December 14, 2010

City of Tempe
ATTN: Samuel Thompson
3500 S. Rural Road
Tempe, Arizona 85282

RE: Mill Avenue/S-Ficus Tree Evaluation

Mr. Thompson,

Pursuant to your request a reevaluation of the Ficus trees located on Mill Avenue/S has been completed. These trees where originally examined in December 2009 by Mr. Andrew Trotter (WCA Vice-President, ISA Certified Arborist) and a hazard ranking was then assigned to each. The purpose of the most recent examination was to assess the current health and condition of the trees and to offer any observations as to the continued decline or any increase in hazard rankings. The assessment took place on November 2, 2010 and all comments and recommendations that follow are based on the observations made by Mr. Trotter.

OBSERVATIONS: At the request of the city, Mr. Trotter went out and reevaluated the subject trees, found along the 100-700 blocks of Mill Avenue/S. As can be found on the attached spreadsheet, each tree was reassessed and a new ranking assigned as necessary. Of the 113 ficus trees present at the time of the initial evaluation 49 where identified as having defects that classified them as hazardous; these 49 are the subject of this reevaluation. Since that time, 10 of the trees continued to decline and have been reclassified in order to reflect this change with 3 of those trees having been removed due to their hazardous conditions.

COMMENTS: In the first report, the scale below was provided as a way to rank those trees identified as hazardous. The number of trees originally listed for each category may have changed for various reasons including a continued decline in health and or vigor which bumped it into a higher hazard ranking or a tree may have been removed. Any changes are noted on the attached spreadsheet and are highlighted in "ORANGE" (see pages 4-5).

- **Hazard 1**: The tree has structural defects that will likely increase limb or tree failure within the next 10 years. In some cases, damage can be mitigated by pruning. Originally 24 trees were identified as Hazard 1; there are now 21 trees in this category.
- **Hazard 2**: The tree has serious structural defects and some canopy loss, which will likely lead to tree or limb failure within the next 5 years and should be removed sometime within this time frame. Originally 15 trees were identified as Hazard 2; there are now 11 trees in this category.

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- **Hazard 3**: The tree has extreme structural defects and major canopy loss. These trees are highly hazardous and will likely lead to tree and/or limb failure within the next 3 years and should be removed as soon as possible. Originally 10 trees were identified as Hazard 3 there are now 13 trees in this category.
- **Hazard 4**: The tree is considered dead. Dead trees should always be removed as soon as they are detected as they are unpredictable and could fail at any time. Originally no trees were identified as Hazard 4; there is now 1 tree in this category.

SUMMARY: The original reasons given for the state of these trees are still valid, since the structural defects that were present, for the most part still exist. For instance, many of the trees have sunburn along their trunks where they have been left exposed to the hot sun. Ficus trees prefer a tropical climate and the thin bark of this species burns very easily when exposed to the type of temperatures associated with the local environment (see Figures 1 and 2). This type of issue can easily be prevent by planting species that are more appropriate for the weather conditions found at this location. If this species is desired in the city, it is best that it be planted in protected areas, sheltered from the hot sun.

Another issue that was raised is that a large number of the trees were originally identified as having poor branch attachments with included bark (see Figures 3-6). This defect cannot be corrected on older, established trees and the problem will only worsen as the trees grow and the branches increase in caliper. Most of these structural hazards can be prevented by proper training of the trees while they are young (called "Structural Pruning"). However, most of the defects we find in the landscape now occurred due to problems arising from past nursery practices where the terminal leader of most decurrent trees were headed back to force branching. This results in what appears to be a well proportioned tree when purchased, but most branches are too low, too close together, and about the same size (and the tree seldom has a leader). These problems are seldom corrected once the tree is in the landscape and the practice is no longer done by reputable nurseries. Proper pruning and the possible use of cabling and bracing can minimize these hazards in most mature trees. However, sometimes it will be best to remove the hazardous branch or even the entire tree in order to mitigate the risk associated with the defect.

Also, many of the trees are growing in restricted planting areas with limited recourses, and the overall health and stability of the trees is being adversely affected (see Figures 7 and 8). A high number of the trees are leaning already, and in areas frequented by both vehicular traffic as wells as pedestrians. Due to the location, a failure of any part of these trees will most likely cause damage or injury and they should be very closely monitored for any changes in canopy orientation within the landscape. If at any time a change is noted, immediate action should be taken to remove the tree.

The only specific recommendations that are offered at this time are to maintain a regular cycle of pruning, focusing on keeping the canopies as light is possible and removing as many hazardous limbs as is realistic; this can be accomplished with thinning, structural pruning and reduction

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pruning. These recommendations are in compliance with all current ISA Best Management Practices concerning *Structural Development* and *Tree Pruning*. In addition, selecting plant material which is better suited to the local climate and infrastructure will help ensure a long and sustainable presence of the tree(s) in the landscape. Any and all tree work (from planting to removals) should always be performed by ISA Certified Arborists and/or ISA Certified Tree Workers.

Should you have any questions or require additional information, please feel free to contact either Mr. Trotter at (714) 920-1262 or myself at (714) 412-7813.

Respectfully,

Rebecca Mejia

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Address	Street	Side	Tree #	DBH	Height	Old Rating	Newest Observations	New Rating
100X	MILL AV /S	Front	1	19-24	15-30	Hazard-2	large branch cracks	Hazard-2
100X	MILL AV /S	Front	7	19-24	15-30	Hazard-1	similar condition 11-2-10	Hazard-1
100X	MILL AV /S	Front	9	19-24	15-30	Hazard-1	similar condition 11-2-10	Hazard-1
100X	MILL AV /S	Front	10	19-24	15-30	Hazard-1	similar condition 11-2-10	Hazard-1
201X	MILL AV /S	Front	4	13-18	15-30	Hazard-3	similar condition 11-2-10	Hazard-3
201X	MILL AV /S	Front	5	13-18	15-30	Hazard-3	similar condition 11-2-10 low vigor	Hazard-3
201X	MILL AV /S	Front	6	13-18	15-30	Hazard-3	similar condition 11-2-10 large branch loss	Hazard-3
201X	MILL AV /S	Front	7	13-18	15-30	Hazard-3	similar condition 11-2-10 large branch loss	Hazard-3
201X	MILL AV /S	Front	8	13-18	15-30	Hazard-2	similar condition 11-2-10	Hazard-2
201X	MILL AV /S	Front	9	19-24	15-30	Hazard-3	similar condition 11-2-10 low vigor	Hazard-3
301X	MILL AV /S	Front	2	13-18	15-30	Hazard-2	similar condition 11-2-10	Hazard-2
301X	MILL AV /S	Front	3	13-18	15-30	Hazard-2	11/2/10 crack in main crotch haz rating 3	Hazard-3
350	MILL AV /S	Front	1	19-24	15-30	Hazard-1	similar condition 11-2-10	Hazard-1
301X	MILL AV /S	Front	6	19-24	15-30	Hazard-1	similar condition 11-2-10	Hazard-1
301X	MILL AV /S	Front	5	13-18	15-30	Hazard-2	11/2/10 crack in main crotch haz rating 3	Hazard-3
398	MILL AV /S	Front	2	19-24	15-30	Hazard-1	similar condition 11-2-10	Hazard-1
398	MILL AV /S	Front	3	19-24	15-30	Hazard-2	11/2/10 large cracks haz 3	Hazard-3
401	MILL AV /S	Front	1	19-24	15-30	Hazard-2	similar condition 11-2-10	Hazard-2
401	MILL AV /S	Front	2	7-12	0-15	Hazard-1	similar condition 11-2-10	Hazard-2
414	MILL AV /S	Front	3	13-18	15-30	Hazard-1	11-2-10 canopy loss haz 2	Hazard-2
414	MILL AV /S	Front	4	13-18	15-30	Hazard-3	11-2-10 tree gone	Removed
414	MILL AV /S	Front	6	13-18	15-30	Hazard-1	similar condition 11-2-10	Hazard-1
407	MILL AV /S	Front	2	13-18	15-30	Hazard-1	similar condition 11-2-10	Hazard-1
411	MILL AV /S	Front	1	13-18	15-30	Hazard-1	similar condition 11-2-10	Hazard-1
423	MILL AV /S	Front	1	13-18	15-30	Hazard-1	similar condition 11-2-10	Hazard-1
425	MILL AV /S	Front	1	13-18	15-30	Hazard-2	11-2-10 large branch cracks haz 3	Hazard-3
425	MILL AV /S	Front	2	19-24	15-30	Hazard-3	11-2-10 80% canopy loss	Hazard-3
425	MILL AV /S	Front	3	19-24	15-30	Hazard-3	11-2-10 80% canopy loss	Hazard-3
414	MILL AV /S	Front	7	13-18	15-30	Hazard-3	11-2-10 large branch cracks haz 4	Hazard-4
501	MILL AV /S	Front	1	13-18	15-30	Hazard-1	similar condition 11-2-10	Hazard-1
501	MILL AV /S	Front	2	13-18	15-30	Hazard-2	similar condition 11-2-10	Hazard-2
509	MILL AV /S	Front	1	13-18	15-30	Hazard-1	11-2-10 some branch decline	Hazard-1

Address	Street	Side	Tree #	DBH	Height	Old Rating	Newest Observations	New Rating
525	MILL AV /S	Front	2	13-18	15-30	Hazard-2	similar condition 11-2-10	Hazard-2
520	MILL AV /S	Front	1	13-18	15-30	Hazard-1	similar condition 11-2-10	Hazard-1
526	MILL AV /S	Front	2	13-18	30-45	Hazard-1	11-2-10 removed	Removed
545	MILL AV /S	Front	1	13-18	15-30	Hazard-2	similar condition 11-2-10	Hazard-2
545	MILL AV /S	Front	2	13-18	15-30	Hazard-3	11-2-10 large branch loss	Hazard-3
545	MILL AV /S	Front	3	13-18	15-30	Hazard-2	11-2-10 branch decline	Hazard-2
601	MILL AV /S	Front	1	13-18	15-30	Hazard-2	similar condition 11-2-10	Hazard-2
640	MILL AV /S	Front	2	7-12	0-15	Hazard-1	similar condition, removed one large branch	Hazard-1
640	MILL AV /S	Front	3	19-24	15-30	Hazard-1	similar condition, removed one large branch over traffic	Hazard-1
640	MILL AV /S	Front	6	19-24	15-30	Hazard-1	similar condition 11-2-10	Hazard-1
640	MILL AV /S	Front	8	13-18	15-30	Hazard-1	similar condition 11-2-10	Hazard-1
699	MILL AV /S	Front	1	7-12	0-15	Hazard-1	similar condition 11-2-10	Hazard-1
4X	UNIVERSITY DR /E	Side	2	7-12	15-30	Hazard-1	similar condition 11-2-10	Hazard-1
740	MILL AV /S	Front	10	19-24	15-30	Hazard-1	similar condition 11-2-10	Hazard-1
740	MILL AV /S	Front	3	19-24	15-30	Hazard-1	similar condition 11-2-10	Hazard-1
740	MILL AV /S	Front	2	19-24	15-30	Hazard-2	11-2-10 large branch loss haz 3	Hazard-3

Figures 1. & 2. Showing examples of trees with severely sunburned trunks. This type of injury will cause canopy dieback and decline and eventually death of the effected branch and/or the entire tree. Ficus trees are considered a tropical species and are extremely sensitive to thermal injury as they have very thin bark. Although they typically have thick, dense canopies, this does not always provide total protection to the lower trunk areas.

Figures 3 & 4. Showing examples of trees with codominant stems (multiple branches of similar diameter arising from a common attachment). The photograph above also depicts limbs with included bark which elevates the risk of failure. This type of defect should have been mitigated while still at the nursery or soon after installation.

Figures 5 & 6. These photographs show sites where limbs recently failed in at least two of the ficus trees. In addition to the limbs breaking, a split now exists on one particular tree and the other limbs at the attachment site are most likely also going to break out (see below).

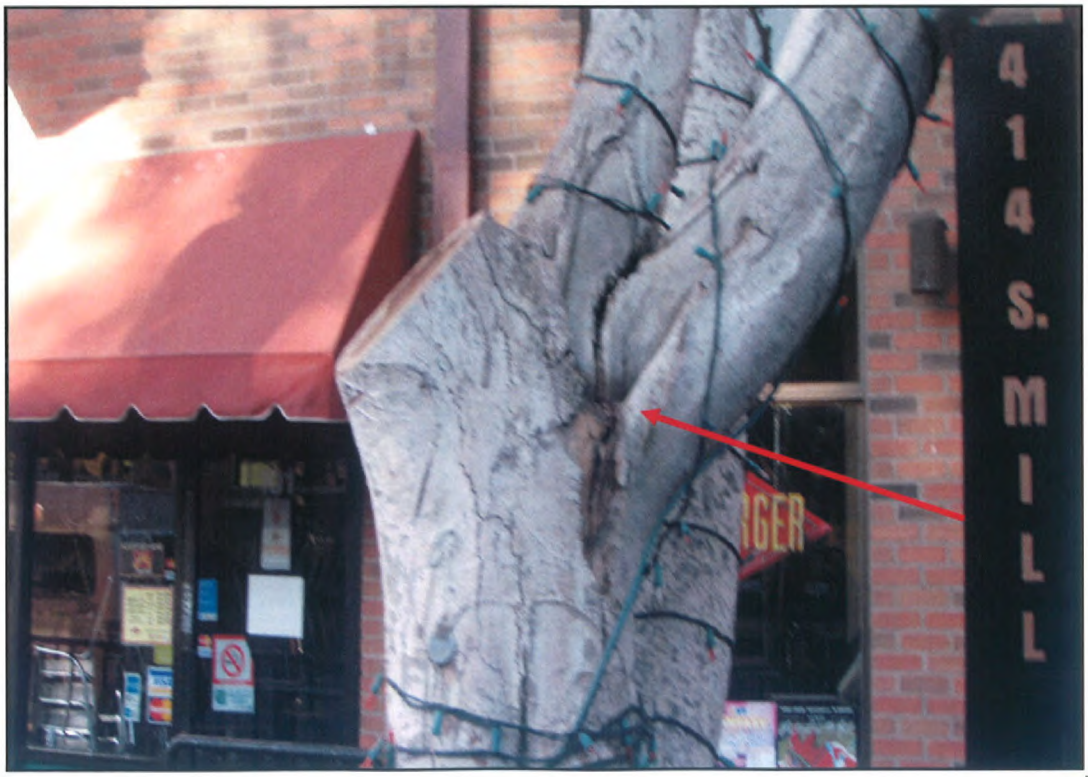

Figure 7 (above). Showing the restricted growth space associated with most of the ficus trees. This type of planting site limits water, air and nutrient movement and uptake as well as proper root development. This often leads to poor tree health and stability issues which may result in the tree toppling over.

Figure 8 (above). Showing another leaning tree with a very large trunk wound and codominant stems, this tree has a high level of risk associated with it. Any tree with these types of defects needs to be very closely monitored and even considered for possible removal from the site.

ASSUMPTIONS AND LIMITING CONDITIONS

1. Care has been taken to obtain all information from reliable sources. All data has been verified insofar as possible; however, the Consultant can neither guarantee nor be responsible for the accuracy of information provided by others.

2. The Consultant will not be required to give testimony or to attend court by reason of this report unless subsequent contractual arrangements are made, including payment of an additional fee for such services as described in the fee schedule and contract of engagement.

3. Loss or alteration of any part of this report invalidates the entire report.

4. Possession of this report or a copy thereof does not imply right of publication or use for any purpose by any other than the person to whom it is addressed, without the prior written consent of the Consultant.

5. This report and any values expressed herein represent the opinion of the Consultant, and the Consultant's fee is in no way contingent upon the reporting of a stipulated result, a specified value, the occurrence of a subsequent event, nor upon any finding to be reported.

6. Unless expressed otherwise: 1) information contained in this report covers only those items that were examined and reflects the condition of those items at the time of inspection; and 2) the inspection is limited to visual examination of accessible items without dissection, excavation, or coring. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the tree(s) or property in question may not arise in the future.

7. Arborists are tree specialists who use their education, knowledge, training, and experience to examine trees, recommend measures to enhance the beauty and health of trees, and attempt to reduce the risk of living near trees. It is highly recommended that you follow the arborist recommendations; however, you may choose to accept or disregard the recommendations and/or seek additional advice.

8. Arborists cannot detect every condition that could possibly lead to the structural failure of a tree. Trees are living organisms that fail in ways we do not fully understand. Conditions are often hidden within trees and below ground. Arborists cannot guarantee that a tree will be healthy or safe under all circumstances, or for a specific period of time. Likewise, remedial treatments performed cannot be guaranteed.

9. Any recommendations and/or performed treatments (including, but not limited to, pruning or removal) of trees may involve considerations beyond the scope of the arborist's services, such as property boundaries, property ownership, site lines, disputes between neighbors, and any other related issues. Arborists cannot take such considerations into account unless complete and accurate information is disclosed to the arborist. An arborist can then be expected to consider and reasonably rely on the completeness and accuracy of the information provided.

10. The author has no personal interest or bias with respect to the subject matter of this report or the parties involved. He/she has inspected the subject tree(s) and to the best of their knowledge and belief, all statements and information presented in the report are true and correct.

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