

Colorado Department of Transportation Staff Bridge Bridge Detail Manual	Chapter: 7 Effective: June 30, 2024 Supersedes: October 11, 2023
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## Engineering Geology

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### 7.1 Purpose

The purpose of this drawing is to give a graphic portrayal of the geological conditions at the site of the structure (bridge, culvert, wall, etc.). This drawing is used to illustrate the outline, stationing, and location of the structure, the locations and results of test borings and proposed elevations of footing, piling or caissons.

### 7.2 Responsibility

This drawing is prepared by the Geotechnical Engineer or Engineering Geologist of record, typically the CDOT Soils & Geotechnical Services or a Geotechnical Consultant. It shows the foundation data from the field investigation. The responsibility for the accuracy of the geological information presented on this drawing rests with the Geotechnical Engineer or Engineering Geologist.

### 7.3 Scales

Suggested zoom scales for presenting the Plan and Elevation views in paper space are as follows: 1" = 30', 1" = 40', 1" = 50', 1" = 60'. For longer walls, a smaller scale may be used.

### 7.4 Plan and Elevation

Whether a Geotechnical Consultant firm or CDOT Soils & Geotechnical Services is preparing the Engineering Geology sheet, a copy of the electronic file of the structure's General Layout (plan, longitudinal section, and typical transverse section), drawn at the correct project coordinates, shall be shared with them for their use.

The detailer may use the bridge worksheet B-GEO-1 Engineering Geology for assistance.

### 7.5 Check Items

Listed below are items that must be checked to see that they appear on the drawing.

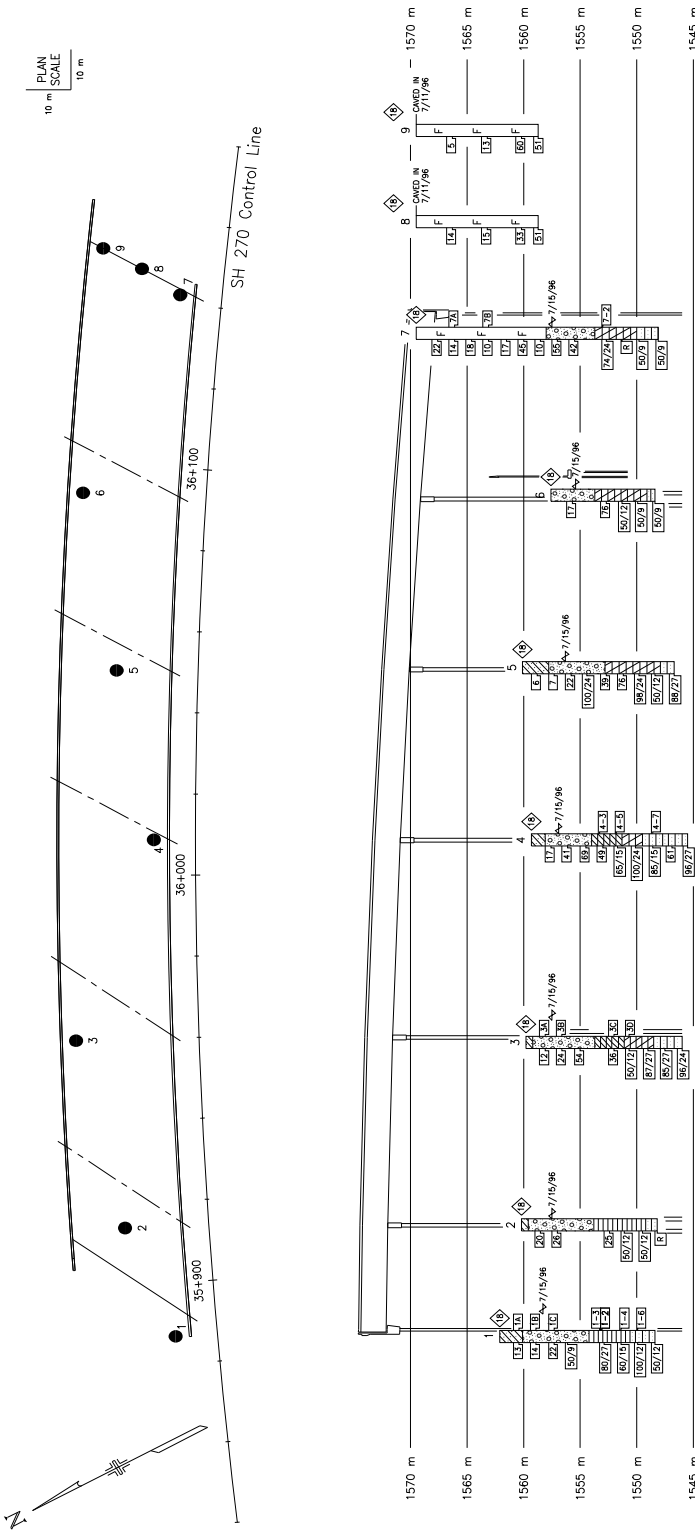
- A) Standard North Arrow.
- B) Show the outline of the structure in both the Plan and Elevation views.
- C) Show footings on the Elevation view, at their correct elevations.
- D) Show piling and caissons, on the Elevation view, to their correct tip elevations.
- E) Stations along Station Line.
- F) Elevation reference on both left and right sides of the Elevation view.

- G) Station Line terminology (Survey Line, Projected Line, etc.).
- H) Project and Subaccount Number.
- I) Check title block for information indicated in Section 7.6.
- J) Initial and date blocks filled in.

## 7.6 Title Block

This drawing is titled "ENGINEERING GEOLOGY". The feature intersected should be shown under "Engineering Geology".

The structure number or numbers and the first initial and last name of the Geologist and the person preparing the drawing shall be filled in.



The boring logs of the above test holes are on file in the Geotechnical Section Office, Staff Materials Branch, (303)757-9274

Sample Number	Depth (meters)	Classification	Cores		ASTM		ASTM		ASTM		ASTM		Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Soil Type	
			Length (m)	Number	Standard	Result	Standard	Result	Standard	Result							
1A	1.0-1.7	Sandy Clay	1.7	1	ASTM D-1585	1.7	1	ASTM D-1585	1.7	1	ASTM D-1585	1.7	1	1.7	1.7	1.7	NP
1B	2.7-3.2	Sandy Clay	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	0.5	0.5	0.5	NP
1C	4.3-4.7	Silty Sand	0.4	1	ASTM D-1585	0.4	1	ASTM D-1585	0.4	1	ASTM D-1585	0.4	1	0.4	0.4	0.4	NP
2A	1.2-1.7	Gravelly Sand	0.5	4	ASTM D-1585	0.5	4	ASTM D-1585	0.5	4	ASTM D-1585	0.5	4	0.5	0.5	0.5	NP
2B	1.7-2.0	Sandy Clay	0.3	3	ASTM D-1585	0.3	3	ASTM D-1585	0.3	3	ASTM D-1585	0.3	3	0.3	0.3	0.3	NP
2C	2.0-2.8	Sandy Clay	0.8	3	ASTM D-1585	0.8	3	ASTM D-1585	0.8	3	ASTM D-1585	0.8	3	0.8	0.8	0.8	NP
2D	2.8-3.4	Sandy Clay	0.6	3	ASTM D-1585	0.6	3	ASTM D-1585	0.6	3	ASTM D-1585	0.6	3	0.6	0.6	0.6	NP
2E	3.4-4.0	Gravelly Sand	0.6	3	ASTM D-1585	0.6	3	ASTM D-1585	0.6	3	ASTM D-1585	0.6	3	0.6	0.6	0.6	NP
2F	4.0-5.0	Sandy Clay	1.0	3	ASTM D-1585	1.0	3	ASTM D-1585	1.0	3	ASTM D-1585	1.0	3	1.0	1.0	1.0	NP
2G	5.0-5.5	Sandy Clay	0.5	3	ASTM D-1585	0.5	3	ASTM D-1585	0.5	3	ASTM D-1585	0.5	3	0.5	0.5	0.5	NP
2H	5.5-6.0	Clay	0.5	2	ASTM D-1585	0.5	2	ASTM D-1585	0.5	2	ASTM D-1585	0.5	2	0.5	0.5	0.5	NP
2I	6.0-6.5	Clay	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	0.5	0.5	0.5	NP
2J	6.5-7.0	Clay	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	0.5	0.5	0.5	NP
2K	7.0-7.5	Clay	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	0.5	0.5	0.5	NP
2L	7.5-8.0	Clay	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	0.5	0.5	0.5	NP
2M	8.0-8.5	Clay	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	0.5	0.5	0.5	NP
2N	8.5-9.0	Clay	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	0.5	0.5	0.5	NP
2O	9.0-9.5	Clay	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	0.5	0.5	0.5	NP
2P	9.5-10.0	Clay	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	0.5	0.5	0.5	NP
2Q	10.0-10.5	Clay	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	0.5	0.5	0.5	NP
2R	10.5-11.0	Clay	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	0.5	0.5	0.5	NP
2S	11.0-11.5	Clay	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	0.5	0.5	0.5	NP
2T	11.5-12.0	Clay	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	0.5	0.5	0.5	NP
2U	12.0-12.5	Clay	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	0.5	0.5	0.5	NP
2V	12.5-13.0	Clay	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	0.5	0.5	0.5	NP
2W	13.0-13.5	Clay	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	0.5	0.5	0.5	NP
2X	13.5-14.0	Clay	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	0.5	0.5	0.5	NP
2Y	14.0-14.5	Clay	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	0.5	0.5	0.5	NP
2Z	14.5-15.0	Clay	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	ASTM D-1585	0.5	1	0.5	0.5	0.5	NP

**LEGEND**

**TEST BORING**

- Location of Test Boring
- Location of Continuous Penetration Test
- 7.5 mm Wireline Boring
- Relay Boring
- ◇ Auger Boring

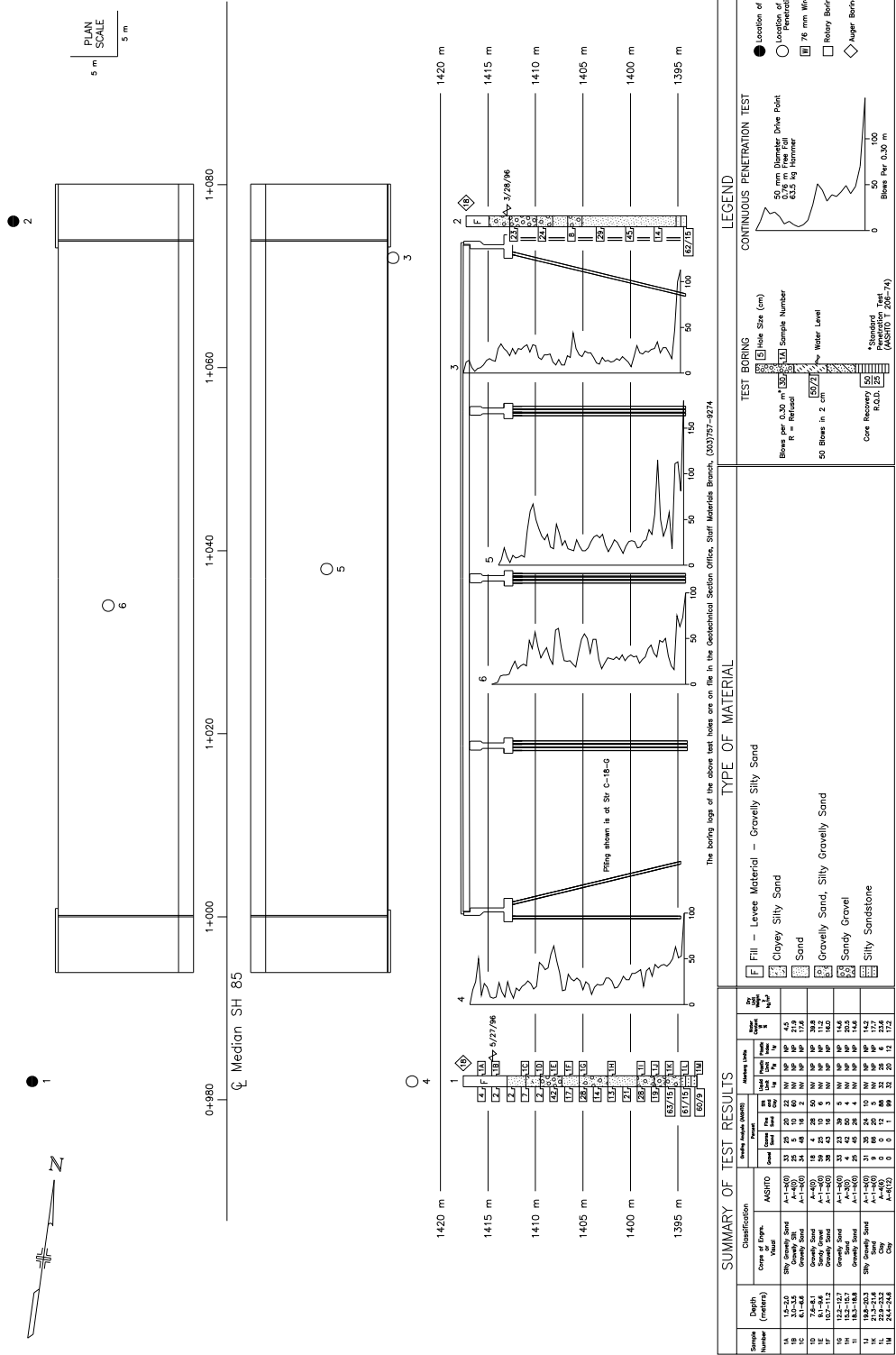
**CONTINUOUS PENETRATION TEST**

50 mm Diameter Drive Point  
63.5 kg Hammer  
Blow Per 0.30 m

**TYPE OF MATERIAL**

- Embankment Fill - Sandy Clay
- Bedrock - Claystone
- Clayey Sand / Sandy Clay
- Bedrock - Silty Shale / Claystone
- Sandy Clay
- Bedrock - Silty Shale
- Gravelly Sand / Sandy Gravel
- Bedrock - Sandstone / Shale

Example 7-1



Example 7-2

