April 28, 2021

Desiree Morgan
Lennar Multifamily Communities
492 9th Street, Suite 300
Oakland, CA 94607

HORT SCIENCE
BARTLETT CONSULTING
A Division of The F.A. Bartlett Tree Expert Company

Subject: **Utility Undergrounding Arborist Report**
Horton St., Emeryville CA

Dear Mrs. Morgan:

Lennar Multifamily Communities is redeveloping the Sherwin Ave. site, in Emeryville, CA. As part of the project, a joint trench will be installed in Horton St., with new '7-boxes' installed in the sidewalk, adjacent to several street trees. LMC requested HortScience | Bartlett Consulting (HBC), Divisions of the F. A. Bartlett Tree Expert Co., to assess the street trees and provide an opinion of the potential impacts from the proposed work. This letter responds to that request.

Description of Trees
I visited the site on March 12, 2021. A total of 22 trees were included in the assessment, with 16 located on the west side of Horton St. and 6 on the east side. Descriptions of individual trees are provided in the ***Tree Assessment Form*** and locations are shown on the ***Tree Assessment Map***.

Since the City arborist had assessed these trees previously in 2014 and 2018, I used the same numbering system for consistency. As such, trees #1, 2, 4, 6-13 and 15-19 were located on the west side of Horton St. and #20-25 on the east side. Tree #14 had been removed since the time of the City arborist evaluations and trees #20-25, included in this report, were not part of the City arborist's assessment.

West side:
All 16 of the trees on the west side of Horton St. were Japanese pagodas (*Sophora japonica*), measuring between 6" and 15" in trunk diameter (Photo 1, following page). All were street trees, located in relatively small cut-outs (2.5'x2.5') in the sidewalk.

Eleven (11) of the Japanese pagodas had displaced the surrounding concrete sidewalk by an estimated 6" to 10", and the curb and gutter by 2" to 8", including #1, 2, 4, 6, 8-12, 16 and 19.

The trees had developed shallow roots between the base material and concrete sidewalk, curb and gutter as a result of a combination species characteristics and insufficient soil volume. This has created significant tripping hazards for pedestrians along the west side of Horton Street.

While most of the Japanese pagodas were in fair condition, there is little that can be done at this point to retrain roots or retrofit improvements around existing trees, such as structural soil, that help promote root development below sidewalk, curbs and gutters.

East side:
The six trees assessed on the east side of Horton included 4 young ginkgos (*Ginkgo biloba*) and two semi-mature Olives (*Olea europaea*). The ginkgos were located between Park and Sherwin Avenues and olives #24 and 25 were located north of 45th Street.

Photo 1 (L): Looking southwest at Japanese pagoda trees #6-11 (R to L). Condition was variable but almost all had displaced the surrounding sidewalk, curb and gutter from 2" to 8" (inset). Inset was taken at tree #11 looking northeast.

The ginkgos were new plantings, with trunk diameters from 4" to 6". All of the ginkgos were in either good or excellent condition, but #21-23 were already starting to outgrow the metal grates placed around their bases (**Photo 2**).

Photo 2 (L): Looking east at ginkgo #21. The trees were all young and in good condition but had already started to grow into the metal grates placed around them.

Olives #24 and 25 measured 10" and 12" in trunk diameter, respectively, and were in good condition. However, both were growing in a very narrow planter and were displacing the adjacent sidewalk by an estimated 2", despite the sidewalk having been recently replaced in this area.

Sidewalk Removal
In anticipation of the proposed work and to better understand the number, size and location of surface roots, the sidewalk adjacent to trees #6-10 was removed. Table 1, following page, provides a brief description of the number and size of the surface roots exposed.

Surface roots ranged from approximately 1" to 10" in diameter, with trees #8-10 having the greatest number and largest sized surface roots (**Table 1** and **Photos 3-7**, following page).

Evaluation of Impacts and Recommendations
The tree assessment was the reference point for tree health and I used the Preliminary Plan Line Horton St. Improvements plan, prepared by CBG engineers (dated July 23, 2020) to assess impacts to the trees.

The plan proposes the following:

- Install a joint trench along the west side of Horton St., approximately 5' from the curb.
- Install new '7-boxes' in the sidewalk in several locations on the west side.
- The joint trench will cross over Horton St. to the east side in several locations to connect to existing utility boxes in the sidewalk or install new boxes.
- Remove and replace the existing sidewalk, curb and gutter on the west side of Horton Street.
- Install a new entry onto 46th Street.

West side
Primary impacts to the street trees would be associated with the replacement of the sidewalk, curb and gutter, utility trenching and installation of the '7-boxes' between trees.

In my professional opinion, impacts to the street trees on the west side of Horton St. would be significant, removing surface roots for sidewalk, curb and gutter replacement and removing all roots to the depth of the excavation for the utility work, some of which will require excavations as deep as 11 feet.

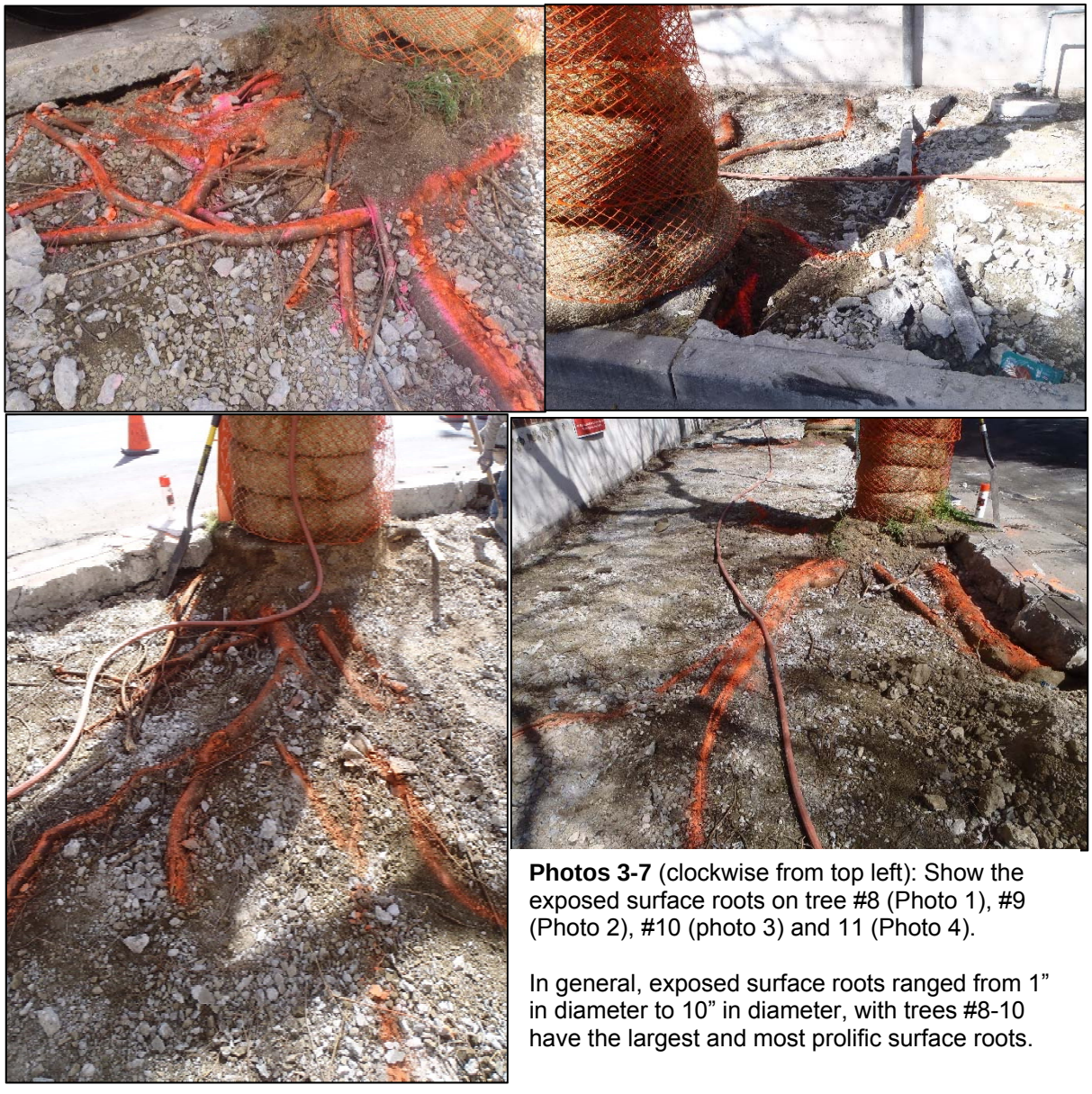
I recommend removing and replacing all of the Japanese pagoda street trees on the west side of Horton Street. This would provide for both continuity of design and assures the new trees will have more soil volume, larger cut-outs and an overall better growing environment. The new growing conditions can be expected to produce healthier and larger trees and reduce the potential for future infrastructure displacement.

East side
Based on my assessment of the proposed work, ginkgos #20-23 will tolerate the impacts from the proposed trenching. Tree #21 would be the closest of the ginkgos to the joint trench at approximately 5'.

Olives #24 and 25 would both be approximately 4' to 5' from the joint trench. The trees are semi-mature and in good condition and the species is tolerant of root loss. I believe both olives #24 and 25 will tolerate the root loss associated with excavation of the joint trench and installation of the utility box within the sidewalk.

Table 1: Number and size of exposed surface roots
Horton St., Emeryville

Tag #	Species	Diameter	# of surface roots	Size range of surface roots
6	Japanese pagoda	9	6	~2" to 6" in diameter
7	Japanese pagoda	10	2	~1" and 4" in diameter
8	Japanese pagoda	8	8-10	~1" to 8" in diameter
9	Japanese pagoda	13	4-6	~2" to 10" in diameter
10	Japanese pagoda	11	5-6	~1" to 10" in diameter
11	Japanese pagoda	15	6-8	~1" to 8" in diameter



Photos 3-7 (clockwise from top left): Show the exposed surface roots on tree #8 (Photo 1), #9 (Photo 2), #10 (photo 3) and 11 (Photo 4).

In general, exposed surface roots ranged from 1” in diameter to 10” in diameter, with trees #8-10 have the largest and most prolific surface roots.

Preservation Considerations
If the street trees on the west side of Horton St. were to be preserved, tree stability and health would be compromised. In addition, as new roots developed they would eventually cause similar displacement of the infrastructure. Both a loss of tree stability and displacement of the sidewalk, curb and gutter represent potential hazards for pedestrians.

Undergrounding of the overhead electric lines requires trenching, installation of utility boxes, utilities, etc. resulting in excavation as deep as 11 feet well within the limits of the structural root systems. This level of impact would compromise tree health and destabilize the trees, potentially leading to whole tree failures.

In addition, whatever roots remained near the surface would continue to grow in length and diameter. These roots can be expected to cause future sidewalk, curb and gutter displacement, creating future tripping hazards.

Finally, in reviewing the Off-site Improvement Plans prepared by IMA (no date), detail #5 on LS1000 (Underground treatment around roots) requires water jetting around existing roots and installation of structural soil. The water jetting is proposed at 12" spacing and 24" in depth. The holes would be backfilled with a sand/compost mix, then the entire area would be covered with 4" of clean crushed rock and the sidewalk poured on top. The notes indicate that 'some roots are allowed to remain in the rock matrix'.

I believe this treatment has the potential to further destabilize the trees. Water jetting at such close spacing and to a depth of 24" would disturb soil anchoring roots below the surface. Also, any roots left in the rock matrix can be expected to continue to grow in length and diameter, potentially displacing the new sidewalk.

Summary
In summary, preservation of the Japanese pagoda trees on the west side of Horton St. is not practical due to shallow roots, inadequate soil volume and construction activities that will cause irreparable damage to the trees. Preservation of the trees would result in future sidewalk, curb and gutter displacement, new ped/bike hazards and an increased potential for whole tree failures.

Tree stability, the potential for whole tree failures and future sidewalk, curb and gutter damage are concerns should the street trees on the west side of Horton St. be preserved. Tree stability would only be further compromised by the proposed water jetting required as part of the off-site improvement plans.

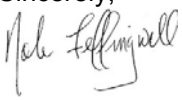
I recommend removal of all of the Japanese pagoda trees on the west side of Horton St. for continuity of design and to provide the best possible growing conditions for the new trees. This will help with tree and root development, reducing the potential for future infrastructure displacement.

In addition, The City of Emeryville Urban Forestry Ordinance, Chapter 10, section 7-10-03 defines nuisance trees as those that created safety hazards and damage public improvements. In my professional opinion, all of the Japanese pagoda trees that have displaced the surrounding sidewalk, curb and gutter certainly qualify a 'nuisance trees'.

All of the young ginkgos and olives #24 and 25 on the east side of Horton St. can be preserved. Some amount of root pruning can be expected for olives #24 and 25.

Please contact me if you have any questions regarding my observations or recommendations.

Sincerely,



John Leffingwell
Board Certified Master Arborist WE-3966B
Registered Consulting Arborist #442

Attached: ***Tree Assessment Form***

Tree Assessment Map

Tree Assessment

Horton Street
Emeryville, California
March 2021

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TREE No.	SPECIES	TRUNK DIAMETER (in.)	CONDITION 1=poor 5=excellent	SUITABILITY for PRESERVATION	COMMENTS	Driplines (ft.) North	South	East	West
1	Japanese pagoda	13	3	Low	Street tree; multiple attachments at 15'; slight lean W.; displaced sidewalk 8" & curb 8".	12	12	12	10
2	Japanese pagoda	13	3	Low	Street tree; multiple attachments at 15'; fair form and structure; filled available space; displaced sidewalk 10" & curb 2".	12	15	12	10
4	Japanese pagoda	9	3	Low	Street tree; multiple attachments at 7'; fair form and structure displaced sidewalk 6" & curb 2".	15	12	12	10
6	Japanese pagoda	9	3	Low	Street tree; multiple attachments at 10'; fair form and structure displaced sidewalk & curb 6".	10	15	10	10
7	Japanese pagoda	10	2	Low	Street tree; codominant trunks at 8'; poor form and structure; lost stem E. @ 10'; minor sidewalk displacement.	12	15	15	10
8	Japanese pagoda	8	3	Low	Street tree; codominant trunks at 8'; asymmetric form; stem removed @ 6' E.; basal wound E.; displaced sidewalk 8" & curb 2".	10	12	12	10
9	Japanese pagoda	13	2	Low	Street tree; codominant trunks at 8'; poor form and structure; displaced sidewalk & curb 8".	15	12	20	10
10	Japanese pagoda	11	3	Low	Street tree; codominant trunks at 8'; fair form and structure; displaced sidewalk & curb 8".	10	15	15	10
11	Japanese pagoda	15	3	Low	Street tree; codominant trunks at 8'; one sided SE.; displaced sidewalk 10" & curb 8".	10	20	15	15
12	Japanese pagoda	9	3	Moderate	Street tree; multiple attachments at 8'; stems fused at attachments; displaced sidewalk 3" & curb 1".	12	12	10	12
13	Japanese pagoda	8	4	Moderate	Street tree; codominant trunks at 7'; stem removed at 10'; minor sidewalk displacement.	12	12	12	12
15	Japanese pagoda	6	3	Moderate	Street tree; multiple attachments at 7'; E. stem dead; minor sidewalk displacement.	10	10	8	10

Tree Assessment

Horton Street
Emeryville, California
March 2021

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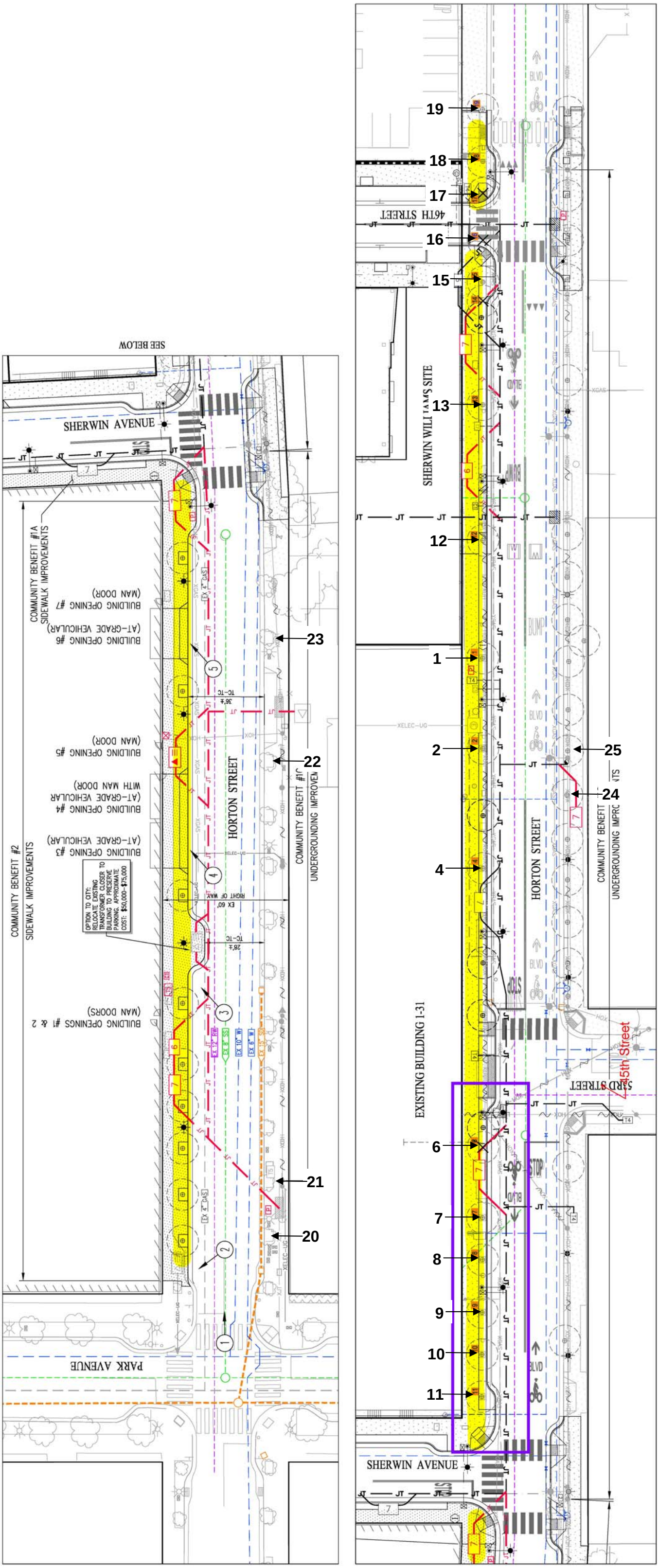
TREE No.	SPECIES	TRUNK DIAMETER (in.)	CONDITION 1=poor 5=excellent	SUITABILITY for PRESERVATION	COMMENTS	Driplines (ft.) North	South	East	West
16	Japanese pagoda	6	3	Low	Street tree; multiple attachments at 7’; W. stems dead; displaced sidewalk 2”.	8	5	8	5
17	Japanese pagoda	6	4	Moderate	Street tree; codominant trunks at 7’; good form.	8	10	8	12
18	Japanese pagoda	6	4	Moderate	Street tree; multiple attachments at 8’; good form.	8	10	10	10
19	Japanese pagoda	12	3	Moderate	Street tree; multiple attachments at 6’; SE. stem broken at attachment; displaced sidewalk 3”.	15	15	12	15
20	Ginkgo	4	4	Moderate	Street tree; codominant trunks at 4’; leans SW.;	5	5	5	5
21	Ginkgo	5	5	High	Street tree; multiple attachments at 5’; good form; starting to outgrow metal grate.	5	5	5	5
22	Ginkgo	6	5	High	Street tree; multiple attachments at 5’; good form; starting to outgrow metal grate.	5	5	5	5
23	Ginkgo	5,3	4	Moderate	Street tree; slight lean SW.; basal damage & starting to outgrow metal grate.	5	5	5	5
24	Olive	10	4	Moderate	Street tree; codominant trunks at 4' & 6’; trunk wounds where hit by trucks; displaced sidewalk 2”.	8	10	10	10
25	Olive	12	4	Moderate	Street tree; multiple attachments at 6’; outgrown very narrow planter ; displaced sidewalk 2”.	10	10	10	12



Tree Assessment Map

Horton Street
Emeryville, CA

Prepared for:
Lennar Multifamily Communities
Oakland, CA

March 2021

No Scale

Notes

- Base map provided by: Lennar
- Numbered tree locations are approximate.

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