Project Report

NTR MARG, Hyderabad

Condition Pavement Strength Testing

for Selected Road section

Using IRSM ERAY 20MT Falling Weight Deflectometer

29-Jun-2018

Prepared By

INDIAN ROAD SURVEY & MANAGEMENT PVT. LTD.

Email:- info@irsm.in

Client Contact	Srinivas Vallabhaneni Director & CEO **Vishwa Samudra Engineering Pvt Ltd - Avani Ecoprojects Pvt Ltd** 46, Amar Cooperative Society Jubilee Hills, Hyderabad 500033 040 - 64642919
IRSM Contact	**Mr. Abhishek Tiwari** General Manager **INDIAN ROAD SURVEY & MANAGEMENT PVT. LTD.** H84, Plot No.1421, 13th Main Road Anna Nagar, Chennai 600040, India 044 - 42612401 / 42612402 / 42612403 Fax: 91 - 44- 43500005
Project Number	

Reviewed by	
Mr Vilvakumar, Transportation Engineer, **Email:** vilva@irsm.in	Mr AbhishekTiwari, General Manager **Email:** abhishek@irsm.in
Mr. Bruce Clayton Road Asset Management Systems Advisor **Email:** bruceclayton.tssp@gmail.com	

ACKNOWLEDGEMENTS

The Project was outsourced by M/s Vishwa Samudra Engineering Pvt Ltd, M/s Avani Ecoprojects Pvt Ltd to M/s Indian Road Survey & Management Pvt. Ltd. (IRSM), Chennai. We the team members whole heartedly thank, M/s Vishwa Samudra Engineering Pvt Ltd, M/s Avani Ecoprojects Pvt Ltd and all Staff & Engineers for the opportunity and all their co-operation provided at the survey site and encouragement provided to complete this project successfully.

G. Parasuraman

Managing Director

Indian Road Survey & Management Pvt. Ltd

Contents

1. Introduction

Indian Road Survey and Management Pvt Ltd., (IRSM) has been selected to undertake the Structural Condition Survey using ERAY Falling Weight Deflectometer (FWD). The IRSM survey team has started and completed the data collection on 29-Jun -2018. The survey team has collected the survey data in NTR Marg, Hyderabad.

IRSM's Falling Weight Deflectometer equipment was supplied and operated by IRSM staff and this report presents the technical methodology and factual data collected as part of this survey.

IRSM's, FWD collects data statically and can complete up to 30-40 test points per hour depending on the test spacing and traffic environment.

1.1. IRSM Company Profile

INDIAN ROAD SURVEY AND MANAGMENT (IRSM) is a 50-50 joint venture with ARRB Group Ltd Australia. IRSM is self-equipped with ARRB Australia make "HAWKEYE 2000 Professional Network Survey Vehicle" (NSV) and ERAY make "Eray-FWD20MT Falling Weight Deflectometer" (FWD) which are being regularly serviced and tested to guarantee a quality product.

IRSM has an experienced and professional team of trained engineers and technicians with appropriate training and relevant experience. As such, IRSM is the local provider capable of providing high quality Data Collection Services.

IRSM is an ISO 9001 for Quality assurance & ISO 39001 for Road Traffic Safety certified company which is first of its kind in India. This ensures a quality safely & on time delivery of project for client.

During the past 25 years, ARRB has built a reputation as premier automated pavement condition service providers in Australia and throughout the Asia region.

Given ARRB's experience in Automated Road Data Collection projects, IRSM is able to offer services that will provide the end user with a complete pavement condition and asset survey of the valuable road network. Our proven track record in projects of this type allows us to offer experienced staff and proven equipment, culminating in quality results at an extremely low risk to the M/s Vishwa Samudra Engineering Pvt Ltd and M/s Avani Ecoprojects Pvt Ltd. We hope to work with M/s Vishwa Samudra Engineering Pvt Ltd and M/s Avani Ecoprojects Pvt Ltd, for a long term so that the organisation can benefit from our vast experience in collecting data over many road networks with IRSM's advance data acquisition and processing technology with the use of state-of-the-art Hawkeye 2000 Professional NSV and Eray-FWD20MT Falling Weight Deflectometer equipment.

As mentioned above, IRSM is a joint venture established in 2009 and has the full support of the two International Companies.

1.1.1. Taisei International

M/s ***Taisei International***, is a one stop shop for all NDT equipment's who have worked extensively in India providing various NDT equipment from a range of suppliers including ARRB, Cooper, Delta, Transtech Systems, Carl Bro Intelligent Solutions, Fuji Telcom and many more. Taisei International has wide range of equipment with trained engineers for customer support.

1.1.2. ARRB Group

ARRB Group is the leading Australian provider of value added research and technical services addressing transport problems.

The organisation employs over 200 staff who form a multi-disciplinary pool of highly qualified research professionals, experienced engineers, and specialist technical and support staff. ARRB Group has certified laboratory and testing facilities and has implemented a program to gain Quality Assurance certification.

ARRB Group has its headquarters in Melbourne, and offices in Perth, Brisbane, Adelaide, Sydney and Jakarta. ARRB has completed over 500 network level road condition surveys for a range of clients, including State Road Authorities, International customers, Local Government and Private Industries.

Choosing IRSM & ARRB to supply road data collection will provide you with the following benefits:

- ARRB is the preferred pavement data provider for Australian State Road Authorities and numerous local government authorities and regional road groups.
- IRSM & ARRB equipment is maintained to the highest standard being regularly serviced and tested to guarantee a quality product.
- IRSM & ARRB surveys are conducted by trained engineers, and technicians with the appropriate training and relevant experience.
- ARRB has dedicated quality procedures which are accredited by NATA and ISO 9001:2008

1.1.3. **Project Scope**

Hyderabad R & B department has constructed a road sections using Stabilroad German Soil Stabilization technology by its principle contractor Vishwa Samudra Engineering Pvt Ltd with their technical partners Avani Ecoprojects Pvt Ltd, Hyderabad. Vishwa Samudra Engineering Pvt Ltd have outsourced work to **IRSM Pvt Ltd** for the Structural condition testing survey using the IRSM Falling Weight Deflectometer (FWD) and subsequent analysis is to ascertain the relative performance of the pavement of 1.2 km approx., in this road section.

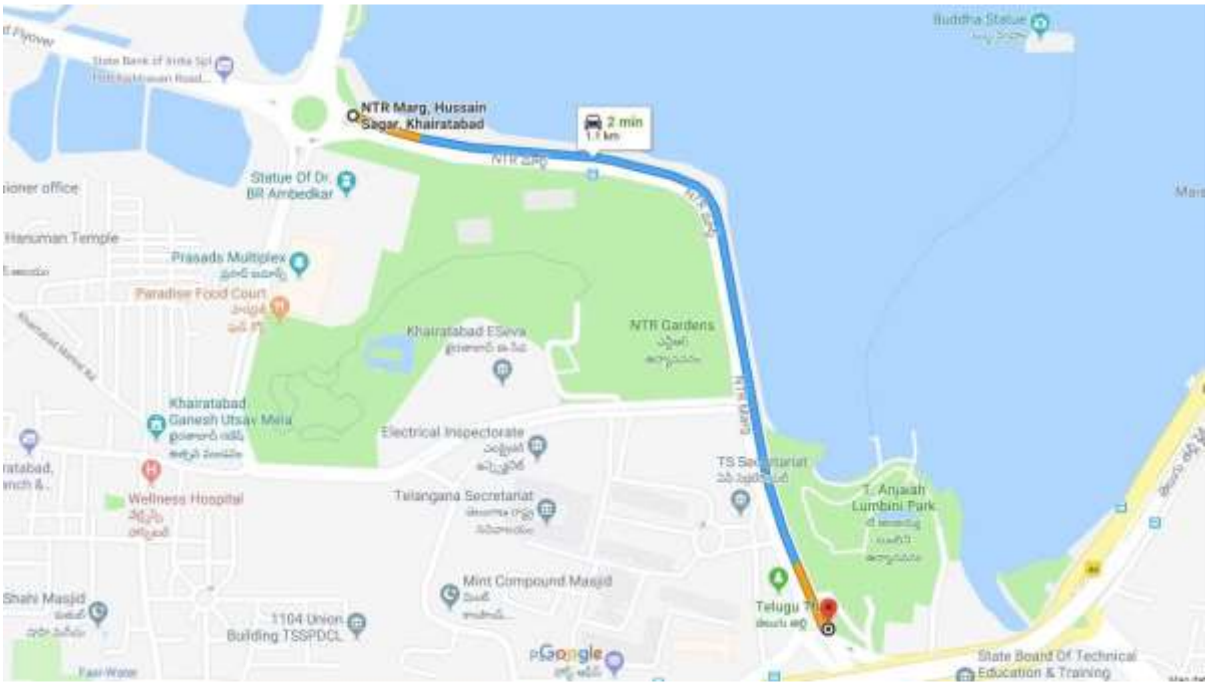


Figure 1-1 Map of Project Corridor

1.1.4. Data collection:

After signing the contract, The IRSM FWD & Survey Crew was mobilized to NTR MARG site and completed data collection using IRSM FWD on 29-Jun-18 for the 1.2 km approx.

Advantage of Falling Weight Deflectometer Over BBD:

- FWD is Non-destructive test equipment for pavements
- FWD Imparts a dynamic load to a pavement structure Simulates a moving wheel load whereas BBD is Static.
- FWD Provides fast, non-destructive evaluation of pavements whereas BBD takes much time.
- FWD is safe operating on project site as it is compatible and can be operated inside vehicle and one test takes few seconds, so it is without much disturbance to moving traffic whereas on BBD it is not the case.
- FWD Provides information on condition of underlying pavement layers
- Benkelman beam can only measure the maximum deflection, but FWD can measure the exact shape of the deflected bowl. Two pavements may have same maximum deflection, but different shapes will perform differently.
- We can back calculate the moduli values of the different pavement layers (by matching the measured and computed bowl ordinates using software) and these moduli values can be used to compute the stresses in different pavement layers using any pavement analysis software. Such analysis is not possible in a BBD.
- We can estimate the structural inadequacy and also calculate the residual life of pavements with FWD.
- BBD can do the test for pavements with relatively thin bituminous surfacing (but for the current pavements with high pavement thickness as well as bituminous layer thickness, we should resort to FWD.

IRSM have collected data and here presenting the reports on the current condition of various test sections and subsequent analysis is to ascertain the relative performance of the pavement in NTR MARG road section which will help M/s Vishwa Samudra Engineering Pvt Ltd, in its future planning related to the Road Infrastructure Development.

2. Methodology

IRSM's survey crew mobilized to the test locations following instruction to proceed and receipt of testing program details.

The collected raw data were handed over to IRSM's processing center in the IRSM's head office in Chennai. A series of processing tasks were completed including:

- Rationalization of network data for manipulating and generating a variety of reports
- Generating tabular reports and developing correlations between current condition and composition.
- Generating graphical reports of current pavement performance.

The FWD data collection has been collected below

1) Prepare the FWD unit for deflection testing
2) Bring the FWD to a stopped position at the beginning of the test section, centered on the outside wheel path (or specific position), and take a measurement by applying load using following sequence:
   a) One settling drop to ensure proper contact.
   b) Three drops with an applied load of 40 KN ± 10% (or Specified Load).
3) Deflections are recorded from the sensors located at the center of the loading plate for each drop except the settling drop.
4) Along with these deflection data, the parameter like Chainage, Temperature, Date and Time and position of Sensors will also be recorded.
5) After each measurement, drive the FWD forward to next measurement point.

During the data collection process, the testing patterns we have used the lined pattern. In this position, the Data Collection will be made in the same direction. For example: if the Measurement at the beginning of the section is taken on outside wheel path, then the next measurement has to be taken after moving to the specified interval on same direction. While starting the adjacent lane, an offset distance is considered while starting and continued as stated earlier. Refer Figure 2-1 Data collection Pattern – Lined

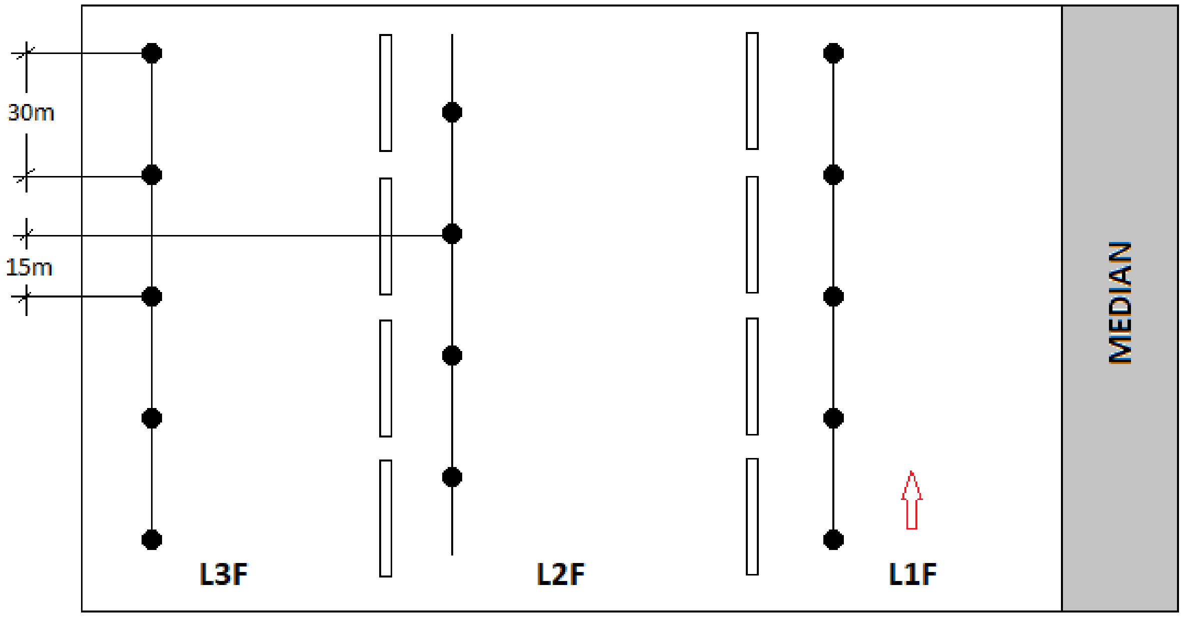


Figure 2-1 Data collection Pattern – Lined

2.1. FWD testing

IRSM has a Eray-FWD20MT FWD. This unit is fitted with a magnetic sensor-based odometer for linear reference. The odometer is capable of recording the chainage to an accuracy of 0.1 metre.

Specifically, the testing will be conducted with:

- Nine geophones to record the deflection bowl at 0, 200, 300, 450, 600, 900, 1200, 1500 and 1800mm from the center of the load.
- A testing cycle at each location which will comprise of a seating drop followed by at least one drop cycle for each target loading. The drop cycles are used to determine the repeatability of the deflection data at a test location.
- A load pulse applied through a 300mm diameter loading plate with 5mm of rubber.
- An operating system which is capable of being set to a predefined load for testing the pavement, in this case around 40 KN for flexible Pavement.
- Equipment which will electronically capture and store the location, load, deflection and temperature data for test cycle at each test location.

- An odometer capable of recording the chainage to an accuracy of 0.1 meter per kilometer or less.
- An infra-red thermometer which will be used to record the pavement temperature and a thermocouple based sensor that will measure air temperature.

Testing will be carried out at appropriate intervals.

The recording of location references will be undertaken in accordance with the client's requirements. This entails all chainages being recorded as the distance from the start of the link in the prescribed direction.

IRSM undertake field checks to ensure the quality of the data collected. The data collected at each test location should be checked prior to storing the results in the field. The minimum checks required are:

- The targeted loading of 80KN is within the acceptable range of ± 10%.
- Valid deflections are recorded on each geophone.
- The deflections are decreasing – a check to ensure the deflections decrease with distance from the impact location.
- The deflection bowl readings are consistent for both test cycles of each target load – ensures only repeatable deflection data for a location is stored.

Here, in this site while trying with 40KN load, deflection is so lean and difficult to vary errors relating to formation the deflection bowl. Based on IRSM experience, FWD crew has adopted 80KN load testing in this road section and successfully executed survey.

The data collected will be checked during processing to ensure the field checks are met, the location referencing is correct and that all processing errors are eliminated. During the processing, checking will be undertaken to ensure the data delivered meets the defined requirements.

2.2. Description of Falling Weight Deflectometer

IRSM used a Eray-FWD20MT Falling Weight Deflectometer. These units are a non-destructive pavement testing device which provides accurate data on the response of the pavement (specifically the surface deflection bowl) to dynamic loads by simulating actual wheel loads in both response and duration. This allows more accurate and rapid measurement of pavement deflection under load than traditional methods.

All testing is controlled by a personal computer which is located in the vehicle towing the FWD. As a result, only one operator is required to conduct a survey on most occasions making it less labour/ equipment intensive than traditional methods.

A dynamic load is generated by the dropping of a mass from a pre-set height onto a 300-mm diameter plate. The magnitude of the load and the pavement response are measured by a load cell and nine geophones. One geophone is located immediately under the load, whilst the others are located at variable offsets from the centre of the load.

The test load can be varied between 7 and 150 KN to meet the requirements of the particular task and the pavement response for up to four different magnitudes of load can be measured during any test sequence.

The offsets of the geophones can be set to any distance up to 1800 mm from the centre of the load and a typical sequence can be completed in approximately one minute. Highly accurate deflection bowl measurements are therefore possible and the FWD is very useful for carrying out large-scale pavement surveys.

This data can assist in applications such as pavement overlay design, pavement condition surveys and in the development and operation of Pavement Management Systems (PMS). It is also used as input in back-calculation of pavement Moduli packages such as ARRB's EFROMD2 or Dynatest's ELMOD6.

The FWD is integrally mounted on a trailer which is towed by a dedicated vehicle.

Figure 2-2 - IRSM's Falling Weight Deflectometer – PRI2100

The IRSM FWD and towing vehicle also contain all necessary equipment to perform the survey in a safe and efficient manner including clearly visible identification signs, double sided arrow boards and flashing lights for which a permit has been issued. The FWD can be equipped with GPS allowing for accurate location of test locations if required.

Confidence limits

Load cell accuracy	1% i.e., ±1 kPa (1kPa = 0.145 psi)
Load resolution	0.03 - 0.12 kN (7 - 26 lbf), magnitude dependent
Load Pulse Shape	Essentially half-sine
Load Plate	300 mm Diameter, 4 Segmented
Deflection range	± 3.5 mm (138 mils)
Deflector accuracy	≤ 2% i.e., ± 3 microns (1 micron = 0.04 mil)
Deflector resolution	0.2 µm
Distance Measuring Instrument	0.1%

Equipment Calibration Certificate

TAISEI INTERNATIONAL
"Taisei House" No. 01-076/4/C-24,
Survey No. 24, Ganga Enclave,
Lane next to SBI, Opp. Byrraju Foundation,
Medchal Road, Petbasheerabad,
Hyderabad - 500 055. R.R. Dist. Telangana
Ph : 91-40-27165395, Fax : 91-40-27165393

ERAY

Suzhou Eray Imp.&Exp.Co.,Ltd.

苏州费格特进出口有限公司

CERTIFICATION OF CALIBARTION	
Owner: Taisei International	Date of calibration: 17-11-2017
FWD No. ERAY-FWD20MT	Next calibration,geophones: 18-12-2018
ERAY Contract No.: 16ERAY026	Next calibration,load cell: 18-12-2018
	Calibrated by: ERAY Calibration Station
	Calibartion Certificate Number: ERAY2017/11/17

Calibration Gain/Slope

Geophone Sensor	Grain/Slope	External ref
1	0.9801	Not Used
2	0.9905	Not Used
3	0.9743	Not Used
4	0.9884	Not Used
5	0.9747	Not Used
6	0.9725	Not Used
7	1.0019	Not Used
8	0.9966	Not Used
9	0.9712	Not Used
Not Used	Not Used	Not Used
Not Used	Not Used	Not Used
Not Used	Not Used	Not Used
Not Used	Not Used	Not Used
Not Used	Not Used	Not Used
Not Used	Not Used	Not Used
Load Cell	0.6082	Not Used

Signature & Stamp: 苏州费格特进出口有限公司 SUZHOU ERAY IMP.&EXP.CO.,LTD. 佘 雷

Ray shen 佘雷

IRSM

3. Site Observations at the time of Testing:

During the time of survey, few observations were recorded by site engineers

3.1. Road Inventory

Carriageway Width

The project road has three lanes with paved carriageway of 8.8m width and 1.5 m paved shoulders on either side of the carriageway. The carriageway is built with BT & WMM with stabilizing agent of three coat surface dressing as wearing course.

Terrain

The project road is passing through the plain terrain and an average travel speed of 40 to 60 kmph is observed. Speed restriction is applied in areas with habitation to slow down the vehicle to 20Kmph.

Road Geometries

There is sharp curve found along the alignment. The vertical alignment is generally having smooth geometry. There are some locations observed, where adequate sight distances are not available which need improvement to the standards.

3.2. Visual Condition Survey

Major observations found during visual condition survey are narrated below.

- Entire stretch of the project highway is in good condition with the overlay.
- Surface shoulders are found in fair condition having width of 0.2 m on both side of the carriageway.
- overtopping is observed at on the project road.
- Water stagnation is observed at on the project road.
- Project Road was Beside to the Hussain Sagar Lake.

3.3. Site Sketch

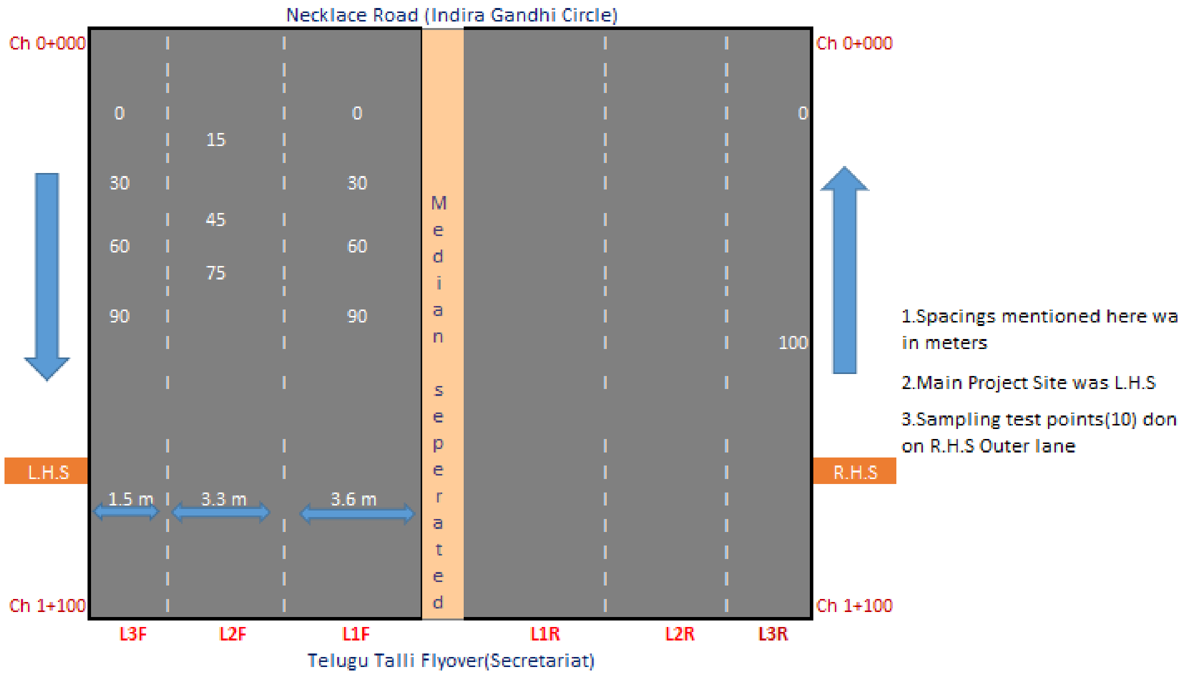


Fig: Site Details for The Project NTR Marg

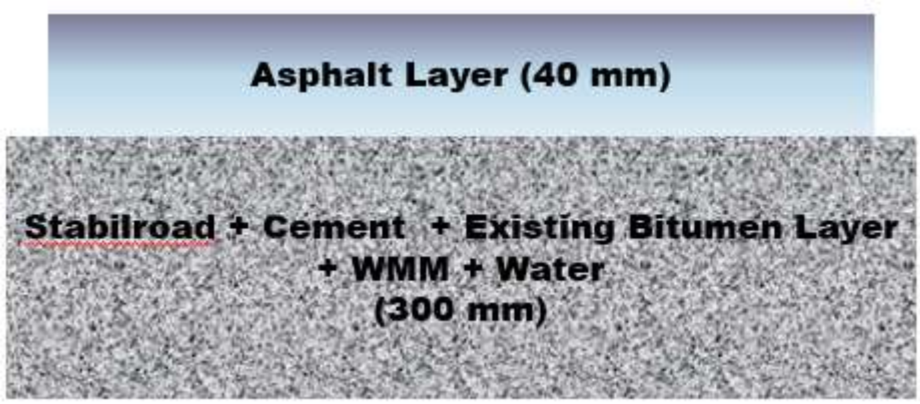
Figure 3-1 Site Section Sketch

3.4. Traffic Details

It is understood that the design traffic volumes were calculated based on traffic growth, vehicle damage factors etc. provided from traffic counts. From the client records, we have identified traffic as 50.00 MSA.

3.5. Pavement Layer Details

Details related to the Pavement Layers have been provided by the client.



During Analysis, the same pavement thickness has been considered as 40mm Bituminous layer and 300mm Cementitious layer.

List of Photograph showing some site condition

4. Analysis Methodology

IRC 115: 2014 procedures were used as reference and provided Structural evaluation and strengthening of flexible Pavements. Accordingly, the sequence of testing and analysis steps has been conducted in accordance with the IRC 115:2014.

4.1. For Flexible Pavements:

The Remaining Life Analysis on the Flexible Pavement analysis is carried by Evaluating the Elastic Modulus of each Layers and Performance of Flexible Pavement - Fatigue and Rutting Behavioral checks.

The step by step analysis for flexible pavement has been explained in the flow chart attached below.

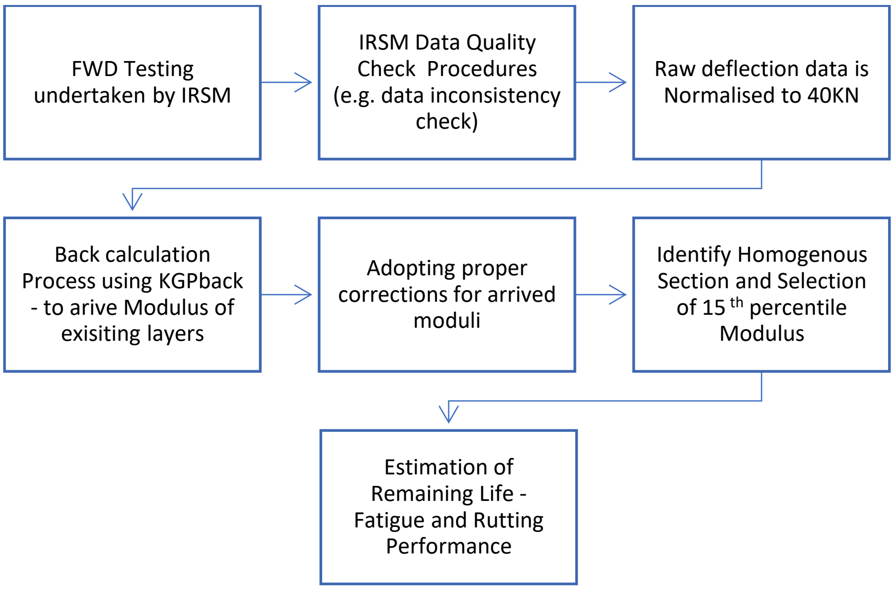


Figure 4-1 Process Flow to determine pavement modulus values

These has been Explained in the procedural steps below

1. The recorded data was normalized to a standard load – 40kN (IRC 115).

2. The normalized deflections were then back calculated using the KGP-back Application (refer 4.1.1) to obtain Elastic Modulus values of Bituminous, Granular layer and Sub-grade.

3. The corrections factors will be applied to all layers as suggested in IRC 115:2014.

In accordance with Section 6.4.2 of IRC 115, the calculated modulus values in the Bituminous Layers have been adjusted relative to the standard temperature of 35°C using equation 4 and 5 of IRC 115: 2014.

$$E_{T1} = \lambda E_{T2}$$ Eq 4, IRC115:2014

$$\lambda = \frac{1-0.238 \ \ln T1}{1-0.238 \ \ln T2}$$ Eq 5, IRC115:2014

Where

λ - Temperature Correction factor

E_{T1} - Backcalculated Modulus (MPa) at Temperature T1

E_{T2} - Backcalculated Modulus (MPa) at Temperature T2

In accordance with Section 6.5.2 of IRC 115, the calculated modulus values for Sub-grade and Granular Layer have been adjusted relative to the moisture conditions at the time of the testing. Since the granular layer present here is cementitious Layer - No correction needs to be applied to this cementitious layer.

$$\mathrm{E}_{\mathrm{Subgrade\_Monsoon}} = 3.351 * (\mathrm{E}_{\mathrm{Subgrade\_Winter}})^{0.7688} - 28.9$$ Eq 6, IRC115:2014

$$\mathrm{E}_{\mathrm{Subgrade\_Monsoon}} = 0.8554 * (\mathrm{E}_{\mathrm{Subgrade}_{\mathrm{Summer}}}) - 8.461$$ Eq 7, IRC115:2014

4. Using these corrected Moduli Values - Homogenous sections are prepared and 15th percentile Moduli values are selected for Design. Here, we have considered Each section as one homogenous section.

5. Checking the in-serviceability of the Pavement layers through Performance criteria - analyzing the Remaining life (IRC 115) with reference to the Traffic MSA.

Initially, The Critical Strains Values - tensile strain (in the bituminous layer), ε_t and compressive strain (at the top of the sub-grade layer), ε_v are evaluated using the IRC approved program IITPAVE application (refer 4.1.2).

Using the Critical Strain values, the pavement performance in term of Fatigue and Rutting ca be evaluated as provided in Section 8.3 of IRC 115.

Fatigue Model

$$N_f = 0.711 * 10^{-4} * [\frac{1}{\varepsilon_t}]^{3.89} * \left[\frac{1}{M_{Bit}}\right]^{0.854}$$ Eq16, IRC115:2014

Rutting Model

$N_R = 1.41 * 10^{-8} * \left[\frac{1}{\varepsilon_v}\right]^{4.5337}$ Eq17, IRC115:2014

For special case of Cementitious Layer,

A. Fatigue life in terms of standard axles

$N = RF \left[\frac{11300/E^{0.0804}+191}{\varepsilon_t}\right]^{12}$ Eq6.6, IRC37:2012

B. Fatigue equations for cumulative Damage Analysis

$\log N_{fi} = \frac{0.972-(\sigma_t/M_R up)}{0.0825}$ Eq6.7, IRC37:2012

Using these equations, Actual Remaining Life of the pavement retained can be Evaluated in terms of Traffic MSA.

4.1.1. KGPback Application

KGPback is a genetic algorithm-based model for back calculation of layer moduli provided along with IRC 115 publication. It uses linear elastic theory for the analysis of pavement in its forward calculation algorithm.

The procedure provided in Appendix III has been adopted to back calculate the Elastic modulus values of each layer listed below

- The Normalize the raw deflection values to 40KN
- Derive the limits for Modulus of Bituminous layer, Granular layer and Sub grade as discussed in Appendix III.8 of IRC 115:2014 and IRC 37: 2012

  For this project, The Limits has been considered as below:

	Low Limit	Upper Limit
Bituminous layers	750MPa,	3000MPa.
Cementitious layer[1]	2000MPa	9000MPa
Subgrade[2]	$1.2*E_{sg\ calc}*0.8$	$1.2*E_{sg\ calc}*1.2$

---

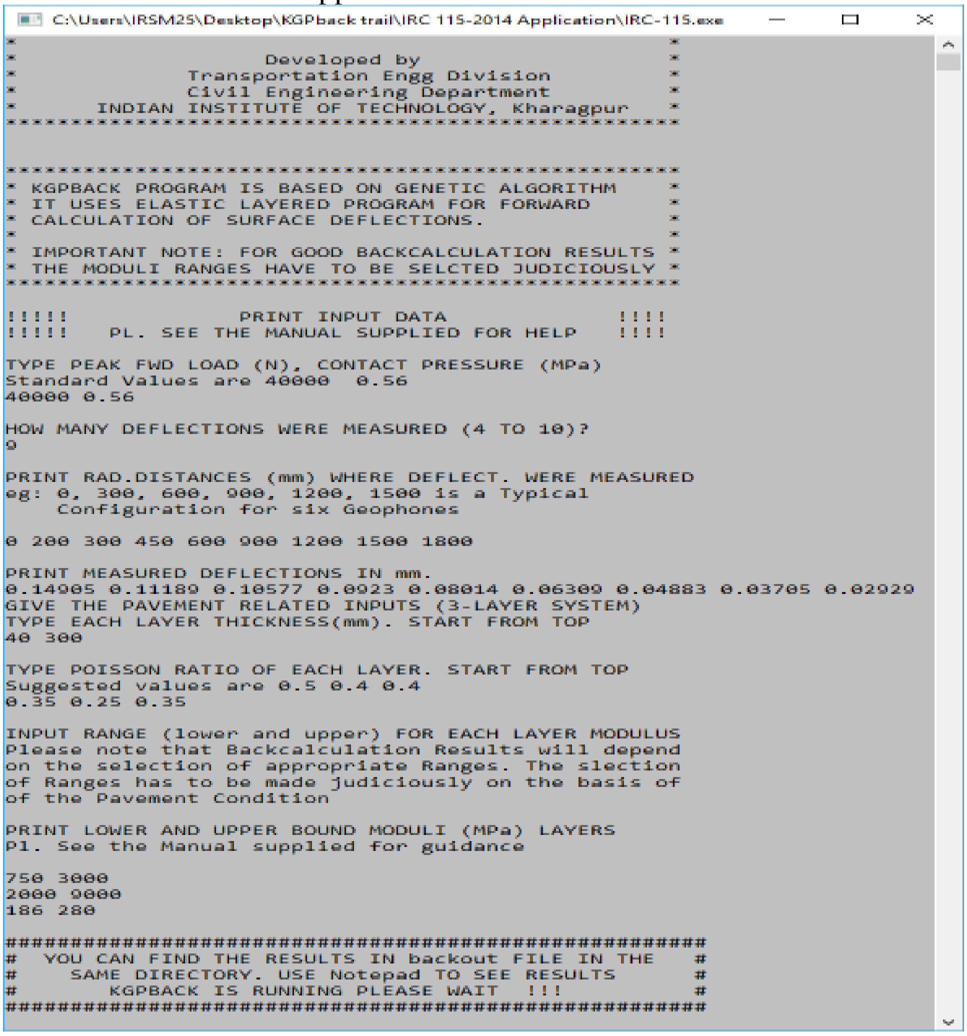
[1] For Cementitious Layer, the limits are derived based on UCS value shared by the client from their Records.

$E_{cgsb} = 1000 * UCS$ Eq 7.2 from IRC 37-2012

[2] $E_{sgcalc} = \frac{\left(\frac{2}{1-\mu}\right)*P}{(3.14*r*w)}$ EqIII.2, IRC115:2014

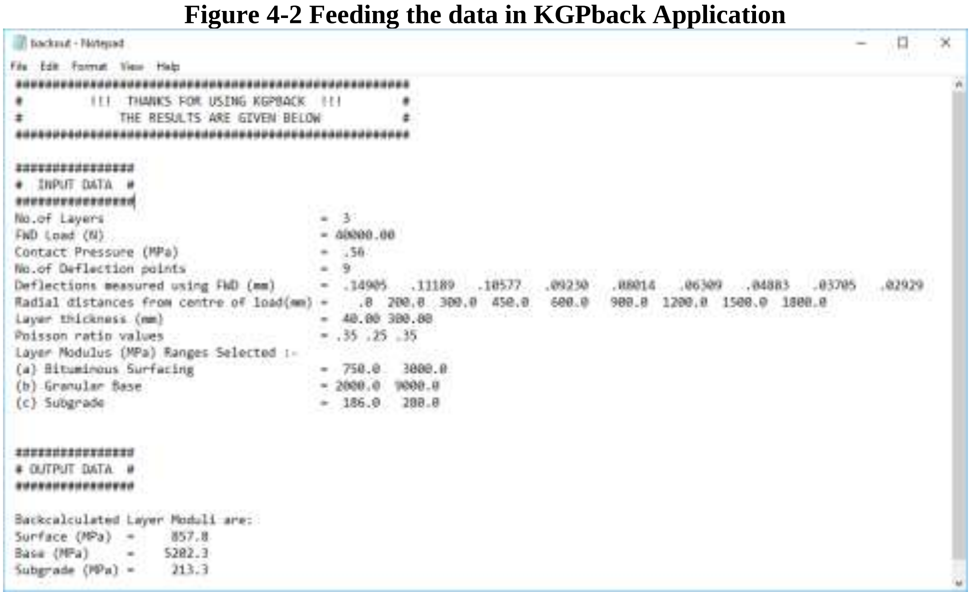
- Feed the pavement structure detailing values appropriately in KGPback application
- Modulus values can be arrived; Review the results.

The screen shot of the KGPback application has been attached below.



```
C:\Users\IRSM25\Desktop\KGPback trail\IRC 115-2014 Application\IRC-115.exe
*                                                          *
*              Developed by                                *
*         Transportation Engg Division                     *
*         Civil Engineering Department                     *
*    INDIAN INSTITUTE OF TECHNOLOGY, Kharagpur             *
************************************************************

************************************************************
* KGPBACK PROGRAM IS BASED ON GENETIC ALGORITHM            *
* IT USES ELASTIC LAYERED PROGRAM FOR FORWARD              *
* CALCULATION OF SURFACE DEFLECTIONS.                      *
*                                                          *
* IMPORTANT NOTE: FOR GOOD BACKCALCULATION RESULTS         *
* THE MODULI RANGES HAVE TO BE SELCTED JUDICIOUSLY         *
************************************************************

!!!!!            PRINT INPUT DATA                  !!!!
!!!!!   PL. SEE THE MANUAL SUPPLIED FOR HELP       !!!!

TYPE PEAK FWD LOAD (N), CONTACT PRESSURE (MPa)
Standard Values are 40000  0.56
40000 0.56

HOW MANY DEFLECTIONS WERE MEASURED (4 TO 10)?
9

PRINT RAD.DISTANCES (mm) WHERE DEFLECT. WERE MEASURED
eg: 0, 300, 600, 900, 1200, 1500 is a Typical
    Configuration for six Geophones

0 200 300 450 600 900 1200 1500 1800

PRINT MEASURED DEFLECTIONS IN mm.
0.14905 0.11189 0.10577 0.0923 0.08014 0.06309 0.04883 0.03705 0.02929
GIVE THE PAVEMENT RELATED INPUTS (3-LAYER SYSTEM)
TYPE EACH LAYER THICKNESS(mm). START FROM TOP
40 300

TYPE POISSON RATIO OF EACH LAYER. START FROM TOP
Suggested values are 0.5 0.4 0.4
0.35 0.25 0.35

INPUT RANGE (lower and upper) FOR EACH LAYER MODULUS
Please note that Backcalculation Results will depend
on the selection of appropriate Ranges. The slection
of Ranges has to be made judiciously on the basis of
of the Pavement Condition

PRINT LOWER AND UPPER BOUND MODULI (MPa) LAYERS
Pl. See the Manual supplied for guidance

750 3000
2000 9000
186 280

############################################################
#  YOU CAN FIND THE RESULTS IN backout FILE IN THE         #
#    SAME DIRECTORY. USE Notepad TO SEE RESULTS            #
#       KGPBACK IS RUNNING PLEASE WAIT   !!!               #
############################################################
```

Figure 4-2 Feeding the data in KGPback Application



```
backout - Notepad
File  Edit  Format  View  Help
####################################################
#        !!!  THANKS FOR USING KGPBACK  !!!        #
#            THE RESULTS ARE GIVEN BELOW           #
####################################################

################
#  INPUT DATA  #
################
No.of Layers                            =  3
FWD Load (N)                            = 40000.00
Contact Pressure (MPa)                  =  .56
No.of Deflection points                 =  9
Deflections measured using FWD (mm)     =  .14905  .11189  .10577  .09230  .08014  .06309  .04883  .03705  .02929
Radial distances from centre of load(mm) =    .0  200.0  300.0  450.0  600.0  900.0  1200.0  1500.0  1800.0
Layer thickness (mm)                    =  40.00 300.00
Poisson ratio values                    = .35 .25 .35
Layer Modulus (MPa) Ranges Selected :-
(a) Bituminous Surfacing                =  750.0   3000.0
(b) Granular Base                       = 2000.0  9000.0
(c) Subgrade                            =  186.0   280.0


################
# OUTPUT DATA  #
################

Backcalculated Layer Moduli are:
Surface (MPa)  =     857.8
Base (MPa)     =    5282.3
Subgrade (MPa) =     213.3
```

Figure 4-3 Results obtained from KGPback

4.1.2. IITPAVE Application

IITPAVE is a multilayer elastic layer linear analysis program provided along with IRC 37: 2012. This IITPAVE has been used for the computation of stresses and strains in flexible pavements. Tensile strain ε_t , at the bottom of the bituminous layer and the vertical strain ε_v , on the top of the subgrade are conventionally considered as critical parameters for pavement design to limit cracking and rutting in the bituminous layers and non-bituminous layers respectively. Under repeated wheel loads the pavement foundation materials in different layers do not behave linear elastically. The granular materials and subgrade soils are nonlinear with an elastic modulus varying with level of stresses.

An overview of the analysis process using this IITPAVE is presented below.

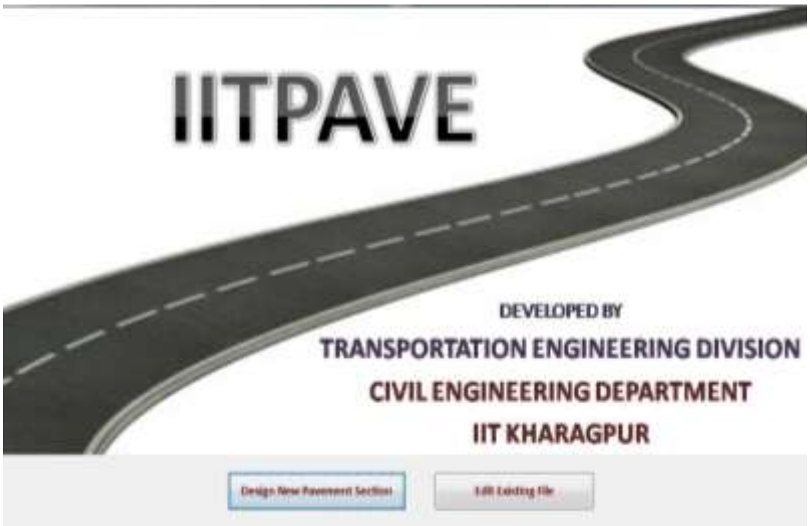


Figure 4-4 - Opening Page - IITPAVE

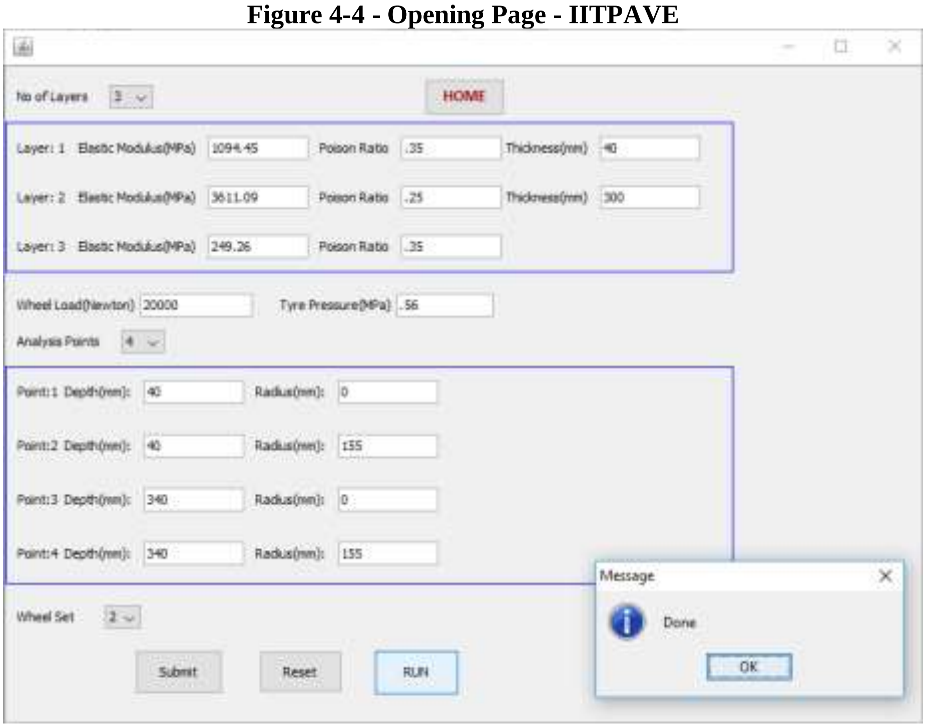


Figure 4-5 – Providing the input values, obtained via KGPback

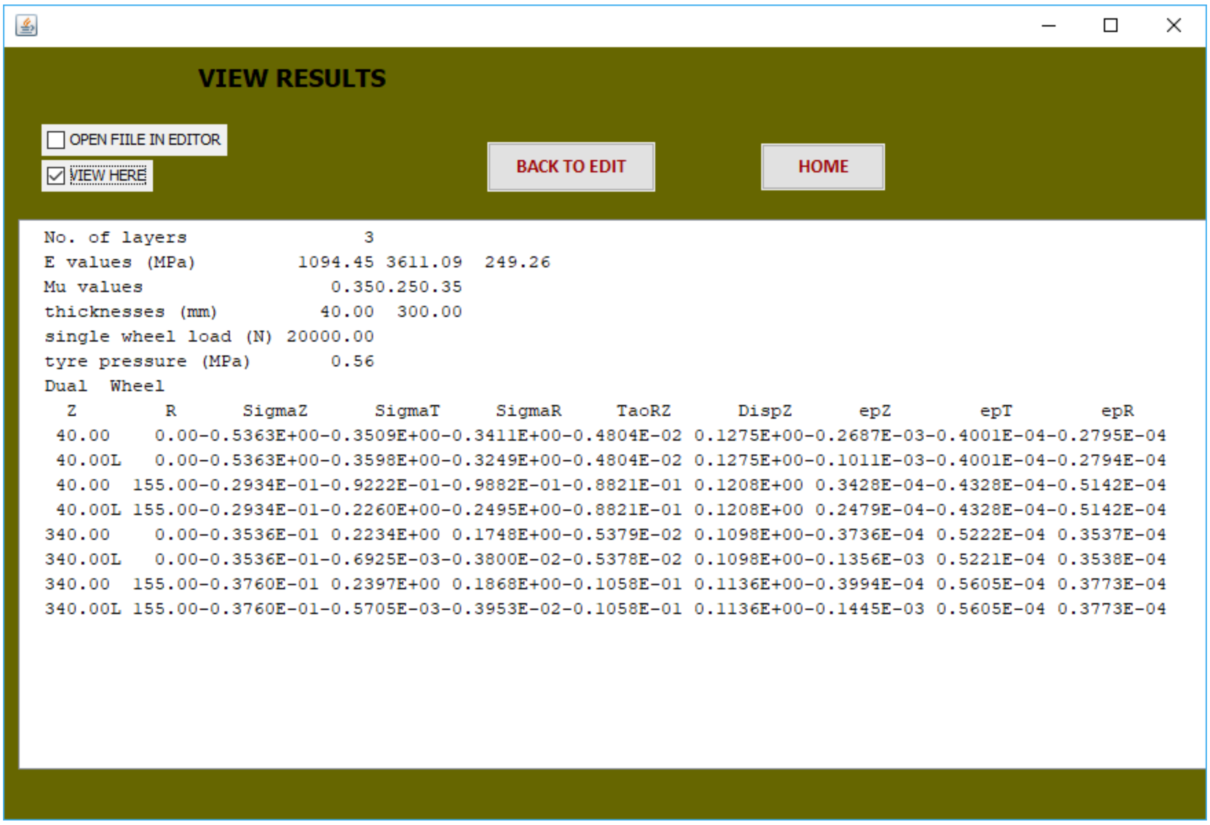


Figure 4-6 - Obtaining required strain values for checking Fatigue and Rutting performances.

5. Results

5.1. Falling Weight Deflectometer (FWD) Results

Listed below are the parameters included in the spreadsheet describing the data fields:

Location	File name indicating road name and direction
Chainage	Distance from start point in meters
Date	Date of Testing
Time	Time of FWD test
Drop	Number of drop number, only second drop presented
D0	Deflection under load at 0mm offset
D200	Deflection at 200mm offset from load
D300	Deflection at 300mm offset from load
D450	Deflection at 450mm offset from load
D600	Deflection at 600mm offset from load
D900	Deflection at 900mm offset from load
D1200	Deflection at 1200mm offset from load
D1500	Deflection at 1500mm offset from load
D1800	Deflection at 1800mm offset from load
kPa	Applied surface pressure from FWD load
kN	Applied surface load
Air (deg)	Air Temperature (Deg C)
Sur (deg)	Surface Temperature (Deg C) measured by non-contact sensor

5.2. Maximum Deflection

IRSM's Falling Weight Deflectometer (FWD) was used to collect pavement strength and stiffness information and these values are reported in mm. The results of the normalized maximum deflection testing are presented below.

5.3. Normalised Deflection Values

In accordance with international best practice and with Section 4.4 of IRC 115, the recorded deflection values have been normalized to the equivalent applied pressure of 40KN.

This Load is representative of a standard ESAL. The following figure presents the Peak Deflection.

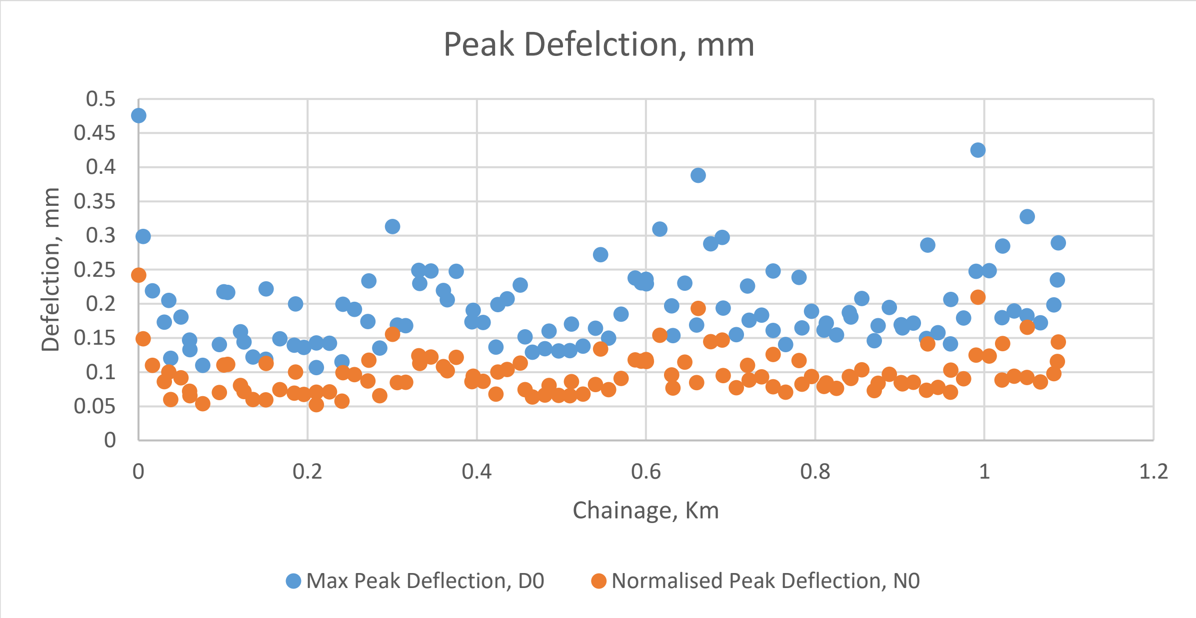


Figure 5-1 Peak Deflection @ NTR Marg, Hyderabad

5.4. Modulus Values

In accordance with IRC 115 and IRC 37:2012, the recorded deflection values have been analyzed to determine back-calculated modulus value. The processed results are attached in Appendix.

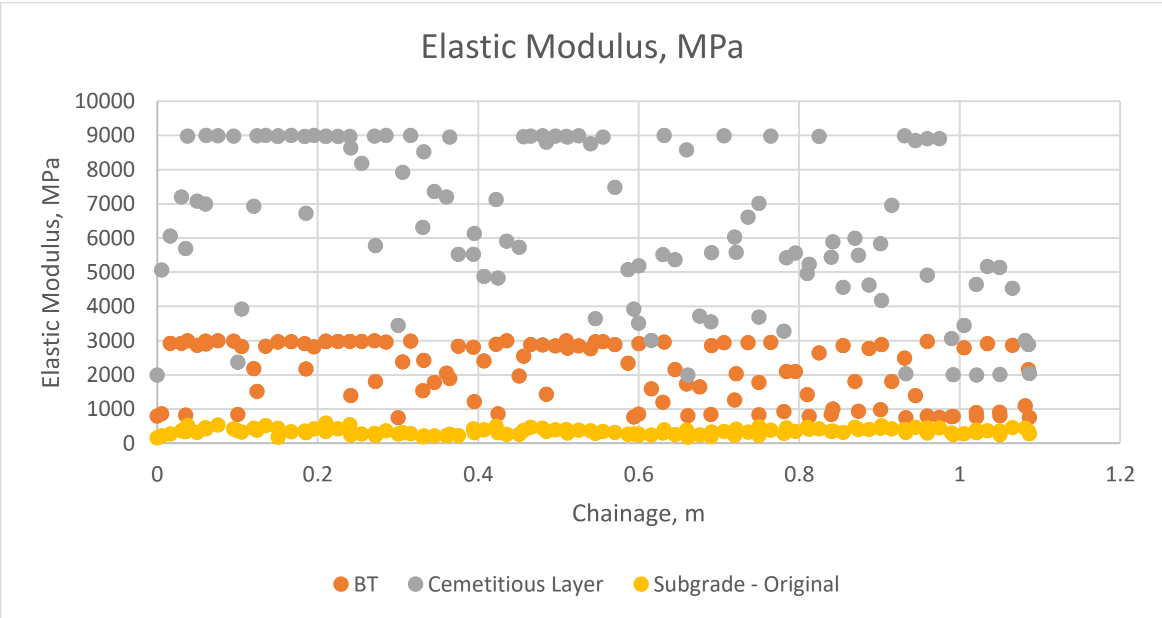


Figure 5-2 Back-calculated E-moduli Value for NTR Marg, Hyderabad

5.4.1. **Temperature Corrected Values**

In accordance with Section 6.4.2 of IRC 115, the calculated modulus values in the Layer 1 Bituminous Layers have been adjusted relative to the standard temperature of 35°C. Temperature corrections were made based on the infrared pavement temperature readings collected at the time of deflection testing.

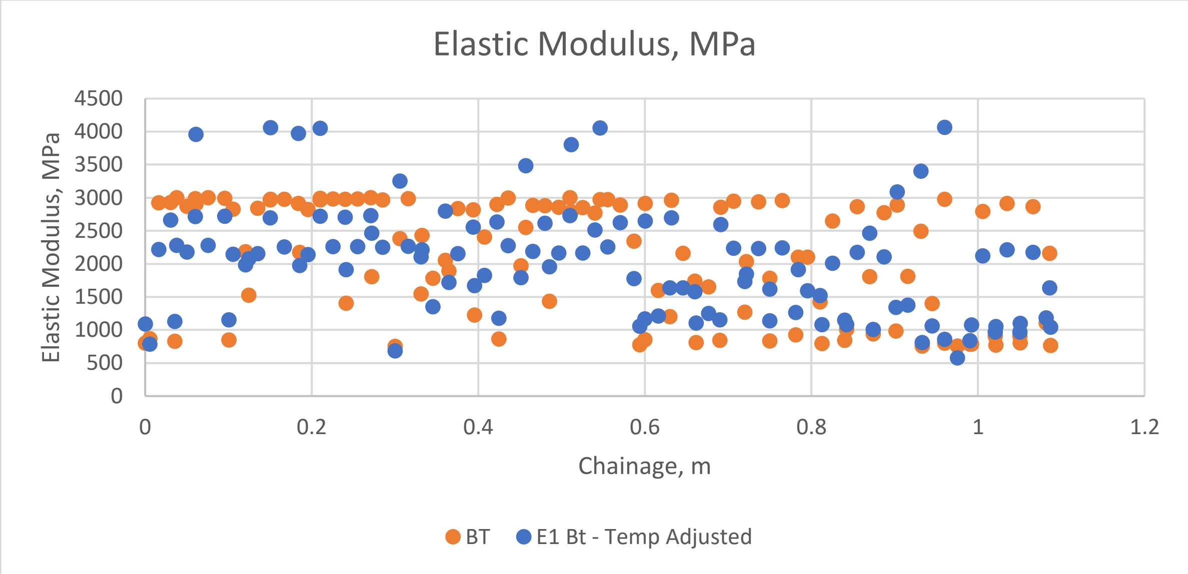


Figure 5-3 Elastic Modulus Layer 1 Temperature Adjusted

5.4.2. **Seasonal Corrected Values**

In accordance with Section 6.5.2 of IRC 115 - No correction applied to Cementitious Layer and Subgrade, as the test was executed in monsoon season.

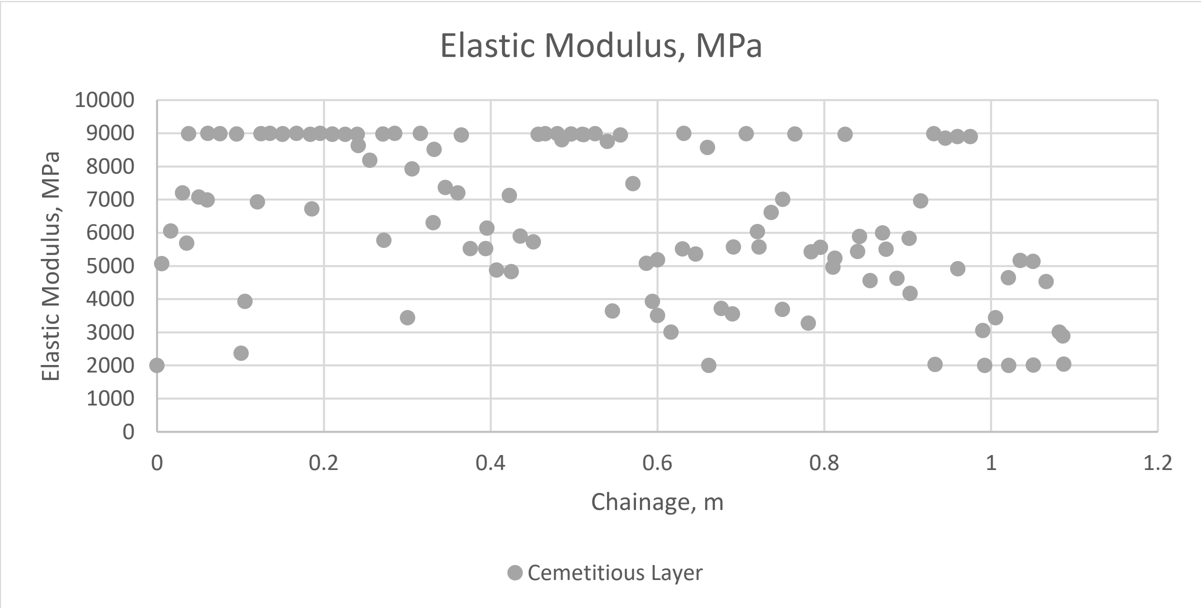


Figure 5-4 Elastic Modulus Layer 2 Cementitious Layer

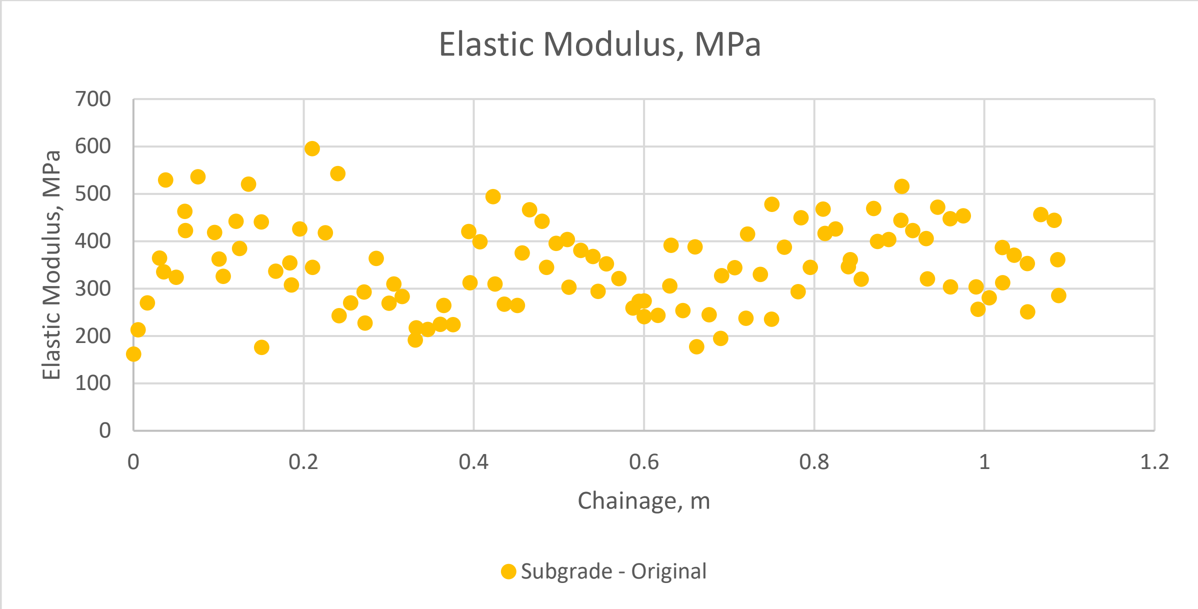


Figure 5-5 Elastic Modulus Layer 3 Subgrade

5.5. Performance Criteria

The Pavement performance is evaluated to find the actual Remaining Life retained at present in terms of Fatigue and Rutting performances for Flexible Pavements. The Design traffic is considered as 50 MSA from clients Records.

As Discussed in Section 4.1 the analysis has been carried out. Based on the Deflection data - Elastic Modulus values has been processed. After applying appropriate correction to Derived Elastic modulus values, the Sections has been grouped to Road-wise and 15% percentile values has been arrived.

The evaluated Fatigue performance of Bituminous layer, Rutting performance based on Subgrade layer, fatigue performance in cementitious layer are listed below

Section	15 % percentile			Fatigue in Bituminous Layer, Nf (MSA)	Fatigue in Cementitious Layer (B), Nfi (MSA)	Rutting in Sub-grade, N (MSA)	Design Traffic Ni(MSA)	Safe / Not Safe
	E – Bituminous Temp Adj	E2 Cementitious (Original)	E3 Subgrade (Original)					
NTR MARG	1094.45	3611.09	249.26	16871.97	18229.81	3624.32	50	Safe

6. Discussion and Conclusion

The project consists of a small road sections near NTR Marg in Hyderabad, Telangana. The total length of the existing project corridor is 1.2 km approx.

IRSM's Eray-FWD20MT Falling Weight Deflectometer was engaged for data collection and the survey was done on 29-Jun-2018. The testing was undertaken in all sections, that reflected the road conditions and pavement composition. Subsequently the analysis was undertaken with appropriate pavement compositions as per IRC guidelines - IRC 115: 2014 and IRC 37: 2012.

The results from the entire stretch are presented in Section 5.
The results indicate:

- NTR Marg road section has a uniform Pavement composition.
- During initial Testing, it is observed the deflection readings recorded in these sub sections indicates a very stiff underlying layers ensuring the privileges of the high performance heavy volume pavements.
- for Back calculation process, the limits for Subgrade and Bituminous layer has been considered based on the IRC 115: 2014 and for cementitious layer the limits have been considered based on IRC 37: 2012. The same has been discussed 4.1.1
- Through the performance check, the existing pavement is found to be satisfactorily safe in terms of Fatigue performance of Bituminous Layer & cementitious layer and Rutting performance based on Subgrade Layer.
- Variability in the calculated results may be a reflection on variability of the pavement composition along the alignment. For each section, the available information only supports the consideration of provided pavement composition in that section.

Appendix I – FWD Raw Deflection Data

Point	Filename	Chainage	Lane	Drop	Deflection in microns									Load	Temp	Remarks
					D(1)	D(2)	D(3)	D(4)	D(5)	D(6)	D(7)	D(8)	D(9)	kN	oC	
					0	200	300	450	600	900	1200	1500	1800			
	NTR MARG	0.0054	L1F	1	316.8	222.1	211.6	185.1	161.3	126.4	98	76	59.8	80.33	32.8	
	NTR MARG	0.0054	L1F	2	293	226.2	211.6	184.4	160.3	126.1	97.3	74.4	57.9	80.11	32.8	
1	NTR MARG	0.0054	L1F	3	286.5	224.5	212.8	185.5	160.3	126.9	98.3	72.4	58.4	80.09	32.8	Good
	NTR MARG	0.0304	L1F	1	172.9	137.9	127.4	108.4	94.6	73.2	57.7	45.5	34.9	80.38	32.8	
	NTR MARG	0.0304	L1F	2	172.5	138.9	127.5	105.6	93.6	72.5	56.1	43.7	34.1	79.77	32.8	
2	NTR MARG	0.0304	L1F	3	174.2	139.5	129.5	106.3	93.7	72.9	57	44.3	35.1	80.06	32.8	Good
	NTR MARG	0.0602	L1F	1	147	120.1	110.5	96.9	80.6	61.5	46.9	33.8	23.6	81.43	32.8	
	NTR MARG	0.0602	L1F	2	146.9	119.1	110	95.7	81.9	61	47	34.8	24	80.83	32.8	
3	NTR MARG	0.0602	L1F	3	147	119.1	110.8	95.8	81.9	60.8	48.1	34.9	25.9	81.19	32.8	Good
	NTR MARG	0.0954	L1F	1	141.1	115.3	109.2	96.4	80.8	60.9	53.4	38	30.8	80.14	32.8	
	NTR MARG	0.0954	L1F	2	139.7	114.1	107.3	96.7	80.2	60.7	53.4	36.9	31.4	79.36	32.8	
4	NTR MARG	0.0954	L1F	3	140.5	115.3	107.6	95	79.7	62.5	52.1	36.7	31.2	79.57	32.8	Good
	NTR MARG	0.1204	L1F	1	159.9	122.1	108.2	94.2	79.9	58	43.5	35	29.4	79.16	32.8	
	NTR MARG	0.1204	L1F	2	158.5	119.5	109.6	94	81.3	57.4	42.6	35.8	28.2	78.41	32.8	
5	NTR MARG	0.1204	L1F	3	160.3	120.1	109.7	93.5	80.8	57.5	42.8	36.2	28.8	79.14	32.8	Good
	NTR MARG	0.1502	L1F	1	119.3	96.9	90.6	81.1	70.3	62.5	54.4	48.2	40.8	80.25	32.8	
	NTR MARG	0.1502	L1F	2	119.2	96.6	89.2	81	71	62.2	52.9	49.3	43.1	79.68	32.8	
6	NTR MARG	0.1502	L1F	3	118.3	95.7	88.3	80.8	71.2	62.6	52.7	47.8	42.1	79.47	32.8	Good
	NTR MARG	0.1854	L1F	1	200.9	156.8	145.6	129.9	111.5	82.4	64.9	54.1	42.3	79.96	32.8	
	NTR MARG	0.1854	L1F	2	200	157.2	146.9	129.5	110.4	80	62.7	53.6	41.8	79.41	32.8	
7	NTR MARG	0.1854	L1F	3	199	156.8	146.9	130.7	110.4	81.7	63.5	54.4	43	79.66	32.8	Good
	NTR MARG	0.2101	L1F	1	106.2	78.2	75.6	66	60	46.1	40.1	33.3	28.5	81.19	32.8	
	NTR MARG	0.2101	L1F	2	107.1	78.9	77.1	67.8	60.7	45.9	40.4	31.9	28.4	81.85	32.8	
8	NTR MARG	0.2101	L1F	3	107.3	79.5	76.9	67.4	60.6	47.4	40.9	31.9	27.7	81.7	32.8	Good
	NTR MARG	0.2402	L1F	1	116.3	83.8	81.1	71.8	63.4	52.4	42	31.1	30	79.97	32.8	
	NTR MARG	0.2402	L1F	2	114.2	83.3	78.3	70.3	61.6	50.4	40.6	30.8	29.4	79.31	32.8	
9	NTR MARG	0.2402	L1F	3	115.2	83.3	78.5	70	61.5	50.4	40	31.3	28.5	79.73	32.8	Good
	NTR MARG	0.2709	L1F	1	173.1	141.1	134.5	120.1	108.3	85.6	71.3	60.5	48.8	79.99	32.8	
	NTR MARG	0.2709	L1F	2	174.3	140.9	135.4	119.5	108.1	86.7	73.2	62.6	51.6	80.21	32.8	
10	NTR MARG	0.2709	L1F	3	175.6	141.5	135.6	120.8	108.8	87.7	72.9	62.8	51.7	80.15	32.8	Good
	NTR MARG	0.3002	L1F	1	316	212.7	189.7	159.3	136.5	104.6	81.4	56.3	43.1	80.54	32.8	
	NTR MARG	0.3002	L1F	2	313.5	213.2	190.1	160.2	136.8	103.7	80.5	58.3	44.3	80.58	32.8	
11	NTR MARG	0.3002	L1F	3	310.9	213.1	190	160.3	136.3	104	81.5	58.8	44.1	80.62	32.8	Good
	NTR MARG	0.3323	L1F	1	230.1	191.4	183.3	166.4	146.7	118.7	96.3	75.7	61.6	81.3	32.8	
	NTR MARG	0.3323	L1F	2	229.7	189.5	184	165.4	147.5	118.1	95.6	75.9	59.5	81.33	32.8	
12	NTR MARG	0.3323	L1F	3	230.3	190.7	185.4	165.7	148.9	120.2	98	76.5	61.4	81.43	32.8	Good
	NTR MARG	0.3647	L1F	1	204.1	163.6	157.1	139.3	122.3	96.8	77.5	60.8	51.1	80.3	32.8	
	NTR MARG	0.3647	L1F	2	206.5	162.8	157.8	139.7	123.2	96.8	78.4	60.1	50	80.66	32.8	
13	NTR MARG	0.3647	L1F	3	208.1	165.3	159	140.9	123.7	97.1	79.2	62.4	50.5	81.36	32.8	Good

Point	Filename	Chainage	Lane	Drop	Deflection in microns									Load	Temp	Remarks
					D(1)	D(2)	D(3)	D(4)	D(5)	D(6)	D(7)	D(8)	D(9)	kN	oC	
					0	200	300	450	600	900	1200	1500	1800			
	NTR MARG	0.394	L1F	1	173.9	130.1	124.1	104.6	91.1	62.6	54.5	31.4	30.1	80.51	32.8	
	NTR MARG	0.394	L1F	2	173.4	130.9	124.1	106.9	90.9	63	53.8	33.1	30.5	80.47	32.8	
14	NTR MARG	0.394	L1F	3	174	131.3	124.2	106.8	91.9	63.4	53.8	34.5	30.6	80.52	32.8	Good
	NTR MARG	0.4224	L1F	1	136.3	115.4	104.2	90.2	77.3	57.5	41.1	28.9	24.7	80.62	32.8	
	NTR MARG	0.4224	L1F	2	136.9	114.8	102.9	89	76.4	55.8	42.4	29.4	24.2	80.61	32.8	
15	NTR MARG	0.4224	L1F	3	137.9	115.5	104.2	90.4	77.2	57.3	41.9	30.6	24.9	80.39	32.8	Good
	NTR MARG	0.4511	L1F	1	225.2	178.5	174.3	153.8	134.5	103.1	78.5	58.6	46	79.72	32.8	
	NTR MARG	0.4511	L1F	2	229.9	180.5	176.6	156.2	137.1	105.6	80.3	56.9	46.9	81.36	32.8	
16	NTR MARG	0.4511	L1F	3	228.7	178	174.9	153.9	134.8	104.8	78.9	56	44.8	79.9	32.8	Good
	NTR MARG	0.4801	L1F	1	133.3	107.1	97.9	87	75.4	59.2	47.3	37.2	32.9	79.73	32.8	
	NTR MARG	0.4801	L1F	2	135.1	109.8	102.8	92.2	78.4	60	49.4	37.7	29.4	81.6	32.8	
17	NTR MARG	0.4801	L1F	3	135.2	110	103.3	89.7	78.6	61.4	48.7	38	33.2	81.21	32.8	Good
	NTR MARG	0.5099	L1F	1	131.7	117.5	111.3	97.9	86.1	66	50.9	39.7	32.6	80.4	32.8	
	NTR MARG	0.5099	L1F	2	131.3	117	110.3	97	84.5	66.4	51.8	40.6	33.4	79.85	32.8	
18	NTR MARG	0.5099	L1F	3	132.3	117.8	111.6	99.1	85.9	67.1	51.6	44.5	33.6	80.16	32.8	Good
	NTR MARG	0.54	L1F	1	164.5	129.3	121.6	107.1	90.8	69.9	56.8	43.4	35.1	80.72	32.8	
	NTR MARG	0.54	L1F	2	163.9	126.8	120.6	106.1	90	70.6	55.5	42.4	35.2	79.42	32.8	
19	NTR MARG	0.54	L1F	3	165.4	128.3	121.4	105.9	91.7	70.8	55.2	43.2	36	79.96	32.8	Good
	NTR MARG	0.5704	L1F	1	185.5	150.4	143	125.2	107.7	82.2	65.8	48.9	41.9	81.68	32.8	
	NTR MARG	0.5704	L1F	2	184.9	150.1	142.9	125	108.2	80.4	66	48.9	40.7	81.41	32.8	
20	NTR MARG	0.5704	L1F	3	185.2	150.8	143.6	125.8	108.2	81.2	65.8	50.4	42	81.14	32.8	Good
	NTR MARG	0.6002	L1F	1	229.2	197.8	188.7	169.3	146.1	110.2	83	63.7	48.9	79.15	32.8	
	NTR MARG	0.6002	L1F	2	229.7	200.4	188	170.4	145.8	110.8	83.8	64.3	49.6	79.33	32.8	
21	NTR MARG	0.6002	L1F	3	230.6	203	190.3	170.4	146.3	111.8	85	65.2	50.5	79.36	32.8	Good
	NTR MARG	0.6317	L1F	1	154.4	118	111.4	99.8	85.5	67.8	51.9	42.8	34.1	80.15	32.8	
	NTR MARG	0.6317	L1F	2	153.8	118.1	111.7	99.9	84.4	66.9	53.2	43.7	34.2	79.97	32.8	
22	NTR MARG	0.6317	L1F	3	153.5	117	111.7	99.3	86.6	67.8	52.8	42.9	34.4	80.13	32.8	Good
	NTR MARG	0.6598	L1F	1	166	127.3	117.4	103	86	65.7	53.1	43.8	31.4	79.52	32.8	
	NTR MARG	0.6598	L1F	2	170.8	125.2	118.5	104.5	87.7	66.6	52	43.9	35	79.93	32.8	
23	NTR MARG	0.6598	L1F	3	171.2	125.3	117.9	103.1	87	65.5	51.5	43.1	31.8	79.6	32.8	Good
	NTR MARG	0.691	L1F	1	196.1	167.1	151.7	139.2	121.5	83.6	65.9	44.3	39	81.48	32.8	
	NTR MARG	0.691	L1F	2	193.4	165.7	150.4	138.3	121	81.8	65	44.7	37.5	81.36	32.8	
24	NTR MARG	0.691	L1F	3	192.9	166.1	150.8	136	120.6	82.1	65.3	44.9	38	81.32	32.8	Good
	NTR MARG	0.7217	L1F	1	176.3	129.2	127.9	108	93	64.9	49.8	40.8	26	79.85	32.8	
	NTR MARG	0.7217	L1F	2	175.8	128.9	126.9	107.7	93.4	64.2	47.4	38.2	26.9	79.66	32.8	
25	NTR MARG	0.7217	L1F	3	176.4	132.6	123.8	107.2	89.8	64.2	53.3	40.9	25.4	79.21	32.8	Good
	NTR MARG	0.7501	L1F	1	162.5	119	108.9	91.5	77.1	60.9	46.7	30.5	27.1	82.17	32.8	
	NTR MARG	0.7501	L1F	2	160.9	115.8	108.6	92.4	78.3	60.4	46	31.6	26.5	81.91	32.8	
26	NTR MARG	0.7501	L1F	3	160.6	116.6	108	90.9	76.2	60.1	45.6	31.4	26.7	81.75	32.8	Good
	NTR MARG	0.7842	L1F	1	165.1	129	119.4	105.5	86.2	62	46.8	30.1	25.9	80.28	32.8	
27	NTR MARG	0.7842	L1F	2	164.7	128.2	121.3	105.8	88.4	61.8	46.3	32.2	28.2	79.98	32.8	Good

Point	Filename	Chainage	Lane	Drop	Deflection in microns									Load	Temp	Remarks
					D(1)	D(2)	D(3)	D(4)	D(5)	D(6)	D(7)	D(8)	D(9)	kN	oC	
					0	200	300	450	600	900	1200	1500	1800			
	NTR MARG	0.7842	L1F	3	164.6	127.2	120	105.4	87.2	62.2	46.6	31.3	25.5	79.74	32.8	
	NTR MARG	0.8103	L1F	1	161	125.2	117.3	99	80.3	57.8	42.6	30.3	28.5	82.3	36.5	
	NTR MARG	0.8103	L1F	2	159.7	123.1	115.3	98.5	81.5	58.2	42.9	32.1	28.6	81.43	36.5	
28	NTR MARG	0.8103	L1F	3	164.2	121.1	115.4	98.1	82	60	41.8	31.4	29.9	81.57	36.5	Good
	NTR MARG	0.8421	L1F	1	181.4	140.5	130.4	112.9	96.2	70.9	55.5	42.2	38.7	79.82	36.5	
	NTR MARG	0.8421	L1F	2	180.2	139.6	129.8	113	97.6	70.9	55.3	42.1	37.1	79.11	36.5	
29	NTR MARG	0.8421	L1F	3	181.5	140.6	130.3	113	97.8	70	55.1	42	36.5	79.21	36.5	Good
	NTR MARG	0.8742	L1F	1	168.6	134.8	127.1	110.3	94.9	69.7	51.6	40.7	28.3	80.27	36.5	
	NTR MARG	0.8742	L1F	2	167.4	131.2	125.5	109.8	93.3	69	50	40.3	25.8	79.6	36.5	
30	NTR MARG	0.8742	L1F	3	168.3	133.4	126.5	110.4	93.5	69.9	52.8	41.6	28.3	80.01	36.5	Good
	NTR MARG	0.9029	L1F	1	165.7	118	104.1	84.8	67.7	47.9	36.2	31.7	26.4	79.92	36.5	
	NTR MARG	0.9029	L1F	2	164.2	115.3	103.5	84.9	67.1	48.2	35.9	31.6	27.2	79.31	36.5	
31	NTR MARG	0.9029	L1F	3	164.6	115.8	103.5	83.9	66.3	48.2	37.8	30.9	26.3	79.08	36.5	Good
	NTR MARG	0.933	L1F	1	290.3	210.3	191.9	156.8	125.6	85.3	61.4	46	36	81.01	36.5	
	NTR MARG	0.933	L1F	2	285.4	209.5	190.3	155.6	126.1	85.1	61.2	45.7	35.9	80.2	36.5	
32	NTR MARG	0.933	L1F	3	282.5	211.4	192.5	157.5	126.6	86	62.4	46.1	36.5	81	36.5	Good
	NTR MARG	0.96	L1F	1	207.3	168.3	163.1	142.8	122.5	94.2	71.3	53.9	34	80.39	36.5	
	NTR MARG	0.96	L1F	2	206.5	167.7	161.6	142.2	123.3	93.4	71	53.4	36.5	80.09	36.5	
33	NTR MARG	0.96	L1F	3	206.3	167.5	161.6	142.5	123.6	94.4	71.3	53.9	37.3	79.76	36.5	Good
	NTR MARG	0.9901	L1F	1	249.3	188.1	175.2	150.3	126.4	89.9	64.5	51.1	37.2	79.3	36.5	
	NTR MARG	0.9901	L1F	2	248.4	186	175.6	149.2	127	90.6	65.1	51.4	36.9	79.14	36.5	
34	NTR MARG	0.9901	L1F	3	245.7	186.5	175.9	149.6	127.3	91.6	66.2	52.2	36.9	79.14	36.5	Good
	NTR MARG	1.0208	L1F	1	180.4	147.6	137.7	119.4	99.4	74.1	54.3	39.8	32.7	81.58	36.5	
	NTR MARG	1.0208	L1F	2	179.8	147.3	137.1	118.5	99.6	73	52.2	37.4	32.2	81.32	36.5	
35	NTR MARG	1.0208	L1F	3	179.6	146.7	135.2	120.2	97.9	72.8	52.6	37.7	31	80.91	36.5	Good
	NTR MARG	1.0501	L1F	1	182	150.1	139.9	122.5	102.8	75.4	58.9	39.4	35.8	78.83	36.5	
	NTR MARG	1.0501	L1F	2	182.9	150.3	140	122	103.6	76.2	58.3	41.3	35.4	79.49	36.5	
36	NTR MARG	1.0501	L1F	3	184.1	150.5	140.8	121.7	103.9	77	57.6	41.5	35.4	79.47	36.5	Good
	NTR MARG	1.0819	L1F	1	194.9	152.2	138.6	115.3	91.4	65.7	43.7	33.1	26.2	81.51	36.5	
	NTR MARG	1.0819	L1F	2	196.5	152.6	137.6	114.1	88.8	64.5	44	34.3	26.7	81.13	36.5	
37	NTR MARG	1.0819	L1F	3	204.5	150.5	136	113	91	64.4	44.3	33.1	26.2	80.69	36.5	Good
	NTR MARG	0.0162	L2F	1	221.2	174.2	162.9	145.4	125.8	96.7	77.1	55.8	49.1	79.61	28.5	
	NTR MARG	0.0162	L2F	2	218.3	175.6	162.3	142.5	124.7	99.2	77.5	55.2	49.9	79.24	28.5	
38	NTR MARG	0.0162	L2F	3	218.8	174.9	162.7	141.6	122.8	97.8	77.5	56.1	49.3	79.59	28.5	Good
	NTR MARG	0.0378	L2F	1	119.9	92.8	81.4	73.9	68.3	50.2	43.7	27.7	21.4	80.17	28.5	
	NTR MARG	0.0378	L2F	2	120.8	92.5	85.1	77.4	68.2	53.1	44.1	31.6	23.4	80.52	28.5	
39	NTR MARG	0.0378	L2F	3	120.8	92.1	84.5	76.8	69.3	53	44	31.2	24.6	80.12	28.5	Good
	NTR MARG	0.05	L2F	1	189.4	149.6	142.2	124	104.7	82.2	62.6	48.1	37.7	78.99	28.5	
	NTR MARG	0.05	L2F	2	178.2	148.6	141	122.6	103.8	81.6	61.1	47.7	38.1	78.52	28.5	
40	NTR MARG	0.05	L2F	3	174.6	150.2	142.3	122.8	102.9	81.9	62.8	48.1	38.1	78.66	28.5	Good
41	NTR MARG	0.0756	L2F	1	109.5	87.7	84	74.6	67.3	51.6	44.1	31.4	28.3	81.69	28.5	Good

Point	Filename	Chainage	Lane	Drop	Deflection in microns									Load	Temp	Remarks
					D(1)	D(2)	D(3)	D(4)	D(5)	D(6)	D(7)	D(8)	D(9)	kN	oC	
					0	200	300	450	600	900	1200	1500	1800			
	NTR MARG	0.0756	L2F	2	110.1	88.5	83.9	74.9	66.7	52.3	44.4	31.8	28.4	81.65	28.5	
	NTR MARG	0.0756	L2F	3	110.4	89.1	84.5	75.7	67.7	52.8	44.6	32.6	29	81.69	28.5	
	NTR MARG	0.1054	L2F	1	215.8	167	157.7	131.8	108.9	80.3	58.2	41.2	39.4	77.88	28.5	
	NTR MARG	0.1054	L2F	2	217.6	167.7	156.2	130.7	109.7	80	59.2	43.8	40	77.48	28.5	
42	NTR MARG	0.1054	L2F	3	218.1	168.4	156.4	131.5	109.1	81	60.2	43.2	40.3	78.25	28.5	Good
	NTR MARG	0.1352	L2F	1	120.6	93.4	88.9	77.5	64.2	56.5	45	32.9	27.1	81.89	28.5	
	NTR MARG	0.1352	L2F	2	123.2	94.3	88.7	76	64.1	56	45.1	32.3	28.6	81.29	28.5	
43	NTR MARG	0.1352	L2F	3	122.9	93.7	89.2	76.6	66.3	55.8	46.1	32.5	26.2	81.71	28.5	Good
	NTR MARG	0.167	L2F	1	150.2	128.3	123.1	111.5	99.1	79.6	66.1	49.8	39.2	80.38	28.5	
	NTR MARG	0.167	L2F	2	149	128.4	122.4	111.1	98.5	79.1	65.6	50.7	38.6	79.78	28.5	
44	NTR MARG	0.167	L2F	3	148.3	128	123	111.4	98.3	79.7	65.3	51.8	38.8	79.18	28.5	Good
	NTR MARG	0.1954	L2F	1	135.9	104	97.7	89.8	79.8	62.4	53	41.3	39.6	81.01	28.5	
	NTR MARG	0.1954	L2F	2	137.5	103.3	98.1	88.8	78	64.2	52.9	43.3	39.5	81.1	28.5	
45	NTR MARG	0.1954	L2F	3	136.5	102.2	96.6	88.6	78.1	64.9	52.4	43	39	80.07	28.5	Good
	NTR MARG	0.2255	L2F	1	143.1	114.6	108	99.1	81.2	67.4	55.5	40.4	23.9	80.32	28.5	
	NTR MARG	0.2255	L2F	2	142.3	114.7	108.9	98.2	82.9	67.9	55	41.7	27.9	80.15	28.5	
46	NTR MARG	0.2255	L2F	3	142.6	114.6	109	98.2	82.4	67.7	55.1	41.1	27	79.69	28.5	Good
	NTR MARG	0.255	L2F	1	192	164.7	152.8	136.8	121	96.1	76.6	57.9	46.9	79.48	28.5	
	NTR MARG	0.255	L2F	2	191.9	165.8	152.9	136	119.8	96.2	77.4	59.4	47.4	79.28	28.5	
47	NTR MARG	0.255	L2F	3	192.4	168.3	153.7	137.3	121.2	96.1	77.3	59.2	46.7	79.32	28.5	Good
	NTR MARG	0.2851	L2F	1	135.4	118.6	115.6	104.4	91.6	75.8	69.1	50	46.4	82.47	28.5	
	NTR MARG	0.2851	L2F	2	135.1	118.3	115.3	103	91.2	77.8	68.3	51	46.7	82.11	28.5	
48	NTR MARG	0.2851	L2F	3	135.8	118.6	116.5	102.6	95.7	78.1	67	54.3	46.8	82.18	28.5	Good
	NTR MARG	0.3158	L2F	1	168.3	146.9	139.3	126.1	111.1	91.5	74.1	56.6	48.3	79.23	28.5	
	NTR MARG	0.3158	L2F	2	169.3	147.5	138.5	125.6	110.3	90.5	73.7	57.6	51	78.75	28.5	
49	NTR MARG	0.3158	L2F	3	167.6	145.4	138.8	124.6	111.6	90.6	73.9	56.3	47	78.49	28.5	Good
	NTR MARG	0.3456	L2F	1	240.4	199.5	193.5	173	150.5	124.1	100.5	75.1	61.9	81.1	28.5	
	NTR MARG	0.3456	L2F	2	243.2	201.4	194.3	173.2	151.5	124.2	98.4	77.1	61.3	80.88	28.5	
50	NTR MARG	0.3456	L2F	3	261	203.7	195.5	172.3	151.7	123.5	100.8	76.2	60.6	81.31	28.5	Good
	NTR MARG	0.3754	L2F	1	246.7	214.8	200.8	180.4	155.3	119.5	92	63.9	58.9	81.87	28.5	
	NTR MARG	0.3754	L2F	2	248.3	216.1	201	180.9	156.3	119.3	92.2	67.5	60.1	81.02	28.5	
51	NTR MARG	0.3754	L2F	3	248.5	216.6	200.3	178.6	156.9	120.7	91.1	68.9	60.2	80.9	28.5	Good
	NTR MARG	0.4072	L2F	1	175	146.8	131.9	118.8	95.5	75	55.8	37.1	25.7	80.18	28.5	
	NTR MARG	0.4072	L2F	2	172.7	145.7	131.7	117.5	96.7	73.9	54.7	36.7	24.2	79.97	28.5	
52	NTR MARG	0.4072	L2F	3	170.7	146.5	132.3	117.1	97.2	74.1	55.2	37.8	30.2	79.3	28.5	Good
	NTR MARG	0.4356	L2F	1	209.5	183.1	172.9	151.9	129.8	97.6	80.4	58	45.5	80.46	28.5	
	NTR MARG	0.4356	L2F	2	207.1	180.1	170.7	151	131.6	100.9	81.3	57.7	44.3	79.53	28.5	
53	NTR MARG	0.4356	L2F	3	206.1	180.5	170.7	150.9	132	98.5	79.2	59	44.1	79.39	28.5	Good
	NTR MARG	0.4654	L2F	1	130.1	104.8	96.6	88	72.4	56.4	46.6	37.3	30	81.99	28.5	
	NTR MARG	0.4654	L2F	2	129.1	103.4	96.5	88	71.9	57.2	45.8	36.5	29.9	81.17	28.5	
54	NTR MARG	0.4654	L2F	3	129.1	103.3	95.3	87.7	73.7	57.8	46.4	37	29.6	80.67	28.5	Good

Point	Filename	Chainage	Lane	Drop	Deflection in microns									Load	Temp	Remarks
					D(1)	D(2)	D(3)	D(4)	D(5)	D(6)	D(7)	D(8)	D(9)	kN	oC	
					0	200	300	450	600	900	1200	1500	1800			
	NTR MARG	0.4964	L2F	1	132	112	109.6	97.4	86.5	67.7	55.6	36.5	34.4	80.04	28.5	
	NTR MARG	0.4964	L2F	2	131.9	112.5	111.8	97	86.9	68.3	55.4	41.1	36	79.69	28.5	
55	NTR MARG	0.4964	L2F	3	130.5	112.4	111.6	97.3	87.4	70.3	55.8	40.8	35	79.16	28.5	Good
	NTR MARG	0.5254	L2F	1	139.7	119.6	112.7	101.2	87.2	72.4	57	45.4	35.3	81.71	28.5	
	NTR MARG	0.5254	L2F	2	138.9	119.5	113.8	101.2	89.7	73.5	59.7	47.9	37.8	81.01	28.5	
56	NTR MARG	0.5254	L2F	3	136.2	116.6	108.6	100.2	88.9	71.7	56.8	45.7	37.8	80.34	28.5	Good
	NTR MARG	0.5555	L2F	1	149.7	131.8	123.6	109.4	95.3	73.5	62.3	45.6	38.1	80.44	28.5	
	NTR MARG	0.5555	L2F	2	149.2	129.6	122.5	107.5	94.2	74.3	62	45.8	38.6	79.74	28.5	
57	NTR MARG	0.5555	L2F	3	150.4	130.7	123.6	108.5	94.9	75.9	62.3	46.5	38.3	80.34	28.5	Good
	NTR MARG	0.5868	L2F	1	237.4	191.2	181.7	159.1	134.9	100.5	84	55.6	48	80.47	28.5	
	NTR MARG	0.5868	L2F	2	238.4	192	181.1	156.6	138.3	103.1	84.1	60.7	49.6	80.66	28.5	
58	NTR MARG	0.5868	L2F	3	237.6	189.9	180.8	156.7	138.3	103.5	83.5	60.2	49.5	80.23	28.5	Good
	NTR MARG	0.6161	L2F	1	337.3	227.8	210.4	183.1	151.1	110.1	84.5	60.7	49	80.44	28.5	
	NTR MARG	0.6161	L2F	2	282.9	226.4	211.2	181.8	153.1	112.2	84.5	63.1	49.8	80.2	28.5	
59	NTR MARG	0.6161	L2F	3	308.3	226.6	212.7	183	154.6	112.4	83.5	65	51.4	80.13	28.5	Good
	NTR MARG	0.6456	L2F	1	230.2	195	184.2	163.7	138.5	107.8	81.4	60.4	47	79.99	28.5	
	NTR MARG	0.6456	L2F	2	230.4	194.6	186.1	163.2	138.6	108.3	82.5	61.4	47.5	80.32	28.5	
60	NTR MARG	0.6456	L2F	3	230.4	194.2	184.4	163.3	137.9	108	81.7	62.5	47.6	79.84	28.5	Good
	NTR MARG	0.6763	L2F	1	282.7	211.5	200	175	151	114	83	58.2	55	80.3	28.5	
	NTR MARG	0.6763	L2F	2	285.1	209.7	198.3	173.4	149.3	112.5	82.9	58.2	49.8	79.28	28.5	
61	NTR MARG	0.6763	L2F	3	296.7	208.9	198.5	173.4	150.7	112.7	83.6	61.8	52.6	79.36	28.5	Good
	NTR MARG	0.7064	L2F	1	155.5	134.7	127.7	116.8	102.6	78.3	64.9	43.1	36	80.28	28.5	
	NTR MARG	0.7064	L2F	2	155.6	134	126.8	116.7	102.3	78.2	65.5	43.3	37.5	80.15	28.5	
62	NTR MARG	0.7064	L2F	3	154.6	137.6	127.3	115.6	101.9	77.8	63.6	42.7	35.3	79.85	28.5	Good
	NTR MARG	0.7365	L2F	1	183.9	146.3	136.7	121.1	103	80.9	61.4	46.7	35.5	79.14	28.5	
	NTR MARG	0.7365	L2F	2	183.7	145.7	136.2	121.6	102.4	80.5	62	46.8	37.1	78.32	28.5	
63	NTR MARG	0.7365	L2F	3	183.3	146.3	136.2	120.4	102	81.2	62.3	47.4	37.1	78.32	28.5	Good
	NTR MARG	0.7649	L2F	1	141	123.9	116.5	103.5	89.6	69.3	52.7	39.7	33.1	79.7	28.5	
	NTR MARG	0.7649	L2F	2	141.5	125.8	116.6	103.1	89.3	68.9	53.6	36.6	32.9	79.67	28.5	
64	NTR MARG	0.7649	L2F	3	139.9	124.7	114.9	103.4	89.4	69.6	54.6	41.5	33.3	79.35	28.5	Good
	NTR MARG	0.7953	L2F	1	188.9	155.3	147.7	130.2	107.7	84.7	64.6	41.8	33	80.45	28.5	
	NTR MARG	0.7953	L2F	2	191.2	157.4	148.2	128.6	108.9	85.5	65.8	42.1	34.4	81.29	28.5	
65	NTR MARG	0.7953	L2F	3	188.6	156.9	147.8	128.8	107.3	83.9	64.9	42	34.1	80.23	28.5	Good
	NTR MARG	0.8251	L2F	1	154.7	117.8	106.6	93.4	77.8	62.6	47.4	37.2	31.1	81.31	28.5	
	NTR MARG	0.8251	L2F	2	154.7	116.6	107.3	94	78.4	62.1	48.5	40.3	31.9	80.94	28.5	
66	NTR MARG	0.8251	L2F	3	154.8	115.5	108.8	95	80.7	62.8	47.2	38	31.7	80.7	28.5	Good
	NTR MARG	0.8549	L2F	1	206.3	169.5	159.4	138.4	116	84.9	64.6	48.8	37	80.45	28.5	
	NTR MARG	0.8549	L2F	2	208.4	172.9	159.1	139	115.6	86.1	65.7	49.9	36.7	80.52	28.5	
67	NTR MARG	0.8549	L2F	3	208.9	172.9	159	137.9	114.8	85.6	65.3	49.3	38	80.12	28.5	Good
	NTR MARG	0.8873	L2F	1	195.5	142.8	127.3	111.4	86.3	63.8	50.3	41.6	29.5	80.44	28.5	
68	NTR MARG	0.8873	L2F	2	194.2	145.3	127.9	110	86.5	62.7	49.9	42.9	30.9	80.18	28.5	Good

Point	Filename	Chainage	Lane	Drop	Deflection in microns									Load	Temp	Remarks
					D(1)	D(2)	D(3)	D(4)	D(5)	D(6)	D(7)	D(8)	D(9)	kN	oC	
					0	200	300	450	600	900	1200	1500	1800			
	NTR MARG	0.8873	L2F	3	194.8	144.1	128.9	110.2	87.6	62	50.6	43	31.4	80.69	28.5	
	NTR MARG	0.9157	L2F	1	172.3	123.8	116	100.7	86.1	63.9	50.3	33.5	31.9	80.54	28.5	
	NTR MARG	0.9157	L2F	2	171.6	123.4	115.6	100.4	85.1	63.7	50.4	34.1	32	80.5	28.5	
69	NTR MARG	0.9157	L2F	3	171.5	123.4	115.3	100.5	86	63.6	49.8	35.7	30.9	80.3	28.5	Good
	NTR MARG	0.945	L2F	1	158.5	114.2	102.1	86.1	72.2	56.3	44.6	35.7	26.9	81.29	28.5	
	NTR MARG	0.945	L2F	2	158.7	113.5	103.4	86.1	72.6	56.7	45.7	35.9	28.1	81.19	28.5	
70	NTR MARG	0.945	L2F	3	157.3	112.5	102.2	85.7	72.2	56.2	45.3	35.8	26.5	81.04	28.5	Good
	NTR MARG	0.9751	L2F	1	179.1	113.4	101.1	85.7	73.6	53.1	45.7	36.3	31.4	79.43	28.5	
	NTR MARG	0.9751	L2F	2	180.1	113.5	101.6	86.3	73.3	55.3	44.4	37	29.8	79.38	28.5	
71	NTR MARG	0.9751	L2F	3	179.1	113	102.5	86.3	73.5	54.7	44.1	38.5	31.9	79.42	28.5	Good
	NTR MARG	1.0055	L2F	1	249.8	205.8	187	160.9	131.2	96.4	68.8	58.2	45.1	80.59	28.5	
	NTR MARG	1.0055	L2F	2	249.1	201.4	185.3	159.2	131.9	96.7	70.5	56.5	43	80.61	28.5	
72	NTR MARG	1.0055	L2F	3	248	202.1	184.5	157.9	131.8	95.8	71.6	52.8	43.7	79.88	28.5	Good
	NTR MARG	1.035	L2F	1	191.7	149.8	137.3	117.6	95.8	67.3	53.6	43.6	35.4	80.37	28.5	
	NTR MARG	1.035	L2F	2	190.1	149.7	136.1	117.8	95.6	66.3	54.5	44	34.1	80.21	28.5	
73	NTR MARG	1.035	L2F	3	188.2	150.6	137.2	117.4	97.1	68.2	54.6	44.8	34.5	80.78	28.5	Good
	NTR MARG	1.066	L2F	1	172.2	135.6	125.8	106.1	80.2	58	44	33.5	26.2	80.76	28.5	
	NTR MARG	1.066	L2F	2	173	134.5	126.5	105.5	80.6	59.1	44.3	33.5	25.8	80.55	28.5	
74	NTR MARG	1.066	L2F	3	172.1	135.1	124.6	105.2	82.7	59.4	44.7	33.9	25.9	80.29	28.5	Good
	NTR MARG	1.0859	L2F	1	234.2	181.4	172.2	140.4	114.3	79	57.8	39.7	31.3	81.68	28.5	
	NTR MARG	1.0859	L2F	2	236.4	180.7	170.8	140.9	116.2	79.2	56.1	39.5	32.4	81.44	28.5	
75	NTR MARG	1.0859	L2F	3	234.7	178.7	170.3	140.2	115.4	78.1	56.8	38.8	30.6	80.88	28.5	Good
	NTR MARG	0	L3F	1	469.8	368.3	335.3	273.7	229.6	162.1	121.1	85.4	66.4	78.92	41.6	
	NTR MARG	0	L3F	2	464.7	367.6	333.1	273.4	229.5	163.6	123.2	88.6	65.7	78.64	41.6	
76	NTR MARG	0	L3F	3	493.8	365.7	331	271.8	227.5	163.2	122.3	86.3	65.6	78.39	41.6	Good
	NTR MARG	0.0355	L3F	1	206.2	155.7	141.1	124.9	109	81.4	65.6	45.2	41.8	82.39	41.6	
	NTR MARG	0.0355	L3F	2	205.7	154.6	140.9	123.8	109.3	81.9	65.6	44.7	43.9	82.62	41.6	
77	NTR MARG	0.0355	L3F	3	204.5	151.7	137	122	106.8	82.1	64.8	42.3	40.8	80.85	41.6	Good
	NTR MARG	0.0608	L3F	1	133.4	111.5	106.3	95.2	81	66	50	35.6	32.5	81.6	41.6	
	NTR MARG	0.0608	L3F	2	132.6	111.1	105.5	94.6	81.8	64.3	50	36.9	31.2	81.17	41.6	
78	NTR MARG	0.0608	L3F	3	132.9	111.2	107.4	95.2	81.4	64.3	51	38.7	33.5	80.85	41.6	Good
	NTR MARG	0.1006	L3F	1	217	200.9	185.9	166.1	118.6	72	51.1	46.8	26.9	79.14	41.6	
	NTR MARG	0.1006	L3F	2	217.5	202	189.1	162.7	119.6	71.2	48.2	46.4	28.1	78.67	41.6	
79	NTR MARG	0.1006	L3F	3	219.6	201.6	186.5	162	116.8	71.2	45.2	47	25.1	78.37	41.6	Good
	NTR MARG	0.1245	L3F	1	144.3	122.7	113.8	103.6	89.1	70.1	55.4	40.6	34.1	80.59	41.6	
	NTR MARG	0.1245	L3F	2	144.8	122.2	113.4	103.4	90.5	69.7	55.2	40.1	33.9	80.32	41.6	
80	NTR MARG	0.1245	L3F	3	144.5	121.3	113.7	103	89	68.8	55.9	40.1	33.1	79.89	41.6	Good
	NTR MARG	0.1506	L3F	1	221.8	200.2	192.1	177	159.3	135	116.7	95	79.6	78.63	41.6	
	NTR MARG	0.1506	L3F	2	223.8	201.8	194.7	176.9	161.7	136.9	116.7	97	81.1	79.02	41.6	
81	NTR MARG	0.1506	L3F	3	220.9	198.8	191.4	176.6	159.3	134.8	116.6	97.5	79.5	78.31	41.6	Good
82	NTR MARG	0.1838	L3F	1	139.3	118.6	111.7	104.8	93.5	78.8	62.6	47.8	40.1	80.58	41.6	Good

Point	Filename	Chainage	Lane	Drop	Deflection in microns									Load	Temp	Remarks
					D(1)	D(2)	D(3)	D(4)	D(5)	D(6)	D(7)	D(8)	D(9)	kN	oC	
					0	200	300	450	600	900	1200	1500	1800			
	NTR MARG	0.1838	L3F	2	140.4	118.4	113.3	104.1	94.6	78.8	64.2	50.2	40.2	81.26	41.6	
	NTR MARG	0.1838	L3F	3	139.9	117.9	113.3	103.2	94.2	78.6	64.4	50.1	39.6	80.36	41.6	
	NTR MARG	0.2102	L3F	1	142.3	117.4	114.5	103.6	93.6	77.6	65.6	52.2	39.2	80.27	41.6	
	NTR MARG	0.2102	L3F	2	142.8	117.9	115.6	104.8	94.9	79.1	66.2	52.1	42.7	80.42	41.6	
83	NTR MARG	0.2102	L3F	3	144.4	119	115.7	106.1	94.7	80	64.2	52.8	41.3	81.06	41.6	Good
	NTR MARG	0.2414	L3F	1	199.5	172.3	165.3	149.7	133.9	105.5	87.2	64.8	54	80.32	41.6	
	NTR MARG	0.2414	L3F	2	199.2	171.3	164.4	148.2	133.1	106.8	85.7	67	54.5	80.22	41.6	
84	NTR MARG	0.2414	L3F	3	200.5	171.9	165.9	148.9	134.7	107.1	87.7	65.4	54	80.46	41.6	Good
	NTR MARG	0.2721	L3F	1	235.9	199.6	187.7	165.3	144.9	114.7	91.5	71.3	57.6	79.82	41.6	
	NTR MARG	0.2721	L3F	2	233.3	198.3	186.6	164.5	143.8	115.2	92.6	69	56.3	79.21	41.6	
85	NTR MARG	0.2721	L3F	3	232.9	197.6	186.1	165.5	142.9	114.5	93.2	69.2	52.9	79.21	41.6	Good
	NTR MARG	0.3059	L3F	1	169.4	146.4	138.5	120.7	107	82	64.2	49.6	41.5	79.78	41.6	
	NTR MARG	0.3059	L3F	2	168.5	145.9	138.7	120.5	106.6	82	65	51.1	41.5	79.37	41.6	
86	NTR MARG	0.3059	L3F	3	169.6	146.5	140	121.3	108.1	83	65.7	51.8	44.4	79.27	41.6	Good
	NTR MARG	0.3312	L3F	1	249.2	223.7	212.6	190.1	170.3	136.8	109.8	85	65.1	80.42	41.6	
	NTR MARG	0.3312	L3F	2	248.1	220.9	211	188.6	169.9	136.4	108.5	84.6	65.8	79.86	41.6	
87	NTR MARG	0.3312	L3F	3	250.4	221.5	211.9	191.5	170.5	137.8	110	85.8	66.9	80.4	41.6	Good
	NTR MARG	0.3605	L3F	1	219	193.4	178.7	164.8	145.5	115.5	94.1	75	57.6	81.32	41.6	
	NTR MARG	0.3605	L3F	2	219.3	195.1	180.3	163.8	145.3	116.1	95.8	73.8	58.2	80.82	41.6	
88	NTR MARG	0.3605	L3F	3	220.5	194.3	179.9	163.6	145.2	114.7	93.7	74.1	56.9	80.88	41.6	Good
	NTR MARG	0.3954	L3F	1	190.8	159.2	147.5	131.4	116.2	86.9	67	50.6	40	81.15	41.6	
	NTR MARG	0.3954	L3F	2	191.6	160.8	149.2	133.1	118.1	87.8	66.3	50.7	40.5	81.31	41.6	
89	NTR MARG	0.3954	L3F	3	189.8	160.7	151.1	129.7	113.9	85.9	65.9	50.2	39.8	80.83	41.6	Good
	NTR MARG	0.4247	L3F	1	200.3	168.8	160.5	139.7	120.7	88.2	66	48.3	37.8	79.48	41.6	
	NTR MARG	0.4247	L3F	2	198.3	166.3	159.2	139.6	119.9	88.5	66.2	46.3	38	79.04	41.6	
90	NTR MARG	0.4247	L3F	3	199.1	167.3	160	139.3	121.5	89.8	66.6	47.3	38.5	79.18	41.6	Good
	NTR MARG	0.4568	L3F	1	150.4	122.8	114.8	101.4	89.3	70.4	56.2	41.7	35.8	80.47	41.6	
	NTR MARG	0.4568	L3F	2	153.2	124.7	117.9	103.1	90.8	72.1	57.8	41.9	36.1	82.64	41.6	
91	NTR MARG	0.4568	L3F	3	151.6	123.9	117	101.9	91.5	70.9	56.9	44	36.1	81.14	41.6	Good
	NTR MARG	0.4852	L3F	1	161.6	130.6	123.9	108.5	96.2	75.9	60.1	46	36.7	79.72	41.6	
	NTR MARG	0.4852	L3F	2	159.5	131.3	124.1	107.5	95.7	76.4	60	46	36.9	79.16	41.6	
92	NTR MARG	0.4852	L3F	3	159.2	129.8	123.9	107.1	95.7	75.7	60.3	46.7	37	78.99	41.6	Good
	NTR MARG	0.5116	L3F	1	171.5	143.2	135	117.9	105.5	84.9	68.5	53.8	42.7	79.78	41.6	
	NTR MARG	0.5116	L3F	2	171.1	141.7	133.9	116.5	104.3	84.5	67.6	53.4	43	79.15	41.6	
93	NTR MARG	0.5116	L3F	3	169.3	140.4	132.3	115.8	103	83.2	67.8	53.3	42.2	78.41	41.6	Good
	NTR MARG	0.546	L3F	1	262.3	173.1	162	135.9	119.4	93.7	73.1	54.5	46.3	81.87	41.6	
	NTR MARG	0.546	L3F	2	263.9	171.3	160.5	135.6	118.6	93.9	73.6	54.3	47	80.73	41.6	
94	NTR MARG	0.546	L3F	3	290.7	171.9	161.2	137	119.6	93.3	72.3	55.5	46.7	81.24	41.6	Good
	NTR MARG	0.594	L3F	1	231.9	198.7	187	168.1	142	102.2	74.4	54.1	41.7	79.75	41.6	
	NTR MARG	0.594	L3F	2	230.7	195.3	188.1	166.6	141.3	101.4	73.1	53.3	42.1	79.42	41.6	
95	NTR MARG	0.594	L3F	3	230.4	196.3	188.7	166.3	140.5	100.5	72.8	55	42	79.09	41.6	Good

Point	Filename	Chainage	Lane	Drop	Deflection in microns									Load	Temp	Remarks
					D(1)	D(2)	D(3)	D(4)	D(5)	D(6)	D(7)	D(8)	D(9)	kN	oC	
					0	200	300	450	600	900	1200	1500	1800			
	NTR MARG	0.6	L3F	1	241.1	201.6	192	166.9	142.1	105.5	75	52.3	42.1	79.92	41.6	
	NTR MARG	0.6	L3F	2	233.5	202.7	190.6	165.2	142.1	104.7	73.5	52.9	40.8	79.24	41.6	
96	NTR MARG	0.6	L3F	3	233.9	202.2	191.4	165.7	143.3	105.9	74.3	53.2	42.5	79.31	41.6	Good
	NTR MARG	0.6301	L3F	1	195.4	170.2	159.8	147.1	121.1	87.8	67.2	49	40.4	81.87	41.6	
	NTR MARG	0.6301	L3F	2	197.8	170.2	161.9	146.4	122.2	90.1	68.9	52.2	41.9	81.9	41.6	
97	NTR MARG	0.6301	L3F	3	198.4	170.2	161.8	144.5	122.3	89.6	68.8	52.7	40.7	81.96	41.6	Good
	NTR MARG	0.6616	L3F	1	389.6	329.6	305.9	264.3	223.1	158.5	114.8	81.3	63.9	80.77	41.6	
	NTR MARG	0.6616	L3F	2	386.6	325.3	303	261.9	221.2	157.1	113.5	81.9	62.7	79.7	41.6	
98	NTR MARG	0.6616	L3F	3	389.3	327.9	305.1	263.5	223.1	158.9	115.5	82.6	63.7	80.11	41.6	Good
	NTR MARG	0.69	L3F	1	296.9	263.9	251.6	221.1	190.9	142.5	109.3	77.7	61.3	80.92	41.6	
	NTR MARG	0.69	L3F	2	296.7	264.2	252.4	221.1	191.7	143.5	109.8	78.1	61.8	80.83	41.6	
99	NTR MARG	0.69	L3F	3	299.2	267.2	254.4	226.2	193.1	145	111.3	78.8	62.6	81.13	41.6	Good
	NTR MARG	0.7198	L3F	1	226.3	197.6	189.1	169.8	149.1	115.5	91.9	68.4	51.3	81.96	41.6	
	NTR MARG	0.7198	L3F	2	225.5	196.9	189	167.4	147.4	114.5	90.7	69.2	54.5	82.01	41.6	
100	NTR MARG	0.7198	L3F	3	226.5	197.1	191.2	168.1	149.6	115	89.6	69.6	51.2	81.8	41.6	Good
	NTR MARG	0.7499	L3F	1	248.9	226.3	216.5	190.3	164.6	122.1	90.2	64.9	48.4	78.8	41.6	
	NTR MARG	0.7499	L3F	2	247.7	225	215.4	187.6	162.4	119.2	90.7	62.1	44.4	78.51	41.6	
101	NTR MARG	0.7499	L3F	3	248.6	224.7	215.8	187.9	161.4	119.2	90.6	62.4	44.1	78.98	41.6	Good
	NTR MARG	0.7809	L3F	1	240.7	201.5	189.9	161.1	137.6	97	74.2	49.3	39.5	81.89	41.6	
	NTR MARG	0.7809	L3F	2	237.6	198.6	188.6	163.1	136.2	97.1	73.5	49	37.1	81.53	41.6	
102	NTR MARG	0.7809	L3F	3	238.7	201	189.2	165.8	138	97.2	73.5	49.8	39.1	81.54	41.6	Good
	NTR MARG	0.8127	L3F	1	172.6	134.4	126.2	108.2	91.7	66.4	50.6	36.8	30	81.53	41.6	
	NTR MARG	0.8127	L3F	2	171.8	134.3	126	107.2	90.9	65.8	50.9	37.6	28.9	81.6	41.6	
103	NTR MARG	0.8127	L3F	3	172.2	133.6	125.9	107.9	90.1	66	48.4	38.2	30.2	81.24	41.6	Good
	NTR MARG	0.84	L3F	1	185.9	149.7	142	122.4	105.2	78.3	58.6	42.4	34.9	80.16	41.6	
	NTR MARG	0.84	L3F	2	188.3	149.2	143.3	122.6	106.1	79.2	59.5	45.2	35.7	80.26	41.6	
104	NTR MARG	0.84	L3F	3	188.2	149.3	142.8	122.6	105.6	78.9	59.2	45.7	35.8	79.86	41.6	Good
	NTR MARG	0.8698	L3F	1	146.6	115.3	109.2	94.3	77.8	55.6	41.6	32	26.4	80.06	41.6	
	NTR MARG	0.8698	L3F	2	146.5	116	109.2	95.6	78	54.7	43.8	30.2	29.4	79.91	41.6	
105	NTR MARG	0.8698	L3F	3	146.1	116	109.9	94.9	77.6	55.8	44.5	29	29.9	80.01	41.6	Good
	NTR MARG	0.9016	L3F	1	169.9	121.6	112.4	95.1	79.4	57	45.4	36.4	30.2	80.33	41.6	
	NTR MARG	0.9016	L3F	2	168	119.2	110.5	93.4	78.2	56.9	44.3	37.4	30.4	79.43	41.6	
106	NTR MARG	0.9016	L3F	3	171.8	121.7	112	95.6	79.7	57.5	46.2	38	29.5	79.91	41.6	Good
	NTR MARG	0.9314	L3F	1	150.2	113.7	108.8	94.6	80.5	62.5	51.5	43.5	36.1	81.77	41.6	
	NTR MARG	0.9314	L3F	2	149.5	112.9	108.7	94	83.3	62.7	51.7	44.3	35.8	81.3	41.6	
107	NTR MARG	0.9314	L3F	3	149.3	113.3	107.6	94.2	81.6	61.9	50.8	45.1	35.8	81.12	41.6	Good
	NTR MARG	0.9598	L3F	1	143	107.8	99	84.3	70	56.8	44.4	35	33.7	79.92	41.6	
	NTR MARG	0.9598	L3F	2	141.1	106.4	98.8	84.4	69.4	56.5	43.8	36.3	35.5	79.45	41.6	
108	NTR MARG	0.9598	L3F	3	141.1	106.9	98.9	85.7	68.1	55.5	44.5	36.6	35.4	80.1	41.6	Good
	NTR MARG	0.9922	L3F	1	431.3	293.9	256.1	204.2	160.9	101	75.2	52.5	44.5	80.81	41.6	
109	NTR MARG	0.9922	L3F	2	423.3	295.8	260.9	205.6	161.4	104.3	74.5	52.3	40.8	81.64	41.6	Good

Point	Filename	Chainage	Lane	Drop	Deflection in microns									Load	Temp	Remarks
					D(1)	D(2)	D(3)	D(4)	D(5)	D(6)	D(7)	D(8)	D(9)	kN	oC	
					0	200	300	450	600	900	1200	1500	1800			
	NTR MARG	0.9922	L3F	3	422	293.2	260.9	203.3	159.3	106.6	75.1	55.3	40.9	80.66	41.6	
	NTR MARG	1.0212	L3F	1	285.9	226	203.2	161.8	127.3	78.8	59.7	45.1	39.6	79.65	41.6	
	NTR MARG	1.0212	L3F	2	285.2	228.4	207.4	162.8	133.4	82.8	61	46.8	36.9	80.39	41.6	
110	NTR MARG	1.0212	L3F	3	283.1	228.4	206.7	161.2	130.9	82.4	61.4	47.4	39.8	80.56	41.6	Good
	NTR MARG	1.0505	L3F	1	333.2	252.9	226.7	181.3	143.4	100	77	57.5	48	78.92	41.6	
	NTR MARG	1.0505	L3F	2	333	251.8	226.3	180.4	144.9	102.6	76.6	59.8	48.4	79.16	41.6	
111	NTR MARG	1.0505	L3F	3	317.8	252.7	227.4	181.5	145.7	100.3	77.4	60.6	51.9	79.4	41.6	Good
	NTR MARG	1.0871	L3F	1	286.8	233.3	210.4	176.5	141	99.1	69.2	50.1	37.9	80.4	41.6	
	NTR MARG	1.0871	L3F	2	289.3	234.7	213.1	176.9	143.8	99	69.2	52.6	37.9	80.81	41.6	
112	NTR MARG	1.0871	L3F	3	293	231.1	210.9	173.7	143.5	99.9	70.8	48.5	37.4	79.94	41.6	Good

Appendix II – Results

Sno	Chainage	Corrected Deflection in mm									KGP back results			Correction for Temp and Summer Season			15%		
		D(1)	D(2)	D(3)	D(4)	D(5)	D(6)	D(7)	D(8)	D(9)	BT	Granular	subgrade	E1 Temp Adj	**E2 Original**	E3 Original	E1 Temp Adj	E2 (Original)	E3 (Original)
1	0.01	0.15	0.11	0.11	0.09	0.08	0.06	0.05	0.04	0.03	864	5072	214	786	5072	214			
2	0.03	0.09	0.07	0.06	0.05	0.05	0.04	0.03	0.02	0.02	2927	7207	365	2660	7207	365			
3	0.06	0.07	0.06	0.05	0.05	0.04	0.03	0.02	0.02	0.01	2987	6995	463	2714	6995	463			
4	0.1	0.07	0.06	0.05	0.05	0.04	0.03	0.03	0.02	0.02	2991	8980	419	2718	8980	419			
5	0.12	0.08	0.06	0.06	0.05	0.04	0.03	0.02	0.02	0.01	2184	6934	443	1985	6934	443			
6	0.15	0.06	0.05	0.04	0.04	0.04	0.03	0.03	0.02	0.02	2965	8973	441	2694	8973	441			
7	0.19	0.1	0.08	0.07	0.07	0.06	0.04	0.03	0.03	0.02	2171	6721	308	1973	6721	308			
8	0.21	0.05	0.04	0.04	0.03	0.03	0.02	0.02	0.02	0.01	2991	8980	596	2718	8980	596			
9	0.24	0.06	0.04	0.04	0.04	0.03	0.03	0.02	0.02	0.01	2976	8973	543	2704	8973	543			
10	0.27	0.09	0.07	0.07	0.06	0.05	0.04	0.04	0.03	0.03	3000	8980	293	2726	8980	293			
11	0.3	0.16	0.11	0.09	0.08	0.07	0.05	0.04	0.03	0.02	750	3444	270	682	3444	270			
12	0.33	0.11	0.09	0.09	0.08	0.07	0.06	0.05	0.04	0.03	2430	8521	218	2209	8521	218			
13	0.36	0.1	0.08	0.08	0.07	0.06	0.05	0.04	0.03	0.03	1889	8952	265	1717	8952	265			
14	0.39	0.09	0.06	0.06	0.05	0.05	0.03	0.03	0.02	0.02	2813	5531	421	2556	5531	421			
15	0.42	0.07	0.06	0.05	0.04	0.04	0.03	0.02	0.01	0.01	2897	7125	494	2632	7125	494			
16	0.45	0.11	0.09	0.09	0.08	0.07	0.05	0.04	0.03	0.02	1969	5729	265	1789	5729	265			
17	0.48	0.07	0.05	0.05	0.04	0.04	0.03	0.02	0.02	0.02	2877	8993	443	2614	8993	443			
18	0.51	0.07	0.06	0.06	0.05	0.04	0.03	0.03	0.02	0.02	3000	8973	404	2726	8973	404			
19	0.54	0.08	0.06	0.06	0.05	0.05	0.04	0.03	0.02	0.02	2765	8754	368	2512	8754	368			
20	0.57	0.09	0.07	0.07	0.06	0.05	0.04	0.03	0.02	0.02	2886	7488	322	2622	7488	322			

Sno	Chainage	Corrected Deflection in mm									KGP back results			Correction for Temp and Summer Season			15%		
		D(1)	D(2)	D(3)	D(4)	D(5)	D(6)	D(7)	D(8)	D(9)	BT	Granular	subgrade	E1 Temp Adj	**E2 Original**	E3 Original	E1 Temp Adj	E2 (Original)	E3 (Original)
21	0.6	0.12	0.1	0.1	0.09	0.07	0.06	0.04	0.03	0.03	2910	5189	241	2644	5189	241			
22	0.63	0.08	0.06	0.06	0.05	0.04	0.03	0.03	0.02	0.02	2963	9000	392	2692	9000	392			
23	0.66	0.09	0.06	0.06	0.05	0.04	0.03	0.03	0.02	0.02	1735	8576	388	1577	8576	388			
24	0.69	0.1	0.08	0.07	0.07	0.06	0.04	0.03	0.02	0.02	2855	5572	328	2594	5572	328			
25	0.72	0.09	0.07	0.06	0.05	0.05	0.03	0.03	0.02	0.01	2030	5579	415	1845	5579	415			
26	0.75	0.08	0.06	0.05	0.04	0.04	0.03	0.02	0.02	0.01	1779	7016	478	1617	7016	478			
27	0.78	0.08	0.06	0.06	0.05	0.04	0.03	0.02	0.02	0.01	2100	5428	450	1909	5428	450			
28	0.81	0.08	0.06	0.06	0.05	0.04	0.03	0.02	0.02	0.01	1421	4963	468	1519	4963	468			
29	0.84	0.09	0.07	0.07	0.06	0.05	0.04	0.03	0.02	0.02	1007	5894	362	1077	5894	362			
30	0.87	0.08	0.07	0.06	0.06	0.05	0.03	0.03	0.02	0.01	939	5503	400	1004	5503	400			
31	0.9	0.08	0.06	0.05	0.04	0.03	0.02	0.02	0.02	0.01	2888	4176	516	3088	4176	516			
32	0.93	0.14	0.1	0.09	0.08	0.06	0.04	0.03	0.02	0.02	754	2034	321	807	2034	321			
33	0.96	0.1	0.08	0.08	0.07	0.06	0.05	0.04	0.03	0.02	801	4915	304	856	4915	304			
34	0.99	0.13	0.09	0.09	0.08	0.06	0.05	0.03	0.03	0.02	783	3061	304	837	3061	304			
35	1.02	0.09	0.07	0.07	0.06	0.05	0.04	0.03	0.02	0.02	904	4648	387	967	4648	387			
36	1.05	0.09	0.08	0.07	0.06	0.05	0.04	0.03	0.02	0.02	906	5141	353	969	5141	353			
37	1.08	0.1	0.07	0.07	0.06	0.04	0.03	0.02	0.02	0.01	1102	3006	444	1178	3006	444			
38	0.02	0.11	0.09	0.08	0.07	0.06	0.05	0.04	0.03	0.02	2921	6058	270	2216	6058	270			
39	0.04	0.06	0.05	0.04	0.04	0.03	0.03	0.02	0.02	0.01	3000	8986	529	2276	8986	529			
40	0.05	0.09	0.08	0.07	0.06	0.05	0.04	0.03	0.02	0.02	2870	7084	324	2178	7084	324			
41	0.08	0.05	0.04	0.04	0.04	0.03	0.03	0.02	0.02	0.01	3000	8993	536	2276	8993	536			
42	0.11	0.11	0.09	0.08	0.07	0.06	0.04	0.03	0.02	0.02	2826	3930	326	2145	3930	326			

Sno	Chainage	Corrected Deflection in mm									KGP back results			Correction for Temp and Summer Season			15%		
		D(1)	D(2)	D(3)	D(4)	D(5)	D(6)	D(7)	D(8)	D(9)	BT	Granular	subgrade	E1 Temp Adj	**E2 Original**	E3 Original	E1 Temp Adj	E2 (Original)	E3 (Original)
43	0.14	0.06	0.05	0.04	0.04	0.03	0.03	0.02	0.02	0.01	2837	9000	521	2153	9000	521			
44	0.17	0.07	0.06	0.06	0.06	0.05	0.04	0.03	0.03	0.02	2974	9000	337	2256	9000	337			
45	0.2	0.07	0.05	0.05	0.04	0.04	0.03	0.03	0.02	0.02	2820	9000	426	2140	9000	426			
46	0.23	0.07	0.06	0.05	0.05	0.04	0.03	0.03	0.02	0.01	2980	8973	418	2261	8973	418			
47	0.26	0.1	0.08	0.08	0.07	0.06	0.05	0.04	0.03	0.02	2978	8186	270	2260	8186	270			
48	0.29	0.07	0.06	0.06	0.05	0.05	0.04	0.03	0.03	0.02	2965	9000	364	2250	9000	364			
49	0.32	0.09	0.07	0.07	0.06	0.06	0.05	0.04	0.03	0.02	2985	9000	284	2265	9000	284			
50	0.35	0.12	0.1	0.1	0.09	0.07	0.06	0.05	0.04	0.03	1782	7365	214	1352	7365	214			
51	0.38	0.12	0.11	0.1	0.09	0.08	0.06	0.05	0.03	0.03	2835	5531	225	2151	5531	225			
52	0.41	0.09	0.07	0.07	0.06	0.05	0.04	0.03	0.02	0.01	2404	4881	399	1824	4881	399			
53	0.44	0.1	0.09	0.09	0.08	0.07	0.05	0.04	0.03	0.02	2996	5907	268	2273	5907	268			
54	0.47	0.06	0.05	0.05	0.04	0.04	0.03	0.02	0.02	0.01	2883	8986	467	2188	8986	467			
55	0.5	0.07	0.06	0.06	0.05	0.04	0.03	0.03	0.02	0.02	2853	8980	396	2165	8980	396			
56	0.53	0.07	0.06	0.06	0.05	0.04	0.04	0.03	0.02	0.02	2850	8993	381	2163	8993	381			
57	0.56	0.07	0.07	0.06	0.05	0.05	0.04	0.03	0.02	0.02	2971	8952	353	2255	8952	353			
58	0.59	0.12	0.09	0.09	0.08	0.07	0.05	0.04	0.03	0.02	2340	5079	259	1776	5079	259			
59	0.62	0.15	0.11	0.11	0.09	0.08	0.06	0.04	0.03	0.02	1595	3006	244	1210	3006	244			
60	0.65	0.12	0.1	0.09	0.08	0.07	0.05	0.04	0.03	0.02	2158	5367	254	1637	5367	254			
61	0.68	0.14	0.11	0.1	0.09	0.08	0.06	0.04	0.03	0.03	1647	3718	245	1250	3718	245			
62	0.71	0.08	0.07	0.06	0.06	0.05	0.04	0.03	0.02	0.02	2945	8993	344	2235	8993	344			
63	0.74	0.09	0.07	0.07	0.06	0.05	0.04	0.03	0.02	0.02	2938	6612	330	2230	6612	330			
64	0.76	0.07	0.06	0.06	0.05	0.04	0.03	0.03	0.02	0.02	2954	8980	388	2241	8980	388			

Sno	Chainage	Corrected Deflection in mm									KGP back results			Correction for Temp and Summer Season			15%		
		D(1)	D(2)	D(3)	D(4)	D(5)	D(6)	D(7)	D(8)	D(9)	BT	Granular	subgrade	E1 Temp Adj	**E2 Original**	E3 Original	E1 Temp Adj	E2 (Original)	E3 (Original)
65	0.8	0.09	0.08	0.07	0.06	0.05	0.04	0.03	0.02	0.02	2098	5565	345	1592	5565	345			
66	0.83	0.08	0.06	0.05	0.05	0.04	0.03	0.02	0.02	0.02	2646	8973	426	2008	8973	426			
67	0.85	0.1	0.09	0.08	0.07	0.06	0.04	0.03	0.02	0.02	2861	4566	320	2171	4566	320			
68	0.89	0.1	0.07	0.06	0.05	0.04	0.03	0.03	0.02	0.02	2771	4628	404	2103	4628	404			
69	0.92	0.09	0.06	0.06	0.05	0.04	0.03	0.02	0.02	0.02	1808	6961	423	1372	6961	423			
70	0.95	0.08	0.06	0.05	0.04	0.04	0.03	0.02	0.02	0.01	1397	8856	472	1060	8856	472			
71	0.98	0.09	0.06	0.05	0.04	0.04	0.03	0.02	0.02	0.02	757	8904	454	574	8904	454			
72	1.01	0.12	0.1	0.09	0.08	0.07	0.05	0.03	0.03	0.02	2793	3444	281	2120	3444	281			
73	1.04	0.09	0.07	0.07	0.06	0.05	0.03	0.03	0.02	0.02	2912	5168	371	2210	5168	371			
74	1.07	0.09	0.07	0.06	0.05	0.04	0.03	0.02	0.02	0.01	2864	4532	456	2173	4532	456			
75	1.09	0.12	0.09	0.08	0.07	0.06	0.04	0.03	0.02	0.02	2158	2890	361	1637	2890	361			
76	0	0.24	0.19	0.17	0.14	0.12	0.08	0.06	0.04	0.03	796	2000	162	1087	2000	162			
77	0.04	0.1	0.08	0.07	0.06	0.05	0.04	0.03	0.02	0.02	827	5695	336	1129	5695	336			
78	0.06	0.07	0.05	0.05	0.05	0.04	0.03	0.02	0.02	0.02	2901	9000	423	3959	9000	423			
79	0.1	0.11	0.1	0.1	0.08	0.06	0.04	0.02	0.02	0.01	845	2370	363	1153	2370	363			
80	0.12	0.07	0.06	0.06	0.05	0.04	0.03	0.03	0.02	0.02	1522	8993	385	2077	8993	385			
81	0.15	0.11	0.1	0.1	0.09	0.08	0.07	0.06	0.05	0.04	2974	8993	177	4058	8993	177			
82	0.18	0.07	0.06	0.06	0.05	0.05	0.04	0.03	0.02	0.02	2910	8973	355	3971	8973	355			
83	0.21	0.07	0.06	0.06	0.05	0.05	0.04	0.03	0.03	0.02	2967	8973	345	4049	8973	345			
84	0.24	0.1	0.09	0.08	0.07	0.07	0.05	0.04	0.03	0.03	1401	8637	243	1912	8637	243			
85	0.27	0.12	0.1	0.09	0.08	0.07	0.06	0.05	0.04	0.03	1806	5777	227	2464	5777	227			
86	0.31	0.09	0.07	0.07	0.06	0.05	0.04	0.03	0.03	0.02	2382	7926	310	3251	7926	310			

Sno	Chainage	Corrected Deflection in mm									KGP back results			Correction for Temp and Summer Season			15%		
		D(1)	D(2)	D(3)	D(4)	D(5)	D(6)	D(7)	D(8)	D(9)	BT	Granular	subgrade	E1 Temp Adj	**E2 Original**	E3 Original	E1 Temp Adj	E2 (Original)	E3 (Original)
87	0.33	0.12	0.11	0.11	0.09	0.08	0.07	0.05	0.04	0.03	1542	6311	192	2104	6311	192			
88	0.36	0.11	0.1	0.09	0.08	0.07	0.06	0.05	0.04	0.03	2050	7200	225	2798	7200	225			
89	0.4	0.09	0.08	0.07	0.06	0.06	0.04	0.03	0.02	0.02	1223	6140	313	1669	6140	313			
90	0.42	0.1	0.08	0.08	0.07	0.06	0.04	0.03	0.02	0.02	860	4833	310	1174	4833	310			
91	0.46	0.07	0.06	0.06	0.05	0.04	0.03	0.03	0.02	0.02	2551	8966	376	3482	8966	376			
92	0.49	0.08	0.07	0.06	0.05	0.05	0.04	0.03	0.02	0.02	1432	8802	345	1954	8802	345			
93	0.51	0.09	0.07	0.07	0.06	0.05	0.04	0.03	0.03	0.02	2785	8959	304	3800	8959	304			
94	0.55	0.13	0.08	0.08	0.07	0.06	0.05	0.04	0.03	0.02	2971	3642	294	4055	3642	294			
95	0.59	0.12	0.1	0.09	0.08	0.07	0.05	0.04	0.03	0.02	774	3930	274	1057	3930	274			
96	0.6	0.12	0.1	0.1	0.08	0.07	0.05	0.04	0.03	0.02	853	3512	274	1165	3512	274			
97	0.63	0.1	0.08	0.08	0.07	0.06	0.04	0.03	0.03	0.02	1199	5517	306	1636	5517	306			
98	0.66	0.19	0.16	0.15	0.13	0.11	0.08	0.06	0.04	0.03	809	2000	178	1105	2000	178			
99	0.69	0.15	0.13	0.12	0.11	0.09	0.07	0.05	0.04	0.03	842	3553	195	1150	3553	195			
100	0.72	0.11	0.1	0.09	0.08	0.07	0.06	0.04	0.03	0.03	1269	6037	238	1732	6037	238			
101	0.75	0.13	0.11	0.11	0.1	0.08	0.06	0.05	0.03	0.02	834	3690	236	1138	3690	236			
102	0.78	0.12	0.1	0.09	0.08	0.07	0.05	0.04	0.02	0.02	926	3280	294	1264	3280	294			
103	0.81	0.08	0.07	0.06	0.05	0.04	0.03	0.02	0.02	0.01	792	5237	417	1081	5237	417			
104	0.84	0.09	0.07	0.07	0.06	0.05	0.04	0.03	0.02	0.02	840	5442	346	1147	5442	346			
105	0.87	0.07	0.06	0.05	0.05	0.04	0.03	0.02	0.02	0.01	1806	5996	470	2464	5996	470			
106	0.9	0.09	0.06	0.06	0.05	0.04	0.03	0.02	0.02	0.02	981	5832	444	1339	5832	444			
107	0.93	0.07	0.06	0.05	0.05	0.04	0.03	0.03	0.02	0.02	2492	8993	406	3401	8993	406			
108	0.96	0.07	0.05	0.05	0.04	0.03	0.03	0.02	0.02	0.02	2976	8904	448	4061	8904	448			

Sno	Chainage	Corrected Deflection in mm									KGP back results			Correction for Temp and Summer Season			15%		
		D(1)	D(2)	D(3)	D(4)	D(5)	D(6)	D(7)	D(8)	D(9)	BT	Granular	subgrade	E1 Temp Adj	**E2 Original**	E3 Original	E1 Temp Adj	E2 (Original)	E3 (Original)
109	0.99	0.21	0.15	0.13	0.1	0.08	0.05	0.04	0.03	0.02	785	2007	257	1072	2007	257			
110	1.02	0.14	0.11	0.1	0.08	0.07	0.04	0.03	0.02	0.02	770	2000	312	1051	2000	312			
111	1.05	0.17	0.13	0.11	0.09	0.07	0.05	0.04	0.03	0.02	805	2014	252	1099	2014	252			
112	1.09	0.14	0.12	0.11	0.09	0.07	0.05	0.03	0.03	0.02	763	2041	286	1042	2041	286	1094	3611	249