

# MORETON BAY FIG TREE

*(Ficus macrophylla)*

## PROTECTION, PRESERVATION

AND

## MAINTENANCE PROGRAM

at

**Santa Monica Miramar Hotel**

Presented to:

**Ocean Avenue LLC**  
Santa Monica, California



February 26, 2018 Tree Report

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## Preface on Company Name Change

In 1949 ValleyCrest Companies opened its doors in the San Fernando Valley. What followed was a slow but steady rise to become one of the premier landscape services companies in the nation with offices primarily in the southwest and sunbelt states.

In 1939 Brickman Landscape opened its doors in Chicago and followed a similar path of slow and steady growth primarily in the Pacific Northwest, Midwest, Northeast, and Mid-Atlantic states.

In 2015 ValleyCrest Companies and The Brickman Group merged. In the process of merging the combined management teams opted to re-brand the resulting new entity with a new name, logo, and overall new look.

The merger created the BrightView Companies and its various service sector divisions:

- Valley Crest Tree Company became BrightView Tree Company
- ValleyCrest Landscape Development became BrightView Landscape Development
- ValleyCrest Landscape Maintenance became BrightView Landscape Services
- ValleyCrest Golf Maintenance became BrightView Golf Maintenance

In all respects the merger has served to enhance and expand the quality and consistency of the services that Ocean Avenue LLC and the Miramar Hotel have come to expect under the ValleyCrest name. BrightView remains committed to all of the proposed plans and programs described in this document as developed over the twelve years of monitoring and maintenance of the hotel's landmark Moreton Bay Fig.

For the balance of this document all prior references to Valley Crest Tree Company, ValleyCrest Landscape Development, or ValleyCrest Landscape Services have been replaced with the BrightView name style. Exceptions to this are any historical documents referenced in the appendix.

## Section 1

### PURPOSE OF THIS REPORT

Founded in 1949, as Valley Crest Nurseries, the re-branded BrightView Tree Company, based in Calabasas, California (BVTC), is part of the largest integrated landscape services company in the United States, offering design, installation, maintenance, and tree growing, tree preservation, and tree moving. Working closely with Ocean Avenue LLC (the "Owner"), the owner of the Miramar Hotel in Santa Monica, California (the "Hotel"), BrightView has nurtured and cared for the landmark Moreton Bay Fig Tree (*Ficus macrophylla*) (the "Heritage Tree") at the Hotel since 2006.

The Owner has proposed a comprehensive redevelopment of the Hotel which would feature the Heritage Tree as a key centerpiece. In that regard, BrightView has been asked to prepare a report which will:

- Analyze and Confirm the Tree's Existing Condition
- Assess the Potential Impacts on the Tree from the Proposed Construction
- Propose a Comprehensive Tree Protection Plan and Monitoring Program
- Provide Recommendations for Landscape Treatments Within the Canopy Zone
- Evaluate the Overall Feasibility of the Protection and Preservation Program

The Owner is clearly committed to the preservation of this outstanding landscape feature – and has invested substantial resources to return vigor and strength to the Heritage Tree and improve its longevity.

#### **About BrightView Tree Company**

BrightView Tree Company's Specimen Tree Division provides expert tree relocation, storage, and preservation services worldwide. For over 60 years, BVTC has been in the business of relocating, installing, supplying, and caring for an array of mature and one-of-a-kind trees that have been procured and preserved from their original setting.

BVTC's staff represents a cumulative wealth of 400 years of field experience and over 100 years of management experience in this highly specialized realm of horticultural services. As a result, the BVTC team is increasingly called on as the expert in tree relocation and tree preservation services. The firm's portfolio of work includes an extensive list of prominent projects in Mediterranean climate zones and the southwest, as well as around the world in places such as United Arab Emirates, where BVTC crews introduced the side-boxing method of tree relocation and preservation in support of a number of significant projects within the region.

BVTC's customers include a demanding and horticulturally astute clientele that routinely rely upon the firm's expertise. Among these customers are:

- The Los Angeles Arboretum
- Descanso Gardens
- The J. Paul Getty Trust
- The Huntington Library, Art Collections, and Botanic Gardens
- Walt Disney Imagineering
- Disneyland Anaheim
- Stanford University
- The Los Angeles Zoo
- The San Diego Zoo
- The Al Ain Wildlife Park and Resort
- Wynn Resorts

Highlights from the company's portfolio include the following:

- The successful relocation of 1,300 mature oaks as part of the Lake Sherwood Golf Course
- The successful relocation of a 100-year old Ficus using a twenty-six foot (26') tree box
- The successful relocation of a 150-year old Oak to preserve it from the path a new road
- The successful relocating a 150-year old Oak to make way for a tennis complex
- Boxing and preserving over 1,000 specimen Acacia and Mesquite trees under extreme desert conditions in the United Arab Emirates as part of the Al Ain Wildlife Park project
- The successful relocation of a 250-year old Oak to preserve it from the path of housing

The BVTC staff includes twelve (12) International Society of Arborists (ISA) Certified Arborists. The management team holds a broad set of degrees in the field of horticulture and plant science. The company and its leadership are active members of the prominent trade and industry associations including:

- International Society of Arboriculture (ISA)
- Western Chapter of the International Society of Arboriculture (WCISA)
- Street Tree Seminar (STS)
- Golf Course Superintendents Association of America (GCSAA)
- California Landscape Contractor's Association (CLCA)
- American Society of Landscape Architects (ASLA)
- California Association of Nurseries and Garden Centers (CANGC)
- The National Association of Landscape Professionals (NALP)

Please do not hesitate to contact our offices should you require additional information or further clarification of the matters discussed in this report.

## Section 2

### 2007 TREE RESTORATION PROGRAM

Since acquiring the Hotel, the Owner has made a concerted effort to learn more about the Heritage Tree, and to solicit opinions from prominent Arborists concerning how the tree should be maintained going forward to ensure its health, vitality, and longevity.

Understanding that the Heritage Tree had significant historical as well as botanical value, Owner contacted BVTC to help develop a long-term management plan.

In March of 2007, BVTC arborist Dave Teuschler, an International Society of Arborists Certified Arborist, inspected the Heritage Tree to determine what steps needed to be taken to preserve, protect, and enhance the tree so that it could continue to thrive for many years to come. In addition, the inspection considered practical issues such as:

- **Public Safety:** Improving the tree to a condition that renders it safe for the many hotel visitors and hotel employees who pass beneath it on foot or in vehicles.
- **Property Damage:** Protecting the surrounding buildings and other landscape assets adjacent to or abutting the tree.

Pruning specifications and work conditions were developed in accordance with International Society of Arboriculture standards that are widely accepted and currently in use.

In this initial report, the following observations were made:

- The current health condition of the tree was found to be good as shown by previous year's growth, leaf size, lack of dead wood in the canopy and overall color and vigor.
- A great deal of over pruning of the tree had taken place in the past. It had been severely "lion-tail" pruned (intermediate side stems pruned off of branches leaving large clusters of foliage at the terminal ends).
- The lion-tailing had put all of the branch weight at the terminal ends of the branches, which resulted in a need to install support cables throughout the canopy as a means of preventing catastrophic limb failure which could severely affect the tree's health and could create a public safety issue.
- The tree is completely surrounded by driveway, building, and sidewalks and is accessible to the general public and vehicles suggesting compacted soils with reduced air and water infiltration into the root zone

- Many of the tree's branches were touching the sides of the existing buildings. This contact created abrasions and rub scars on the tree as well as posing a potential for damaging these structures.

Based upon the foregoing observations, the Owner requested that BrightView prepare a comprehensive restoration program inclusive of recommendations for the ongoing maintenance of the Heritage Tree. BrightView and the Owner made a point of engaging the public and seeking peer review from additional local arborists. A copy of Dave Teuschler's March 2011 report is included as Appendix 1.

### **Working with the City of Santa Monica**

Following our initial inspection and in light of our observations, an on-site meeting was held on Friday, March 14<sup>th</sup>, 2008 with Mr. Walt Warriner, the former Community Forest & Public Landscape Superintendent for the City of Santa Monica, the Owner and the BVTC arborist team. The purpose of this site meeting was to develop a collaborative assessment of the best short and long-term management plans for preserving the Heritage Tree as a community landmark by enhancing its overall health and vigor.

It was generally observed by all that while the tree was in very good condition for a tree of its age, there was no documented work plan for the tree and little work had been performed in recent times to address some of the tree's basic arboricultural issues including the "lion-tailing". The group agreed upon the key elements of a superior arboricultural management plan. It was agreed that a written plan would be developed and submitted to the City for review, comments, and approval so that the much-needed maintenance work could be started. It was the Owner's critical objective to schedule the work for the optimal benefit of the tree and it was agreed that the work should begin as soon as possible.

### **2007 Tree Work Plan**

The following detailed work plan ("2007 Tree Work Plan") was developed by BVTC and was consistent with the guidance in the City's Urban Forest Master Plan. It demonstrates the high level of expertise which was solicited, and the very specific actions proposed for the work plan. A pre-work meeting was held with all members of the team and the work was supervised at all times by a Certified Arborist.

Note that within the context of the 2007 Tree Work Plan, the use of the word 'shall' indicates a practice that was mandatory. The use of the word 'should' refers to a practice that was highly recommended.

Objectives

Reduce potential hazardous conditions in this *Ficus macrophylla* by initiating a long-term program of crown restoration through selective, incremental pruning to correct structural damage and imbalances resulting from improper or inadequate tree maintenance programs of prior years. The following activities were included in the program to meet this objective:

- Removing dead branches.
- Reducing the weight of branches or stems with included bark.
- Reducing the weight toward the ends of branches that have been lion-tailed during previous pruning.
- Crown thinning of the canopy.
- Removing over-structure branches.
- Removing crossing branches.
- Adjusting and or replacing cables within the canopy of the tree.
- Adjusting canopy lighting attachments.

General Procedures

The 2007 Tree Work Plan recommended the following general procedures:

- Live branches less than 1.5 inches in diameter should not be removed.
- Dead branches greater than 1.5 inches in diameter (measured at the base of the branch) shall be removed from the canopy of the tree.
- No live branches greater than 4 inches in diameter shall be removed from the tree without authorization.
- Remove no more than 20 percent of the live foliage from the tree unless indicated below.

Specific Procedures

The following specific procedures were included as part of the 2007 Tree Work Plan:

- Weight on main scaffold limbs with bark shall be reduced by approximately one-third by removing some secondary branches toward the ends of the limbs and/or by removing the end of the branch using a drop-crotch cut.
- If less than 20 percent of the foliage was removed on a mature tree following the procedures described above, then the canopy was to be thinned to allow more light to reach the ground under the tree and to reduce damage from wind storms. The foliage removed shall be taken primarily from the outer edge of the canopy, not from the interior. Interior branches shall be left on the tree. Water sprouts from the interior of the tree were not to be removed.

- Root zone should be protected during pruning operations.

#### Pruning Techniques

Pruning cuts shall be in accordance with ANSI A300 pruning standards.

#### Tools and Equipment Requirements

- Climbing spurs shall not be used when climbing the tree except if needed to expedite the rescue of another tree worker from within the canopy.
- Equipment and work practices that damage bark or cambium should be avoided.
- Rope injury from loading out heavy limbs should be avoided.

#### General

The tree work is to be supervised by an I.S.A. Certified Arborist. Certification is through the International Society of Arboriculture, Champaign, IL. A Certified Arborist shall be on site at all times during tree work activities.

#### Safety

All work shall be performed by workers trained in accordance with ANSI Z133.1 safety regulations as required by OSHA.

#### Public Outreach

Planning for the tree work anticipated that there would be concern from the local community once crews started removing branches from the Heritage Tree. In anticipation of this, the Owner initiated an outreach program to provide background and context to the proposed pruning and to solicit community input prior to commencing work. An informative newspaper article told the story of this historical tree and provided the community with insight into the need for a long-term tree management plan (a copy of this article is included in Appendix 2 to this report).



## Section 3

### ONGOING MAINTENANCE PROGRAM

Since BVTC's initial inspection and commencement of the restorative pruning program in 2007, the subject tree has been continuously maintained by trained maintenance gardeners from BrightView Landscape Maintenance and trained tree workers and BVTC Certified Arborists in accordance with the 2007 Tree Work Plan. The ongoing maintenance program has consisted of a broad range of routine and seasonal maintenance operations.

The original March 2007 Arborist's Report outlined the recommended actions to preserve, protect, and enhance the Heritage Tree. Those actions, as described in the prior section, involved pruning and other structural improvements that have been systematically implemented over a period of several years. The work done to date has resulted in the elimination of all of the health concerns outlined in the initial inspection while further improving the health and vigor of the tree. Ongoing work to that end has continued on an annual basis as needed and as directed by a Certified Arborist.

In addition to these actions, routine and seasonal management practices have been implemented for the ongoing care and protection of the tree. These include:

- Weekly management of irrigation
- Monthly observation and reporting of any structural issues to be addressed
- Minimization of under-story planting
- Hardscape placement to minimize impact to the root zone
- Inspection of the tree for any pest, disease, or nutritional needs and implementation of remediation practices as required
- Written reports prepared and submitted to Owner as needed

## Section 4

### EXISTING CONDITION OF THE TREE

As part of the ongoing management of the Heritage Tree, Ocean Avenue LLC, and BrightView Landscape Services (BVLC) have conducted periodic inspections of the tree to assess its health and structure. In addition to routine inspections by BVLC personnel, the team has engaged the services of an independent Arborist to provide an authoritative second opinion.

The most recent of these Arborist inspections was conducted on November 14, 2017. As with prior site inspections, this most recent review was performed by Mr. Kerry Norman of Arbor Essence. Mr. Norman is an independent ISA Certified Master Arborist (ISA No. WE-3643B). In addition, Mr. Norman is a Registered Consulting Arborist (No. 471) by the American Society of Consulting Arborists (ASCA).

The Arborist inspections are made in order to evaluate the tree's current health and vigor. The November 2017 report is included as Appendix 3. Mr. Norman's previous report was prepared on April 10, 2013, and is attached to this document as Appendix 4.

Both the November 2017 and April 2013 reports describe the tree as being in overall excellent condition:

- Color and vigor is optimal
- No structural issues require immediate attention
- Landscape management practices do not create negative conditions
- Hardscape is appropriately installed and maintained

Note that BrightView's Arborists visit the site each year in conjunction with annual / seasonal tree maintenance activities. The purpose of these visits is to oversee these maintenance activities and to observe the general health and physical condition of the tree. Inspections to date, including the most recent during tree maintenance activities in March of 2017, have observed tree color, structural condition, landscape management practices, and hardscape condition and maintenance practices that are consistent with those set forth above.

## Section 5

# OBSERVATIONS

## BASED UPON 2018 REVISED BUILDING AND SITE PLANS

Following an international design competition involving many of the world's top architects, Ocean Avenue LLC engaged Pelli, Clarke Pelli Architects (PCPA) as the design architect for the Miramar Redevelopment. In order to ensure that the public realm was as special as the building itself, the award-winning firm of Gustafson Guthrie Nichol (GGN) was added to the team as Landscape Design Architect.

In response to a request from the Ocean Avenue LLC, BrightView has reviewed the revised 2018 hotel design and site plan from PCPA and GGN to assess its potential impact upon the Heritage Tree. The following are the results of that horticultural / arboricultural review process.

1. BrightView has reviewed the proposed new schematic design of the open space at the corner of Wilshire Boulevard and Ocean Avenue. It is clear that the design team thoroughly reviewed the original Tree Preservation and Protection Report (December 12, 2013) and carefully followed its recommendations with respect to the Heritage Tree. Indeed, the proposed new plan represents a significant improvement over the earlier HKS Hill Glazier (HKS) master plan from 2013 with respect to the health of the tree.
2. Below grade, the revised parking garage design in the 2018 design has increased the minimum distance between the underground parking garage and the drip line of the tree as follows:
  - From 4'-1" to 12'-2" on the east side
  - From 12'-8" to 24'-3" on the north side
  - From 17'-8" to 21'-3" on the south side
  - No excavation on the west side of the Heritage Tree.

Based on a review of the new GGN plan and given that basement structures on the east side of the tree already encroach on the drip line, the anticipated shoring and excavation will have no impact on the roots within the tree's drip line and minimal impact outside the drip line and results in a significantly better layout for the tree than the previous HKS concept from 2013.

3. GGN's current design eliminates the existing paved driveway. The driveway encircled the tree and greatly encroached into the tree's drip line and root zone. While the tree has adapted to this condition, the driveway nonetheless created an impervious surface that did not allow for proper irrigation within the root zone. In addition, the impervious surface prevented the exchange of the various atmospheric and root-produced gasses that support healthy plant development.

By eliminating the hard paved surface the underlying soil is opened up to improved root growth within the drip line area. The removal of the circular driveway pavement resulted in the creation of an open area below the tree. This open area has a wide range of possible programmable uses.

4. GGN's current landscape design provides for a raised deck platform with a continuous bench encircling the Heritage Tree. The deck is supported by micro-piles to protect the exposed roots without requiring additional soil or paving to raise the grade around the tree. This raised deck creates airspace below the deck that allows nutrients and water to reach the tree's roots. By elevating and leveling the walking surface around the tree, the deck greatly improves access to the tree while deterring visitors from climbing upon the buttress roots or compacting the soil within the critical root zone. This creative design solution significantly improves upon the recommendations in our December 12, 2013 report with respect to the treatment of the exposed roots and the area underneath the tree following removal of the existing paving. As a result, BrightView believes GGN's deck concept is superior to the design previously proposed by HKS in 2013.
5. Finally, the proposed pedestrian pathway around the Heritage Tree has been moved outside of the tree's drip line, which will also be an improvement for the long-term health of the tree.

## Section 6

# POTENTIAL CONSTRUCTION IMPACTS OF THE PROPOSED REDEVELOPMENT PROJECT

The 2018 concept for the redevelopment of the 4.5-acre property is designed around the Heritage Tree, which is intended to be the centerpiece of the new plan for the Miramar. The purpose of this section is to recommend a program that will minimize the impact of the proposed site construction activities upon the health and well-being of the Heritage Tree. This program will analyze potential impacts to the tree's environment as well as potential impacts to the tree's physical being itself.

### Environmental Impacts

In considering the health and well-being of the Heritage Tree, we need to consider the physical space that supports and nurtures the tree. This area consists of the "Rhizosphere"; the upper layer of soil where the tree's roots take in moisture and nutrients, exchange various gasses through the pore spaces between soil particles and interact with symbiotic soil microorganisms. The Rhizosphere typically extends out to the "drip line" of the tree (the diameter of the furthest reach of the tree's foliage).

Environmental issues are less obvious to the untrained eyes. Identifying these potential impacts ahead of time and incorporating appropriate policies and procedures for mitigation are the proven and accepted best practice in tree preservation. The greatest potential environmental issues created by demolition and construction activities fall into the following categories:

- Soil compaction from excessive foot traffic or the use of equipment within the drip line
- Overly wet soil resulting from nuisance water from various construction activities
- Overly dry soil resulting from cessation of normal irrigation operations during construction
- Contamination of the soil with common construction materials impacting soil chemistry or the symbiotic soil microorganisms
- Dust landing on foliage impacting air exchange and photosynthesis
- Dust landing on foliage having potential adverse chemical reactions with the leaves
- Fumes from construction equipment having adverse chemical reactions with the leaves

All of the above items are addressed in the Tree Protection Plan outlined in Section 7 and are all manageable through (a) training, (b) procedural requirements, and (c) monitoring for compliance.

**Physical Impacts**

The risk of direct physical damage to the tree's roots, trunk, branches, and foliage is easily understood and managed by properly trained construction workers and is easily mitigated through physical barriers. The primary forms of physical damage from demolition and construction activities are chipping, gouges, cuts, and abrasions to surface roots, the trunk, lower branches, and perimeter branch tips located near areas of proposed multi-story construction. The necessary preventive training and protective barriers mitigate these risks and are outlined in the Tree Protection Plan as discussed in Section 7.

**Tolerance of the Tree to Potential Root Reduction**

Ficus trees are relatively robust and exhibit a high tolerance to root reduction. Root reductions outside of the "drip zone" are anticipated to have no impact to the health and vigor of the tree. The health of the tree is further enhanced if the root reduction is done incrementally where only select roots totaling no more than twenty-five percent (25%) of the known perimeter roots are pruned at any one time and a sufficient number of large structural roots are left to anchor the tree against wind loads. Further, root pruning, when required, is best if a period of sixty (60) to ninety (90) days is allowed to lapse between individual root pruning cycles.

Proper root pruning techniques include clean cuts with sharp instruments. Root pruning results in the development of new, smaller, and more fibrous roots at the point of pruning. These smaller "feeder" roots ultimately increase the trees ability to absorb water and nutrients and thereby improve its health.

**Tolerance of the Tree to Potential Canopy Reduction**

As with root pruning, Ficus species are tolerant of canopy reduction. Evidence of this is the improved general vigor achieved through the incremental restorative pruning and canopy reduction performed on the Heritage Tree since 2007.

Canopy reduction is a widely accepted means of reducing foliage, and therefore transpiration. Transpiration is the release of water vapor from the tree through the leaves as a function of the tree's normal respiration and as a means by which the tree cools its immediate environment during hot weather). Reducing transpiration through foliar pruning is a common practice used to off-set reductions in root mass that accompany the digging and transplanting of mature trees. Ficus are no exception to these biological processes.

As with all tree pruning, the selection of which branches or roots should be cut is best left to trained tree workers and Certified Arborists.

## Section 7

# PROPOSED TREE PROTECTION PLAN

The primary goal of the tree management program recommended by BVTC is to ensure the long-term health, enhancement, and preservation of this historic tree. Under the existing maintenance plan, the program to manage the canopy and increase the overall health, vigor, and structural needs of the tree have been described and implemented with great success. These recommendations were made with tree preservation in mind and in compliance with the City's Urban Forest Master Plan (Appendix J Tree Care Guidelines). Protection and preservation are very achievable goals for this tree.

### Specific Pre-Construction Measures

Construction activities that are contemplated for the property have been evaluated for their potential impacts to the Heritage Tree. Much has been previously undertaken to bring the tree back up to its optimal condition. As a result, the tree is in excellent condition to experience construction activity with no negative impact to its health and longevity. In addition, the proposed redevelopment plan has been carefully redesigned to avoid any significant encroachment of the tree's drip line, whether above or below grade. Physical protective barriers around the tree and targeted construction strategies will provide for a sufficient level of tree protection as discussed in this section. Below are the key tree protection strategies that will be implemented protect and preserve this historic tree:

### Preservation and Protection Measures During Construction

#### Evaluation of Impacts to the Root System

A walk through was performed on-site to make observations which suggest the following likely distribution of the expected reach and depth of the root system:

- The root zone of any tree will be influenced by its surrounding soil structure (relative compaction and pore space) and soil moisture content. The Miramar site exhibits typical urban conditions of compacted soil and a history of shallow surface watering.
- The subject tree has been growing at a site where the surface of the ground is covered by significant areas of paved hardscape, including the main hotel entrance drive.
- The existence of the surface paving has resulted in compacted soils with little opportunity for water infiltration, and less opportunity for the exchange of atmospheric gasses necessary for healthy root growth.
- Under these conditions, the root zone for the Ficus tree will tend to remain close to the surface as evidenced by the tree's root crown flare and buttress roots.

- The general consensus is that the roots of the subject tree will likely be found no deeper than four feet (4') near the tree's drip line and only slightly deeper as one approaches the trunk.
- The lateral expansion of the root zone has been constrained on the north and east sides by the footings and basement walls of the existing buildings.

Based on the above observations it is the opinion of the Project Arborists that the existing root system is likely to be most prevalent on the west and south sides of the tree where it is less constrained by hardscape or structures. In addition, it is only in these areas, which are furthest from the proposed construction activity where one will likely find any roots growing beyond the canopy drip line of the tree.

The City of Santa Monica's **Urban Forest Master Plan** (UFMP) suggests that a Tree Protection Zone (TPZ) be identified beyond the tree's drip line. As a precaution the UFMP recommends for broad canopied trees like the *Ficus macrophylla* that this zone cover an additional ten feet outward from the drip line of the tree.

Both the tree and the site have been reviewed by both BrightView's Certified Arborist and an independent Certified Arborist. It has been the shared judgment of both that, given consideration for the species of tree, the health of the tree, the existing hardscape driveway surrounding the tree, and the layout of the existing and proposed structures (where portions of the basements and structures already encroach into the drip line of the tree), that the existing tree drip line is a sufficient Tree Protection Zone. In our professional opinion, which is backed by six decades of field experience, carefully monitored work by trained personnel with proper precautions can be conducted up to the drip line of the tree with no negative impact to the tree.

The Arborist's opinion is supported by the recent tree preservation work in conjunction with the Palisades Garden Walk project near to the site. On that project, three large *Ficus macrophylla* were boxed and relocated. The tree drip lines were in the range of fifty feet (50') and the trees were boxed in twenty-foot (20') and twenty-two foot (22') boxes. The boxing operation was accompanied by an appropriate program of canopy reduction. The successful transplant of these trees speaks to the Moreton Bay Fig's high degree of tolerance to root reduction.

The construction activity most likely to affect the root system will arise after the demolition of the existing buildings as the contractor installs a shoring system to facilitate the construction of the basement areas of the proposed new hotel. This shoring will need to be eighteen inches (18") to twenty-four inches (24") nearer to the tree than the proposed structures below-grade walls. The proposed basement and parking garage in the current concept design plans provide a minimum clearance of 12'-2" to the tree's drip line on the eastern side of the tree and

at least 21'-3" to the tree's drip line on the other three sides. Based upon this layout, and the fact that the existing basement on the eastern side of the tree encroaches on the drip line in certain locations, there appears to be no impact to the tree's roots inside of the drip line and minimal impact outside the furthest edges of the drip line.

Based upon a conversation with Morley Builders, which has worked with Owner on the construction feasibility of the project, it is anticipated that once installed, the new below-grade structures will be reinforced with diagonal tie-back anchors. It is expected that these anchors will be directionally drilled starting at an elevation that is eight feet (8') below the surface grade and angled downward at approximately twenty-five (25) degrees below horizontal. As a result, it is most likely that the shoring tie-backs will miss all active areas of the root system.

### **Root Pruning Protocol**

Ficus roots are highly tolerant of pruning activity as they are quick to regenerate additional roots when pruned. In fact, it is common for the roots left behind from tree removal to begin sprouting new growth. The following protocol should be followed with respect to any construction activity in the vicinity of the tree:

- At the beginning of construction, the footprint of all construction activity will be marked in the vicinity of the drip line.
- Excavation using hand tools, air spade, or water techniques shall be used to expose all roots abutting demolition or construction work at the drip line.
- All roots shall be gently exposed, and a photographic record made of the exposed roots.
- Based on the number and size of roots found in this area, BVTC shall recommend to Owner a plan that will provide an appropriate sequence of pruning.
- The exposed root zone will be kept hydrated during the examination with a temporary cover of peat moss. At the completion of the examination or pruning process, the roots will be backfilled with a loosely packed organic blend of peat moss and site soil that will favor root development.
- Root pruning, if required, will be limited to non-structural, peripheral roots. No roots greater than two inches (2") in diameter will be pruned or disturbed within the drip line of the tree.
- Root pruning, if required where roots abut construction, will be done incrementally over a period of time. No more than twenty-five percent (25%) of the roots abutting the drip line will be pruned in any sixty (60) day period.
- Where roots are identified to be pruned at a later date, the location of the roots to be pruned in the future shall be marked and recorded prior to backfill so that additional exploratory digging will not be required.

- It is highly likely that roots will have self-grafted into conjoined masses along the basement walls to the south east of the tree trunk. At the recommendation of the Project Arborist, such roots may be candidates for therapeutic pruning. The general recommendation is that these roots be pruned, regardless of size, to allow for the formation of new feeder roots that will take advantage of the expanded landscape areas that will result from the proposed revised hotel footprint. These areas will become available for unimpeded future root growth in the eastern half of the root zone.
- With the exception of the self-grafted / conjoined roots noted above, no roots larger than two inches (2") will be pruned unless no alternate is feasible. Further, no such roots will be cut without first consulting with the Project Arborist.

Overall, the impact to the root system from the construction of the Miramar will fall within the normal and acceptable range for Ficus trees and should have no material impact on its health and longevity. Additionally, the layout for the proposed replacement resort will reduce the amount of pavement within and beyond the drip line of the tree. This reduction in paved hardscape will have the beneficial result of relieving compaction and improving water infiltration and gas exchange within drip line of the tree.

#### **Potential Site Work Impacts**

Major underground utilities are not expected to impact the protection area of the tree. A review of the current civil engineering drawings did not reveal any underground utilities routed through the root zone. Any landscape utilities such as irrigation sprinklers, site lighting, or other similar items installed within the root zone of the tree shall be routed in the least invasive location and hand dug and backfilled as approved by the Project Arborist and the project's Landscape Architect.

#### **Impacts from Construction Vibration**

Trees typically respond to vibration by building what is referred to as "reaction wood" where the woody tissue of the tree builds additional girth. This is the concept behind the theory that young trees should not be staked or guyed so that their response to movement, such as wind, will encourage the development of a stronger trunk structure over time. This process is slow and typically occurs without our noticing. We see no negative impact and suggest that there will be no visible signs, symptoms, or physical manifestations resulting from construction-induced vibration over the course of the construction schedule

It is BVTC's opinion that, with the implementation of the Tree Protection Plan's strategies set forth in this section, there will be minimal impact to the Heritage Tree as a result of the proposed construction activity.

**Potential Canopy Pruning Impacts to the Moreton Bay Fig**

Ficus, as a tree species, is highly tolerant of pruning of both above and below ground woody elements such as branches and roots. Over the last six years, in order to achieve crown restoration for improved safety and structural appearance, the tree has undergone strategic crown pruning under the supervision of an ISA Certified Arborist. The results of this work have been very successful and are now part of the ongoing long-term management plan for the tree. New growth is apparent throughout the crown and the overall health, structure, and aesthetics of the tree have been improved dramatically.

The underground roots of the tree are expected to respond in a similar favorable manner with respect to any pruning as they will quickly begin to regenerate new roots in the impact zone when pruning cuts are made in accordance with the protocols outline above.

**Tree Protection Measures**

1. Prior to pavement demolition, the trunk of the tree should be equipped with “trunk armor” consisting of 2” x 4” wood planking set at 10” apart around the circumference of the tree. Planking is to be padded where it touches the bark of the tree and held in place with metal strapping. This armor may be removed after completion of demolition activities provided that the following steps are taken:
  - a. Upon the completion of pavement demolition, the entire soil surface area within the drip line is to be covered with a protective layer of four to six inches (4” – 6”) of bark mulch to reduce compaction and hold moisture.
  - b. A six foot (6’) tall temporary chain link fence is to be erected around the drip line to keep equipment and personnel out of the critical root zone. This fence shall include an access gate to allow for inspection within the drip line during construction. The fence shall feature posted signs indicating “Tree Protection Zone – Keep Out”
2. Existing vehicular and pedestrian hardscape covering a majority of the area within the drip line will be scored by saw-cutting to allow for a controlled breaking and removal operations. Where feasible, the breaking and removal of the perimeter hardscape will be by hand or will utilize low-ground pressure (LGP), tracked mini-excavators reaching inward from outside the drip line. Such equipment operations will only proceed if there is sufficient clearance beneath the branches to operate the excavator’s boom. Demolition and removal of hardscape beyond the reach of these pieces of equipment will be by hand with an air spade if necessary.
3. Should access be necessary within the drip line, the existing grade will be covered with double, overlapping sheets of one inch (1”) thick plywood or eight inches (8”) of wood mulch to distribute the weight of the equipment and minimize compaction and rutting. Plywood and / or mulch shall not be used as a bridging material for driving over exposed

tree roots. A Certified Arborist shall review and approve access and driving surfaces prior to use.

4. Extreme care, hand labor, or low ground pressure (LGP) equipment is to be used for the preparation of any sub-grade structures for the limited new pavement within the drip line.
5. Hand trenching or pot-hole excavation and directional boring equipment should be used in lieu of open-cut machine trenching for conduit, piping, or other underground wet or dry utilities within the drip line of the tree.
  - a. Where feasible, any piping or conduits are to go either over or under roots encountered while trenching within the drip line.
  - b. Where a drainage pipe flow gradient is to be maintained and piping cannot be shifted above or below to avoid roots, re-routing of the pipe shall be the first option considered. Where rerouting cannot be accomplished, root pruning may be considered after inspection and consultation by a Certified Arborist. All such pruning shall be performed by trained pruning personnel under the supervision of a Certified Arborist.
  - c. Note that the present plans do not foresee any significant drain lines or other utilities being routed through the drip line.
6. During demolition and construction activity, the following practices should be followed:
  - a. Dust control measures should be in place and there should be a periodic washing of accumulated dust from the foliage of the tree as needed.
  - b. Washing of the foliage, when needed, will be conducted during off-hours to not impact other construction operations, or encourage the adhesion of additional dust to wet leaves.
  - c. Items that could cause damage to the tree if they fall from areas above the tree crown will be secured.
  - d. Any damage to the tree that occurs as a result of construction activity will be reported to the Project Arborist who will then provide a written report of recommendations to repair or stabilize the damaged part of the tree and provide the report to the City's Community Forester.
  - e. Proper safety perimeters will be maintained around any welding operations where sparks may damage tree foliage.
  - f. Absolutely no discharge of paints, solvents, or other wash-out activities will be permitted on the site and especially not within the protected drip line of the tree.
  - g. No equipment, materials, supplies, fill soil, or aggregate materials shall be stockpiled in the drip line.

- 7. Irrigation of the tree during the construction operation will be accomplished with a temporary drip irrigation system. The timing of irrigation will be determined from readings taken from a soil moisture gauge supplemented by periodic visual inspections of soil collected with a soil probe.

## Section 8

# PROPOSED TREE PROTECTION TRAINING PROGRAM

Critical to the success of this tree protection and preservation program will be sensitizing all on-site personnel to the importance of the Moreton Bay Fig as a unique horticultural specimen, a beloved community landmark, and as an irreplaceable visual / environmental asset to the resort itself. While such sensitivity is ingrained in the Owner, the City, and the Landscape Professionals involved in the project, it may not be evident to the Civil Engineering or General Building Construction teams that will ultimately dominate the site.

Subscribing to the belief that education and communication are the keys to the project's success, BVTC has proposed a comprehensive Tree Protection **Training Program**. Participation in this Tree Protection Training Program will be mandatory for **ALL** personnel that will be working on site.

The Tree Protection Training Program consists of the following elements:

1. Prior to the commencement of construction activities on site, the Owner will conduct a series of training sessions focusing on the critical elements of the Tree Protection, Preservation, and Maintenance Program. Each training session will cover the same material but will be offered several times to keep class sizes manageable yet inclusive of all the key project trades as they are brought on to the construction team.
2. Classes will be conducted by the Owner's Project Arborists. The Community Forester will be advised in advance of course times and will be invited to review the curriculum and observe the inaugural class at his / her discretion.
3. Course content will cover all aspects of the following:
  - a. Identifying the work limits around the tree
  - b. Identifying the required minimum protective systems required at the limits of, and within the drip line.
  - c. Identifying allowable work near the tree and within the drip line.
  - d. Establishing the absolute authority of the Project Arborist to shut down any / all operations that may damage or defeat the protective systems or violate the allowable work in or near the drip line.
  - e. Establishing the protocol for the scheduling and advance notification to the Project Arborist prior to any work in or near the drip line.

- f. Establishing the “zero-tolerance” criticality of the Protection, Preservation, and Maintenance Program and the penalties for work in violation of the work limits or allowable work inside or near the drip line.
4. At the discretion of the Instructor Arborist, the course participants may be required to participate in a question-and-answer session to assess the retention of critical information by the class.
5. Upon satisfactory completion of the course, each participant will be entered into a log and will receive a decal to place on their hard hat. No personnel will be allowed into the work area of the project without the Tree Protection Training decal on their hard hat. Exceptions will be made for inspectors, vendor representatives, or other incidental personnel provided that they only enter the work area if they are accompanied by an approved escort who does have the necessary decal on his / her hard hat.
6. The courses will be video taped and course content made available for use as subsequent construction personnel are brought onto the project team during later stages of work.

## Section 9

# PROPOSED TREE MONITORING PROGRAM

### **Construction Monitoring Program**

The Heritage Tree will require routine, periodic inspections during construction to monitor soil moisture level and to determine if construction work has resulted in detrimental stress to the tree. Inspections should be followed by written recommendations where needed as to watering, supplemental mulching, supplemental pruning, pest, or disease control.

### **Post-Construction Monitoring and Maintenance**

After the completion of construction, the current program of landscape maintenance under the canopy of the tree and the strategies to continuously work to improve the overall health, structure, and longevity of the tree as described in the current maintenance plan should resume. An annual review by an ISA Certified Arborist of these practices should be done to update any additional practices that should be implemented.

All Arborist's reports, before, during, and after construction should be available to the City of Santa Monica for review upon request.

## Section 10

# POTENTIAL IMPACTS ON THE TREE FROM SHADOWS OF NEW BUILDINGS

The orientation of the new structures and their relationship to the Heritage Tree is favorable to sun exposure. A Shade and Shadow Study of the 2018 design, completed by Pelli Clarke Pelli Architects dated February 1, 2018 shows minimal amounts of tree canopy in shadow for periods of over three (3) hours as measured at the Spring, Summer, Fall and Winter Solstices. A copy of the Shade and Shadow Study is included as Appendix 5. The study illustrates that the balance of the tree will still receive a good amount of afternoon sun based on the footprint of the new building which is of a similar height of the existing Ocean Tower. The height and setbacks of the new buildings from the Ficus tree allows the tree to continue to have access to sunlight.

Additionally, it should be noted that leaves that function in full sun develop a different internal architecture than leaves in continual shade. As such, leaves that exhibiting “high-light” architecture, when placed into deep shade, will eventually fall from the tree, and be replaced by leaves that adjust to the new light levels by means of modified internal “low-light” architecture. Such low-light architecture leaves are typically larger in size to provide more exposed surface area, and thinner in cross-section to allow for greater light penetration into the leaf to reach the photosynthetic chloroplasts located therein.

Given that the construction of the building will occur over time and the change in light levels will be neither dramatic nor sudden, it is most likely that within any areas that may be in partial shade, the leaf drop will be minimal, piecemeal, and gradual with some small number of high-light leaves falling off and being incrementally replaced over an extended period of time. By the time the buildings are completed, and the shade and shadow patterns set, the tree should have made all necessary internal adaptation so as to show no visible sign of any negative impact.

## Section 11

# RECOMMENDATIONS FOR LANDSCAPE TREATMENTS WITHIN THE TREE CANOPY ZONE

During the last several years, important improvements have been made in the landscape beneath the tree to improve the relationship between the tree's requirements and the general landscape. Currently there is strategic, yet non-intrusive, landscaping in place under the canopy and among the open areas of the root zone of the tree.

### Added Open Surface Area

A clear benefit of the proposed development plan as currently designed is the elimination of the existing impervious vehicular hardscape pavement at the *porte cochere and the new raised deck platform to enhance access to the tree and protect the exposed roots of the tree*. This pavement presently covers a significant percentage of the ground area within the tree's drip line. The removal of this pavement will accomplish several very significant horticultural improvements for the tree:

- Reduce compaction of the soil below the tree
- Provide an extensive area for irrigation water infiltration
- Provide for improved atmospheric gas exchange within the Rhizosphere

The above environmental improvements within the tree's root zone are more than sufficient to offset any negative impact from select perimeter root pruning that may be required to accommodate the new construction.

### New Drainage, Irrigation, Lighting, and Planting Guidelines

New irrigation, landscape lighting, and planting in the area within the drip line shall follow the same guidelines as are currently in place along with the following:

- Drainage lines, if required, shall be designed to avoid roots to the maximum extent possible. Where installed, drain lines shall be placed in as shallow an excavation as possible. Further, all such excavation shall be by hand and / or air spade.
- If a drain pipe's flow line gradient intersects a root, every effort shall be made to route the pipe under the root if feasible. If it becomes necessary to prune the root, all pruning shall be made under the supervision and advisement of a Certified Arborist.
- Lighting, where required, shall be low-voltage with wiring routed in flexible plastic conduit, on grade, and in spaces between surface roots and hidden within the mulch layer.

- Irrigation mainlines, control valves, and quick-coupling valves shall be located outside of the tree's drip line. Lateral lines serving irrigation systems within the drip line shall be generally limited to drip irrigation installed as above grade tubing hidden within the mulch layer.
- Where irrigation piping may be required to be installed below grade, all trench excavation shall be by hand with piping run over or under roots as dictated by the individual situation. No root pruning is anticipated to facilitate irrigation installation.
- Planting shall be limited to strategic zones of select, non-invasive planting limited to interstitial spaces between major roots. Plants shall be selected to share a common watering requirement to the Ficus tree (hydro-zone compatibility) to allow for uniform irrigation application within the overall planter area.
- Unplanted areas shall make extensive use of organic surface mulch, decorative stone, or other protective treatments

### **Hardscape Guidelines**

The 2018 conceptual design contemplates a pedestrian sidewalk around the Heritage Tree outside of the tree's drip line which is a significant improvement from the existing condition and an improvement from the previous 2013 HKS plan. These areas of pavement will still be constructed with a shallow structural cross-section so as to avoid or minimize any sub-grade preparation that might damage near-surface roots outside of the drip line of the tree.

## Section 12

# CONCLUSION

By all accounts, the preservation of the Heritage Tree is feasible for the following summarized reasons:

- The tree is in overall excellent health
- The tree is a relatively hardy species tolerant of minor impacts or encroachments
- Remedial and restorative pruning has effectively improved the tree's health and tolerance
- The proposed new 2018 schematic landscape design is a thoughtful approach to highlighting the natural beauty of the Heritage Tree for all to enjoy, while ensuring its long-term health and vitality.
- As described above, the anticipated shoring and excavation in the new 2018 design will have no impact on the roots within the tree's drip line and minimal impact outside the drip line.
- When construction of the elevated wood deck surrounding the tree begins, the placement of the micro-piles should be approved by the Project Arborist.
- The spacing of the structural wood support members for the elevated wood deck should be developed in consultation with the Project Arborist.
- The system for watering the tree root zone area below the wood deck should be developed in consultation with the Project Arborist.
- The proposed 2018 design removes existing pavement around the tree to improve the root zone environment
- The proposed 2018 design expands the available area for future root development
- The proposed 2018 design respects the drip line and avoids root damage
- Pavement areas are outside the drip line of the tree and will be minimally invasive, so as to avoid or minimize any sub-grade preparation that might damage near-surface roots.
- A full GPR map of the root zone has been generated to guide delicate perimeter work
- Perimeter work should be by hand or shall use minimally invasive equipment and techniques
- Monitoring and maintenance shall be conducted throughout the demolition and construction
- All personnel working on the tree should be trained horticulturalists or arborists
- Construction personnel working near the tree will receive instruction regarding tree protection protocols and drip zone limits and bounds.

- No roots larger than two inches (2") in diameter should be cut within the drip line of the tree (except as noted in Section 11).
- Outside the drip line of the tree, roots larger than 2" in diameter may be cut under the supervision of the Project Arborist.

The conclusion of the Arborists and horticulturalists involved in the development of the program that with the above measures, this tree will survive the construction process and will continue to thrive as the centerpiece of the proposed hotel and will ensure the health and longevity of the Heritage Tree for many years to come.

## Section 13

### SUPPLEMENTAL INFORMATION

### REGARDING THE GROUND PENETRATING RADAR SURVEY

At BrightView's suggestion, Ocean Avenue LLC engaged **Arborist On-Site** to provide a tree **Root Radar Scanning Report**. A detailed scanning of critical areas of concern was conducted using Ground-Penetrating Radar (GPR). GPR is commonly used for this type of investigation and is acknowledged as the most reliable, non-invasive tool for assessing root depth and approximate sizes.

It should be noted that there are no practitioners of GPR in the Southern California area. It was necessary to retain **Arborist On-Site** of San Jose, California to perform this GPR survey. The additional information revealed about the status of the tree is of significant importance and serves as further evidence of Ocean Avenue LLC's on-going commitment to work with BrightView's tree protection team in developing the optimal plan to protect the Heritage Tree.

The Arborist On-Site report, (a copy of which is attached as Appendix 6 - **ISA Arborist's Report** [Ground-Penetrating Radar]) confirmed many of the assumptions that BrightView made in its December 12, 2013 analysis of the status of the Heritage Tree:

1. A majority of the tree's roots are located on the south side of the tree and have grown toward Wilshire Boulevard. This growth pattern takes advantage of the larger area of open space with greater access to soil moisture and air the absence of underground basements.
2. The majority of the tree's roots are located between a depth of 30-35" with little to no surface roots outside of the exposed roots within the tree's drip line. Root growth in this range is the result two forces:
  - a) The tree's natural geotropism (tendency for the roots to grown downward) where soil texture and compaction levels allow.
  - b) The limited ability for atmospheric gasses and water to penetrate lower strata of the site soils tends to preclude root growth at greater depths

### Conclusions

The information revealed by the GPR Root Radar Scanning Report provides accurate data as to the depth and size of roots along critical drip line interfaces with the proposed construction. Access to this information in the simple graphic form provided in the report accomplishes the following:

1. The data demonstrates a reduced likelihood of clashes between construction and roots.
2. Where potential clashes are identified but unavoidable, the availability of the top view and profile view data reduces the need for detrimental “pot-holing” of to locate roots that may require selective pruning.
3. No roots larger than two inches (2”) in diameter should be cut within the drip line of the tree.
4. Outside the drip line of the tree, roots larger than 2” in diameter may be cut under the supervision of the Project Arborist.

## Section 14 APPENDIX

The following documents are included as attachments to this Tree Report

1. Valley Crest Tree Care Services: *Ficus macrophyllum*  
Moreton Bay Fig, Santa Monica Miramar Hotel & Bungalows March 2011
2. Time for a Trim, Santa Monica Daily Press, Article Date Unknown
3. Arbor Essence: Evaluation of Landmark Ficus November 16, 2017
4. Arbor Essence: Health Assessment of Moreton Bay Fig April 10, 2013
5. Shade and Shadow Study by Pelli Clarke Pelli Architects February 1, 2018
6. ISA Arborist's Report (Ground-Penetrating Radar) October 9, 2014



# ValleyCrest

Tree Care Services



**Ficus Macrophyllum**  
**Moreton Bay Fig**  
**Santa Monica Miramar Hotel & Bungalows**

March 2011

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## A. History and Background

In June 1976, the Landmarks Commission of the City of Santa Monica initiated proceedings for the designation of the Moreton Bay Fig tree (the "Ficus") at the Miramar Hotel (the "Hotel") as a landmark and in August of the same year approved the designation based on the following findings:

1. The Ficus is identified with an historical personage of local, state, and national history in that it was planted by members of Senator J.P. Jones' family.
2. It symbolizes elements of the cultural, social, economic, and political history of the city in that it is located on the former estate of Senator Jones, one of the founders of the City of Santa Monica.
3. It has aesthetic interest and value in that it is a fine botanical example of its species.

It is estimated that the Ficus was planted sometime around 1879, making it approximately 132 years old. The tree currently measures approximately 60 feet in height, 110 feet in spread, and has a diameter at breast height (DBH) of approximately 72 feet. Other examples of this species can be found in Los Angeles, San Diego, Santa Paula, and Santa Barbara where the tree is considered to be the largest known specimen in the continental United States.

The Ficus is named after Moreton Bay in southern Queensland, although it is found elsewhere. An evergreen tree that can reach heights of 200 feet, its trunk can be massive, with thick, prominent buttressing roots, and reach a diameter of 8 feet. The rough bark is grey-brown.

Since acquiring the Hotel, MSD Capital, L.P. (the "Owner") has made a concerted effort to learn more about the Ficus, and to solicit opinions from prominent arborists concerning how the tree should be maintained going forward.

Understanding that the Ficus had significant historical as well as botanical value, the Owners began to develop a long term management program for the tree and in the winter of 2006 contacted Valley Crest Tree Company, Calabasas, California to provide input into the planning process.

## B. 2007 Arborist's Report and Work Plan

### 1. The Initial Report

In March of 2007, Valley Crest Tree Company arborist Dave Teuschler, an International Society of Arborists Certified Arborist, inspected the Ficus for the purpose of determining what steps need to be taken to preserve, protect, and enhance the tree so that it will continue to thrive for many years to come. In addition, the review considered public safety to make sure that the Ficus is in a condition that is safe for the many Hotel visitors who pass beneath it and protection of the property and buildings on this site. Pruning specifications and work conditions were then developed and assembled in accordance with International Society of Arboriculture standards that are widely accepted and currently in use.

In Mr. Teuschler's initial report, the following observation and recommendations were made:

#### Observations

- The Ficus has not undergone any significant maintenance in years. Nevertheless, the tree is in moderately good health, as shown by previous years' growth, leaf size, lack of dead wood in the canopy and overall color and vigor.
- A great deal of over pruning of this tree has taken place in the past. It has been lion tailed severely. This practice of removing all of the interior branches forces the tree to produce new foliage and the extreme branch ends.
- The result of lion tailing has put all of the branch weight out at the ends of the branches which required installation of support cables in the canopy in the past as a means of preventing catastrophic limb failure.
- This tree is completely surrounded by driveway, building, and sidewalks and is accessible to the general public and vehicles.
- Many of the tree branches touch the existing buildings and abrasions and rub scars exist which indicate these branches have been striking the building and pose a potential risk for property damage.

#### Recommendations

- End weight needs to be removed from this tree to make it safer for those who pass beneath it. You will see that large limbs have fallen in the past as shown by large open wounds which are in the process of compartmentalization. This is traditionally why tree branches are cabled. This tree currently has a system of cabling installed. Removing some end weight off of the end of the branches reduces that potential risk of another branch falling.

- All pruning should be done with the highest regard for the historical importance of this heritage tree and in compliance with ISA standards
- It is recommended that the pruning of this tree should be undertaken in several phases. In the first phase, all pruning will be limited to approximately one-half of the final crown reduction and will focus reducing end weight by approximately 30% as well as over structure branching.
- This pruning should take place in the warmer months of the year when the tree is actively growing. This would be considered April through October in Santa Monica.
- All pruning should be supervised by and ISA certified arborist and should be in accordance with all tree maintenance regulations set forth by the City of Santa Monica

## **2. Working with the City of Santa Monica**

Following this initial inspection an on site meeting was held with Mr. Walt Warriner, Community Forest & Public Landscape Superintendent, City of Santa Monica, the Owners, and the arborist team from Valley Crest Tree Company. This was a walk through discussion regarding the short- and long-term management for the Ficus with the intent on developing a collaborative assessment of the best way forward for preserving this tree as a community landmark and enhancing its overall health and vigor in the year to come.

It was generally observed by all that while the tree was in very good condition for a tree of its age, there was no documented work plan for the tree and little work had been performed in recent times to address some basic arboricultural issues. Discussions amongst the group led to agreement of the elements of good arboricultural management effort. From that point, it was agreed that a written plan would be developed by the Owner and submitted to the City for review, comments, and approval so that much needed deferred maintenance could be started. As owners, it was important to time the work for the optimal benefit of the tree and it was agreed that the work should begin as soon as possible.

## **3. The Work Plan**

The following detailed work plan was developed and approved by the City to be implemented in a series of phases over a period of years to ensure the long term health of the tree. It demonstrates the high level of expertise which was solicited and the very specific actions that were to take place during execution of the work plan. A pre-work meeting was held with all members of the team and the work was supervised at all times by a Certified Arborist. The purpose of this report is to describe the phased work and maintenance program as implemented for the tree since our initial review in 2007. This

program has improved the tree's previous moderately good health to its current excellent condition.

*Pruning Specifications for Ficus Macrophylla at the Miramar Hotel  
in the City of Santa Monica*

by Dave Teuschler  
I.S.A. Certified Arborist # WE – 4177A  
Valley Crest Tree Company, Specimen Tree Division, Los Angeles, California

Background Information

- This is a heritage Ficus macrophylla. It was planted in 1879.
- This tree is the focal point of the Miramar Hotel in Santa Monica. The current vehicle entry and turn around encircles three fourths of the area beneath the canopy of the tree.
- Although the tree has been infrequently and improperly pruned in the past, its current health appears to be good.
- There are signs of prior limb failures within the canopy of this tree (figure 1).
- It appears that this tree has been overly thinned in the past. This thinning eliminated interior foliage and pushed all new growth towards the extreme ends of the branches. A practice that is called "lion tailing".

The word 'shall' indicates a practice that is mandatory. The word 'should' refers to a practice that is highly recommended.

Objectives

Reduce potential hazardous conditions in this Ficus macrophylla, begin correcting improper pruning that has taken place in the past and improve tree structure by:

- Removing dead branches.
- Reducing the weight of branches or stems with included bark.
- Reducing the weight toward the ends of branches that have been lion tailed during previous pruning (figure 2).
- Crown thinning of the canopy (figure 3).
- Removing over-structure branches (figures 4, 5).
- Removing crossing branches (figure 6).
- Adjusting and or replacing cables within the canopy of the tree (figure 7).
- Adjusting canopy lighting attachments (figure 8).

General Procedures

- Live branches less than 1.5 inches diameter should not be removed.

- Dead branches greater than 1.5 inches in diameter (measured at the base of the branch) shall be removed from the canopy of the tree.
- No live branches greater than 4 inches diameter shall be removed from the tree without authorization.
- Remove no more than 20 percent of live foliage from the tree unless indicated below.

#### Specific Procedures

1. Weight on main scaffold limbs with included bark shall be reduced by approximately one-third by removing some secondary branches toward the ends of the limbs and/or by removing the end of the branch using a drop-crotch cut.
2. If less than 20 percent of the foliage was removed on a mature tree following procedures 1 above, thin the canopy to allow more light to reach the ground under the tree and to reduce damage from wind storms. The foliage removed shall be taken primarily from the outer edge of the canopy, not from the interior (figure 9). Interior branches shall be left on the tree. Do not remove water sprouts from the interior of the tree.
3. Root zone shall be protected during pruning operations.

#### Pruning techniques

Pruning cuts shall be in accordance with ANSI A300 pruning standards. See attached documents.

#### Tools and equipment

- Climbing spurs shall not be used when climbing trees, except to climb a tree to be removed or to perform an aerial rescue of an injured worker.
- Equipment and work practices that damage bark or cambium should be avoided.
- Rope injury from loading out heavy limbs should be avoided.

#### General

Work will be supervised by an I.S.A. certified arborist. Certification is through the International Society of Arboriculture, Champaign, IL. A certified arborist shall be on site at all times during work activities.

#### Safety

All work shall be performed by workers trained in accordance with ANSI Z133.1 safety regulations as required by OSHA. See attached documents.

#### Exclusions

Only the Ficus macrophylla is to be pruned. All other trees at this location will require a separate pruning specification if they are to be pruned.

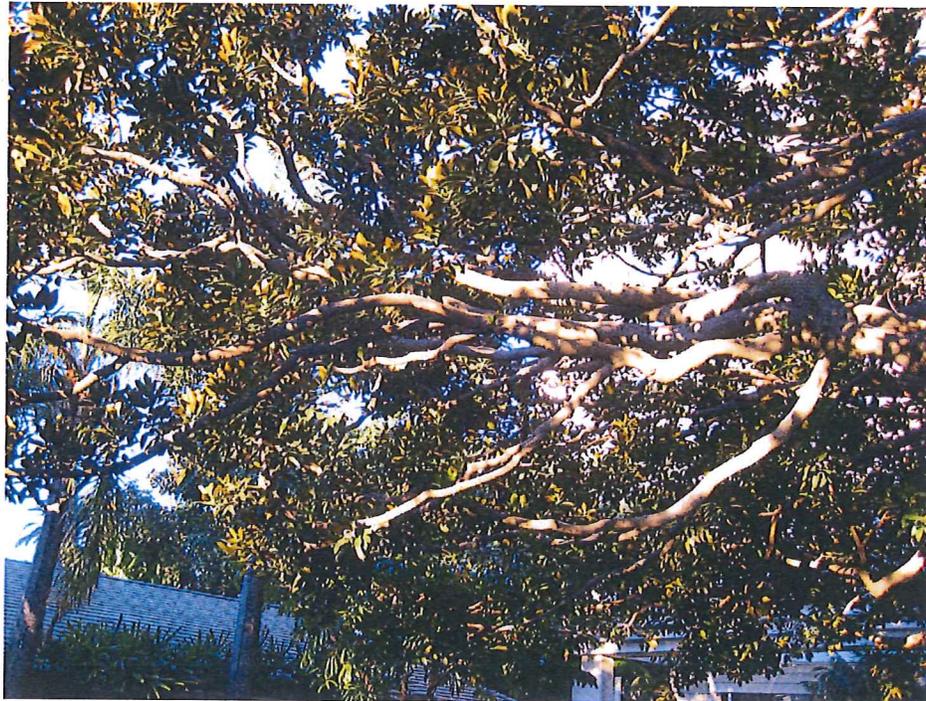
#### Additional Requirements

All debris and equipment shall be removed from the site by the end of each workday and public area shall be kept in a clean condition.

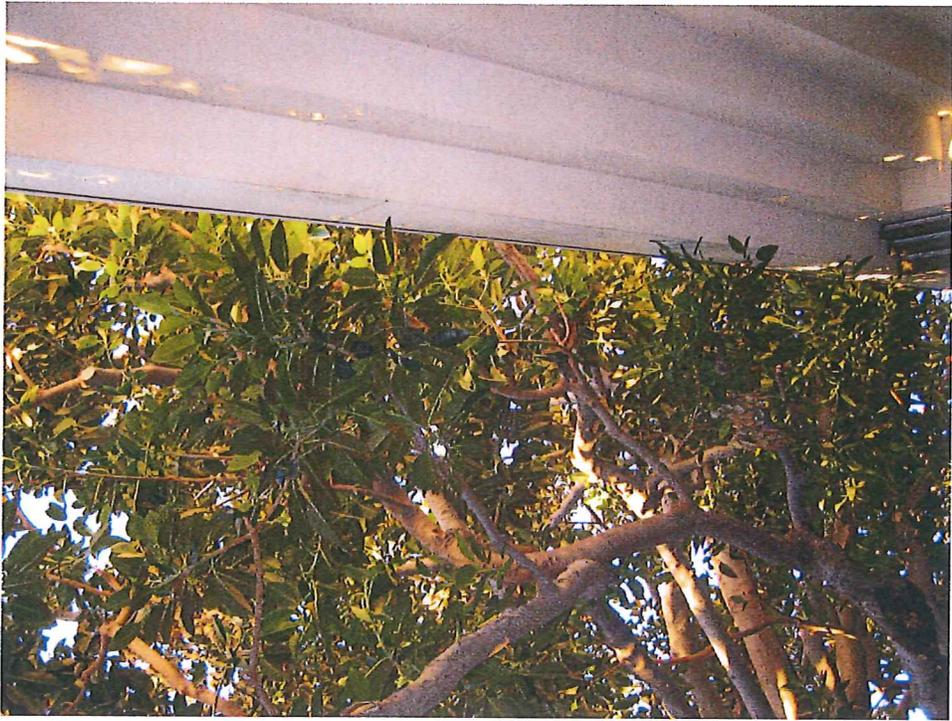
Examples of Work to be Performed



Canopy of tree impacting structure needs to be reduced



Extremely long branches carrying excessive weight are a hazard



Branches growing inside of roofline need to be rebalanced



Selective pruning is needed to reduce the encroachment

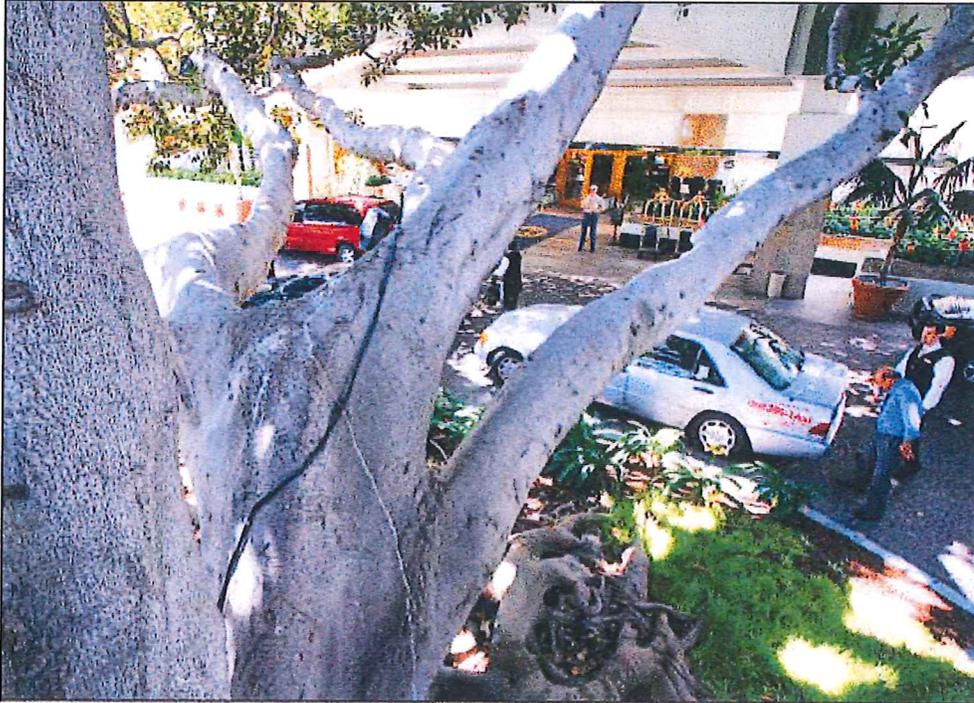
#### 4. Community Outreach

As part of the planning for commencing much needed work on the Ficus, outreach to the community was initiated to provide background for the work and to solicit any input before commencing work. A newspaper article told the story of this historical tree and provided the community with insight into the need for a long-term plan for this botanical specimen.



**LANDMARK NEEDS MAINTENANCE:** With its branches stretching out over the Fairmont Miramar Hotel driveway, the landmarked Moretor Bay fig tree is the second largest found in California. Hotel management plans to do some much-needed pruning in May.

Brandon Wise [brandonw@smdp.com](mailto:brandonw@smdp.com)



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**IMPORTANT PROJECT:** Officials at the Fairmont Miramar Hotel are making plans to trim the historic Moreton Bay fig tree.

# Time for a trim

## Historic Moreton Bay fig tree to receive some maintenance

BY DAILY PRESS STAFF

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While it hasn't been that long since the historic landmark was last trimmed, the tree has seen better days and those at the hotel are planning to give it some tender loving care in the next few weeks to ensure it stays around for another 100 years.

"There are certain areas of the tree that are carrying an awful lot of weight and some of those branches are so heavy and fragile that it has become a safety issue," said Ellis O'Connor, general manager of the Fairmont.

"We just want to get the word out and let people know what we are planning to do because the tree is one of the focal points of Santa Monica," O'Connor added. "Everyone is proud of it and we want them to know we are doing this for the right reasons, for the best interest of the tree."

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O'Connor said the Fairmont has been working with City Hall and professional arborists to come up with the best plan to preserve and strengthen the fig, which could include using cables to support some of the larger limbs. Fairmont is awaiting approval from the Landmarks Commission and hopes to start trimming May 1.

"We have done extensive reports about the effects of pos-

sible over trimming to see how much should be taken off of it," O'Connor said. "We have been in close communication with the city of Santa Monica and their tree department."

The company that will perform the work is ValleyCrest. The job should take anywhere from five to 10 days, O'Connor said.

The Fairmont's fig has a rich history. Dating back more than 100 years ago, an unknown sailor from Australia is believed to have carried the original sapling off his ship into a local Santa Monica watering hole. Unable to pay for his drinks, he gave the sapling to the bartender as payment. The bartender, having no use for the sapling, gave it to the wife of Nevada's Sen. John P. Jones, who founded Santa Monica in 1885 and who built the original Miramar as a family mansion in 1889. The Jones' gardener, a man by the name of W.H. Lee, planted it in the garden amongst some rare and exotic plants, some of which are still thriving today.

The Jones family sold their home shortly before the senator died in 1912 and it was converted into the Miramar Hotel in 1921. By this time, the original sapling had already grown to an impressive size and was widely recognized as the "Jones Family Tree." Although a modern building replaced the Jones' residence in 1938, the tree continued to serve as a focal point for outdoor meetings and local festivities, a tradition that is still followed today.

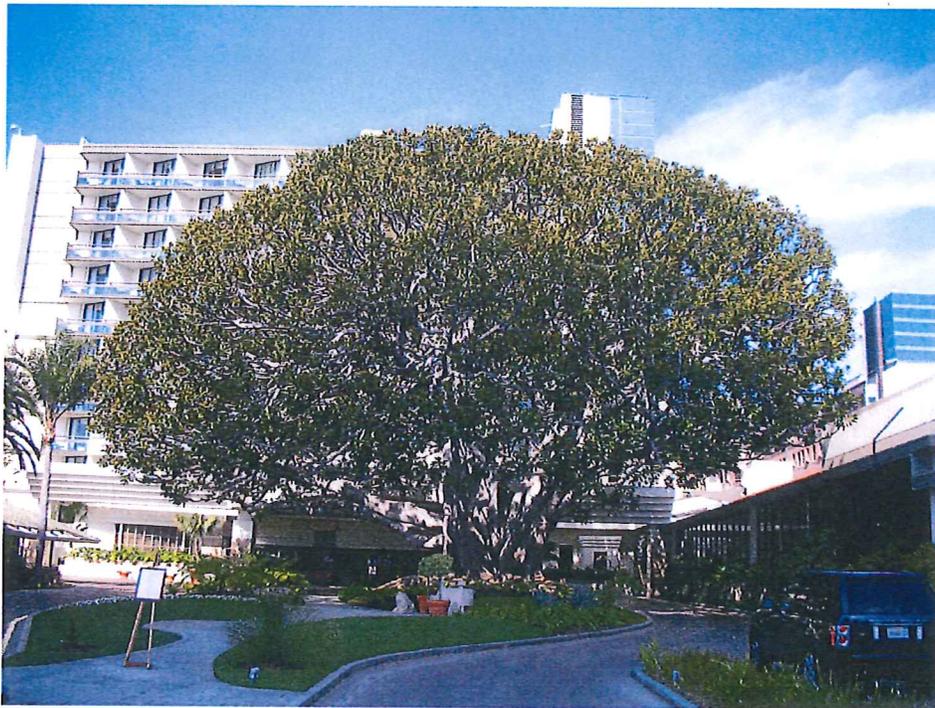
In 1969, the Santa Monica chapter of the Daughters of the American Revolution held a special ceremony commemorating the planting of the tree and issued a memorial plaque which is now affixed to the tree's base among the flowers near the sidewalk path. The Santa Monica Landmark's Commission during the United States bicentennial year in 1976 declared the tree an historic landmark.

[news@smdp.com](mailto:news@smdp.com)

**5. Results of Owner's Management Plan**



Before management was begun



Phase One Completed

### C. 2010 Phase 2 Maintenance and Pruning Program

In March of 2010, ValleyCrest implemented Phase 2 of the maintenance and pruning program for the tree. These activities included the following:

- Crown reduction with an emphasis on an overall smaller canopy to reduce the risk of limb failures
- Crown thin per ANSI standards of 25% of the entire canopy
- Pruned the end weight of lateral branches throughout the canopy to reduce chances of limb failures
- Pruned back the lateral branches over structures for building clearance
- Inspected and made minor adjustments to the existing cabling system to ensure proper support for the lateral limbs

### D. 2011 Phase 3 Maintenance and Pruning Program; Arborist's Update Report and

In February of 2011, ValleyCrest implemented Phase 3 of the maintenance and pruning program, which included the following work:

- Crown reduction of approximately 4' to 5'
- Crown thin per ANSI standards of 25% of the entire canopy
- Pruned the end weight of the lateral branches throughout the canopy to help reduce end weight to reduce the chances of limb failure
- Pruned back lateral branches over structure for building clearance
- Inspected and made minor adjustments to the existing cabling system supporting the larger lateral limbs for proper support

In accordance with the original 2007 work plan, the current overall health condition of the tree appears to be excellent. Overall, the tree is showing good uniformity, healthy growth and healthy leaf size, color and vigor. Shown below are several before and after pictures from the start of the maintenance project through the February 2011 Phase 3 pruning.

**March 8, 2011**



Before picture of first trimming over structure for building clearance. 2008



After picture of last trimming for building clearance completed Feb 22, 2011



Side view picture of before crown thinning of 25% . 2008



Side view picture of after crown thinning of 25% Completed Feb 22, 2011



Front view picture before Crown reduction. 2008



Front view picture after crown reduction. Completed Feb 22, 2011

There is, however, a section on the back side of the tree (see photos #1 and #2 below) that does *not* show the same positive appearance. In this area, there is visual evidence of stunted growth, dwarfed leaf size, thinning canopy, lack of color and vigor.

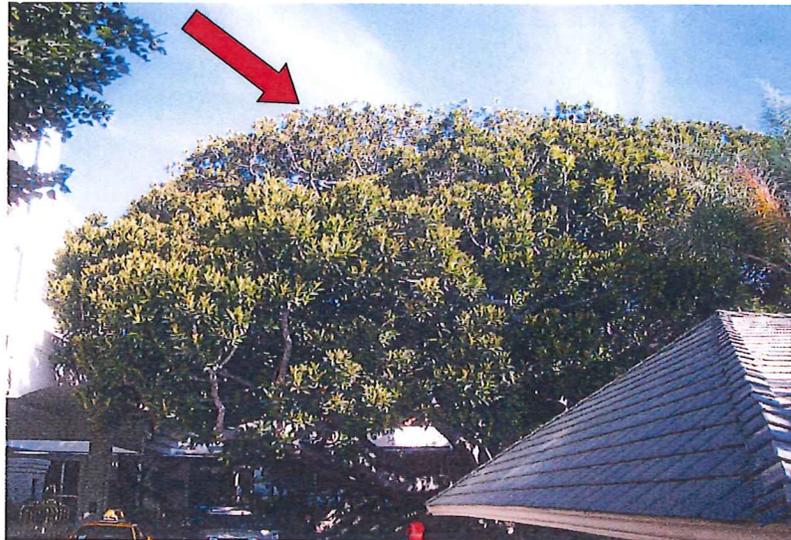


Photo #1



Photo 2

The area of decline is isolated to one main large “parent leader.” There are five points where cabling hardware has been installed for the purpose of support as shown in photo #3 and #4.

Cabling systems are installed in the tree limbs to increase the weight each limb can hold, thus a larger-sized canopy is created. With a larger canopy, the cables help to limit limb breakage and the potential threat to property or people below. However, when hardware is installed in a tree, a wound is created in the vascular system at the point of entry. A developmental process unique to trees is the ability of the tissue surrounding the cable at the point of entry to compartmentalize around the wound. When this reaction is triggered the tree forms boundaries around the wounded area.

The limb shown in photo #3 has too many wounds in a confined area, restricting the proper function/flow of the vascular system. The compartmentalized tissue creates an abnormal “maze” like effect to the vascular system thus reducing the flow of nutrients. Therefore, the nutrients are not readily able to reach the upper canopy resulting in a poor performing or struggling upper canopy.



Photo #3

Another likely contributing factor to the poor performance of the limb is the large wound shown in photo #4 along the trunk caused from a previous broken lateral limb.



Photo #4

The last item of concern is a crossing lateral branch indicated on Photo #5 that is rubbing and exerting pressure against the main struggling parent limb.



Photo #5

### Recommendation

We are strategically allowing lateral limbs to grow and mask the stunted parent limb shown in photos #1 and #2. Ultimately, the lateral limbs will grow to help maintain the shape of the canopy. The stunted parent limb will not be removed because the existing cables, shown in photo #3 and 4 are supporting other structurally important limbs.

In conclusion, any added stress should be avoided to help prolong the life span of this majestic tree such as the following:

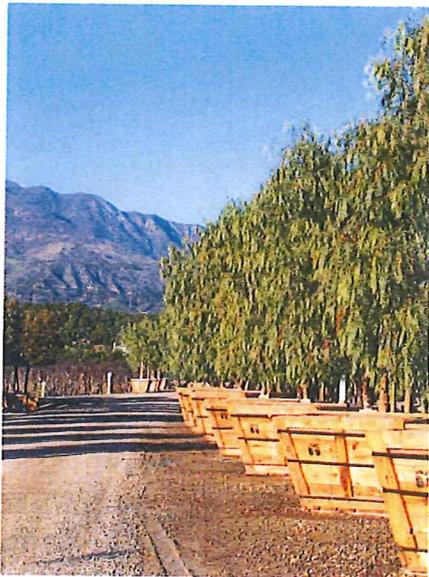
1. Avoid new plantings that will disturb the soil. This will prevent root hair loss which is essential for nutrient uptake.
2. Avoid installing lighting that will require additional holes to be drilled into the bark. Use the existing anchor points where possible.

## E. Long-Term Hotel Revitalization Plan

We understand that the Owner is in the process of considering various long-term Hotel revitalization scenarios, and that preservation of the Ficus is central to each alternative. Valley Crest Tree Company will work with the Owner to develop a tree protection plan that ensures the long-term health and vitality of the Ficus, in accordance with applicable City of Santa Monica ordinances and good arboreal practice.

## F. About Valley Crest Tree Company

As the largest producer of containerized specimen trees in the West, Valley Crest Tree Company offers an unparalleled variety of high quality trees to landscape contractors, architects and developers seeking to create mature and distinctive landscapes. With 800 acres of state-of-the-art growing grounds in northern and southern California, the Nursery Division's standing inventory of 15 gallon through 72 inch boxes includes a broad cross-section of shrubs and trees. The Specimen Division offers expert tree relocation, storage and preservation services worldwide and an array of mature and one of kind mature trees that have been procured and preserved from their original setting.





## Appendix 2

Santa Monica Daily Press

Visit us online at [smdp.com](http://smdp.com)Brandon Wise [brandonw@smdp.com](mailto:brandonw@smdp.com)**IMPORTANT PROJECT:** Officials at the Fairmont Miramar Hotel are making plans to trim the historic Moreton Bay fig tree.

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[news@smdp.com](mailto:news@smdp.com)

[ 35 ]

November 16, 2017

Mr. Dustin Peterson  
Fairmont Mira mar Hotel  
Santa Monica, CA

Regarding: Evaluation of Landmark Ficus  
Fairmont Mira Mar Hotel  
Santa Monica, CA

Dear Mr. Peterson,

At your request I visited the referenced site November 14, 2017. I was asked to evaluate the current health condition of the Landmark Morton Bay Fig tree in front of the hotel.

My visual inspection was performed from ground level and did not involve any invasive or advanced diagnostics. The tree was visually examined to assess its current state of health and to identify any apparent pest or structural problems. The lower trunk area was sounded using a rubber mallet to check for any indication of internal cavities or decay, and the crown of the tree was inspected using binoculars.

The tree appears very healthy with good foliage color and strong seasonal shoot growth. No signs of stress or decline were observed in the tree. The south side of the crown is not quite as full as the north, but I simply attribute this to exposure.

Compared to photos of the tree taken in 2013, the tree generally appears to be healthier, foliage color has improved, and crown density has also increased.

There are several support cables installed in the tree, some of which are very slack. I also question the workmanship of the cable installation and suggest having the cables check by a reputable company, and adjusted or modified as needed.

It should be noted that the study of trees is not an exact science and arboriculture does not detect or predict with any certainty. The arborist therefore is not responsible for tree defects or soil conditions that cannot be identified by a prudent and reasonable inspection.

If you have any questions or require other services please contact me at the number listed below.

Respectfully,  
Arbor Essence



---

Kerry Norman  
ASCA, Registered Consulting Arborist #471  
ISA Board-Certified Master Arborist #WE-3643B  
ISA Tree Risk Assessor Qualification

Appendix 4

April 10, 2013

Mr. Robert Crudup  
Valley Crest Tree Company  
24151 Ventura Boulevard  
Calabasas, California 91302

Regarding: Health Assessment of Morton Bay Fig  
Miramar Hotel  
101 Wilshire Blvd.  
Santa Monica, CA

Dear Mr. Crudup,

At your request I visited the above referenced site April 9, 2013. The purpose of this visit was to inspect a landmark Morton Bay Fig (*Ficus macrophylla*), to evaluate its current condition.

My inspection of the tree was performed from ground level and did not include any extensive or invasive diagnostics. The tree was inspected to assess its overall health and structural condition, and to identify any signs or symptoms of insect pest or disease problems.

The subject tree is located growing in a large planter outside the main entry to the hotel. The tree is massive in size with several large stems and an immense canopy.

Overall the tree appears to be in healthy stable condition. The tree displays good foliage color, and healthy new shoot growth throughout its entire crown. The tree does not display any stress or decline symptoms. No significant insect pest or disease problems were observed in the tree, nor were any major structural defects identified.

In preparation for proposed construction and hotel renovations the tree has progressively been pruned for crown reduction over the past few years. This approach has enabled the crown to be significantly reduced without impacting tree health, vigor and structure.

Only a few minor structural defects were observed in the tree, which include two distinct wounds in the lower portion in two of the main stems. Currently it appears that decay is minimal and there is enough sound healthy wood to reasonably support the stems with little risk.

I did note the extraordinary number of cables installed in the crown of the tree. Some of the cables appears to be very old having been installed many years ago, and others look as though they were installed more recently. Many of the cables appear to be redundant and probably can be removed, while others were simply installed incorrectly and need to be replaced, modified or adjusted. It is recommended that cables in trees be inspected annually and adjusted as needed.

I also observed a large birds nest on the upper north side of the crown; we must be mindful to protect and nests when working in the tree.

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If you have any questions or require other services please contact me at the number listed below.

Respectfully,  
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---

Kerry Norman  
ASCA, Registered Consulting Arborist #471  
ISA Board-Certified Master Arborist #WE-3643B  
PNW-ISA Certified Tree Risk Assessor, CTRA #1034

Appendix 5



SUMMER SOLSTICE (JUNE 21)



SPRING EQUINOX (MARCH 21)



WINTER SOLSTICE (DECEMBER 21)



FALL EQUINOX (SEPTEMBER 21)

<b>MIRAMAR</b> HOTEL & RESIDENCES REDEVELOPMENT FEBRUARY 01, 2018	APPLICANT OCEAN AVENUE, LLC 100 WILSHIRE BOULEVARD SANTA MONICA, CA 90401 310.458.3600	PROJECT ADDRESS 1133 OCEAN AVENUE SANTA MONICA, CA 310.899.4184	DEVELOPER THE ATHENS GROUP 101 WILSHIRE BOULEVARD SANTA MONICA, CA 310.899.4184	ARCHITECT <b>PCPA</b> 322 EIGHTH AVENUE NEW YORK, NY 10001 212.417.9496	LANDSCAPE ARCHITECT <b>GGN</b> 1922 1ST AVENUE SEATTLE, WA 98101 206.903.6802	DESIGN CONSULTANTS URBAN LETTER ARB/ENVIRONMENTAL/SS/KA HENNESSY GROUP CIVIL/FUSCOE ENGINEERING/CHATEL HISTORIC PRESERVATION/CHATEL PARKING/WALKER CONSULTANTS	SHEET NAME <b>SHADE AND SHADOW STUDY</b>	SHEET NUMBER <b>APP-01</b>
	MIRAMAR HOTEL & RESIDENCES REDEVELOPMENT - SHADING STUDY							

# Arborist OnSite®

Horticultural Consulting Inc.

130 San Ramon Drive San Jose, California 95111  
Direct 408/ 226-3427 Fax 408/ 227-9901  
Robert@arboristonsite.com

Appendix 6

## ISA Certified Arborist Report

### Submitted To:

Ocean Avenue, LLC  
100 Wilshire Blvd., Suite 1700  
Santa Monica CA 90401

### Project Location:

The Fairmont Miramar Hotel  
101 Wilshire Blvd.  
Santa Monica, California 90401

### Submitted By:

Robert Booty, Registered Member # 487  
The American Society of Consulting Arborists  
ISA Certified Arborist WC-4286  
October 9, 2014

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Markers for Fairmont Hotel .....	7
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## Assignment

Ocean Avenue, LLC, the owner of the Fairmont Miramar Hotel in Santa Monica, California, is planning a comprehensive redevelopment of the site that will include an underground parking structure. Their heritage tree, a Moreton bay fig (*Ficus macrophylla*) (the “Heritage Tree”), is located in the center of the site and will remain a focal point of the redeveloped hotel.

Ocean Avenue LLC previously engaged Valley Crest Tree Company to provide a comprehensive tree protection, preservation and maintenance plan to protect the Heritage Tree. At Valley Crest’s suggestion, Ocean Avenue LLC requested my services to utilize ground penetrating radar to locate the tree roots within the proposed construction area and to provide specific information as to root location, density and depth in order to provide as much information as possible to ensure the on-going health and vitality of the Heritage Tree during and after construction.

## Observations

I visited the site on September 7, 2014. The Heritage Tree is located in the center of a round-about driveway at the entrance to the hotel. Traffic circles around the tree on a stone mosaic drive way. The tree is surrounded on three sides by buildings. The Heritage Tree is about 80 feet tall and appears to be in excellent health. I am very impressed with the quality in which it is being pruned and cared for.

## Discussion / Conclusions

I completed a total of seventeen individual line scans around the tree; all, with the exception of one were next to the buildings that are proposed to be removed as part of the redevelopment plan. Sixteen of the scans utilized the 400MHz antenna and only identified structural roots one inch in diameter or greater. I did one scan (#17) along the entrance to the hotel itself with the 900MHz antenna in order to identify the smaller absorbing roots (i.e., those that are a quarter inch in diameter or greater).

As you evaluate the larger structural roots found on pages 13-30 and begin actual construction, those smaller roots are present in the soil although they are not identified in these 16 scans. The shallowest roots are about two inches below the surface and the deepest roots are at a depth of forty inches, with the majority of the structural roots being consistently found at 30-35 inches in depth.

The site map on page 8 shows the actual scanning locations and the virtual trench plots shown on pages 13-30 are very helpful in understanding root density near the buildings that will be removed as part of the redevelopment plan.

## Methodology

### How does it work?

Ground-Penetrating Radar (GPR) is an established technique that has been used worldwide for over 65 years. Radar is an object-detection system that uses *electromagnetic waves* – specifically *radio waves* – to identify the range, altitude, direction, or speed of both moving and fixed objects. When an electromagnetic wave<sup>1</sup> emitted from a small surface transmit antenna / receiver encounters a boundary between objects with different electromagnetic properties, it will reflect, refract, and or diffract from the boundary in a predictable manner. Radar waves or signals are reflected especially well by materials of considerable *electrical conductivity*.

The radar signals that are reflected back towards the antenna are the desirable ones that create the image and make radar work. An air-filled tree trunk (*with a decayed hollow*) or a partially air-filled incipient (early stage) decay zone inside a cell wall within a tree are excellent reflectors for detection by GPR systems. Use of GPR instrumentation for internal tree trunk decay detection and below ground root locating is one of its latest uses in the field of tree risk assessment.

GPR uses today seem endless. When you look at the weather report, you are looking at a Doppler weather radar scan; it will tell you where the heaviest amounts of rain will fall in your area. It works like this, the radar signal, as it passes through the clouds is reflected back to a transmit receiver antenna that measures the density of the moisture in them and the speed they are traveling. You can then determine approximately when it will start raining and how much rain will fall in a given area. Radar is used in aviation, automobiles, law enforcement and locating objects below ground.

---

<sup>1</sup> Daniels, D.J. 1996, Surface-Penetrating Radar. The Institute of Electrical Engineers, ISBN 0-85296-0.

## Root Mapping

### An Introduction to Below-Ground Tree Root Mapping using Ground – Penetrating Radar (GPR)

Ground-Penetrating Radar used as a method of mapping tree roots has several of the following advantages over other methods of root locating,

- It is capable of scanning the root systems of multiple trees under field conditions in a short time.
- 1. It is completely non-invasive and does not disturb the soils or damage the trees being examined, and causes no harm to the environment.
- 2. Being non-invasive, it allows repeated measurements that will reveal long-term root system development.
- 3. It allows observation of root distribution beneath hard surfaces (concrete, asphalt, and bricks) roads and buildings.

Its accuracy is sufficient to locate structural roots with diameters from less than 1 cm (0.4 in.) to 3 cm (1.2 in.) or more. It can characterize roots at both the individual tree and stand levels, facilitating

There were two different radar antennas utilized for this project. The 900MHz antenna begins identifying roots that are a quarter inch in diameter and larger and has a depth penetration of thirty-nine inches. The 400MHz antenna identifies roots that are one inch in diameter and larger and will penetrate down through the soil to twelve feet. These two different antennas are specifically used to identify the smaller absorbing roots and then the deeper and larger structural roots of trees.

## Analysis Results

# Top Down View

There are two ways to view the data obtained from the use of Ground Penetrating Radar. Both are designed to provide better understanding of existing root depth, pattern, and density. The first method we utilized is the top down view; this is an aerial view looking down on the property. This is how the radar looks at the existing roots. As the antenna is moved along the ground every 2/10ths of an inch, a radar signal is released into the ground at a predetermined depth.

As this signal encounters a root, it is reflected off its top and back to a receiver inside the antenna. This returned signal is displayed as an x in the final report and indicates the presence of a root. The colored x indicates the depth of the root. The advantage of the top down view is that it displays all roots found at all depths on one map and this will allow you to see the density of the roots around a given tree.

Secondly, one can observe all roots within a given soil profile depth. On the following pages, you will notice three soil profiles depicted. When looking at the top down view of the scans, keep in mind that each x marks the presence of a root. These roots are connected to the tree from the root flare as they grow into the soil and then grow outward in all directions; roots that have no obstructions and can travel laterally twice the height of the tree. This is what gives the tree stability.

# Markers for Fairmont Hotel

## Markers Scan #1

1. start

## Markers Scan #2

1. start
2. Entering exposed root zone
3. passing center of tree
4. Exiting exposed root zone

## Markers Scan #3

1. start
2. Entering exposed root zone
3. passing center of tree

## Markers Scan #4

1. start
2. passing center of tree
3. Exiting exposed root zone

## Markers Scan #5

1. start

## Markers Scan #6

- 1.start
2. passing center of tree

## Markers Scan #7

1. start

## Markers Scan #8

1. start
2. passing center of tree

## Markers Scan #9

1. start

## Markers Scan #10

1. start
2. Entering exposed root zone
3. passing center of tree

## Markers Scan #11

1. start
2. passing center of tree
3. Exiting exposed root

## Markers Scan #12

1. start
2. Exiting exposed root zone

## Markers Scan #13

1. start

## Markers Scan #14

1. start

## Markers Scan #15

1. start

## Markers Scan #16

1. start

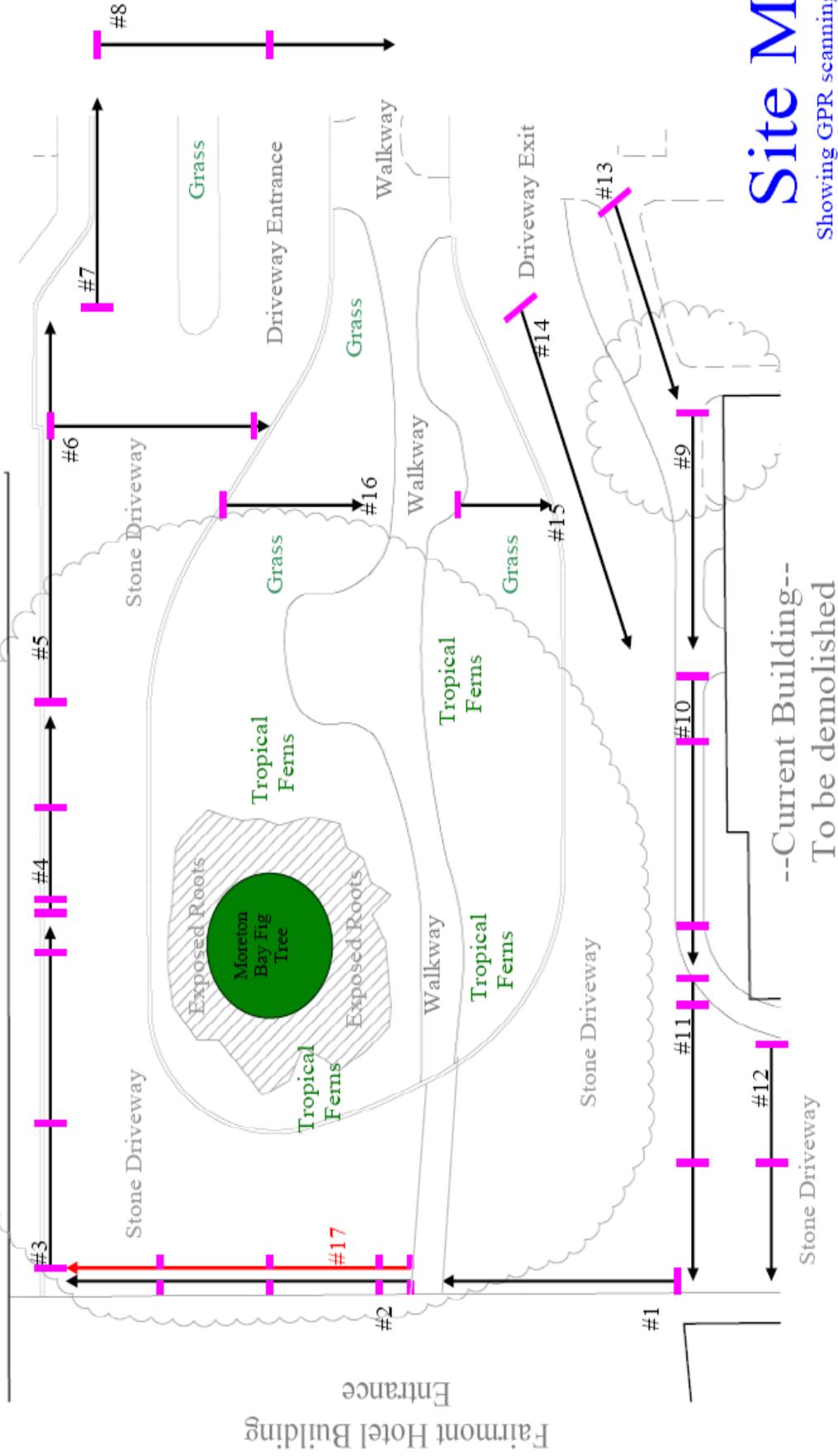
## Markers Scan #17

1. start
2. Entering exposed root zone
3. passing center of tree
4. Exiting exposed root zone

**Pink markers** are used during the scan to identify physical objects above ground during the root scan. These markers will help to compare above ground locations verses root density under the stone drive way.

--Current Building--  
Proposed underground  
Garage Site

400 Antenna  
900 Antenna



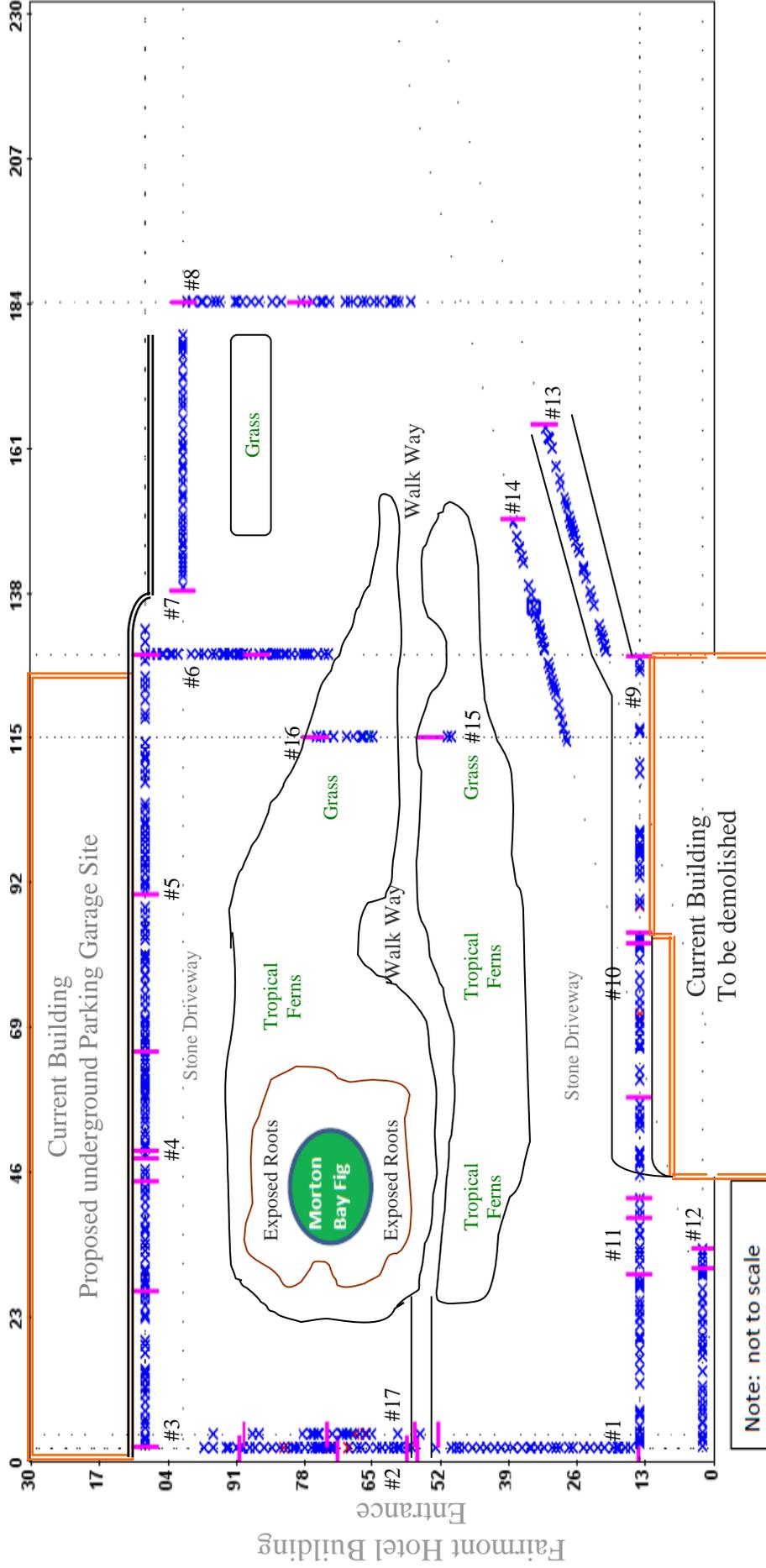
Fairmont Hotel Building  
Entrance

# Site Map

Showing GPR scanning locations  
And markers

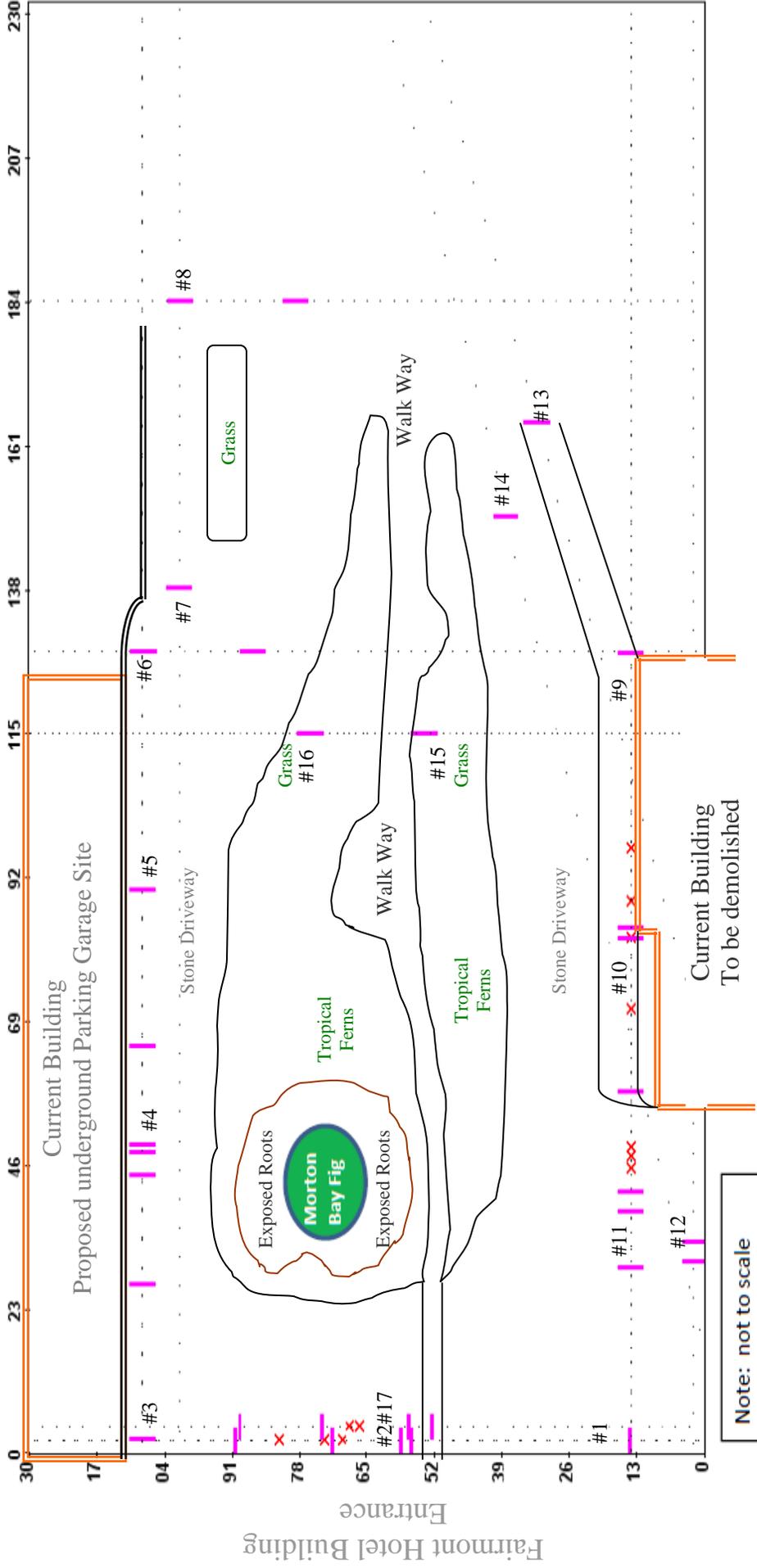
# Top-Down View

All Roots Found Down to 55.5 inches in Depth



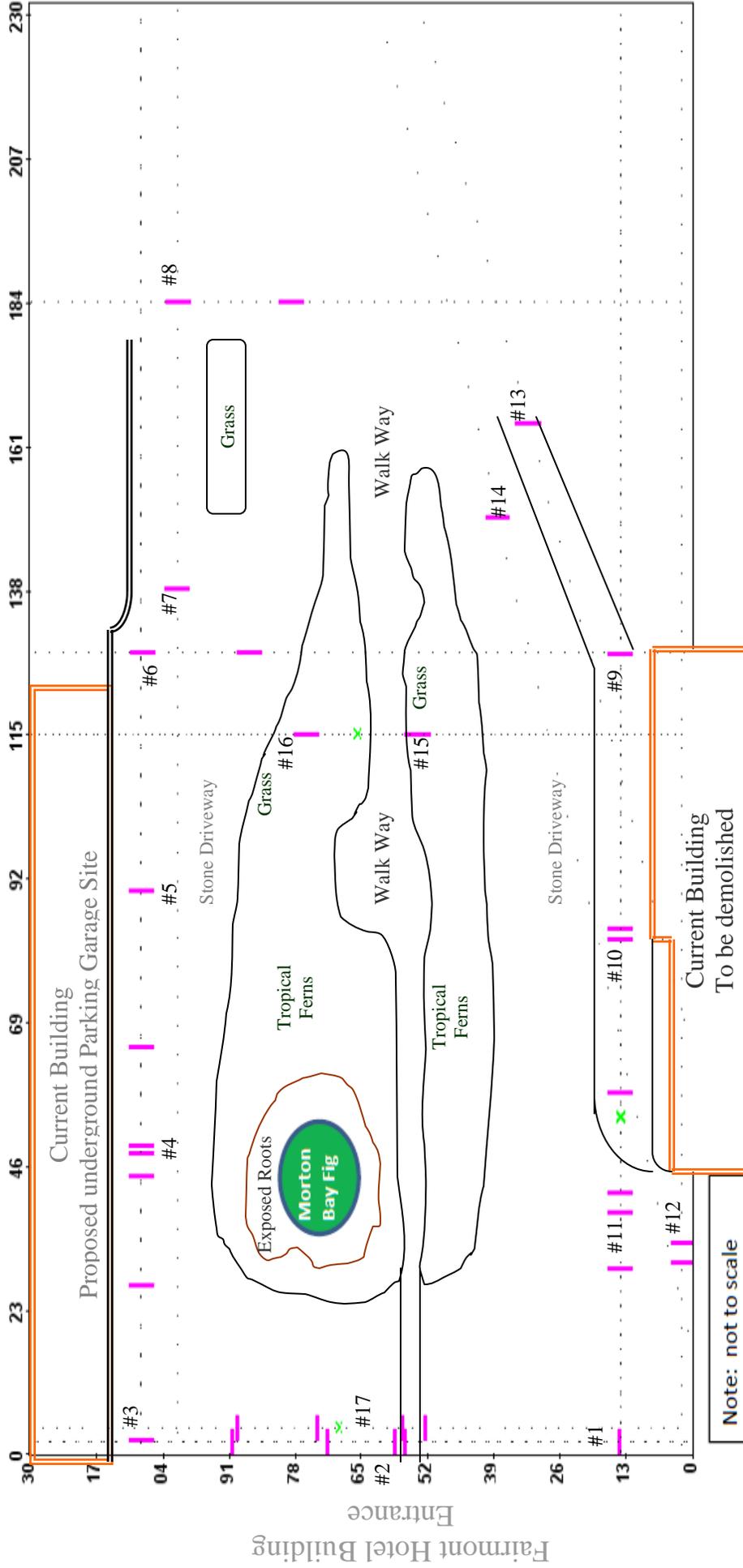
# Top-Down View

All Roots Found from 0.0 to 8.0 inches in Depth



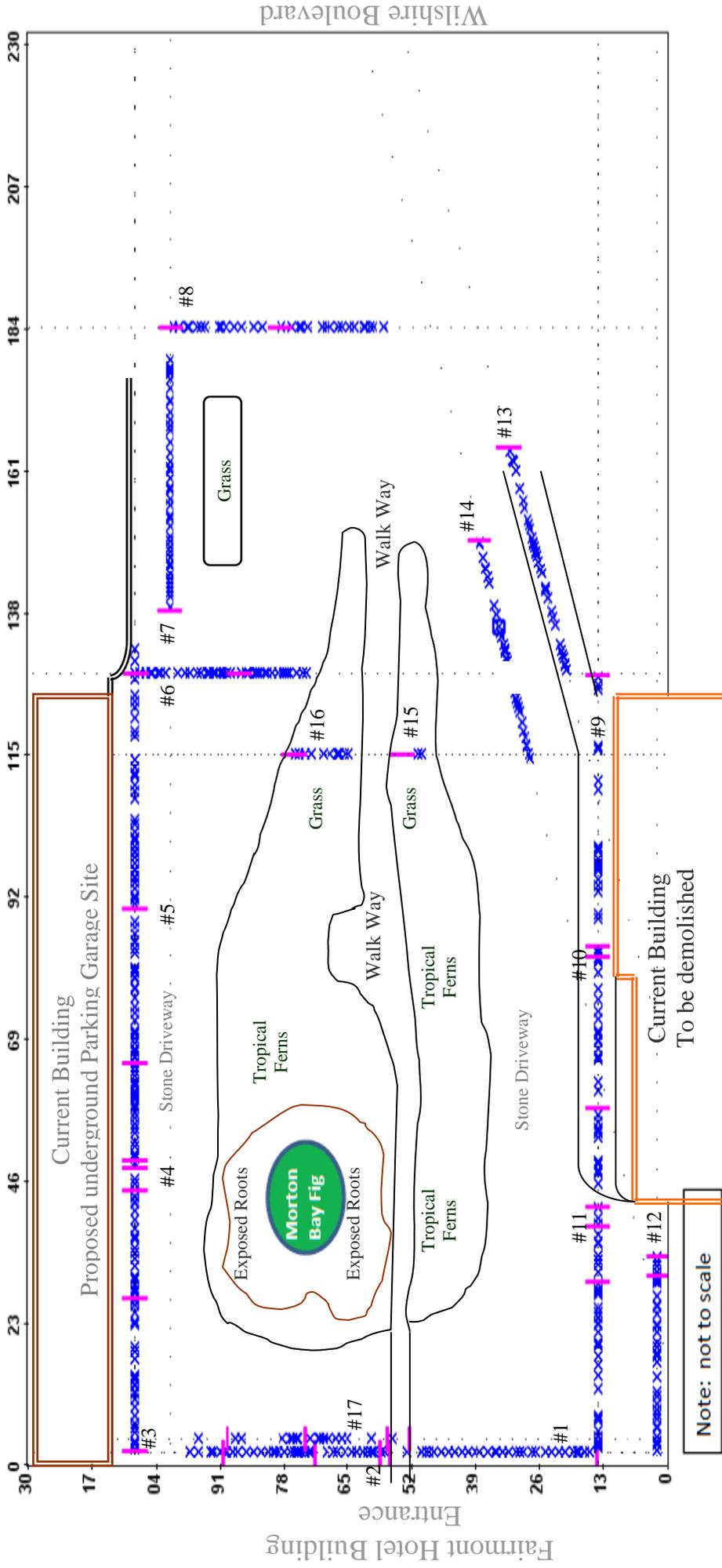
# Top-Down View

All Roots Found from 8.0 – 16.0 inches in Depth



# Top-Down View

All Roots Found from 16.0 – 55.5 inches in Depth



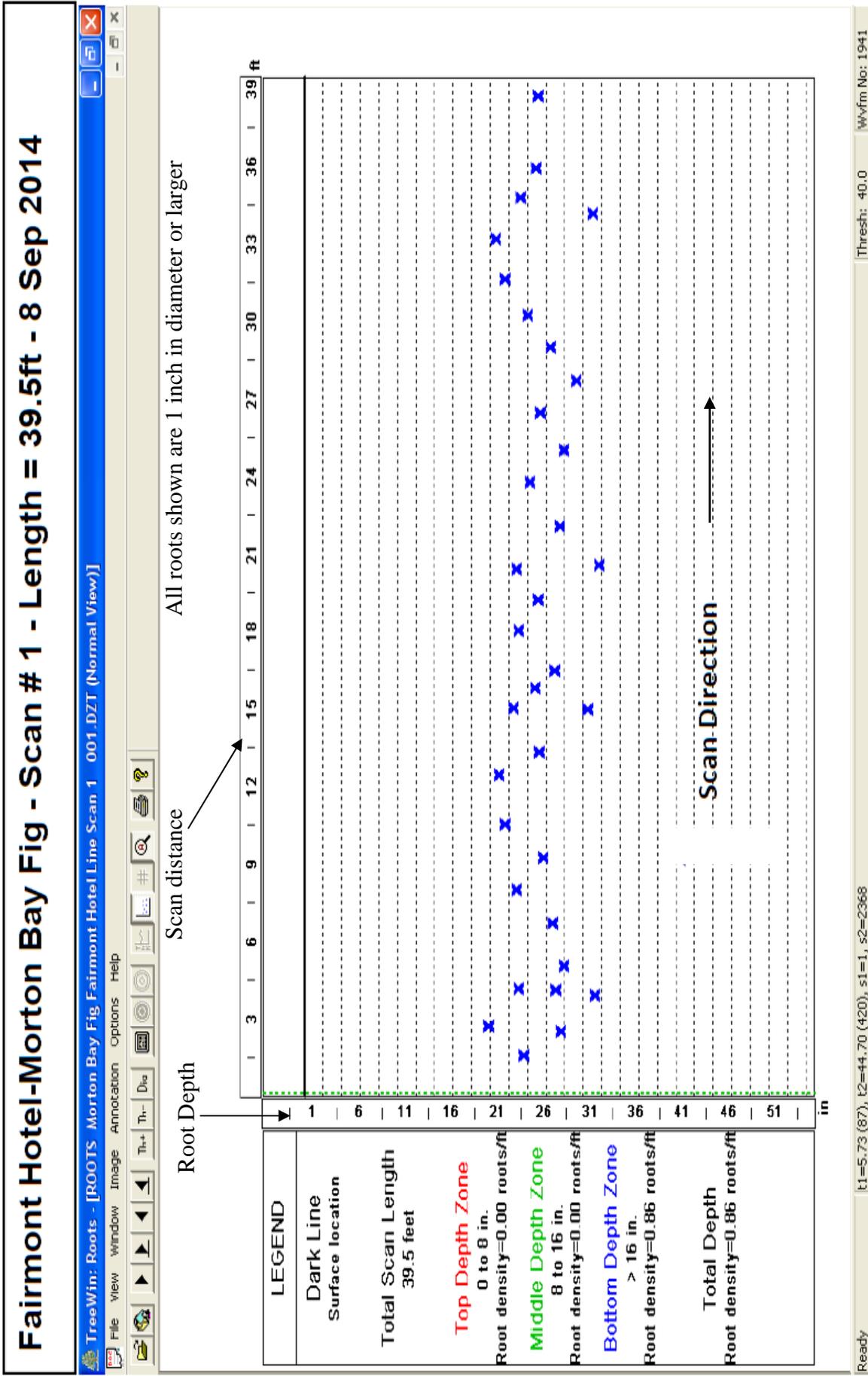
## Analysis Results

### Virtual Trench View

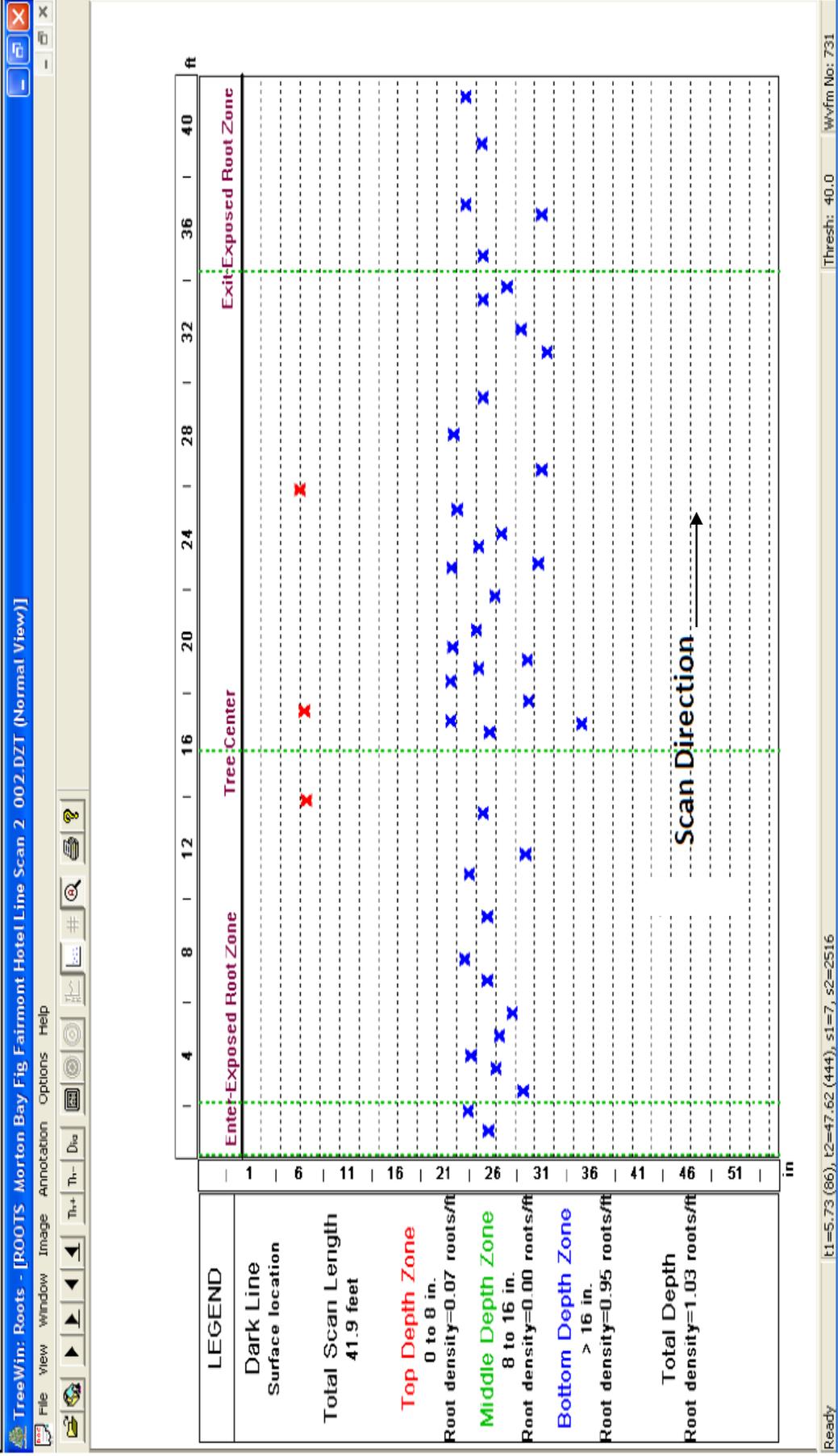
Another way of viewing the root data is as a virtual trench. The following panels represent each of the seventeen individual radar line scans from the site as if they were the walls of a trench. Think of this as if you were excavating a deep trench with a back-hoe. As you dig, tree roots will be encountered at various levels in the soil profile. After you have completed your trench, you then are able to walk down and stand in the bottom.

Looking up at the earthen wall, you are able to see the severed tree roots protruding from the soil at the various depths of your trench. As you look at the following 17 virtual trench scans, each x on the wall represents a severed root. Each colored x represents a different depth where the root is located.

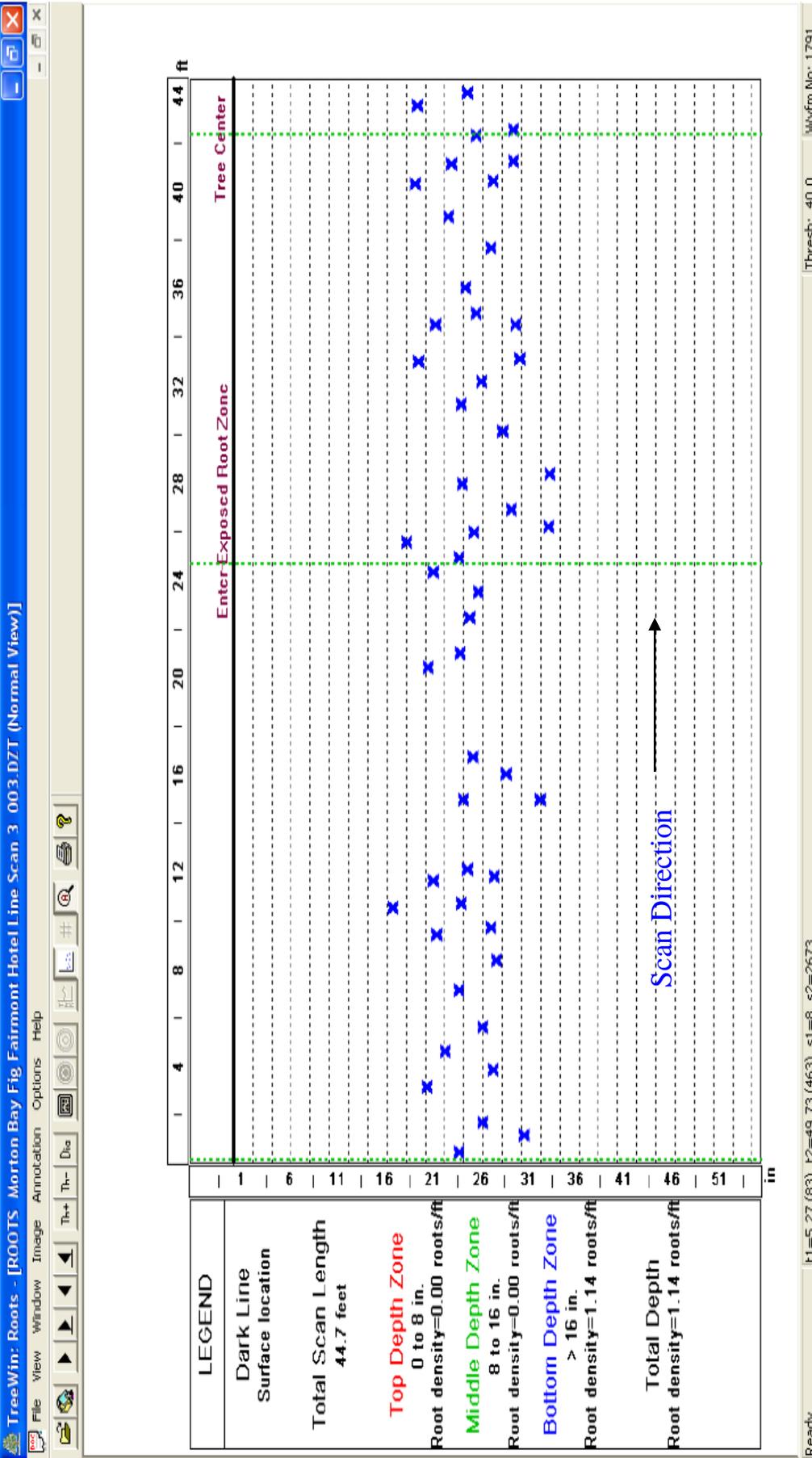
One advantage of the trench view over the top down view is that allows you to look at individual roots within their three represented depth zones to see the actual depth of each individual root.



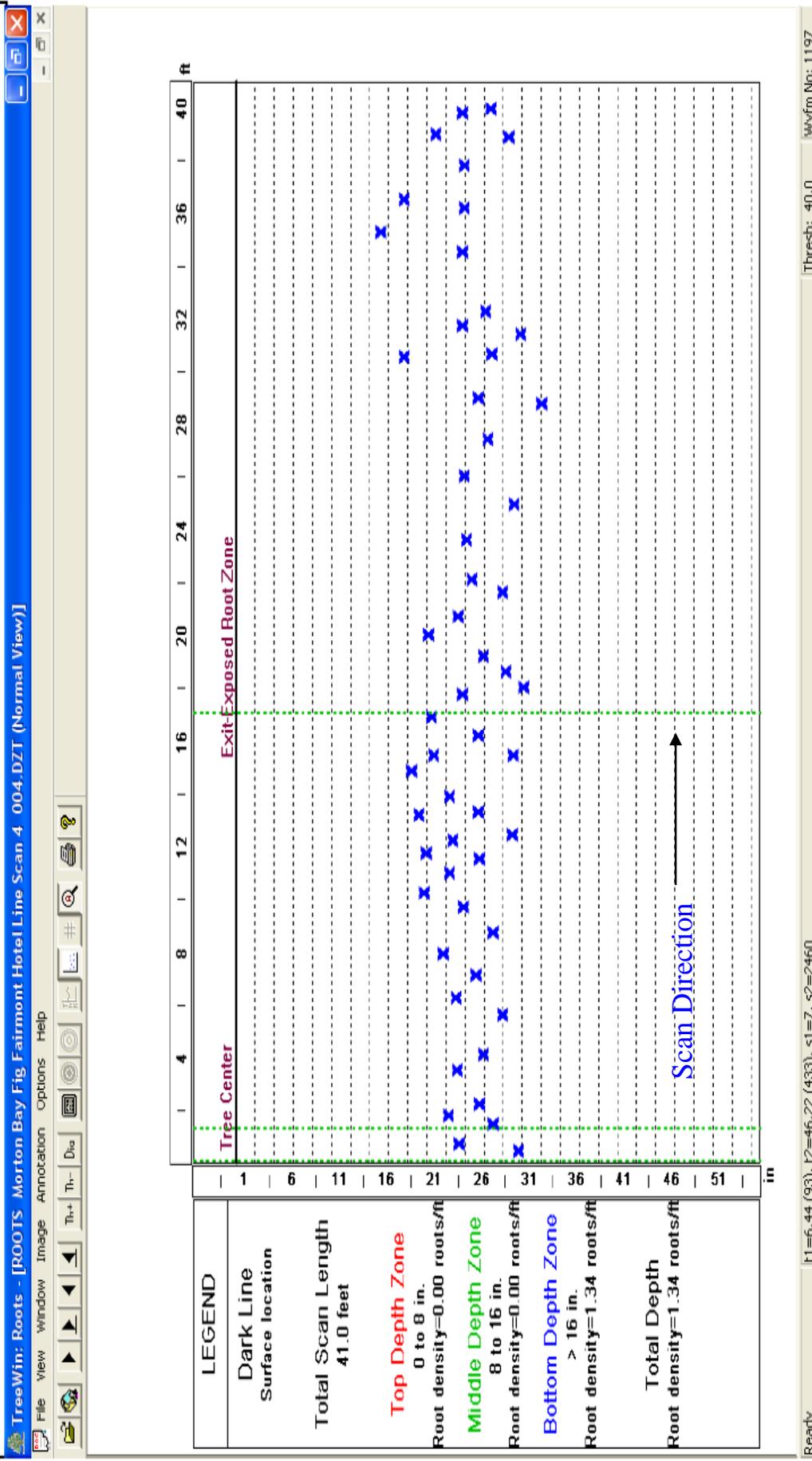
# Fairmont Hotel-Morton Bay Fig - Scan # 2 - Length = 41.9ft - 8 Sep 2014



# Fairmont Hotel-Morton Bay Fig - Scan # 3 - Length = 44.7ft - 8 Sep 2014



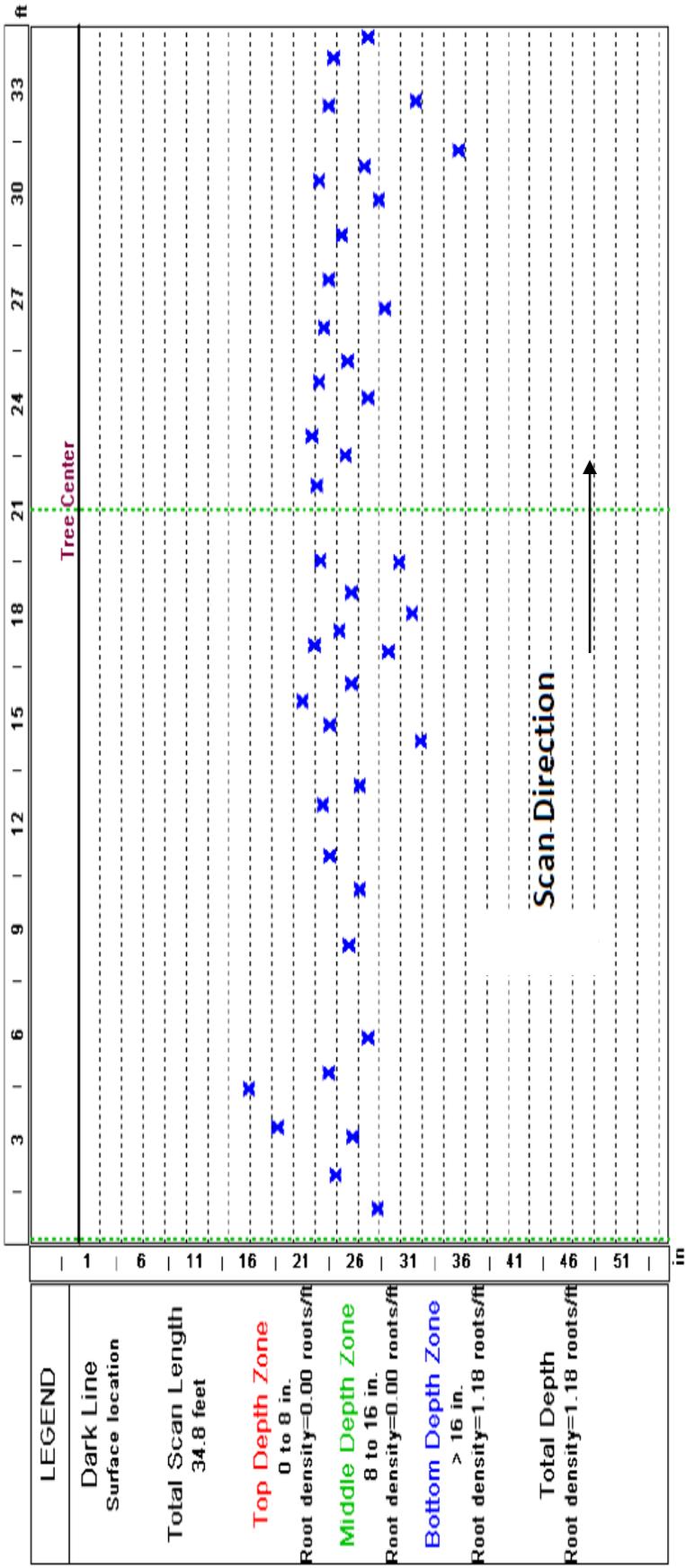
# Fairmont Hotel-Morton Bay Fig - Scan # 4 - Length = 41.0ft - 8 Sep 2014



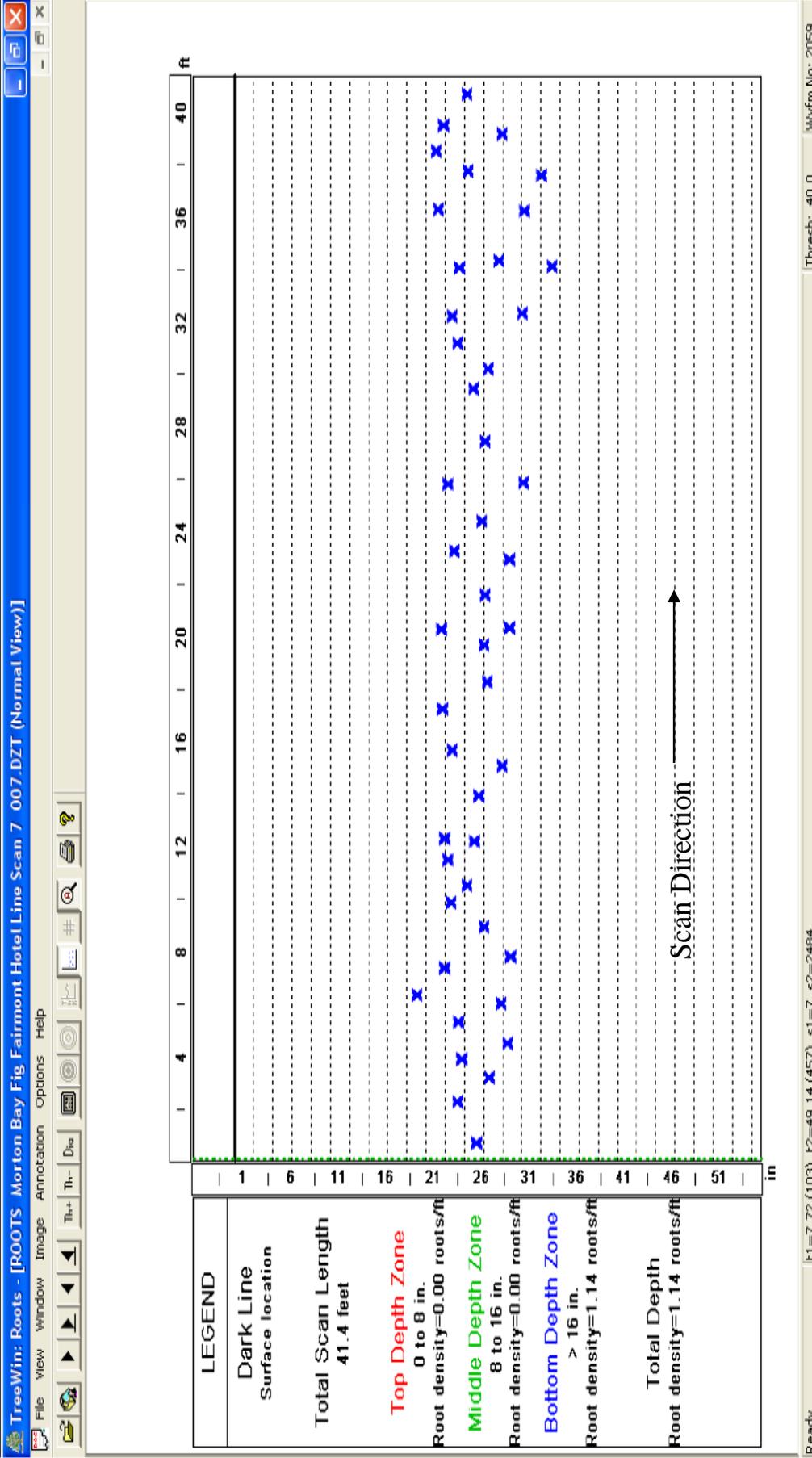


# Fairmont Hotel-Morton Bay Fig - Scan # 6 - Length = 34.8ft - 8 Sep 2014

TreeWin: Roots - [ROOTS Morton Bay Fig Fairmont Hotel Line Scan 6 006.DZT (Normal View)]

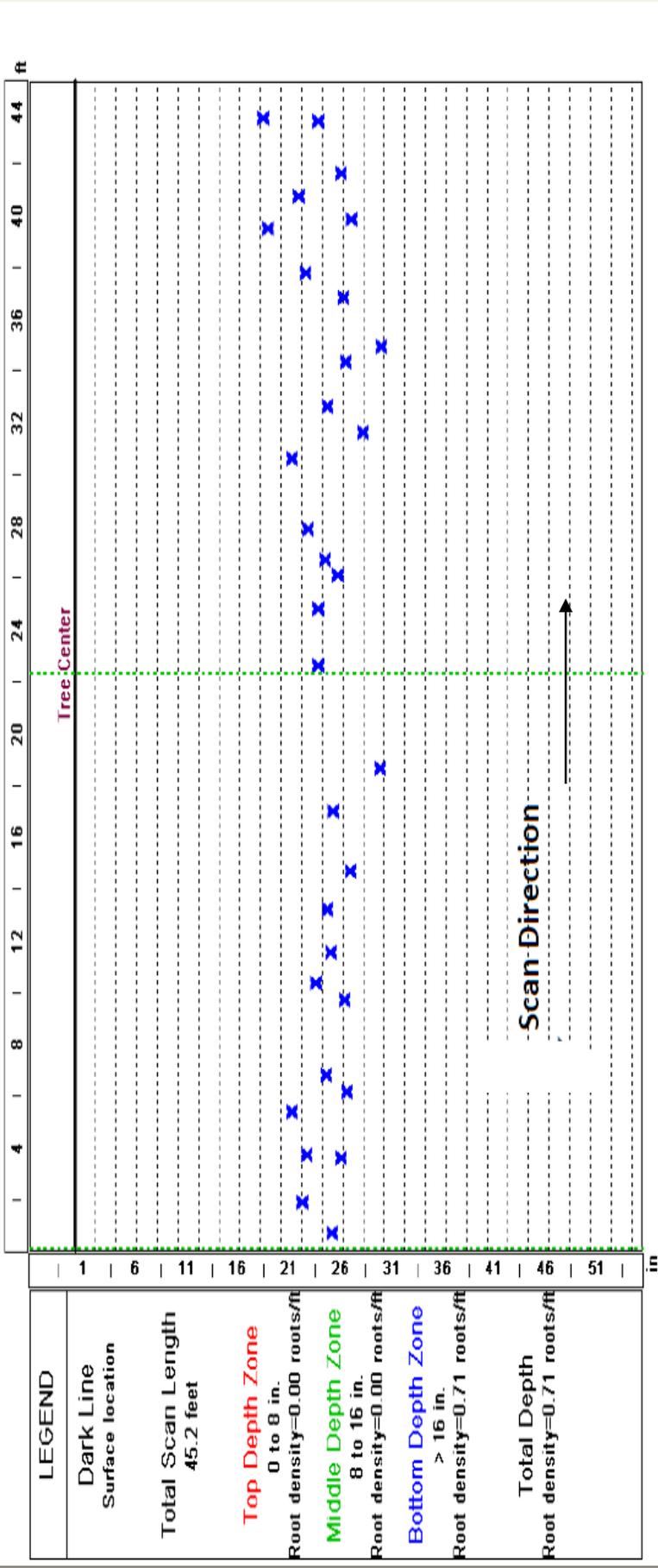


# Fairmont Hotel-Morton Bay Fig - Scan # 7 - Length = 41.4ft - 8 Sep 2014



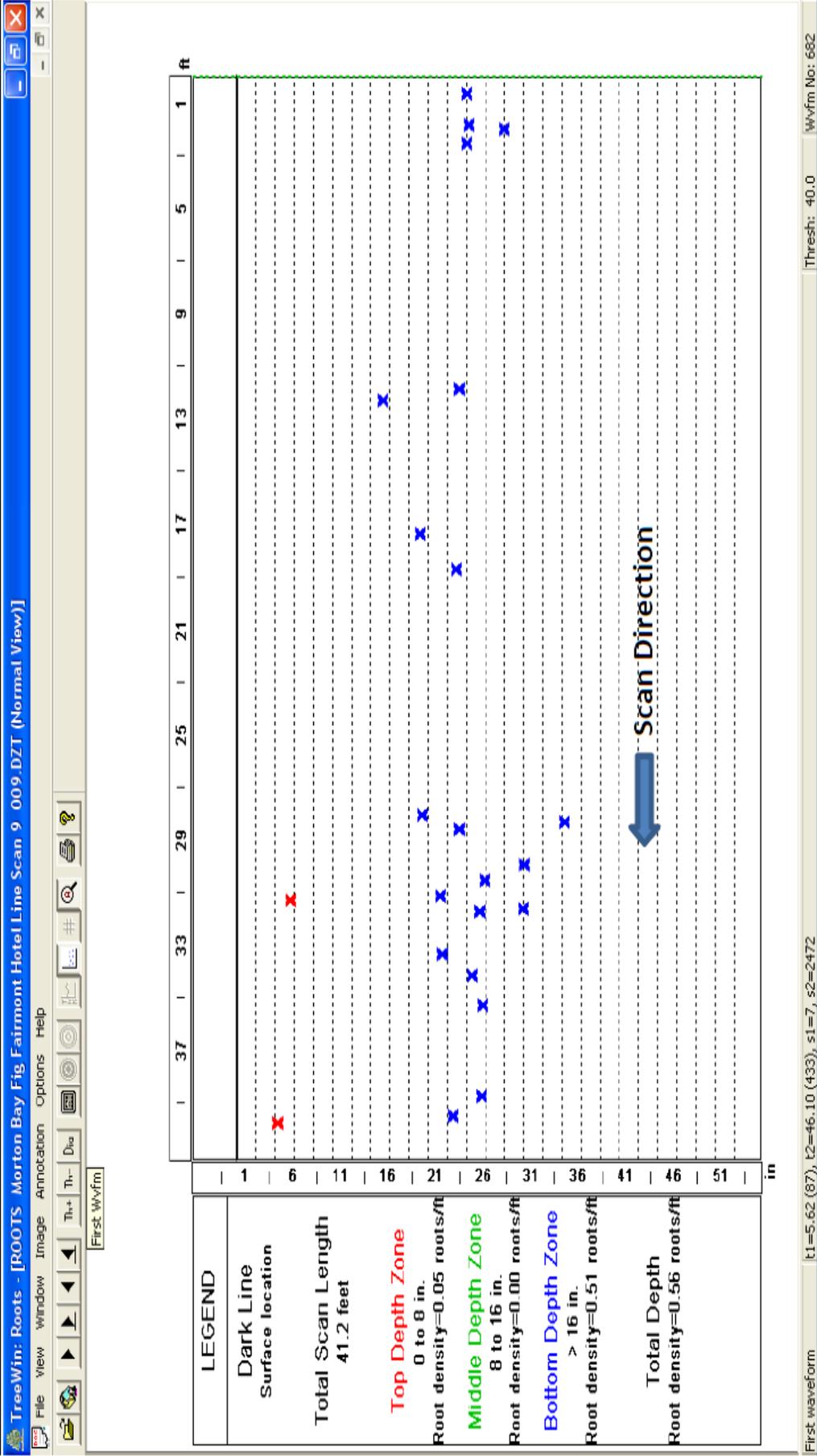
# Fairmont Hotel-Morton Bay Fig - Scan # 8 - Length = 45.2ft - 8 Sep 2014

TreeWin: Roots - [ROOTS Morton Bay Fig Fairmont Hotel Line Scan 8 008.DZI (Normal View)]



Ready | t1=6.08 (89), t2=48.56 (452), s1=11, s2=2712 | Thresh: 40.0 | Wvfm No: 915

# Fairmont Hotel-Morton Bay Fig - Scan # 9 - Length = 41.2ft - 8 Sep 2014



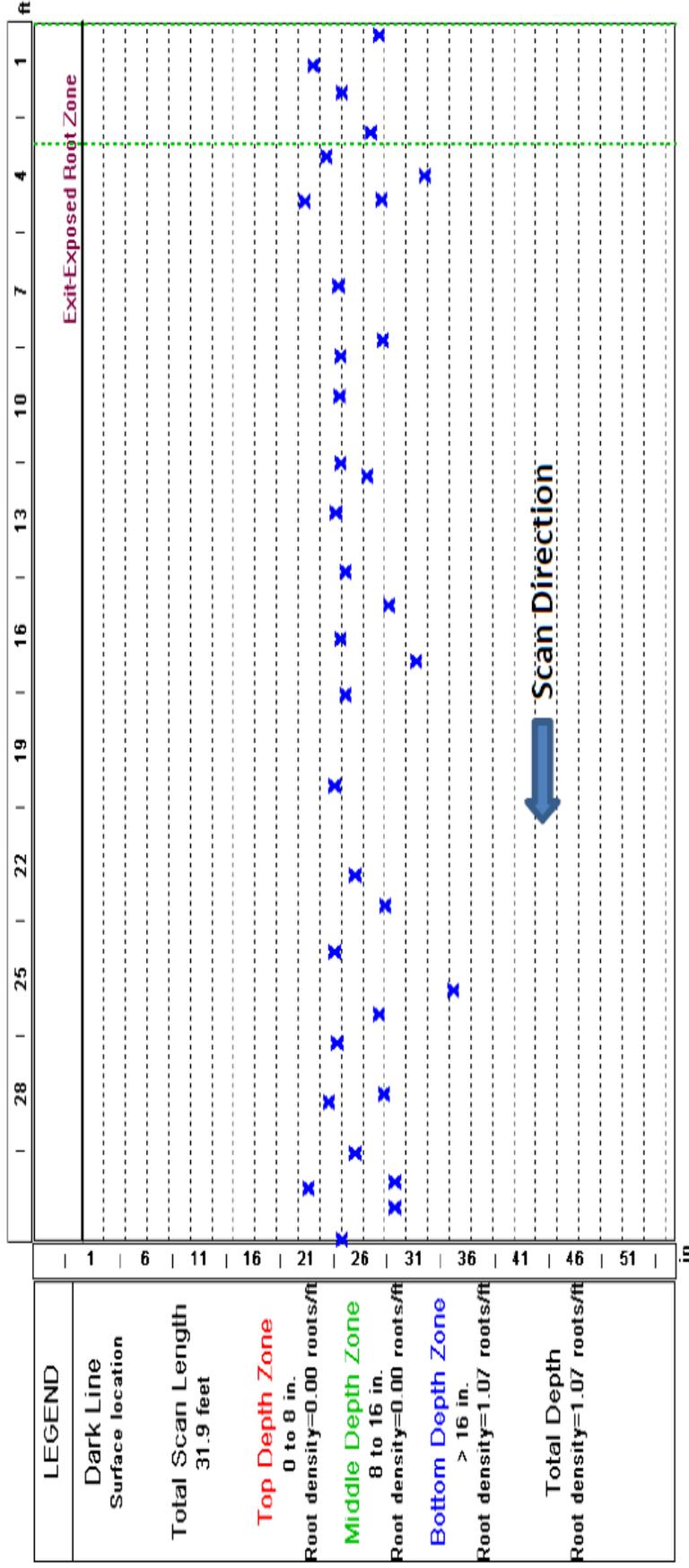




# Fairmont Hotel-Morton Bay Fig - Scan # 12 - Length = 31.9ft - 8 Sep 2014

TreeWin: Roots - [ROOTS Morton Bay Fig Fairmont Hotel Line Scan 12 012.DZT (Normal View)]

File View Window Image Annotation Options Help



Ready | t1=4.91 (80), t2=48.44 (452), s1=1, s2=1912

Thresh: 40.0

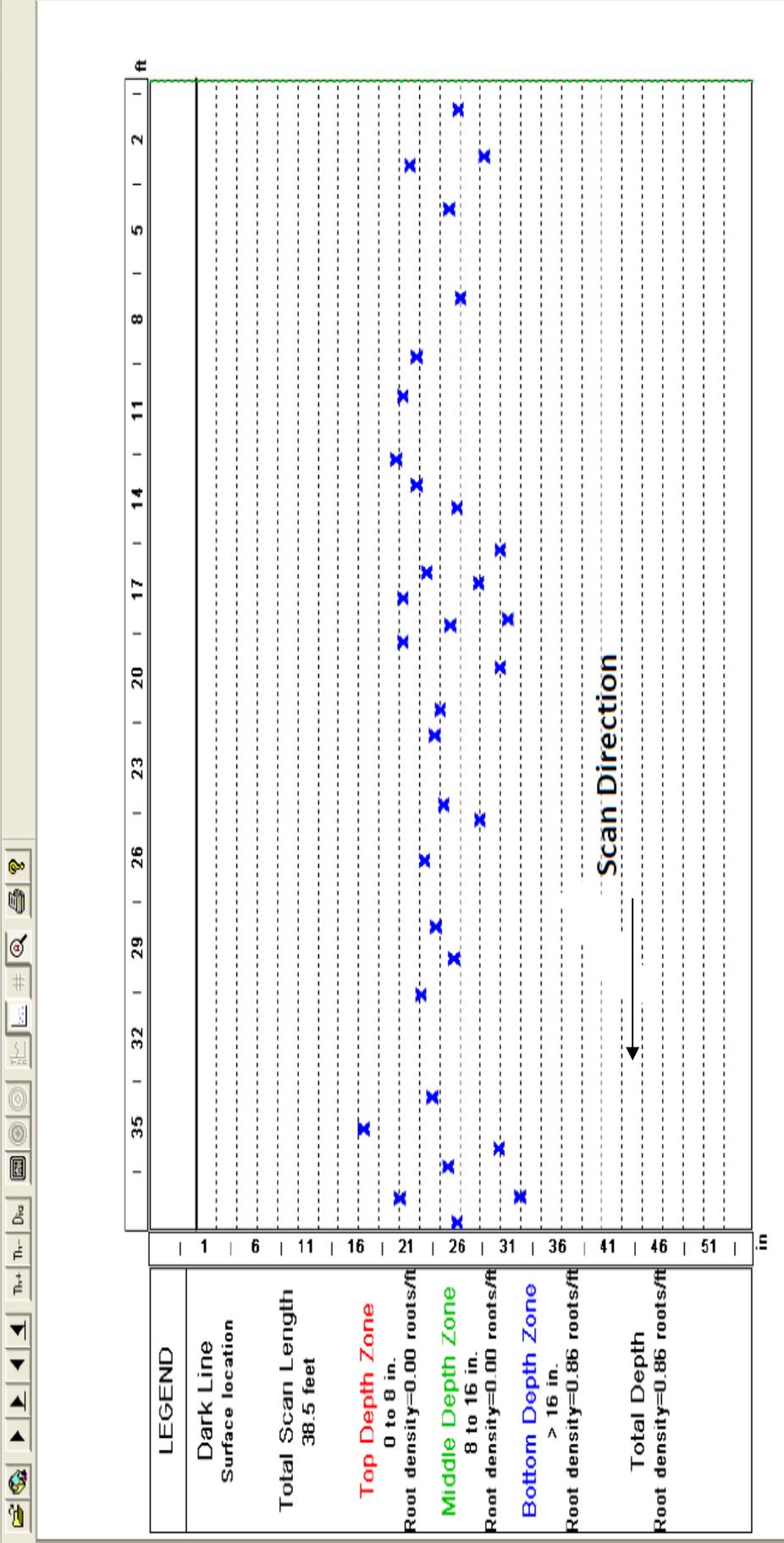
Wvfm No: 973

# Fairmont Hotel-Morton Bay Fig - Scan # 13 - Length = 38.5ft - 8 Sep 2014

TreeWin: Roots - [ROOTS Morton Bay Fig Fairmont Hotel Line Scan 13 013-DZT (Normal View)]

File View Window Image Annotation Options Help

Th+ Th- Dca #



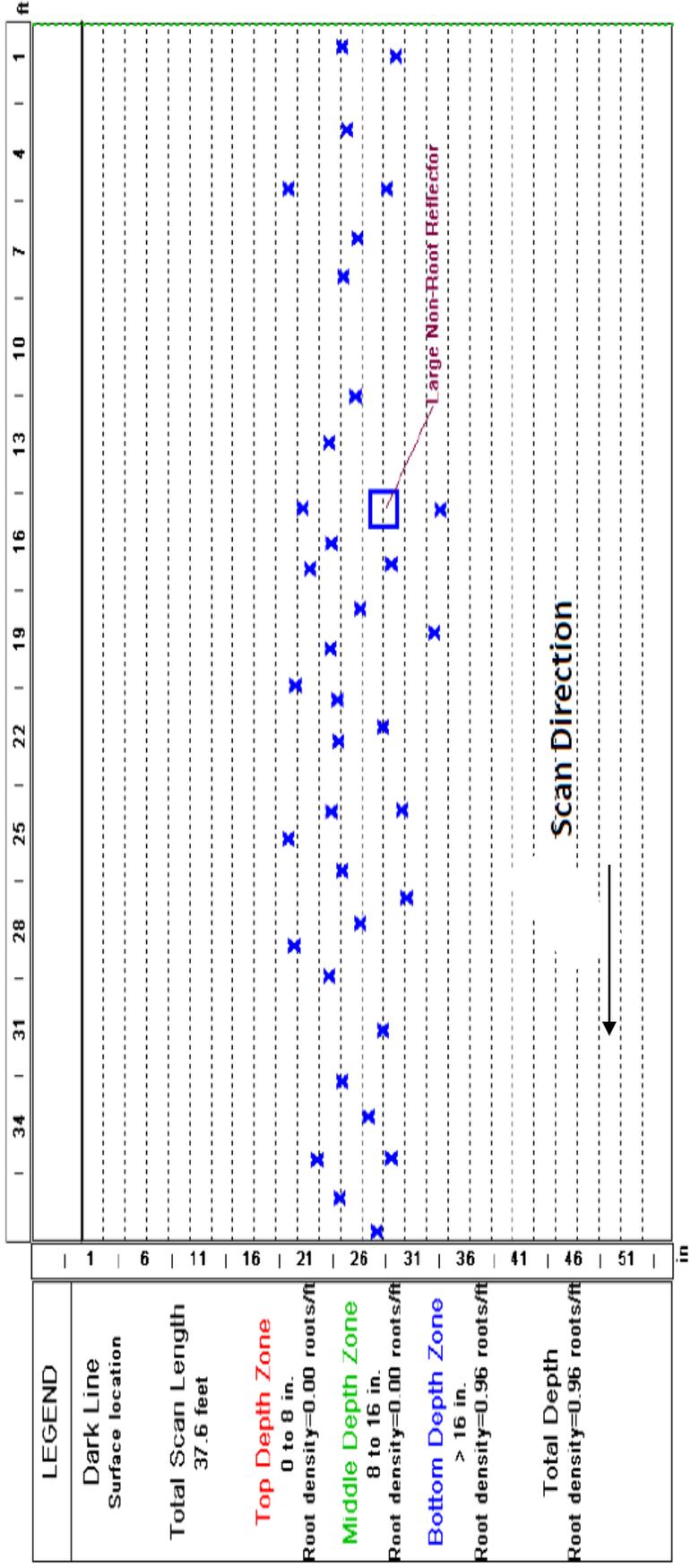
First waveform t1=7.25 (101), t2=47.74 (447), s1=1, s2=2308

Thresh: 40.0 Wvfm No: 1443

# Fairmont Hotel-Morton Bay Fig - Scan # 14 - Length = 37.6ft - 8 Sep 2014

TreeWin: Roots - [ROOTS Morton Bay Fig Fairmont Hotel Line Scan 14 014.DZT (Normal View)]

File View Window Image Annotation Options Help

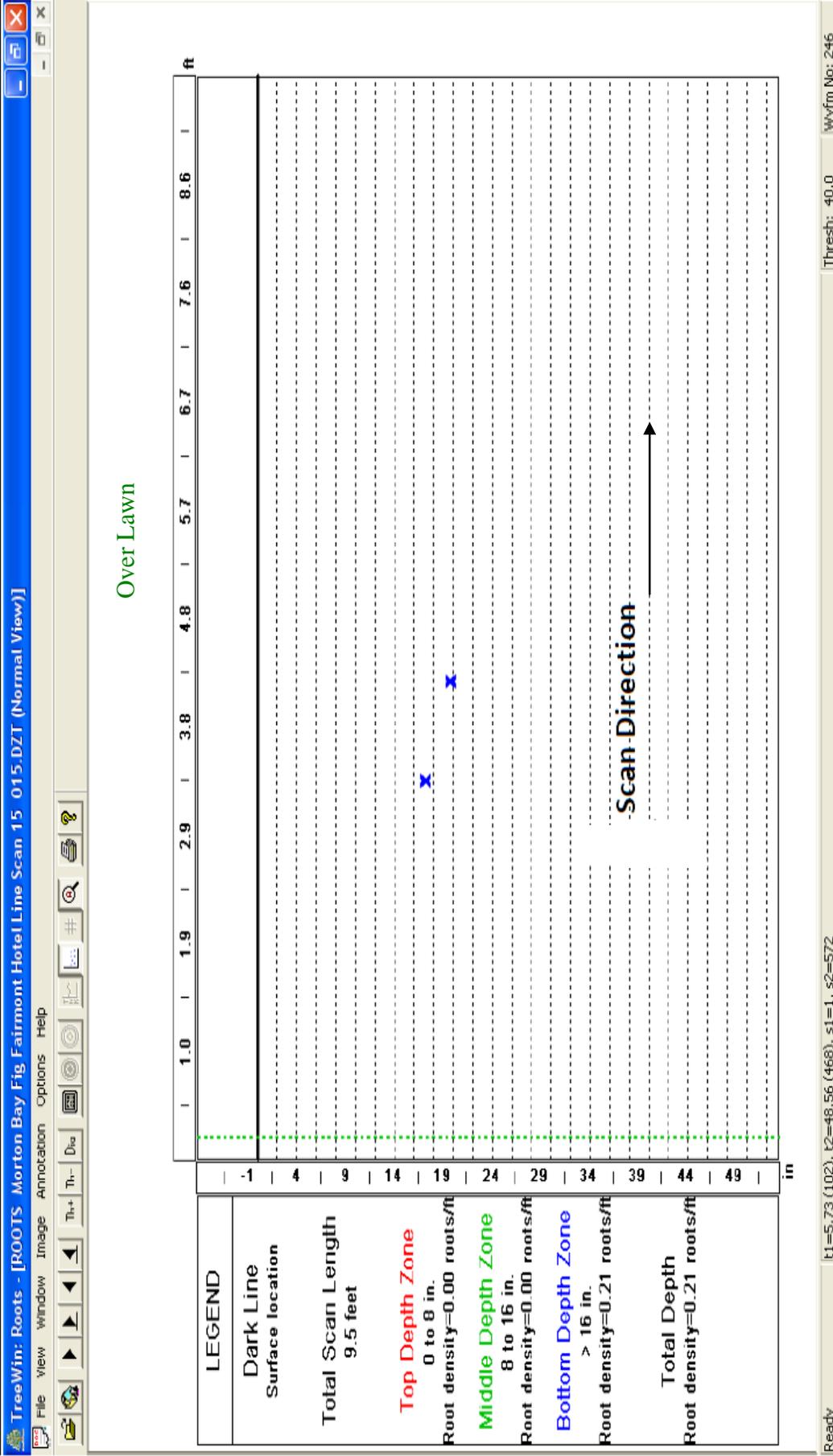


Ready | t1=9.95 (124), t2=44.11 (416), s1=1, s2=2256

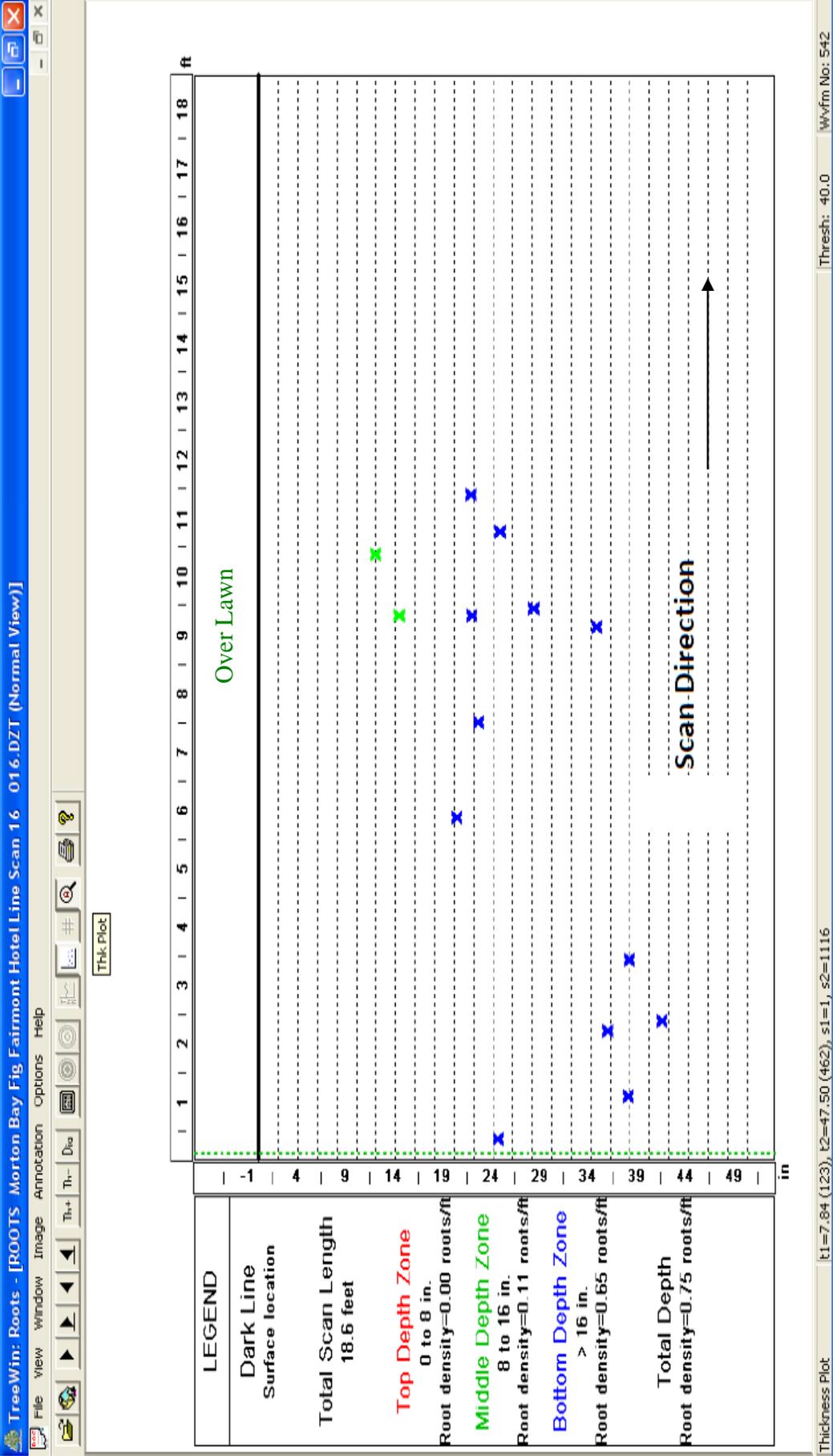
Thresh: 40.0

Wvfm No: 1617

# Fairmont Hotel-Morton Bay Fig - Scan # 15 - Length = 9.5ft - 8 Sep 2014



# Fairmont Hotel-Morton Bay Fig - Scan # 16 - Length = 18.6ft - 8 Sep 2014



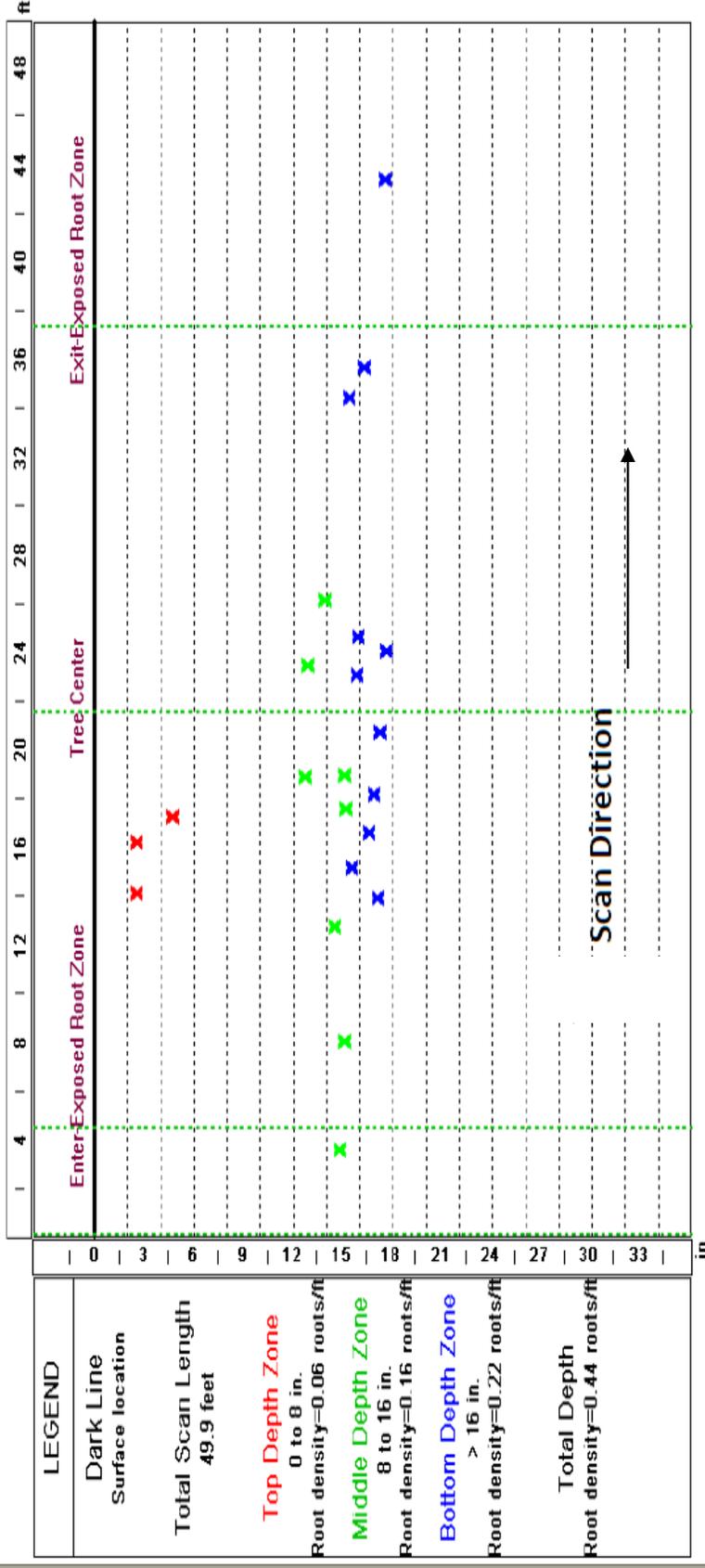
# Fairmont Hotel-Morton Bay Fig - Scan # 17 - Length = 49.9ft - 8 Sep 2014

TreeWin: Roots - [ROOTS Morton Bay Fig Fairmont Hotel Line Scan 17 017.DZT (Normal View)]

File View Window Image Annotation Options Help

Th+ Th- Dia # ?

All roots shown are 1/4 inch or larger



October 9, 2014

Fairmont Miramar Hotel - Moreton Bay Fig Root Mapping

Santa Monica, California

## Appendix A



## Appendix B



## TreeRadar / Arborist OnSite Disclaimer

**1. Use at Customer's Risk.** TreeRadar and Arborist OnSite endeavors to use equipment that generates useful information and, when provided, to prepare reports that will reflect its best judgment in light of the facts as it knows them, provided that you comply with all of your obligations to TreeRadar, but TreeRadar or Arborist OnSite does not guarantee the outcome of its efforts or the structural integrity of any tree. Any report prepared by TreeRadar or Arborist OnSite is used strictly at your sole risk. TreeRadar is not a certified arborist facility and its personnel are not certified arborists, and you are solely responsible for engaging the services of a certified arborist in interpreting any report or other information provided by TreeRadar.

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## Assumptions and Limiting Conditions

1. Any legal description provided to the appraiser or consultant is assumed to be correct. No responsibility is assumed for matters legal in character nor is any opinion rendered as to the quality of any title.
2. The appraiser or consultant can neither guarantee nor be responsible for accuracy of information provided by others, information not provided or disclosed.
3. The appraiser or consultant shall not be required to give testimony or to attend court by reason of this appraisal or consultation/reports unless subsequent written arrangements are made, including payment of an additional fee for services.
4. Loss or removal of any part of this report invalidates the entire appraisal or report/evaluation.
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6. This report and the values expressed herein represent the opinion of the appraiser or consultant, and the appraiser's or consultants fee is in no way contingent upon the reporting of a specified value nor upon any finding to be reported.
7. Sketches, diagrams, graphs, photos, ect., in this report, being intended as visual aids, are not necessarily to scale and should not be construed as engineering reports or surveys.
8. This report has been made in conformity with acceptable appraisal/evaluation/diagnostic reporting techniques and procedures, as recommended by the International Society of Arboriculture.
9. No tree described in this report was climbed, unless otherwise stated. Arborist OnSite® cannot assume responsibility for any defects which could only have been discovered by climbing. A full root collar or root crown inspection, consisting of excavating the soil around the tree to uncover hidden defects or disease involving the root collar and major buttress roots, was not performed, unless otherwise stated. Arborist OnSite® cannot accept responsibility for any root defects which could only have been discovered by such an inspection.

### Consulting 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 medicine, cannot be guaranteed. Trees can be managed but they cannot be controlled. To live near trees is to accept some degree of risk. The only way to eliminate all risk associated with trees is to eliminate all trees.

# Certification of Performance

I, Robert Booty, certify:

- That I have personally inspected the tree(s) and/or the property referred to in this report, and have stated my findings accurately. The extent of the evaluation and or appraisal is stated in the attached report and the terms and conditions;
- That I have no current interest in the vegetation or the property that is the subject of this report, and I have no personal interest or bias with respect to the parties involved;
- That the analysis, opinions and conclusions stated herein are my own, and are based on current scientific procedures and facts;
- That my compensation is not contingent upon the reporting of a predetermined conclusion that favors the cause of the client or any other party, nor upon the results of the assessment, the attainment of stipulated results, or the occurrence of any subsequent events;
- That my analysis, opinions, and conclusions were developed and this report has been prepared according to commonly accepted arboricultural practices;
- That no one provided significant professional assistance to the consultant, except as indicated within the report.

I further certify that I am a Registered Member of the American Society of Consulting Arborists, and I am an International Society of Arboriculture Certified Arborist. I have been involved in the practice of arboriculture and the care and study of trees for over 45 years.

Signed: \_\_\_\_\_

Date: October 18, 2014