Ogden Report-1992

9.0 SUMMARY

The following are pertinent data derived from the Ogden Phase I environmental assessment:
There is an inactive landfill on the LTMR site south of Ralston Creek.
The 25 acres of the LTMR site north of Ralston Creek does not appear to have been impacted by human activities.
The property that borders the south bank of Ralston Creek appears to be polluted by discharges from the landfill. Visible hydrocarbons are on the water surface.
Groundwater samples from the landfill contain lead at concentrations of .0065 mg/L, which is above the EPA drinking water standard of .0050 mg/L.
Soil samples from the landfill contain volatile organic compounds. Offending analytes are methylenechloride, acetone, tetrachloroethane, toluene, and total xylenes.
A composite soil sample demonstrated an excessive concentration of lead in the amount of 54 mg/kg

10.0 RECOMMENDATIONS

Based on the evaluation of prior data and data collected during the Preliminary Phase II site assessment, it is probable that contaminants are present on the site and that the potential for migration to offsite localities exists. Therefore, we would recommend the following activities to more clearly define the extent and nature of contamination on the LTMR site:

- Excavate spot locations of high magnetic response to determine if leaking drums are present.
- Design a statistically-based random soil sampling program.
- Design a statistically-based groundwater sampling program. Install deeper auger drilled monitoring wells at 30 to 50 ft depth.
- Case with large enough PVC for retrieving samples by bailing or the bladder pump method.
- Screen shallow groundwater monitoring wells in the landfill material and schedule sampling to be collected to allow for seasonal flux of contaminants.
- Determine perched water elevation. Selectively screen below landfill in permanent water table at low aquifer confining elevations to test for heavy compounds.
- Determining permanent water table and, if possible, the lower base confining depth.
- Schedule interval time sampling for surface water monitoring of Ralston Creek. Identify flora/fauna kill mechanisms.
- **Landfill area should not be developed for commercial or residential construction.** (Emphasis added)
- Monitor contemporary methane presence

Chen Report-1982

Based on these readings, it appears that combustible gas is being generated within this landfill in quantities sufficient to be considered a hazard. The combustible range of methane gas is between 5% and 15% by volume in air. Concentrations above this range are too rich to burn.

However, gas migration or exposure to the atmosphere will result in dilution of the gas and result in a flammable condition. Care should be taken when excavating within or adjacent to the landfill mass. Venting of excavations will be required. Any C " J > "z /..J <1 structures built over the landfill will require special methane gas controls. There are 2 basic approaches to controlling the migration of methane into structures. These include barriers separating the proposed structure from the landfill and ventilation systems.

Access roads, parking areas, underground utilities and other facilities constructed on landfill materials will be subjected to large ... differential movements and a corrosive environment. Hie owner should be aware of the high risk of distress associated with construction on landfills.

CONCLUSIONS
(1) The proposed structure should be founded on piers drilled into bedrock and designed for maximum end bearing pressure of 40,000 psf, a skin friction of 4,000 psf and a minimum dead load pressure of 15,000 psf, with design and construction details as outlined.
(2) Alternate foundation systems consisting of steel H-piles and designed for a maximum stress of 12,000 psi with tip reinforcement or spread footings placed on the lower sand and gravel strata and designed for a maximum bearing pressure of 6,000 psf may be used.
(3) Trash fill varying in depth from 8 to 16 feet was encountered across the site south of Ralston Creek. **This landfill material is generating sufficient quantities of combustible methane gas to be hazardous**

Proposed RV Storage Yard Geotechnical Engineering Report 6800 Kilmer Street August 4, 2023 | Terracon Project No. 25235085

The Ralston Creek Trail is located adjacent to the northwest corner of the site between Ralston Creek and the Croke Canal. This trail is used for public recreation. There are no fences or other barriers to prevent access to the site. **The closest residence to the site is located within 200 feet of the southeast corner of the site across the Croke Canal**. P 551 (Since this section is from a 1995 report, the house identified is probably the non-HOA house below me)

Based upon the results of our field exploration and laboratory testing, it is our opinion that the existing fill materials and landfill debris should not be used to support foundations, interior slabs, exterior slabs-on-grade construction without complete removal and modification. P 114

Existing Fill Materials and Landfill Debris About 9 to 14 feet of existing fill materials and landfill debris was encountered in the exploratory borings. The landfill debris primarily consisted of construction debris and domestic trash. We understand the site is within the boundaries of a pre-existing landfill. Landfill debris can degrade and/or decompose over time, consolidate with fluctuation or infiltration of water, or collapse unpredictably, resulting in a very high risk of movement. **Because of the high risk of significant movement, it is our opinion that unimproved existing fill and landfill debris should not be used to support foundations or slab-on-grade construction. Due to the depths of the fill and debris, complete removal of the fill and landfill debris may be cost-prohibitive for the project.** P 121

The stability of subgrade soils may be affected by precipitation, repetitive construction traffic, or other factors. If unstable conditions are encountered or develop during construction, workability may be improved by overexcavation of wet zones and mixing these soils with crushed gravel. Use of geotextiles could also be considered as a stabilization technique. Lightweight excavation equipment may be required to reduce subgrade pumping.

Engineered fill should consist of approved materials that are free of organic matter and debris. P 123

1. We recommend that engineered fill be tested for water content and compaction during placement. Should the results of the in-place density tests indicate the specified water or compaction limits have not been met, the area represented by the test should be reworked and retested as required until the specified water and compaction requirements are achieved.
2. Water levels should be maintained low enough to allow for satisfactory compaction to be achieved without the compacted fill material pumping when proofrolled.
3. Moisture conditioned clay soils should not be allowed to dry out. A loss of moisture within these materials could result in an increase in the materials expansive potential. **Subsequent wetting of these materials could result in undesirable movement.** P 124-125

Utility Recommendations
It has been our experience with other structures constructed on landfill debris that utilities constructed below or adjacent to structures on landfill debris will move significantly and will likely require excavation and full replacement multiple times over the life of the office building. Utilities constructed below structurally-supported floor systems should not be supported on the subgrade, but should be suspended in crawlspace areas independent of the subgrade materials. Utilities outside of the office building constructed on or within the existing fill materials over the existing landfill debris will have a very high risk of movement. Long-term movement from the landfill debris cannot be quantified due to the nature of the debris, and reduction or

elimination of this type of movement is likely only possible through complete removal of the fill and debris. **It is our opinion that movement on the order of 2 feet or more is possible.** P 127

Structurally Supported Floor Recommendations

Based on the subsurface conditions, slabs-on-grade constructed on the landfill debris without any modification is not recommended, as the slabs will have a very high risk of movement. Due to the depths of the fill and debris, complete removal of the fill and landfill debris below the office building may be cost-prohibitive for the project. On this basis, we recommend the interior floor system of the office building be designed as a structurally supported floor, supported independently of the of the subgrade materials. P 129

Exterior Flatwork

Exterior flatwork constructed over unimproved landfill debris will have a very high the risk of long-term movement. Long-term movement from unimproved landfill debris cannot be quantified due to the nature of the debris, and reduction of this type of movement is likely only possible through complete removal of the fill and debris. Due to the depths of the fill and debris, complete removal of the fill and landfill debris below exterior flatwork may be cost-prohibitive for the project. Support of exterior flatwork on the existing fill and landfill debris can be considered; **however, it has been our experience that flatwork constructed on unimproved landfill debris will move significantly and will likely require frequent observation and maintenance, in addition to full replacement multiple times over the life of the development.** Frequent maintenance and full replacement of flatwork on unimproved landfill debris should be anticipated for this development. To reduce the risk of shallow, localized movement of exterior flatwork, we recommend that the subgrade materials are scarified or removed to a depth of at least 12 inches and properly moisture treating and compacting suitable on-site soils to grade. New fill materials beneath slabs-on-grade should be placed and compacted as outlined in the Earthwork section of this report. Again, t**his recommendation is intended to reduce the risk of shallow, localized movement but will not reduce the risk of deep, long-term movement of the existing fill and landfill debris.** P 130

For the proposed RV storage lot, Table 5.07.1.1 of the Standards states the minimum 20-year, 18-kip Equivalent Single Axle Load (ESAL) for Commercial and Business parking lots as 70,000. This ESAL value was utilized for our design. We anticipated a gravel fire access road may be planned at the site. We have assumed that the fire access road will experience a maximum of one trip per week of a fire truck with a maximum weight of 85,000 pounds and three axles. The traffic loading for the fire truck is included in our ESAL estimate for this project. P 131

It is imperative that the subgrade be protected from a loss of moisture. **A significant loss of moisture of the pavement supporting materials could result in additional movement of the subgrade.** P 132

Aggregate-Surfaced Roadways –

Maintenance Future performance of aggregate surface areas constructed at this site will be dependent upon several factors, including:

■ Maintaining stable moisture content of the subgrade soils both before and after roadway construction.

■ Providing for a planned program of preventative maintenance. Rutting of the aggregate surface layer and loss of surfacing materials will occur over the life of the drives/parking areas. Maintenance of the surface material and drainage are critical to the performance of aggregate surface roads. Since the surface materials are unprotected, proper drainage is key against loss of strength and stability of the surface materials. **Poor drainage allows water to remain on the surface and percolate into the aggregate base course section, reducing the strength of the underlying subgrade soils.** Well-shaped crowns with a slope of at least ½ inch per foot and adequate surface ditches or subsurface drains are essential to achieving rapid surface drainage.

Maintenance of the roadway shape and ditches or drains should be performed at least twice a year, particularly during wetter periods of the year and when snow removal is required, though more frequent maintenance may be required depending on actual traffic, drainage, and smoothness requirements. If unstable conditions develop during roadway usage, scarifying and drying of the subgrade, or placement of additional gravel material may be required. **Loss of surfacing materials from dust can be significant and may result in a roadway surface course that is several inches thinner within a few years. The reduced thickness will result in loss of strength and poor drainage.** P 133

Construction Considerations
Site grading is generally accomplished early in the construction phase. However, as construction proceeds, the subgrade may be disturbed due to utility excavations, construction traffic, desiccation, or rainfall. As a result, the subgrade may not be suitable for construction and corrective action will be required. The subgrade should be carefully evaluated at the time of construction for signs of disturbance or excessive rutting. **If disturbance has occurred, subgrade areas should be reworked, moisture conditioned, and properly compacted** to the recommendations in this report immediately prior to placing aggregate surface materials. P 132

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken. P 134