

Draft Environmental Impact Assessment

Project Number: 43253-026
June 2018

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

Annex 3 (Part 3)

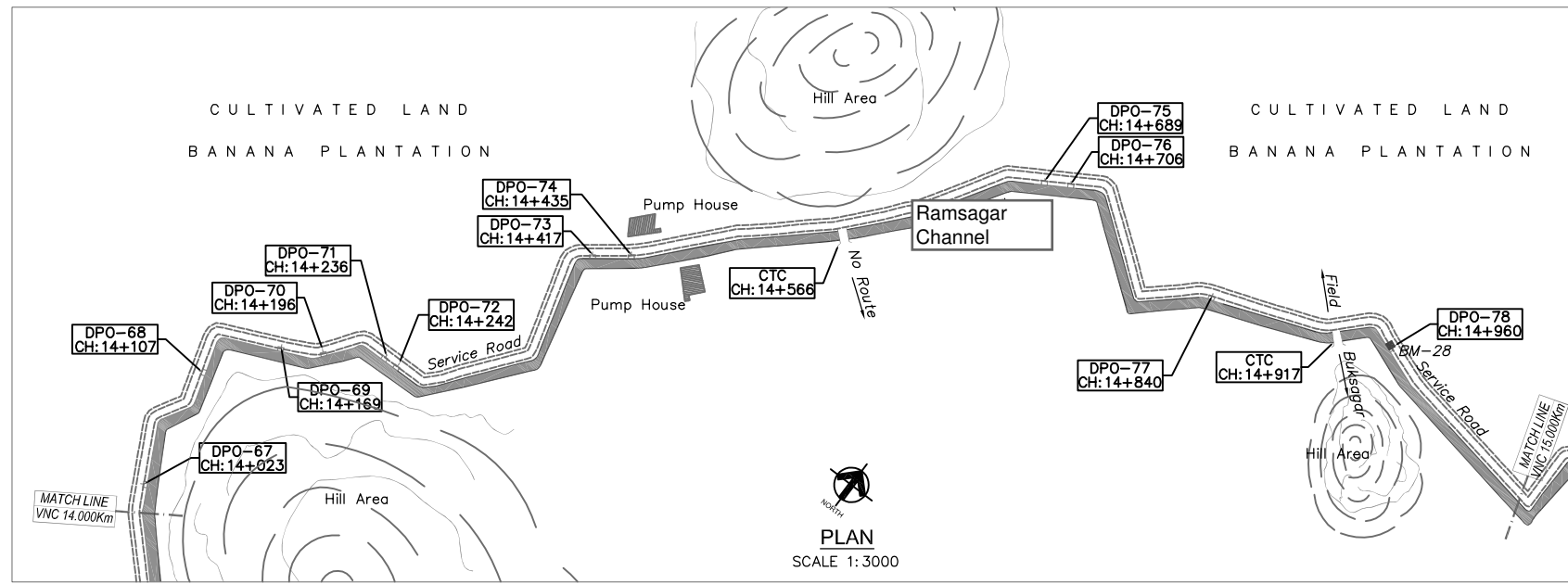
Prepared by the Karnataka Neeravari Nigam Limited for the State Government of Karnataka and the Asian Development Bank.

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Annexure 3

**STRUCTURES UNDERGOING
REHABILITATION AND
TYPICAL DRAWINGS**



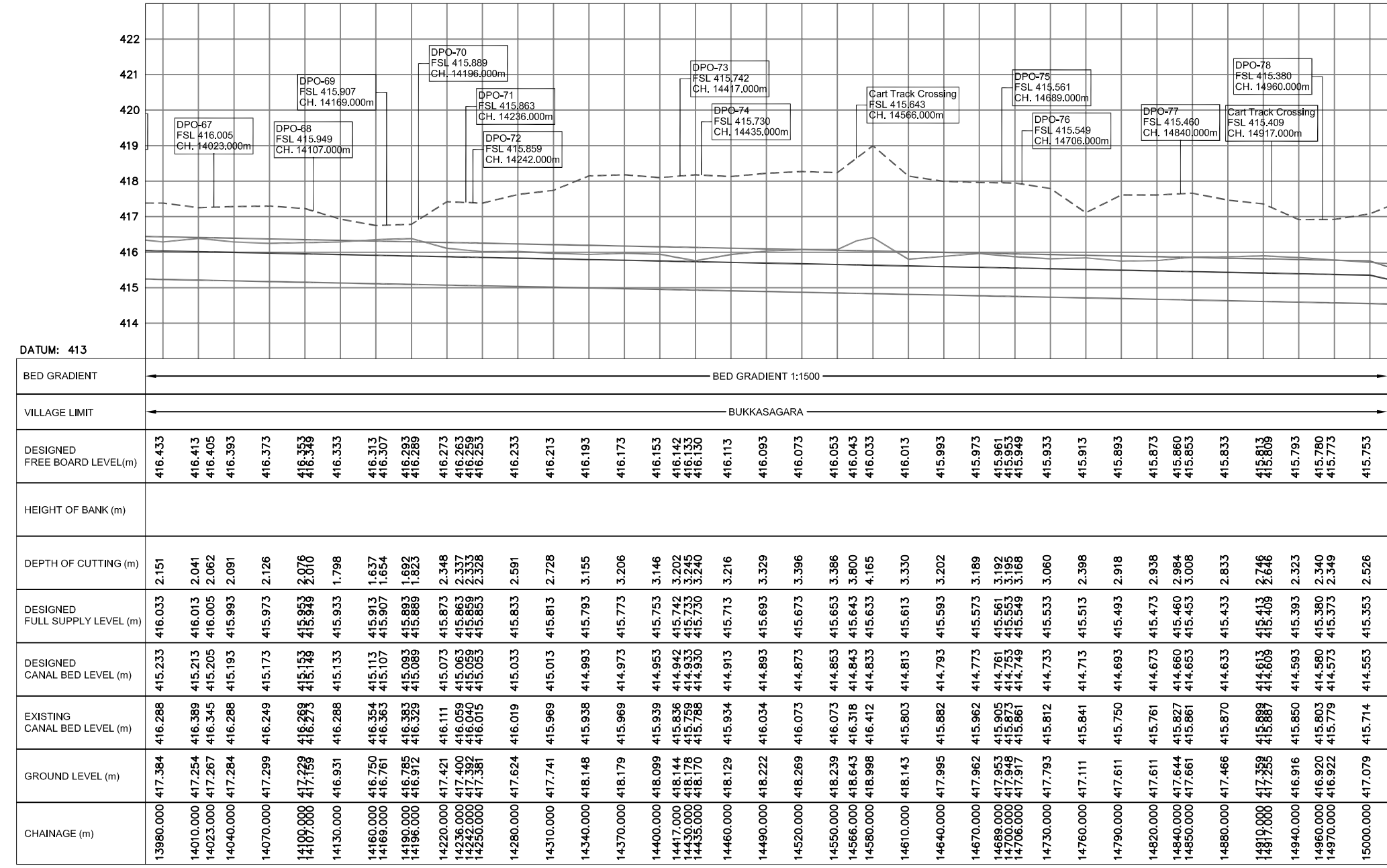
PLAN
SCALE 1:3000

NOTES:

- ALL LEVELS AND CHAINAGES ARE IN METERS UNLESS OTHERWISE SPECIFIED.
- DO NOT SCALE THE DRAWING

LEGENDS	SYMBOL
Compound wall. Wire fence. Cultivation limit.	— — — — —
Pylon Electric Pole. Transformer. Telegraph/Telephone line. Power Line.	— — — — —
Roads, Road centreline, Canal, Streams	— — — — —
Railway with KM Stone. Broad gauge; Other gauges.	— — — — —
Building: Permanent; Temporary; Under construction. Village	— — — — —
Bridges with piers. Culvert. KM pillar. Sub-KM pillar.	— — — — —
Lamp post.	— — — — —
Well: Lined; Unlined; Tube; Bore. Pump House. Temple. Mosque. Idgah.	— — — — —
Embankment. Cutting. Quarry. Hedge.	— — — — —
Field bund. Grass. Bamboo.	— — — — —
Kilometer Stone. Graveyard. Sign Board. Gate	— — — — —
Ground Level	— — — — —
Existing Canal bed level	— — — — —
Proposed Canal bed level	— — — — —
Proposed Full supply level	— — — — —
Proposed Free board level	— — — — —

HYDRAULIC PARTICULARS	
No.	REACH in 'm'
1	REQUIRED DISCHARGE(CUMECs)
2	DESIGNED DISCHARGE(CUMECs)
3	BED WIDTH(m)
4	FULL SUPPLY DEPTH(m)
5	SIDE SLOPE(H:V)
6	TOTAL FREE BOARD(m)
7	LINED FREE BOARD(m)
8	BED GRADIENT
9	VELOCITY(m/s)
10	RUGOSITY COEFFICIENT (n)



LONGITUDINAL SECTION
SCALE HOR 1:3000
VER 1:100

LIST OF STRUCTURES							
No.	Type of Structure	Chainage	C.B.L		F.S.L		Head Loss
			U/S 'm'	D/S 'm'	U/S 'm'	D/S 'm'	
103	Direct Pipe Outlet-67	14023	415.205	415.205	416.005	416.005	0.0
104	Direct Pipe Outlet-68	14107	415.149	415.149	415.949	415.949	0.0
105	Direct Pipe Outlet-69	14169	415.107	415.107	415.907	415.907	0.0
106	Direct Pipe Outlet-70	14196	415.089	415.089	415.889	415.889	0.0
107	Direct Pipe Outlet-71	14236	415.063	415.063	415.863	415.863	0.0
108	Direct Pipe Outlet-72	14242	415.059	415.059	415.859	415.859	0.0
109	Direct Pipe Outlet-73	14417	414.942	414.942	415.742	415.742	0.0
110	Direct Pipe Outlet-74	14435	414.930	414.930	415.730	415.730	0.0
111	Cart Track Crossing	14566	414.843	414.843	415.643	415.643	0.0
112	Direct Pipe Outlet-75	14689	414.761	414.761	415.561	415.561	0.0
113	Direct Pipe Outlet-76	14706	414.749	414.749	415.549	415.549	0.0
114	Direct Pipe Outlet-77	14840	414.660	414.660	415.460	415.460	0.0
115	Cart Track Crossing	14917	414.609	414.609	415.409	415.409	0.0
116	Direct Pipe Outlet-78	14960	414.580	414.580	415.380	415.380	0.0

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

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

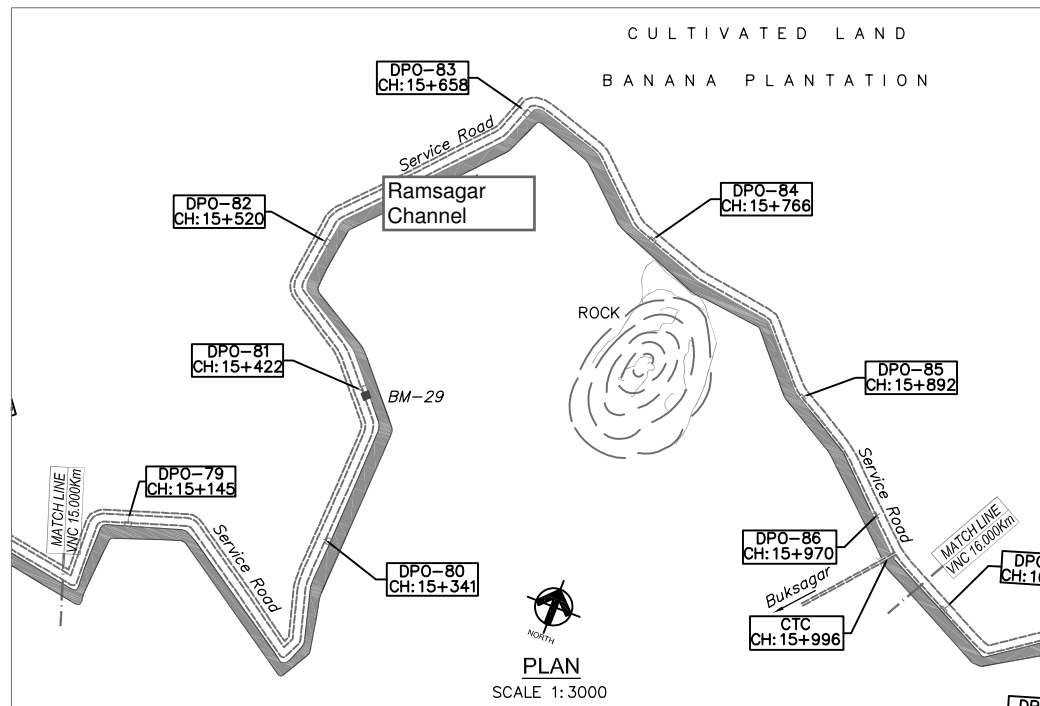
DRAWING TITLE
**PLAN AND LONGITUDINAL SECTION OF
TURTHA CHANNEL
(14+000 Km to 15+000 Km)**

Date	Drw.	Pre.	Chk.	App.	Scale.	Drawing Status.
					AS SHOWN	FOR APPROVAL
Project No.	Drawing No.			Sheet No.	Rev.	
	KNNL-VNC-TC-P&L-002			15 of 19	0	

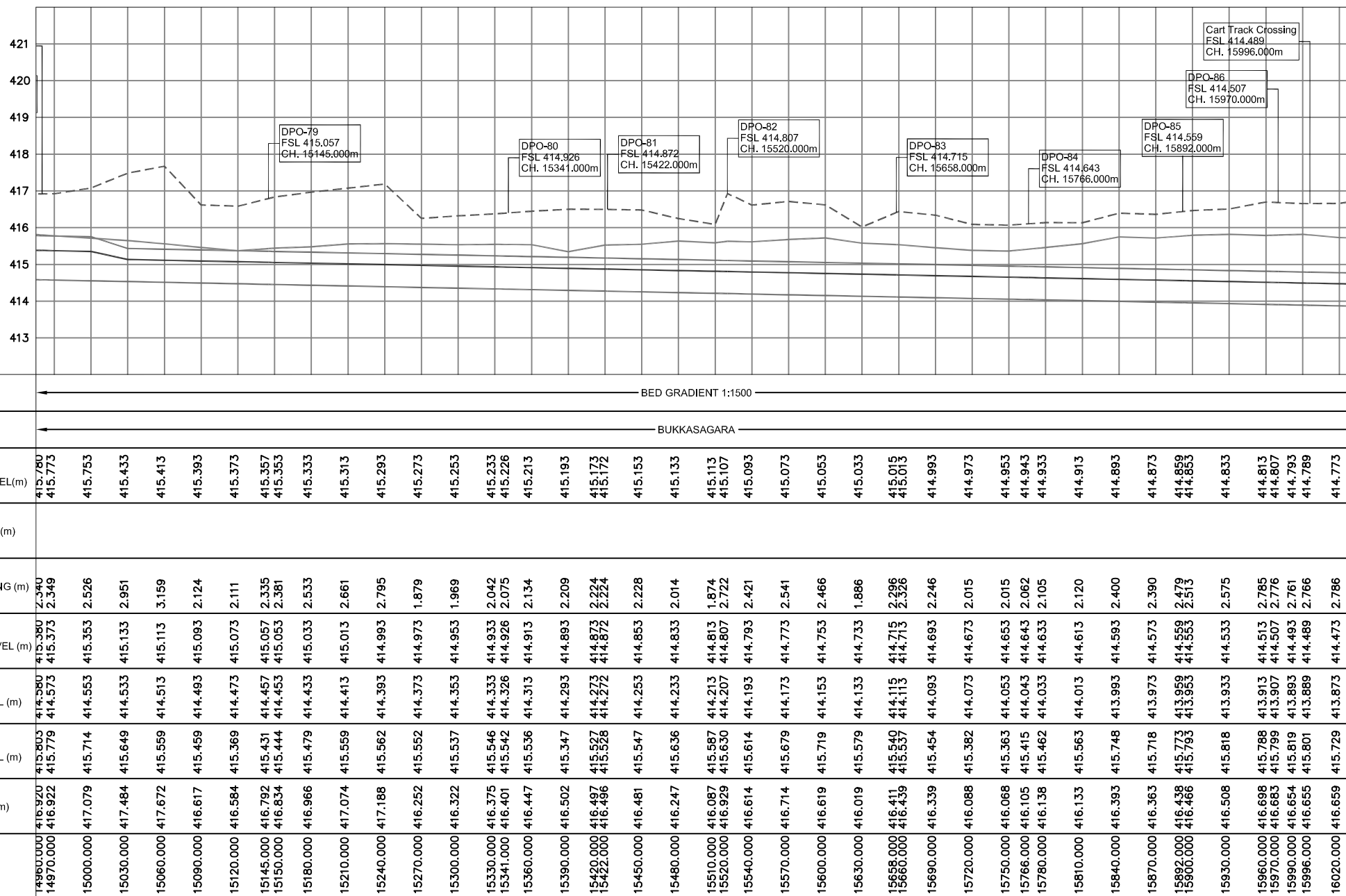
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Checked: [Signature]

Approved: [Signature]



PLAN
SCALE 1:3000



DATUM: 412

CHAINAGE (m)	GROUND LEVEL (m)	EXISTING CANAL BED LEVEL (m)	DESIGNED CANAL BED LEVEL (m)	DESIGNED FULL SUPPLY LEVEL (m)	DEPTH OF CUTTING (m)	HEIGHT OF BANK (m)	DESIGNED FREE BOARD LEVEL (m)
14970.000	416.922	415.779	414.573	415.373	2.349	415.753	415.773
15000.000	417.079	415.714	414.553	415.353	2.526	415.433	415.433
15030.000	417.484	415.649	414.533	415.133	2.951	415.413	415.393
15060.000	417.672	415.559	414.513	415.113	3.159	415.373	415.353
15090.000	416.617	415.459	414.493	415.093	2.124	415.357	415.333
15120.000	416.584	415.369	414.473	415.073	2.111	415.313	415.293
15145.000	416.792	415.431	414.457	415.057	2.335	415.273	415.253
15150.000	416.834	415.444	414.453	415.053	2.381	415.233	415.213
15180.000	416.966	415.479	414.433	415.033	2.533	415.193	415.172
15210.000	417.074	415.559	414.413	415.013	2.661	415.153	415.133
15240.000	417.188	415.562	414.393	414.993	2.795	415.113	415.093
15270.000	416.252	415.552	414.373	414.973	1.879	415.073	415.053
15300.000	416.322	415.537	414.353	414.953	1.969	415.033	415.013
15330.000	416.375	415.546	414.333	414.933	2.042	414.993	414.973
15341.000	416.401	415.542	414.326	414.926	2.075	414.953	414.933
15360.000	416.447	415.536	414.313	414.913	2.134	414.913	414.893
15390.000	416.502	415.347	414.293	414.893	2.209	414.873	414.853
15420.000	416.497	415.527	414.273	414.873	2.224	414.833	414.813
15422.000	416.496	415.528	414.272	414.872	2.224	414.813	414.793
15450.000	416.481	415.547	414.253	414.853	2.228	414.773	414.753
15480.000	416.247	415.636	414.233	414.833	2.014	414.733	414.713
15510.000	416.087	415.587	414.213	414.813	1.874	414.693	414.673
15520.000	416.929	415.630	414.207	414.807	2.722	414.653	414.633
15540.000	416.614	415.614	414.193	414.793	2.421	414.613	414.593
15570.000	416.714	415.679	414.173	414.773	2.541	414.573	414.553
15600.000	416.619	415.719	414.153	414.753	2.466	414.533	414.513
15630.000	416.019	415.579	414.133	414.733	1.866	414.493	414.473
15658.000	416.411	415.540	414.115	414.715	2.296	414.453	414.433
15660.000	416.439	415.537	414.113	414.713	2.326	414.413	414.393
15690.000	416.339	415.454	414.093	414.693	2.246	414.373	414.353
15720.000	416.088	415.382	414.073	414.673	2.015	414.333	414.313
15750.000	416.068	415.363	414.053	414.653	2.015	414.293	414.273
15766.000	416.105	415.415	414.043	414.643	2.062	414.253	414.233
15780.000	416.138	415.462	414.033	414.633	2.105	414.213	414.193
15810.000	416.133	415.563	414.013	414.613	2.120	414.173	414.153
15840.000	416.393	415.748	413.993	414.593	2.400	414.133	414.113
15870.000	416.363	415.718	413.973	414.573	2.390	414.093	414.073
15892.000	416.438	415.773	413.959	414.559	2.479	414.053	414.033
15900.000	416.466	415.783	413.953	414.553	2.513	414.013	413.993
15930.000	416.508	415.818	413.933	414.533	2.575	413.973	413.953
15960.000	416.698	415.788	413.913	414.513	2.785	413.933	413.913
15970.000	416.683	415.799	413.907	414.507	2.776	413.893	413.873
15990.000	416.654	415.819	413.893	414.493	2.761	413.853	413.833
15996.000	416.655	415.801	413.889	414.489	2.766	413.813	413.793
16020.000	416.659	415.729	413.873	414.473	2.786	413.773	413.753

LONGITUDINAL SECTION

SCALE HOR 1:3000
VER 1:100

- NOTES:
01. ALL LEVELS AND CHAINAGES ARE IN METERS UNLESS OTHERWISE SPECIFIED.
02. DO NOT SCALE THE DRAWING

LEGENDS	SYMBOL
Compound wall. Wire fence. Cultivation limit.	
Pylon. Electric Pole. Transformer. Telegraph/Telephone line. Power Line.	
Roads, Road centreline, Canal, Streams	
Railway with KM Stone. Broad gauge; Other gauges.	
Building: Permanent; Temporary; Under construction. Village	
Bridges with piers. Culvert. KM pillar. Sub-KM pillar. Lamp post.	
Well: Lined; Unlined; Tube; Bore. Pump House. Temple. Mosque. Idgah.	
Embankment. Cutting. Quarry. Hedge.	
Field bund. Grass. Bamboo.	
Kilometer Stone. Graveyard. Sign Board. Gate	
Ground Level	
Existing Canal bed level	
Proposed Canal bed level	
Proposed Full supply level	
Proposed Free board level	

HYDRAULIC PARTICULARS		
No.	CANAL DETAILS	REACH in 'm'
1	REQUIRED DISCHARGE(CUMecs)	0.739
2	DESIGNED DISCHARGE(CUMecs)	0.776
3	BED WIDTH(m)	0.7
4	FULL SUPPLY DEPTH(m)	0.6
5	SIDE SLOPE(H:V)	1.5:1
6	TOTAL FREE BOARD(m)	0.3
7	LINED FREE BOARD(m)	0.3
8	BED GRADIENT	1:1500
9	VELOCITY(m/s)	0.692
10	RUGOSITY COEFFICIENT (n)	0.018

LIST OF STRUCTURES							
No.	Type of Structure	Chainage	C.B.L		F.S.L		Head Loss
			U/S 'm'	D/S 'm'	U/S 'm'	D/S 'm'	
117	Direct Pipe Outlet-79	15145	414.457	414.457	415.057	415.057	0.0
118	Direct Pipe Outlet-80	15341	414.326	414.326	414.926	414.926	0.0
119	Direct Pipe Outlet-81	15422	414.272	414.272	414.872	414.872	0.0
120	Direct Pipe Outlet-82	15520	414.207	414.207	414.807	414.807	0.0
121	Direct Pipe Outlet-83	15658	414.115	414.115	414.715	414.715	0.0
122	Direct Pipe Outlet-84	15766	414.043	414.043	414.643	414.643	0.0
123	Direct Pipe Outlet-85	15892	413.959	413.959	414.559	414.559	0.0
124	Direct Pipe Outlet-86	15970	413.907	413.907	414.507	414.507	0.0
125	Cart Track Crossing	15996	413.889	413.889	414.489	414.489	0.0

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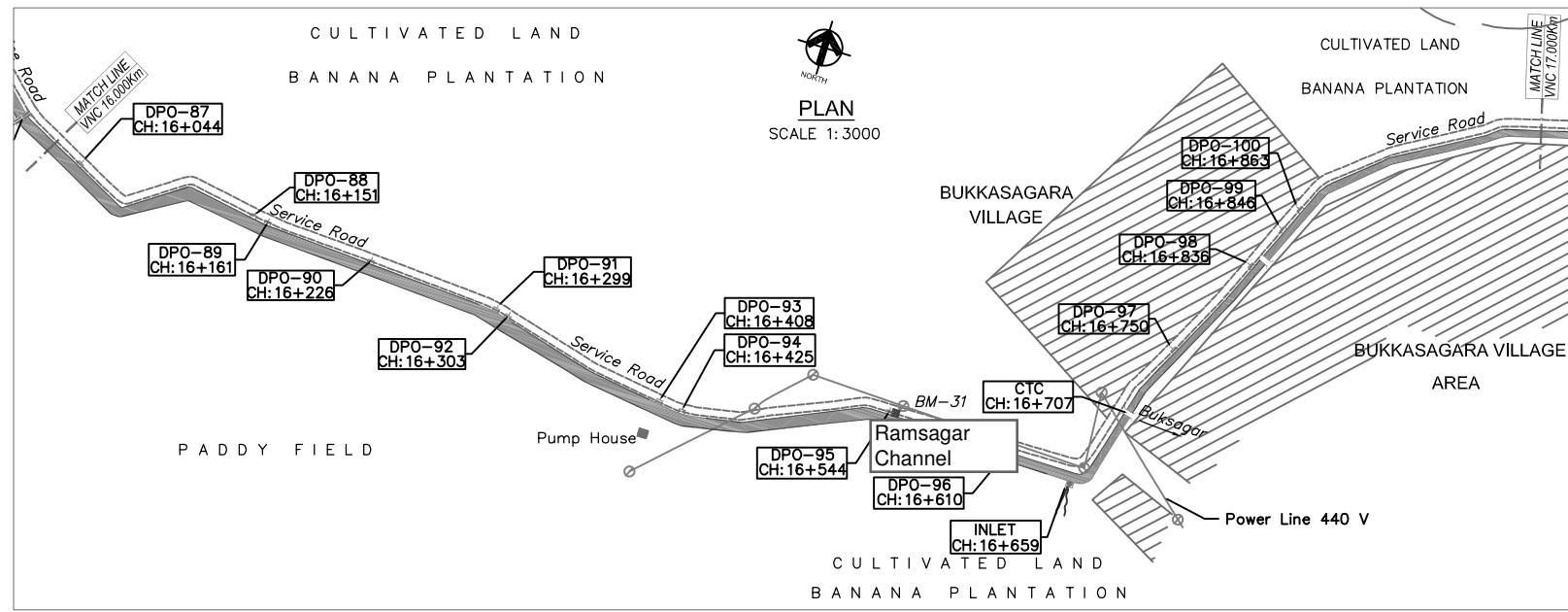
PROJECT TITLE
**MODERNISATION OF VIJAYANAGARA CHANNELS
IN TUNGABHADRA PROJECT**

DRAWING TITLE
**PLAN AND LONGITUDINAL SECTION OF
TURTHA CHANNEL
(15+000 Km to 16+000 Km)**

Date	Drw.	Pre.	Chk.	App.	Scale.	Drawing Status.
					AS SHOWN	FOR APPROVAL

Project No.	Drawing No.	Sheet No.	Rev.
	KNNL-VNC-TC-P&L-002	16 of 19	0

Approval stamps and signatures of project officials.

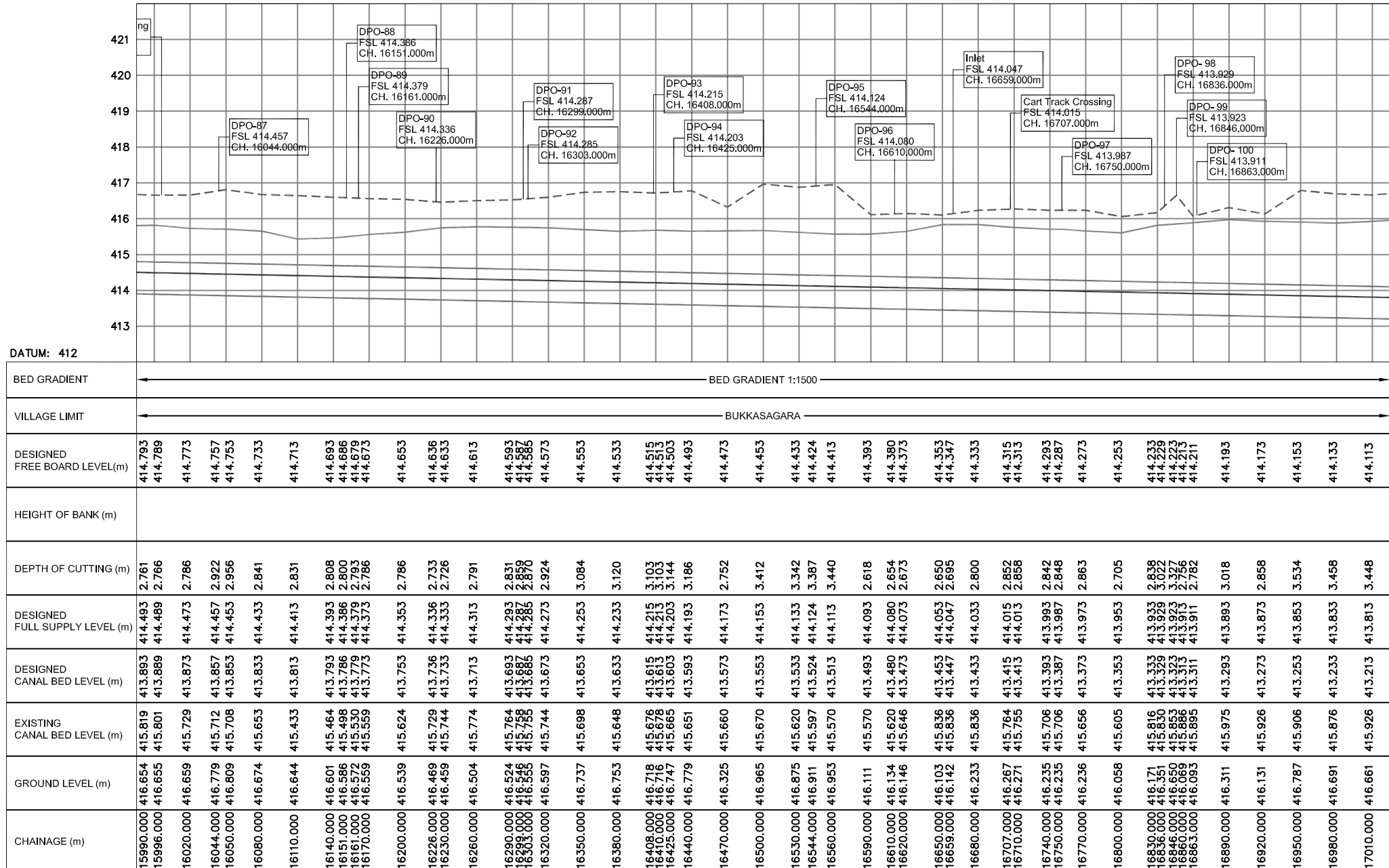


NOTES:

- ALL LEVELS AND CHAINAGES ARE IN METERS UNLESS OTHERWISE SPECIFIED.
- DO NOT SCALE THE DRAWING

LEGENDS	SYMBOL
Compound wall, Wire fence, Cultivation limit.	— — — — —
Pyon, Electric Pole, Transformer, Telegraph/Telephone line, Power Line.	— — — — —
Roads, Road centreline, Canal, Streams	— — — — —
Railway with KM Stone: Broad gauge; Other gauges.	— — — — —
Building: Permanent; Temporary; Under construction. Village	— — — — —
Bridges with piers, Culvert, KM pillar, Sub-KM pillar, Lamp post.	— — — — —
Well: Lined; Unlined; Tube; Bore; Pump House; Temple, Mosque, Idgah.	— — — — —
Embankment, Cutting, Quarry, Hedge.	— — — — —
Field bund., Grass, Bamboo.	— — — — —
Kilometer Stone, Graveyard, Sign Board, Gate	— — — — —
Ground Level	— — — — —
Existing Canal bed level	— — — — —
Proposed Canal bed level	— — — — —
Proposed Full supply level	— — — — —
Proposed Free board level	— — — — —

HYDRAULIC PARTICULARS	
No.	REACH in m'
1	CH: 16000-17000m
2	REQUIRED DISCHARGE(CUMEC/S)
3	DESIGNED DISCHARGE(CUMEC/S)
4	BED WIDTH(m)
5	FULL SUPPLY DEPTH(m)
6	SIDE SLOPE(H:V)
7	TOTAL FREE BOARD(m)
8	LINED FREE BOARD(m)
9	BED GRADIENT
10	VELOCITY(m/s)
11	RUGOSITY COEFFICIENT (n)



LIST OF STRUCTURES							
No.	Type of Structure	Chainage	C.B.L	F.S.L	Head	Loss	
126	Direct Pipe Outlet-87	16044	413.857	413.857	414.457	414.457	0.0
127	Direct Pipe Outlet-88	16151	413.786	413.786	414.386	414.386	0.0
128	Direct Pipe Outlet-89	16161	413.779	413.779	414.379	414.379	0.0
129	Direct Pipe Outlet-90	16226	413.736	413.736	414.336	414.336	0.0
130	Direct Pipe Outlet-91	16299	413.687	413.687	414.287	414.287	0.0
131	Direct Pipe Outlet-92	16303	413.685	413.685	414.285	414.285	0.0
132	Direct Pipe Outlet-93	16408	413.615	413.615	414.215	414.215	0.0
133	Direct Pipe Outlet-94	16425	413.603	413.603	414.203	414.203	0.0
134	Direct Pipe Outlet-95	16544	413.524	413.524	414.124	414.124	0.0
135	Direct Pipe Outlet-96	16610	413.480	413.480	414.080	414.080	0.0
136	Inlet	16659	413.447	413.447	414.047	414.047	0.0
137	Cart Track Crossing	16707	413.415	413.415	414.015	414.015	0.0
138	Direct Pipe Outlet-97	16750	413.387	413.387	413.987	413.987	0.0
139	Direct Pipe Outlet-98	16836	413.329	413.329	413.929	413.929	0.0
140	Direct Pipe Outlet-99	16846	413.323	413.323	413.923	413.923	0.0
141	Direct Pipe Outlet-100	16863	413.311	413.311	413.911	413.911	0.0

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PROJECT TITLE
MODERNISATION OF VIJAYANAGARA CHANNELS IN TUNGABHADRA PROJECT

DRAWING TITLE
PLAN AND LONGITUDINAL SECTION OF TURTHA CHANNEL (16+000 Km to 17+000 Km)

Date	Drw.	Pre.	Chk.	App.	Scale.	Drawing Status.
					AS SHOWN	FOR APPROVAL
Project No.	Drawing No.	Sheet No.	Rev.			
	KNNL-VNC-TC-P&L-002	17 of 19	0			

APPROVED

Author _____

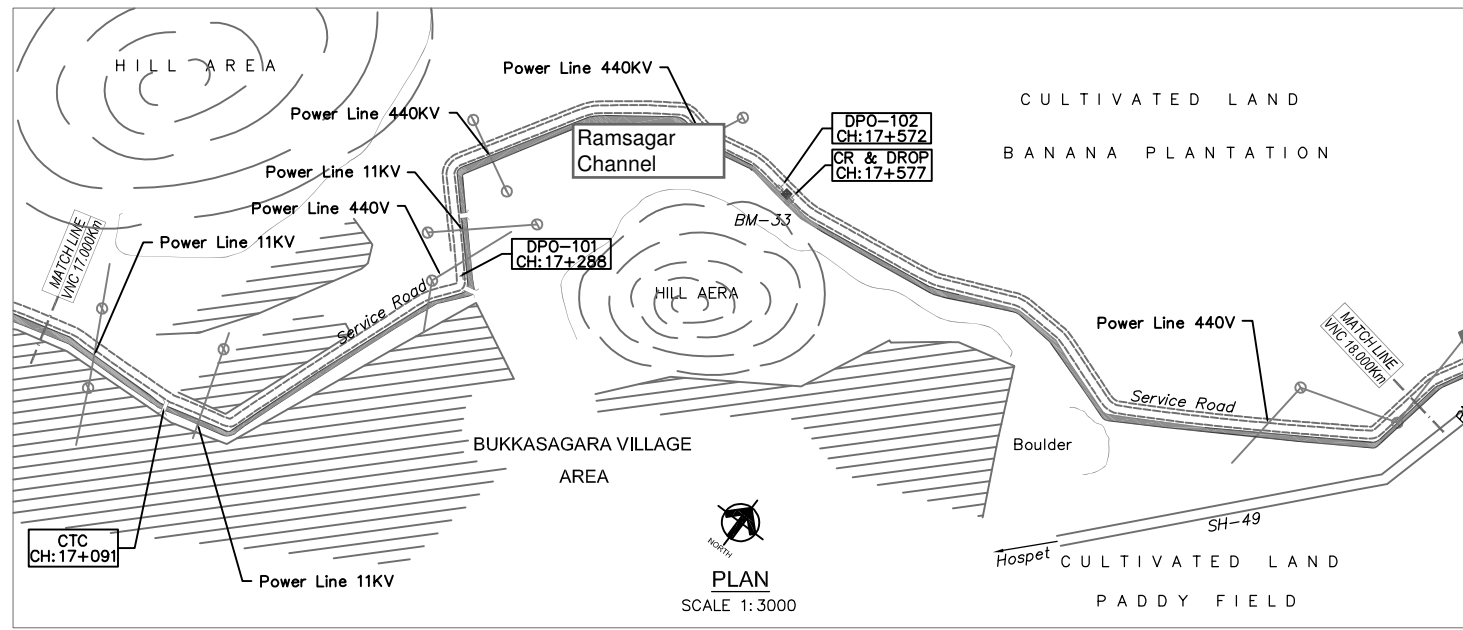
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Drawn _____

Scale _____

Date _____

LONGITUDINAL SECTION
SCALE HOR 1:3000
VER 1:100

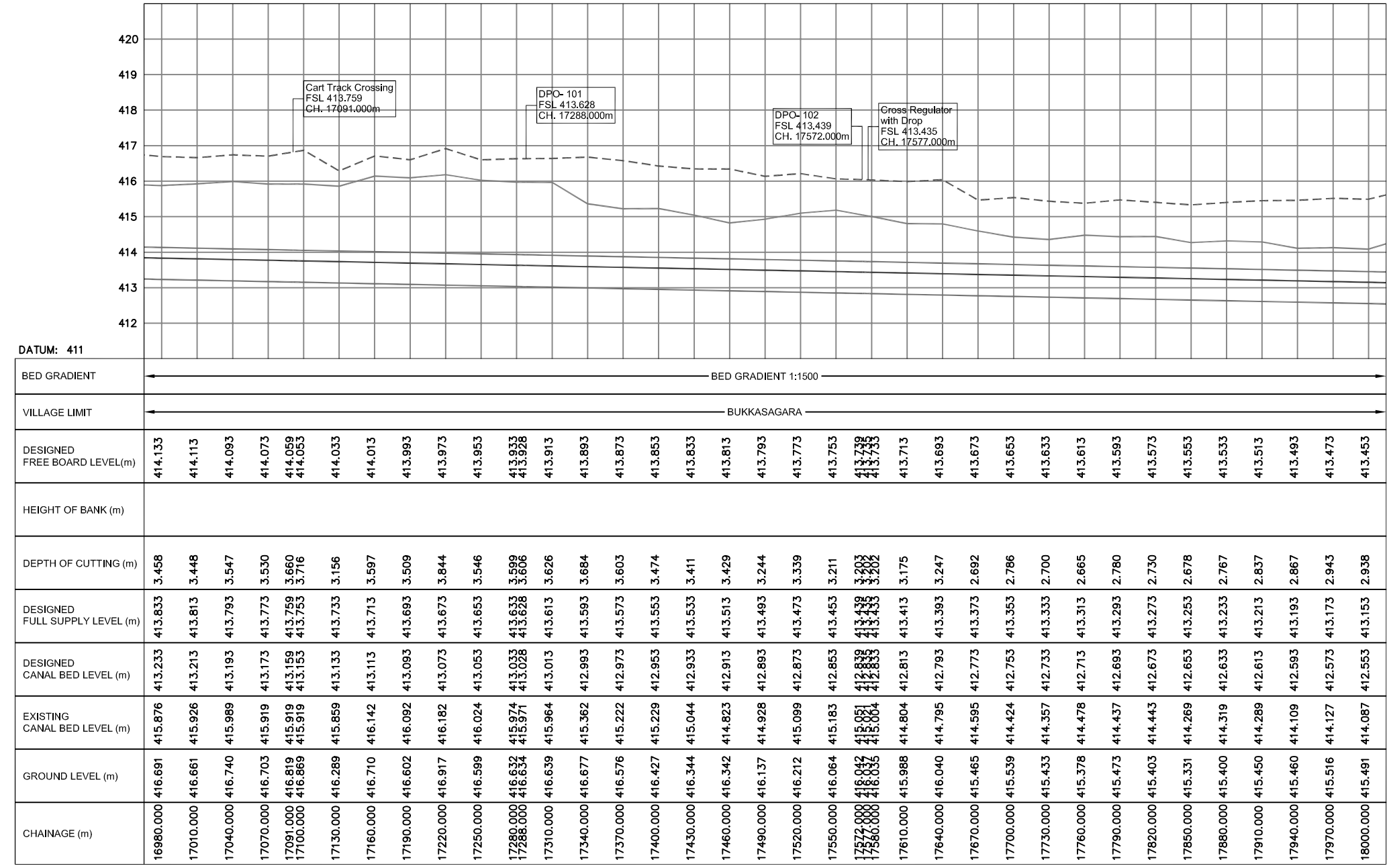


NOTES:

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LEGENDS	SYMBOL
Compound wall, Wire fence, Cultivation limit.	— — — — —
Pylon, Electric Pole, Transformer, Telegraph/Telephone line.	— — — — —
Power Line.	— — — — —
Roads, Road centreline, Canal, Streams	— — — — —
Railway with KM Stone: Broad gauge; Other gauges.	— — — — —
Building: Permanent; Temporary; Under construction; Village	— — — — —
Bridges with piers, Culvert, KM pillar, Sub-KM pillar.	— — — — —
Lamp post.	— — — — —
Well: Lined; Unlined; Tube; Bore; Pump House; Temple.	— — — — —
Mosque, Idgah.	— — — — —
Embankment, Cutting, Quarry, Hedge.	— — — — —
Field bund., Grass, Bamboo.	— — — — —
Kilometer Stone, Graveyard, Sign Board, Gate	— — — — —
Ground Level	— — — — —
Existing Canal bed level	— — — — —
Proposed Canal bed level	— — — — —
Proposed Full supply level	— — — — —
Proposed Free board level	— — — — —

HYDRAULIC PARTICULARS		
No.	CANAL DETAILS	REACH in 'm'
1	REQUIRED DISCHARGE(CUMECs)	0.739
2	DESIGNED DISCHARGE(CUMECs)	0.776
3	BED WIDTH(m)	0.7
4	FULL SUPPLY DEPTH(m)	0.6
5	SIDE SLOPE(H:V)	1.5:1
6	TOTAL FREE BOARD(m)	0.3
7	LINED FREE BOARD(m)	0.3
8	BED GRADIENT	1:1500
9	VELOCITY(m/s)	0.692
10	RUGOSITY COEFFICIENT (n)	0.018



LONGITUDINAL SECTION
SCALE HOR 1:3000
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LIST OF STRUCTURES							
No.	Type of Structure	Chainage	C.B.L		F.S.L		Head Loss
			U/S 'm'	D/S 'm'	U/S 'm'	D/S 'm'	
142	Cart Track Crossing	17091	413.159	413.159	413.759	413.759	0.0
143	Direct Pipe Outlet-101	17288	413.028	413.028	413.628	413.628	0.0
144	Direct Pipe Outlet-102	17572	412.839	412.839	413.439	413.439	0.0
145	CR / Drop	17577	412.835	412.835	413.435	413.435	0.0

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

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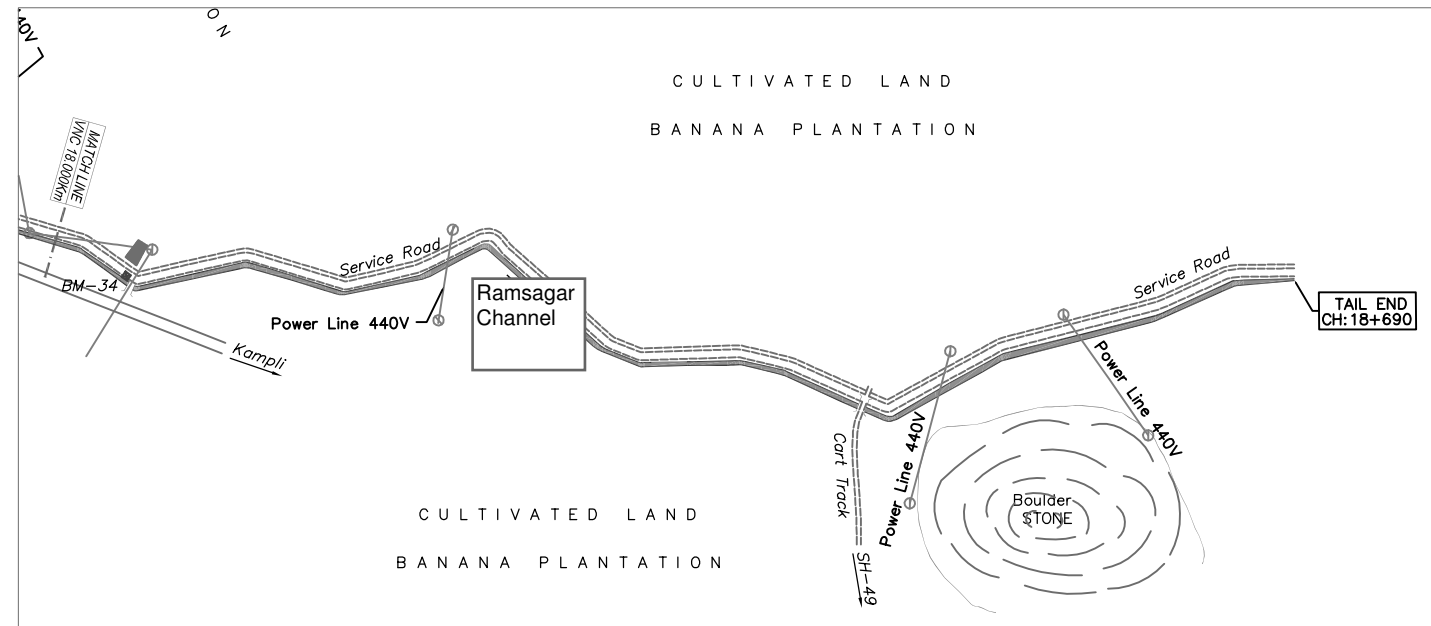
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DRAWING TITLE
**PLAN AND LONGITUDINAL SECTION OF
TURTHA CHANNEL
(17+000 Km to 18+000 Km)**

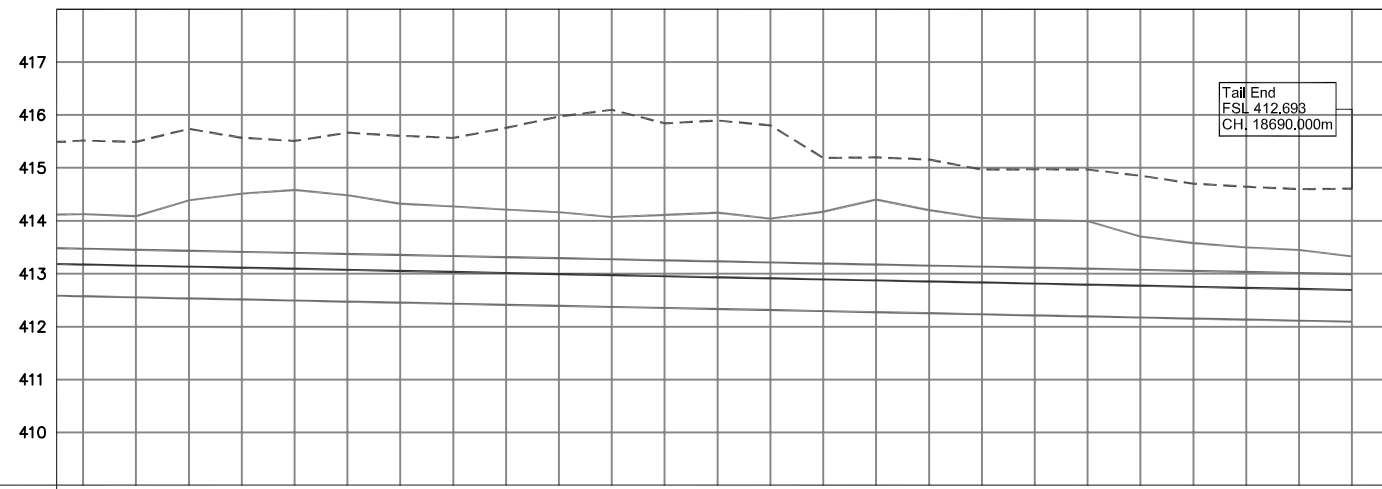
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					AS SHOWN	FOR APPROVAL

Project No.	Drawing No.	Sheet No.	Rev.
	KNNL-VNC-TC-P&L-002	18 of 19	0

Approval stamps and signatures for the project, including the client and consultant.



PLAN
SCALE 1: 3000



DATUM: 409

CHAINAGE (m)	BED GRADIENT		VILLAGE LIMIT	
	BUKKASAGARA			
17970.000	413.473	413.173	414.127	415.516
18000.000	413.453	413.153	414.087	415.491
18030.000	413.433	413.133	414.387	415.737
18060.000	413.413	413.113	414.514	415.569
18090.000	413.393	413.093	414.584	415.509
18120.000	413.373	413.073	414.484	415.664
18150.000	413.353	413.053	414.321	415.606
18180.000	413.333	413.033	414.271	415.566
18210.000	413.313	413.013	414.210	415.756
18240.000	413.293	412.993	414.162	415.969
18270.000	413.273	412.973	414.072	416.097
18300.000	413.253	412.953	414.112	415.842
18330.000	413.233	412.933	414.152	415.894
18360.000	413.213	412.913	414.042	415.803
18390.000	413.193	412.893	414.172	415.188
18420.000	413.173	412.873	414.403	415.198
18450.000	413.153	412.853	414.202	415.158
18480.000	413.133	412.833	414.053	414.968
18510.000	413.113	412.813	414.013	414.973
18540.000	413.093	412.793	413.992	414.968
18570.000	413.073	412.773	413.703	414.852
18600.000	413.053	412.753	413.578	414.701
18630.000	413.033	412.733	413.498	414.643
18660.000	413.013	412.713	413.448	414.598
18690.000	412.993	412.693	413.328	414.607

LONGITUDINAL SECTION
SCALE HOR 1: 3000
VER 1: 100

NOTES:

- ALL LEVELS AND CHAINAGES ARE IN METERS UNLESS OTHERWISE SPECIFIED.
- DO NOT SCALE THE DRAWING

LEGENDS	SYMBOL
Compound wall. Wire fence. Cultivation limit.	— — — — —
Pylon. Electric Pole. Transformer. Telegraph/Telephone line. Power Line.	— — — — —
Roads, Road centreline, Canal, Streams	— — — — —
Railway with KM Stone: Broad gauge; Other gauges.	— — — — —
Building: Permanent; Temporary; Under construction. Village	— — — — —
Bridges with piers. Culvert. KM pillar. Sub-KM pillar. Lamp post.	— — — — —
Well: Lined; Unlined; Tube; Bore. Pump House. Temple. Mosque. Idgah.	— — — — —
Embankment. Cutting. Quarry. Hedge.	— — — — —
Field bund.. Grass. Bamboo.	— — — — —
Kilometer Stone. Graveyard. Sign Board. Gate	— — — — —
Ground Level	— — — — —
Existing Canal bed level	— — — — —
Proposed Canal bed level	— — — — —
Proposed Full supply level	— — — — —
Proposed Free board level	— — — — —

HYDRAULIC PARTICULARS		
No.	CANAL DETAILS	REACH in 'm'
1	REQUIRED DISCHARGE(CUMECs)	0.739
2	DESIGNED DISCHARGE(CUMECs)	0.776
3	BED WIDTH(m)	0.7
4	FULL SUPPLY DEPTH(m)	0.6
5	SIDE SLOPE(H:V)	1.5:1
6	TOTAL FREE BOARD(m)	0.3
7	LINED FREE BOARD(m)	0.3
8	BED GRADIENT	1:1500
9	VELOCITY(m/s)	0.692
10	RUGOSITY COEFFICIENT (n)	0.018

LIST OF STRUCTURES

No.	Type of Structure	Chainage	C.B.L		F.S.L		Head Loss
			U/S 'm'	D/S 'm'	U/S 'm'	D/S 'm'	
146	Tail End	18690	412.093	412.093	412.693	412.693	0.0

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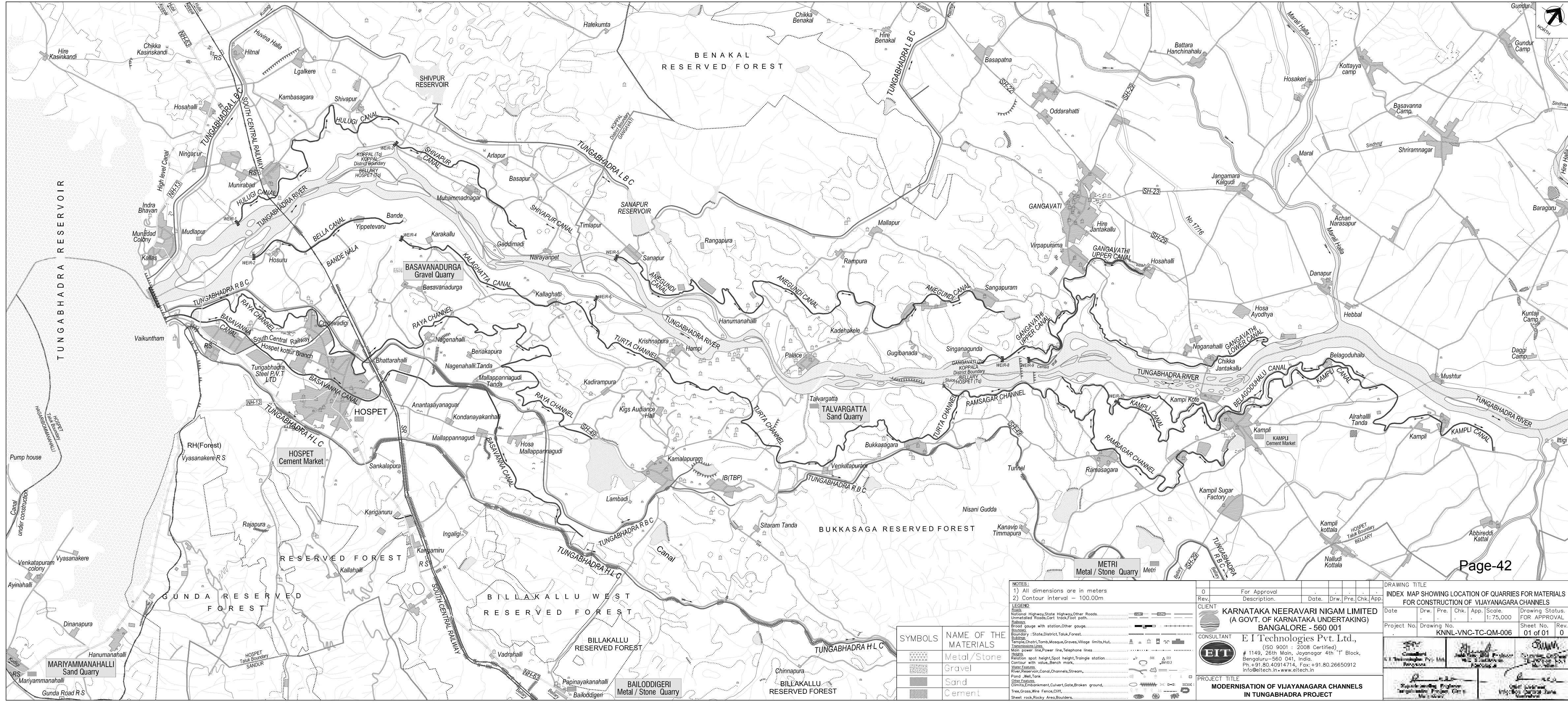
PROJECT TITLE
**MODERNISATION OF VIJAYANAGARA CHANNELS
IN TUNGABHADRA PROJECT**

DRAWING TITLE
**PLAN AND LONGITUDINAL SECTION OF
TURTHA CHANNEL
(18+000 Km to 18+690 Km)**

Date	Drw.	Pre.	Chk.	App.	Scale.	Drawing Status.
					AS SHOWN	FOR APPROVAL

Project No.	Drawing No.	Sheet No.	Rev.
	KNNL-VNC-TC-P&L-002	19 of 19	0

Project Engineer	Project Director



NOTES:
 1) All dimensions are in meters
 2) Contour interval - 100.00m

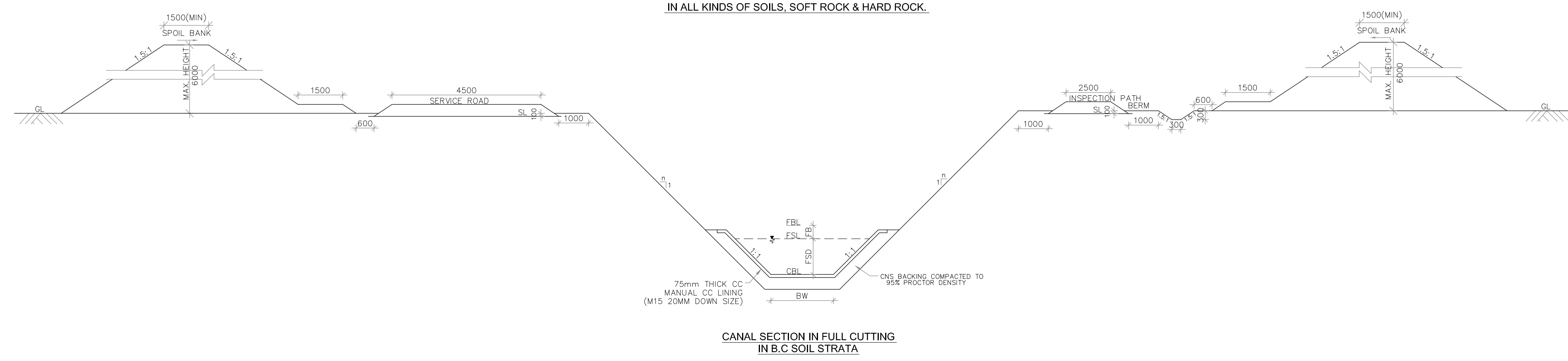
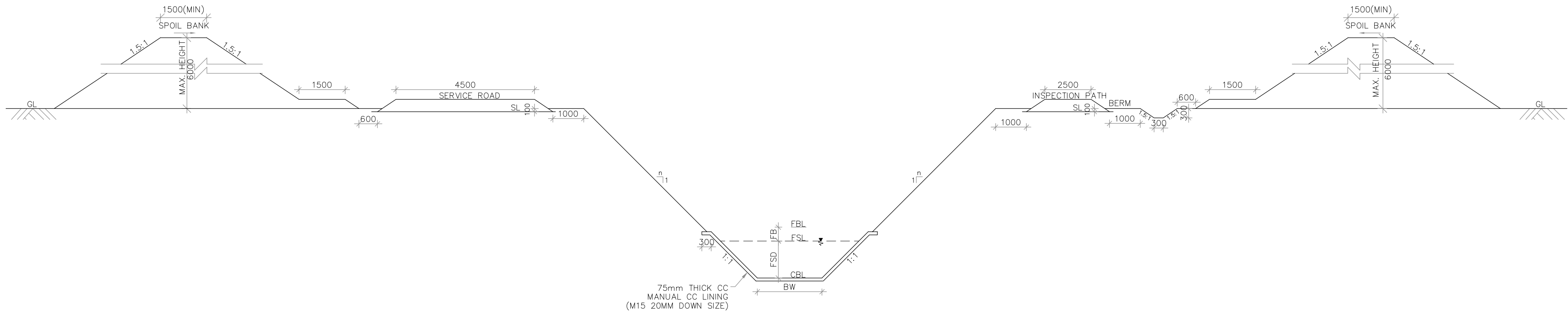
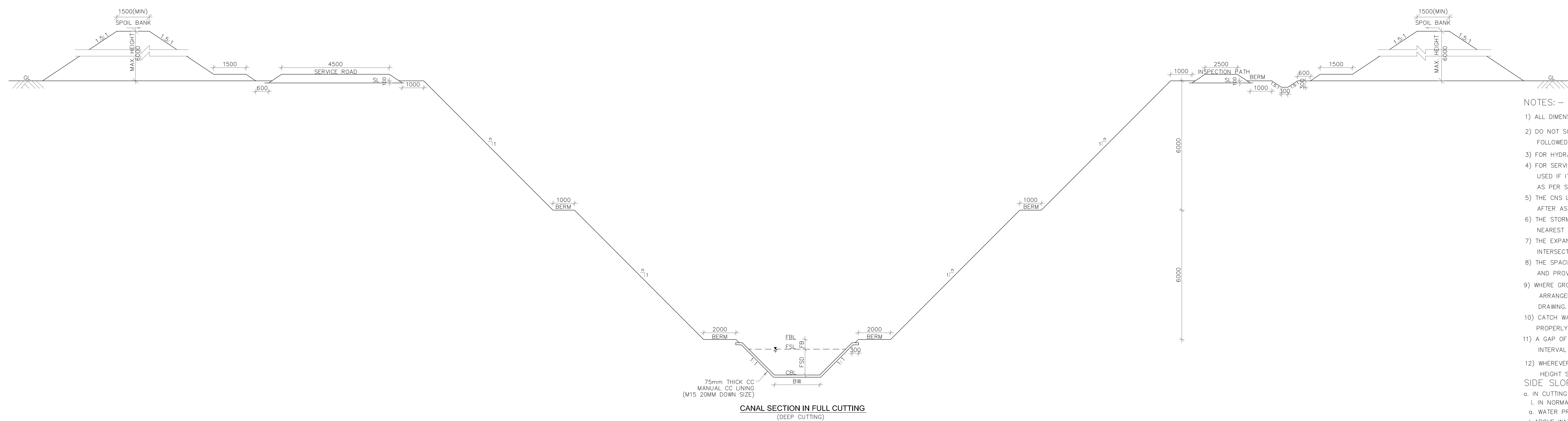
LEGEND

	National Highway, State Highway, Other Roads
	Unmetalled Road, Cart track, Foot path
	Railway
	Broad gauge with station, Other gauge
	Boundary : State, District, Taluk, Forest
	Buildings
	Temple, Chattri, Tomb, Mosque, Graves, Village limits, Hut
	Transmission Lines
	Main power line, Power line, Telephone lines
	Height
	Radiation spot height, Spot height, Triangle station
	Contour with value, Bench mark
	Water Features
	River, Reservoir, Canal, Channels, Stream
	Pond, Well, Tank
	Other Features
	Embankment, Culvert, Gate, Broken ground
	Tree, Grass, Wire Fence, Cliff
	Sheet rock, Rocky Area, Boulders

SYMBOLS	NAME OF THE MATERIALS
	Metal/Stone
	Gravel
	Sand
	Cement

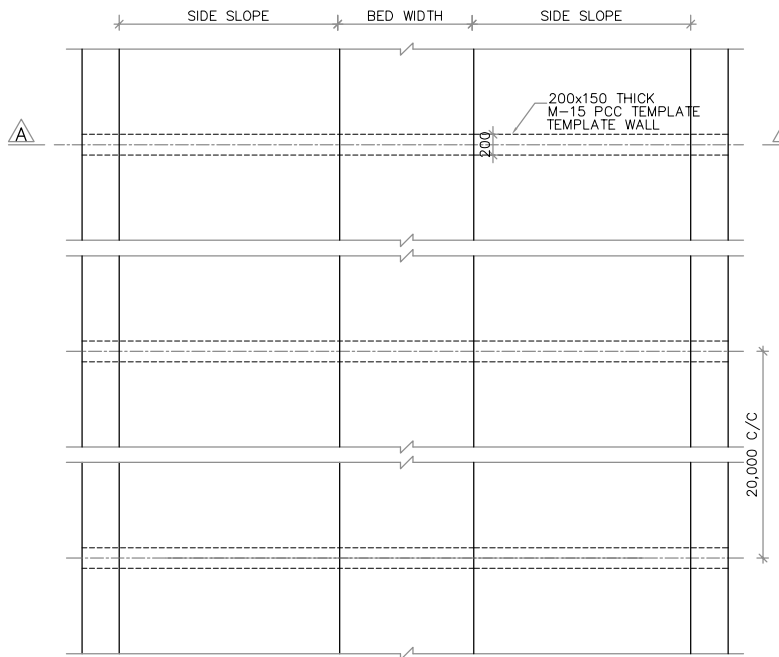
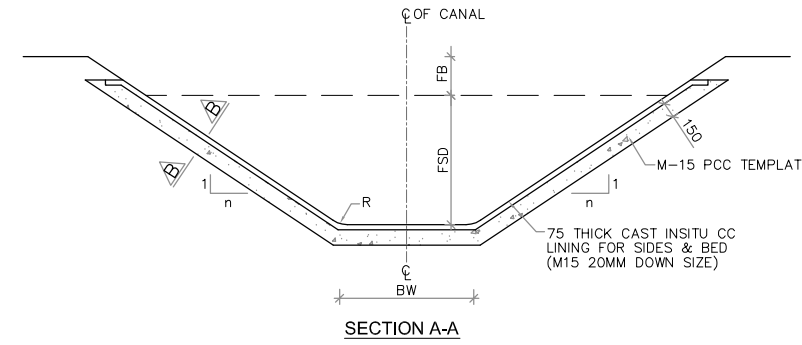
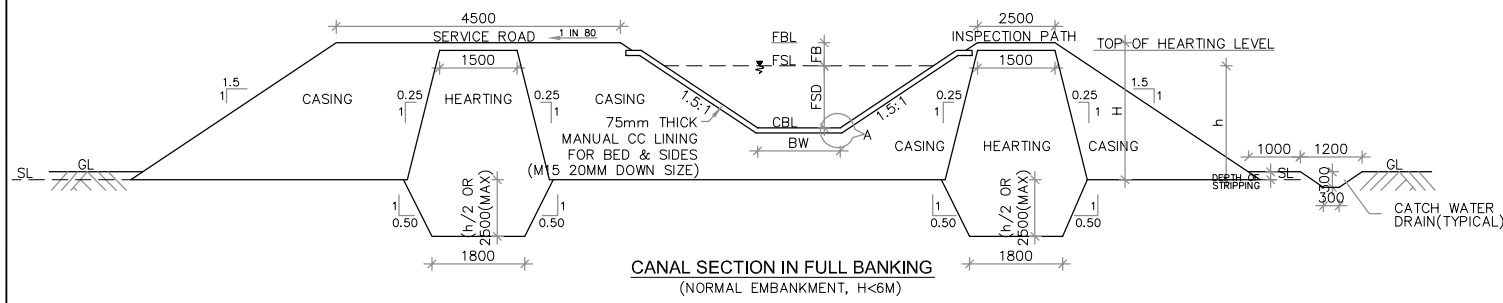
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Rev.	Description	Date	Drw.	Pre.	Chk.	App.		
CLIENT								
KARNATAKA NEERAVARI NIGAM LIMITED (A GOVT. OF KARNATAKA UNDERTAKING) BANGALORE - 560 001								
CONSULTANT								
E I Technologies Pvt. Ltd., (ISO 9001 : 2008 Certified) # 1149, 26th Main, 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									
INDEX MAP SHOWING LOCATION OF QUARRIES FOR MATERIALS FOR CONSTRUCTION OF VIJAYANAGARA CHANNELS									
Date	Drw.	Pre.	Chk.	App.	Scale	Drawing Status			
					1:75,000	FOR APPROVAL			
Project No.	Drawing No.	Sheet No.		Rev.					
	KNNL-VNC-TC-QM-006	01 of 01		0					

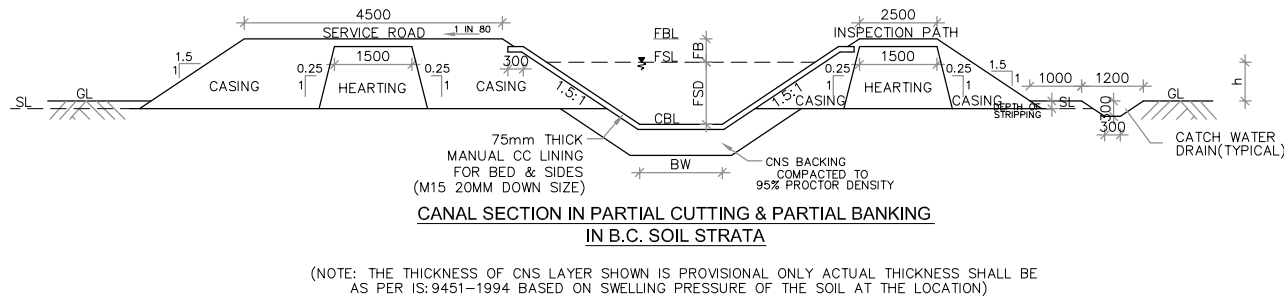


- NOTES: -**
- 1) ALL DIMENSIONS ARE IN MILLIMETRE
 - 2) DO NOT SCALE THE DRAWING. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
 - 3) FOR HYDRAULIC PARAMETERS REFER APPROVED REACHWISE STATEMENT.
 - 4) FOR SERVICE ROAD AND INSPECTION PATH EXCAVATED EARTH MAY BE USED IF IT IS APPROVED BY THE ENGINEER INCHARGE AND SHALL BE AS PER SPECIFICATIONS.
 - 5) THE CNS LAYER BACKING SHALL BE PROVIDED FOR B.C SOIL STRATA AFTER ASSESSING THE SWELL PRESSURE OF THE STRATA MET WITH.
 - 6) THE STORM WATER SHALL BE SUITABLY DRAINED TO THE NEAREST VALLEY.
 - 7) THE EXPANSION JOINT SHALL BE PROVIDED WHEREVER STRUCTURE INTERSECT THE CANAL LINING.
 - 8) THE SPACING OF CONTRACTION JOINTS SHALL BE 5m C/C AND PROVIDED WHEREVER LINING IS CONTINUOUS.
 - 9) WHERE GROUND WATER TABLE IS ABOVE C.B.L UNDER DRAINAGE ARRANGEMENT WITH NR.V. SHALL BE PROVIDED AS SHOWN IN SEPARATE DRAWING.
 - 10) CATCH WATER DRAINS ESPECIALLY ON U/S SIDE SHALL BE PROPERLY DESIGNED FOR INDIVIDUAL CATCHMENTS.
 - 11) A GAP OF 5m WIDTH SHALL BE LEFT IN SPOIL BANKS AT 150m INTERVAL FOR DRAINAGE.
 - 12) WHEREVER STRATA CHANGES BETWEEN BERMS, SIDE SLOPES IN THAT HEIGHT SHALL BE JUDICIOUSLY PROVIDED.
- SIDE SLOPES:**
- a. IN CUTTING
 - i. IN NORMAL CUTTING
 - ii. ABOVE WATER PRISM NORMAL CUT
 - b. IN DEEP CUT REACHES
 - i. HR / SR = 1:1
 - ii. IN BC SOIL = 1.5:1
 - c. BC SOIL = 1.5:1
 - d. IN PARTIAL BANKING/BANKING
 - i. INNER n=1.5
 - ii. OUTER n=1.5
- LEGEND: -**
- 1) CC - CEMENT CONCRETE.
 - 2) FB - FREE BOARD
 - 3) BW - BED WIDTH
 - 4) GL - GROUND LEVEL
 - 5) M15 - GRADE OF CONCRETE AS PER IS456
 - 6) FSD - FULL SUPPLY DEPTH

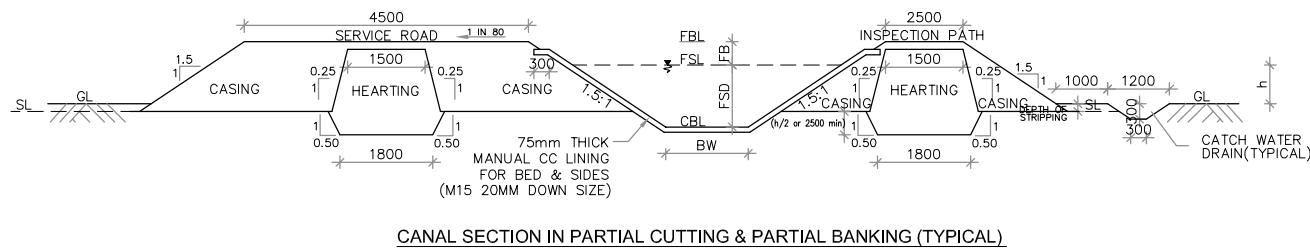
0	For Approval						
Rev.	Description.	Date.	Drw.	Pre.	Chk.	App.	
CLIENT KARNATAKA NEERAVARI NIGAM LIMITED (A GOVT. OF KARNATAKA UNDERTAKING) BANGALORE - 560 001							
CONSULTANT E I Technologies Pvt. Ltd., (ISO 9001 : 2008 Certified) # 1149, 26th Main, Jayanagar 4th 'T' Block, Bengaluru-560 041, India. 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 TYPICAL CROSS SECTIONS OF MAIN CANAL IN FULL CUTTING FOR RAMSAGAR CHANNEL							
Date	Drw.	Pre.	Chk.	App.	Scale.	Drawing Status.	
					AS SHOWN	FOR APPROVAL	
Project No.	Drawing No.					Sheet No.	Rev.
	KNNL-VNC-TC-TYP-CS-003					01 of 02	0
 Consultant Engineer E I Technologies Pvt. Ltd. Bangalore		 Administrative Engineer M.C. Subrahmanya Ramsagar		 Executive Engineer T.C. Munirabed Munirabed			
 Superintending Engineer Tungabhadra Project Circle Munirabed		 Chief Engineer Irrigation Central Zone Munirabed					



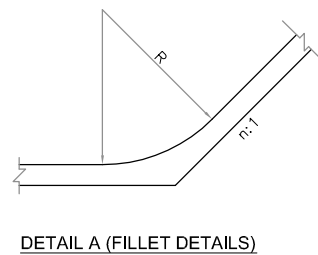
PLAN LAYOUT OF PCC TEMPLATE
(TO BE PROVIDED AT EVERY 20M C/C IN ALL REACHES ALONG THE CANAL)



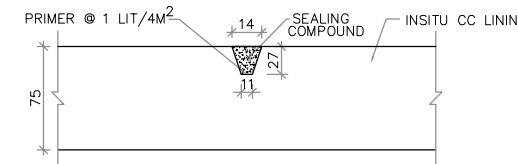
(NOTE: THE THICKNESS OF CNS LAYER SHOWN IS PROVISIONAL ONLY ACTUAL THICKNESS SHALL BE AS PER IS:9451-1994 BASED ON SWELLING PRESSURE OF THE SOIL AT THE LOCATION)



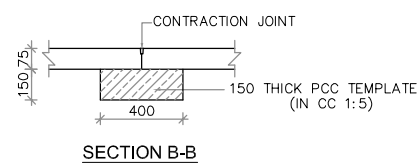
CANAL SECTION IN PARTIAL CUTTING & PARTIAL BANKING (TYPICAL)



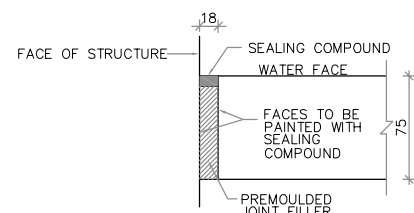
NOTES:-
IF n=1.0 THEN R=1/2 F.S.D
IF n=1.5 THEN R=3/4 F.S.D



CONTRACTION JOINT
(AT EVERY 5.0m)

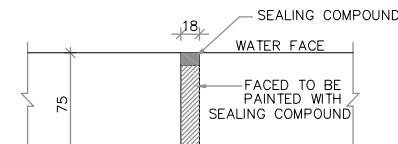


SECTION B-B



DETAILS OF EXPANSION JOINT (TYPICAL)

(TO BE PROVIDED WHEREVER STRUCTURES INTERSECT CANAL LINING)

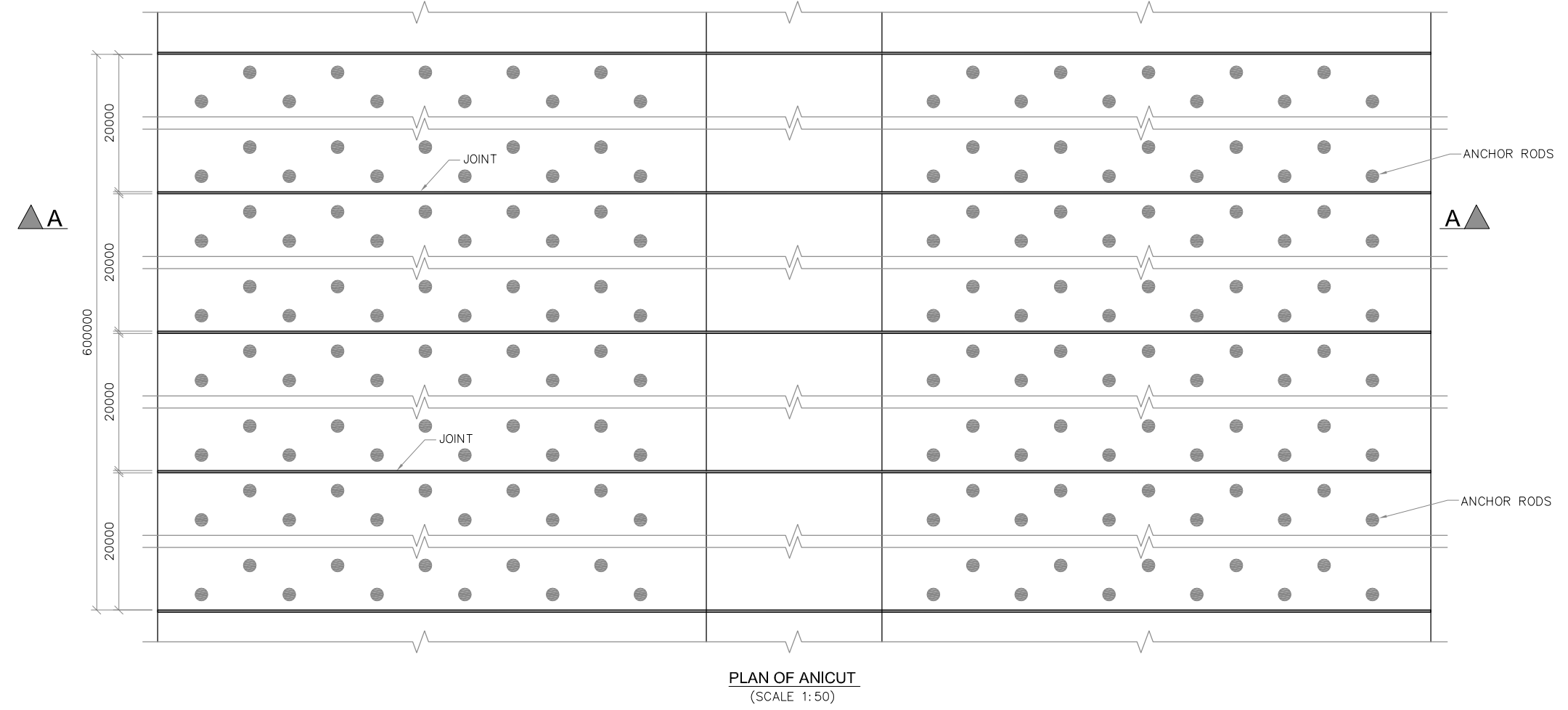
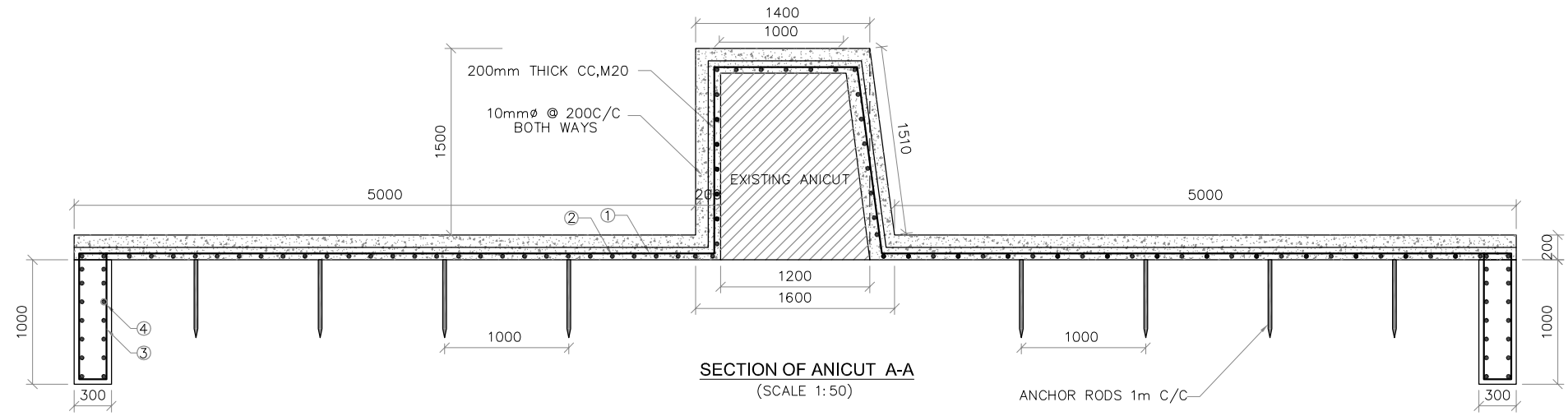


DETAILS OF EXPANSION JOINT (TYPICAL)
(TO BE PROVIDED AT EVERY 20M C/C IN CANAL LINING)

NOTES:-

- 1) ALL DIMENSIONS ARE IN MILLIMETRE AND REDUCED LEVELS ARE IN METRES.
 - 2) DO NOT SCALE THE DRAWING. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
 - 3) FOR OTHER NOTES AND DETAILS REFER DWG.
 - 4) CATCH WATER DRAINS ESPECIALLY ON I.P SIDE, SHALL BE PROPERLY DESIGNED FOR INDIVIDUAL CATCHMENTS.
 - 5) GENERALLY, IN FULL EMBANKMENT REACHES, IF THE PERMEABILITY OF SOIL IS HIGH, HORIZONTAL HEARTING BLANKET BELOW CANAL BED WIDTH SHALL BE PROVIDED WITH THE APPROVAL OF THE COMPETENT AUTHORITY
 - 6) BORROW PITS, ADJACENT TO CANAL, IF REQUIRED, SHALL BE DESIGNED ON THE BASIS OF SOIL PROPERTIES AND STABILITY ANALYSIS
 - 7) STRIPPING DEPTH SHALL BE ADOPTED AS 22.50cms.(AS PER IS4701-1982, STRIPPING DEPTH ADOPTED FOR CULTIVATED LAND SHALL BE 15.00 TO 22.50cms)
 - 8) MATERIALS:
CONCRETE: GRADE AS SPECIFIED CONFIRMING TO IS:456
REINFORCEMENT: Fe 415 CONFIRMING TO IS 1786.
 - 9) CLEAR COVER TO ANY REINFORCEMENT : 25mm.
 - 10) LAP LENGTH OF THE BARS SHALL BE 50xBAR DIA. NOT MORE THAN 50% OF BARS SHALL BE LAPPED AT ONE LOCATION.
 - 11) WHEREVER TOTAL NO. OF BARS ARE SPECIFIED, THEY ARE TO BE SPACED UNIFORMLY UNLESS MENTIONED OTHERWISE.
 - 12) EXPANSION JOINT TO BE PROVIDED WHERE EVER LINING INTERSECTS STRUCTURES.
 - 13) ALL CONCRETE LINING WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH IS:3873 AND RELEVANT CODES.
 - 14) TOP OF HEARTING LEVEL = TOP OF LINING.
TOP OF LINING = FSL+0.30 IF FB = 0.45m
TOP OF LINING = FSL+0.15 IF FB = 0.30m
- SIDE SLOPES:
- a. IN CUTTING
 - i. IN NORMAL CUTTING
a. WATER PRISM = 1:1
b. ABOVE WATER PRISM NORMAL CUT
c. IN HR/SR = 1:1
d. IN BC SOIL = 1.5:1
 - ii. IN DEEP CUT REACHES
a. HR = 0.5:1 (WITH 2M BERM AT FREE BOARD LEVEL)
b. SR / AKS = 1:1
c. BC SOIL = 1.5:1
 - b. IN PARTIAL BANKING/BANKING
 - i. INNER n=1.5
 - ii. OUTER n=1.5
- LEGEND:-
- 1) CC - CEMENT CONCRETE.
 - 2) FB - FREE BOARD
 - 3) BW - BED WIDTH
 - 4) GL - GROUND LEVEL
 - 5) M15 - GRADE OF CONCRETE AS PER IS456
 - 6) FSD - FULL SUPPLY DEPTH

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. 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 TYPICAL CROSS SECTION OF MAIN CANAL IN PARTIAL CUT AND BANK FOR RAMSAGAR CHANNEL					
Project No.	Drawing No.	Sheet No.	Rev.		
	KNNL-VNC-TC-TYP-CS-003	02 of 02	0		
					
					



SCHEDULE OF REINFORCEMENT

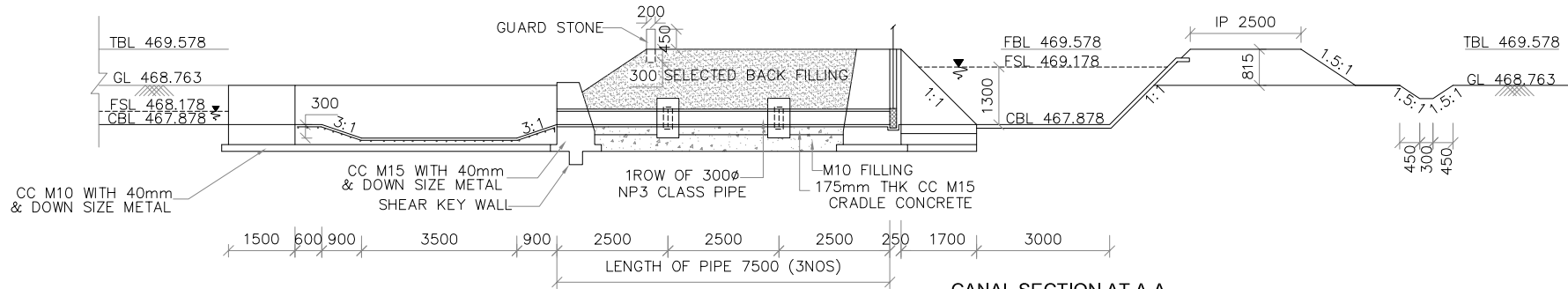
MEMBER	BAR MARK	DIA OF BAR (mm)	SPACING OF BAR (mm)	NO.OF BAR	SHAPE OF BARS (DIMENSION ARE IN MM) (NOT TO SCALE)	LENGTH OF EACH BAR (mm)	TOTAL LENGTH IN METRES	UNIT WEIGHT IN Kg/m	TOTAL WEIGHT IN Kg
ANECUT	1	10	200	3001		13810	41444	0.62	25695
	2	10	200	71		599950	42596	0.62	26410
CUT OFF WALL	3	10	200	3001x2		2200	13204	0.62	8187
	4	10	200	2x12		599950	14399	0.62	8927

TOTAL = 69219 kg
 +5% WASTAGE = 3461
 TOTAL = 72680 kg
 SAY = 72.70 kg
 Tonnes

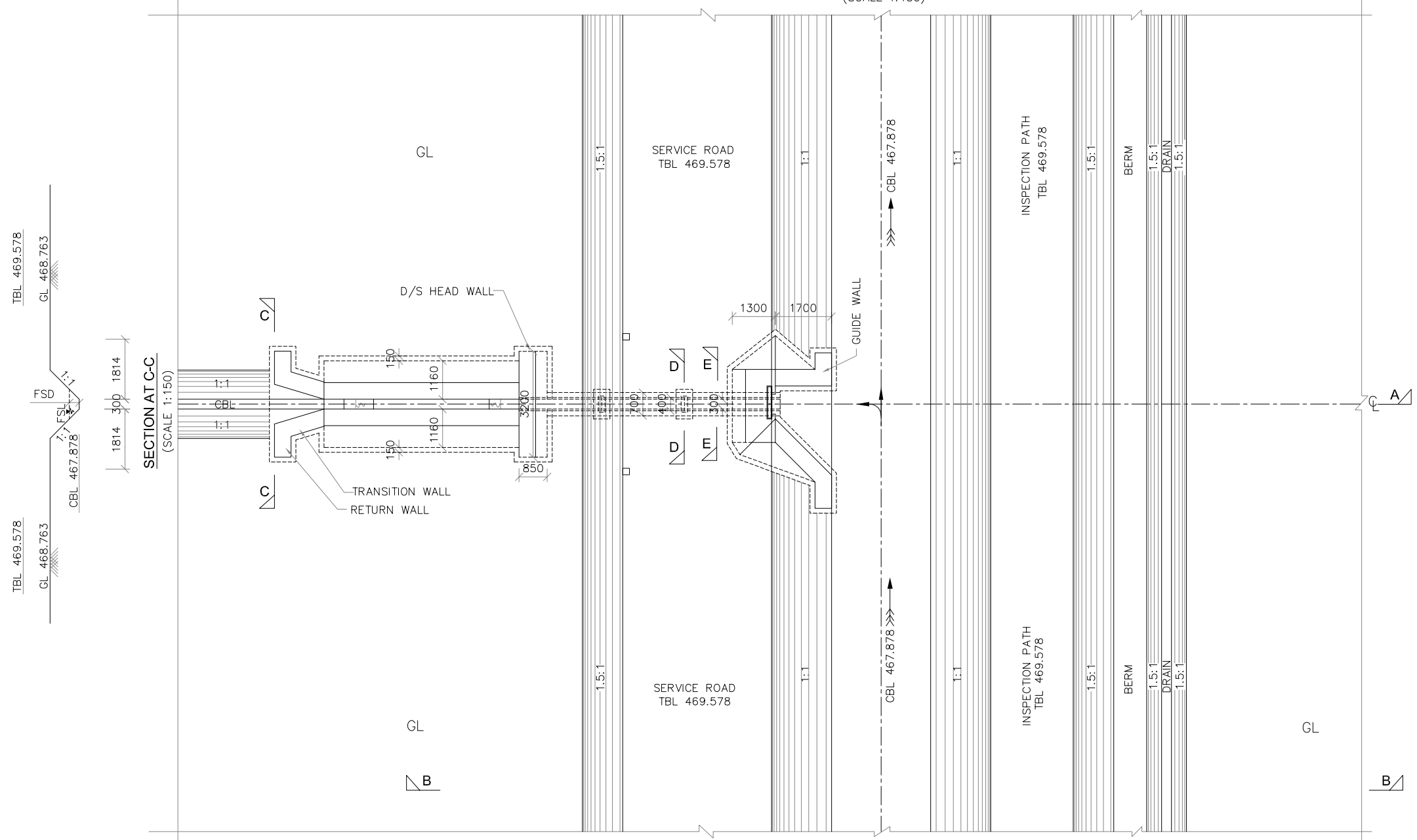
- NOTES**
- ALL DIMENSIONS ARE IN MILLIMETRES AND REDUCED LEVELS ARE IN METRES.
 - DO NOT SCALE THE DRAWING. WRITTEN DIMENSIONS ONLY SHALL BE FOLLOWED.
 - GRADE OF CONCRETE : CONFORMING TO IS 456-2000
 (i) LEVELLING COURSE IN FOUNDATION - CC M10 WITH 40mm AND DOWN SIZE COARSE AGGREGATE.
 (ii) RETAIN WALLS, WING WALLS, ABUTMENT AND APPROACH SLAB - CC M15 WITH 40mm AND DOWN SIZE COARSE AGGREGATE.
 - ALL REINFORCEMENT SHALL BE OF HIGH YIELD STRENGTH DE FORMED BARS (GRADE DESIGNATION Fe415).
 - SHARP EDGES OF CONCRETE SHALL BE CHAMFERED.

Rev.	0	For Approval	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. Ph. +91.80.40914714, Fax: +91.80.26650912 info@eitech.in • www.eitech.in						
Project Title	MODERNISATION OF VIJAYANAGARA CHANNELS IN TUNGABHADRA PROJECT						

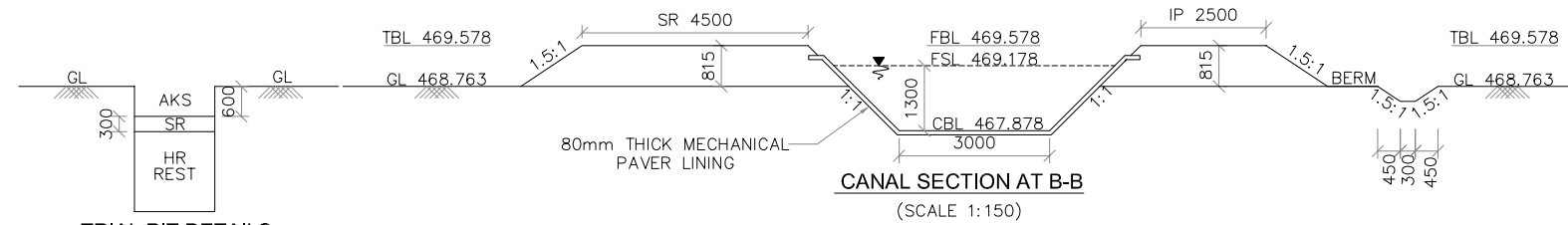
DRAWING TITLE							
IMPROVEMENT TO Bichal Anicut							
Date	Drw.	Pre.	Chk.	App.	Scale.	Drawing Status.	
					1:50,000	FOR APPROVAL	
Project No.	Drawing No.			Sheet No.	Rev.		
	KNNL-VNC-TC-STR-AC-005			01 OF 01	0		



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



PLAN
(SCALE 1:150)



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

TRIAL PIT DETAILS

- 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) 100mm 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.

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

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

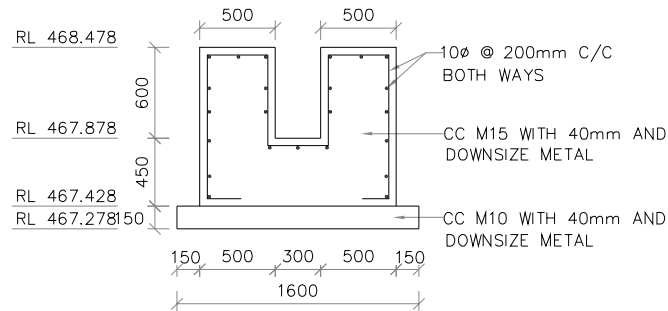
CONSULTANT
E I Technologies Pvt. Ltd.
(ISO 9001 : 2008 Certified)
1149, 26th Main, Jayanagar 4th 'T' Block,
Bengaluru-560 041, India.
Ph. +91.80.40914714, Fax: +91.80.26650912
info@eitech.in, www.eitech.in

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

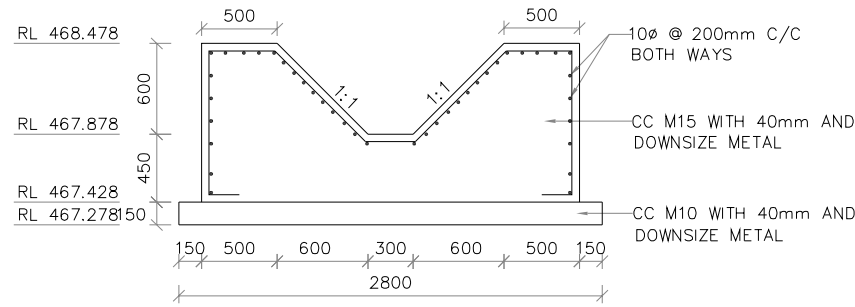
DRAWING TITLE
**CONSTRUCTION OF DIRECT PIPE OUTLET
AT CH: 6+385 KM FOR RAYA CHANNEL**

Date	Drw.	Pre.	Chk.	App.	Scale	Drawing Status
					AS SHOWN	FOR APPROVAL
Project No.	Drawing No.	Sheet No.	Rev.			
	KNNL-VNC-RC-STR-DPO-005	01 of 04	0			

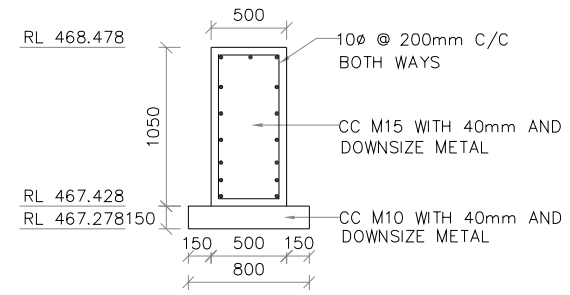
 Consultant E I Technologies Pvt. Ltd. Bangalore	 Authorized Person KARNATAKA NEERAVARI NIGAM LIMITED Bangalore	 Drawing Engineer E I Technologies Pvt. Ltd. Bangalore
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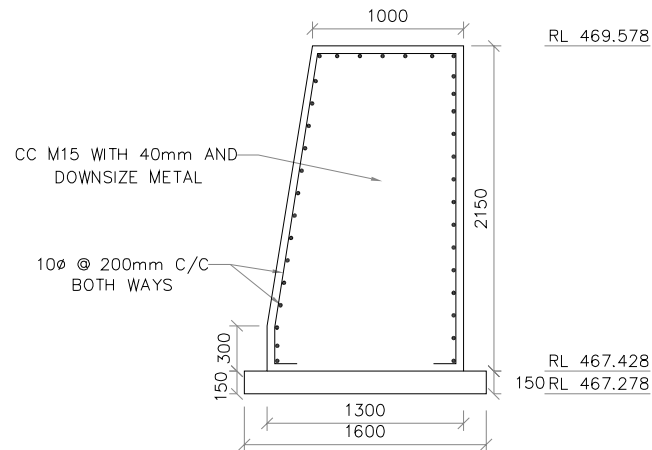
**SECTIONAL ELEVATION FOR
TRANSITION WALLS AT START**
(SCALE 1:50)



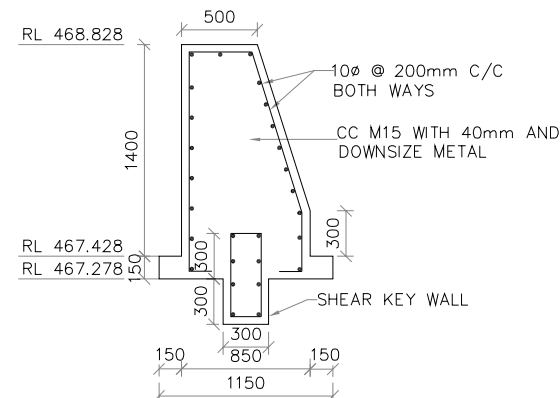
**SECTIONAL ELEVATION FOR
TRANSITION WALLS AT END**
(SCALE 1:50)



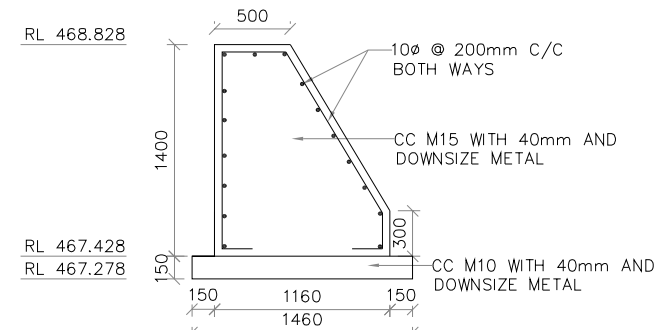
SECTION OF RETURN WALL
(SCALE 1:50)



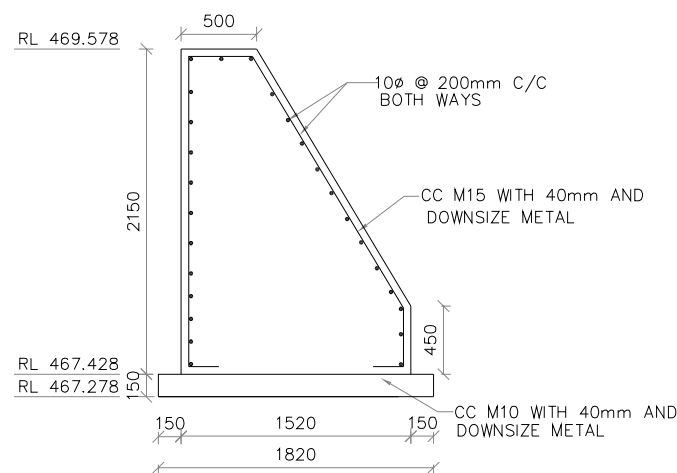
SECTION OF U/S HEAD WALL
(SCALE 1:50)



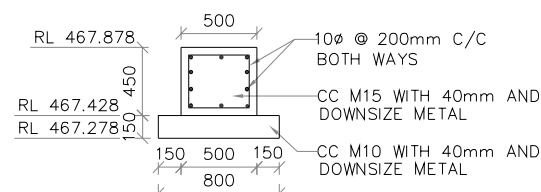
SECTION OF D/S HEAD WALL
(SCALE 1:50)



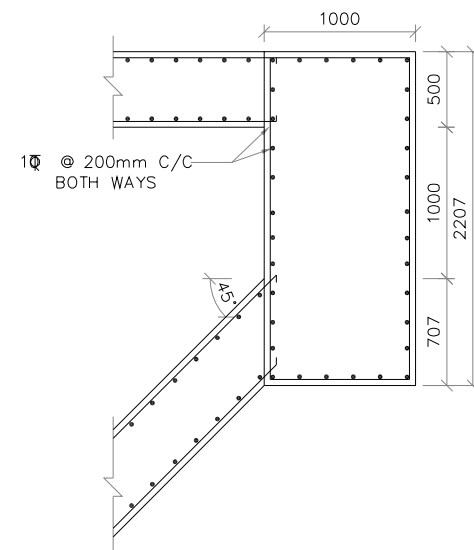
SECTION OF BASIN SIDE WALL
(SCALE 1:50)



**SECTION OF GUIDE WALL
AT MAXIMUM HEIGHT**
(SCALE 1:50)



**SECTION OF GUIDE WALL
AT MINIMUM HEIGHT**
(SCALE 1:50)



**SKIN REINFORCEMENT DETAILS OF
U/S HEAD WALL AND GUIDE WALLS**
(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.

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

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

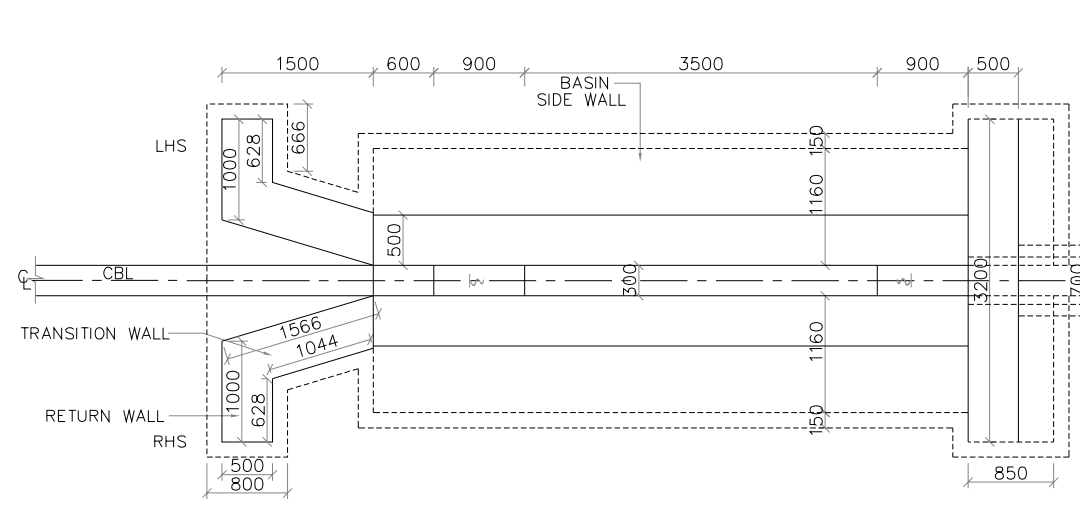
CONSULTANT
E I Technologies Pvt. Ltd.
(ISO 9001 : 2008 Certified)
1149, 26th Main, Jayanagar 4th 'T' Block,
Bengaluru-560 041, India.
Ph. +91.80.40914714, Fax: +91.80.26650912
info@eitech.in, www.eitech.in

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

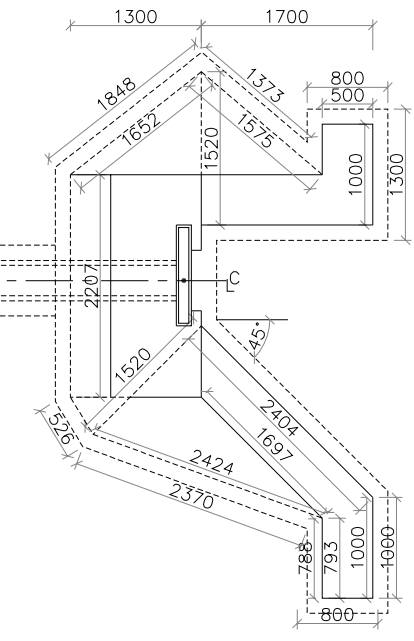
DRAWING TITLE
**CONSTRUCTION OF DIRECT PIPE OUTLET
AT CH: 6+385 KM FOR RAYA CHANNEL**

Date	Drw.	Pre.	Chk.	App.	Scale	Drawing Status
					AS SHOWN	FOR APPROVAL
Project No.	Drawing No.	Sheet No.	Rev.			
	KNNL-VNC-RC-STR-DPO-005	02 of 04	0			

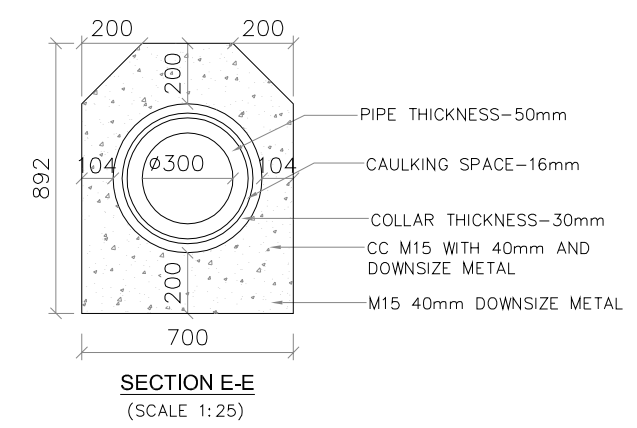
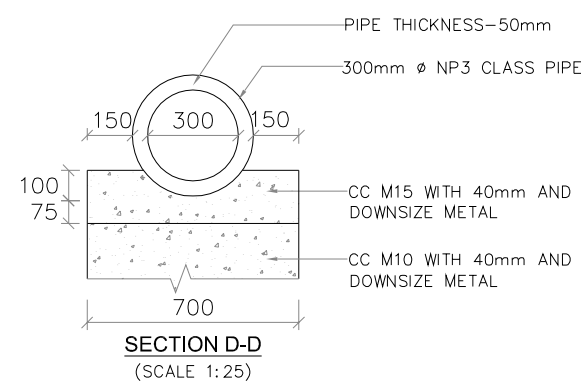
 E I Technologies Pvt. Ltd. Bangalore	 Karnataka Neeravari Nigam Limited Bangalore	 Government of Karnataka Bangalore
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PLAN OF D/S HEAD WALL, STILLING BASIN, SIDE WALLS AND TRANSITION WALLS
(SCALE 1:75)

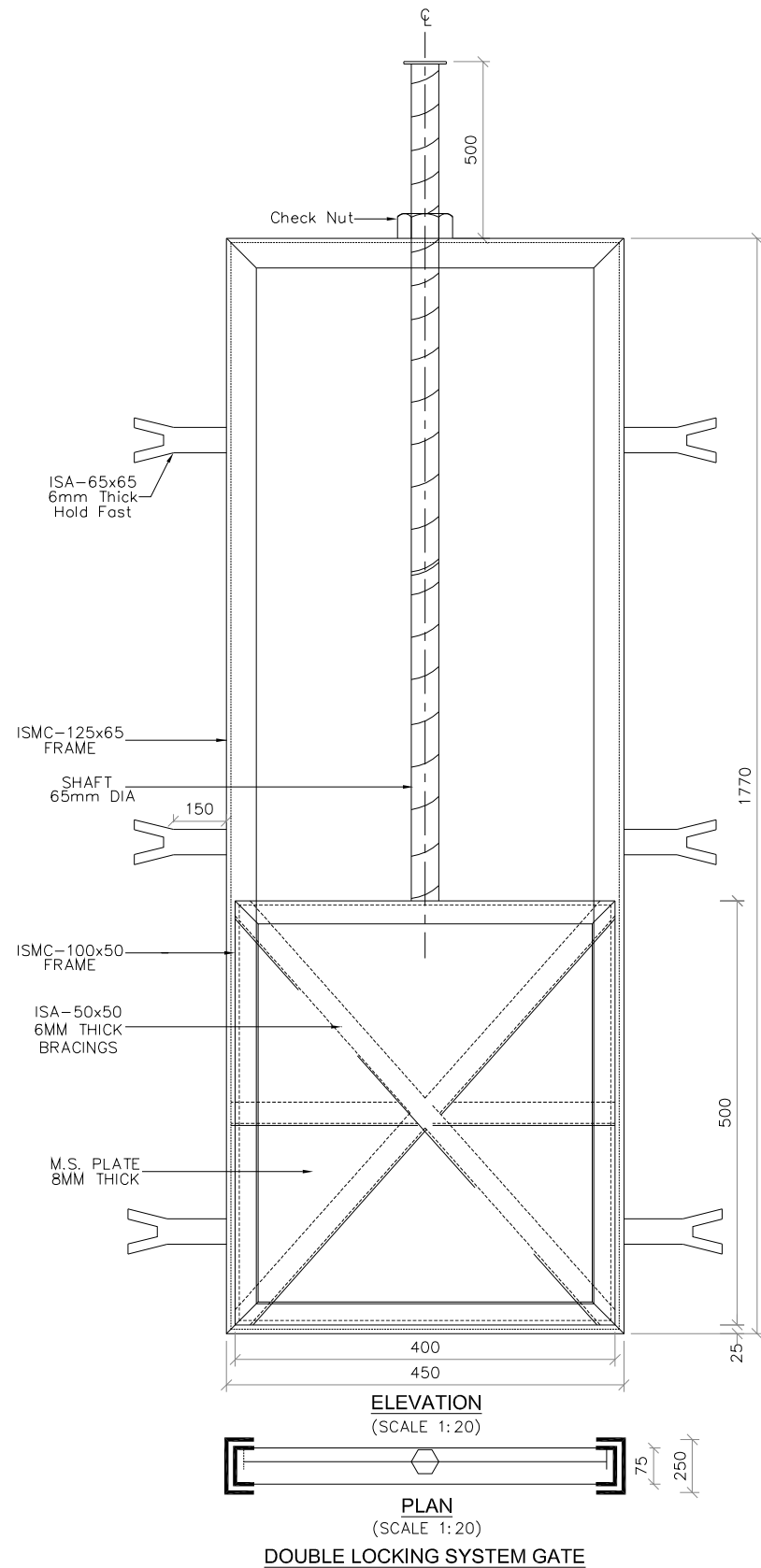


PLAN OF U/S HEAD WALL, GUIDE WALL, RETURN WALL AND U/S BASIN
(SCALE 1:75)



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.

0	For Approval					
Rev.	Description	Date	Drw.	Pre.	Chk.	App.
<p>CLIENT KARNATAKA NEERAVARI NIGAM LIMITED (A GOVT. OF KARNATAKA UNDERTAKING) BANGALORE - 560 001</p> <p>CONSULTANT 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</p>						
<p>PROJECT TITLE MODERNISATION OF VIJAYANAGARA CHANNELS IN TUNGABHADRA PROJECT</p>						
<p>DRAWING TITLE CONSTRUCTION OF DIRECT PIPE OUTLET AT CH: 6+385 KM FOR RAYA CHANNEL</p>						
Date	Drw.	Pre.	Chk.	App.	Scale.	Drawing Status.
					AS SHOWN	FOR APPROVAL
Project No.	Drawing No.	Sheet No.	Rev.			
	KNNL-VNC-RC-STR-DPO-005	03 of 04	0			
<p>Author: [Signature]</p>		<p>Checked: [Signature]</p>		<p>Approved: [Signature]</p>		
<p>Author: [Signature]</p>		<p>Checked: [Signature]</p>		<p>Approved: [Signature]</p>		



SL. NO.	ITEMS	UNIT	DIMENSION	WT./M (kg/sqm)	TOTAL WT. (kg)
1	ISMC-125 X 65 FRAME	RMT	4.45	12.70	56.51
2	ISMC-100 X 50 FRAME	RMT	1.80	9.20	16.56
3	ISA-5050; 6MM THICK. FOR BRACINGS.	RMT	1.69	4.50	7.605
4	ISA-6565; 6MM THICK. FOR HOLD-FASTS	RMT	0.90	5.80	5.22
5	M.S. PLATE 8MM THICK	SQM	0.20	62.80	12.56
6	SHAFT 65MM Ø M.S.	RMT	1.75	26.05	45.59
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. = 178.047 Kgs
 SAY = 179.000 Kgs
 = 0.179 MT

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.
<p>CLIENT KARNATAKA NEERAVARI NIGAM LIMITED (A GOVT. OF KARNATAKA UNDERTAKING) BANGALORE - 560 001</p>						
<p>CONSULTANT 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</p>						
<p>PROJECT TITLE MODERNISATION OF VIJAYANAGARA CHANNELS IN TUNGABHADRA PROJECT</p>						
<p>DRAWING TITLE CONSTRUCTION OF DIRECT PIPE OUTLET AT CH: 6+385 KM FOR RAYA CHANNEL</p>						
Date	Drw.	Pre.	Chk.	App.	Scale.	Drawing Status.
					AS SHOWN	FOR APPROVAL
Project No.	Drawing No.	Sheet No.	Rev.			
	KNNL-VNC-RC-STR-DPO-005	04 of 04	0			