

Transcripts of videos in module “Example Level Run”

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We are here at Snake Creek near Charleston, Utah. Mike freeman and I are going to run a set of station levels. We have a gaging station which is a stilling well equipped with an electric tape gage which is our primary reference gage. Stage is sensed inside of the stilling well. We also have an auxiliary gage located outside of the stilling well which is a vertical staff plate. We have an RM on this side of the bank located right next to the structure over here. We have a second RM located on the other bank on the other side of the structure. We also have a third RM located on a piece of concrete upstream from where I'm standing.

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We are going to begin this level circuit with a backsight to reference mark number four to establish our initial instrument height. My first reading is 5.153 feet. I'm going to do a check reading and it is also 5.153 feet, which gives me an initial height of instrument of 8.737.

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We are now going to take our first foresight to reference mark number one, RM1. My initial reading is 5.346 feet. I'm going to do a quick check read, which is also 5.346 feet, which gives me an elevation of 3.391 feet for reference mark one.

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We are now going to take a foresight to reference mark number five. My initial reading is 4.889. I'm going to do a quick check. The check reading is also 4.889, which gives me an elevation of 3.848 feet.

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River stage at this gaging station is sensed inside of a stilling well. Our primary reference gage is the electric tape gage shown here. To obtain a gage height or water surface elevation inside of the stilling well, this weight

attached to the electric tape gage is lowered down to the water surface and the stage is read at the electric tape index. As you can see this index which is the black line is not exactly on the shelf of the gaging station. In order for us to get us a foresight at the elevation of the electric tape index we have placed some coins on the shelf. We are using a pocket rod instead of a self reading rod or the bar code rod because we cannot fit those inside of the gaging station.

We are now going to take a foresight on the electric tape index. If you will notice we are using a pocket rod held on a set of coins that are on the instrument shelf. I have to use the optical system of this digital level because it is a self reading rod. And my read is 1.386, which gives me an elevation of 7.351 feet.

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We are now going to take a foresight to a reference point on our auxiliary vertical staff gage. The rod is being held at the point of 5.52 feet on the vertical staff gage. And now we are going to read the rod. Our first reading is 3.203 feet. We'll do a quick check read here, which is also 3.203 feet which gives us an elevation of 5.534 feet at that point on the vertical staff gage, which is a difference of 0.014 feet.

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We are now going to take a foresight on the water surface. Mike is holding a rod on a stable rock on the channel bed. I'm going to ask Mike to read the back of the rod, the self reading portion of the rod, to give me the depth of water. The depth of the water is 0.380 feet and now I'm going to take a foresight to get an elevation of the channel bed. And my initial rod reading is 6.219. I'm going to take a quick check, which is also 6.219. So I have an elevation of that rock, the top of that rock on the channel bed, of 2.518 feet. I'm going to add the depth that Mike reported to me of 0.380 feet to get an elevation of the water surface of 2.898 feet.

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We just got done shooting our fore shots on the water surface, now we need to check our reference gages. We are going to take a reading on the ETG here; by lowering the brass weight down to the water surface, I've got a gage height of 2.90. Then I'm going to look at our recorder which is a float tape and we have a stage of 2.90 as well.

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The final objective point of this level circuit is a shot on the bottom of the electric tape weight. However, because the electric tape weight is below the shelf we need to move the instrument so that it's low enough to hit the bottom of that weight. In order to do so we have established a stable turning point by driving a screwdriver into the ground. So now I'm going to take a foresight on that turning point, the screwdriver. And my first read is 6.131 feet. I'll do a quick check, and my check read is also 6.131 feet, which gives me an elevation of turning point 1 of 2.606.

I've now moved the instrument to where it's low enough so that I can get a nice shot into that door of the gaging station and now I have to establish this height of instrument from turning point one that we established with the past foresight from the last set up. My first read is 3.009, and my check read is also 3.009.

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The final objective point of this level circuit is a shot on the bottom of the electric tape gage weight. I've set the instrument up low enough so that I can see into the gaging station. I'm going to ask Mike, my rod man, to lower the weight until the bottom of the weight is at the cross hairs of the instrument and then I'm going to ask him to give me a gage height reading at the electric tape index, and if the two are in agreement, I would expect that, that value will equal the height of instrument. Down, down, right there. Mike what's that reading. The reading of the electric tape index is 5.61 and the reading in the height of instrument is 5.615; those agree.

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We have obtained our first foresights and computed our first elevations for all of the objective points in this level circuit. We are now at the point in which we need to take our second foresights to obtain second elevations for those same objective points. So we've established another stable turning point over by the gage from which we can get an established elevation, shake up the instrument and move it, take a backsight back to it, to obtain a new height of instrument. And our rod reading is 1.349, and I'm going to do a quick check and that is also 1.349, which gives me an elevation of our second turning point of 4.266 feet.

So now I need to establish a new instrument height so I'm going to shake up the instrument; slightly move it in its space so it's at a new instrument height.

I've shaken up the instrument by changing its height and now I'm ready to take a backsight to turning point number two to establish a new instrument height. After I establish that new instrument height I'm going to follow the level circuit backwards from the way I shot it the first time and get my second foresights on the bottom of the wire weight and then similar to the first level circuit I'm going to move the instrument back to that same location through the use of a turning point. I'm going to get another height of instrument and I'm going to shoot the same reference marks, the water surface, the auxiliary gage, the electric tape index, and then finally close it out with a final shot to the origin, reference mark number four.

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I'm now going to take a foresight to the bottom of the electric tape weight. I'm going to ask Mike to lower it down so it's in the cross hairs of the instrument. Mike, down, down, keep coming. That's good. What's the reading of the index; 5.66, and my instrument height is 5.666.

I now have to move the instrument to an area where I can shoot all the rest of the objective points, so I'm establishing another turning point. We are going to call it turning point three. And the rod read is 3.061. I'm going to shoot it again; 3.061, which gives me an elevation of 2.605 for our new turning point.

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I'm now ready to establish my final instrument height from a backsight to turning point number three. My rod reading is 6.094; quick little check; 6.904, which gives me a new instrument height of 8.699.

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We are now going to take a foresight to the electric tape index. Just as before we are going to be holding a pocket rod, so it's a self read I have to make with the optical system of the digital level. And the reading is 1.350, which gives me an elevation of 7.349.

We are now ready to take our second foresight on the water surface. Similar to the way we did it before, Mike has found a stable rock onto which he is holding the rod. I'm going to shoot a foresight to the rod to obtain the elevation of that rock. I'm then going to ask Mike to give me the cut, essentially the depth of the water above that rock, which I'm going to add to the elevation to get the water surface elevation. My initial rod reading is 6.201, and I'll do a quick check, 6.201. Mike, I'd like a cut please. We are going to have a cut of 0.42 which we are going to add to the elevation of the bottom of the channel which was at 2.498 to get a water surface elevation of 2.918. I'm also going to ask Mike for an accuracy estimate. He's saying the rod is being held plus or minus 0.02 of the water surface. We are now going to read the reference gage and the auxiliary gage as well as the data recorder.

We are now ready to take our second foresight on our auxiliary vertical staff gage from a reference point on the backing. My first shot is 3.166 feet. I'll do a quick check; 3.166 feet gives me an elevation of 5.53 and on that staff plate that reference point is marked at 5.52 feet.

We are now going to take our second foresight to reference mark number five. My rod reading is 4.853. I'll do a quick check; 4.853, to give me an elevation of 3.846 feet.

We are now going to take our second foresight on reference mark number one, RM1. My rod reading is 5.309 feet; quick check and its 5.039 feet, to give me an elevation of 3.390 feet.

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We are now ready to close out this level circuit with a final foresight to our origin, reference mark number four. The first rod reading is 5.114; quick check, 5.114, to give me an elevation of 3.585 feet.

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We completed our level circuit with a circuit closure error of 0.001 feet. We had four instrument set ups which gives us an allowable closure error of 0.006 feet. So the levels have closed successfully.