

SINNOTT CONSULTING

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May 28, 2009

Boulder Bay Resort
Brian Helm, Executive Project Mgr.
P.O. Box 307
Crystal Bay, NV 89402

Re. Select Tree Preservation Feasibility &
Tree Protection Measures for the Boulder Bay Resort

Dear Mr. Helm:

Upon your request, I evaluated the feasibility of retaining select trees at various locations within the Boulder Bay Resort property. The site evaluation addressed the current health of the trees on the inspection date, May 20, 2009 and the impact that construction would have on each of them.

Tree protection measures during the construction process were also requested for the Boulder Bay project. They are addressed on pages 2 - 5.

SITE EVALUATION PER TREE

- Tree A14 Recommend removal. There is to be a 15 foot grade difference between the existing & proposed conditions in the vicinity of this tree. There is also going to be a sidewalk within 3 feet of the south side of the tree and on the west side of the tree, a sidewalk within 1 foot and a heated road within 7 feet.
- Tree A28 Recommend retaining. The retaining wall for a proposed water feature has been reconfigured in order to retain this tree.
- Tree F1 Recommend removal. There is going to be construction impact within on four sides of the tree. Realigning Lakeview Road will occur on the north, south and west sides. The grade will be increased by 5 feet to accommodate the realignment and there will be a cut within 1 foot of the base of the tree for the Lakeview Road retaining wall. The east side will have the new Lakeview Road installed.
- Tree F2 Recommend removal. Same as tree F1 except that the west side of the tree will have a 4 foot grade increase and then a cut within 2 feet of the base of the tree for the Lakeview Road retaining wall.
- Tree H10 Recommend removal. There is going to be construction impact on all four sides of the tree. The north, south and west sides will have retaining walls with terraced soil within 11 feet. The east side will be within 5 feet of Building B.
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TREE PROTECTION MEASURES

Tree protection measures for the Boulder Bay Resort can help reduce construction impact on the trees if the measures are followed throughout the entire project. The majority of tree roots are normally in the first 2 feet of soil which is where most soil disturbance occurs. This is why tree protection during construction is vital. Root injury often does not exhibit signs until 2 to 10+ years after a project has been completed. *Despite following all Tree Protection Measures, the proximity of the trees in relation to the required grade changes on this project site increases the risk of tree loss.*

Pre-Construction

1. ***Emphasize tree protection in the preconstruction meeting.***
 - a. Review the responsibility of all parties involved in the construction process to protect trees designated to be saved.
 - b. Review above ground tree issues.
 - c. Review below ground root issues.
 - d. Review tree protection recommendations.
 - e. Review tree damage evaluations and replacement of damaged trees

2. ***All trees designated to be preserved are to be noted on all improvement plans.***

3. ***Tree Protection Zones (TPZ)***
 - a. Establish tree root protection zones (TPZ) as far beyond the dripline as possible with the minimum distance being the actual dripline.
 - b. Fence entire groups of trees where possible.
 - c. Install chain-link fencing or an equivalent strength that will be noticed if hit and that will remain standing throughout the project.
 - d. Maintain hardscape (asphalt or concrete) where possible for as long as possible. Existing hardscape provides excellent root protection during construction.
 - e. Install 8" of wood mulch chips in the TPZ to prevent drying of soil if there is not hardscape.
 - f. Maintain the existing grade within the TPZ. An increase in soil suffocates tree roots & inhibits water and nutrients to the root system. A decrease in soil removes roots; small roots that feed the tree, large roots that stabilize the tree.
 - g. The following activities are not allowed within the TPZ:
 1. Driving
 2. Parking
 3. Storage
 4. Dumping Anything (Spoils)
 5. Washing Out Anything
 6. Using the tree trunk for anything such as a temporary power pole, sign post, etc.
 7. No Activity, No Trespass in the TPZ

4. ***Protect tree roots from heat if the hardscape is to be heated in the winter.*** Roots cannot be heated and stimulated to grow in the winter without detrimental effects on a tree.
5. ***Tree Trunk Protection Fencing***
 - a. Install 2 x 4 lumber secured with banding around the trunk of trees noted to be saved.
 - b. Do not attach boards or banding directly into bark.
 - c. Install lumber from the base of the tree up to the first whorl of branches.
 - d. The height of the 2 x 4's needs to be the height that guarantees protection of the bark from any equipment on site.
 - e. Buttress roots (large flare roots at the base of the trunk) cannot be damaged without compromising the health / stability of trees (another reason for 2 x 4 trunk protection).
6. ***Lightly root feed with an approved mycorrhizae / fertilizer product.***
7. ***Verify in writing, following a site inspection, that conditions have been met for fencing (both the Tree Protection Zone and Tree Trunk), mulching and fertilizing.***
8. ***Combine utility trenches to reduce the negative impact on tree roots.***

Construction

9. ***Maintain all tree protection fencing as originally installed and approved to prevent trunk wounds and root compaction.*** Any changes in fencing to be approved by the project arborist. Although fencing will be limited for some trees due to proposed structures, hardscape, water features, etc., it will prevent bark damage and root damage from possible parking, storage, dumping spoils and washing out of equipment. Most roots grow in the top two feet of soil which is where the majority of soil disturbance occurs. The small fibrous roots conduct water and nutrients, the large lateral roots anchor the tree. Both of these type roots are what gets damaged and/or destroyed if a site is not protected.
10. ***Tunnel / bore under roots or hand dig in all TPZ areas, preserve roots greater than 2” in this area. Bark tissue on roots cannot be damaged during hand excavation.***
11. ***Hand digging may be necessary to determine if lateral (support) roots are present on the tree in the direction of the foundation.*** Correct root pruning needs to be performed so as not to compromise the stability of the tree and create potential future liability issues.

12. Root Pruning

- a. Root pruning to be performed by or under the direction of a qualified arborist. Because roots are not visible until exposed from the soil, pruning recommendations often times need to be made in the field. A recommendation for removal of a tree will sometimes need to be made rather than root pruning due to the potential for tree failure.
- b. Any roots encountered larger than 2" need to be hand dug to expose & correct root pruning be performed if needed.
- c. Cleanly prune smaller exposed roots back to the soil horizon; ragged torn roots are not to be left to promote decay & allow for entry of root rot diseases / decay organisms.
- d. Small roots to be cut with hand pruners, medium size roots with loppers and large roots with a saw.
- e. *An excavator or any sort of heavy equipment is not considered a pruning tool.*
- f. All tools need to be clean and sharp.

13. Root Exposure

- a. Promptly cover exposed roots to prevent desiccation from sunlight and drying air.
- b. Roots to be kept covered with tarps kept damp, shotcrete or a material that will keep roots from desiccating and becoming non-functional. Exposure to sunlight and drying air leaves roots non functional; this is a major contributing factor to stress placed on trees during and after construction.

14. Irrigation

- a. Irrigate within the dripline of trees if natural precipitation does not occur: once a week during hot, summer months, once every three weeks in the spring and fall and once a month in the winter. *Irrigation is vital to tree survival.*
- b. In TPZ areas within hardscape, drill holes through the asphalt or concrete every 12" to allow irrigation to reach roots.
- c. Irrigate to a soil depth of 24 inches.
- d. Monitor the soil moisture under the mulch to adjust the watering prescription as needed.
- e. Do not saturate the soil where foot and/or equipment traffic will occur. Irrigate preferably on Friday so that soil will dry by Monday to avoid compaction and site damage.

15. Crown Pruning

- a. Prune tree branches that will conflict with the structures, utility lines, vehicles or machinery.
- b. Prune using a reputable, qualified tree service.
- c. Pruning to be performed under the direction of a qualified arborist.
- d. Prune using current ANSI (American National Standards Institute) A300 pruning standards, making proper pruning cuts without the use of climbing spikes.

16. Tree Damage

- a. Any tree damaged is to be evaluated by the project arborist to determine possible repair method.

17. Replacement of Damaged Beyond Repair Tree

- a. If a tree is determined to be damaged beyond repair by the project arborist, the Contractor will be responsible for replacement trees of the same species or a substitution approved by the TRPA.
- b. The size and quantity of replacement trees shall be decided by TRPA prior to permit acknowledgment.
- c. If the Contractor questions *damage beyond repair*, an independent evaluation report by a qualified Certified Arborist can be submitted.
 1. Report to cover damage assessment, recommended repairs and replacement agreement if damaged tree dies within 5 years of date of damage. Replacement agreement to include Design Workshop installation specifications.
 2. Report to be reviewed by project arborist and comments submitted to TRPA.
 3. Report to be submitted to TRPA.
 4. Independent report to be paid for by the Contractor.

18. Replacement Tree Stock

- a. Trees to meet current ANSI Z60 American Standard for Nursery Stock.
- b. Trees to have the following:
 1. No circling, girdling, kinked or j roots.
 2. No topped trees.
 3. A single main leader.
 4. No insect, disease, mechanical or rodent damage.
 5. Appropriate trunk taper to stand upright without stakes.
 6. Evidence of healthy roots, bark and shoot growth.

19. Questions

- a. If any questions arise concerning trees, roots or pruning, contact the project consulting Certified Arborist @ email: sincon@sbcglobal.net, cell: 775.721.1231, office: 775.884.1883.

ASSUMPTIONS AND LIMITING CONDITIONS

1. Any ownership to property provided to the consultant is assumed to be correct. Any and all property is evaluated as though free and clear.
2. Property is assumed to not be in violation of any applicable codes, ordinances, statutes or other governmental regulations.
3. Care has been taken to obtain all information from reliable sources. Site plans and tree information provided to Sinnott Consulting for this report has been obtained from Boulder Bay Resort.
4. The consultant shall not be required to give testimony or to attend court by reason of this report unless subsequent contractual arrangements are made.
5. Loss or alteration of any part of this report invalidates the entire report.
6. Possession of this report or a copy thereof does not imply right to publication or use for any purpose by any other than the person to whom it is addressed without the prior expressed written or verbal consent of the consultant.
7. This report represents the opinion of the consultant and the consultant's fee is in no way contingent upon the reporting of a stipulated result, the occurrence of a subsequent event, nor any finding to be reported.
8. Information contained in this report covers only those items that were examined and reflects the condition of those items at the time of inspection. There is no warranty or guarantee, expressed or implied that problems or deficiencies of the plants or property in question may not arise in the future.

I certify that all the statements of fact in this report are correct to the best of my knowledge and belief, and are made in good faith.

Molly Sinnott

Certified Arborist
WE-0369