Appendix B

Arborist Report

Kielty Arborist Services

Certified Arborist WE#0476A
P.O. Box 6187
San Mateo, CA 94403
650-515-9783

April 13, 2020

David J. Powers & Assoicates
Attn: Amber Sharpe
1871 The Alameda, Suite 200
San Jose, CA 95126

Site: 3000 Bowers Avenue, Santa Clara CA

Dear Ms. Sharpe,

As requested on Friday, October 25, 2019, Kielty Arborist Services LLC visited the above site for the purpose of inspecting and commenting on the trees. Development is planned for the site, and your concern as to the future health and safety of existing trees has prompted this visit. Plans A1.01, C2.0, L1.01, and L4.01 were reviewed for writing this report. A tree protection plan for the trees to be retained will also be provided at the end of this report.

Criteria used for rating condition of trees:
All inspections were made from the ground; the trees were not climbed for this inspection. The trees in question were located on an existing topography map provided by you. The trees were then measured for diameter at 54 inches above ground level (DBH or diameter at breast height). The trees were given a condition rating based on 50 percent existing tree health and 50 percent tree structure using the following scale:

Condition Ratings

1	-	29	Very Poor (tree #51)
30	-	49	Poor (trees #2, 3, 5, 8, 19, 28-50, 54-56)
50	-	69	Fair (trees #1, 4, 6, 7, 9-11, 14, 15, 17, 18, 20, 21, 24-26, 52, 53, 57)
70	-	89	Good (trees #12, 13, 16, 22, 23, 27)
90	-	100	Excellent (no excellent trees surveyed)

The height of the trees was measured using a Nikon Forestry 550 Hypsometer. The spread was paced off. Comments and recommendations for future maintenance are provided. The conservation suitability worksheet from the Best Management Practices, "Managing Trees During Construction", book was used to evaluate each trees suitability for preservation for the retained trees. Trees that are preserved on development sites must be carefully selected to make sure that they may survive developmental impacts, adapt to a new environment and perform well in the landscape. The goal is to identify trees that have the potential for long-term preservation. Factors looked at are tree health, structural integrity, species response to construction impacts, and tree age and longevity.

Survey Key:
DBH- Indicates diameter at breast height (54 inches above grade)
CON- Indicates condition rating
HT/SP- Indicates tree height and canopy spread in feet
*- Indicates tree on neighboring property

Survey:

Tree#	Species	DBH	CON	HT/SP	Comments
1	Italian stone pine *(Pinus pinea)*	47.0	60	35/45	Good vigor, poor form, codominant at 5 feet with poor unions, spreading canopy, heavy over street, poor street tree choice.
Preserve or remove-Preserve **Suitability for preservation-Moderate**					
2	Mulberry *(Morus alba)*	18.9	45	35/40	Good vigor, poor form, topped, decay.
Preserve or remove-Preserve **Suitability for preservation-Poor**					
3	Mulberry *(Morus alba)*	20.7	45	35/40	Good vigor, poor form, topped, decay.
Preserve or remove-Preserve **Suitability for preservation-Poor**					
4	Italian stone pine *(Pinus pinea)*	40.0	65	30/40	Good vigor, fair form, well maintained, cabled in past, heavy lateral limbs.
Preserve or remove-Preserve **Suitability for preservation-Moderate**					
5	Mulberry *(Morus alba)*	24.0	45	30/40	Good vigor, poor form, topped, decay.
Preserve or remove-Remove					
6	Italian stone pine *(Pinus pinea)*	43.3	50	40/40	Good vigor, fair to poor form, multi leader at 5 feet with fair to poor unions, history of limb loss.
Preserve or remove-Remove					
7	Italian stone pine *(Pinus pinea)*	42.4	55	55/50	Good vigor, fair form, lawn mower damage to roots.
Preserve or remove-Remove					

Tree#	Species	DBH	CON	HT/SP	Comments
8	Mulberry *(Morus alba)*	14.3	45	40/30	Good vigor, poor form, topped.
Preserve or remove-Remove					
9	Italian stone pine *(Pinus pinea)*	49.0	60	45/45	Good vigor, fair form, multi leader at 3 feet.
Preserve or remove-Remove					
10	Italian stone pine *(Pinus pinea)*	42.0	50	45/45	Good vigor, fair form, heavy into property, poor codominant union with included bark.
Preserve or remove-Remove					
11	Italian stone pine *(Pinus pinea)*	42.8	60	45/45	Good vigor, fair form, codominant at 5 feet.
Preserve or remove-Remove					
12	Mexican fan palm *(Washingtonia robusta)*	29.0	70	50/8	Good vigor, good form.
Preserve or remove-Preserve					
Suitability for preservation- Moderate					
13	Mexican fan palm *(Washingtonia robusta)*	28.0	70	50/8	Good vigor, good form.
Preserve or remove-Preserve					
Suitability for preservation- Good					
14	Silver dollar gum *(Eucalyptus polyanthemos)*	18.8	60	40/18	Fair vigor, fair form.
Preserve or remove-Preserve					
Suitability for preservation- Good					
15	Silver dollar gum *(Eucalyptus polyanthemos)*	13.5	60	40/18	Fair vigor, fair form, close to street.
Preserve or remove-Preserve					
Suitability for preservation- Moderate					
16	London plane *(Platanus x hispanica)*	11.0	80	40/30	Good vigor, good form.
Preserve or remove-Preserve					
Suitability for preservation- Good					

Tree#	Species	DBH	CON	HT/SP	Comments
17	Italian stone pine *(Pinus pinea)*	47.1	60	45/50	Good vigor, fair form, codominant at 5 feet with poor union.

Preserve or remove-Preserve
Suitability for preservation- Moderate

18	Italian stone pine *(Pinus pinea)*	40.5	60	45/40	Good vigor, fair form, heavy lateral limbs.

Preserve or remove-Preserve
Suitability for preservation- Moderate

19	River red gum *(Eucalyptus camaldulensis)*	30.5	45	45/45	Good vigor, fair form, large cracks on limbs.

Preserve or remove-Remove

20	Italian stone pine *(Pinus pinea)*	57.8	60	45/45	Good vigor, fair form, codominant at 4 feet with fair to poor unions.

Preserve or remove-Remove

21	Italian stone pine *(Pinus pinea)*	43.1	60	45/45	Good vigor, fair form, codominant at 4 feet with fair to poor unions.

Preserve or remove-Preserve
Suitability for preservation- Moderate

22	Mexican fan palm *(Washingtonia robusta)*	22.0	70	65/8	Good vigor, fair form.

Preserve or remove-Remove

23	Mexican fan palm *(Washingtonia robusta)*	22.0	70	65/8	Good vigor, fair form.

Preserve or remove-Remove

24	Italian stone pine *(Pinus pinea)*	52.5	60	40/50	Good vigor, fair form, codominant at 5 feet with fair to poor unions.

Preserve or remove-Remove

25	Italian stone pine *(Pinus pinea)*	45.3	60	40/50	Good vigor, fair form, codominant at 5 feet with fair to poor unions.

Preserve or remove-Remove

26	Italian stone pine *(Pinus pinea)*	49.1	60	40/50	Good vigor, fair from, codominant at 5 feet with fair to poor unions.

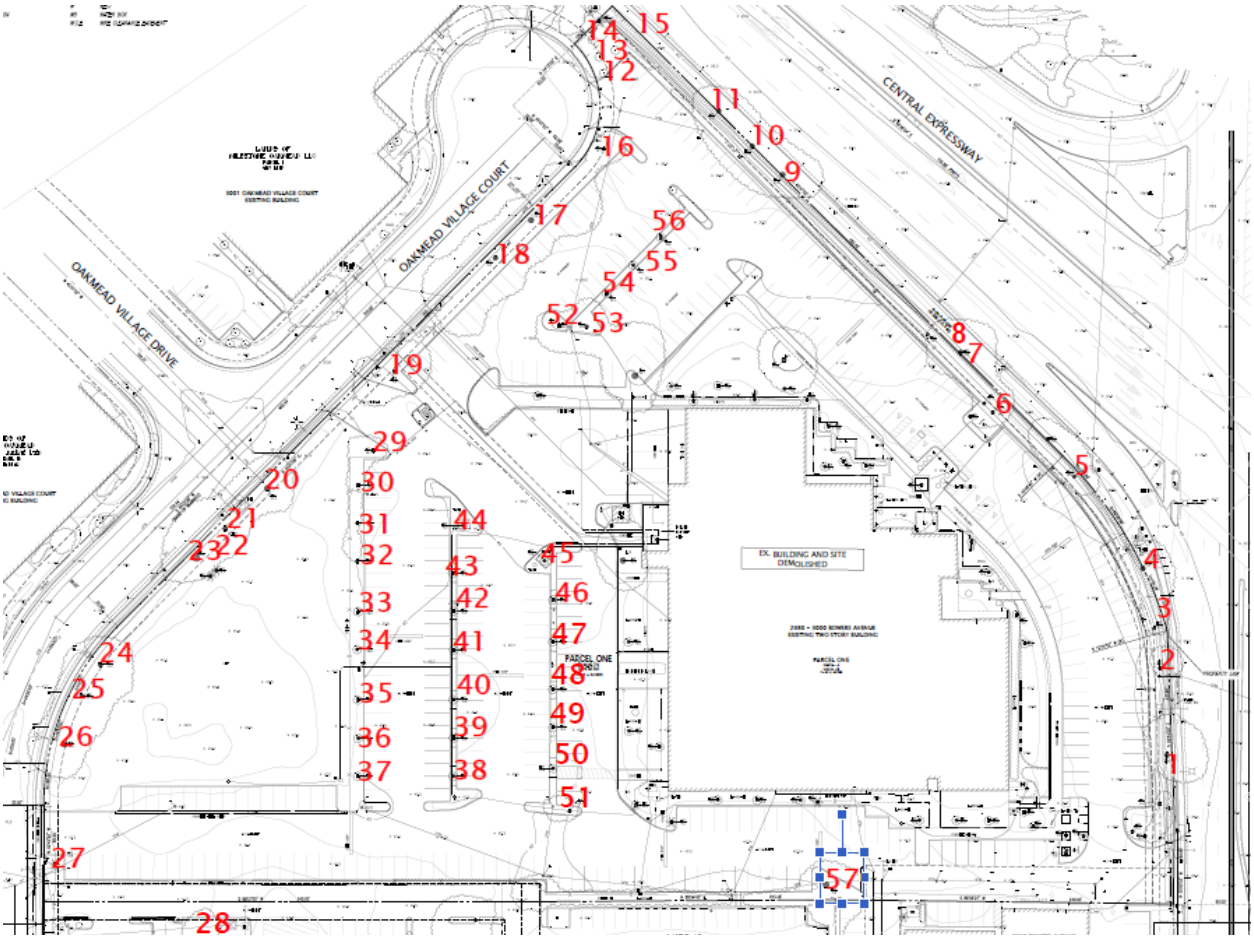
Preserve or remove-Preserve
Suitability for preservation- Moderate

Tree#	Species	DBH	CON	HT/SP	Comments
27	Mexican fan palm *(Washingtonia robusta)*	15.0	70	25/8	Good vigor, good form, young tree.
Preserve or remove-Remove					
28*	Redwood *(Sequoia sempervirens)*	18est	45	30/12	Poor vigor, fair form, drought stressed in decline, in small planting strip.
Preserve or remove-Preserve					
Suitability for preservation- Good					
29	Mulberry *(Morus alba)*	19.3	45	25/25	Fair vigor, poor form, topped.
Preserve or remove-Remove					
30	Mulberry *(Morus alba)*	15.6	45	25/25	Fair vigor, poor form, topped.
Preserve or remove-Remove					
31	Mulberry *(Morus alba)*	16.3	45	25/25	Fair vigor, poor form, topped.
Preserve or remove-Remove					
32	Mulberry *(Morus alba)*	14.3	45	25/25	Fair vigor, poor form, topped.
Preserve or remove-Remove					
33	Mulberry *(Morus alba)*	17.7	45	25/25	Fair vigor, poor form, topped.
Preserve or remove-Remove					
34	Mulberry *(Morus alba)*	12.8	45	25/25	Fair vigor, poor form, topped.
Preserve or remove-Remove					
35	Mulberry *(Morus alba)*	19.5	45	25/25	Fair vigor, poor form, topped.
Preserve or remove-Remove					
36	Mulberry *(Morus alba)*	14.2	45	25/25	Fair vigor, poor form, topped.
Preserve or remove-Remove					

Tree#	Species	DBH	CON	HT/SP	Comments
37	Mulberry *(Morus alba)*	16.1	45	25/25	Fair vigor, poor form, topped.
Preserve or remove-Remove					
38	Mulberry *(Morus alba)*	13.5	45	25/25	Fair to poor vigor, poor form, topped, in small planting strip surrounded by hardscape
Preserve or remove-Remove					
39	Mulberry *(Morus alba)*	16.2	45	25/25	Fair to poor vigor, poor form, topped, in small planting strip surrounded by hardscape
Preserve or remove-Remove					
40	Mulberry *(Morus alba)*	14.6	45	25/25	Fair to poor vigor, poor form, topped, in small planting strip surrounded by hardscape
Preserve or remove-Remove					
41	Mulberry *(Morus alba)*	14.1	45	25/25	Fair to poor vigor, poor form, topped, in small planting strip surrounded by hardscape
Preserve or remove-Remove					
42	Mulberry *(Morus alba)*	11.9	45	25/25	Fair to poor vigor, poor form, topped, in small planting strip surrounded by hardscape
Preserve or remove-Remove					
43	Mulberry *(Morus alba)*	16.3	45	25/25	Fair to poor vigor, poor form, topped, in small planting strip surrounded by hardscape
Preserve or remove-Remove					
44	Mulberry *(Morus alba)*	17.5	45	25/25	Fair to poor vigor, poor form, topped, in small planting strip surrounded by hardscape
Preserve or remove-Remove					
45	Mulberry *(Morus alba)*	14.0	45	25/25	Fair to poor vigor, poor form, topped, in small planting strip surrounded by hardscape
Preserve or remove-Remove					
46	Mulberry *(Morus alba)*	12.5	45	25/25	Fair to poor vigor, poor form, topped, in small planting strip surrounded by hardscape
Preserve or remove-Remove					
47	Mulberry *(Morus alba)*	16.0	45	25/25	Fair to poor vigor, poor form, topped, in small planting strip surrounded by hardscape
Preserve or remove-Remove					

Tree#	Species	DBH	CON	HT/SP	Comments
48	Mulberry *(Morus alba)*	14.0	45	25/25	Fair to poor vigor, poor form, topped, in small planting strip surrounded by hardscape
Preserve or remove-Remove					
49	Mulberry *(Morus alba)*	11.8	45	25/25	Fair to poor vigor, poor form, topped, in small planting strip surrounded by hardscape
Preserve or remove-Remove					
50	Mulberry *(Morus alba)*	15.5	45	25/25	Fair to poor vigor, poor form, topped, in small planting strip surrounded by hardscape
Preserve or remove-Remove					
51	River red gum *(Eucalyptus camaldulensis)*	20.5	25	35/25	Poor vigor, fair form, abundance of dead wood, in decline.
Preserve or remove-Remove					
52	Italian stone pine *(Pinus pinea)*	21.5	50	40/30	Fair vigor, poor form, codominant at 10 feet with included bark, in small planting area.
Preserve or remove-Remove					
53	Italian stone pine *(Pinus pinea)*	39.0	50	40/30	Fair vigor, fair form, in small planting area surrounded by hardscape.
Preserve or remove-Remove					
54	Mulberry *(Morus alba)*	13.8	45	25/25	Fair vigor, poor form, topped.
Preserve or remove-Remove					
55	Mulberry *(Morus alba)*	12.3	45	25/25	Fair vigor, poor form, topped.
Preserve or remove-Remove					
56	Mulberry *(Morus alba)*	15.2	45	25/25	Fair vigor, poor form, topped.
Preserve or remove-Remove					
57	Italian stone pine *(Pinus pinea)*	45.0	50	45/50	Fair vigor, fair to poor form, poor union.
Preserve or remove-Remove					

ALL TREES WITH A DIAMETER MEASUREMENT OF 11 INCHES OR LARGER ARE PROTECTED IN THE CITY OF SANTA CLARA



Showing tree locations

Tree suitability for preservation:
The conservation suitability worksheet from the Best Management Practices, "Managing Trees During Construction", book was used to evaluate each trees suitability for preservation. Using this worksheet takes into account the trees health, distance from tree where roots are to be cut or distance from soil fill, structural defects, construction tolerance of species, tree age, location of construction activity, existing soil quality, and species desirability. After filling out the sheet it gives you a number. Below are the number ratings with an explanation.

Trees with a rating of 80 or higher have a good suitability for preservation, and have a high potential for longevity on the site after construction. These trees are given a high suitability for preservation.

Trees with a rating of 60-79 have a moderate suitability for preservation, and may require more in-depth management and monitoring, before, during, and after construction, and may have a shorter lifespan than those in the "good" category. These trees are given a moderate suitability for preservation.

Trees with a rating of 59 or below have a poor suitability for preservation, and would be expected to decline during or after construction regardless of management. These trees are given a low suitability for preservation rating.

Trees within the proposed building footprints or proposed hardscapes were not looked at, as these trees need to be removed to facilitate construction.

Tree# and preservation rating of retained trees

#1-Moderate	#2- Moderate	#3- Moderate	#4- Moderate
#12- Moderate	#13- Good	#14- Good	#15- Moderate
#16- Good	#17- Moderate	#18-Moderate	#21- Moderate
#26- Moderate	#28- Good		

The majority of the trees are proposed for removal to facilitate the construction and proposed landscape. 14 trees are shown on the plans to be retained.

10 trees have a moderate preservation rating and will require more in-depth management and monitoring, before, during, and after construction. These trees are #1-4, 12, 15, 17, 18, 21, and 26.

Site observations:
The landscape at 3000 Bowers has been poorly maintained in the past as no apparent recent maintenance to the trees was observed. All of the mulberry trees have been repeatedly topped in the past. Many large Italian stone pine trees were observed near the street.

Showing topped mulberry tree

Summary:
Trees surveyed with a condition rating lower than 50 are considered to be poor trees and should be removed regardless of the proposed construction. All of the surveyed mulberry trees were given poor condition ratings due to being topped repeatedly. Topping trees is not an acceptable pruning practice due to future hazards created. Topping trees leads to decay at the point of origin as the cut is too large for the tree to develop enough wound wood to stop the spread of decay. Future growth following topping cuts consist of weakly attached sprout like growth. These new limbs do not develop proper branch to trunk attachments, and as a result future limb failure is at a high risk. Mulberry trees #2 and #3 are the only mulberry trees on site to be retained at this time. These trees should be pruned annually to reduce risk of limb failure. Crown reduction pruning should be applied to these trees to reduce limb failure risk.

Showing lawn mower damage

All of the surveyed Italian stone pine trees are mature trees. Past lawn mower damage was observed at the root crowns of all the pine trees with surface roots being damaged. It appears that the landscape has been covered by mulch and a weed barrier. The pine trees all have dense canopies. Naturally most of the Italian stone pine trees are codominant with poor attachments (included bark) observed. The natural architecture of this species is poor and makes the tree prone to limb and trunk failure. Not only do they develop poor codominant unions, but the species also has a wide spreading canopy that creates more stress on the poorly formed unions and heightens risk of limb failure. This species needs a large area for root growth, and generally are not a well-suited species for street trees. The species has a branch strength rating of weak to medium weak (https://selectree.calpoly.edu/tree-detail/pinus-pinea). Most branch failures (60%) occur at the point of attachment due to included bark. Root failures are the most common types of failures reported with this species according to the California tree failure report program. All of the pine trees to be retained are recommended to be pruned to reduce heavy end weight on the lateral limbs and to reduce stress to the poorly formed codominant unions. Cabling of large codominant leaders is also recommended to reduce limb failure risk.

Tree replacement plan:
Generally, the City of Santa Clara requires a tree replacement ration of 2:1 for each tree removed. There is a lot of room for replacement trees on site to be planted. 43 trees are proposed for removal. Using the 2:1 ratio 86 trees are need as mitigation for the removed trees.

Recommendations for the retained trees:
The large Italian stone pine trees to be retained are mature trees and will require a larger no excavation zone as mature trees are less tolerant to construction impacts. The mulberry trees to be retained will also require a larger no excavation zone as they have structural defects. Pine trees and mulberry trees have a moderate to good tolerance of construction impacts as seen in Best Management Practices, " Managing Trees During Construction". Before construction is to start, all of the retained pine trees and mulberry trees must be mitigated to improve their overall risk of limb failure through crown reduction pruning and cabling. The trunk formula method was used to determine the tree protection zone radius. Because the pine trees and mulberry trees are mature and have a moderate to good tolerance to construction a tree protection zone multiplication factor of 8 was given to these trees. Below are recommended distances to be maintained from the retained pine trees and mulberry trees to any proposed excavation (including grading).
#1-31 feet #2-13 feet #3-14 feet #4-27 feet #17-31 feet #18-27 feet
#21-29 feet #26-33 feet

Proposed hardscapes (pathways) within the above distances should be constructed on top of existing natural grade while using biaxial geogrid as an underlayment. By using this "zero cut method" the trees structural stability can be maintained. The geogrid will help to reduce compaction levels within the tree protection zones. Any underground utility lines within the above distances can be excavated by hand in combination with an air knife. Lines will need to be placed below or besides roots to avoid cutting roots where necessary. Exposed roots during this process will need to be kept moist by wrapping the roots with burlap and spraying down the burlap multiple times a day. If the above distances from the trees to excavation or construction recommendations cannot be done, then the trees should be removed and replaced. Tree protection fencing will need to be installed and maintained at the above distances throughout the construction process. During hardscape construction or utility line work within these distances, tree protection fencing will need to be temporarily reduced. The Project Arborist will need to be on site during the proposed work within the above distances. During this time the work will be documented with mitigation measures recommended as needed. Impacts to these trees are expected to be minor if the above recommendations are followed. The existing landscaped areas for the large Italian stone pine trees are recommended to be retained as is. All of the pine trees have large elevated root crowns. Any grading near these could impact health and stability.

Arrow showing landscape area below stone pine trees. This area should remain unaltered if possible.

Mexican fan palm trees #12 and #13, as well as Silver dollar eucalyptus trees #14 and #15 are near the proposed grass paver area and landscape work. These trees have a moderate tolerance to construction impacts and are young trees. These trees were therefore given a tree protection zone multiplication factor of 6. Below is the recommended offset from construction impacts for the palm trees and eucalyptus trees.

#12- 14.5 feet #13- 14.5 feet #14- 9 feet
#15- 7 feet

The proposed hardscape work within the above distances should take place on top of grade while using biaxial geogrid as an underlayment. If this can happen then impacts would be nonexistent as no cut would be needed.

Showing palm trees and eucalyptus trees

London plane tree #16 is a young tree and has a good tolerance to construction impacts. A tree protection zone multiplication factor of 6 was given to the tree. The distance from proposed excavation should be at least 6 feet from this tree. If this distance can be maintained no impacts are expected.

No impacts due to the proposed construction are expected for neighboring redwood tree #28, as the proposed work is far from the tree. However, the redwood tree is in significant decline likely due to drought stress. The following tree protection plan will help to reduce impacts to the trees to be retained on site.

Tree Protection Plan:

Tree Protection Zones

Tree protection zones should be installed and maintained throughout the entire length of the project. Fencing for tree protection zones should be 6' tall, metal chain link material supported by metal 2" diameter poles, pounded into the ground to a depth of no less than 2'. The location for the protective fencing for the protected trees on site should be installed no closer to the trunk than the dripline (canopy spread) in order to protect the integrity of the tree. The location of the tree protection fencing may be modified by the planning director. When it is not possible to place tree protection fencing at the dripline because of the proposed work or existing hardscapes, the tree protection fencing shall be placed at the edge of the proposed work or hardscapes. No equipment or materials shall be stored or cleaned inside the protection zones. Areas where tree protection fencing needs to be reduced for access, should be mulched with 6" of coarse wood chips with ½ inch plywood on top. The plywood boards should be attached together in order to minimize movement. The spreading of chips will help to reduce compaction and improve soil

structure. All tree protection measures must be installed prior to any demolition or construction activity at the site. The non-protected trees are recommended to be protected in the same manner as the protected trees on site. No signs, wires, or any other object shall be attached to the trees. A 4 inch thick layer of mulch is recommended to be placed within the tree protection zones.

Landscape Buffer
Where tree protection does not cover the entire root zone of the trees, or when a smaller tree protection zone is needed for access, a landscape buffer consisting of wood chips spread to a depth of six inches with plywood or steel plates placed on top will be placed where foot traffic is expected to be heavy. The landscape buffer will help to reduce compaction to the unprotected root zone.

Root Cutting
Any roots to be cut shall be monitored and documented. Large roots (over 2" diameter) or large masses of roots to be cut must be inspected by the site arborist. The site arborist, at this time, may recommend irrigation or fertilization of the root zone. All roots needing to be cut should be cut clean with a saw or lopper. Roots to be left exposed for a period of time should be covered with layers of burlap and kept moist.

Grading
The existing grade level around the trees shall be maintained out to the dripline of the trees when possible. Anytime existing grades are to be changed underneath the dripline of a protected tree more than 4" special mitigation measures will need to be put into action to reduce impacts to the trees. Aeration will need to be provided to root zones of trees that are to experience fill soil being placed within the tree root zones. Grades shall not be lowered when within 6 times the diameter of a protected tree on site. Lowering grades will result in roots needing to be cut and is highly discouraged.

Trenching and Excavation
Trenching for irrigation, drainage, electrical or any other reason shall be done by hand when inside the dripline of a protected tree. Hand digging and the careful placement of pipes below or besides protected roots will significantly reduce root loss, thus reducing trauma to the tree. All trenches shall be backfilled with native materials and compacted to near its original level, as soon as possible. Trenches to be left open for a period of time, will require the covering of all exposed roots with burlap and be kept moist. The trenches will also need to be covered with plywood to help protect the exposed roots.

Irrigation

Imported trees- On a construction site, I recommend irrigation during winter months, 1 time per month. Seasonal rainfall may reduce the need for additional irrigation. During the warm season, April – November, my recommendation is to use heavy irrigation, 2 times per month. This type of irrigation should be started prior to any excavation. The irrigation will improve the vigor and water content of the trees. The on-site arborist may make adjustments to the irrigation recommendations as needed. The foliage of the trees may need cleaning if dust levels are extreme. Removing dust from the foliage will help to reduce mite and insect infestation.

Inspections

It is the contractor's responsibility to contact the site arborist when work is to take place underneath the canopy or dripline of a protected tree on site. Kielty Arborist Services can be reached by email at kkarbor0476@yahoo.com or by phone at (650) 515-9783 (Kevin). On this site it is recommended to conduct monthly inspections to make sure tree protection is still up and that the contractor follows the arborist recommendations.

Post construction

Once construction has been completed the trees are recommended to be re-inspected with compaction levels tested. Mitigation measures may need to be applied after construction has been completed. The retained pine and mulberry trees are recommended to be put on a routine maintenance schedule/ inspection schedule. The trees are recommended to be inspected annually.

The information included in this report is believed to be true and based on sound arboricultural principles and practices.

Sincerely,
Kevin Kielty Certified Arborist WE#0476A Kevin Kielty

Kielty Arborist Services

P.O. Box 6187
San Mateo, CA 94403
650-515-9783

ARBORIST DISCLOSURE STATEMENT

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. Clients may choose to accept or disregard the recommendations of the arborist or seek additional advice.

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 specified period of time. Likewise, remedial treatments, like a medicine, cannot be guaranteed.

Treatment, pruning, and 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, landlord-tenant matters, etc. Arborists cannot take such issues into account unless complete and accurate information is given to the arborist. The person hiring the arborist accepts full responsibility for authorizing the recommended treatment or remedial measures.

Trees can be managed, but they cannot be controlled. To live near a tree is to accept some degree of risk. The only way to eliminate all risks is to eliminate all trees.

Arborist: Kevin Kielty
Kevin R. Kielty

Date: August 13, 2020