

Review of Retaining Wall at 519 Florence St
Information submitted by Trish Meeks

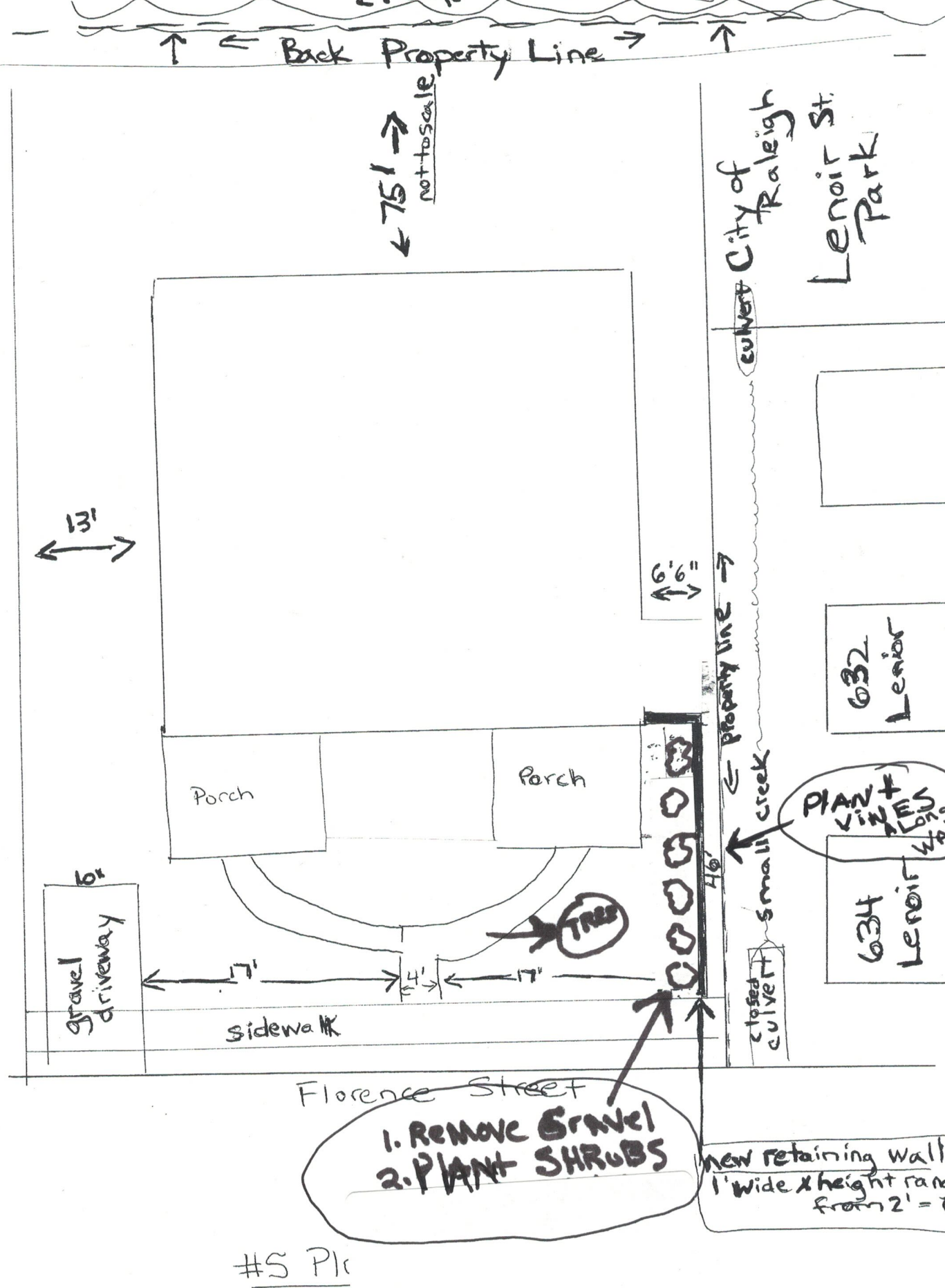
Distinguishing Factors:

1. This wall is below the property street grade, unlike any other wall found in the neighborhood.
2. Due to the extreme slope of Florence St and the Rocky Branch creek, the retaining wall is required to maintain the integrity of the house structure.
3. Throughout most of the Boylan Heights neighborhood the Rocky Branch creek is piped (see attached map), but adjacent to the subject property the creek is daylighted. The open creek heightens the grade/elevation drop and extreme elevation change. If the creek were piped and channeled here, a smaller wall and sloped grading would be sufficient.
4. The prior wall was built without footings, had a 25% bulge, and was not visible due to being completely covered with ground cover (English Ivy).
5. An inventory of retaining walls in the Boylan Heights neighborhood was conducted. As a result of this count, it was determined that the predominant wall type is *cinder block wall*, 18 properties, stone wall, 11 properties and *flat concrete and block concrete stone* are found on a total 16 properties; the remaining walls are brick: 6, brick and stone: 3, wood: 5. Many walls were covered with groundcover, making this a predominant feature. Clearly, while stone is can be considered desirable, it is not the predominant wall type in the Boylan Heights Historic District.

Remedies:

1. Applicant is willing to replant an appropriate groundcover, as determined by staff, so that the current below grade wall is not visible.
2. Applicant agrees that the gravel installed in the yard alongside the wall is incongruous and applicant agrees to remove it.
3. Applicant will restore a planted area as depicted in accompanying drawing.
4. A 10" masonry cap of genuine fieldstone will be created at ground level will be created on top of the retaining wall. This will cover the grade level top of the wall and making the grade level portion of the wall consistent with historical aspirations.

Proposed Rosengarten Greenway Extension



NOT TO SCALE















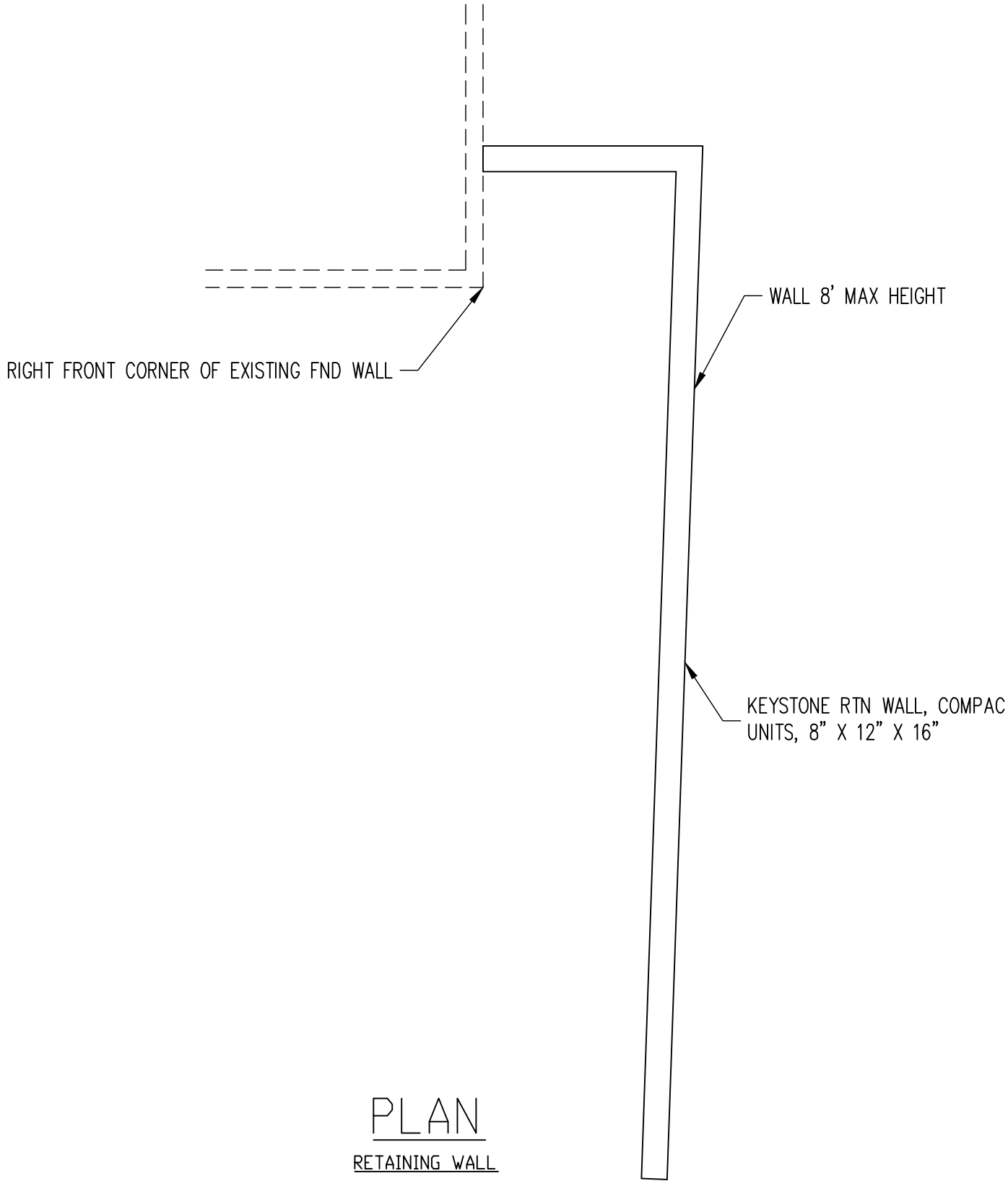




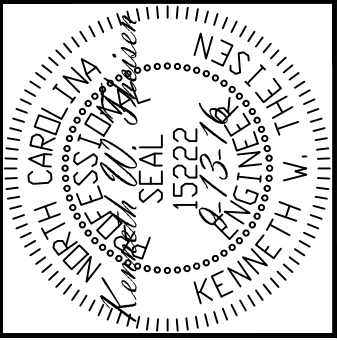








PLAN
RETAINING WALL
 $\frac{3}{16}'' = 1'-0''$



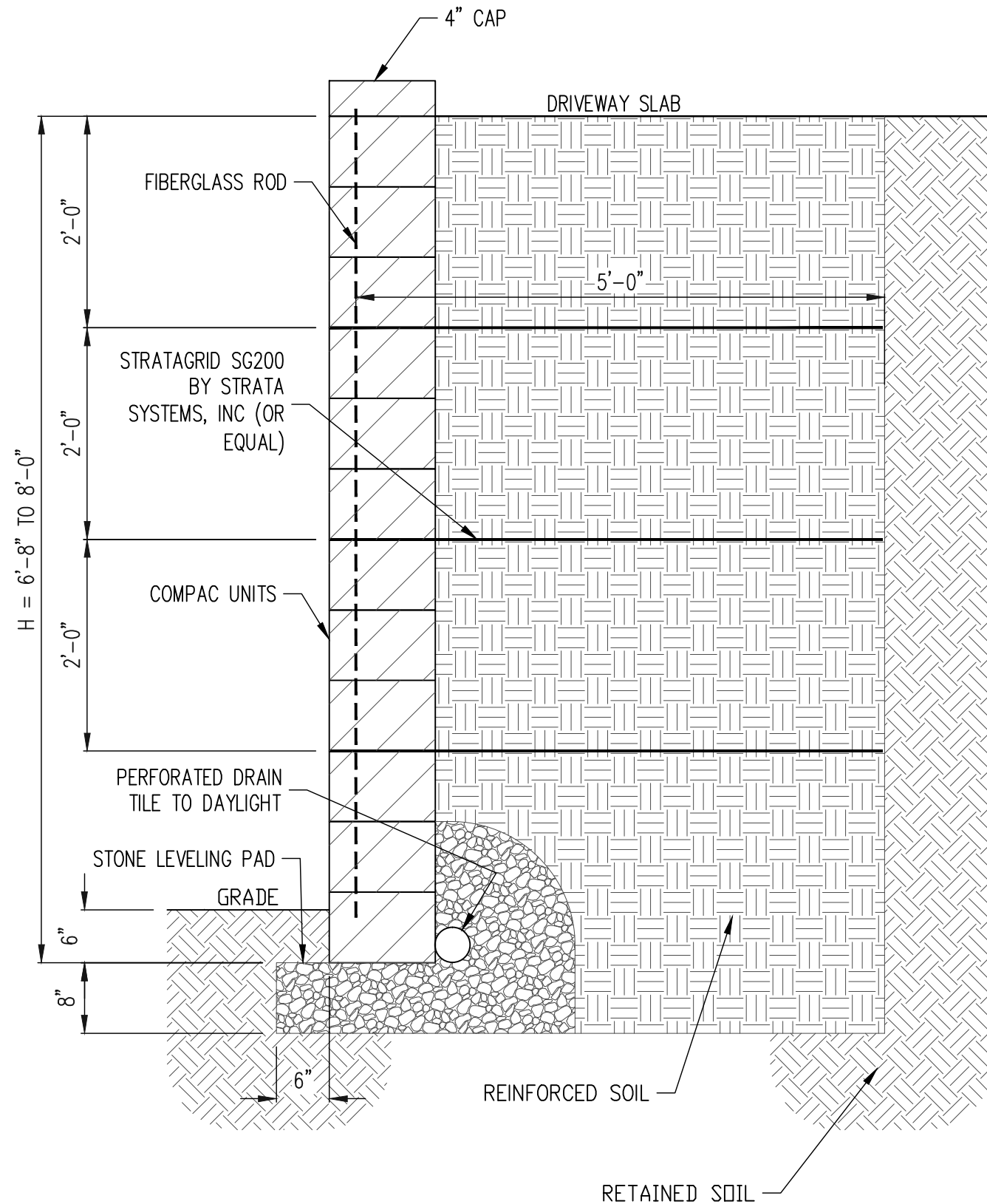
Engineering
ST
Lech

STRUCTURAL ENGINEERS
License No. C-3870
183 Wind Chime Court, Suite 100
Raleigh, North Carolina 27615
ASSOCIATES, P.A. (919) 844-1661 Fax (919) 844-1665

JAY'S LAWN AND LANDSCAPE CO.			
SCOPE:	RETAINING WALL DESIGN		
LOC:	519 FLORENCE STREET	ENG: KWT	REV:
		DATE	9-13-16

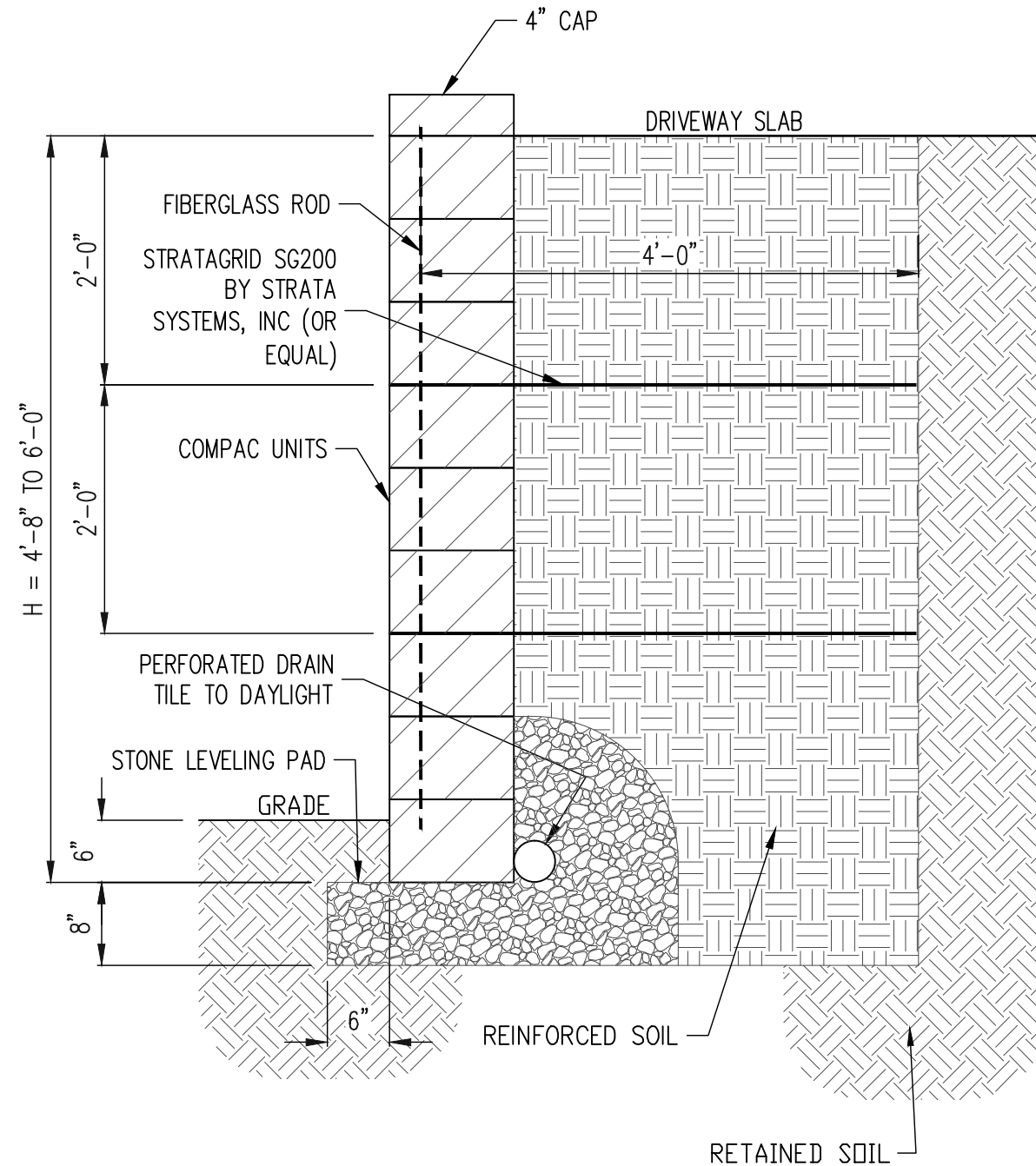
PROJECT NO.
16-65-356

SHEET NO.
S1
1 of 6

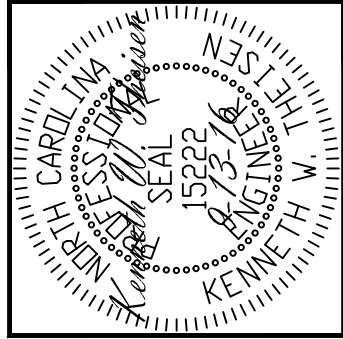


1 SECTION
KEYSTONE WALL, H =
6'-8" TO 8'-0"
3/4" = 1'-0"

NOTE: REINFORCED SOIL TO BE SOIL WITH A MINIMUM
INTERNAL ANGLE OF FRICTION OF 28°, MINIMUM MOIST
DENSITY OF 115 PCF. COMPACT PER SECTION 3.05,
SHEET SD5. OPTION: REINFORCED SOIL TO BE WASHED
STONE OR GRAVEL



2 SECTION
KEYSTONE WALL, H =
4'-8" TO 6'-0"
3/4" = 1'-0"



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JAY'S LAWN AND LANDSCAPE CO.

RETAINING WALL DESIGN

ENC: KWT

REV:

DATE: 9-13-16

PROJECT NO.

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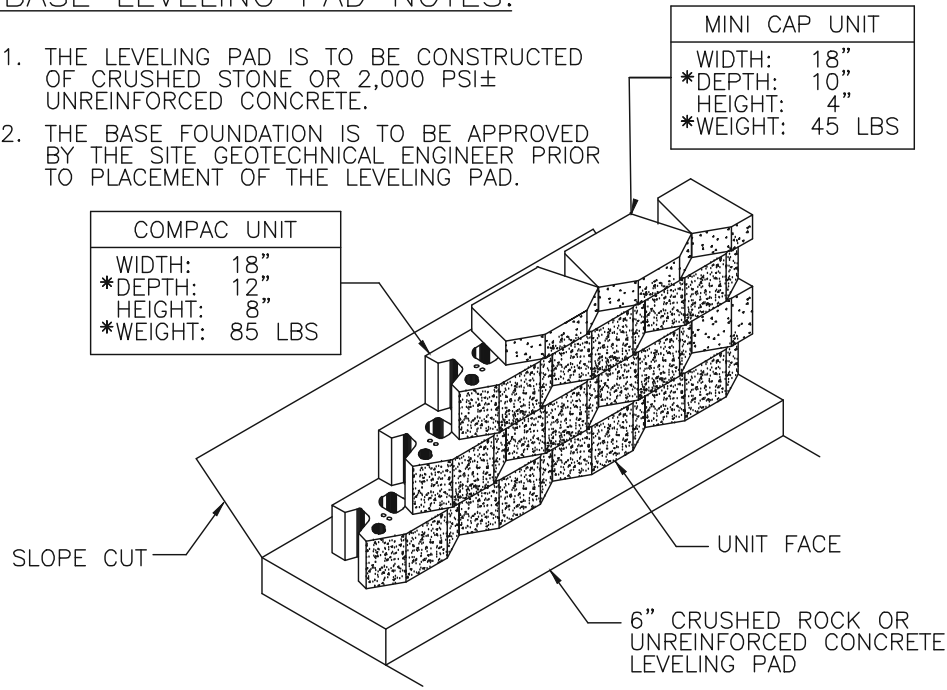
SHEET NO.

SD1

2 of 6

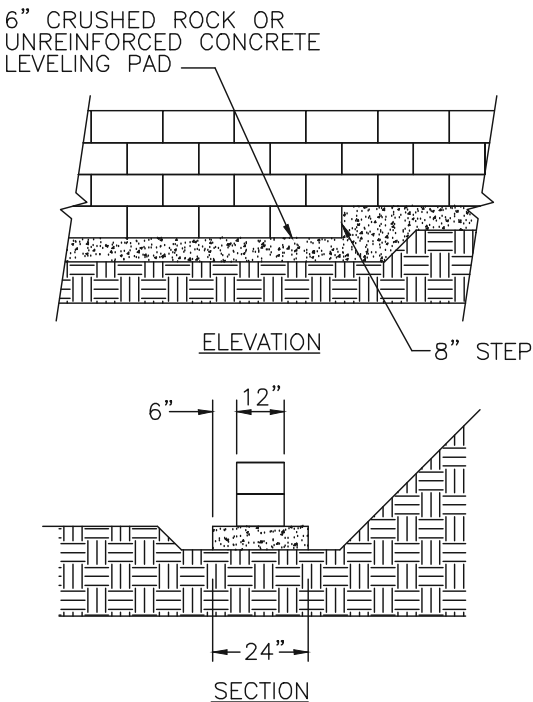
BASE LEVELING PAD NOTES:

1. THE LEVELING PAD IS TO BE CONSTRUCTED OF CRUSHED STONE OR 2,000 PSI± UNREINFORCED CONCRETE.
2. THE BASE FOUNDATION IS TO BE APPROVED BY THE SITE GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT OF THE LEVELING PAD.

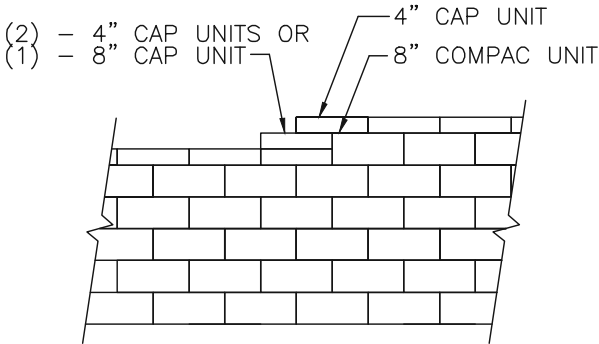


1/5 COMPAC UNIT/BASE PAD ISOMETRIC VIEW
SCALE: 3/8" = 1'-0"

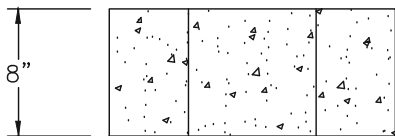
*DIMENSIONS & WEIGHT MAY VARY BY REGION



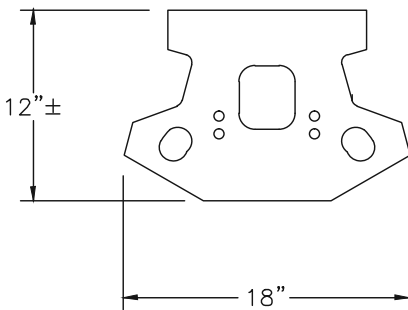
2/5 LEVELING PAD DETAIL
SCALE: 1/4" = 1'-0"



3/5 TOP OF WALL STEPS
SCALE: 1/4" = 1'-0"



COMPAC ELEVATION

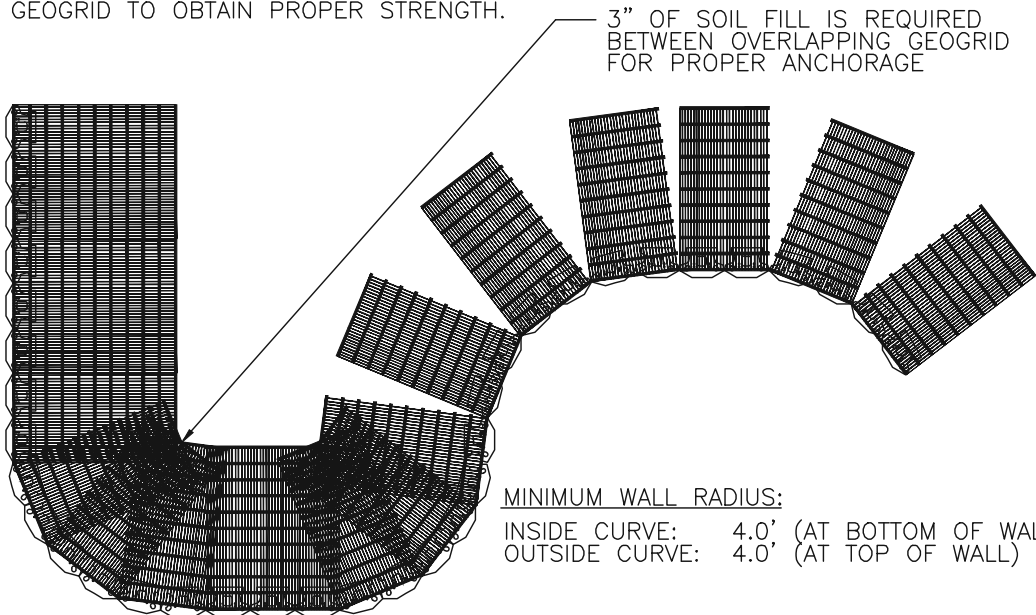


COMPAC PLAN

4/5 COMPAC UNIT
SCALE: 1" = 1'-0"

NOTE:

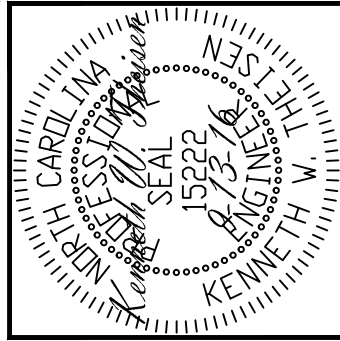
1. CHECK WITH MANUFACTURER SPECIFICATIONS ON CORRECT DIRECTION OF ORIENTATION FOR GEOGRID TO OBTAIN PROPER STRENGTH.



MINIMUM WALL RADIUS:

INSIDE CURVE: 4.0' (AT BOTTOM OF WALL)
OUTSIDE CURVE: 4.0' (AT TOP OF WALL)

5/5 GEOGRID INSTALLATION ON CURVES
SCALE: 5/32" = 1'-0"



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SCOPE	RETAINING WALL DESIGN	ENG	KWT
LOC	519 FLORENCE STREET	REV	
		DATE	9-13-16

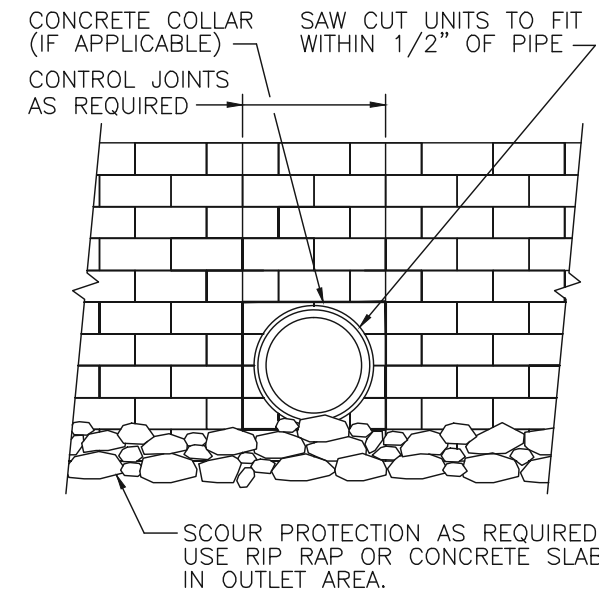
PROJECT NO.
16-65-356

SHEET NO.
SD3

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NOTE:

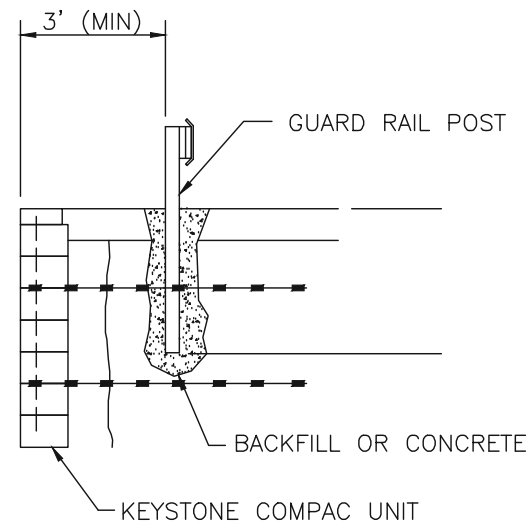
1. FOR PIPES LARGER THAN 24", A CONCRETE COLLAR MAY BE CAST AROUND PIPE FOR EASE OF CONSTRUCTION AND APPEARANCE.



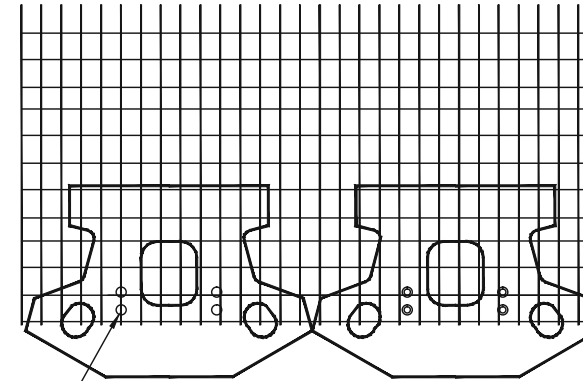
7
5 TYPICAL PIPE OUTLET DETAIL
SCALE: 1/4" = 1'-0"

NOTE:

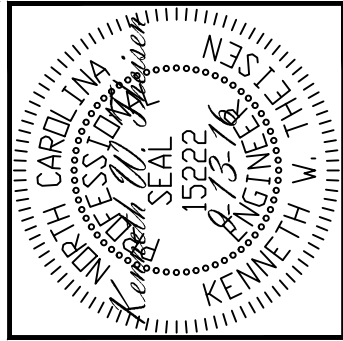
1. AUGER THROUGH GEOGRID LAYERS.
2. BACKFILL OR CONCRETE GUARD RAIL POST IN PLACE



8
5 TYPICAL GUARD RAIL DETAIL
SCALE: 1/4" = 1'-0"



6
5 GRID & PIN CONNECTION
SCALE: 1" = 1'-0"



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SCOPE: RETAINING WALL DESIGN

LOC: 519 FLORENCE STREET

ENC: KWT	REV:	DATE: 9-13-16
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PROJECT NO.
16-65-356

SHEET NO.
SD4

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MODULAR CONCRETE RETAINING WALL

PART 1: GENERAL

1.01 Description

- A. Work shall consist of furnishing and construction of a KEYSTONE Retaining Wall System or equal in accordance with these specifications and in reasonably close conformity with the lines, grades, design, and dimensions shown on the plans.
- B. Work includes preparing foundation soil, furnishing and installing leveling pad, unit drainage fill and backfill
- C. Work includes furnishing and installing geogrid soil reinforcement of the type, size, location, and lengths designated on the construction drawings.

1.02 Reference Documents

A. American Society for Testing and Materials (ASTM)

1. ASTM C-1372 Specification for Segmental Retaining Wall Units
2. ASTM D-422 Particle Size Analysis
3. ASTM D-698 Laboratory Compaction Characteristics of Soil -Standard Effort
4. ASTM D-4318 Liquid Limit, Plastic Limit and Plasticity Index of Soils
5. ASTM D-4595 Tensile Properties of Geotextiles - Wide Width Strip
6. ASTM D-5262 Unconfined Tension Creep Behavior of Geosynthetics
7. ASTM D-3034 Polyvinyl Chloride Pipe (PVC)
8. ASTM D-1248 Corrugated Plastic Pipe

B. Geosynthetic Research Institute (GRI)

1. GRI-GG4 Determination of Long Term Design Strength of Geogrids
2. GRI-GG5 Determination of Geogrid (soil) Pullout

C. National Concrete Masonry Association (NCMA)

1. NCMA SRWU-1 Test Method for Determining Connection Strength of SRW
2. NCMA SRWU-2 Test Method for Determining Shear Strength of SRW

1.03 Delivery, Storage and Handling

- A. Contractor shall check all materials upon delivery to assure that the proper type, grade, color, and certification has been received.
- B. Contractor shall protect all materials from damage due to jobsite conditions and in accordance with manufacturer's recommendations. Damaged materials shall not be incorporated into the work.

PART 2: PRODUCTS

2.01 Definitions

- A. Modular Unit - a concrete retaining wall element machine made from portland cement, water, and aggregates.
- B. Structural Geogrid - a structural element formed by a regular network of integrally connected tensile elements with apertures of sufficient size to allow interlocking with surrounding soil, rock, or earth and function primarily as reinforcement.
- C. Unit Drainage Fill - drainage aggregate which is placed within and immediately behind the modular concrete units.
- D. Reinforced Backfill - compacted soil which is placed within the reinforced soil volume as outlined on the plans.

2.02 Modular Concrete Retaining Wall Units

- A. Modular concrete units shall conform to the following architectural requirements: face color - concrete gray - standard manufacturers' color may be specified by the Owner. face finish - sculptured rock face in angular tri-planer configuration. Other face finishes will not be allowed without written approval of Owner. bond configuration - running with bonds nominally located at midpoint vertically adjacent units, in both straight and curved alignments.

Exposed surfaces of units shall be free of chips, cracks or other imperfections when viewed from a distance of 10 feet under diffused lighting.

- B. Modular concrete materials shall conform to the requirements of ASTM C1372 - Standard Specifications for Segmental Retaining Wall Units.

- C. Modular concrete units shall conform to the following structural and geometric requirements measured in accordance with appropriate references:

compressive strength = 3000 psi minimum;
absorption = 8 % maximum (6% in northern states) for standard weight aggregates;

dimensional tolerances = ± 1/8" from nominal unit dimensions not including rough split face, ±1/16" unit height - top and bottom planes;

unit size - 8" (H) x 18" (W) x 12" (D) minimum;

unit weight - 75 lbs/unit minimum for standard weight aggregates;
inter-unit shear strength - 600 plf minimum at 2 psi normal pressure;

geogrid/unit peak connection strength - 600 plf minimum at 2 psi normal force.

- D. Modular concrete units shall conform to the following constructability requirements:

vertical setback = No vertical setback.

alignment and grid positioning mechanism - fiberglass pins, two per unit minimum; maximum horizontal gap between erected units shall be - 1/2 inch.

2.03 Shear Connectors

- A. Shear connectors shall be 1/2 inch diameter thermoset isophthalic polyester resin-pultruded fiberglass reinforcement rods or equivalent to provide connection between vertically and horizontally adjacent units. Strength of shear connectors between vertical adjacent units shall be applicable over a design temperature of 10 degrees F to + 100 degrees F.

- B. Shear connectors shall be capable of holding the geogrid in the proper design position during grid pre-tensioning and backfilling.

2.04 Base Leveling Pad Material

- A. Material shall consist of a compacted crushed stone base or non-reinforced concrete as shown on the construction drawings.
- B. The maximum aggregate size shall be limited to 3/4 inch unless field tests have been performed to evaluate potential strength reductions to the geogrid design due to damage during construction.
- C. Material can be site excavated soils where the above requirements can be met. Unsuitable soils for backfill (high plastic clays or organic soils) shall not be used in the backfill or in the reinforced soil mass.

2.07 Geogrid soil reinforcement

- A. Geosynthetic reinforcement shall consist of geogrids manufactured specifically for soil reinforcement applications and shall be manufactured from high tenacity polyester yarn or high density polyethylene. Polyester geogrid shall be knitted from high tenacity polyester filament yarn with a molecular weight exceeding 25,000 Meg/m and a carboxyl end group values less than 30. Polyester geogrid shall be coated with an impregnated PVC coating that resists peeling, cracking, and stripping.

- B. Place the front of units side-by-side. Do not leave gaps between adjacent units. Layout of corners and curves shall be in accordance with manufacturer's recommendations.

- C. Install shear/connecting devices per manufacturer's recommendations.

- D. Place and compact drainage fill within and behind wall units. Place and compact backfill soil behind drainage fill. Follow wall erection and drainage fill closely with structure backfill.

2.08 Drainage pipe

- A. If required, the drainage pipe shall be perforated or slotted PVC pipe manufactured in accordance with ASTM D-3034 or corrugated HDPE pipe manufactured in accordance with ASTM D-1248.

PART 3 EXECUTION

3.01 Base Leveling Pad

- A. Leveling pad material shall be placed to the lines and grades shown on the construction drawings, to a minimum thickness of 6 inches and extend laterally a minimum of 6" in front and behind the modular wall unit.

- B. Soil leveling pad materials shall be compacted to a minimum of 95 % Standard Proctor density per ASTM D-698

- C. Leveling pad shall be prepared to insure full contact to the base surface of the concrete units.

3.03 Modular Unit Installation

- A. First course of units shall be placed on the leveling pad at the appropriate line and grade. Alignment and level shall be checked in all directions and insure that all units are in full contact with the base and properly seated.

- B. Place the front of units side-by-side. Do not leave gaps between adjacent units. Layout of corners and curves shall be in accordance with manufacturer's recommendations.

- C. Install shear/connecting devices per manufacturer's recommendations.

- D. Place and compact drainage fill within and behind wall units. Place and compact backfill soil behind drainage fill. Follow wall erection and drainage fill closely with structure backfill.

- E. Maximum stacked vertical height of wall units, prior to unit drainage fill and backfill placement and compaction, shall not exceed two courses.

3.04 Structural Geogrid Installation

- A. Geogrid shall be oriented with the highest strength axis perpendicular to the wall alignment.

- B. Geogrid reinforcement shall be placed at the strengths, lengths, and elevations shown on the construction design drawings or as directed by the Engineer.

- C. The geogrid shall be laid horizontally on compacted backfill and attached to the modular wall units. Place the next course of modular concrete units over the geogrid. The geogrid shall be pulled taut, and anchored prior to backfill placement on the geogrid.

- D. Geogrid reinforcements shall be continuous throughout their embedment lengths and placed side-by-side to provide 100% coverage at each level. Spliced connections between shorter pieces of geogrid or gaps between adjacent pieces of geogrid are not permitted.

3.05 Reinforced Backfill Placement

- A. Reinforced backfill shall be placed, spread, and compacted in such a manner that minimizes the development of slack in the geogrid and installation damage.

- B. Reinforced backfill shall be placed and compacted in lifts not to exceed 6 inches where hand compaction is used, or 8 - 10 inches where heavy compaction equipment is used. Lift thickness shall be decreased to achieve the required density as required.

- C. Reinforced backfill shall be compacted to 95% of the maximum density as determined by ASTM D698. The moisture content of the backfill material prior to and during compaction shall be uniformly distributed throughout each layer and shall be dry of optimum, + 0%, - 3%.

- D. Only lightweight hand-operated equipment shall be allowed within 3 feet from the tail of the modular concrete unit.

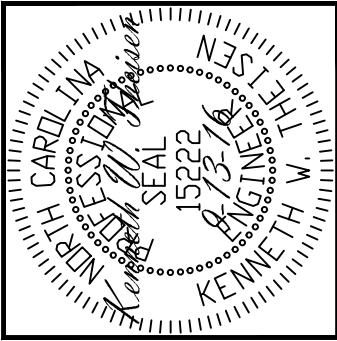
- E. Tracked construction equipment shall not be operated directly upon the geogrid reinforcement. A minimum fill thickness of 6 inches is required prior to operation of tracked vehicles over the geogrid. Tracked vehicle turning should be kept to a minimum to prevent tracks from displacing the fill and damaging the geogrid.

- F. Rubber tired equipment may pass over geogrid reinforcement at slow speeds, less than 10 MPH. Sudden braking and sharp turning shall be avoided.

- G. At the end of each day's operation, the Contractor shall slope the last lift of reinforced backfill away from the wall units to direct runoff away from wall face. The Contractor shall not allow surface runoff from adjacent areas to enter the wall construction site.

3.06 Cap Installation

- A. Cap units shall be glued to underlying units with an all-weather adhesive recommended by the manufacturer.



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JAY'S LAWN AND LANDSCAPE CO.		RETAINING WALL DESIGN		ENG	KWT
SCOPE	LOC	519 FLORENCE STREET	REV:	DATE	
				9-13-16	

PROJECT NO.
16-65-356

SHEET NO.
SD5
6 of 6

Raleigh Historic Development Commission – Certificate of Appropriateness (COA) Application



DEVELOPMENT SERVICES DEPARTMENT

Development Services
Customer Service Center
One Exchange Plaza
1 Exchange Plaza, Suite 400
Raleigh, North Carolina 27601
Phone 919-996-2495
eFax 919-996-1831



RALEIGH HISTORIC DEVELOPMENT COMMISSION

CHK # 2767

- ☐ Minor Work (staff review) – 1 copy
- ☒ Major Work (COA Committee review) – 10 copies
- ☐ Additions Greater than 25% of Building Square Footage
- ☐ New Buildings
- ☐ Demo of Contributing Historic Resource
- ☐ All Other

☐ Post Approval Re-review of Conditions of Approval

For Office Use Only

Transaction # 496768

File # 190-16-CA

Fee \$147.00

Amount Paid ~~\$147.00~~ \$147.00

Received Date 12/05/2016

Received By Pamela Best

Property Street Address 519 Florence St

Historic District BOYLAW

Historic Property/Landmark name (if applicable)

Owner's Name TRISH MEEKS

Lot size .19 (width in feet) 69' (depth in feet) 157'

For applications that require review by the COA Committee (Major Work), provide addressed, stamped envelopes to owners of all properties within 100 feet (i.e. both sides, in front (across the street), and behind the property) not including the width of public streets or alleys (Label Creator).

Property Address	Property Address
515 Florence St	
513 Florence St	
632 Lenior St	
634 Lenior St	
501. S. BOYLAW	

25 env

I understand that all applications that require review by the commission's Certificate of Appropriateness Committee must be submitted by 4:00 p.m. on the application deadline; otherwise, consideration will be delayed until the following committee meeting. An incomplete application will not be accepted.

Type or print the following:

Applicant Trish Weeks

Mailing Address 519 Florence St.

City RALEIGH

State N.C.

Zip Code 27603

Date 11/24/2016

Daytime Phone 919-755-1999

Email Address frishmeeks48@gmail.com.

Applicant Signature 

Office Use Only

Will you be applying for rehabilitation tax credits for this project? ☐ Yes ☒ No

Type of Work _____

Did you consult with staff prior to filing the application? ☒ Yes ☒ No

36

Design Guidelines - Please cite the applicable sections of the design guidelines (www.rhdc.org).

[illegible]

Minor Work Approval (office use only)

Upon being signed and dated below by the Planning Director or designee, this application becomes the Minor Work Certificate of Appropriateness. It is valid until _____. Please post the enclosed placard form of the certificate as indicated at the bottom of the card. Issuance of a Minor Work Certificate shall not relieve the applicant, contractor, tenant, or property owner from obtaining any other permit required by City Code or any law. Minor Works are subject to an appeals period of 30 days from the date of approval.

Signature (City of Raleigh) _____ Date _____

TO BE COMPLETED BY APPLICANT			TO BE COMPLETED BY CITY STAFF		
	YES	N/A	YES	NO	N/A
Attach 8-1/2" x 11" or 11" x 17" sheets with written descriptions and drawings, photographs, and other graphic information necessary to completely describe the project. Use the checklist below to be sure your application is complete.					
<u>Minor Work</u> (staff review) – 1 copy					
<u>Major Work</u> (COA Committee review) – 10 copies					
1. Written description. Describe clearly and in detail the nature of your project. Include exact dimensions for materials to be used (e.g. width of siding, window trim, etc.)	<input checked="" type="checkbox"/>				
2. Description of materials (Provide samples, if appropriate)	<input type="checkbox"/>				
3. Photographs of existing conditions are required. Minimum image size 4" x 6" as printed. Maximum 2 images per page.	<input checked="" type="checkbox"/>				
4. Paint Schedule (if applicable)	<input type="checkbox"/>	<input type="checkbox"/>			
5. Plot plan (if applicable). A plot plan showing relationship of buildings, additions, sidewalks, drives, trees, property lines, etc., must be provided if your project includes any addition, demolition, fences/walls, or other landscape work. Show accurate measurements. You may also use a copy of the survey you received when you bought your property. Revise the copy as needed to show existing conditions and your proposed work.	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
6. Drawings showing existing and proposed work <ul style="list-style-type: none"> <input type="checkbox"/> Plan drawings <input type="checkbox"/> Elevation drawings showing the façade(s) <input type="checkbox"/> Dimensions shown on drawings and/or graphic scale (required) <input type="checkbox"/> 11" x 17" or 8-1/2" x 11" reductions of full-size drawings. If reduced size is so small as to be illegible, make 11" x 17" or 8-1/2" x 11" snap shots of individual drawings from the big sheet. 	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
7. Stamped envelopes addressed to all property owners within 100 feet of property not counting the width of public streets and alleys (required for Major Work). Use the <u>Label Creator</u> to determine the addresses.	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
8. Fee (<u>See Development Fee Schedule</u>)	<input checked="" type="checkbox"/>				

1. Description of work:

My property, 519 Florence St, is located on a lot that has a substantial grade change, and is adjacent to a small creek; there is a very sharp decline in the grade at the southern property line. The amount of foundation exposed on the north side is 1'8" and on the southern side of my house the foundation is 6'3" out of the ground. In addition to this foundation variation, there was a stone retaining wall along the front southern edge of the property. The stone was barely visible due to heavy ivy growth. In May 2016, a 12' portion of the wall collapsed.

The nature of this project is the replacement of this old retaining wall. A stone mason examined the stone wall in hopes that it could be repaired; however, he determined that the remaining portion wall had too much lean and was not properly built with any sort of footings or other necessary support. Additionally, due to the proximity of the creek, creating a simple slope was not possible; a retaining wall was necessary to protect the integrity of my foundation.

The project wall is 46' long with a 6' 90 degree turn, and runs along the southern edge of my property line. Due to the strong slope of the property towards the creek, it is important to note that *the top of this 6' wall is actually at ground level*. See Picture #

2. Materials:

The materials used to build the replacement wall are grey 8" keystone curved concrete faced block. Appropriate drainage and engineered grid assured the integrity of the structure. This same material was used in the Project Enlightenment parking lot, as seen in picture # 1 and Lenior Street Park as seen in picture # 2. *Both of these walls are within the 100' radius of my property.*

The disturbed area was seeded and straw applied.

I am open to suggestions with regard to planting any sort of non-invasive vines along the wall.

3. Photographs:

- #3 Picture of collapsed wall, indicates proximity of creek
- #4 Picture of up close collapse and proximity of house foundation
- # 5 View of collapsed wall from neighbors yard
- # 6 finished wall
- #7 top view of finished wall

RIGHT FRONT CORNER
OF EXISTING FND WALL

EXISTING RETAINING WALL

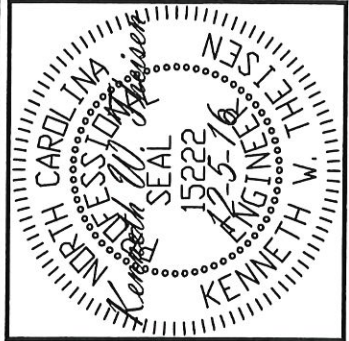
SUMMARY

A site inspection was performed for the purpose of evaluating an existing stone masonry retaining wall. The wall was found to be in a failing state, with evidence of the wall cracking and leaning. Replacement of the wall is recommended.

PLAN

RETAINING WALL

$3/16" = 1'-0"$



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	LOC	519 FLORENCE STREET	ENG KWT
		REV:	DATE 12-5-16

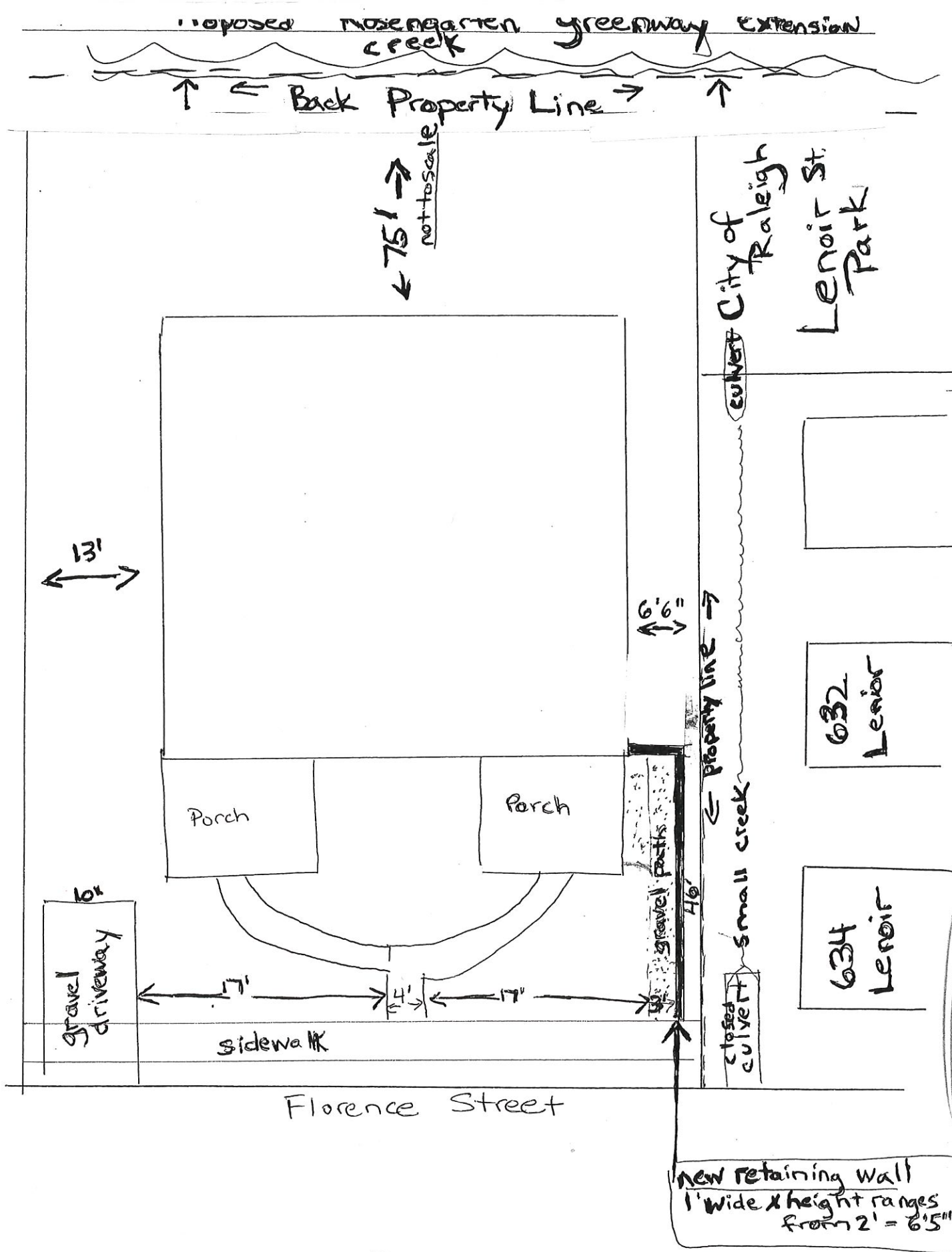
PROJECT NO.

16-65-468

SHEET NO.

S1

1 of 1

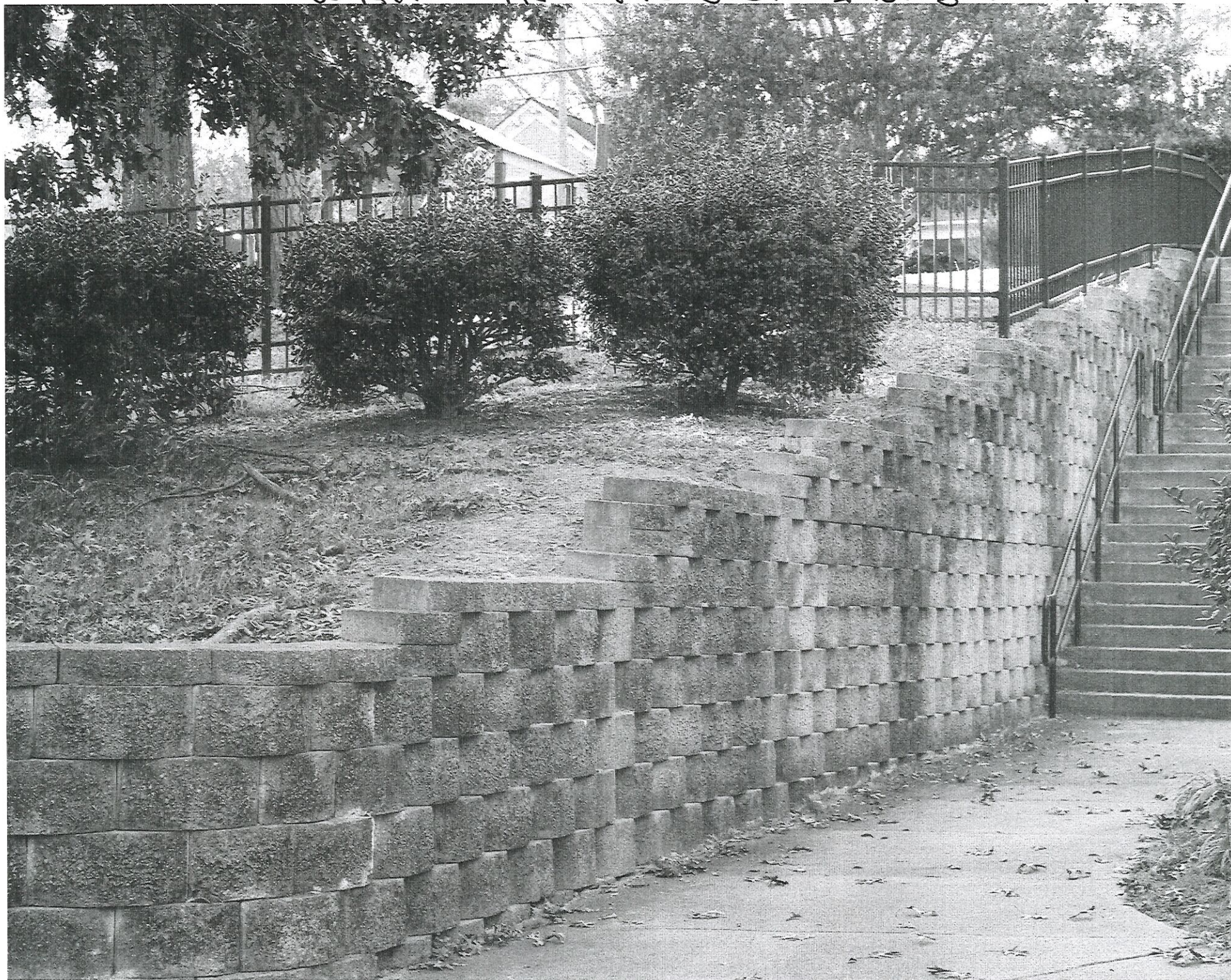


#5 Plot Plan

NOT TO SCALE

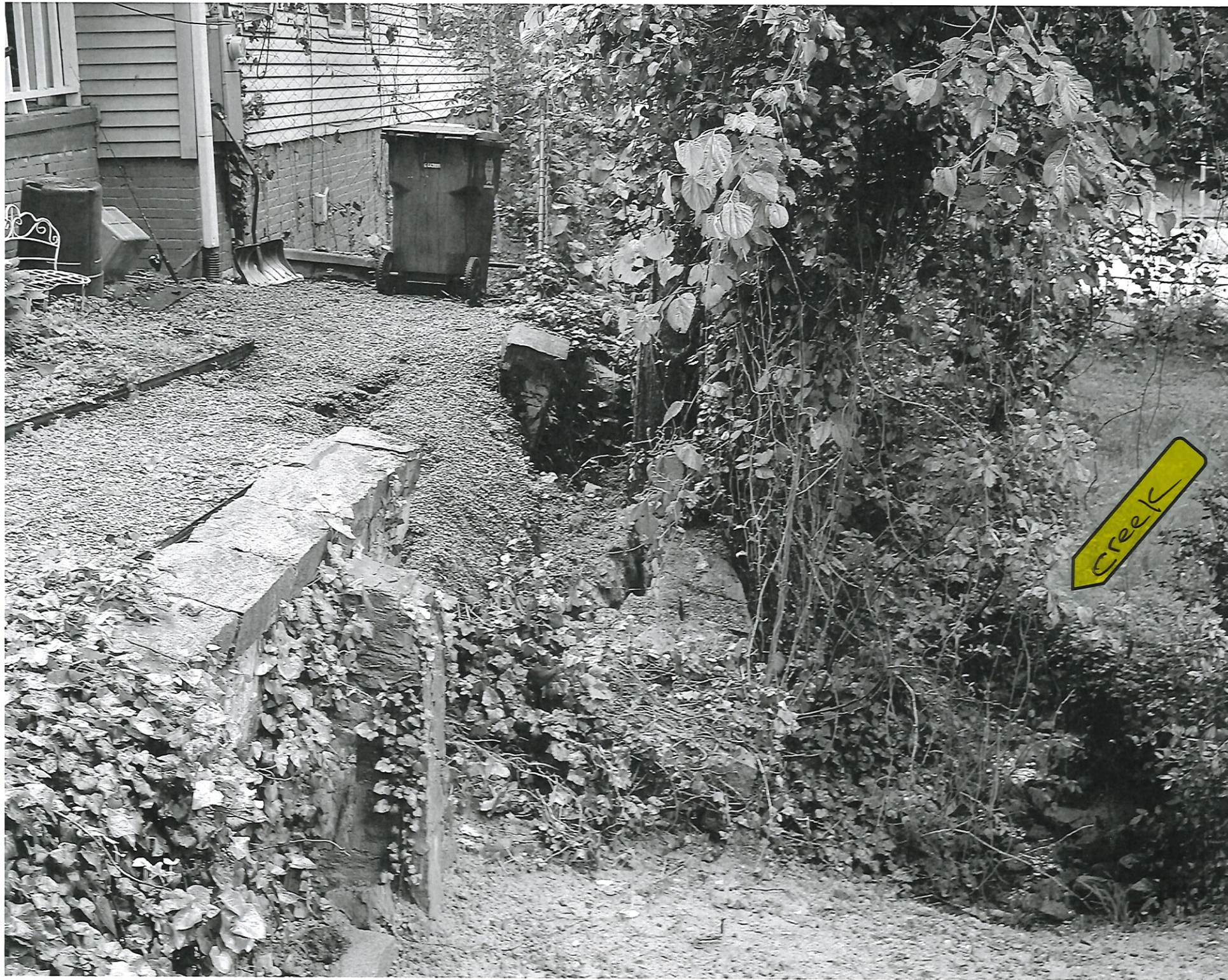
WALL AT PROJECT ENLIGHTENMENT

①

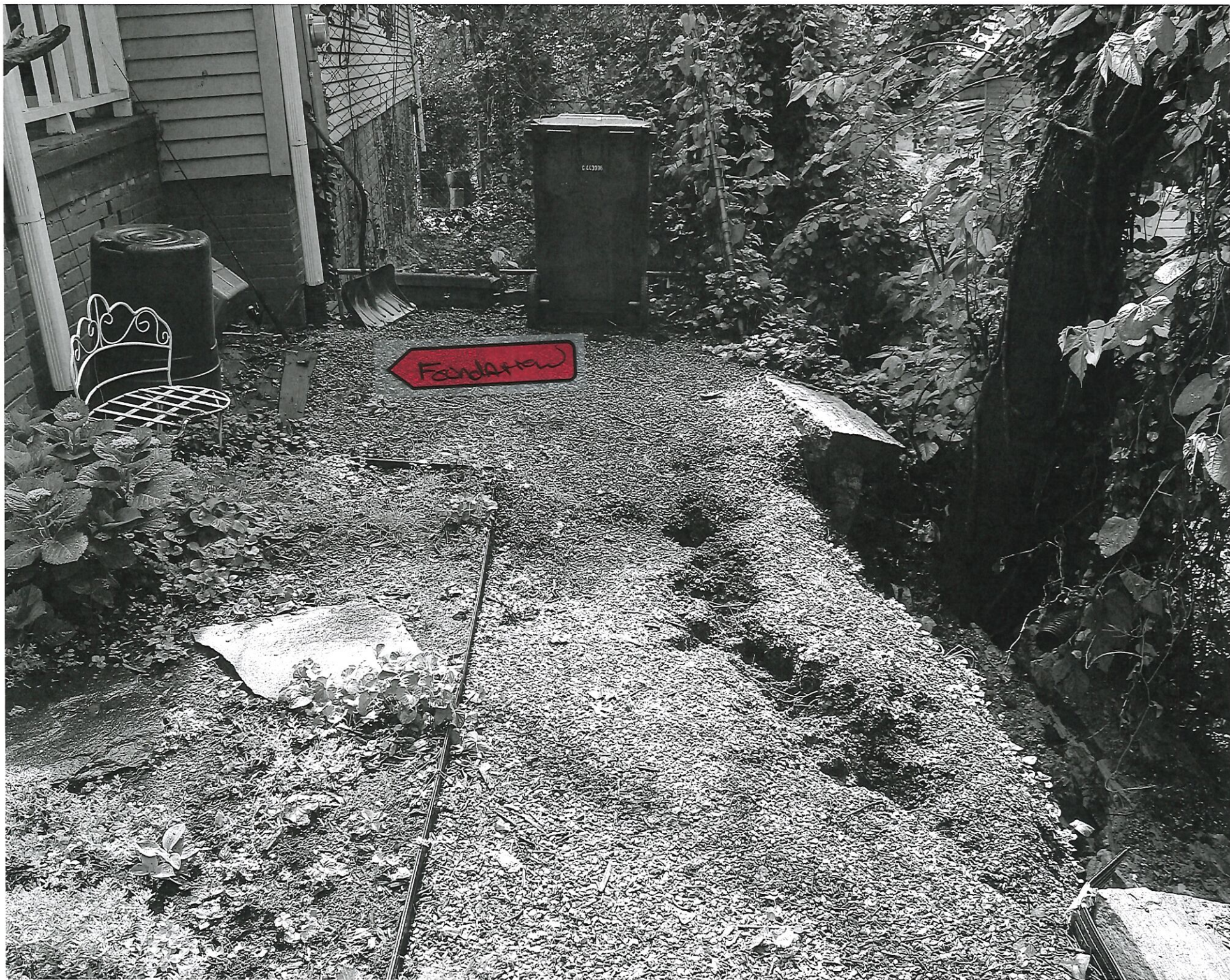




② Venice Park



W



7



②
A





2