

Dirt Gravel and Low  
Volume Road Program

# Geomorphic Assessment Tool

WEBINAR

1/4/24

Starts 9am



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# Geomorphic Assessment Online Tool

## Basics

- Online geomorphic assessment tool for LongPro surveys
- Based off current geomorphic assessment Excel spreadsheet
- Real time error checking
- Individual county login Entity and Pin
- County assessments stored in one location
- Accessible by CDGRS staff remotely

# Survey Data Entry

INITIAL SETUP (SETUP #1)		TURNING POINT (TP #1)		TURNING POINT (TP #2)		TURNING POINT (TP #3)	
BM #1 Elevation (ft) -	100.00	FS to TP#1 (ft)	13.95	FS to TP#2 (ft)		FS to TP#3 (ft)	
Backsight (BS) to BM #1 (ft) -	0.70	TP#1 Elevation (ft)	88.75	TP#2 Elevation (ft)	92.35	TP#3 Elevation (ft)	92.35
Height of Instrument (HI) (ft) -	100.7	BS to TP#1 (ft)	3.60	BS to TP#2 (ft)		BS to TP#3 (ft)	
ST start -	0.00	HI #2 (ft)	92.35	HI #3 (ft)	92.35	HI #4 (ft)	92.35
ST end -	313.00	ST start -	329.00	ST start -		ST start -	
		ST end -	413.00	ST end -		ST end -	

Geomorphic Assessment - Existing Conditions					
all data in ft					
STATION (ST)	FORESIGHT - BED (FS)	BED ELEVATION	NOTES	crest stability rating	other notes, etc.
0.00	11.45	89.25	Crest	good	1st crest below junction with tributary
7.00	11.60	89.10	Bed		
14.00	11.85	88.85	End GC		
29.00	14.50	86.20	Pool		
43.00	14.30	86.40	Bed		
63.00	13.15	87.55	Glide		
84.00	12.00	88.70	Crest	good	
95.00	12.70	88.00	Bed		
110.00	12.75	87.95	End GC		
144.00	14.00	86.70	Bed		
156.00	14.35	86.35	Pool		
158.00	13.75	86.95	Inlet Invert		existing crossing is two 7' round tanker cars
158.00	6.75	93.95	Inlet Top		existing crossing misaligned, pulling channel to north
158.00	13.75	86.95	Bed @ Inlet		
158.00	6.00	94.70	US Road Edge		
175.00	5.50	95.20	Centerline Road		
198.00	6.00	94.70	DS Road Edge		
198.00	14.45	86.25	Outlet Invert		
198.00	7.45	93.25	Outlet Top		
198.00	14.45	86.25	Bed @ Outlet		
210.00	14.70	86.00	Bed		end of riprap apron at pipe outlet
212.00	15.65	85.05	Bed		drop from riprap apron at outlet into pool
225.00	15.80	84.90	Pool		
240.00	15.35	85.35	Bed		
247.00	14.15	86.55	Glide		
262.00	13.20	87.50	Crest	moderate	Scour Pool Tailcrest - Good?
273.00	13.50	87.20	Bed		
298.00	13.75	86.95	End GC		
313.00	14.80	85.90	Bed		
329.00	7.10	85.25	Pool		
336.00	6.40	85.95	Bed		
353.00	6.70	85.65	Bed		



### Existing Conditions Data Entry

#### Benchmarks

Add the initial benchmark (BM) below. Enter the Elevation/Backsight and the Height will be calculated once you set Backsight. The Elevation will be calculated (based on the existing height of the selected benchmark/turning point).

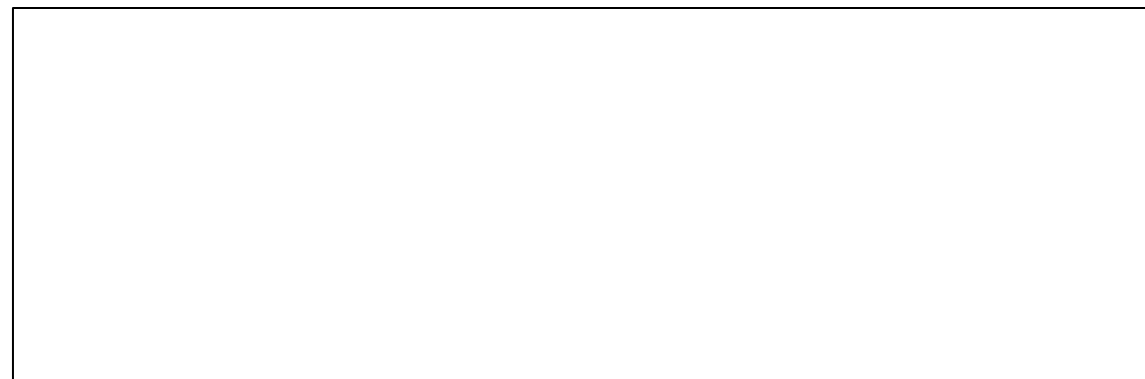
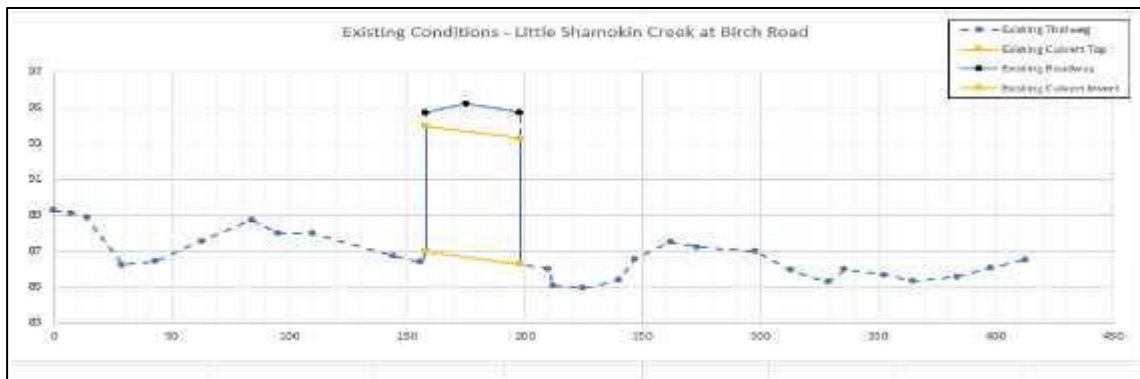
	Foresight	Elevation	Backsight	Height
BM 1	--	100.00	8.58	108.58
TP 2	8.58	100.00	1.53	101.53

[Add New Turning Point](#)

#### Survey Data

Begin to enter existing data points below. As data is entered, a graph will appear and update reflecting entered data the benchmark/turning point is added into the section above.

BM	Station	Foresight	Bed Elevation	Note/Tag	Crest Stability
BM 1	0.00	5.67	102.91	Crest	good
BM 1	4.00	6.91	101.67	End GC	
BM 1	7.00	7.12	101.46	Pool	
BM 1	14.50	6.65	101.93	Crest	moderate
BM 1	20.00	6.81	101.77	End GC	
BM 1	25.00	7.16	101.42	Pool	
BM 1	28.50	7.23	101.35	Crest	poor
BM 1	31.00	7.41	101.17	End GC	
BM 1	36.00	7.57	101.01	Pool	
BM 1	41.00	7.60	100.98	Crest	moderate
BM 1	43.00	7.82	100.76	End GC	
BM 1	45.00	8.02	100.56	Pool	
BM 1	47.00	7.98	100.60	Crest	moderate
BM 1	49.00	8.25	100.33	End GC	



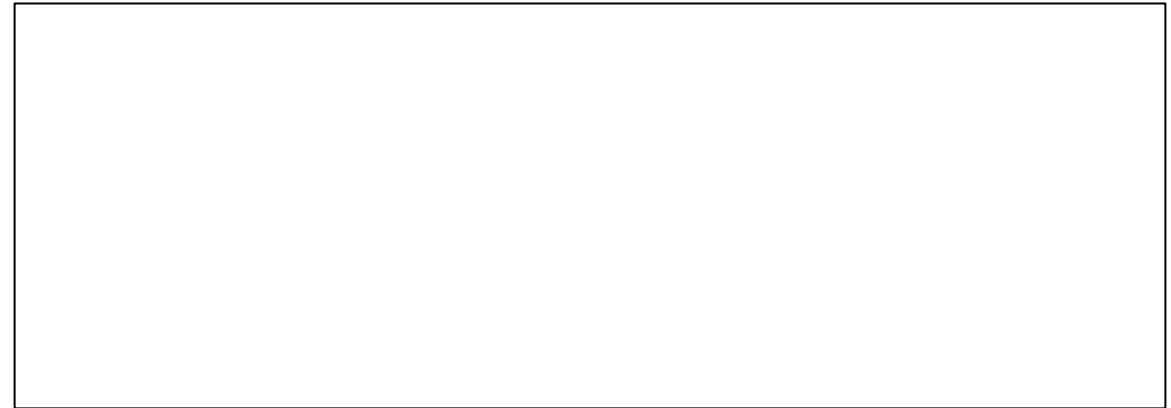
# Cross Section Data Entry

<i>Cross Section</i>		<i>all data in ft</i>	
STATION (ST)	FORESIGHT (FS)	ELEVATION	NOTES
0.00	0.76	104.97	BOLP
1.70	1.72	104.01	TOB
3.50	3.04	102.69	BKF
5.00	3.49	102.24	BED
7.50	3.88	101.85	LEW
9.50	4.01	101.72	THW
13.50	3.74	101.99	REW
15.00	3.43	102.30	BKF
16.00	2.17	103.56	TOB
18.00	2.08	103.65	BORP

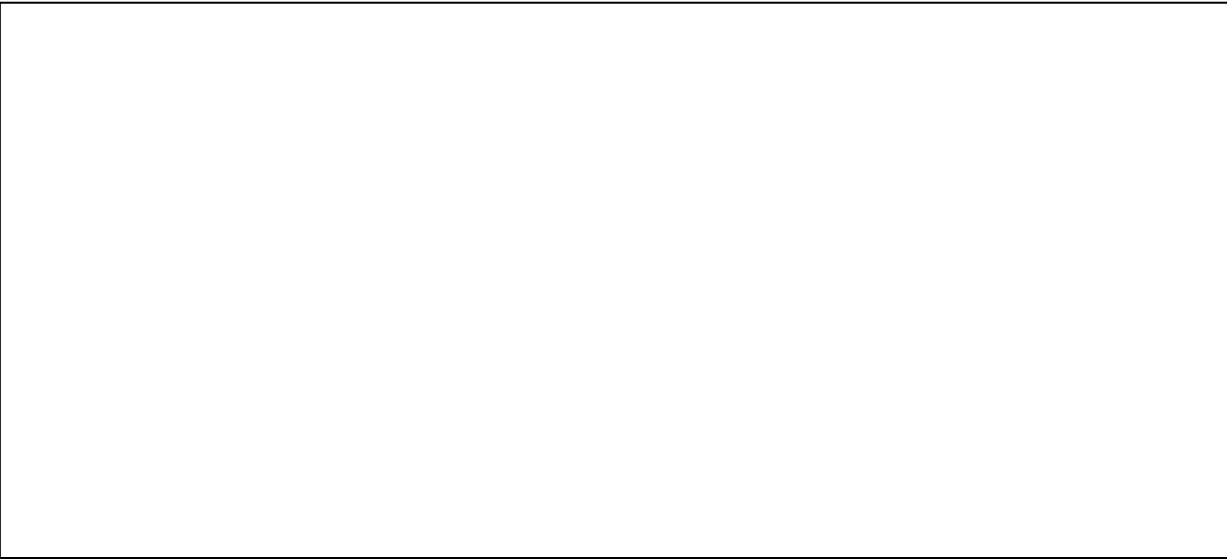


### Cross Section Data Entry

Station	Foresight	Bed Elevation	Tag		
<input type="text" value="1.00"/>	<input type="text" value="3.85"/>	<input type="text" value="112.43"/>	<input type="text" value="BOLP"/>	<input type="button" value="+"/>	<input type="button" value="🗑"/>
<input type="text" value="3.00"/>	<input type="text" value="4.20"/>	<input type="text" value="112.78"/>	<input type="text" value="TOB"/>	<input type="button" value="+"/>	<input type="button" value="🗑"/>
<input type="text" value="4.00"/>	<input type="text" value="4.45"/>	<input type="text" value="113.03"/>	<input type="text" value="BKF"/>	<input type="button" value="+"/>	<input type="button" value="🗑"/>
<input type="text" value="5.00"/>	<input type="text" value="4.90"/>	<input type="text" value="113.48"/>	<input type="text" value="BED"/>	<input type="button" value="+"/>	<input type="button" value="🗑"/>
<input type="text" value="6.50"/>	<input type="text" value="5.35"/>	<input type="text" value="113.93"/>	<input type="text" value="LEW"/>	<input type="button" value="+"/>	<input type="button" value="🗑"/>
<input type="text" value="9.00"/>	<input type="text" value="5.60"/>	<input type="text" value="114.18"/>	<input type="text" value="THW"/>	<input type="button" value="+"/>	<input type="button" value="🗑"/>
<input type="text" value="11.00"/>	<input type="text" value="5.32"/>	<input type="text" value="113.90"/>	<input type="text" value="REW"/>	<input type="button" value="+"/>	<input type="button" value="🗑"/>
<input type="text" value="14.00"/>	<input type="text" value="5.20"/>	<input type="text" value="113.78"/>	<input type="text" value="BED"/>	<input type="button" value="+"/>	<input type="button" value="🗑"/>
<input type="text" value="17.50"/>	<input type="text" value="4.42"/>	<input type="text" value="113.00"/>	<input type="text" value="GRND"/>	<input type="button" value="+"/>	<input type="button" value="🗑"/>
<input type="text" value="19.50"/>	<input type="text" value="3.95"/>	<input type="text" value="112.53"/>	<input type="text" value="TOB"/>	<input type="button" value="+"/>	<input type="button" value="🗑"/>
<input type="text" value="20.50"/>	<input type="text" value="3.85"/>	<input type="text" value="112.43"/>	<input type="text" value="BORP"/>	<input type="button" value="+"/>	<input type="button" value="🗑"/>



# Proposed Conditions Analysis



**Avg. Bankfull Width Measurement (ft)** 14.00  
**Anticipated bank margin width** 3.00  
**Estimated minimum effective opening width** 20.00  
**Ratio of Proposed Width to Avg Width** 1.43  
**Proposed deck width** 20.0  
**Side Slope Degrees** 26.6

Slope Ratio (h:v)	Degrees
2.0:1	26.6
2.5:1	21.8
3.0:1	18.4

**Proposed beam & deck height** 1.5  
**Proposed bridge length (LB to RB) (ft)** 42

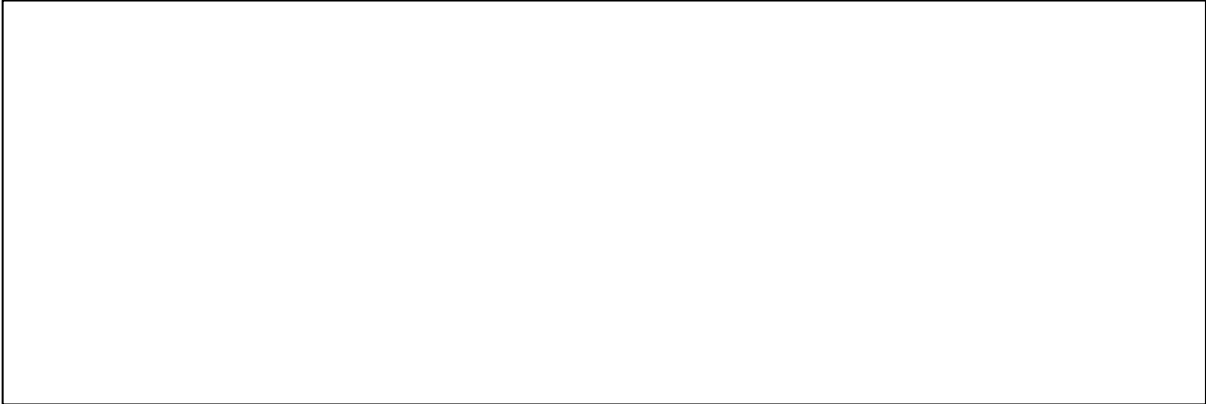
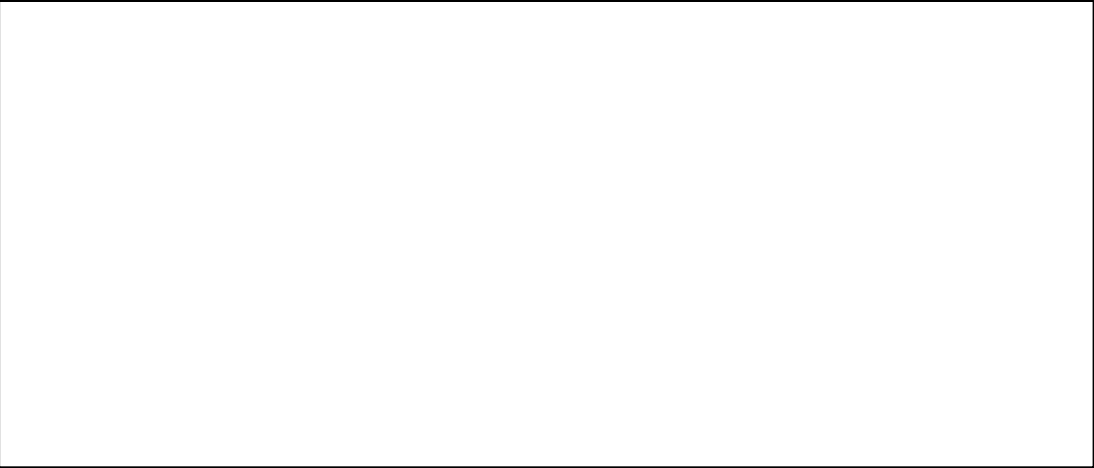
Save

Spread Footer Recommendations				
	ST	Bottom of Beam Elev.	Top of Footer Elev.	Culvert Top Elev.
Recommended structure inlet (ft)	227	95.73	97.23	92.22
Recommended structure outlet (ft)	247	95.73	97.23	91.03

Proposed bed elevation at Inlet (ft) 91.07  
 Proposed bed at Outlet (ft) 89.88  
 Hydraulic opening height at inlet (ft) 4.66

**Proposed Roadway**

Existing US Road Elev. (ft) 95.73  
 Height to Elevate Existing Roadway Approaches 1.5



# Summary of Existing and Proposed Conditions

Summary of Existing Conditions			Summary of Recommended Proposed Conditions (Bottomless)		
<b>EXISTING CHANNEL</b>			<b>EXISTING CHANNEL</b>		
	<i>ft/ft</i>	%		<i>ft/ft</i>	%
<i>Average channel slope upstream of tie-in point</i>	0.024	2.4%	<i>Average channel slope upstream of tie-in point</i>	0.024	2.4%
<i>Average channel slope downstream of tie-in point</i>	0.031	3.1%	<i>Average channel slope downstream of tie-in point</i>	0.031	3.1%
<b>REFERENCE REACH</b>			<b>RECONSTRUCTED REACH</b>		
	<i>ft/ft</i>	%		<i>ft/ft</i>	%
<i>Reference Reach Slope</i>	0.023	2.3%	<i>Reconstructed reach slope (Continuity Slope)</i>	0.026	2.6%
<i>Reference reach slope is +/-25% of</i>	0.019	1.9%			
	0.032	3.2%			
	<i>ft</i>			<i>ft</i>	
<i>Typical reference grade control spacing</i>	39.5		<i>Total reconstructed reach length</i>	150	
<i>(min)</i>	34		<i>Reconstructed reach length upstream of inlet</i>	39	
<i>(max)</i>	45		<i>Reconstructed reach length downstream of outlet</i>	55	
<i>Typical grade control length</i>	21.0		<i>Average grade control length</i>	21.0	
<i>(min)</i>	18.00		<i>Average grade control spacing (crest-to-crest)</i>	50	
<i>(max)</i>	24.00		<i>Constructed grade control feature type</i>	Constructed Riffle	
<i>Typical pool depth</i>	1.4		<i>Typical pool depth (constructed)</i>	1.4	
<i>Max pool depth</i>	1.50				
<i>Bankfull depth (@grade control crest) (ft)</i>	0.61		<i>Bankfull depth (@grade control crest) (ft)</i>	0.61	
	<i>mm</i>	<i>in</i>		<i>Rock Size</i>	
<i>Substrate D<sub>50</sub></i>	33.5	1.3	<i>Substrate D<sub>50</sub></i>	2"-	
<i>Substrate D<sub>84</sub></i>	93.12	3.7	<i>Substrate D<sub>84</sub></i>	R-2	
<i>Substrate D<sub>98</sub></i>	356.34	14.0	<i>Substrate D<sub>98</sub></i>	R-4	
<b>EXISTING CULVERT</b>			<b>PROPOSED CULVERT</b>		
	<b>STATION</b>	<b>ELEVATION</b>		<b>STATION</b>	<b>ELEVATION</b>
<i>Inlet invert</i>	150.00	95.93	<i>Bottom of Footing at Inlet</i>	150.00	93.32
<i>Inlet top-of-opening</i>	150.00	99.11	<i>Inlet top-of-opening</i>	150.00	100.03
<i>Outlet invert</i>	206.00	93.77	<i>Bottom of Footing at Outlet</i>	206.00	91.89
<i>Outlet top-of-opening</i>	206.00	96.36	<i>Outlet top-of-opening</i>	206.00	98.60
<i>Width of existing structure</i>	4.5		<i>Width of proposed structure</i>	10.2	
<i>Ratio of existing structure width to bankfull width</i>	64%		<i>Ratio of proposed structure width to bankfull width</i>	1.46	
<i>Length of existng structure (US to DS)</i>	56		<i>Length of proposed structure (US to DS)</i>	56.0	
<i>Slope of existng structure (bottom)</i>	0.039	3.9%	<i>Slope of proposed structure</i>	0.026	2.6%
			<i>Minimum bury depth (bottom of footings)</i>	3.00	
<b>ROADWAY (along existing structure alignment)</b>			<b>PROPOSED ROADWAY (along existing structure alignment)</b>		
	<b>STATION</b>	<b>ELEVATION</b>		<b>STATION</b>	<b>ELEVATION</b>
<i>US road edge</i>	162.00	98.53	<i>US road edge</i>	162.00	101.13
<i>Centerline road</i>	172.00	98.08	<i>Centerline road</i>	172.00	100.68
<i>DS road edge</i>	186.00	97.29	<i>DS road edge</i>	186.00	99.89
<b>ROAD FILL COVERAGE</b>			<b>PROPOSED ROAD FILL COVERAGE</b>		
	<i>ft</i>			<i>ft</i>	
<i>@ US road edge</i>	-0.58		<i>@ US road edge</i>	1.4	
<i>@ DS road edge</i>	0.93		<i>@ DS road edge</i>	1.4	

<https://www.engr.psu.edu/geomorphic-assessment/>

The screenshot shows a web browser window with the following elements:

- Browser Tab:** Geomorphic Assessments
- Address Bar:** [engr.psu.edu/geomorphic-assessment/login.aspx?ReturnUrl=%2fgeomorphic-assessment%2f](https://engr.psu.edu/geomorphic-assessment/login.aspx?ReturnUrl=%2fgeomorphic-assessment%2f)
- Taskbar:** Includes icons for Gmail, Imported, Grades and Attend..., Center for Dirt and..., 12 Messier Objects..., Canvas | Penn State, Public Parcel Viewer, Sign In, and Geomorphic Assess...
- Page Header:**
  - PennState College of Engineering** logo on the left.
  - LARSON TRANSPORTATION INSTITUTE** text in the center.
  - Geomorphic Assessments** title on the right.
- Login Form:** A box containing:
  - Entity:**
  - Pin:**
  - Login** button
  - Clear** button

# DGLVR Geomorphic Assessment Tool – Questions??

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