GORDON
GEOTECHNICAL
ENGINEERING, INC.

REPORT
GEOLOGIC RECONNAISSANCE STUDY
BUILDABLE AREA EXPANSION
EMERSON HILLS SUBDIVISION LOT #12
LIBERTY, UTAH

September 23, 2016

Job No. 406-01A-16

Prepared for:
Distinct Homes, LLC
2490 Wall Avenue
Ogden, Utah 84401

Prepared by:
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September 23, 2016
Job No. 406-01A-16

Distinct Homes, LLC
2490 Wall Avenue
Ogden, Utah 84401

Attention: Mr. Kevin Parkinson

Ladies and Gentlemen:

Re: Report
Geologic Reconnaissance Study
Buildable Area Expansion
Emerson Hills Subdivision Lot #12
Liberty, Utah

1. INTRODUCTION

1.1 GENERAL

This report presents the results of our geologic reconnaissance study performed for the proposed expansion of the buildable area at Lot #12, Emerson Hills Subdivision in Liberty, Utah. The general location of the site with respect to major topographic features and existing facilities, as of 1991 and 1998, is presented on Figure 1, Vicinity Map. A detailed location of the site showing existing roadways and surrounding facilities, on an air photograph base, is presented on Figure 2, Area Map. A more detailed layout of the site showing the existing buildable area and proposed expansion is presented on Figure 3, Site Plan.

Gordon Geotechnical Engineering, Inc. (G^2) previously performed a geotechnical and geologic hazards study for the site dated August 12, 2016[1].

1.2 OBJECTIVES AND SCOPE

The objectives and scope of our study were planned in discussions between Mr. Kevin Parkinson or Distinct Homes, LLC and Mr. Patrick Emery of G^2.

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[1] "Report, Geotechnical and Geologic Hazards Study, Proposed Single-Family Residential Structure, Emerson Hills Subdivision Lot #12, Liberty, Utah," G^2 Job No. 406-001-16, Dated August 12, 2016.

In general, the objectives of this study were to:

1. Evaluate the potential for geologic hazards or geologic concerns associated with the proposed buildable area expansion including landslides, shallow groundwater, expansive soil and rock, radon, flooding, and earthquakes.

In accomplishing these objectives, our scope has included the following:

1. A reconnaissance site visit.

2. A review of available geologic maps, and engineering geologic report.

3. An office program consisting of the correlation of available data, geologic analyses, and the preparation of this summary report.

1.3 PROFESSIONAL STATEMENTS

Supporting data upon which our recommendations are based are presented in subsequent sections of this report. Recommendations presented herein are governed by the physical properties of the soils encountered in the previously completed exploration test pits, measured and projected groundwater conditions, and the layout and design data discussed in Section 2., Proposed Buildable Area Expansion, of this report. If subsurface conditions other than those described in this report are encountered and/or if design and layout changes are implemented, G^2 must be informed so that our recommendations can be reviewed and amended, if necessary.

Our professional services have been performed, our findings developed, and our recommendations prepared in accordance with generally accepted engineering principles and practices in this area at this time.

2. PROPOSED BUILDABLE AREA EXPANSION

The existing buildable area, identified on the subdivision plat, has been defined according to USGS quad maps and the proper setback distances defined by Weber County.

The proposed expansion extends to the southeast from the southern boundary of the existing buildable area. The irregularly-shaped area is confined by the toe of the alluvial terrace slope to the west and a 20-foot setback from the property line to the east.

3. SITE CONDITIONS

3.1 SURFACE

The overall site consists of an irregular-shaped parcel of vacant land containing 5.44 acres. The site is located north of the town of Liberty, Utah on the west side of North Fork Road near

the confluence of Durfee Creek and the North Fork of the Ogden River. Vegetation consists of a heavy growth of grasses, weeds, and shrubs as well as several large river birch, willow, and cottonwood trees.

The overall topography in the area slopes down to the east/southeast with a total relief of approximately 130 feet across the site. The slopes vary significantly across the lot from nearly flat, to a grade of approximately 25 percent in the buildable area, and approximately 64 percent along the 130+ foot tall river-carved slope on the southern portion of the lot.

The surface of the proposed buildable area expansion is mostly flat and heavily vegetated with shrubs and large trees.

Our review of geologic maps, indicate that the surficial geology in this area consists of primarily alluvial terrace and floodplain deposits from the Pleistocene era. The site is situated within an alluvial valley associated with the North Fork of the Ogden River. The geologic materials consist of predominantly rounded sand and gravel with numerous cobbles and small boulders.

Representative photographs of the site area are shown on Figure 4, Photographs.

4. DISCUSSIONS AND RECOMMENDATIONS

4.1 SUMMARY OF FINDINGS

Based upon our reconnaissance site visit, geologic map review, hazard report review, and conditions encountered in our geotechnical study, we find the proposed buildable area expansion to be suitable from a geologic standpoint. Detailed discussion on the potential geologic hazards is provided in the following sections.

4.2 GEOLOGIC HAZARDS

4.2.1 Slope Stability and Landslide Hazard

A review of Utah Geological Survey Landslide Maps (Elliott and Harty, 2010) identified no known landslide deposits at the site. Additionally, the engineering geology report for the subdivision[2] including a reconnaissance site visit and aerial photograph review identified no indication of slope failure at the site.

During our reconnaissance site visit, the slopes at the site were closely investigated and no signs of past or imminent slope failure were identified.

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[2] "Report, Engineering Geology Reconnaissance and Evaluation, Proposed Emerson Hills Subdivision, North Fork Ogden River, Ogden Valley, Town of Liberty, Weber County, Utah", AGRA Earth & Environmental Job No. 7-817-000855, Dated May 20, 1997.

The geologic materials comprising the slopes were likely deposited concurrently with the high stand of Lake Bonneville, approximately 15,000 years ago (Crittenden and Sorensen 1985a,b). Thus, the slopes at the site are stable in their current state despite being subjected to multiple seismic events. The slope stability and landslide hazard is considered "low".

Where site development requires significant earthwork modification to existing slopes, we recommend the pertinent geotechnical/slope stability studies be conducted.

4.2.2 Rockfall Hazard

No significant loose boulders were identified on the surface of the slopes at the site. Rockfall hazard is considered "low".

4.2.3 Flooding (FEMA Flood Plain)

A review of FEMA flood insurance maps indicates that the majority of the site is located in Zone X, which is defined as the area of minimal flood hazard. The buildable area expansion is located well beyond 100 feet away from Zone A, which is defined as the area of the 100-year flood event.

4.2.4 Shallow Groundwater

Groundwater was encountered in our geotechnical study at a depth of 10 feet below the ground surface. Although the groundwater level is expected to fluctuate one to two feet with the flow of the river, it is not expected to affect any future construction at the site.

The recommendations for floor slabs and foundation subdrains will be the same as per our geotechnical study for the site.

4.2.5 Expansive Soil and Rock

The coarse granular and occasional interbedded sandy silt soils encountered at the site do not exhibit moisture sensitive characteristics.

4.2.6 Indoor Radon-Hazard

A review of the Radon-Hazard Potential map for Ogden Valley (Solomon, 1996) indicates that the site is located within an area having "high" radon-hazard potential. Radon-hazard determination takes into account several factors including the source and nature of the geologic materials, and results from nearby indoor radon tests. The soils encountered at the site are highly permeable and are sourced primarily from nearby Precambrian bedrock units which contain trace amounts of Uranium. Indoor radon tests in the area have shown levels greater than 4 pCi/L.

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We appreciate the opportunity of providing this service for you. If you have any questions or require additional information, please do not hesitate to contact us.

Respectfully submitted,

Gordon Geotechnical Engineering, Inc.

Jordan K. Culp, EIT
Staff Geological Engineer

Reviewed by:

Patrick R. Emery, State of Utah No. 7941710
Senior Engineer

JKC/PRE:sn

Encl. Figure 1, Vicinity Map
Figure 2, Area Map
Figure 3, Site Plan
Figure 4, Photographs

Addressee (3 + email)

LICENSED PROFESSIONAL ENGINEER
7941710
PATRICK R. EMERY
9/23/16
STATE OF UTAH

DISTINCT HOMES, LLC
JOB NO. 406-01A-16

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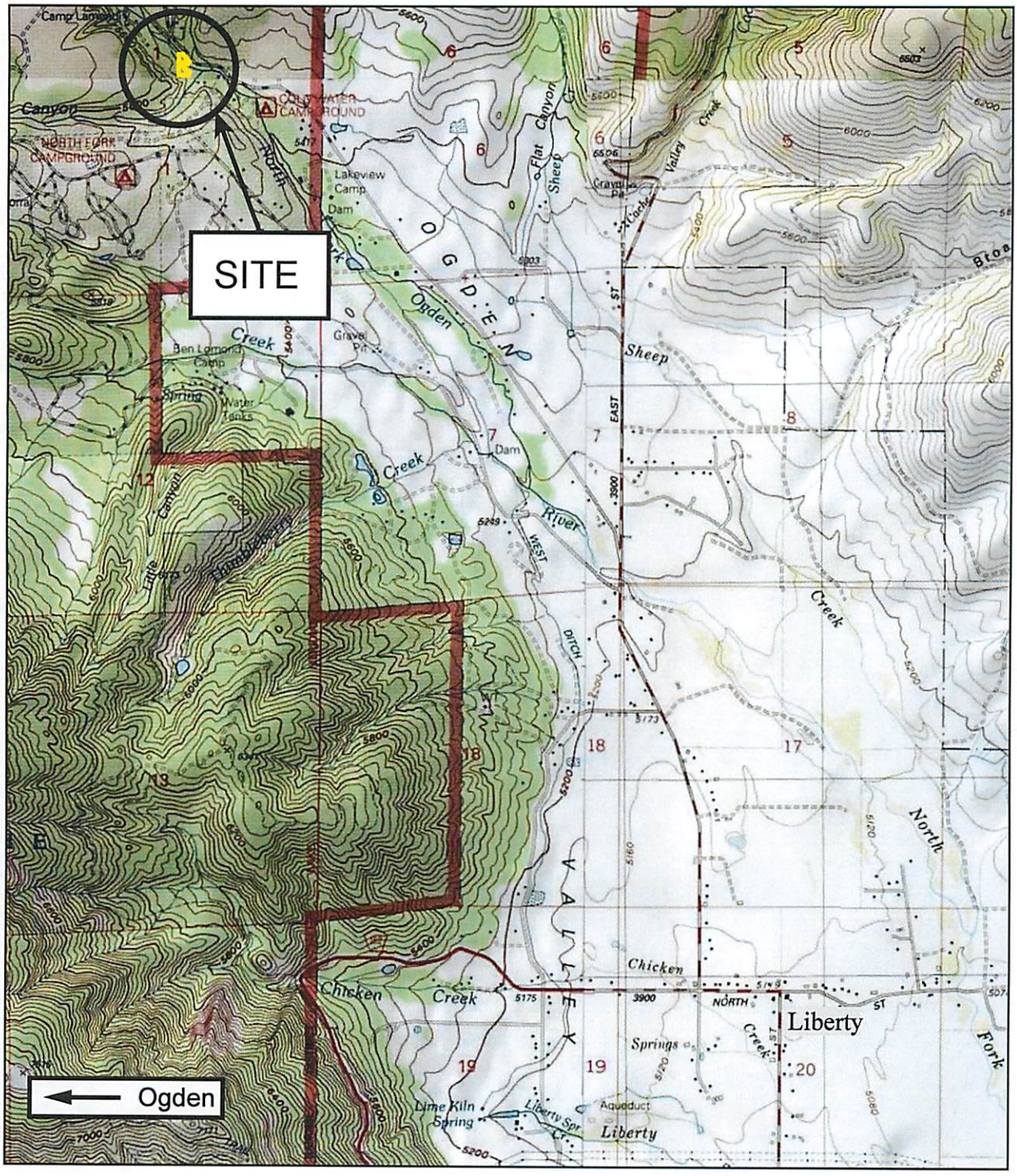

REFERENCE:
USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE MAPS
TITLED "NORTH OGDEN, UTAH", DATED 1998
AND "HUTNSVILLE, UTAH", DATED 1991

FIGURE 1
VICINITY MAP

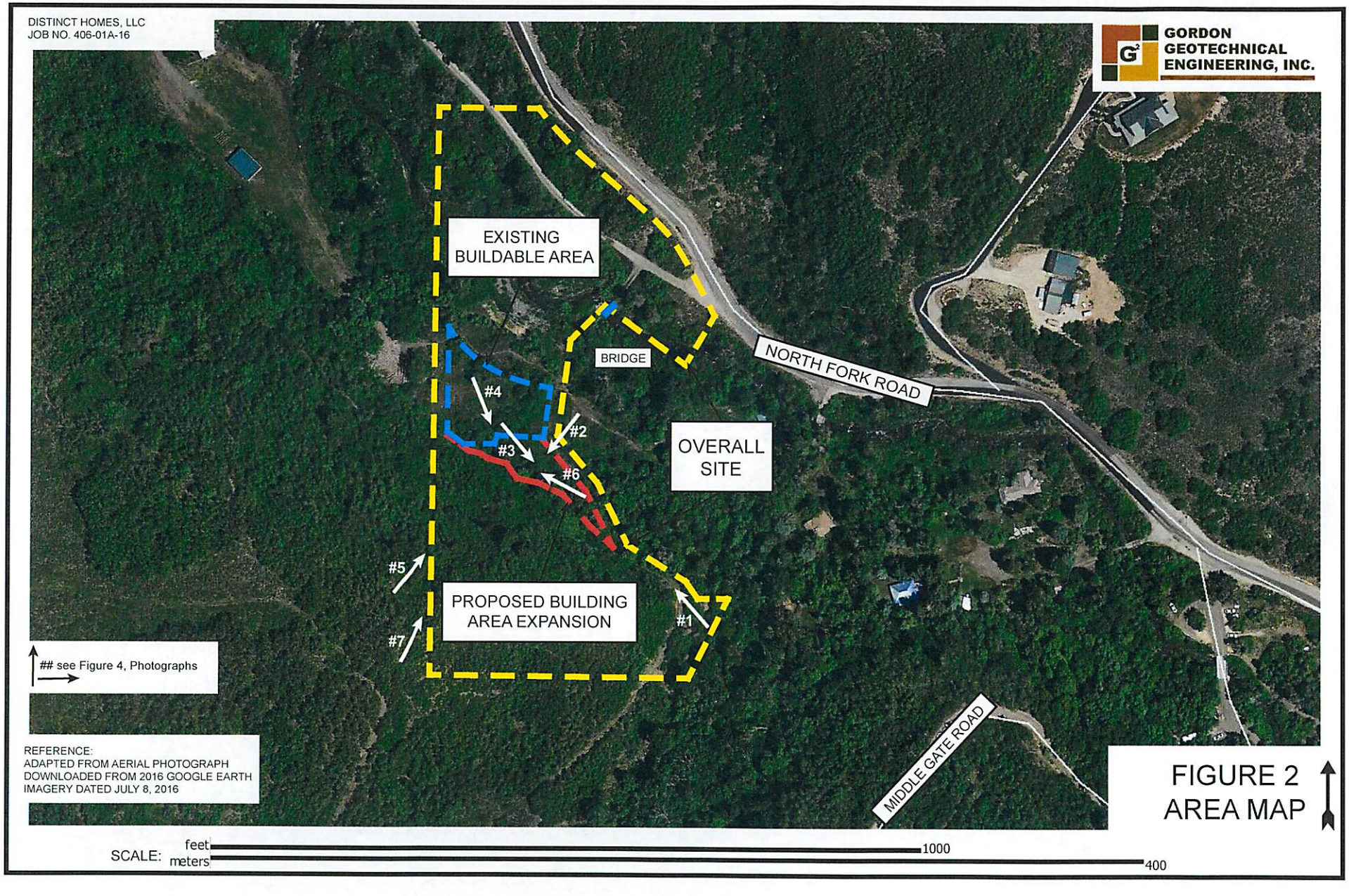

FIGURE 2
AREA MAP

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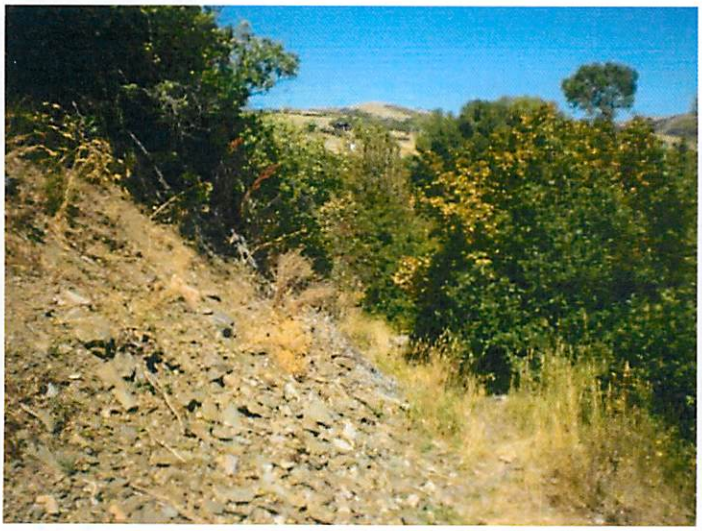

#1 View of roadcut exposed geologic materials comprising the slopes at the site.

#2 Facing southwest from the buildable area expansion toward the heavily vegetated slope.

#3 Facing southeast across the proposed building area expansion.

#4 Facing southeast, overall buildable area.

Locations and direction, see Figure 2, Area Map

FIGURE 4
PHOTOGRAPHS

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#5 Facing northeast from the top of the 130+ foot slope.

#6 Facing northwest, buildable area.

#7 Facing northeast from the top of the large slope across the rest of the subdivision.

FIGURE 4
PHOTOGRAPHS (CONT.)

Locations and direction, see Figure 2, Area Map

DISTINCT HOMES, LLC
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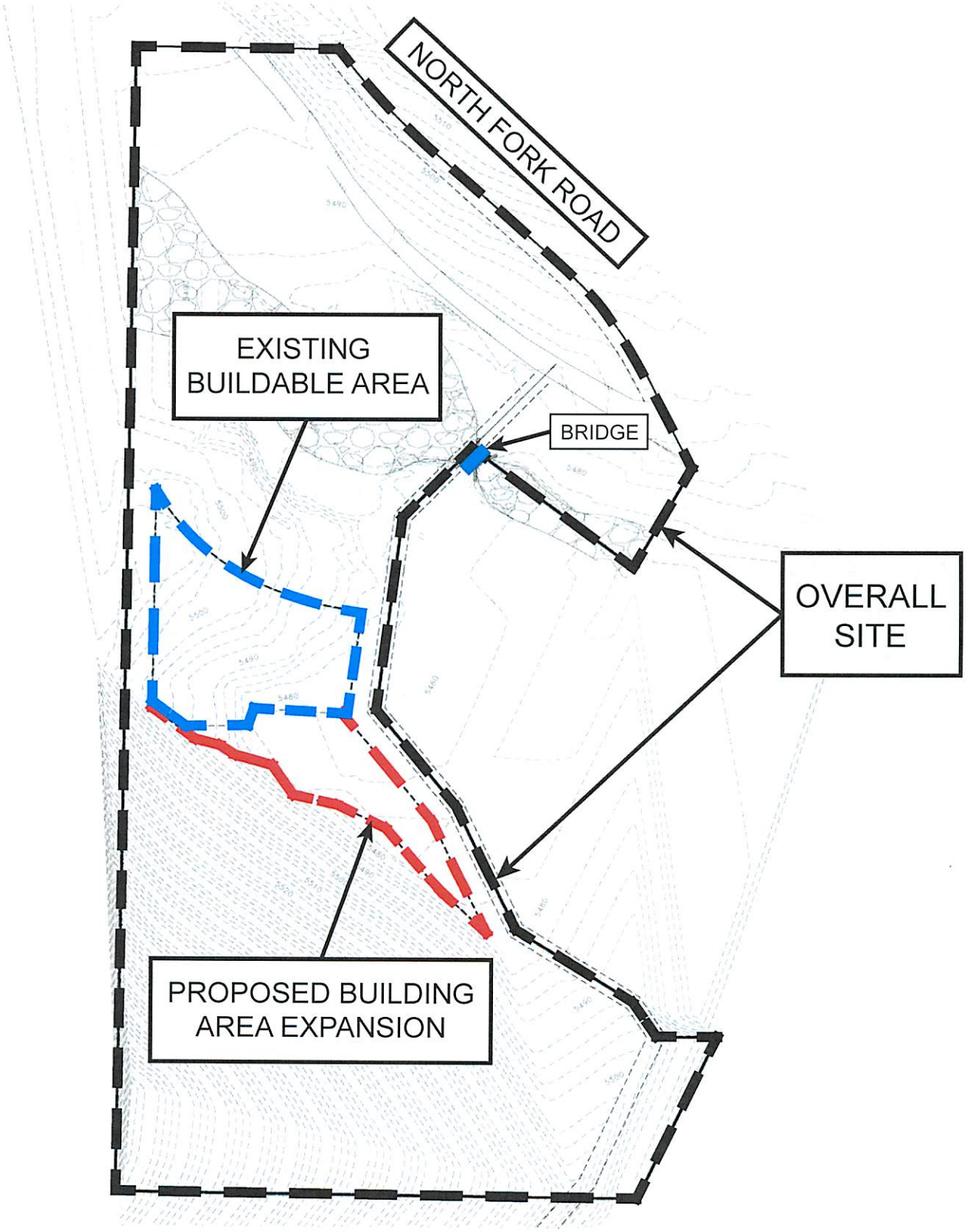

REFERENCE:
ADAPTED FROM DRAWING ENTITLED
"TOPOGRAPHIC SITE PLAN FOR KEVIN PARKINSON"
BY GARDNER ENGINEERING, NOT DATED

NOT TO SCALE

FIGURE 3
SITE PLAN