

NOTICE OF MEETING
HILLSIDE REVIEW BOARD
CITY OF ST. GEORGE
WASHINGTON COUNTY, UTAH

Public Notice

Notice is hereby given that the Hillside Review Board of the City of St. George, Washington County, Utah, will hold meetings at the referenced site on **Wednesday, November 30, 2022**, commencing on-site at approximately 9:00 a.m.

The estimated site times are in bold. The agenda for the meeting is as follows:

1. Consider a request for a hillside development permit for a residential retaining wall. The applicant is requesting that the Hillside Review Board consider the structural stability and mitigate the appearance and location of this retaining wall. The property is currently zoned R-1-8 (Single Family Residential, minimum lot size 8,000sf). The site is located at 150 N. Donlee Drive. The applicant is Ryan and Martina Davis. Case No. 2022-HS-018.
Meeting time is approx. 9:00 am

Carol Davidson, AICP, CFM, CPM
Senior Planner
Development Services

Reasonable Accommodation: The City of St. George will make efforts to provide reasonable accommodations to disabled members of the public in accessing City programs. Please contact the City Human Resources Office at (435) 627-4674 at least 24 hours in advance if you have special needs.

Meeting Location

Item #1 – Kneaders parking lot – 199 N. Bluff Street



HILLSIDE REVIEW BOARD AGENDA REPORT: 11/30/2022

150 N. Donlee Drive Hillside Development Permit (Case No. 2022-HS-018)		
Request:	A Hillside Development Permit to mitigate the placement of a block wall in the hillside development overlay zone.	
Applicant:	Ryan and Martina Davis	
Representative:	same	
Location:	150 N. Donlee Drive	
General Plan:	Low Density Residential (LDR), Open Space (OS)	
Existing Zoning:	R-1-8 (Single Family Residential, minimum lot size 8,000 sf)	
Surrounding Zoning:	North	R-1-8
	South	R-1-8
	East	OS (Open Space
	West	R-1-8
Land Area:	Approximately 0.26 acres	



BACKGROUND

This is a request to obtain a hillside permit for the property located at 150 N. Donlee Drive, Lot 201, Valley View Heights Phase 2 (see Exhibit A, Final Plat). The applicant has put in a retaining wall along their rear property line, which is along the ridgeline above Bluff Street, to build up the property to make the yard more usable. The retaining wall was built without a hillside or building permit. After the retaining wall was built, the applicant hired a third-party engineer to evaluate the stability of the retaining wall. Please refer to Exhibit B to view the entire report

This hillside item has two purposes. The first is to determine if the retaining wall that was installed is structural sound, and if this Board agrees with the submitted engineering report found in Exhibit A. The second purpose is to mitigate the ridgeline setback issue. This property was subdivided before the hillside ordinance went into effect. According to the Ridgeline Map, this property is not located within the Cuesta (100' setback) or Plateau Ridge Line (50' setback); therefore, the ridgeline setback for this location is 30'. The location of the ridgeline has not been determined for this location. Please refer to the photos provided in Exhibit C.

APPLICABLE ORDINANCE(S) (Selected portions)

10-13A-6: Building Setbacks and Additional Design Standards:

- A. *Setbacks:* All setbacks shall conform to the underlying zone criteria except as provided herein. No structure or accessory structure shall be constructed within the setback area as defined below. However, a see-through wrought iron fence with at least fifty percent (50%) of the fence open, landscaping, and a nonvertical swimming pool are permitted in the setback area.
 - 1. *Ridgelines:* All ridgelines as shown on the ridgeline map shall be subject to the setback provisions contained herein. Setbacks from ridgelines not identified on the ridgeline map shall be a minimum of thirty feet (30'), or greater if recommended in the geotechnical reports.
 - 2. *Plateaus:* On plateaus, the setback from the ridgeline shall be a minimum of fifty feet (50') unless a greater setback is recommended in the geotechnical reports.
- C. *Cuesta:* Where a ridgeline occurs on a cuesta, the minimum setback shall be one hundred feet (100') measured normal (perpendicular) to the closest point of the ridge, unless a greater setback is recommended in the geotechnical report.
- D. *Additional Design Standards:*

1. Retaining walls shall be colored to blend into the surrounding natural geology.
2. Retaining wall height is limited to the heights set forth in chapter 18 of this title and the standards for rock wall construction.
3. Building exterior colors shall be earth tone and blend with the surrounding natural landscape.
4. In residential zones, “no disturbance” areas shall be held as the “common area” of a project. Common areas shall be owned and maintained by the homeowners’ association or may be deeded to the city when accepted by the city.
5. In nonresidential zones, any “no disturbance” area shall be identified on the final site plan or final plat.
6. Any required no disturbance area shall be identified on the ground with temporary fencing or other approved means to prevent accidental disturbance of the area during construction and such fencing shall be installed prior to issuance of a grading permit.
7. The building site shall be located on the flattest portion of the parcel.
8. No structure shall extend over any natural ridgeline. The structure shall be in contact with the ground at all edges. (Ord. 2019-10-002, 10-10-2019)

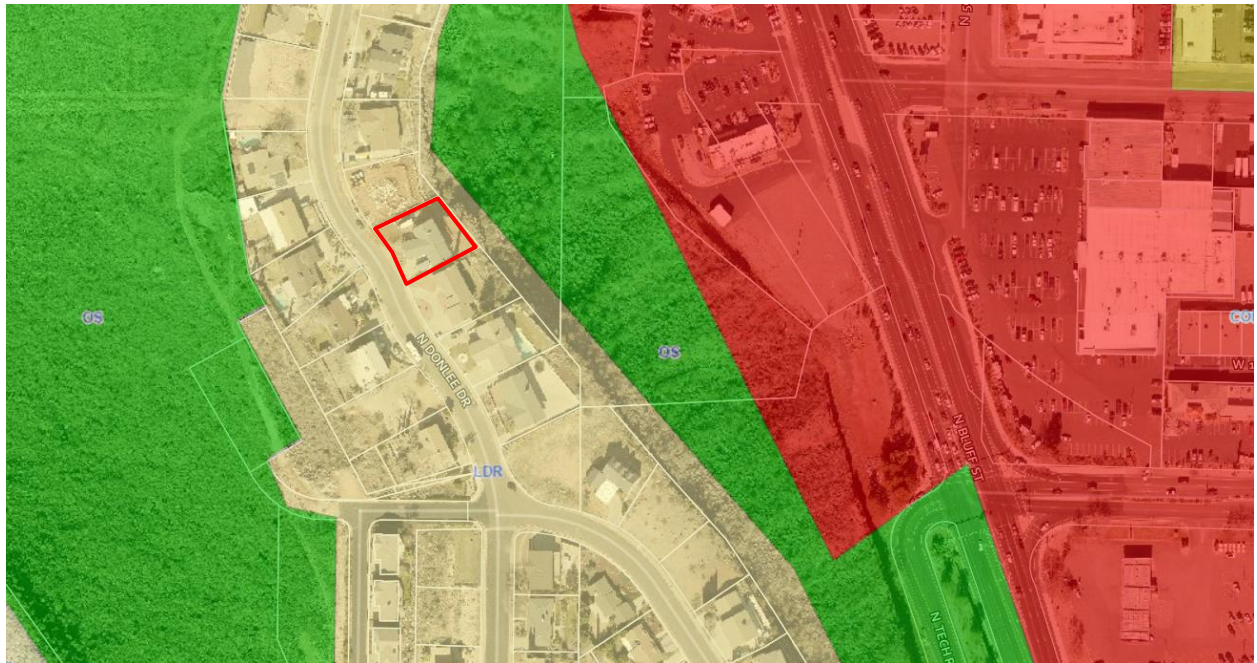
EXHIBITS PROVIDED

1. Exhibit A – Valley View Heights Phase 2 Final Plat
“Exhibit A” shows lot 201 of the final plat of Valley View Heights Phase 2
2. Exhibit B – Engineering Report
“Exhibit B” is a report made by Landmark engineers of the structural stability of the existing retaining wall
3. Exhibit C – Photos of the property before and after
“Exhibit C” are a collection of photos showing the location before and after the building of the retaining wall

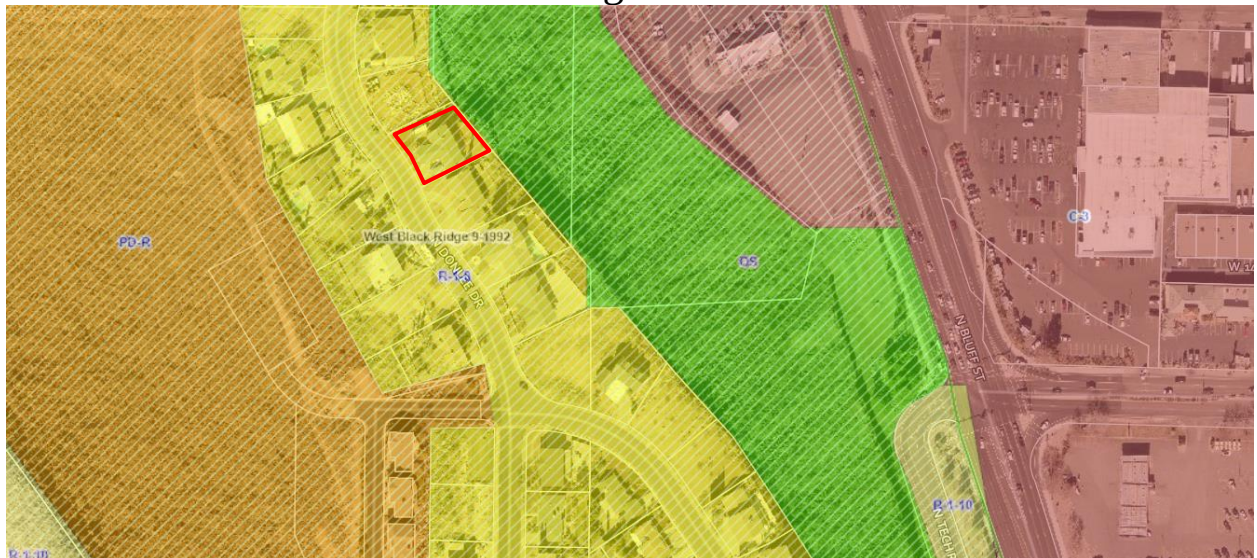
RECOMMENDATION

Staff recommends that the hillside review board evaluate the information provided to determine if the retaining wall built along the rear property line of 150 N, Donlee Drive is stable and whether any additional mitigation is necessary on look and location of this retaining wall.

General Plan - COM



Zoning - R-1-8



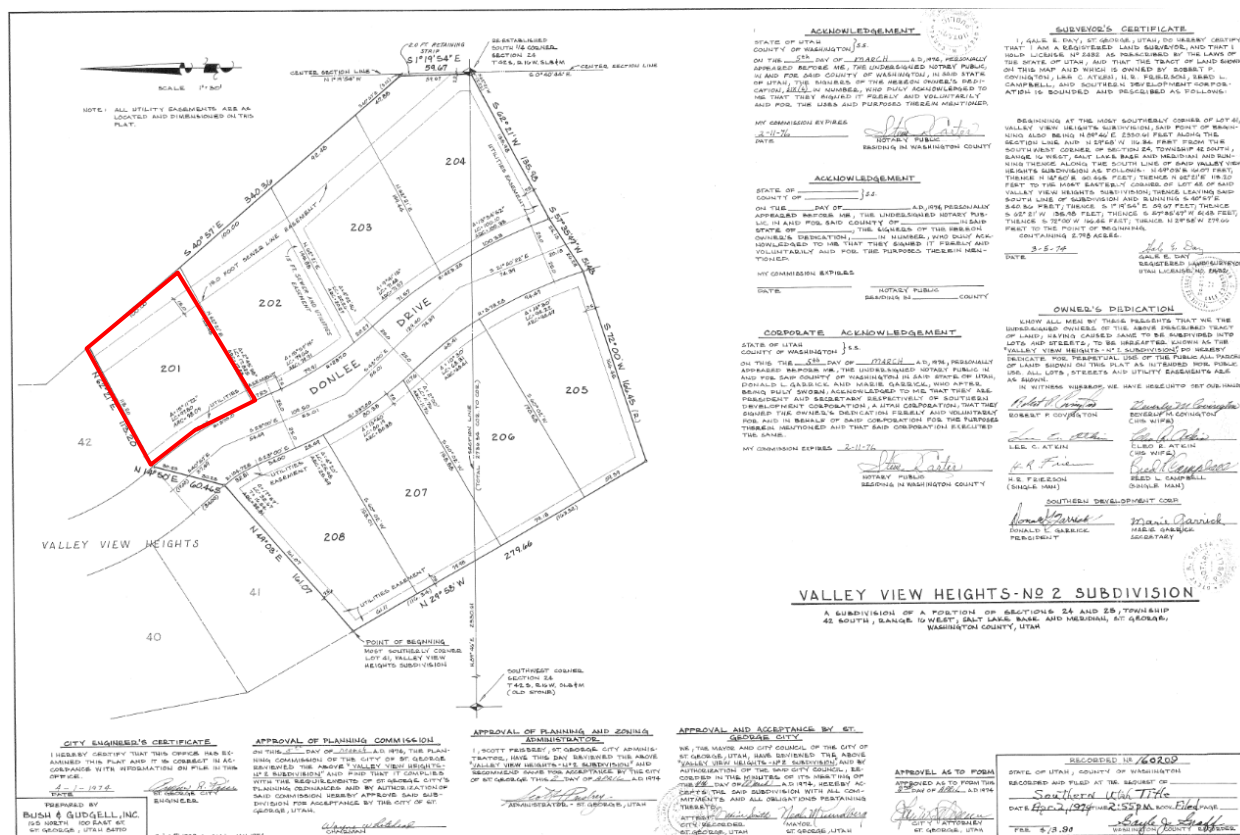


Exhibit B

Retaining Wall Engineering Report



September 12, 2022

Ryan Davis
150 North Donlee Drive
St. George, Utah 84770

Subject: Concrete Block Wall Letter
150 North Donlee Drive
St. George, Utah
Landmark Project #220603

Ryan:

A two-tiered Redi-Rock concrete block wall is under construction in the backyard of the residence at 150 North Donlee Drive in St. George, Utah. The wall is located near the top of a 160-foot tall slope leading down to a parking lot on Bluff Street. A site visit by one of our engineers was completed to assess site conditions and to aid in a block wall analysis to assess the stability of the block wall.

ON-SITE VISIT

As part of the on-site visit, an engineer from Landmark and a field technician visited the site of the block wall and completed soils density tests, dynamic cone penetrometer (DCP) tests, and measured the slope below the wall with a Smart Level.

Soil density tests were performed on samples of the imported backfill at or near the existing ground surface on both the upper and lower tiers. The tests showed that the soil had dry densities ranging from 103.0 to 123.2 pcf with an average dry density of 112.6 pcf. The moisture content of the soil ranged from 3.3 to 13.7 percent with an average of 8.9 percent. The average in-place density of the soils, taking the moisture into account, was 122.6 pcf. A soil density sheet is attached to this letter.

Two dynamic cone penetrometer tests were performed on the soils adjacent to the soil density tests. One DCP test was performed on the backfill for each tier. When performing a DCP test, a 17.6-pound weight is dropped from a specified height multiple times to drive a cone tipped, metal rod into the ground. The penetration of the cone rod per blow is correlated to California Bearing Ratio (CBR) values.

The cone was driven deeper into the ground than the soil density testing was able to measure. The DCP testing was completed to show the density of the soil at depth compared to the surficial soils. The testing shows that the CBR values stayed relatively consistent with depth, indicating that the soils down to the maximum depth of the DCP testing (approximately 34 inches) was compacted in a similar manner to the surficial soils.

The slope below the bottom tier of the block wall was measured with a smart level to be 40 degrees down to the east.

It was observed that the blocks used for the block walls were Redi Rock blocks that were 41 inches deep. The lower tier was observed to be 10.5 feet in height at its highest point. The bench between walls was measured to be 8 feet. The upper tier was observed to be 9 feet in height.

Basalt bedrock was observed to be located immediately below the bottom tier of the wall. The basalt appears to slope up to the level of the house at the top of the upper tier of the block wall.

INTERNAL SABILITY ANALYSIS

Using the Redi Rock Wall + program, a block wall analysis was performed based on the density tests, DCP tests, soil used as backfill and the wall configuration. It is our understanding that the wall was not constructed with geogrid reinforcement, and therefore, was analyzed as a gravity retaining wall. The wall analysis was performed using an effective moist unit weight of 120 pcf with an internal friction angle of 32 degrees. The wall configuration was input in the program as observed on-site.

The wall was shown to have factors of safety exceeding 1.5 for overturning stability and slip, factor of safety greater than 2.0 for bearing capacity, and an eccentricity of 0.160.

SUMMARY and RECOMMENDATIONS

It is the opinion of Landmark Testing and Engineering that the block walls as constructed meet minimum factors of safety and will function as intended. At the time of our visit the lower tier had a maximum wall height of 10.5 feet and the upper tier had a maximum wall height of 9 feet. The wall heights should be decreased to meet city requirements either by removing blocks or increasing the embedment of the walls.

Typical moisture control recommendations include, but are not limited to, grading the ground surface drain surficial water away from the walls and limiting vegetation on or adjacent to the walls.

We understand that a pool is to be built behind the upper tier of the wall. We recommend that the pool be located as far from the residence and wall as possible, and a minimum of 10 feet from the rear face of the block in the upper wall. A leak in the pool poses a significant risk to the stability of the walls. It should be understood that Landmark does not recommend the placement of pools proximate to retaining walls unless the retaining wall has been specifically designed for this condition.

However, if the pool is to be built behind the wall despite our recommendation, strict moisture control recommendations should be followed. These recommendations include but are not limited to the following:

- The pool should be located a minimum of 10 feet from the retaining wall and existing structure.
- Plumbing is a significant source of leaks. All plumbing should be fully leak tested and approved prior to filling of the pool.
- The water level in the pool should be strictly monitored and consideration should be given for installing a leak monitoring system. Any leaks should be repaired immediately.
- Consideration should be given to installing an impermeable membrane beneath and extending up the sides of the pool.

- We recommend concrete flatwork with drains surrounding the pool to drain surface water away from the pool and other structures.

Our services for this letter did not include a soils investigation beneath the pool. Construction of the pool is to be completed by the contractor according to best industry practices. Construction, maintenance, ownership, and all consequences associated with the pool are to be accepted by the pool owner.

Landmark did not design the concrete block retaining walls, nor compete construction testing during their construction. Our services consisted only of the information found in this letter, and this letter should not be considered a Letter of Compliance nor an acceptance of liability.

If you have any questions or would like to discuss this project, please contact the undersigned at (435) 986-0566.

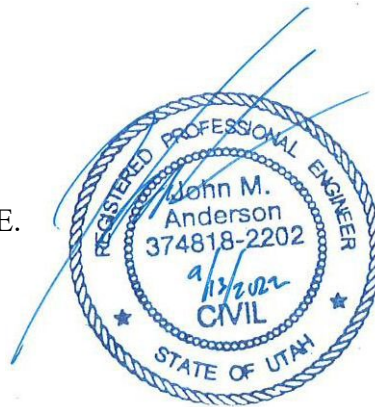
Sincerely,

LANDMARK TESTING & ENGINEERING



Kent Nelson, P.E.
Project Engineer

John M. Anderson, P.E.
Project Engineer



[illegible]



Dynamic Cone Penetrometer

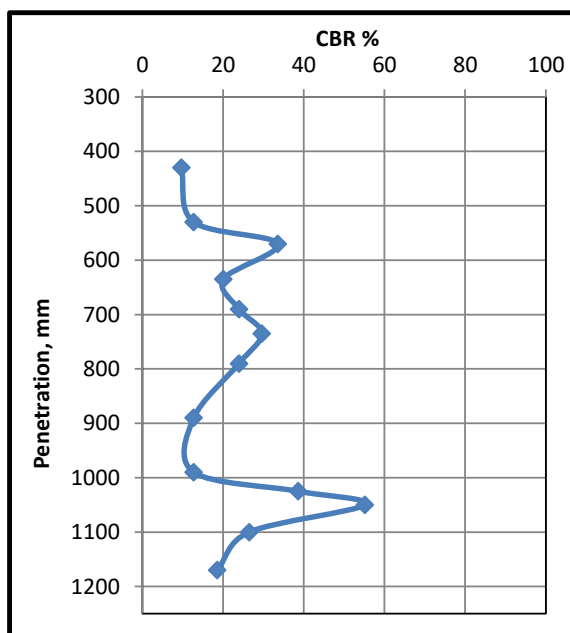
Project: 150 North Donlee Drive
 Project #: 220603
 Sample Location: Lower Tier
 Soil Classification: SILTY SAND (SM)

Date: 9/2/2022
 Tested By: K. Nelson
 Hammer Wt: 17.6 lb
 Water Table Depth: Not Encountered

Number of Blows	Cumulative Penetration, mm	Penetration Between Readings, mm	Penetration per Blow, mm	Hammer Factor	DCP Index, mm/blow	CBR %
Initial	300					
5	430	130	26	1	26	10
5	530	100	20	1	20	13
5	570	40	8	1	8	34
5	635	65	13	1	13	20
5	690	55	11	1	11	24
5	735	45	9	1	9	30
5	790	55	11	1	11	24
5	890	100	20	1	20	13
5	990	100	20	1	20	13
5	1025	35	7	1	7	39
5	1050	25	5	2	5	55
5	1100	50	10	3	10	26
5	1170	70	14	1	14	19

Tabulated Correlation of CBR vs. DCP Index

DCP Index mm/blow	CBR %	DCP Index mm/blow	CBR %	DCP Index mm/blow	CBR %
<3	100	39	4.8	69-71	2.5
3	80	40	4.7	72-74	2.4
4	60	41	4.6	75-77	2.3
5	50	42	4.4	78-80	2.2
6	40	43	4.3	81-83	2.1
7	35	44	4.2	84-87	2.0
8	30	45	4.1	88-91	1.9
9	25	46	4.0	92-96	1.8
10-11	20	47	3.9	97-101	1.7
12	18	48	3.8	102-107	1.6
13	16	49-50	3.7	108-114	1.5
14	15	51	3.6	115-121	1.4
15	14	52	3.5	112-130	1.3
16	13	53-54	3.4	131-140	1.2
17	12	55	3.3	141-152	1.1
18-19	11	56-57	3.2	153-166	1.0
20-21	10	58	3.1	167-183	0.9
22-23	9	59-60	3.0	184-205	0.8
24-26	8	61-62	2.9	206-233	0.7
27-29	7	63-64	2.8	234-271	0.6
30-34	6	65-66	2.7	272-234	0.5
35-38	5	67-68	2.6	>324	<0.5





Dynamic Cone Penetrometer

Project: 150 North Donlee Drive
 Project #: 220603
 Sample Location: Upper Tier
 Soil Classification: SILTY SAND (SM)

Date: 9/2/2022
 Tested By: K. Nelson
 Hammer Wt: 17.6 lb
 Water Table Depth: Not Encountered

Number of Blows	Cumulative Penetration, mm	Penetration Between Readings, mm	Penetration per Blow, mm	Hammer Factor	DCP Index, mm/blow	CBR %
Initial	270					
5	325	55	11	1	11	24
5	395	70	14	1	14	19
5	470	75	15	1	15	17
5	560	90	18	1	18	14
5	740	180	36	1	36	7
5	790	50	10	1	10	26
5	805	15	3	1	3	95
	Refusal					

Tabulated Corelation of CBR vs. DCP Index

DCP Index mm/blow	CBR %	DCP Index mm/blow	CBR %	DCP Index mm/blow	CBR %
<3	100	39	4.8	69-71	2.5
3	80	40	4.7	72-74	2.4
4	60	41	4.6	75-77	2.3
5	50	42	4.4	78-80	2.2
6	40	43	4.3	81-83	2.1
7	35	44	4.2	84-87	2.0
8	30	45	4.1	88-91	1.9
9	25	46	4.0	92-96	1.8
10-11	20	47	3.9	97-101	1.7
12	18	48	3.8	102-107	1.6
13	16	49-50	3.7	108-114	1.5
14	15	51	3.6	115-121	1.4
15	14	52	3.5	112-130	1.3
16	13	53-54	3.4	131-140	1.2
17	12	55	3.3	141-152	1.1
18-19	11	56-57	3.2	153-166	1.0
20-21	10	58	3.1	167-183	0.9
22-23	9	59-60	3.0	184-205	0.8
24-26	8	61-62	2.9	206-233	0.7
27-29	7	63-64	2.8	234-271	0.6
30-34	6	65-66	2.7	272-234	0.5
35-38	5	67-68	2.6	>324	<0.5

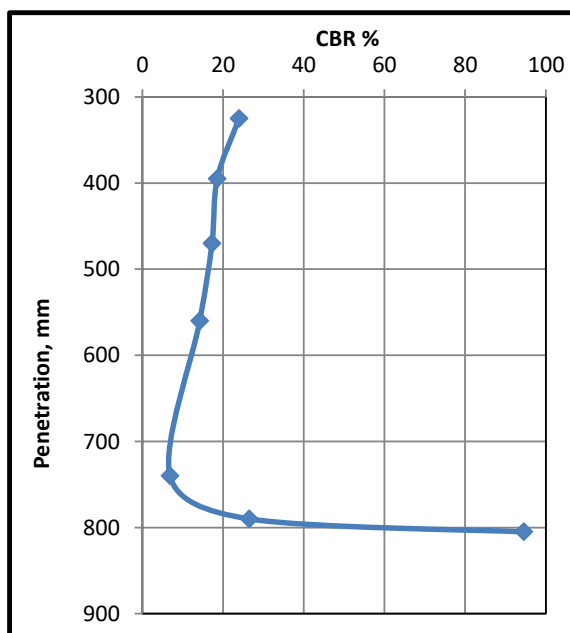


Exhibit C

Before and After Photos of the Project



Rear of House – Before



Rear of House - Before



Rear of House – Before



Rear of House – Google Earth



Rear of House – 11/21/2022



Rear of House – 11/21/2022



Rear of House – 11/21/2022



Rear of House – 11/21/2022