RESPONSE TO COUNTY OF SAN DIEGO REVIEW COMMENTS FOR ROCKFALL POTENTIAL

MEADOWOOD (PANKEY RANCH) SAN DIEGO COUNTY, CALIFORNIA

GEOCON
INCORPORATED

GEOTECHNICAL
ENVIRONMENTAL
MATERIALS

FOR

PARDEE HOMES
SAN DIEGO, CALIFORNIA

MARCH 31, 2011
PROJECT NO. 06931-42-01

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March 31, 2011

Pardee Homes
6025 Edgewood Bend Court
San Diego, California 92130

Attention: Mr. Allen Kashani

Subject: MEADOWOOD (PANKEY RANCH)
SAN DIEGO COUNTY, CALIFORNIA
RESPONSE TO COUNTY OF SAN DIEGO REVIEW COMMENTS
FOR ROCKFALL POTENTIAL

Reference: *Update Geotechnical Investigation, Meadowood (Pankey Ranch), San Diego, California,* prepared by Geocon Incorporated dated November 20, 2006 (Project No. 06931-42-01).

Dear Mr. Kashani:

We have prepared this letter to respond to County of San Diego review comments regarding rockfall potential at the subject project. Our update geotechnical investigation (Reference 1) identified the potential for rockfall on the project site. The County of San Diego wants lots that may be subject to a rockfall hazard identified and specific measures provided that would reduce the hazard. To provide mitigation measures, Geocon Incorporated performed additional field mapping to locate potentially unstable boulders.

Based on our field mapping, rockfall potential exists on the west-facing slope of Rosemary's Mountain. Rosemary's Mountain consists of granitic rock in varying stages of decomposition with numerous exposed hardrock ledges and corestones. The area of potential rockfall includes the east side of proposed Horse Ranch Creek Road from Pala Road to approximately 3,000 feet into the project area. Areas to the north and east of Rosemary's Mountain are underlain by gabbroic rock with a very weathered mantle (decomposed granite) with very few exposed corestones.

The identified area of having a rockfall potential is not located on the Meadowood project site and will not be impacted by grading and construction of the Meadowood development. Lots located on the Meadowood project down gradient from the potential area of rockfall include the proposed school site and residential Lots 386 through 396, 403, 404, and 406 through 411. These lots are located on the west side of Horse Ranch Creek Road from near the project entrance up to and including the proposed school site. The proposed Horse Ranch Creek Road provides an approximately 100-foot-wide level buffer between the slope and the residential lots. This buffer provides rockfall mitigation as it reduces the potential for rockfall from the slope to impact lots west of the roadway. With respect to the school

site, there are fewer identified boulders on the hillside to the east. Additionally, the slope inclination near the bottom of Rosemary's Mountain in this area flattens out. The flatter slope inclination should slow down boulders should they dislodge and roll down the hill.

We recommend mitigation of rockfall potential consisting of: (1) identify boulders that have a high potential for rockfall and anchor/rock bolt, break and/or remove these rocks from the hillside; (2) identify boulders that have a less significant rockfall potential, test these rocks with excavation equipment, and remove rocks that move or appear to be unstable; and (3) monitor rocks identified as having a less significant rockfall potential during development of the Meadowood project. Figures 1 and 2 (map pocket) show the approximate locations of specific boulders that have been identified as having rockfall potential. Boulders that appear to have been undercut by erosion or to be precariously balanced are considered as having a high potential for rockfall and should be removed and/or mitigated as recommended hereinafter.

Boulders that do not appear to have been undercut by erosion and are considered to have a less potential for rockfall are also identified on Figures 1 and 2. These boulders should be tested by applying pressure from excavation equipment during rockfall mitigation to see if they are loose or unstable. Loose or unstable rocks should be removed as recommended for rocks that have a high potential for rockfall. Rocks that do not move when tested or have been identified as having a less significant rockfall potential should be monitored during site development as recommended hereinafter.

Four large boulders within or adjacent to Horse Ranch Creek Road are identified on the figures. These boulders should be removed during grading of the roadway.

To reduce the potential for rockfall on the Meadowood project site we recommend the following:

1. Boulders identified as having a high potential (eroded at the base or entirely free from the soil) should be broken and removed from the slope, or alternatively rock bolted to the slope. This will require use of an excavator with a rock breaking device or drilling the rock and using chemicals that break rock, or the use of anchors to pin the rock to the slope. Large rocks that are impractical to completely remove or anchor to the slope should be broken down such that they are relatively flat or on contour with the slope face to create a rock with a shape that will not roll.

2. Boulders identified as having a less significant rockfall potential should be tested by applying pressure with the excavator. If the boulders move they should be mitigated as recommended under No. 1. Boulders that that are small enough such that they can easily be moved should be pushed or rolled down the slope.

3. Boulders identified as having a less potential for rockfall should be monitored on a weekly basis during grading to assess if movement occurs. Following grading we recommend the identified boulders be observed on a quarterly basis until completion of the Meadowood development. If during the monitoring period boulders move or dislodge, we recommend the boulders be removed as recommended above.

4. During the monitoring period after a period of heavy rain, the boulders should be observed to assess if runoff has caused undermining of the downhill side of the boulder. Removal and/or breaking of the boulders as recommended should be performed if undermining occurs.

We have also shown on Figures 1 and 2 the suggested ingress/egress to each of the boulders considered to have a high potential for rockfall, and those that should be tested during rockfall mitigation. For many of the identified boulders, ingress/egress can be achieved by using existing roads and trails. It appears that existing trails/roads can be used to get within approximately 50 feet of the boulders identified as having a high potential for rockfall. An area of disturbance 15 feet in width will likely be required for access to boulders and pushing boulders down the slope. We estimate a width of approximately 15 feet around each boulder will be required to break or anchor the boulders.

In conclusion, specific rocks and boulders have been located which have significant rockfall potential and require mitigation on the west-facing slope of Rosemary's Mountain above the project site. Boulders have also been identified that have a less than significant rockfall potential, which will require further testing and possibly mitigation. To completely eliminate the potential for rockfall, particularly in the event of a major seismic event on the Elsinore fault or other potential seismic sources in the region, would require mitigation of all of the exposed rocks/boulders on the slope which is impractical and cannot be economically performed. However, by following the recommendations provided in this report, it is our opinion that the potential for rockfall hazards to adversely impact structures proposed on the Meadowood project would be reduced to a level of less than significant. The area where rockfall potential has been identified is not a part of the Meadowood project site and is owned by others. Predicated on conditions as they exist today, if the west-facing slope of Rosemary's Mountain is altered in any way in the future, conclusions and recommendations in this report may no longer be valid.

Should you have any questions regarding this report, or if we may be of further service, please contact the undersigned at your convenience.

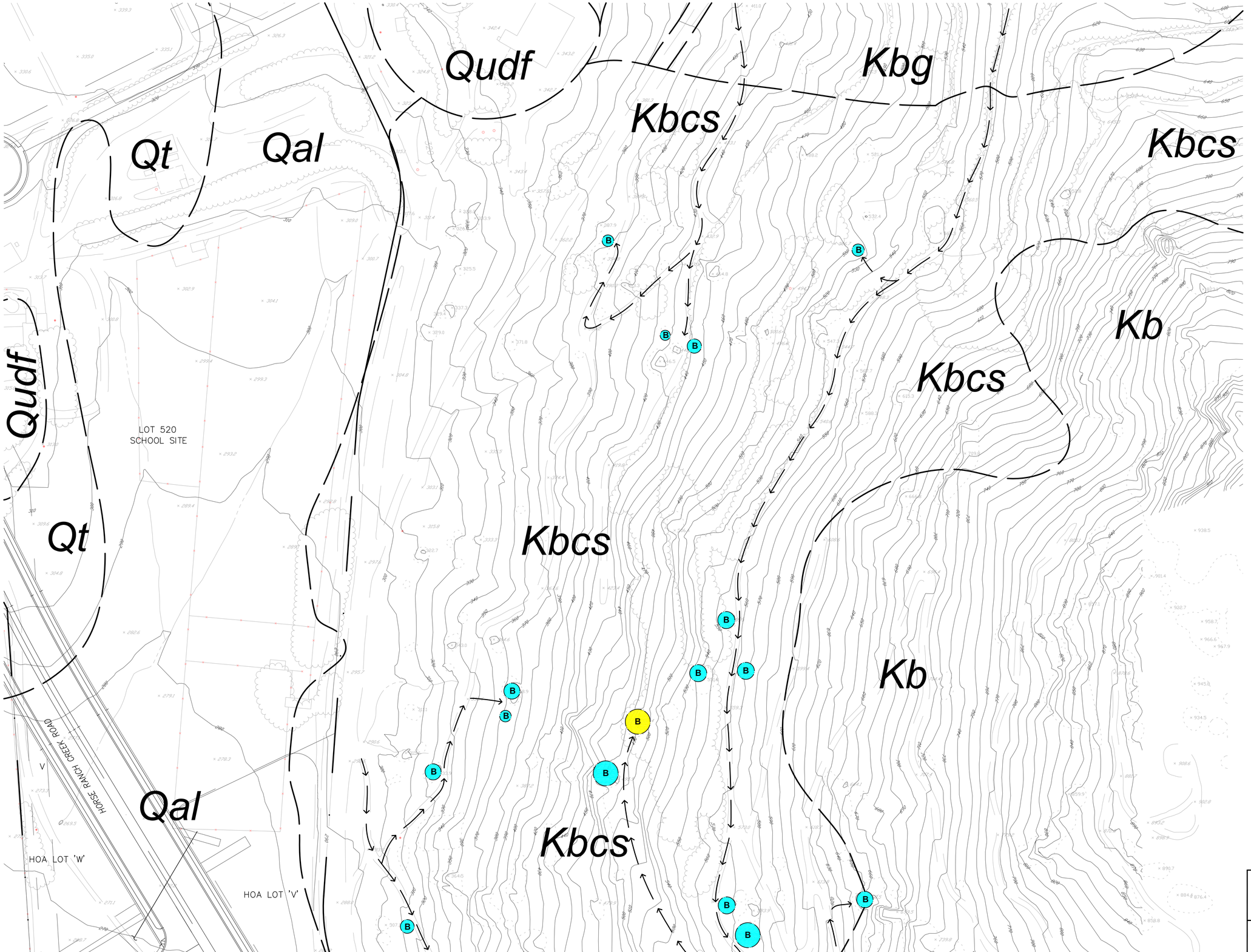
Very truly yours,

GEOCON INCORPORATED

Rodney C. Mikesell
GE 2533

RCM:dmc

(1) Addressee
(2) Recon Environmental, Inc.
Attention: Ms. Bobbi Herdes



GRAPHIC SCALE
0' 30' 60' 90' 120' 180' 240'
SCALE 1"= 60'

LEGEND

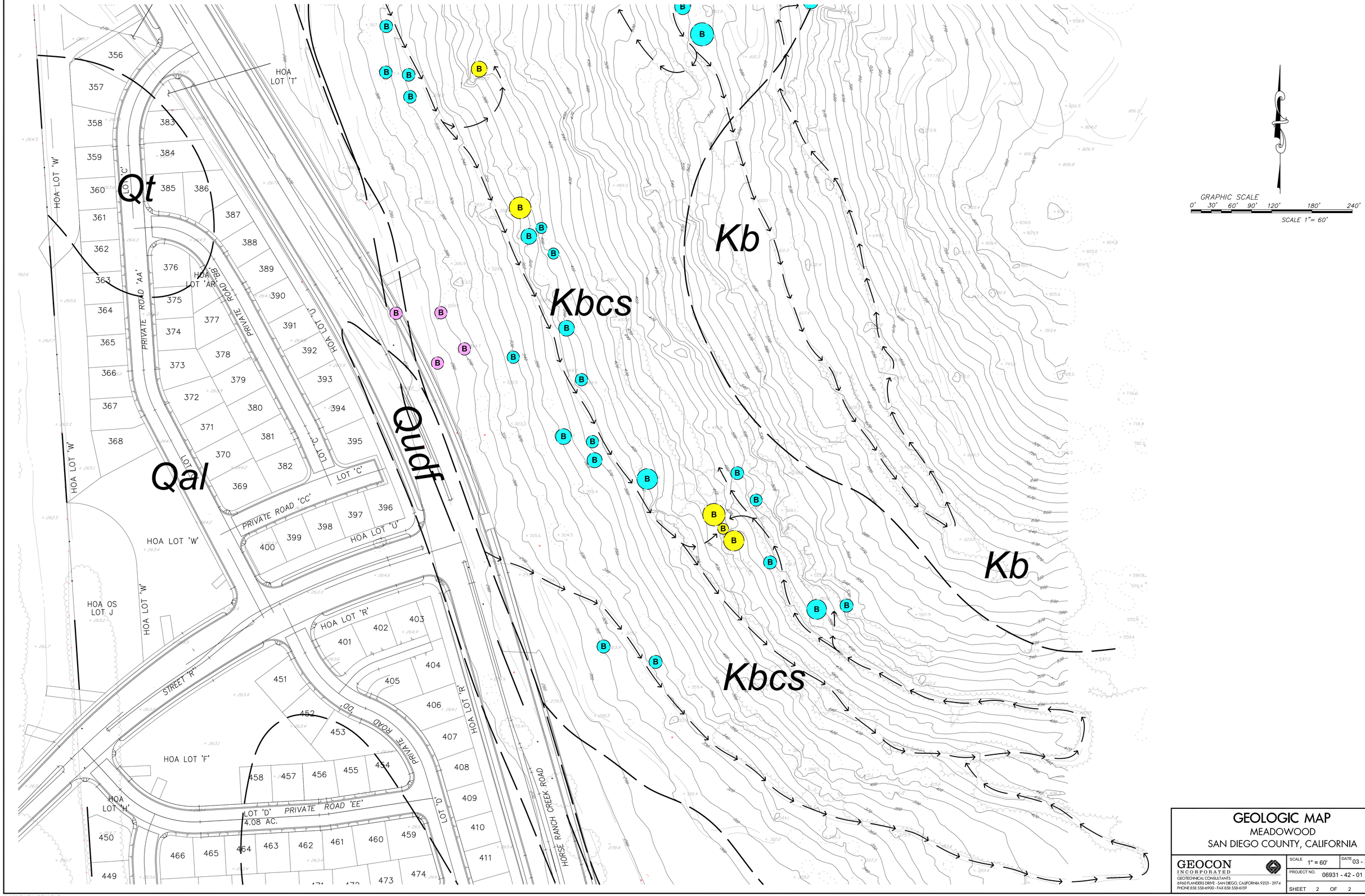
- Qudf.....UNDOCUMENTED FILL
- Qudfr.....UNDOCUMENTED FILL RUBBLE (Mostly oversize concrete chunks)
- Qal.....ALLUVIUM
- Qt.....TERRACE DEPOSIT
- Kb.....BONSALL TONALITE
- Kbg.....BONSALL TONALITE GNEISS
- Kbcs.....BONSALL TONALITE CORESTONE ZONE
- Ksm.....SAN MARCOS GABBRO
- .....APPROX. LOCATION OF GEOLOGIC CONTACT
- B.....APPROX. LOCATION OF LARGE BOULDERS TO BE TESTED AND MONITORED (Diameter of symbol approximate maximum diameter of boulder)
- B.....BOULDER TO BE REMEDIATED
- B.....BOULDERS IN ROADWAY PRISIM TO BE REMOVED DURING GRADING
- .....POTENTIAL ACESS ROUTES TO REMEDIAL ROCKFALL-BOULDERS

GEOLOGIC MAP
MEADOWOOD
SAN DIEGO COUNTY, CALIFORNIA

GEOCON INCORPORATED
GEOTECHNICAL CONSULTANTS
6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974
PHONE 858 558-6900 - FAX 858 558-6159

SCALE	1" = 60'	DATE	03 - 31 - 2011
PROJECT NO.	06931 - 42 - 01	FIGURE	1
SHEET	1 OF 2		

24X36.DWG/LADRILLONO



GEOLOGIC MAP
MEADOWOOD
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SCALE	1" = 60'	DATE	03 - 31 - 2011
PROJECT NO.	06931 - 42 - 01	FIGURE	2
SHEET	2 OF 2		

24X36.DWG/LADRILLONO