

Flood Plain Measurements on South Margin Bella Terra Property
Bysynergy LLC, developer; Located off Lower Loop Road, Sedona, Arizona
Done at the request of local resident Brian Myers
by Paul A. Lindberg, Geological Engineer, Sedona Arizona
Arizona Professional Geologist #22226
October 22, 2006

Introduction

At the request of Brian Myers, and done without compensation as an unbiased geological engineer, the writer examined the southern margin of the Bella Terra development where it fronts on Oak Creek, a perennial stream. The property owner has had large amounts of loose fill dumped onto the former flood plain of Oak Creek and removed native habitat trees along most of a newly formed bench, supposedly above the "100 year flood plain". He had a surveyor place pickets the boundary of an imagined "100 year flood plain", the boundary of which was obtained from an unknown source. The recent flooding in late 2004 nearly overwhelmed the newly created gravel filled bench but the former edge of the flood plain has been buried.

Method of Measurement

On October 22, 2006 the writer, assisted by Brian Myers, measured three elevation profiles from the current level of Oak Creek (relatively low flow) to three of the supposed "100 year flood plain" pickets. Figure 1 shows two profiles measured with a hand-held level from the surface of Oak Creek to the named pickets and the top surface of the newly filled land. The top of the fill lies between 7.3 to 11.1 feet above creek level.

Figure 2 is more extensive and includes a plan and projected section. Bearings and distances were measured by Brunton compass and cloth tape. Elevations were obtained with a hand-held sighting level. At the "100 year flood plain" picket located 119.5 feet east of the western boundary of the Bella Terra property the filled level lies 7.5 feet above the surface of Oak Creek, located 315 feet to the southeast. The fill has covered obvious flood plain material composed of abundant, cleanly washed boulders. At this same site there is a 3 foot diameter culvert that ends in an un-drained open pit within the filled ground. The top of this culvert, not yet connected to Oak Creek, lies only 4.6 feet above the level of Oak Creek as of October 22, 2006. The base of the culvert pipe lies a mere 1.6 feet above creek level.

Measurements of debris clinging to trees and 2004 flood photographs taken by next door resident Lou Fornier (153 Keller Lane, Lower Loop Road) shows that water rose to at least 7.0 feet above the current level of Oak Creek as of October 22, 2006.

Conclusions

1. The newly placed unconsolidated fill along the creek-side southern boundary of the Bella Terra property has been filled over an obvious flood plain. The flood in late 2004 came close to over-topping that bench with a rise above the level of Oak Creek as of October 22, 2006 to an estimated 7.0 feet. Similar floods in December 1971 and 1993 were of about the same magnitude as the 2004 flood, indicating that flooding of this magnitude every decade cannot be the hypothetical "100 year flood" event.

2. The culvert that is supposed to drain the western portion of the Bella Terra property is a 3 foot diameter zinc-coated spiral steel pipe whose top lies about 4.6 feet above the current low water level of Oak Creek, and its base is a mere 1.6 feet above the current level of Oak Creek. Even if this pipe were to be connected to drain into Oak Creek the next expected flood would quickly backfill and plug the pipe, preventing drainage from the property.
3. Downstream from the Bella Terra property is Red Rock State Park. On the same day as the above measurements were taken I measured the high water debris marks left by the 2004 flood. It showed that the water rose at least 11 feet at the Sentinel Crossing in the park. This is compatible with the findings upstream where a steeper creek gradient is present. Park officials thought the high water was even higher, up to an estimated 17 feet.
4. It is the opinion of the writer that the entire lower back-filled portion of the Bella Terra property is improperly engineered and is in danger of being overwhelmed by the next "100 year flood" due within the next decade.

Respectfully submitted,

Paul A. Lindberg



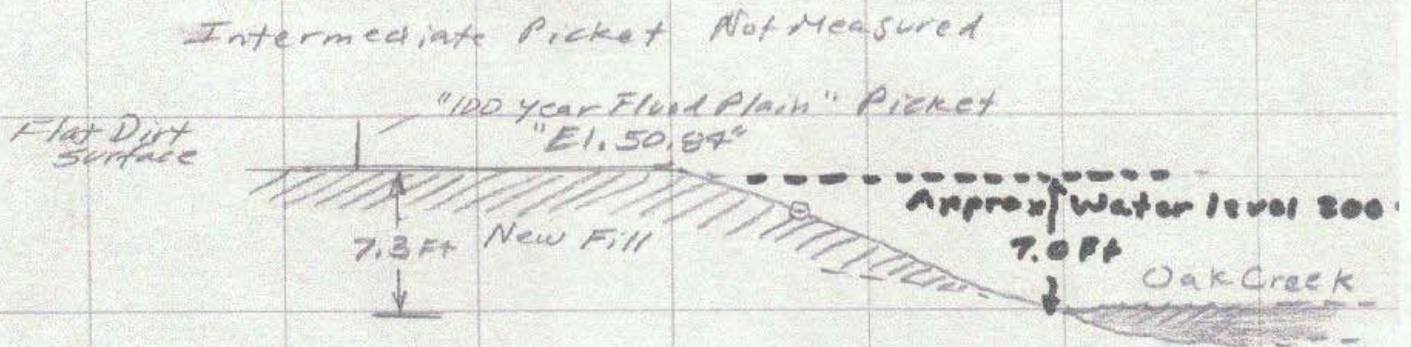
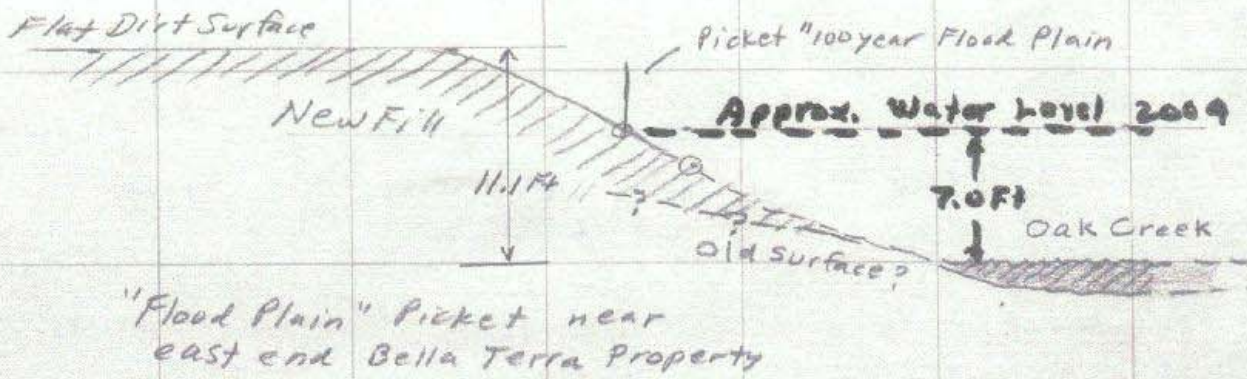


Figure 1 to Accompany
 Oct. 22, 2006 memo
 "Flood Plain Measurements
 on South Margin of Bel
 Terra Property"