



CITY OF WEST LAKE HILLS, TEXAS
NOTICE OF BOARD OF ADJUSTMENT (BOA) REGULAR MEETING
Wednesday, January 13, 2021 at 7:00 PM

Notice is hereby given that the Board of Adjustment (BOA) of the City of West Lake Hills, Texas, will hold a Regular Meeting on the 13th of January 2021 at 7:00 p.m., at which time the following items will be discussed, to-wit:

REMOTE ACCESS ONLY:

In accordance with the order of the Office of the Governor issued March 16, 2020, the City Council of the City of West Lake Hills will conduct a telephonic meeting in order to advance the public health goal of limiting face-to-face meetings (also called “social distancing”) to slow the spread of the Coronavirus (COVID19).

The public may participate in this meeting by dialing in to the following toll free number: (346) 248-7799, Meeting ID 813 6431 7759, Password: 772907

If you wish to speak during the meeting, please provide your name, phone number and the item number you wish to speak on to citysec@westlakehills.org by 1:00 P.M. on January 13, 2021

Members of the public who wish to submit their written comments in lieu of speaking shall submit their comments by emailing citysec@westlakehills.org. Comments must be received by 1:00 P.M. on January 13, 2021

1. Call to Order
2. Citizen Communications The City Council Welcomes Public Comments at this Point on any Issue. If the Issue is Listed on the Agenda, the Speaker May Choose to Comment During the Public Comment Period or When the Specific Agenda item is Taken Up by the Council Later in the Meeting. The Council Cannot Respond to Matters Not Listed on the Agenda Until a Future Meeting. Speakers Shall Limit Their Comments to Five (5) Minutes Each
3. Consent Agenda All Consent Agenda Items Listed are Considered to be Routine by the City Council and Will be Enacted by One (1) Motion. No Separate Discussion or Action on any of the Items is Necessary Unless Desired by a Council Member or Citizen

a. Approval of the December 9, 2020 Regular Meeting Minutes

4. **Land Use 809 Canyon Creek:** Discuss and Consider Action on Several Variance Requests in Order to Rehabilitate/Remodel an Existing Home that is Non-Conforming:
- 1) Reduction/encroachment of the interior side setback for new steps to the deck, rehabilitate an existing overhang, and rehabilitate the existing structure
 - 2) Encroachment into front setback to allow the rehabilitation of the existing structure and add new rain screen overhang over the front door
 - 3) Encroachment into side street setback for rehabilitation of the existing structure and addition of overhang
 - 4) Replacement of a failing retaining wall on the right side of the house encroaching in the setback that is taller than the maximum permitted 18 inches height in a setback
 - 5) Cut/fill and construction of new retaining wall on left side of the house that encroaches the setbacks and is greater than 6 feet in height
 - 6) Grading and drainage/cut to the left of the house in a setback
 - 7) Remove of Tree # 182 (14 inch Chinese Tallow)
- (West Lake Hills Code Sections 22.03.275(3); 22.03.276; 22.03.170(g), 22.03.304(4), 22.03.281). Owner Samuel Dillard/Applicant Waterloo Permits, LLC.
- Note: This item requires dual BOA and City Council action. BOA considers variances #1 – 6 and City Council considers variance #7**

a. Public Hearing: All Persons Wishing to Speak for or Against Shall be Heard.

5. Adjournment

Approved by: Linda Anthony, Mayor

Certificate

I certify that the above Notice of the January 13, 2021 Board of Adjustment Regular Meeting was posted on the bulletin board at the Municipal Building, 911 Westlake Drive, West Lake Hills, Texas on January 8, 2021 by 5:00 pm. and will remain posted continuously until said meeting is convened.

Signed by: Stephanie Mills, City Secretary

The City of West Lake Hills is committed to compliance with the Americans with Disabilities Act. Reasonable accommodations and equal access to communications will be provided upon request.

All items on the agenda are for discussion and/or action. City Council reserves the right to adjourn into executive session at any time during the course of this meeting to discuss any of the matters listed above, as authorized by Texas Government Code Sections 551.071 (Consultation with Attorney), 551.072 (Deliberations about Real Property), 551.073 (Deliberations about Gifts and Donations), 551.074 (Personnel Matters), 551.076 (Deliberations about Security Devices), and 551.086 (Economic Development).

CITY OF WEST LAKE HILLS, TEXAS
MINUTES OF A BOARD OF ADJUSTMENT (BOA) REGULAR MEETING
Wednesday, December 9, 2020 at 7:00 PM

1. Call to Order

With a quorum present, Mayor Anthony called the meeting to order at 7:01 p.m. Members in attendance were Mayor Linda Anthony and Councilmembers Brian Plunkett, Beth South and Darin Walker. Mayor Pro Tem O'Connor and Councilmember McCollough were absent at roll call

2. Citizen Communications The City Council Welcomes Public Comments at this Point on any Issue. If the Issue is Listed on the Agenda, the Speaker May Choose to Comment During the Public Comment Period or When the Specific Agenda item is Taken Up by the Council Later in the Meeting. The Council Cannot Respond to Matters Not Listed on the Agenda Until a Future Meeting. Speakers Shall Limit Their Comments to Five (5) Minutes Each

Mayor Anthony opened the meeting for public comments. Hearing none, the public comment section was closed

3. Consent Agenda All Consent Agenda Items Listed are Considered to be Routine by the City Council and Will be Enacted by One (1) Motion. No Separate Discussion or Action on any of the Items is Necessary Unless Desired by a Council Member or Citizen

- a. Approval of the November 11, 2020 Regular Meeting Minutes
- b. **9 Rocky River Cove:** Adopt an Ordinance for a Special Use Permit Request to Allow the Construction of a Guest Quarters/Pool Pavilion Located on a Property Zoned R – 1 – One-Family Residential. (West Lake Hills Code Sec. 38.03.032 and Article 38.04). Applicant/Owner Todd Hasie

Motion to add Item #4 to the Consent Agenda made by Councilmember Plunkett with a Second by Councilmember South. Motion carried by a vote of 3 ayes to 0 nays with Mayor Pro Tem and Councilmember McCollough absent

Motion for Approval of the remainder of the Consent Agenda made by Councilmember Walker with a Second by Councilmember South

Motion for Approval carried unanimously by a vote of 3 ayes to 0 nays, with Mayor Pro Tem O'Connor and Councilmember McCollough absent

4. Land Use 310 Westhaven Drive: Discuss and Consider Action on a Request for Two (2) Variances to Remodel an Existing Nonconforming Cabana:

- 1) Building Setback Encroachment
- 2) Exceed Maximum Allowed Impervious Cover.

(West Lake Hills Code Sec. 22.03.281). Applicants/Owners Andrew Schwartz and Sylvia Arabian.

- a. Public Hearing: All Persons Wishing to Speak for or Against Shall be Heard.

**This item was added to the Consent Agenda and subsequently approved
Mayor Pro Tem O'Connor joined the meeting at this time**

5. **Land Use 416 Ridgewood:** Discuss and Consider Action on a Variance Request to Encroach a Setback in Order to Construct an Accessory Building to Serve as a Home Office or School Room (West Lake Hills Code Sec. 22.03.001) Applicant Victoria Keith

a. **Public Hearing:** All Persons Wishing to Speak for or Against Shall be Heard.

Motion for Approval made by Councilmember Walker with a Second by Mayor Pro Tem O'Connor

Motion for Approval carried unanimously by a vote of 4 ayes to 0 nays, with Councilmember McCollough absent

6. Adjournment

Motion to adjourn the meeting made at 7:18 pm by Councilmember Walker with a Second by Mayor Pro Tem O'Connor

Motion for Approval carried unanimously by a vote of 4 ayes to 0 nays, with Councilmember McCollough absent

Respectfully submitted,

LINDA ANTHONY, MAYOR

ATTEST:

Stephanie Mills, City Secretary

These minutes were approved on _____, 2020.



**SETBACKS, CUT/FILL, RETAINING WALL,
& TREE VARIANCES
STAFF REPORT**

JANUARY 13, 2021

Project Address: 809 Canyon Creek Drive

Project Number: 16005

Agenda Item: Land Use: 809 Canyon Creek: Discussion/consideration of several variance requests in order to rehabilitate/remodel an existing home that is non-conforming: 1) Reduction/encroachment of the interior side setback for new steps to the deck, rehabilitate an existing overhang, and rehabilitate the existing structure; 2) Encroachment into front setback to allow the rehabilitation of the existing structure and add new rain screen overhang over the front door; 3) Encroachment into side street setback for rehabilitation of the existing structure and addition of overhang; 4) Replacement of a failing retaining wall on the right side of the house encroaching in the setback and is taller than the maximum 18 inches height; 5) Cut/fill and construction of new retaining wall on left side of the house that encroaches the setbacks and is greater than 6ft in height; 6) Grading and drainage/cut to the left of the house in a setback; 7) Remove Tree # 182 - a 14 inch Chinese Tallow. (West Lake Hills Code Sections 22.03.275(3); 22.03.276; 22.03.170(g), 22.03.304(4), 22.03.281). Owner Samuel Dillard/Applicant Waterloo Permits, LLC.

Applicant Information: Owner Samuel Dillard/Applicant Waterloo Permits, LLC

Hearing Dates:

September 16, 2020 ZAPCO

January 13, 2021 Board of Adjustment/City Council

Location: The subject property is located north of Terrace Mountain Drive, south of Wild Basin Ledge and west of The High Road.

Zoning & Site Characteristics:

The subject property and surrounding neighborhood are zoned R-1 – One-Family Residential. The property is approximately 0.7 acre. There is currently an existing house on the property.

Background & Analysis:

This variance was originally scheduled for the October 14, 2020 Board of Adjustment/City Council meeting, but was removed from the agenda due to the need for additional information regarding drainage and the proposed retaining wall. Since that time, the applicant has addressed the City Engineer's drainage comments and the drainage approval letter is included

in the packet. Staff re-sent public notice letters prior to the January 13, 2021 Board of Adjustment/City Council meeting.

The homeowner, Samuel Dillard, is requesting several variances in order to rehabilitate and remodel his existing home. Portions of the home encroach into the front and side setbacks. A building permit application was submitted in April 2020, and it has been on hold because several variances were needed.

Setback Encroachment Variances for Primary Structure (Variance # 1 – 3 on Revised Site Plan):

Setback encroachment variances have been requested for the rehabilitation of the existing house that encroaches the setbacks, including repair/replacement of windows, trim, siding, and doors. Additionally, new deck steps are proposed on the right side of the house that partially encroach the setback; and a new front door overhang and awning are proposed which also encroach into the setback.

Cut/Fill/Retaining Wall Variances (Variance #s 4 – 6 on Revised Site Plan):

Drainage issues along the left (south) side of the house have caused problems including wood rot on that side of the house. One of the variances being requested is for drainage improvements including cut/fill and a retaining wall in the side/south setback to address the drainage issues. The proposed retaining wall varies in height, ranging from approximately 12 inches at the front to 10 feet at the back of the wall and will include a cut approximately 10 feet.

There is an existing wooden retaining wall on the right (north) side of the house located in the setback which the applicant explains should be replaced because it is failing. The City's Code of Ordinances allows cut/fill including retaining walls up to 18" in the setbacks, and the proposed replacement wall will be between 24 – 30 inches in height.

Tree Variance (Variance # 7 on Revised Site Plan):

A variance for a 14 inch Chinese Tallow, Tree # 182, is being requested because it is located along the proposed cut on the left side of the house.

Variance Criteria Review:

When applying for a variance, the applicant has established by competent evidence that:

1. The strict or literal enforcement of the terms of this chapter, because of special conditions, will result in unnecessary hardship to the applicant.

The application states – "The structure is existing non compliant based on setback regulations. Proposed setback encroachments are limited to an overhang projection at front door, interior remodel, new steps at deck. If the ordinance is strictly/literally enforced the proposed entry door will be exposed to the elements..."

“Because of the existing topography, damage has occurred to the structure because of insufficient drainage. Because of the difficult terrain, access without the cutting is also prohibitive.”

2. There will not be unreasonable disruption of the natural terrain or unreasonable destruction of existing flora.

The application states – “The majority of the site will remain intact that is outside of the limits of construction. The requested variance is calculated with preserving as much of the flora and natural terrain.”

3. There is no reasonable alternative to the requisite variance that will alleviate the difficulty or hardship complained of.

The application states – “The project has gone through several iterations to avoid seeking a variance. Because of some of the drainage damage, field visits, etc. it was noted that without the cut, the owner will need to keep an eye on drainage and potential property damage along the left side of the property.”

4. The variance will not be greater than the minimum required to alleviate the difficulty or hardship complained of.

The application states – “Site drainage is an ongoing battle for lots with difficult terrain. The cut is approximately 10’ from the building. Doing anything less may create a maintenance issue for the homeowner. The overhang at the front door is to screen water. The retaining wall on the right side is failing. The wood steps on the right side of the house at deck are for access and maintenance.”

5. The variance does not violate the intent of the Zoning Ordinance or goals of the Comprehensive Plan.

The application states – “We came into this process trying not to request variances, but it was quickly apparent that something needed to happen with the property, not only aesthetics and septic replacement, but for the longevity of the home. In short, we feel the variance does not violate the intent of the Zoning Ordinance or Comprehensive Plan by preserving and improving the existing home.”

6. The variance will not adversely affect neighboring properties or interfere with the enjoyment of these properties by their owners.

The application states – “The variances will not impact any neighbors. The neighboring property downhill may appreciate replacing a failing retaining wall. The drainage from the cut will be in line with the existing drainage pattern on the left side of the property, and because of the higher elevation, sight lines to the wall will be extremely limited and covered by the house. Remodeling the structure in the setback will only be beneficial to the neighboring properties.”

Traffic/Transportation

There may be an impact on traffic in that area during construction process.

Lighting

Outdoor lighting is not proposed with this variance request. Any outdoor lighting will need to comply with the City's Code.

Building Code

The property and future construction will have to comply with all applicable City codes.

Subdivision

This request will not change the subdivision.

Comprehensive Planning Analysis

The existing and future land use comply with the Master Plan.

Zoning & Planning Commission Recommendation

During the September 16, 2020 meeting, the Commissioners unanimously recommended approval of variances 1 – 4 and made no recommendation on the remaining variances due to the lack of information regarding drainage and grading.

Staff Recommendation

The staff recommendation is approval for variances 1 through 4 (setback encroachments to repair/rehabilitate existing structures in setback; replace awning and overhang at front door; replace existing wooden retaining wall this is failing) and 7 (tree variance – needed for equipment access for septic system). The staff recommendation for variances 5 and 6 (cut/fill/drainage and new retaining wall in the side setback) is denial due to the lack of minimization of the requested variances, in particular the large retaining wall and cut.

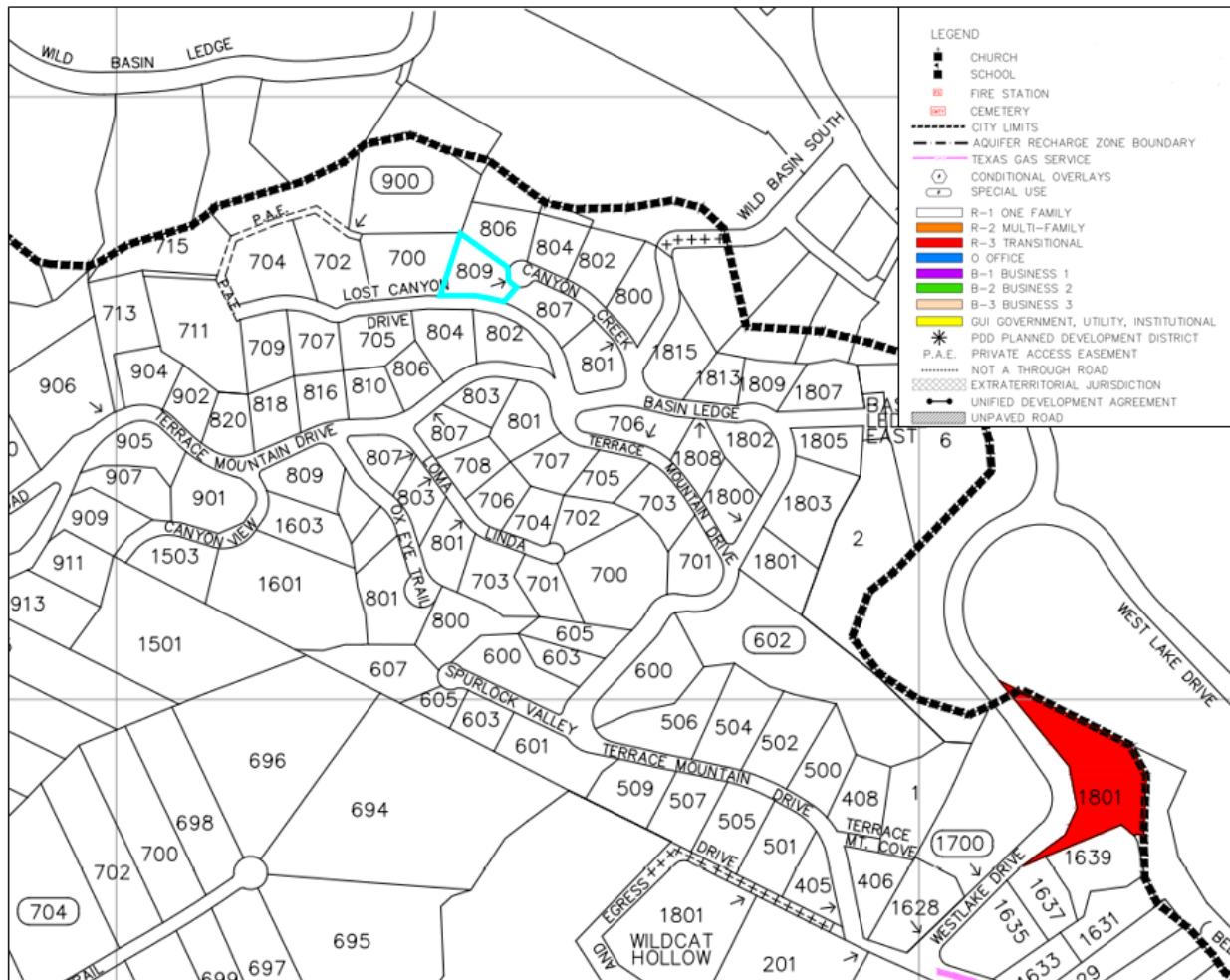
If variance 7 is granted (removal of Tree # 182), the applicant is responsible for replacing it at 150% with single-trunk trees with trunk diameters of at least 2 inches.

Links to Relevant Code:

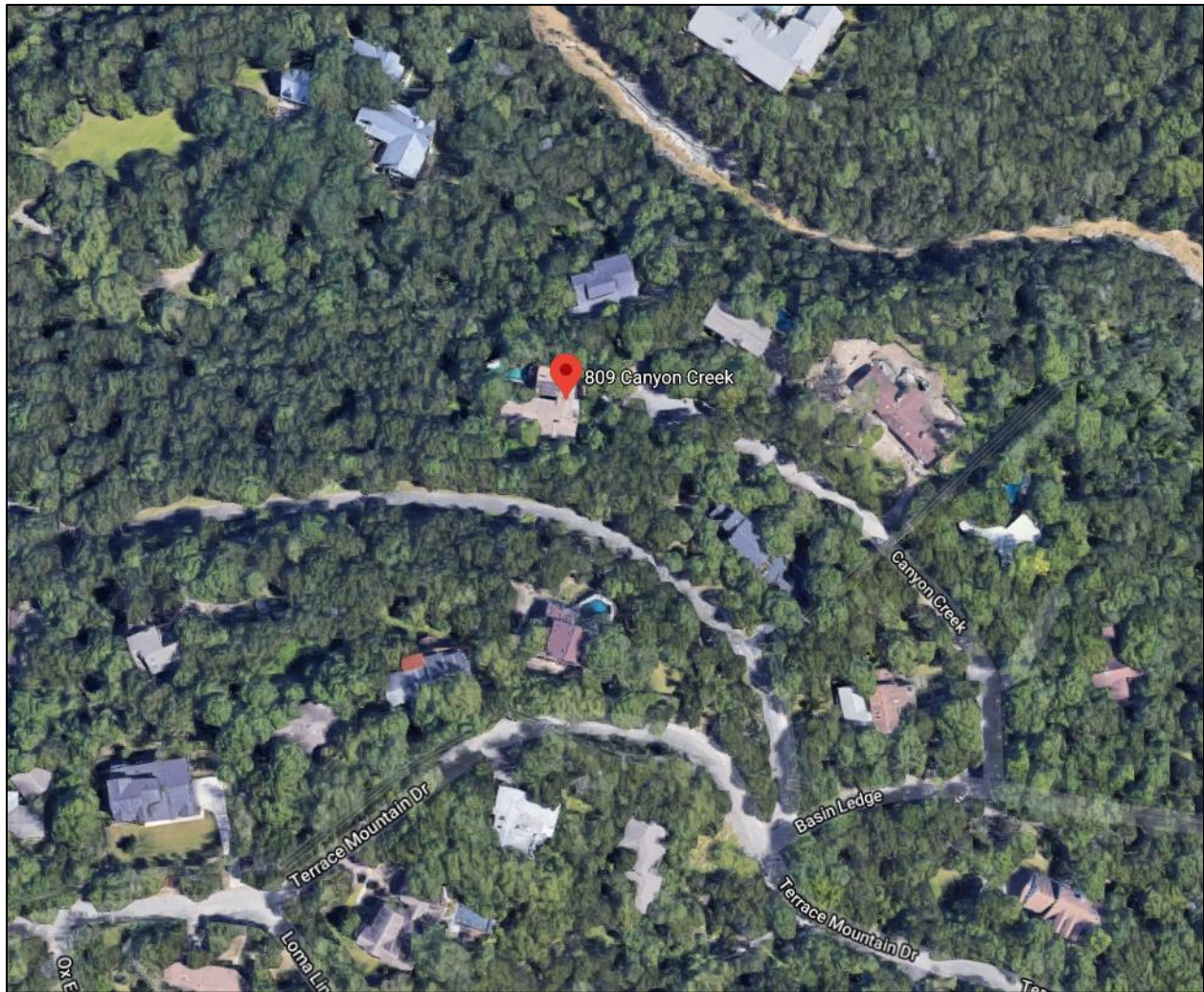
- [Sec. 22.03.170 Site disturbance \(excavation, grading or filling\)](#)
- [Sec. 22.03.281 Schedule of regulations](#)
- [Sec. 22.03.304 Tree and vegetation removal and replacement](#)
- [Sec. 22.03.514 Criteria and process required for granting variance](#)

(Maps to follow)

Zoning:



Aerial:



CITY OF WEST LAKE HILLS, TEXAS
MINUTES OF A ZONING & PLANNING COMMISSION (ZAPCO) REGULAR MEETING
Wednesday, September 16, 2020 at 6:30 PM



1. Call to Order. Chairman Robert Meisel.

With a quorum present, Chairman Meisel called the meeting to order at 6:30 p.m. Members in attendance were Chairman Robert Meisel, Vice-Chairman Jim Pledger, Commissioners Laurie Maccini, Bill Vandersteel and James Vaughan. Bill Harwell was absent.

2. Consent Agenda The following items are considered to be self-explanatory by the Commission and will be enacted with one motion. There will be no separate discussion of these item/s unless a Commission Member or citizen so requests.
 - a. Approval of the August 19, 2020 Regular Meeting Minutes.

COMMISSIONER VANDERSTEEL MOVES TO APPROVE THE AUGUST 19, 2020 MINUTES. COMMISSIONER PLEDGER SECONDS. UNANIMOUS (4-0) APPROVAL.

3. Land Use **402 Camp Craft Road:** Discussion/Recommendation on a variance application for six (6) variances in order to remodel the existing non-conforming home and accessory structures: 1) Refurbish and allow an existing non-conforming main structure to remain in a side setback; 2) Refurbish and allow an existing non-conforming accessory structure to remain in a rear setback; 3) Enclose/refurbish an existing non-conforming structure (sport court) in a rear and side setback; 4) Allow an existing driveway to be rehabilitated and remain in a side setback; 5) Removal of a 27" Crepe Myrtle Tree; and 6) Removal of a 15" Oak Tree (West Lake Hills Code Sections 22.03.281, 22.03.175, 22.03.304(4)). Owners Robert and Tanja Lee/Applicant CleanTag Permits - Linda Sullivan.
 - a. Staff Briefing

City Planner Naini: Staff Report is given.

Staff Recommendation: Approval due to the characteristics of the property. No further encroachments.

Commissioner Vandersteel: I'm confused about 1994 approved variances.

Commissioner Maccini: The new plans they are showing a stone patio there.

Commissioner Vaughan: There is a drainage easement by the main house. On the bond committee, Camp Craft is one of our priorities. Any information on how the city plans to use the easement?

Planner Naini: We don't have anything in the plans.

b. Presentation by applicant

Robert and Tanja Lee are present. We fell in love with it. We like the historical value. We're excited to make it into our dream home. We are wanting to reduce impervious cover.

The same two buildings had previous variances. With regard to the Tree #94, it is growing against the house and is a hazard. It is rubbing against the house. The other is a crape myrtle.

c. Public Hearing: All persons wishing to speak for or against shall be heard.

Chairman Meisel opened the meeting for public comments. Hearing none, the public comment section was closed.

d. Deliberation and Action

Commissioner Vandersteel: I'm confused about the rear setback lines. Why is it at 40'?

Robert Lee: I don't have anything to add about the setback. We want to remove the majority of the driveway.

Chairman Meisel: You may want to note on the drawings that is being removed.

COMMISSIONER VANDERSTEEL MOVES TO RECOMMEND APPROVAL OF ALL VARIANCES. COMMISSIONER VAUGHAN SECONDS.

Commissioner Maccini: The sport court, I'm concerned about the trees surrounding it and recommends caution. I'm excited it won't be commercial.

UNANIMOUS (4-0) APPROVAL.

4. Land Use 809 Canyon Creek: Discussion/consideration of several variance requests in

order to rehabilitate/remodel an existing home that is non-conforming: 1) Reduction/encroachment of the interior side setback for new steps to the deck, rehabilitate an existing overhang, and rehabilitate the existing structure; 2) Encroachment into front setback to allow the rehabilitation of the existing structure and add new rain screen overhang over the front door; 3) Encroachment into side street setback for rehabilitation of the existing structure and addition of overhang; 4) Replacement of a failing retaining wall on the right side of the house encroaching in the setback that is taller than the maximum permitted 18 inches height in a setback; 5) Cut/fill and construction of new retaining wall on left side of the house that encroaches the setbacks and is greater than 6 feet in height; 6) Grading and drainage/cut to the left of the house in a setback; 7) Remove of Tree # 182 (14 inch Chinese Tallow). (West Lake Hills Code Sections 22.03.275(3); 22.03.276; 22.03.170(g), 22.03.304(4), 22.03.281). Owner Samuel Dillard/Applicant Waterloo Permits, LLC.

a. Staff Briefing

City Planner Naini: Staff Briefing is given.

Staff Recommendation: Approval of variances 1-4. Denial for 5-7 due to the lack of minimization.

b. Presentation by applicant

Dusty Waldrop is the General Contractor. We've been working on this for 13 months. There is a 60' grade change and two 50' front setbacks. The house is unlivable in its current state. The septic is shot and is on the back side of the property. It is a difficult challenge. How do we rehabilitate this house without the variances?

c. Public Hearing: All persons wishing to speak for or against shall be heard.

Chairman Meisel opened the meeting for public comments.

Michelle Bassett lives at 804 Canyon Creek: I welcome the Dillards to the neighborhood. I need to know where the water is going. I've hired an engineer to help me. thank you for your time.

Chairman Meisel closes the public comment section.

d. Deliberation and Action

Commissioner Vandersteel had questions for the neighbor.

Michelle Bassette: It's challenging.

Commissioner Vandersteel speaks about access to the new septic system and the need

for the removal of the tree.

Michelle: I'm to the northeast.

Dusty: There is an area between you and the Dillard's that is like a drainage and rolls through the cul-de-sac, is that correct?

Michelle: It rushes down to my driveway.

Dusty: What changes will effect the neighbors discussing with engineers? We're thinking about the people around us.

Commissioner Vaughan: Anjali, I brought up city code and they will have to submit a drainage plan along with the approved variances? It can be disapproved?

Planner Naini: A building plan has been submitted but has been on hold because of the variance application. Drainage issues need to be addressed. Drainage waivers are handled at the staff level.

Commissioner Vaughan: Staff could disapprove it?

Planner Naini: We can do something to get it resolved.

Commissioner Pledger: Discusses staff recommendation for denial due to no minimization. That retaining wall is important from a drainage point. We need to be sure we're not creating a bigger problem.

Commissioner Maccini addresses safety issues. Can we recommend 1-4 and a non-vote on the others?

Commissioner Vaughan: I like the idea from the Chairman.

COMMISSIONER VAUGHAN MOVES TO RECOMMEND APPROVAL FOR VARIANCES 1-4 AND NO RECOMMENDATION ON THE REST FOR LACK FROM CITY ENGINEERING REGARDING DRAINAGE AND GRADING. COMMISSIONER VANDERSTEEL SECONDS. UNANIMOUS (4-0) APPROVAL.

5. Adjournment. Chairman Robert Meisel.

Motion to adjourn the meeting AT 7:35 P.M.

Respectfully submitted,

ROBERT MEISEL, CHAIRMAN

ATTEST:

ZAPCO Secretary Mark Litrell

These minutes were approved on _____, 2020.

APPLICATION COVER SHEET

Property Address: 809 CANYON CREEK DR

Applicant Name: SAMUEL LUTHER DILLARD

Designated Agent (if any, Power of Attorney Required): DUSTY WALDROP

Applicant Phone Number: 5127628995 Email Address: [REDACTED]

Date Application was Submitted: 07.16.20

Variance(s) Requested: 1/2/3. REMODEL/ADDITION TO EXIST STRUCTURE IN FRONT, SIDE STREET, AND SIDE SETBACK
4/5. NEW RETAINING WALL 10' HIGH AND REPLACING FAILING RETAINING WALL 3' HIGH IN SETBACK
6. NEW CUT >18" IN SIDESTREET SETBACK. APPROXIMATE CUT HEIGHT 8'
7. REMOVAL OF 14" CHINESE TALLOW 5. REBUILD EXISTING RETAINING WALL IN SETBACK.

Applicant completes above section; City Staff completes the section below:

Variance File Number: _____ [A sequential identifier based on application date and noted in a
Variance Application Log maintained by staff. Examples: 20110903A, 20110903B, 20111021A, etc.]

Application Fees Due: \$ _____ ☐ Fees Received on _____ by _____

DRAFT APPLICATION PACKET MATERIALS

Draft Application Packet Received on _____ by _____

☐ Letter to ZAPCO Chairperson ☐ Variance Approval Criteria Answers

☐ Site Plan Coversheet ☐ Site Plan Drawings

☐ Elevation Views and Floor Plans (new structures only)

☐ Septic Assessment (new structures only)

☐ Additional Support Materials (if any): _____

☐ Power of Attorney (if any) – Designated Representative: _____

Staff Analysis completed on _____ by _____

Staff Analysis sent to Applicant on _____ by _____

FINAL APPLICATION PACKET

Final Application Packet Reviewed and Approved on _____ by _____

Notice to Proceed Letter sent to Applicant on _____ by _____

• Notification Letter must be postmarked by _____ ☐ Confirmed by _____

• Sign must be posted by _____ ☐ Confirmed by _____

15 Copies of Final Packet received on _____ ☐ Confirmed by _____

ZAPCO

Scheduled for ZAPCO Hearing on: _____

ZAPCO Action Letter sent on _____ by _____

ZAPCO Recommendation: _____

Conditions/Comments (if any): _____

Modified application and materials (if any) received on _____ by _____

BOA/CITY COUNCIL

Scheduled for BOA/Council Hearing on: _____

BOA/Council Action: _____

Conditions/Comments (if any): _____

BOA/Council Action Letter sent on _____ by _____

FOLLOW-UP

Follow-up dates (vegetative screening installed, survival verification, etc.): _____

• Notifications added to Incode on _____ by _____

Postponement History (if any): _____

Notes: _____

ANSWERS TO VARIANCE APPROVAL CRITERIA QUESTIONS

1. DESCRIBE IN DETAIL ANY SPECIAL CONDITIONS YOU BELIEVE WILL RESULT IN UNNECESSARY HARDSHIP TO YOU IF THE TERMS OF THIS ORDINANCE ARE STRICTLY/LITERALLY ENFORCED.

THE STRUCTURE IS EXISTING NON COMPLIANT BASED ON SETBACK REGULATIONS. PROPOSED ADDITION SETBACK ENCROACHMENTS ARE LIMITED TO AN OVERHANG PROJECTION AT FRONT DOOR, INTERIOR REMODEL, NEW STEPS AT DECK. IF THE ORDINANCE IS STRICTLY/LITERALLY ENFORCED THE PROPOSED ENTRY DOOR WILL BE EXPOSED TO THE ELEMENTS, THE REMODEL WOULD BE LIMITED TO MAINTENANCE AND ACCESS TO THE POOL FOR MAINTENANCE WOULD REQUIRE EITHER HEADING UP A STEEP HILL OR THROUGH THE RESIDENCE.

BECAUSE OF THE EXISTING TOPOGRAPHY, DAMAGE HAS OCCURED TO THE STRUCTURE BECAUSE OF INSUFFICIENT DRAINAGE. BECAUSE OF THE DIFFICULT TERRAIN, ACCESS WITHOUT THE CUTTING IS ALSO PROHIBITIVE. THE CUT ALONG THE LEFT SIDE OF THE PROPERTY WILL REQUIRE THE REMOVAL OF 14" CHINESE TALLOW. THERE IS AN EXISTING RETAINING WALL ALONG THE RIGHT SIDE OF PROPERTY THAT IS MADE OF WOOD AND IS FAILING. BEING UNABLE TO CUT, INSTALL THE NEEDED RETAINING WALLS WILL PUT THE LONGEVITY OF THE STRUCTURE AT RISK, AS WELL AS THE ADJACENT PROPERTY.

2. WHY DO YOU THINK THE NATURAL TERRAIN AND EXISTING FLORA WILL NOT BE UNREASONABLY DISRUPTED OR DESTROYED IN THE VARIANCE YOU ARE REQUESTING IS GRANTED?

THE MAJORITY OF THE SITE WILL REMAIN INTACT THAT IS OUTSIDE OF THE LIMITS OF CONSTRUCTION. THE REQUESTED VARIANCE IS CALCULATED WITH PRESERVING AS MUCH OF THE FLORA AND NATURAL TERRAIN.

3. WHAT OTHER REASONABLE ALTERNATIVES HAVE YOU CONSIDERED? WHY WON'T THESE OTHER OPTIONS ALLEVIATE THE DIFFICULTY OR HARSHIP THAT YOU THINK EXISTS?

THE PROJECT HAS GONE THROUGH SEVERAL ITERATIONS TO AVOID SEEKING A VARIANCE. BECAUSE OF SOME OF THE DRAINAGE DAMAGE, FIELD VISITS, ETC IT WAS NOTED THAT WITHOUT THE CUT, THE OWNER WILL NEED TO KEEP AN EYE ON DRAINAGE AND POTENTIAL PROPERTY DAMAGE ALONG THE LEFT SIDE OF THE PROPERTY.

4. WHY DO YOU BELIEVE THE VARIANCE YOU ARE REQUESTING IS THE MINIMUM REQUIRED TO ALLEVIATE THE DIFFICULTY OR HARSHIP YOU THINK EXISTS?

SITE DRAINAGE IS AN ONGOING BATTLE FOR LOTS WITH DIFFICULT TERRAIN. THE CUT IS APPROXIMATELY 10' FROM THE BUILDING. DOING ANYTHING LESS MAY CREATE A MAINTENANCE ISSUE FOR THE HOMEOWNER. THE OVERHANG AT THE FRONT DOOR IS TO SCREEN WATER. THE RETAINING WALL ON THE RIGHT SIDE IS FAILING. THE WOOD STEPS ON THE RIGHT SIDE OF THE HOUSE AT DECK ARE FOR ACCESS AND MAINTENANCE.

5. WHY DO YOU BELIEVE YOUR VARIANCE DOES NOT VIOLATE THE INTENT OF THE ZONING ORDINANCE OR THE GOALS OF THE CITY'S COMPREHENSIVE PLAN?

WE CAME INTO THIS PROCESS TRYING NOT TO REQUEST VARIANCES, BUT IT WAS QUICKLY APPARENT THAT SOMETHING NEEDED TO HAPPEN WITH THE PROPERTY, NOT ONLY ASTHETICS AND SEPTIC REPLACEMENT, BUT FOR THE LONGEVITY OF THE HOME. IN SHORT, WE FEEL THE VARIANCE DOES NOT VIOLATE THE INTENT OF THE ZONING ORDINANCE OR COMPREHENSIVE PLAN BY PRESERVING AND IMPROVING THE EXISTING HOME.

6. WHY DO YOU BELIEVE YOUR VARIANCE WILL NOT ADVERSELY AFFECT NEIGHBORING PROPERTIES OR INTERFERE WITH THE ENJOYMENT OF THESE PROPERTIES BY THEIR OWNERS?

THE VARIANCES WILL NOT IMPACT ANY NEIGHBORS. THE NEIGHBORING PROPERTY DOWNHILL MAY APPRECIATE REPLACING A FAILING RETAINING WALL. THE DRAINAGE FROM THE CUT WILL BE IN LINE WITH THE EXISTING DRAINAGE PATTERN ON THE LEFT SIDE OF THE PROPERTY, AND BECAUSE OF THE HIGHER ELEVATION, SIGHT LINES TO THE WALL WILL BE EXTREMELY LIMITED AND COVERED BY THE HOUSE. REMODELING THE STRUCTURE IN THE SETBACK WILL ONLY BE BENEFICIAL TO THE NEIGHBORING PROPERTIES.



SPECIAL POWER OF ATTORNEY FORM

KNOW ALL PERSONS BY THIS DOCUMENT that I, SAMUEL LUTHER DILLARD
have made, constituted and appointed DUSTY WALDROP
to be my duly authorized representative in connection with an application dated 07.16.20,
to be heard by the Building Design Committee, Zoning & Planning Commission, and City
Council/Board of Adjustment of the City of West Lake Hills, Texas. All representations, whether
oral or written, made by the representative in support of the request have the full force and effect
of the applicant's approval. I do by this document constitute the above named representative as
my true and lawful attorney-in-fact to act in my name, place and stead, to do and perform any act
in connection with such application which I myself might perform or do if I was personally present.

Samuel L. Dillard
Property Owner/Applicant Name

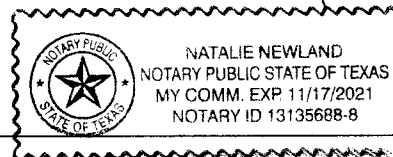
[Signature]
Property Owner/Applicant Signature

809 Canyon Creek DR. Austin TX 78746
Street Address City State Zip Code

940 867 3384
Property Owner/Applicant Phone Number

This instrument was acknowledged before me on this the 17 day of July, 20 20.

[Signature]
Notary Public in and for the State of Texas



LETTER TO ZAPCO CHAIRPERSON

DATE 07.16.2020

Chairman Robert Meisel
West Lake Hills Zoning and Planning Commission
911 Westlake Dr
West Lake Hills, Texas 78746

Dear Mr. Chairman:

The home was recently purchased and it was apparent that the home required some major repairs and septic replacement due to age and drainage issues. Because of the cost of repairing and replacing, it was decided to tackle these items plus the additional scope of work since it would be more cost effective to perform all of the work at the same time.

The home has gone through several iterations to minimize encroachments into the setback. The left side addition has been pulled back from the setback completely. Unfortunately, most of the front of the structure and a portion of the right side of the structure currently encroach regardless. Drainage along the left side of the house has caused wood rot on the existing home and without the cut may prove difficult to provide positive drainage away from the slab. An old wooden retaining wall along the right side of the property is failing and needs to be replaced. It is currently in the setback and a couple feet high.

Because of this, we are asking for the following variances.

1. Setbacks 22.03.275(3) – reduction in interior side setback, for new steps to deck, rehabilitation of existing structure, and existing overhang.
2. Setbacks 22.03.275 (3) – reduction in front setback to allow rehabilitation of existing structure, and new rain screen overhang over front door.
3. Setbacks 22.03.275 (3) – reduction in side street setback for rehabilitation of existing structure, and addition overhangs.
4. Setbacks for Accessory Structures 22.03.276 – this variance would apply to the replacement of the failing retaining wall on the right side of house and the new >6' retaining wall on the left side of the house
5. 22.03.170(G) – retaining walls >6' in height. Variance to cut and build retaining wall >6' in height
6. 22.03.170(f) Grading and Drainage – proposed cut along left side of house to improve drainage.
7. 22.03.304(4) Tree and Vegetation- As part of the cut along the left side of the property we will require the removal of a 14" Chinese Tallow.

We understand that the project is complex in nature, and find ourselves asking for these variances to improve the quality, functionality, and livability of the existing structure, while improving the property with as minimum of impact to the existing site as feasible.

Best Regards

D Waldrop

LOT 5
THE RESUBDIVISION OF PART OF
LOST CANYON RANCH
VOLUME 75 PAGE 200

LOT 19
STONEHEDGE ESTATES - BLOCK P
VOLUME 13 PAGE 18

DILLARD RESIDENCE REMODEL
809 CANYON CREEK WESTLAKE, TX
SITEPLAN - VARIANCE EXHIBIT

PERMIT SET
shelter • design studio + workshop
78704 • 512 .657 .4705 • randal@shelterdesignstudio.com

DATE: AUGUST 4, 2020
JOB NUMBER:
DRAWN BY:
CHECKED BY:
INITIALS

3607 S Lamar Blvd Suite 102 • Austin, Texas

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REVISIONS

SPS
O F : XX

Page 22 of 64

1 SITE PLAN - VARIANCES

LOST CANYON (50' R.O.W.)

1" = 10'-0"

VARIANCES

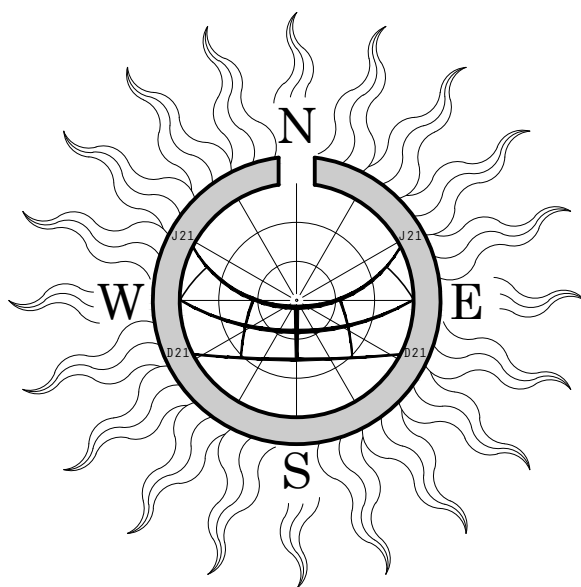
1. SETBACKS 22.03.275(3) BUILDING SETBACK DISTANCES - THIS WILL APPLY TO THE EXISTING HOUSE TO BE REMODELED,
(1A) THE NEW OVERHANG AT THE FRONT DOOR, 3' DEEP STEEL AWNING.
(1B) NEW DECK STEPS ON THE RIGHT SIDE OF HOUSE TO REPLACE EXISTING.
2. REDUCE FRONT FROM 50 TO 30 - FOR AWNING AND REHABILITATION OF EXISTING STRUCTURE.
REPLACE WINDOW WITH AN ENTRY DOOR. REPLACE EXISTING WINDOWS, NEW STEEL AWNING AT FRONT ENTRY DOOR. REPAIR AND REPLACE EXISTING SIDING AND TRIM.
3. REDUCE SIDE STREET FROM 50 TO 30 - REHABILITATION OF EXISTING STRUCTURE.
REPLACE EXISTING DOORS, REPLACE EXISTING WINDOWS, AND REPAIR AND REPLACE EXISTING SIDING AND TRIM.
4. REDUCE INTERIOR SIDE FROM 25 TO 5' TO REHAB EXISTING STRUCTURE.
REDUCTION TO 5' TO ACCOUNT FOR EXISTING OVERHANG.
REPLACE EXISTING WINDOWS, AND REPAIR AND REPLACE EXISTING SIDING AND TRIM.
5. 22.03.276 SETBACKS FOR ACCESSORY STRUCTURES -RETAINING WALLS - THIS WILL APPLY TO BOTH NEW RETAINING WALLS.
(5A) REPLACE THE EXISTING WOODEN WALL ON THE RIGHT SIDE OF THE HOUSE THAT IS FAILING. EXISTING HEIGHT VARIES 12"-24"
(5B) NEW RETAINING WALL FOR THE +/- 10' CUT ON THE LEFT SIDE OF THE HOUSE, FACING EXISTING HOUSE, HIDDEN FROM THE NEIGHBORS AND STREET.
6. 22.03.170(6) - RETAINING WALL GREATER THAN 6' IN HEIGHT - THIS APPLIES TO THE WALL ON THE LEFT SIDE OF THE HOUSE.
FINAL MAX HEIGHT BETWEEN 9'-10'. FACING EXISTING HOUSE, HIDDEN FROM THE NEIGHBORS AND STREET.
7. 22.03.170 (F) GRADING AND DRAINAGE - ASSUMED FOR CUT ON LEFT SIDE OF HOUSE > 18" IN A SETBACK NO EXCAVATION, GRADING OR FILLING SHALL BE PERMITTED IN SETBACKS EXCEPT FOR UP TO 18 INCHES IN HEIGHT OR DEPTH
EXPANDING EXISTING SITE CUT FROM 5' TO 8' OFF THE EXISTING HOUSE TO 10' FROM THE EXISTING HOUSE TO ACCOMMODATE SUFFICIENT SITE DRAINAGE
8. 22.03.304(4) - TREE AND VEGETATION REMODEL AND REPLACEMENT
WE ARE PROPOSING THE REMOVAL OF TREES 182 (14" CHINESE TALLOW)

AREA OF VARIANCES
AREA OF NEW ADDITIONS

CANYON CREEK
(40' R.O.W.)

EDGE OF PAVEMENT

LOT 2



5' X 40' GUY EASEMENT
PER PLAT

N80°06'11"W
C=92.07'
A=92.46'
R=298.98'

S56°31'04"W 64.71'

N88°32'00"W 98.07'

LOT 1

EXISTING GARAGE
WITH SECOND FLOOR
LIVING SPACE

EXISTING
ONE STORY
ROCK AND FRAME
HOUSE

EXPAND EXISTING CUT FOR
DRAINAGE, SEPTIC, AND
CONSTRUCTION ACCESS

RETAINING WALL
MAX HEIGHT 10'-0"

10' BUILDING LINE
PER PLAT

30' BUILDING LINE
PER PLAT

30' BUILDING LINE
PER PLAT

25' BUILDING LINE

S55°21'17"E 174.77'

10' BUILDING LINE
PER PLAT

25' BUILDING LINE

N19°03'08"E 196.83'

0.4'

0.6'

LEGEND

① 1/2" IRON ROD FOUND
● FIRE HYDRANT
⊙ WATER METER
⊙ SEPTIC LID
⊙ SANITARY CLEANOUT
⊙ AIR CONDITIONER
▲ IRRIGATION CONTROL VALVE

— X — WIRE FENCE
— // — WOOD BOARD FENCE
- - - - - OVERHEAD UTILITY LINE
○ TREE "CROWN"
AND
○ TREE TAG NUMBER

▨ ROCK WALL
(RECORD BEARING AND DISTANCE)

LOT 5
THE RESUBDIVISION OF PART OF
LOST CANYON RANCH
VOLUME 75 PAGE 200

N19°03'08"E 196.83'

LOT 19
STONEHEDGE ESTATES - BLOCK P
VOLUME 13 PAGE 18

BUILDING COVERAGE (PROPOSED)	
AREAS	COVERAGE
1ST FLOOR CONDITIONED AREA *	2786
2ND FLOOR CONDITIONED AREA	--
3RD FLOOR CONDITIONED AREA	--
BASEMENT	--
GARAGE / CARPORT *	640
WOOD DECKS	--
BREEZEWAYS	42
COVERED PATIOS *	--
COVERED PORCHES *	388
BALCONIES *	--
SWIMMING POOLS	--
STORAGE	164
OTHER BLDG / COVERED	178
TOTAL BUILDING AREA	4198

TOTAL BUILDING COVERAGE ON LOT	
BUILDING AREA	3174
AREA OF LOT	30,492.0
PERCENT OF COVERAGE	10.4%

SCHEDULE OF DRAWINGS	
SP-1	SITE PLAN
SP-2	EXISTING SURVEY
SP-2	SITE ACCESS PLAN
A-1.1	FIRST FLOOR NOTES PLAN
A-2.1	ELEVATIONS
A-2.2	ELEVATIONS
A-2.2	DOOR & WINDOW SCHEDULES
A-3.1	ROOF PLAN
A-4.1	INTERIOR ELEVATIONS
A-5.1	FIRST FLOOR ELECTRICAL PLAN

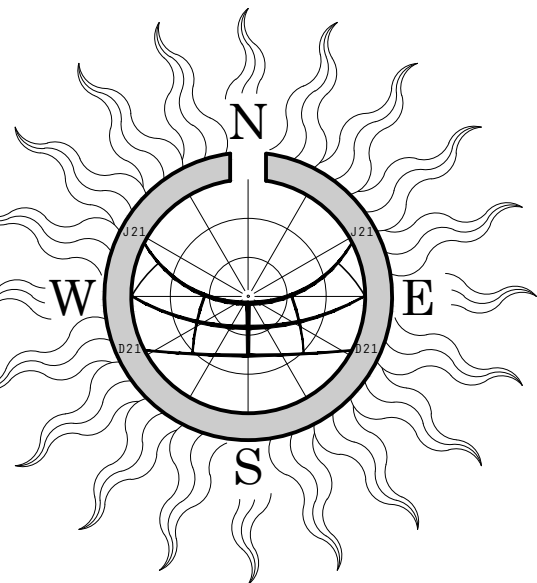
BUILDER TO VERIFY METES AND BOUNDS,
BUILDING LINES AND EASEMENTS PRIOR
TO PERFORMING ANY LOT IMPROVEMENTS.

LEGAL DESCRIPTION
LOT 1 BLK P STONEHEDGE ESTATES BLK P
TRAVIS COUNTY, TEXAS

BUILDER
DUSTY WALDROP
WALDROP BECKWORTH, LLC
BUILDER/BROKER
512-342-9500

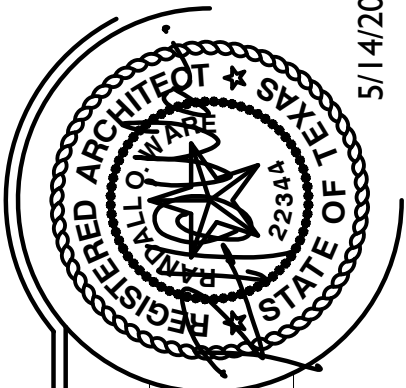
SURVEYOR
HOLT CARSON INCORPORATED
PROFESSIONAL LAND SURVEYORS
1904 FORTVIEW ROAD AUSTIN, TX
(512) 442-0990

IMPERVIOUS COVERAGE CHART		
AREAS	EXIST.	NEW
TOTAL BUILDING COVERAGE	3072	94
DRIVEWAY AREA	716	--
SIDEWALK & WALKWAYS	54	--
UNCOVERED PATIOS	--	--
UNCOVERED WOOD DECKS	350	59
AC & SPA EQUIP. PADS	40	--
CONCRETE DECKS	521	211
OTHER- LANDSCAPE WALLS & STEPS	281	121
POOL / SPA	544	--
TOTAL COVERED	5578	485
AREA OF LOT		30,492.0
PERCENTAGE OF LOT COVERED		19.9%
25% ALLOWABLE		7623
EXISTING IMPERVIOUS COVERAGE CHART IS ON SP2		



1 SITE PLAN - NEW

1" = 10'-0"



DATE: MAY 14, 2020
JOB NUMBER: --
DRAWN BY: ROW
CHECKED BY: INITIALS

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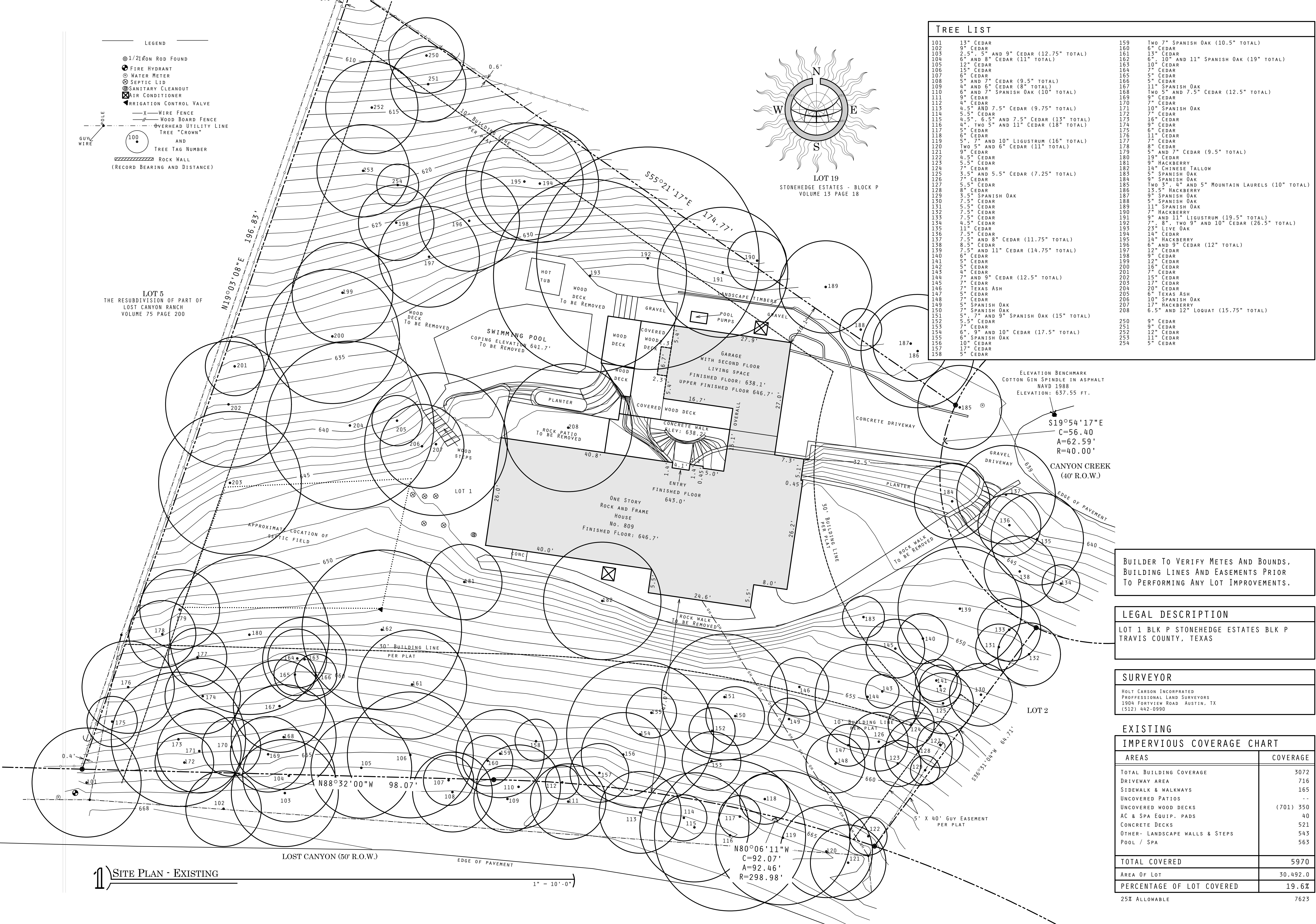
DILLARD RESIDENCE REMODEL
809 CANYON CREEK WESTLAKE, TX

SITEPLAN

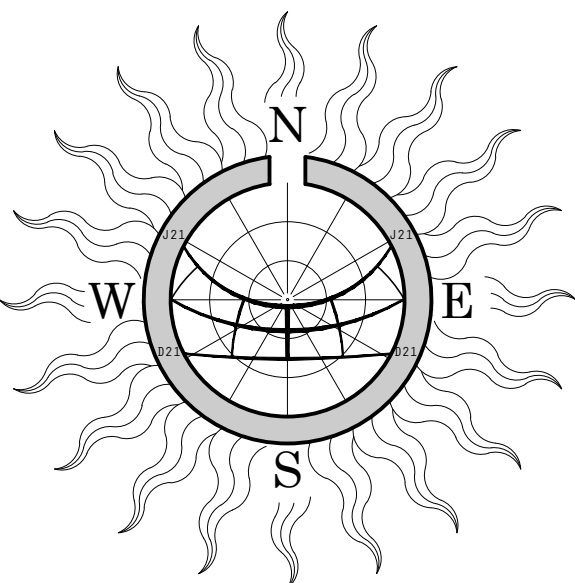
REVISIONS	

SP1

OF XX



- LEGEND
- 1/2" IRON ROD FOUND
 - FIRE HYDRANT
 - WATER METER
 - SEPTIC LID
 - SANITARY CLEANOUT
 - AIR CONDITIONER
 - IRRIGATION CONTROL VALVE
 - WIRE FENCE
 - WOOD BOARD FENCE
 - OVERHEAD UTILITY LINE
 - TREE "CROWN"
 - AND
 - TREE TAG NUMBER
 - ROCK WALL
 - (RECORD BEARING AND DISTANCE)



LOT 19
STONEHEDGE ESTATES - BLOCK P
VOLUME 13 PAGE 18

TREE LIST			
101	13" CEDAR	159	TWO 7" SPANISH OAK (10.5" TOTAL)
102	9" CEDAR	160	6" CEDAR
103	2.5", 5" AND 9" CEDAR (12.75" TOTAL)	161	13" CEDAR
104	6" AND 8" CEDAR (11" TOTAL)	162	10" AND 11" SPANISH OAK (19" TOTAL)
105	12" CEDAR	163	10" CEDAR
106	15" CEDAR	164	7" CEDAR
107	6" CEDAR	165	5" CEDAR
108	5" AND 7" CEDAR (9.5" TOTAL)	166	5" CEDAR
109	4" AND 6" CEDAR (8" TOTAL)	167	11" SPANISH OAK
110	6" AND 7" SPANISH OAK (10" TOTAL)	168	TWO 5" AND 7.5" CEDAR (12.5" TOTAL)
111	9" CEDAR	169	9" CEDAR
112	4" CEDAR	170	7" CEDAR
113	4.5" AND 7.5" CEDAR (9.75" TOTAL)	171	10" SPANISH OAK
114	5.5" CEDAR	172	7" CEDAR
115	4.5", 6.5" AND 7.5" CEDAR (13" TOTAL)	173	16" CEDAR
116	4", TWO 5" AND 11" CEDAR (18" TOTAL)	174	9" CEDAR
117	5" CEDAR	175	6" CEDAR
118	6" CEDAR	176	11" CEDAR
119	5", 7" AND 10" LIGUSTRUM (16" TOTAL)	177	7" CEDAR
120	TWO 5" AND 6" CEDAR (11" TOTAL)	178	8" CEDAR
121	9" CEDAR	179	5" AND 7" CEDAR (9.5" TOTAL)
122	4.5" CEDAR	180	19" CEDAR
123	5.5" CEDAR	181	9" HACKBERRY
124	7" CEDAR	182	14" CHINESE TALLOW
125	3.5" AND 5.5" CEDAR (7.25" TOTAL)	183	5" SPANISH OAK
126	7" CEDAR	184	9" SPANISH OAK
127	5.5" CEDAR	185	TWO 3", 4" AND 5" MOUNTAIN LAURELS (10" TOTAL)
128	8" CEDAR	186	13.5" HACKBERRY
129	3.5" SPANISH OAK	187	9" SPANISH OAK
130	7.5" CEDAR	188	5" SPANISH OAK
131	5.5" CEDAR	189	11" SPANISH OAK
132	7.5" CEDAR	190	7" HACKBERRY
133	7.5" CEDAR	191	9" AND 11" LIGUSTRUM (19.5" TOTAL)
134	4.5" CEDAR	192	8", TWO 9" AND 10" CEDAR (26.5" TOTAL)
135	11" CEDAR	193	23" LIVE OAK
136	7.5" CEDAR	194	14" CEDAR
137	7.5" AND 8" CEDAR (11.75" TOTAL)	195	14" HACKBERRY
138	8.5" CEDAR	196	6" AND 9" CEDAR (12" TOTAL)
139	7.5" AND 11" CEDAR (14.75" TOTAL)	197	12" CEDAR
140	9" CEDAR	198	9" CEDAR
141	5" CEDAR	199	12" CEDAR
142	5" CEDAR	200	16" CEDAR
143	4" CEDAR	201	7" CEDAR
144	7" AND 9" CEDAR (12.5" TOTAL)	202	15" CEDAR
145	7" CEDAR	203	17" CEDAR
146	7" TEXAS ASH	204	20" CEDAR
147	5" CEDAR	205	6" TEXAS ASH
148	7" CEDAR	206	10" SPANISH OAK
149	5" SPANISH OAK	207	17" HACKBERRY
150	7" SPANISH OAK	208	6.5" AND 12" LOQUAT (15.75" TOTAL)
151	5" AND 9" SPANISH OAK (15" TOTAL)	250	9" CEDAR
152	5.5" CEDAR	251	9" CEDAR
153	7" CEDAR	252	12" CEDAR
154	6", 9" AND 10" CEDAR (17.5" TOTAL)	253	11" CEDAR
155	6" SPANISH OAK	254	5" CEDAR
156	10" CEDAR		
157	17" CEDAR		
158	5" CEDAR		

BUILDER TO VERIFY METES AND BOUNDS,
BUILDING LINES AND EASEMENTS PRIOR
TO PERFORMING ANY LOT IMPROVEMENTS.

LEGAL DESCRIPTION

LOT 1 BLK P STONEHEDGE ESTATES BLK P
TRAVIS COUNTY, TEXAS

SURVEYOR

HOLT CARSON INCORPORATED
PROFESSIONAL LAND SURVEYORS
1904 FORTVIEW ROAD AUSTIN, TX
(512) 442-0990

EXISTING

IMPERVIOUS COVERAGE CHART

AREAS	COVERAGE
TOTAL BUILDING COVERAGE	3072
DRIVEWAY AREA	716
SIDEWALK & WALKWAYS	165
UNCOVERED PATIOS	--
UNCOVERED WOOD DECKS	(701) 350
AC & SPA EQUIP. PADS	40
CONCRETE DECKS	521
OTHER- LANDSCAPE WALLS & STEPS	543
POOL / SPA	563

TOTAL COVERED	5970
AREA OF LOT	30,492.0
PERCENTAGE OF LOT COVERED	19.6%

25% ALLOWABLE

7623

PERMIT SET

DILLARD RESIDENCE REMODEL

809 CANYON CREEK WESTLAKE, TX

SITEPLAN - EXISTING

REVISIONS

SPD

OF XX

DATE: MAY 14, 2020
JOB NUMBER: 188
DRAWN BY: ROW
CHECKED BY: INITIALS

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5/14/20

1 SITE PLAN - EXISTING

1" = 10'-0"

1. GENERAL NOTES:

1. PLANS THAT ARE NOT SIGNED AND SEALED BY RANDALL O. WARE, ARCHITECT ARE TO BE CONSIDERED PRELIMINARY.

2. BUILDER TO REFER TO IRC 2015, SECTION R308.1 - R308.6 FOR WINDOW GLAZING REQUIREMENTS IN HAZARDOUS LOCATIONS.

3. HVAC ZONE 1:
MAIN HOUSE

4. W.H. ZONE 1:
MAIN HOUSE

HVAC ZONE 2:

W.H. ZONE 2:

HVAC ZONE 3:

5. THE WORKING DRAWINGS IN THIS SET MAY NOT ADDRESS ALL THE REQUIREMENTS IN THE BUILDING CODES. IT IS THE CONTRACTORS RESPONSIBILITY TO KNOW THE CODES AND THAT CONSTRUCTION COMPLY WITH THE LATEST VERSION OF THE BUILDING CODES AS ADOPTED BY THE JURISDICTION HAVING AUTHORITY OVER THIS PROJECT. (THIS MAY INCLUDE THE FOLLOWING VERSIONS: THE 2015 INTERNATIONAL RESIDENTIAL CODE, 2015 INTERNATIONAL ENERGY CONSERVATION CODE, 2015 UNIFORM PLUMBING CODE, 2015 UNIFORM MECHANICAL CODE, AND 2011 NATIONAL ELECTRIC CODE.)

6. THE CONTRACTOR MUST REFER TO NOTE, DIMENSION AND ENGINEERING PLANS TO FRAME OR TO PROVIDE ENGINEERED TRUSSES FOR THIS HOUSE.

7. MINIMUM HEARTH EXTENSION REQUIREMENTS FOR FIREPLACE OPENINGS AS PER THE 2015 INTERNATIONAL RESIDENTIAL CODE (SEE DRAWINGS A & B BELOW.)

12"

3'-6"

12"

1'-8"

MIN.

HEARTH EXTENSION

12"

3'-6"

12"

1'-4"

MIN.

A. HEARTH FOR 42" FIREPLACE

12"

3'-6"

12"

1'-8"

MIN.

HEARTH EXTENSION

12"

3'-6"

12"

1'-4"

MIN.

B. HEARTH FOR 36" FIREPLACE

8. MINIMUM AND MAXIMUM STAIR REQUIREMENTS AS PER THE 2015 INTERNATIONAL RESIDENTIAL CODE SECTION R311.7. (SEE DWG. C BELOW)

C. STAIR DETAIL

1 1/4" MIN TO 2" MAX DIA.

CONTINUOUS RAIL W/ BALUSTERS AT 4" O.C.

2 X 12 STRINGERS

11"

10" MIN.

7.75" MAX.

34" MIN.

38" MAX. HT.

SEE PLAN FOR DIM.

9. NOTE: REFER TO NOTE, DIMENSION AND ENGINEERING PLANS TO FRAME OR TO PROVIDE TRUSSES FOR THIS HOUSE

10. DOOR OPENING SIZES ARE ABBREVIATED AS FOLLOWS:

3080

= 3'-0"W X 8'-0"H DOOR

2. ABBREVIATIONS:

WINDOWS

GL. - GLASS

TEMP - TEMPERED GLASS

DOORS

FG. - FIBERGLASS

SL. - SINGLE LIGHT

SC. - SOLID CORE

MECHANICAL

R.A.G. - RETURN AIR GRILL

FLOORING

CONC - CONCRETE

CRPT - CARPET

HDWD - HARDWOOD

S. TILE - STONE TILE

MISC.

CLG. - CEILING

TEMP - TEMPERED GLASS

COL. - COLUMN

ELL. - ELLIPTICAL

FD - FURR DOWN

HB - HOSE BIB

MAS - MASONRY

MFCTR. - MANUFACTURER

MTL - METAL

OPT - OPTIONAL

R.A.G. - RETURN AIR GRILL

S.R.O. - SHEET ROCK OPENING

V.W.B. - VERIFY WITH BUILDER

V.W.O. - VERIFY WITH OWNER

V.W.A. - VERIFY WITH ARCHITECT

3. LEGEND

2 X 4 WALL

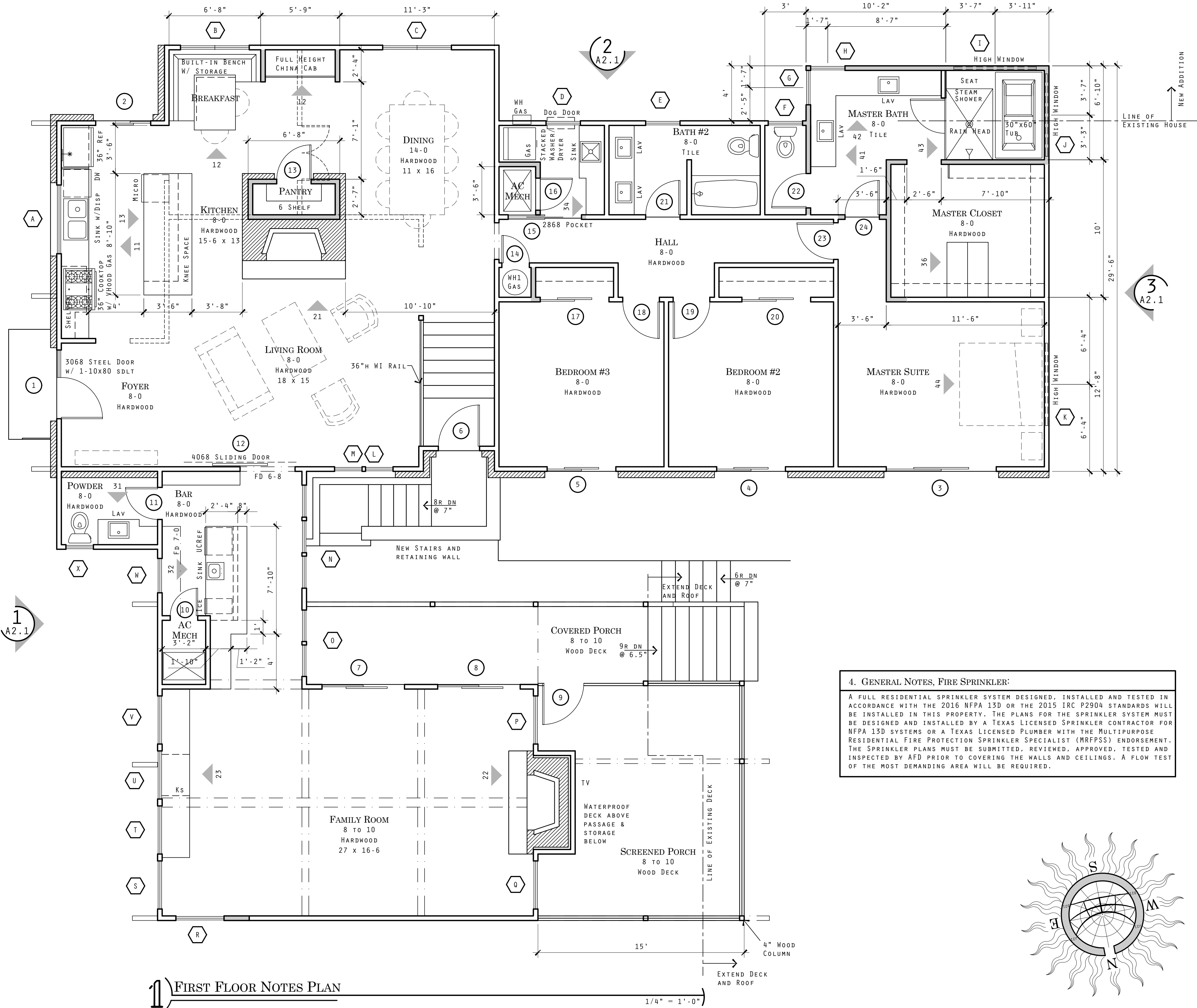
2 X 6 WALL

MASONRY WALL

EXISTING WALLS

WALLS TO BE REMOVED

NEW WALLS



4. GENERAL NOTES, FIRE SPRINKLER:

A FULL RESIDENTIAL SPRINKLER SYSTEM DESIGNED, INSTALLED AND TESTED IN ACCORDANCE WITH THE 2016 NFPA 13D OR THE 2015 IRC P2904 STANDARDS WILL BE INSTALLED IN THIS PROPERTY. THE PLANS FOR THE SPRINKLER SYSTEM MUST BE DESIGNED AND INSTALLED BY A TEXAS LICENSED SPRINKLER CONTRACTOR FOR NFPA 13D SYSTEMS OR A TEXAS LICENSED PLUMBER WITH THE MULTIPURPOSE RESIDENTIAL FIRE PROTECTION SPRINKLER SPECIALIST (MRFPS) ENDORSEMENT. THE SPRINKLER PLANS MUST BE SUBMITTED, REVIEWED, APPROVED, TESTED AND INSPECTED BY AFD PRIOR TO COVERING THE WALLS AND CEILINGS. A FLOW TEST OF THE MOST DEMANDING AREA WILL BE REQUIRED.

DATE: MAY 14, 2020
JOB NUMBER: XX
DRAWN BY: INITIALS
CHECKED BY: INITIALS

PERMIT SET

DILLARD RESIDENCE REMODEL
809 CANYON CREEK WESTLAKE, TX

FIRST FLOOR NOTES PLAN

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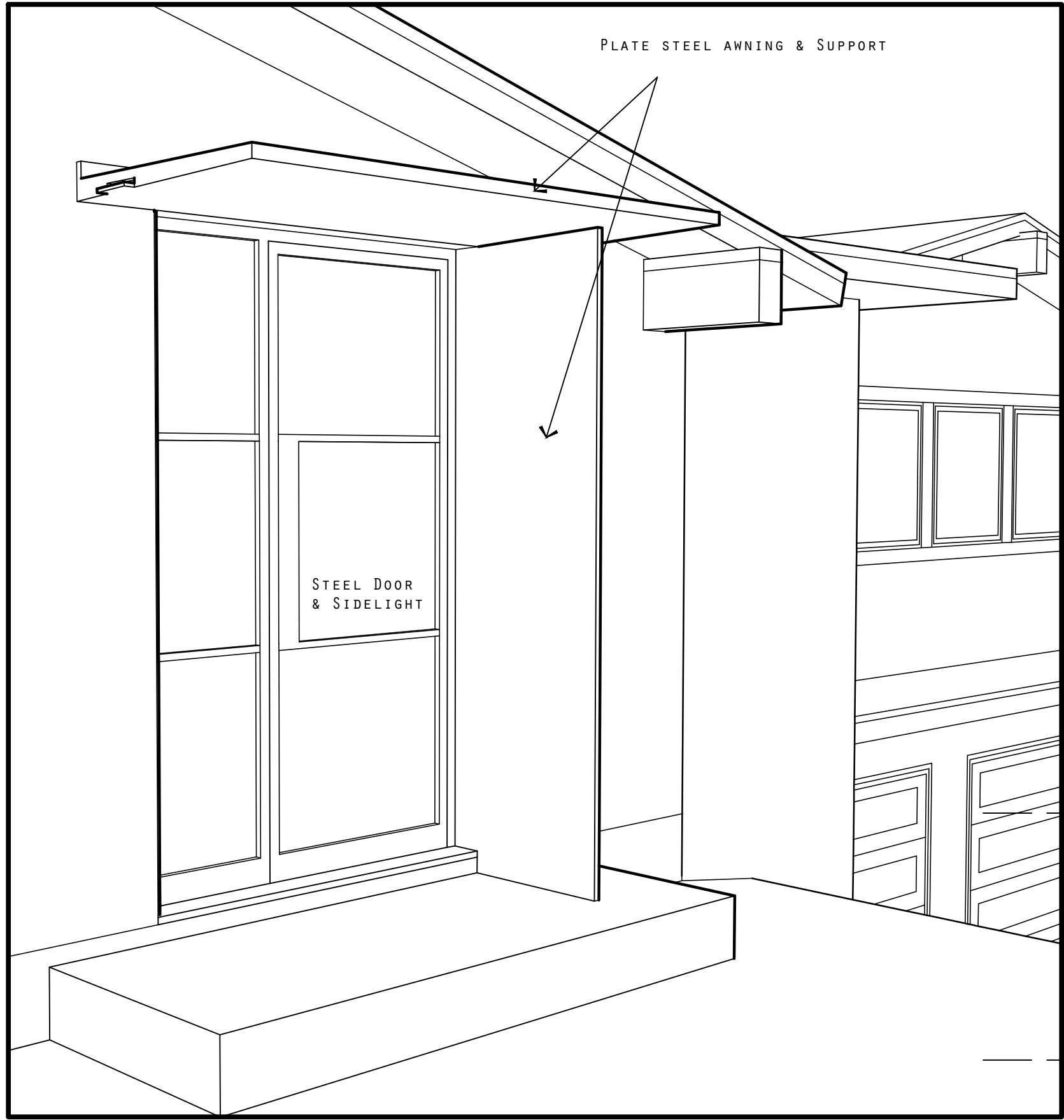
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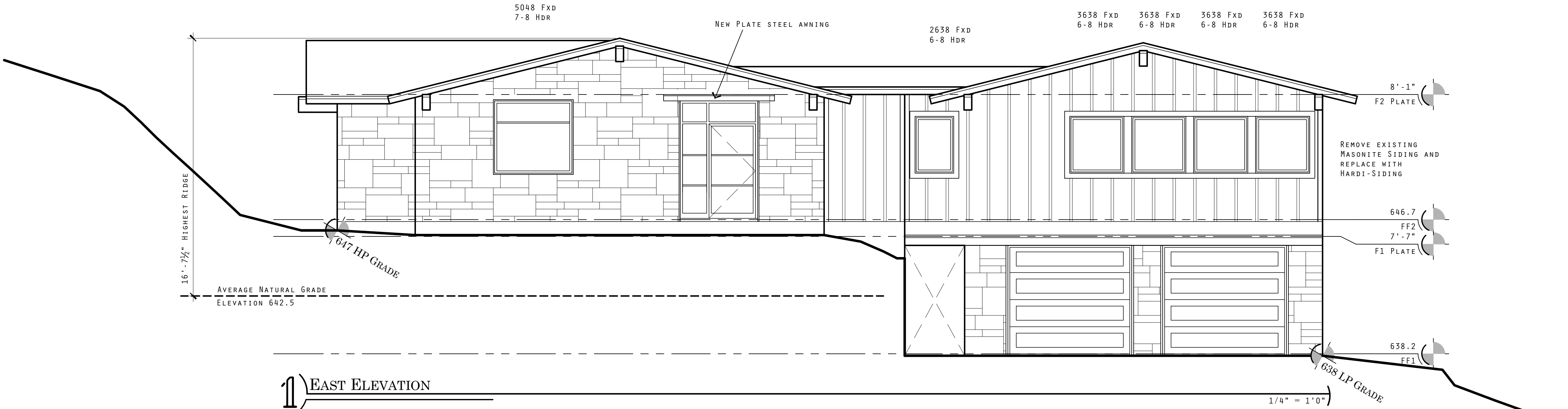
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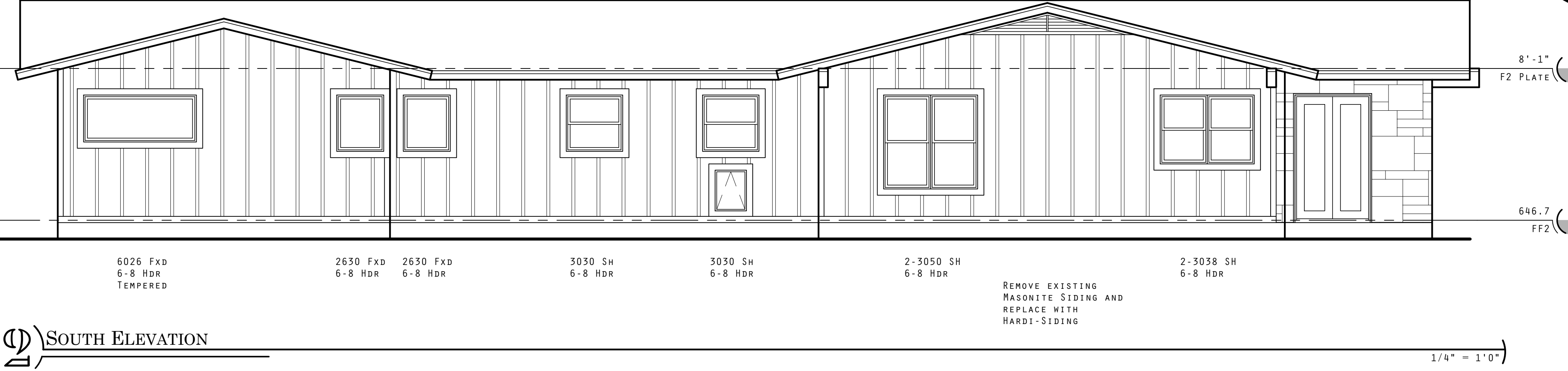
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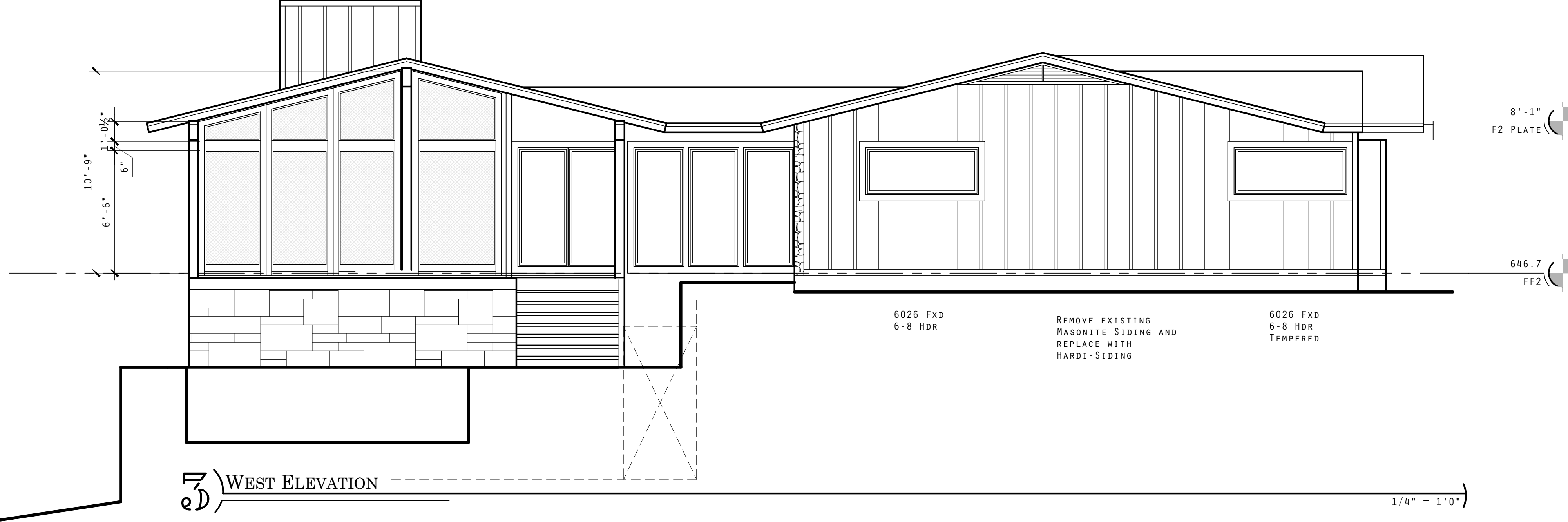
1 ENTRY AWNING



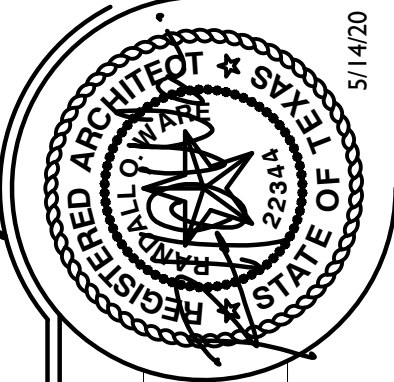
1 EAST ELEVATION



2 SOUTH ELEVATION



3 WEST ELEVATION



DATE: MAY 14, 2020
JOB NUMBER: XX
DRAWN BY: INITIALS
CHECKED BY: INITIALS

PERMIT SET

DILLARD RESIDENCE REMODEL
809 CANYON CREEK WESTLAKE, TX
EXTERIOR ELEVATIONS

REVISIONS

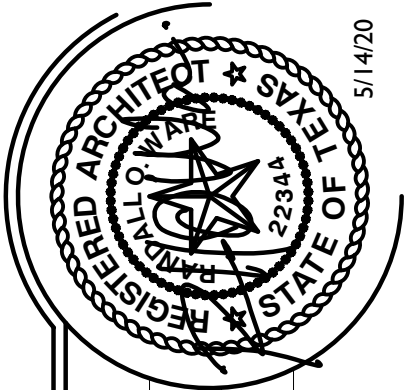
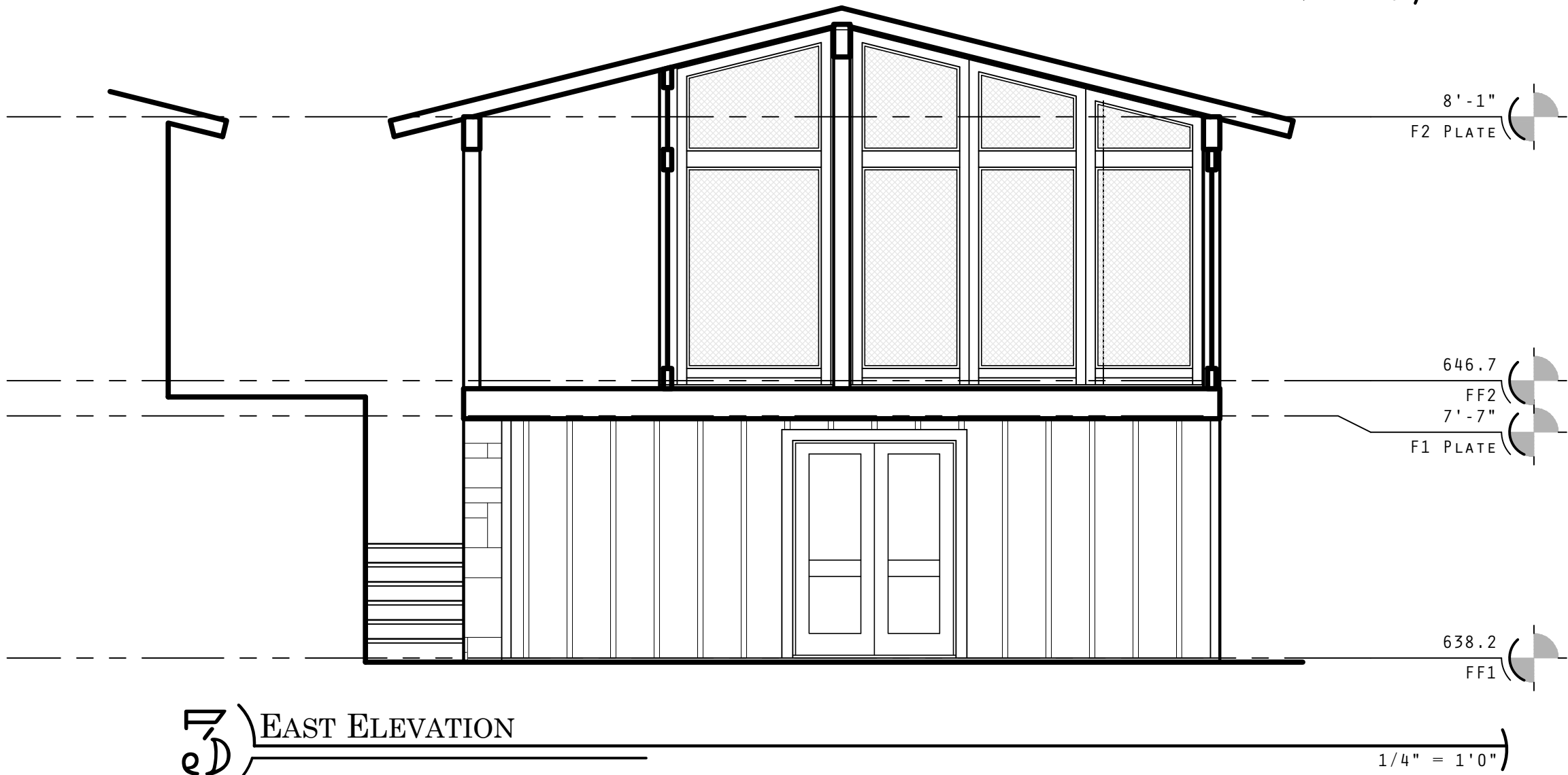
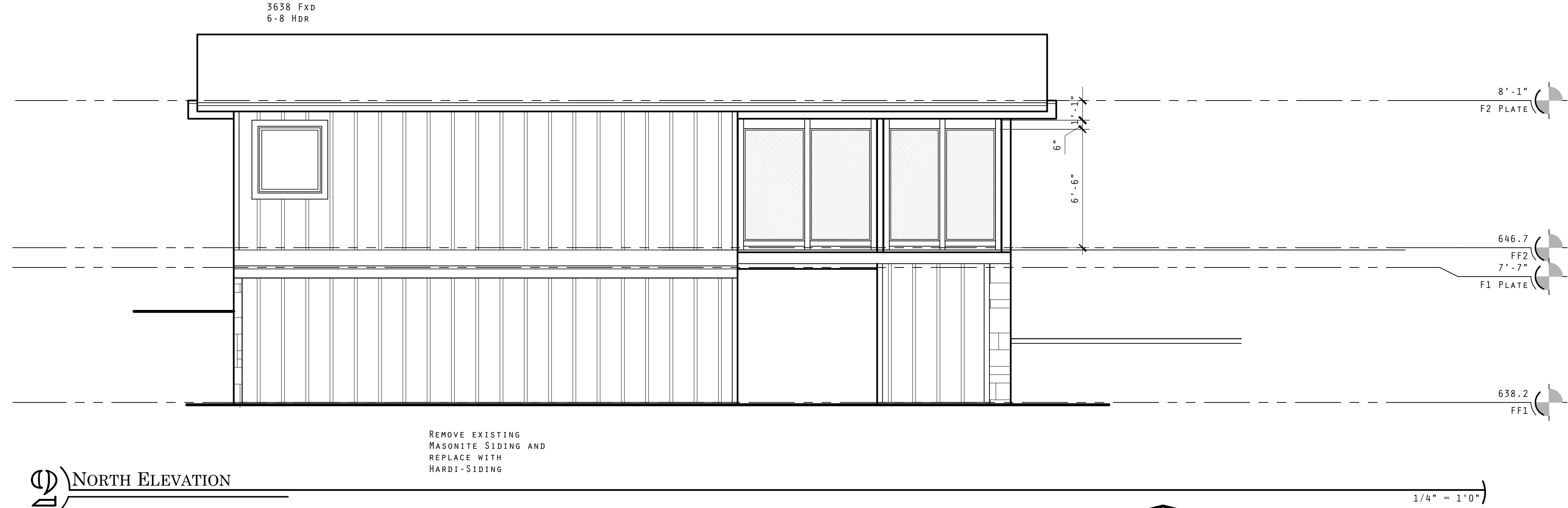
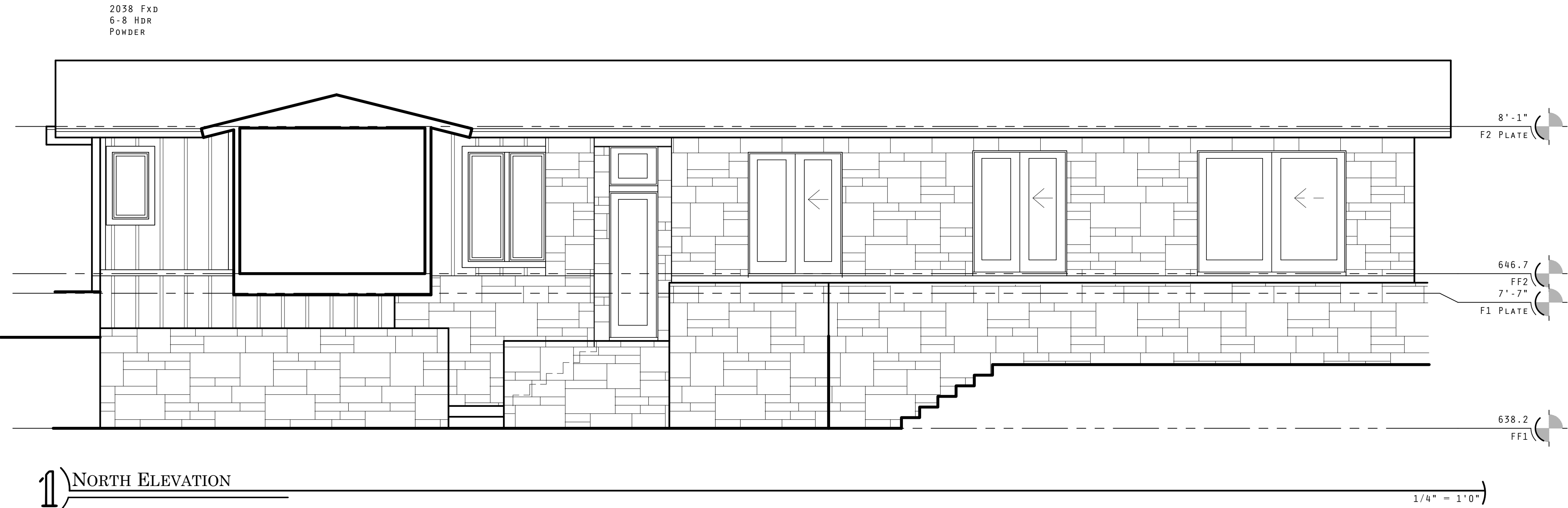
A2.1
O F : XX

5/14/20

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78704 • 512 • 657 • 4705 • randall@shelterdesignstudio.com

3607 S Lamar Blvd Suite 102 • Austin, Texas

© 2020 • Randall O. Ware



DATE: MAY 14, 2020
JOB NUMBER: XX
DRAWN BY: INITIALS
CHECKED BY: INITIALS

PERMIT SET

DILLARD RESIDENCE REMODEL
809 CANYON CREEK WESTLAKE, TX

EXTERIOR ELEVATIONS

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REVISIONS	
Δ	
Δ	
Δ	

A2.2
O F : XX



This view is on the left side of the house, looking towards the front from the rear. This area is a constant water issue to the existing home. In an effort to quell the water and prevent damage the previous owners installed a makeshift culvert to divert the water to the front. Regardless of the culvert, the house still suffered damage from the water runoff. The proposed cut, is approximately 10' from the overhang. This will provide ample space for water to drain without causing further damage to home.



This is a view on the right side of the house, showing the old woodend retaining wall that is failing. The wood timbers are separating and bulding out.

LOT 5
THE RESUBDIVISION OF PART OF
LOST CANYON RANCH
VOLUME 75 PAGE 200

LOT 19
STONEHEDGE ESTATES - BLOCK P
VOLUME 13 PAGE 18

1 SITE PLAN - VARIANCES

LOST CANYON (50' R.O.W.)

1" = 10'-0"

VARIANCES

1. SETBACKS 22.03.275(3) BUILDING SETBACK DISTANCES - THIS WILL APPLY TO THE EXISTING HOUSE TO BE REMODELED,
NEW DECK STEPS ON THE RIGHT SIDE OF HOUSE TO REPLACE EXISTING.
REPLACE EXISTING WINDOWS, AND REPAIR AND REPLACE EXISTING SIDING AND TRIM.

2. REDUCE FRONT FROM 50 TO 30 - FOR AWNING AND REHABILITATION OF EXISTING STRUCTURE.
REPLACE WINDOW WITH AN ENTRY DOOR. REPLACE EXISTING WINDOWS, NEW STEEL AWNING AT FRONT ENTRY DOOR. REPAIR AND REPLACE EXISTING SIDING AND TRIM. ADD NEW OVERHANG AT THE FRONT DOOR, 3' DEEP STEEL AWNING.

3. REDUCE SIDE STREET FROM 50 TO 30 - REHABILITATION OF EXISTING STRUCTURE.
REPLACE EXISTING DOORS, REPLACE EXISTING WINDOWS, AND REPAIR AND REPLACE EXISTING SIDING AND TRIM.

4. 22.03.276 SETBACKS FOR ACCESSORY STRUCTURES -RETAINING WALLS - THIS WILL APPLY TO BOTH NEW RETAINING WALLS.
(4A) REPLACE THE EXISTING WOODEN WALL ON THE RIGHT SIDE OF THE HOUSE THAT IS FAILING. EXISTING HEIGHT VARIES 12"-24"
(4B) NEW RETAINING WALL FOR THE +/- 10' CUT ON THE LEFT SIDE OF THE HOUSE. FACING EXISTING HOUSE, HIDDEN FROM THE NEIGHBORS AND STREET.

5. 22.03.170(6) - RETAINING WALL GREATER THAN 6' IN HEIGHT - THIS APPLIES TO THE WALL ON THE LEFT SIDE OF THE HOUSE.
FINAL MAX HEIGHT BETWEEN 9'-10'. FACING EXISTING HOUSE, HIDDEN FROM THE NEIGHBORS AND STREET.

6. 22.03.170 (F) GRADING AND DRAINAGE - ASSUMED FOR CUT ON LEFT SIDE OF HOUSE > 18" IN A SETBACK NO EXCAVATION, GRADING OR FILLING SHALL BE PERMITTED IN SETBACKS EXCEPT FOR UP TO 18 INCHES IN HEIGHT OR DEPTH
EXPANDING EXISTING SITE CUT FROM 5' TO 8' OFF THE EXISTING HOUSE TO 10' FROM THE EXISTING HOUSE TO ACCOMMODATE SUFFICIENT SITE DRAINAGE

7. 22.03.304(4) - TREE AND VEGETATION REMODEL AND REPLACEMENT
WE ARE PROPOSING THE REMOVAL OF TREES 182 (14" CHINESE TALLOW)

AREA OF VARIANCES

AREA OF NEW ADDITIONS

DATE: SEPTEMBER 2, 2020
JOB NUMBER:
DRAWN BY:
CHECKED BY:
INITIALS

PERMIT SET

DILLARD RESIDENCE REMODEL
809 CANYON CREEK WESTLAKE, TX

SITEPLAN - VARIANCE EXHIBIT

shelter • design studio + workshop
78704 • 512 .657 .4705 • randal@shelterdesignstudio.com

REVISIONS	

SPS

O F : XX

Page 30 of 64

Anjali,

As Randall stated below, the excavation/septic contractor that looked at the site with us said he needed 10ft to safely maneuver his machinery around the left side of the house so that the necessary improvements to the septic and residence could be completed.

Prior to coming to you with our plans, we spent numerous hours over several months discussing various options on how to tackle this project with its many hardships. As you can see by the site plan, we have a 60ft grade change from left to right of the property. This severe slope limits our options to access the left side of the house where the work is needed. We explored coming from Lost Canyon, the right side of the house, and ultimately settled on left side of the house. Entering the site from the cul-de-sac, and along the left side of the house is the least amount of overall impact on the property, the safest route for machinery to ingress/egress for improvements, and quite honestly the only real option we have.

As I stated above, the plans we have submitted thus far are the result of 18 months of work. It is a collaboration of effort by myself as general contractor, Randall as the architect, and Jay as the civil engineer. We put the plans together after meeting with numerous subcontractors onsite to determine the safest route for the necessary machinery, and the least impactful to the overall site.

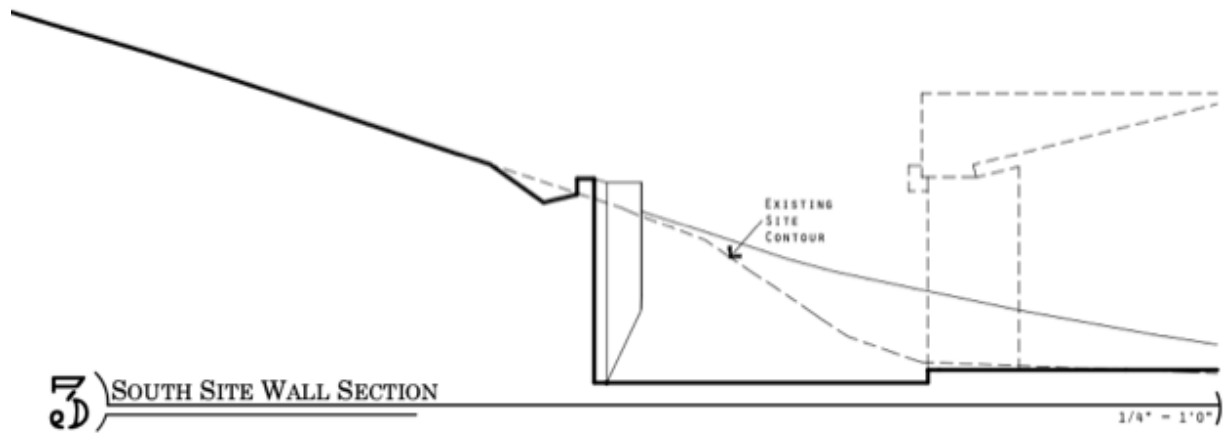
Please do not push this project to another month. The house in its current state is not livable. We have been working very diligently to address all of the requirements thrown at us. Our client has spent over \$50,000 to assemble a team of experts to get this point. As I stated earlier, we just do not have any other options to safely access the area(s) of needed improvements so that the existing residence can be habitable by its owner.

Dusty Waldrop
Waldrop Beckworth, LLC
512-342-9500

From: Randall O. Ware <randallware@gmail.com>
Sent: Tuesday, December 29, 2020 1:33 PM
To: Anjali Naini <planner@westlakehills.org>
Cc: Jay Campbell <jcampbell94@att.net>; dusty@wb-tx.com; Roy Jenson <roy@waterloopermits.com>
Subject: Re: 809 Canyon Creek - Variances Postponed

Hi Anjali,

We had some discussion earlier on about making a cut to help the drainage around the house (the current finish floor is within an inch or two of the current grade) and another about construction access to the rear of the house for work on the septic system. The grade from the side street to the area of the septic was deemed too steep for the heavy equipment to safely navigate and would affect multiple trees. There is no access around the other side of the house. We came to the current solution so we would affect as little of the lot and as few trees as possible. It would both accomplish the drainage issue and by cutting a little further off the house, solve the access problem. We were told we need 10' of width for the equipment to get through. The house is cut into the side of the hill and height of the wall is related to the fact we are chasing the grade up the hill as we make the cut to get the 10' width for access.



Randall O. Ware - Architect, AIA
Shelter Design Studio + Workshop
randall@shelterdesignstudio.com
(512) 657-4705



1120 S. Capital of Texas Highway
CityView 2, Suite 100
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TBPE Firm #6535
P - 512.338.1704 F - 512.338.1784
kfriese.com

January 6, 2021

Mr. Travis Askey
City of West Lake Hills, City Administrator
911 Westlake Drive
West Lake Hills, TX 78746

Sent Via: E-mail

Re: Acceptance of drainage review for Permit No. 15737 809 Canyon Creek

Dear Mr. Askey:

K Friese + Associates, Inc. (KFA) has reviewed the drainage submittal for the above referenced project for compliance with the City of Westlake Hills (WLH) Code of Ordinances Section 36.01.008(8).

The project engineer has submitted information demonstrating compliance with the City Ordinances, in particular to 36.01.008(8)(L)(ii) to not increase the rate of runoff during the 2-, 10-, and 25-year storm events and to not increase the risk of flood damages to development during the 100-year storm event.

All responsibility for the adequacy of the above referenced report and plans remains with the engineer of record. In recommending acceptance, KFA must rely upon the adequacy of the work of the engineer of record.

Regards,

Lauren Winek, PE
Project Engineer

Enclosure: Copy of final review comments.
Copy of final drainage submittal.



Date: January 6, 2021

Jay Campbell, PE
LNV, Inc.
7500 Rialto Blvd
Building 1, Suite 240
Austin, TX 78735

RE: Permit No. 15737 809 Canyon Creek Drainage Plan – Review 5

The above-referenced report and plans were reviewed by the City. We are providing the following comments based on a cursory review of the submittal, additional comments may be generated upon the re-submittal:

General

1. The project is located within the Edwards Aquifer Recharge Zone. Provide a copy of TCEQ permit approval prior to permit issuance or show an exemption per 30 TAC 213.5(h). Any changes required per TCEQ must be resubmitted to the City of West Lake Hills for acceptance.
1-R1) The proposed site conditions are in compliance with TCEQ Chapter 213 requirements. Note per Sheet 3 that proposed conditions are under 20% IC and therefore do not require TCEQ permitting.
1-C1) Cleared.
2. Provide the location of all existing and proposed fences including the type of fence.
2-R1) Existing fence demonstrated and labeled on Sheet 2, no proposed fence.
2-C1) Cleared.
3. Please provide spot elevations and finished floor elevations for the proposed structures, slabs, driveways, porches, patios, pools and outbuildings on all sides. Finished grades are required to be sloped to direct stormwater away from the structures.
3-R1) Sheet 2 provides spot elevations and grading plans.
3-C1) Cleared.
4. Indicate the materials for impervious cover categories in the plan view and provide a table summarizing the type of impervious cover for each drainage basin. Please reference West Lake Hills Ordinance Section 1.01.003 for impervious cover calculations. The existing and proposed impervious cover tables in the architecture plans shows a decrease in impervious cover of 258 sqft. The drainage report says there is an increase of 92 sqft. Please correct the discrepancy.
4-R1) Sheet 3 has updated impervious cover calculations and report has been updated.
4-C1) Please provide an updated drainage report.
4-R2) Drainage report attached.
4-C2) The drainage report mentions a drainage easement on site and that the site drains to the drainage easement. Please show the drainage easement referenced in the report on the plans.

4-R3) *The drainage easement reference was an error and has been removed from the drainage report.*

4-C3) **Cleared.**

Drainage

5. Verify the sheet flow calculations as it appears the manning's "n" coefficients for DA E1 and DA P1 are inconsistent with the West Lake Hills Drainage and Erosion Control Design Manual Table 3-5.

5-R1) *Manning's Coefficients are shown on Sheet 3 and comply with WLH D&EC Design Manual.*

5-C1) **Please verify manning coefficient used for the offsite drainage areas. The coefficient 0.24 is used which corresponds to dense grass, however the first 100 feet of flow appear to be on a roadway.**

5-R2) *Calculations are updated, see Sheet 3.*

5-C2) **Cleared.**

Detention

6. Rainwater harvesting is not an approved detention method for the City of West Lake Hills. Please provide proper stormwater mitigation.

6-R1) *Note that the proposed conditions do not exceed 20% IC and rainwater harvesting is not proposed for this permit. The collection system is intended for detention purposes only. Adjustments have been made to Sheet 2 for clarity.*

6-C1) **Cleared. Collections tanks are proposed for detention and not water quality.**

7. Per the West Lake Hills Drainage and Erosion Control Design Manual Sec. 5.1(g), detention ponds shall be designed with an outlet structure to allow safe passage of the 100-year post-development design storm runoff. Provide calculations for the outlet structure and emergency spillway showing compliance.

7-R1) *See Sheet 2 for proposed detention pond plan. Note that a 4-foot diameter tank is identified for detention purposes and will not be used for water quality or any other purpose other than providing detention needed to comply with WLH drainage requirements. Calculations are provided on sheet 3.*

7-C1) **Please provide calculations for the appropriate sizing of the overflow spillway.**

7-R2) *Spillway has been added to detention system. HEC-HMS was used to analyze/size pond, outlet, and emergency overflow spillway.*

7-C2) **Please revise detention system detail on sheet 2. Only the callouts are shown. Please provide calculations or HEC-HMS output for emergency overflow spillway.**

7-R3) *Sheet 2 has been updated for cross-sectional detail. Calculation for the pond along with elevations demonstrated for each storm event, are shown on Sheet 3.*

7-C3) **Cleared.**

8. Provide the 100-year WSEL for the pond and indicate the freeboard. Freeboard of at least 1.0 foot within the pond must be provided per West Lake Hills Drainage and Erosion Control Design Manual Sec. 5.1(p).

8-R1) *Calculations and details are provided on Sheet 3 and include the required 1 foot freeboard. Sheet 2 provide a cross sectional detail of the detention pond with the 100 year WSEL freeboard demonstrated.*

8-C1) **Cleared.**

9. Per the West Lake Hills Drainage and Erosion Control Design Manual Sec. 5.3, provide the stage, storage, and discharge summary table for the 2-year, 10-year, 25-year, and 100-year storm events.

9-R1) *The required table is provided on Sheet 3.*

9-C1) **Cleared.**

Notes

1. Please include the following notes:

a) "Project is a Type (1, 2, or 3) Development"

1-R1) *Type 1 Development note provided on Sheet 1*

1-C1) **Cleared.**

b) "No fences or structures are allowed across any drainage easement."

1-R2) *Added to Sheet 2, Drainage notes, #9*

1-C2) **Cleared.**

Review 2 Comments

1. Finished grades are required to be sloped to direct stormwater away from the structures. Finished floor elevations of structures adjacent to stormwater conveyance must have floor slab elevation or bottom of floor joists at or above the 100-year water surface elevation. Please provide calculations demonstrating compliance with the swale between the wall and the house.

1-R1) *Finished grades are provided on the drainage plan (see Sheet 2) and include FFE's. Property does not include 100 year floodplain and is approximate 90 feet above floodplain of nearby dry creek. Note that updated plans include sizing for the concrete swale behind proposed retaining wall and the gravel swale between home and proposed wall. The swale is sized to contain a 100 year storm event.*

1-C1) **A portion of the swale adjacent to the house will have a depth that will exceed the FFE of the house shown at 646.70 and swale bottom elevation shown at 647.0 with 0.25 foot depth of flow.**

1-R2) *The swale has been removed and area inlets are proposed to drain area between the house and proposed wall. The drainage system capacity surpasses the 100 year max peak flow and all calculation are provided on Sheet 4.*

1-C2) **Cleared.**

2. Please verify the lag time calculations for the onsite drainage is correct if the minimum time of concentration used is 10 minutes.

2-R1) *Lag time have been revised as directed and updated values are used with the HEC-HMS analysis. See Sheet 4 for updated tables, calculations, and HMS results.*

2-C1) **Cleared.**

Review 3 Comments

1. Please verify the area of the lot. The plat submitted shows the lot size as 0.64 acres and the plans show the lot size as 0.7 acres.

1-R1) *The lot size was verified form TCAD records. Will research this to determine why there's a discrepancy. Note that if any minor corrections are provided to the lot size, the proposed conditions will still conform with West Lake Hills drainage criteria.*

1-C1) **Cleared.**

2. Please provide channel improvements in compliance with Section 2.3.4 of the City of West Lake Hills Drainage and Erosion Control Design Manual, showing the 25-year storm event plus the minimum freeboard of 0.5 feet.

2-R1) *The proposed channel has been removed and replaced with area inlets.*

2-C1) **Cleared.**

3. Per the West Lake Hills Drainage and Erosion Control Design Manual Sec. 2.3, developed drainage flows must enter and depart from a developed area in the same manner and location as under pre-development conditions. Please provide additional analysis demonstrate flows are not increasing at any point along the property due to the proposed construction of the retaining wall and swale.

3-R1) Additional detail and calculations have been provided. Sheet 1 – Drainage map has been updated with three points of interest, 1. Cul-de-sac/RPW 2/ Side lot line, and 3. Back lot line. The calculations clearly show the proposed drainage patterns and demonstrate calculations and modeled results showing a decrease in peak flows along the property as required. Note that plans identify grading to maintain designated drainage boundaries and the proposed wall area will entirely drain to the POI2 and have plenty of distance to drain in a sheet flow manner at the property line, with NO increase in peak flows.

3-C1) Cleared.

4. Please note the City of West Lake Hills Drainage and Erosion Control Design Manual was updated in May of 2020.

4-C1) Please disregard this comment. The original permit submittal was in April, before the updated DCM was released.

Review 4 Comments

1. Please verify drainage areas are labeled correctly in the proposed drainage area map. The labels don't match what is shown in the table or in the HEC-HMs Model layout for Existing and Proposed Conditions.

2-R1) The drainage map (SHEET 1) and table shown in calculation sheet (SHEET 3) have been updated and now match.

2-C1) Cleared.

2. The plans and drainage report indicate there is a swale upstream of the wall and indicate there is a detail. No detail is shown in the plans.

2-R1) The detail for the retaining wall has been added to Sheet 4.

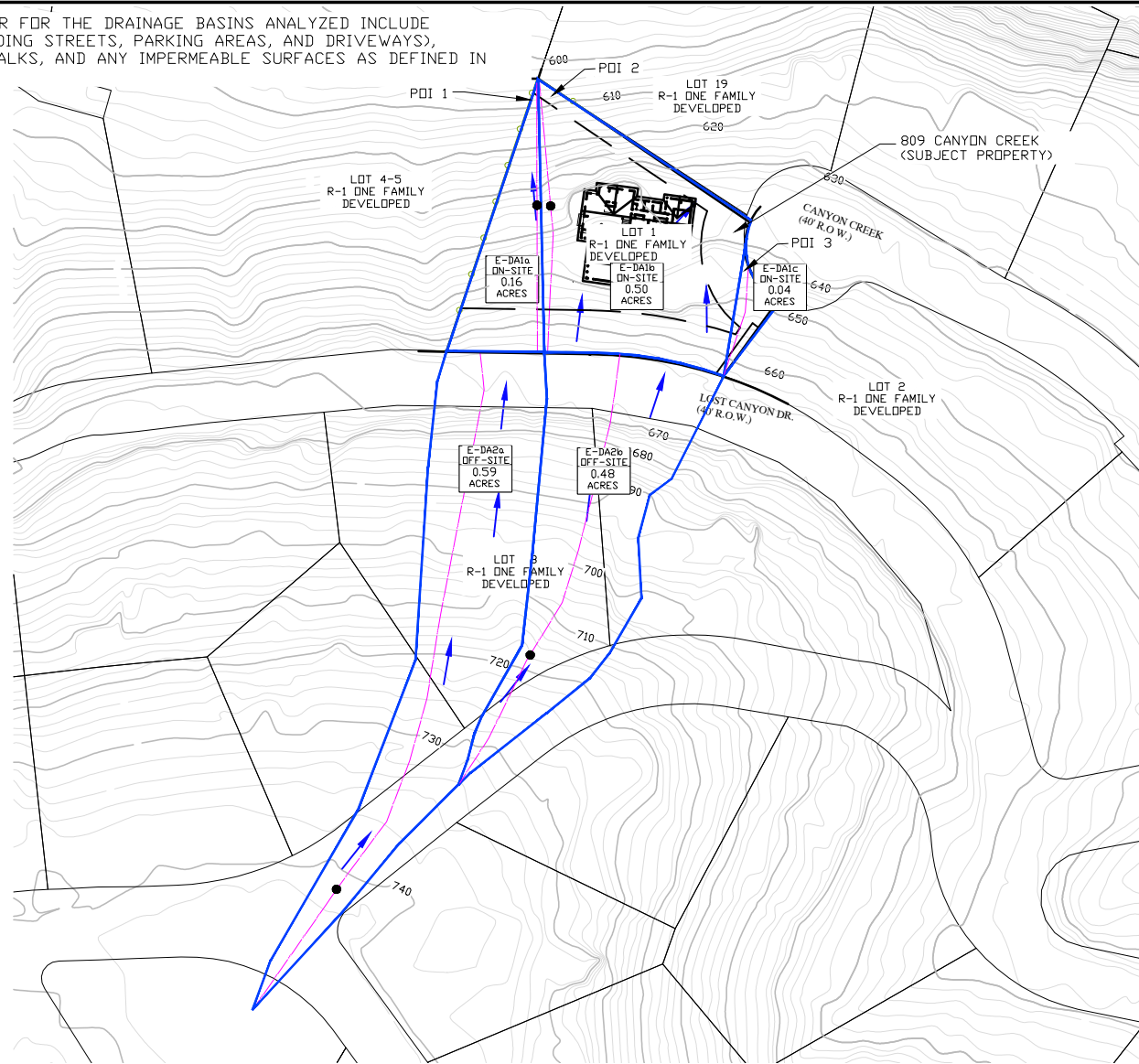
2-C1) Cleared.

All submittals should be submitted to the City of West Lake Hills Planning Department and should include PDFs and at a minimum 1 copy of the plans and the drainage report. A comment response letter shall be provided. Please email me at planner@westlakehills.org or call me at (512) 327-3628 if you have any further questions.

Sincerely,

K Friese + Associates, Inc.
City Engineer

IMPERVIOUS COVER FOR THE DRAINAGE BASINS ANALYZED INCLUDE PAVEMENT (INCLUDING STREETS, PARKING AREAS, AND DRIVEWAYS), BUILDINGS, SIDEWALKS, AND ANY IMPERMEABLE SURFACES AS DEFINED IN WLH SEC 1.01.003.



EXISTING CONDITIONS

1" = 120'

GENERAL NOTES:

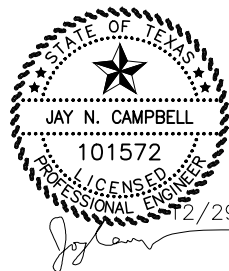
1. THIS PROJECT IS A TYPE I DEVELOPMENT AS CATERGORIZED BY WEST LAKE HILLS (WLH).
2. THE SUBJECT PROPERTY, 805 WESTBROOK, IS LOCATED WITHIN THE EDWARDS AQUIFER RECHARGE ZONE AND IS EXEMPT FROM EAPP RULES PER 30 TAC 213.5(h)(2).

LEGEND

- RUNOFF FLOW DIRECTION
- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION
- FLOW TRANSITION
- 752 CONTOUR



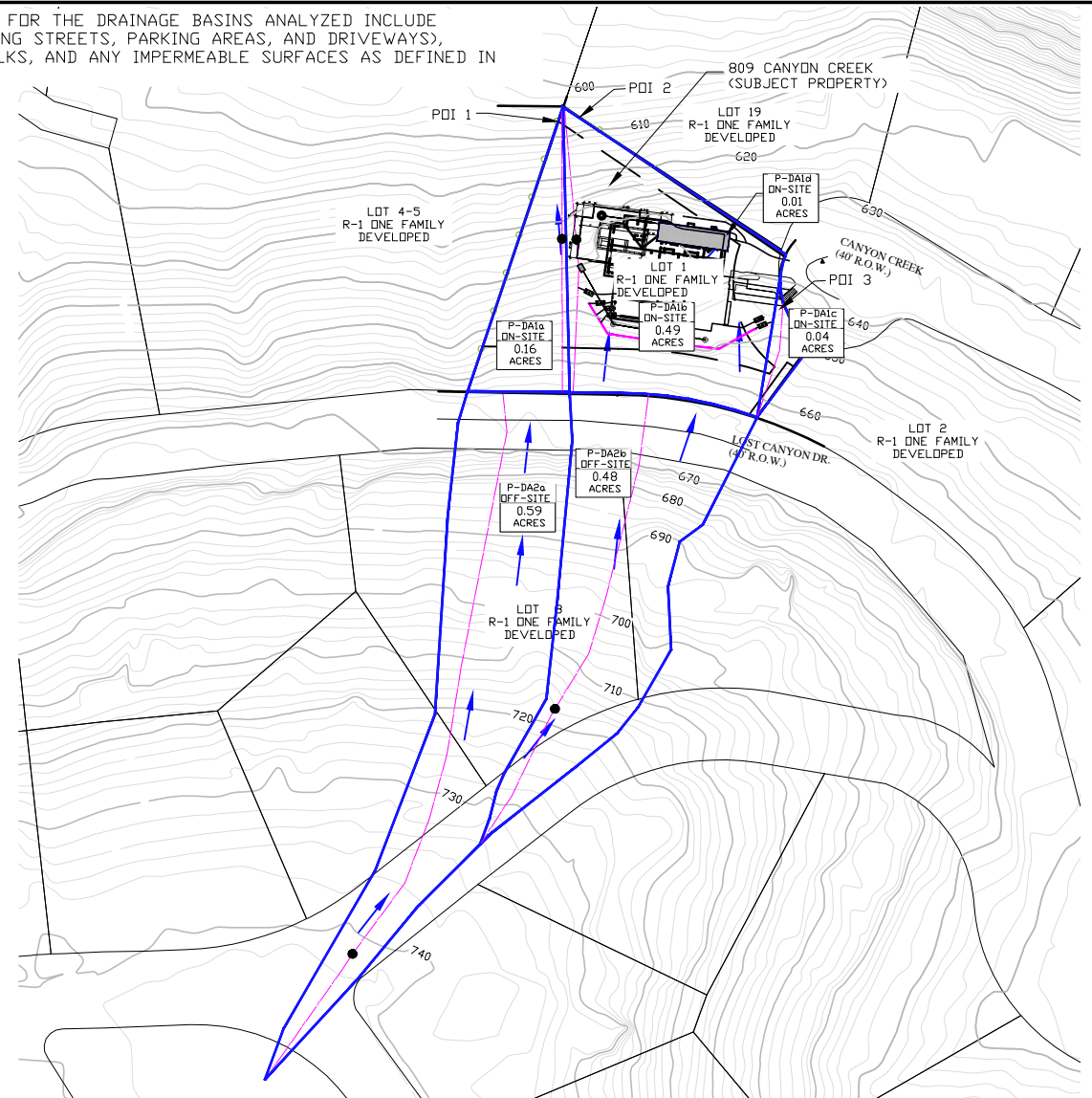
809 CANYON CREEK
DRAINAGE ANALYSIS
DRAINAGE AREA MAP
SHEET 1



Impervious Cover Calculations Pre-Development Conditions	
Area	Coverage (sf)
Building Coverage	3072
Driveway	716
Sidewalk/Walkway	165
Uncovered Patio	0
*Uncovered Wood Deck	350
AC/Spa Pads	40
Concrete Decks	521
Other - Landscape Walls & Steps	543
Pool/Spa	563
*50% credit for wood deck	
	5970

Lot Size (sf) = 30,492
% Coverage = 19.58%

IMPERVIOUS COVER FOR THE DRAINAGE BASINS ANALYZED INCLUDE PAVEMENT (INCLUDING STREETS, PARKING AREAS, AND DRIVEWAYS), BUILDINGS, SIDEWALKS, AND ANY IMPERMEABLE SURFACES AS DEFINED IN WLH SEC 1.01.003.

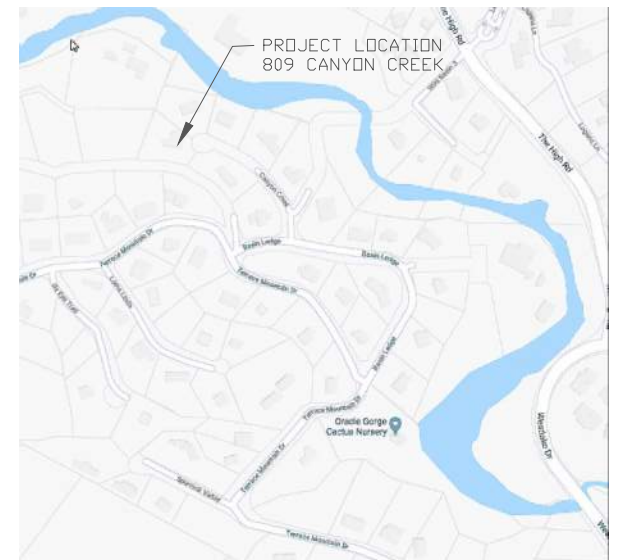


PROPOSED CONDITIONS

1" = 120'

Impervious Cover Calculations Post-Development Conditions	
Area	Coverage (sf)
Building Coverage	3166
Driveway	716
Sidewalk/Walkway	54
Uncovered Patio	0
*Uncovered Wood Deck	497
AC/Spa Pads	40
Concrete Decks	702
Other - Landscape Walls & Steps	368
Pool/Spa	544
	6087

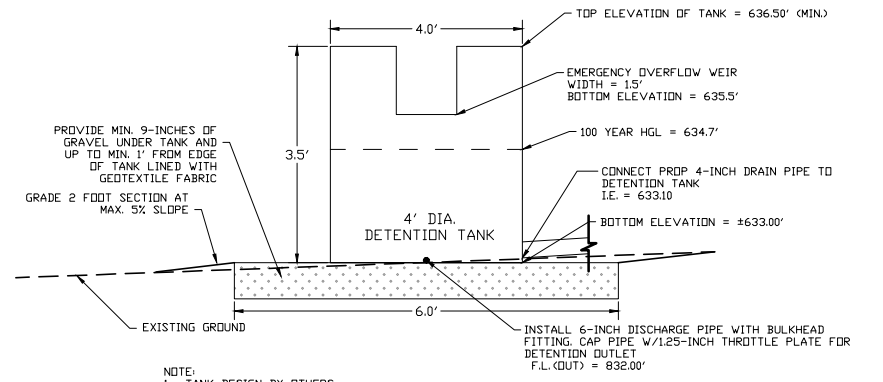
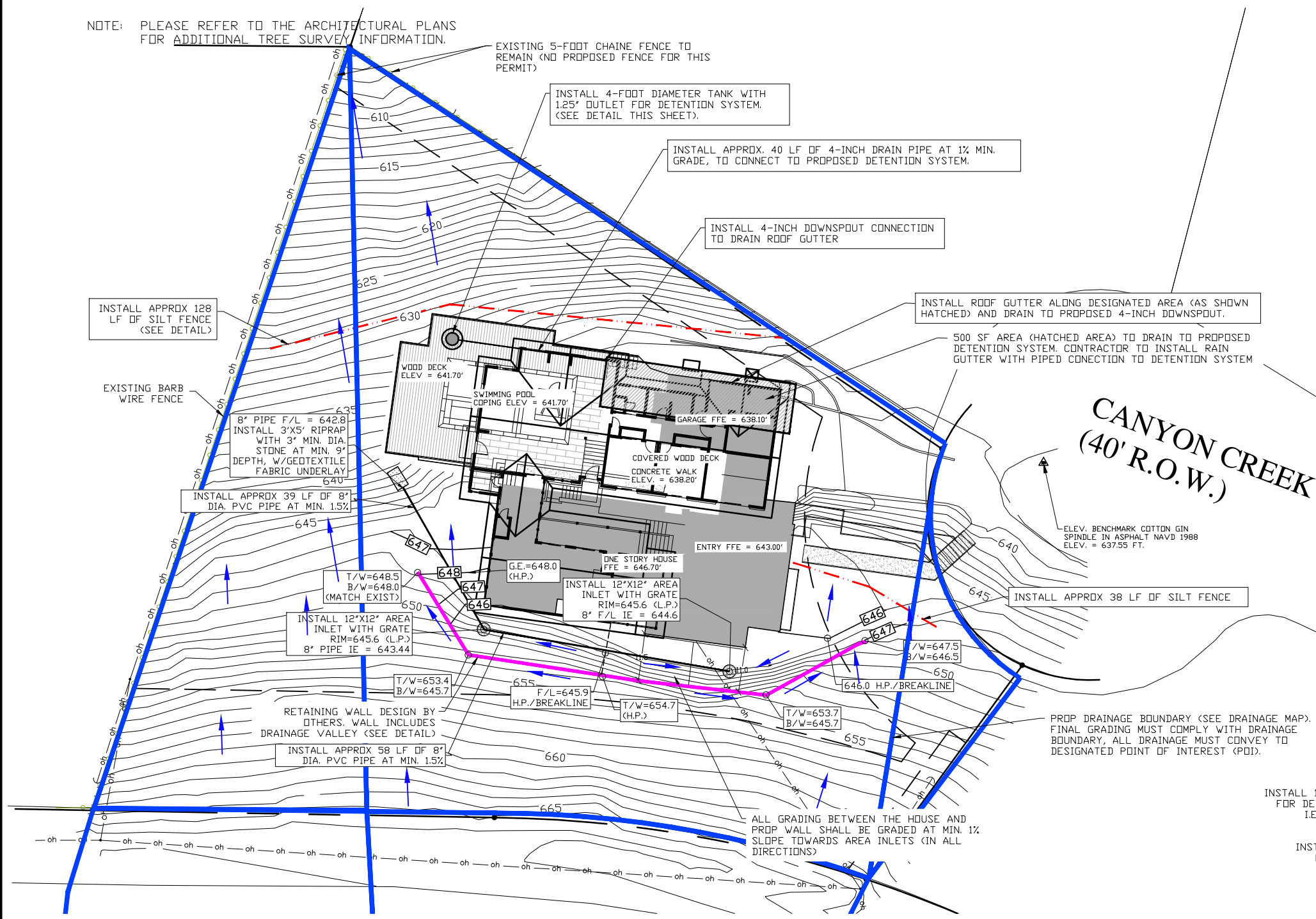
Lot Size (sf) = 30,492
% Coverage = 19.96%



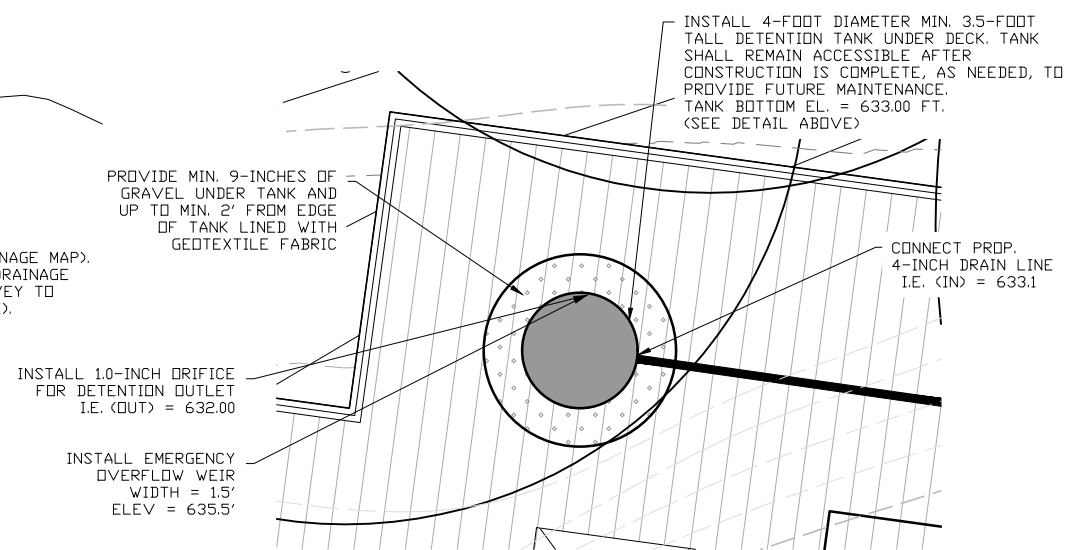
VICINITY MAP
N.T.S.



NOTE: PLEASE REFER TO THE ARCHITECTURAL PLANS FOR ADDITIONAL TREE SURVEY INFORMATION.



DETENTION SYSTEM DETAIL (CROSS SECTION)
N.T.S.



DETENTION SYSTEM DETAIL (PLAN VIEW)
1"=5'

LEGEND

- RUNOFF FLOW DIRECTION
- DRAINAGE AREA BOUNDARY
- CONTOUR
- SILT FENCE
- METAL FENCE
- BENCHMARK

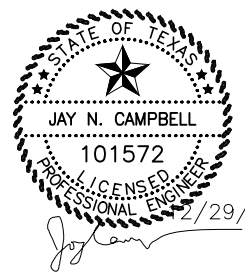
1"=30'



CONSTRUCTION SEQUENCE:

1. INSTALL SOIL EROSION CONTROLS
2. INSTALL TEMPORARY DETENTION FACILITIES (IF NEEDED)
3. BEGIN SITE CLEARING, GRUBBING, AND TOPSOIL STRIPPING
4. STABILIZE DISTURBED AREAS WITH BARE GROUND, WHERE CONSTRUCTION CEASES FOR 14 DAYS OR LONGER, WITH NATIVE SEED VEGETATION OR OTHER SOIL STABILIZATION METHODS TO EFFECTIVELY PREVENT SOIL EROSION
5. PERFORM CONSTRUCTION ACTIVITIES
6. INSTALL DETENTION SYSTEM
7. INSPECT SITE FOR DISTURBED AREAS WITH BARE GROUND AND VEGETATE AS NEEDED
8. MONITOR ALL VEGETATED AREAS UNTIL STABILIZED
9. REMOVE TEMPORARY SOIL EROSION CONTROL MEASURES

AFTER CONSTRUCTION IS COMPLETE, THE OWNER SHALL PERIODICALLY INSPECT THE POND AND REMOVE SEDIMENT AND DEBRIS AS NEEDED TO MAINTAIN PROPER FUNCTIONALITY OF THE POND.



809 CANYON CREEK
DRAINAGE IMPROVEMENT PLAN
ON-SITE DRAINAGE PLAN
& SOIL EROSION CONTROL
SHEET 2

DRAINAGE NOTES:

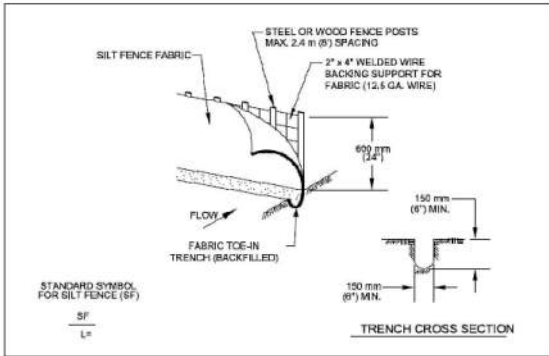
1. WE CERTIFY THAT ALL EASEMENTS ARE SHOWN ON THIS PLAN.
2. NO CONCENTRATED STORMWATER FLOWS WILL LEAVE THIS LOT ONTO ADJACENT PROPERTIES, UNLESS THEY DISCHARGE DIRECTLY INTO AN APPROVED CHANNEL THAT IS WITHIN A DRAINAGE EASEMENT.
3. THE DRAINAGE DESIGNER IS RESPONSIBLE FOR THE ADEQUACY OF THESE PLANS. IN ACCEPTING THESE PLANS, THE CITY OF WEST LAKE HILLS AND ALL REVIEWERS RELY UPON THE ADEQUACY OF THE DESIGN BY THE DRAINAGE ENGINEER.
4. PER TPDES GENERAL PERMIT NO. 150000, DISTURBED AREAS ON WHICH CONSTRUCTION ACTIVITIES HAVE CEASED (TEMPORARILY OR PERMANENTLY) SHALL BE STABILIZED WITHIN 14 DAYS UNLESS ACTIVITY RESUMES WITHIN 21 DAYS.
5. THE OWNER OF THE PROPERTY IS RESPONSIBLE FOR CLEANING AND REMOVING ALL SEDIMENT THAT IS WASHED FROM THE SITE IN DEDICATED STREETS, ALLEYS, WATERWAYS, OR OTHER PROPERTIES.
6. STRIPPING OF VEGETATION FROM PROJECT SITES SHALL BE PHASED SO AS TO EXPOSE THE MINIMUM AMOUNT OF AREA TO SOIL EROSION FOR THE SHORTEST POSSIBLE PERIOD OF TIME PER THE WLH DRAINAGE AND EROSION CONTROL DESIGN MANUAL SEC 7.1(1).
7. THIS PROJECT IS NOT LOCATED WITHIN A FLOOD HAZARD AREA PER THE EFFECTIVE FEMA FIRM PANEL 48453C0445J EFF. 1/6/2016.
8. NOTE THAT THIS PROJECT IS LOCATED WITHIN THE EDWARDS AQUIFER RECHARGE ZONE AND ALL CONSTRUCTION SHALL COMPLY WITH TCEQ REQUIREMENTS.
9. NO FENCES OR STRUCTURES ARE ALLOWED ACROSS ANY DRAINAGE EASEMENT.

Basin ID	Area	Area	Time Of Concentration Calculations - Pre-Development Conditions																				Tl (lag)			
			Sheet Flow					Shallow Concentrated Flow					Gutter Flow												Total	Total
			Length	Manning s "n"	Slope	Velocity	Tc	Length	Manning s "n"	Slope	Velocity	Tc	Length	Manning s "n"	Slope	Bottom Width	Side Slopes	Depth of Flow	Velocity	Tc	Avg Slope	Tc		Tc MIN.		
	[acres]	[mi^2]	[ft]		[%]	[fps]	[min]	[ft]		[%]	[fps]	[min]	[ft]		[%]	[ft]	[ft/ft]	[ft]	[fps]	[min]	[%]	[min]	[min]	[min]		
E-DA2a Off-Site	0.59	0.00092	100.0	0.016	12.5%	2.20	0.76	387.0	0.20	20.4%	7.29	0.88									16.5%	1.64	10.00	6.00		
E-DA2b Off-Site	0.48	0.00075	100.0	0.016	2.0%	1.06	1.58	216.0	0.22	25.9%	8.22	0.44									14.0%	2.02	10.00	6.00		
E-DA1a On-Site	0.16	0.00025	100.0	0.24	30.0%	0.36	4.66	82.0	0.24	35.0%	9.55	0.14									32.5%	4.80	10.00	6.00		
E-DA1b On-Site	0.50	0.00078	100.0	0.24	30.0%	0.36	4.66	85.0	0.24	35.3%	9.59	0.15									32.6%	4.81	10.00	6.00		
E-DA1c On-Site	0.04	0.00006	76.0	0.24	19.1%	0.28	4.48														19.1%	4.48	10.00	6.00		

Notes: Mannings "n" values from WLH Drainage and Erosion Control Design Manual - Table 3-5

Basin ID	Time Of Concentration Calculations - Post-Development Conditions																							
	Area	Area	Sheet Flow					Shallow Concentrated Flow					Gutter Flow									Total	Total	
			Length	Mannings "n"	Slope	Velocity	Tc	Length	Manning s "n"	Slope	Velocity	Tc	Length	Manning s "n"	Slope	Bottom Width	Side Slopes	Depth of Flow	Velocity	Tc	Avg Slope	Tc	TC MIN.	Tl (lag)
	[acres]	[mi^2]	[ft]		[%]	[fps]	[min]	[ft]		[%]	[fps]	[min]	[ft]		[%]	[ft]	[ft/ft]	[ft]	[fps]	[min]	[%]	[min]	[min]	[min]
P-DA2a Off-Site	0.59	0.00092	100.0	0.016	12.5%	2.20	0.76	387.0	0.20	20.4%	7.29	0.88									16.5%	1.64	10.00	6.00
P-DA2b Off-Site	0.48	0.00075	100.0	0.016	2.0%	1.06	1.58	216.0	0.22	25.9%	8.22	0.44									14.0%	2.02	10.00	6.00
P-DA1a On-Site	0.16	0.00025	100.0	0.24	30.0%	0.36	4.66	82.0	0.24	35.0%	9.55	0.14									32.5%	4.80	10.00	6.00
P-DA1b On-Site	0.49	0.00077	100.0	0.24	30.0%	0.36	4.66	85.0	0.24	35.3%	9.59	0.15									32.6%	4.81	10.00	6.00
P-DA1c On-Site	0.04	0.00006	76.0	0.24	19.1%	0.28	4.48														19.1%	4.48	10.00	6.00
P-DA1d On-Site	0.01	0.00002	15.0	0.016	25.0%	1.99	0.13														25.0%	0.13	10.00	6.00

Notes: Mannings "n" values from WLH Drainage and Erosion Control Design Manual - Table 3-5



1. STEEL OR WOOD POSTS WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POST MUST BE EMBEDDED A MINIMUM OF 300 mm (12 INCHES). IF WOOD POSTS CANNOT ACHIEVE 300 mm (12 inches) DEPTH, USE STEEL POSTS.
2. THE TOE OF THE SILT FENCE SHALL BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW.
3. THE TRENCH MUST BE A MINIMUM OF 150 mm (6 inches) DEEP AND 150 mm (6 inches) WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.
4. SILT FENCE FABRIC SHOULD BE SECURELY FASTENED TO EACH STEEL OR WOOD SUPPORT POST OR TO WOVEN WIRE, WHICH IS IN TURN ATTACHED TO THE STEEL OR WOOD FENCE POST.
5. INSPECTION SHALL BE MADE WEEKLY OR AFTER EACH RAINFALL EVENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
6. SILT FENCE SHALL BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.
7. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 150 mm (6 inches). THE SILT SHALL BE DISPOSED OF ON AN APPROVED SITE AND IN SUCH A MANNER THAT WILL NOT CONTRIBUTE TO ADDITIONAL SILTATION.

CITY OF AUSTIN WATERSHED PROTECTION DEPARTMENT		SILT FENCE	
RECORD COPY SIGNED BY MORGAN BYARS	09/01/2011 ADOPTED	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 642S-1

DRAINAGE NOTES:

1. IF SEDIMENT IS CONVEYED FROM THE SITE DURING CONSTRUCTION OR THE EROSION CONTROL FENCE IS NOT PROPERLY MAINTAINED, THE OWNER OF THE PROPERTY IS RESPONSIBLE FOR CLEANING AND REMOVING ALL SEDIMENT THAT IS WASHED FROM THE SITE AND INSTALLING ADDITIONAL BEST MANAGEMENT PRACTICES AT THE DIRECTION OF THE CITY.
2. THE CURVE NUMBER (CN) USED FOR HEC-HMS FOR ALL SUB-BASINS IS 79. WEB SOIL SURVEY RESULTS, DEVELOPMENT AREA TYPE, AND GROUND COVER WHERE CONSIDERED FOR DETERMINING THE CURVE NUMBER FOR THE OVERALL SITE. CN DETERMINATION METHODS WERE BASED ON USDA - URBAN HYDROLOGY FOR SMALL WATERSHEDS - TR-55 METHODS.

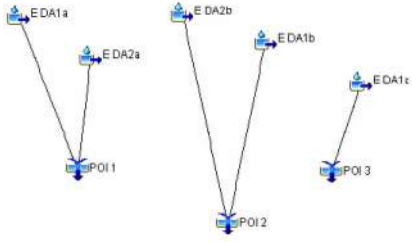
809 CANYON CREEK
DRAINAGE IMPROVEMENT PLAN
CALCULATIONS & DETAILS
SHEET 3

Post-Development HMS Peak Flow Pond Depth Results											
Peak Flow (2 yr)	Depth (2yr)	Storage (2yr)	Peak Flow (10 year)	Depth (10yr)	Storage (10 yr)	Peak Flow (25 yr)	Depth (25yr)	Storage (25yr)	Peak Flow (100 yr)	Depth (100yr)	Storage (100yr)
(cfs)	(ft)	(ac-ft)	(cfs)	(ft)	(ac-ft)	(cfs)	(ft)	(ac-ft)	(cfs)	(ft)	(ac-ft)
0.023	0.315	0.000	0.041	0.745	0.000	0.051	1.067	0.000	0.068	1.686	0.000

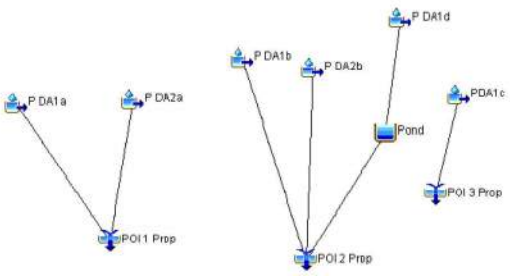
Pre-Development HMS Peak Flow Results				
Basin ID	Peak Flow (2 yr)	Peak Flow (10 year)	Peak Flow (25 yr)	Peak Flow (100 yr)
	(cfs)	(cfs)	(cfs)	(cfs)
E-DA2a Off-Site	0.79	1.73	2.29	3.21
E-DA2b Off-Site	0.64	1.41	1.87	2.62
E-DA1a On-Site	0.19	0.45	0.61	0.86
E-DA1b On-Site	0.71	1.51	1.98	2.76
E-DA1c On-Site	0.05	0.11	0.06	0.21
POI 1	0.98	2.19	2.89	4.07
POI 2	1.35	2.92	3.85	5.38
POI 3	0.05	0.11	0.15	0.21

Post-Development HMS Peak Flow Results				
PondID	Peak Flow (2 yr)	Peak Flow (10 year)	Peak Flow (25 yr)	Peak Flow (100 yr)
	(cfs)	(cfs)	(cfs)	(cfs)
P-DA2a Off-Site	0.79	1.73	2.29	3.21
P-DA2b Off-Site	0.64	1.41	1.87	2.62
P-DA1a On-Site	0.19	0.45	0.61	0.86
P-DA1b On-Site	0.62	1.41	1.88	2.66
P-DA1c On-Site	0.05	0.11	0.06	0.23
P-DA1d On-Site	0.03	0.05	0.06	0.08
POI 1	0.98	2.19	2.89	4.07
POI 2	1.28	2.86	3.79	5.33
POI 3	0.05	0.11	0.15	0.21

HMS MODEL CALCULATION RESULTS

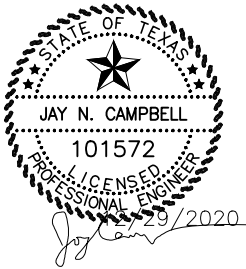


HMS MODEL LAYOUT FOR EXISTING AND PROPOSED CONDITIONS



Pond Drawdown Time Calculations		
Formula for orifice discharge: Q = aC*sqrt(2gh)		
Height of Tank (min.)	3.5 ft	
Daimeter of Tank	4.00 ft	
Daimeter of Pond Outlet =	1 inches	
Depth of Pond for 100 yr =	3.564 feet	
Flow Rate =	0.008 cfs	
Pond Volume =	4.0 cft	
Drawdown Time =	8.798 min	

DETENTION SYSTEM DRAWDOWN CALCS



NOTE:

THE CURVE NUMBER FOR EACH DRAINAGE BASIN IS BASED ON THE SOIL CONDITIONS (SEE SOIL REPORT HSG RATING - INCLUDED WITH THE DRAINAGE REPORT) WITH CLASS D HSG SOIL GROUPS. 1 ACRE OR LESS LOT SIZE (DEVELOPED AREA). CURVE NUMBERS WERE DERIVED BY USING THE TABLE 3-7 AND THE WEB SOIL SURVEY RESULTS (SEE DRAINAGE REPORT).

Impervious Cover Calculations Post-Development Conditions			
BASIN	Area (acres)	Estimated Impervious Cover (%)	Estimated Impervious Cover (acres)
P-DA2a Off-Site	0.59	15.0%	0.089
P-DA2b Off-Site	0.48	15.0%	0.072
P-DA1a On-Site	0.16	0.0%	0.000
P-DA1b On-Site	0.49	26.1%	0.128
P-DA1c On-Site	0.04	5.0%	0.002
P-DA1d On-Site	0.01	100.0%	0.010

Impervious Cover Calculations Pre-Development Conditions			
BASIN	Area (acres)	Estimated Impervious Cover (%)	Estimated Impervious Cover (acres)
E-DA2a Off-Site	0.59	15.00%	0.089
E-DA2b Off-Site	0.48	15.00%	0.072
E-DA1a On-Site	0.16	0.00%	0.000
E-DA1b On-Site	0.50	26.60%	0.133
E-DA1c On-Site	0.04	5.00%	0.002

IMPERVIOUS COVER CALCULATIONS

Curve Number Calculations - Proposed Conditions				
	Area	Impervious Cover (IC)	IC	CN for HSG Rating D
	[acres]	%	Acres	
P-DA2a Off-Site	0.59	15.0%	0.09	84
P-DA2b Off-Site	0.48	15.0%	0.07	84
P-DA1a On-Site	0.16	0.0%	0.00	84
P-DA1b On-Site	0.49	26.7%	0.13	84
P-DA1c On-Site	0.04	5.0%	0.00	84
P-DA1d On-Site	0.01	100.0%	0.01	84

*HEC-HMS model was used to evaluate pre and post-development conditions. The % impervious cover was adjusted to evaluate the increase in impervious cover (not CN)

CURVE NUMBER

Curve Number Calculations - Existing Conditions				
	Area	Impervious Cover (IC)	IC	CN for HSG Rating D
	[acres]	%	Acres	
E-DA2a Off-Site	0.59	15.0%	0.09	84
E-DA2b Off-Site	0.48	15.0%	0.07	84
E-DA1a On-Site	0.16	0.0%	0.00	84
E-DA1b On-Site	0.50	26.6%	0.13	84
E-DA1c On-Site	0.04	5.0%	0.00	84

*CN selected per soil survey and WLH Drainage and Erosion Control Design Manual, Table 3-7

*HEC-HMS model was used to evaluate pre and post-development conditions. The % impervious cover was adjusted to evaluate the increase in impervious cover (not CN)

CURVE NUMBER TABLE

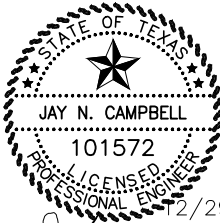
Post-Development Conditions - Swale Sizing With Rational Method

Drainage Basin ID	Tc (min)	Area (acres)	Estimated Impervious Cover (%)	Estimated Impervious Cover (acres)	2 yr Composite C	2 yr Rainfall Intensity (in/hr)	2 yr Q peak (cfs)	10 yr Composite C	10 yr Rainfall Intensity (in/hr)	10 yr Q peak (cfs)	25 yr Composite C	25 yr Rainfall Intensity (in/hr)	25yr Q peak (cfs)	100 yr Composite C	100 yr Rainfall Intensity (in/hr)	100yr Q peak (cfs)	Sub-Basin Slope Category
DA P1 Off-Site	7.7	0.390	15.0%	0.059	0.48	5.56	1.04	0.48	8.62	1.97	0.48	10.35	2.12	0.48	13.50	3.15	steep
DA2 (Gravel Swale)	1.2	0.030	10.0%	0.000	0.35	7.92	0.08	0.35	8.66	1.07	0.35	15.02	0.17	0.35	19.86	0.26	flat

WLH D&ECM Section 3.3 - Rational Method used for calculations, Q=k(cIA), developed with fair conditions

Time Of Concentration Calculations - Post-Development Conditions - Swale Sizing

Basin ID	0	0	Sheet Flow					Shallow Concentrated Flow					Gutter Flow									Total	Total
			Length	Mannings "n"	Slope	Velocity	Tc	Length	Mannings s "n"	Slope	Velocity	Tc	Length	Mannings s "n"	Slope	Bottom Width	Side Slopes	Depth of Flow	Velocity	Tc	Avg Slope	Tc	TC MIN.
	Area	Area	[ft]		[%]	[fps]	[min]	[ft]		[%]	[fps]	[min]	[ft]		[%]	[ft]	[ft/ft]	[ft]	[fps]	[min]	[%]	[min]	[min]
DA P1 Off-Site	0.39	0.00061	100.0	0.240	9.5%	0.23	7.38	225.0	0.24	59.7%	12.47	0.30									34.6%	7.68	10.00
DA2 (Gravel Swale)	0.03	0.00005	0.0					116.0	0.02	1.0%	1.61	1.20									1.0%	1.20	10.00



Worksheet: concrete swale (wall)

Uniform Flow | Gradually Varied Flow | Messages

Solve For: Normal Depth | Friction Method: Manning Formula

Roughness Coefficient: 0.012 | Flow Area: 0.25 ft²

Channel Slope: 0.02500 ft/ft | Wetted Perimeter: 1.43 ft

Normal Depth: 0.50 ft | Hydraulic Radius: 0.18 ft

Left Side Slope: 1.00 ft/ft (H:V) | Top Width: 1.01 ft

Right Side Slope: 1.00 ft/ft (H:V) | Critical Depth: 0.69 ft

Discharge: 1.56 ft³/s | Critical Slope: 0.00475 ft/ft

Velocity: 6.20 ft/s | Velocity Head: 0.60 ft

Specific Energy: 1.10 ft | Froude Number: 2.18

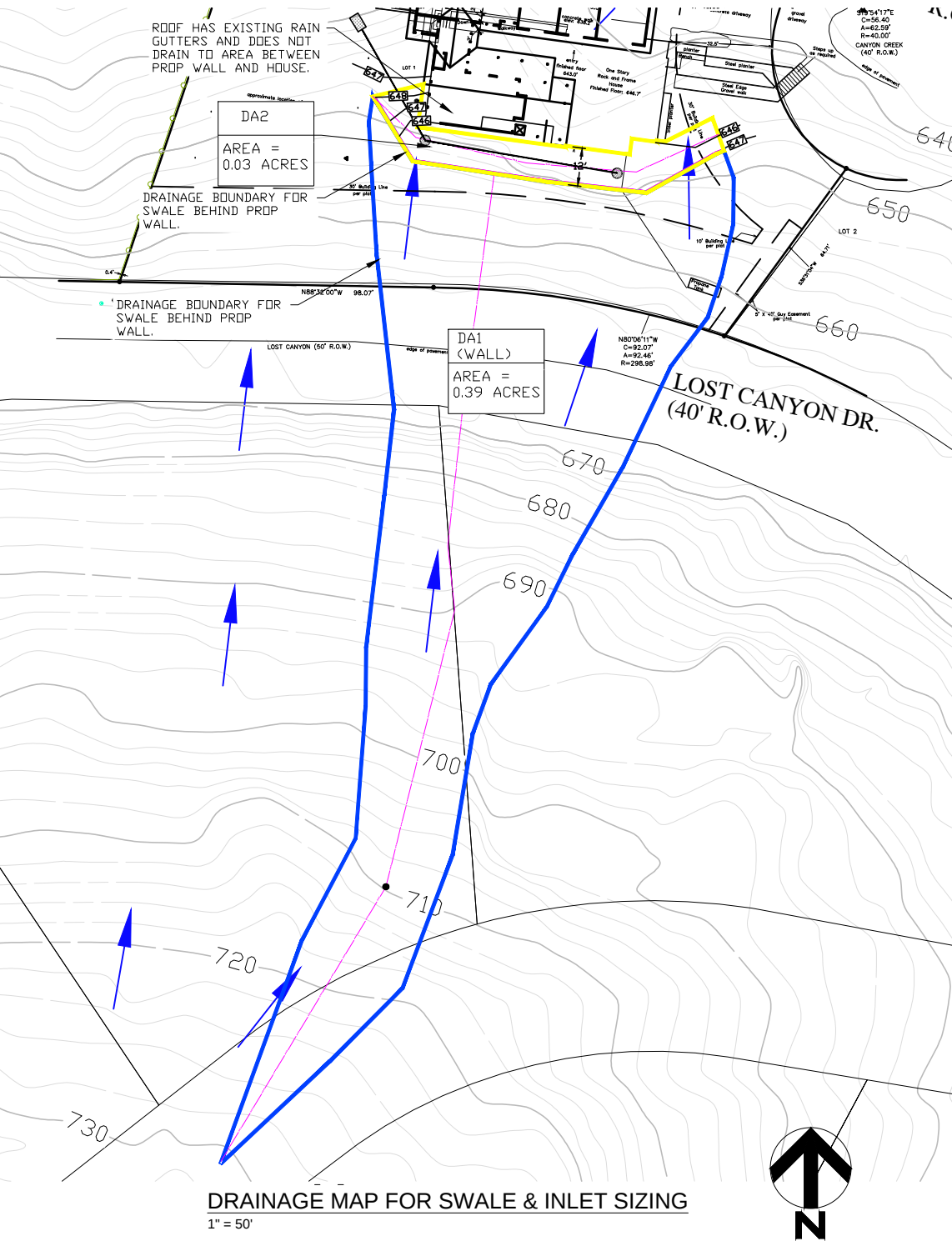
Flow Type: Supercritical

Calculation Successful.

Surface (developed)	c			Area (undeveloped)	c
Pavement				Cultivated	
Asphaltic	0.81			Flat, 0-2%	0.36
Concrete	0.83			Average, 2-7%	0.41
Grass (Lawn, Parks)				Steep, over 7%	0.44
Condition	poor	fair	good	Pasture/Range	
Flat 0-2%	0.37	0.30	0.25	Flat, 0-2%	0.3
Average 2-7%	0.43	0.38	0.35	Average, 2-7%	0.38
Steep over 7%	0.45	0.42	0.40	Steep, over 7%	0.42
"Poor" consists of less than 50% coverage				Forest/Woodlands	
"Fair" consists of btwn 50 and 75% coverage				Flat, 0-2%	0.28
"Good" consists of greater than 75% coverage				Average, 2-7%	0.36
				Steep, over 7%	0.41

Intensity	I = a/(t+b)^c		
	a	b	c
2	45.24	9.339	0.7399
10	61.25	8.352	0.7147
25	69.96	7.941	0.6954
100	77.310	6.832	0.6524

Table 3-3: Antecedent Precipitation Coefficient (k)	
Frequency	k
2 year	1
10 year	1
25 year	1.1
100 year	1.25



CONC SWALE (BEHIND WALL) CAPACITY (FLOW MASTER RESULTS)

Worksheet: Circular Pipe - 1

Uniform Flow | Gradually Varied Flow | Messages

Solve For: Full Flow Capacity | Friction Method: Manning Formula

Roughness Coefficient: 0.010 | Flow Area: 0.35 ft²

Channel Slope: 0.01500 ft/ft | Wetted Perimeter: 2.19 ft

Normal Depth: 0.67 ft | Hydraulic Radius: 0.17 ft

Diameter: 0.67 ft | Top Width: 0.69 ft

Discharge: 1.95 ft³/s | Percent Full: 100.0 %

Velocity: 5.53 ft/s | Critical Slope: 0.01267 ft/ft

Velocity Head: 0.48 ft | Specific Energy: 1.15 ft

Specific Energy: 1.15 ft | Froude Number: 0.09

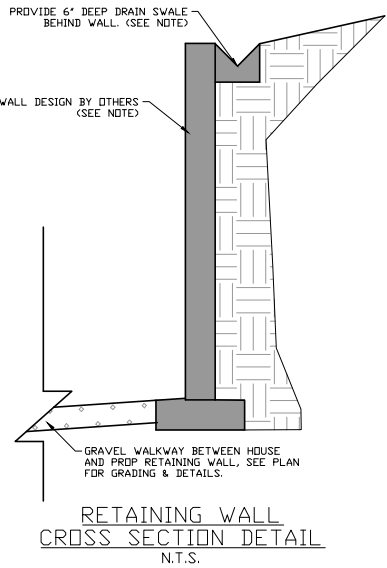
Froude Number: 0.09 | Maximum Discharge: 2.18 ft³/s

Discharge Full: 1.95 ft³/s | Slope Full: 0.01500 ft/ft

Slope Full: 0.01500 ft/ft | Flow Type: Subcritical

Calculation Successful.

8" PIPE FLOW CAPACITY (FLOW MASTER RESULTS)



INLET CAPACITY $Q = 0.0108\sigma(D)^{0.5}$ (UNITS = INCHES)

$A = 72 \text{ IN}^2$ (WITH 50% RED FOR OPENING)

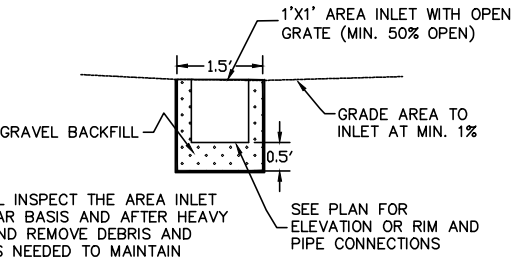
DEPTH OF WATER OVER GRATE = 3 INCHES

$Q = 1.36 \text{ CFS}$

MAX FLOW (100 YR PEAK) TO INLETS = $3.4 - 1.58 = 1.82 \text{ CFS}$

MAX FLOW (100 YR PEAK) TO EACH INLET = $1.82/2 = 0.91 \text{ CFS}$

PEAK FLOW FOR 8" PIPE AT 1.5% = 1.95 CFS (SEE FLOW MASTER RESULTS THIS SHEET)



NOTE: OWNER SHALL INSPECT THE AREA INLET ON A REGULAR BASIS AND AFTER HEAVY RAINFALLS AND REMOVE DEBRIS AND SEDIMENT, AS NEEDED TO MAINTAIN FUNCTION.

AREA INLET DETAIL (N.T.S.)

- RETAINING WALL NOTES:
- THE PROPOSED RETAINING WALL ON THESE PLANS ARE PROVIDED FOR LOCATION, GRADING, AND FOR DRAINAGE ANALYSIS PURPOSES. WALL DESIGN BY OTHERS.
 - RETAINING WALL INCLUDES CONC. SWALE TO PROVIDE FLOW DIVERSION. THE PEAK RATE FOR 100 YEAR STORM EVENT = 3.4 CFS. COMBINED CAPACITY OF CONC SWALE AT RETAINING WALL AND DRAINAGE BETWEEN HOUSE AND WALL = 3.4 CFS.
 - NOTE THAT DRAINAGE AREAS CONVEYING FLOW TO THE PROP RETAINING WALL AREA (DA1 & DA2) SHALL DISCHARGE TO POI #2 (SEE DRAINAGE MAP). CONTRACTOR IS RESPONSIBLE FOR PROVIDING GRADING, PER PLAN & AS NEEDED TO ENSURE THAT THE DA1 & DA2 DRAIN TO POI #2.
 - THE RETAINING WALL WILL NOT ALTER OR CHANGE THE CONDITION OF SITE RUNOFF FOR THE PROPOSED CONDITION AND WILL NOT CREATE ADVERSE EFFECTS TO ADJACENT OR DOWNSTREAM PROPERTIES.

- LEGEND
- RUNOFF FLOW DIRECTION
 - DRAINAGE AREA BOUNDARY
 - TIME OF CONCENTRATION
 - FLOW TRANSITION
 - CONTOUR

**ENGINEER'S DRAINAGE REPORT
FOR
809 CANYON CREEK**

WEST LAKE HILLS
TRAVIS COUNTY, TEXAS

**Prepared by
Jay Campbell, PE
PE License No. 101572**



December 29, 2020

Table of Contents

1.0 Project Description.....	1
2.0 Hydrology	1
2.1 Methodology	2
2.2 Ground Cover.....	2
2.3 Hydrology	2
3.0 Hydraulic Analysis Results.....	3
4.0 Conclusion	3

Figures

1. Site Vicinity Map

Tables

1. Table 1: Peak Flows for Existing Conditions
2. Table 2: Peak Flows for Proposed Conditions

Appendices

1. Drainage Area Map
2. H&H Calculations
3. Soil Survey Data
4. FEMA FIRM Map
5. Drainage Plan
6. Drainage Plan for Proposed Retaining Wall

1.0 Project Description

The Drainage Engineer, Jay Campbell PE, was retained by the owner of 809 Canyon Creek to prepare this Engineer's Drainage Report. The purpose of the report is to provide an explanation of existing and proposed drainage conditions and demonstrate that the project will comply with West Lake Hills (WLH) permit requirements. The existing Lot 1 (809 Canyon Creek) is a lot with an existing home, zoned for residential use (R-1 One Family per WLH Zoning). The owners have applied for a building permit with WLH for various site improvements. This report is being submitted as required by WLH Drainage and Erosion Control Design Manual Sec. 2.3.



FIGURE 1 – Site Vicinity Map

2.0 Hydrology

The purpose of this section is to describe the conditions of the existing watershed boundary and the overall drainage patterns and explanation of the drainage analysis.

2.1 Methodology

The hydrologic analysis methods used in this study meet the City of West Lake Hills (WLH) standards. Calculations and methods that were used are in accordance with the WLH Drainage and Soil Erosion Control Design Manual dated March 2018.

A combination of current aerial images, topographic survey performed by professional survey for the subject lot (Lot 4), 7.5 minute USGS topography maps and on-site analysis of drainage patterns were used to determine the stormwater drainage boundaries as shown in **Appendix 1** – Drainage Area Map.

HEC-HMS software issued by the Army Corps of Engineers was used with the SCS Unit Hydrograph Method for determining peak stormwater flows for the drainage basins. The calculations are shown in the attached **Appendix 2** and were performed per WLH requirements.

2.2 Ground Cover

The existing ground cover consists of grass, landscaping, home with decks, swimming pool, pool house, and moderate tree cover. The topography is mostly steep in areas with average slopes exceeding 30 percent. A soils report is included in the report as **Appendix 3** demonstrating soil conditions including hydrologic soil group numbers with results demonstrating Class D soils.

2.3 Hydrology

The drainage area map containing the subject properties is provided in **Appendix 1** of this report. The subject property is approximately 0.7 acres per TCAD. It should be noted that the original plat show the property to be 0.64 acres but may not be accurate. This is currently being researched for discrepancy. Regardless of any minor differences in the acreage, the drainage plan will still provide a reduced peak rate of runoff for the proposed condition and conformance will be provided with TCEQ's Chapter 213. The offsite drainage area that contributes runoff to the subject property is approximately 1.07 acres. The project area and contributing watershed boundaries are not within a 100 year floodplain as demonstrated on the FIRM Map shown in **Appendix 4**.

The proposed improvements associated with this permit are demonstrated on the drainage plan provided in **Appendix 5**. The modeled results of the HEC-HMS analysis indicate that the proposed improvements for this permit will not create an increase in the peak flows at any point along the subject property boundary. It should be noted that the improvements for this permit include a slight increase impervious cover of 117 sf which creates a slight increase in the rate of runoff. The drainage plan includes a 4 foot diameter tank to be located under the pool deck the will detain runoff from a 500 sf catchment area from the garage roof and will slow release the runoff to reduce the peak flows to be less than the existing condition peak flows.

Time of concentration travel times were calculated using the WLH Drainage and Erosion Control Manual. HEC-HMS software was used for providing the hydrologic analysis, using the SCS Unit Hydrographic method. The 2, 10, 25, and 100 year storm frequencies were analyzed and results demonstrate no increase in the peak rate of runoff along the property boundary.

3.0 Hydraulic Analysis Results

Table 1 below summarizes the peak flows that were determined for existing conditions for each drainage boundary.

Table 2 below summarizes the peak flows that were determined for proposed conditions for each drainage boundary.

Pre-Development HMS Peak Flow Results				
Basin ID	Peak Flow (2 yr)	Peak Flow (10 year)	Peak Flow (25 yr)	Peak Flow (100 yr)
	(cfs)	(cfs)	(cfs)	(cfs)
DA2a Off-Site	0.79	1.73	2.29	3.21
DA2b Off-Site	0.64	1.41	1.87	2.62
DA1a On-Site	0.19	0.45	0.61	0.86
DA1b On-Site	0.71	1.51	1.98	2.76
DA1c On-Site	0.05	0.11	0.06	0.21
POI 1	0.98	2.19	2.89	4.07
POI 2	1.35	2.92	3.85	5.38
POI 3	0.05	0.11	0.15	0.21

Post-Development HMS Peak Flow Results				
PondID	Peak Flow (2 yr)	Peak Flow (10 year)	Peak Flow (25 yr)	Peak Flow (100 yr)
	(cfs)	(cfs)	(cfs)	(cfs)
DA2a Off-Site	0.79	1.73	2.29	3.21
DA2b Off-Site	0.64	1.41	1.87	2.62
DA1aOn-Site	0.19	2.19	0.61	0.86
DA1b On-Site	0.62	1.41	1.88	2.66
DA1c On-Site	0.05	0.11	0.06	0.23
DA1d On-Site	0.03	0.05	0.06	0.08
POI 1	0.98	2.19	2.89	4.07
POI 2	1.28	2.86	3.79	5.33
POI 3	0.05	0.11	0.15	0.21

HMS MODEL CALCULATION RESULTS

Drainage analysis was also provided for the proposed retaining wall. The retaining wall includes a concrete swale to be located on the backside of the wall to provide conveyance of upgradient runoff as shown on **Appendix 6**. The gravel area between the housed and the proposed wall is designed with two area inlets and piped drainage system to drain the area. The combined capacity of the concrete swale and the drainage inlets is capable of conveying more than the 100 year storm event peak flow. The rational method was used to determine peak flows and additional calculations are provided in **Appendix 6**.

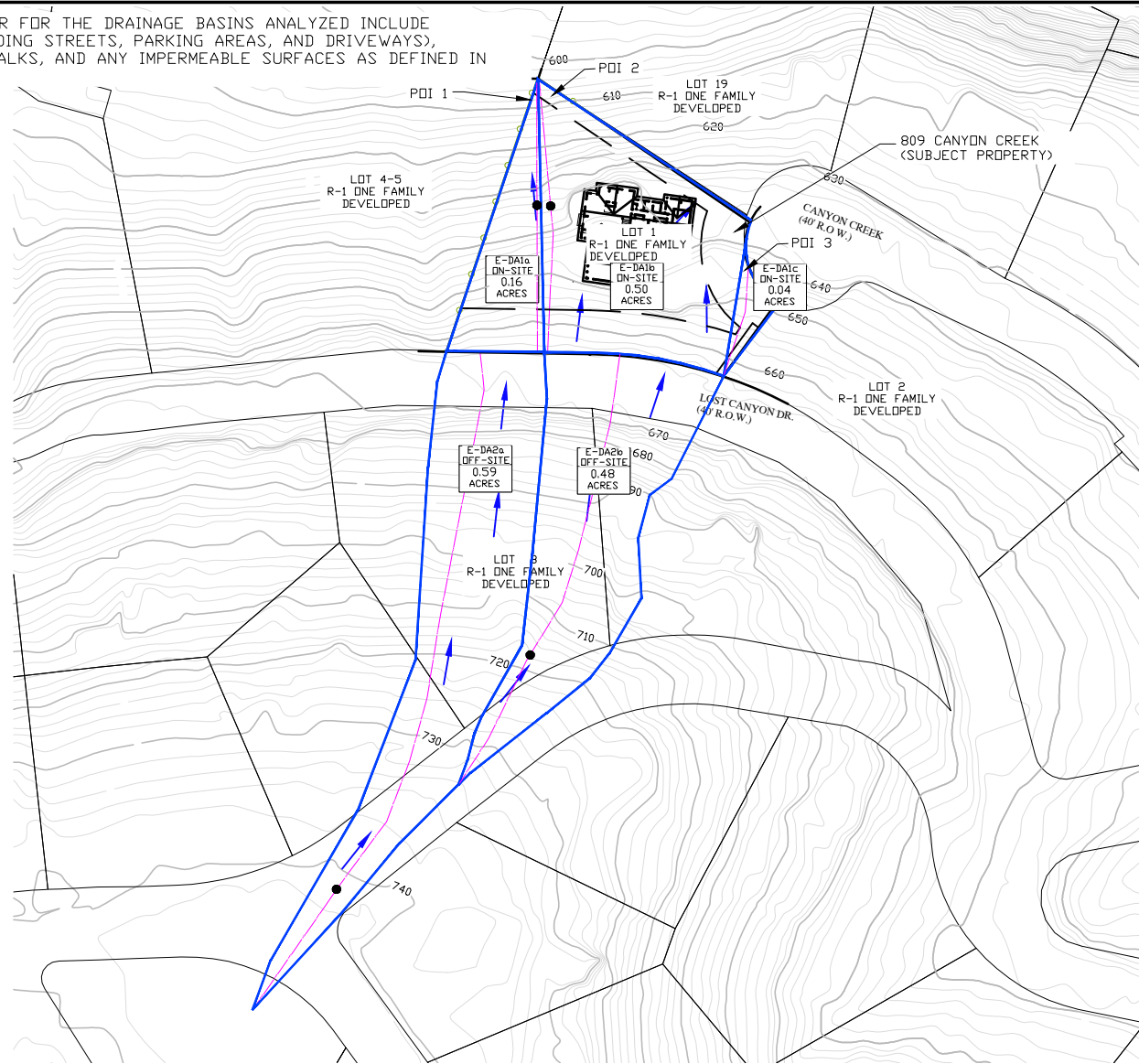
More detail on calculations are provided on **Appendix 2** and **Appendix 6** of this report.

4.0 Conclusion

The hydraulic analysis results provided in section 3 demonstrate that with the provided drainage plan, there will be no increase in peak stormwater flows for the designated frequency storms analyzed. The addition of the proposed retaining wall will provide significant drainage improvements and protection for the existing home and will not alter the overall drainage pattern for the proposed conditions. The proposed improvements for this permit conform to the WLH drainage requirements.

Appendix 1
Drainage Area Map

IMPERVIOUS COVER FOR THE DRAINAGE BASINS ANALYZED INCLUDE PAVEMENT (INCLUDING STREETS, PARKING AREAS, AND DRIVEWAYS), BUILDINGS, SIDEWALKS, AND ANY IMPERMEABLE SURFACES AS DEFINED IN WLH SEC 1.01.003.



EXISTING CONDITIONS

1" = 120'

GENERAL NOTES:

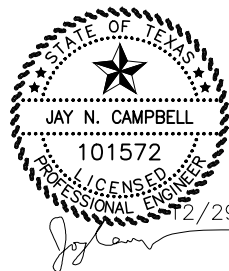
1. THIS PROJECT IS A TYPE I DEVELOPMENT AS CATERGORIZED BY WEST LAKE HILLS (WLH).
2. THE SUBJECT PROPERTY, 805 WESTBROOK, IS LOCATED WITHIN THE EDWARDS AQUIFER RECHARGE ZONE AND IS EXEMPT FROM EAPP RULES PER 30 TAC 213.5(h)(2).

LEGEND

- RUNOFF FLOW DIRECTION
- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION
- FLOW TRANSITION
- 752 CONTOUR



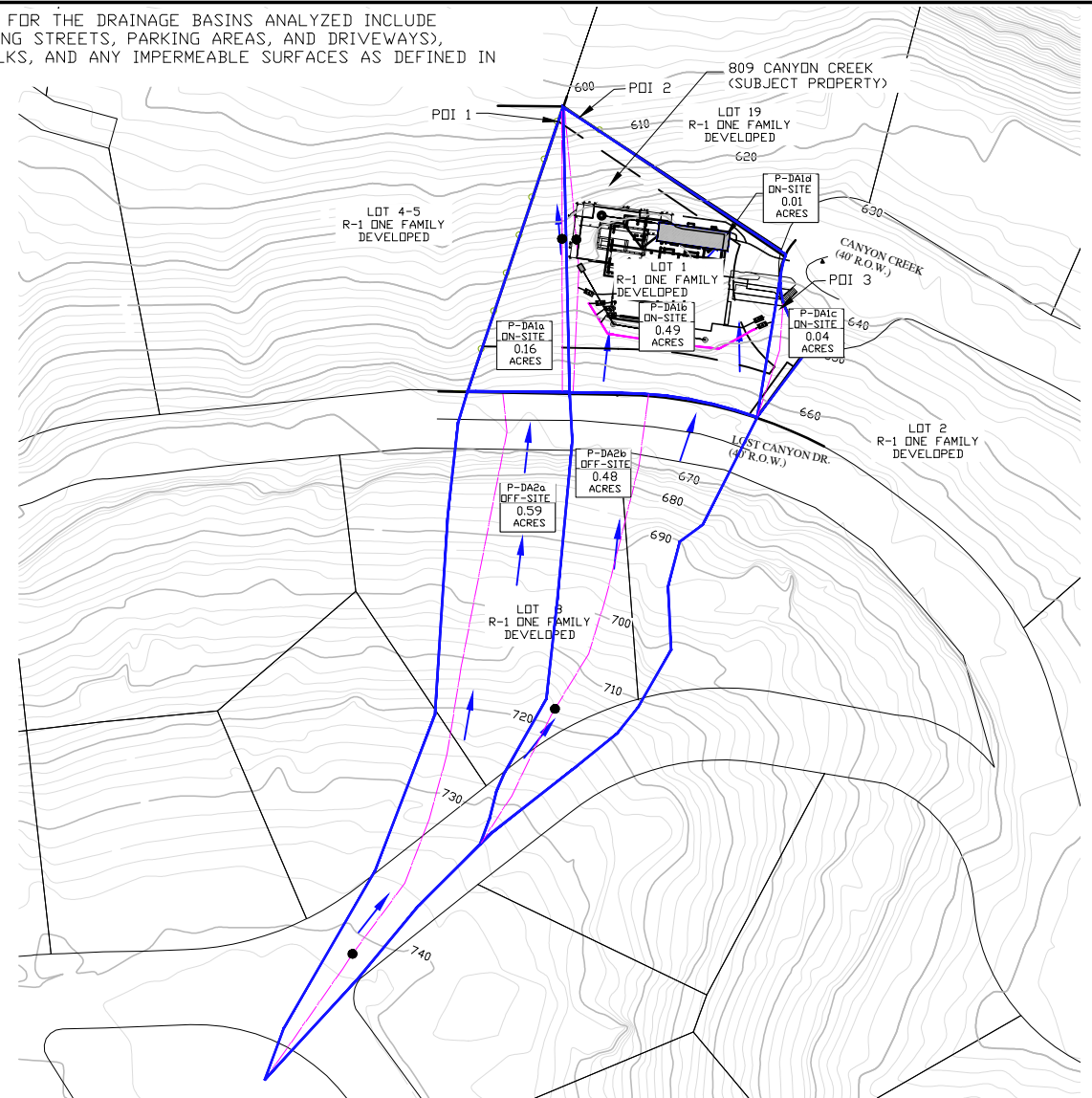
809 CANYON CREEK
DRAINAGE ANALYSIS
DRAINAGE AREA MAP
SHEET 1



Impervious Cover Calculations Pre-Development Conditions	
Area	Coverage (sf)
Building Coverage	3072
Driveway	716
Sidewalk/Walkway	165
Uncovered Patio	0
*Uncovered Wood Deck	350
AC/Spa Pads	40
Concrete Decks	521
Other - Landscape Walls & Steps	543
Pool/Spa	563
*50% credit for wood deck	
	5970

Lot Size (sf) = 30,492
% Coverage = 19.58%

IMPERVIOUS COVER FOR THE DRAINAGE BASINS ANALYZED INCLUDE PAVEMENT (INCLUDING STREETS, PARKING AREAS, AND DRIVEWAYS), BUILDINGS, SIDEWALKS, AND ANY IMPERMEABLE SURFACES AS DEFINED IN WLH SEC 1.01.003.

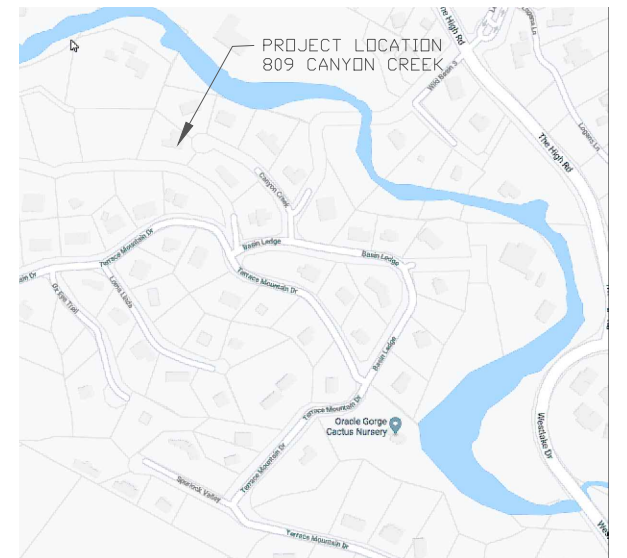


PROPOSED CONDITIONS

1" = 120'

Impervious Cover Calculations Post-Development Conditions	
Area	Coverage (sf)
Building Coverage	3166
Driveway	716
Sidewalk/Walkway	54
Uncovered Patio	0
*Uncovered Wood Deck	497
AC/Spa Pads	40
Concrete Decks	702
Other - Landscape Walls & Steps	368
Pool/Spa	544
	6087

Lot Size (sf) = 30,492
% Coverage = 19.96%



VICINITY MAP
N.T.S.



IMPERVIOUS COVER CALCULATIONS

NOTE: SEE ARCHITECTURAL PLANS FOR DETAILED IMPERVIOUS COVER INFORMATION, AND PROPOSED IMPROVEMENTS TO BUILDINGS, POOL DECK AND OTHER.

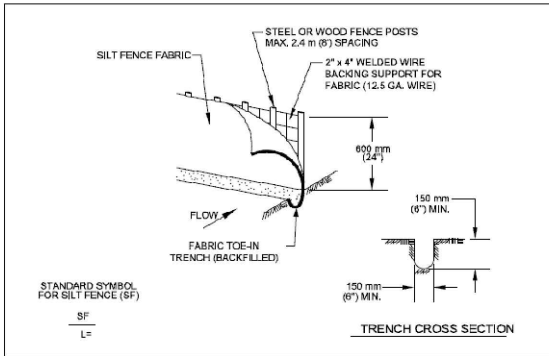
Appendix 2 H&H Calculations

Basin ID	Area	Area	Time Of Concentration Calculations - Pre-Development Conditions																					
			Sheet Flow					Shallow Concentrated Flow					Gutter Flow								Total		Total	Tl (lag)
			Length	Manning s "n"	Slope	Velocity	Tc	Length	Manning s "n"	Slope	Velocity	Tc	Length	Manning s "n"	Slope	Bottom Width	Side Slopes	Depth of Flow	Velocity	Tc	Avg Slope	Tc	Tc MIN.	
	[acres]	[mi^2]	[ft]		[%]	[fps]	[min]	[ft]		[%]	[fps]	[min]	[ft]		[%]	[ft]	[ft/ft]	[ft]	[fps]	[min]	[%]	[min]	[min]	[min]
E-DA2a Off-Site	0.59	0.00092	100.0	0.016	12.5%	2.20	0.76	387.0	0.20	20.4%	7.29	0.88									16.5%	1.64	10.00	6.00
E-DA2b Off-Site	0.48	0.00075	100.0	0.016	2.0%	1.06	1.58	216.0	0.22	25.9%	8.22	0.44									14.0%	2.02	10.00	6.00
E-DA1a On-Site	0.16	0.00025	100.0	0.24	30.0%	0.36	4.66	82.0	0.24	35.0%	9.55	0.14									32.5%	4.80	10.00	6.00
E-DA1b On-Site	0.50	0.00078	100.0	0.24	30.0%	0.36	4.66	85.0	0.24	35.3%	9.59	0.15									32.6%	4.81	10.00	6.00
E-DA1c On-Site	0.04	0.00006	76.0	0.24	19.1%	0.28	4.48														19.1%	4.48	10.00	6.00

Notes: Mannings "n" values from WLH Drainage and Erosion Control Design Manual - Table 3-5

Basin ID	Time Of Concentration Calculations - Post-Development Conditions																							Tl (lag)
	Area	Area	Sheet Flow					Shallow Concentrated Flow					Gutter Flow									Total	Total	
			Length	Mannings "n"	Slope	Velocity	Tc	Length	Manning s "n"	Slope	Velocity	Tc	Length	Manning s "n"	Slope	Bottom Width	Side Slopes	Depth of Flow	Velocity	Tc	Avg Slope	Tc	TC MIN.	
	[acres]	[mi^2]	[ft]		[%]	[fps]	[min]	[ft]		[%]	[fps]	[min]	[ft]		[%]	[ft]	[ft/ft]	[ft]	[fps]	[min]	[%]	[min]	[min]	
P-DA2a Off-Site	0.59	0.00092	100.0	0.016	12.5%	2.20	0.76	387.0	0.20	20.4%	7.29	0.88									16.5%	1.64	10.00	
P-DA2b Off-Site	0.48	0.00075	100.0	0.016	2.0%	1.06	1.58	216.0	0.22	25.9%	8.22	0.44									14.0%	2.02	10.00	
P-DA1a On-Site	0.16	0.00025	100.0	0.24	30.0%	0.36	4.66	82.0	0.24	35.0%	9.55	0.14									32.5%	4.80	10.00	
P-DA1b On-Site	0.49	0.00077	100.0	0.24	30.0%	0.36	4.66	85.0	0.24	35.3%	9.59	0.15									32.6%	4.81	10.00	
P-DA1c On-Site	0.04	0.00006	76.0	0.24	19.1%	0.28	4.48														19.1%	4.48	10.00	
P-DA1d On-Site	0.01	0.00002	15.0	0.016	25.0%	1.99	0.13														25.0%	0.13	10.00	

Notes: Mannings "n" values from WLH Drainage and Erosion Control Design Manual - Table 3-5



1. STEEL OR WOOD POSTS WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POST MUST BE EMBEDDED A MINIMUM OF 300 mm (12 INCHES). IF WOOD POSTS CANNOT ACHIEVE 300 mm (12 inches) DEPTH, USE STEEL POSTS.
2. THE TOE OF THE SILT FENCE SHALL BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW.
3. THE TRENCH MUST BE A MINIMUM OF 150 mm (6 inches) DEEP AND 150 mm (6 inches) WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.
4. SILT FENCE FABRIC SHOULD BE SECURELY FASTENED TO EACH STEEL OR WOOD SUPPORT POST OR TO WOVEN WIRE, WHICH IS IN TURN ATTACHED TO THE STEEL OR WOOD FENCE POST.
5. INSPECTION SHALL BE MADE WEEKLY OR AFTER EACH RAINFALL EVENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
6. SILT FENCE SHALL BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.
7. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 150 mm (6 inches). THE SILT SHALL BE DISPOSED OF ON AN APPROVED SITE AND IN SUCH A MANNER THAT WILL NOT CONTRIBUTE TO ADDITIONAL SILTATION.

CITY OF AUSTIN WATERSHED PROTECTION DEPARTMENT		SILT FENCE	
RECORD COPY SIGNED BY MORGAN BYARS	09/01/2011 ADOPTED	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 642S-1

DRAINAGE NOTES:

1. IF SEDIMENT IS CONVEYED FROM THE SITE DURING CONSTRUCTION OR THE EROSION CONTROL FENCE IS NOT PROPERLY MAINTAINED, THE OWNER OF THE PROPERTY IS RESPONSIBLE FOR CLEANING AND REMOVING ALL SEDIMENT THAT IS WASHED FROM THE SITE AND INSTALLING ADDITIONAL BEST MANAGEMENT PRACTICES AT THE DIRECTION OF THE CITY.
2. THE CURVE NUMBER (CN) USED FOR HEC-HMS FOR ALL SUB-BASINS IS 79. WEB SOIL SURVEY RESULTS, DEVELOPMENT AREA TYPE, AND GROUND COVER WHERE CONSIDERED FOR DETERMINING THE CURVE NUMBER FOR THE OVERALL SITE. CN DETERMINATION METHODS WERE BASED ON USDA - URBAN HYDROLOGY FOR SMALL WATERSHEDS - TR-55 METHODS.

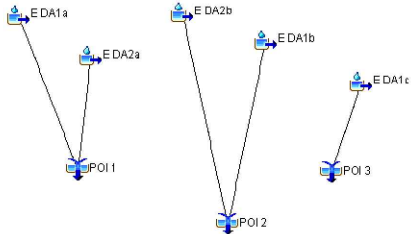
809 CANYON CREEK
DRAINAGE IMPROVEMENT PLAN
CALCULATIONS & DETAILS
SHEET 3

Post-Development HMS Peak Flow Pond Depth Results											
Peak Flow (2 yr)	Depth (2yr)	Storage (2yr)	Peak Flow (10 year)	Depth (10yr)	Storage (10 yr)	Peak Flow (25 yr)	Depth (25yr)	Storage (25yr)	Peak Flow (100 yr)	Depth (100yr)	Storage (100yr)
(cfs)	(ft)	(ac-ft)	(cfs)	(ft)	(ac-ft)	(cfs)	(ft)	(ac-ft)	(cfs)	(ft)	(ac-ft)
0.023	0.315	0.000	0.041	0.745	0.000	0.051	1.067	0.000	0.068	1.686	0.000

Pre-Development HMS Peak Flow Results				
Basin ID	Peak Flow (2 yr)	Peak Flow (10 year)	Peak Flow (25 yr)	Peak Flow (100 yr)
	(cfs)	(cfs)	(cfs)	(cfs)
E-DA2a Off-Site	0.79	1.73	2.29	3.21
E-DA2b Off-Site	0.64	1.41	1.87	2.62
E-DA1a On-Site	0.19	0.45	0.61	0.86
E-DA1b On-Site	0.71	1.51	1.98	2.76
E-DA1c On-Site	0.05	0.11	0.06	0.21
POI 1	0.98	2.19	2.89	4.07
POI 2	1.35	2.92	3.85	5.38
POI 3	0.05	0.11	0.15	0.21

Post-Development HMS Peak Flow Results				
PondID	Peak Flow (2 yr)	Peak Flow (10 year)	Peak Flow (25 yr)	Peak Flow (100 yr)
	(cfs)	(cfs)	(cfs)	(cfs)
P-DA2a Off-Site	0.79	1.73	2.29	3.21
P-DA2b Off-Site	0.64	1.41	1.87	2.62
P-DA1a On-Site	0.19	2.19	0.61	0.86
P-DA1b On-Site	0.62	1.41	1.88	2.66
P-DA1c On-Site	0.05	0.11	0.06	0.23
P-DA1d On-Site	0.03	0.05	0.06	0.08
POI 1	0.98	2.19	2.89	4.07
POI 2	1.28	2.86	3.79	5.33
POI 3	0.05	0.11	0.15	0.21

HMS MODEL CALCULATION RESULTS



HMS MODEL LAYOUT FOR EXISTING AND PROPOSED CONDITIONS

Pond Drawdown Time Calculations		
Formula for orifice discharge: Q = aC*sqrt(2gh)		
Height of Tank (min.)		3.5 ft
Daimeter of Tank		4.00 ft
Daimeter of Pond Outlet =		1 inches
Depth of Pond for 100 yr =		3.564 feet
Flow Rate =		0.008 cfs
Pond Volume =		4.0 cft
Drawdown Time =		8.798 min

DETENTION SYSTEM DRAWDOWN CALCS



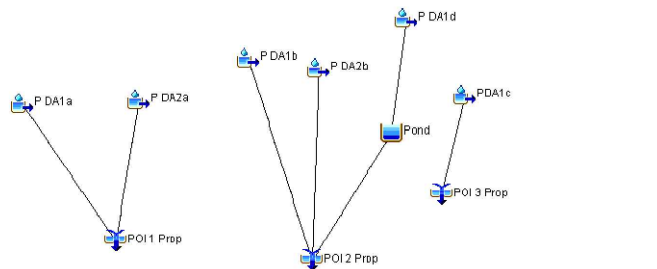
NOTE:

THE CURVE NUMBER FOR EACH DRAINAGE BASIN IS BASED ON THE SOIL CONDITIONS (SEE SOIL REPORT HSG RATING - INCLUDED WITH THE DRAINAGE REPORT) WITH CLASS D HSG SOIL GROUPS. 1 ACRE OR LESS LOT SIZE (DEVELOPED AREA). CURVE NUMBERS WERE DERIVED BY USING THE TABLE 3-7 AND THE WEB SOIL SURVEY RESULTS (SEE DRAINAGE REPORT).

Impervious Cover Calculations Post-Development Conditions			
BASIN	Area (acres)	Estimated Impervious Cover (%)	Estimated Impervious Cover (acres)
P-DA2a Off-Site	0.59	15.0%	0.089
P-DA2b Off-Site	0.48	15.0%	0.072
P-DA1a On-Site	0.16	0.0%	0.000
P-DA1b On-Site	0.49	26.1%	0.128
P-DA1c On-Site	0.04	5.0%	0.002
P-DA1d On-Site	0.01	100.0%	0.010

Impervious Cover Calculations Pre-Development Conditions			
BASIN	Area (acres)	Estimated Impervious Cover (%)	Estimated Impervious Cover (acres)
E-DA2a Off-Site	0.59	15.00%	0.089
E-DA2b Off-Site	0.48	15.00%	0.072
E-DA1a On-Site	0.16	0.00%	0.000
E-DA1b On-Site	0.50	26.60%	0.133
E-DA1c On-Site	0.04	5.00%	0.002

IMPERVIOUS COVER CALCULATIONS



Curve Number Calculations - Proposed Conditions				
	Area	Impervious Cover (IC)	IC	CN for HSG Rating D
	[acres]	%	Acres	
P-DA2a Off-Site	0.59	15.0%	0.09	84
P-DA2b Off-Site	0.48	15.0%	0.07	84
P-DA1a On-Site	0.16	0.0%	0.00	84
P-DA1b On-Site	0.49	26.7%	0.13	84
P-DA1c On-Site	0.04	5.0%	0.00	84
P-DA1d On-Site	0.01	100.0%	0.01	84

*HEC-HMS model was used to evaluate pre and post-development conditions. The % impervious cover was adjusted to evaluate the increase in impervious cover (not CN)

CURVE NUMBER

Curve Number Calculations - Existing Conditions				
	Area	Impervious Cover (IC)	IC	CN for HSG Rating D
	[acres]	%	Acres	
E-DA2a Off-Site	0.59	15.0%	0.09	84
E-DA2b Off-Site	0.48	15.0%	0.07	84
E-DA1a On-Site	0.16	0.0%	0.00	84
E-DA1b On-Site	0.50	26.6%	0.13	84
E-DA1c On-Site	0.04	5.0%	0.00	84

*CN selected per soil survey and WLH Drainage and Erosion Control Design Manual, Table 3-7

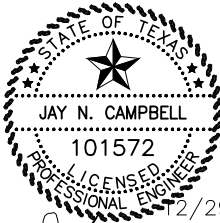
*HEC-HMS model was used to evaluate pre and post-development conditions. The % impervious cover was adjusted to evaluate the increase in impervious cover (not CN)

CURVE NUMBER TABLE

Post-Development Conditions - Swale Sizing With Rational Method

Drainage Basin ID	Tc (min)	Area (acres)	Estimated Impervious Cover (%)	Estimated Impervious Cover (acres)	2 yr Composite C	2 yr Rainfall Intensity (in/hr)	2 yr Q peak (cfs)	10 yr Composite C	10 yr Rainfall Intensity (in/hr)	10 yr Q peak (cfs)	25 yr Composite C	25 yr Rainfall Intensity (in/hr)	25yr Q peak (cfs)	100 yr Composite C	100 yr Rainfall Intensity (in/hr)	100yr Q peak (cfs)	Sub-Basin Slope Category
DA P1 Off-Site	7.7	0.390	15.0%	0.059	0.48	5.56	1.04	0.48	8.62	1.97	0.48	10.35	2.12	0.48	13.50	3.15	steep
DA2 (Gravel Swale)	1.2	0.030	10.0%	0.000	0.35	7.92	0.08	0.35	8.66	1.07	0.35	15.02	0.17	0.35	19.86	0.26	flat

WLH D&ECM Section 3.3 - Rational Method used for calculations, Q=k(cIA), developed with fair conditions



Time Of Concentration Calculations - Post-Development Conditions - Swale Sizing

Basin ID	0	0	Sheet Flow					Shallow Concentrated Flow					Gutter Flow									Total	Total
			Length	Mannings "n"	Slope	Velocity	Tc	Length	Mannings s "n"	Slope	Velocity	Tc	Length	Mannings s "n"	Slope	Bottom Width	Side Slopes	Depth of Flow	Velocity	Tc	Avg Slope	Tc	TC MIN.
	Area	Area	[ft]		[%]	[fps]	[min]	[ft]		[%]	[fps]	[min]	[ft]		[%]	[ft]	[ft/ft]	[ft]	[fps]	[min]	[%]	[min]	[min]
DA P1 Off-Site	0.39	0.00061	100.0	0.240	9.5%	0.23	7.38	225.0	0.24	59.7%	12.47	0.30									34.6%	7.68	10.00
DA2 (Gravel Swale)	0.03	0.00005	0.0					116.0	0.02	1.0%	1.61	1.20									1.0%	1.20	10.00

Worksheet: concrete swale (wall)

Uniform Flow Gradually Varied Flow Messages

Solve For: Normal Depth Friction Method: Manning Formula

Roughness Coefficient: 0.012

Channel Slope: 0.02500

Normal Depth: 0.50

Left Side Slope: 1.00

Right Side Slope: 1.00

Discharge: 1.56

Flow Area: 0.25

Wetted Perimeter: 1.43

Hydraulic Radius: 0.18

Top Width: 1.01

Critical Depth: 0.69

Critical Slope: 0.00475

Velocity: 6.20

Velocity Head: 0.60

Specific Energy: 1.10

Froude Number: 2.18

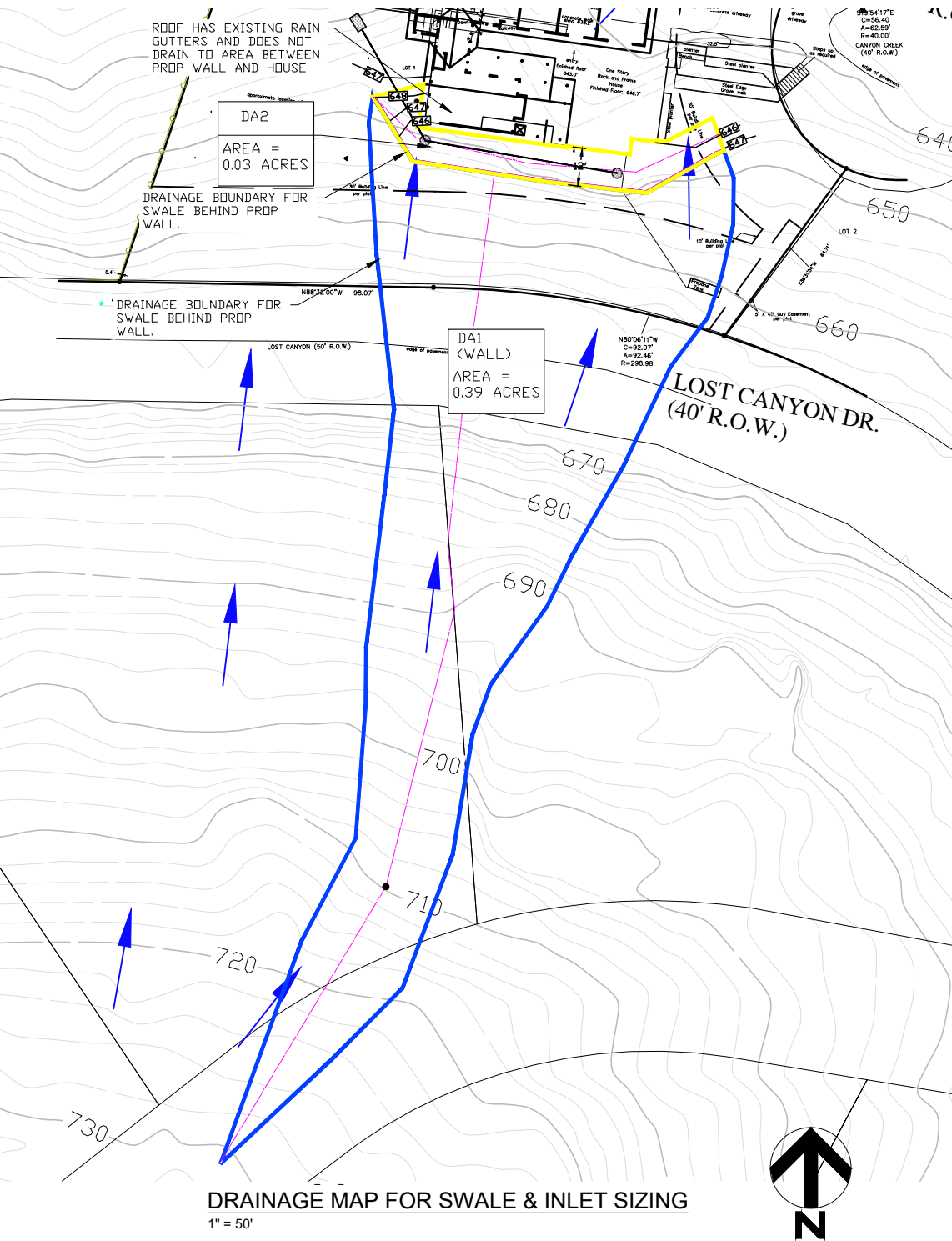
Flow Type: Supercritical

Calculation Successful.

Surface (developed)	c			Area (undeveloped)	c
Pavement				Cultivated	
Asphaltic	0.81			Flat, 0-2%	0.36
Concrete	0.83			Average, 2-7%	0.41
Grass (Lawn, Parks)				Steep, over 7%	0.44
Condition	poor	fair	good	Pasture/Range	
Flat 0-2%	0.37	0.30	0.25	Flat, 0-2%	0.3
Average 2-7%	0.43	0.38	0.35	Average, 2-7%	0.38
Steep over 7%	0.45	0.42	0.40	Steep, over 7%	0.42
"Poor" consists of less than 50% coverage				Forest/Woodlands	
"Fair" consists of btwn 50 and 75% coverage				Flat, 0-2%	0.28
"Good" consists of greater than 75% coverage				Average, 2-7%	0.36
				Steep, over 7%	0.41

Intensity	I = a/(t+b)^c		
	a	b	c
2	45.24	9.339	0.7399
10	61.25	8.352	0.7147
25	69.96	7.941	0.6954
100	77.310	6.832	0.6524

Table 3-3: Antecedent Precipitation Coefficient (k)	
Frequency	k
2 year	1
10 year	1
25 year	1.1
100 year	1.25



CONC SWALE (BEHIND WALL) CAPACITY (FLOW MASTER RESULTS)

Worksheet: Circular Pipe - 1

Uniform Flow Gradually Varied Flow Messages

Solve For: Full Flow Capacity Friction Method: Manning Formula

Roughness Coefficient: 0.010

Channel Slope: 0.01500

Normal Depth: 0.67

Diameter: 0.67

Discharge: 1.95

Flow Area: 0.35

Wetted Perimeter: 2.19

Hydraulic Radius: 0.17

Top Width: 0.68

Critical Depth: 0.62

Percent Full: 100.0

Critical Slope: 0.01267

Velocity: 5.53

Velocity Head: 0.48

Specific Energy: 1.15

Froude Number: 0.08

Maximum Discharge: 2.19

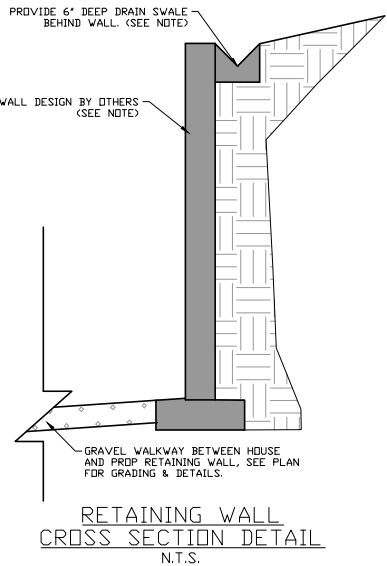
Discharge Full: 1.95

Slope Full: 0.01500

Flow Type: SubCritical

Calculation Successful.

8" PIPE FLOW CAPACITY (FLOW MASTER RESULTS)



INLET CAPACITY $Q = 0.0108\sigma(D)^{0.5}$ (UNITS = INCHES)

A = 72 IN² (WITH 50% RED FOR OPENING)

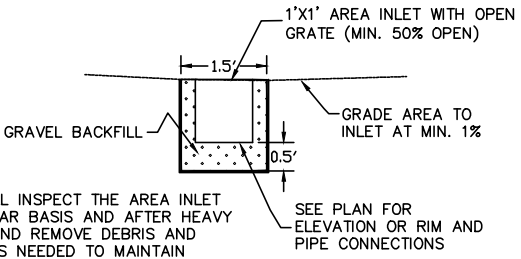
DEPTH OF WATER OVER GRATE = 3 INCHES

$Q = 1.36$ CFS

MAX FLOW (100 YR PEAK) TO INLETS = 3.4 - 1.58 = 1.82 CFS

MAX FLOW (100 YR PEAK) TO EACH INLET = 1.82/2 = 0.91 CFS

PEAK FLOW FOR 8" PIPE AT 1.5% = 1.95 CFS (SEE FLOW MASTER RESULTS THIS SHEET)



NOTE: OWNER SHALL INSPECT THE AREA INLET ON A REGULAR BASIS AND AFTER HEAVY RAINFALLS AND REMOVE DEBRIS AND SEDIMENT, AS NEEDED TO MAINTAIN FUNCTION.

AREA INLET DETAIL (N.T.S.)

- RETAINING WALL NOTES:
- THE PROPOSED RETAINING WALL ON THESE PLANS ARE PROVIDED FOR LOCATION, GRADING, AND FOR DRAINAGE ANALYSIS PURPOSES. WALL DESIGN BY OTHERS.
 - RETAINING WALL INCLUDES CONC. SWALE TO PROVIDE FLOW DIVERSION. THE PEAK RATE FOR 100 YEAR STORM EVENT = 3.4 CFS. COMBINED CAPACITY OF CONC SWALE AT RETAINING WALL AND DRAINAGE BETWEEN HOUSE AND WALL = 3.4 CFS.
 - NOTE THAT DRAINAGE AREAS CONVEYING FLOW TO THE PROP RETAINING WALL AREA (DA1 & DA2) SHALL DISCHARGE TO POI #2 (SEE DRAINAGE MAP). CONTRACTOR IS RESPONSIBLE FOR PROVIDING GRADING, PER PLAN & AS NEEDED TO ENSURE THAT THE DA1 & DA2 DRAIN TO POI #2.
 - THE RETAINING WALL WILL NOT ALTER OR CHANGE THE CONDITION OF SITE RUNOFF FOR THE PROPOSED CONDITION AND WILL NOT CREATE ADVERSE EFFECTS TO ADJACENT OR DOWNSTREAM PROPERTIES.

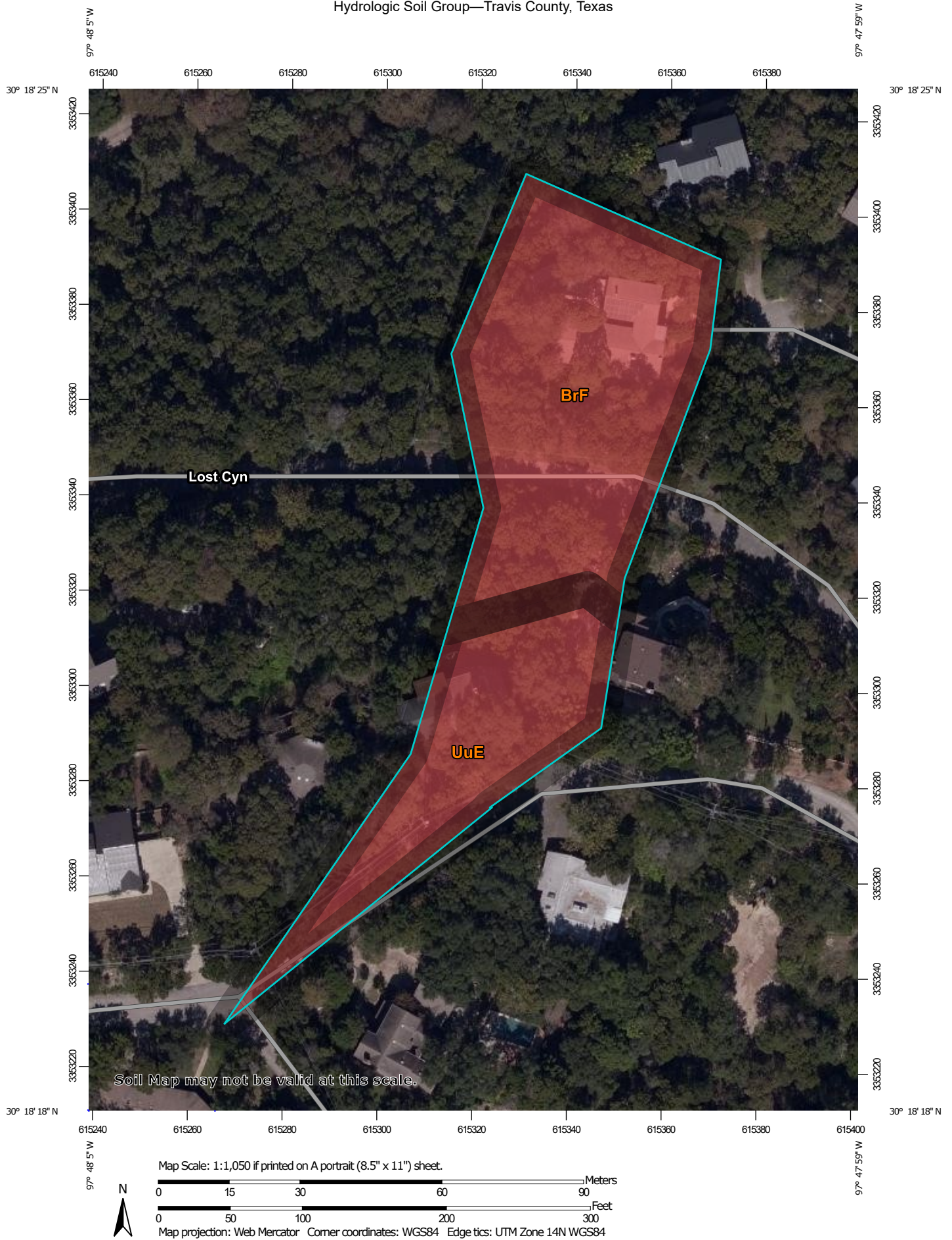
809 CANYON CREEK
DRAINAGE ANALYSIS
DRAINAGE PLAN
SHEET 4

- LEGEND
- RUNOFF FLOW DIRECTION
 - DRAINAGE AREA BOUNDARY
 - TIME OF CONCENTRATION
 - FLOW TRANSITION
 - CONTOUR

Appendix 3

Soil Survey Results

Hydrologic Soil Group—Travis County, Texas



**Natural Resources
Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

Soil Rating Polygons

 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Lines

 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Points

 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available

Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Travis County, Texas
 Survey Area Data: Version 21, Sep 12, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 27, 2018—Nov 16, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
BrF	Brackett soils and Urban land, 12 to 30 percent slopes	D	0.9	64.2%
UuE	Urban land and Brackett soils, 1 to 12 percent slopes	D	0.5	35.8%
Totals for Area of Interest			1.4	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

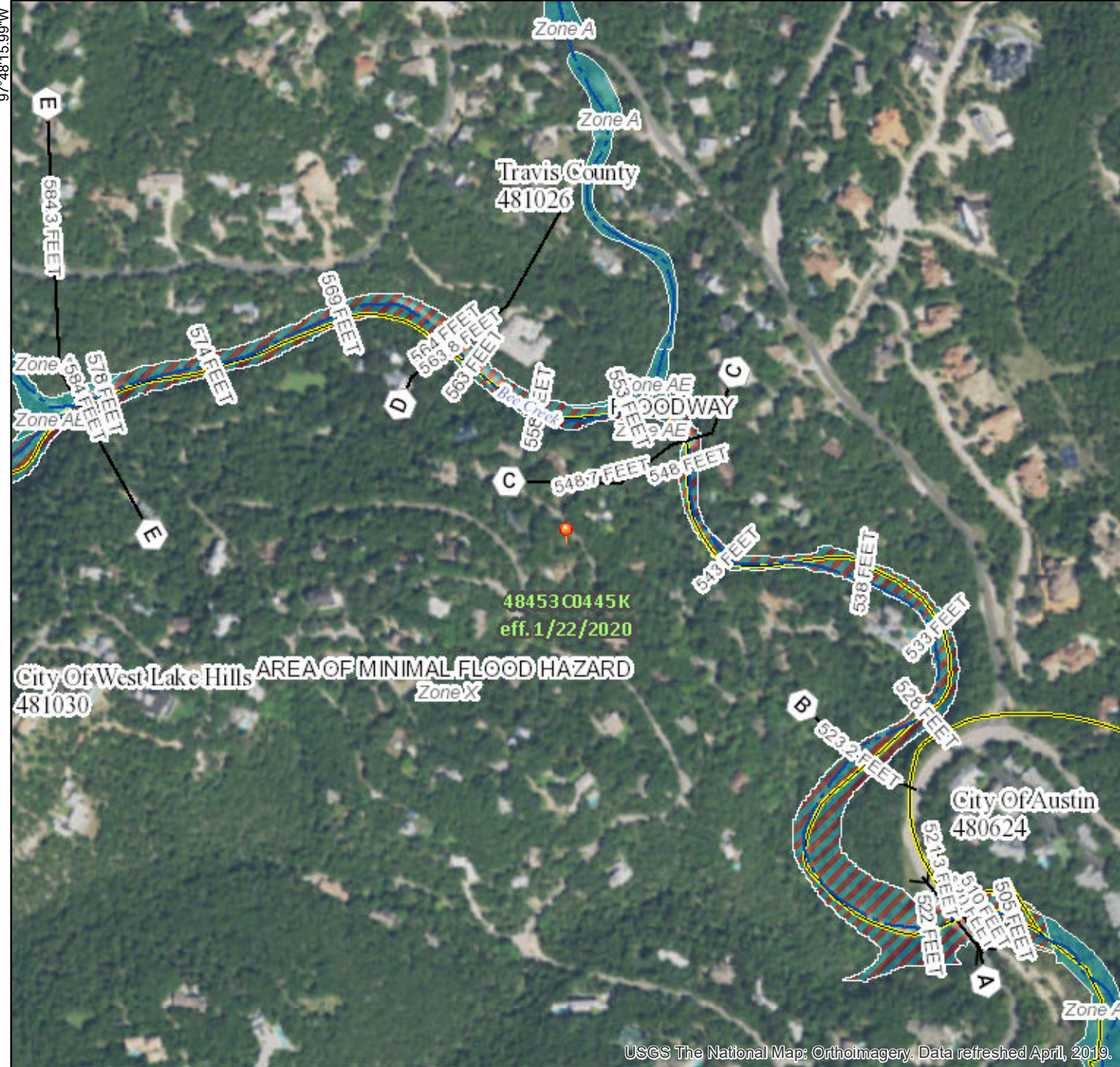
Tie-break Rule: Higher

Appendix 4 FEMA Map

National Flood Hazard Layer FIRMette



30°18'37.72"N



USGS The National Map: Orthoimagery. Data refreshed April, 2019. 1:6,000

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5 Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

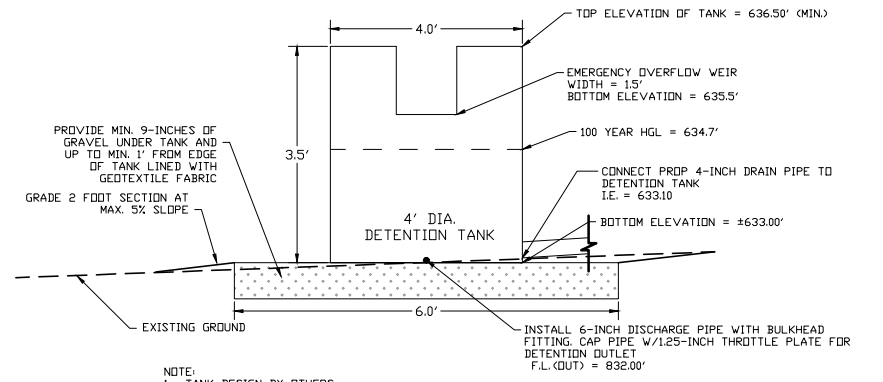
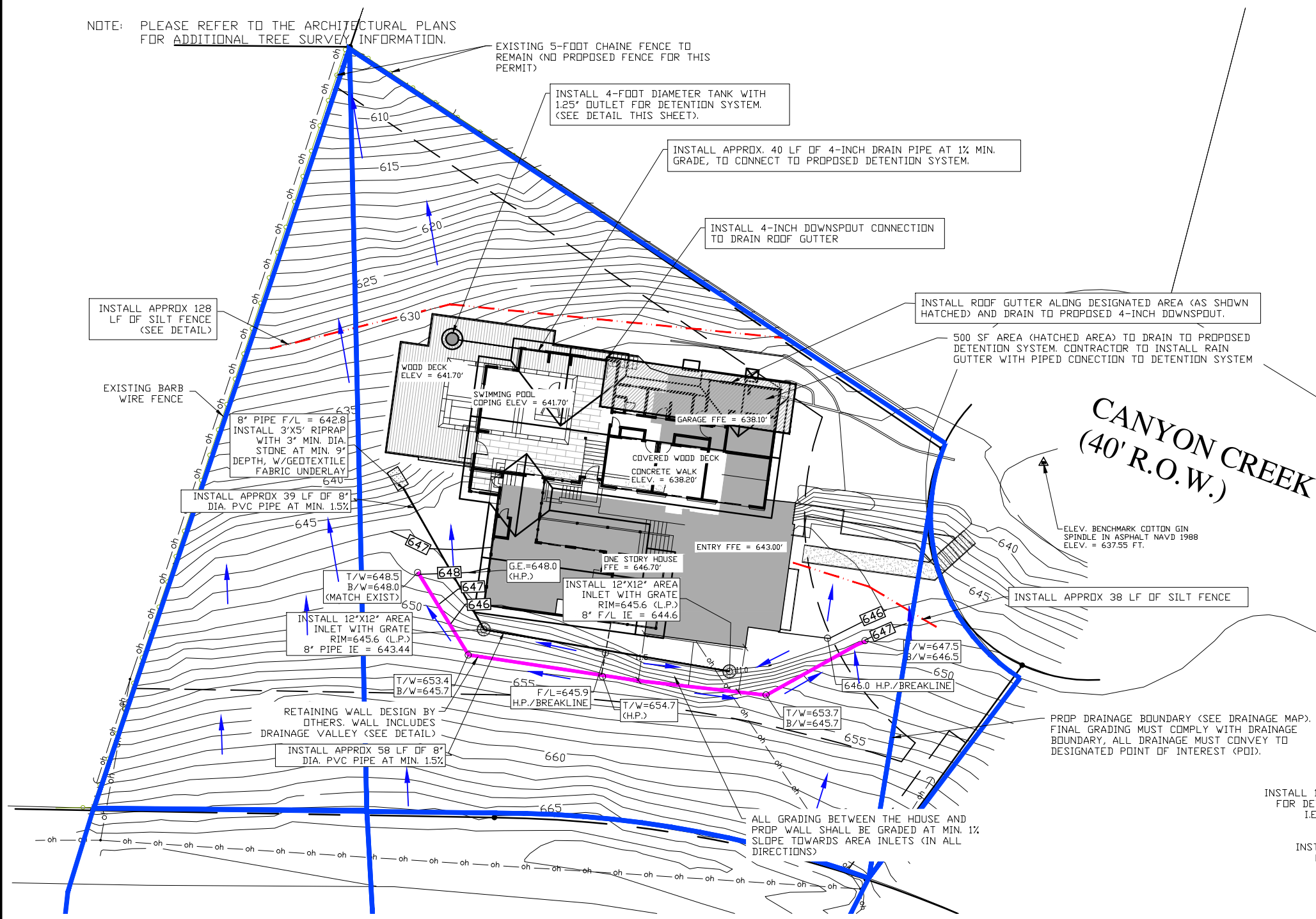
This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 3/17/2020 at 7:36:31 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

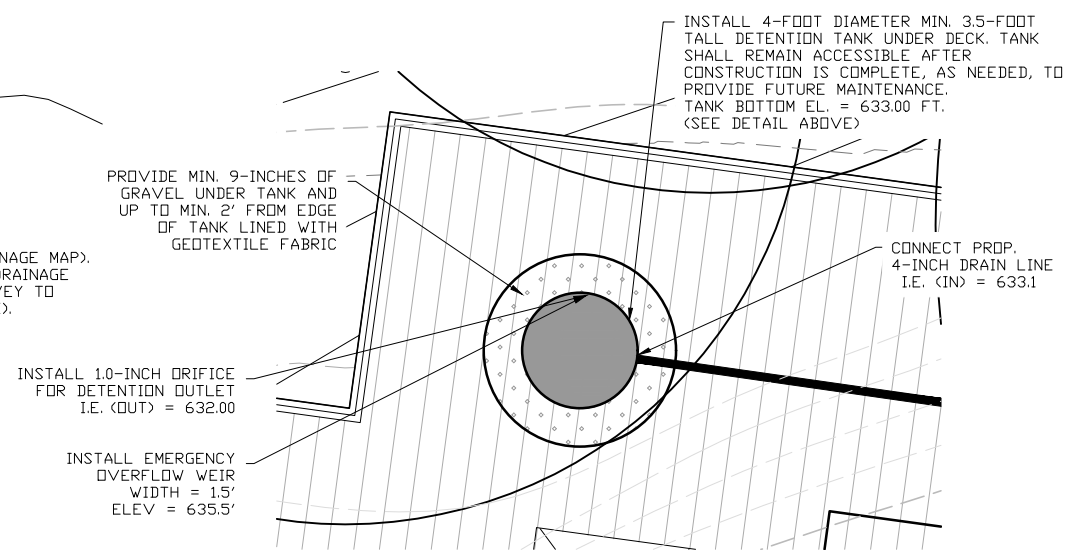
This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Appendix 5 Drainage Plan

NOTE: PLEASE REFER TO THE ARCHITECTURAL PLANS FOR ADDITIONAL TREE SURVEY INFORMATION.



DETENTION SYSTEM DETAIL (CROSS SECTION)
N.T.S.



DETENTION SYSTEM DETAIL (PLAN VIEW)
1"=5'

LEGEND

- RUNOFF FLOW DIRECTION
- DRAINAGE AREA BOUNDARY
- CONTOUR
- SILT FENCE
- METAL FENCE
- ▲ BENCHMARK

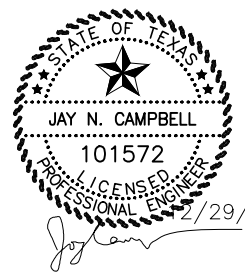
1"=30'



CONSTRUCTION SEQUENCE:

1. INSTALL SOIL EROSION CONTROLS
2. INSTALL TEMPORARY DETENTION FACILITIES (IF NEEDED)
3. BEGIN SITE CLEARING, GRUBBING, AND TOPSOIL STRIPPING
4. STABILIZE DISTURBED AREAS WITH BARE GROUND, WHERE CONSTRUCTION CEASES FOR 14 DAYS OR LONGER, WITH NATIVE SEED VEGETATION OR OTHER SOIL STABILIZATION METHODS TO EFFECTIVELY PREVENT SOIL EROSION
5. PERFORM CONSTRUCTION ACTIVITIES
6. INSTALL DETENTION SYSTEM
7. INSPECT SITE FOR DISTURBED AREAS WITH BARE GROUND AND VEGETATE AS NEEDED
8. MONITOR ALL VEGETATED AREAS UNTIL STABILIZED
9. REMOVE TEMPORARY SOIL EROSION CONTROL MEASURES

AFTER CONSTRUCTION IS COMPLETE, THE OWNER SHALL PERIODICALLY INSPECT THE POND AND REMOVE SEDIMENT AND DEBRIS AS NEEDED TO MAINTAIN PROPER FUNCTIONALITY OF THE POND.



809 CANYON CREEK
DRAINAGE IMPROVEMENT PLAN
ON-SITE DRAINAGE PLAN
& SOIL EROSION CONTROL
SHEET 2

DRAINAGE NOTES:

1. WE CERTIFY THAT ALL EASEMENTS ARE SHOWN ON THIS PLAN.
2. NO CONCENTRATED STORMWATER FLOWS WILL LEAVE THIS LOT ONTO ADJACENT PROPERTIES, UNLESS THEY DISCHARGE DIRECTLY INTO AN APPROVED CHANNEL THAT IS WITHIN A DRAINAGE EASEMENT.
3. THE DRAINAGE DESIGNER IS RESPONSIBLE FOR THE ADEQUACY OF THESE PLANS. IN ACCEPTING THESE PLANS, THE CITY OF WEST LAKE HILLS AND ALL REVIEWERS RELY UPON THE ADEQUACY OF THE DESIGN BY THE DRAINAGE ENGINEER.
4. PER TPDES GENERAL PERMIT NO. 150000, DISTURBED AREAS ON WHICH CONSTRUCTION ACTIVITIES HAVE CEASED (TEMPORARILY OR PERMANENTLY) SHALL BE STABILIZED WITHIN 14 DAYS UNLESS ACTIVITY RESUMES WITHIN 21 DAYS.
5. THE OWNER OF THE PROPERTY IS RESPONSIBLE FOR CLEANING AND REMOVING ALL SEDIMENT THAT IS WASHED FROM THE SITE IN DEDICATED STREETS, ALLEYS, WATERWAYS, OR OTHER PROPERTIES.
6. STRIPPING OF VEGETATION FROM PROJECT SITES SHALL BE PHASED SO AS TO EXPOSE THE MINIMUM AMOUNT OF AREA TO SOIL EROSION FOR THE SHORTEST POSSIBLE PERIOD OF TIME PER THE WLH DRAINAGE AND EROSION CONTROL DESIGN MANUAL SEC 7.1(1).
7. THIS PROJECT IS NOT LOCATED WITHIN A FLOOD HAZARD AREA PER THE EFFECTIVE FEMA FIRM PANEL 48453C0445J EFF. 1/6/2016.
8. NOTE THAT THIS PROJECT IS LOCATED WITHIN THE EDWARDS AQUIFER RECHARGE ZONE AND ALL CONSTRUCTION SHALL COMPLY WITH TCEQ REQUIREMENTS.
9. NO FENCES OR STRUCTURES ARE ALLOWED ACROSS ANY DRAINAGE EASEMENT.

Anjali Naini

From: Mark pzsec
Sent: Monday, August 31, 2020 7:58 AM
To: Anjali Naini
Subject: FW: 809 Canyon Creek Drive Variance Request

Follow Up Flag: Follow up
Flag Status: Flagged

Good morning!

I'm adding this e-mail to the variance file.

-----Original Message-----

From: [REDACTED]
Sent: Sunday, August 30, 2020 8:25 PM
To: Mark pzsec <pzsec@westlakehills.org>
Subject: 809 Canyon Creek Drive Variance Request

Hello Mark

We have no objections to the variances requested by Samuel Dillard for 809 Canyon Creek Drive.

Sincerely, Camilla and James Hughes 800 Canyon Creek Drive

Anjali Naini

From: Mark pzsec
Sent: Monday, September 14, 2020 4:39 PM
To: Anjali Naini
Subject: FW: Variance Application/809 Canyon Creek Drive

Follow Up Flag: Follow up
Flag Status: Flagged

From: Michelle Bassett [REDACTED]
Sent: Monday, September 14, 2020 2:50 PM
To: Robert Meisel <zapco1@westlakehills.org>; James Vaughan <zapco2@westlakehills.org>; Laurie Maccini <zapco3@westlakehills.org>; Jim Pledger <zapco4@westlakehills.org>; William H Vandersteel <zapco5@westlakehills.org>; Bill Harwell <zapco7@westlakehills.org>
Cc: Rick Coneway <[REDACTED]>; Mark pzsec <pzsec@westlakehills.org>
Subject: Variance Application/809 Canyon Creek Drive

RE: Variance Request on ZAPCO agenda, Wednesday, 9/16, 809 Canyon Creek Drive

Dear Chairman Meisel and ZAPCO Members:

Having lived at 804 Canyon Creek Drive for just over 30 years, I've learned the hard way that changes on the above-referenced property have the potential to wreak havoc on my own. The consequences have been very costly. In past years, the previous owner did tree clearing, trench digging, and rock work, with and without permits, that cost me thousands in damage and repairs.

I'm very pleased to have the applicant, Mr. Dillard, as my new neighbor, and in no way do I wish to cause him unnecessary delay in getting started on his renovation. However, this application fails to answer my concerns about potential water re-routing, and I need more time and more information before I'm comfortable that my property won't be further damaged.

I've engaged the services of Rick Coneway, P.E. to assist me in understanding the implications of these variances. I'll be meeting with Mr. Coneway at the property this week, and will need to allow him the time to evaluate the plan and make his recommendations.

On two occasions, when I've reached out to Mr. Dillard, he's offered to put his civil engineer and/or contractor in touch with me. To date, that hasn't happened, and because this application is on this week's agenda, **I must respectfully request a postponement.**

As always, I appreciate your dedication to the City. I know your job isn't easy, but it is vital to maintaining the quality of life we enjoy in West Lake Hills. Thank you.

Sincerely yours,

Michelle Segall Bassett
804 Canyon Creek Drive
West Lake Hills, Tx 78746
[REDACTED]
512-695-3206

Anjali Naini

From: Jim DeCosmo [REDACTED]
Sent: Monday, September 14, 2020 7:03 PM
To: Anjali Naini
Cc: Cindy DeCosmo
Subject: 809 Canyon Creek Variance Request

Zoning and Planning Commission, Board of Adjustment

We are familiar with the property and issues identified in the request of variances. We fully support the approval of the variances yet take exception with the city relative to requiring a variance to remove a Chinese Tallow, a non-native invasive species. We should be encouraging home owners to remove Tallow, not charging them through the variance process, this make absolutely no sense!

Jim and Cindy DeCosmo
802 Canyon Creek, West Lake Hills, TX 78746