GROUP DELTA

GDC Project No. GF 2078 November 9, 2015

ENGINEERING INVESTIGATION REPORT

Prepared For:	Resch Polster & Berger, LLP On behalf of Rodeo Holdings, LLC 1840 Century Park East, 17th Floor Los Angeles, California
Representative:	Mr. Michael Byerts
Site Location:	497 S. Lake Avenue Pasadena, CA 91101
Case Number:	BC542643
Purpose of this Report:	To evaluate existing damages to the structure and the extent of damages resulting from three overgrown ficus trees adjacent to the property.
Field Reconnaissance Date:	October 20, 2015
Personnel Present on Site Visit:	Mr. Sean Wilson, MS, PG, CEG Mr. Hans F. Mager, BS, RCE, SE Ms. Hysun Lee, BS, EIT

Report Prepared by:
GROUP DELTA CONSULTANTS

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1.0 INTRODUCTION

At the request of Resch Polster & Berger, LLP on behalf of Rodeo Holdings, LLC, Group Delta Consultants (GDC) has carried out a limited engineering investigation of the reported distress at the commercial building located at 497 S. Lake Avenue (Talbot's Retail Store), in Pasadena, California. More specifically, we were asked to examine the existing damages at 497 S. Lake Avenue and determine the extent of damages from the overgrown sidewalk trees owned by the City of Pasadena. We understand that a roof drain reportedly has been repeatedly blocked by excessive tree debris and the sidewalk has apparently been damaged by tree root intrusion and growth.

2.0 SCOPE OF WORK

Our scope of work included the following:

- Site reconnaissance on October 20, 2015 by Hans F. Mager, SE, RCE, Sean Wilson, PG, CEG and Hysun Lee of Group Delta Consultants.
- Observations of the interior and exterior of the commercial building occupied by Talbots.
- Preliminary structural engineering analysis of 2x12 roof joists and preliminary evaluation of potential for future distress and/or failure.
- Performance of a floor level survey at the east (front portion, near damaged sidewalk area) of 497 S. Lake Ave utilizing manometer equipment.
- Performance of a camera inspection by a licensed plumber of the building drain lines.
- Review of verified complaint, dated April 15, 2014 for Case No. BC542643.
- Review of historical aerial photos.
- Review of City of Pasadena building records.
- Evaluation of the extent and probable cause(s) of distress to the structure.
- Preparation of this report.

This report and the opinions expressed herein are based on our limited observations at the site, the drain line inspection and verbal information provided by the owners' representatives.

3.0 BACKGROUND INFORMATION

3.1 Site and Building Description

The subject property is situated west of S. Lake Ave and north of California Blvd, within the City of Pasadena, California (Figures 1 to 5). The structure at 497 S. Lake Ave is currently occupied by Talbots, a clothing retail store. The generally east facing Talbots commercial building (Photos 1 to 7) consists of an approximately 8,200 square foot, single story structure. According to public records, the building was built in 1954.

The building rear and side walls are constructed of masonry. The building storefront has been modernized with aluminum frames and glass panels. The main roof structure is comprised of transverse clear spanning steel tapered girders, spaced at approximately 20 feet on center (o.c.), which bear upon the masonry side walls. Between the girders, hung from their top flanges, are 2x12 conventional lumber joists at 16"o.c. sheathed with plywood (Photos 8 through 11). The floor/foundation system is slab-on-grade with continuous perimeter footings.

Retail parking lot is located rear side of the building and it is accessible from S. Hudson Avenue. There are three mature ficus trees about 10 feet away from the Talbots store front. There are multiple patched work on the store front sidewalk. The building pad is relatively leveled on flat ground.

3.2 Situation History

For more than several years, three very large ficus trees have been overhanging the front portions of the subject building roof (Figures 2 to 5 and 9 to 11). Leaves and other tree debris continuously fall upon the roof causing roof drain blockages. During rains this can result in water ponding upon the roof front two corners to a depth of at least 1'-6". At the surface level, large tree roots are heaving up and fracturing the front public sidewalk, causing damages to the concrete sidewalk as well as raised edges and out of level concrete surfaces, resulting in a pedestrian trip hazard. Leaves, berries and other debris from the trees cover portions of the subject roof and the front sidewalk access to the building.

3.3 Plumbing Inspection by Taylor Leak Detection, Inc.

Taylor Leak Detection (TLD) performed an inspection of the building sewer system and the rainwater downspout system on October 22, 2015. The following are the excerpts from their report, dated October 22, 2015 (also attached as Attachment 1).

> *"We were asked to video inspect portions of the sewer system and the rain water downspout system at the above site. We were advised that there are large trees in the parkway in front of the building."*

The following is excerpted from the TLD report regarding the sewer lines:

> *"In the subject unit, there are two bathrooms. We video inspected the four inch collector line from a two inch wall cleanout. We inspected the line approximately 40 feet under the concrete slab sub floor towards the front of the building to a location in the storage room.*
>
> *Under the storage room, the line is heavily deteriorated, and standing water was encountered. The line is cast iron which, due to its age is subject to deterioration. The line appears subject to stoppage.*
>
> *We inspected the line an additional 15 feet to a location under the show room. The line under the show room appeared satisfactory. The camera could not proceed beyond this point."*

In a phone discussion with Tighe Taylor of TLD[1] and as discussed in the TLD report, accessing and inspecting the sewer line in the front of the building would require installation of additional cleanout(s).

[1] Phone discussion with Tighe Taylor on October 30, 2015 regarding TLD report.

Drain cleanouts provide an entry location to remove clogs in drain lines and to allow insertion of a camera to inspect the drain system. The only cleanout for the building is located in the rear (west) end of the structure and is a 2-inch line that does not allow for observing the entire (100 plus) feet of sewer line. TLD was able to video inspect 55 feet of the line. There should be a cleanout in front of the building, but one is not present. To install a cleanout in front of the building would likely require at least a 3 to 4 feet deep excavation to access the drain line and install the cleanout. An option suggested by TLD would be to excavate and uncover the sewer line in the storage room to replace the heavily deteriorated 4-foot section. This line is 28 inches deep at this point. After this cleanout is installed, the line may be more effectively cleaned and inspected toward the front of the building. After the storage room cleanout is installed, and if the line outside of the building cannot be inspected or cleaned, then a second cleanout in front of the building could be installed.

The following is excerpted from the TLD report regarding the roof downspouts:

> *"There are two relevant roof downspouts, a south downspout and a north downspout. The south downspout, it was reported, is operative, and the north downspout is not. The slope of the roof is such that some water coming onto the roof runs exclusively to the south downspout, and other water runs exclusively to the north downspout.*
>
> *Presently, water running towards the north downspout is pumped by a pump to the south downspout.*
>
> *We video inspected the north downspout. This line runs down inside of the north exterior side wall of the building for two floors. On the vertical drop, the line is full of water. It does not appear to be broken.*
>
> *We presume that the line turns out under the foundation on the north side, runs into the north side yard, and turns east to run under the front sidewalk to a curb opening at the street, a distance of approximately 25 feet. In the curb opening, and, we presume, along much of the horizontal run from the building to the curb, the line is completely stopped up with mud."*

We were told that the south horizontal drain under the sidewalk is completely impacted with mud and debris from the roof drainage. Reportedly, a jet rodder could be used from the street and scour the line clean. However, TLD was told that a plumbing snake broke off in the line, which may be a problem for a jet rodder. The other option would be abandoning the horizontal line, cutting 25 feet of concrete and installing a new line.

3.4 Review of Historical Aerial Photos

A limited research of historical aerial photographs was performed as part of this investigation to determine the history of the property. Our review of aerial photographs, taken between 1952 and 2014, revealed the following:

- Aerial photographs dated 1953 (Figure 6), show that the site (497 S. Lake) was not yet developed and was occupied with vegetation.
- Aerial photographs dated 1954 (Figure 7), show that the site has been cleared of the vegetation.

- Aerial photographs dated 1964 (Figure 8), show that the structure had been built and a row of small trees along the sidewalk on S. Lake Avenue, east of the subject site. These trees appear to be relatively small, and separated from each other, suggesting that they had been recently planted when the aerial photograph was taken.
- Aerial photographs dated November 2003 (Figure 9) show mature ficus trees along the property line compared to the 1964 aerial photograph (Figure 8). The ficus trees appeared to have been overhanging the front portion of the building.
- Aerial photographs dated 2007 and 2015 (Figures 10 and 11) show the ficus trees have grown larger and overhang a larger area of the front (east) portion of the building.

3.5 Review of City of Pasadena Building Records

We have reviewed building records from the Online Permit Center of City of Pasadena. The online database generally provides permits from 1985 to the present. Review of the records indicated that other than for the demolition of the old storefront, construction of the new modern storefront, and other minor work, such as construction of low wall partitions and electrical work, there has been no significant alteration to the property. The records are attached in this report as Attachment 2.

We were also provided with plans and permits for the addition and remodeling of the adjacent building to the south of 497 S. Lake Avenue. These plans are dated 1980 and are for work done at 505 S. Lake Avenue.

4.0 SITE OBSERVATIONS

4.1 Introduction

The following site observations were made by Sean Wilson, PG, CEG and Hans F. Mager, SE, RCE of GDC, on October 20, 2015. The descriptions presented denote typical representative damages and are not intended as a complete inventory of all damages that may be present.

4.2 Site Observations

4.2.1 Exterior

4.2.1.1 Roof Distress and Drainage

The roof of the structure is surrounded by parapet[2] walls at all 4 of its sides (Photos 12, 13, 14, 15 & 16). At the front of the building are large trees which overhang the roof and continuously drop leaves, berries and other debris onto the roof causing the blockage of roof drains (Photos 12, 14, 17, 18, 19 & 20). At the time of our inspection, ponded water approximately 6 inches deep remained from a recent rain at the northeasterly front corner of the building where a pump had been installed to drain the area (Photos 21, 22 & 23).

Based upon observed parapet heights, we estimate that, at the very least, 1'-6" of water will pond at the buildings two front corners before it begins to run over the central high point of the roof (Figure 12).

[2] A parapet is a barrier which is an extension of the wall at the edge of a roof.

A 1'-6" depth of water weighs approximately 94 psf. Low slope roofs, as at this building, are designed to support an additional service live load of 20 psf above their actual weight. Allowable bending stress values for #2 Douglas fir joists with a duration of load increase for roofs is approximately 1562 psi. Our preliminary structural calculations indicate that the 2x12 roof joists below the area of ponding would be stressed to approximately 2673 psi, at least 70% overstressed above the building code allowable design values, and that at those areas local roof collapse is a serious risk.

At the front entry area of the building are two small, lower roofs above the storefront aluminum and glass structure (Photos 3, 24 & 25). These have their own parapets and become filled with tree debris. The upper small roof drains back onto the main roof through a scupper (Photos 26 & 27), which when clogged by the debris will cause it to reservoir approximately a foot of water.

Roof scupper holes have been bored through the northerly masonry wall for emergency drainage of the northeasterly roof corner when roof drains are blocked (Photos 21, 28 & 29). These are too small and will become clogged with tree debris during deep water ponding events.

4.2.1.2 East (Front) Side and Sidewalk Distress

The front sidewalk concrete is heaved up and fractured by large tree roots (Photos 30 through 33). The crack locations and damage pattern are associated with growth of the subject tree roots. This action is destroying the sidewalk and causing raised edges and out of level surfaces resulting in a pedestrian trip hazard. The vertical offsets in the sidewalk have been patched at several locations, in an apparent attempt to reduce the trip hazard associated with the offsets (Photos 34, 35 & 36). Some of the vertical offsets are up to 2 inches.

At the north store entrance, we observed a west-trending 1/64-inch wide crack in the concrete slab that is a separate pour of concrete from the sidewalk (Photo 37). This crack has some worn edges indicating that it has likely been present for some time. This crack is consistent with being a concrete shrinkage crack that developed during original concrete curing. However, it cannot be ruled out that this crack is caused or worsened by tree root growth under the slab.

North of the south entrance, the ¾-inch thick serpentine architectural stone finish is cracked (Photos 38 and 39) due to long-term movement of the sidewalk into the roughly 20.5" x 30.5"stone slab, which is most likely due to ongoing tree root growth. An adjacent sidewalk crack near this damage is vertically offset about 1/8-inch to 3/16-inch, with the north side up (Photo 40).

We observed four curb drain outlets in front of the subject building that are between 3.75 to 4.25 inches in diameter (Photos 41, 42, 43, 44). We observed that all of these drains have some degree of infilling with dirt and debris. Another curb drain, just north of the ones discussed above, is the furthest from the ficus trees and has roots that appear to be growing out of the drain (Photo 45).

4.2.2 Interior

4.2.2.1 Attic

The roof structural system was observed from within the attic (Photos 8, 9, 10 & 11). Access was limited to a small area above the rear of the building due to fire separations as seen to the left in (Photo 10).

4.2.2.2 Store Area

The front entry floor area of the north entrance is covered with 11¾-inch square floor tiles (Photo 46). We observed a few cracked floor tiles and some of these have detached from the underlying slab (Photos 47 through 49). The cracks in these floor tiles are most likely due to impacts of heavy objects onto the tiles. The damaged tiles are covered with a floor mat. The floor perimeters are covered with wood plank flooring and the majority of the store flooring is carpet (Photo 50).

Wall and ceiling panel damages consist of minor cosmetic crack damages. In the front ceiling, a minor hairline width crack is present (Photo 51). A linear east-trending hairline width crack extends east of an air vent (Photo 52). A few patched and unopened linear cracks/separations are in the north portion of the ceiling and appear to be at wall panel junctions (Photo 53). In the northeast portion of the store, at the base of the front window, there are linear hairline to 1/64-inch wide cracks at corner bead and wall junctions in the low wall (Photo 54). Some drywall/plaster damage (possibly due to impact) is also present (Photo 55). A stepped hairline width crack is near the northeast corner junction. The wood floor shoe mold trim at this location has a slight vertical offset with the north mold up relative to the south mold. These cosmetic damages are consistent with normal adjustments from building material dilation and shrinkage in response to environmental changes, including fluctuations in temperature and humidity.

5.0 FLOOR LEVEL SURVEY

We conducted a floor level (manometer) survey of the east (front) portion of the structure (Figure 14). A manometer works on the principle that two interconnected columns of water will seek the same level, regardless of the distance between the columns. Using this principle, one water column is placed at a fixed location which serves as the zero point or datum. The other column is provided with a calibrated scale to measure differences in elevation above or below the datum. The calibrated water column is moved throughout the building and differences in elevation relative to the datum are recorded. The data points obtained are then contoured.

The relative elevations were contoured at an interval of 0.20-inch. The survey was adjusted to account for differences in floor coverings and adjusted be in the same reference plane as the main carpeted slab. For reference, a generally accepted tolerance for new construction is about 1 inch of fall in 20 horizontal feet. A published tolerance for slabs-on-grade is all points on a slab must be ± ¾-inch above or below a specified elevation.[3]

The total relief of the measured slab is approximately 2.4 inches (Figure 12). The highest point is located at the middle section of the store, about 10 feet east from dressing room entrance. The lowest point is in the southern portion of store, about 15 feet west of the south side entrance. The most significant elevation differential is located just east of the dressing room, where 1.3 inches of elevation difference is within a horizontal distance of 10 feet.

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[3] Ballast, D.K., 2007, Handbook of Construction Tolerances, John Wiley & Sons, Inc.

The northern two-thirds of the slab is relatively level with about 0.8 inches of differential across the north store area. There is an east/west trending high ridge from the entrance toward the dressing room area and another high area adjacent to the northern wall. In the south store area, the slab has the lowest point that is about 0.6 inches lower than the south entrance. These elevation differentials in the slab are consistent with tree root growth: the higher slab near the south entrance; and, the east/west trending high ridge extending west from the north entrance.

6.0 CONCLUSIONS

Based on our observations and the information gathered during this investigation, it is our professional opinion that the following hazards and damages have been caused or exacerbated by the subject ficus trees in front of the building:

- Tree leaves, berries and other debris accumulate on the roof and contribute to blockage of roof drainage, especially the north roof drain that is impacted by mud and debris. This blockage does not allow free flowing drainage.
- Because the roof drainage is blocked and water ponds on the roof. It is our opinion that at least at the two front corners of the Talbots building, there exists a danger of roof collapse during roof water ponding events as these cause serious bending overstress of the 2x12 roof joists below.
- A couple of the curb drain outlets have roots, indicating apparent root intrusion from the ficus trees, which are most likely contributing to blockage of free flowing drainage.
- The tree roots have caused significant uplift and crack damages to the sidewalk and possibly damage to the concrete slab in front of the north entrance.
- Tree root uplift of the sidewalk has resulted in distress and crack damage to the architectural serpentine stone finish near the south entrance.
- The uplift and sidewalk panel offsets create an unsafe condition for pedestrians and retail patrons.
- Leaves, berries and other debris from the trees create a pedestrian slip hazard, especially when wet.

The floor level survey data is consistent with tree root growth causing slab uplift. If tree roots under the slab are present and continue to grow, damages related to tree root uplift will worsen.

7.0 PRELIMINARY RECOMMENDATIONS

At the very least tree limbs should be cut back, clear and away, from the front of the building so that no branches overhang the roof. To prevent further sidewalk and building damages, tree removal will be required.

The depth of water ponding that has repeatedly occurred is truly dangerous. In the event that future roof drain blockages may continue, emergency overflow scuppers should be constructed at all four

corners of the roof located at the deepest point of ponding. Those scuppers currently existing at the front, northerly corner of the building are too small and also subject to blockages (Photos 21, 28 & 29).

8.0 REMARKS

This report has been prepared for Resch Polster & Berger, LLP on behalf of Rodeo Holdings, LLC to provide engineering information regarding conditions at 497 S. Lake Avenue, Pasadena, CA 91101. This report has not been prepared for use by other parties or for other purposes, and may not contain sufficient information for other than the intended use.

The opinions expressed herein are based on our visual observations of the surface and limited study only, per your request, and are limited to the stated areas of concern. The presence or nature of additional adverse conditions (including hidden structural and geologic) at the site cannot be evaluated on the basis of our visual observations above, and would require a detailed investigation, including destructive testing, a field (subsurface) exploration and/or a laboratory testing program, to more fully evaluate. This report applies only to the area examined. It does not describe the remaining portions of the subject property (e.g., rear parking lot or foundations). Our opinions rendered apply to conditions in the subject areas observed by us as of the date of this report.

Environmental services were not offered for this investigation and the report does not contain environmental findings, conclusions or recommendations. None of our services were designed or conducted for the purpose of mold prevention.

Specific repair recommendations also were not within the scope of our investigation. All repairs should be designed and performed by licensed professionals. It should be recognized that GDC does not accept responsibility for any work not designed by or performed under the observation of our firm.

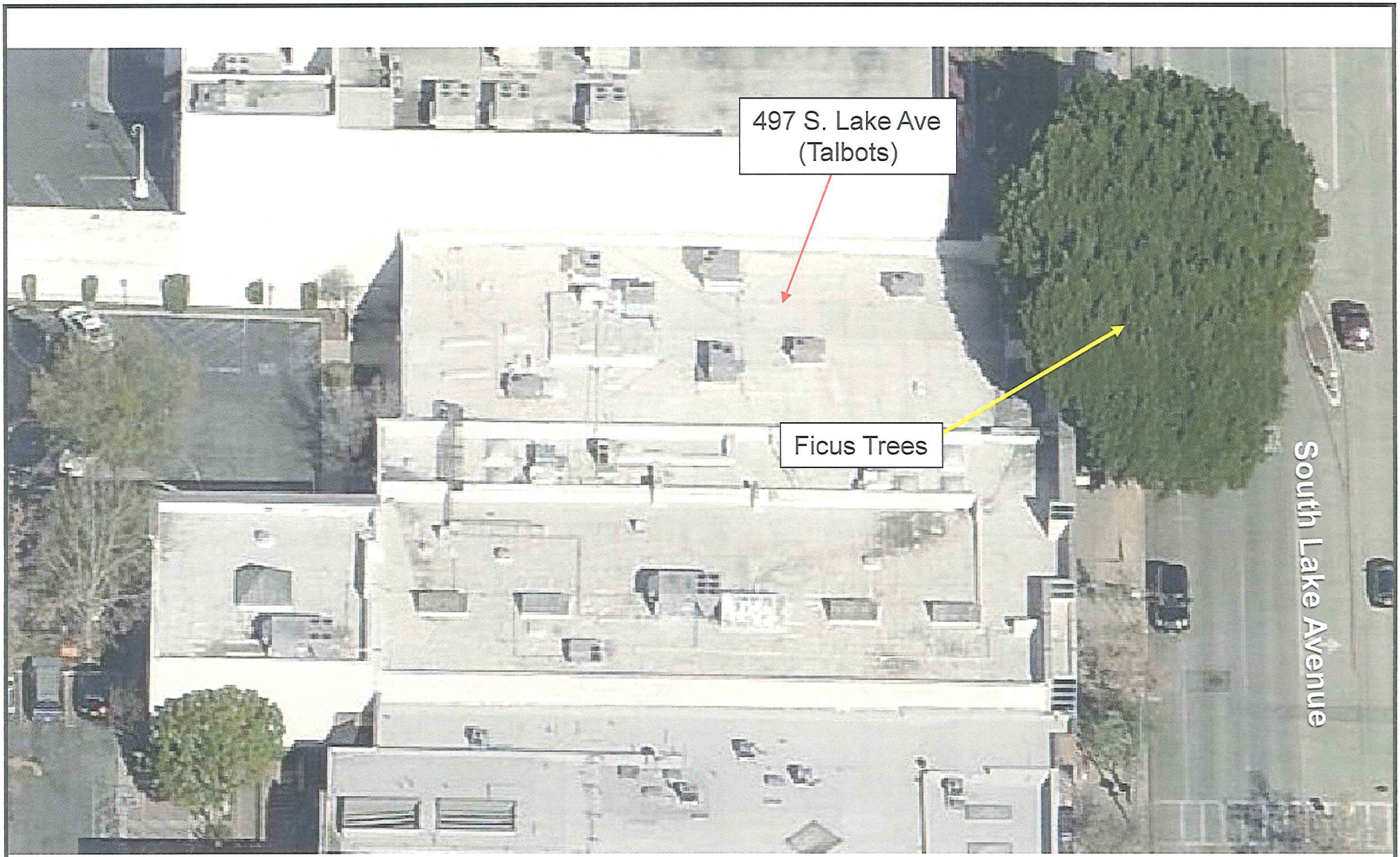
Services performed by this office have been conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions. No other warranties are expressed or implied.

FIGURES

N

Reference: Pictometry Online & Google Maps

GROUP DELTA	**GROUP DELTA CONSULTANTS, INC.** ENGINEERS AND GEOLOGISTS	**FIGURE NUMBER** **1**
	PROJECT NAME: 497 S. Lake Ave., Pasadena, CA	**PROJECT NUMBER** **GF-2078**
	CASE NUMBER: BC542643	**Date:** **October, 2015**



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Imagery Date:01/22/2014

Reference: Pictometry Online

GROUP DELTA	**GROUP DELTA CONSULTANTS, INC.** ENGINEERS AND GEOLOGISTS	**FIGURE NUMBER** **2**
	PROJECT NAME: 497 S. Lake Ave., Pasadena, CA	**PROJECT NUMBER** **GF-2078**
	CASE NUMBER: BC542643	**Date:** **October, 2015**

Imagery Date: 01/22/2014

N

Reference: Pictometry Online

GROUP DELTA	**GROUP DELTA CONSULTANTS, INC.** ENGINEERS AND GEOLOGISTS	**FIGURE NUMBER** 3
	PROJECT NAME: 497 S. Lake Ave., Pasadena, CA	**PROJECT NUMBER** GF-2078
	CASE NUMBER: BC542643	**Date:** October, 2015

Imagery Date: 01/22/2014

N

Reference: Pictometry Online

GROUP DELTA	**GROUP DELTA CONSULTANTS, INC.** ENGINEERS AND GEOLOGISTS	**FIGURE NUMBER** 4
	PROJECT NAME: 497 S. Lake Ave., Pasadena, CA	**PROJECT NUMBER** **GF-2078**
	CASE NUMBER: BC542643	**Date:** **October, 2015**

Imagery Date: 01/22/2014

N

Reference: Pictometry Online

GROUP DELTA	**GROUP DELTA CONSULTANTS, INC.** ENGINEERS AND GEOLOGISTS	**FIGURE NUMBER** 5
	PROJECT NAME: 497 S. Lake Ave., Pasadena, CA	**PROJECT NUMBER** GF-2078
	CASE NUMBER: BC542643	**Date:** October, 2015

N

Imagery Date: 1952

Reference: Historic Aerials by NETR Online

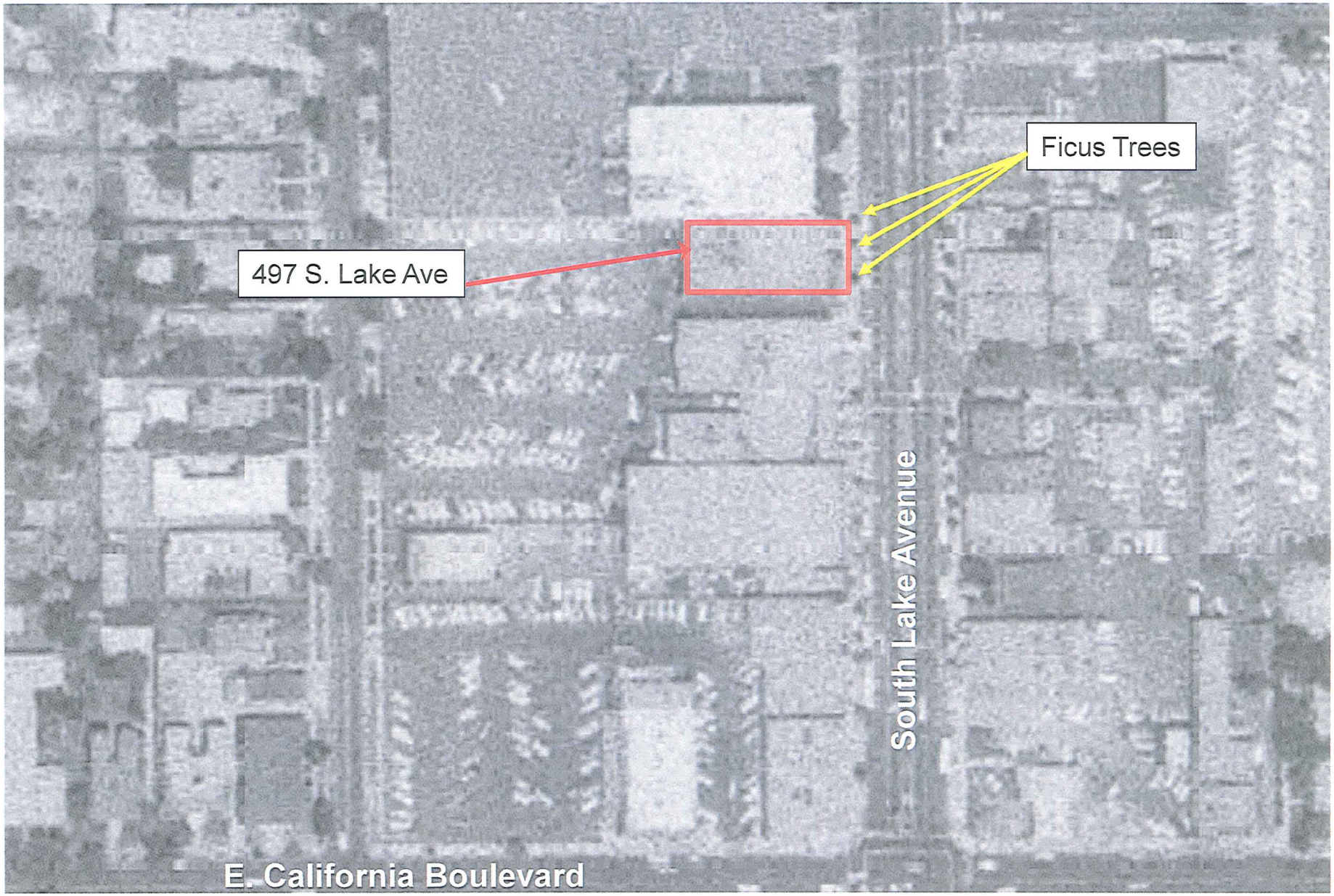
GROUP DELTA	**GROUP DELTA CONSULTANTS, INC.** ENGINEERS AND GEOLOGISTS	**FIGURE NUMBER** 6
	PROJECT NAME: 497 S. Lake Ave., Pasadena, CA	**PROJECT NUMBER** GF-2078
	CASE NUMBER: BC542643	**Date:** October, 2015

N

Imagery Date: 1953

Reference: Historic Aerials by NETR Online

GROUP DELTA	**GROUP DELTA CONSULTANTS, INC.** ENGINEERS AND GEOLOGISTS	**FIGURE NUMBER** 7
	PROJECT NAME: 497 S. Lake Ave., Pasadena, CA	**PROJECT NUMBER** GF-2078
	CASE NUMBER: BC542643	**Date:** October, 2015



N

Imagery Date: 1964

Reference: Historic Aerials by NETR Online

GROUP DELTA	**GROUP DELTA CONSULTANTS, INC.** ENGINEERS AND GEOLOGISTS	**FIGURE NUMBER** 8
	PROJECT NAME: 497 S. Lake Ave., Pasadena, CA	**PROJECT NUMBER** GF-2078
	CASE NUMBER: BC542643	**Date:** October, 2015

N

Imagery Date:11/30/2003

Reference: Google Earth

GROUP DELTA	**GROUP DELTA CONSULTANTS, INC.** ENGINEERS AND GEOLOGISTS	**FIGURE NUMBER** 9
	PROJECT NAME: 497 S. Lake Ave., Pasadena, CA	**PROJECT NUMBER** GF-2078
	CASE NUMBER: BC542643	**Date:** October, 2015

N

Imagery Date: 7/30/2007

Reference: Google Earth

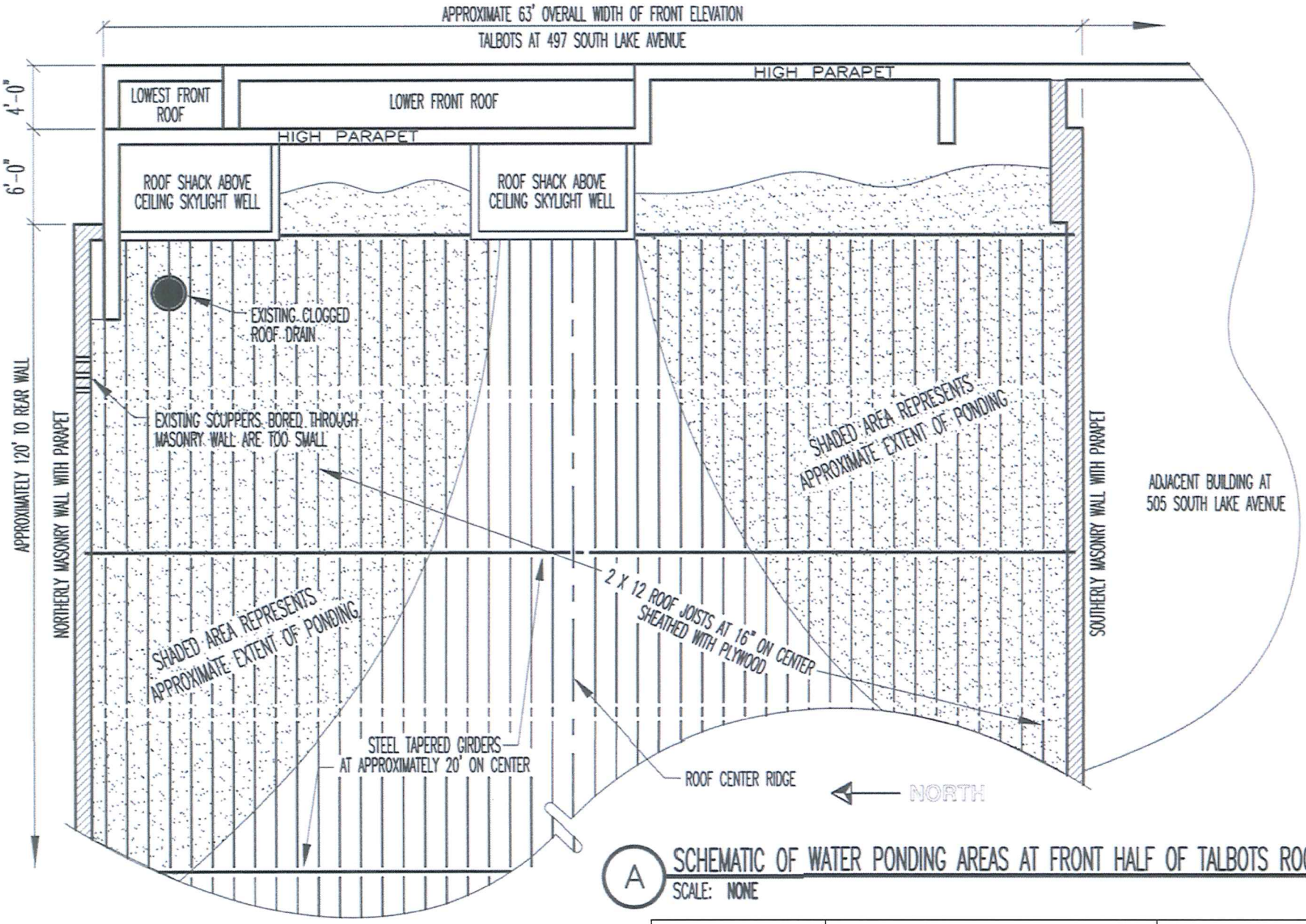
GROUP DELTA	**GROUP DELTA CONSULTANTS, INC.** ENGINEERS AND GEOLOGISTS	**FIGURE NUMBER** **10**
	PROJECT NAME: 497 S. Lake Ave., Pasadena, CA	**PROJECT NUMBER** **GF-2078**
	CASE NUMBER: BC542643	**Date:** **October, 2015**

N

Imagery Date: 3/24/2015

Reference: Google Earth

GROUP DELTA	**GROUP DELTA CONSULTANTS, INC.** ENGINEERS AND GEOLOGISTS	**FIGURE NUMBER** **11**
	PROJECT NAME: 497 S. Lake Ave., Pasadena, CA	**PROJECT NUMBER** **GF-2078**
	CASE NUMBER: BC542643	**Date:** **October, 2015**

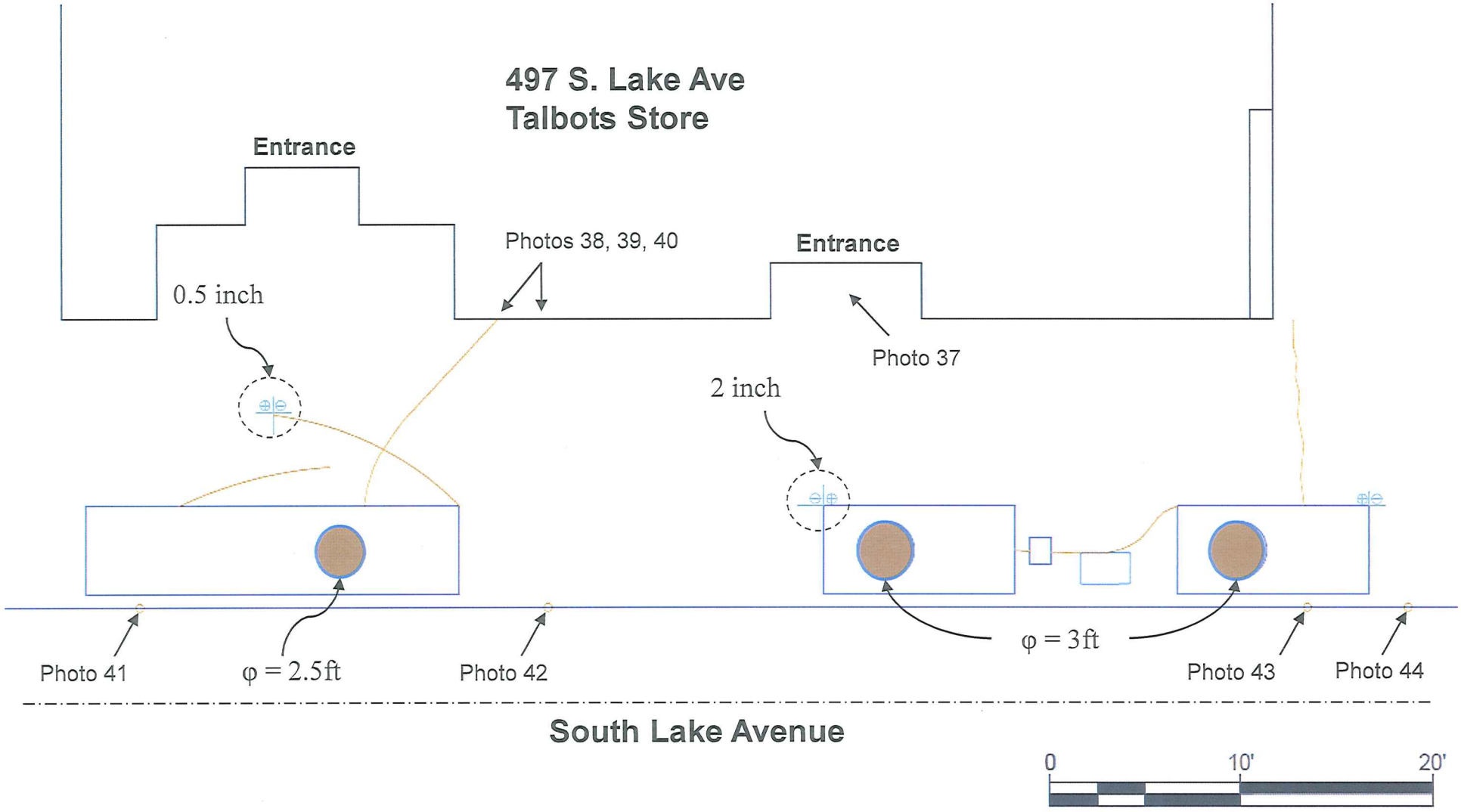


A SCHEMATIC OF WATER PONDING AREAS AT FRONT HALF OF TALBOTS ROOF

SCALE: NONE

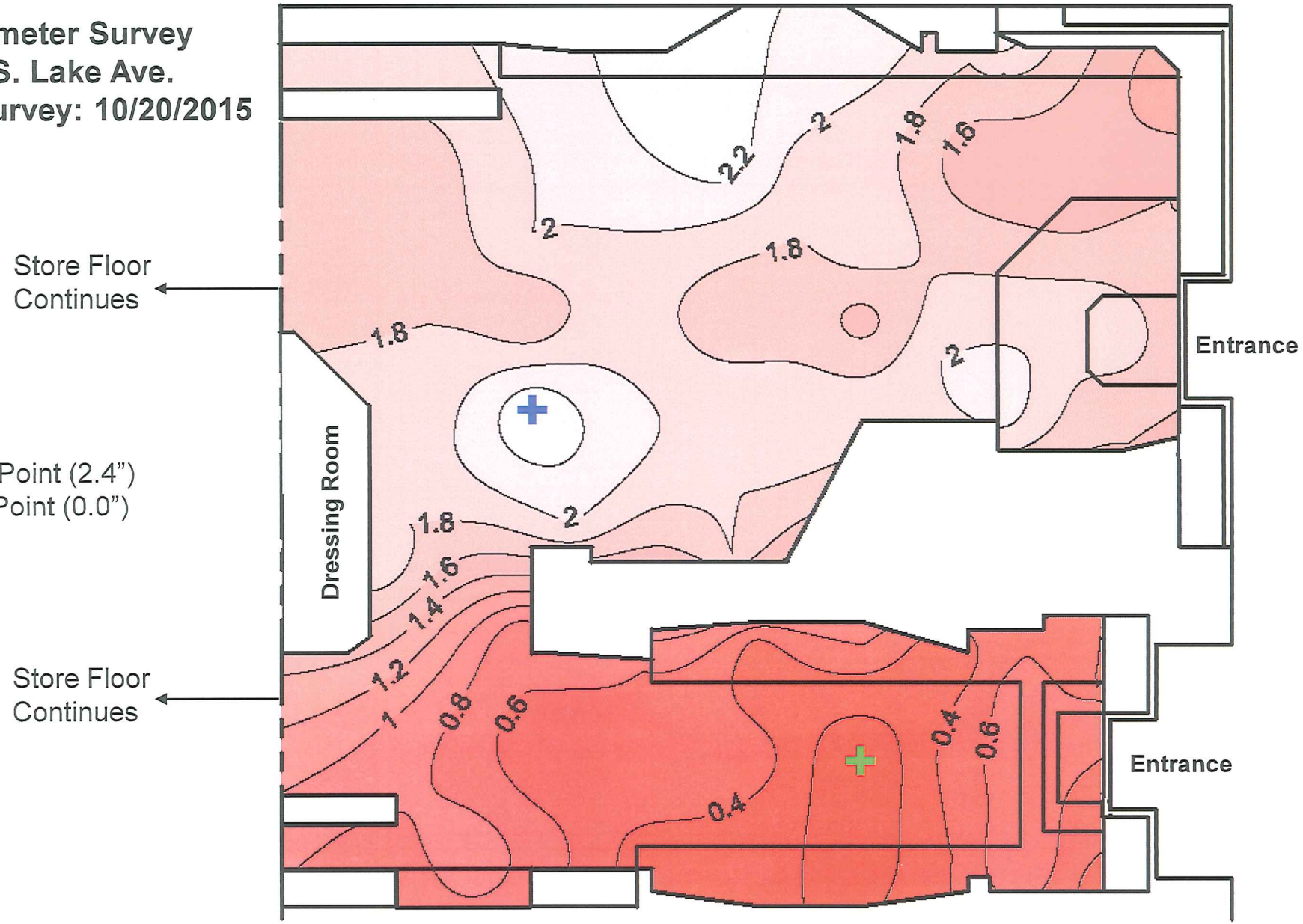
GROUP DELTA	**GROUP DELTA CONSULTANTS, INC.** ENGINEERS AND GEOLOGISTS	**FIGURE NUMBER** **12**
	PROJECT NAME: 497 S. Lake Ave., Pasadena, CA	**PROJECT NUMBER** **GF-2078**
	CASE NUMBER: BC542643	**Date:** **October, 2015**

Date of Survey: 10/20/2015



GROUP DELTA	GROUP DELTA CONSULTANTS, INC. ENGINEERS AND GEOLOGISTS	FIGURE NUMBER 13
	PROJECT NAME: 497 S. Lake Ave., Pasadena, CA	PROJECT NUMBER GF-2078
	CASE NUMBER: BC542643	Date: October, 2015

Manometer Survey
497 S. Lake Ave.
Date of Survey: 10/20/2015



GROUP DELTA	GROUP DELTA CONSULTANTS, INC. ENGINEERS AND GEOLOGISTS	FIGURE NUMBER 14
	PROJECT NAME: 497 S. Lake Ave., Pasadena, CA	PROJECT NUMBER GF-2078
	CASE NUMBER: BC542643	Date: October, 2015