

# Environmental Impact Assessment

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Project Number: 43253-026  
June 2019

## India: Karnataka Integrated and Sustainable Water Resources Management Investment Program – Project 2

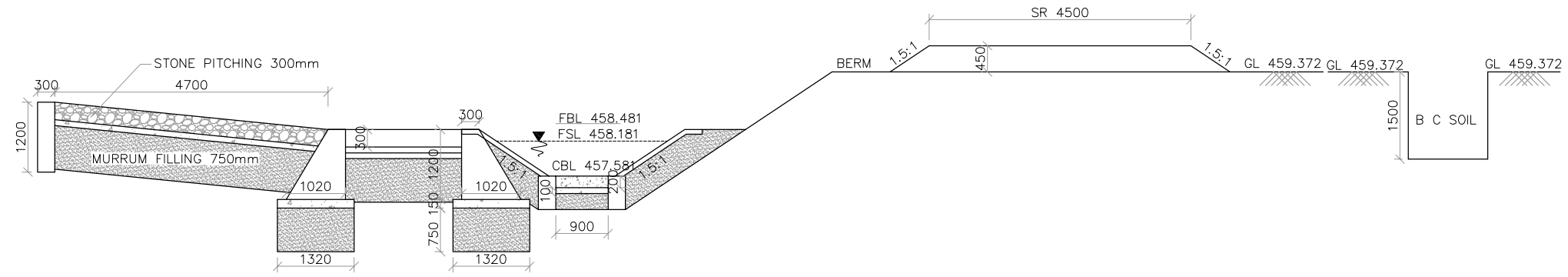
### Vijayanagara Channels

Annexure 2 part 2

Prepared by Project Management Unit, Karnataka Integrated and Sustainable Water Resources Management Investment Program Karnataka Neeravari Nigam Ltd. for the Asian Development Bank. This is an updated version of the draft originally posted in June 2018 available on <https://www.adb.org/India:Karnataka Integrated and Sustainable Water>

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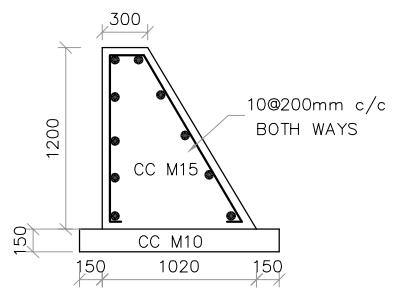
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LONGITUDINAL SECTION  
(SCALE :100)



PLAN  
(SCALE :100)



SECTION HEAD WALL  
(SCALE 1:50)

**NOTES**

- 1) ALL DIMENSIONS ARE IN MILLIMETRES AND REDUCED LEVELS ARE IN METRES.
- 2) DO NOT SCALE THE DRAWING. WRITTEN DIMENSIONS ONLY SHALL BE FOLLOWED.
- 3) GRADE OF CONCRETE :
  - (I). CC M10 WITH 40mm DOWNSIZE METAL - FOUNDATION BED CONCRETE.
  - (II). CC M15 WITH 40mm DOWN SIZE METAL - HEAD WALLS SILT TRAP
  - (III). CC M15 WITH 20mm DOWN SIZE METAL - BELOW SILT TRAP, CUT OFF WALLS, CANAL PORTION.
  - (IV). CC M20 WITH 20mm DOWN SIZE METAL FOR DECK SLAB AND KERB - TROUGH
- 4) SKIN REINFORCEMENT OF 10@ 200mm C/C BOTH WAYS IS PROVIDED.
- 5) MINIMUM CLEAR COVER TO THE REINFORCEMENT SHALL BE 50mm UNLESS OTHERWISE MENTIONED.
- 6) DRY STONE PITCHING IS PROVIDED WHEREVER NECESSARY.
- 7) CNS LINING IS PROVIDED WHEREVER BC SOIL STRATA MET WITH

0	For Approval					
Rev.	Description.	Date.	Drw.	Pre.	Chk.	App.

CLIENT  
**KARNATAKA NEERAVARI NIGAM LIMITED**  
(A GOVT. OF KARNATAKA UNDERTAKING)  
BANGALORE - 560 001

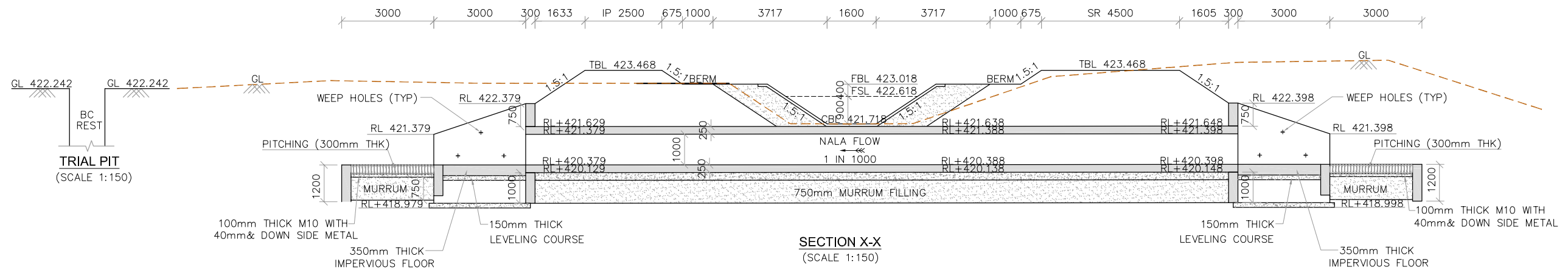
CONSULTANT **E I Technologies Pvt. Ltd.,**  
(ISO 9001 : 2008 Certified)  
# 1149, 26th Main, Jayanagar 4th 'T' Block,  
Bengaluru-560 041, India.  
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PROJECT TITLE  
**MODERNISATION OF VIJAYANAGARA CHANNELS  
IN TUNGABHADRA PROJECT**

DRAWING TITLE  
**CONSTRUCTION OF INLET AT  
CH : 2+385km OF HULUGI CHANNEL**

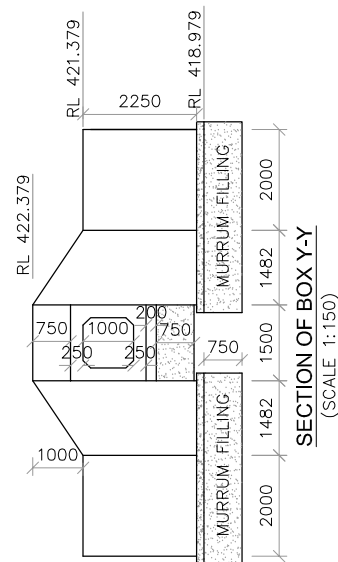
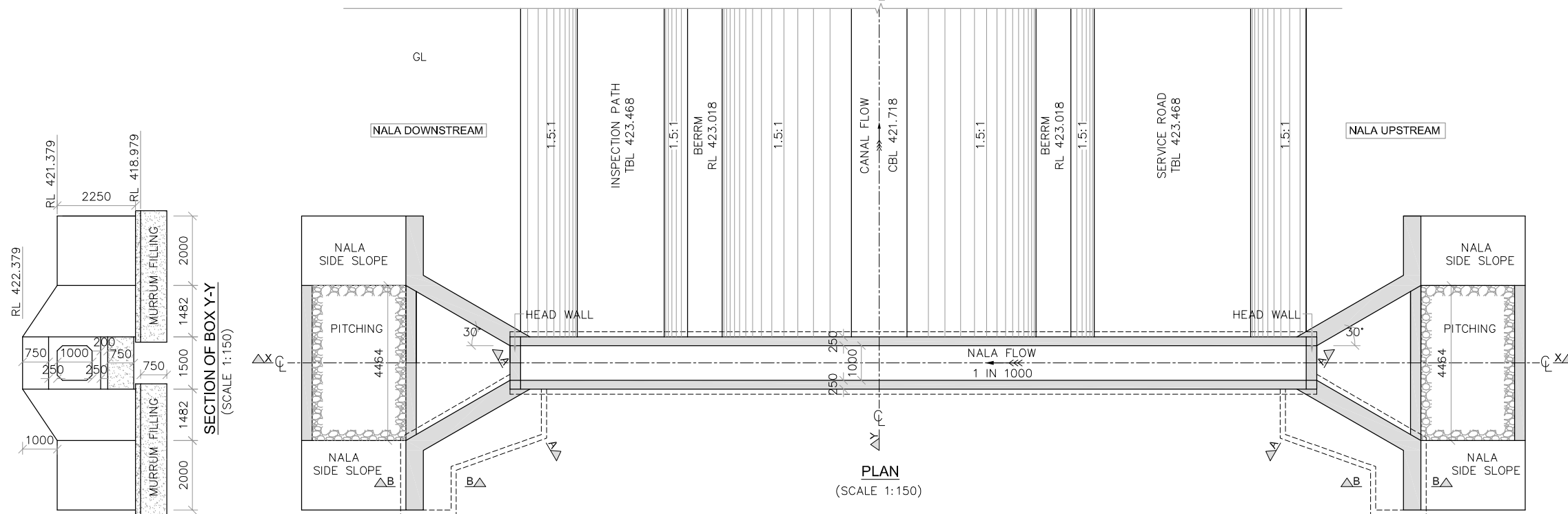
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Project No.	Drawing No.	Sheet No.	Rev.			
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 Consultant E I Technologies Pvt. Ltd. Bangalore	 Asst. Executive Engineer VNC Sub-Division Kamalapur	 Executive Engineer TR Division No.1 Munirabad
 Superintending Engineer Tungabhadra Project Circle Munirabad	 Chief Engineer Irrigation Central Zone Munirabad	



DATUM: 463

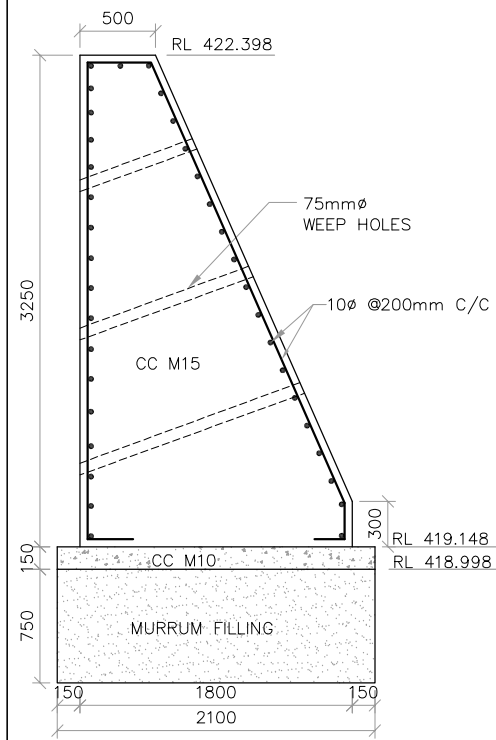
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CHAINAGE (m)		22.00	17.00	12.00	7.00	2.00	0.00	2.00	7.00	12.00	17.00	22.00



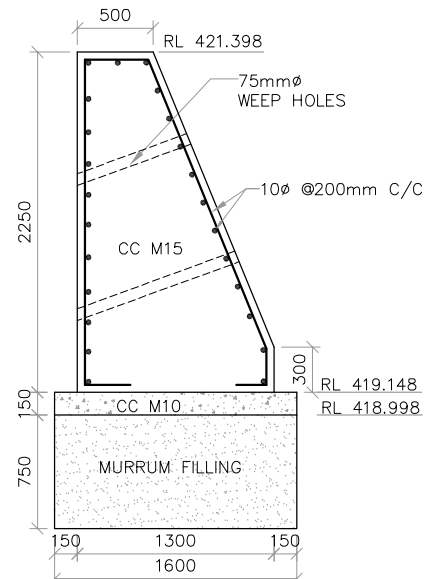
- NOTES**
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  - DO NOT SCALE THE DRAWING. WRITTEN DIMENSIONS ONLY SHALL BE FOLLOWED.
  - GRADE OF CONCRETE : CONFORMING TO IS 456-2000
    - FOUNDATION BED CONCRETE - CC M10 WITH 40mm AND DOWNSIZE METAL.
    - WING WALLS AND RETURN WALLS - CC M15 WITH 40mm & DOWNSIZE METAL.
    - BOX AND HEAD WALL - CC M20 WITH 20mm AND DOWNSIZE METAL.
    - CUTOFF WALL, CANAL LINING AND IMPERVIOUS FLOOR - CC M15 WITH 20mm AND DOWNSIZE METAL.
  - REINFORCEMENT SHALL BE HIGH YIELD STRENGTH DEFORMED BARS OF GRADE Fe 415 CONFORMING TO IS 1786-1985.

- SKIN REINFORCEMENT: WING WALLS, RETURN WALLS AND CUT OFF WALLS - 10 # AT 200 C/C ON BOTH WAYS PROPOSED.
- MINIMUM COVER TO ANY REINFORCEMENT SHALL BE 50mm UNLESS OTHERWISE MENTIONED.
- HAUNCH REINFORCEMENT SHALL BE LAPPED WITH MAIN REINFORCEMENT.
- ADEQUATE WEEPHOLES SHALL BE PROVIDED IN WING WALLS AND RETURNS AT NOT MORE THAN 2000mm C/C HORIZONTALLY AND 1000mm C/C VERTICALLY REGULARLY STAGGERED THE WEEPHOLES SHALL BE PROVIDED UP TO THE BED LEVEL.
- ALL BANKS SHALL BE COMPACTED THOROUGHLY AS PER SPECIFICATION AND FINISHED TO THE REQUIRED STANDARDS.
- BED CONCRETE OF 200mm THICK IS PROVIDED BELOW THE BOX
- DRY STONE PITCHING IS PROVIDED WHEREVER NECESSARY.

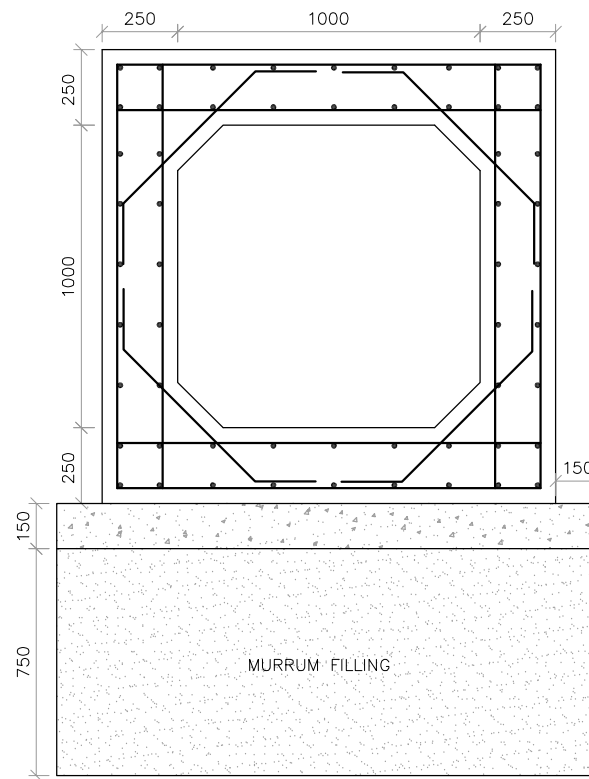
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CLIENT <b>KARNATAKA NEERAVARI NIGAM LIMITED</b> (A GOVT. OF KARNATAKA UNDERTAKING) BANGALORE - 560 001							
CONSULTANT <b>E I Technologies Pvt. Ltd.,</b> (ISO 9001 : 2008 Certified) # 1149, 26th Main, Jayanagar 4th 'T' Block, Bengaluru-560 041, India. Ph. +91.80.40914714, Fax: +91.80.26650912 info@eitech.in • www.eitech.in							
PROJECT TITLE <b>MODERNISATION OF VIJAYANAGARA CHANNELS</b> <b>IN TUNGABHADRA PROJECT</b>							
DRAWING TITLE							
<b>CONSTRUCTION OF UNDER TUNNEL</b> <b>AT CH: 7+431km FOR ANEGONDI CANAL</b>							
Date	Drw.	Pre.	Chk.	App.	Scale.	Drawing Status.	
					AS SHOWN	FOR APPROVAL	
Project No.	Drawing No.			Sheet No.		Rev.	
	KNNL-VNC-AC-STR-UT-007			01 of 02		0	
Consultant <b>E I Technologies Pvt. Ltd.</b> Bangalore		Asst. Executive Engineer <b>VNC Sub-Division</b> Kamalapur		Executive Engineer <b>TR Division No.1</b> Munirabad			
Superintending Engineer <b>Tungabhadra Project Circle</b> Munirabad				Chief Engineer <b>Irrigation Central Zone</b> Munirabad			



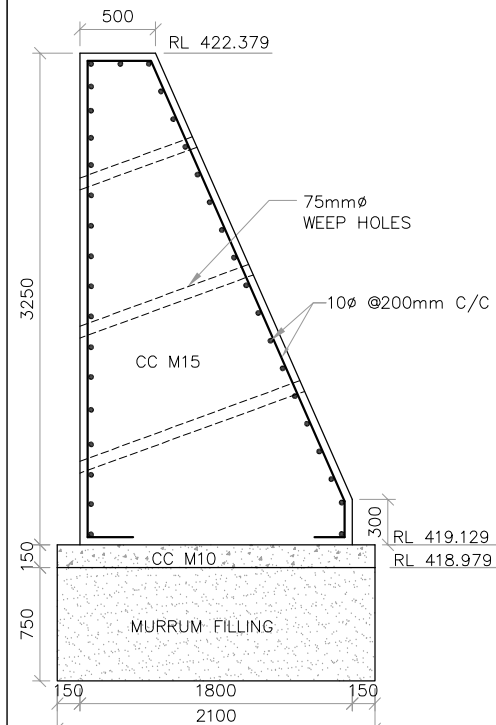
SECTION OF U/S WING WALL  
(AT MAXIMUM HEIGHT)  
(SECTION C-C)  
(SCALE 1:50)



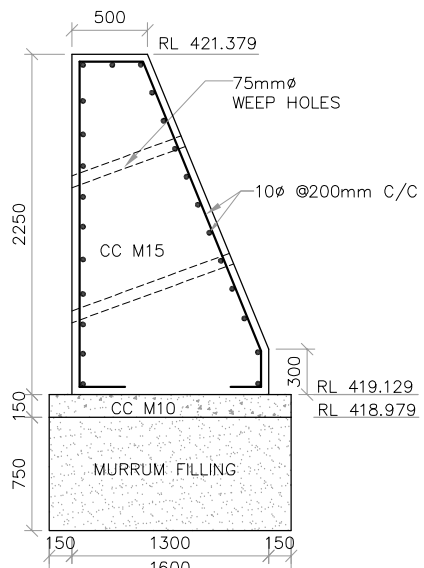
SECTION OF U/S RETURN WALL  
(SECTION D-D)  
(SCALE 1:50)



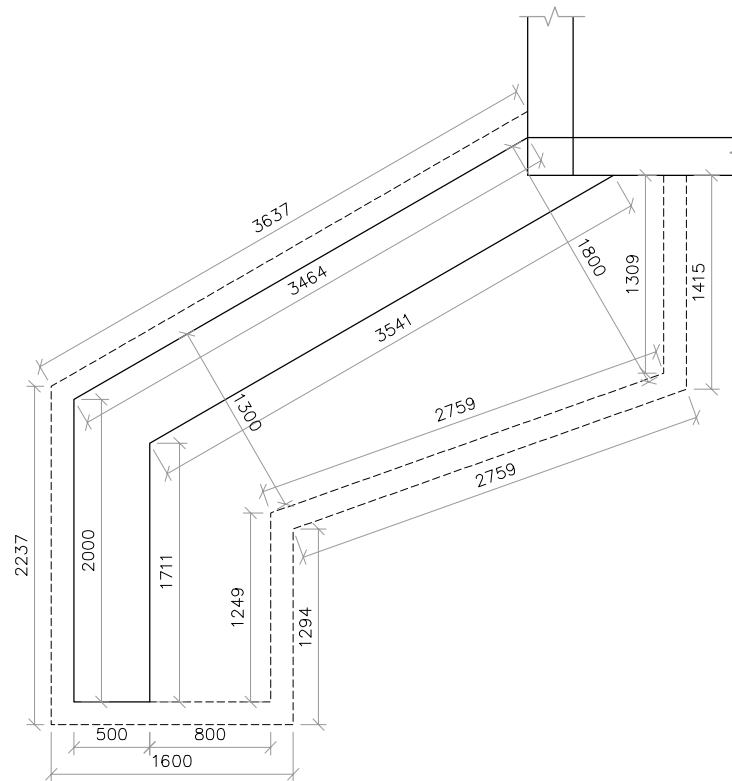
REINFORCEMENT DETAILS OF BOX  
(SCALE 1:25)



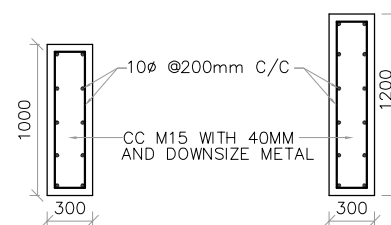
SECTION OF D/S WING WALL  
(AT MAXIMUM HEIGHT)  
(SECTION A-A)  
(SCALE 1:50)



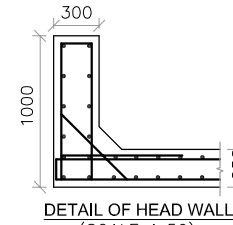
SECTION OF D/S RETURN WALL  
(SECTION B-B)  
(SCALE 1:50)



PLAN OF WING WALL (U/S AND D/S)  
(SCALE 1:50)



DETAILS CUT OFF WALL  
(SCALE 1:50)



DETAIL OF HEAD WALL  
(SCALE 1:50)

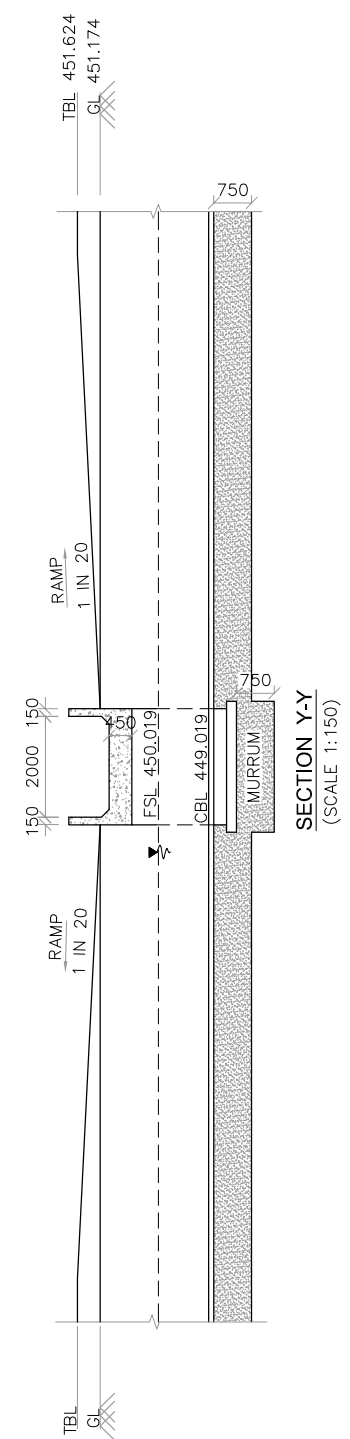
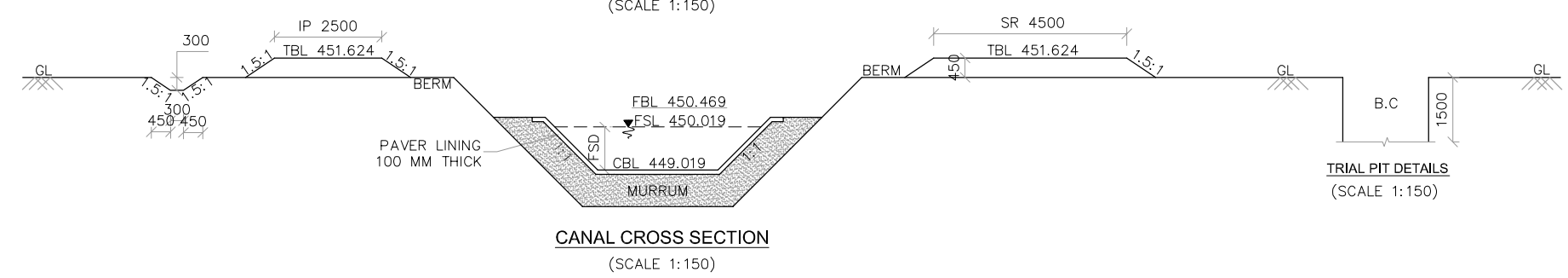
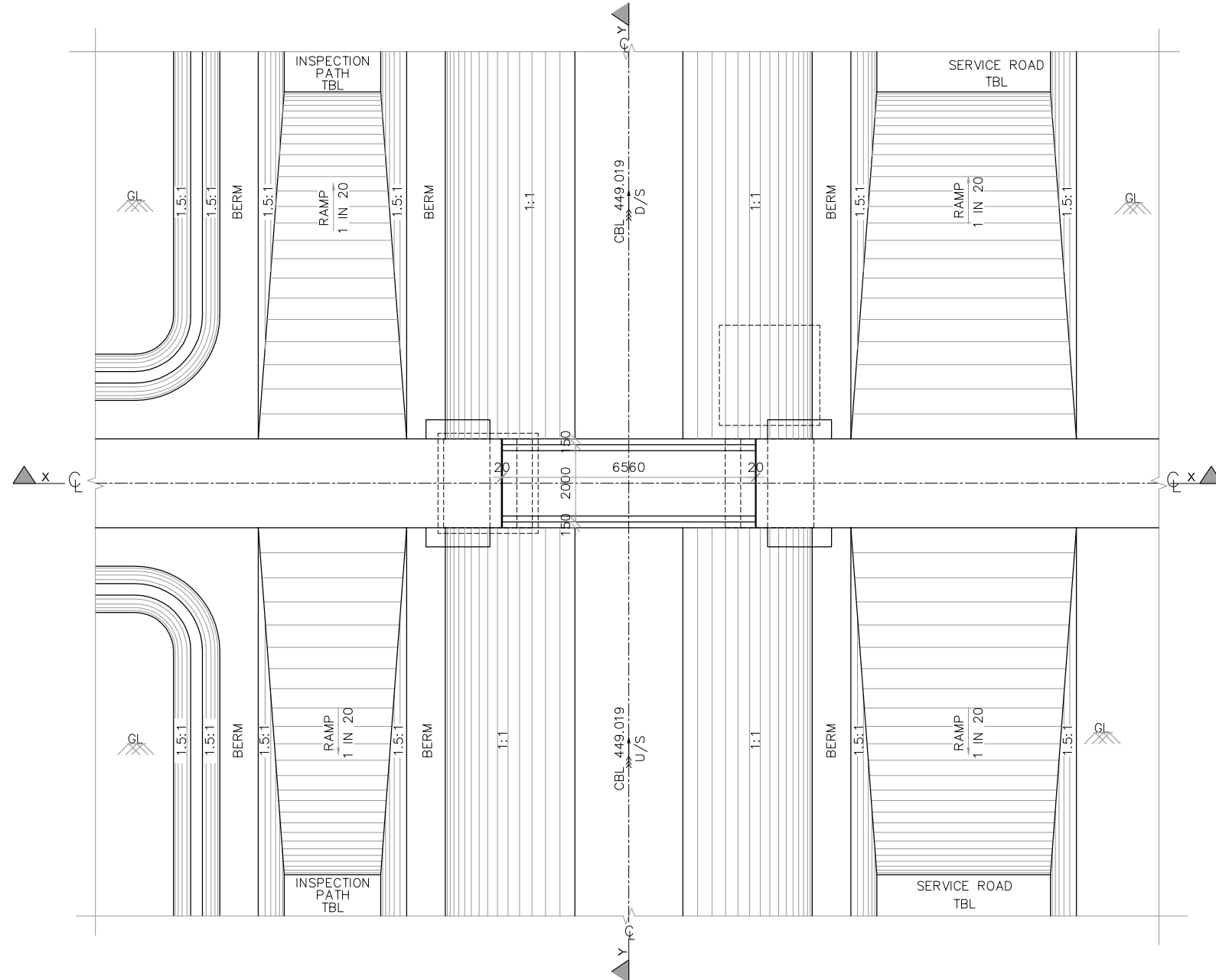
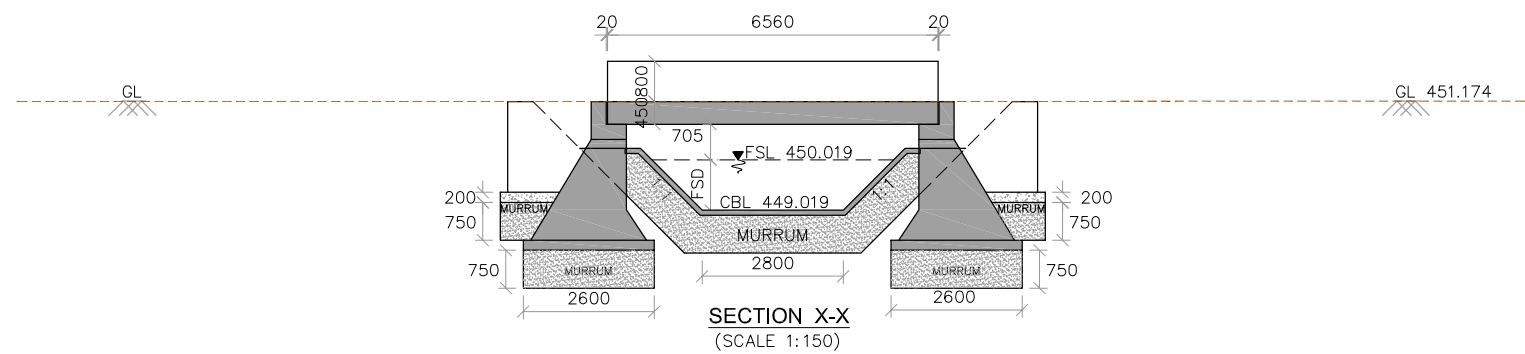
BAR BENDING SCHEDULE OF BOX CULVERT

	BAR	BAR NO	BAR DIA (mm)	SPACING (mm)	No. OF BARS	SHAPE OF BARS (ALL DIMENSIONS ARE IN mm) (NOT TO SCALE)	LENGTH OF EACH BAR (mm)	TOTAL LENGTH (m)	UNIT WT (kg/m)	TOTAL WT (kg)
TOP SLAB	Main	1	10	150	156 X 2	1380 10#@150mm(1) 1380	250 250	1880	586.56	0.617 363.67
	Dist	2	10	200	8 X 2	23122	250 250	23122	369.95	0.617 229.37
BOTTOM SLAB	Main	3	10	150	156 X 2	1380 12#@150mm(4) 23122	250 250	1880	586.56	0.617 363.67
	Dist	4	10	200	8 X 2	23122	250 250	23122	369.95	0.617 229.37
SIDE WALLS	Main	5	10	150	156 X 4	250 1380	1380	1880	1173.12	0.617 727.33
	Dist	6	10	200	8 X 4	23122	1380	23122	739.90	0.617 458.74
HAUNCH	TOP	7	10	150	156 X 2	150 150 10#@150mm(7)	150 150	1078	336.33	0.617 208.52
	BOTTOM	8	10	150	156 X 2	150 150 10#@150mm(8)	150 150	1078	236.33	0.617 208.52
CUT OFF WALLS (ENDS)	Long	9	10	200	23 X 3	200 1100	1100	2800	193.20	0.617 119.12
	Trans	10	10	200	14 X 3	10#@200mm(9) 100 4364	100	4564	191.69	0.617 118.18
CUT OFF WALL (END OF HEAD WALL)	Long	11	10	200	8 X 2	200 900	900	2400	38.40	0.617 23.68
	Trans	12	10	200	12 X 2	10#@200mm(11) 100 1400	100	1600	38.40	0.617 23.68
HEAD WALLS	Long	13	10	200	9 X 2	220 710 220 910	910	3080	55.44	0.617 34.18
	Trans	14	10	200	10 X 2	200 600 1420	600	1620	32.40	0.617 19.98
WING WALL AT WING WALL AT BOX JUNCTION U/S	Long	15	10	200	20 X 2	400 3150 3500	3500	7600	304.00	0.617 187.43
	Trans	16	10	200	38 X 2	100 100 3785	100 250	200	15.20	0.617 9.37
WING WALL AT WING WALL AT BOX JUNCTION D/S	Long	17	10	200	20 X 2	400 3150 3500	3500	7600	304.00	0.617 187.43
	Trans	18	10	200	38 X 2	100 100 3785	100 250	200	15.20	0.617 9.37
RETURN U/S AND D/S	Long	19	10	200	20 X 2	400 2150 2350	2350	5480	219.20	0.617 135.15
	Trans	20	10	200	38 X 2	100 100 1502	100 250	1702	129.35	0.617 79.75

TOTAL = 3736.51Kg  
ADD 5% WASTAGE = 186.82  
TOTAL = 3923.33Kg  
SAY = 3924Kg

0		For Approval				DRAWING TITLE							
Rev.	Description	Date	Drw.	Pre.	Chk.	App.	CONSTRUCTION OF UNDER TUNNEL AT CH: 7+431km FOR ANEGONDI CANAL						
CLIENT							Date	Drw.	Pre.	Chk.	App.	Scale.	Drawing Status.
KARNATAKA NEERAVARI NIGAM LIMITED (A GOVT. OF KARNATAKA UNDERTAKING) BANGALORE - 560 001							AS SHOWN		FOR APPROVAL				
CONSULTANT							Project No.	Drawing No.	Sheet No.	Rev.			
E I Technologies Pvt. Ltd., (ISO 9001 : 2008 Certified) # 1149, 26th Main, Jayanagar 4th 'T' Block, Bengaluru-560 041, India. Ph.+91.80.40914714, Fax: +91.80.26650912 info@eitech.in www.eitech.in							KNNL-VNC-AC-STR-UT-007		02 of 02		0		
PROJECT TITLE							Consultant		Asst. Executive Engineer		Executive Engineer		
MODERNISATION OF VIJAYANAGARA CHANNELS IN TUNGABHADRA PROJECT							E I Technologies Pvt. Ltd. Bangalore		VNC Sub-Division Kamalapur		TR-Division No.1 Murrabad		
							Superintending Engineer		Chief Engineer				
							Tungabhadra Project Circle Murrabad		Irrigation Central Zone Murrabad				





TRIAL PIT DETAILS  
(SCALE 1:150)

**NOTES AND SPECIFICATIONS**

- 1) ALL DIMENSIONS ARE IN MILLIMETRES AND REDUCED LEVELS ARE IN METRES.
- 2) DO NOT SCALE THE DRAWING. WRITTEN DIMENSIONS ONLY SHALL BE FOLLOWED.
- 3) THE BRIDGE IS DESIGNED ADOPTING THE FOLLOWING IRC AND IS CODES.  
IRC-5-1998.  
IRC-6-2000.  
IRC-21-2000.  
IRC-78-2000.  
IRC-83-2000.  
IS 456-2000.
- 4) GRADE OF CONCRETE : CONFORMING TO IS 456-2000  
(i) LEVELLING COURSE IN FOUNDATION - CC M10 WITH 40mm AND DOWN SIZE COARSE AGGREGATE.  
(ii) RETAIN WALLS, WING WALLS, ABUTMENT AND APPROACH SLAB - CC M15 WITH 40mm AND DOWN SIZE COARSE AGGREGATE.  
(iii) ABUTMENT CAP, DIRT WALL, PIER, PIER RAFT, DECK SLAB SIDE WALL, HAND RAILS, KERBS AND WEARING COAT - RCC M20 WITH 20mm AND DOWN SIZE COARSE AGGREGATE.
- 5) BACK FILLING SHALL BE DONE SIMULTANEOUSLY WITH THE RAISING OF THE STRUCTURE WITH  $\phi$  VALUE OF SOIL NOT LESS THAN 28°.
- 6) ALL REINFORCEMENT SHALL BE OF HIGH YIELD STRENGTH DE FORMED BARS (GRADE DESIGNATION Fe415).
- 7) SHARP EDGES OF CONCRETE SHALL BE CHAMFERED.
- 8) FILLING BEHIND ABUTMENTS AND RETURNS SHALL BE AS PER RELEVANT IRC SPECIFICATIONS.

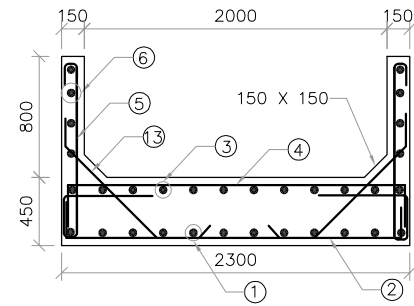
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PROJECT TITLE  
**MODERNISATION OF VIJAYANAGARA CHANNELS IN TUNGABHADRA PROJECT**

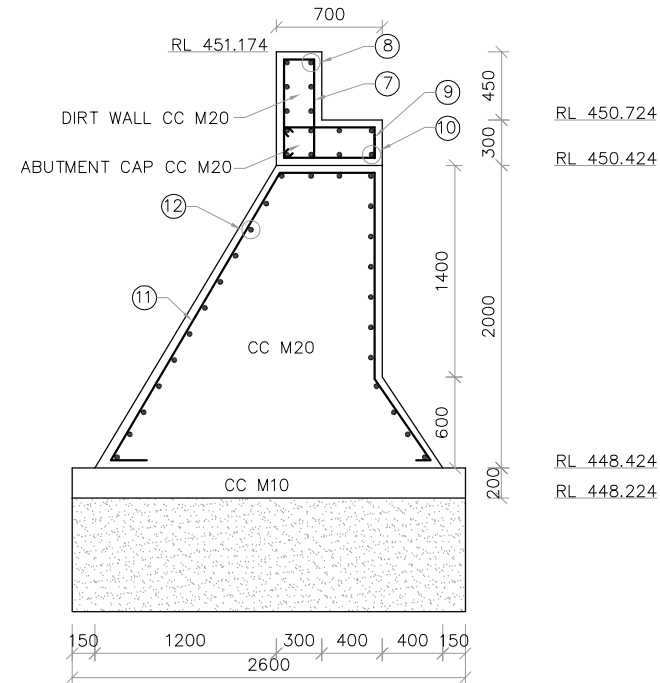
DRAWING TITLE  
**CONSTRUCTION OF FOOT BRIDGE AT CH: 0+144 FOR KALAGHATTA CANAL**

Date	Drw.	Pre.	Chk.	App.	Scale	Drawing Status
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Project No.	Drawing No.	Sheet No.				Rev.
	KNNL-VNC-KC-STR-FB-007	01 of 02				0

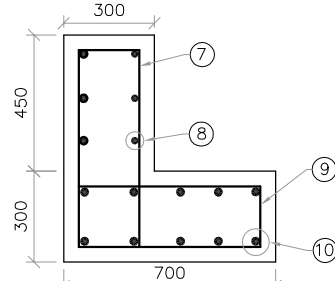
Consultant E I Technologies Pvt. Ltd. Bangalore	Asst. Executive Engineer VNC Sub-Division Kamalahpur	Executive Engineer TR Division No.1 Munirabad
Superintending Engineer Tungabhadra Project Circle Munirabad	Chief Engineer Irrigation Central Zone Munirabad	



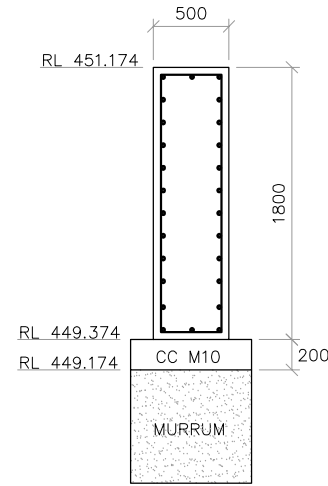
**REINFORCEMENT DETAILS OF DECK SLAB**  
(SCALE 1:50)



**ABUTMENT DETAILS -CS**  
(SCALE 1:50)



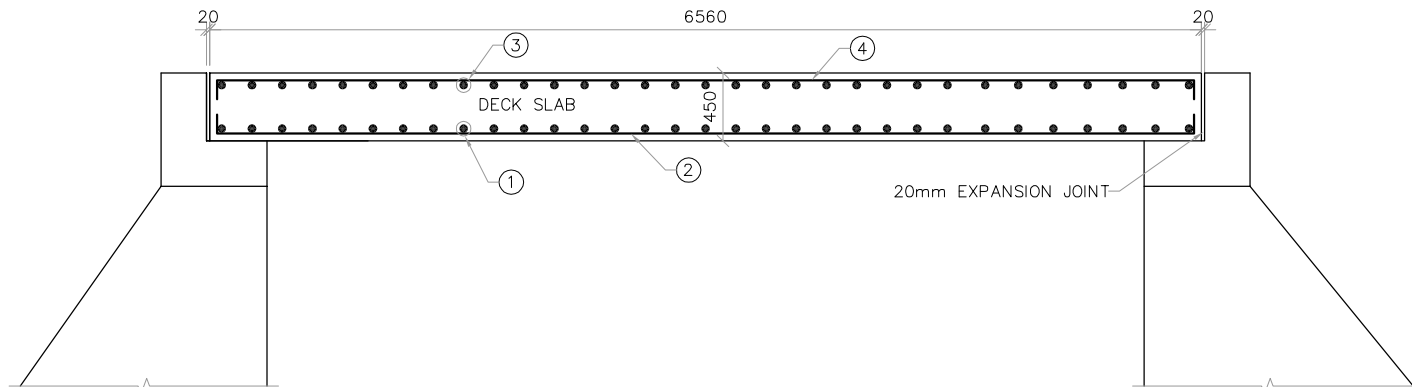
**DIRT WALL & ABUTMENT CAP**  
(SCALE 1:25)



**SECTION OF FIN WALL**  
(SCALE 1:50)

**SCHEDULE OF REINFORCEMENT**

MEMBER	BAR MARK	DIA OF BAR (mm)	SPACING OF BAR (mm)	NO. OF BAR	SHAPE OF BARS (DIMENSION ARE IN MM) (NOT TO SCALE)	LENGTH OF EACH BAR (mm)	TOTAL LENGTH IN METRES	UNIT WEIGHT IN Kg/m	TOTAL WEIGHT IN Kg	
SLAB	1	16	140	17	6460 ①	6460	109.820	1.58	173.515	
	2	10	250	27	100 2200 100 ②	2400	64.8	0.62	40.17	
	3	16	140	17	6460 ③	6460	109.820	1.58	173.515	
	4	10	250	28	100 2200 100 ④	2400	64.8	0.62	40.17	
SIDE WALLS	5	10	200	34X2	100 100 800 100 400 350 100 ⑤	2300	156.4	0.62	96.968	
	6	10	200	7X2	6460 ⑥	6460	90.44	0.62	56.07	
DIRT WALL	7	10	200	10X2	200 059 ⑦	1700	34	0.62	21.08	
	8	10	200	9X2	2200 ⑧	2200	39.6	0.62	24.552	
ABUTMENT CAP	9	10	200	13X2	600 200 600 ⑨	1600	41.6	0.62	25.8	
	10	10	200	9X2	2200 ⑩	2200	39.6	0.62	24.552	
ABUTMENT	11	10	200	13X2	600 1400 671 100 100 ⑪	5104	132.704	0.62	82.27	
	12	10	200	27X2	2200 ⑫	2200	118.80	0.62	73.65	
HAUNCH	13	10	200	34X2	100 150 585 ⑬	815	55.42	0.62	34.36	
FIN WALL	14	10	200	7	400 1700 1700 ⑭	4200	29.4	0.62	18.23	
	15	10	200	22	1060 ⑮	1060	23.32	0.62	14.45	
							TOTAL=899.35 Kg			
							5% WASTAGE=44.96			
							GRAND TOTAL=945 Kg			



**REINFORCEMENT DETAILS OF DECK SLAB**  
(SCALE 1:50)

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BANGALORE - 560 001

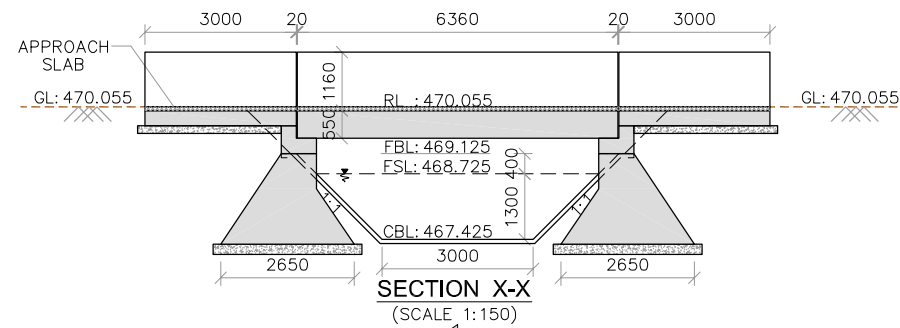
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**DRAWING TITLE**  
**CONSTRUCTION OF FOOT BRIDGE AT CH: 0+144 FOR KALAGHATTA CANAL**

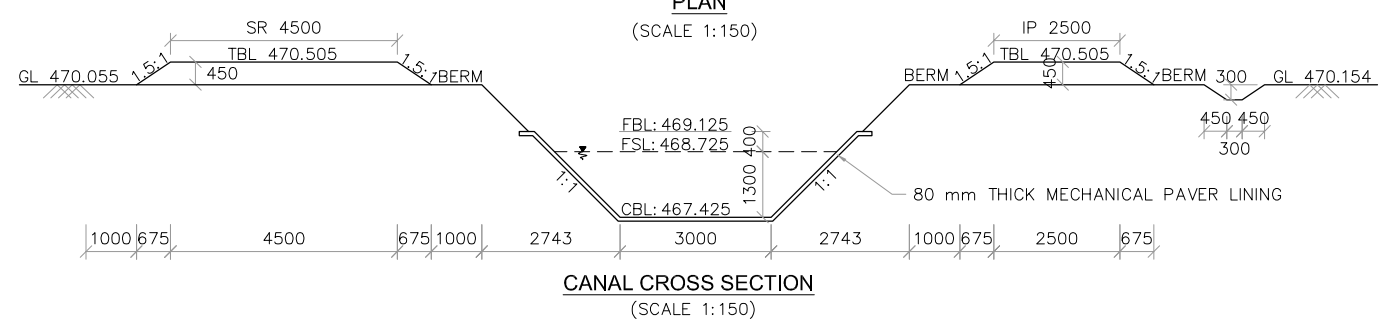
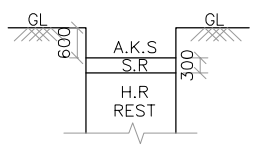
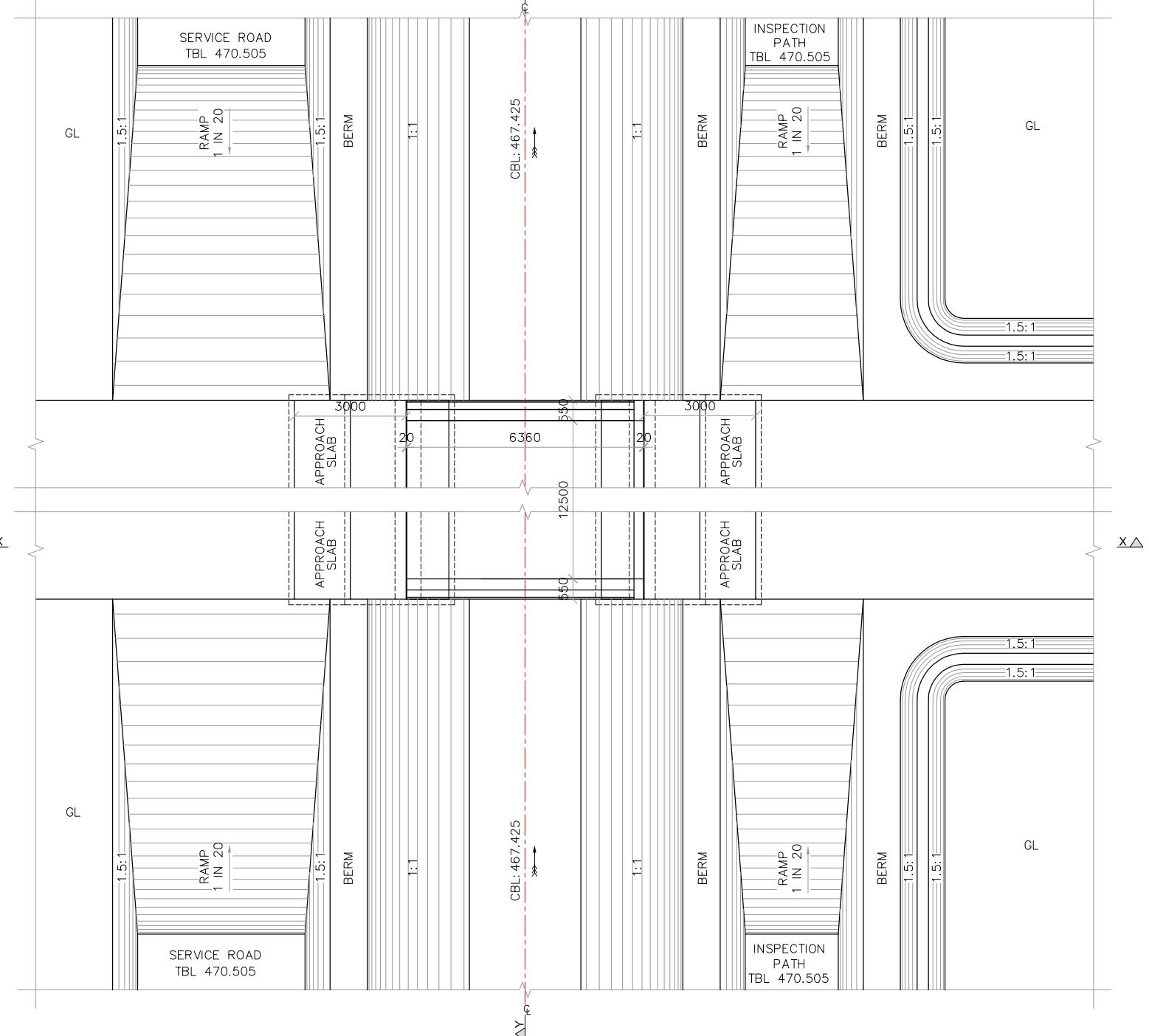
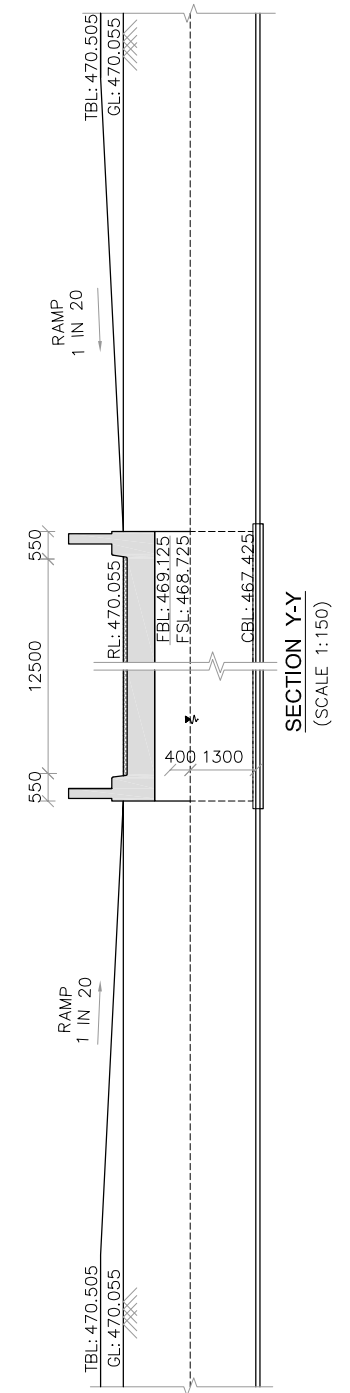
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- 2) DO NOT SCALE THE DRAWING. WRITTEN DIMENSIONS ONLY SHALL BE FOLLOWED.
- 3) GRADE OF CONCRETE : CONFORMING TO IS 456-2000
  - (i) LEVELLING COURSE IN FOUNDATION - CC M10 WITH 40mm AND DOWN SIZE COARSE AGGREGATE.
  - (ii) RETAIN WALLS, WING WALLS, ABUTMENT AND APPROACH SLAB - CC M15 WITH 40mm AND DOWN SIZE COARSE AGGREGATE.
  - (iii) ABUTMENT CAP, DIRT WALL, PIER, PIER RAFT, DECK SLAB SIDE WALL, HAND RAILS, KERBS AND WEARING COAT - RCC M20 WITH 20mm AND DOWN SIZE COARSE AGGREGATE.
- 4) BACK FILLING SHALL BE DONE SIMULTANEOUSLY WITH THE RAISING OF THE STRUCTURE WITH  $\phi$  VALUE OF SOIL NOT LESS THAN 28'.
- 5) ALL REINFORCEMENT SHALL BE OF HIGH YIELD STRENGTH DE FORMED BARS (GRADE DESIGNATION Fe415).
- 6) SHARP EDGES OF CONCRETE SHALL BE CHAMFERED.
- 7) FILLING BEHIND ABUTMENTS AND RETURNS SHALL BE AS PER RELEVANT IRC SPECIFICATIONS.



0	For Approval				
Rev.	Description	Date	Drw.	Pre.	Chk.

CLIENT  
**KARNATAKA NEERAVARI NIGAM LIMITED**  
 (A GOVT. OF KARNATAKA UNDERTAKING)  
 BANGALORE - 560 001

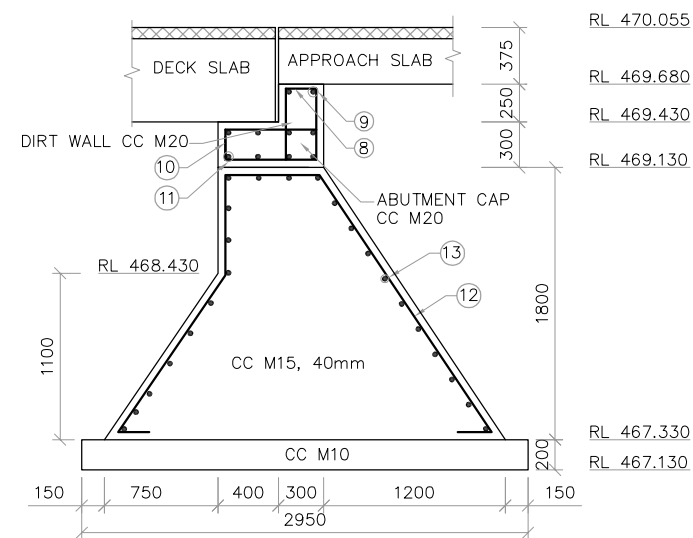
CONSULTANT  
**E I Technologies Pvt. Ltd.**  
 (ISO 9001 : 2008 Certified)  
 # 1149, 26th Main, Jayanagar 4th 'T' Block,  
 Bengaluru-560 041, India.  
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 info@eitech.in / www.eitech.in

PROJECT TITLE  
**MODERNISATION OF VIJAYANAGARA CHANNELS IN TUNGABHADRA PROJECT**

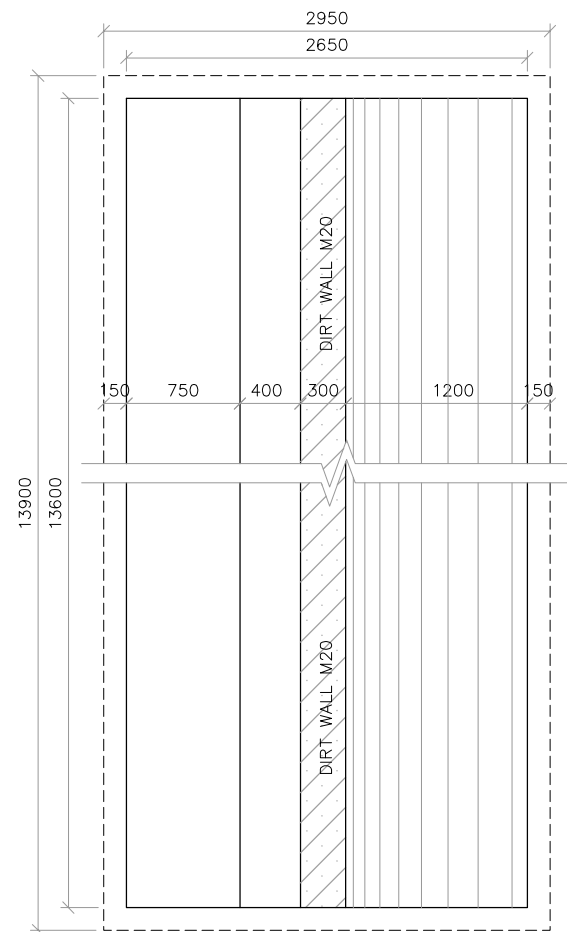
DRAWING TITLE  
**DRAWING FOR THE CONSTRUCTION OF MAJOR ROAD BRIDGE AT CH:8+196km FOR RAYA CHANNEL**

Date	Drw.	Pre.	Chk.	App.	Scale	Drawing Status
					AS SHOWN	FOR APPROVAL
Project No.	Drawing No.	Sheet No.	Rev.			
	KNNL-VNC-RC-STR-MRB-000	01 of 03	0			

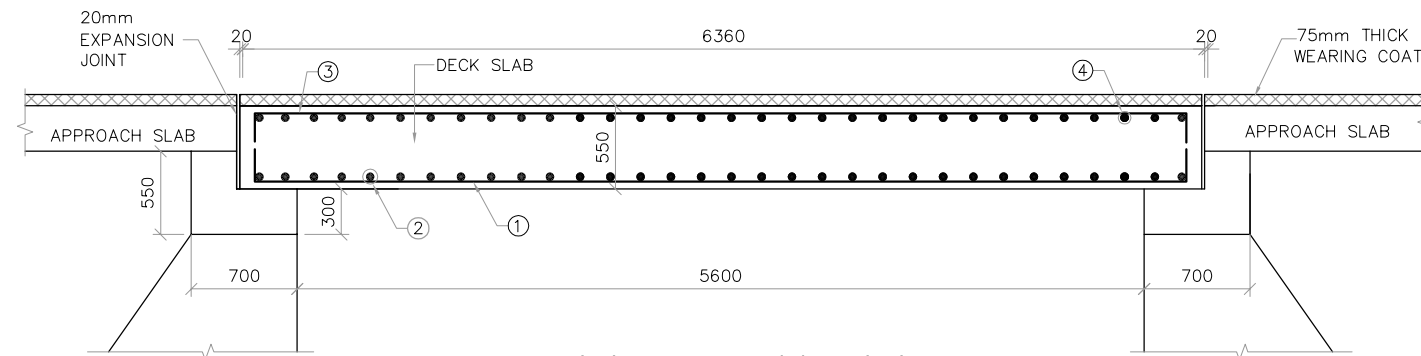
 Consultant E I Technologies Pvt. Ltd. Bangalore	 Asst. Executive Engineer VNC Sub-Division Kamalapur	 Executive Engineer TR Division No.1 Muribad
 Superintending Engineer Tungabhadra Project Circle Muribad	 Chief Engineer Irrigation Central Zone Muribad	



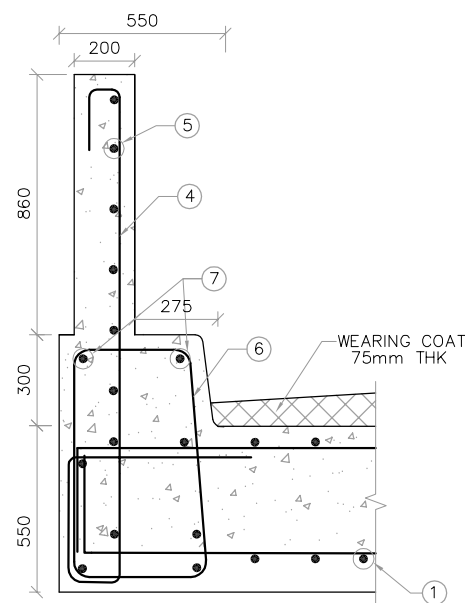
**ABUTMENT DETAILS  
U/S & D/S  
(SCALE 1:50)**



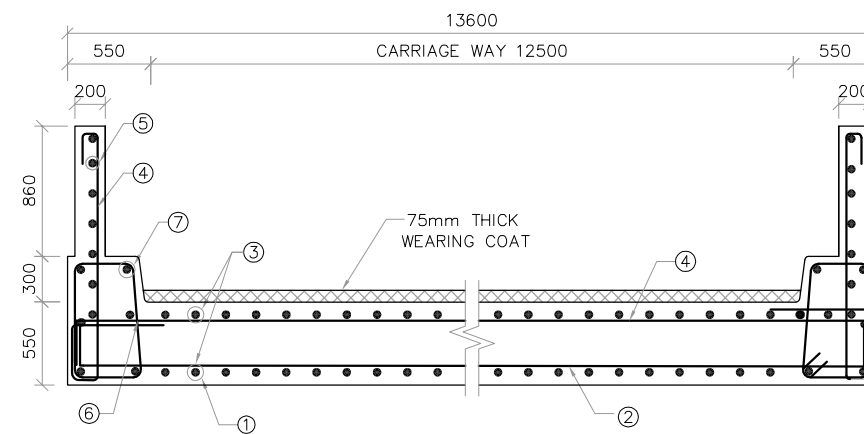
**PLAN OF ABUTMENT  
(SCALE 1:50)**



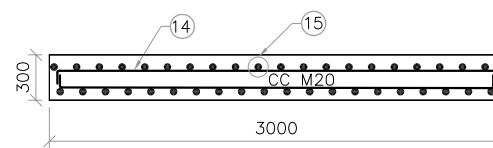
**REINFORCEMENT DETAILS OF DECK SLAB  
(SCALE 1:50)**



**REINFORCEMENT DETAILS OF SIDE WALL  
(SCALE 1:25)**



**REINFORCEMENT DETAILS OF DECK SLAB  
(SCALE 1:50)**



**REINFORCEMENT DETAILS  
OF APPROACH SLAB  
(SCALE 1:50)**

**NOTES**

- 1) ALL DIMENSIONS ARE IN MILLIMETRES AND REDUCED LEVELS ARE IN METRES.
- 2) DO NOT SCALE THE DRAWING. WRITTEN DIMENSIONS ONLY SHALL BE FOLLOWED.

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Rev.	Description	Date	Drw.	Pre.	Chk.	App.

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**CONSULTANT**  
**E I Technologies Pvt. Ltd.,**  
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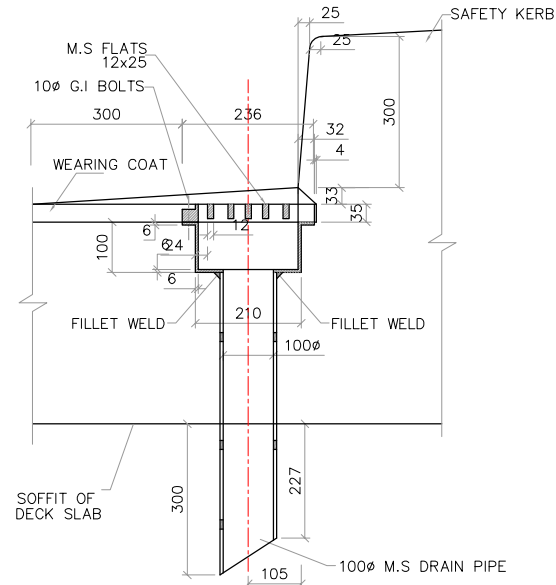
**PROJECT TITLE**  
**MODERNISATION OF VIJAYANAGARA CHANNELS  
 IN TUNGABHADRA PROJECT**

**DRAWING TITLE**  
**DRAWING FOR THE CONSTRUCTION OF MAJOR ROAD  
 BRIDGE AT CH:8+196km FOR RAYA CHANNEL**

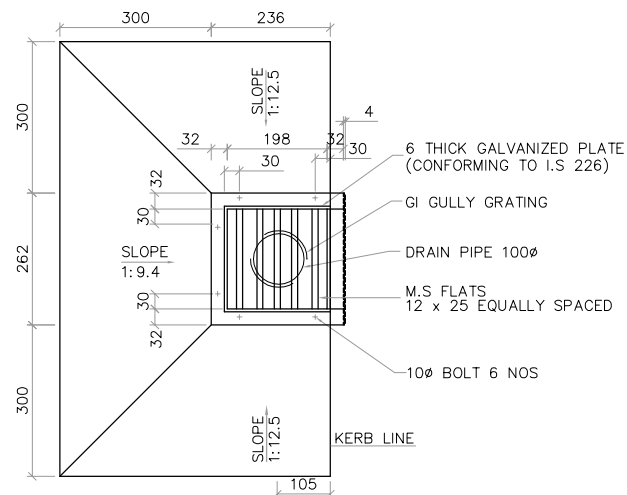
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Project No.	Drawing No.	Sheet No.		Rev.		
.	KNNL-VNC-RC-STR-MRB-000	02 of 03		0		

Consultant E I Technologies Pvt. Ltd. Bangalore	Asst. Executive Engineer VNC Sub-Division Kamalapur	Executive Engineer TR Division No.1 Munirabad
Superintending Engineer Tungabhadra Project Circle Munirabad	Chief Engineer Irrigation Central Zone Munirabad	





**SECTION OF DRAINAGE SPOUT AND COLLECTION PIT**  
(SCALE 1:15)



**PLAN DETAILS OF DRAINAGE SPOUT AND COLLECTION PIT**  
(SCALE 1:15)  
#ONE WATER SPOUT PER 20SQ.M. OF DECK AREA IS CONSIDERED ADEQUATE

**SCHEDULE OF REINFORCEMENT**

MEMBER	BAR MARK	DIA OF BAR (mm)	SPACING OF BAR (mm)	NO.OF BAR	SHAPE OF BARS (DIMENSION ARE IN MM) (NOT TO SCALE)	LENGTH OF EACH BAR (mm)	TOTAL LENGTH IN METRES	UNIT WEIGHT IN Kg/m	TOTAL WEIGHT IN Kg
SLAB	1	20	140	98	200-①-200	6660	652.68	2.47	1609.82
	2	12	150	43	150-②-150	13800	593.40	0.89	526.90
	3	20	140	98	200-③-200	6660	652.68	2.47	1609.82
	4	12	150	43	150-④-150	13800	593.40	0.89	526.90
SIDE WALLS	5	10	200	33x2	100-⑤-1610-400-100	2760	182.16	0.62	112.32
	6	10	200	6x2	150-⑥-6260-150	6560	78.72	0.62	48.54
KERB	7	10	200	33x2	450-⑦-450-200-450	2352	155.21	0.62	95.71
	8	10	200	13x2	150-⑧-6260-150	6560	170.56	0.62	105.17
DIRT WALL	9	10	200	69x2	450-⑨-450-200-450	1500	207.00	0.62	127.64
	10	10	200	2x2	150-⑩-13500-150	13800	55.20	0.62	34.04
ABUTMENT CAP	11	10	200	69x2	600-⑪-600-200-600	1800	248.40	0.62	153.17
	12	10	200	10x2	150-⑫-13500-150	13800	276.00	0.62	170.19
ABUTMENT	13	10	200	69x2	2094-⑬-650-1107-100-100	4651	641.82	0.62	395.75
	14	10	200	25x2	150-⑭-13500-150	13800	690.00	0.62	425.47
APPROACH SLAB	15	12	150	91x4	100-⑮-2900-100	3100	1128.4	0.89	1001.94
	16	10	150	22x4	100-⑯-13500-100	13700	1205.6	0.62	743.39

TOTAL = 7686.75 kg  
5% WASTAGE = 384.34 kg  
TOTAL = 8071.09 kg  
SAY = 8100 kg

**NOTES**

- 1) ALL DIMENSIONS ARE IN MILLIMETRES AND REDUCED LEVELS ARE IN METRES.
- 2) DO NOT SCALE THE DRAWING. WRITTEN DIMENSIONS ONLY SHALL BE FOLLOWED.

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Rev.	Description	Date	Drw.	Pre.	Chk.	App.

**CLIENT**  
KARNATAKA NEERAVARI NIGAM LIMITED  
(A GOVT. OF KARNATAKA UNDERTAKING)  
BANGALORE - 560 001

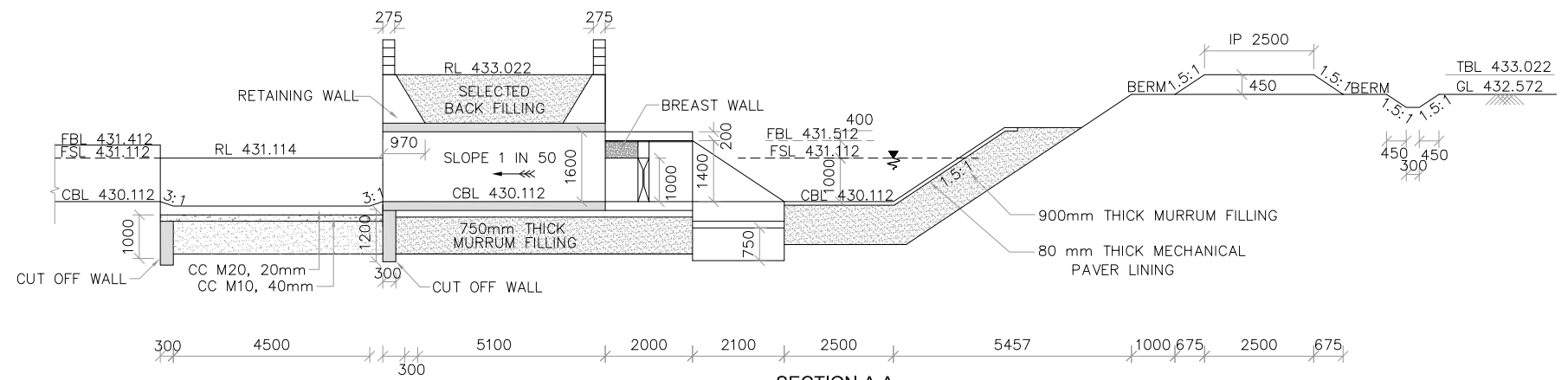
**CONSULTANT**  
**E I Technologies Pvt. Ltd.,**  
(ISO 9001 : 2008 Certified)  
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**PROJECT TITLE**  
**MODERNIZATION OF VIJAYANAGARA CHANNELS IN TUNGABHADRA PROJECT**

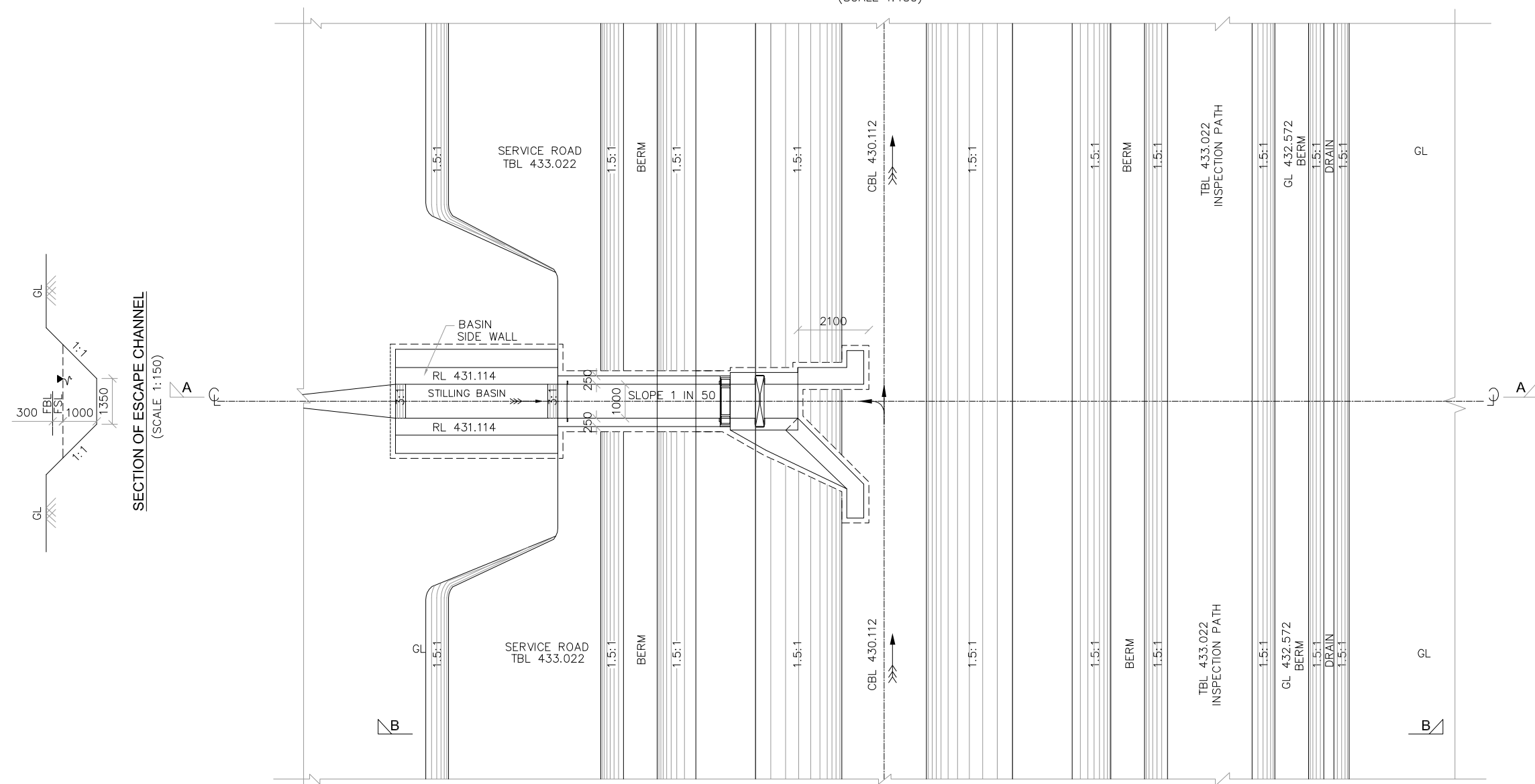
**DRAWING TITLE**  
**DRAWING FOR THE CONSTRUCTION OF MAJOR ROAD BRIDGE AT CH:8+196km FOR RAYA CHANNEL**

Date	Drw.	Pre.	Chk.	App.	Scale.	Drawing Status.
.	.	.	.	.	AS SHOWN	FOR APPROVAL
Project No.	Drawing No.	Sheet No.		Rev.		
.	KNNL-VNC-RC-STR-MRB-000	03 of 03		0		

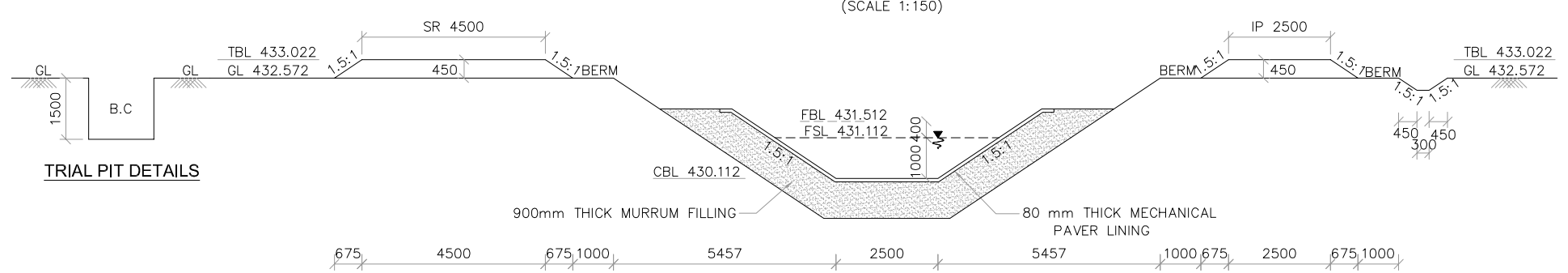
Consultant E I Technologies Pvt. Ltd. Bangalore	Asst. Executive Engineer VNC Sub-Division Kamalahalli	Executive Engineer TR Division No.1 Munirabad
Superintending Engineer Tungabhadra Project Circle Munirabad	Chief Engineer Irrigation Central Zone Munirabad	



SECTION-A-A  
(SCALE 1:150)

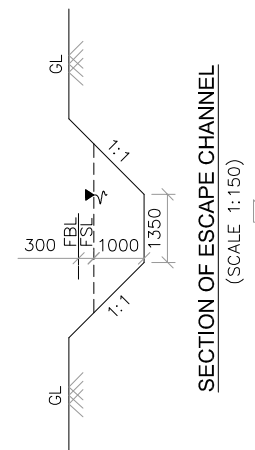


PLAN  
(SCALE 1:150)



CANAL SECTION AT B-B  
(SCALE 1:150)

TRIAL PIT DETAILS



SECTION OF ESCAPE CHANNEL  
(SCALE 1:150)

- NOTES**
- 1) ALL DIMENSIONS ARE IN MILLIMETRES AND REDUCED LEVELS ARE IN METRES.
  - 2) DO NOT SCALE THE DRAWING. WRITTEN DIMENSIONS ONLY SHALL BE FOLLOWED.
  - 3) GRADE OF CONCRETE :  
(I). CC M10 WITH 40mm DOWNSIZE METAL - FOUNDATION BED CONCRETE.  
(II). CC M15 WITH 40mm DOWN SIZE METAL - GUIDE WALLS, U/S & D/S HEAD WALLS, SHEAR KEY WALL, BASIN SIDE WALLS, TRANSITION WALLS, RETURN WALLS & CRADLE CONCRETE BELOW PIPE.  
(III). CC M15 WITH 20mm DOWN SIZE METAL - U/S BASIN, STILLING BASIN, SLAB, STEPS, AND CANAL LINING.
  - 4) 80mm THICK CC LINING IS PROVIDED FOR MAIN CANAL, 75mm THICK CC LINING IS PROVIDED FOR DISTRIBUTARY CANAL.
  - 5) SKIN REINFORCEMENT OF 10# AT 200mm C/C BOTH WAYS IS PROVIDED.
  - 6) MINIMUM CLEAR COVER TO THE REINFORCEMENT SHALL BE 50mm UNLESS OTHERWISE MENTIONED.
  - 7) NP3 CLASS HUMER PIPES ARE PROPOSED.
  - 8) CATCH WATER DRAIN SHOULD BE SUITABLY DIVERTED TO NATURAL STREAM OR NALAS.
  - 9) DRY STONE PITCHING IS PROVIDED WHEREVER NECESSARY.

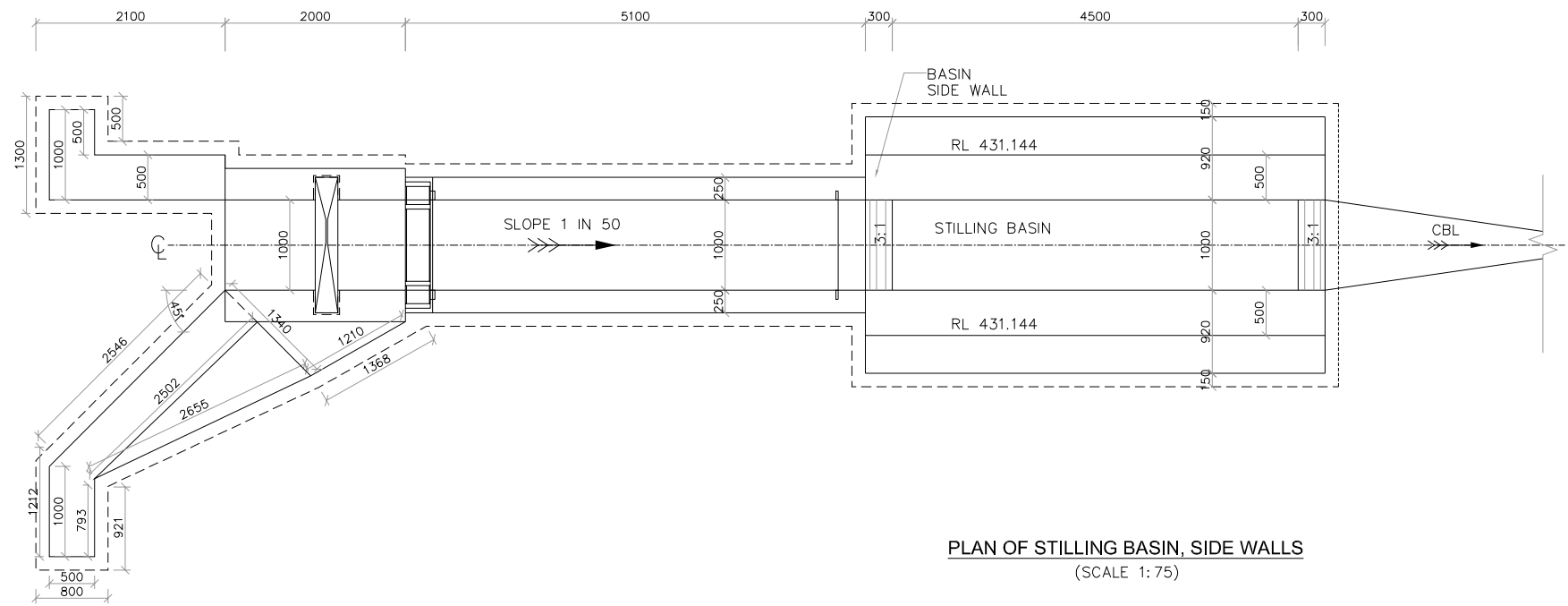
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Rev.	Description	Date	Drw.	Pre.	Chk.	App.
CLIENT <b>KARNATAKA NEERAVARI NIGAM LIMITED</b> (A GOVT. OF KARNATAKA UNDERTAKING) BANGALORE - 560 001						
CONSULTANT <b>E I Technologies Pvt. Ltd.,</b> (ISO 9001 : 2008 Certified) # 1149, 26th Main, Jayanagar 4th 'T' Block, Bengaluru-560 041, India. Ph.+91.80.40914714, Fax: +91.80.26650912 info@eitech.in www.eitech.in						

PROJECT TITLE  
**MODERNISATION OF VIJAYANAGARA CHANNELS IN TUNGABHADRA PROJECT**

DRAWING TITLE  
**Construction of Scouring sluice at CH: 1+221 km of Ramsagar Channel**

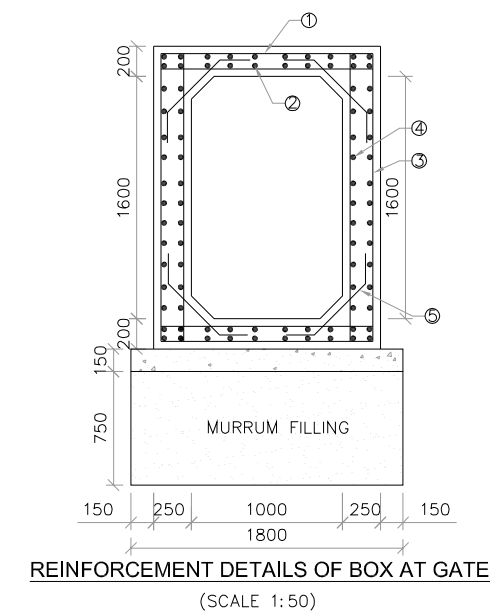
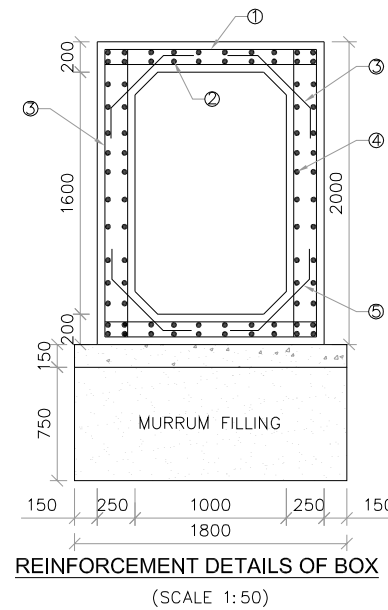
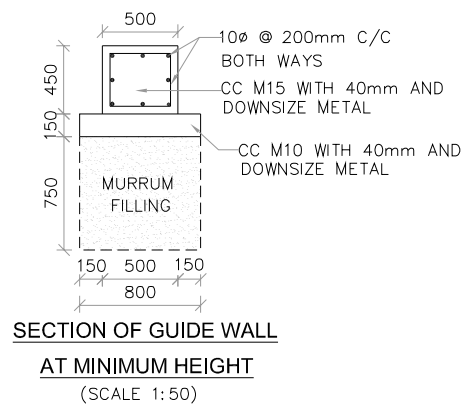
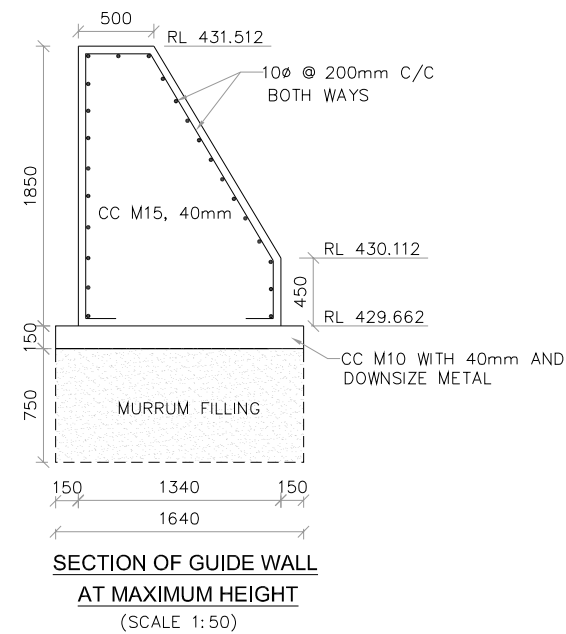
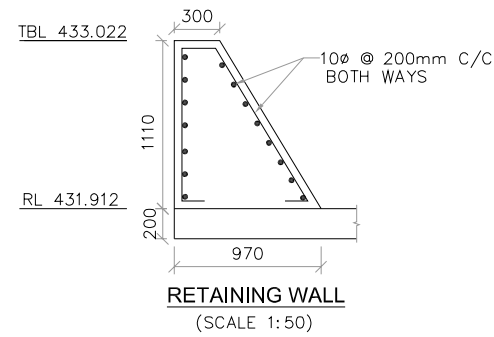
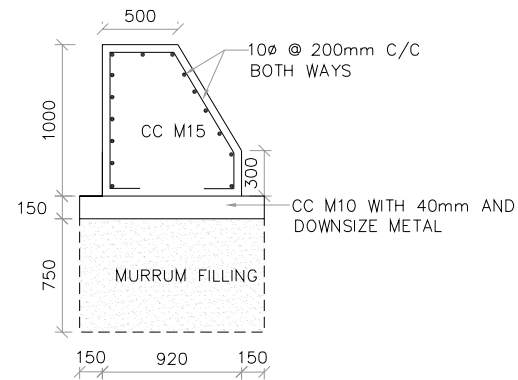
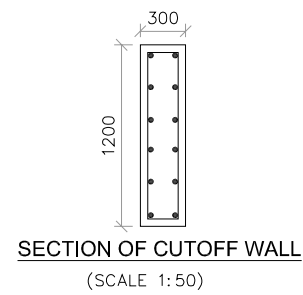
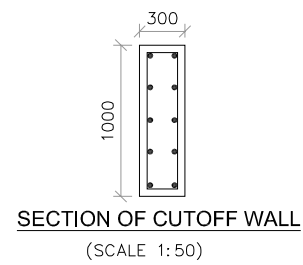
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.	.	.	.	.	AS SHOWN	FOR APPROVAL
Project No.	Drawing No.	Sheet No.		Rev.		
.	KNNL-VNC-TC-STR-SS-005	01 of 03		0		

Consultant E I Technologies Pvt. Ltd. Bangalore	Asst. Executive Engineer VNC Sub-Division Kamalapur	Executive Engineer TR Division No.1 Munirabad
Superintending Engineer Tungabhadra Project Circle Munirabad	Chief Engineer Irrigation Central Zone Munirabad	



PLAN OF STILLING BASIN, SIDE WALLS  
(SCALE 1: 75)

PLAN OF GUIDE WALL, BOX  
(SCALE 1: 75)



**NOTES**

- 1) ALL DIMENSIONS ARE IN MILLIMETRES AND REDUCED LEVELS ARE IN METRES.
- 2) DO NOT SCALE THE DRAWING. WRITTEN DIMENSIONS ONLY SHALL BE FOLLOWED.

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Rev.	Description	Date	Drw.	Pre.	Chk.	App.

CLIENT  
**KARNATAKA NEERAVARI NIGAM LIMITED**  
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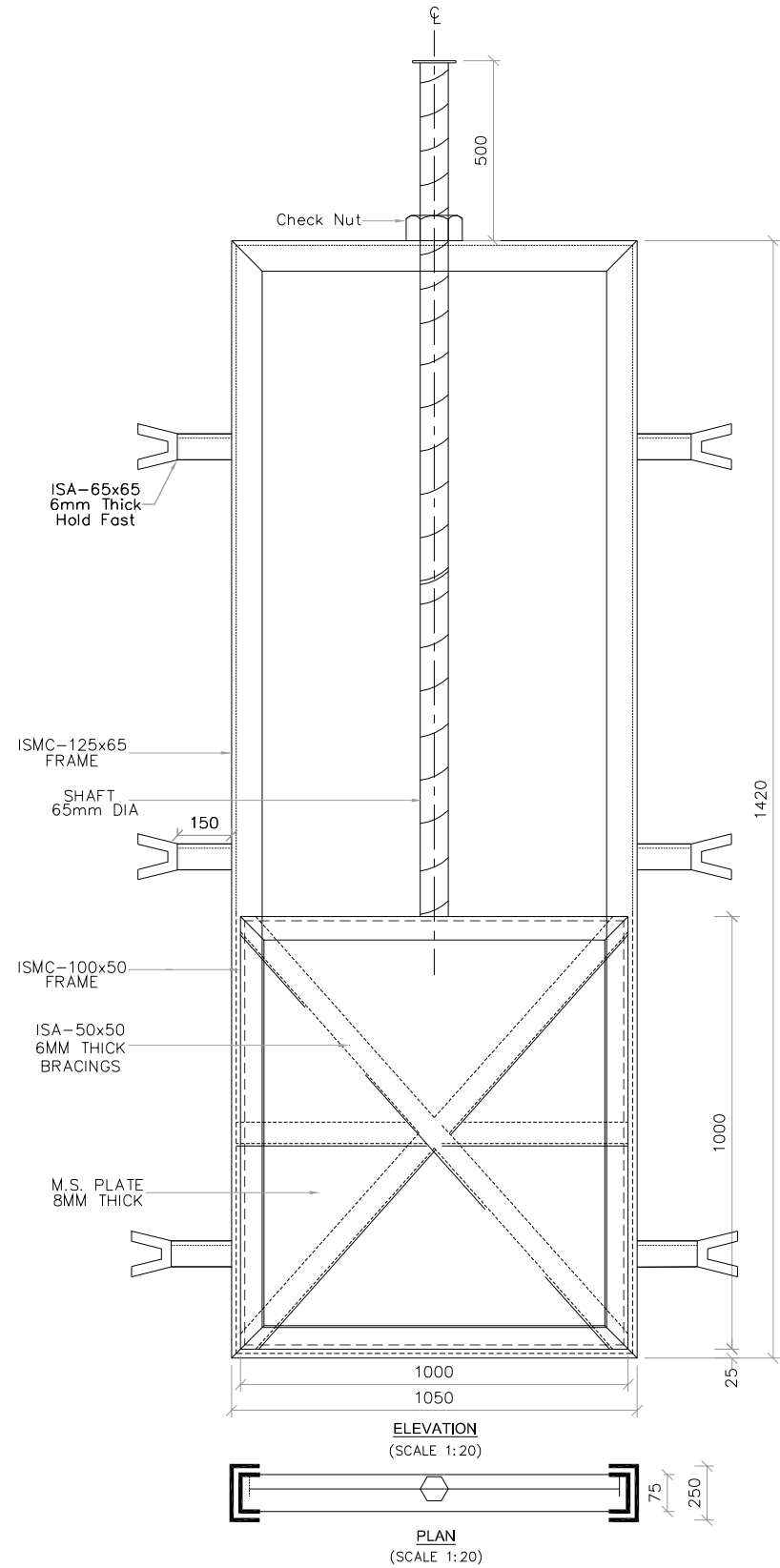
CONSULTANT  
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PROJECT TITLE  
**MODERNISATION OF VIJAYANAGARA CHANNELS  
IN TUNGABHADRA PROJECT**

DRAWING TITLE  
**Construction of Scouring sluice at CH: 1+221 km of  
Ramsagar Channel**

Date	Drw.	Pre.	Chk.	App.	Scale	Drawing Status
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Project No.	Drawing No.	Sheet No.		Rev.		
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 Consultant E I Technologies Pvt. Ltd. Bangalore	 Asst. Executive Engineer VNC Sub-Division Kamalapur	 Executive Engineer TR Division No.1 Muribad
 Superintending Engineer Tungabhadra Project Circle Muribad	 Chief Engineer Irrigation Central Zone Muribad	



SL. NO.	ITEMS	UNIT	DIMENSION	WT./M (kg/sqm)	TOTAL WT. (kg)
1	ISMC-125 X 65 FRAME	RMT	4.95	12.70	62.86
2	ISMC-100 X 50 FRAME	RMT	4.00	9.20	36.80
3	ISA-5050; 6MM THICK. FOR BRACINGS.	RMT	3.83	4.50	17.24
4	ISA-6565; 6MM THICK. FOR HOLD-FASTS	RMT	1.80	5.80	10.44
5	M.S. PLATE 8MM THICK	SQM	1.00	62.80	62.80
6	SHAFT 65MM Ø M.S.	RMT	0.9	26.05	23.44
7	CHECK NUT M.S.	NO.	1.00	4.00	4.00
8	WHEEL M.S.	NO.	1.00	30.00	30.00

TOTAL Wt. = 247.580 Kgs  
 SAY = 248.000 Kgs  
 = 0.248 MT

### SCHEDULE OF REINFORCEMENT FOR BOX

MEMBER	BAR MARK	DIA OF BAR (mm)	SPACING OF BAR (mm)	NO. OF BAR	SHAPE OF BARS (DIMENSION ARE IN MM) (NOT TO SCALE)	LENGTH OF EACH BAR (mm)	TOTAL LENGTH IN METRES	UNIT WEIGHT IN Kg/m	TOTAL WEIGHT IN Kg
BOX	1	12	150	35X4		1600	224.00	0.888	197.120
	2	10	200	8X4		5100	163.20	0.620	101.18
SIDE WALLS	3	12	150	35X4		2200	80.00	0.888	271.04
	4	10	200	11X4		5000	220.00	0.620	136.40
HAUNCH	5	10	150	35X4		1790	250.60	0.620	155.372
TOTAL=861.112 Kg 5% WASTAGE=43.06 Kg GRAND TOTAL=904.172 Kg SAY=905 Kg									

### SCHEDULE OF REINFORCEMENT FOR BOX AT GATE

MEMBER	BAR MARK	DIA OF BAR (mm)	SPACING OF BAR (mm)	NO. OF BAR	SHAPE OF BARS (DIMENSION ARE IN MM) (NOT TO SCALE)	LENGTH OF EACH BAR (mm)	TOTAL LENGTH IN METRES	UNIT WEIGHT IN Kg/m	TOTAL WEIGHT IN Kg
BOX	1	12	150	14X4		1600	89.60	0.888	79.56
	2	10	200	8X4		2000	64.00	0.620	39.68
SIDE WALLS	3	12	150	14X4		2200	123.20	0.888	109.40
	4	10	200	11X4		1900	83.60	0.620	51.83
HAUNCH	5	10	150	14X4		1790	100.24	0.620	62.15
TOTAL=342.62 Kg 5% WASTAGE=17.13 Kg GRAND TOTAL=359.751 Kg SAY=360 Kg									

### NOTES

- 1) ALL DIMENSIONS ARE IN MM AND REDUCED LEVELS ARE IN METRES.
- 2) DRAWING SHALL NOT BE SCALED OR MEASURED.

0	For Approval					
Rev.	Description.	Date.	Drw.	Pre.	Chk.	App.

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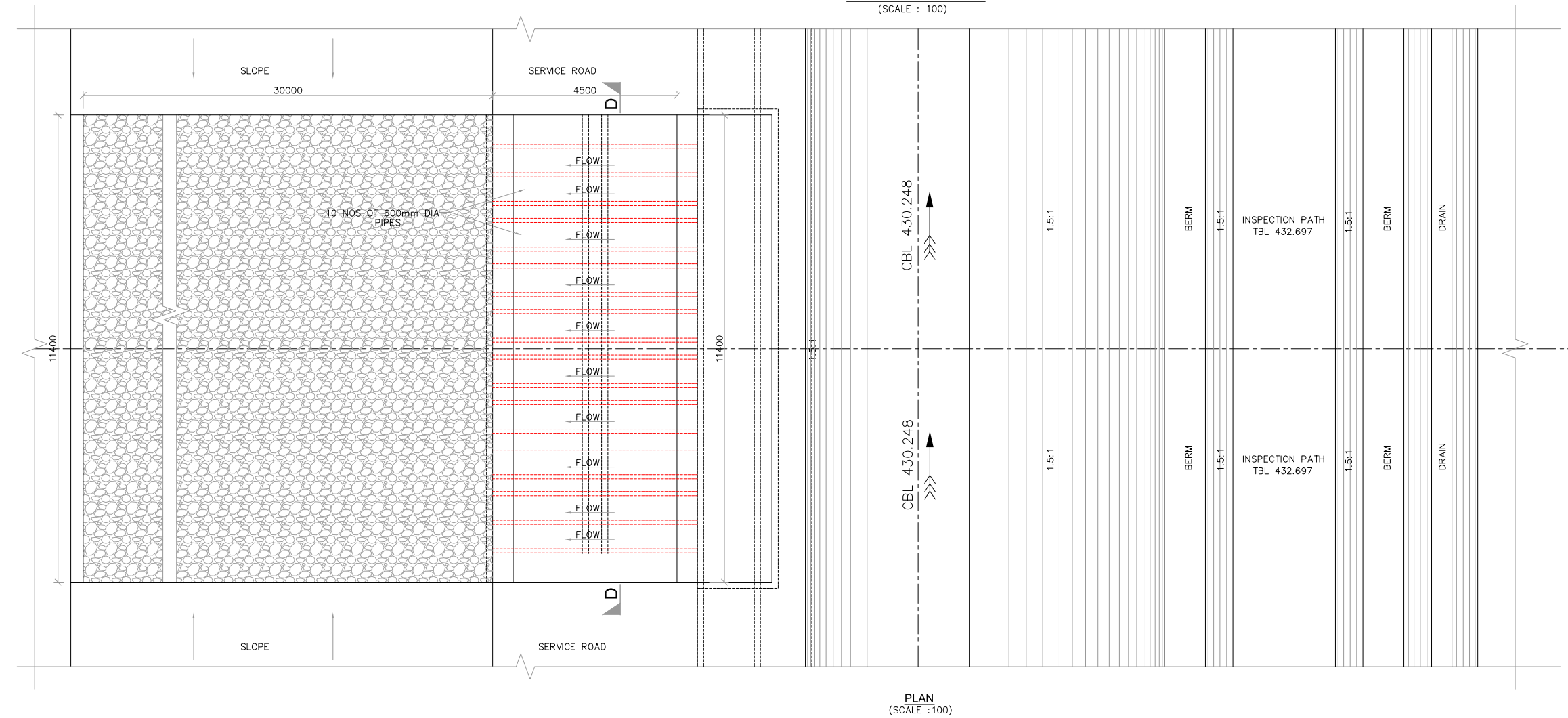
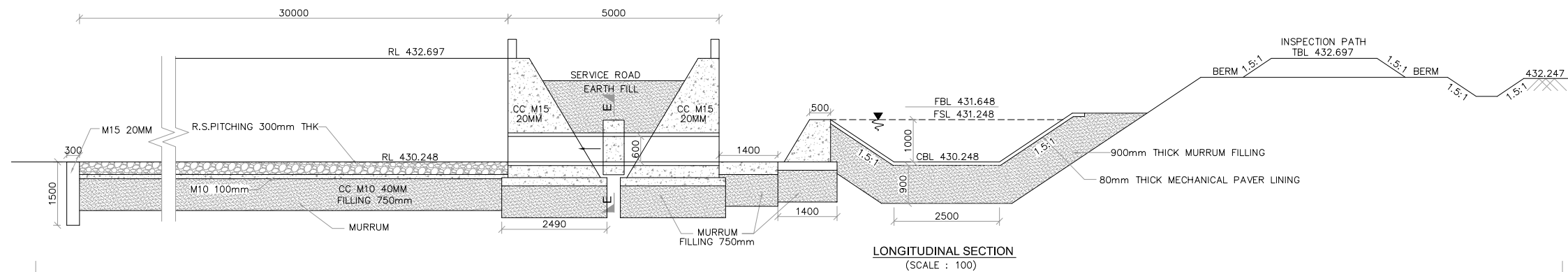
PROJECT TITLE  
**MODERNISATION OF VIJAYANAGARA CHANNELS  
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DRAWING TITLE  
**Construction of Scouring sluice at CH: 1+221 km of  
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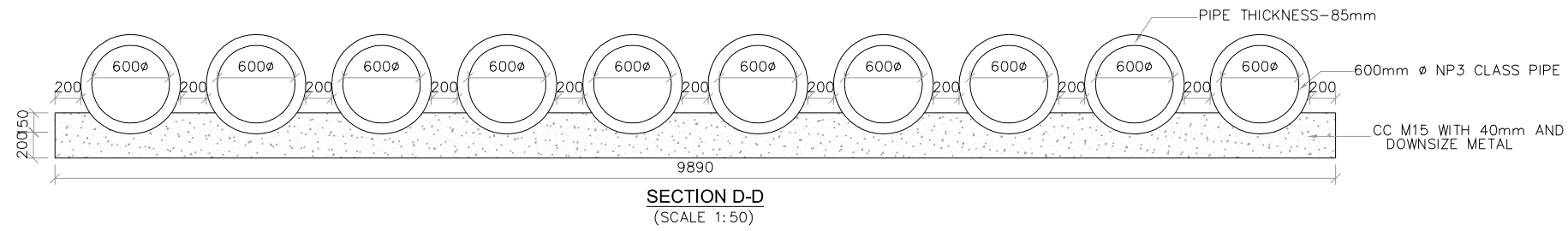




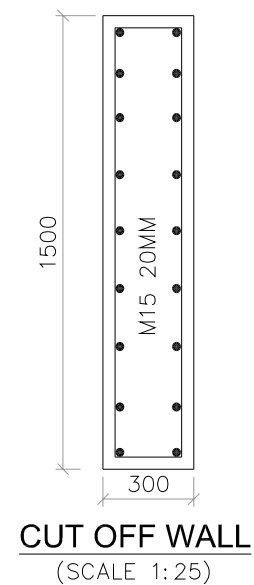
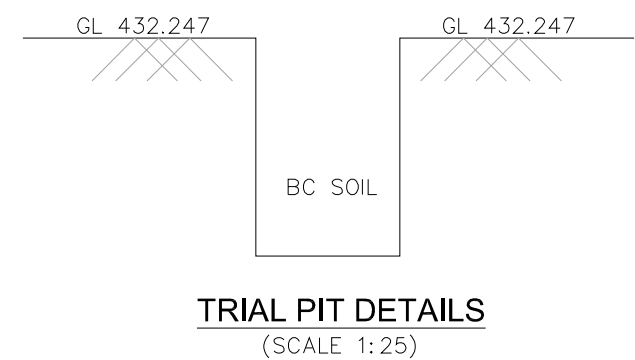
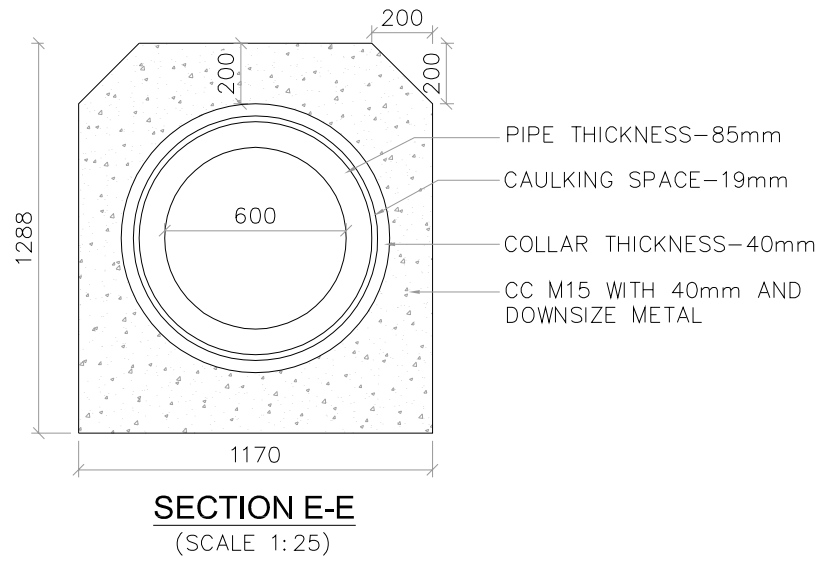
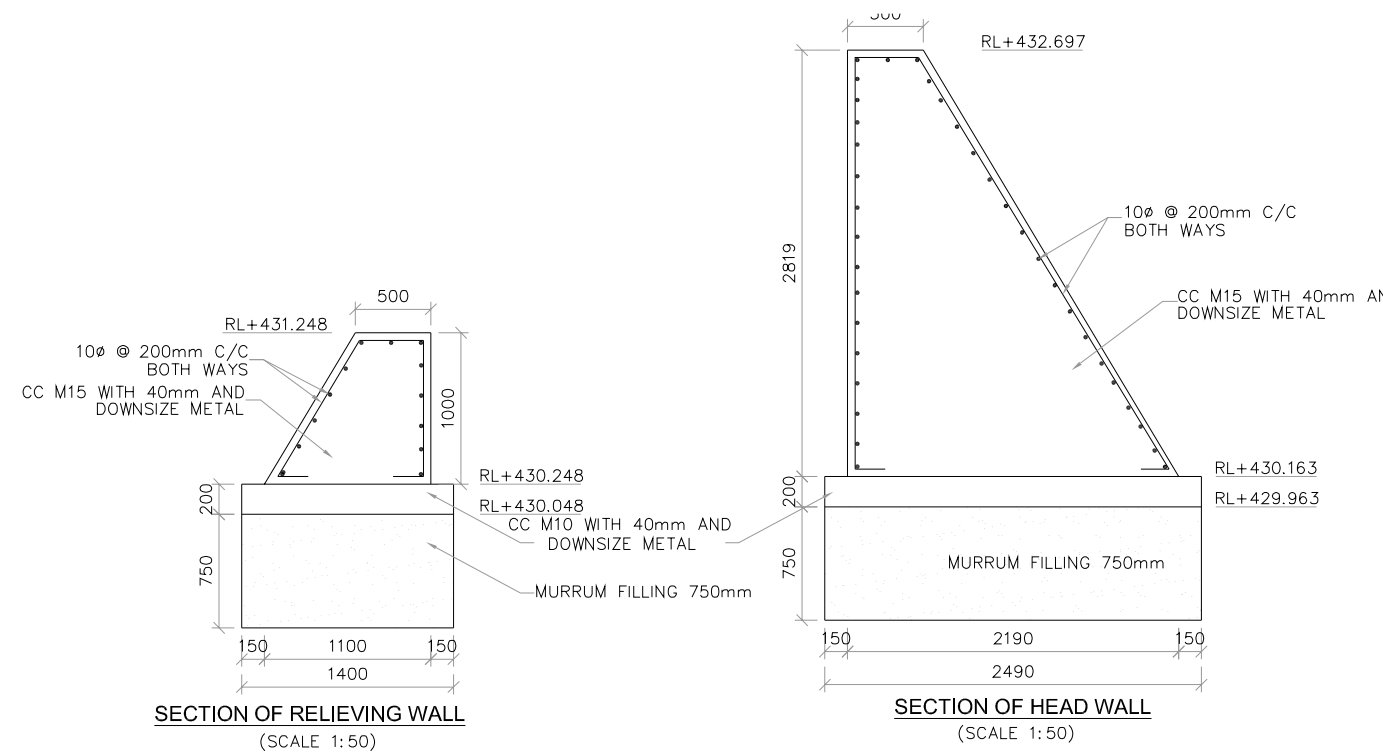
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- 2) DO NOT SCALE THE DRAWING. WRITTEN DIMENSIONS ONLY SHALL BE FOLLOWED.
- 3) GRADE OF CONCRETE :
  - (I). CC M10 WITH 40mm DOWNSIZE METAL – FOUNDATION BED CONCRETE.
  - (II). CC M15 WITH 40mm DOWN SIZE METAL – HEAD WALLS SILT TRAP
  - (III). CC M15 WITH 20mm DOWN SIZE METAL – BELOW SILT TRAP, CUT OFF WALLS, CANAL PORTION.
  - (IV). CC M20 WITH 20mm DOWN SIZE METAL FOR DECK SLAB AND KERB – TROUGH
- 4) SKIN REINFORCEMENT OF 10 $\phi$  AT 200mm C/C BOTH WAYS IS PROVIDED.
- 5) MINIMUM CLEAR COVER TO THE REINFORCEMENT SHALL BE 50mm UNLESS OTHERWISE MENTIONED.
- 6) DRY STONE PITCHING IS PROVIDED WHEREVER NECESSARY.
- 7) CNS LINING IS PROVIDED WHEREVER CONCRETE TOUCHES THE GROUND

0	For Approval					
Rev.	Description.	Date.	Drw.	Pre.	Chk.	App.
CLIENT <b>KARNATAKA NEERAVARI NIGAM LIMITED</b> (A GOVT. OF KARNATAKA UNDERTAKING) BANGALORE - 560 001						
CONSULTANT <b>E I Technologies Pvt. Ltd.,</b> (ISO 9001 : 2008 Certified) # 1149, 26th Main, Jayanagar 4th 'T' Block, Bengaluru-560 041, India. Ph. +91.80.40914714, Fax: +91.80.26650912 info@eitech.in, www.eitech.in						
PROJECT TITLE <b>MODERNISATION OF VIJAYANAGARA CHANNELS          IN TUNGABHADRA PROJECT</b>						
DRAWING TITLE <b>Construction of Relieving Weir at CH: 0+880km of          Ramsagar canal</b>						
Date	Drw.	Pre.	Chk.	App.	Scale.	Drawing Status.
.	.	.	.	.	AS SHOWN	FOR APPROVAL
Project No.	Drawing No.	Sheet No.	Rev.			
.	KNNL-VNC-TC-STR-RW-008	01 of 02	0			
Consultant E I Technologies Pvt. Ltd. Bangalore		Asst. Executive Engineer VNC Sub-Division Kamalapur		Executive Engineer TR Division No.1 Muribad		
Superintending Engineer Tungabhadra Project Circle Muribad			Chief Engineer Irrigation Central Zone Muribad			



- NOTES**
- 1) ALL DIMENSIONS ARE IN MILLIMETRES AND REDUCED LEVELS ARE IN METRES.
  - 2) DO NOT SCALE THE DRAWING. WRITTEN DIMENSIONS ONLY SHALL BE FOLLOWED.



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PROJECT TITLE <b>MODERNISATION OF VIJAYANAGARA CHANNELS IN TUNGABHADRA PROJECT</b>						
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Date	Drw.	Pre.	Chk.	App.	Scale	Drawing Status
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Project No.	Drawing No.	Sheet No.		Rev.		
	KNNL-VNC-TC-STR-RW-008	02 of 02		0		
 Consultant E I Technologies Pvt. Ltd. Bangalore		 Asst. Executive Engineer VNC Sub-Division Kamalapur		 Executive Engineer TR Division No.1 Munirabad		
 Superintending Engineer Tungabhadra Project Circle Munirabad			 Chief Engineer Irrigation Central Zone Munirabad			