



SOUTH CENTRAL RAILWAY

Headquarters Office,
Works Branch,
Rail Nilayam, 5th Floor
Secunderabad-500025

No W 71 BR/Bridge Policy

Dated: 04-12-2020

Sr.DEN/Co-ord/BZA,GNT,GTL,SC,HYB,NED

Sub: Execution of RUB/Bridge works with BOX Segmental / Pushing method – Reg.

Ref: 1 This office letter no W 352/BR/Policy/Subways dated 04-06-2015

2 RDSO letter no CBS/Cut & Cover dated 12-10-2017

3 RDSO letter no CBS/Box pushing dated 05-11-2018

At present, RUB/Bridge works in this Railway are being executed either through launching of shorter length BOX segments through Cut & Cover method (with or without RH girders) or by pushing method using longer length BOX segments. Wherever shorter length BOX segments have been used for construction of the bridge, problems of excessive gaps at joints, misalignment of segments etc., are reported in many cases. In the case of BOX pushing, issues like collapse of soil under the track, disturbance to track alignment during pushing etc., were reported during execution.

Hence, for all future proposals of BOX construction under running tracks, divisions shall adopt BOX pushing method using RH girder to the extent possible as per Rly Board's policy guidelines dated 29-05-2015 which were communicated to all divisions earlier vide letter under Ref (1). This method will be speedier than conventional BOX pushing and will avoid construction of heavy thrust bed for pushing of BOX segments through formation as the pushing can be achieved using an auxiliary thrust bed. Alternately, method of rolling of BOX under the track after insertion of RH girder (Air pushing) without a thrust bed can also be tried for single cell BOX as suggested under RDSO's letter under ref (2).

Construction of BOX by launching with shorter length segments should be proposed only when it is not possible to insert RH girders or when BOX pushing/rolling itself is not feasible due to any other site specific constraints. Similarly, BOX pushing without RH girder should be resorted under special circumstances like Yards having multiple lines, Double vent BOX of larger width etc. In such cases of pushing, innovated methodology of providing steel protection plate at formation level adopted in N.Rly and circulated vide RDSO letter under Ref (3) shall be tried to enhance safety. Adequate justification should be furnished while processing the GADs for approval wherever BOX insertion without RH girder or with shorter length BOX segments is being proposed. Copies of the letters referred above are placed on <https://scr.indianrailways.gov.in/> under Engineering OL sub-head for ready reference.

K. Rama Krishna
4/12/2020

(K. Rama Krishna)

Chief Bridge Engineer

Copy: CAO(C), CE/RSW, CE/BRH for information.



SOUTH CENTRAL RAILWAY
OFFICE OF THE PRINCIPAL CHIEF ENGINEER
5TH FLOOR, RAIL NILAYAM, SECUNDERABAD - 71

W.352/BR/POLICY/SUBWAYS

04-06-15

Sr.DEN/Co-Ord/SC, HYB, BZA, GNT, NED&GTL

Sub: Construction of Road Under Bridge (RUB's)

Ref: Railway Board letter No.2014/CE-III/BR/Bridge Policy dated
29-05-15

In connection with the above subject, please find enclosed a copy of the Railway Board letter under reference received from Executive Director/CE/B&S-II railway board, regarding restrictions in construction of Road Under Bridge, by Box pushing method.

This is for your kind information and necessary action.

Encl: As above


(N. Janardhana Reddy)

AEN/ROB

For Chief Bridge Engineer

6
4-6-15


Copy to OS/ROB, SSE/ROB, JE/ROB

**GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS
(RAILWAY BOARD)**

No.2014/CE-III/BR/Bridge Policy

New Delhi, Dated 29.05.2015

**Principal Chief Engineer,
All Zonal Railways**

**Chief Administrative Officers (Construction)
All Zonal Railways**

Sub: Construction of Road Under Bridge (RUBs)

It has come to the notice of Board that at some locations there had been certain collapse of earth while carrying out the work of Road under Bridges using Box Pushing Techniques and this led to unsafe conditions. This issue has also been discussed in the recently held PCE conference on 22nd of April 2015 and it has been reiterated that Box Pushing Technique should not be resorted for providing Limited Subway/ RUB.

In view of the aforesaid, Zonal Railway is directed to construct the Road Under Bridges or Limited Height Subway preferably by using relieving girders to the extent possible and in exceptional circumstances Box Pushing Techniques should be adopted that too, with the personal approval of PCE/CAO/C concerned.


29/5/2015
(S.K. Pathak)

**Executive Director/CE/B&S-II
Railway Board**

Copy to:

1. Chief Bridge Engineers. All Zonal Railways.
2. ED/B&S, RDSO
3. ED/Structures, RDSO

Plr circulate to all Division


02-06-15
CBT

DyCE/Brden
Arvind
for n/a *Agarwal* *2/6/15*

Abhay Kumar

अभय कुमार

Director/ B&S/ CB-II

निदेशक/पुल एवं संरचना/ सीबी-2

Signature

भारत सरकार-रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ- 226011

S.No. 29

Government of India-Ministry of Railways
Research Designs & Standards Organisation
Lucknow- 226011

Rly. : 032-42124 Phone / Fax : 0522-2465706

Email : dbs2rdso@gmail.com

No. CBS/Cut & Cover

Dated: 12.10.2017

A. The Chief Bridge Engineer:

1. Central Railway, Mumbai CST-400 001
2. Eastern Railway, Fairlie Place, Kolkata-700 001
3. East Central Railway, Hazipur - 844101
4. East-Coast Railway, Bhubaneshwar- 751 016
5. Northern Railway, Baroda House, New Delhi- 110 001
6. North-Central Railway, Allahabad.211 001
7. North Eastern Railway, Gorakhpur-273 001
8. North-Western Railway, Jaipur 302 001
9. Northeast Frontier Railway, Maligaon, Guwahati-781 011
10. Southern Railway, Park Town, Chennai-600 003
11. South Central Railway, Rail Nilayam, Secunderabad-500 371
12. South East Central Railway, Bilaspur 495 004
13. South Eastern Railway, Garden Reach, Kolkata-700 043
14. South-Western Railway, Hubli 580 023
15. Western Railway, Mumbai-400 020
16. West-Central Railway, Jabalpur- 482 001

Sub: Construction of RUB/Subway as a single barrel by using combination of 'Cut, Open and push the RCC Box' method.

Southern Railway developed a drawing for construction of RUB/LHS/Subway by combining cut, open and pushing the RCC box (air pushing) as a single unit. In this method complete box has been casted as single unit outside the track in the same alignment of level crossing and during block the complete single unit was pushed to the pre decided location after cutting the embankment.

Based on this drawing, the work of elimination of unmanned LC No. 65D in Arrakkonam - Renigunta section at Km 123/35-37 in Chennai Division of Southern Railway was executed. The size and length of the RCC box was 5m x 3.66 m and 14m respectively weighing about 385 tonnes. Box was pushed using girder, roller, jacks etc. without thrust bed.

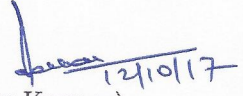
Presently, the work of RUB/LHS/Subway is being done mainly by two methods-Box pushing method and segmental box method. While Zonal Railway have gained experience in both the methods over a period of time, both the methods have certain drawbacks like casting of heavy thrust bed and slow progress of work in case of box pushing method and requirement of heavy capacity cranes, OHE shutdown, gap in box segments etc. in case of segmental box method.

The method developed by Southern Railway have certain advantages like elimination of gap (as single box insertion planned), no thrust bed requirement, pushing arrangements (i.e. girder, roller, jacks etc.) can be rotated/re-used for pushing the boxes, elimination of high capacity cranes, no OHE shutdown. Due to this inherent advantage over the methods presently being adopted for the work of ROB/LHS/Subway, there is saving in execution cost also.

Keeping in view above, a typical drawing bearing No. RDSO/B-10160 to execute the work for construction of RUB/LHS/Subway has been developed (uploaded on RDSO website www.rdsr.railnet.gov.in) which can be followed by Zonal Railway with following stipulations:-

- (i) This drawing is applicable for single unit RCC box for a length up to 14m only with size 5m wide and 3.66 m high (inner dimensions) weighing about 385 tonnes.
- (ii) For boxes of different sizes, Zonal railway should design and check stresses resulting from point loads at four jacking points, supporting arrangement and adequacy of base slab etc.
- (iii) This method to be used initially with RH girder only. After getting sufficient experience, this method can be applied without RH girder also in future.
- (iv) After adoption of this drawing each railway should give feedback for further improvement.
- (v) The box has to be cast in the same alignment of level crossing of final location. In order to facilitate the works of construction of subway, the approach road of LC to be suitably diverted.

For any assistance, Shri K.N.Murthy, SSE/Bridge/Chennai/Egmore, Mob. No. 9003061224 can be contacted who was associated with the execution of work at unmanned LC No. 65D in Chennai Division.


(Abhay Kumar)
Director/B&S/CB-II
For Director General

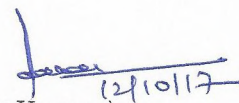


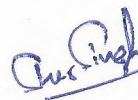
o/c

Copy to:

B. The Chief Administrative Officer (Constn.):

1. Central Railway, Mumbai CST-400 001.
 2. Eastern Railway, Fairlie Place, Kolkata-700 001.
 3. East Central Railway, Mahendrugat, Patna (Bihar)-800 004.
 4. East Coast Railway, Bhubaneswar, (Orissa) 751 016
 5. Northern Railway, Kashmere Gate, Delhi-110 006.
 6. USBRL Project, Northern Railway, Satyam Complex, Trikuta Nagar Extn., Jammu-180 020.
 7. North Central Railway, Allahabad, (U.P.).
 8. North Eastern Railway, Gorakhpur-273 001.
 9. North Western Railway, Jaipur, (Rajasthan) 482 001
 10. Southern Railway, 183, Periyar High Road, Egmore, Chennai - 600 008
 11. South Central Railway, DRM/Secunderabad Office Compound, Secunderabad-500 371.
 12. South Eastern Railway, Garden Reach, Kolkata-700 043
 13. South East Central Railway, Bilaspur 495 004
 14. South Western Railway, No. 18 Miller Road, Bangalore, (Karnataka) 560 046
 15. Western Railway, Mumbai-400 020.
 16. West Central Railway, Jabalpur. (M.P.) 482 001
 17. Southern Railway, Karshaga Road, GCDA Complex, 1st Floor, Ernakulam, Kerala-682 012.
- C.** General Manager (Construction), Construction Organization, N.F. Railway, Maligaon, Guwahati.
- D.** Executive Director Civil Engg./B&S, Railway Board, Rail Bhawan, Room No.140A, New Delhi-110001
- E.** Director, Indian Railway Institute of Civil Engineering (IRICEN), Pune - 410 001.


(Abhay Kumar)
Director/B&S/CB-II
For Director General



o/c

V.K. Srivastava
वी०के०श्रीवास्तव
Executive Director/Structures
कार्यकारी निदेशक/संरचना



भारत सरकार - रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ - 226011
Government of India-Ministry of Railways
Research Designs & Standards Organisation
Lucknow- 226011
Rly. : 032-421246 Phone / Fax : 0522-2465704
Email : edstructures@gmail.com

No. CBS/Box Pushing

Dated: 05.11.18

Principal Chief Engineer,
All Zonal Railways
(as per mailing list attached)

Chief Administrative Officer (Construction)
All Zonal Railways
(as per mailing list attached)

Sub: New methodology for construction of subway.

Ref.: Board's letter No. 2017/CE-IV/RUB/88 dated 30.10.2018.

Northern Railway has adopted an innovative methodology for construction of subways using Box Pushing Technique by providing a steel protection plate arrangement at the formation level which has the advantage of faster progress and less disturbances to the track during the box pushing operations. The methodology was also discussed in the PCE & CAO/C's Seminar held on 31.10.18 and 01.11.18 in Railway Board. Vide the letter under reference, Board has also directed for circulation of the innovated methodology to all Zonal Railways.

Northern Railway has recently executed the box pushing with innovated methodology at the following locations:

- 1) RUB at km47/11-13 between Sonapat and Sandal Kalan stations on Delhi-Ambala section
- 2) RUB at km 126/11-13 between Karnal and Beni Khurd stations on Delhi-Ambala section

The relevant drawings for the above locations are enclosed. After adoption of the innovated methodology for construction of RUB/Subway, Zonal Railways are requested to provide feedback for further improvement. A copy of this letter has also been uploaded on railnet site 10.100.2.19 -> Bridges and Structures Directorate -> RDSO's letters to Rlys.

For any assistance Shri S.K.Shukla, SSE/W/C/PNP, Mb.9729530228 and Shri K.P.Singh, XEN/C/PNP, Mb. 9717638314, who were associated with the execution of this RUB/Subway work with protection plate arrangement, may be contacted.

DA:

- (a) General Arrangement Drg. No. Dy.CE/C/CSB Plan No. LM-877/2016.
- (b) Drawings of protection arrangement (Dy.CE/C/CSB Plan No. LM-934/2017)

- (c) Launching Methodology for protection arrangement and box pushing methodology (Dy.CE/C/CSB Plan No. LM-944/2018)
- (d) General Arrangement Drg. No. XEN/Br:(S&D)/898/GAD.
- (e) Drawings of pushing arrangement (Dy.CE/C/CSB Plan No. LM-874/2016).
- (f) Launching Methodology for protection arrangement and box pushing methodology (Dy.CE/C/CSB Plan No. LM-921/2017).


05/11/18
(V.K Srivastava)

Executive Director/Structures

Copy to:

- I. General Manager (Construction), Construction Organization, N.F. Railway, Maligaon, Guwahati.
- II. Executive Director Civil Engg./B&S, Railway Board, Rail Bhawan, Room No.140A, New Delhi-110001
- III. Director, Indian Railway Institute of Civil Engineering (IRICEN), Pune - 410 001.


05/11/18
(V.K Srivastava)

Executive Director/Structures

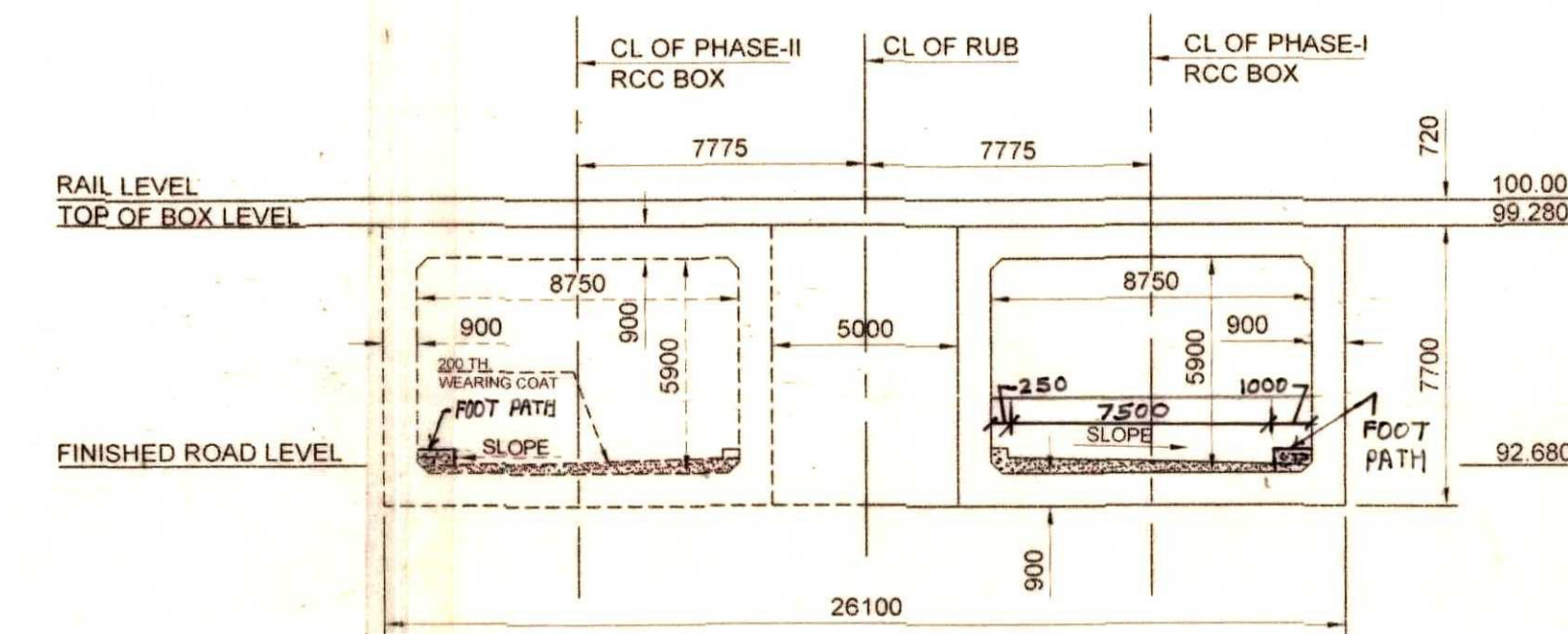
Mailing list:

A. The Principal Chief Engineer :

1. Central Railway, Mumbai CST-400 001
2. Eastern Railway, Fairlie Place, Kolkata-700 001
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4. East-Coast Railway, Bhubaneshwar- 751 016
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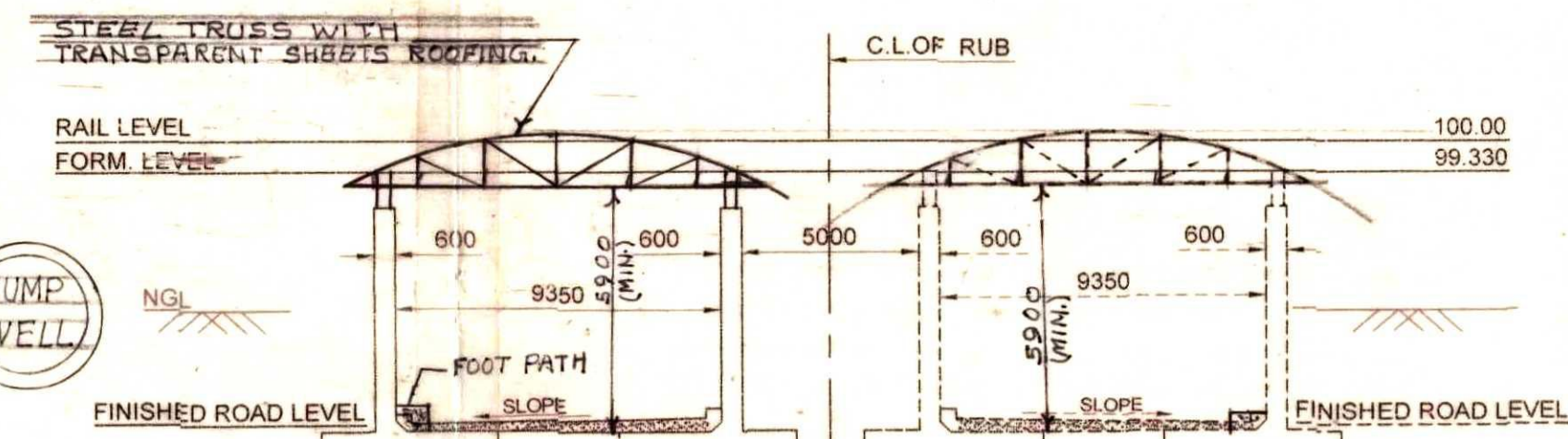
B. The Chief Administrative Officer (Construction):

1. Central Railway, Mumbai CST-400 001.
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17. Southern Railway, Karshaga Road, GCDA Complex, 1st Floor, Ernakulam, Kerala- 682 012.

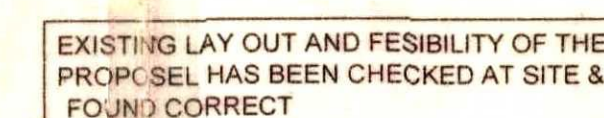


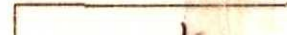
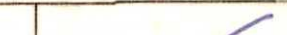
SECTIONAL ELEVATION AT A-A

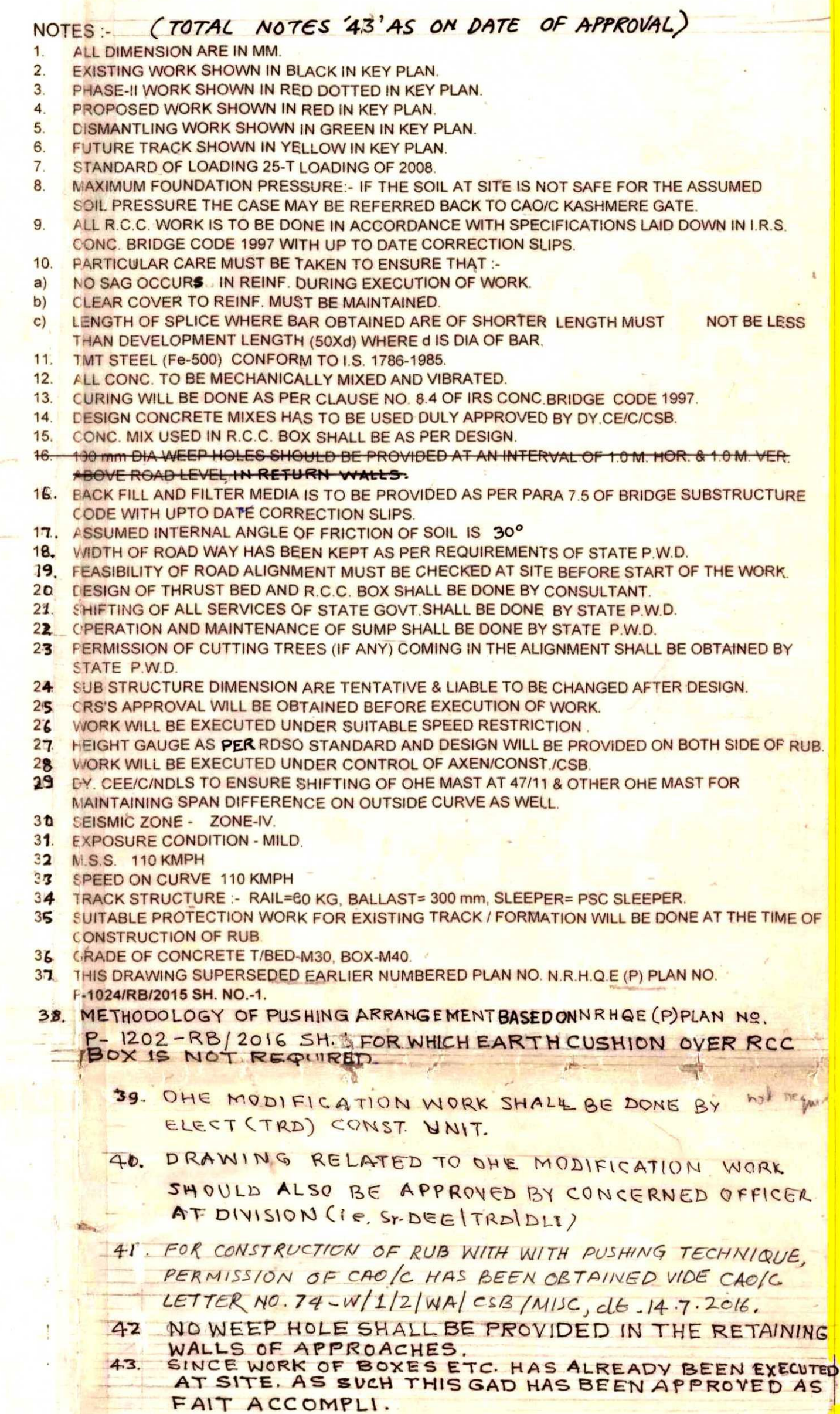
L-SECTION



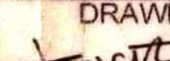
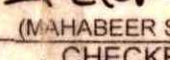
PLAN



		
SDO/PWD/SNP	XFN/PWD	SE/PWD



NO	DATE	REVISION	BY	CHKD

PROJECT	DELHI DIVISION		
CONSTRUCTION OF ROAD UNDER BRIDGE RCC BOX 2X8.75X5.90 m. AT Km. 47/12-14 ON DELHI - AMBALA SECTION NEAR SANDAL KALAN STATION (BY PUSHING TECHNIQUE)			
CLIENT	NORTHERN RAILWAY		
TITLE	GENERAL ARRANGEMENT		
FIELD OFFICE	DEPUTY CHIEF ENGINEER/CONST. N.R. SHIVAJI BRIDGE, NEW DELHI		
DRAWN  (M. MAHABIER SINGH) CHECKED  (M. MAHABIER SINGH)	APPROVED	SCALE: - 1:200 DATE: -	DRG.NO. DY.CE/C/CSB PLAN NO. RUB-877/2016

NOTES :-

1. ALL DIMENSION ARE IN MM.
2. EXISTING SHOWN IN BLACK IN KEY PLAN.
3. PROPOSED WORK SHOWN IN RED IN KEY PLAN.
4. PROPOSED WORK SHOWN IN RED IN KEY PLAN.
5. FUTURE TRACK SHOWN IN YELLOW IN KEY PLAN.
6. PUSHING ARRANGEMENT SHOWN IN RED MAIN PLAN.
7. SIZE OF BEAM MAY BE CHANGED TO PROVIDE SUPER ELEVATION (IF REQUIRED).
8. E-250 BR/A QUALITY STEEL TO BE USED IN FABRICATION OF PROTECTION ARRANGEMENT.
9. THIS DRAWING BASED ON EARLY APPROVED DRAWING NO. N.R.H.Q.E.(P) PLAN NO. P-1202-RB/2016 SH.NO.1.

METHODOLOGY

PRE BLOCK ACTIVITY

1. SPEED RESTRICTION OF 20KMPH WILL BE IMPOSED. RAIL CUT WILL BE PROVIDED IN TRACKS.
2. BALLAST WILL BE REMOVED FROM CRIB AND SHOULDERS.

DURING TRAFFIC BLOCK

1. TRACK WILL BE REMOVED DURING TRAFFIC BLOCK.
2. THE BALLAST CUSHION UNDER SLEEPER WILL BE REMOVED AND FORMATION WILL BE LEVELED.
3. 54 mm THICK SAND LAYER WILL BE LAID ON FORMATION (LEVELING COURSE).
4. 16 mm TH. MS PLATE WITH ISHB FIXED ON IT WILL BE PROVIDED AS PER DIRECTION OF ENGINEER INCHARGE OVER EXCAVATED TRACK.
5. RUBBER PAD WILL BE PROVIDED ABOVE ISHB 150 BEFORE LAYING OF TRACK.
6. TRACK WILL BE PLACED & CONNECTED.
7. BLOCK WILL BE CLEARED.

POST BLOCK ACTIVITY

1. THE ENDS OF 16mm MS PLATE WILL BE ANCHORED WITH JOIST ALREADY FIXED WITH ANCHOR WALL AT THRUST BED.
2. PROTECTION SYSTEM BELOW BOTH TRACK WILL BE CONNECTED TOGETHER.
3. PUSHING WILL BE CARRIED OUT TILL COMPLETION.
4. ON COMPLETION OF PUSHING, JOINTS BETWEEN BOXES SHALL BE GROUTED & SEALED.

DURING BLOCK (AFTER COMPLETION OF WORK)

1. REMOVE TRACK.
2. REMOVE PROTECTION PLATE.
3. LAY BALLAST.
4. LINK TRACK.
5. CLEAR TRAFFIC BLOCK.

Pushing Methodology :-

1. Pushing of both side boxes will be done simultaneously and minimum 550mm gap between front line of boxes will be maintaining.

SN.	DATE	DESCRIPTION	SIGN.
REVISIONS			

NORTHERN RAILWAY

DRAWING OFFICE

DEPUTY CHIEF ENGINEER/CONST. SHIVAJI BRIDGE, NEW DELHI



PROJECT:-

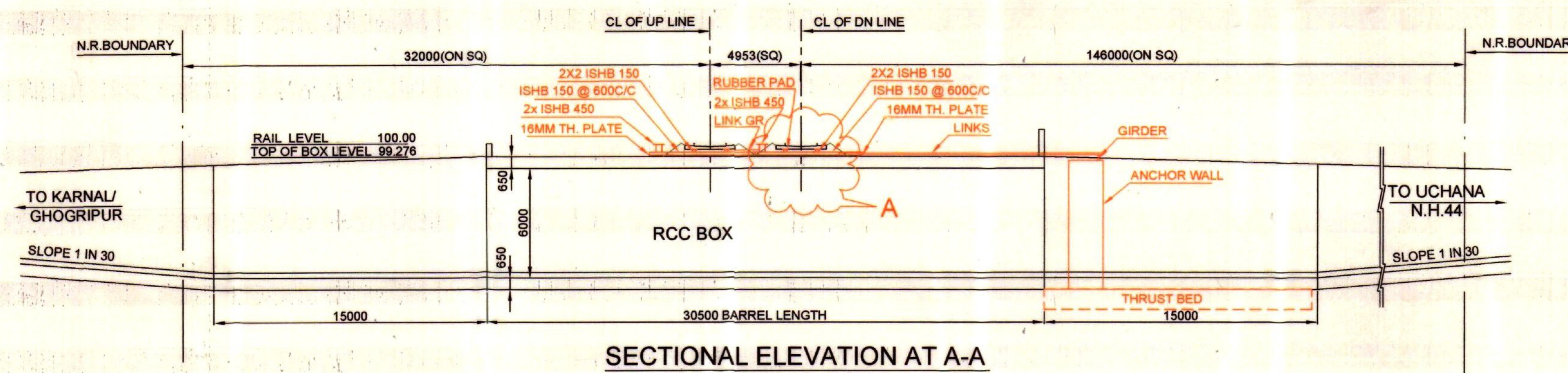
DELHI DIVISION

CONSTRUCTION OF ROAD UNDER BRIDGE
FOR RELIEF ROADFROM UCHANA TO GHOGRIPUR TO NH-44
(VIA BAJIDA JATTAN - DAHA JAGIR SECTION)
AT KM.126/11-13 ON DELHI-AMBALA SECTION

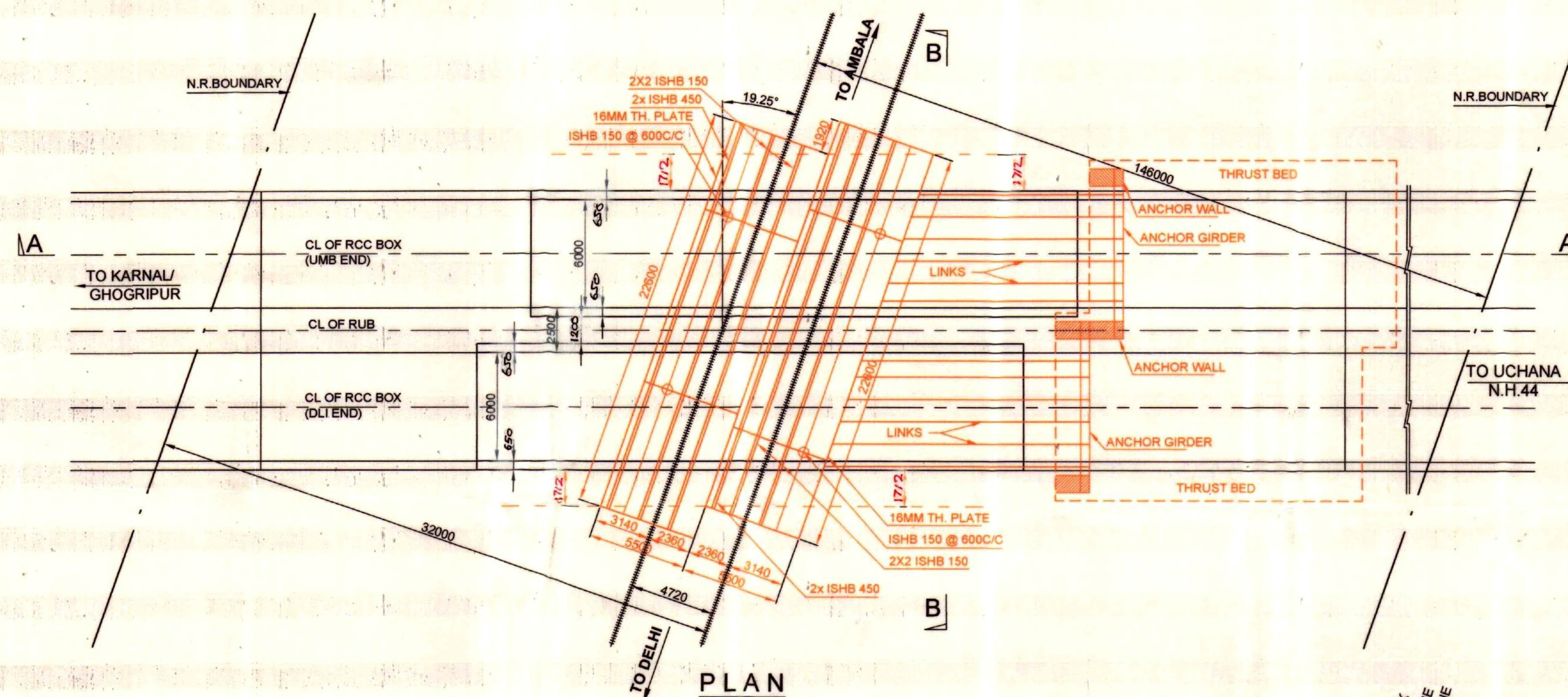
PROTECTION ARRANGEMENT

DRAWN <i>[Signature]</i> (MAHABEER SINGH)	SCALE:- 1:200.	DATE:-
CHECKED (CHANDER PAL)	DY.CE/C/CSB PLAN NO. RUB-934/2017	HQ CASE FILE NO.
NRHQE (P) PLAN NO. P-1053-RB/2015 SH.NO.4		

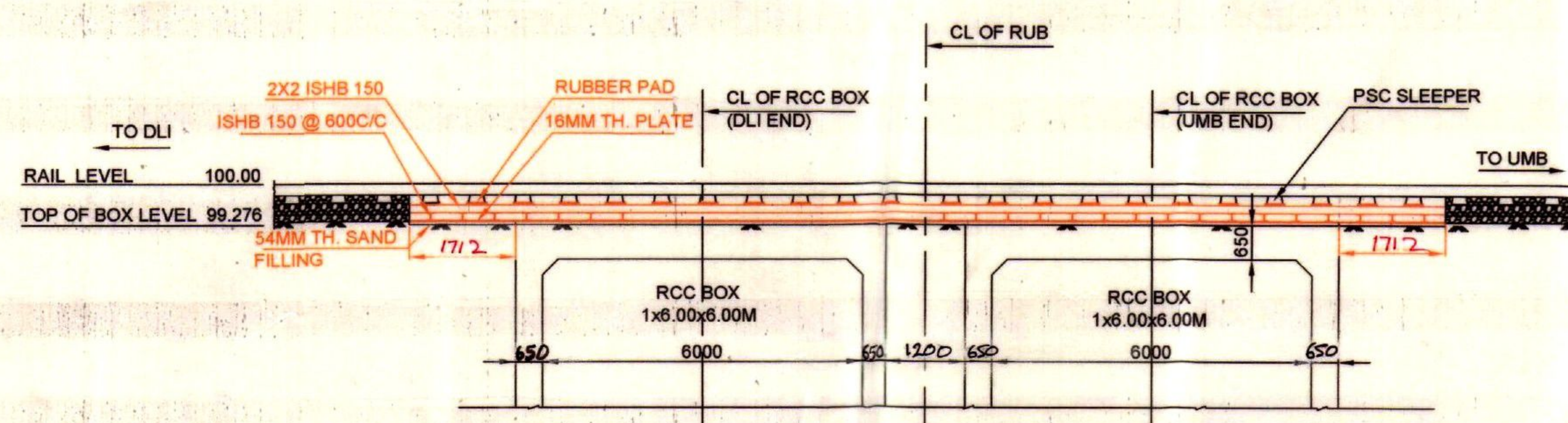
<i>[Signature]</i> (S. K. SHUKLA)	<i>[Signature]</i> (K. P. SINGH)	<i>[Signature]</i> (R. K. GUPTA)	<i>[Signature]</i> (V. P. DUDEJA)
SSE/W/C/PNP	XEN/C/PNP	DY.CE/C/CSB	CE/C/CENTRAL



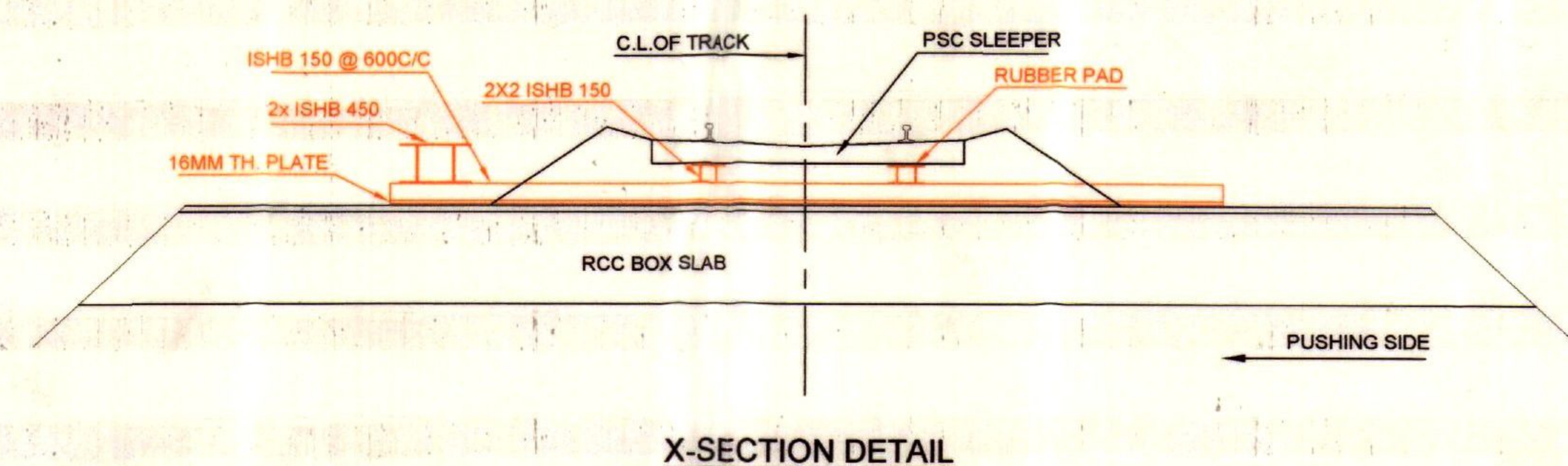
SECTIONAL ELEVATION AT A-A



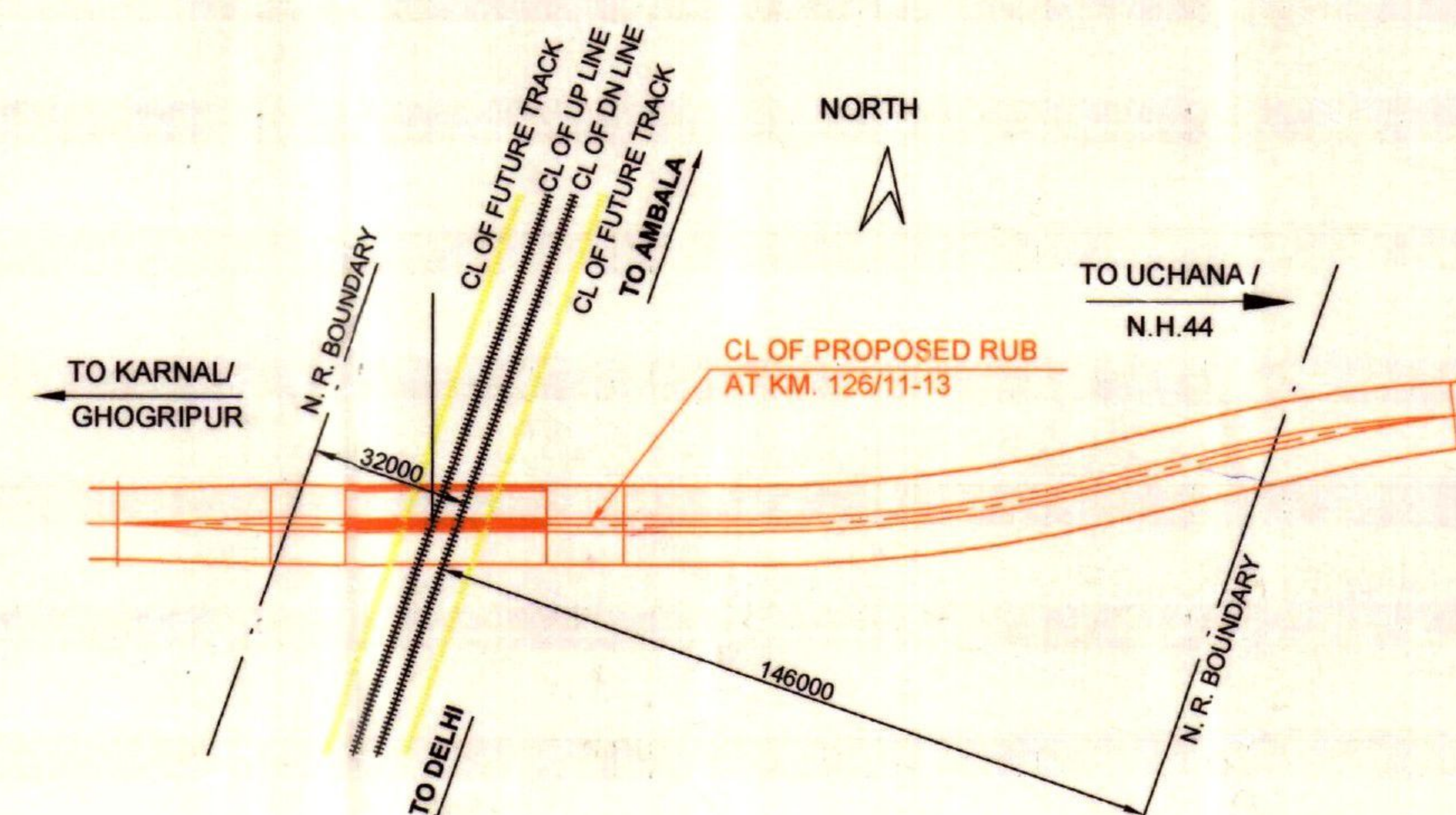
PLAN



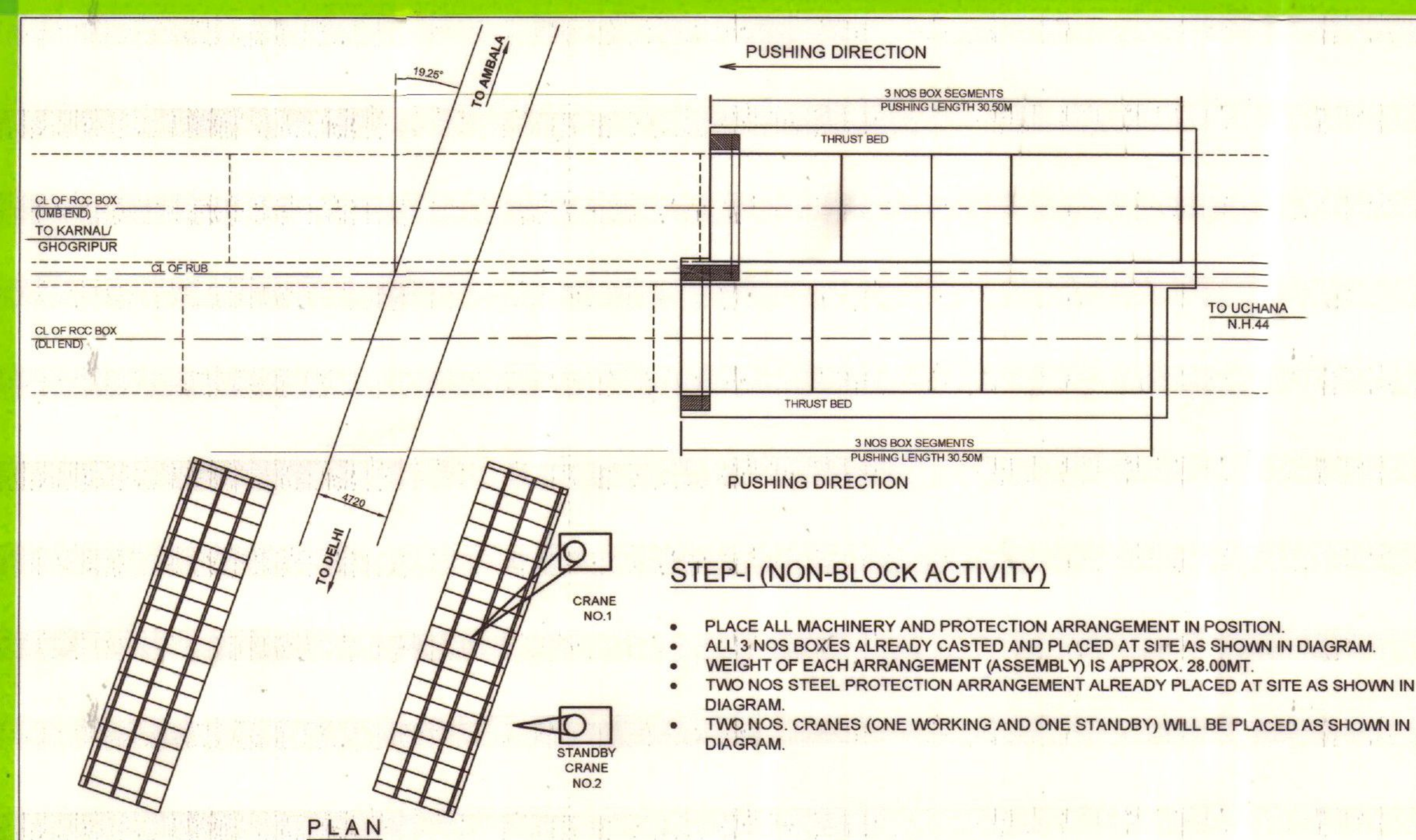
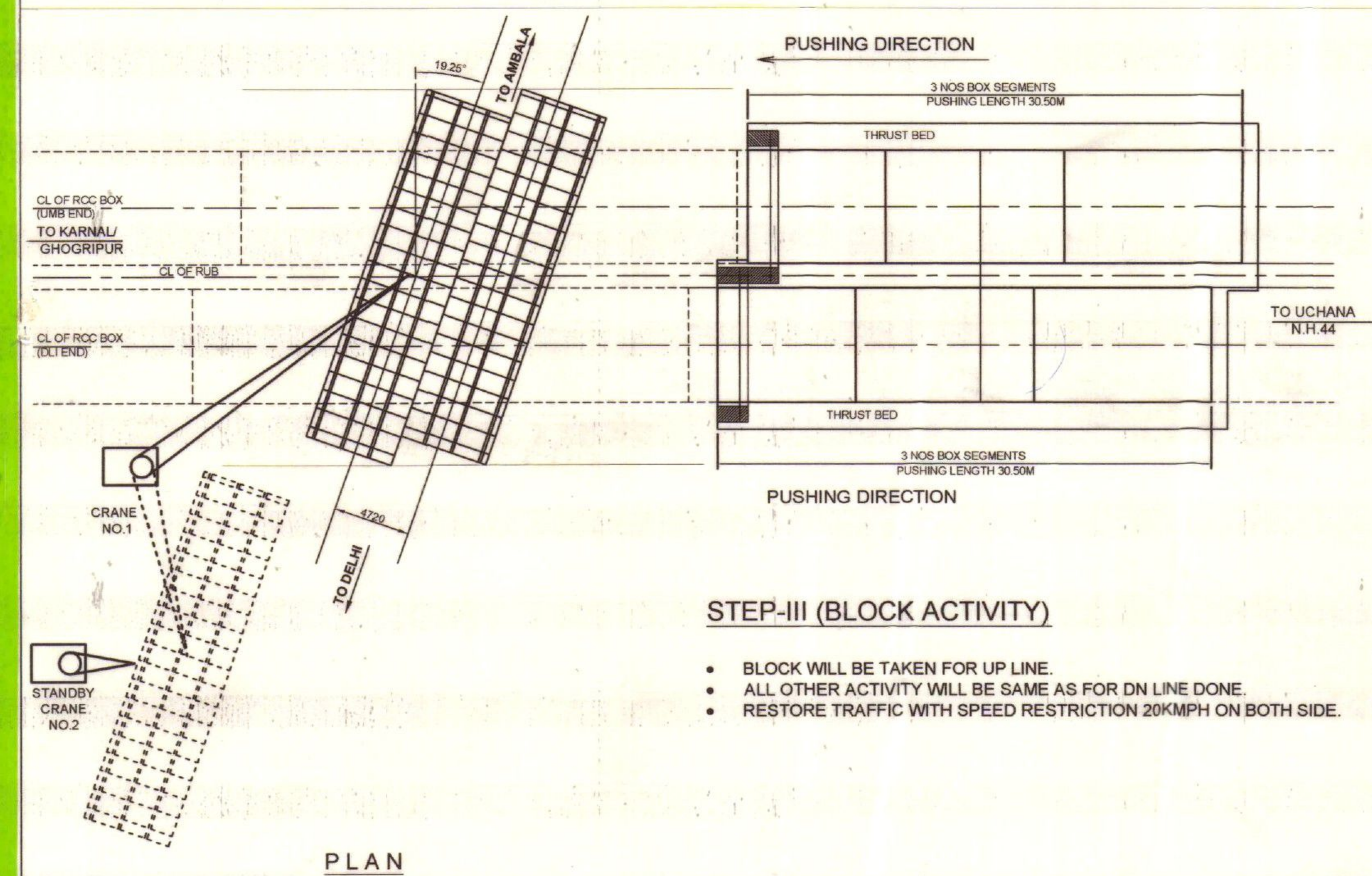
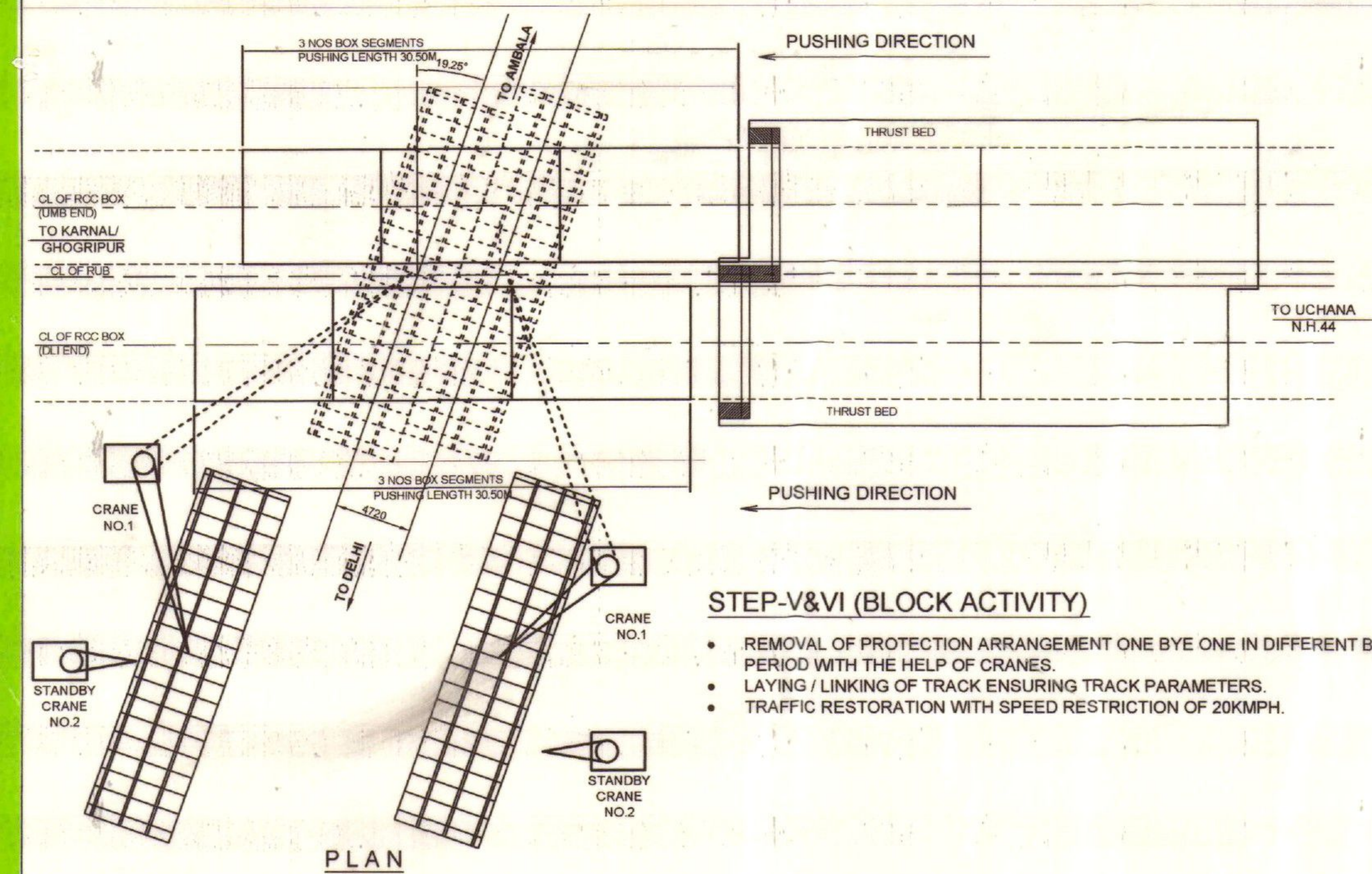
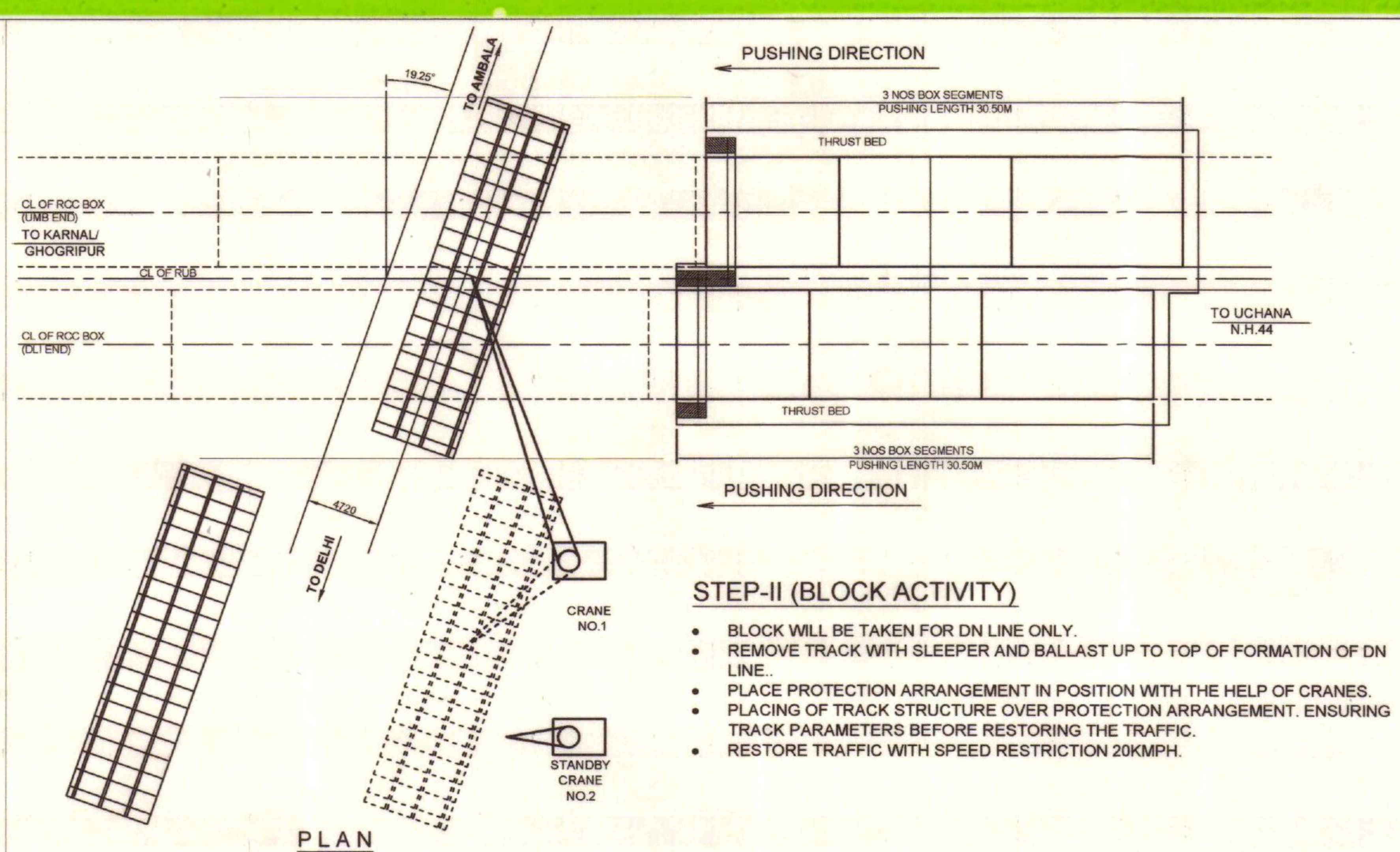
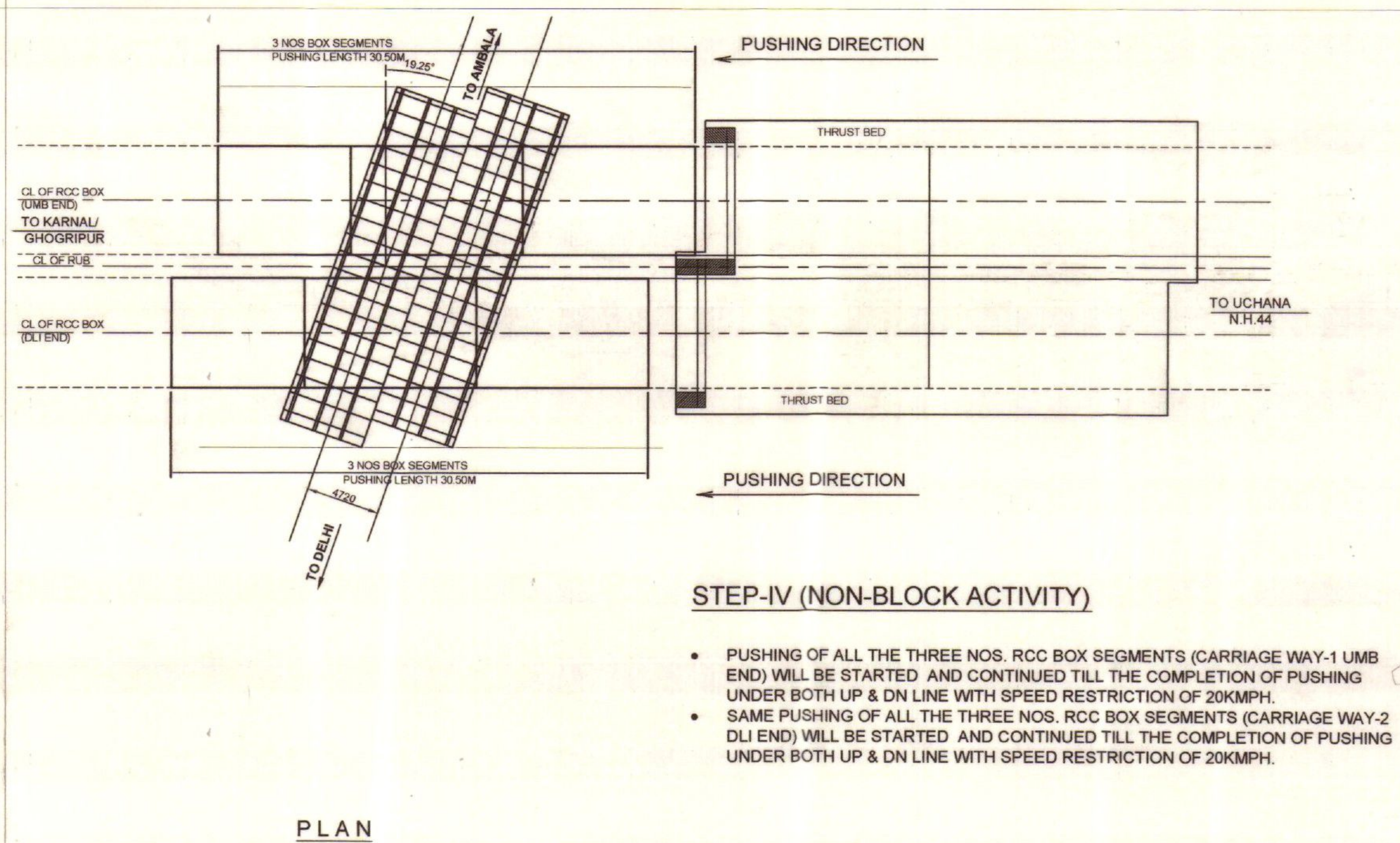
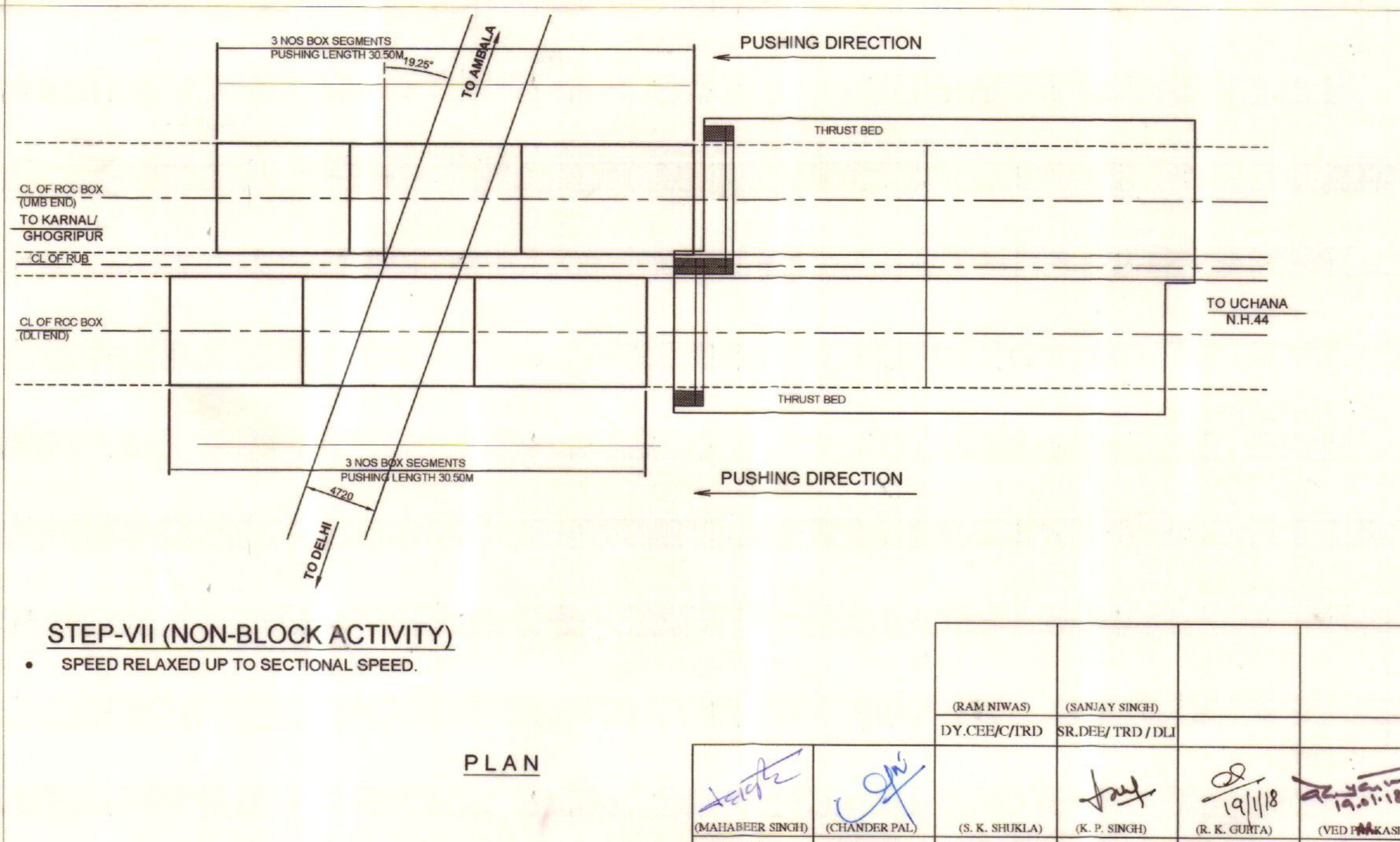
SECTION B-B



X-SECTION DETAIL



KEY PLAN



FABRICATION AND ASSEMBLING

DETAIL OF PROTECTION ARRANGEMENT

- 2 NOS STEEL PLATE GIRDER WITH ISHB FABRICATED AND ASSEMBLED AS PER APPROVED DRAWING NO. NRHQE(P) PLAN NO.P-1053-RB/2015
- SIZE OF PROTECTION ARRANGEMENT 22.60x5.50M.
- WEIGHT OF EACH ASSEMBLY 28 MT(APPROX.)
- TOTAL TWO NOS OF PROTECTION ARRANGEMENT WILL BE LAUNCHED FOR BOTH UP AND DN LINE TRACK AS SHOWN IN STEPS.
- ROAD CRANE OF SUITABLE CAPACITY WILL BE ARRANGED AND PLACED IN POSITION.
- ONE NOS CRANE STANDBY WILL BE AVAILABLE AT SITE.

LAUNCHING SEQUENCES

PRE BLOCK ACTIVITY

- SPEED RESTRICTION OF 20KMPH WILL BE IMPOSED RAIL CUT WILL BE PROVIDED IN TRACKS.
- FISH PLATES WILL BE PROVIDED ON ALL JOINTS.
- BALLAST WILL BE REMOVED FROM CRIB & SHOULDERS.

DURING TRAFFIC BLOCK

- TRACK WILL BE REMOVED DURING TRAFFIC BLOCK.
- THE BALLAST CUSHION UNDER SLEEPER WILL BE REMOVED AND FORMATION WILL BE LEVELED.
- 25mm THICK SAND LAYER WILL BE LAID ON FORMATION (LEVELING COURSE)
- 16 mm THICK MS PLATE WITH ISHB FIXED (TEMPORARY GIRDER) ON IT WILL BE PROVIDED AS PER DIRECTION ENGINEER INCHARGE OVER FORMATION.
- PLACING OF TRACK PANEL WITH OF PSC SLEEPER OVER FABRICATED STRUCTURE (PROTECTION ARRANGEMENT).
- RUBBER PAD WILL BE PROVIDED OVER ISHB 150 BEFORE LAYING OF TRACK PANEL.
- SLEEPER WILL BE CONNECTED WITH STEEL CLAMS WITH PROTECTION ARRANGEMENT.
- BLOCK WILL BE REMOVED.

POST BLOCK ACTIVITY

- THE ENDS OF 16mm THICK PLATE WILL BE CONNECTED WITH JOIST ALREADY FIXED WITH ANCHOR COLUMNS OVER THRUST BED.
- PROTECTION ARRANGEMENT BELOW BOTH TRACK WILL BE CONNECTED TOGETHER.
- PUSHING WILL BE CARRIED OUT TILL COMPLETION.
- ON COMPLETION OF PUSHING JOINTS BETWEEN RCC BOX WILL BE SEALED.

DURING BLOCK ACTIVITY (AFTER COMPLETION OF WORK/PUSHING)

- REMOVE TRACK.
- REMOVE PROTECTION ARRANGEMENT.
- LAY BALLAST.
- LINK TRACK.
- CLEAR TRAFFIC BLOCK.

NOTE:-

- BEFORE STARTING THE WORK FOR PUSHING OF PRE CAST RCC BOX ONE MODIFICATION WORK AT PROPOSED LOCATION SHOULD BE DONE BY ELECT. (TRD) CONST. UNIT (RE LOCATION OF ONE MAST 126/11 & 126/12)
- PUSHING METHODOLOGY:**
PUSHING OF BOTH SIDE BOXES WILL BE DONE SYMULTANEOUSLY AND MINIMUM 5500 mm GAP BETWEEN FRONT LINE OF BOXES WILL BE MAINTAINED.

SN.	DATE	DESCRIPTION	SIGN.

REVISIONS

RS CONSULTANCY SERVICES 875, SECTOR 12A, PANCHKULA (HR)	RS CONSTRUCTION COMPANY 988/7, PATIALA CHOWK, JIND-126102 (HR)
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DESIGN BY:

PROJECT:-

CONSTRUCTION OF ROAD UNDER BRIDGE
FOR RELIEF ROAD FROM UCHANA TO GHOGRIPUR TO NH-44
(VIA BAJIDA JATTAN - DAHA JAGIR SECTION)
AT KM.126/11-13 ON DELHI-AMBALA SECTION

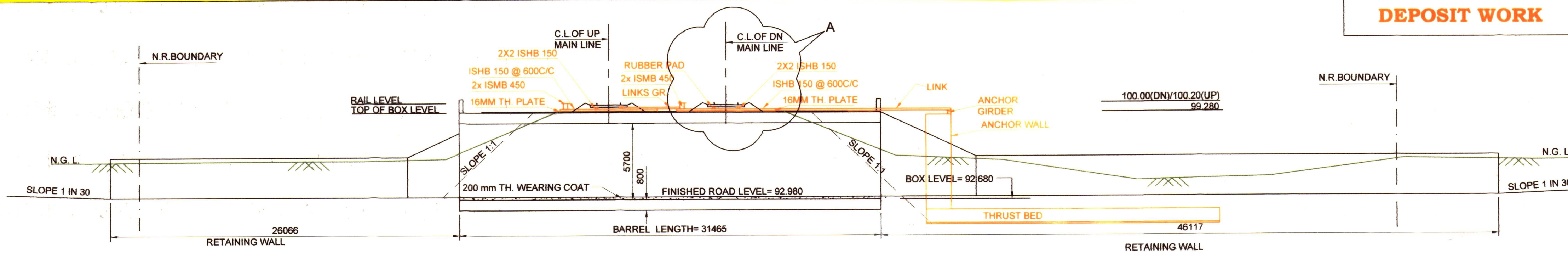
LAUNCHING METHODOLOGY FOR PROTECTION ARRANGEMENT AND BOX PUSHING METHODOLOGY

SCALE = NOT TO SCALE

DY.CE/C/CSB PLAN NO. RUB-944/2018

NRHQE(P) PLAN NO. P-1053-RB/2015 SH.No.5

(RAM NIWAS) DY.CE/C/CSB	(SANJAY SINGH) SR.DEL/TRD/DLI		
(MAHABEER SINGH) JE/DRO/C/CSB	(CHANDER PAL) SSE/D/C/CSB	(S. K. SHUKLA) SSE/W/C/PNP	(K. P. SINGH) XEN/C/PNP
		(R. K. GUPTA) DY.CE/C/CSB	(VED PRAKASH) CE/C/CENTRAL



SECTIONAL ELEVATION AT A-A

NOTES :-

1. ALL DIMENSION ARE IN MM.
2. EXISTING SHOWN IN BLACK IN KEY PLAN.
3. PROPOSED WORK SHOWN IN RED IN KEY PLAN.
4. PROPOSED PHASE-II WORK SHOWN IN RED DOTTED IN KEY PLAN.
5. FUTURE TRACK SHOWN IN YELLOW IN KEY PLAN.
6. PUSHING ARRANGEMENT SHOWN IN RED MAIN PLAN.
7. SIZE OF BEAM MAY BE CHANGED TO PROVIDE SUPER ELEVATION (IF REQUIRED).
8. E-250 BR/A QUALITY STEEL TO BE USED IN FABRICATION OF PROTECTION ARRANGEMENT.

METHODOLOGY

PRE BLOCK ACTIVITY

1. SPEED RESTRICTION OF 20KMPH WILL BE IMPOSED. RAIL CUT WILL BE PROVIDED IN TRACKS.
2. BALLAST WILL BE REMOVED FROM CRIB AND SHOULDERS.

DURING TRAFFIC BLOCK

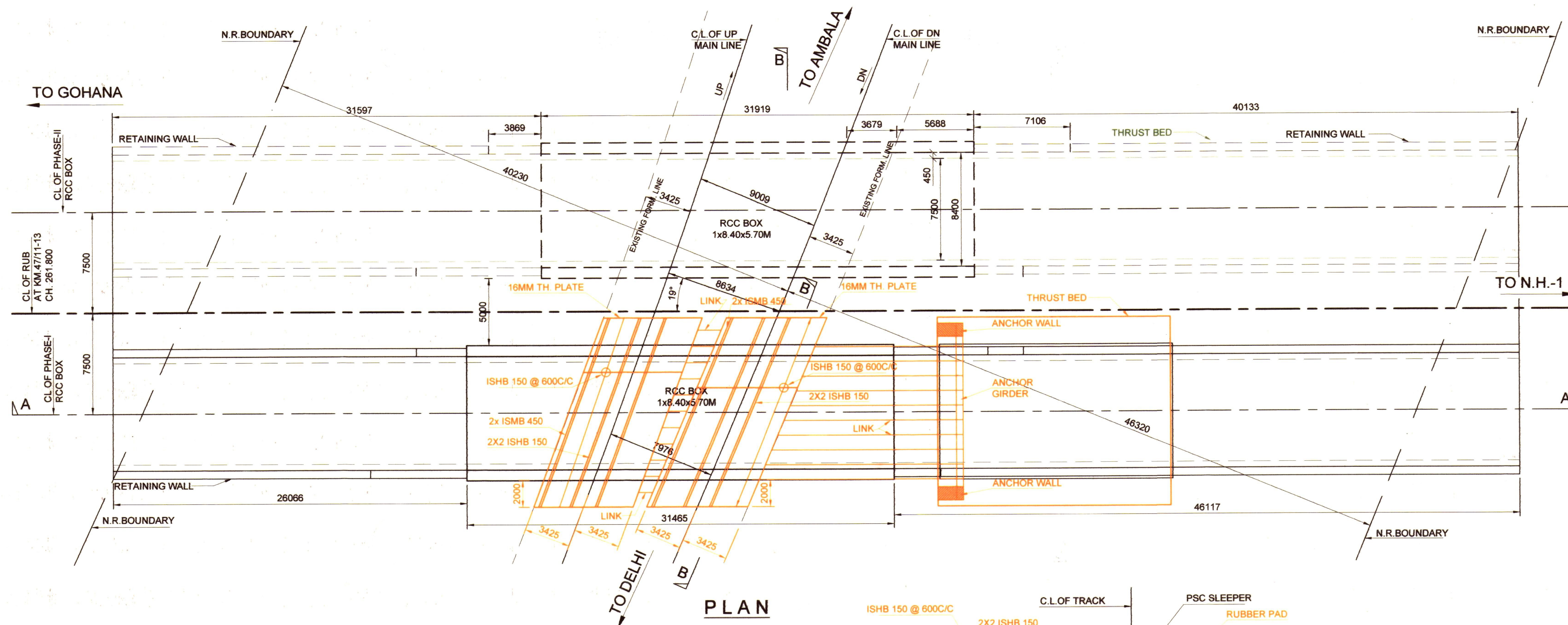
1. TRACK WILL BE REMOVED DURING TRAFFIC BLOCK.
2. THE BALLAST CUSHION UNDER SLEEPER WILL BE REMOVED AND FORMATION WILL BE LEVELED.
3. 25 mm THICK SAND LAYER WILL BE LAID ON FORMATION (LEVELING COURSE).
4. 16 mm TH. MS PLATE WITH ISHB FIXED ON IT WILL BE PROVIDED AS PER DIRECTION OF ENGINEER INCHARGE OVER EXCAVATED TRACK.
5. RUBBER PAD WILL BE PROVIDED ABOVE ISHB 150 BEFORE LAYING OF TRACK.
6. TRACK WILL BE PLACED & CONNECTED.
7. BLOCK WILL BE CLEARED.

POST BLOCK ACTIVITY

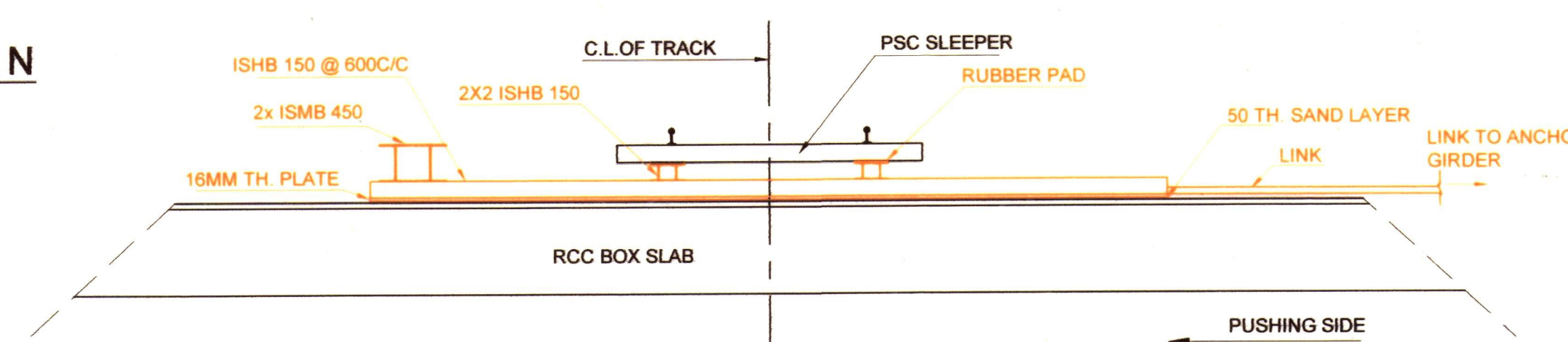
1. THE ENDS OF 16mm MS PLATE WILL BE ANCHORED WITH JOIST ALREADY FIXED WITH ANCHOR WALL AT THRUST BED.
2. PROTECTION SYSTEM BELOW BOTH TRACK WILL BE CONNECTED TOGETHER.
3. PUSHING WILL BE CARRIED OUT TILL COMPLETION.
4. ON COMPLETION OF PUSHING, JOINTS BETWEEN BOXES SHALL BE GROUTED & SEALED.

DURING BLOCK (AFTER COMPLETION OF WORK)

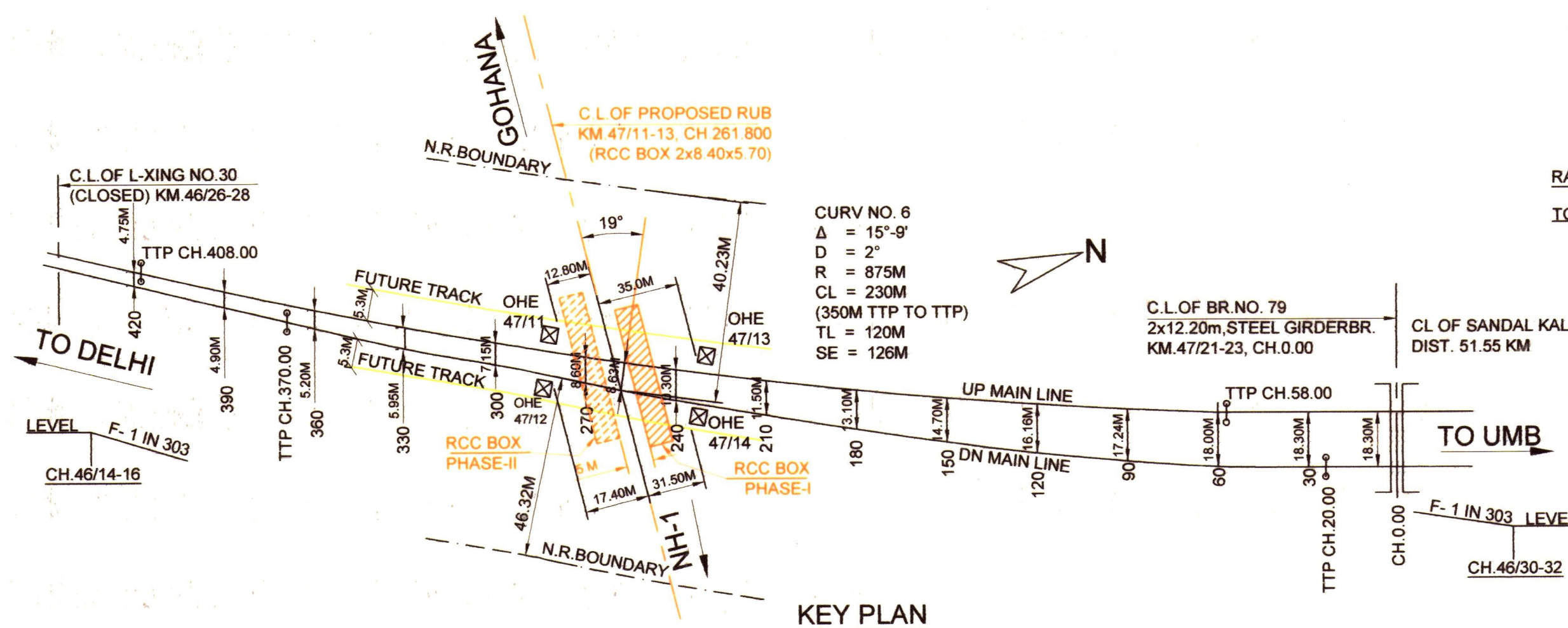
1. REMOVE TRACK.
2. REMOVE PROTECTION PLATE.
3. LAY BALLAST.
4. LINK TRACK.
5. CLEAR TRAFFIC BLOCK.



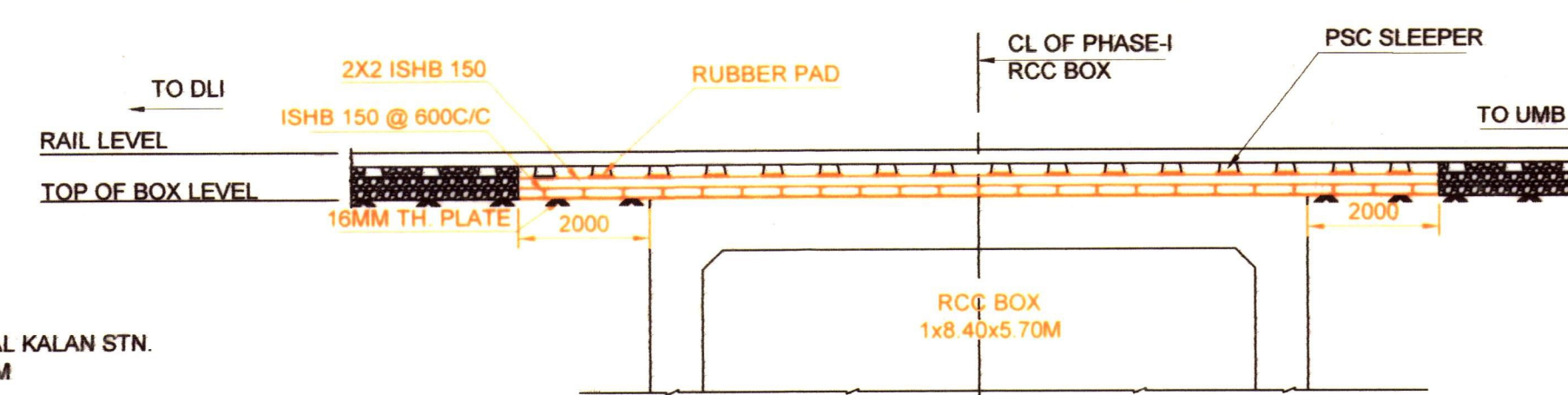
PLAN



DETAIL - A



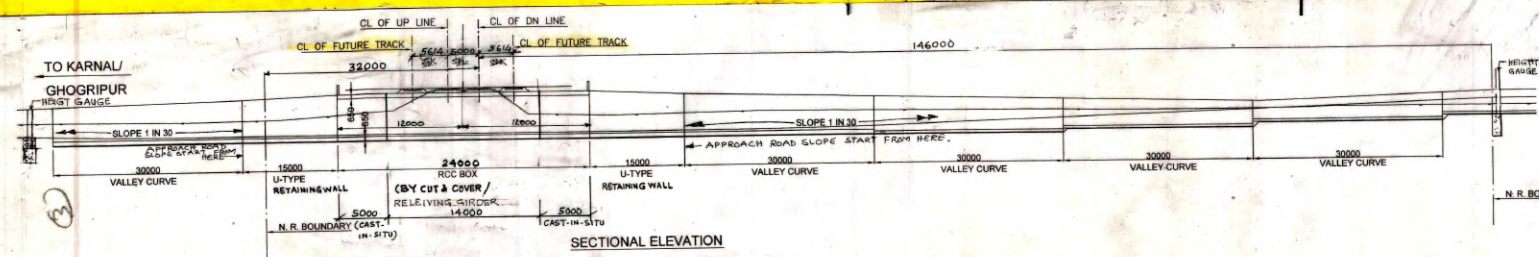
KEY PLAN



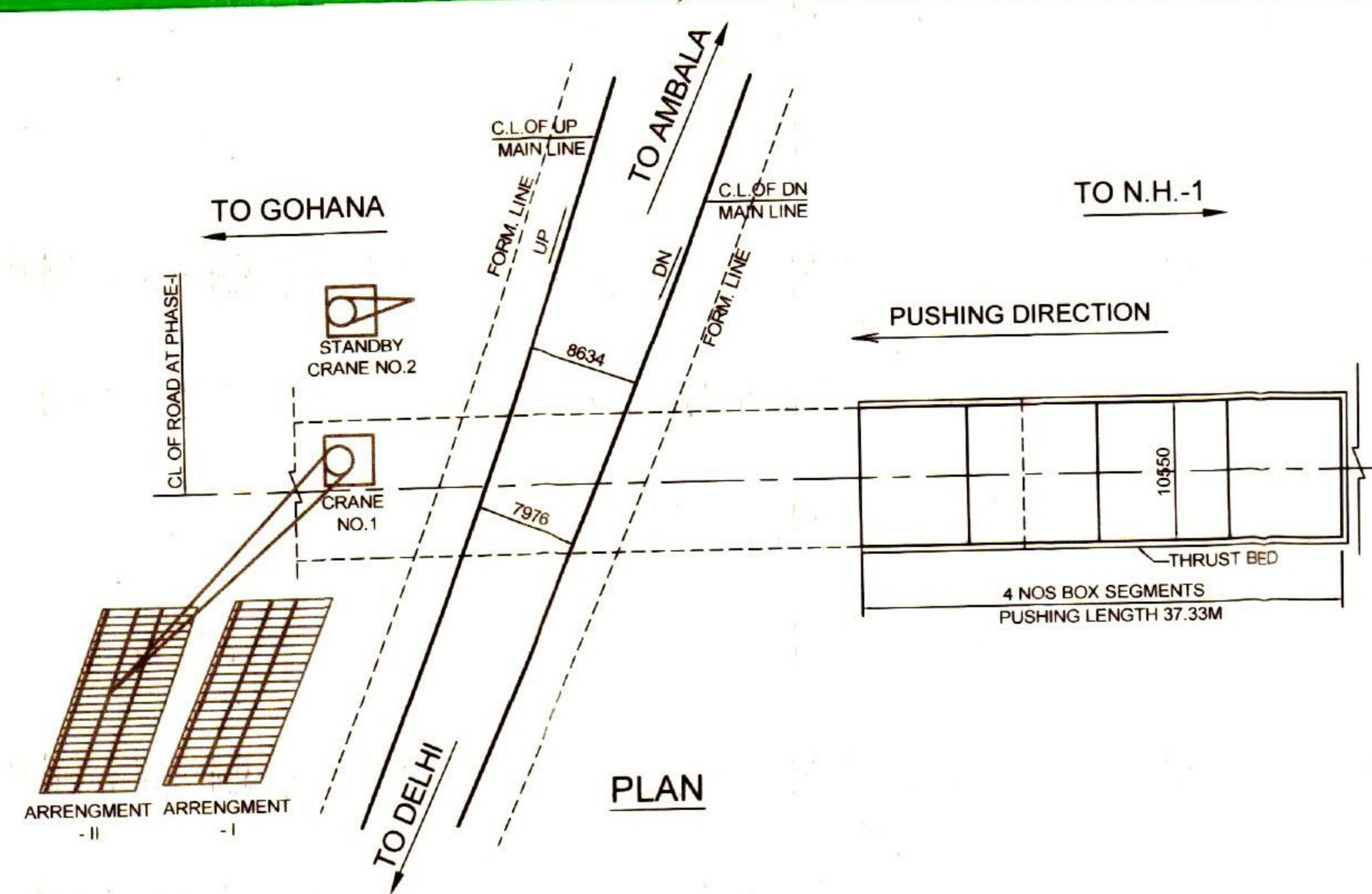
SECTION B-B

NO	DATE	REVISION	BY	CHKD

PROJECT	DELHI DIVISION CONSTRUCTION OF ROAD UNDER BRIDGE RCC BOX 2X8.40X5.70 m. AT Km. 47/11-13 ON DELHI - AMBALA SECTION NEAR SANDAL KALAN STATION (BY PUSHING TECHNIQUE)			
CLIENT	NORTHERN RAILWAY			
TITLE	PUSHING ARRANGEMENT			
FIELD OFFICE	DEPUTY CHIEF ENGINEER/CONST. N.R. SHIVAJI BRIDGE, NEW DELHI			
DRAWN (MAHADEEP SINGH) CHECKED (CHANDER PAL)	APPROVED	SCALE:- 1:200 DATE:-	DRG.NO. DY.CE/C/CSB PLAN NO. LM-874/2016	
SSE/W/C/CSB	AXEN/C/CSB	DY.CE/C/CSB	CE/C/CENTRAL	

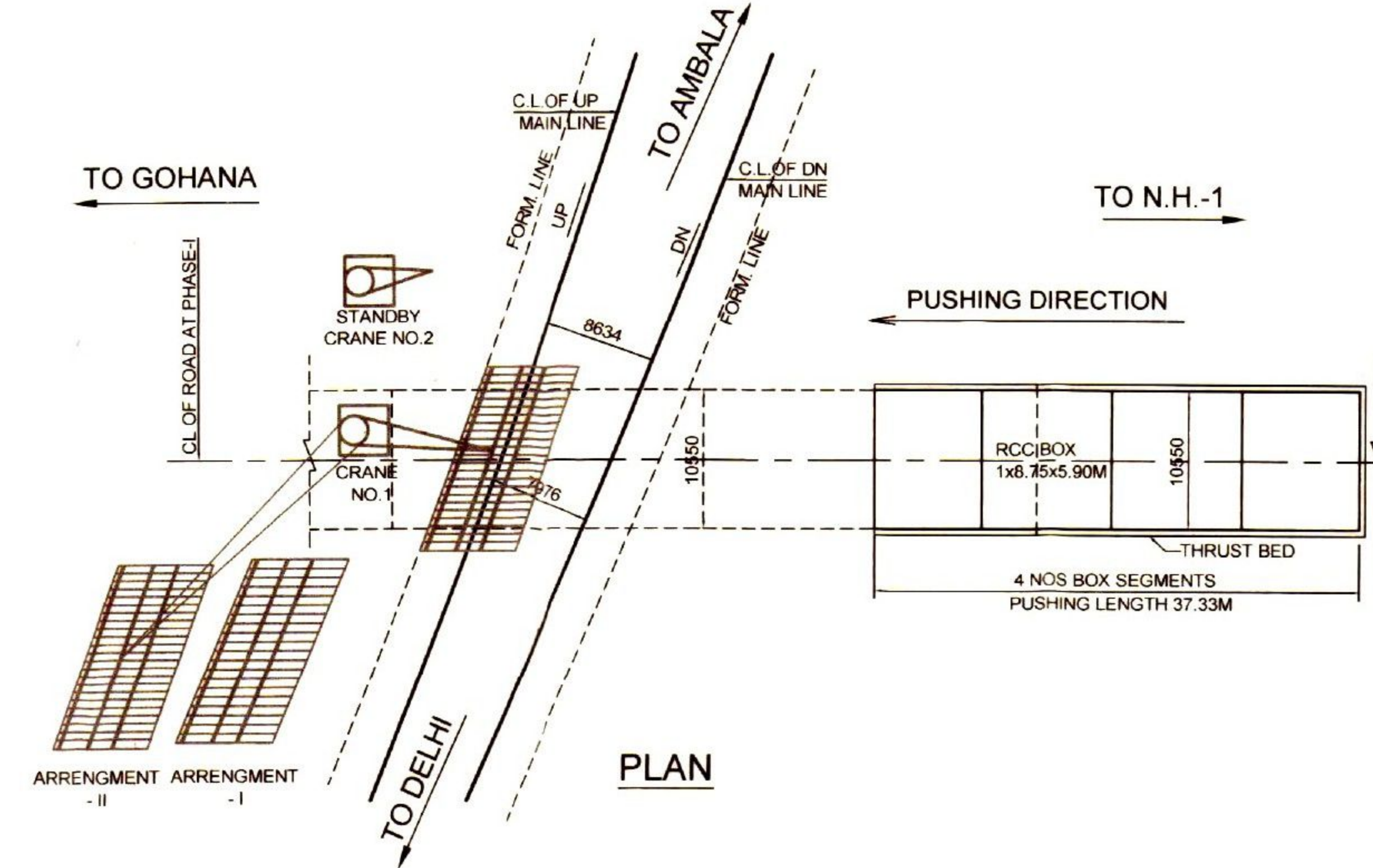


CUTTING/FILLING	1.06	2.29	3.75	5.203	6.650	8.100	9.550	11.000	12.450	13.900	15.350	16.800	18.250	19.700	21.150	22.600	24.050	25.500	26.950	28.400	29.850	31.300	32.750	34.200	35.650	37.100	38.550	40.000	41.450	42.900	44.350	45.800	47.250	48.700	50.150	51.600	53.050	54.500	55.950	57.400	58.850	60.300	61.750	63.200	64.650	66.100	67.550	69.000	70.450	71.900	73.350	74.800	76.250	77.700	79.150	80.600	82.050	83.500	84.950	86.400	87.850	89.300	90.750	92.200	93.650	95.100	96.550	98.000	99.450	100.900	102.350	103.800	105.250	106.700	108.150	109.600	111.050	112.500	113.950	115.400	116.850	118.300	119.750	121.200	122.650	124.100	125.550	127.000	128.450	129.900	131.350	132.800	134.250	135.700	137.150	138.600	140.050	141.500	142.950	144.400	145.850	147.300	148.750	150.200	151.650	153.100	154.550	156.000	157.450	158.900	160.350	161.800	163.250	164.700	166.150	167.600	169.050	170.500	171.950	173.400	174.850	176.300	177.750	179.200	180.650	182.100	183.550	185.000	186.450	187.900	189.350	190.800	192.250	193.700	195.150	196.600	198.050	199.500	200.950	202.400	203.850	205.300	206.750	208.200	209.650	211.100	212.550	214.000	215.450	216.900	218.350	219.800	221.250	222.700	224.150	225.600	227.050	228.500	229.950	231.400	232.850	234.300	235.750	237.200	238.650	240.100	241.550	243.000	244.450	245.900	247.350	248.800	250.250	251.700	253.150	254.600	256.050	257.500	258.950	260.400	261.850	263.300	264.750	266.200	267.650	269.100	270.550	272.000	273.450	274.900	276.350	277.800	279.250	280.700	282.150	283.600	285.050	286.500	287.950	289.400	290.850	292.300	293.750	295.200	296.650	298.100	299.550	301.000	302.450	303.900	305.350	306.800	308.250	309.700	311.150	312.600	314.050	315.500	316.950	318.400	319.850	321.300	322.750	324.200	325.650	327.100	328.550	330.000	331.450	332.900	334.350	335.800	337.250	338.700	340.150	341.600	343.050	344.500	345.950	347.400	348.850	350.300	351.750	353.200	354.650	356.100	357.550	359.000	360.450	361.900	363.350	364.800	366.250	367.700	369.150	370.600	372.050	373.500	374.950	376.400	377.850	379.300	380.750	382.200	383.650	385.100	386.550	388.000	389.450	390.900	392.350	393.800	395.250	396.700	398.150	399.600	401.050	402.500	403.950	405.400	406.850	408.300	409.750	411.200	412.650	414.100	415.550	417.000	418.450	419.900	421.350	422.800	424.250	425.700	427.150	428.600	429.950	431.400	432.850	434.300	435.750	437.200	438.650	440.100	441.550	443.000	444.450	445.900	447.350	448.800	450.250	451.700	453.150	454.600	456.050	457.500	458.950	460.400	461.850	463.300	464.750	466.200	467.650	469.100	470.550	472.000	473.450	474.900	476.350	477.800	479.250	480.700	482.150	483.600	485.050	486.500	487.950	489.400	490.850	492.300	493.750	495.200	496.650	498.100	499.550	501.000	502.450	503.900	505.350	506.800	508.250	509.700	511.150	512.600	514.050	515.500	516.950	518.400	519.850	521.300	522.750	524.200	525.650	527.100	528.550	530.000	531.450	532.900	534.350	535.800	537.250	538.700	540.150	541.600	543.050	544.500	545.950	547.400	548.850	550.300	551.750	553.200	554.650	556.100	557.550	559.000	560.450	561.900	563.350	564.800	566.250	567.700	569.150	570.600	572.050	573.500	574.950	576.400	577.850	579.300	580.750	582.200	583.650	585.100	586.550	588.000	589.450	590.900	592.350	593.800	595.250	596.700	598.150	599.600	601.050	602.500	603.950	605.400	606.850	608.300	609.750	611.200	612.650	614.100	615.550	617.000	618.450	619.900	621.350	622.800	624.250	625.700	627.150	628.600	630.050	631.500	632.950	634.400	635.850	637.300	638.750	640.200	641.650	643.100	644.550	646.000	647.450	648.900	650.350	651.800	653.250	654.700	656.150	657.600	659.050	660.500	661.950	663.400	664.850	666.300	667.750	669.200	670.650	672.100	673.550	675.000	676.450	677.900	679.350	680.800	682.250	683.700	685.150	686.600	688.050	689.500	690.950	692.400	693.850	695.300	696.750	698.200	699.650	701.100	702.550	704.000	705.450	706.900	708.350	709.800	711.250	712.700	714.150	715.600	717.050	718.500	719.950	721.400	722.850	724.300	725.750	727.200	728.650	730.100	731.550	733.000	734.450	735.900	737.350	738.800	740.250	741.700	743.150	744.600	746.050	747.500	748.950	750.400	751.850	753.300	754.750	756.200	757.650	759.100	760.550	762.000	763.450	764.900	766.350	767.800	769.250	770.700	772.150	773.600	775.050	776.500	777.950	779.400	780.850	782.300	783.750	785.200	786.650	788.100	789.550	791.000	792.450	793.900	795.350	796.800	798.250	799.700	801.150	802.600	804.050	805.500	806.950	808.400	809.850	811.300	812.750	814.200	815.650	817.100	818.550	819.950	821.400	822.850	824.300	825.750	827.200	828.650	830.100	831.550	833.000	834.450	835.900	837.350	838.800	840.250	841.700	843.150	844.600	846.050	847.500	848.950	850.400	851.850	853.300	854.750	856.200	857.650	859.100	860.550	862.000	863.450	864.900	866.350	867.800	869.250	870.700	872.150	873.600	875.050	876.500	877.950	879.400	880.850	882.300	883.750	885.200	886.650	888.100	889.550	891.000	892.450	893.900	895.350	896.800	898.250	899.700	901.150	902.600	904.050	905.500	906.950	908.400	909.850	911.300	912.750	914.200	915.650	917.100	918.550	919.950	921.400	922.850	924.300	925.750	927.200	928.650	930.100	931.550	933.000	934.450	935.900	937.350	938.800	940.250	941.700	943.150	944.600	946.050	947.500	948.950	950.400	951.850	953.300	954.750	956.200	957.650	959.100	960.550	962.000	963.450	964.900	966.350	967.800	969.250	970.700	972.150	973.600	975.050	976.500	977.950	979.400	980.850	982.300	983.750	985.200	986.650	988.100	989.550	991.000	992.450	993.900	995.350	996.800	998.250	999.700	1000.000
PROPOSED GROUND LEVEL	233.706	231.599	230.492	229.385	228.278	227.171	226.064	224.957	223.850	222.743	221.636	220.529	219.422	218.315	217.208	216.101	214.994	213.887	212.780	211.673	210.566	209.459	208.352	207.245	206.138	205.031	203.924	202.817	201.710	200.603	199.496	198.389	197.282	196.175	195.068	193.961	192.854	191.747	190.640	189.533	188.426	187.319	186.212	185.105	183.998	182.891	181.784	180.677	179.570	178.463	177.356	176.249	175.142	174.035	172.928	171.821	170.714	169.607	168.500	167.393	166.286	165.179	164.072	162.965	161.858	160.751	159.644	158.537	157.430	156.323	155.216	154.109	153.002	151.895	150.788	149.681	148.574	147.467	146.360	145.253	144.146	143.039	141.932	140.825	139.718	138.611	137.504	136.397	135.290	134.183	133.076	131.969	130.862	129.755	128.648	127.541	126.434	125.327	124.220	123.113	122.006	120.899	119.792	118.685	117.578	116.471	115.364	114.257	113.150	112.043	110.936	109.829	108.722	107.615	106.508	105.401	104.294	103.187	102.080	100.973	99.866	98.759	97.652	96.545	95.438	94.331	93.224	92.117	91.010	89.903	88.796	87.689	86.582	85.475	84.368	83.261	82.154	81.047	79.940	78.833	77.726	76.619	75.512	74.405	73.298	72.191	71.084	69.977	68.870	67.763	66.656	65.549	64.442	63.335	62.228	61.121	60.014	58.907	57.800	56.693	55.586	54.479	53.372	52.265	51.158	50.051	48.944	47.837	46.730	45.623	44.516	43.409	42.302	41.195	40.088	38.981	37.874	36.767	35.660	34.553	33.446	32.339	31.232	30.125	29.018	27.911	26.804	25.697	24.590	23.483	22.376	21.269	20.162	19.055	17.948	16.841	15.734	14.627	13.520	12.413	11.306	10.199	9.092	7.985	6.878	5.771	4.664	3.557	2.450	1.343	0.236	-0.871	-1.978	-3.085	-4.192	-5.299	-6.406	-7.513	-8.620	-9.727	-10.834	-11.941	-13.048	-14.155	-15.262	-16.369	-17.476	-18.583	-19.690	-20.797	-21.904	-23.011	-24.118	-25.225	-26.332	-27.439	-28.546	-29.653	-30.760	-31.867	-32.974	-34.081	-35.188	-36.295	-37.402	-38.509	-39.616	-40.723	-41.830	-42.937	-44.044	-45.151	-46.258	-47.365	-48.472	-49.579	-50.686	-51.793	-52.900	-54.007	-55.114	-56.221	-57.328	-58.435	-59.542	-60.649	-61.756	-62.863	-63.970	-65.077	-66.184	-67.291	-68.398	-69.505	-70.612	-71.719	-72.826	-73.933	-75.040	-76.147	-77.254	-78.361	-79.468	-80.575	-81.682	-82.789	-83.896	-85.003	-86.110	-87.217	-88.324	-89.431	-90.538	-91.645	-92.752	-93.859	-94.966	-96.073	-97.180	-98.287	-99.394	-100.501	-101.608	-102.715	-103.822	-104.929	-106.036	-107.143	-108.250	-109.357	-110.464	-111.571	-112.678	-113.785	-114.892	-115.999	-117.106	-118.213	-119.320	-120.427	-121.534	-122.641	-123.748	-124.855	-125.962	-127.069	-128.176	-129.283	-130.390	-131.497	-132.604	-133.711	-134.818	-135.925	-137.032	-138.139	-139.246	-140.353	-141.460	-142.567	-143.674	-144.781	-145.888	-146.995																																																																																																																																																																																																																																																																																																																																																											



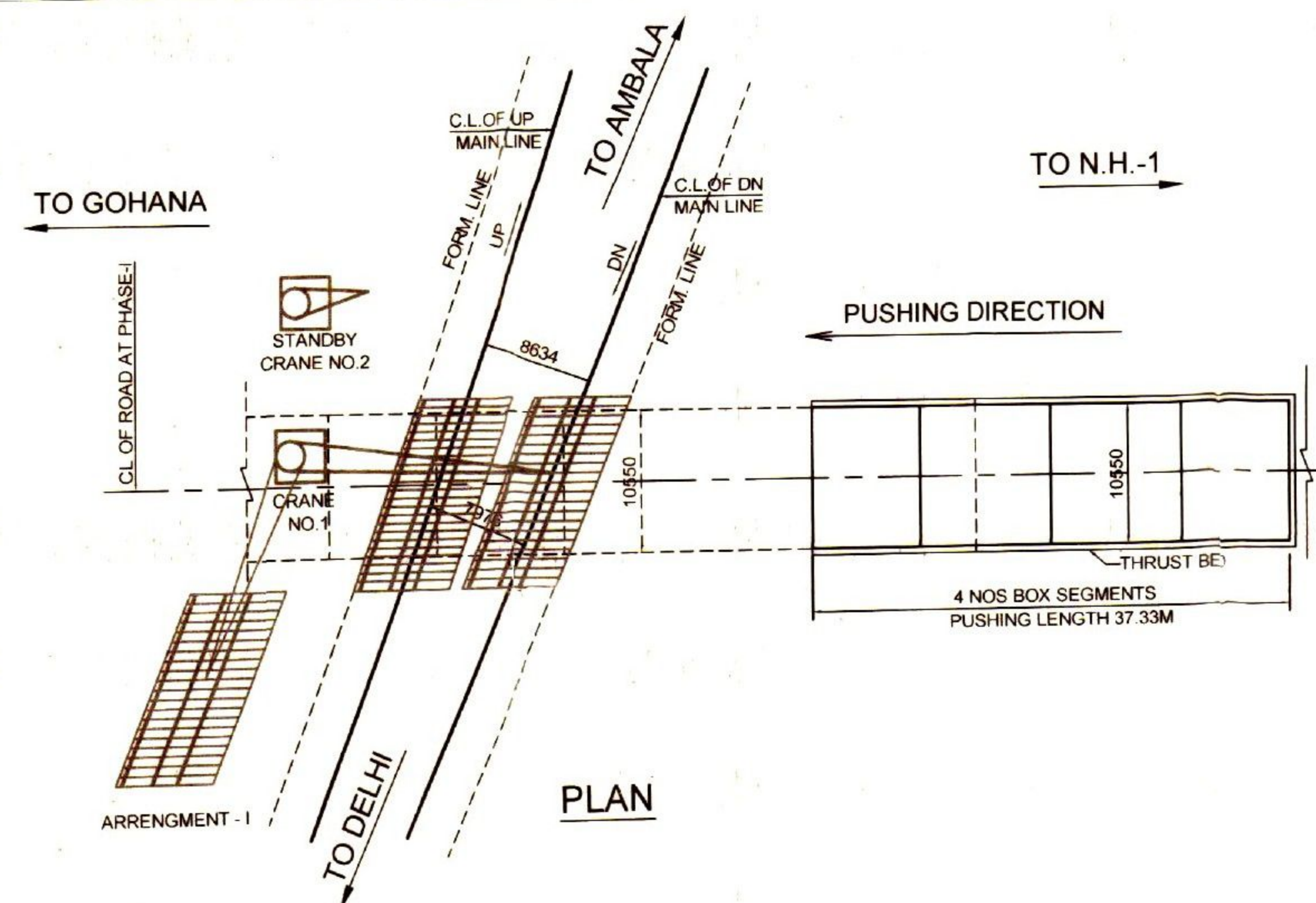
STEP-I (NON-BLOCK ACTIVITY)

- PLACE ALL MACHINERY AND PROTECTION ARRANGEMENT IN POSITION.
- ALL 4 NOS BOXES ALREADY CASTED AND PLACED AS SITE AS SHOWN IN DIAGRAM.
- WEIGHT OF EACH ARRANGEMENT IS APPROX. 21.00MT.
- TWO NOS STEEL PROTECTION ARRANGEMENT ALREADY PLACED AT SITE AS SHOWN IN DIAGRAM.
- TWO NOS. CRANES (ONE WORKING AND ONE STANDBY) WILL BE PLACED AS SHOWN IN DIAGRAM.



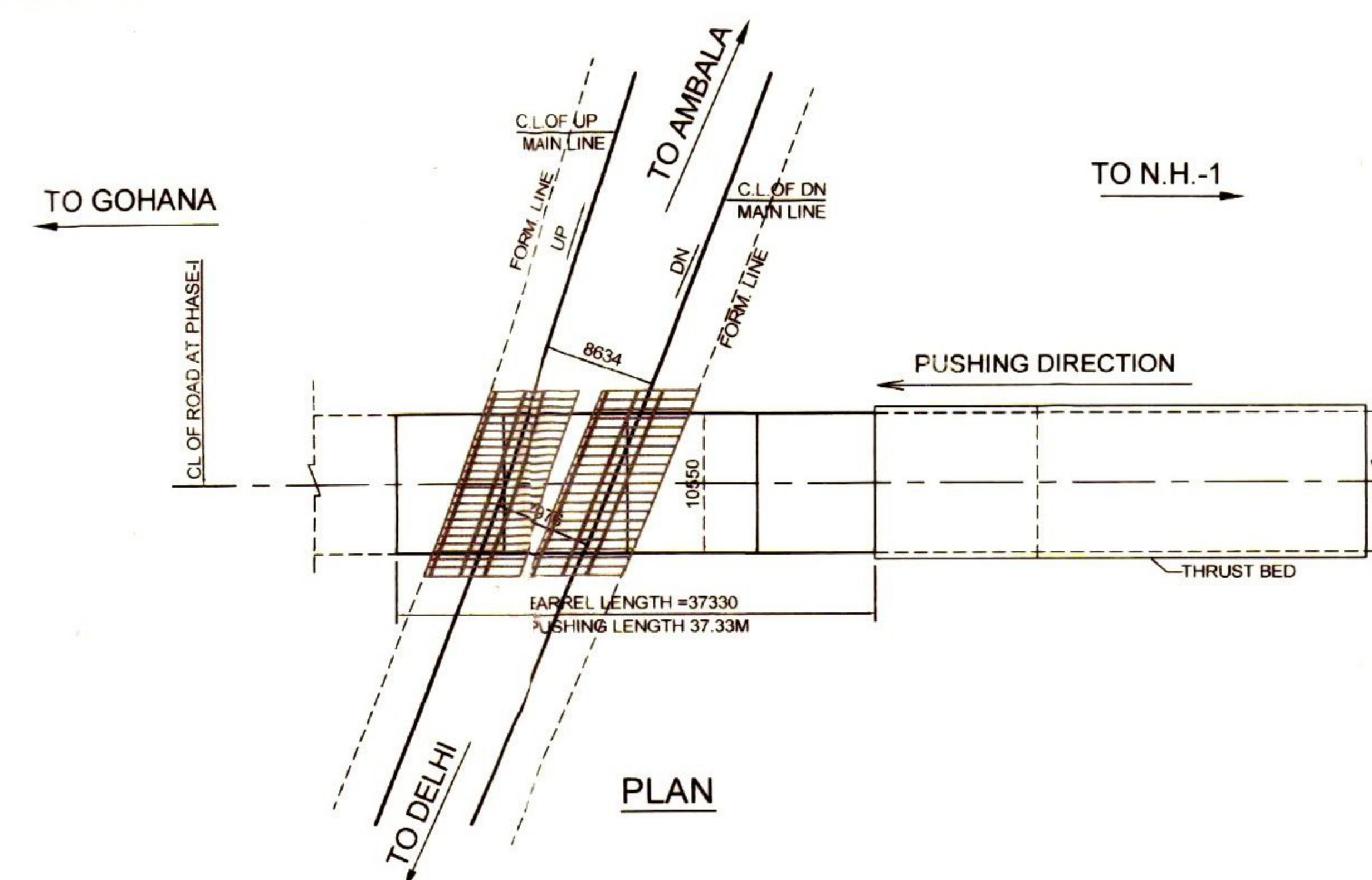
STEP-II (BLOCK ACTIVITY)

- BLOCK WILL BE TAKEN FOR UP LINE ONLY.
- REMOVE TRACK WITH SLEEPER AND BALLAST UP TO TOP OF FORMATION OF UP LINE.
- PLACE PROTECTION ARRANGEMENT IN POSITION WITH THE HELP OF CRANE.
- PLACING OF TRACK STRUCTURE OVER PROTECTION ARRANGEMENT. ENSURING TRACK PARAMETERS BEFORE RESTORING THE TRAFFIC.
- RESTORE TRAFFIC WITH SPEED RESTRICTION 20KMPH.



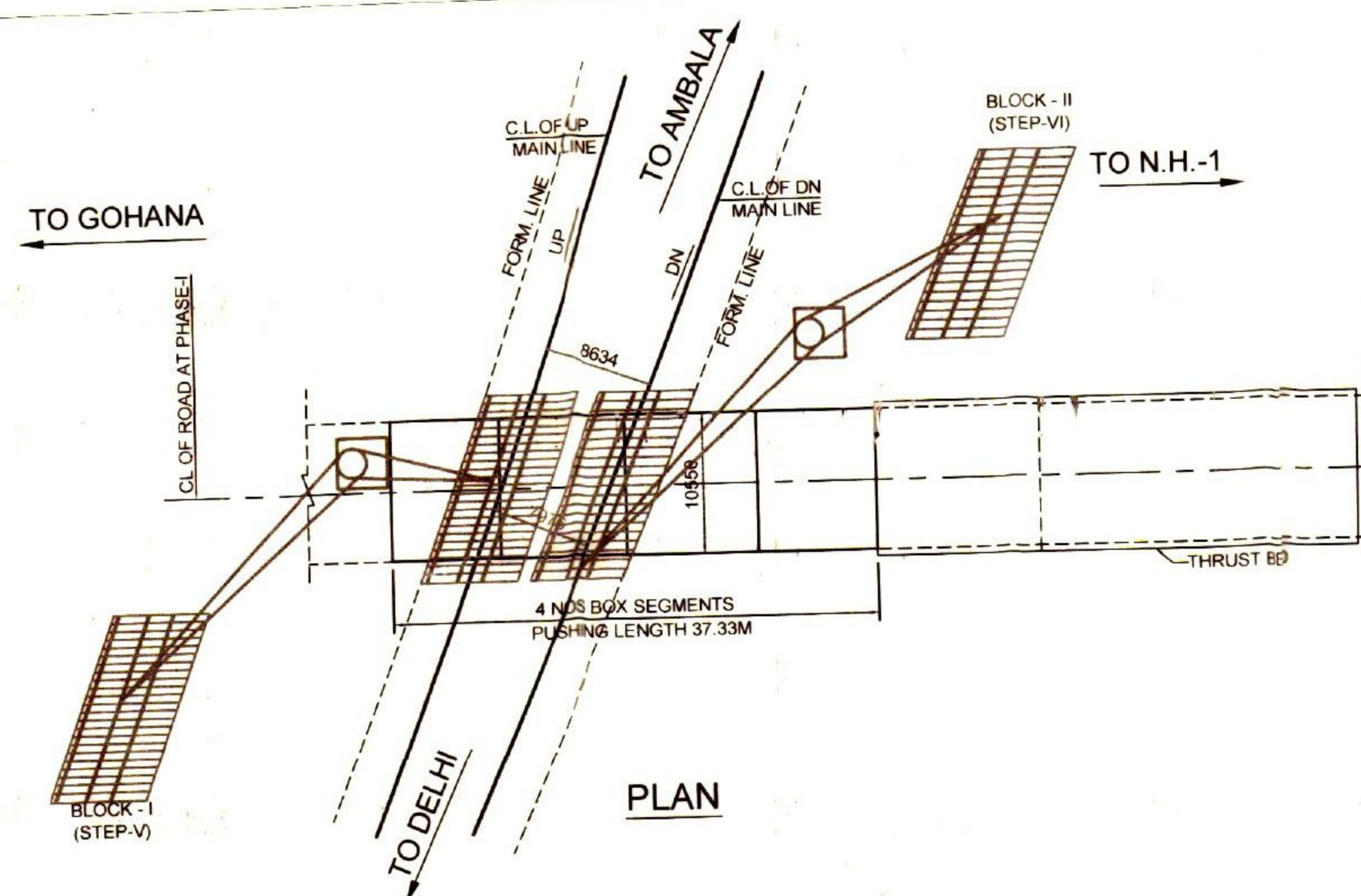
STEP-III (BLOCK ACTIVITY)

- BLOCK WILL BE TAKEN FOR UP & DN BOTH LINE.
- ALL OTHER ACTIVITY WILL BE SAME AS FOR UP LINE DONE.
- RESTORE TRAFFIC WITH SPEED RESTRICTION 20KMPH ON BOTH SIDE.



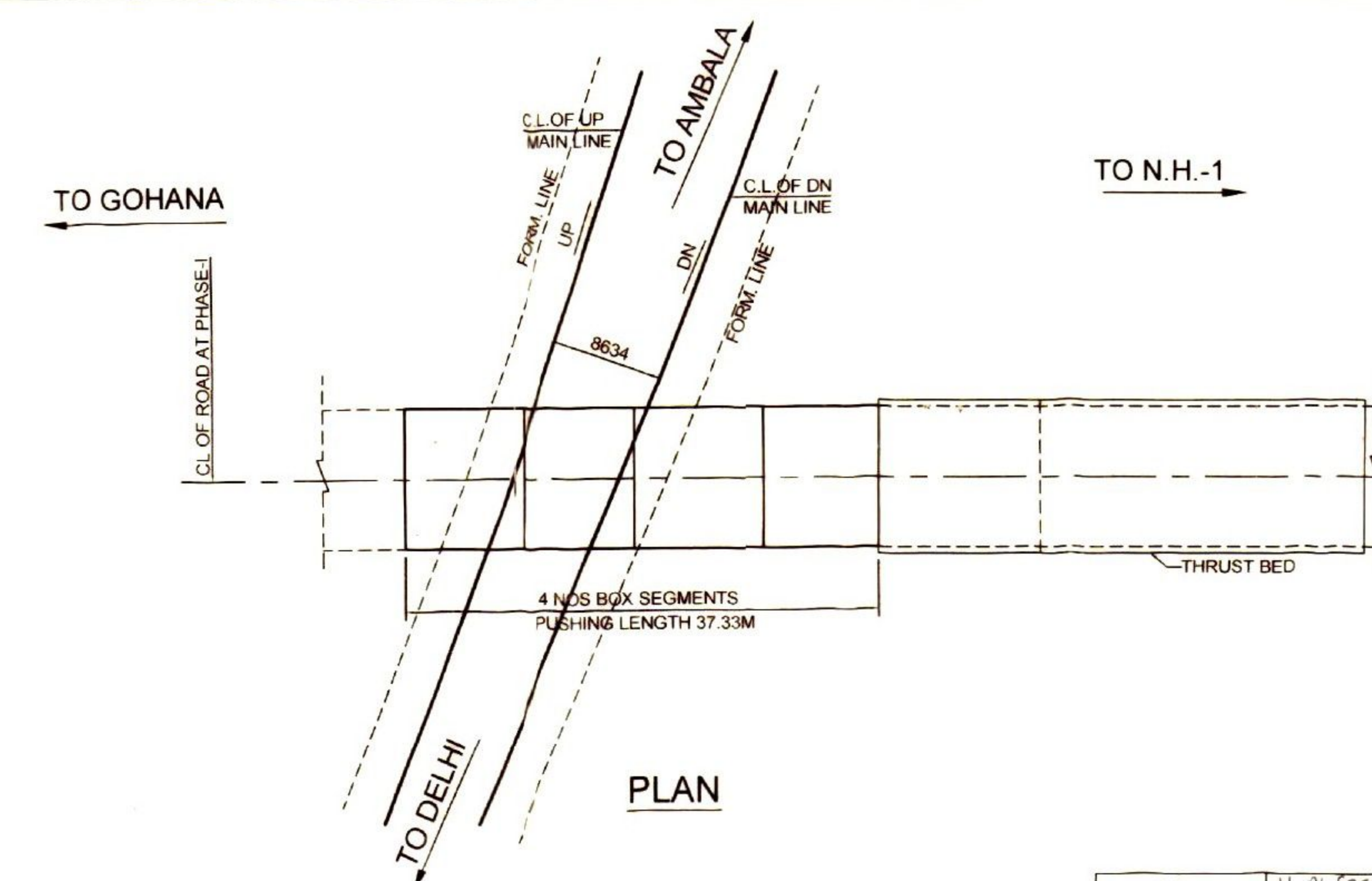
STEP-IV (NON-BLOCK ACTIVITY)

- PUSHING OF ALL THE FOUR NOS. RCC BOX SEGMENTS WILL BE STARTED AND CONTINUED TILL THE COMPLETING PUSHING UNDER BOTH UP & DN LINE WITH SPEED RESTRICTION OF 20KMPH.



STEP-V&VI (BLOCK ACTIVITY)

- REMOVAL OF PROTECTION ARRANGEMENT ONE BY ONE IN DIFFERENT BLOCK PERIOD WITH THE HELP OF CRANE.
- LAYING / LINKING OF TRACK ENSURING TRACK PARAMETERS.
- TRACK RESTORING WITH SPEED RESTRICTION OF 20KMPH.



STEP-VII (NON-BLOCK ACTIVITY)

- SPEED RELAXED UP TO SECTIONAL SPEED.

FABRICATION AND ASSEMBLING

DETAIL OF PROTECTION ARRANGEMENT

- 2 NOS STEEL PLATE GIRDER WITH ISHB FABRICATED AND ASSEMBLED AS PER APPROVED DRAWING NO. NRHQE(P) PLAN NO. P-1202-RB/2016/ SH.NO.1
- SIZE OF PROTECTION ARRANGEMENT 14.50x6.85M.
- WEIGHT OF EACH ASSEMBLY 21MT (APPROX.)
- TOTAL TWO NOS OF PROTECTION ARRANGEMENT WILL BE LAUNCHED FOR BOTH UP AND DN LINE TRACK AS SHOWN IN STEPS.
- ROAD CRANE OF SUITABLE CAPACITY WILL BE ARRANGED AND PLACED IN POSITION.
- ONE NOS CRANE STANDBY WILL BE AVAILABLE AT SITE.

LAUNCHING SEQUENCES

PRE BLOCK ACTIVITY

- SPEED RESTRICTION OF 20KMPH WILL BE IMPOSED RAIL CUT WILL BE PROVIDED IN TRACKS.
- FISH PLATES PROVIDE ON ALL JOINTS.
- BALLAST WILL BE REMOVED FROM CRIB & SHOULDERS.

DURING TRAFFIC BLOCK

- TRACK WILL BE REMOVED DURING TRAFFIC BLOCK.
- THE BALLAST CUSHION UNDER SLEEPER WILL BE REMOVED AND FORMATION WILL BE LEVELED.
- 25mm THICK SAND LAYER WILL BE LAID ON FORMATION (LEVELING COURSE)
- 16 mm THICK MS PLATE WITH ISHB FIXED (TEMPORARY GIRDER) ON IT WILL BE PROVIDED AS PER DIRECTION ENGINEER INCHARGE OVER FORMATION.
- PLACING OF TRACK PANEL WITH OF PSC SLEEPER OVER FABRICATED STRUCTURE (PROTECTION ARRANGEMENT).
- RUBBER PAD WILL BE PROVIDED OVER ISHB 150 BEFORE LAYING OF TRACK PANEL.
- SLEEPER WILL BE CONNECTED WITH STEEL CLAMS WITH PROTECTION ARRANGEMENT.
- BLOCK WILL BE REMOVED.

POST BLOCK ACTIVITY

- THE ENDS OF 16mm THICK PLATE WILL BE CONNECTED WITH JOIST ALREADY FIXED WITH ANCHOR COLUMNS OVER THRUST BED.
- PROTECTION ARRANGEMENT BELOW BOTH TRACK WILL BE CONNECTED TOGETHER.
- PUSHING WILL BE CARRIED OUT TILL COMPLETION.
- ON COMPLETION OF PUSHING JOINTS BETWEEN RCC BOX WILL BE SEALED.

DURING BLOCK ACTIVITY (AFTER COMPLETION OF WORK/PUSHING)

- REMOVE TRACK.
- REMOVE PROTECTION ARRANGEMENT.
- LAY BALLAST.
- LINK TRACK.
- CLEAR TRAFFIC BLOCK.

NOTE:

- BEFORE STARTING THE WORK FOR PUSHING OF PRECAST RCC BOXES THE MODIFICATION WORK AT PROPOSED LOCATION SHOULD BE DONE BY ELECT (TRD) CONST. UNIT (Relocation of one meter at 47/11A 47/12)

Sl.	DATE	DESCRIPTION	SIGN.

REVISIONS

SRS CONSULTANCY SERVICES 875, SECTOR 12A, PANCHKULA (HR)	RS CONSTRUCTION COMPANY 988/7, PATIALA CHOWK, JIND-126102 (HR)
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DESIGN BY:

PROJECT:-

**CONSTRUCTION OF ROAD UNDER BRIDGE
RCC BOX 2X8.75X5.90 m. AT Km. 47/11-13
ON DELHI - AMBALA SECTION
NEAR SANDAL KALAN STATION
(BY PUSHING TECHNIQUE)**

LAUNCHING METHODOLOGY FOR PROTECTION ARRANGEMENT AND BOX PUSHING METHODOLOGY

SCALE = NOT TO SCALE

DY.CE/C/CSB PLAN NO. **RUB-921/2017**

NRHQE(P) PLAN NO. **P-1202-RB/2016 SH. NO. 6**

8/2/17	8/2/17	8/2/17	8/2/17	8/2/17	8/2/17
(RAM NIWAS)	(SANJAY SINGH)	(K. P. SINGH)	(R. K. GUPTA)	(VED PARKASH)	(C.E./C/CSB)
DY.CEE/C/TRD	SR.DEE/ TRD / DLI	CEE/ C/ TKJ	CEDE/ B. H.		
S.S. SHUKLA	(MAHABEER SINGH)	(CHANDER PAUL)	(K. P. SINGH)	(R. K. GUPTA)	(VED PARKASH)
SSE/ W/ JMD	JE/DRG/C/CSB	SSE/DC/CSB	AXEN/C/CSB	DY.CE/C/CSB	C.E./C/CSB

