

**SANTA YNEZ COMMUNITY SERVICES DISTRICT**

**MEMORANDUM**

**TO:** Board of Directors  
**FROM:** Loch Dreizler, General Manager  
**DATE:** December 21, 2022  
**SUBJECT:** Horizon Drive Sewer Easement Subsidence

**Proposed Motion / Recommendation**

Finalize the discussion on the Horizon Drive sewer easement subsidence.

**Policy Implications**

The District has *Construction Standards for Public Sewage System Improvements*. These standards are incorporated into project construction documents and specifications.

**Fiscal Implications**

There is approximately \$195,000 remaining from the Horizon Drive project loan fund to use for additional repairs or other Horizon Drive related projects.

**Alternatives Considered**

None

**Discussion**

Recall the chronology graphic from October's Board Memo

**Board direction from the previous meetings:**

- Notify the contractor of the steps the district has taken
- Solicit a proposal from soils consultant(s) to provide additional assurance by taking additional compactions samples within a safe depth of the new sewer line
  - Geo-Solutions - indicated that additional compaction test may not add new information and recommended a change to the top two feet of the trench line for additional assurance.
  - Earth Systems - provided a proposal for five additional compaction samples – scheduled for November 7, 2022
- Take additional compactions samples near *Areas of Concern* and two or three random compaction samples for comparison.
  - Earth Systems took five additional samples – 3 in areas of concern and two random samples
  - Awaiting laboratory reports from compaction sampling – 10 to 20 working days for laboratory results. (November 21 to December 5)
- Review Earth Systems compaction samples to help revise design standards and specifications for future projects

### Recommended design standard changes:

1. Require contractor to wrap gravel bedding in filter fabric before backfilling begins
2. The construction project had 23 compaction sample locations, but we might consider modifying the specifications to do more compaction testing at varying depths.
3. Consider site-specific potential impacts on trenching and backfilling – in this instance, there is nearby stormwater runoff and a county-designated flood plain. We are also familiar with groundwater impacts on existing septic systems.
4. Lastly, understand that native material under normal conditions will subside plus or minus 1% per depth of the trench and that some surface subsidence should be expected and repaired by staff when practical. For example, if the trench is 10' deep, up to .2 feet or about 2¼ inches may naturally subside.

### Attachment:

- Summary report of Soil Moisture / Density and Relative Compaction Profile of the Sewer Trench Backfill
- Auger Type Compaction Samples by Number of Blows

### Notes

- A.** The new samples do not supersede, detract from, or contradict previous results performed by District consultants, and Geo Solution compact results remain accurate.
- B.** The newest compaction results are a guideline for reference only and to aid the district in future decisions about our specifications and standards as indicated above; we were cautioned by Earth Systems about comparing them directly to the Geo-Solution samples, which were taken during construction and these new samples were taken under different conditions using a different technique.
  - a. These latest compaction results differ from those taken during construction because the construction compaction samples were done at varied lifts of undisturbed samples. By contrast, these new compaction samples were taken using a hammer, and a 4" diameter auger pounded into the ground to an 8.5' depth.
  - b. Various other soil conditions can influence the soil characteristics observed during this new sampling process, including cobbles or boulders, cementation, variations in soil moisture, the presence of groundwater, and other factors.
  - c. The higher the number of blows (hammer) – the higher the relative compactions (see the following page)
  - d. More of an art than a science when determining the reasons for soil subsidence:
    - i. The original greatest area of concern had the best compaction results
    - ii. A random sample had the 2<sup>nd</sup> highest compaction results

Boring Legend

Boring #1 - was just inside the corral and had the highest relative compaction.

Boring #2 - was just outside the corral

Boring #3 - was the 3<sup>rd</sup> boring where staff suspected less compaction from previous observations.

Boring #4 - was the first random sample, had the second highest relative compaction

Boring #5 - was the second random sample

Hammer Blow Count - Compaction Samples								
November 7, 2022 by Earth Systems								
Boring Number		1.5	2	2.5	Depth'			
1	87	3	5	7	Blows	15		
		3.5	4	4.5	Depth'			
	87	5	14	21	Blows	40		
		5.5	6	6.5	Depth'			
	89	11	36	50	Blows	97		
		7.5	8	8.5	Depth'			
	97	16	34	50	Blows	100		
Average Relative Compaction	90	Total Number of Hammer Blows				252	88	1
Boring Number		1.5	2	2.5	Depth'			
2	86	3	3	5	Blows	11		
		3.5	4	4.5	Depth'			
	80	2	4	8	Blows	14		
		5.5	6	6.5	Depth'			
	81	10	24	45	Blows	79		
		7.5	8	8.5	Depth'			
	85	12	30	50	Blows	92		
Average Relative Compaction	83	Total Number of Hammer Blows				196	83	3
Boring Number		1.5	2	2.5	Depth'			
3	82	3	4	9	Blows	16		
		3.5	4	4.5	Depth'			
	84	5	7	8	Blows	20		
		5.5	6	6.5	Depth'			
	81	6	9	15	Blows	30		
		7.5	8	8.5	Depth'			
	76	12	12	19	Blows	43		
Average Relative Compaction	81	Total Number of Hammer Blows				109	81.5	5
Boring Number		1.5	2	2.5	Depth'			
4	88	12	25	33	Blows	70		
		3.5	4	4.5	Depth'			
	78	8	13	18	Blows	39		
		5.5	6	6.5	Depth'			
	89	12	21	33	Blows	66		
		7.5	8	8.5	Depth'			
	87	11	25	32	Blows	68		
Average Relative Compaction	86	Total Number of Hammer Blows				243	87.5	2
Boring Number		1.5	2	2.5	Depth'			
5	76	10	10	14	Blows	34		
		3.5	4	4.5	Depth'			
	82	10	10	16	Blows	36		
		10	24	45	Depth'			
	81	8	11	16	Blows	35		
		46	46.5	47	Depth'			
	83	5	11	17	Blows	33		
Average Relative Compaction	81	Total Number of Hammer Blows				138	81.5	4