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ANALYZE THE TIME AND COST IN SURVEYING WITH DIFFERENT TYPES OF INSTRUMENTS USED IN THE FIELD OF LEVELLING

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Abstract

In surveying engineering we are finding leveling with different instruments in various different field works. So, I am working on different and different instrument finding leveling in surveying. On ours construction industry various instrument are use in leveling likes as Auto level, Dumpy level, Theodolite and total station. In this all instrument we finding leveling in field works like as road, railways, building, sewerage line etc. In this chapter we discuss how to find out leveling and what is easy process in different condition. In this process I am analysis various situations like as project cost, timing. If the project's cost is high likes as working on national highway or express way and timing of the projects is less in this case I am using total station because of the total station is fastest process of doing working on such types of works. If we are using auto level / dumpy level on that condition we are not comfortable with this instruments because of timing is more required at this projects. But another project likes as a streets making of 100m/200m. In this condition we have not prefer total station because of that condition I am able to working with total station. Total station is required skill labors and the cost of total station is very high as comparisons of auto level /dumpy level and operating system of auto level / dumpy level is to easy as comparison of auto level. If we are working a small projects or low cost project like as 5-10 lakh so, that condition we are not effort total station and skills workers because of the project cost is low as comparison of expanses.

Keywords:- Auto level, Dumpy level, Theodolite, Total station.

1. INTRODUCTION

Since Last 15-20 years technology is upgrades in the field of surveying new technology is used on this current timing and timing of projects is less givens by the govt. or owners .So, we have required more technology and skills labors is required to complete the projects in given time. In that condition we are doing arrangements of all the materials and instruments on time. In project of making a express highway more than 200km than we are required more good arrangements likes as labors required, materials required , instruments is to used projects works. In this projects work we doing working of leveling so such types of work I amusing total station on this project.

If we are working a small project likes as 200m-300m of sewerage line in this condition working with auto level because of this condition we have not required total station because of auto level range is up to 300m and auto level cost is not more than of total station.

1.1 Dumpy level:-

It is an instrument level with a small telescope rigidly fixed and rotates in horizontal direction. This instrument is used only when the working on small projects likes as 100m, 200m, 500m.

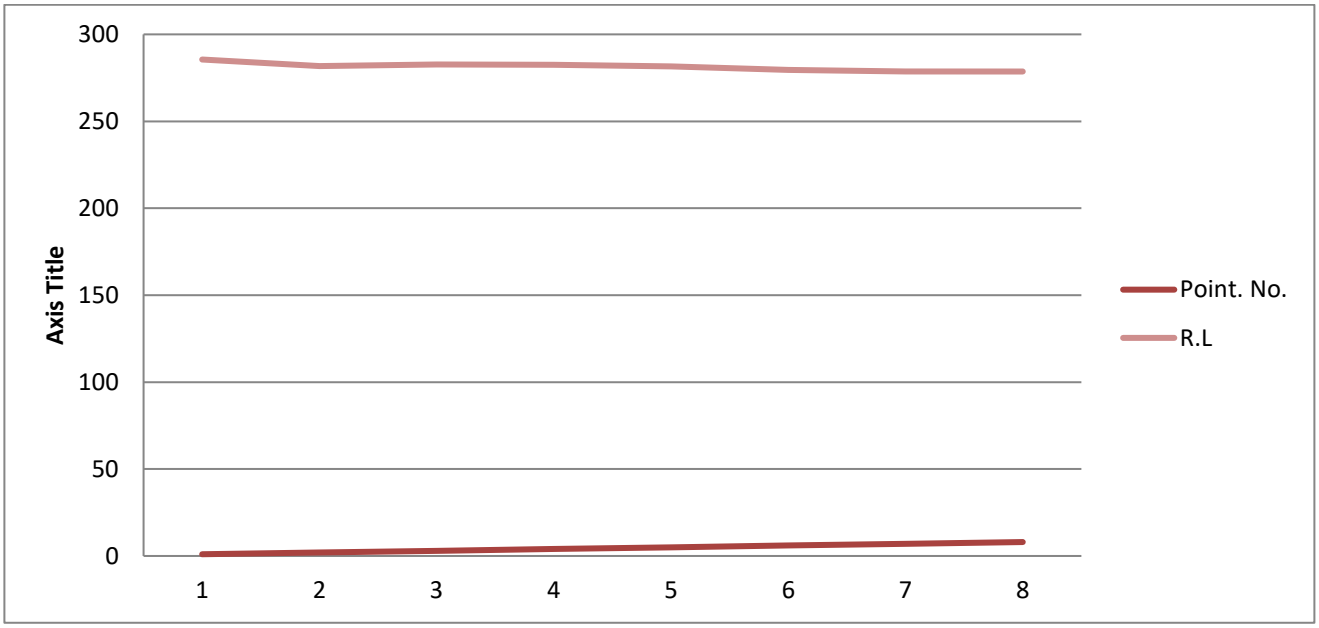
Examples

Station Numbers	Back Sight	Intermediate Sight	For Sight	Height of Instrument	Reduce Level	Remarks
1.	1.231			380.791	379.500	
2.		2.239			378.492	P1
3.		3.148			377.583	P2
4.	1.221		1.102	380.850	379.629	
5.		1.321			379.529	P3
6.		1.447			379.403	P4
7.	3.998		1.779	383.069	379.071	
8.			3.457		379.612	
	∑B.S=6.450		**∑F.S= 6.338**			

Confirmation by this method:- ∑B.S – ∑F.S = Last R.L – First R.L

6.450 – 6.338 = 379.500 – 379.612

0.112=0.112 Hence Ok



1.2 Auto Level

Auto level is defined as that to find out taking reading. With the help of this reading to find out reduce level of the givens points. It used in surveying, Building & Railways with a vertical staff to measure height differences and its to transfer, measuring and set heights.

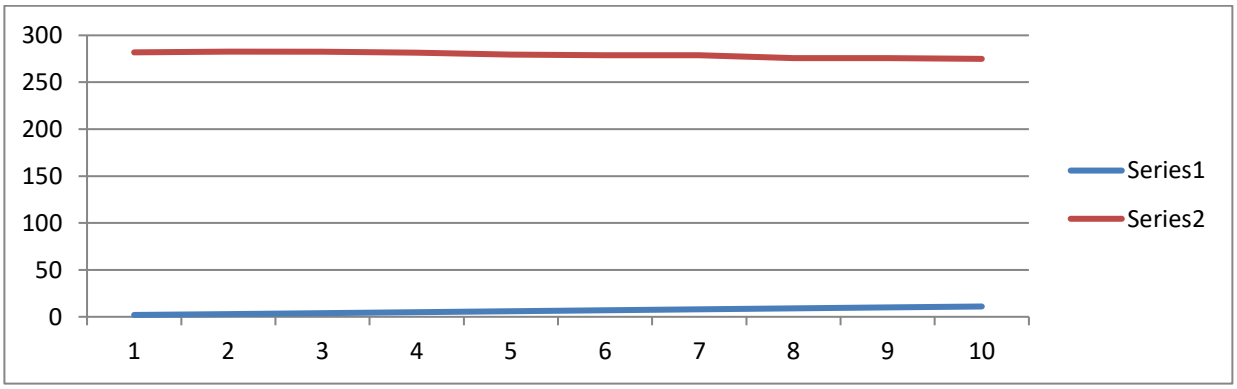
Examples

Station Numbers	Back Sight	Inter mediate Sight	For Sight	Height of Instrument	Reduce Level	Remarks
1.	0.125			285.660	285.535	
2.		3.891			281.769	P1
3.		3.011			282.649	P2
4.		3.178			282.482	P3
5.	0.121		3.985	281.796	281.675	
6.		2.315			279.481	P4
7.		3.127			278.669	P5
8.	0.147		3.101	278.842	278.695	
9.		3.127			275.715	P6
10.		3.123			275.719	P7
11.			3.897		274.945	
	∑B.S=0.393		**∑F.S= 10.983**			

Confirmation by this method:- ∑B.S – ∑F.S = Last R.L – First R.L

0.393 – 10.983 = 274.945 – 285.535= -10.590

-10.590 = - 10.590 Hence Ok



1.3 Theodolite

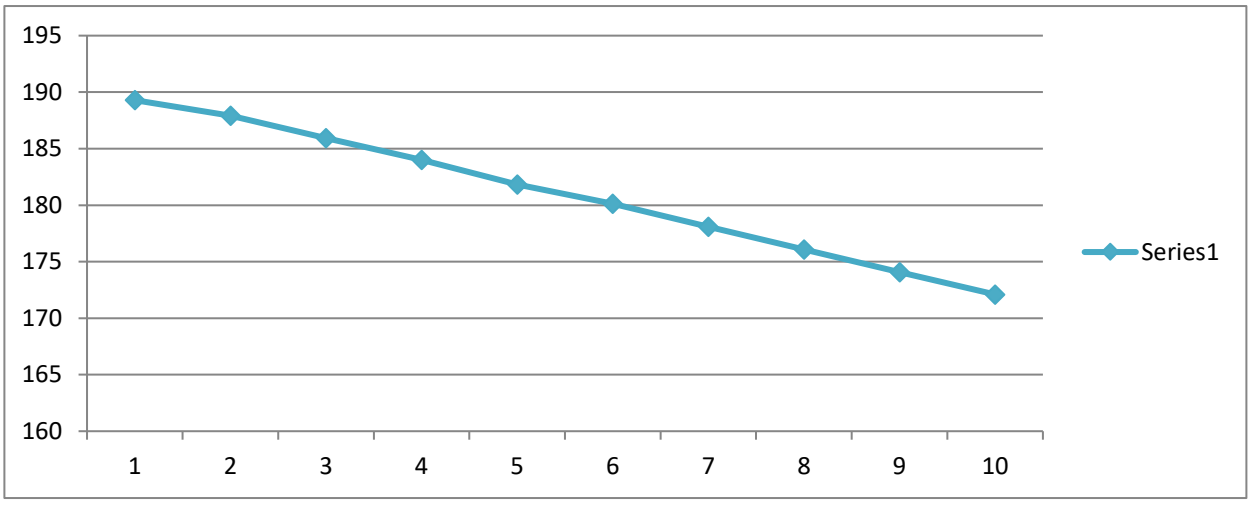
These types of instruments used mainly in to calculate the horizontal and vertical angles. This instrument is different from three another instruments this is used mainly in calculate the angles but in any case these instrument not present than that condition we are using this instruments. If we are using the theodolite for the leveling than that case we are more time to taking readings. Setting of this instrument is not easy because of the telescope always fixed in 90^0 and reading taking very carefully.

Examples

Station Numbers	Back Sight	Inter mediate Sight	For Sight	Height of Instrument	Reduce Level	Remarks
A	0.329			57.829	57.500	
B		3.489			54.340	P1
C		3.987			53.842	P2
D	0.121		3.998	53.952	53.831	
E		2.312			51.640	P3
F		3.157			50.795	P4
G	0.015		3.891	50.076	50.061	
H		3.457			46.619	P5
I		3.729			46.347	P6
J			3.969		46.107	
	∑B.S= 0.465		**∑F.S=11.858**			

Confirmation by this method:- ∑B.S – ∑F.S = Last R.L – First R.L

0.465 – 11.858 = 46.107– 57.500= -11.393



1.4 Total Station

This is an instrument whose calculate all types of level, co-ordination, angles, etc. According to me this instruments is father of surveying. This instrument is used on large amounts of projects because of its cost is high and required skills labors and experience civil engineering staff. On the leveling I am using total station for a long or high cost project because of that timing is important in such projects. This is used in long types of leveling such as express highway like as 200km to 300km.

Total Station

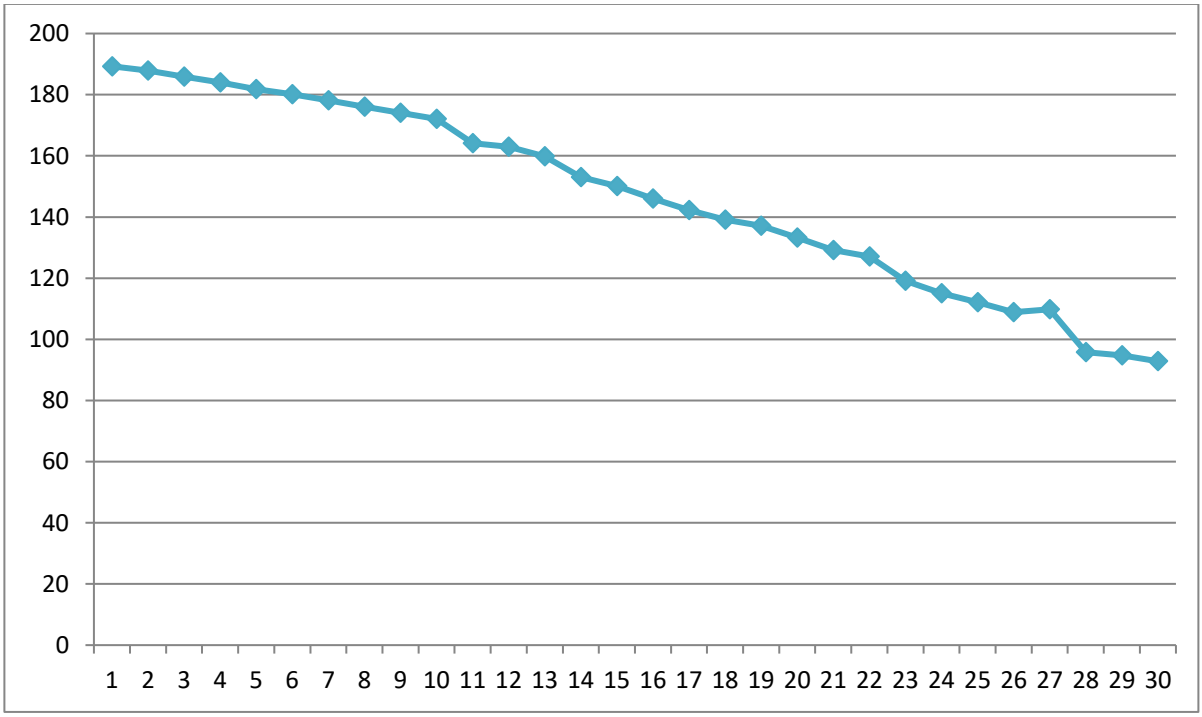
Examples

Station Numbers	Back Sight	Inter mediate Sight	For Sight	Height of Instrument	Reduce Level	Remarks
P1	2.859			392.148	189.289	
P2		4.234			187.914	
P3		6.212			185.936	
P4		8.129			184.019	
P5		10.312			181.836	
P6	1.089		12.009	381.228	180.139	
P7		3.125			178.103	
P8		5.141			176.087	
P9		7.159			174.069	
P10		9.129			172.099	
P11	1.098		17.128	365.198	164.100	
P12		2.199			162.999	
P13		5.327			159.871	
P14		12.124			153.074	
P15		15.139			150.059	
P16	0.289		19.127	346.360	146.071	
P17		4.129			142.231	
P18		7.289			139.071	
P19		9.197			137.163	
P20		13.127			133.233	
P21	1.080		17.198	330.242	129.162	
P22		3.129			127.113	
P23		11.128			119.114	
P24		15.239			115.003	
P25		18.128			112.114	
P26	2.078		21.369	310.951	108.873	

P27		1.158			109.793	
P28		15.129			095.822	
P29		16.187			094.764	
P30			18.126		092.825	
	∑B.S= 8.493		**∑F.S= 104.957**			

Confirmation by this method:- ∑B.S – ∑F.S = Last R.L – First R.L

8.493 – 104.957 = 092.825– 189.289= -96.464



Conclusions:-

This Auto Level, Dumpy Level, Theodolite and Total station are used in doing working to find leveling. But this instrument is used in different and different projects work. In these instruments three instruments are same but theodolite is different in these instruments because of this timing and setting time of this instrument is high as comparison of this three different instruments. If projects length is low than this condition we used auto level, Dumpy level and theodolite . But timing is less and we have sufficient fund for the projects than that condition we are using total station. If the project's cost is high and length of leveling surveying is high than that case of we are use total station.

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