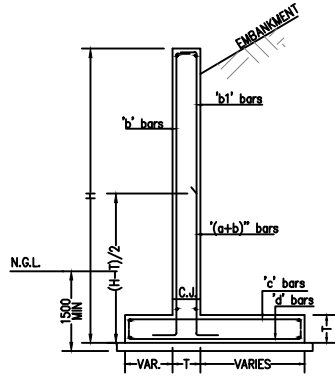
REV	DATE	DESCRIPTION	SIGN
AMENDMENTS			
CLIENT:			
 Project Implementation Unit (PIU) Integrated Flood Resilience and Adaptation Project (IFRAP) Component I			
PROJECT:			
 Consulting Services For Design, Procurement Assistance, Contract Administration and Construction Supervision (Road Infrastructure Sub-Component)			
LEAD CONSULTANT:			
 ZEERUK INTERNATIONAL (PVT) LTD 3rd Floor, Aura Square Plaza, F-11 Markaz, Islamabad Ph: 051-2224215-16, FAX: 051-2224217  KASIB CONSULTANTS PVT. LTD			
TITLE:			
SINGLE CELL BOX CULVERT SLAB REINFORCEMENT DETAIL			
STATUS:			
ISSUED FOR CONSTRUCTION			
DRAWN: SAIF		APPROVED: INAM MINHAS	
DESIGNED: AHMED		SCALE: AS SHOWN	
CHECKED: ANAS		DATE: NOV, 2025	
DRAWING NO. ZI/IFRAP/STR/SBC-03			REV NO. 0



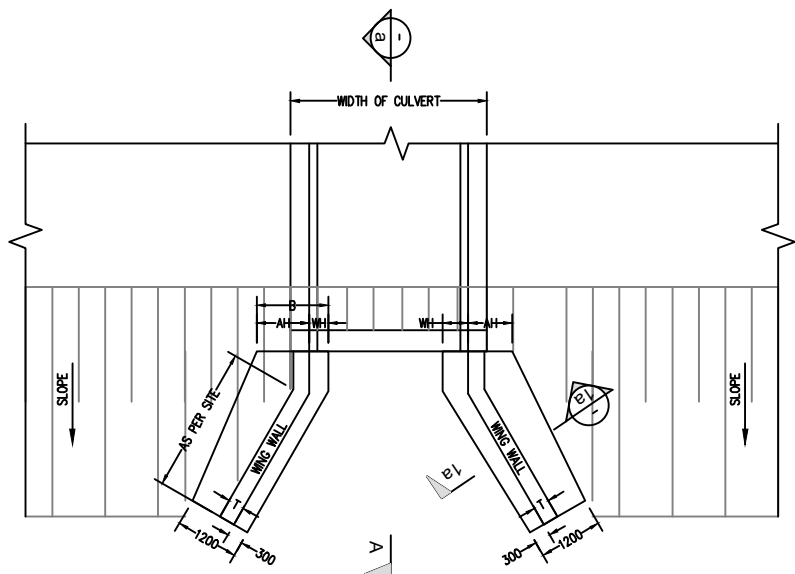
TYPICAL ELEVATION OF WING WALL



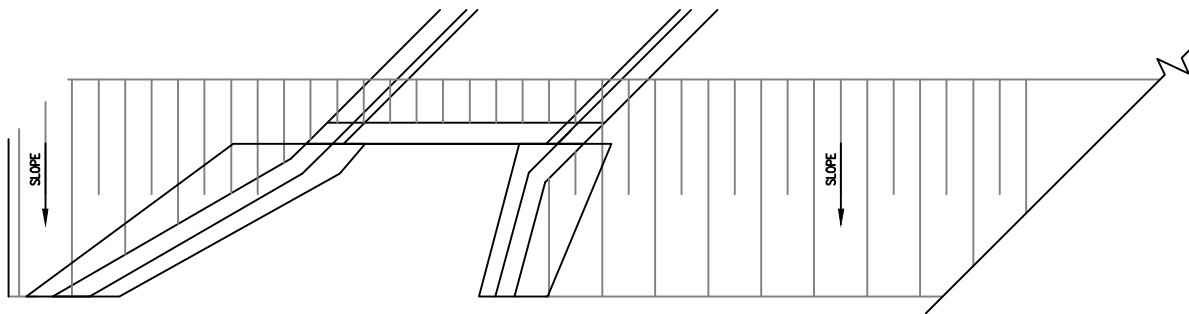
TYPICAL ELEVATION OF WING WALL
(SHOWING REINFORCEMENT)



SECTION 1a-1a



TYPICAL PLAN OF BOX CULVERT
WITHOUT SKEW



TYPICAL PLAN OF BOX CULVERT
WITH SKEW

H	AH	T	WH	B	WINGWALL REINF. SCHEDULE								DISTRIBUTION BARS			
					MAIN REINF. BARS								WALL		BASE	
					a		b & b1		c		d					
					Ø	Spacing	Ø	Spacing	Ø	Spacing	Ø	Spacing	Ø	Spacing	Ø	Spacing
m	m	m	m	m	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
4.0	0.8	0.3	2.0	3.1	16	150	16	200	16	200	20	200	12	200	12	200
3.0	0.5	0.3	1.6	2.40	12	150	12	200	16	200	20	200	12	200	12	200
2.0	0.45	0.3	1.5	2.25	12	200	12	200	16	200	16	200	12	200	12	200

- NOTES
1. CLEAR COVER TO REINFORCEMENT IS 50mm.
 2. THE CLEAR CONC. COVER TO SURFACES HAVING CONTACT WITH THE SOIL IS 75mm.
 3. ALL BARS ARE (H.Y.S) HIGH YIELD DEFORMED STEEL WITH $f_y=410$ N/mm (60KSI).
 4. CONCRETE SHALL HAVE A MINIMUM 28 DAYS CYLINDER STRENGTH OF 4000 psi.
 5. LEAN CONCRETE SHALL HAVE A MINIMUM 28 DAYS CYLINDER STRENGTH OF 100 Kg/CM.
 6. UNLESS OTHERWISE SHOWN ON THE DRAWINGS LAPS IN REINFORCING STEEL BARS SHALL BE STAGGERED, MINIMUM LENGTH OF LAP SHALL BE 48 TIMES THE SMALLER BAR DIAMETER SPICED.
 7. ALL CONCRETE FACES BURIED IN SOIL BE PAINTED WITH TWO COATS OF HOT BITUMEN.
 8. ALL DIMENSION ARE IN MILLIMETERS.
 9. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.
 10. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH OTHER RELEVANT DRAWING.
 11. THE CLEAR CONC. COVER TO SURFACES HAVING CONTACT WITH THE SOIL IS 75mm.

REV	DATE	DESCRIPTION	SIGN
AMENDMENTS			
CLIENT:			
 Project Implementation Unit (PIU) Integrated Flood Resilience and Adaptation Project (IFRAP) Component I			
PROJECT:			
 Consulting Services For Design, Procurement Assistance, Contract Administration and Construction Supervision (Road Infrastructure Sub-Component)			
LEAD CONSULTANT:			
 ZEERUK INTERNATIONAL (PVT)LTD 3rd Floor, Aura Square Plaza, F-11 Markaz, Islamabad Ph: 051-2224215-16, FAX: 051-2224217 KASIB CONSULTANTS PVT. LTD			
TITLE:			
SINGLE CELL BOX CULVERT TYPICAL WING WALL DETAILS			
STATUS:			
ISSUED FOR CONSTRUCTION			
DRAWN:		APPROVED:	
SAIF		INAM MINHAS	
DESIGNED:		SCALE:	
AHMED		AS SHOWN	
CHECKED:		DATE:	
ANAS		NOV, 2025	
DRAWING NO.			REV NO.
ZI/IFRAP/STR/SBC-05			0

DOUBLE CELL BOX CULVERT

IFRAP PROPOSED BOX CULVERTS						
Sr. No.	CHAINAGE (Km)	STRUCTURE TYPE	WIDTH (m)	HEIGHT (m)	CELL	SKEW (Degree)
1	25+920	Box Culvert	3	1.5	2	0
2	37+300	Box Culvert	2	2	2	0

- 1.CULVERT FOUNDATION IS DESIGNED ON AN ALLOWABLE BEARING CAPACITY OF 1.25 TSF (≈130 KPA).
- 2.REMOVE ALL SOFT, LOOSE, ORGANIC, OR UNSUITABLE MATERIAL FROM FOUNDATION BED PRIOR TO CONSTRUCTION.
- 3.COMPACT EXISTING GROUND TO MINIMUM 95% MDD (MODIFIED PROCTOR)AS PER ASTM D 1557 / AASHTO T 180.
- 4.PROVIDE 6–INCH (150 MM) THICK SAND CUSHION, COMPACTED TO 95% MDD, IN LAYERS NOT EXCEEDING 150 MM LOOSE THICKNESS.
- 5.PROVIDE 50 MM PLAIN CEMENT CONCRETE(PCC)BLINDING OVER COMPACTED SAND LAYER FORCLEAN AND LEVEL BEDDING.
- 6.CONTRACTOR SHALL PERFORM FIELD DENSITY TESTS AS PER ASTM D 1556 / AASHTO T 191TO VERIFY 95% MDD COMPACTION FOR SUBGRADE AND SAND CUSHION.
- 7.ANY SOFT POCKETS ENCOUNTERED DURING PROOF–ROLLING SHALL BE REMOVED AND REPLACED WITH APPROVED ENGINEERED FILL COMPACTED TO 95% MD.
- 8.IN WATER–LOGGED SOIL CONDITIONS, PERFORM PLATE LOAD TEST (ASTM D1194)TO 3 TIMES THE DESIGN LOADTO VERIFY ALLOWABLE BEARING CAPACITY BEFORE PLACING BLINDING CONCRETE.
- 9.BLINDING MUST BE UNIFORM, LEVEL AND FREE FROM HONEYCOMBING, SEGREGATION OR STANDING WATER.
- 10.CULVERT UNITS SHALL NOT BE PLACED UNTIL THE ENGINEER APPROVES THE FOUNDATION PREPARATION AND COMPACTION TEST RESULTS.

NOTES

1. CLEAR COVER TO REINFORCEMENT IS 50mm.

2. THE CLEAR CONC. COVER TO SURFACES HAVING CONTACT WITH THE SOIL IS 75mm.

3. ALL BARS ARE (H.Y.S) HIGH YIELD DEFORMED STEEL WITH fy=410 N/mm (60KSI).

4. CONCRETE SHALL HAVE A MINIMUM 28 DAYS CYLINDER STRENGTH OF 4000 psi.

5. LEAN CONCRETE SHALL HAVE A MINIMUM 28 DAYS CYLINDER STRENGTH OF 100 Kg/CM.

6. UNLESS OTHERWISE SHOWN ON THE DRAWINGS LAPS IN REINFORCING STEEL BARS SHALL BE STAGGERED, MINIMUM LENGTH OF LAP SHALL BE 48 TIMES THE SMALLER BAR DIAMETER SPLICED.

7. ALL CONCRETE FACES BURIED IN SOIL BE PAINTED WITH TWO COATS OF HOT BITUMEN.

8. ALL DIMENSION ARE IN MILLIMETERS.

9. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.

10. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH OTHER RELEVANT DRAWING.

11. THE CLEAR CONC. COVER TO SURFACES HAVING CONTACT WITH THE SOIL IS 75mm.

12. INVERT LEVELS AND SKEWS ARE TENTATIVE, SHALL BE ADJUSTED AS PER SITE CONDITIONS AFTER APPROVAL FROM THE ENGINEER.

REV

DATE

DESCRIPTION

SIGN

AMENDMENTS

CLIENT:



Project Implementation Unit (PIU)
Integrated Flood Resilience and
Adaptation Project (IFRAP)
Component I

PROJECT:



Consulting Services For
Design, Procurement Assistance, Contract
Administration and Construction Supervision
(Road Infrastructure Sub-Component)

LEAD CONSULTANT:



ZEERUK INTERNATIONAL (PVT)LTD
3rd Floor, Aura Square Plaza,
F-11 Markaz, Islamabad
Ph: 051-2224215-16, FAX: 051-2224217

KASIB CONSULTANTS
PVT. LTD

TITLE:

DOUBLE CELL BOX CULVERT
LIST OF STRUCTURE

STATUS:

ISSUED FOR CONSTRUCTION

DRAWN:

SAIF

APPROVED:

INAM MINHAS

DESIGNED:

AHMED

SCALE:

AS SHOWN

SHEET:

CHECKED:

ANAS

DATE:

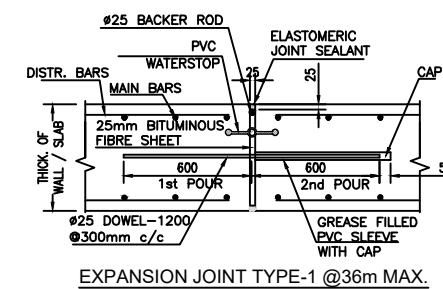
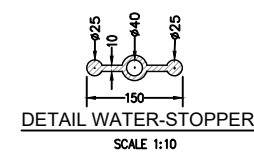
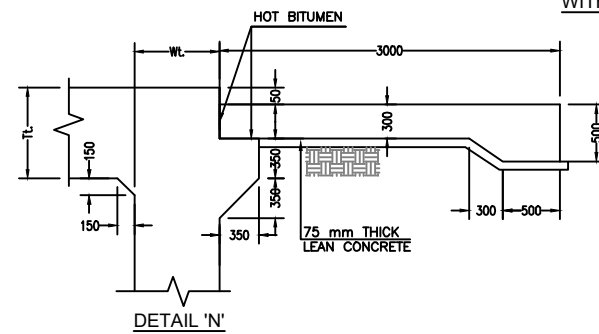
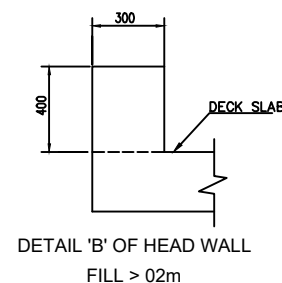
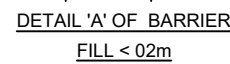
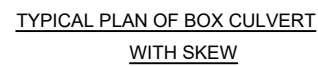
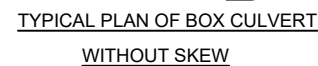
NOV, 2025

DRAWING NO.

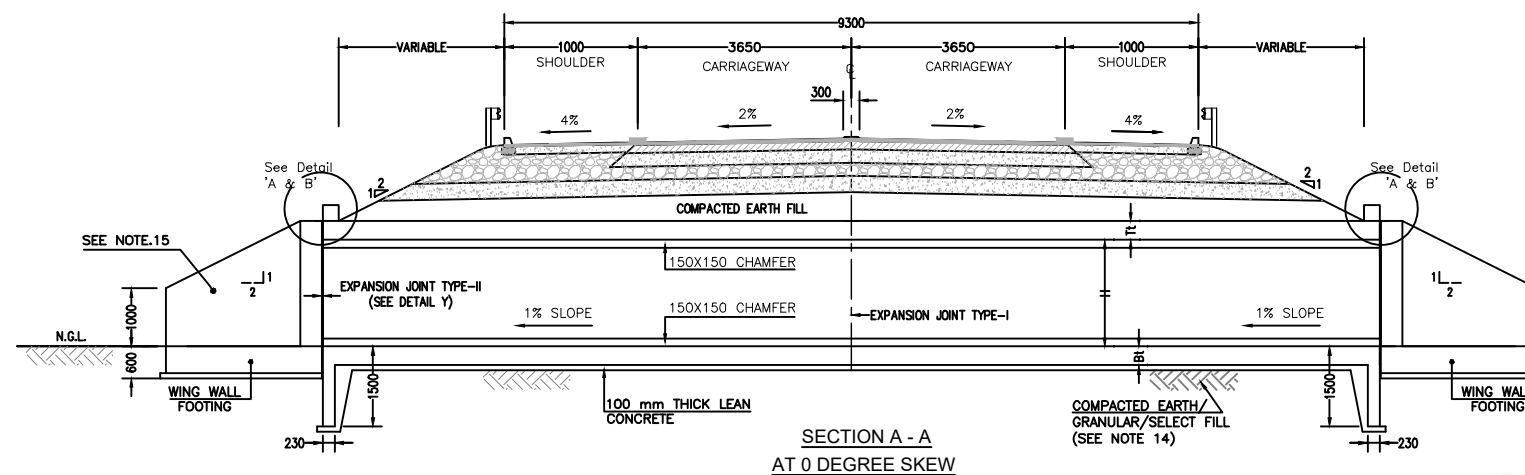
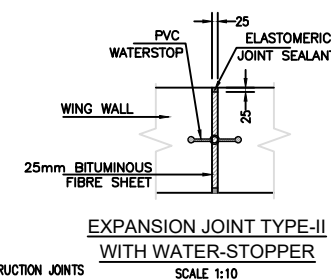
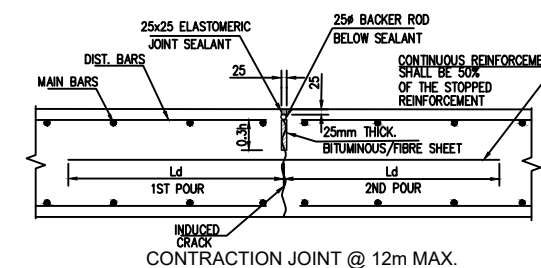
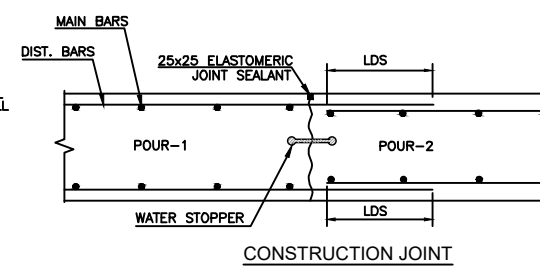
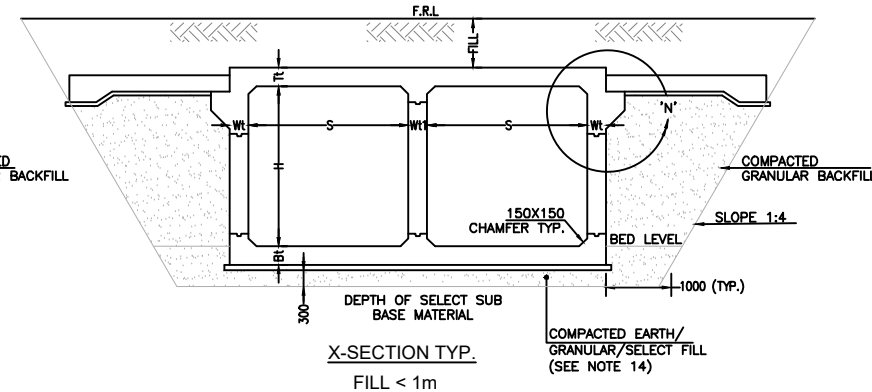
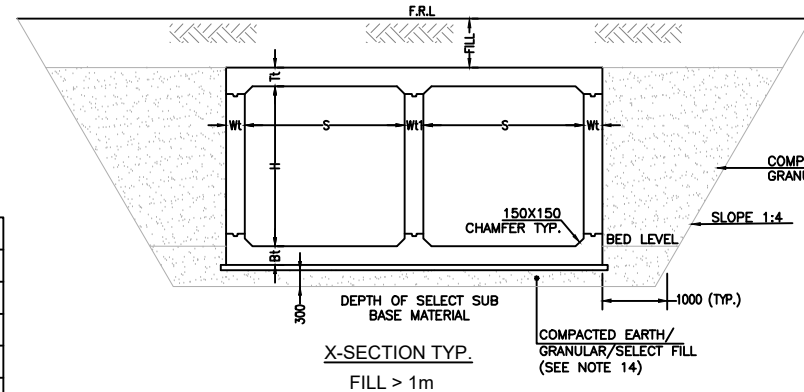
ZI/IFRAP/STR/ DBC-01

REV NO.

0



CULVERT SKEW	ANGLE A	ANGLE B
0°	60°	60°
0° - 5°	65°	55°
5° - 10°	70°	50°
10° - 15°	75°	45°
15° - 20°	80°	45°
20° - 25°	85°	45°
25° - 30°	90°	45°
30° - 35°	95°	40°
35° - 40°	100°	35°
40° - 45°	105°	30°



NOTE-
WATER STOPPER TO BE PROVIDED ON ALL EXPANSION AND CONSTRUCTION JOINTS

- | NOTES | |
|-------|---|
| 1. | CLEAR COVER TO REINFORCEMENT IS 50mm. |
| 2. | THE CLEAR CONC. COVER TO SURFACES HAVING CONTACT WITH THE SOIL IS 75mm. |
| 3. | ALL BARS ARE (H.Y.S) HIGH YIELD DEFORMED STEEL WITH $f_y=410$ N/mm (60KSI). |
| 4. | CONCRETE SHALL HAVE A MINIMUM 28 DAYS CYLINDER STRENGTH OF 4000 psi. |
| 5. | LEAN CONCRETE SHALL HAVE A MINIMUM 28 DAYS CYLINDER STRENGTH OF 100 Kg/CM. |
| 6. | UNLESS OTHERWISE SHOWN ON THE DRAWINGS LAPS IN REINFORCING STEEL BARS SHALL BE STAGGERED, MINIMUM LENGTH OF LAP SHALL BE 48 TIMES THE SMALLER BAR DIAMETER SPLICED. |
| 7. | ALL CONCRETE FACES BURIED IN SOIL BE PAINTED WITH TWO COATS OF HOT BITUMEN. |
| 8. | ALL DIMENSION ARE IN MILLIMETERS. |
| 9. | ONLY WRITTEN DIMENSIONS TO BE FOLLOWED. |
| 10. | THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH OTHER RELEVANT DRAWING. |
| 11. | EXPANSION JOINT SHOULD BE PROVIDED. AFTER EVERY FOUR CELL (TRANSVERSELY). |
| 12. | CONTRACTION JOINT SHOULD BE PROVIDED FOR CULVERT LENGTH MORE THAN 12.00 M. |
| 13. | THE CLEAR CONC. COVER TO SURFACES HAVING CONTACT WITH THE SOIL IS 75mm. |
| 14. | DEPTH OF GRANULAR AND SELECT BACKFILL SHALL BE PROVIDED IF REQUIRED AS PER SITE CONDITIONS (EXAMPLE: IN WATER LOGGED AREA), OR IF DECIDED BY THE ENGINEER. |
| 15. | FOR TYPICAL WING WALL DETAILS REFER TO DRG.NO. ZI/FRAP/STR/DBC-07 |

REV	DATE	DESCRIPTION	SIGN

AMENDMENTS

CLIENT:



Project Implementation Unit (PIU)
Integrated Flood Resilience and
Adaptation Project (IFRAP)
Component I

PROJECT:



Consulting Services For
Design, Procurement Assistance, Contract
Administration and Construction Supervision
(Road Infrastructure Sub-Component)

LEAD CONSULTANT:



ZEERUK INTERNATIONAL (PVT)LTD
3rd Floor, Aura Square Plaza,
F-11 Markaz, Islamabad
Ph: 051-2224215-16, FAX: 051-2224217

KASIB CONSULTANTS
PVT. LTD

TITLE:

DOUBLE CELL BOX CULVERT
GENERAL ARRANGEMENT PLAN &
ELEVATION

STATUS:

ISSUED FOR CONSTRUCTION

DRAWN:

APPROVED: INAM MINHAS

DESIGNED:

SCALE:	SHEET:
--------	--------

CHECKED:

AS SHOWN	
DATE:	APR 1988

DRAWING NO.

	REV NO
--	--------

ZI/IFRAP/STR/ DBC-02

EV NC
0

DOUBLE CELL BOX CULVERT

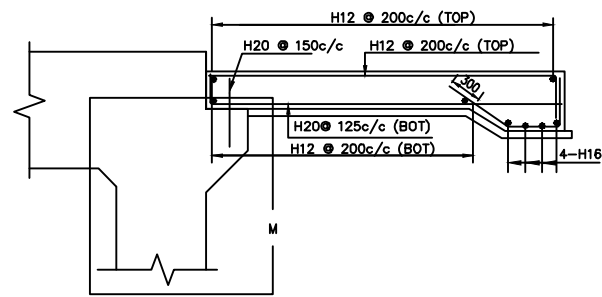
S No	Fill upto (m)	No of cells	Span (m)	Height (m)	Tt (m)	Bt (m)	Wt (m)	Wt 1 (m)	Bar Mark A	Bar Mark B	Bar Mark C	Bar Mark D	Bar Mark E	Bar Mark F	Bar Mark G	Bar Mark H	Bar Mark I	Bar Mark J	Bar Mark K
1	0-2	2	2	2	0.25	0.25	0.25	0.2	12@175	12@200	12@200	16@175	16@200	16@200	16@175	12@250		12@250	12@250
2	2-4	2	2	2	0.25	0.25	0.25	0.2	12@300	12@225	12@225	16@300	16@225	16@225	16@300	12@250	16@300	12@250	12@225
3	0-2	2	3	1.5	0.3	0.3	0.3	0.25	16@250	12@150	12@150	16@250	16@150	16@150	16@250	12@200	16@250	12@200	12@300
4	2-4	2	3	1.5	0.3	0.325	0.3	0.25	20@300	16@250	16@250	20@300	16@125	16@125	20@300	12@200	20@300	12@200	12@175

TABLE NO. 3

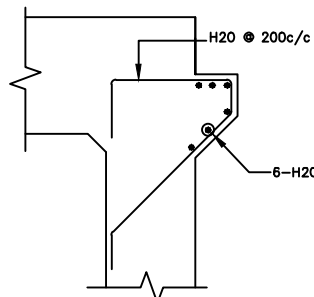
- * THE DESIGN IS ONLY VALID FOR THE FILL HEIGHTS GIVEN IN TABLE NO. 3.
- * THE DRAWINGS NEED TO BE READ IN CONJUNCTION WITH RELEVANT HIGHWAY DRAWINGS (PLAN AND PROFILE) BEFORE START OF CONSTRUCTION.
- * CONTRACTOR TO ACHIEVE 95% MAX. DRY DENSITY (MDD) AS PER NHA SPECIFICATIONS 104, CLAUSE 104.2 (THE COMPACTION OF NATURAL GROUND BELOW FOUNDATION OF STRUCTURE SHALL BE 95% OF MAX DRY DENSITY CONDUCTED AND CHECKED AGAINST AASHTO T-180-D).
- * IF 95% MDD DOES NOT COMPLY, CONTRACTOR TO NOTIFY THE GEOTECH ENGINEER

NOTES

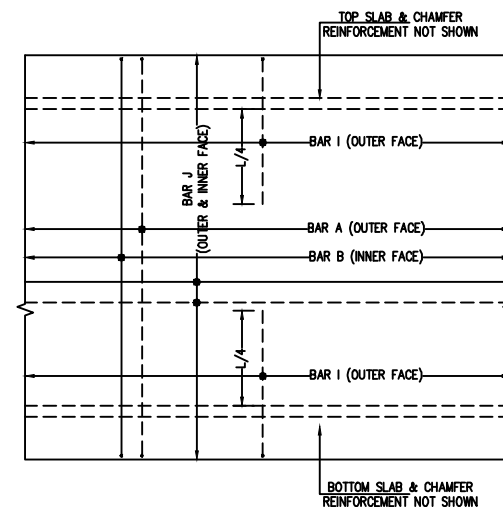
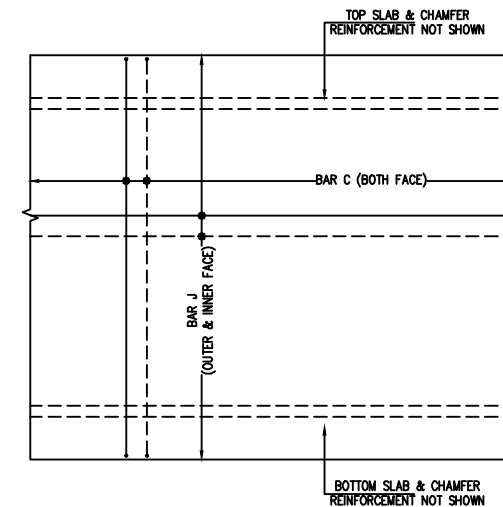
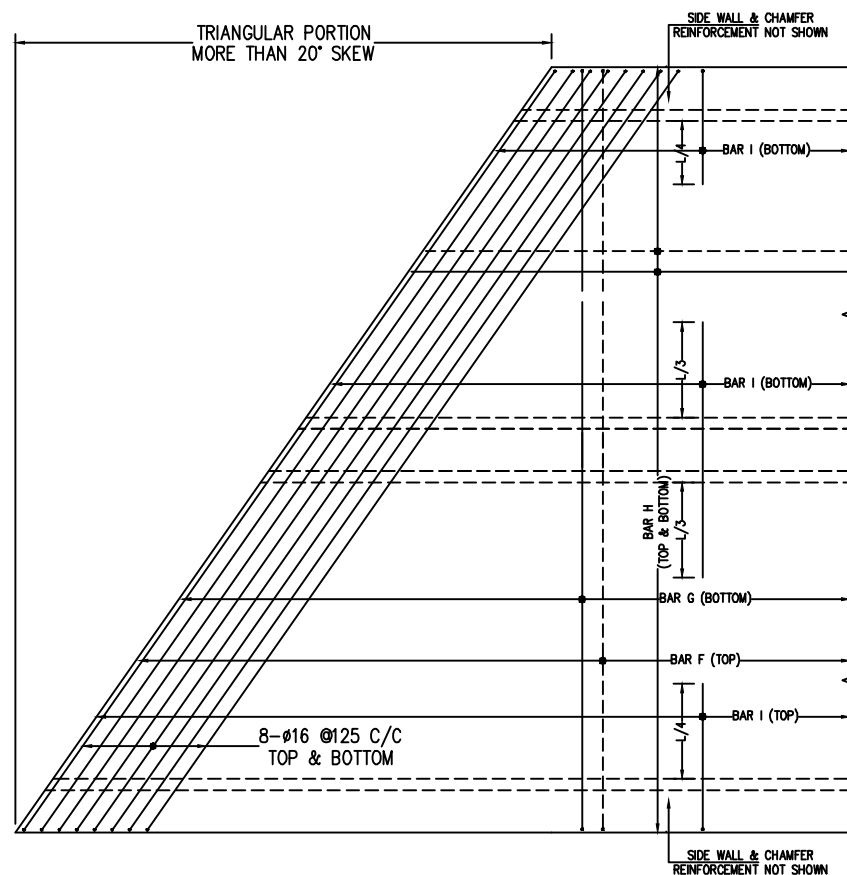
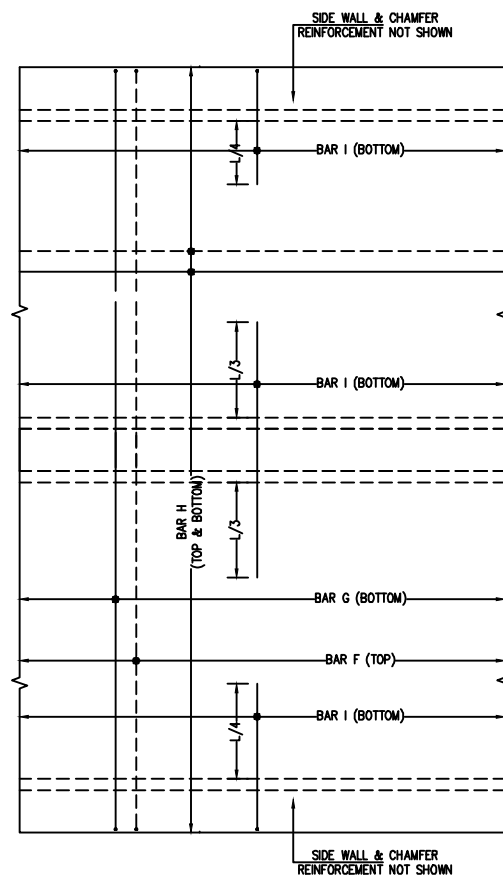
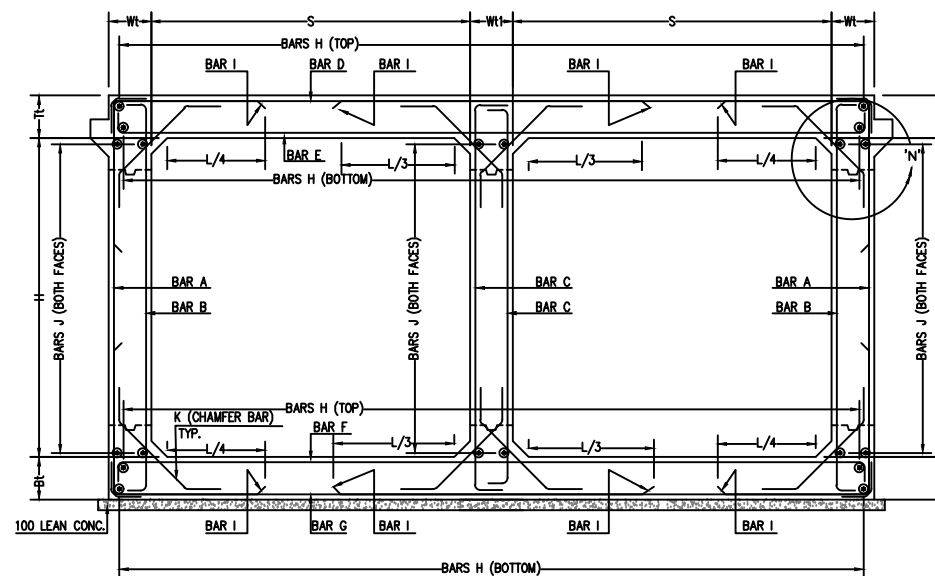
1. CLEAR COVER TO REINFORCEMENT IS 50mm.
2. THE CLEAR CONC. COVER TO SURFACES HAVING CONTACT WITH THE SOIL IS 75mm.
3. ALL BARS ARE (H.Y.S) HIGH YIELD DEFORMED STEEL WITH $f_y=410$ N/mm (60KSI).
4. CONCRETE SHALL HAVE A MINIMUM 28 DAYS CYLINDER STRENGTH OF 4000 psi.
5. LEAN CONCRETE SHALL HAVE A MINIMUM 28 DAYS CYLINDER STRENGTH OF 100 Kg/cm.
6. UNLESS OTHERWISE SHOWN ON THE DRAWINGS LAPS IN REINFORCING STEEL BARS SHALL BE STAGGERED, MINIMUM LENGTH OF LAP SHALL BE 48 TIMES THE SMALLER BAR DIAMETER SPLICED.
7. ALL CONCRETE FACES BURIED IN SOIL BE PAINTED WITH TWO COATS OF HOT BITUMEN.
8. ALL DIMENSION ARE IN MILLIMETERS.
9. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.
10. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH OTHER RELEVANT DRAWING.
11. EXPANSION JOINT SHOULD BE PROVIDED. AFTER EVERY FOUR CELL (TRANSVERSELY).
12. CONTRACTION JOINT SHOULD BE PROVIDED FOR CULVERT LENGTH MORE THAN 12.00 M.
13. THE CLEAR CONC. COVER TO SURFACES HAVING CONTACT WITH THE SOIL IS 75mm.



REINF. DETAIL 'N'

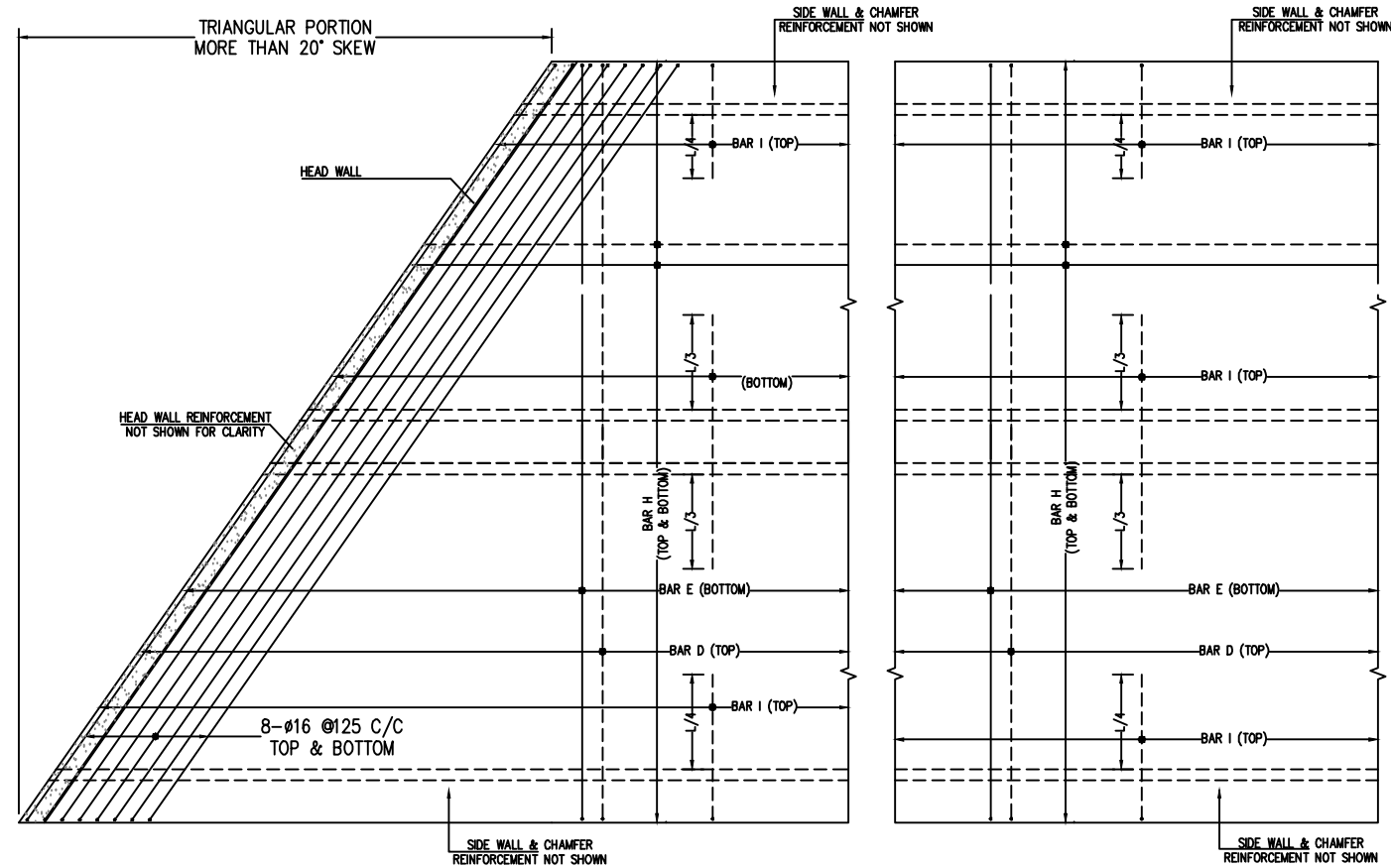


DETAIL 'M'

TYPICAL R.C.C BOX CULVERT
SIDE WALLTYPICAL R.C.C BOX CULVERT
INNER WALLTYPICAL R.C.C BOX CULVERT BOTTOM SLAB
AT SKEWTYPICAL R.C.C BOX CULVERT
BOTTOM SLAB PLAN

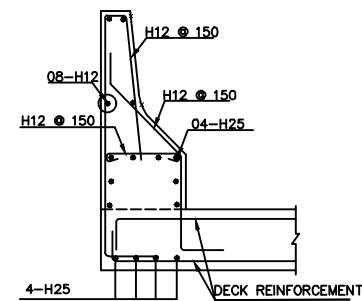
TYPICAL REINF. BOX SECTION

REV	DATE	DESCRIPTION	SIGN
AMENDMENTS			
CLIENT:			
			
PROJECT:			
			
LEAD CONSULTANT:			
 ZEERUK INTERNATIONAL (PVT)LTD 3rd Floor, Aura Square Plaza, F-11 Markaz, Islamabad Ph: 051-2224215-16, FAX: 051-2224217  KASIB CONSULTANTS PVT. LTD			
TITLE:			
DOUBLE CELL BOX CULVERT SLAB REINFORCEMENT DETAIL			
STATUS:			
ISSUED FOR CONSTRUCTION			
DRAWN: SAIF		APPROVED: INAM MINHAS	
DESIGNED: AHMED		SCALE: AS SHOWN SHEET:	
CHECKED: ANAS		DATE: NOV, 2025	
DRAWING NO. ZI/IFRAP/STR/ DBC-03			REV NO. 0

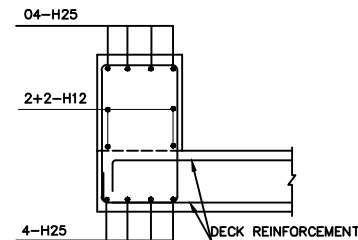


TYPICAL R.C.C BOX CULVERT TOP SLAB
AT SKEW
(FOR REINFORCEMENT DETAILS REFER SHEET 03/TABLE NO. 3)

TYPICAL R.C.C BOX CULVERT
TOP SLAB PLAN



REINFORCEMENT DETAIL
OF BARRIER



REINFORCEMENT DETAIL
OF HEAD WALL

NOTES

1. CLEAR COVER TO REINFORCEMENT IS 50mm.
2. THE CLEAR CONC. COVER TO SURFACES HAVING CONTACT WITH THE SOIL IS 75mm.
3. ALL BARS ARE (H.Y.S) HIGH YIELD DEFORMED STEEL WITH $f_y=410$ N/mm (60KSI).
4. CONCRETE SHALL HAVE A MINIMUM 28 DAYS CYLINDER STRENGTH OF 4000 psi.
5. LEAN CONCRETE SHALL HAVE A MINIMUM 28 DAYS CYLINDER STRENGTH OF 100 Kg/cm.
6. UNLESS OTHERWISE SHOWN ON THE DRAWINGS LAPS IN REINFORCING STEEL BARS SHALL BE STAGGERED, MINIMUM LENGTH OF LAP SHALL BE 48 TIMES THE SMALLER BAR DIAMETER SPICED.
7. ALL CONCRETE FACES BURIED IN SOIL BE PAINTED WITH TWO COATS OF HOT BITUMEN.
8. ALL DIMENSION ARE IN MILLIMETERS.
9. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.
10. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH OTHER RELEVANT DRAWING.
11. EXPANSION JOINT SHOULD BE PROVIDED. AFTER EVERY FOUR CELL (TRANSVERSELY).
12. CONTRACTION JOINT SHOULD BE PROVIDED FOR CULVERT LENGTH MORE THAN 12.00 M.
13. THE CLEAR CONC. COVER TO SURFACES HAVING CONTACT WITH THE SOIL IS 75mm.

REV	DATE	DESCRIPTION	SIGN
AMENDMENTS			
CLIENT:			
 Project Implementation Unit (PIU) Integrated Flood Resilience and Adaptation Project (IFRAP) Component I			
PROJECT:			
 Consulting Services For Design, Procurement Assistance, Contract Administration and Construction Supervision (Road Infrastructure Sub-Component)			
LEAD CONSULTANT:			
 ZEERUK INTERNATIONAL (PVT) LTD 3rd Floor, Aura Square Plaza, F-11 Markaz, Islamabad Ph: 051-2224215-16, FAX: 051-2224217  KASIB CONSULTANTS PVT. LTD			
TITLE:			
DOUBLE CELL BOX CULVERT SLAB & BARRIER REINFORCEMENT DETAIL			
STATUS:			
ISSUED FOR CONSTRUCTION			
DRAWN: SAIF		APPROVED: INAM MINHAS	
DESIGNED: AHMED		SCALE: AS SHOWN	SHEET:
CHECKED: ANAS		DATE: NOV, 2025	
DRAWING NO. ZI/IFRAP/STR/ DBC-04			REV NO. 0

MULTI CELL BOX CULVERT

IFRAP PROPOSED BOX CULVERTS						
Sr. No.	CHAINAGE (Km)	STRUCTU RE TYPE	WIDTH (m)	HEIGHT (m)	CELL	SKEW (Degree)
1	16+500	Box Culvert	4	2.5	13	0
2	18+948	Box Culvert	4	2.5	13	0
3	23+220	Box Culvert	4	2.5	10	0
4	27+220	Box Culvert	4	2.5	8	0
5	29+160	Box Culvert	3	2.5	4	0
6	33+940	Box Culvert	3	2.5	4	0

- 1.CULVERT FOUNDATION IS DESIGNED ON AN ALLOWABLE BEARING CAPACITY OF 1.25 TSF (≈130 KPA).
- 2.REMOVE ALL SOFT, LOOSE, ORGANIC, OR UNSUITABLE MATERIAL FROM FOUNDATION BED PRIOR TO CONSTRUCTION.
- 3.COMPACT EXISTING GROUND TO MINIMUM 95% MDD (MODIFIED PROCTOR)AS PER ASTM D 1557 / AASHTO T 180.
- 4.PROVIDE 6-INCH (150 MM) THICK SAND CUSHION, COMPACTED TO 95% MDD, IN LAYERS NOT EXCEEDING 150 MM LOOSE THICKNESS.
- 5.PROVIDE 50 MM PLAIN CEMENT CONCRETE(PCC)BLINDING OVER COMPACTED SAND LAYER FORCLEAN AND LEVEL BEDDING.
- 6.CONTRACTOR SHALL PERFORM FIELD DENSITY TESTS AS PER ASTM D 1556 / AASHTO T 191TO VERIFY 95% MDD COMPACTION FOR SUBGRADE AND SAND CUSHION.
- 7.ANY SOFT POCKETS ENCOUNTERED DURING PROOF-ROLLING SHALL BE REMOVED AND REPLACED WITH APPROVED ENGINEERED FILL COMPACTED TO 95% MD.
- 8.IN WATER-LOGGED SOIL CONDITIONS, PERFORM PLATE LOAD TEST (ASTM D1194)TO 3 TIMES THE DESIGN LOADTO VERIFY ALLOWABLE BEARING CAPACITY BEFORE PLACING BLINDING CONCRETE.
- 9.BLINDING MUST BE UNIFORM, LEVEL AND FREE FROM HONEYCOMBING, SEGREGATION OR STANDING WATER.
- 10.CULVERT UNITS SHALL NOT BE PLACED UNTIL THE ENGINEER APPROVES THE FOUNDATION PREPARATION AND COMPACTION TEST RESULTS.

NOTES

1. CLEAR COVER TO REINFORCEMENT IS 50mm.

2. THE CLEAR CONC. COVER TO SURFACES HAVING CONTACT WITH THE SOIL IS 75mm.

3. ALL BARS ARE (H.Y.S) HIGH YIELD DEFORMED STEEL WITH $f_y=410$ N/mm (60KSI).

4. CONCRETE SHALL HAVE A MINIMUM 28 DAYS CYLINDER STRENGTH OF 4000 psi.

5. LEAN CONCRETE SHALL HAVE A MINIMUM 28 DAYS CYLINDER STRENGTH OF 100 Kg/cm.

6. UNLESS OTHERWISE SHOWN ON THE DRAWINGS LAPS IN REINFORCING STEEL BARS SHALL BE STAGGERED, MINIMUM LENGTH OF LAP SHALL BE 48 TIMES THE SMALLER BAR DIAMETER SPLICED.

7. ALL CONCRETE FACES BURIED IN SOIL BE PAINTED WITH TWO COATS OF HOT BITUMEN.

8. ALL DIMENSION ARE IN MILLIMETERS.

9. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.

10. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH OTHER RELEVANT DRAWING.

11. THE CLEAR CONC. COVER TO SURFACES HAVING CONTACT WITH THE SOIL IS 75mm.

12. INVERT LEVELS AND SKEWS ARE TENTATIVE, SHALL BE ADJUSTED AS PER SITE CONDITIONS AFTER APPROVAL FROM THE ENGINEER.

REV

DATE

DESCRIPTION

SIGN

AMENDMENTS

CLIENT:



Project Implementation Unit (PIU)
Integrated Flood Resilience and
Adaptation Project (IFRAP)
Component I

PROJECT:



Consulting Services For
Design, Procurement Assistance, Contract
Administration and Construction Supervision
(Road Infrastructure Sub-Component)

LEAD CONSULTANT:



ZEERUK INTERNATIONAL (PVT)LTD
3rd Floor, Aura Square Plaza,
F-11 Markaz, Islamabad
Ph: 051-2224215-16, FAX: 051-2224217

KASIB CONSULTANTS
PVT. LTD

TITLE:

MULTI CELL BOX CULVERT
LIST OF STRUCTURE

STATUS:

ISSUED FOR CONSTRUCTION

DRAWN:

SAIF

APPROVED:

INAM MINHAS

DESIGNED:

AHMED

SCALE:

AS SHOWN

SHEET:

CHECKED:

ANAS

DATE:

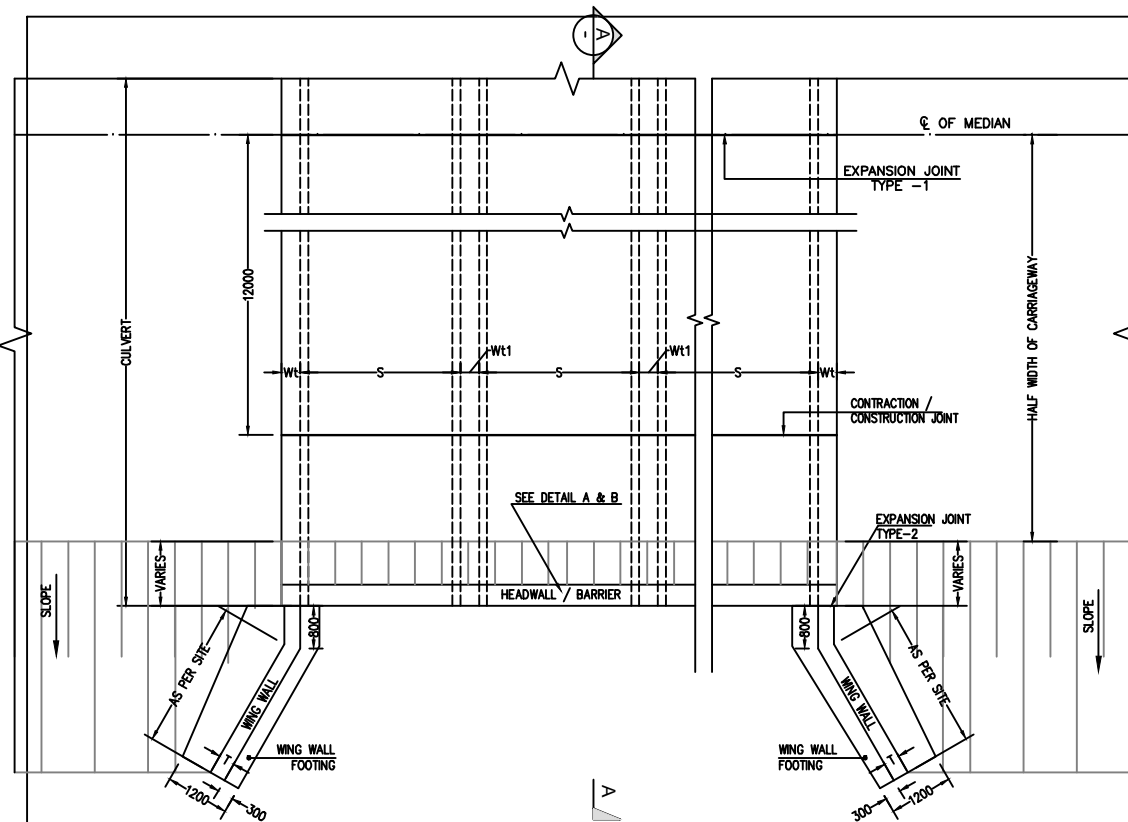
NOV, 2025

DRAWING NO.

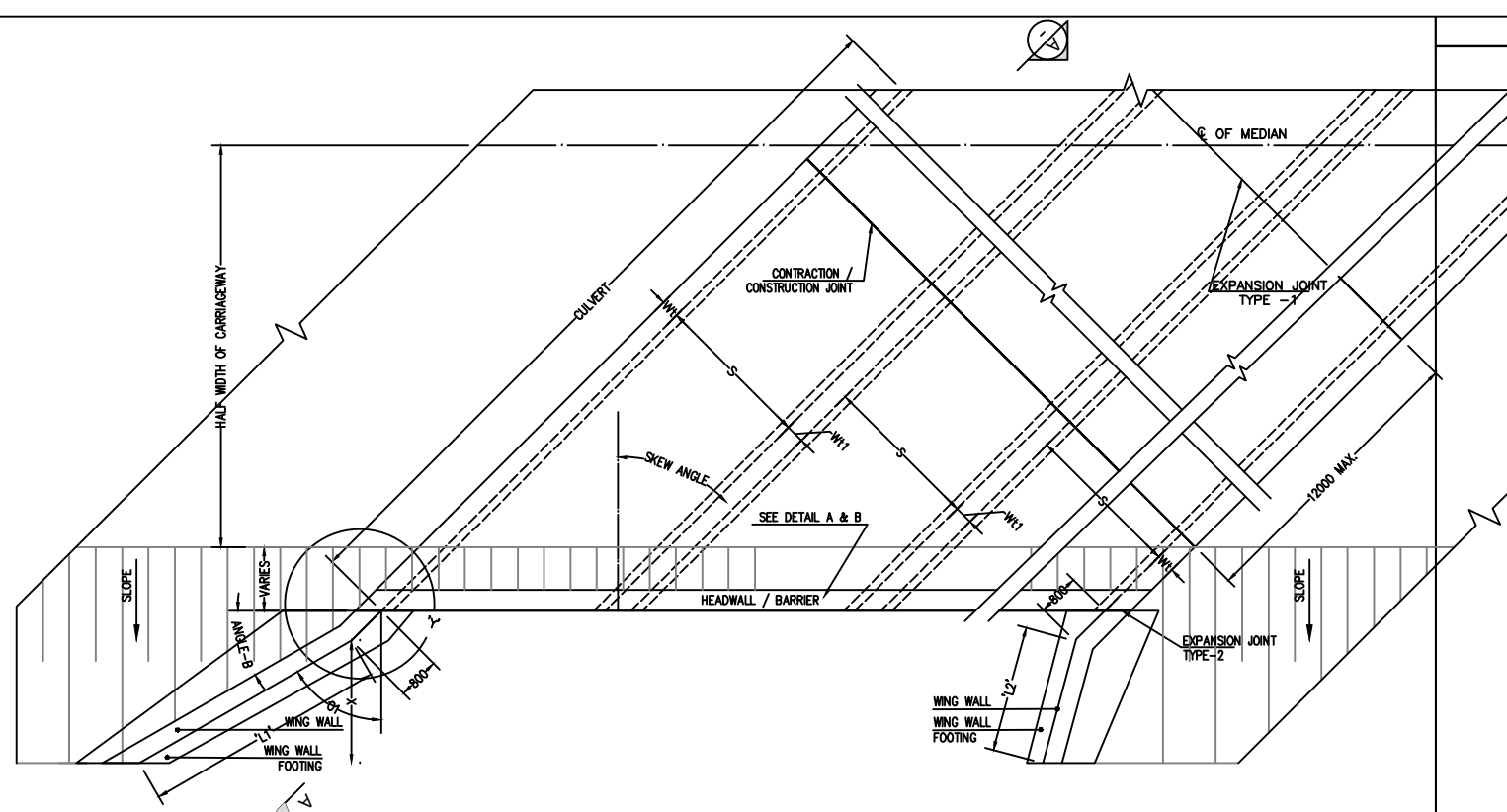
ZI/IFRAP/STR/ MBC-01

REV NO.

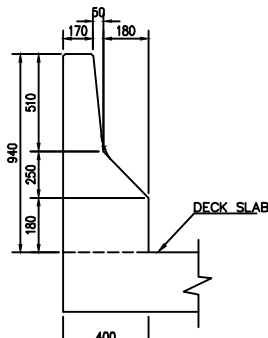
0



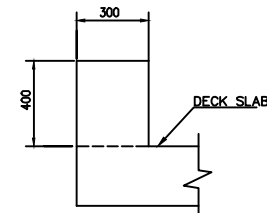
TYPICAL PLAN OF BOX CULVERT
WITHOUT SKEW



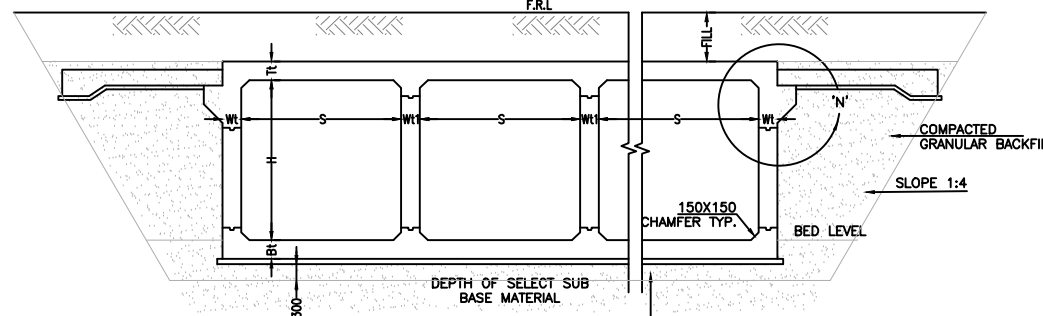
TYPICAL PLAN OF BOX CULVERT
WITH SKEW



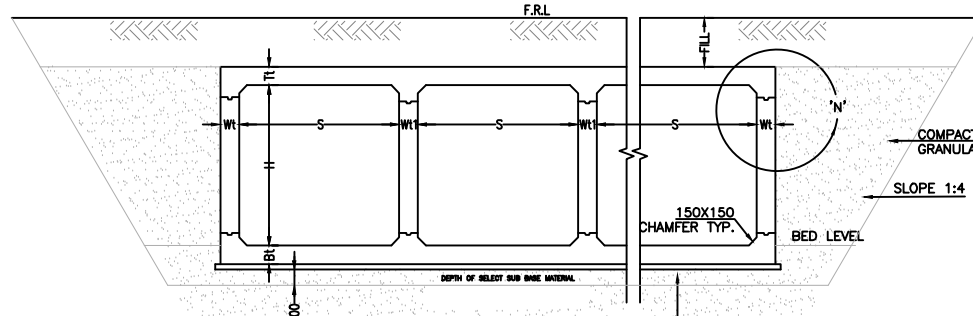
DETAIL 'A' OF BARRIER
FILL < 02m



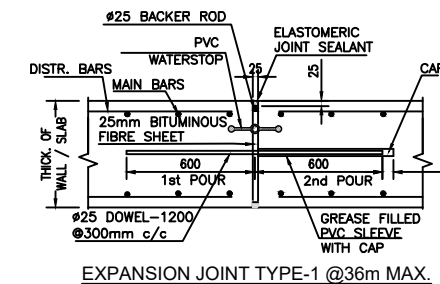
DETAIL 'B' OF HEAD WALL
FILL > 02m



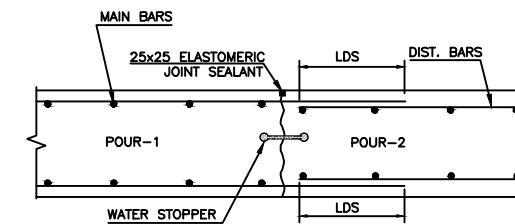
X-SECTION TYP.
FILL < 1m



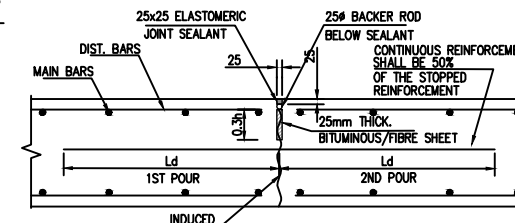
X-SECTION TYP.
FILL > 1m



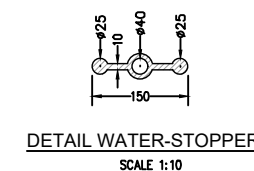
EXPANSION JOINT TYPE-1 @ 36m MAX.



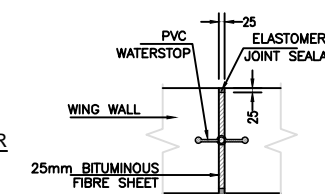
CONSTRUCTION JOINT



CONTRACTION JOINT @ 12m MAX.

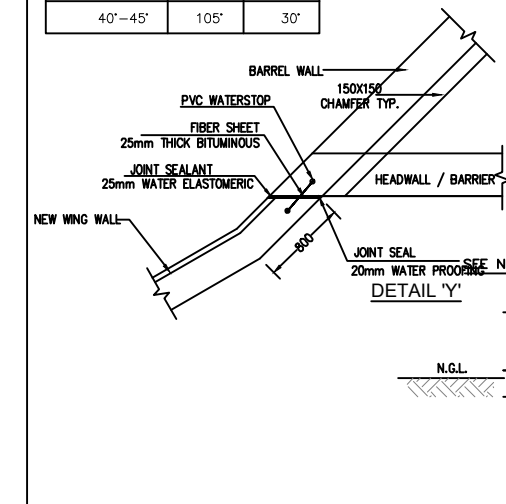


DETAIL WATER-STOPPER
SCALE 1:10

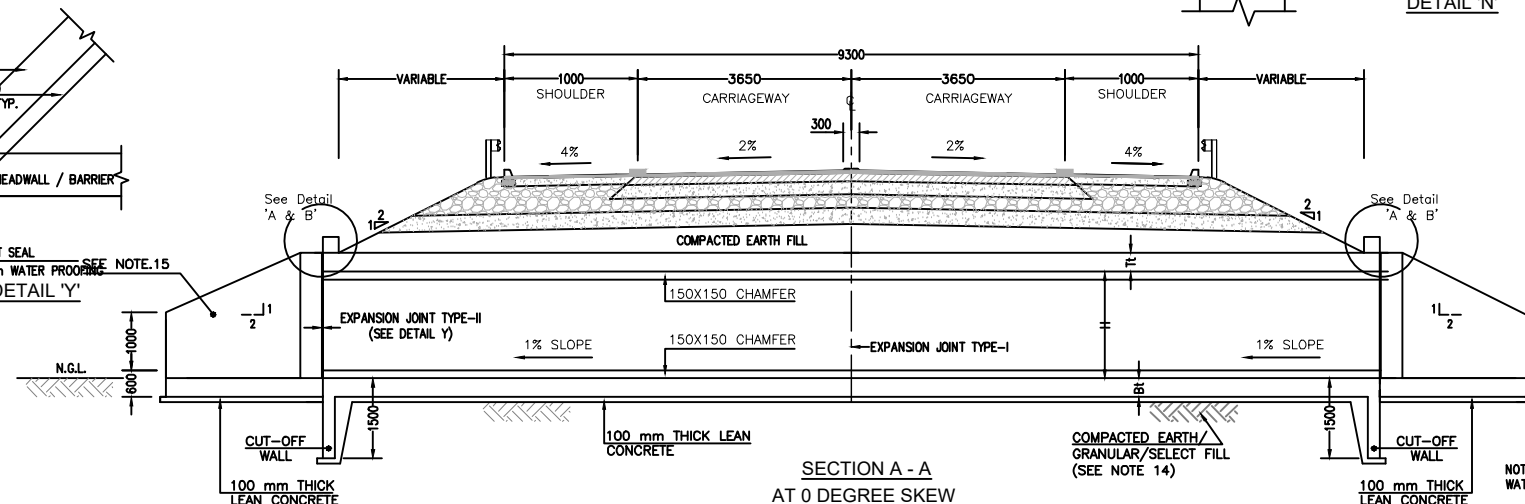


EXPANSION JOINT TYPE-II
WITH WATER-STOPPER
SCALE 1:10

CULVERT SKEW	ANGLE A	ANGLE B
0°	60°	60°
0°-5°	65°	55°
5°-10°	70°	50°
10°-15°	75°	45°
15°-20°	80°	45°
20°-25°	85°	45°
25°-30°	90°	45°
30°-35°	95°	40°
35°-40°	100°	35°
40°-45°	105°	30°



DETAIL 'Y'



SECTION A-A
AT 0 DEGREE SKEW

NOTE-
WATER STOPPER TO BE PROVIDED ON ALL EXPANSION AND CONSTRUCTION JOINTS

NOTES

- CLEAR COVER TO REINFORCEMENT IS 50mm.
- THE CLEAR CONC. COVER TO SURFACES HAVING CONTACT WITH THE SOIL IS 75mm.
- ALL BARS ARE (H.Y.S) HIGH YIELD DEFORMED STEEL WITH $f_y=410$ N/mm (60KSI).
- CONCRETE SHALL HAVE A MINIMUM 28 DAYS CYLINDER STRENGTH OF 4000 psi.
- LEAN CONCRETE SHALL HAVE A MINIMUM 28 DAYS CYLINDER STRENGTH OF 100 Kg/cm.
- UNLESS OTHERWISE SHOWN ON THE DRAWINGS LAPS IN REINFORCING STEEL BARS SHALL BE STAGGERED, MINIMUM LENGTH OF LAP SHALL BE 48 TIMES THE SMALLER BAR DIAMETER SPICED.
- ALL CONCRETE FACES BURIED IN SOIL BE PAINTED WITH TWO COATS OF HOT BITUMEN.
- ALL DIMENSION ARE IN MILLIMETERS.
- ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.
- THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH OTHER RELEVANT DRAWING.
- EXPANSION JOINT SHOULD BE PROVIDED AFTER EVERY FOUR CELL (TRANSVERSELY).
- CONTRACTION JOINT SHOULD BE PROVIDED FOR CULVERT LENGTH MORE THAN 12.00 M.
- THE CLEAR CONC. COVER TO SURFACES HAVING CONTACT WITH THE SOIL IS 75mm.
- DEPTH OF GRANULAR AND SELECT BACKFILL SHALL BE PROVIDED IF REQUIRED AS PER SITE CONDITIONS (EXAMPLE: WATER LOGGED AREA), OR AS DECIDED BY THE ENGINEER.
- FOR TYPICAL WING WALL DETAILS REFER TO DRG.NO. ZI/IFRAP/STR/MBC-06

REV	DATE	DESCRIPTION	SIGN
AMENDMENTS			
CLIENT:			
Project Implementation Unit (PIU) Integrated Flood Resilience and Adaptation Project (IFRAP) Component I			
PROJECT:			
Consulting Services For Design, Procurement Assistance, Contract Administration and Construction Supervision (Road Infrastructure Sub-Component)			
LEAD CONSULTANT:			
ZEERUK INTERNATIONAL (PVT)LTD 3rd Floor, Anna Square Plaza, F-11 Markaz, Islamabad Ph: 051-2224215-16, FAX: 051-2224217 KASIB CONSULTANTS PVT. LTD			
TITLE:			
MULTI CELL BOX CULVERT GENERAL ARRANGEMENT PLAN & ELEVATION			
STATUS:			
ISSUED FOR CONSTRUCTION			
DRAWN:		APPROVED:	
SAIF		INAM MINHAS	
DESIGNED:		SCALE:	
AHMED		AS SHOWN	
CHECKED:		DATE:	
ANAS		NOV, 2025	
DRAWING NO.			REV NO.
ZI/IFRAP/STR/MBC-02			0

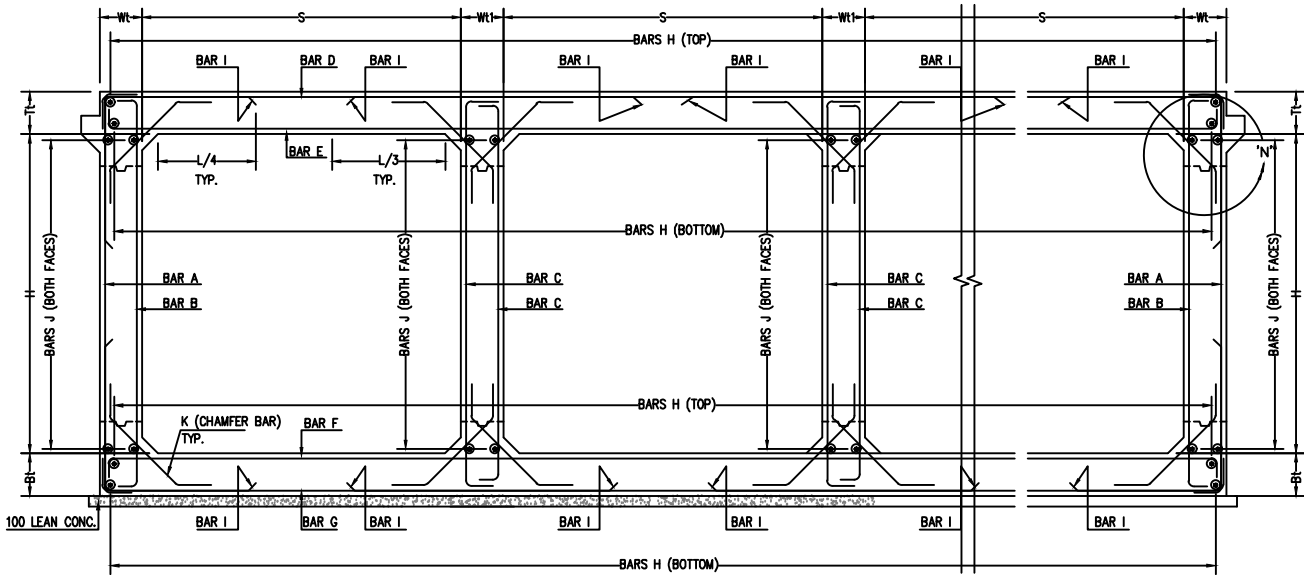
MULTI CELL BOX CULVERT																			
S No	Fill upto (m)	No of cells	Span (m)	Height (m)	Tt (m)	Bt (m)	Wt (m)	Wt 1 (m)	Bar Mark A	Bar Mark B	Bar Mark C	Bar Mark D	Bar Mark E	Bar Mark F	Bar Mark G	Bar Mark H	Bar Mark I	Bar Mark J	Bar Mark K
1	0-2	GREATER THAN TWO CELL	3	2.5	0.3	0.3	0.3	0.25	16@150	12@150	12@150	16@150	16@150	16@150	16@150	12@200		12@200	12@300
2	2-4		3	2.5	0.3	0.325	0.3	0.25	20@300	12@125	12@125	20@300	16@125	16@125	20@300	12@200	20@300	12@200	12@250
3	0-2		4	2.5	0.45	0.5	0.45	0.4	20@300	16@200	16@150	20@300	20@140	20@140	20@300	12@200	20@300	12@200	12@280
4	2-4		4	2.5	0.45	0.5	0.45	0.4	20@200	16@140	16@150	20@200	20@140	20@140	20@200	12@200	20@200	12@200	12@200

TABLE NO. 3

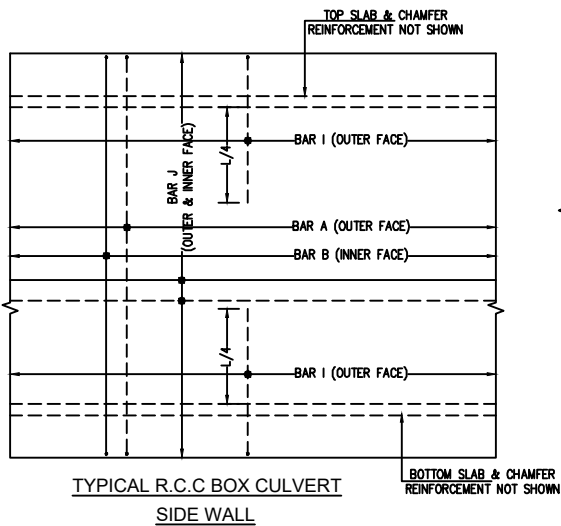
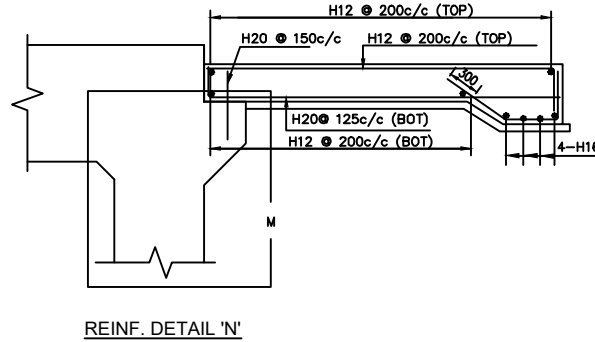
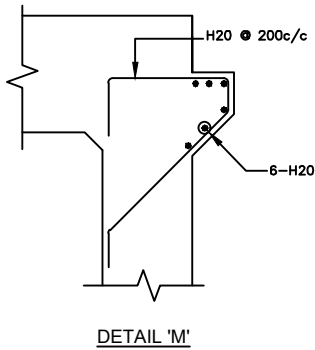
- THE DESIGN IS ONLY VALID FOR THE FILL HEIGHTS GIVEN IN TABLE NO. 3.
- THE DRAWINGS NEED TO BE READ IN CONJUNCTION WITH RELEVANT HIGHWAY DRAWINGS (PLAN AND PROFILE) BEFORE START OF CONSTRUCTION.
- CONTRACTOR TO ACHIEVE 95% MAX. DRY DENSITY (MDD) AS PER NHA SPECIFICATIONS 104, CLAUSE 104.2 (THE COMPACTION OF NATURAL GROUND BELOW FOUNDATION OF STRUCTURE SHALL BE 95% OF MAX DRY DENSITY CONDUCTED AND CHECKED AGAINST AASHTO T-180-D).
- IF 95% MDD DOES NOT COMPLY, CONTRACTOR TO NOTIFY THE GEOTECH ENGINEER

NOTES

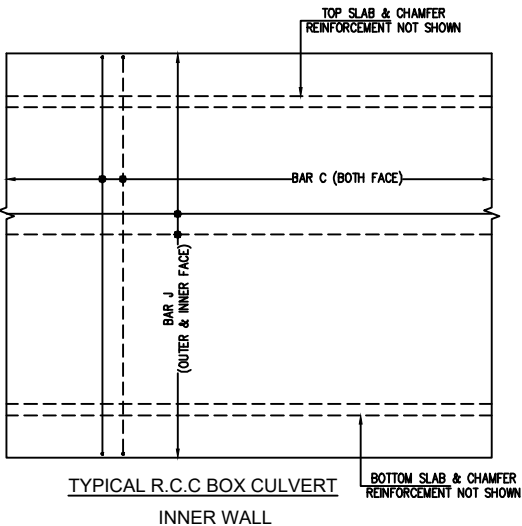
- CLEAR COVER TO REINFORCEMENT IS 50mm.
- THE CLEAR CONC. COVER TO SURFACES HAVING CONTACT WITH THE SOIL IS 75mm.
- ALL BARS ARE (H.Y.S) HIGH YIELD DEFORMED STEEL WITH $f_y=410$ N/mm (60KSI).
- CONCRETE SHALL HAVE A MINIMUM 28 DAYS CYLINDER STRENGTH OF 4000 psi.
- LEAN CONCRETE SHALL HAVE A MINIMUM 28 DAYS CYLINDER STRENGTH OF 100 Kg/CM.
- UNLESS OTHERWISE SHOWN ON THE DRAWINGS LAPS IN REINFORCING STEEL BARS SHALL BE STAGGERED, MINIMUM LENGTH OF LAP SHALL BE 48 TIMES THE SMALLER BAR DIAMETER SPICED.
- ALL CONCRETE FACES BURIED IN SOIL BE PAINTED WITH TWO COATS OF HOT BITUMEN.
- ALL DIMENSION ARE IN MILLIMETERS.
- ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.
- THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH OTHER RELEVANT DRAWING.
- EXPANSION JOINT SHOULD BE PROVIDED. AFTER EVERY FOUR CELL (TRANSVERSELY).
- CONTRACTION JOINT SHOULD BE PROVIDED FOR CULVERT LENGTH MORE THAN 12.00 M.
- THE CLEAR CONC. COVER TO SURFACES HAVING CONTACT WITH THE SOIL IS 75mm.



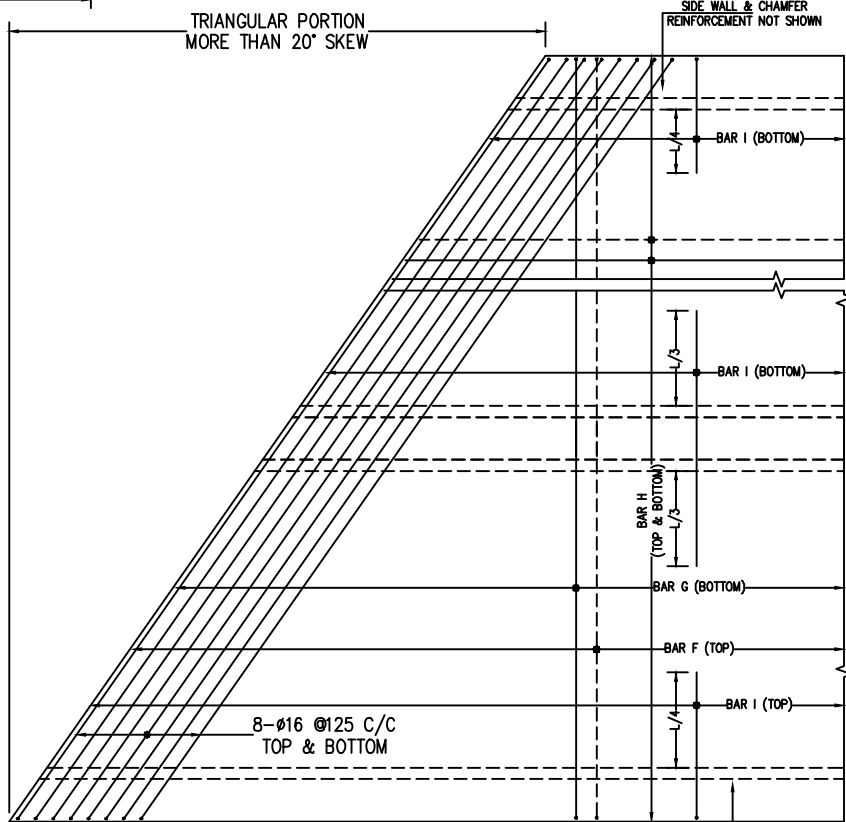
TYPICAL REINF. MULTI CELL BOX SECTION



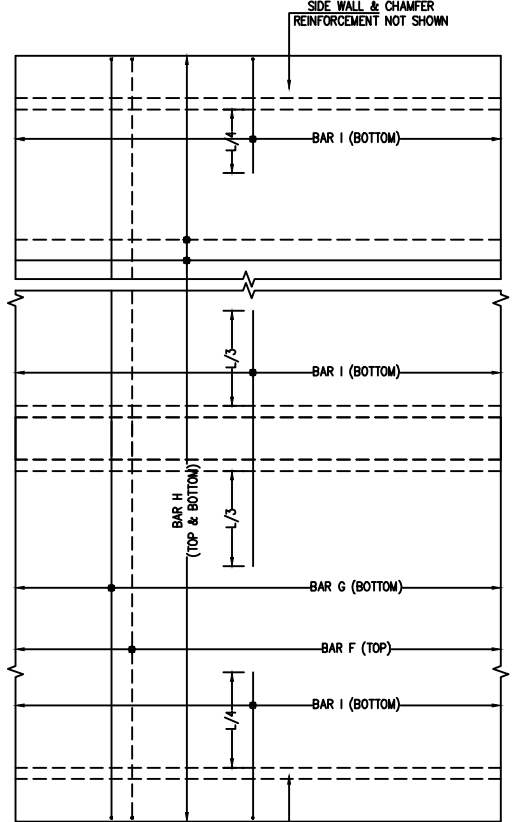
TYPICAL R.C.C BOX CULVERT
SIDE WALL



TYPICAL R.C.C BOX CULVERT
INNER WALL

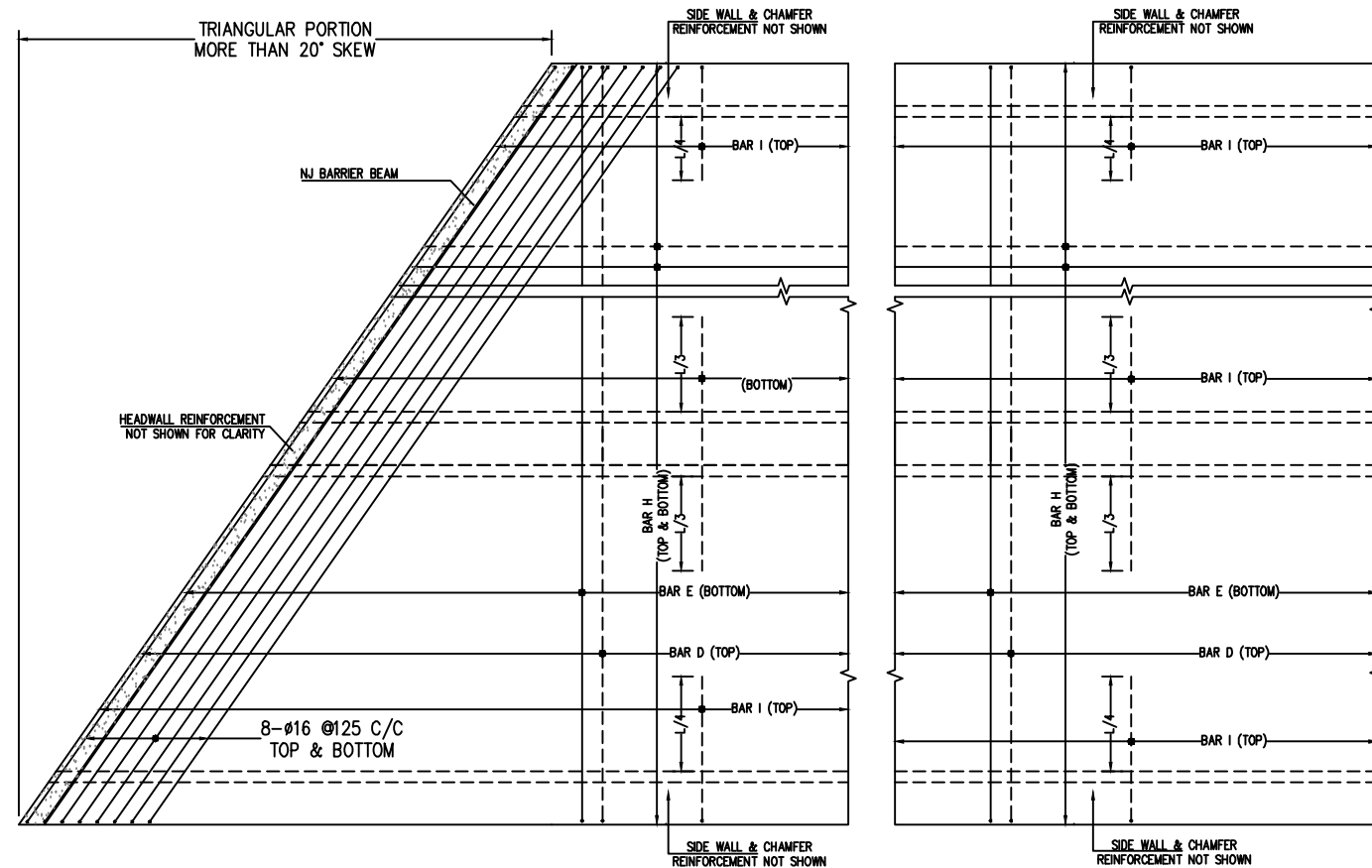


TYPICAL R.C.C BOX CULVERT BOTTOM SLAB
AT SKEW



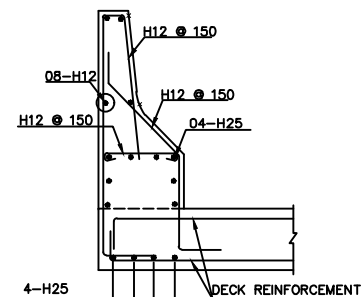
TYPICAL R.C.C BOX CULVERT
BOTTOM SLAB PLAN

REV	DATE	DESCRIPTION	SIGN
AMENDMENTS			
CLIENT:			
 Project Implementation Unit (PIU) Integrated Flood Resilience and Adaptation Project (IFRAP) Component I			
PROJECT:			
 Consulting Services For Design, Procurement Assistance, Contract Administration and Construction Supervision (Road Infrastructure Sub-Component)			
LEAD CONSULTANT:			
 ZEERUK INTERNATIONAL (PVT)LTD 3rd Floor, Aura Square Plaza, F-11 Markaz, Islamabad Ph: 051-2224215-16, FAX: 051-2224217  KASIB CONSULTANTS PVT. LTD			
TITLE:			
MULTI CELL BOX CULVERT SLAB REINFORCEMENT DETAIL			
STATUS:			
ISSUED FOR CONSTRUCTION			
DRAWN: SAIF		APPROVED: INAM MINHAS	
DESIGNED: AHMED		SCALE: AS SHOWN	
CHECKED: ANAS		DATE: NOV, 2025	
DRAWING NO. ZU/IFRAP/STR/ MBC-03			REV NO. 0

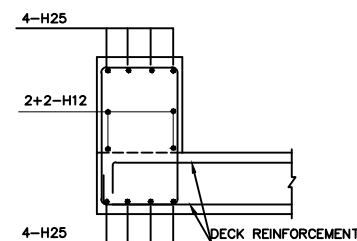


TYPICAL R.C.C BOX CULVERT TOP SLAB
AT SKEW
(FOR REINFORCEMENT DETAILS REFER SHEET 03/TABLE NO. 3)

TYPICAL R.C.C BOX CULVERT
TOP SLAB PLAN



REINFORCEMENT DETAIL
OF BARRIER

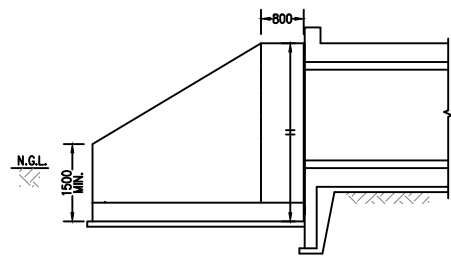


REINFORCEMENT DETAIL
OF HEAD WALL

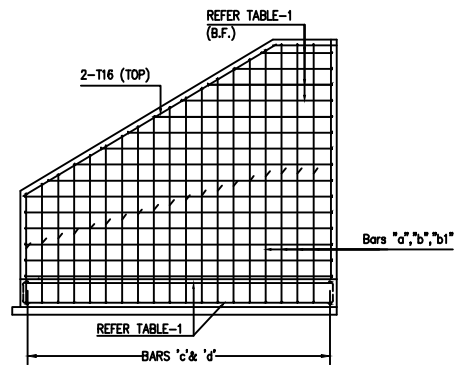
NOTES

1. CLEAR COVER TO REINFORCEMENT IS 50mm.
2. THE CLEAR CONC. COVER TO SURFACES HAVING CONTACT WITH THE SOIL IS 75mm.
3. ALL BARS ARE (H.Y.S) HIGH YIELD DEFORMED STEEL WITH $f_y=410$ N/mm (60KSI).
4. CONCRETE SHALL HAVE A MINIMUM 28 DAYS CYLINDER STRENGTH OF 4000 psi.
5. LEAN CONCRETE SHALL HAVE A MINIMUM 28 DAYS CYLINDER STRENGTH OF 100 Kg/CM.
6. UNLESS OTHERWISE SHOWN ON THE DRAWINGS LAPS IN REINFORCING STEEL BARS SHALL BE STAGGERED, MINIMUM LENGTH OF LAP SHALL BE 48 TIMES THE SMALLER BAR DIAMETER SPLICED.
7. ALL CONCRETE FACES BURIED IN SOIL BE PAINTED WITH TWO COATS OF HOT BITUMEN.
8. ALL DIMENSION ARE IN MILLIMETERS.
9. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.
10. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH OTHER RELEVANT DRAWING.
11. EXPANSION JOINT SHOULD BE PROVIDED. AFTER EVERY FOUR CELL (TRANSVERSELY).
12. CONTRACTION JOINT SHOULD BE PROVIDED FOR CULVERT LENGTH MORE THAN 12.00 M.
13. THE CLEAR CONC. COVER TO SURFACES HAVING CONTACT WITH THE SOIL IS 75mm.

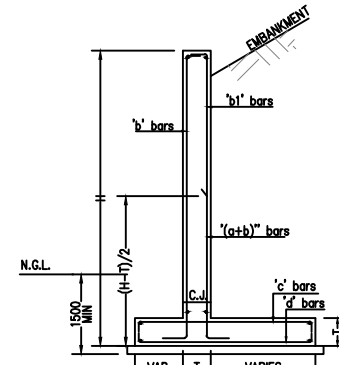
REV	DATE	DESCRIPTION	SIGN
AMENDMENTS			
CLIENT:			
 Project Implementation Unit (PIU) Integrated Flood Resilience and Adaptation Project (IFRAP) Component I			
PROJECT:			
 Consulting Services For Design, Procurement Assistance, Contract Administration and Construction Supervision (Road Infrastructure Sub-Component)			
LEAD CONSULTANT:			
 ZEERUK INTERNATIONAL (PVT) LTD 3rd Floor, Aura Square Plaza, F-11 Markaz, Islamabad Ph: 051-2224215-16, FAX: 051-2224217  KASIB CONSULTANTS PVT. LTD			
TITLE:			
MULTI CELL BOX CULVERT SLAB & BARRIER REINFORCEMENT DETAIL			
STATUS:			
ISSUED FOR CONSTRUCTION			
DRAWN: SAIF		APPROVED: INAM MINHAS	
DESIGNED: AHMED		SCALE: AS SHOWN	SHEET:
CHECKED: ANAS		DATE: NOV, 2025	
DRAWING NO. ZI/IFRAP/STR/ MBC-04			REV NO. 0



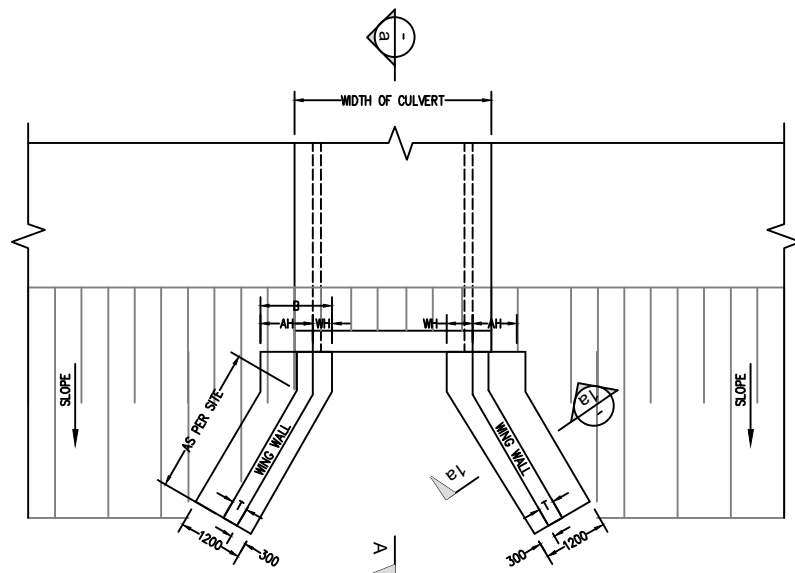
TYPICAL ELEVATION OF WING WALL



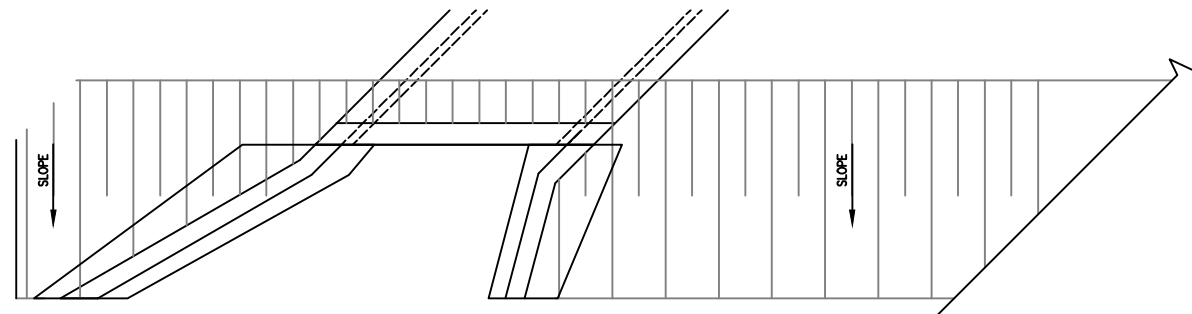
TYPICAL ELEVATION OF WING WALL
(SHOWING REINFORCEMENT)



SECTION 1a-1a



TYPICAL PLAN OF BOX CULVERT
WITHOUT SKEW



TYPICAL PLAN OF BOX CULVERT
WITH SKEW

H	AH	T	WH	B	WINGWALL REINF. SCHEDULE								DISTRIBUTION BARS			
					MAIN REINF. BARS								WALL		BASE	
					a		b & b1		c		d					
					Ø	Spacing	Ø	Spacing	Ø	Spacing	Ø	Spacing	Ø	Spacing	Ø	Spacing
m	m	m	m	m	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
4.0	0.8	0.3	2.0	3.1	16	150	16	200	16	200	20	200	12	200	12	200
3.0	0.5	0.3	1.6	2.40	12	150	12	200	16	200	20	200	12	200	12	200
2.0	0.45	0.3	1.5	2.25	12	200	12	200	16	200	16	200	12	200	12	200

NOTES

1. CLEAR COVER TO REINFORCEMENT IS 50mm.
2. THE CLEAR CONC. COVER TO SURFACES HAVING CONTACT WITH THE SOIL IS 75mm.
3. ALL BARS ARE (H.Y.S) HIGH YIELD DEFORMED STEEL WITH $f_y=410$ N/mm (60KSI).
4. CONCRETE SHALL HAVE A MINIMUM 28 DAYS CYLINDER STRENGTH OF 4000 psi.
5. LEAN CONCRETE SHALL HAVE A MINIMUM 28 DAYS CYLINDER STRENGTH OF 100 Kg/CM.
6. UNLESS OTHERWISE SHOWN ON THE DRAWINGS LAPS IN REINFORCING STEEL BARS SHALL BE STAGGERED, MINIMUM LENGTH OF LAP SHALL BE 48 TIMES THE SMALLER BAR DIAMETER SPLICED.
7. ALL CONCRETE FACES BURIED IN SOIL BE PAINTED WITH TWO COATS OF HOT BITUMEN.
8. ALL DIMENSION ARE IN MILLIMETERS.
9. ONLY WRITTEN DIMENSIONS TO BE FOLLOWED.
10. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH OTHER RELEVANT DRAWING.
11. THE CLEAR CONC. COVER TO SURFACES HAVING CONTACT WITH THE SOIL IS 75mm.

REV	DATE	DESCRIPTION	SIGN
AMENDMENTS			
CLIENT:			
 Project Implementation Unit (PIU) Integrated Flood Resilience and Adaptation Project (IFRAP) Component I			
PROJECT:			
 Consulting Services For Design, Procurement Assistance, Contract Administration and Construction Supervision (Road Infrastructure Sub-Component)			
LEAD CONSULTANT:			
 ZEERUK INTERNATIONAL (PVT)LTD 3rd Floor, Aura Square Plaza, F-11 Markaz, Islamabad Ph: 051-2224215-16, FAX: 051-2224217  KASIB CONSULTANTS PVT. LTD			
TITLE:			
MULTI CELL BOX CULVERT TYPICAL WING WALL DETAILS			
STATUS:			
ISSUED FOR CONSTRUCTION			
DRAWN: SAIF		APPROVED: INAM MINHAS	
DESIGNED: AHMED		SCALE: AS SHOWN	
CHECKED: ANAS		DATE: NOV, 2025	
DRAWING NO. ZI/IFRAP/STR/ MBC-06			REV NO. 0