

**ATTACHMENT A
GEOTECHNICAL
RECOMMENDATION LETTER**

WHITMAN COUNTY

Department of Public Works

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Colfax, WA 99111

March 3, 2020

TO: **FILE No. XEW36**

RE: **REPORT**
Geotechnical Engineering Evaluation
Summary Report for the
MRW Building Remodel Project
Solid Waste Facility – Carothers Road
Whitman County, Washington

The purpose of this evaluation is to assess the geotechnical engineering related conditions within the proposed construction area and provide opinions and recommendations with respect to project design and construction. The following steps were included in the scope:

- Reviewed previous geotechnical information for the site from the new Waste Transfer Facility project, and appurtenant structures/improvements, initiated in 2012.
- Reviewed the construction-related information for the new facilities at the site with respect to the geotechnical features.
- Reviewed historical information for the site with respect to the existing MRW facility, including recent installation of utilities around the site improvements.
- Participated in meetings with the design team regarding the proposed site improvements, including layout information regarding the proposed additions.
- Prepared this summary report of findings and recommendation relative to the proposed improvements.

Proposed Construction

Whitman County, in its desire to upgrade facilities at the Carothers Road Solid Waste handling facility, wishes to upgrade the existing Moderate Risk Waste (MRW) Building to improve functionality, environmental protections, and improve worker safety. The upgraded building will incorporate the existing facility into the footprint, and include two additions to enhance function.

The following generally describes the project as included in Great West Engineering's Design Basis Report:

- Provide adequate secondary containment in the material processing areas.
- Provide sufficient ventilation, including ventilation cabinets at the bulking stations and spot/snorkeler ventilation for future can crusher and/or aerosol can crusher units.
- Provide fixed-combustible gas monitoring, both low and high, for the detection of gases.

- Provide explosion-proof electrical systems for the possibility of flammable gas buildup within the building areas.
- Enclose the MRW Building and add a cover to the material drop-off areas to provide a sheltered receiving area for vehicles.
- Add additional enclosed building areas to facilitate the various functions for material handling and storage.
- Improve site conditions around the building to compliment the function of the new processing and storage areas.

Subsurface Conditions

The subsurface conditions at the Carothers Road Solid Waste Facility consist of a mixture of undisturbed native soils, disturbed native soils/uncontrolled fill materials (consisting of materials similar to the native materials), and compacted crushed aggregate surfacing materials. The existing MRW building is situated in an area that sits in an old cut, created when the site was originally developed for solid waste handling. The cut exposed native clay soils that were overlain by approximately two feet of fill and disturbed native soils. There are no pertinent geotechnical-related records from the original building construction. Furthermore, there are no records regarding the level of compaction, or the details of site preparation.

The area of the proposed MRW Building remodel and expansion is near the existing recyclables storage facility. The existing MRW facility shows no drastic signs of settlement related distress. It is presumed that the near surface fills have been in place for at least 20 years, and our observations are that the fill is similar in character and material types as the fill that was encountered in the area of the nearby new Waste Transfer Building. A geotechnical investigation was completed for planning and construction of the new Waste Transfer Building and appurtenant improvements. The study was conducted by Strata, Inc, of Pullman, WA, and documented in a report dated August 29, 2012. Two exploratory borings were completed in the general vicinity of the MRW Building, and encountered materials similar to those we have observed in nearby utility excavations. The exploration and engineering recommendations from that study, in conjunction with observations and known site history, formed much of the basis for the conclusions and recommendation contained herein.

Opinions

The location for the MRW Building remodel and proposed additions are underlain at 2.5 to 3 feet by native clay soils. The materials, if exposed and prepared in accordance with this report, are considered suitable for support of the proposed foundations. It is recommended that foundations bear directly on undisturbed native soils or on compacted fill that derive their support from the underlying native materials. Foundations excavations prepared in this manner may be designed for a minimum static bearing capacity of 2000 psf (pounds per square foot). A one-third increase in bearing capacity can be assumed for transient (instantaneous) loads such as seismic.

The surface materials, in the vicinity of the proposed construction, are uncontrolled and undocumented fill. The thickness of the uncontrolled fill is not precisely known, but varies between about 2.5 and 3 feet. The uncontrolled fill in the proposed additions shall be removed down to suitable support material, and replaced with controlled and compacted structural fill to

the subgrade level for the proposed building additions. Slabs on grade for the additions should bear on undisturbed native material, or upon compacted fill. Most of the material removed from the areas of the additions can likely be re-used as compacted fill for the support of slabs on grade. Some deleterious materials (such as chunks of concrete, asphalt, and organic rich topsoil) may exist within the uncontrolled fill. These materials are not suitable for re-use as compacted fill.

Site Preparation

The site shall be stripped to at least two feet below the design grade for the MRW Building. The resulting surface must be reviewed by the Geotechnical Engineer (“Whitman County Engineer”) to determine if additional excavation is required to provide suitable support for the intended improvements. If additional excavation is required, then the material must be removed to the satisfaction of the Geotechnical Engineer, then replaced with compacted general backfill. If additional excavation is not required, then the resulting surface must be “proof” compacted prior to receiving structural fill or placing the improvements. Undisturbed native soils (free of soft spots) are suitable for support of the improvements. Once the material is excavated to a suitable material, the planned subgrade can be established by placing controlled and compacted structural fill.

The anticipated excavations in the native and fill soils can be accomplished with conventional soil excavation equipment such as backhoes, trackhoes and bulldozers. The majority of the material excavated from the areas is suitable for re-use as general backfill. Excavated material that exhibits excessive moisture, organics, or other deleterious material (such as concrete and asphalt chunks) is not suitable for re-use.

Subgrade Preparation

Any created surface that is to receive fill over it, including roads and yard areas, must be “proof” compacted to identify soft spots or unsuitable materials. Any fill material placed to support the improvements must be compacted to structural fill requirements, at least 95% of the maximum density, as determined by ASTM D-1557, Modified Proctor.

All materials to receive structural fill, or to be used as structural fill, must be approved by the Geotechnical Engineer prior to use. The subgrade materials must be moisture conditioned to within 3% on the “dry” side of optimum moisture (as determined by ASTM D-1557), or within 2% on the “wet” side of optimum. All subgrades must be tested by the construction contractor, and either approved or rejected, by the Owner’s representative prior to receiving fill materials or placement of structures.

Compacted General Backfill

Fill materials placed at the site under or within 5 feet of the site improvements, or used for trench backfill, shall be placed as structural fill. Native soils excavated from the site (excluding topsoil) are suitable for re-use general backfill. Imported general fill or backfill, shall consist of material designated as GW, GP, GM, SW, SP or SM according to the Unified Soil Classification System. Fill shall be placed in lift that do not exceed 8 inches in uncompacted thickness.

Structural Fill Requirements

Fill materials placed under or within 5 feet of the site improvements, or used for trench backfill, shall be placed as structural fill. Native soils excavated from the site (excluding topsoil) are suitable for re-use as general fill and backfill. Imported fill, that will be used for structural support, shall consist of structural fill material designated as crushed aggregate, such as ¾-inch or 5/8-inch minus crushed surfacing. Requirements for structural fill shall be in accordance with the project design documents.

Any fill placed as a structural fill (to support site improvements) must be compacted as structural fill, to at least 95% of ASTM D-1557, Modified Proctor. All materials to either receive structural fill, or to be used as structural fill, must be approved by the Geotechnical Engineer prior to use. All structural fills must be moisture conditioned to within 3% on the “dry” side of optimum moisture (as determined by ASTM D-1557), or within 2% on the “wet” side of optimum. All fill placement will be tested, and either approved or rejected, by the owner’s representative. All pipe bedding materials must consist of rounded or sub-rounded granular aggregate, specifically intended for that purpose.

Soil Properties

Soil friction values, for design of foundations and earth structures, can be computed using the following:

Soil to soil: Phi min = 30 degrees

Soil to crushed rock: Phi min = 30 degrees

Crushed rock to rock: Phi min = 45 degrees

Cast in place Concrete

Cast-in-place concrete elements and portland cement concrete pavements and slabs should be designed for their intended use. Structural concrete shall have a minimum compressive strength of 4,000 psi and general site utility pads shall have a minimum strength of 3,000 psi. Exposed concrete surfaces shall contain at least 4.5 to 7 percent entrained air content. All concrete improvements must be underlain by compacted structural fill, consisting of at least 8 inches of Crushed 5/8 -inch minus CSTC, compacted to at least 95% of the maximum as determined by ASTM D-1557, Modified Proctor. The crushed surfacing must be underlain by compacted fill material consisting of native soil or imported structural fill.

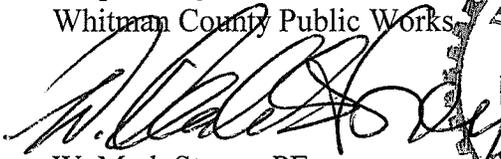
Roadway Surfacing

The project will consist of multiple building and site improvements. At the completion of the project, many of the areas not blocked by bollards in proximity to the improvements will be accessible to vehicular traffic. These areas shall be surfaced with at least 8 inches of compacted CSTC, underlain by a non-woven separation geotextile (such as 6-ounce non-woven GXT). In areas to receive Asphaltic Concrete Paving (ACP) shall be underlain by at least 8 inches of compacted CSTC. All CSTC shall be compacted to at least 95% of the maximum as determined by ASTM D-1557, Modified Proctor. Alternately, in areas that are to receive ACP paving that have not been disturbed during construction of the project shall be “proof” compacted to the satisfaction of the Geotechnical Engineer. Any soft spots or unsuitable areas shall be mitigated

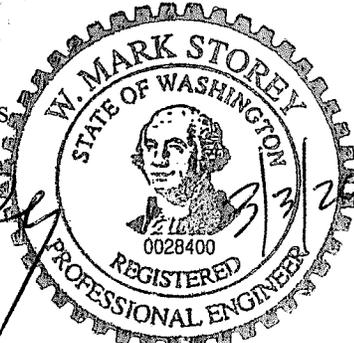
(removal and replacement of soft areas with CSTC) to the satisfaction of the Geotechnical Engineer prior to paving.

All geotechnical questions shall be directed to the Geotechnical Engineer or his authorized representative.

Respectfully Submitted,
Whitman County Public Works



W. Mark Storey, PE
Whitman County Engineer



EXPIRES 9-22-20