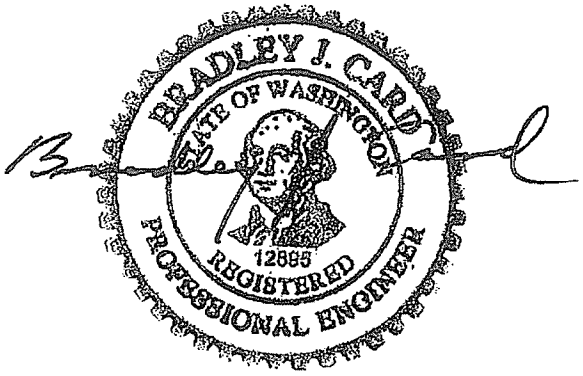
# REPORT ON GEOTECHNICAL INVESTIGATION

## 8710 and 8860 Thorp Prairie Road
## Cle Elum, Washington




**May 2012**

**Job No. 12089A**

**Prepared by**

**PLSA Engineering & Surveying**
**1120 West Lincoln Avenue**
**Yakima, Washington 98902**
**(509) 575-6990**

# REPORT ON GEOTECHNICAL INVESTIGATION

**8710 and 8860 Thorp Prairie Road**
**Cle Elum, Washington**

## INTRODUCTION

CDPC, LLC retained PLSA Engineering and Surveying to perform a geotechnical investigation of two contiguous parcels totaling approximately 65 acres at 8710 and 8860 Thorp Prairie Road, Cle Elum, Washington.

This report summarizes the results of our geotechnical investigation and offers our recommendations for soil bearing values and site preparation for mobilizing soil support. The investigation consisted of visual inspection of the area and excavation of five soil test pits using a Bobcat mini-excavator. Geotechnical engineers from PLSA, experienced with local soil conditions, logged each test pit and observed and field classified the soils found.

Included in this report are the following:

- Soils logs and field classifications of the soils encountered in the five test pits.
- Groundwater presence.
- Estimated frost penetration.
- Recommended footing depth.
- Recommended footing trench preparation.
- Soil bearing recommendations.
- Structural fill recommendations.
- Parking lot site preparation and paving recommendations.
- Seismic zone information.
- Storm water infiltration rate.
- Liquefaction Potential
-

## LAND USE AND SURFACE CONDITIONS

A formerly timbered area of approximately 65 acres has been cleared and then used as a hayfield for many years. The property is bordered by Thorp Prairie Road on the west, a steep ravine on the north, Kittitas Reclamation District Canal followed by a steep bluff on the east, and timbered property on the south. A farmhouse, barn, outbuildings, and equipment are found in the northwest corner of the site with the balance being gently sloping open ground. Electric and telephone utilities are available.

The default seismic soil classification for the location is Site Class D. Based on Soil Site Class D, the USGS reports the following seismic parameters for designs using the provisions of the 2009 International Building Code:

**Table 1. Seismic Design Parameters**

| | 0.2 Second | 1.0 Second |
|---|---|---|
| Maximum Considered Earthquake (MCE) Spectral Acceleration | $S_s$=0.623 | $S_1$=0.210 |
| Site Coefficient | $F_a$=1.301 | $F_v$=1.981 |
| MCE Adjusted for Site Class effects (Site Class D) | $S_{MS}$=0.811 | $S_{M1}$=0.415 |
| Design Spectral Acceleration | $S_{DS}$=0.541 | $S_{D1}$=0.277 |

## LIQUEFACTION POTENTIAL

Liquefaction is a phenomenon caused by a rapid increase in pore water pressure in loose soils that reduces the effective stress between soil particles to near zero. This rapid increase in pore water pressure can cause a loss of soil shear strength. This location has no history of liquefaction.

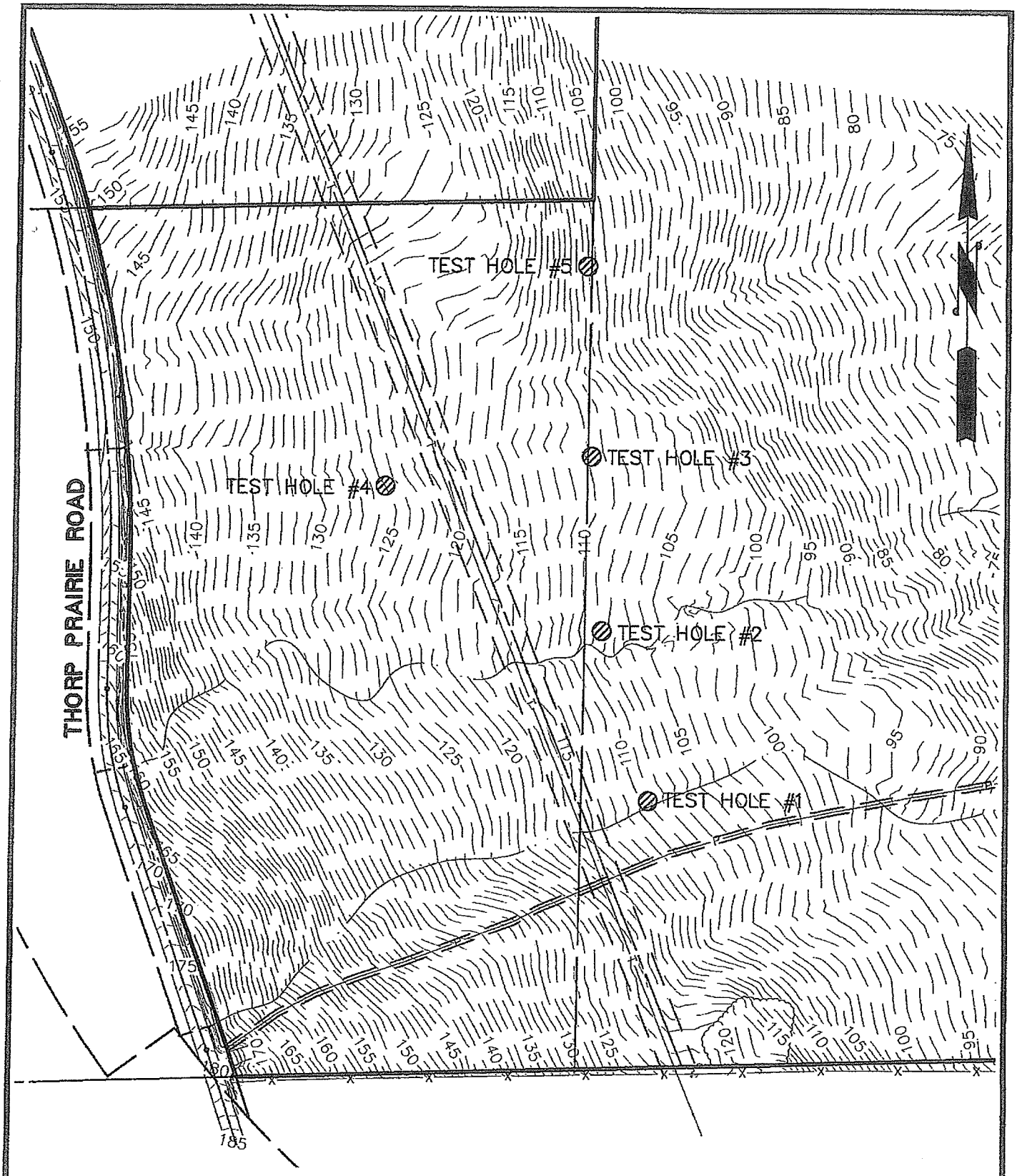
## SUB-SURFACE CONDITIONS

Test pit logs may be found in Plates 1 through 5. Test Pit locations are depicted in Figure 1. Soils encountered in the five test pits were similar with all having a surface stratum of moist silty clay down to a stratum of clay, cobbles, and gravel encountered at 5 to 7 feet below ground surface (bgs) where backhoe refusal was met. Free groundwater was encountered at approximately 3 feet below the ground surface in four of the test pits. USDA Soil Conservation Service (SCS) classifies the soil as "Swauk-Qualla complex", which is predominantly highly plastic clay. See Appendix I, NRCS Soil Engineering Properties.

Frost action is usually severe in the area due to the water holding capacity of the silty clay soils. Frost penetration for the project location is estimated at 36 inches. Frost damage may be minimized by placing footings a minimum of 36 inches below finished grade and by placing footings on fill of free draining soil such as crushed rock.

## SOIL BEARING RECOMMENDATIONS

Plastic clay soils, such as that reported by NRCS to be on the site, tend to shrink and swell with changing moisture content and are increasingly unstable as moisture content increases. There are strategies for increasing soil stability. One such strategy is mixing the soil with lime which increases stability. Lime is a by-product of controlled atmosphere storage used by the nearby fruit industry and is often available for hauling cost. Another strategy is to excavate to a depth where soil moisture is relatively constant and therefore shrink and swell are minimized. Upon reaching a depth at which soil moisture variation is small, geotexile fabric and possibly geogrid is placed to provide separation between the selected fill material and the clay and to increase shear strength of the clay so as to support the contemplated load. All of these strategies require




JUNE 7, 2012
JOB NO. 12089

**PLSA**

ENGINEERING-SURVEYING-PLANNING
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**TEST PIT LOCATIONS**
**8860 THORP PRAIRIE ROAD**
**CLE ELUM, WASHINGTON**

PREPARED FOR
C.D.C.P.

investigation beyond the scope of this geotechnical investigation and the cost is greater relative to sites having soils more suitable for supporting structures or paving.

PLSA understands that a single story industrial/commercial building with up to 8-10 foot wall height and having fabric roof covering are contemplated.

The silty clay soil present exhibits moisture holding capacity. Soils relied on for slab support and which are persistently too moist for the subgrade to be compacted to 95 of maximum density as determined by ASTM D-1557 are recommended to be prepared by placing geotextile fabric, such as Mirafi 500X, on the proof rolled subgrade. Place a drainage layer over the geotextile consisting of a minimum of 12 inches of 3/4-inch minus, free-draining, cohesionless, crushed rock compacted in layers to 95 percent of maximum density as determined by ASTM D-1557. This subgrade preparation should achieve a subgrade reaction value, $K_S$, of 180.

If the 95 percent compaction of the subgrade is achievable, the geotextile fabric may be omitted.

Silty clay soil in footing trenches is expected to contain too much moisture to achieve 95 percent compaction as determined by ASTM D-1557, and to resist drying by aeration. Footing trench preparation is recommended as follows: Excavate footing trenches to reach the stratum containing cobbles and gravel and a minimum of 2 feet wider than the footing. Proof roll the exposed trench bottom, place geotextile fabric such as Mirafi 500X across the trench bottom and a minimum one foot up each side. Then place a drainage layer of a minimum of 12 inches of compact, cohesionless, free-draining, granular material, such as 3/4-inch minus crushed rock compacted in 4 inch lifts to 95 percent of ASTM D-1557 up to desired footing grade.

Using a recommended minimum footing width of two feet and the footing trench preparation method recommended above, satisfactory soil support for loadings up to 2,000 pounds per square foot (psf) should be achieved.

NRCS reports a significantly higher Plasticity Index and a relatively high shrink/swell potential. This could result in volume change in soils supporting footings or slabs. This is manifested by settlement or expansion. This volume change can be minimized by placing footings at depth where the cobbles and gravel is encountered and moisture content of the soil remains constant within a narrow range. Alternatively, footings and slabs can be placed on free draining fill extending down to a depth selected to minimize seasonal changes in soil moisture content. For buildings having footing loads equivalent to that of a residence, basement depth is usually sufficient to achieve a location of relatively stable moisture content.

All roof and surface drainage is recommended to be directed away from the footings. Buildings should be elevated or placed on structural fill as necessary to provide slope to insure adequate drainage.

## STRUCTURAL FILL

Structural fill should not be placed over debris that may be poorly consolidated or contain organic material or metal which may decompose and settle with time. All such unsuitable materials should be removed and replaced with additional structural fill as described herein. All

areas to receive structural fill are recommended to be stripped of all vegetation, organic material, demolition debris, and trash and proof rolled to 95 percent of maximum density as determined by ASTM D-1557 for a depth of 6 inches before placing fill.

The undisturbed soil supporting structural fill should be near optimum moisture content for compaction. Add water or dry the soil by processing as necessary to achieve moisture content suitable for compaction. Fill subgrade soils too wet to be adequately compacted should be dried to a suitable moisture content before receiving structural fill, or the structural fill should be placed over geotextile fabric, such as Mirafi 500X followed by geogrid reinforcement.

Imported soil used for structural fill is recommended to be cohesionless, free draining, non-plastic material with a maximum particle size of two inches, or other material as approved by a geotechnical engineer from this office.

All structural fill should be placed and compacted in layers not exceeding 6 inches in thickness. Water should be added as needed to achieve satisfactory moisture content for compaction.

Recommended compaction for structural fill is 95 percent of maximum density as determined by ASTM D-1557. All fill shall be firm and stable. It is further recommended that all soil compaction as recommended herein be monitored using a nuclear density gauge.

Excavations resulting from removal of underground structures such as septic tanks and petroleum tanks are recommended to be backfilled using procedures described for structural fill.

Structural fill placed as described above is expected to provide bearing support equivalent to that for footing trenches in the native silty clay soil, which have been prepared as recommended herein.

## STORM WATER INFILTRATION

Storm water infiltration rate is affected by the degree of soil compaction. The infiltration rate for uncompacted native soil typically found at the location studied is less than ¼ inch per hour. Infiltration rate testing is recommended before design of a storm water management system relying on percolation into the ground for disposal. Construction of a grassy swale(s) to receive storm water has promise of being an economical storm water management choice.

## PAVING RECOMMENDATIONS

All areas to be paved should be cleared of all grass, roots, trash, metal and organic materials down to full depth below the paving mat. The exposed soil surface should then be proof rolled to 90 percent of maximum compaction as determined by ASTM D-1557 using a mechanical vibratory compactor. If soil is too wet to achieve compaction and cannot be effectively dried, place geotextile fabric such as Mirafi 500X over the prepared subgrade. Place compact base material and asphaltic concrete paving as described below

The following specification is our recommendation for paving and subgrade: Asphaltic Concrete Paving shall conform to Washington State Department of Transportation Standard

Specifications 2004, Division 5, Class HMA ½. Compact the subgrade and any fill to 95 percent of maximum compaction as determined by ASTM D-1557. Areas subject to truck traffic shall be a minimum of 3 inches of asphaltic concrete placed over a minimum of 12 inches of free-draining, compact, granular base material conforming to the particle size distribution found in the Standard Specifications, Division 9 for HMA ½.

Asphaltic concrete paving placed on parking lot areas used exclusively by automobiles may be reduced to two inches compacted thickness.

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# EXCAVATION LOG NO.: 1

BY: BJC/SG
DATE: 5/29/12
JOB NO. 12089A
ELEVATION:
LOCATION: SOUTH END PROP. NORTH OF BURIED ELECTRIC POWER LINE

SURFACE CONDITIONS: GRASS

| DEPTH IN FEET | MOISTURE CONTENT % | UNIT WEIGHT | SAMPLE | SYMBOL | DESCRIPTION | REMARKS |
|---|---|---|---|---|---|---|
| 1<br>2<br>3 | | | | CH | DARK BROWN CLAY | WET |
| 4<br>5<br>6 | | | | CH | TAN CLAY | FREE GROUNDWATER |
| 7<br>8<br>9<br>10<br>11<br>12<br>13<br>14<br>15 | | | | CH | CLAY, COBBLES, GRAVEL - BACKHOE REFUSAL EXCAVATION TERMINATED | |

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# EXCAVATION LOG NO.: 2

BY: BJC/SG
JOB NO. 12089A
LOCATION: NORTH OF TEST PIT NO. 1

DATE: 5/29/12
ELEVATION:

SURFACE CONDITIONS: GRASS

| DEPTH IN FEET | MOISTURE CONTENT % | UNIT WEIGHT | SAMPLE | SYMBOL | DESCRIPTION | REMARKS |
|---|---|---|---|---|---|---|
| 1 | | | | CH | DARK BROWN CLAY | MOIST |
| 2 | | | | | | |
| 3 | | | | | | WET |
| | | | | | FREE GROUNWATER | WET |
| 4 | | | | CH | BROWN CLAY, COBBLES, GRAVEL & CLAY | MOIST |
| 5 | | | | | | |
| 6 | | | | | BACKHOE REFUSAL EXCAVATION TERMINATED | |
| 7 | | | | | | |
| 8 | | | | | | |
| 9 | | | | | | |
| 10 | | | | | | |
| 11 | | | | | | |
| 12 | | | | | | |
| 13 | | | | | | |
| 14 | | | | | | |
| 15 | | | | | | |

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# EXCAVATION LOG NO.: 3

BY: BJC/SG
JOB NO. 12089A
LOCATION: NORTH OF TEST PIT NO. 2

DATE: 5/29/12
ELEVATION:

SURFACE CONDITIONS: ALFALFA

| DEPTH IN FEET | MOISTURE CONTENT % | UNIT WEIGHT | SAMPLE | SYMBOL | DESCRIPTION | REMARKS |
|---|---|---|---|---|---|---|
| 1 | | | | CH | CLAY | MOIST |
| 2 | | | | | | |
| 3 | | | | CH | CLAY & BOULDERS | FREE GROUNDWATER |
| 4 | | | | CH | CLAY & COBBLES | WET |
| 5 | | | | CH | RED/BROWN CLAY, COBBLES & BOULDERS | VERY MOIST |
| 6 | | | | | BACKHOE REFUSAL EXCAVATION TERMINATED | |
| 7 | | | | | | |
| 8 | | | | | | |
| 9 | | | | | | |
| 10 | | | | | | |
| 11 | | | | | | |
| 12 | | | | | | |
| 13 | | | | | | |
| 14 | | | | | | |
| 15 | | | | | | |

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# EXCAVATION LOG NO.: 4

BY: BJC/SG
JOB NO. 12089A
LOCATION: NORTH OF TEST PIT NO. 3

DATE: 5/29/12
ELEVATION:

SURFACE CONDITIONS: ALFALFA

| DEPTH IN FEET | MOISTURE CONTENT % | UNIT WEIGHT | SAMPLE | SYMBOL | DESCRIPTION | REMARKS |
|---|---|---|---|---|---|---|
| 1 2 | | | | CH | CLAY SOME COBBLES | DRY |
| 3 | | | | CH | RED/BROWN CLAY WITH COBBLES | MOIST |
| 4 5 | | | | CH | LARGE BOULDERS (3) WITH CLAY | MOIST |
| 6 7 8 9 10 11 12 13 4 15 | | | | | BACKHOE REFUSAL EXCAVTION TERMINATED | |

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# EXCAVATION LOG NO.: 5

BY: BJC/SG
JOB NO. 12089A
LOCATION: NORTH OF TEST PIT NO. 3

DATE: 5/29/12
ELEVATION:

SURFACE CONDITIONS: ALFALFA

| DEPTH IN FEET | MOISTURE CONTENT % | UNIT WEIGHT | SAMPLE | SYMBOL | DESCRIPTION | REMARKS |
|---|---|---|---|---|---|---|
| 1 | | | | CH | DARK BROWN CLAY | MOIST |
| 2 | | | | | | |
| 3 | | | | | FREE GROUNDWATER | WET |
| 4 | | | | CH | RED/BROWN CLAY WITH SOME COBBLES & GRAVEL | MOIST |
| 5 | | | | | | |
| 6 | | | | | | |
| 7 | | | | | | |
| 8 | | | | | EXCAVATION TERMINATED | |
| 9 | | | | | | |
| 10 | | | | | | |
| 11 | | | | | | |
| 12 | | | | | | |
| 13 | | | | | | |
| 14 | | | | | | |
| 15 | | | | | | |

# APPENDIX I

# NRCS SOIL ENGINEERING PROPERTIES

Table 8.--Engineering Properties--Continued

| Map symbol and soil name | Depth | USDA texture | Classification | | Fragments | | Percentage passing sieve number-- | | | | Liquid limit | Plasticity index |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Unified | AASHTO | >10 inches | 3-10 inches | 4 | 10 | 40 | 200 | | |
| | *In* | | | | *Pct* | *Pct* | | | | | *Pct* | |
| 831: | | | | | | | | | | | | |
| Qualla | 0-7 | Loam | CL-ML, CL | A-4 | 0 | 0 | 100 | 90-100 | 85-100 | 65-85 | 20-30 | 5-10 |
| | 7-28 | Silt loam, loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 90-100 | 85-100 | 65-85 | 25-35 | 5-15 |
| | 28-38 | Silt loam, loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 90-100 | 85-100 | 65-85 | 25-35 | 5-15 |
| | 38-42 | Clay loam | CL | A-7 | 0 | 0 | 90-100 | 90-100 | 85-100 | 75-100 | 40-50 | 15-25 |
| | 42-60 | Clay loam, gravelly clay loam | CL | A-6, A-7 | 0 | 0-5 | 90-100 | 90-100 | 85-100 | 75-100 | 35-45 | 15-20 |
| 832: | | | | | | | | | | | | |
| Qualla | 0-7 | Loam | CL-ML, CL | A-4 | 0 | 0 | 100 | 90-100 | 85-100 | 65-85 | 20-30 | 5-10 |
| | 7-28 | Silt loam, loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 90-100 | 85-100 | 65-85 | 25-35 | 5-15 |
| | 28-38 | Silt loam, loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 90-100 | 85-100 | 65-85 | 25-35 | 5-15 |
| | 38-42 | Clay loam | CL | A-7 | 0 | 0 | 90-100 | 90-100 | 85-100 | 75-100 | 40-50 | 15-25 |
| | 42-60 | Clay loam, gravelly clay loam | CL | A-6, A-7 | 0 | 0-5 | 90-100 | 90-100 | 85-100 | 75-100 | 35-45 | 15-20 |
| 833: | | | | | | | | | | | | |
| Swauk | 0-5 | Loam | CL-ML, CL | A-4 | 0 | 0 | 95-100 | 85-100 | 80-95 | 60-80 | 25-30 | 5-10 |
| | 5-18 | Clay loam, gravelly clay loam | CL | A-6, A-7 | 0 | 0 | 85-100 | 75-100 | 70-95 | 55-80 | 35-45 | 15-20 |
| | 18-31 | Clay, gravelly clay | CH | A-7 | 0 | 0 | 75-100 | 70-100 | 65-95 | 50-80 | 50-60 | 25-35 |
| | 31-60 | Gravelly clay loam, clay loam | CL, SC | A-6, A-7 | 0 | 0-5 | 75-100 | 65-95 | 60-90 | 40-75 | 35-45 | 15-20 |
| 835: | | | | | | | | | | | | |
| Swauk | 0-5 | Loam | CL-ML, CL | A-4 | 0 | 0 | 95-100 | 85-100 | 80-95 | 60-80 | 25-30 | 5-10 |
| | 5-18 | Clay loam, gravelly clay loam | CL | A-6, A-7 | 0 | 0 | 85-100 | 75-100 | 70-95 | 55-80 | 35-45 | 15-20 |
| | 18-31 | Clay, gravelly clay | CH | A-7 | 0 | 0 | 75-100 | 70-100 | 65-95 | 50-80 | 50-60 | 25-35 |
| | 31-60 | Gravelly clay loam, clay loam | CL, SC | A-6, A-7 | 0 | 0-5 | 75-100 | 65-95 | 60-90 | 40-75 | 35-45 | 15-20 |
| Qualla | 0-7 | Loam | CL-ML, CL | A-4 | 0 | 0 | 100 | 90-100 | 85-100 | 65-85 | 20-30 | 5-10 |
| | 7-28 | Silt loam, loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 90-100 | 85-100 | 65-85 | 25-35 | 5-15 |
| | 28-38 | Silt loam, loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 90-100 | 85-100 | 65-85 | 25-35 | 5-15 |
| | 38-42 | Clay loam | CL | A-7 | 0 | 0 | 90-100 | 90-100 | 85-100 | 75-100 | 40-50 | 15-25 |
| | 42-60 | Clay loam, gravelly clay loam | CL | A-6, A-7 | 0 | 0-5 | 90-100 | 90-100 | 85-100 | 75-100 | 35-45 | 15-20 |

Table 8.--Engineering Properties--Continued

| Map symbol and soil name | Depth | USDA texture | Classification | | Fragments | | Percentage passing sieve number-- | | | | Liquid limit | Plasticity index |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Unified | AASHTO | >10 inches | 3-10 inches | 4 | 10 | 40 | 200 | | |
| | In | | | | Pct | Pct | | | | | Pct | |
| 825: | | | | | | | | | | | | |
| Pachneum--------- | 0-8 | Ashy loam | ML | A-4 | 0 | 0 | 100 | 95-100 | 90-100 | 75-85 | 20-35 | NP-5 |
| | 8-18 | Ashy loam, ashy silt loam | ML | A-4 | 0 | 0 | 100 | 95-100 | 90-100 | 75-85 | 20-35 | NP-5 |
| | 18-26 | Clay loam, silty clay loam | CL | A-6, A-7 | 0 | 0 | 100 | 95-100 | 90-100 | 75-85 | 35-45 | 15-25 |
| | 26-33 | Clay loam, silty clay loam | CL | A-6, A-7 | 0 | 0 | 100 | 95-100 | 90-100 | 75-85 | 35-45 | 15-20 |
| | 33-47 | Clay loam, silty clay loam | CL | A-6, A-7 | 0 | 0 | 100 | 95-100 | 90-100 | 75-85 | 35-45 | 15-20 |
| | 47-60 | Clay loam, silty clay loam | CL | A-6, A-7 | 0 | 0 | 100 | 95-100 | 90-100 | 75-85 | 35-45 | 15-20 |
| 828: | | | | | | | | | | | | |
| Swauk---------- | 0-5 | Loam | CL-ML, CL | A-4 | 0 | 0 | 95-100 | 85-100 | 80-95 | 60-80 | 25-30 | 5-10 |
| | 5-18 | Clay loam, gravelly clay loam | CL | A-6, A-7 | 0 | 0 | 85-100 | 75-100 | 70-95 | 55-80 | 35-45 | 15-20 |
| | 18-31 | Clay, gravelly clay | CH | A-7 | 0 | 0 | 75-100 | 70-100 | 65-95 | 50-80 | 50-60 | 25-35 |
| | 31-60 | Gravelly clay loam, clay loam | CL, SC | A-6, A-7 | 0 | 0-5 | 75-100 | 65-95 | 60-90 | 40-75 | 35-45 | 15-20 |
| 829: | | | | | | | | | | | | |
| Swauk---------- | 0-5 | Loam | CL-ML, CL | A-4 | 0 | 0 | 95-100 | 85-100 | 80-95 | 60-80 | 25-30 | 5-10 |
| | 5-18 | Clay loam, gravelly clay loam | CL | A-6, A-7 | 0 | 0 | 85-100 | 75-100 | 70-95 | 55-80 | 35-45 | 15-20 |
| | 18-31 | Clay, gravelly clay | CH | A-7 | 0 | 0 | 75-100 | 70-100 | 65-95 | 50-80 | 50-60 | 25-35 |
| | 31-60 | Gravelly clay loam, clay loam | CL, SC | A-6, A-7 | 0 | 0-5 | 75-100 | 65-95 | 60-90 | 40-75 | 35-45 | 15-20 |
| 830: | | | | | | | | | | | | |
| Swauk---------- | 0-5 | Loam | CL-ML, CL | A-4 | 0 | 0 | 95-100 | 85-100 | 80-95 | 60-80 | 25-30 | 5-10 |
| | 5-18 | Clay loam, gravelly clay loam | CL | A-6, A-7 | 0 | 0 | 85-100 | 75-100 | 70-95 | 55-80 | 35-45 | 15-20 |
| | 18-31 | Clay, gravelly clay | CH | A-7 | 0 | 0 | 75-100 | 70-100 | 65-95 | 50-80 | 50-60 | 25-35 |
| | 31-60 | Gravelly clay loam, clay loam | CL, SC | A-6, A-7 | 0 | 0-5 | 75-100 | 65-95 | 60-90 | 40-75 | 35-45 | 15-20 |
| Qualla---------- | 0-7 | Loam | CL-ML, CL | A-4 | 0 | 0 | 100 | 90-100 | 85-100 | 65-85 | 20-30 | 5-10 |
| | 7-28 | Silt loam, loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 90-100 | 85-100 | 65-85 | 25-35 | 5-15 |
| | 28-38 | Silt loam, loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 90-100 | 85-100 | 65-85 | 25-35 | 5-15 |
| | 38-42 | Clay loam | CL | A-7 | 0 | 0 | 90-100 | 90-100 | 85-100 | 75-100 | 40-50 | 15-25 |
| | 42-60 | Clay loam, gravelly clay loam | CL | A-6, A-7 | 0 | 0-5 | 90-100 | 90-100 | 85-100 | 75-100 | 35-45 | 15-20 |

PLSA ENGINEERING & SURVEYING

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August 7, 2012

CDPC, LLC
SRM Development, LLC
111 North Post, Suite 200
Spokane, WA 99201

Attn: Larry Jenkins

Re: Supplemental Geotechnical Report
8710 and 8860 Thorp Prairie Road
Cle Elum, Washington

Gentlemen:

Three copies of our supplemental geotechnical report for the referenced location in Cle Elum, Washington are enclosed. PLSA soils laboratory tests for plasticity index (PI) obtained substantially lower values than those reported by NRCS for the site. This lower PI value is indication that the soils are more suitable for the contemplated construction.

Thank you for allowing us to have been of service.

Sincerely,

Brad Card

Brad Card, P.E.
Principal Engineer

BC:jc
Enclosures

1120 West Lincoln Avenue • Yakima, Washington 98902 • (509) 575-6990 • FAX (509) 575-6993

# REPORT ON SUPPLEMENTAL GEOTECHNICAL INVESTIGATION

## 8710 and 8860 Thorp Prairie Road
## Cle Elum, Washington


**August 2012**

**Job No. 12089A**

**Prepared by**

**PLSA Engineering & Surveying**
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