TINPENG

FALLING WEIGHT DEFLECTOMETER

STANDARD: ASTM D4694

The falling weight deflectometer (FWD) is a trailer-mounted, non-destructive, high-precision, testing system used to evaluate pavement conditions and physical properties. It simulates the load when a car passes over the pavement to measure its vertical deflection response to that load. It is convenient, fast, safe and labor-saving, and is suitable for long-distance and continuous measurement.

FWD is mainly composed of the main frame, operating mechanism, falling weight assembly, hydraulic system, sensor system, electrical system, monitoring and safety guidance system, etc. Equipped with data acquisition and processing software, which can record the original data of deflection, load, temperature and relevant pavement information such as pile number, realize data normalization processing, various error calculations, etc., and analyze the data and make them into charts and reports.

It can accurately assess the structural condition of highways, local roads, parking lots and airport runways, and can also be applied to roadbeds and subbases during construction. It is widely used in road research, design, reconstruction and pavement management.

FEATURES

- Fully automatic "one-touch" operation. A "one-touch" button is installed in the cab. After reaching the test position, the user only needs to press the button and the equipment will automatically run. After the test is completed, the equipment will automatically be locked for transportation.
- The single-point detection and collection time is within 20 seconds (three times of lifting and dropping the hammer and collecting data are completed in accordance with the specifications).
- High measurement accuracy. The FWD system is scientifically designed. High-performance sensors, high-precision and high-speed data acquisition system, and customized digital signal processing algorithms ensure the accuracy and reliability of deflection data.
- Safety interlock protection device. An interlocking joint is installed between the deflectometer and the test vehicle. During the movement of the test vehicle, the equipment is in a protected state and operation is not allowed, which effectively protects the safety of the equipment and the test vehicle.
- It has dual synchronous lifting platforms, which makes data collection more stable and improves data accuracy.
- Each main function has an alternative second solution (or function) to improve the reliability of the whole equipment.

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TECHNICAL SPECIFICATIONS

Model	Falling weight deflectometer FWD-2000K	Heavy weight deflectometer FWD-5000K (Special for airports)
Load range	0-90kN (extendable to 130kN)	0-240kN (extendable to 350kN)
Dynamic force measuring range	0~150kN	0~500kN
Load cell error	≤±1%	
Load error	≤±2%	
Load repeatability	≤±1%	
Load pulse shape	Half-sine wave	
Load plate	300mm	450mm
Displacement measurement range	0-3.5mm	
Deflection sensor	Geophone, 1-9pcs (standard configuration is 9 pcs)	
Deflection sensor error	≤±1%	
Deflection error	Center ≤±2%; Non-center ≤±3%	
Deflection resolution	0.1μm	
Deflection repeatability	Center ≤±1% Non-center ≤±1.5%	
Temperature sensor	2 pcs. Ambient temperature and pavement temperature can be measured separately.	
Temperature error	≤±2℃	
Distance error	≤±0.5m	
Single point test speed	<20 s/point (three times)	<40s/point (three times)
Hammer lifting method	Hydraulic	
Loading plate lifting method	Hydraulic	
Data transmission	Wi-Fi /Wired network transmission	USB transmission
Power supply	12v	24v
Trailer body	German original chassis. Dimensions: 3500*1800*1400mm, which is convenient for turning and safe for driving.	German original chassis, dimensions: 4400*1850*1780mm
Other information	Unique test data positioning function: Each measuring point contains the longitude and latitude geographic location information from GPS/Beidou, providing a scientific basis for repeated observation, comparison and analysis of the same point in the future.	

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FALLING WEIGHT DEFLECTOMETER

Original Date

Project:					Date:	2024/4/9	Test NO.													
Company:					Standard:	JTG F80/1-2017、JTG D50-2017、JTG 3450-2019														
Test Company:																				
Location:					Instrument:	Auto FWD (CFWD-10T)														
Temperture:			21.7℃		Instrument Temper:	25.1℃														
Lane	Direction	Mileage	Num	Load KN	FWD(μm)									Notice	GPS		Ground T℃	Ambienen tT℃		
					D0	D1	D2	D3	D4	D5	D6	D7	D8		North	East				
Lane	front	K100+100	1	101.68	1024.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				17.1	13.5		
			2	57.90	679.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0	0	17.2	13.5		
			3	57.95	673.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				17.2	13.4		
Lane	front	K100+075	1	59.37	729.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				17.2	13.4		
			2	58.21	690.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0	0	17.1	13.4		
			3	58.22	685.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				17.2	13.4		
Lane	front	K100+050	1	99.41	1033.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				17.2	13.4		
			2	99.78	1008.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0	0	17.2	13.5		
			3	99.93	998.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				17.2	13.4		
Lane	front	K100+025	1	100.08	996.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				17.2	14.6		
			2	99.52	1004.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0	0	17.2	14.7		
			3	99.99	977.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				17.3	14.7		
Lane	front	K100+000	1	99.41	1025.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				17.2	14.7		
			2	99.91	986.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0	0	17.2	14.7		
			3	99.88	981.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				17.2	14.7		
Lane	front	K99+975	1	91.67	904.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				17.4	15.1		
			2	156.52	1205.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0	0	17.4	15.1		
			3	156.02	1185.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				17.4	15.2		
Lane	front	K99+950	1	155.46	1253.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				17.5	15.2		
			2	155.05	1235.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0	0	17.5	15.2		
			3	154.18	1220.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				17.5	15.2		

Internal N	Software V	Document	Document	Equipment	Document	Document	Document	Total Ham	Document	Document	Document	Document	Document	Document	Document	Document	Document	Document	Document	Staring Ti	Document	Document	Document	Document	Document	Document	Document	Identification n	
23071801	3			0	0			3	0	0	0	0	0	0	0	0	0	0	0	45432.472	0	0	1	2				0	
Hammering	Measuring	Vehicle Di	Station	Station(Km	Station(m	CarriageWa	loading le	Single Poi	Loading(KN	Displacem	Displacem	Displacem	Displacem	Displacem	Displacem	Displacem	Displacem	Displacem	Displacem	Equivalent	Ground Tem	Environmen	Latitude N	Longitude	Validity	Station Ma	Void	Time		
1	1	UpGoing	K0+5	0	5	CarriageWa	1	1	99.1	134.13	267.21	233.94	208.06	153.95	113.48	86.22	64.69	60.05	0	13.53	26	28	-1.968807	30.150243	Yes		0	5/20/2024 11:19:26 AM		
2	1	UpGoing	K0+5	0	5	CarriageWa	1	2	99.94	265.19	231.84	204.09	180.46	134.39	99.95	76.82	63.08	57.61	0	26.53	26	28	-1.968807	30.150243	Yes		0	5/20/2024 11:19:30 AM		
3	1	UpGoing	K0+5	0	5	CarriageWa	1	3	100.28	253.83	224.49	196.97	175.35	129.46	97.75	77.11	63.72	56.53	0	25.31	26	28	-1.968807	30.150243	Yes		0	5/20/2024 11:19:35 AM		

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