भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(सडक परिवहन और राजमार्ग मंत्रालय, भारत सरकार)
National Highways Authority of India
(Ministry of Road Transport and Highways, Government of India)
श्रेत्रीय कार्यालय : 41-29-45A, सर्वे नं: 373/2A, कोदंडरामालयम्,चलसानी नगर,
रानीगारीतोटा, कृष्णालंका, विजयावाडा - 520 013, आन्ध्र प्रदेश
Regional Office: D.No. 41-29-45A, RS.No. : 373/2A, Kodandaramalayam, Chalasani Nagar,
Ranigari Thota, Krishna Lanka, Vijayawada - 520 013, Andhra Pradesh.
फोन / Tel : 0866-2483910, ई-मैल/e-mail: rovijayawada@nhai.org, nhairovja@gmail.com
वेब/ web: www.nhai.gov.in

Ref: NHAI/RO-VJA/Polavaram-Pipeline/727+800/2025-26/ 1127

April 08, 2025

INVITATION OF PUBLIC COMMENTS

Sub: NHAI, RO - Vijayawada - Permission for NOC for laying pipeline Crossing at Km. 727+800 at Sanivada Village, Kurmanpalem Mandal, Visakhapatnam District in the section of Anandpuram-Visakhapatnam-Ankapali (city limits) on NH-16 in the State of Andhra Pradesh - **Public comments** - Reg.

The Project Director, PIU - Visakhapatnam submitted a proposal of Executive Engineer, PIPLMC Division, Visakhapatnam for laying of drinking water pipeline with single crossing at Km. 727+800 at Sanivada Village, Kurmanpalem Mandal, Visakhapatnam District in the section of Anandpuram-Visakhapatnam-Ankapali (city limits) on NH-16.

As per MORTH guidelines vide letter No.RW/NH-33044/29/2015/S&R® dated 22nd November 2016, the Highway Administration will put out the application in the Ministry's website for 30 days seeking claims and objections (on grounds of public inconvenience, safety and general public interest).

In view of the above, the comments of public, if any, on the above mentioned proposal is invited on below mentioned address.

Regional Officer - Vijayawada,
National Highways Authority of India,
Regional Office, Dr. No.41-29-45A, R. S. No.373/2A
Near Kodandaramalayam, Chalasani Nagar,
Ranigarithota, Krishnalanka, Vijayawada - 520 013.
Email: rovijayawada@nhai.org

(R.K. Singh, IES)
CGM (Tech) & Regional Officer

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(सडक परिवहन और राजमार्ग मंत्रालय, भारत सरकार)
National Highways Authority of India
(Ministry of Road Transport and Highways, Government of India)
श्रेत्रीय कार्यालय : 41-29-45A, सर्वे नं: 373/2A, कोदंडरामालयम्,चलसानी नगर,
रानीगारीतोटा, कृष्णालंका, विजयावाडा - 520 013, आन्ध्र प्रदेश
Regional Office: D.No. 41-29-45A, RS.No. : 373/2A, Kodandaramalayam, Chalasani Nagar,
Ranigari Thota, Krishna Lanka, Vijayawada - 520 013, Andhra Pradesh.
फोन / Tel : 0866-2483910, ई-मैल/e-mail: rovijayawada@nhai.org, nhairovja@gmail.com
वेब/ web: www.nhai.gov.in

Ref: NHAI/RO-VJA/Polavaram-Pipeline/727+800/2025-26/1128 **April 08, 2025**

To

The Sr. Technical Director,
NIC, Transport Bhawan,
New Delhi- 110001.

Sub: NHAI, RO - Vijayawada - Permission for NOC for laying pipeline Crossing at Km. 727+800 at Sanivada Village, Kurmanpalem Mandal, Visakhapatnam District in the section of Anandpuram-Visakhapatnam-Ankapali (city limits) on NH-16 in the State of Andhra Pradesh - **Public comments** - Reg.

Sir,

Please find enclosed herewith a proposal submitted by Executive Engineer, PIPLMC Division, Visakhapatnam for laying of drinking water pipeline with single crossing at Km. 727+800 at Sanivada Village, Kurmanpalem Mandal, Visakhapatnam District in the section of Anandpuram-Visakhapatnam-Ankapali (city limits) on NH-16.

2. As per MORTH guidelines vide letter No.RW/NH-33044/29/2015/S&R® dated 22nd November 2016, the application along with the recommendations of PD, PIU-Visakhapatnam are enclosed herewith with a request to hoist the same in the Ministry's website for 30 days seeking claims and objections (on grounds of public inconvenience, safety and general public interest), for taking further necessary action.

Encl: As above

Yours faithfully,

(R.K. Singh, IES)
CGM (Tech) & Regional Officer

Copy to:
(i) PD, PIU - Visakhapatnam
(ii) The Executive Engineer, PIPLMC Division, Visakhapatnam - for information.

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(सड़क परिवहन और राजमार्ग मंत्रालय भारत सरकार)
National Highways Authority of India
(Ministry of Road Transport and Highways, Government of India)
परियोजना कार्यालयन इकाई (जि वयू), भा.रा.रा.पा.एन्कलेव, कि.मी. 2/8 रा.रा.-16
हनुमन्तवाका, विशाखपट्टणम - 530 040, ए.पि., भारत
Project Implementation Unit (GQ), NHAI Enclave, KM 2/8 NH-16
Hanumanthavaka, Visakhapatnam - 530 040, A.P., India
फोन / Tel : 0891-2707600, 2714119
ई-मेइल/ E-mail : vis@nhai.org, nhaipiuvsp@gmail.com, वेब : www.nhai.gov.in

NHAI/PIU-VSP/Polavaram-Pipeline/83/727+800/2024-25/ 5041 **March, 10th 2025.**

To

The Regional officer,
National Highways Authority of India,
D.No.:41-29-45/A, R.S.No:373/2
Kodanda ramalayam, Chalasani nagar,
Ranigarithota, Krishnalanka.
Vijayawada.

Sub NHAI - PIU, Visakhapatnam - Permission for NOC for laying pipeline Crossing @KM 727+800 at Sanivada(village) Kurmanpalem Mandal, Visakhapatnam(dist), Andhra Pradesh-**Issue of NOC**-Reg

Ref: 1. letter no:EE/PIPLMC/Pipeline/Vsp/106m dated:19.02.2025(received this office 20.02.2025).
2.T/o letter no: NHAI/PIU-VSP/Polavaram-Pipeline/83/727+800/2024-25/4927, dated:21.02.2025.
3.IE Letter M/s Global: GIS/AE/PBMC/NH-16/NOC@727+800/2024-25/15, dt:06.03.2025.

Sir,

Vide ref 1st cited above, Executive Engineer, PIPLMC Division, Visakhapatnam has submitted the proposal for laying of drinking water pipeline with single Crossing @KM 727+800 at Sanivada(village) Kurmanpalem Mandal, Visakhapatnam(dist), Andhra Pradesh in the section of Anandpuram-Visakhapatnam-Ankapalii(City-Limits) of NH-16.

2. The proposal was forwarded to the Supervision Consultant vide this office letter 2nd cited for recommendations and feasibility. The Supervision Consultant has inspected the site and recommended the above proposal vide ref 3rd cited.

3. The following documents are submitted by the Agency as per the MORTH guidelines dated 22.11.2016.

(a) Proposal letter.
(b) Check List.
(c) Specification Report to accompanying the estimate towards License Fees for Laying of drinking water pipeline.
(d) License Fees Estimate.
(e) Agreement regarding granting of Right of Way permission.
(f) Undertaking for Performance Bank Guarantee.

निगमित कार्यालय : जी-5, एवं-6, सेबटर-10, द्वारका, नई दिल्ली -110 075, फोन :91-11-25074100 / 25074200, वेबसैट : http:\\www.nhai.org
Corporate Office : G-5 & 6, Sector-10, Dwarka, **NEW DELHI** - 110 075, **Phone** :91-11-25074100 / 25074200, **Website :** http:\\www.nhai.org

(h) Power of Attorney.
(i) Affidavit to take all the actions as prescribed in the Check List from 5.1 to 5.12.
(j) Format for maintain records of ROW permission granted for laying Pipeline.
(k) Brief description of Horizontal Directional Drilling.
(l) Cross section & Strip plan.

4. Further, it is to inform that as per point no 1.19 (C) in the checklist, the minimum distance for crossing from the existing structure on the highway should be more than 15mts. However, O/o Executive Engineer has proposed for laying of pipeline with in 7metres from Existing Structure i.e. 727+797 as the land available with irrigation department is only up to 7mts from the existing structure.

5. They have also submitted that further acquisition of land may consume time due to which the project may get severely delayed as it is essential supply of drinking water to Visakhapatnam city. Moreover, the project is intended to be completed by June-2025 as per directions oh Hon'ble Chief Minister of Andhra Pradesh. Hence, the request of the Executive Engineer may be considered in view of the importance of the project. Moreover, it is pertinent to mention that as per Ministry guideline no: RW/NH-33044/29/2015/S&R(R), dt.22.11.2016 there is no such condition of minimum distance of 15mts for crossing of pipeline from the existing structure. However, the same is required as per Regional Officer, MoRT&H, Vijayawada letter addressed to Chief Engineer(R&B) Vide letter no: RO/VJA/Misc24BAccessutility/7 dated:13.04.2017.

6. The proposed location for laying drinking water pipe line falls on NH-16 passing through the Visakhapatnam city limits. The DPR for construction of grade separators at various locations on NH-16 from KM 682+950 to KM 741+256 passing through Visakhapatnam city limits is under progress. However, Executive Engineer, PIPLMC Division, Visakhapatnam has submitted an undertaking stating that *"We do undertake that i/we relocate service road/approach road/utilities at my/our own cost notwithstanding the permission granted within such time as will be stipulated by NHAI for future six laning or any other development".*

7. In view of the recommendations of the Consultants, the proposal submitted by Executive Engineer, PIPLMC Division, Visakhapatnam for issuance of NOC, is herewith recommended for the approval of Competent Authority.

Yours faithfully,

Encl: Proposal in two sets
(01 Original + 01 Duplicate)

(Prabhat Ranjan)
DGM(T) & Project Director

CERTIFICATE

1 It is certified that the proposal for "laying of pipeline with single Crossing @KM 727+800 at Sanivada(village) Kurmanpalem Mandal, Visakhapatnam(dist), Andhra Pradesh in the section of Anandpuram-Visakhapatnam-Ankapalii(City-Limits) of NH-16" is confirming of all the standard conditions / guidelines issued vide Ministry circular No. RW/NH-33044/29/2015/S&R(R) dt. 22.11.2016.

2 It is certified that any other location of utility line would be extremely difficult and unreasonable costly and installation of utility line within ROW will not adversely affect the design, stability & traffic survey of the highway nor the likely improvement such as widening of the carriageway, easing of curve etc.

3 I will ensure supervision of the work of laying of utility and ensure that the defects in road portion after laying of utility are recorded.

4 I will notify/forfeit the BG for claims for damages done/disruption in working, if any.

5 It is certified that the details of the proposed permission shall be entered in the Register of Records of the Permission maintained by PIU.

Site-Engineer

Deputy Manager (Tech)

10/3/2025

DGM (T) &Project Director

CHECK-LIST

Guidelines for processing the proposal for laying of Pressure Pipe line (Utility line)in the land acrossNational Highways vested with NHAI/PWD/BRO.

S.No.	Item	Information Status	Remarks
1	General Information		
1.1	Name and Address of the Applicant/Agency	O/o The Executive Engineer, PIPLMC Division,CE North Coast Campus, Pedawaltair,Visakhapatnam -530003, Andhra Pradesh, India.	
1.2	National Highway Number	NH-16	
1.3	State	Andhra Pradesh	
1.4	Location	Before Aganampudi toll plaza –Visakhapatnam City	
1.5	(Chainage in km)	chainage Km. 727.800**to across the Highway road**for a width of 200 ft. at Kurmanapalem Mandal (sanivada) in Visakhapatnam City in Visakhapatnam District of Andhra Pradesh	
1.6	Length in Meters	60m(Across the National Highway Road)	
1.7	Width of available ROW		
	(a) Left side from center line towards increasingchainage/km direction	30 meters	
	(b) Right side from center line towards increasing chainage/km direction	30 meters	
1.8	Proposal to lay the utility		
	(a) Left side from center line towards increasing chainage/km direction	NA(only one crossing @Km.727.800)	
	(b)Right side from center line towards increasingchainage/km direction	NA(only one crossing @Km.727.800)	
1.9	Proposal to acquire land		
	(a) Left side from center line	Not Applicable	
	(b) Right side from center line	Not Applicable	
1.10	Whether proposal is in the same side where land is not to be acquired	Not Applicable	
	If not then where to lay the cable		
1.11	Details of already laid services, if any, along the proposed route	Not Applicable	
1.12	Number of existing lanes (2/4 6/8 lanes).	4 Lane	
1.13	Proposed Number of lanes (2 lane with pavedshoulders/4/6/8 lanes).	No proposed expansion	
1.14	Service road existing or not	No Service Road	
	If yes then which side	Not Applicable	
	(a) Left side from center line	Not Applicable	

Project Director
National Highways Authority of India
PIU VISAKHAPATNAM

Executive Engineer
PIPLMC Division-6
Visakhapatnam

	fills.		
	(g) The top of the casing/conduit pipe should be at least meter 1.2 meter below the surface of the road subject to being at least 0.3 m below the drain inverts. Mention the proposed details.	More than 2.5 Meters Below the surface of the road	
	(h) Mention the methodology proposed for crossing of road for the proposed Optical Fiber Cable (PRESSURE PIPELINE). Crossing shall be by boring method (HDD) (Trenchless Technology), specially, where the existing road pavement is of cement concrete or dense bituminous concrete type.	HDD Method	
	(i) The casing/conduit pipe shall be installed with an even bearing throughout its length and in such a manner as to prevent the formation of a waterway along it.	Yes	
2	Document / Drawings to be enclosed with the proposal	Enclosed	
2.1	Cross section showing the size of trench for opentrenching method	Not Applicable	
	(Is it normal size of 1.2m deep X 0.3m wide)	Not Applicable	
	(i) Should not be greater than 60 Cm wider than the outer diameter of the pipe	Not Applicable	
	(ii) Located as close to the extreme edge of the right of-way as possible but not less than 15 meters from the center-lines of the nearest carriageway	Not Applicable	
	(iii) Shall not be permitted to run along the NationalHighways when the road formation is situated indouble cutting. Nor shall these be laid over theexisting culverts and bridges.	Not Applicable	
	(iv) These should be so laid that their top is at least 0.6 meter below the ground level so as not to obstruct drainage of the road land.	Not Applicable	
2.2	Cross section showing the size of pit and location of cable for HDD method	HDD Cross-section Enclosed	

Project Director
National Highways Authority of India
PIU-VISAKHAPATNAM

Executive Engineer
PIPLMC Division-6
Visakhapatnam

	by flagman, signs and barricades, and red lights during night hours.		
	(g) If required, a diversion shall be constructed at the expense of agency owning the utility line.	Not Applicable	
2.4.2	Horizontal Directional Drilling (HDD) Method	Details Provided in Methodology of Laying	
2.4.3	Methodology for laying of PRESSURE PIPELINE through CD works and method of laying. In cases where the carrying of PRESSURE PIPELINE on the bridge becomes inescapable	Not Applicable	
3	Draft License Agreement is signed by two witnesses	Enclosed	
3.1	The licensee fee estimates as per Ministry's guide lines issued vide circular No. RW/NH-33044/29/2015/S&R(R) dated 22.11.2016.	Enclosed	
4	Whether Performance Bank Guarantee as per Ministry's Circular no. RW/NH-33044/29/2015/S&(R) dated22.11.2016 is obtained.	Undertaking for Submission of BG has been obtained from The Executive Engineer, PIPLMC Division, CE North Coast Campus, Pedawaltair , Visakhapatnam -530003, Andhra Pradesh, India	
4.1	Confirmation of BG has been obtained or not as per MoRTH/NHAI guidelines	Confirmation of BG Shall Be Obtained After BG Submission By The Executive Engineer, Polavaram Irrigation Project Left Main Canal Division, CE North Coast Campus, Pedawaltair , Visakhapatnam -530003, Andhra Pradesh, India	
5	**Affidavit / Undertaking from the Applicant for the following is to be furnished**		
5.1	Undertaking for not to Damage any other utility, if damaged then to pay the losses either to NHAI or to the concerned agency.	Yes, Enclosed	
5.2	Undertaking for Renewal of Bank Guarantee as and when asked by MORTH/NHAI	Yes, Enclosed	
5.3	Undertaking for Confirming all standard condition of Ministry Circulars and NHAI's guidelines.	Yes, Enclosed	
5.4	Undertaking for Indemnity against all damages and Claims	Yes, Enclosed	
5.5	Undertaking for management of traffic movement during laying of utility line without hampering the traffic.	Yes, Enclosed	

Project Director
National Highways Authority of India
PIU-VISAKHAPATNAM

Executive Engineer
PIPLMC Division-6
Visakhapatnam

	will not have any deleterious effects on any of the bridge components and roadway safety for traffic. (ii) "We do undertake that I/we will relocate service road/ approach road/utilities at my/our own cost not with standing the permission granted within such time as will be stipulated by NHAI" for future six-lane or any other development."	Enclosed Enclosed	
6	Who will sign the agreement on behalf of PRESSURE PIPELINE Laying agency?	O/o The Executive Engineer PIPLMC Division, CE North Coast Campus, Pedawaltair , Visakhapatnam -530003, Andhra Pradesh, India .	
	Power of Attorney to sign the agreement is available or not	NA	
7	The Project Director, will submit the following Certificates		
7.1	Certificate that the proposal is confirming to all standard conditions issued vide Ministry's Circular No: RW/NH-33044/29/2015/S&(R)dated 22.11.2016.	Enclosed	
7.2	Certificate from PD in the following format (i) "It is certified that any other location of PRESSURE PIPELINE would be extremely difficult and unreasonable costly and the installation of PRESSURE PIPELINE within ROW will not adversely affect the design, stability & traffic safety of the highway nor the likely future improvement such as widening of the carriageway, easing of curve etc". (ii) for 6-lanning (a) Where feasibility is available "I do certify that there will be no hindrance to proposed six-lane based on the feasibility report considering proposed structures at the said location". (b) In case feasibility report is not available	Enclosed Enclosed Enclosed	

Project Director
National Highways Authority of India
PIU-VISAKHAPATNAM

Executive Engineer
PIPLMC Division-6
Visakhapatnam

11	Who will pay the claims for damages done/disruption in working Pressure pipeline concessionaire if asked by the Concessionaire.	O/o The Executive Engineer, PIPLMC Division, CE North Coast Campus, Pedawaltair , Visakhapatnam -530003, Andhra Pradesh, India	
12	A certificate from PD that he will enter the proposed permission in the register of records of the permissions in the prescribed proforma (copy enclosed)	-	
13	If any previous approval is accorded for laying cable line, then Photocopy of register of records of permissions accorded (as maintained by PD) be enclosed.	-	

(A. Umesh Kumar)

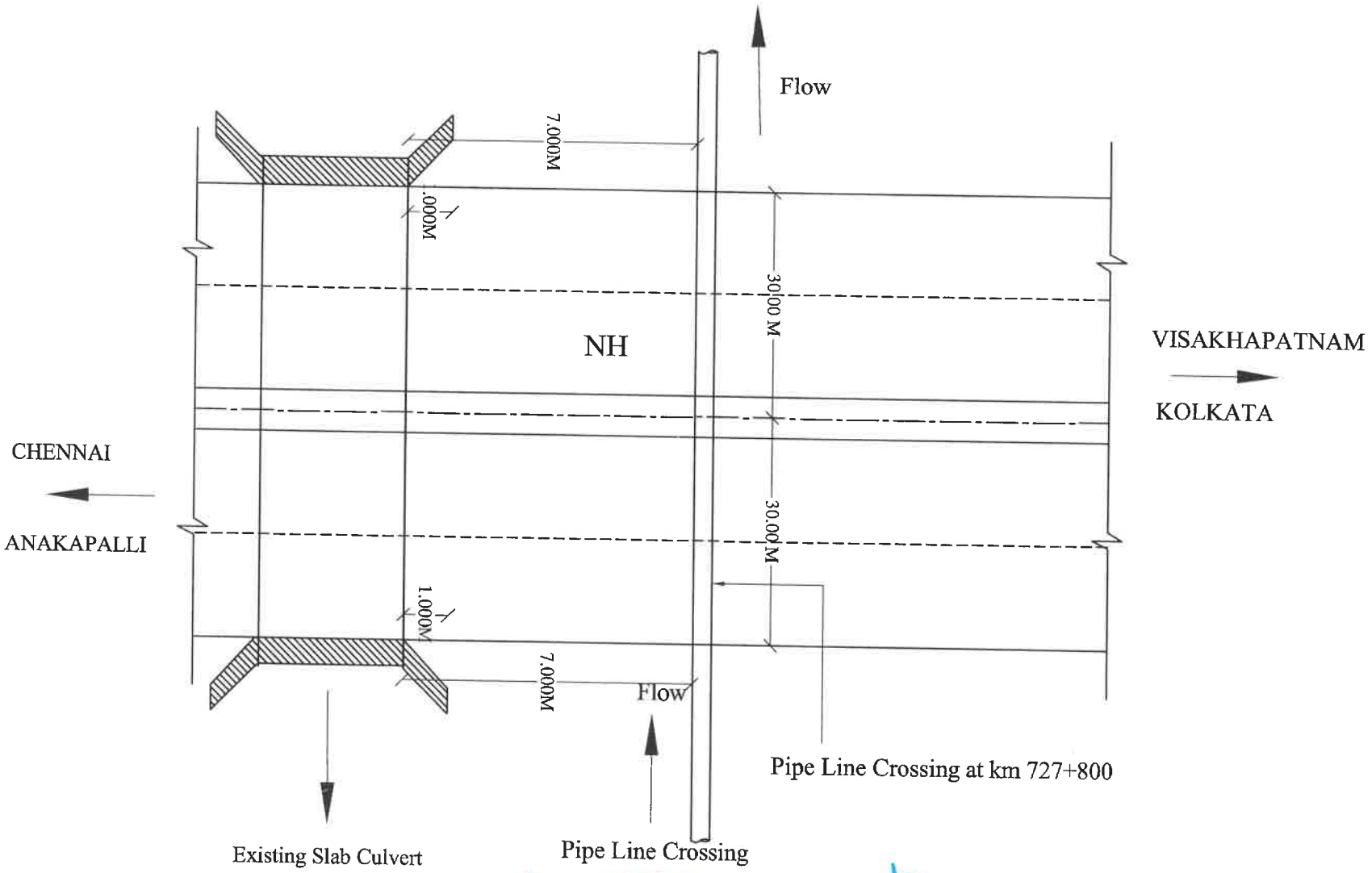
Name, Designation & Signature of the
The Executive Engineer,
PIPLMC Division,
CE North Coast Campus,
Pedawaltair ,
Visakhapatnam -530003,
Andhra Pradesh, India.

Executive Engineer
PIPLMC Division-6
Visakhapatnam

VISAKHAPATNAM PIN - 530 012

Name, Designation & Signature of the
Concerned field authority of NHAI/PWD/BRO.

Project Director
National Highways Authority of India
PIU-VISAKHAPATNAM



Project Director
National Highways Authority of India
PIU-VISAKHAPATNAM

Executive Engineer
PIPLMC Division-6
Visakhapatnam

Calculation of License Fees

Permission for laying of pipeline across NH at chainage km.727.800 at aganampudi,visakhapatam in the State of Andhra Pradesh

Sl.No	Location	Chanaige (in Km)		Length (In Mtrs)	Width (In Mtrs)	Utilized NH Land Area	Prevailling Circle rate of Land in Rs./Sq Yard	Prevailling Circle rate of	Amount
		From	To						
1	2	3	4	5	6	7(5*6)	8	9	10(7*9)
	Sanivada	727.800	727.800	60	1.6	96.00	17000	20332	1951872
	Total Length (in Mtrs)			**60**					
									1951872
	License Fee for public utility shall be equal to utilized NH land area X Prevailing Circle Rate of Land per unit are X 1.5% per annum, subject to minimum of								29,278
	License Fee (minimum of Rs.10,000/-)								29,278
	License Fee for 1st year								29,278
	License Fee for 2nd year i.e., 6% annual increment on 1st year								31,034.7
	License Fee for 3rd year i.e., 6% annual increment on 2nd year								32,896.8
	License Fee for 4th year i.e., 6% annual increment on 3rd year								34,870.6
	License Fee for 5th year i.e., 6% annual increment on 4th year								36,962.8
	Total License Fee to be paid								**1,65,042.8**

Performance bank Guarantee Amount calculation

Amount of Performance Bank Guarantee to be submitted = Total length of pipe X Rs. 500/- per route meter (>1000 mm dia/width)

i.e., 60 X Rs. 500/- = 30000/-

Performance bank Guarantee Amount = 30,000/-

Project Director
National Highways Authority of India
PIU-VISAKHAPATNAM

VISAKHAPATNAM
PIN : 530 012

19/4/25
Executive Engineer
PIPLMC Division-6
Visakhapatnam

सत्यमेव जयते

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(सड़क परिवहन और राजमार्ग मंत्रालय भारत सरकार)
National Highways Authority of India
(Ministry of Road Transport and Highways, Government of India)
परियोजना कार्यालयन इकाई (जि वयू), भा.रा.रा.पा.एन्कलेव, कि.मी. 2/8 रा.रा.-16
हनुमन्तवाका, विशाखपट्टणम - 530 040, ए.पि., भारत
Project Implementation Unit (GQ), NHAI Enclave, KM 2/8 NH-16
Hanumanthavaka, Visakhapatnam - 530 040, A.P., India
फोन / Tel : 0891-2707600, 2714119
ई-मेइल/ E-mail : vis@nhai.org, nhaipiuvsp@gmail.com, वेब : www.nhai.gov.in

NHAI/PIU-VSP/Polavaram-Pipeline/83/727+800/2024-25/4927 February, 21st 2025.

To

Authorised Signatory,
M/s Global Infra Solutions Private Limited,
Visakhapatnam(dist.). Andhra Pradesh.

Sub: NHAI - PIU, Visakhapatnam - Permission for NOC for laying pipeline Crossing @KM 727+800 at Sanivada(village) Kurmanpalem Mandal, Visakhapatnam(dist), Andhra Pradesh-**Issue of NOC**-Reg

Ref: letter no:EE/PIPLMC/Pipeline/Vsp/106[m] dated:19.02.2025(received this office 20.02.2025).

Sir,

Please find enclosed herewith a proposal seeking Permission for NOC for laying pipeline Crossing @KM 727+800 at Sanivada(village) Kurmanpalem Mandal, Visakhapatnam(dist), Andhra Pradesh vide letter under reference cited above.

2. In this regard, it is requested to inspect the site on 22.02.2025 along with the representatives of NHAI, Contractor & Executive Engineer of PIPLMC division and verify the proposal as per MoRT&H guidelines RW/NH-33044/29/20215/S&R(R) dated:22.11.2016 and furnish your report / comments duly signing the Checklist along with recommendations to this office for further action.

Yours truly,

Encl : As above

(Prabhat Ranajan)
DGM(T)& Project Director.

Copy to:

1. Authorized signatory, M/s Shiva buildtech.
2. Executive Engineer, PIPLMC division-6, Visakhapatnam - for information and necessary coordination.

GOVERNMENT OF ANDHRA PRADESH
WATER RESOURCES DEPARTMENT

From:
Sri A. Umesh Kumar,
Executive Engineer,
PIPLMC Division,
Visakhapatnam.

RECEIVED
20 FEB 2025
166
NHAI, PIU, VISAKHAPATNAM

To:
The Project Director,
NHAI, PIU,
NHAI Enclave, Hanumanthavaka,
Visakhapatnam.

Lr. No. EE/PIPLMC ~~SD-7~~/pipeline/~~pkg-8B~~/VSP/ 106M Date. 19.2.2025

Sir,

Sub: Requesting for Right of Way (RoW) Permission for laying pressure pipeline from km. 0.00 to km.10.80 of NWS Scheme under PIPLMC Package-8 works against Jack push method in NH-16 by HDD Methodology at the chainage Km. 0.850 of pressure pipeline for New Water Supply Scheme, at Highway chainage Km. 727.800 to across the Highway road for a width of 60m (200 ft.) at Kurmanapalem Mandal (sanivada) in Visakhapatnam City in Visakhapatnam District of Andhra Pradesh in the Jurisdiction of NHAI, Visakhapatnam.– Regarding.

NHAI PIU	VSP
Dy.M(T)	
PPS(ML)	
PA(KVG)	
ACCTS	
SE-1	
SE-2	
SE-3	
SE-4	
IT	

Ref: (1) Executive Engineer Endt.No: PIPLMC Divn/VSP/DB/BJRUSS-PH-II/ Pkg-I /530S ,Dt.11.08.23.

@@@@@@

With respect to the reference cited above, the work "New Water Supply Scheme from KBR to MGR" under the Polavaram Irrigation Project, Package -8B under the control of o/o the Executive Engineer, Polavaram Irrigation Project Left Main Canal Division, CE North Coast Campus, Pedawaltair, Visakhapatnam under control of the unit of Polavaram Irrigation Project Left Main Canal, Dowlaiswaram is now taking up the work of laying pressure pipeline from km. 0.00 to km.10.80 of NWS scheme under PIPLMC Package-8 works against Jack push method across the Road in NH-16 by HDD Methodology at the chainage Km. 0.850 of pressure pipeline for New Water Supply Scheme, at Highway chainage Km. 727.800 to across the Highway road for a width of 60m(200 ft.) at Kurmanapalem Mandal (sanivada) in Visakhapatnam City in Visakhapatnam District of Andhra Pradesh in the Jurisdiction of NHAI, Visakhapatnam.

Exit and entry pits will be restored to normal condition in accordance with MoRTH guidelines with all the safety measures.

As per point no. 5 & 6 of MORTH guidelines cited above, we shall submit License Fee and a Performance Bank Guarantee for an amount based on the land valuation certificate provided by the respective authority which will be

Executive Engineer
PIPLMC Division-6

Global Infra Solutions Joint-Venture Artefact Projects Ltd. in Association with MS Consultant

#F-2, E-8/11A, SUKHSAGAR APARTMENT, TRILANGA, BHOPAL-462039
+91 9826483009
globalinfrasolutions@gmail.com

Ref. No. GIS/AE/PBMC /NH-16/ NOC@727+800/2024-25/15 Date: 06.03.2025

To
The Project Director
National Highways Authority of India
Project Implementation Unit-Visakhapatnam
NHAI Enclave, km 2/8, NH-5
Hanumanthavaka, Visakhapatnam
Andhra Pradesh-530040.

RECEIVED 06 MAR 2025 5825 NHAI, PIU, VISAKHAPATNAM

Sub.:Consultancy Services for Strengthening and Major Maintenance of Anandapuram-Visakhapatnam-Anakapalli section from Km 682.980 to Km 741.256 and Ranastalam Town Portion from Km 630.120 Km 634.120 of NH-16 in the State of Andhra Pradesh on Performance Based Maintenance Contracts (PBMC) – **Report on Request for NOC for crossing NH-16 at Km727+800 through HDD Method - Reg.**

Ref.:1) Y/o Lr.No.NHAI/PIU-VSP/Polavaram-Pipeline/83/727+800/2024-25/4927 datd February, 21st 2025.
2) PIPLMC Lr.No.EE/PIPLMC/pipeline/VSP/106 dtd.19.02.2025.
3) Contract Agreement Agreement dated 08th August 2024.

Dear Sir,

With regard to your request vide letter cited under 1st reference, we have inspected the site location at Km.727+800 along with the representatives of NHAI, Contractor & Executive Engineer of PIPLMC division-6, Visakhapatnam and verified all the points in the proposal submitted by the Applicant (Executive Engineer, PIPLMC Division-6, Visakhapatnam) seeking No Objection Certificate (NOC) for crossing NH-16 at above said Chainage through HDD Method to lay pressure pipeline (1.6m dia casing pipe & 1.3m dia pipe) is part of New Water Supply Scheme of the Government.

Accordingly, we submit our report is as following.

NHAI PIU	VSP
Dy.M(T)	
PS(MLN)	
PA(RVG)	
ACCTS	
SE-1	
SE-2	
SE-3	
SE-4	
PD	

i) The ROW at said location is 60mtrs as per available records.

ii) The Proposal has been submitted with HDD method.

Further;

1. The check list submitted by the Agency is duly verified for relevant information against each item and is found correct as per the specified MORTH guidelines requirement.
2. The following documents are submitted by the Agency as per the norms and to be followed at site.

a) Proposal Letter addressed to PD/NHAI/PIU, Visakhapatnam.

b) Check List

Continued on 2

Global Infra Solutions Joint-Venture Artefact Projects Ltd. in Association with MS Consultant

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+91 9826483009
globalinfrasolutions@gmail.com

c) Agreement regarding granting of Right of Way permission.

d) Undertaking for Performance Bank Guarantee.

e) Indemnity bond against all damages and claims as Sl. 5.6 of Check list.

f) They have given undertaking to take all the actions as prescribed in the Check List point 5 (5.1 to 5.11)

g) They have given Certificate to take all the actions as prescribed in the Check List5.12.

h) Cross section.

i) Brief description of Horizontal Directional Drilling.

j) Plan and profile submitted to lying of Pressure pipeline on along the Structures and cross Drainages.

k) Undertaking for payment of License Fees/lease Rentals.

l) Undertaking for Shifting / Relocate of Pressure pipeline.

m) Specification Report/License Fees Estimate.

n) Maintenance of ROW records.

Besides, we have noticed the deviation of distance to the proposed crossing point (@Km.727+800) is 7mtrs from the existing structure (slab culvert) @727+800 on NH-16, which is minimum distance of 15meters required to full fill S.No.1.19© in the Check List, in order to meet the MoRT&H guidelines RW/NH-33044/29/20215/S&R(R) dated 22.11.2016.

In view of the above circumstances, we request the Competent Authority to take appropriate decision on issuing the NOC to the Applicant (Executive Engineer, PIPLMC Division-6, Visakhapatnam) for Pressure pipeline crossing.

This is submitted for your information and further necessary action.

For, **Global Infra Solutions JV**
Artefact Projects Ltd. in association with **MS Consultant.**

Suresh Korada
Team Leader

Copy to : 1) Head Office, Global Infra Solutions, Bhopal.
2) Executive Engineer, PIPLMC, Division-6, Visakhapatnam – for information

Annexure-III

[Enclosu[illegible] Ministry Circular No. RW/NH-33044/27/2015-S&R(R) d[illegible]d 22.11.2016]

Format for Maintaining Records of Right-of-Way permission granted for laying Pipeline using HDD Method

(to be maintained separately for every NH and State)

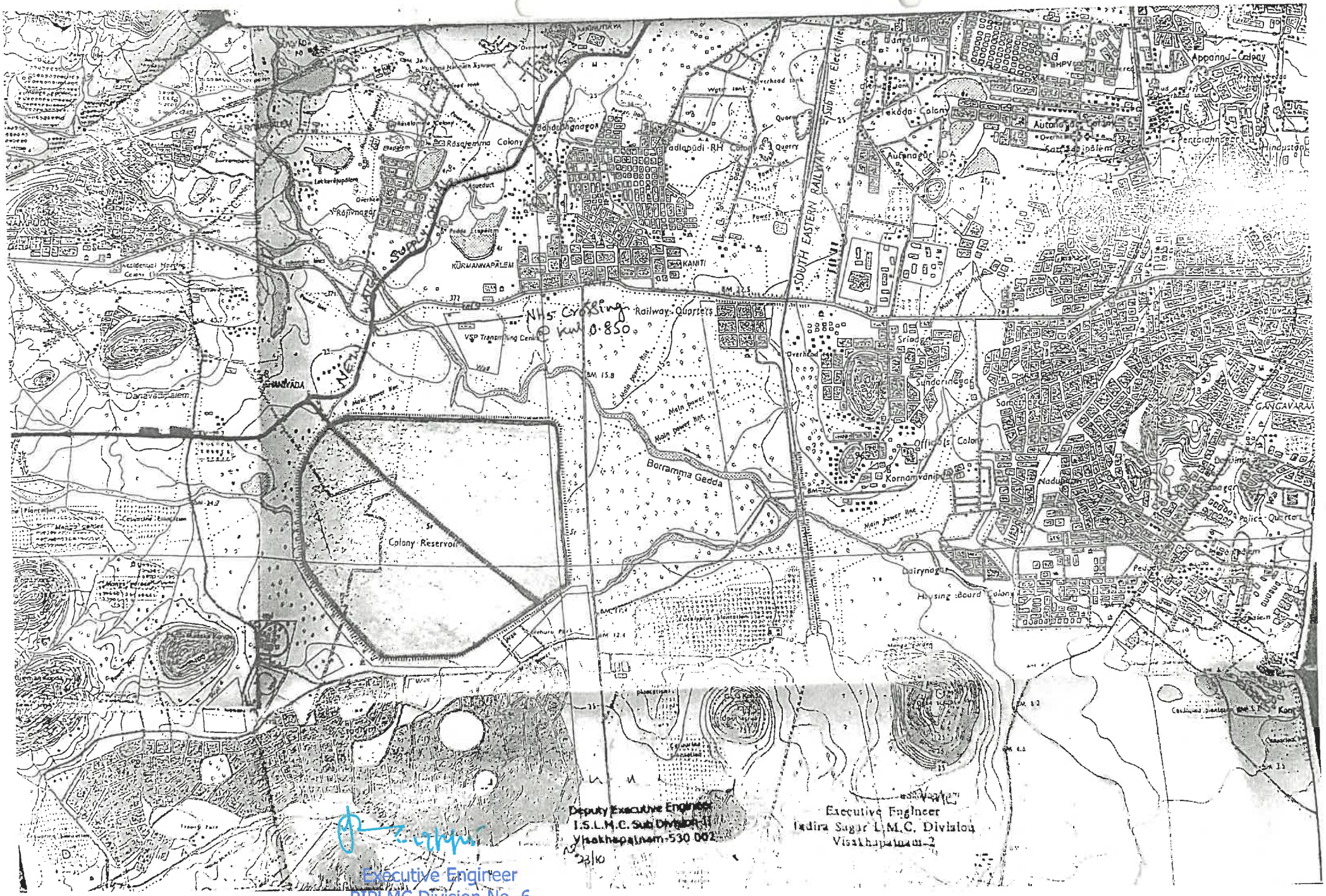
1 Name of State : Andhra pradesh

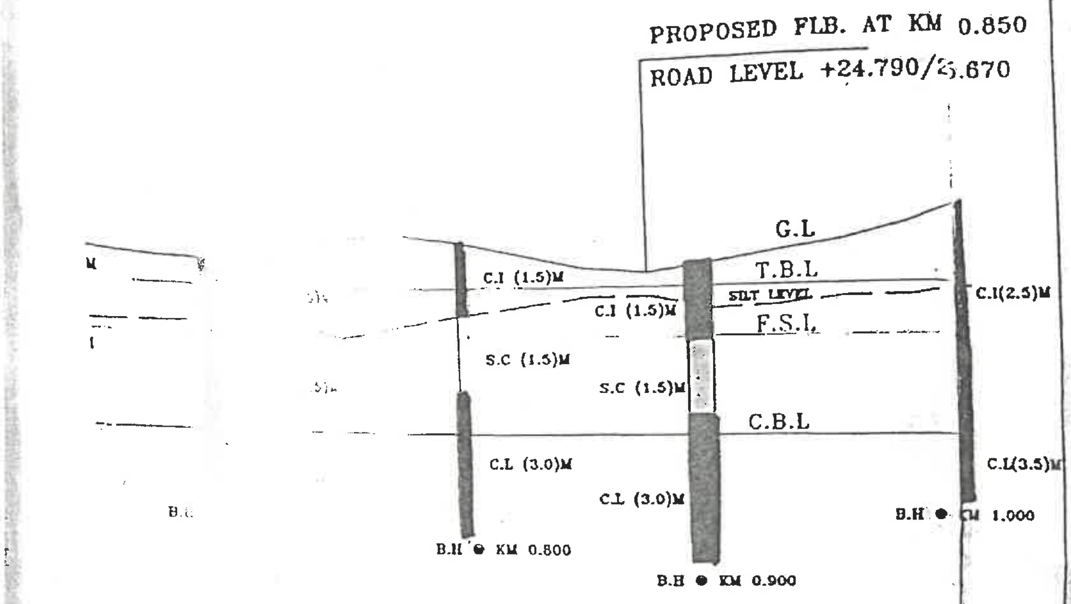
2 Name of Agency : NHAI, Visakhapatnam

3 NH Number : NH-16

S.No	Location (change in Km)	across the NH (towards increasing chainage/km direction	Section and reach	Kind of service	Name of license and contact address	Date of signing of agreement	Date of validity of agreement	Date of last inspection of site	Any deviation from MOST standard norms	Remarks
3	Road Crossing @Km 727.800	Road Crossing	NH-16	Pipe line	The Executive Engineer, Polavaram Irrigation Project Left Main Canal Division, CE North Coast Campus, Pedawaltair , Visakhapatnam -530003, Andhra Pradesh, India.					

Executive Engineer
PIPLMC Division No. 6
Visakhapatnam


SOUTH EASTERN RAILWAY
Railway Quarters
KANITI
KURMANNAPALEM
Borramma Gedda
Colony Reservoir
Kornamvanipalem
Housing Board Colony
Police Quarters
Executive Engineer
Indira Sagar L.M.C. Division
Visakhapatnam-2
Deputy Executive Engineer
I.S.L.M.C. Sub Division-II
Visakhapatnam-530 002.
Executive Engineer
PIPLMC Division No. 6
Visakhapatnam



DATUM : 15.000												
VILLAGE			SANIVADA									
H. OF BANKING												
DEPTH OF CUTTING	3.580	4.000	4.107	3.959	3.681	3.401	3.288	3.476	3.669	3.867	4.178	4.657
TBL	23.127	[illegible]	23.112	23.109	23.105	23.102	23.098	23.094	23.091	23.087	23.084	23.080
FSL	22.127	22.116	22.112	22.109	22.105	22.102	22.098	22.094	22.091	22.087	22.084	22.080
BED LEVELS	20.127	20.116	20.112	20.109	20.105	20.102	20.098	20.094	20.091	20.087	20.084	[illegible]
SILT LEVELS	22.359	[illegible]	22.334	22.548	22.72	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GROUND LEVELS R/L	23.707	24.122	24.219 / [illegible]	24.068 / 23.701	23.786 / [illegible]	23.503 / 23.752	23.388 / 23.542	23.670 / 23.742	23.780 / 24.235	23.954 / 24.217	24.282 / 24.398	24.737 / 24.521
DISTANCE IN MTS.	25.00	[illegible]	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	[illegible]
TOTAL DISTANCE IN KMS.	0.675	[illegible]	0.775	0.800	0.825	0.850	0.875	0.900	0.925	0.950	0.975	[illegible]

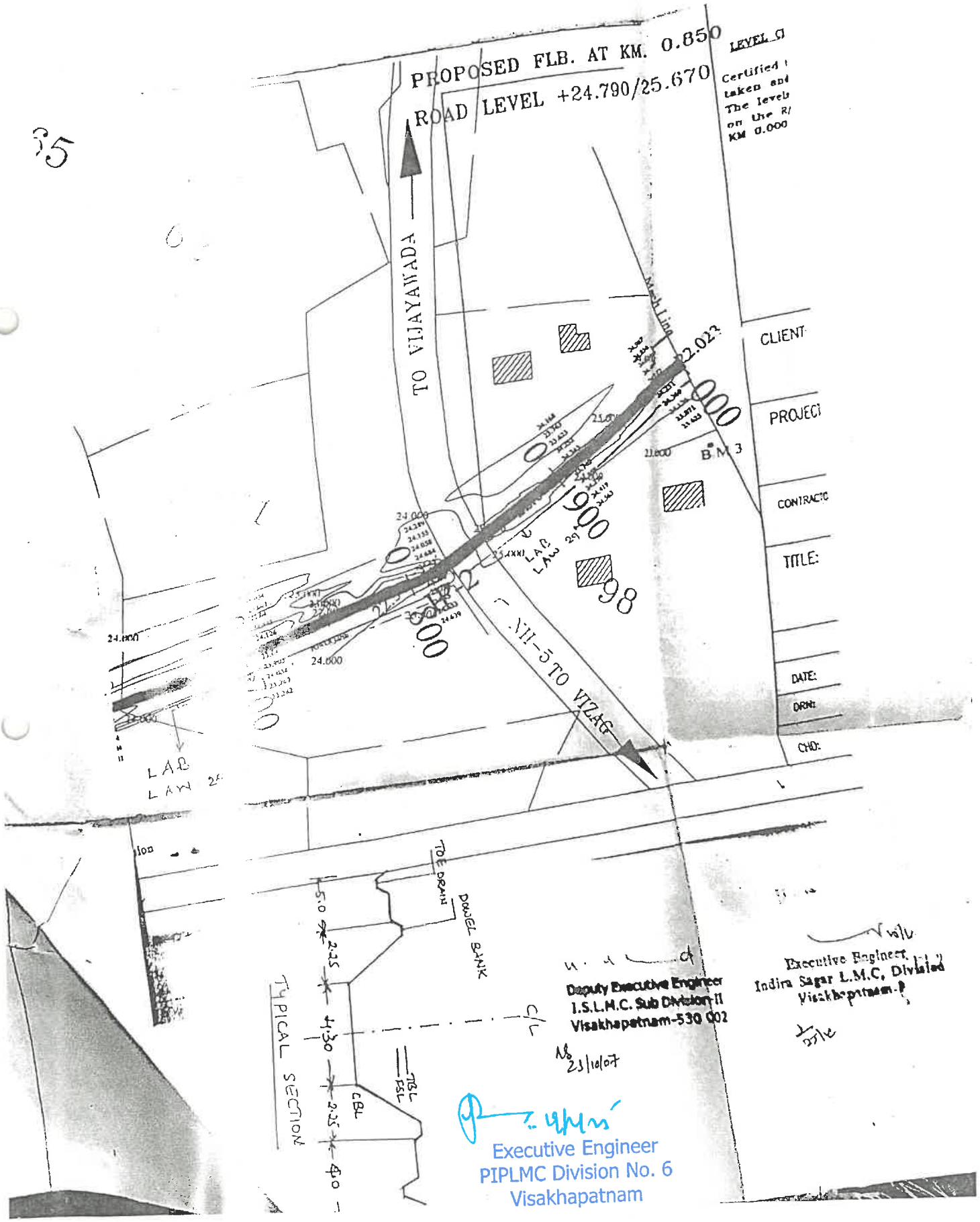
LEVEL C...

Certified ...
recorded ...
The levels ...
of KBR -...
whose val...

Deputy Executive Engineer
I.S.L.M.C. Sub Division-II
Visakhapatnam-530 002
23/10/07

Executive Engineer
Indira Sagar L.M.C. Division
Visakhapatnam-2

Executive Engineer
PIPLMC Division No. 6
Visakhapatnam


PROPOSED FLB. AT KM. 0.850
ROAD LEVEL +24.790/25.670
TO VIJAYAWADA
CLIENT:
PROJECT
CONTRACTO
TITLE:
DATE:
DRN:
CHD:
B.M 3
LAB
LAW
TO VIZAG
TOE DRAIN
DOWEL BANK
TYPICAL SECTION
5.0
2.35
4.30
2.35
4.0
CBL
TBL
FSL
C/L
Deputy Executive Engineer
I.S.L.M.C. Sub Division II
Visakhapatnam-530 002
Executive Engineer,
Indira Sagar L.M.C, Division
Visakhapatnam-6
Executive Engineer
PIPLMC Division No. 6
Visakhapatnam

Specification Report

Specification to accompanying the estimate towards "License fee" for Laying pipeline crossing the NH at Km 727. 800 , total length 60m.(200ft)

Estimate Amount: 19,51,872/-

The Executive Engineer, Polavaram Irrigation Project Left Main Canal Division, CE North Coast Campus, Pedawaltair , Visakhapatnam -530003, Andhra Pradesh, India vide his letter No: have requested to issue permission for Laying of Pipeline crossing the NH at Km 727. 800, total length 60m at Aganampudi .

The rate of land abutting NH/SH/ZPP/MPP obtained from the web site of Registration & Stamps Department, Government of Andhra Pradesh is used for calculation of the License fee. The list of Villages/Municipalities falling in the proposed stretch of road, corresponding chainages and breakup of villages wise land rates are as follows:

S.No	Name of the village	Chainage	Length	Rate of Land abutting NH	
				Per Sq. Yard	Per Sq.m
1	Sanivada	Km.727.800	60m	Rs.17000	Rs.20332

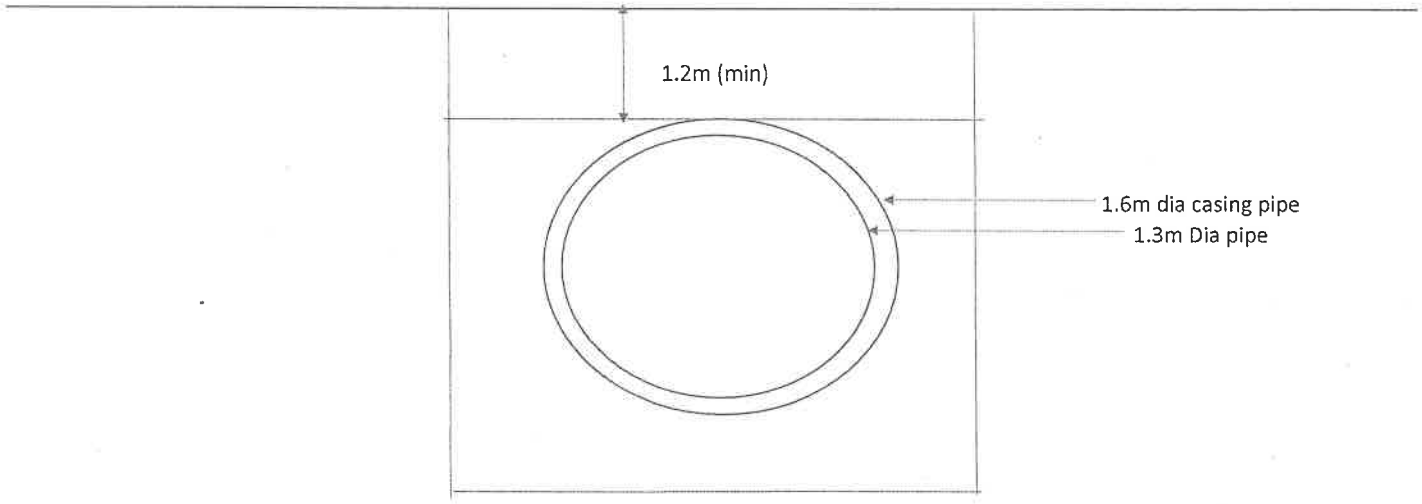
The land rate corresponding to the chainage is used for calculation of License fee.

Executive Engineer
PIPLMC Division No. 6
Visakhapatnam

Project Director

NHAI, Vishakhapatnam.

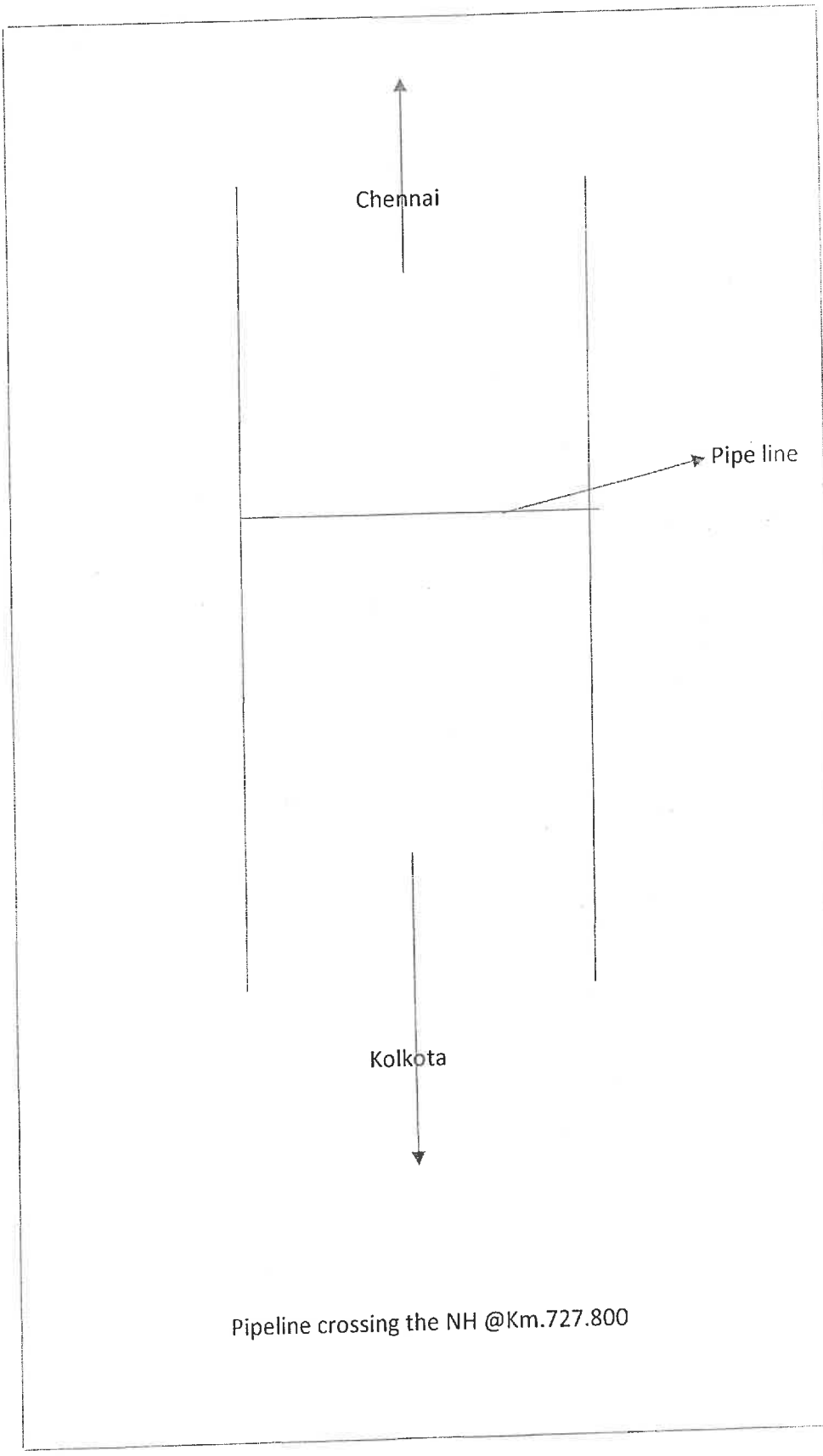
Top of the Road



Instalation of pipe across the Road

Not to scale

Executive Engineer
PIPLMC Division No. 6
Visakhapatnam



Pipeline crossing the NH @Km.727.800

Executive Engineer
PIPLMC Division No. 6
Visakhapatnam

Methodology of Pressure pipeline Laying

Installation of Pressure pipe line by Trenchless Techniques (e.g. by HDD)

For the process of HDD excavation of only 2 pits each of standard size is required which is called Entry pit and exit pit. Pit size may vary based on the site condition. The first stage drills a pilot hole on the designed path, and the second stage (reaming) enlarges the hole by passing a larger cutting tool known as the reamer. The reamer's diameter depends on the size of the Pipe (RCC Hume Pipeline NP_4 in our case) to be pulled back through the bore hole. The driller increases the diameter according to the outer diameter or the conduit and to achieve optimal production. The third stage places the Pipe (1.3m dia pipe) in the enlarged hole by way of the drill stem; It is pulled behind the reamer to allow cantering of the pipe in the newly reamed path. Pit size may vary based on site condition. Entry and exit pits shall be dug at both ends of the segment which shall later on become either a location for man-hole/hand-hole The drilled hole profile between entry and exit pits (except transition areas) shall be as straight as possible.

High Ways/Roads/Railway crossings

Highways /Roads/railway crossings may be crossed by open cut or trenchless technique (HDD/Mouling) appropriate / approved by the authorities (refer typical sketches at the end of this section). Moiling method is generally not suitable for crossing width of more than 20 meters. For such crossings only HDD should be used when trenchless technique only is approved by authorities. RCC Hume pipe shall be provided as additional protection to Pressure pipe line at these crossing locations as a measure to prevent third party damage.

Executive Engineer
PIPLMC Division No. 6
Visakhapatnam

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Government of Andhra Pradesh

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CH. ARUNA KUMARI STAMP VENDOR

Please write or type below this line

Undertaking as per Sl. No. 5 of Check List

5.1 We, O/o The Executive Engineer, Polavaram Irrigation Project Left Main Canal Division, CE North Coast Campus, Pedawaltair, Visakhapatnam -530003, Andhra Pradesh, India are planning to lay pressure pipeline across the Road in NH-16 by HDD Methodology at the chainage Km. 727.800 to across the Highway road for a length of 60m (200 ft.) at Kurmanapalem Mandal (sanivada) in Visakhapatnam City in Visakhapatnam District of Andhra Pradesh under the Jurisdiction of NHAI , PIU, Visakhapatnam.

We here by undertake the following conditions with reference to the above cited work:

5.2 We undertake that not to Damage any other utility, if damaged then to pay the losses either to Authority to the concerned agency

5.3 We undertake to renew the Bank Guarantee as and when asked by MORTH/NHAI.

5.4 We undertake to confirm all standard conditions of Ministry Circulars and NHAI Guidelines.

5.5 We undertake to Indemnify NHAI against all damages and claims.

5.6 We undertake management of traffic movement during laying of utility line without hampering the TABER traffic

5.7 We undertake that if any claim is raised by the Concessionaire/contractor then the same shall be paid by us.

5.8 We undertake that prior approval of the NHAI shall be obtained before undertaking any work of installation, shifting or repairs or alterations to the utility located in the National Highway Right-of-Ways.

G.J.R. AJAY KUMAR
ADVOCATE & NOTARY
PLOT No. 23, D.No:8-1-53/16
Nouka Nagar, Peda Waltair,
Near Visakha Eye Hospital
Visakhapatnam-530017
Andhra Pradesh, India
Ph. No: 9440 20 0015

Executive Engineer
PIPLMC Division No. 6
Visakhapatnam

HF 0027078124

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ANDHRA PRADESH

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5.9 We undertake to bear expenditure, if any, incurred by NHAI for repairing any damage caused to the National Highway by the laying, maintenance or shifting of the utility line. will be borne by us owning the line.

5.10 We undertake that text of the license deed is as per verbatim of MoRTH format (issued vide Ministry's Circular no. RW/NH-33044/29/2015/S&R(R) dated 22.11.2016).

5.11 Not Applicable for pipe line.

5.12 We undertake to carry out the work of moving the utility line at our cost as desired by the MORTH/NHAI for any work of improvement or repairs to the road within a reasonable time (not exceeding 60 days) of the intimation given.

5.13 We undertake to submit a Certificate in the following format:

i. Laying of Utility pipe line (OFC) will not have any deleterious effects on any of the bridge components and road way safety for traffic.

ii. "We do undertake that I/we will relocate service road/approach road/utilities at my/our own cost notwithstanding the permission granted within such time as will be stipulated by NHAI for future six-lane or any other development."

19/2/25

O/o Executive Engineer,
PIPLC Division,
CE North Coast Campus,
Pedawaltair,
Visakhapatnam -530003,
Andhra Pradesh, India

GJRAK NOTARIAL

NOTARY * INDIA * G.J.R. AJAY KUMAR * Regd.No: 732/2011 Visakhapatnam * My Commision expires on 01.05.2026 * Appointed by Govt. of Andhra Pradesh

ATTESTED
19/02/2025
NOTARY
VISAKHAPATNAM
ANDHRA PRADESH
INDIA

G.J.R. AJAY KUMAR
ADVOCATE & NOTARY
PLOT No. 23, D.No:8-1-63/15
Nouka Nagar, Peda Waltair,
Near Visakha Eye Hospital
Visakhapatnam-530 017
Andhra Pradesh, India
Ph. No: 9440120106

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Second Party	:	Not Applicable
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CH. ARUNA KUMARI STAMP VENDOR AP-18006904 Dt. VSP

Please write or type below this line

UNDERTAKING FOR PAYMENT OF LICENSE FEES/LEASE RENTALS

Name of Work: To lay Pressure pipeline across the Road in NH-16 by HDD Methodology at the chainage Km.727.800 across the Highway road for a length of 60m (100ft) at Kurmanapalem Mandal (sanivada) in Visakhapatnam City in Visakhapatnam District of Andhra Pradesh the Jurisdiction of NHAI, PIU, Visakhapatnam.

We, O/o The Executive Engineer, Polavaram Irrigation Project Left Main Canal Division, CE North Coast Campus, Pedawaltair, Visakhapatnam -530003, Andhra Pradesh, India, do hereby undertake that We shall pay License Fees /lease rental changes for granting License for use of Highway land whenever charged by the Highway Administration as per point No. 5 of MORTH guidelines vide letter no. RW/NH 33044/29/201S/S&R(R) Dated: 22nd November 2016.

O/o Executive Engineer,
PIPLMC Division, No. 6
Visakhapatnam

NOTARY Appointed by Govt. of Andhra Pradesh, INDIA G.J.R. AJAY KUMAR Regd.No: 732/2011 Visakhapatnam Commission expires on 01-05-2027

GJRAK NOTARIAL

G.J.R. AJAY KUMAR
ADVOCATE & NOTARY
PLOT No. 23, D.No:8-1-63/16
Nouka Nagar, Peda Waltair,
Near Visakha Eye Hospital
Visakhapatnam-530 017
Andhra Pradesh, India
Ph. No: 9440120106

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CH. ARUNA KUMARI STAMP VENDOR AP18006904

Please write or type below this line

Certificate as per Sl. No. 5.12 of Check List

Name of Work: To lay pressure pipeline in NH-16 by HDD Methodology at the chainage Km. 727.800 to across the Highway road for a length of 60m (200 ft.) at Kurmanapalem Mandal (sanivada) in Visakhapatnam City in Visakhapatnam District of Andhra Pradesh under the Jurisdiction of NHAI , PIU, Visakhapatnam do hereby undertake

i. Laying of pressure pipeline will not have any deleterious effects on any of the bridge components and roadway safety for traffic.

ii. "We do undertake that I/we will relocate service road/approach road/utilities at my/our own cost notwithstanding the permission granted within such time as will be stipulated by NHAI for future six-lane or any other development."

O/o Executive Engineer,
PIPLMC Division
Visakhapatnam

NOTARY * INDIA * G.J.R. AJAY KUMAR * Regd.No: 732/2011 Visakhapatnam * Commission expires on 01-05-2026 * Appointed by Govt. of Andhra Pradesh

GJRAK NOTARIAL

G.J.R. AJAY KUMA..
ADVOCATE & NOTARY
PLOT No. 23, D No:8-1-63/16
Nouka Naga[illegible]eda Waltair,
Near Visak[illegible] Eye Hospital
Visakhapatnam-530 017
Andhra Pradesh, India
Ph. No: 9440120106

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Description of Document	:	Article 0 Not Mentioned
Property Description	:	Not Applicable
Consideration Price (Rs.)	:	0 (Zero)
First Party	:	OFFICE OF THE EE PIPLMC DIVISION NO 6 VSP
Second Party	:	Not Applicable
Paid By (For Whom)	:	OFFICE OF THE EE PIPLMC DIVISION NO 6 VSP
Stamp Duty Amount(Rs.)	:	20 (Twenty only)

STAMP VENDOR CH. PAVANA KUMAR AP18006904 RO-VSP

Please write or type below this line

Undertaking for Shifting/ Relocation of Pipeline

We, The Executive Engineer, Polavaram Irrigation Project Left Main Canal Division, CE North Coast Campus, Pedawaltair , Visakhapatnam -530003, Andhra Pradesh, India. Hereby indemnify The Project director, NHAI, PIU, Visakhapatnam binding ourselves to pay all the losses and claims in respect of laying of Pressure pipeline across the NH-16 Highway chainage Km. 727.800 for a length of 60m(200 ft.) at Kurmanapalem Mandal (sanivada) in Visakhapatnam under the Jurisdiction of NHAI, Vishakhapatnam.

We will shift the Pipeline within 60 days (or as specified by the respective authority) from the date of issue of the notice by the concerned authority to shift/relocate the pipeline, in case it is so required for the purpose of improvement/widening of the road/route/Highway or construction of flyover/bridge and restore the road/land to its original condition at our own cost.

Executive Engineer,
PIPLMC Division,
Visakhapatnam.

GJRAK NOTARIAL

NOTARY Appointed by Govt. of Andhra Pradesh, INDIA G.J.R. AJAY KUMAR Regd.No: 732/2011 Visakhapatnam My Commission expires on 31-05-2026

G.J.R. AJAY KUMAR
ADVOCATE & NOTARY
PLOT No. 23, D.No:8-1-63/16
Nouka Nagar, Peda Waltair,
Near Visakha Eye Hospital
Visakhapatnam-530 017
Andhra Pradesh
Ph. No:9246

HIF 0027078120

ATTESTED
NOTARY 19/02/2025
VISAKHAPATNAM
ANDHRA PRADESH

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Government of Andhra Pradesh

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Certificate No.	:	**IN-AP67754469421241X**
Certificate Issued Date	:	19-Feb-2025 07:30 PM
Account Reference	:	NEWIMPACC (SV)/ ap18006904/ AP-VKP/ AP-VKP/apkrimodu
DDO Code	:	27002308001 O/o IG R
Unique Doc. Reference	:	SUBIN-APAP18006904220142618731 75X
Purchased by	:	OFFICE OF THE EE PIPLMC DIVISION NO 6 VSP
Description of Document	:	Article 0 Not Mentioned
Property Description	:	Not Applicable
Consideration Price (Rs.)	:	0 (Zero)
First Party	:	OFFICE OF THE EE PIPLMC DIVISION NO 6 VSP
Second Party	:	Not Applicable
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Stamp Duty Amount(Rs.)	:	100 (One Hundred only)

CH. ARUNA KUMARI AP18006904 RS VKP STAMP VENDOR

GURAK NOTARIAL

Please write or type below this line

Undertaking for submission of Performance Bank Guarantee

Name of the Route: Laying of Pressure pipeline across the NH-16 Highway chainage Km. 727.800 for a length of 60m (200 ft). at Kurmanapalem Mandal (sanivada) in Visakhapatnam under the Jurisdiction of NHAI, Vishakhapatnam.

We, The Executive Engineer, Polavaram Irrigation Project Left Main Canal Division, CE North Coast Campus, Pedawaltair , Visakhapatnam -530003, Andhra Pradesh, India, do hereby undertake to furnish the performance Bank Guarantee at Rs.500/- per route meter and for a period of one year initially (extendable if required till satisfactory completion of work) as a security against improper restoration of ground in terms of filling/unsatisfactory compaction/Damages caused to other ground installations, utility, services and interference, interruption, disruption of failure caused thereof to any service etc. In case of O/o The Executive Engineer, Polavaram Irrigation Project Left Main Canal Division failing to discharge the obligation of making good the damages caused due to excavated trench, The Project Director, NHAI, PIU, Visakhapatnam which has granted the permission, within a period of 11 months from the date of issue of the Bank Guarantee. O/o The Executive Engineer, Polavaram Irrigation Project Left Main Canal Division shall either furnish a fresh Guarantee or extend the guarantee for a further period of one year.

Executive Engineer,
Polavaram Irrigation Project
Left Main Canal Division
Visakhapatnam

NOTARY ★ G.J.R. AJAY KUMAR ★ Appointed by Govt. of Andhra Pradesh, INDIA ★ Regd.No: 732/2011 Visakhapatnam Commission expires on 01-07-2029

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Certificate No.	:	IN-AP67753559846711X
Certificate Issued Date	:	19-Feb-2025 07:27 PM
Account Reference	:	NEWIMPACC (SV)/ ap18006904/ AP-VKP/ AP-VKP/apkrimodu
DDO Code	:	27002308001 O/o IG R
Unique Doc. Reference	:	SUBIN-APAP18006904220126980556552X
Purchased by	:	OFFICE OF THE EE PIPLMC DIVISION NO 6 VSP
Description of Document	:	Article 0 Not Mentioned
Property Description	:	Not Applicable
Consideration Price (Rs.)	:	0 (Zero)
First Party	:	OFFICE OF THE EE PIPLMC DIVISION NO 6 VSP
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Stamp Duty Amount(Rs.)	:	100 (One Hundred only)

CH. ARUNA KUMARI AP18006904 RO VSP STAMP VENDOR

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GJRAK NOTARIAL

INDEMNITY BOND

Name of the work: Laying of Pressure pipeline across the NH-16 Highway chainage Km. 727.800 for a length of 60m (200 ft.) at Kurmanapalem Mandal (sanivada) in Visakhapatnam under the Jurisdiction of NHAI, Vishakhapatnam.

Indemnity against all damages and claims as per Clause. No.28 of license deed We, , O/o The Executive Engineer, Polavaram Irrigation Project Left Main Canal Division, CE North Coast Campus, Pedawaltair , Visakhapatnam -530003, Andhra Pradesh, India . Hereby indemnify The Project director, NHAI, PIU, Gulbarga binding ourselves to pay all the losses and claims in respect of laying Laying of Pressure pipeline across the NH-16 Highway chainage Km. 727.800 for a width of 100 ft. at Kurmanapalem Mandal sanivada under the Jurisdiction of NHAI, Vishakhapatnam.

Maintenance thereof and against all claims, proceedings, damages, costs, charges and expenses whatsoever in respect thereof in relation there to. Failing such payments of claims in the above work we abide in accepting for recovery of such claims affected from any of our assets.

NOTARY ★ INDIA ★ G.J.R. AJAY KUMAR ★ Regd.No: 732/2011 Visakhapatnam ★ My Commission expires on 01.05.2026 ★ Appointed by Govt. of Andhra Pradesh

Executive Engineer,
PIPLMC Division,
Visakhapatnam.

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HDF 0027078129

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Government of Andhra Pradesh

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Certificate No.	:	**IN-AP67752695556170X**
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DDO Code	:	27002308001 O/o IG R
Unique Doc. Reference	:	SUBIN-APAP1800690422011029130221X
Purchased by	:	OFFICE OF THE EE PIPLMC DIVISION NO 6 VSP
Description of Document	:	Article 0 Not Mentioned
Property Description	:	Not Applicable
Consideration Price (Rs.)	:	0 (Zero)
First Party	:	OFFICE OF THE EE PIPLMC DIVISION NO 6 VSP
Second Party	:	Not Applicable
Paid By (For Whom)	:	OFFICE OF THE EE PIPLMC DIVISION NO 6 VSP
Stamp Duty Amount(Rs.)	:	100 (One Hundred only)

CH. ARUNA KUMARI * STAMP VENDOR * AP18006904 B.O. VSP

IN-AP67752695556170X

Please write or type below this line

AGREEMENT REGARDING GRANTING OF PERMISSIONS FOR LAYING PRESSURE PIPELINE

Agreement to lay pressure pipeline in NH-16 by HDD Methodology at the chainage Km. 727.800 **to across the Highway road** for a length of 60m (200 ft.) at Kurmanapalem Mandal (sanivada) in Visakhapatnam City in Visakhapatnam District of of Andhra Pradesh in the Jurisdiction of NHAI, Visakhapatnam.

This Agreement made this__Day of(Month)of___(year) between NH- 16acting in his executive capacity through_____________(hereinafter referred to as the "Authority" which expression shall unless excluded by or repugnant to the context, include his successors in office and assigns) on the one part, and O/o The Executive Engineer, Polavaram Irrigation Project Left Main Canal Division, CE North Coast Campus, Pedawaltair, Visakhapatnam -530003, Andhra Pradesh, India.,, (herein after referred to as the "Licensee") which expression shall unless repugnant to the context or meaning thereof, include its successors /administrator assignees on the Second part.

Executive Engineer
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INDIA

Whereas the Licensee proposes to lay Pressure pipe line etc. referred to as utility services in subsequent paras.

And whereas the Authority has agreed to grant such permission for way leave on the NH RoW as per terms and conditions hereinafter mentioned.

Now this Agreement witnesses that in consideration of the conditions hereinafter contained and on the part of the Licensee to be observed and performed, the Authority hereby grants to the Licensee permission to lay Pipeline as per the approved drawing attached here to subject to the following conditions, namely.

1. RoW permissions are only enabling in nature. The purpose of extending the way leave facility on the National Highway RoW is not for enhancing the scope of activity of a utility service provider, either by content or by intent. Further, enforceability of the permission so granted shall be restricted only to the extent of provisions/scope of activities defined in the license agreements & for the purpose for which it isgranted.

2. No Licensee shall claims exclusive right on the RoW and any subsequent user will be permitted to use the RoW, either above or below, or by the side of the utilities laid by the first user, subject to technical requirements being fulfilled. Decision of the Authority in relation to fulfillment of technical requirements shall be final and binding on all concerned parties. In case of any disruption/damages is caused to any existing user by the subsequent user, the Authority shall not be held accountable or liable in any manner.

3. The Licensee shall be responsible for undertaking all activities including, but not limited to site identification, survey, design, engineering, arranging finance, project management, obtaining regulatory approvals & necessary clearances, supply of equipment, material, construction, erection, testing and commissioning, maintenance and operation and all other activities essential or required for efficient functioning of their own utility/ industrial infrastructure facilities.

4. The Licensee shall pay license fees @ Rs ……/sq m/month to the Authority. The License fee shall become payable from the date of handing over of RoW land to the Licensee, for laying of utilities/cables/conduits/pipelines for infrastructure/ service provider. As regards Tariff and Terms and conditions for providing common utility ducts along National Highways, there shall be a separate agreement regime.

5. Fee shall to be paid in advance for the period for which permission is granted for entering into a license agreement. In case of renewal, rate prevailing at the time of renewal shall be charged. Delay in deposition of fee shall attract interest @ 15% per annum compounded annually.

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6. Present policy of the MoRT&H is to provide a 2.00 m wide utility corridor on either side of the extreme edge of ROW. In case where utility ducts with sufficient space are already available along NH, the utility services shall be laid in such ducts subject to technical requirements being fulfilled.

7. The pipeline shall be laid at edge of the RoW. In case of restricted width of RoW, which may be adequate only to accommodate the carriageway, central verge, shoulders, slopes of embankment, drains, other road side furniture etc. the utility services shall be laid beyond the toe line of the embankment and clear of the drain.

8. The Licensee shall make his own arrangement for crossing of cross drainage structure, river, etc. below the bed. In case, this is not feasible, the utility services may be carried outside the railings/parapets and the bridge superstructure. The fixing and supporting arrangement with all details shall be required to be approved in advance from the concerned Highway Administration. Additional cost on account of fixing and supporting arrangement as assessed by the Authority shall be payable by the Licensee.

9. In exceptional cases, where ROW is restricted the utility services can be allowed beneath the carriageway of service road, if available, subject to the condition that the utility services be laid in concrete ducts, which will be designed to carry traffic on top. The width of the duct shall not be less than one lane. In such case, it also needs to ensure that maintenance of the utility services shall not interfere with the safe and smooth flow of traffic. The cost of operation and maintenance will have to be borne by the Licensee.

10. It is to be ensured that at no time there is interference with the drainage of the road land and maintenance of the National Highways. Towards this, the top of the utility services shall be at last 0.6 metre below the ground level. However, any structure above ground shall be aesthetically provided for / landscaped with required safety measures as directed by the concerned Authority;

11. The pipeline shall be permitted to cross the National Highway either through structure or conduits specially built for that purpose. The casing / conduit pipe should, as minimum, extend from drain to drain in cuts and toe of slope to toe of slope in the fills and shall be designed in accordance with the provision of IRC and executed following the Specification of the Ministry.

12. Existing drainage structures shall not be allowed to carry the lines across.

13. The top of the casing/conduit pipe containing the utility services (pipeline) to cross the road shall be at least 1.2 m below the top of the sub grade or the existing ground level whichever is lower, subject to being at least 0.3m below the drain inverts. A typical sketch showing the clearance is given in **Attachment.**

14. The pipeline shall cross the National Highway preferable on a line normal to it or as nearly so as practicable.

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15. The casing/conduit pipe for crossing the road may be installed under the road embankment either by boring or digging a trench. Installation by boring method shall be preferred.

16. In case of trenching, the sides of the trench should be done as nearly vertical as possible. The trench width should be at least 30 cm. but not more than 60 cms wider than the outer diameter of the pipe. Filling of the trench shall conform to the specifications contained here-in-below or as supplied by the Highway Authority.

    a. Bedding shall be to a depth not less than 30 cm. It shall consist of granular materials, free of lumps, colds and cobbles, and graded to yield a firm surface without sudden change in the bearing value. Unsuitable soil and rock edges should be excavated and replaced by selected material.

    b. The backfill shall be completed in two stages (i) Side-fill to the level of the top of the pipe (ii) Overfill to the bottom of the road crust.

    c. The side fill shall consist of granular material laid in 15 cm. Layers each consolidated by mechanical temping and controlled addition of moisture to 95% of the proctor's Density. Overfill shall be compacted to the same density as the material that had been removed. Consolidation by saturation or ponding will not be permitted.

    d. The Road crust shall be built to same strength as the existing crust on either side of the trench or to thickness and specification stipulated by the highway Authority

17. The Licensee shall ensure making good the excavated trench for laying utility services by proper filling and compaction, so as to restore the land in to the same condition as it was before digging the trench, clearing debris/loose earth produced due to execution of trenching at least 50m away from the edge of the right of way;

18. All required restoration work subsequent to laying of the cable shall be required to be undertaken by the Licensee at its cost either by itself or through its authorized representative in consultation with the Authority as per predetermined time schedule and quality standards.

19. Prior to commencement of any work on the ground, a performance Bank Guarantee @ Rs. /- Per route metre /Rs per sq m with a validity of one year initially (extendable if required till satisfactory completion of work) shall have to be furnished by the Licensee to the Authority/ its designated agency as a security against improper restoration of ground in terms of filling/ unsatisfactory compaction damages caused to other underground installations/utility services & interference, interruption, disruption or failure caused thereof to any services etc. In case of the Licensee failing to discharge the obligation of making good of the excavated trench/other restoration work, the Authority shall have a right to make good the damages caused by excavation, at the cost of the Licensee and recover the amount by forfeiture of the Bank Guarantee.

20. In case, the Performance Bank Guarantee is invoked as mentioned above, the Licensee shall be required to replenish and reinstate the required Performance Bank Guarantee within one month of such invoking. In case the work contemplated herein is not completed to the satisfaction of the Authority, which has granted the permission, within a period of 11 months from the date of issue of the Bank Guarantee, the Licensee shall either furnish a fresh guarantee or extend the guarantee for a further period of one year. Notwithstanding this, the Licensee shall be liable to pay full compensation to the aggrieved Authority/ its designated agency for any damage sustained by them by reason of the exercise of the ROW facility.

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21. The Licensee shall shift the utility services (pipeline) within 90 days (or as specified by the Authority) from the date of issue of the notice by the Authority to shift /relocate the utility services (pipeline), in case it is so required for the purpose of improvement/widening of the road/route/highway or construction of flyover/bridge and restore the road/land to its original condition at its own cost and risk.

22. The Licensee shall be responsible to ascertain from the respective agency in co-ordination with Authority, regarding the location of other utilities, underground installations/utilities/facilities etc. The Licensee shall ensure the safety and security of already existing cables/underground installations/ utilities/facilities etc. before commencement of the excavation/using the existing cable ducts. The Licensee shall procure insurance from a reputed insurance company against damages to already existing underground installations/utilities/facilities etc.

23. The Licensee shall be solely responsible /liable for full compensation/ indemnification of concerned agency/ aggrieved Authority for any direct, indirect or consequential damages caused to them/claims or replacement sought for at the cost and risk of Licensee. The concerned agency in co-ordination with the Authority shall also have a right to make good such damages/recover the claims by forfeiture of Bank Guarantee.

24. If the Licensee fails to comply with any condition to the satisfaction of the Authority, the same shall be executed by the Authority at the cost and risk of the Licensee.

25. Grant of license is subject to the Licensee satisfying (a) minimum disruption of traffic and (b) no damage to the highways. As far as possible, the Licensee should avoid cutting of road for crossing highways, and other roads and try to carry out the work by Trenchless technology. In case any damage is caused to the road pavement in this process, the Licensee will be required to restore the road to the original condition at its cost. If due to unavoidable reasons the road needs to be cut for crossing or laying a pipeline, the Licensee has to execute the corresponding restoration work in a time bound manner. For clarification, it is hereby mentioned that all required restoration work subsequent to laying of the pipeline shall be required to be undertaken by the Licensee at its cost either by itself or through its Authorized representative in consultation with the Authority as per predetermined time schedule and quality standards. In case of the Licensee failing to discharge the obligation of making good of the excavated trench/other restoration work, the Authority shall have a right to make good the damages caused by excavation, at the cost of the Licensee and recover by forfeiture of the Bank Guarantee.

26. The Licensee shall inform/give a notice to the concerned agency designated by the Authority at least 15 days in advance with route details prior to digging trenches, for fresh or maintenance/repair works. A separate Performance Bank Guarantee for maintenance/repair works shall have to be furnished by the Licensee.

19/2/25
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27. Each day, the extent of digging the trenches should be strictly regulated so that pipeline is laid and trenches filled up before the close of the work at that day. Filling should be completed to the satisfaction of the concerned agency designated by the Authority.

28. The Licensee shall indemnify the concerned agency in the co-ordination with Authority, against all damages and claims, if any, due to the digging of trenches for laying pipeline.

29. The permission for laying utility services(pipeline) is granted maximum for 5 years at a time, which can thereafter be considered for renewal. On payment of additional fee at the time of renewal, the permission shall automatically be renewed, unless defaults exist. In case of renewal, rate prevailing at the time of renewal shall be charged. Delay in deposition of fee shall attract interest @15% per annum compounded annually.

30. The permission shall be valid only for the period it is issued and fee deposited. However, the Authority also has a right to terminate the permission or to extend the period of Agreement.

31. That the Licensee shall not undertake any work of shifting, repairs or alteration to utility services (pipeline) without prior written permission of the concerned agency in co-ordination with the Authority.

32. The permission granted shall not in any way be deemed to convey to the Licensee any ownership right or any interest in route/road/highway land/property, other than what is herein expressly granted. No use of NH RoW will be permitted for any purpose other than that specified in the Agreement.

33. During the subsistence of this Agreement, the utility services (pipeline) located in the highway land/property shall deemed to have been constructed and continued only by the consent and permission of the Authority so that the right of the Licensee to the use thereof shall not become absolute and indefeasible by lapse of time.

34. The Licensee shall bear Stamp Duty charged on this Agreement.

35. Three copies of 'as laid drawings' of utility services (pipeline) (hard and soft copies) with geo-tagged photographs and geo-tagged video recordings of laying of (utility services) pipeline the trench (with respect to the NH) and after complete restoration shall be submitted to the Authority for verification and record within a month of completion of work.

36. The Licensee shall allow free access to the site at all times to the authorized representatives of Authority to inspect the Project facilities and to investigate any matter within their Authority, and upon reasonable notice, shall provide reasonable assistance necessary to carry out their respective duties and functions

37. The utility services (pipeline) shall not be brought into use by the Licensee unless a completion certificate to the effect that utility services (pipeline) has been laid in accordance with the approved specification and drawings and trenches have been filled up to the satisfaction of the concerned agency in co-ordination with the Authority has been obtained. Notwithstanding anything contained herein this Agreement may be cancelled at any time by Authority for a breach of any condition of the same and the Licensee shall neither be entitled to any compensation for any loss caused to it by such cancellation nor shall it be absolved from any liability already incurred.

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INDIA

38. The Licensee shall ensure adherence to relevant Indian standards and follow best industry practices, methods and standards for the purpose of ensuring the safe, efficient and economic design, construction, commissioning, operation, repair and maintenance of any part of the utility services (pipeline) facilities and which practices, methods and standards shall be adjusted as necessary, to take account of:-

    a. Operation, repair and maintenance guidelines given by the manufactures,

    b. The requirement of Law,

    c. The physical conditions at the Site, and

    d. The safety of operating personnel and human beings.

39. The Licensee shall have to provide safety measures like barricading, danger lighting and other necessary caution boards while executing the work.

40. While laying utility services (pipeline), at least one lane of road shall be kept open to traffic at all times. In case of single lane roads, a diversion shall be constructed. If any traffic diversion works are found necessary during the working period such diversion shall be provided at the cost of Licensee.

41. After the termination/ expiry of the agreement, the Licensee shall remove the utility services (pipeline) within 90 days and the site shall be brought back to original condition failing which the Licensee will lose the right to remove the utility services (pipeline). However, before taking up the work of removal of utility services (pipeline) the Licensee shall furnish a fresh Bank Guarantee to the Authority for a period of one year for an amount assessed by the Authority as security for making good the excavated trench by proper filling and compaction, and clearing debris, loose earth produced due to excavation of trenching at least 50 m away from the edge of the RoW.

42. Any dispute in interpretation of the terms and conditions of this Agreement or their implementation shall be referred to High Level Committee comprising the designated representatives of the Authority, Licensee and the concerned agencies and the decision of the committee shall be final and binding on all.

43. For PPP Projects, in case of any financial loss incurred by the respective project concessionaires due to such shifting of utility services (pipeline) by the Licensee, compensation for the same shall be required to be borne by the Licensee in mutual agreement with the respective project concessionaires. MORTH/ NHAI/ Implementing authorities for the project shall not liable to the concessionaire in any this regard.

Executive Engineer
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Andhra Pradesh, India
Ph. No: 9440120106

This agreement has been made in duplicate, each on a Stamp Paper. Each party to this agreement has retained one stamped copy each.

IN WITNESS WHEREOF THE PARTIES HERETO HAVES CAUSED THIS AGREEMENT TO BE EXECUTED THROUGH THEIR RESPECTIVE AUTHORISED REPRENTATIVES THE DAY AND THE YEAR ABOVE WRITTEN.

SIGNED, SEALED AND DELIVERED BY FOR AND ON BEHALF OF AUTHORITY NH

BYSHRI _____

(Signature, Name and address with Stamp)

O/o The Executive Engineer,
Polavaram Irrigation Project Left
Main Canal Division,
CE North Coast Campus, Pedawaltair,
Visakhapatnam -530003, Andhra Pradesh

BY SHRI A. Umesh Kumar

(Signature, Name and address with Stamp)

Executive Engineer
PIPLMC Division No. 6
Visakhapatnam

HOLDER OF GENERAL POWER OF ATTORNEY DATED EXECUTED IN ACCORDANCE WITH THE RESOLUTION NO_____DATED _____PASSED BY THE BOARD OF DIRECTOR IN THE MEETING HELD ON _____

IN THE PRESENCE OF (WITNESSES):

1.

2.

NOTARIAL

NOTARY ★ G.J.R. AJAY KUMAR ★ Appointed by Govt. of Andhra Pradesh, INDIA
Regd.No: 732/2011 Visakhapatnam
My Commission expires on 01.05.2026

G.J.R. AJAY KUMAR
ADVOCATE & NOTARY
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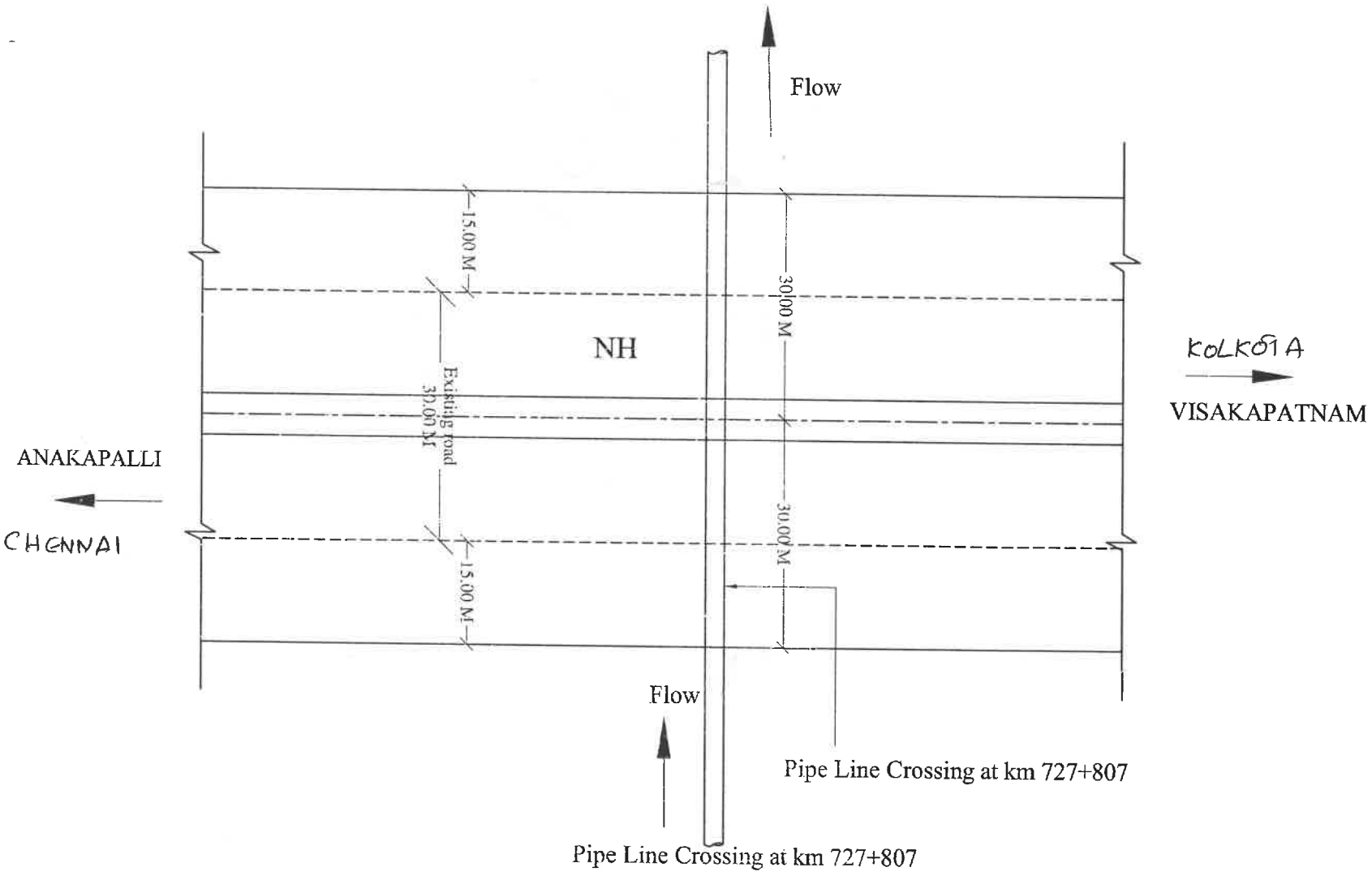
ANDHRA PRADESH
INDIA



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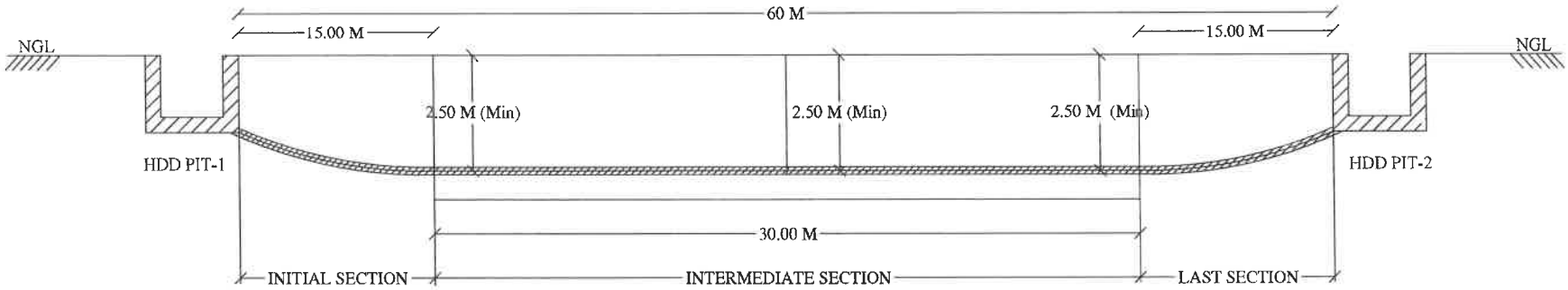
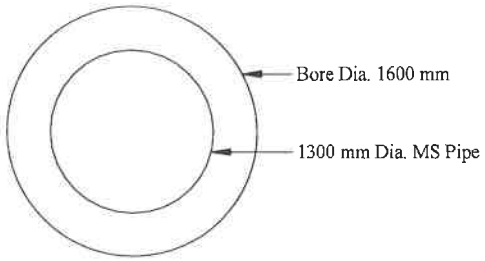
Typical cross section for HDD



Note:- PIT dimension- as required at site.



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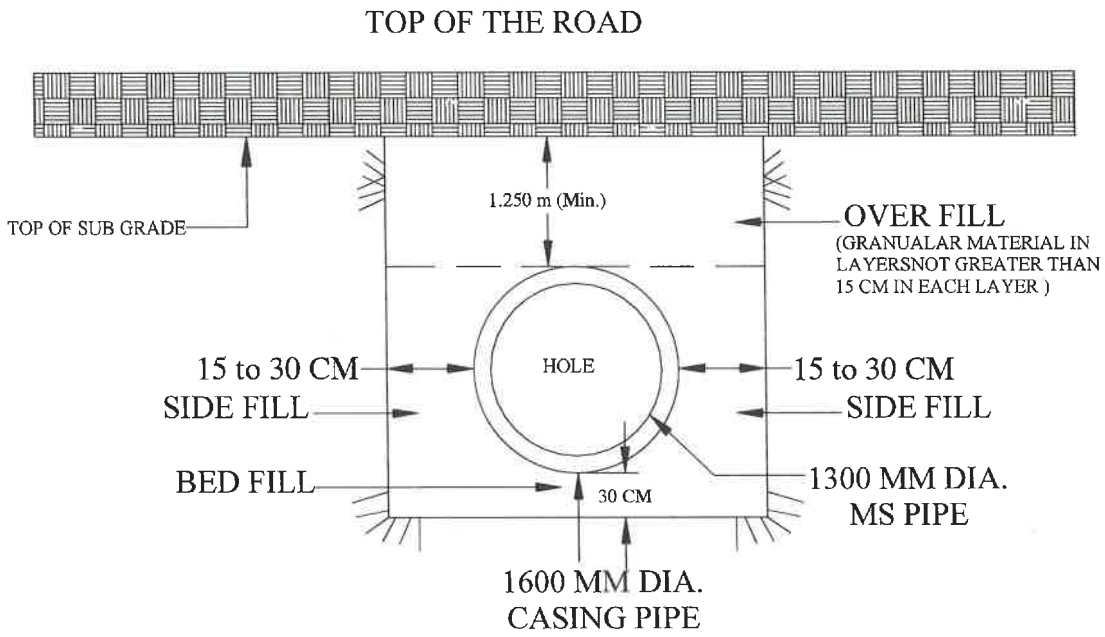

INSTALLATION OF PIPE
ACROSS THE ROAD

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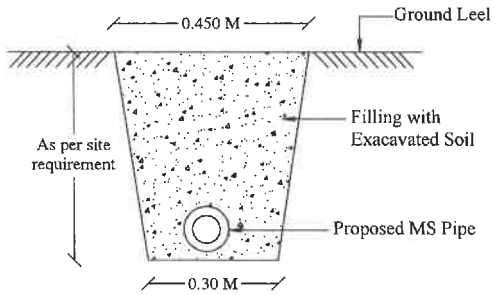
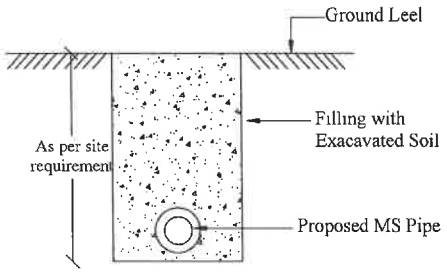


LAYING MS PIPE IN
OPEN TRENCH METHOD



LAYING MS PIPE IN
HDD METHOD

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Note:- PIT dimension- as required at site.

The auger boring

The auger boring is a trenchless technology of piping through a hydraulic jacking setting, which is equipped with rotating cutting instrument, launched from a working ditch, with removal of elaborated soil by auger mechanism (Figure 2.3). With the auger boring rig it is possible to implement pipe laying of steel cases, concrete and polyethylene pipes with diameter from 100 to 1720 mm on distances to 100 m depending on soil types.(5)

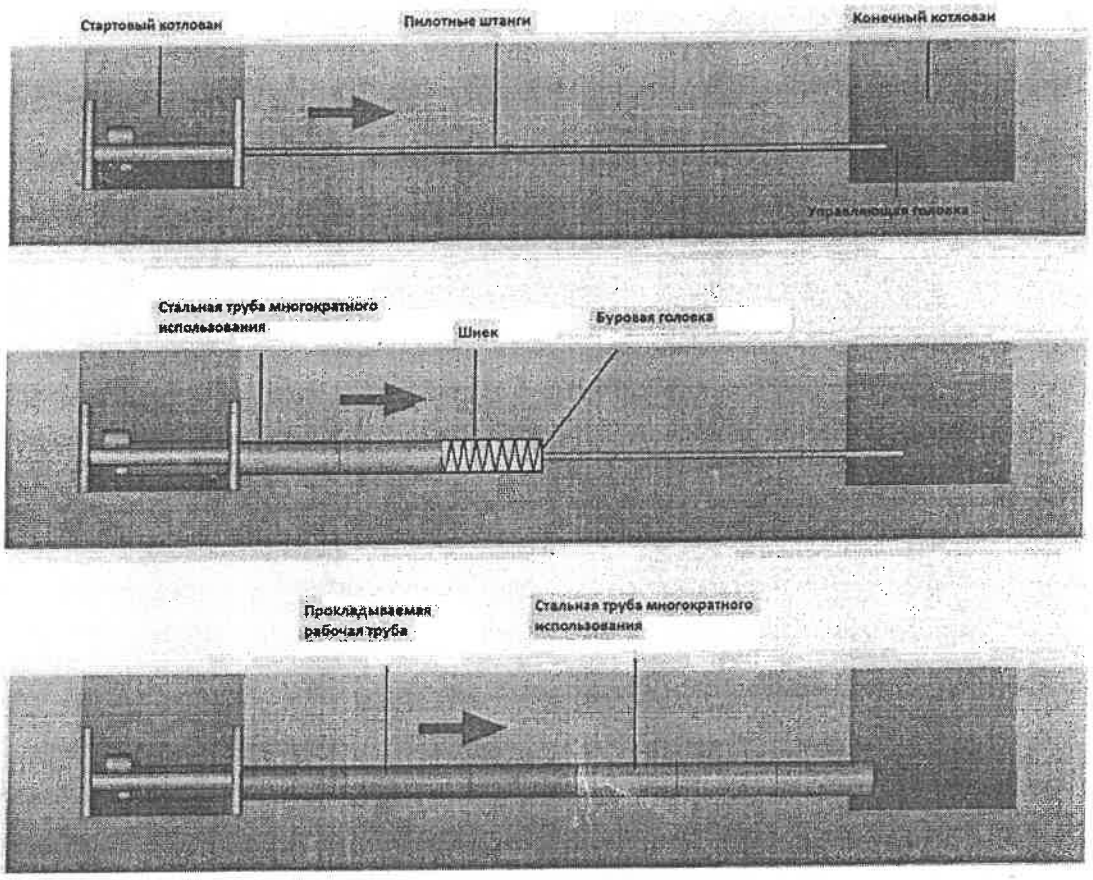

Figure 2.3 The auger boring stages.

It is necessary to have two ditches: starting and adoptive, with the depth lower than pipe laying depth on 0,5-1,0 m in order to release a laying of communications. A powerful jacking station with a pipe ramming mechanism placed on it is mounted in the starting ditch.

On the first stage the preparation of the starting and adoptive ditches is accomplished. On the second stage the descent and installation of auger rig is produced into a ditch. On the third stage the pipe laying is carried out, controlled

by laser. On the final stage the auger is dived to the adoptive ditch and then is pulled out in the reverse order. After that the rig and the augers are extracted from the starting ditch.(8)

Due to special laser control system the auger boring technology allows laying pipes with designed inclination with high accuracy, that very is important in building of a gravity sewer.

The pipe ramming

The essence of the pipe ramming method lies in the fact that the pipe is pushed into a soil by opened end, and the soil, which got into it during the moving of the pipe, is elaborated and removed manually or by hydromechanization tools (Figure 2.4). (5)

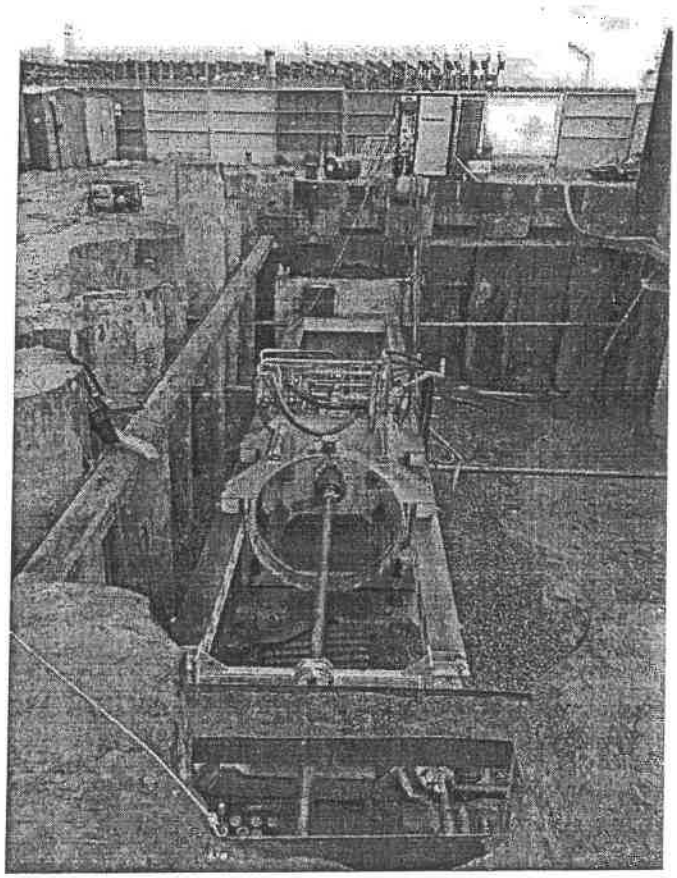

Figure 2.4 The pipe ramming machine.

The pipe ramming method (Figure 2.5) is utilized in case of laying pipes with large diameters (from 800 to 1400 mm) and on distances to 80 m. So appeared the necessity of installing two or four hydraulic jacks (in some cases six) working with the capacity of 200-400 tons. The jacks complicate a stop construction, frames for jacks and a tip. The changed performance of such works is about ten meters. (8)

The length of pipe laying with the utilization of one ditch ranges from 10 to 80 m. Longer tracks are divided into parts. The pipe laying is led from each working ditch, at first, in the direction of the first sector, and then in the reverse order.(8) The working and adoptive ditches are prepared to the pipe ramming as in the impact moling.

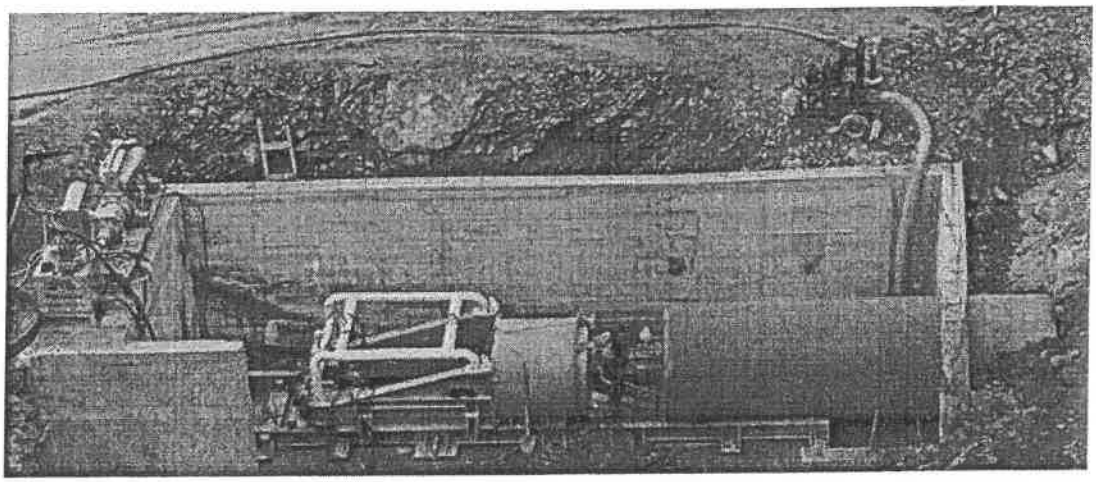

Figure 2.5 The pipe ramming process in action.

This method of directional drilling has a row of advantages: relatively low costs of work, lack of necessity in expensive equipment, a large number of staff is not required. Control of work and correction of direction are made by a specialist placed in the ditch. The control communication damage avoiding also is led by that specialist.

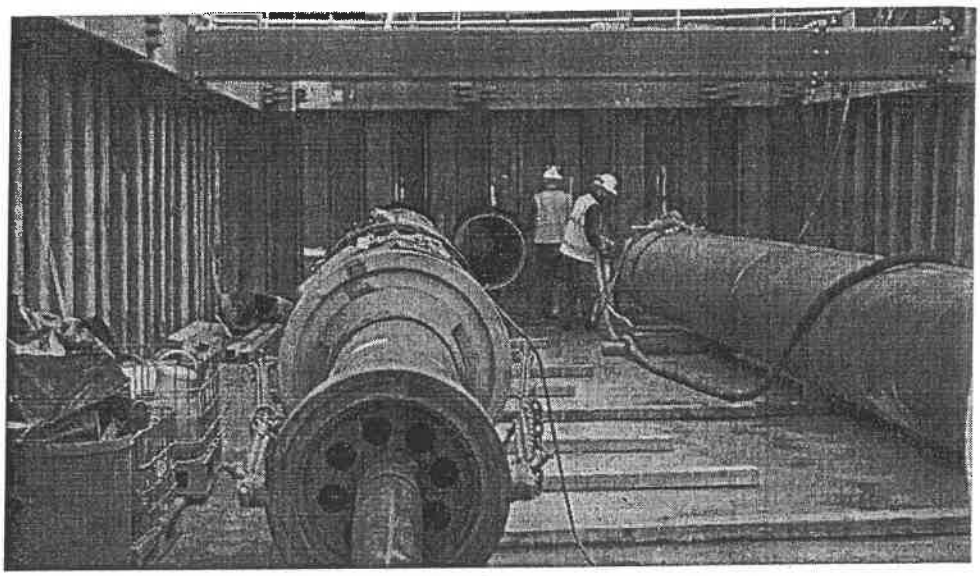

Figure 2.6 The preparation for pipe ramming.

The pipe ramming method is quite simple. A steel case is pushed by hydraulic jacks, usually consisting of two hydraulic jacks, each 100-200 tons of pushing power. The progress of moving stokes is 1,2 -1,3 m. Jacks and the attached pipe are placed into the working ditch. It must have necessary depth with strengthened walls, which can withstand pressure during the implementation of works. A hydraulic drive, which activates the jacks, is placed on the surface near the ditch. The hydraulic jacks start to push the pipe ramming the soil, by continuously moving.(5) The preparatory process for pipe ramming is shown in Figure 2.6.

The horizontal directional drilling

The horizontal directional drilling method (Figure 2.7) also called directional drilling is one of the most common methods in pipe laying for pressure pipelines and for cable cases. This method also can be applied when laying gravity pipelines, but there are some features.

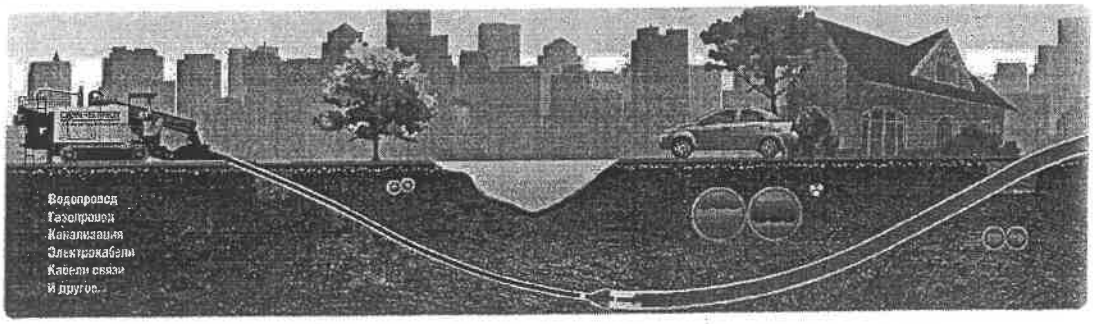

Figure 2.7 Horizontal directional drilling under water obstacle.

Drilling of a well is implemented from the ground surface. The diameter of the well must be wider on 30-50% than a diameter of a pipe. The well is formed by gradual expansion with applying of bentonite and polymers. The bentonite mortar provides removal of the elaborated soil and bears the walls of the well, excluding collapse. The elaborated bentonite mortar is removed with the soil from the working ditch and moved to a dump. The good-formed well without obstructions and collapses is a deposit of success and trouble-free work.(5)

The length of the laying pipes differs from 25 to 1000 m and longer depending on the pulling force and the torque of a drilling rig. The diameter of pipes differs from 63 to 1200 mm. Material is low-pressure polyethylene, steel, cast iron.(2)

Horizontal directional drilling through the designed trajectory is possible due to location system. The drilling trajectory is limited by drilling angle (about 26-34%) and by rod bending radius. The allowable bending percent to one rod varies from 6 to 12% depends on the type of a rod.(3)

Horizontal directional drilling equipment and machinery are very diverse in the present time. The most famous producers are *Vermeer* (Figure 2.8), *Dith With, Tracto-Technik, Robbins, American Augers, Herrenknecht AG and Prime Drilling*. Lately a lot of producers from Korea and China appeared in the horizontal directional drilling market.(7)

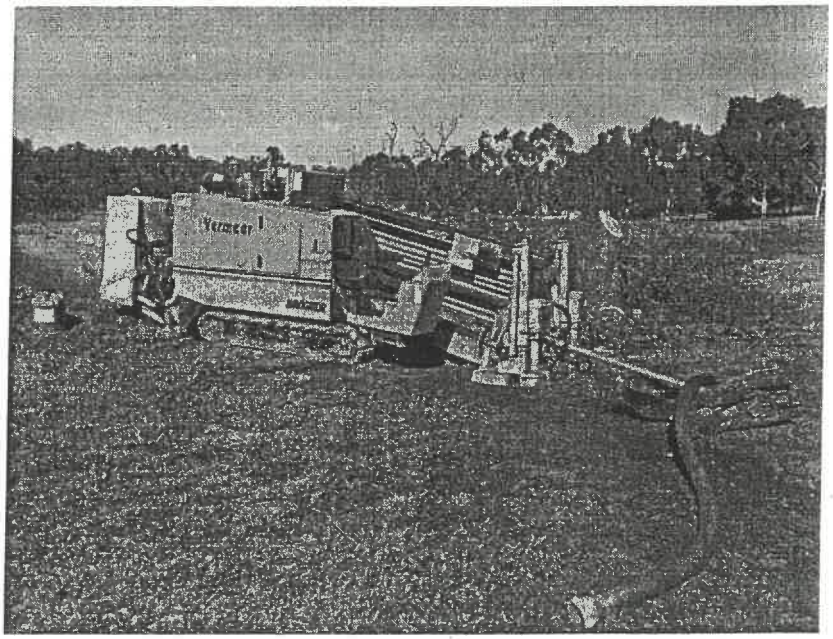

Figure 2.8 The Vermeer drilling rig for HDD.

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ANNEXURE-4

DETAILS OF

TRAFFIC MANAGEMENT

WHILE LAYING OF THE PIPE LINE

ON NH-16

TRAFFIC MANAGEMENT PLAN. Road side construction and maintenance work is hazardous for both the site operative and the road user at work sites in rural areas, traffic is never more than 15 metres away. In addition, speeding vehicles create a whirlwind of dust around the work place and noise from the traffic and maintenance equipment often masks the sound of an impending accident. Under the present system, the traffic operations and safety provisions during improvement maintenance works depend entirely upon the expertise of the engineer. This has been found to be unsafe and efficient. Besides, non-uniformity in the methods of traffic control and placement of signs at various locations increases confusion for road users. In our country, where the travel distances extend up to 300 km or more and where the majority of heavy vehicle drivers are, at best, only semi-literate, there is a need for adopting uniform traffic control methods and devices at construction zones to ensure the safety of both the road users as well as the construction workers. The current techniques of road side – pipe lying wherein traffic is allowed to use part of the existing carriageway create considerable problems for traffic. All this is detrimental to road safety. Traffic lanes become narrow thereby creating problems for cyclists, motor cyclists and animal traffic as vehicle streams are forced closer together. Buffer zones are reduced to zero placing the work force at great risk from passing traffic and road users at risk from parts of construction machinery suddenly swinging into the traffic lanes. The basic object tive of these guidelines is to lay down procedures to be adopted by field engineers to ensure the safe and efficient movement of traffic and also to ensure the safety of workers at site undertaking the construction. (i) Road users are accommodated through and around the construction zones safely with minimum of delays.(ii) Traffic control and the construction activities are co- ordinate to provide for safe and efficient flow of traffic together with efficient, safe and rapid progress of the construction activity;

(iii) Where construction activities are taking place at multiple sites along the same or on parallel routes, construction activity and the movement of road users is co-ordinate to ensure that the total delay along the route or on signed alternative routes is within acceptable limits.

(iv) Driver behavior is effectively influenced so that the speeds are reduced to the desired levels on the approaches to and within the construction zones, and

(v) in the urban environment, works requiring partial road closures on alternative routes should be phased, where possible, so that they are not undertaken at the same time.

GUIDING PRINCIPLES:The construction zone creates where the road user is faced with a series of unusual hazards in the form of unfamiliar routes, substandard horizontal and vertical alignment, adverse cambers, construction equipment etc. The road user also has to watch for traffic control devices apart from performing normal driving functions of vehicle control and responding to other traffic and hazards. . The guiding principles for safety in road construction zones are to:

(i) warn the road user clearly and sufficiently in advance.'

(ii) Provide safe and clearly marked lanes for guiding road users.

(iii) Provide safe and clearly marked buffer and work zones, and

(iv) Provide adequate measures that control driver behavior through construction zones.

Roads with construction sites have higher accident rates, when compared with similar sections of road without construction sites. This is due to several factors, such as, long driving hours, road users social habits, attitudes and motivation, are outside the control of those undertaking the works. However, the authority planning and undertaking the maintenance/improvement works of the road can reduce the increased risk to road users and site workers by considering foreseeable risks, so that they may be avoided or their impact reduced. Though each situation would be unique but there could be a number of common factors. These guidelines cover most of the commonly occurring situations. It should be noted that the design and implementation of temporary schemes should be undertaken with as much care as if it were a permanent scheme, and that it may sometimes be necessary to vary the scheme during the period of the construction phase.

2. COMPONENTS OF THE CONSTRUCTION ZONE.Traffic Control Zone. For the purposes of these guidelines, the construction zone describes that area of the road which is affected by the works and which affects traffic flow and road users. The main area of interest can be called in this context as the "Traffic Control Zone". It includes all those areas of carriageway in advance of the actual work site which are required for advanced warning of the hazard as well as safety zones, the transition zones and the working zone itself. These elements are shown in TMP-Meil-Fig. 2.1 and defined.In urban areas where construction zones are likely to be even more constrained, diversions may have to be taken over adjacent sections of the road network in addition to the sharing of road space by road users. The effects of construction zones may therefore, be felt over a wide area.The Traffic Control Zone can be divided into three components, **the Advance Warning Zone./Transition Zone. /Working Zone.**All construction zones will have a working zone, which is flanked, by a transition zone for each direction of approaching traffic and an advance warning zone will precede these in turn.

ADVANCE WARNING ZONE. (TMP-Meil-Fig. 2.1The "**Advance warning zone**", is the area to warn the road user of the approaching hazard and to prepare them for the change in driving conditions. It is essential for traffic control in the construction zone.

The type of hazard. The advance warning zone is also where the reduction in speed of vehicles should be notified. The drivers should be advised to reduce their speed so as to achieve the desired approach speed before reaching the approach transition zone. The information in this zone is conveyed through a series of traffic signs along the length of the zone. Actual signs to be used are discussed in later paragraphs.

APPROACH TRANSITION ZONE.

The transition zone is the area in which the traffic is guided into the altered traffic flow pattern around the working zone. This is one of the most crucial zones as far as safety aspects are concerned because most of the movements involved are merging turning movements. The transition zone has two components.

1) The Approach Transition Zone and 2) Terminal Transition Zone.The initial part of the transition zone called Approach Transition zone should further reduce the approach speed of vehicles and channel them into the narrower and / or restricted number of lanes, if this is necessary. At other construction zones, it may be necessary to divert traffic away from the original carriageway and the design of the temporary road geometry through the transition zone should take into account the following factors.

(i) The turning radius of the longest vehicle that generally uses the road should be the ruling radius for curves,

(ii) Where changes in vertical profile are required these should be shallow enough to allow safe passages of animal drawn vehicles of these are present in significant numbers).

(iii) The zone should have good drainage to avoid any pending on the road surface.

(iv) Sources of dust should be minimized. This is not only essential for good visibility but also for clearer maintenance of signs and barricades in the zone.

The traffic is taken across the transition zone mostly with the help of signs, barricades, channelisers and pavement markings. The various types of barricades and channelisers are given in detailMost of the accidents at night involve collision between vehicles and objects rather than vehicle to vehicle collision. Reflective paints sheets must therefore be used for making the signs barricades so that these are visible at all times.

WORKING ZONE.The working zone is where the actual construction is being undertaken. It contains the work area and a working space, as well as lateral and longitudinal buffer zones to create the safety zone to protect both the workforce from wayward vehicles entering the area of actual work and the road users from construction equipment.Speeds should continue to be controlled in this, there may also be a difference in the elevation of the road and the diverted path in this zone.The path of the traffic must be very clearly delineated through the traffic control zone. Delineators and channelisers discussed below must be used effectively for this purpose.

TERMINAL TRANSITION ZONE. The Terminal Transition Zone (TTZ) provides a short distance to clear the work area and to return to normal traffic lanes. A downstream of

closing taper may be placed in the TTZ. It may be useful in smoothening the flow of traffic. . The length of the downstream taper may be 25-30 in. There may be occasion when ITZ could include a transition for example as in Fig. 4.20 if a taper is used to shift traffic into opposing lanes around the work area. Then the ITZ should have a taper to shift back to its normal path. This taper would then be in the TTZ for the opposing direction of traffic. If the construction zone is situated on a divided carriageway, there will need to be a smaller length transition zone to return the traffic to the original lanes.

OTHER ASPECTS. The distance between two traffic control zones should be such that the flow of traffic can return to normal stream between them. Separation should permit fast moving traffic to overtake slow moving vehicles so that platoons can be dissipated and traffic normalized. These distances could vary from 2 Kms on urban roads to 5 Kms or 10 Kms on rural roads according to gradients, traffic levels or traffic operation schemes.

The length of traffic control zone will vary and depend on the work being undertaken. . The recommended lengths for each component of the zones for a well located site (with a clearly visible approach) are given in Table 2.1. The longitudinal and lateral buffer zone clearances are shown in the following Table.

TABLE - RECOMMENDED LENGTH TRAFFIC CONTROL ZONES

Average Approach Speed (Kms)	Length of Advanced Warming Zone (m)	Length of Approach Transition Zone (m)	Length of Working Zone (m)
50 or less	100	50	)
51 – 80	100 – 300	50 – 100	)
81 – 100	300 – 500	100 – 200	) varies
Over 100	1000	200 – 300	)

There may be different situations in construction zone requiring full or partial, closure of road for example.

(a) closure of berms only e.g. repairs to slopes, construction/maintenance of road side drains, water pipe line laying, gravelling/paving of hard shoulders, maintenance of traffic signs, repairs to parapets of cross drainage works, guard rails,

(b) Closure of small areas of the carriageway only, e.g. repairs to potholes, resurfacing, and renewing road markings excavation of longitudinal trenches along the berm of the road.

(c) Closure of one lane of the carriageway along with the closure of berms e.g. widening of the carriageway, repairs to culverts, flood damage repairs. These types of works can further be classified according to availability or non-availability of space for operating the displaced traffic on the remaining portion of the carriageway and shoulders.(d) Closure of the entire road width for understanding repairs to pavement of culvert and laying of cross

road pipe line laying. The basic layout of signs and markings should be **followed** . Gaps in the work area may be avoided as these may falsely give an impression to the road users that they have passed the work area. The guide signs in this regard should be installed at appropriate location.

URBAN AREAS: The same basic rules and layouts will apply in urban Areas in Anantapur District, Kurnool District,Kadapa-YSR- Districts(**Town Maps mentioned above**) but may be at premium sometimes and therefore it would be necessary to modify the layouts accordingly. A number of possible amendments to the standard layouts would be given in these guidelines but each case will need to be considered on its merits at all times the safety of all road users as well as the site operatives should be taken into account. In urban situations where road works are to be carried out more attention should be given in the problems of pedestrians and non-motorized vehicles in heavy traffic volumes. As far as possible the road works should be carried out at night, whenever, night time road repairs are not possible, then only day time repairs should be carried out. Repairs during peak hours should also be avoided. The traffic control and construction activity should be co-ordinate in such a manner as to provide for safe and efficient flow of traffic together with safe, efficient and rapid progress of construction activity. As pedestrians are likely to be present at urban sites, and may be diverted onto the carriageway around a working zone, there must always be a safety or buffer zone between the outer pedestrian buffer and the traffic.Availability of proper sight distance for the movement of vehicles at the recommended speed for the stretch in the work zone should be always kept in the mind.

TRAFFIC CONTROL DEVICES : **GENERAL.:**Traffic control devices are the equipment and installations over and on the road, which individually and collectively perform the following tasks.

(i) warn the road user,/(ii) Inform the road user,/(iii) Guide the road user.

(iv) Modify road user behavior/(v) Protect the road user and the vehicle;

(vi) Ensure safe passage to the road user, and/(vii) Provide a safe working area.

A traffic control device in order to be effective should.

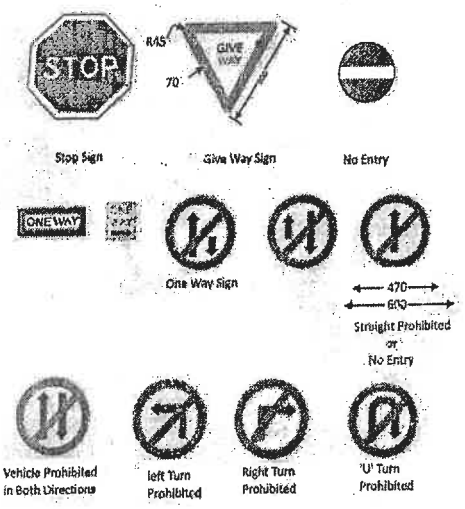
(i) Fulfil the intended need./Command attention and respect of road users. Convey the message in a simple and clear manner./Allow adequate time for proper response from road users, and/2.)Have adequate conspicuity both in day and night. 3.) The primary traffic control devices used in work zones are signs, delineators, barricades, cones, pylons, pavement markings and flashing lights. The following general rules should apply to all traffic control devices within the traffic control zone. Comprehension: All traffic control devices should be capable of being easily understood. A particular device must convey one and only one meaning. Good and clean condition of the device aids comprehension.

(i) Visibility and Stability: Devices should be within the cone of vision of the driver and be placed such that it allows adequate response time at the average approach speed or the desired speed through the traffic control zone. The traffic control devices must be able to resist the local wind pressure, rain and the vibrations etc. of the passing traffic but these should not act as rigid obstacles in the event of a collision.

(ii) Installation and Removal: All traffic control devices should be installed for the minimum required time Traffic control devices by their nature are a hindrance to the normal traffic flow and should be removed immediately after the need, being met by these is fulfilled Existing devices like signs or lane markings should be removed during the temporary works and reinstated thereafter or covered while the temporary devices are in operation. .

(iii) Maintenance: All traffic control devices must be serviced and maintained correctly. Spare devices, parts or paints for road markings must be available at site during the entire period of construction.

MEIL -REGULATORY SIGNS



SIGNS:The road construction and maintenance signs fall into the same three major categories as do other traffic signs, that is Regulatory Signs, Warming Signs and Direction (or Guidance) Signs. The IRC 67 (Code of Practice for Road Signs) provides a list of traffic signs. Where possible, the size, colors and placement of sign shall conform to IRC: 67. The main signs that would be utilized are shown in Fig. 3.1(a) to 3.1(e) this also covers signs that are not included in IRC: 67 but are considered desirable to aid driver's comprehension of the route through the road works. Each sign should be well located so that as message is seen and is clear, which will be assisted if the surroundings are devoid of "unnecessary" signs and other clutter. These signs should be of retro reflective sheeting's of high intensity grade of engineering grade depending upon the importance of the road as directed by the Engineer.

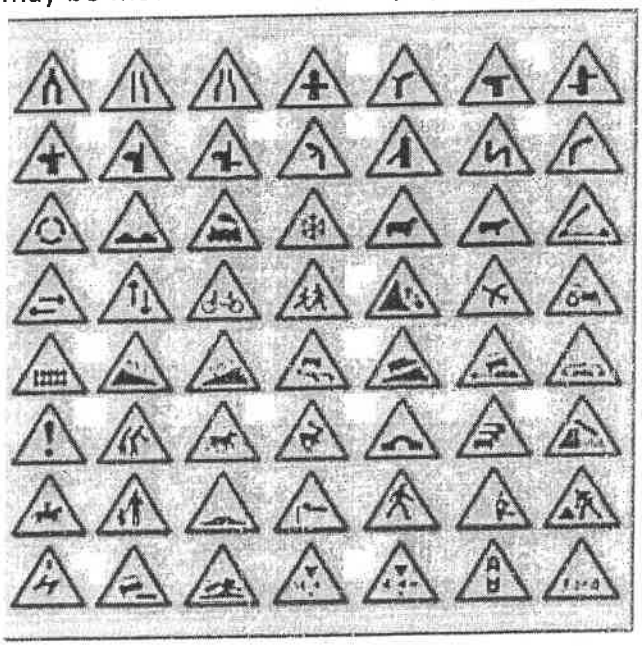
The correct positioning and size of sign will ensure that it can be observed and recognized, thereby providing the driver with more time to react and take action. The following principles should govern the positioning of signs.

(i) Their location should have clear visibility;2.) They should be so placed that driver would have adequate time for responses.

(ii) As a general rule, signs should be placed on the left-hand side of the road where special emphasis is required, duplicate signs should be installed on the left and right side of roadway. In case of hill roads, the signs shall generally be fixed on the valley side of the road unless traffic and road conditions warrant these to be placed on the hill side; and

(iii) The signs should be covered or removed when they are not required.

On kerbed roads, the extreme edge of the sign adjacent to the road shall not be less than 600mm away from the edge of the kerb. On un-kerbed roads, the extreme edge of the sign adjacent to the road shall be at a distance of two to three metre away from the edge of the carriageway depending on local conditions but in no case, shall any part of sign come in the way of vehicular traffic. Where signs are in position for some time and pedestrians are expected, the lower edge of the lowest sign (plate) should not be less than two metre above the surface on which is stands. Fig. 3.2 shows the typical positioning of signs in this case where pedestrians are not expected, signs may be mounted on trestles (tripod) but during wet conditions should be mounted away from the traffic "splash" zone so that they do not become obscured by dim.



REGULATORY SIGNS: Regulatory signs impose legal restriction on all traffic. It is essential, therefore, that they are used only after consulting the local police and traffic authorities. The most likely type of regulatory signs to be used in traffic control zones are: STOP, GIVE WAY, DO NOT ENTER, One Way, Straight Prohibited, Vehicles Prohibited in Both Directions, Left Turn Prohibited, Right Turn Prohibited, 'U' Turn Prohibited, Overtaking Prohibited. No parking, No Stopping and No Standing, keep Left, Compulsory Left Turn, Compulsory Right Turn, Compulsory Straight, Compulsory Straight or Right Turn. Compulsory Straight or Left Turn. Priority to Vehicles in other Direction, Priority to Vehicles in this Direction, Weight Limit, Axle Limit, Height Limit, Length Limit, Restriction Ends, speed Limit (Fig.3.1(a) and 3.1. (e)) and 3.1 (b) Various other signs that are needed to regulate traffic may be required which have not been standardized.

WARNING SIGNSWarning signs in the traffic control zone are utilized to warn the drivers of specific hazards that may be encountered. . The most common type of warning signs for the use in the traffic control zone is men at work. Road Narrows (Single File Traffic), Right Lane Diverted, Left Lane Diverted, Right Lane Closed. Left lane closed. Right lane Closed, median closed, Diversion to other Carriageway. Traffic signal ahead, Two Way Traffic, Rough Road, Slippery Road, Loose Chippings, Divided Road and Divided Road Ends (Fig.

3.1.(d) and (e)) and to permit traffic to reduce speed before entering the work site. This distance is basically related to approach speed and site conditions; however 60m to 100 m is desirable. In urban areas, this distance shall be reduced to 20 m to 50 m. The use of the flag and sign paddle is illustrated in TMP-Meil-Fig. 3.6. Wherever it would be advisable to make the meaning of a sign suitable and more explicit, an inscription is placed below the sign in a rectangular definition plate of width appropriate to the size of warming triangle (Fig. 3(e)). Definition/supplementary plate shall have white background and black letters and black border 20 mm wide. This definition plate shall be placed (below) 150 mm from the bottom of the triangle.

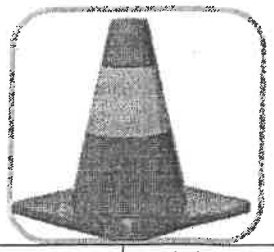


TABLE 3.1. MINIMUM SIGHT LINE DISTANCES AND THE MINIMUM SIZE OF THE SIGNS.

Av/ Speed Km/h	Distance of first sign in advance of the first channelising device m	Size of Warning sign (mm)	Minimum number of signs in advance of the hazard
under 50	100	600	3
51 – 60	100 – 300	750	3
61 - 80	120 – 300	900	3 or 4
81 – 100	300 – 500	1200	4
Over 100	1000	1200 to 1500	4

In case of divided carriageways, the signs should be provided both adjacent to the shoulder and on the central median so as to be visible from all lanes. Larger sign sizes that IRC. 67 are recommended for higher speed roads.

Direction signs: Direction or Guide signs are required at traffic control zones to provide the necessary information and guidance for the alternative route and work being done. These signs shall have black letters. Arrows on yellow (Indian Standard Color No. 368: Traffic Yellow, of 18-5-1978) background. The commonly used guide signs are: diversion, Detour, Diverted Traffic and are shown in Fig. 3.1

DELINEATORS. The delineators are the elements of a total system of traffic control and have two distinct purposes.(i) The delineators and guide the driver to and along a safe path./ (ii) As a taper to move traffic from one lane to another.

Trafficcones and cylinders. Traffic cones are 500 mm, 750 mm and 1000 mm high and 300 mm to 500 mm in diameter or in square shape at base and are often made of plastic or rubber and normally have retro-reflectorised red and white band.Cones and cylinders are easily blown over or displaced unless their bases are loaded with ballast or anchored. It

may, therefore, use heavier weighted cones or use weights such as sand bag rings to provide increased stability but this weight should not present a hazard.

DRUMS Drums about 800 mm to 1,000 mm high and 300 mm in diameter can be used as either channelizing on warning devices. These are highly visible, give the appearance of being formidable objects and therefore command the respect of drivers. . They should be painted in circumferential stripes of alternate black and white of 100 mm to 150 mm width. Drums should be reflectorised for use at night and should never be placed in the roadway without advance warning signs. Fig. 3.3 shows typical dimensions of cones, delineators and drums.

BARRICADES.

Barricades are intended to provide containment without significant deflection or deformation under impact and to redirect errant vehicles along the barrier. They are designed to be easily relocated and have four specific functions to:

(i) Prevent traffic from effecting work areas, such as excavations of material storage sites./(ii) Provide protection to workers,/(iii) Separate two-way traffic, and

(iv) Protect construction such as false work for culverts and other exposed objects. Barricades can be portable or permanent. Portable barricades should be stable under adverse weather conditions and appear substantial but not so much as to cause excessive damage to the vehicle

The horizontal members of Type I and II barricades may be of wooden
Planks metal or other suitable material. These should be 300 mm wide and should
be painted in alternate yellow and white stripes of 150 mm width. The stripes should
Slope away at an angle of 45 degrees in the direction traffic is to pass. Where the
Barricade extends entirely across the carriageway, the stripes shoulDownward towards the
direction the traffic must turn in detouring. Where both left and right turns are provided
for, the chevron stripes should slope downward in both directions from the centre of the
barricade. The entire area of chevrons should be reflectorised so as to be visible from safe
distance. Type I or Type II barricades shall be used when traffic is redirected. These
barricades can be used inter-changeably, and are more useful in repair work that is
generally initiated on emergency basis. . These are erected at the point of closure when a
road section is closed to traffic on construction projects. They may extend completely
across a roadway and its shoulders or from kerb to kerb fig. 3.5 shows some typical
examples of fixed and movable barricades. Where provision must be made for the access of
construction and supervision vehicles, type III barricade must be provided with a gate or
movable section (e.g. of drums) that can be opened and / or closed as required. Sings such
as 'ROAD CLOSED and "DETOUR ARROW' SHOULD BE ERECTED ON THE FIXED
BARRICADES/ Where the works are to be undertaken which will continue for some time or
where the space is limited and there is a need for the protection of the work force,

particularly where the speed of passing traffic may be high, purpose designed concrete or plastic barriers may be used. Their design is often similar to the cross section of a New Jersey Barrier or rectangular and they are some 1.5. mm to 2.0 m long with shaped ends that can be interlocked and connected. Plastic barriers available in trapezoidal shape of about 80 cm to 100 cm length can also be tried. Their use should be carefully controlled until more experience is gained with them but they offer advantages to the workforce in that the speed of impact will be much reduced should there be an accident and the workforce will feel more se cure. They will enable narrower traffic lanes and buffer zones to be employed where space is a premium and vehicle speed likely to be high.

TRAFFIC MANAGEMENT PRACTICES

INTRODUCTION The traffic management strategies to be used at traffic control zones must include the following fundamental principles.

(i) Make traffic safety an integral and high priority element of every project./
(ii) (ii) Avoid inhibiting traffic as much as possible./(iii) Guide drivers in a clear and positive way./!VPerform routine inspection of traffic control elements and traffic operations./ v)Give care and attention to roadside safety.

SITE LAYOUT DEFINITIONS.

Works zone: The excavation, chamber opening, etc, at which workmen will be working.

Working space:: The space around the works area that will need to store tools, excavated material, equipment and plant. It is also the space to allow workmen to move around to do the job. Enough working space must be left to make sure that the movement and operation of the plant (e.g. swinging of jibs and excavator arms) is clear of passing traffic and is not encroaching into the safety zone.)

Safety Zone:the zone that is provided to protect workmen from the traffic and to protect the traffic from them. The safety zone must not be entered in the normal course of work.

Approach Transition Zone: This will vary with the speed limit and the width of the works as given in table 4.1.

Longitudinal Buffer Zone: This is the length between the end of the lead in taper of cones (T) and the working space

Lateral Buffer Zone: this is the width between the working space and moving traffic. It will vary with the speed limit as given in Table 4.2. The lateral buffer zone safety clearance is measured from the outside edge of the working space to the bottom of the conical sections of the cones on the side nearest to the traffic. For roads with a speed restriction of 80 km/h or greater an additional traffic barrier is required at the end of the lead-in taper.

TABLE 4.2.BUFFER ZONE SAFETY CLEARANCES

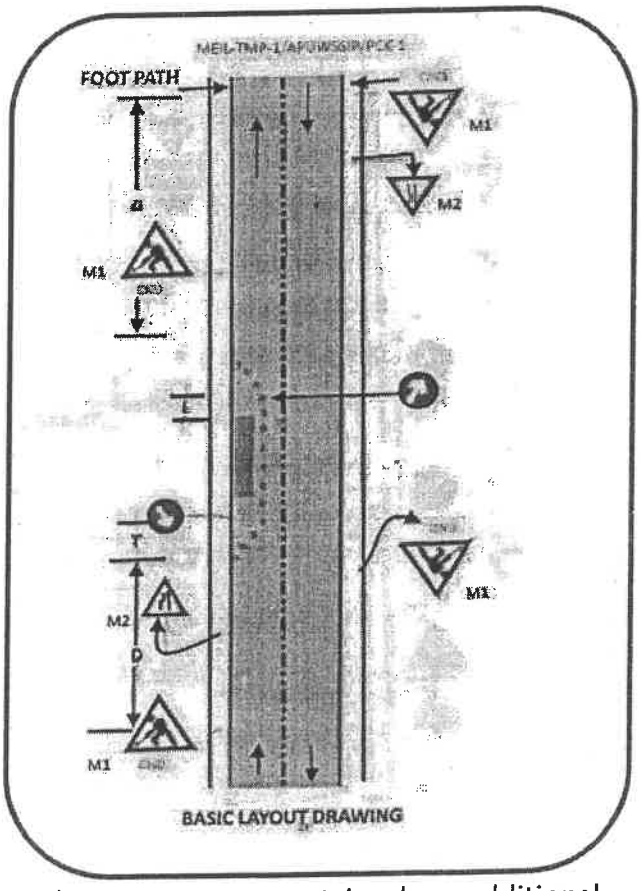
Speed restriction (km/h)	Minimum longitudinal buffer zone (L) (m)	Minimum lateral buffer zone (S) (m)
50 or less	50	0.5
60	15	0.5
80	30	1.2
100	60	1.2
120	120	1.2

Where an advisory speed limit is in operation, speed limit) to determine the minimum longitudinal and lateral buffer zone safety clearances. Wherever traffic speeds are to be reduced, the method must be agreed in advance with the road authority.

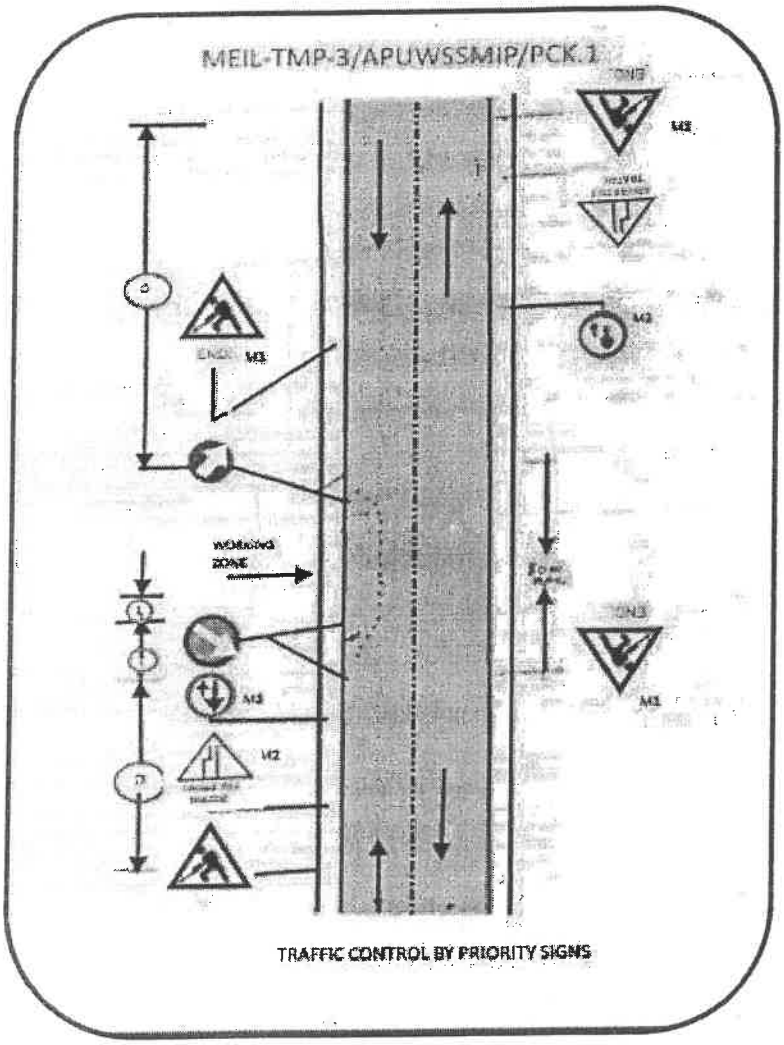
Site Engineer should consider advising emergency services of the location and duration of the works. Working space and safety zones must be provided when personnel are present. This will make it less of an obstruction to traffic. However, it pedestrians are diverted into the carriageway, a safety zone must be provided at all times between the outer pedestrian barrier and the traffic.Where the road width is so restricted as to prohibit the provision of the appropriate lateral buffer safety clearance detailed in Table .

And diversion of traffic would be impractical, traffic speeds must be reduced to less than 1.5 km/h and an agreed safe method of working imposed on the site. This method of working should preclude working in the safety zone wherever possible.
It must be decided in advance is also advised that it should be recorded in writing.

BASIC LAYOUT Though each construction zone will pose unique problems there is a basic layout (TMP-Meil-that should be followed for all schemes but that will need to be amended within the guidelines set out in these guidelines. These will be influenced by:(i) Environment, rural, urban./(ii) Type of carriageway such as single lane, two lanes, four lanes, multi lanes, divided carriageway./(iii)Traffic volume and speed with and without work in progress on road./(iv) type of traffic such as mixed or segregated.(v) Available sight distance in construction zone, and/(vi) Mobility of work zone, that is, for minor pot hole repairs, lane marking etc., the workers and equipment may move along the road. (TMP-Meil-4.1) Fig 4.1. Shows the basic layout that would permit two-way flow of traffic pass the working zone. The road width must be at least 7 m for two way traffic to ensure that problems for buses and Lorries are minimized. A greater width would be desirable if there are a high proportion of vulnerable road users. It should be noted that pedestrians are retained on the existing footway. It should be noted that where the working zone is long, cyclists can experience problems (insecurity caused by the proximity of other vehicles) and this should also be taken into account. On the roads with no buses or goods vehicles and low flows of vulnerable users, width of 5.5 m could be acceptable but two-way working would not be possible. In this case the cones should be used to reduce the carriageway to not more than 3.7 m and traffic should be controlled by one of the methods given below. In cases where a traffic control zone may affect an adjacent railway crossing (the proximity will vary according to traffic flows and local conditions) and there is a chance that traffic may block back across the railway line the railway authorities should be informed. It may be necessary to put in place additional safeguards through the use of additional staff to monitor traffic at the railway and to ensure that at no time does traffic wait on the crossing tself. Similarly, and more commonly, care needs to be taken if the shuttle working area contains a road junction, the more simple layouts may not be acceptable and it will be necessary to use traffic signals to control all the arms. This is dealt with in a separate section.



VARIATIONS ON THE BASIC LAYOUT. **Give** and take system:



(TMP-MEIL-Fig. 4.2) illustrates the Give and Take system of shuttle working. This is intended for low flows and very low volumes of Lorries and no buses.

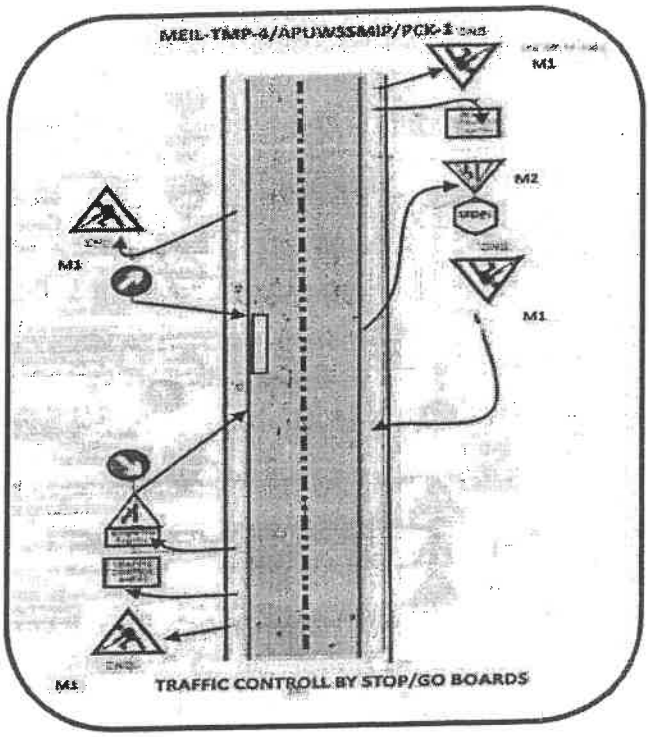
The following conditions must apply. Total two-way traffic flow of less than 400 veh/hour (that is less than 20 vehicles in a three minute period)Less than 20 lorries/hour;
Speed limit is 50 km/h or less; and/Length of the working zone plus both transition zones is not more than 50 m and/Drivers approaching from either direction can see both ends of the site.

Priority signs: As flows and the difficulties of the site increase, enhanced systems are more applicable.

TMP-MEIL-Fig.. Illustrates the next stage, under traffic control by priority signs the following conditions apply.

Total two-way traffic---- flow of less than 850 veh/hour (that is less than 42 vehicles in a three minute period) LENGTH OF THE WORKING ZONE PLUS BOTH TRANSITION ZONES IS NOT MORE THAN 80 M.Drivers approaching from either direction can see through the site from a point 60 m beyond their exit transition zone (coned area), for roads with

a 50 km/h speed limit; on higher speed roads the appropriate clear visibility distances are70 on 60 km/h roads:Not applicable above this speed limit



Stop / Go boards or flags: **(TMP-Meil-** Indicates the layout for the use of Stop / Go boards of flagmen. Table 4.3 sets out the conditions for their use:

PORTABLE TRAFFIC SIGNALS: Portable Traffic Signals for traffic control can be used at most sites that have a length of 300 m or less. However, it should be ensured that the exit from the restricted length of road is not blocked. Otherwise tailbacks will occur which will stop traffic travelling in the opposite direction from moving when the lights change to green. Under no circumstances should portable traffic signals be used at works that straddle a railway level crossing, not to control road traffic within 50 m of a level crossing equipped with twin red light traffic signals. If it is considered that portable traffic signals used elsewhere may cause road traffic to block back to a level crossing, railway management .

must be consulted before work starts. . The portable traffic signals must be controlled manually. The crossing's own road traffic signals and advance warning and informatory signs should remain clearly visible to approaching vehicle drivers. The road authority and traffic police must be informed when portable Traffic signals are going to be used authorization will be required if these signals are to be used at road particulars. The requirements for setting out the signs, cones and portable traffic signals are given in Table 4.1 this give dimension of the Buffer Zone Safety Clearances. **TMP-Meil-** shows the layout of working zone and traffic control by portable traffic signals. The traffic signals timings must be correctly set up to correspond to the length of the works and the speed of the traffic past the site. The detectors must be tested, which are sometimes provided on the signals to make sure that they are working properly before they are used. As back up, Stop/Go boards should be available in case the portable traffic signals break down. WORKS ON FOOTWAYS – ALTERNATIVE WAY FOR PEDESTRIANS: An alternative safe route for pedestrians must be provided if it is necessary to chose a footway of part of a footway. Additional equipment may be required to do this Pedestrian access in property must always be ensured. Temporary pedestrian ways should never be less than I m wide and, wherever,

they should be 1.5. m or more in width If the temporary footway is in the carriageway, the approach should be properly guarded and provided with signs.

The lateral buffer safety clearance (S) of the safety zone must be on the traffic side of the pedestrian barriers. I here clearances are shown in Table - and an illustration of how to put them into practice is shown in TMP-Meil-Fig..

Exceptionally, the use of the other footway may be acceptable in some quiet roads, but if this option is selected the alternative route must be safe to use, and the needs of children and of people with disabilities must be taken into account.

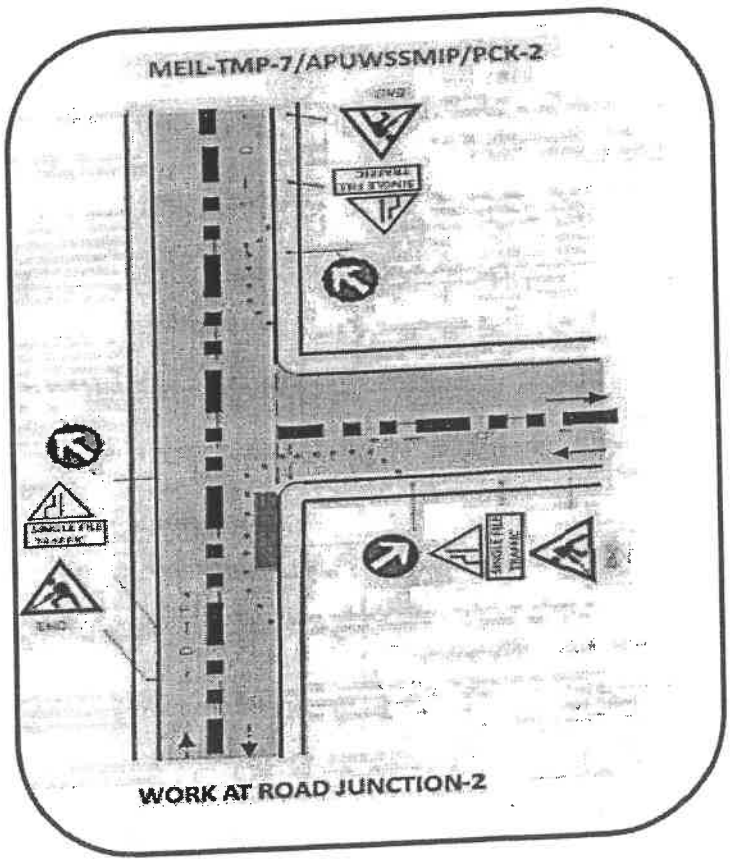
PEDESTRIAN SAFETY. It should be ensured that there is no danger to pedestrians from falling object of sharp edges and that they will not fall over or bump into anything. Scaffolding be marked with white bands at eye level and allow at least 2.1 m headroom.. Kerb ramps or raised footways should be provided to help blind, poorly sighted, elderly and disabled people and for those with prams or wheelchairs.

PEDESTRIAN BARRIERS.Pedestrian barriers should be used to mark out any temporary footway, Place road danger lamps at the ends of the barriers at night. Portable pedestrian barriers, which may include much, should be reasonably right and have A hand rail fixed at between 1.0 m and 1.2. m above ground level

SAFETY ZONE.A safety zone be provided in the carriage way if the works are closer to the kerb than the width of the Lateral Buffer Safety Clearance (S) as given in Table 4.2. Use the basic layout (TMP-Meil- Fig. 4.1). to help with the approach signing and guarding of the safety zone.

PEDESTRIAN CROSSIGS.If the works are on or near formally marked pedestrian crossings, care must be taken to avoid confusing pedestrians. Clear guidance must be given as to where they are expected to cross while the works are ongoing

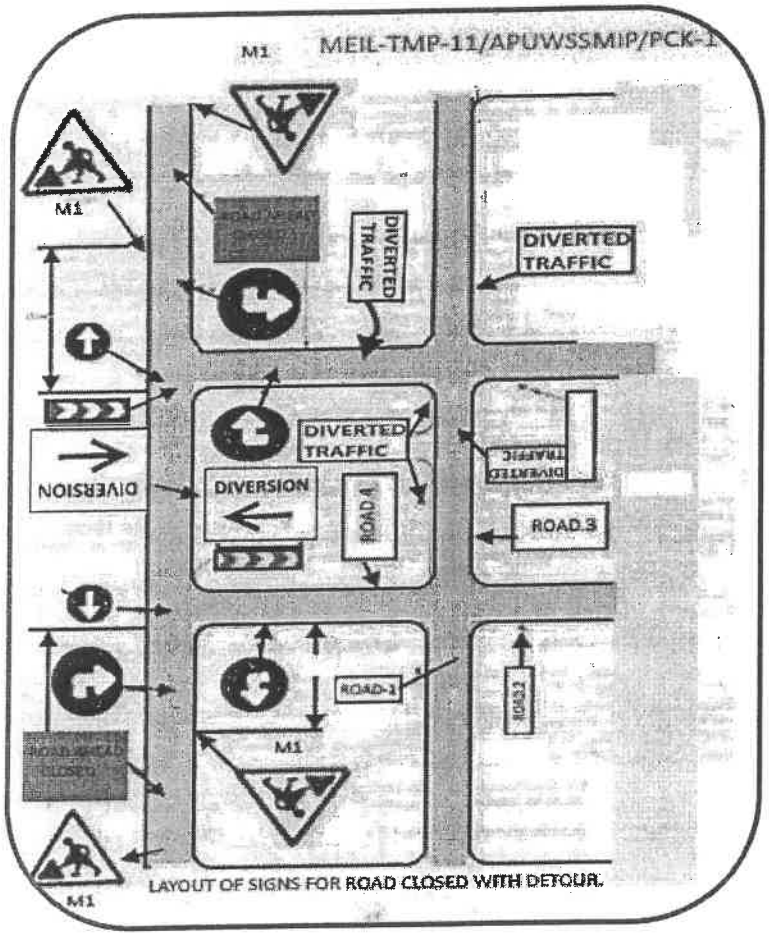
WORKS AT JUNCTIONS.The two-way traffic should be kept flowing past the works if possible. It this is not possible, a diversion route may be required and should be identified by the Road Authority. Men at Works signs with arrow plates will be required on the main route if the works are located on a side road (TMP-Meil)& (TMP-Meil-Fig.)show works on or near the far side



of a junction. At works like these the tapes of cones should be taken up to the approach side of the junction but that any cones near the junction mouth help drivers turn left smoothly. Table 4.1 gives the dimensions D and T and the Site Layout Definitions of 'working space' and the Table 4.2 dimensions of the safety zone.

WORKS ON CONSTRUCTION OF ADDITIONAL CARRIAGEWAY.

The improvement of existing 2-lane carriageway to 4/6 lane divided carriageway facility on arterial roads is a major project activity. , preferably with the advice of a traffic expert. There could be two situations requiring different plant for traffic control.



The central line of the road shifted (eccentric widening):While constructing the additional carriageway, It would have two stages of construction: (a)The new carriageway shall be constructed in the first stage, The traffic would continue to ply in both directions on the existing carriageway and an approached diversion should be taken out of the works zone for the movement of construction and supervision vehicles. Fig. 4.9 shows a typical layout of the signage system. The location of signs for 'works traffic' shall be governed by the location of base camp. The construction zone of new carriageway shall be properly barricaded either by reflectorized delineators or type III barricades on plastic barricades.

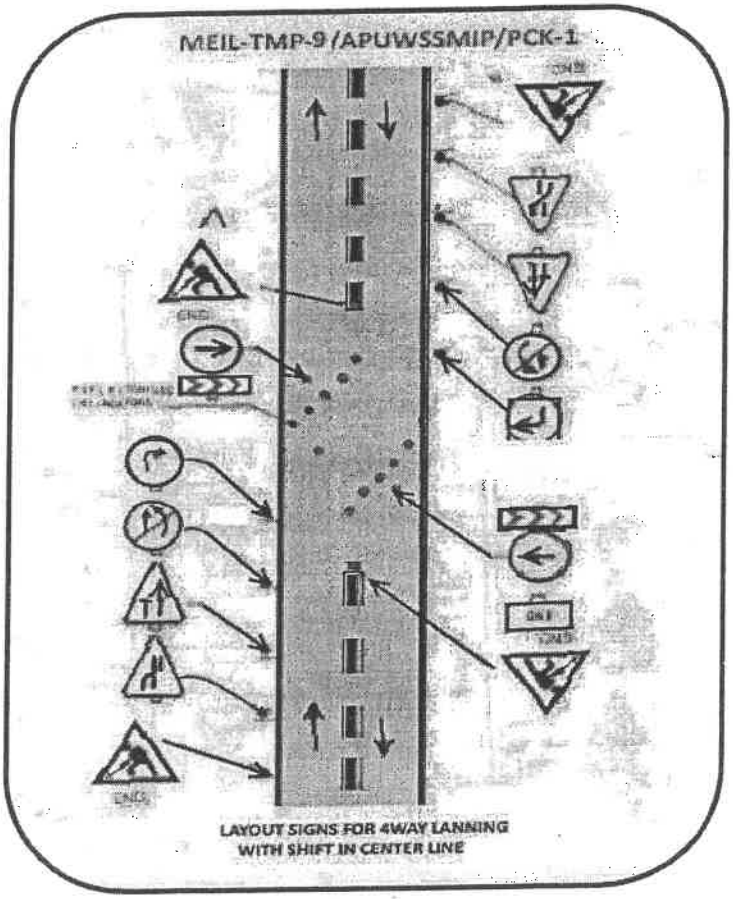
(b) In the second stage of improvement, would involve crossing of the traffic from existing to the new carriageway and then again from the new carriageway to old carriageway. Fig. 4.10 shows the layout of signs and traffic control devices for this stage.

No shift in central line of the road (co-centric widening):This activity would be mostly required to be taken up in the stretches of the road highway passing through built up portions where there may be constraints of land availability. At such locations service roads would also be necessarily constructed for the segregation of the local traffic. Typically it would have three stages. (a) Stage I shall be construction of service roads or diversion road

and the traffic moving on the existing carriageway in both directions. The typical layout of signs and control measures shall be as shown in Fig. 4.11. (b) Stage II of the construction activity shall be strengthening of the existing carriageway and the construction of the median. The traffic shall move in one direction only on the service/direction road constructed on both sides in stage I. The layout for signs and traffic control devices for this stage should be as shown in TMP-Meil Fig. 4.12.

c) In stage III, the work zone shall be shifted to take up the co-centric widening to the adjacent stretch of the road/highway. TMP-Meil Fig. 4.13 shows the layout for signs and traffic control devices for this stage.

DIVIDED CARRIAGEWAY ROADS.:Divided carriageway roads can be found in urban areas where the main purpose is to cope with the expected traffic volume besides providing fast communications between urban centers. Great care must be taken on main divided roads, as both traffic volumes and speeds are likely to be high if the work on these roads involves closing the right hand lane, liaison with the police and road authority will be necessary.



Right lane closure: TMP-Meil Fig. shows a right hand lane closure. Care has to be taken in this situation. .

Left lane closure: If the left-hand lane is closed merging traffic to the left by using a guide island is advisable before transferring into the right-hand lane(s) (TMP-Meil Fig.4.15). The length of the guide island should be:- 50 m long for roads with an 80 km/h or less speed limit, and 100 m long for roads with a 100 km/h or more speed limits. (Section on expressways and high speed divided carriageway roads should also be referred).If may be necessary to merge traffic to the right at a left-hand lane closure – for example from lane I into lane 2. It can be done when:Lane 1 of a six lane divided carriageway is being closed,. OrThere will be no more than about 60 vehicles per 3 minutes on each traffic lane which is left open (1200 vehicles/hour for each traffic lane open).

SIGNAGE REQUIREMENTS: The signage requirements will vary with the speed limit as follows.

Speed limit	Signage requirements
50 km/h	As shown in Figs. 4.14 and 4.15 -that distance
60 km/h	As shown in Figs. 4.14 and 4.15
80 km/h or more	As shown in Figs. 4.14 and 4.15, but with an extra lane closed to traffic sign added on each side of the carriageway to give the sequence of signs shown on the right of this page

Setting out: Table 4.1 gives dimensions D and T and Sign layout Definitions for the definition of working space and the Table 4.2 for the dimensions of the safety zone.

Other planning aspects – execution of maintenance operations: Minor maintenance operations should be confined to small lengths, at a time say 100 m in longitudinal direction, or so, on half the pavement width, leaving the other half for use by traffic. The basic layout and its variations should be used in all cases to ensure optimum safety during these operations including:(i) Repairing the edges of the carriageway, shoulders, cleaning out drains, cutting grass etc., where carriageway is basically not affected. Before starting the work, all warming signs and traffic control devices should be placed as discussed above. . A flagman is probably sufficient and should be present during the work duration.(ii) Repairing small areas of the carriageway, the traffic is to be restricted only due to repairs being carried out such as major pothole and/or patch repairs. The work should preferably be so organized that only half width of carriageway is closed at a time and traffic is allowed on other half and traffic control devices as discussed above.

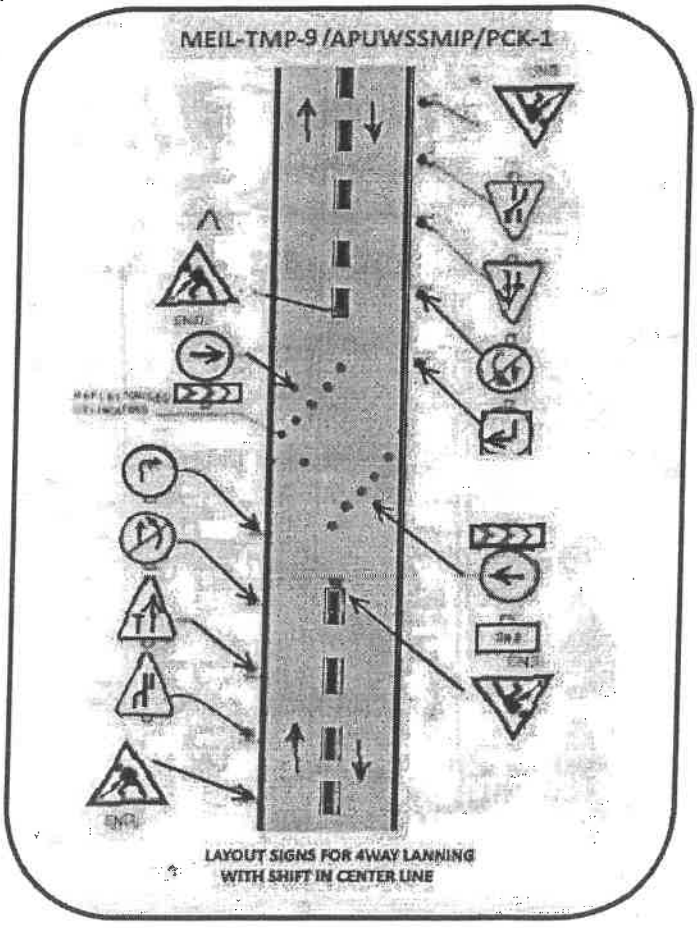
(iii) While working on the center of the carriageway such as center line, lane marking necessitates the traffic to use restricted width on either side. This situation is generally not acceptable and, where possible, the work should be undertaken through the closure of half of the carriageway. If this is not possible, the layout shown in Fig. 4.16 should be used, with extreme caution.

EXPRESSWAYS AND HIGH SPEED DIVIDED CARRIAGEWAY ROADS. An expressway is a road intended for motorized traffic only where pedestrians, pedal cycles, 2/3 wheelers, small engine motor cycles (mopeds) and rickshaws are not allowed. If these categories are allowed, the road is described as a high speed divided carriageway. These divided carriageway facilities can have two three or four lanes in each direction. Because of the high speed of the vehicles using these roads, Stopping distances increase considerably with each 10 km/h increase in speed. Drivers therefore have to have very early warning of restrictions on the road, if accidents are to be avoided. Adequate traffic management measures are, therefore, of great importance to safety. If an accident happens on this type of road, the consequences can be very serious indeed. The key to symbols used in these illustrations is shown in TMP-Meil-Fig. 4.17.Many traffic management techniques are available for longer duration operation.

(i) Partial closure for work on the carriageway./(ii) Partial closure for work on shoulders,/(iii) Detour on secondary network./(iv) Detour on a temporary diversion, and

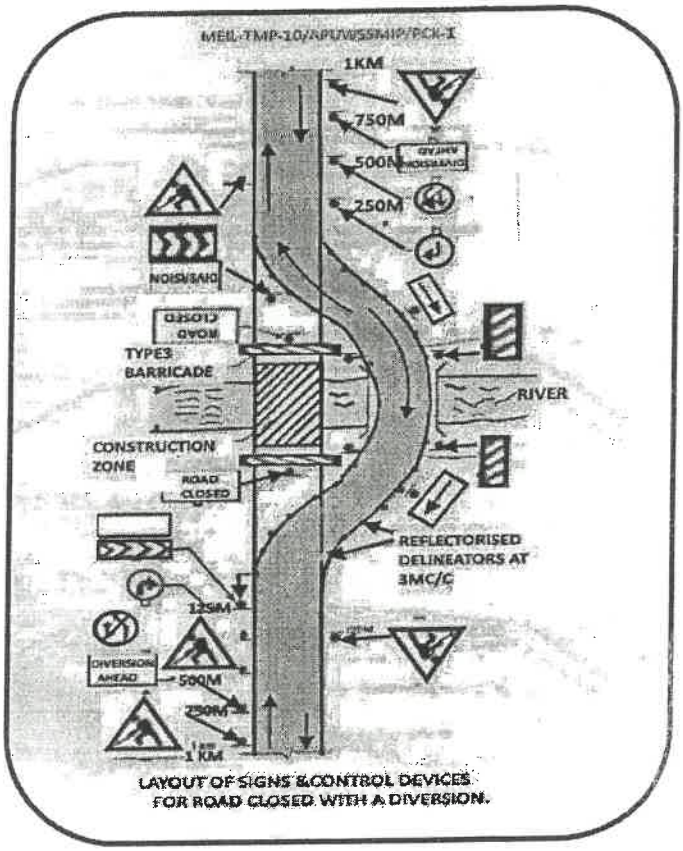
(v) Speed control.

FOUR-LANE DIVIDED CARRIAGEWAYS – (carriageway closure with diversion to opposite carriageway). . In the rural situations it may be possible to reduce traffic flows past the construction zone by diverting traffic to an existing alternative route, thereby improving safety at the site. However, it is likely that this will be a road of lower category and it is also likely that the increase line traffic flows will bring about an increase of accidents on the alternative route. Residential roads in cities should, if possible, be avoided. It is, therefore, acceptable only with low traffic volumes. In such cases, it causes a lot of inconvenience to the users. Before diverting the traffic to any alternative route it must be ensured that traffic detours. (i) are compatible with additional traffic in terms of geometric and structural strength..(ii) Have efficient driver information, and(iii) Are clearly identifiable throughout. **The Public** In the area affected and intending road users should be well informed through press / mass media about the closer/partial closer of the road . **Guidance**: Regarding the diversion of traffic to the alternative route must be provided at the appropriate road



intersections on either side of the section with the construction Zone so that it is possible for the through traffic to divert. This should must be done with suitable warning, regulatory and guide signs at appropriate locate Locations to suit the site requirements .The warning sign of "Men at Work " must be placed before the intersection, for approaching traffic ,together with a supplementary-Plate stating "ROAD AHEAD CLOSED" and with the distance to the hazard. There should also be a diversion sign, indicating the turn to be taken. At the intersection where the diversion starts and it the road is fully closed the use of the permanent type barricade is recommended .

TMP-Meil-TEMPORARY DIVERSIONS:Where the construction zone like cross drainage work and water pipe line crossings would close the road completely ,the remaining carriage way space would be insufficient for the traffic and create large delays and there is no suitable alternative route , it will necessary to construct a temporary carriage way for all or part of the traffic



LAYOUT OF SIGNS &CONTROL DEVICES FOR ROAD CLOSED WITH A DIVERSION.

The temporary carriage way must satisfy the following requirements.

It should have smooth horizontal / vertical profile with smooth vertical a horizontal curves.

It should not get overtopped by flood or drainage discharges under any conditions.

It should have adequate capacity to carter to the expected traffic.

Barricading should be provided to prevent construction material falling on the diversion.

TMP-Meil shows the layout for sign and traffic control devices for temporary diversions.

Speed ControlThe critical information for approaching drivers is as to which lane is blocked so that they can begin moving into the open lane(s) at an early stage. It is preferable to close first the fastest lane and not the slowest, even if the work zone occupies the latter. The reason for this is that slow moving commercial vehicles are more reluctant to give way than the more maneuverable cars which use the fast lane. In this method a reduction in speed is also more easily achieved. If the work zone occupies a centre lane of a multi-lane road, it is recommended to close the adjacent lane to avoid an 'island' situation.

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