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CITY OF LOMPOC - URBAN FORESTRY

CODIE BLEA, SUPERVISOR

1300 W. LAUREL AVE

LOMPOC, CALIFORNIA 93436

September 2, 2013

Dear Mr. Blea

This report summarizes my study and re-evaluation of 9 trees selected from the collection of 56 Italian stone pines currently remaining in the city-owned easement along South H Street in the City of Lompoc.

Of the 9 selected trees, two trees have clear indications of significant destabilization and attempts to mitigate the deterioration while maintaining public safety would be ineffective.

- the significantly destabilized trees located adjacent to properties at 236 and 326 South H Street **should be considered for removal at your earliest opportunity**

Additionally, the tree at 210 South H Street has clear indications of some degree of destabilization and, while attempts to mitigate advancing deterioration may have merit, some higher degree of threat to public safety does persist.

- the tree located adjacent to 210 South H Street **should also be considered for removal though mitigation measures may extend its useful service life**

The remaining trees in this study located along South H Street adjacent to residences at 214, 231 (south tree), 311 (south tree), 322, 408, and 411 (south tree) - with mitigation to assure sufficient stability - appear to merit preservation and use in the landscape for the foreseeable future.

- trees located along South H Street adjacent to residences at 214, 231 (south tree), 311 (south tree), 322, 408, and 411 (south tree) **require mitigation to assure sufficient stability**

It is noteworthy that these trees are old. Old trees such as these have both obvious defects and hidden defects that have accrued over their years of service in the public landscape. Other trees in the grove have demonstrated a pattern of failure. All large old trees eventually fail and fall if they are not taken down before they fall. Therefore, some level of risk remains beyond the ability for professional, competent assessment: this report is not a guarantee as to any tree's fitness for use.

Historic preservation

All living organisms exist for a period of time before they deteriorate, cease living, and in one form or another contribute their space and mass to the ongoing realm. This fact presents inherent challenges to historic preservation of trees – individuals don't persist. Nevertheless, methods can be applied to extend the lifecycle of a 'grove of trees' beyond the timespan of an individual tree's useful service life. In this way, designation of the 60 available growing spaces on South H Street as a 'Stone Pine Grove' provides important opportunities in establishing a context for both individual tree management and for historic preservation.

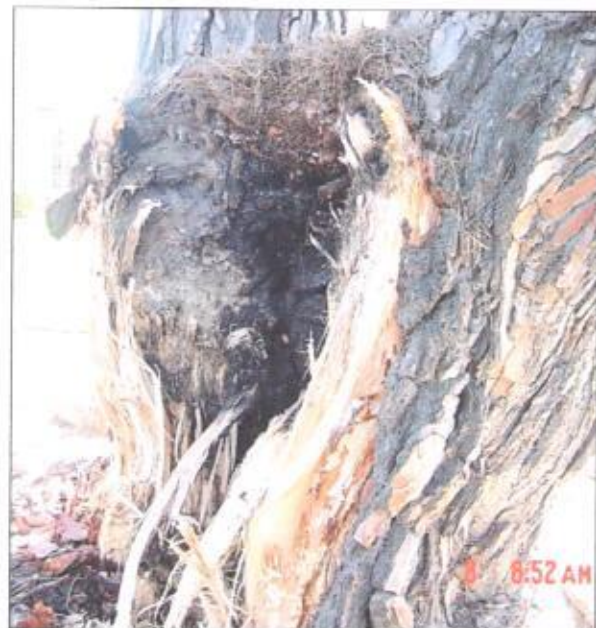
- a formal reforestation program should be initiated to sustain the historical grove

Viewed in the context of an ecosystem, it is beneficial to have some relatively stable very old trees, some healthy and stable mature trees, and some healthy young trees developing stability to provide future resources. Recent history (over the past 10 years) has demonstrated that some of the trees – those with specific defect patterns – tend to fail after about 70 years. Today, there are 4 vacant planting locations from previous failures and 2 or 3 trees that will be removed or are currently under consideration for removal. There are also several trees previously replaced – one was re-planted following a failure in 2003 and is attaining impressive scale and proportions in this short interim period. These factors support reforestation initiatives to maintain historic preservation and yet allow periodic removal and replacement of defective trees.

A history of assessment methods

A protocol was developed following the August 2003 failure of pine located adjacent to 228 South H Street. A fundamental structure of the tree was its multiple large scaffolds originating from a low bifurcation point with a hidden pocket of decay in the center of the scaffold junction. The tree's four tall scaffold limbs supported heavy end weight from lateral branches and the canopy. Load (weight of wind and water? weight from normal canopy growth?) was applied at the end of these the scaffold limbs, which acted as long lever-arms to overburden a weakened point of attachment.

The image, right, is the first tree failure in this 10 year study. It shows the base of a tree at 228 South H Street shortly after it failed in 2003.



The inspection protocol was conveyed using a spreadsheet format; it was understood at the time that follow-up assessments would be performed where changing conditions could be organized, tracked and compared. A report was provided in 2003 recommending 3 trees to be removed (231n, 236, and 326), and identifying others with compromising characteristics requiring treatments to improve their health and safety.

A follow-up site visit and inspection was carried out in 2005, although no formal report was prepared. In 2009 two more trees were lost – one identified with compromising characteristics (301n) and one that was not previously identified as especially high risk (222); a follow-up inspection was performed using the protocol spreadsheet and a formal report was generated. Among the important mitigation measures was strategic pruning to modify the architectural form of the trees, and recommendations for the removal of 4 trees (231n, 236, 323s, and 326).

In January 2010 an initiative to prune all remaining 57 Italian stone pine trees on South H Street was begun with a strategic target to mitigate challenges by reducing exceedingly long limbs. Work ensued on the west side at 201 South H Street, proceeded south on the west side of the street, and returned north on the east side. These measures were intended to be sufficiently aggressive to alleviate potential instability due to end weight, yet sufficiently restrained to maintain biological health functions of each tree. As crews proceeded down the west side these aggressive measures moderated until the point of return back up the east side where end weight reduction was abandoned and thinning and raising techniques prevailed.

This report focuses on a short-list of trees with high indicators for potential instability. Methods used to assess the nine trees are consistent with previous inspections and follow-ups. A spreadsheet has been prepared with previous ratings and recommendations, and new data and recommendations have been provided. Resistograph measurements were taken at 2 locations to support this assessment. As before, these tests are only applied when it might be anticipated that hidden internal defects would be revealed or dismissed. Resistograph Measurement is one column of data included in the spreadsheet; findings associated with this test are provided in the Condition Comments column. Please refer to the attachments for current and past spreadsheet information.

Potential failure scenarios

A variety of failure types can be identified, including:

- lateral branch or limb failure (consequences rather limited due to size and proximity of limb lost)

- scaffold failure (consequences likely significant due to heavy weight of large tree mass and the abundance of associated canopy parts)
- whole tree failure/root failure (consequences significant)
- soil failure/root slippage due to soil-related deficiencies (consequences likely significant due to loss of the entire tree)

Limb failure recently occurred in the pine tree located adjacent to 214 South H Street and previously in others along the parkway. Conditions for potential limb failure defects in this assessment are especially noted where long horizontal limbs exist in pines adjacent to 214, 231s, 311s, 322, 408 and 411s South H Street. Defects associated with excessive and repeated torsional rotation resulting in twists or along long limbs are also noted. These defects are difficult to remedy, but shortening the limb at a strategic juncture often alleviates potential strain. A document entitled Pruning Strategies H - Street Italian Stone Pines was prepared by this office in 2009; I have attached a copy of the document to this report since it remains relevant.

In April of 2013 one of 3 major scaffold limbs failed in the pine adjacent to 231s; scaffolds have failed or were removed as a preventative measure previously over the past 10 years and, in most cases, the entire tree was so damaged it was taken down. Assessment methods consider live crown ratio (especially tall stems with relatively small crowns), excess lean or horizontal aspect, defects at the point of attachment (a pocket of decay), cracks and seams, old wounds, bulges and oddly formed structure. In most cases combinations of defects accumulate and it is the grouping of factors that contribute to increased significance. It is possible to mitigate defects for a period of time - by removing the defective part, by modifying its form, and occasionally other means may be applied to reduce risk. Where treatment does not appear effective the recommendation calls for removal of the tree. This is the case with the pine adjacent to 210, where mitigation may be useful (though a somewhat excessively high risk may still remain), and for the pines adjacent to 236 and 326 recommendations call for removal of the tree.

Several of the selected pines have characteristics that might raise concern for whole tree failure. Whole tree failure is not a recurring pattern along South H Street, but considering recent losses and the potential for risk it seems prudent to consider the possibility and determine the likelihood for this to occur.

The base of the pine adjacent to 214 leans precipitously; soil in the parkway surrounding the tree is excessively moist - there are currently mushrooms growing in the soil north of the tree, behind the direction of lean (the tree has been noted as having excessively moist soil in each of the previous assessments) and the canopy is very high. Measurements were taken of the soil firmness throughout the parkway area using Steel

probe (a pointed stainless steel rod 1/4-inch x 48 inches), which was inserted to a depth of 6 or 8 inches before compaction prevented greater insertion. It appears unlikely that failure might occur due to soil slippage, and root and bole health appear normal based on visual inspection without laboratory testing or excavation for root and soil investigation.

The pine adjacent to 311s has peculiar growth formation at the base; the stem leans southeasterly but the canopy developed normally, radiating above the supporting root-mass. A large circling root was left at the base on the northwest side and there is a slight raise in the soil in this vicinity. Probing the soil revealed no pockets or voids; thus, it appears that the raised soil is not significant. The southeast side of the stem abuts the driveway apron pavement. Some shortening of limbs was provided 3 years ago (to reduce end weight), however, more heavy material can be removed from branch ends to improve stability. The canopy of this tree is thin compared to adjacent trees. Consider measures to improve biological functions (vigor) of this tree.

The pine adjacent to 408 has a new parkway soil treatment with rye grass seeded and ribbons to keep people and animals out. Also apparent is a new irrigation system and soil amendments. Mushrooms (*Marasmius spp*) are growing in several new soil areas. Trees at adjacent locations (one on either side) have fuller canopies (foliage on east side most pronounced reduced tip growth vigor). Take measures to improve biological functions (increase vigor). Consider pruning to shorten selective branches over the roadway to unload these heavy lateral limbs.

The pine adjacent to 411s also leans to the south and has unusual growth forms. The soil was probed and found to be highly compacted (no threat of soil slippage). Investigation of the base of the tree indicates solid tissue and no wounding or deterioration associated with the seam and included bark where scaffolds join the main stem.

Investigation techniques

The nine pine trees addressed in this report were subjected to visual inspection as to their form, branching architecture, canopy density, wounds, and visual defects. Probes were used to determine the depth of pockets formed at the junction of multiple major scaffold limbs (a 5-ft long 1/4-inch gauge stainless steel rod) and in the surrounding soil to determine resistance to insertion (a 4-ft long 1/4-inch tile probe). In addition, a Resistograph was used in two instances: on the tree adjacent to 210 two measurements were taken to determine shell thickness adjacent to an apparent decay pocket (see annotated Resistograph strips, attached) – the thickness was determined to be 9 inches of solid interior wood. A Resistograph measurement was also taken of the pine adjacent to 322, also to determine shell thickness adjacent to a pocket – the thickness was found

to be 10 inches of solid interior wood. Images of each tree document the form, the base, and details of the canopy.

Mitigation recommendations

Mitigation is the process of diminishing risk. Where possible, treatments should be provided to extend the useful service life of selected trees. Pruning to reduce excessive loading of long horizontal limbs should be considered for all the large Italian Stone pines along South H Street; selective pruning to remove or modify poorly formed or defective branches should also be provided.

Historic preservation

The Italian stone pines along South H Street are a valuable and cherished resource for the people of Lompoc. Many of the trees have also demonstrated troubling characteristics – risk of failure – due in part to individual tree scale, their proximity to people's homes, sidewalks and roadways, and due in large part to the long struggle of their service in the urban environment. This study is part of an ongoing culling process where risk might be diminished with advanced awareness of potential challenges, but it should also be viewed as clearing the way for the next parkway tree that will occupy the future Stone pine grove.

Please refer to attachments, including earlier reports addressing these and other trees on South H Street, and attached reference documents prepared previously. I hope you find this information helpful in making your determination about how to deal with these challenging tree issues.

Yours truly,



Michael T. Mahoney, registered consulting arborist



- Enc.: Spreadsheet of evaluation data (2 pages)
Photo references (9 pages)
Annotated Resistograph strips (1 page)
Pruning Strategies (1 page)
2009 report (10 pages)
2003 report (12 pages)

The image, below, is the most recent tree failure in this 10 year study.



231n South H Street June 18, 2013
Photo by Cinda Price via Lompoc Record



CITY OF LOMPOC

November 19, 2013

Dear Resident,

The City of Lompoc has contracted with West Coast Arborists to perform needed tree trimming of the Italian Stone Pines adjacent to your residence. The purpose for the work is to prolong the health and stability of the trees and to preserve the aesthetic value of the Italian Stone Pine grove. The work will take several weeks to be completed. As the work proceeds, portions of the affected street will be closed to thru traffic, due to the positioning needs of the vehicles used during the trimming. West Coast Arborists has been directed to conduct its work in a safe and efficient manner.

We anticipate the trimming project will start on December 2, 2013. Work will begin on the south end of H Street and progress north. Each tree will be posted with a no parking sign the week prior to the trimming, giving advance notice of the dates in which not to park in that area. Those signs will remain until the trimming of that tree is completed.

Please be aware, the trees will drip sap for several days after they have been trimmed. Therefore, you will need to take actions necessary to protect your vehicles and personal property from that sap and need to be cautious when traversing under the trimmed trees.

West Coast Arborists will be doing the work pursuant to a contract with the City at an established price. Please do not ask those workers to perform any other work. If you have any concerns regarding that work, please contact the Urban Forestry Office at 875-8032. We welcome your questions and comments.

Thank you for your attention to this matter and your patience as it proceeds.