

**CLIFTON PLANNING COMMISSION MEETING
TUESDAY, AUGUST 25, 2020, 7:30 PM
ELECTRONIC MEETING VIA ZOOM
CLIFTON, VA 20124**

Until further notice from the Mayor of Clifton, and in accordance with the Resolution of the Planning Commission regarding Remote Participation by Electronic Means Policy and the Town Council Continuity of Government Methods, to the Planning Commission and Authorizing Remote Participation by Electronic Means Without a Physical Quorum Being Present Pursuant to Virginia Law, the Town of Clifton Planning Commission is holding all Meetings noticed herein electronically for the purpose of continuity of government of the Town of Clifton.

The meetings will be conducted using Zoom teleconferencing audio and video service, and connection information will be provided to members of the public to afford the opportunity to citizens to witness the operation of the Town of Clifton government. Connection information is available from, and will be provided by, the Town Clerk upon receiving an emailed request directed to clerk@cliftonva.gov.

Present: Kathy Kalinowski, Chair; Mac Arnold; Jennifer Heilmann; Terry Winkowski, Susan Yantis (from 7:40 PM, onward).
Staff: Amanda Christman, Town Clerk.
Absent: Melissa Milne, Town Council Representative; Michelle Stein

The Regular Meeting was called to order by Kathy Kalinowski at 7:30 PM.

Order of Business:

1. Approve July 28, 2020 Regular Meeting Minutes.

The Clerk will circulate a redlined version of the July 28, 2020 Minutes to the Members for review and approval at the September meeting.

2. Use Permit Applications:

a. Anthony Reid & Associates, LLC: 12644 Chapel Road, #113 & 210.

See attached application.

The Commission reviewed the application for a commercial office use which includes an expansion of space into Suite 210 (Mr. Reid currently has a use permit for a commercial office use for space 112, which he no longer occupies). The hours and nature of the business remain the same for an accounting firm now located at 12644 Chapel Road, Suite 113 and 210. Both Suites together have 384 net square feet of space, there are five employees total, and the hours of operation are 9AM to 10 PM seven days a week. The total square footage of the space is now 384

net square feet and for an office use in a commercial area, 1 parking space is required for every 220 net square feet of office space. Therefore the expanded business would require two additional spaces. A review of the existing parking tabulation sheet for the premises indicates that currently 65 parking spaces are allotted to businesses when only 63 spaces are provided.

- **Chair Kalinowski moved that the Planning Commission not recommend that the Town Council approve the application for a Use Permit given that parking is insufficient, seconded by Member Heilmann. The motion was approved by poll, 4-0 (Member Yantis was absent for the vote).**

b. 7221 Dell Avenue is an application for a final use permit by Kimberly El Boury (formerly Lowell) for the construction of a retaining wall.

See attached application.

- **Chair Kalinowski moved to recommend that the Town Council approve the application for a Final Use Permit for construction from Kim El Boury (formerly Lowell), in light of the applicant's demonstration that the necessary requirements have been met with respect to County permits, and that the construction conformed with the requirements of the Certificate of Appropriateness, seconded by Member Heilmann. The motion was approved by poll, 5-0.**

3. Unfinished Business:

a. Final Use Permit Application for 7184 Clifton Road – Update.

A brief update on the review process was provided by the Clerk.

b. Final Use Permit Application for 12752 Chapel Street – Update.

A brief update on the lot consolidation status was provided by the Clerk.

c. DEQ proposed Corrective Action Agreement & Chapter 11 revisions.

Chair Kalinowski updated the Members on the status of the proposed Corrective Action Agreement with DEQ and the proposed minor changes to Chapter 11 of the Town Code, which will be reviewed by the Town Councilmembers at their September 1, 2020 meeting.

d. Final Use Permit Compliance Project.

Chair Kalinowski updated the Members on staff efforts to ensure that Preliminary Use Permit applicants return for reviews for Final Use Permits within the two-year timeframe established by the Town's zoning ordinance.

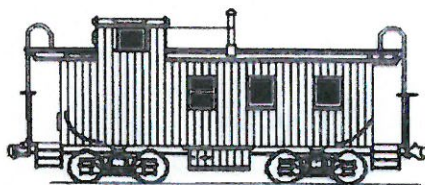
e. Other Ordinance Changes.

The Members discussed other needed changes to the Town Code that could be included in an upcoming Public Hearing, particularly the possibility of performance bonds, if allowable under statute. Member Yantis agreed to research the issue at the County-level.

4. Adjournment.

- **Chair Kalinowski moved to adjourn, seconded by Member Heilmann. The motion was approved by poll, 5-0.**

The Meeting was adjourned at 8:10 PM.



TOWN OF CLIFTON, VIRGINIA

Use Permit Application

Property Address: 12644 Chapel Rd Suite 113, 210		Date: [Month / Year] July/2020		
1. Type of Permit:	<input type="checkbox"/> Construction <input type="checkbox"/> Preliminary Site Plans Attached	<input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Office <input type="checkbox"/> Retail	<input type="checkbox"/> Residential	<input type="checkbox"/> Home Business (Code 9-19.c1)
	<input type="checkbox"/> Special Use <input type="checkbox"/> Restaurant <input type="checkbox"/> Bed & Breakfast <input type="checkbox"/> Multi-Family	<input type="checkbox"/> Subdivision (Code Chapter 10)	<input type="checkbox"/> Boundary Line Adjustment/Lot Consolidation (Code 10-57 to Code 10-59)	<input type="checkbox"/> Public Use
2. Name of Applicant: Anthony Reid				
Mailing Address: 12644 Chapel Rd Suite 113				
Phone: 703-222-9587				
Email Address: areidllc@me.com				
3. Name of Property Clifton House				
Owner (if different): NCH Partners II, LLC				
Mailing Address: 365 Herndon Parkway, Suite 106 Herndon, VA 20170				
4. Name of Business / Organization: Anthony Reid & Associates LLC				
5. Owner of Business / Organization: Anthony Reid				
6. Tax Map Number: 0754-02-0023A				
7. Attach a plat or plan drawn to scale showing the proposed construction, certified by an engineer, surveyor, architect, authorized to practice as such by VA, together with a surveyed plat of the property indicating all building and structure setbacks and height.				
				<input checked="" type="checkbox"/> Plat Attached

8. Attach Floor Plan to Scale (non-residential & home business):		<input checked="" type="checkbox"/> Floor Plan Attached		
9. Zoning District of Premises:	<input type="checkbox"/> Residential (Code 9-19)	<input checked="" type="checkbox"/> Commercial (Code 9-21)	<input type="checkbox"/> Agricultural (Code 9-20)	<input type="checkbox"/> Industrial (Code 9-22)
	<input type="checkbox"/> Church, Park, Community Building			
	<input type="checkbox"/> Community Open Space & Recreation (COSR) (Code 9-23A)		<input type="checkbox"/> Low Impact Commercial (Code 9-23B)	
10. Describe Purpose of Application: To indicate office use at this location, square footage, number of employees, hours, and parking spaces				
10. If Commercial, Home Business, Agricultural or Industrial:				
11. Describe Operation: Tax preparation and bookkeeping.				
11.a. If Non-Residential - Office Use: <u>384</u> SF or Retail/Restaurant Use: _____ SF				
11.b. Days & Hours of Operation (include special events): Sunday-Saturday 9am-10pm				
11.c. Number of Employees on Site at any One Time: <u>5</u>				
11.d. Number of Seats (Restaurant/Church): Total: _____. If applicable, provide number of seats located Inside: _____ and; Outside: _____				
11.e. Gross Floor Area (GFA) of Building or /Premises: <u>384</u> SF (Code 9-13) Net Gross Floor Area if more than one use in building: _____ SF If applicable, GFA devoted to carry-out service within restaurant: _____ SF				
11.f. Number of Off-street Parking Spaces Required: <u>1</u> (Code 9-13)				
11.g. Number of Off-street Parking Spaces Provided* (attach parking plan to scale with dimensions identifying existing and proposed parking spaces): <u>1</u>				
11.h. Gross Floor Area of Dwelling (Home Business Only): _____ SF				
12. Application Fee Enclosed: (Fee schedule in Filing Instructions) \$ <u>75.00</u>				

*PLEASE INCLUDE A PARKING TABULATION FORM FOR BUILDINGS THAT HAVE MORE THAN ONE USER IN THE BUILDING.

Is the applicant or owner a member of a homeowners association (HOA)? Yes No If yes, please obtain the approval of the HOA prior to submission of the application.

HOA REPRESENTATIVE (NAME/SIGNATURE) _____ DATE OF HOA APPROVAL: _____

The undersigned hereby applies for a Use Permit pursuant to Article 2, Section 9-10 of the Zoning Ordinance of the Code of Town of Clifton, Virginia.

APPLICANT'S SIGNATURE: [Signature] DATE: 7/27/2020

PROPERTY OWNER SIGNATURE: [Signature] DATE: 7/31/2020

FOR TOWN USE ONLY

RECEIPT DATE: _____ DATE APPLICATION ACCEPTED: _____

APPLICATION FEE PAID: \$ _____

APPROVED DISAPPROVED

PLANNING COMMISSION: _____
SIGNATURE PRINT

CONDITIONS: _____

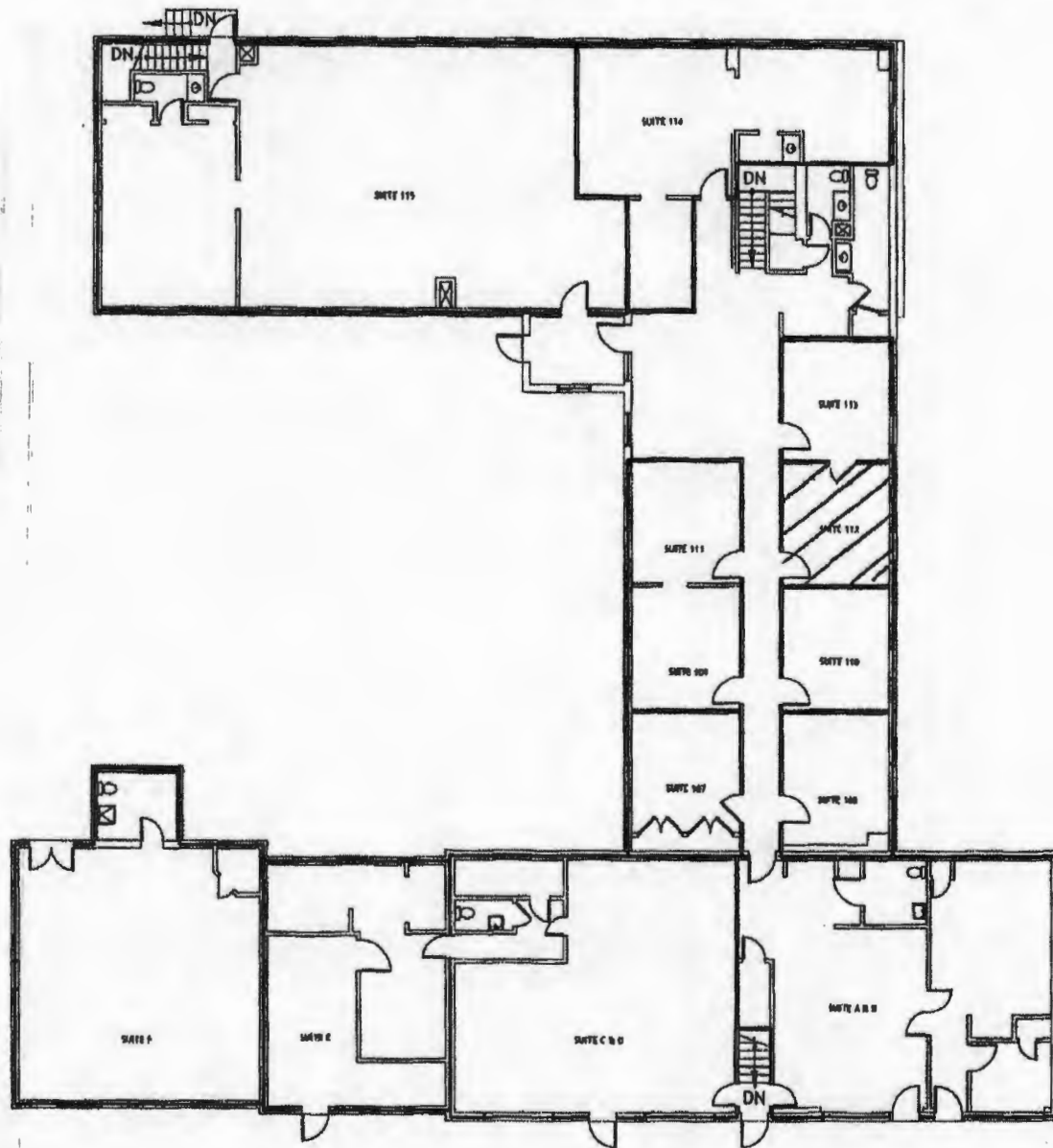
APPROVED DISAPPROVED

TOWN COUNCIL: _____
SIGNATURE PRINT

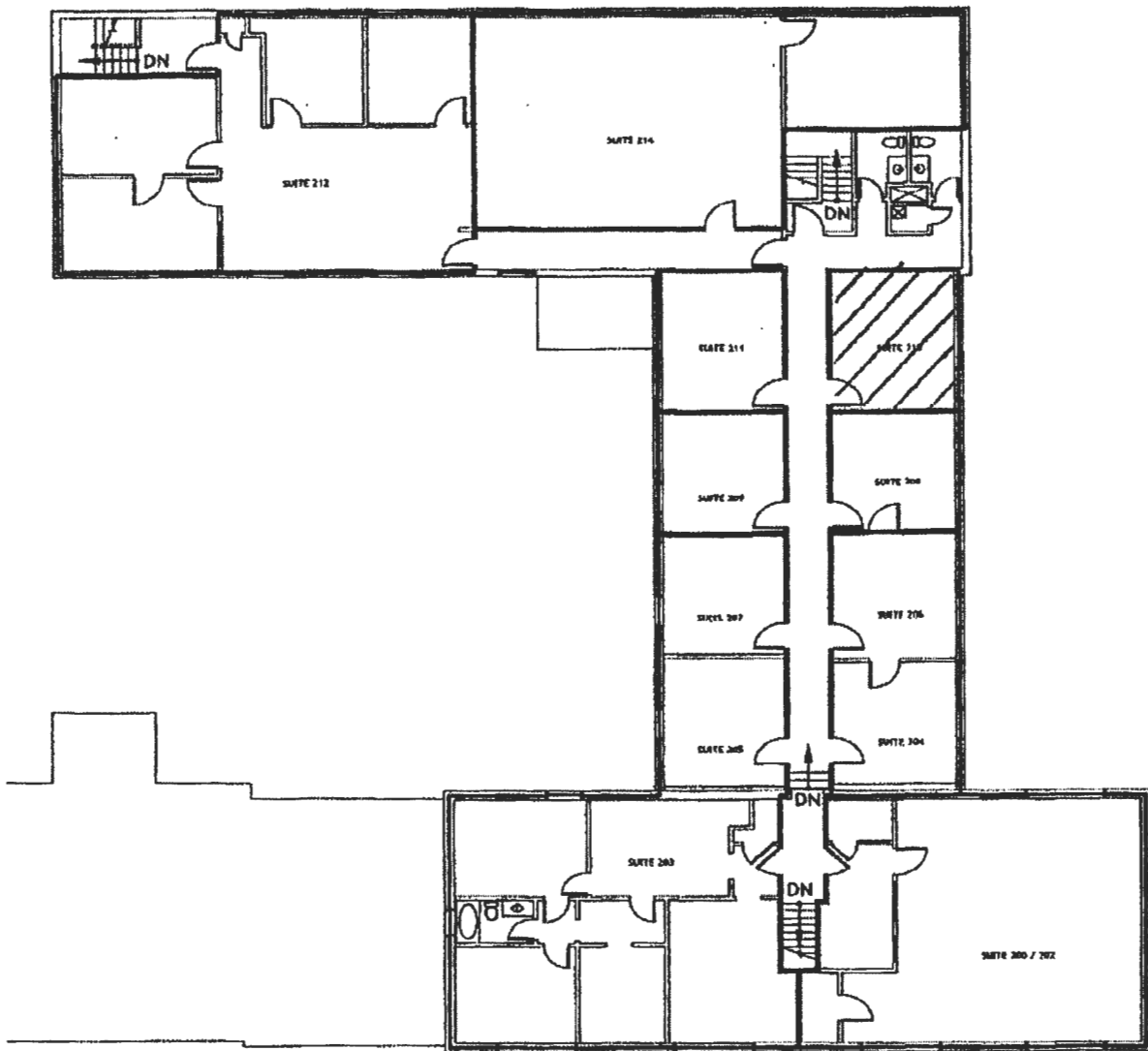
CONDITIONS: _____

EXHIBIT A

Tenant's demised premises measures approximately 400 square feet as shown in the outlined areas below.



**365 Herndon Parkway, Suite 106 ♦ Herndon, Virginia 20170
703-435-3800 Main ♦ 703-689-0949 Fax**



365 Herndon Parkway, Suite 106 ♦ Herndon, Virginia 20170
703-435-3800 Main ♦ 703-689-0949 Fax

Town of Clifton

Commercial Parking Tabulation

Property Name: Clifton House

Address: 12644 Chapel Road

Date: 5/26/2020

Building Total Gross Floor Area: #####

SUITE #	TENANT NAME	NET FLOOR AREA	USE (Restaurant/Office/ Retail/Other Commercial Use)	Max. # EMPLOYEES (Retail/Restaurant only)	NUMBER OF CUSTOMER SEATS (Restaurant only)	PARKING SPACES Approved	DATE OF USE PERMIT (or Council approval)
A & B	Motier	936	Retail/Restaurant	4	14	11	3/3/2020
C & D	Wheelhouse Pilates	856	Retail	2	N/A	5	8/7/2018
E	U.S. Post Office	540	Retail	3	N/A	5	2/5/1992
F	Clifton Cleaners	762	Retail	2	N/A	5	7/7/2015
108, 109, 111, 113-112	Market Financial	776				4	
107, 214	Coppermine Realty	1148	Office	N/A	N/A	5	9/4/2018

112 113, 210	Anthony Reid	200	Office	N/A	N/A	1	7/5/2016
114	Advance Janitorial Services	593	Office	N/A	N/A	2	11/11/2013
115	GoldensHill Papercrafts	1,536	Retail	1	N/A	7	6/3/2014
200, 202	Wheelhouse Yoga	885	Retail	2	N/A	5	9/4/2018
204, 206, 208	AG Chem/Waterworks	592	Office	N/A	N/A	3	7/5/2016
209, 211	Kohlmark Flach Architects	392	Office	N/A	0	2	10/2/2018
212	America, Inc.	1,075	Office	N/A	0	5	3/1/2016
110	Creative Counseling	192	Office	N/A	N/A	1	
205, 207	WY Leadership,	425	Office	N/A	N/A	2	5/6/2020
	Total based on Town records/Use Permits					63	

Total Parking Spaces Required:

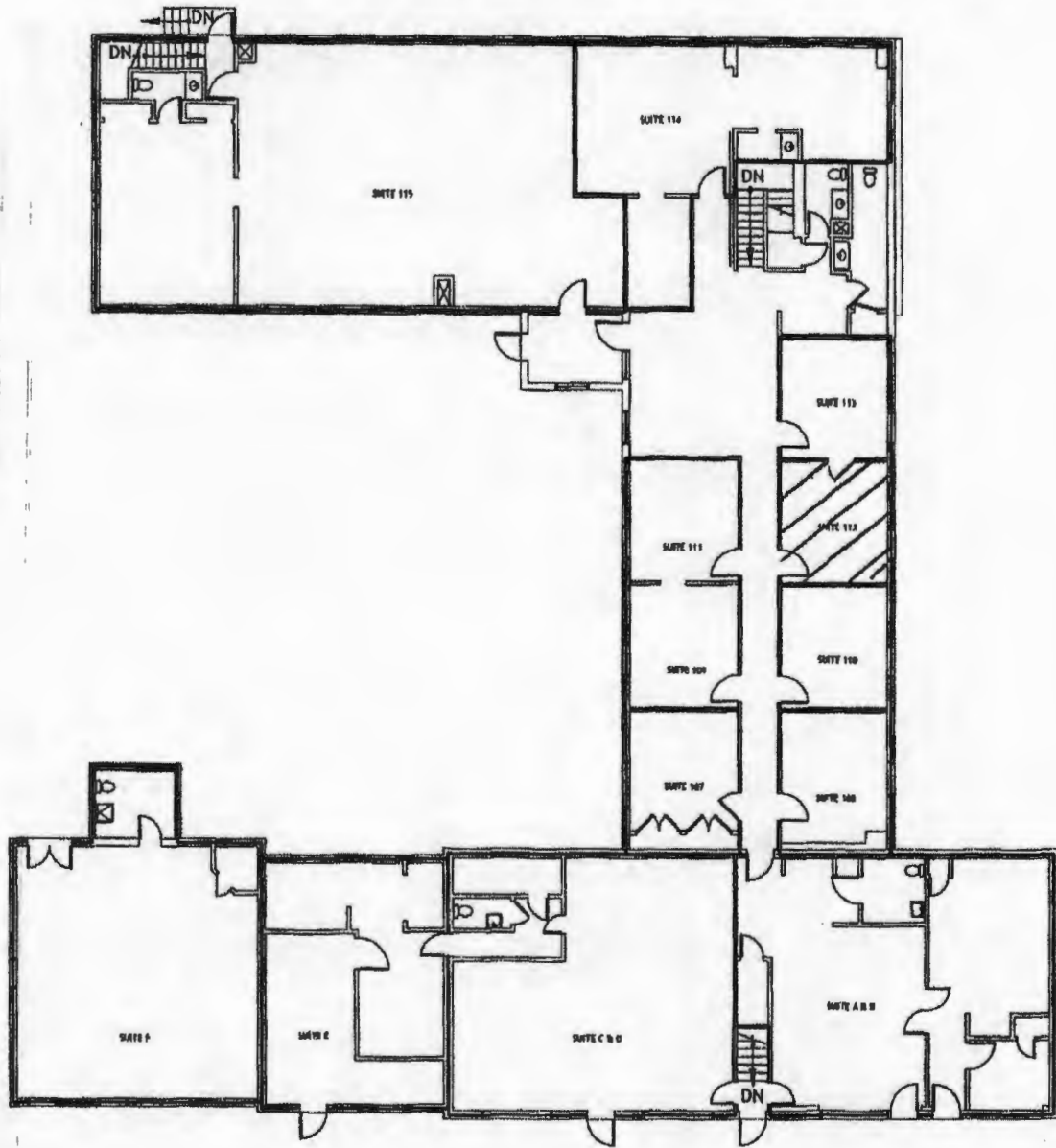
63

Total Parking Spaces Provided:

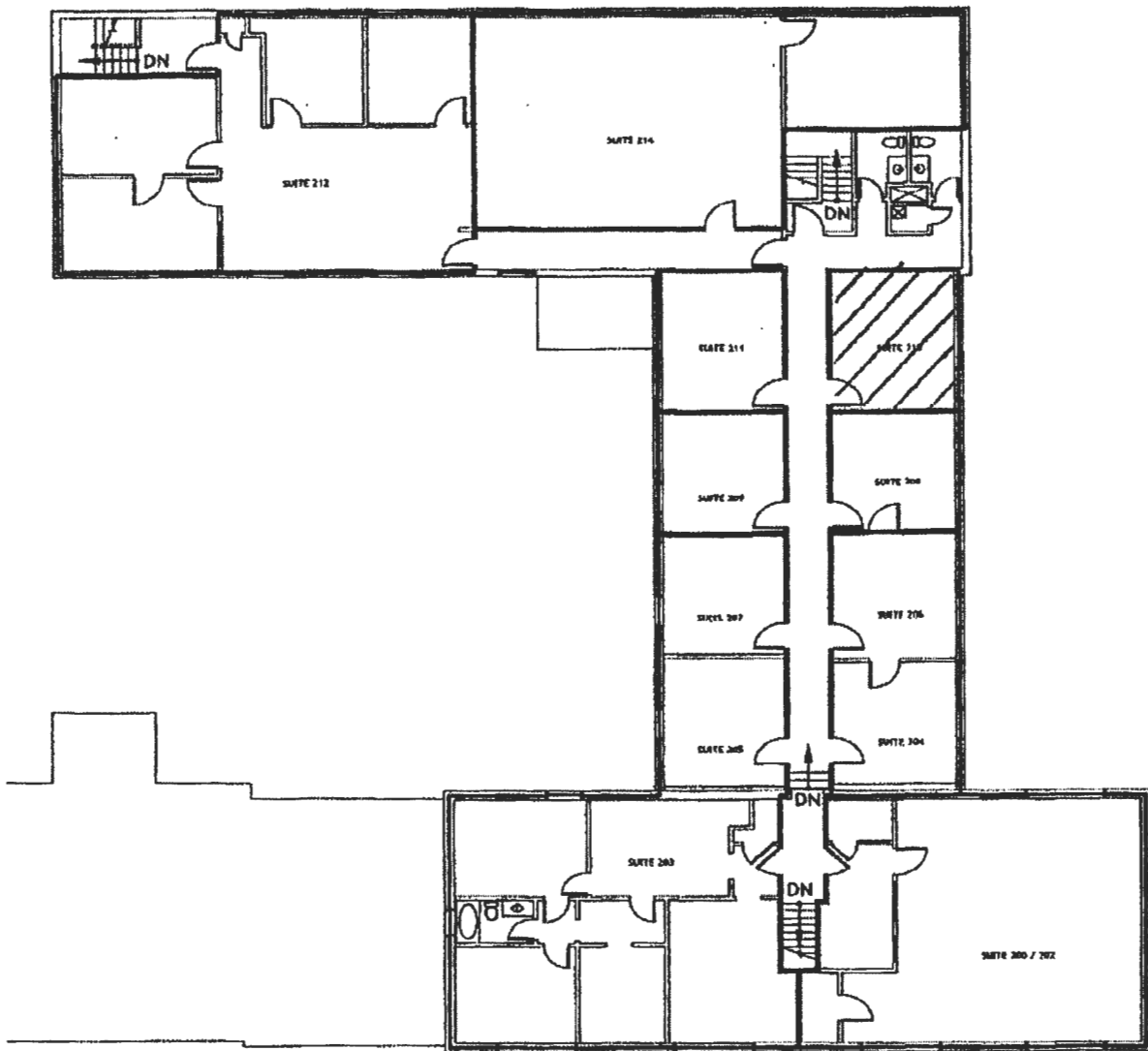
63

EXHIBIT A

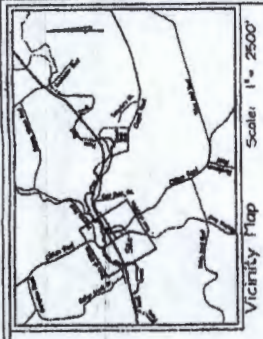
Tenant's demised premises measures approximately 400 square feet as shown in the outlined areas below.



365 Herndon Parkway, Suite 106 ♦ Herndon, Virginia 20170
703-435-3800 Main ♦ 703-689-0949 Fax

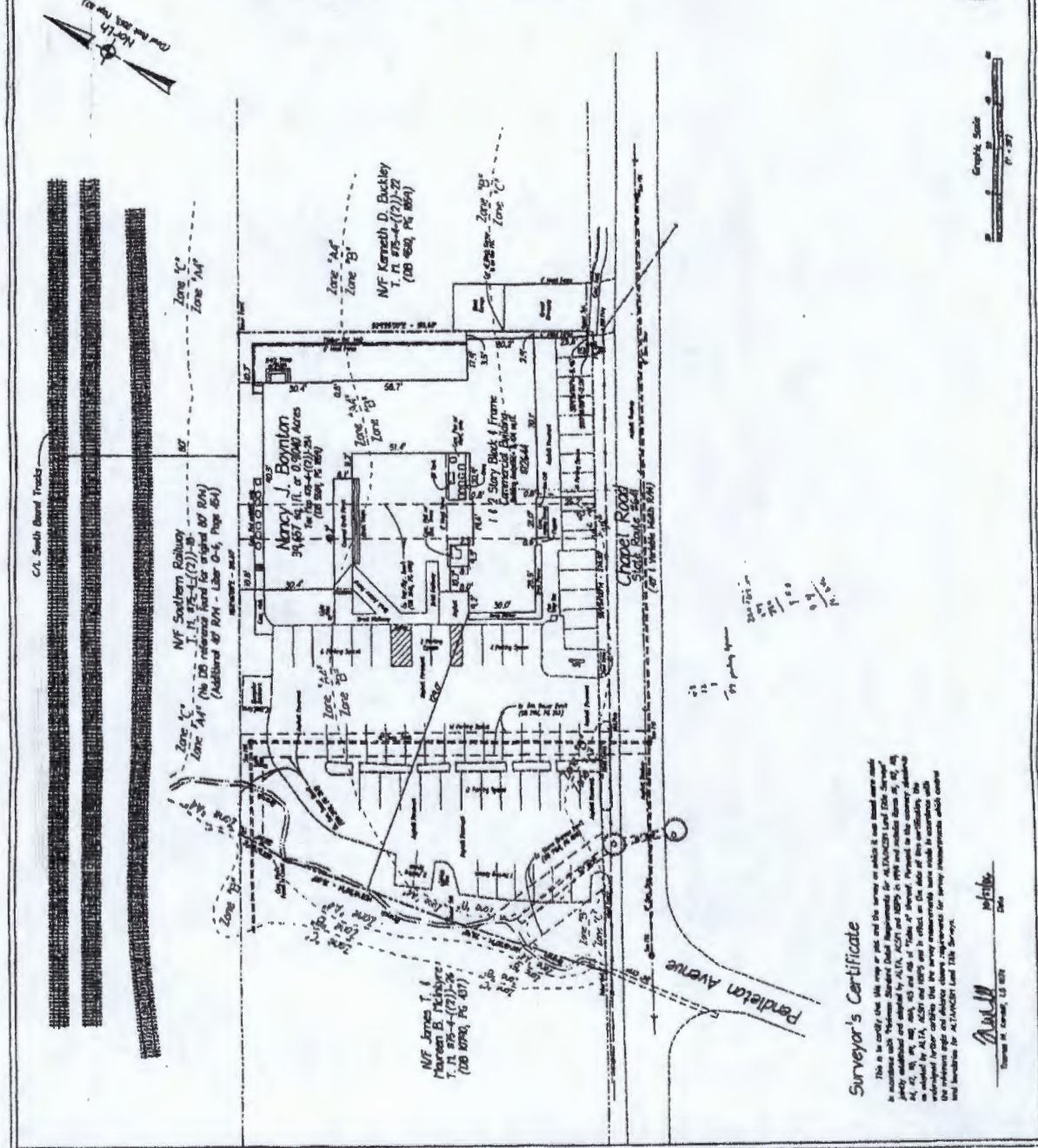


365 Herndon Parkway, Suite 106 ♦ Herndon, Virginia 20170
703-435-3800 Main ♦ 703-689-0949 Fax



Notes:

- 1) The property submitted herein is located in Fairfax County, Virginia, in the City of Fairfax, Virginia, in the County of Fairfax, Virginia, in the State of Virginia, in the United States of America.
- 2) The property is located in the City of Fairfax, Virginia, in the County of Fairfax, Virginia, in the State of Virginia, in the United States of America.
- 3) This report is based on a survey conducted by the Surveyor General of Fairfax County, Virginia, on the 15th day of August, 1954, and is subject to the provisions of the Surveyor General's Act, Chapter 15, Code of Virginia, and the provisions of the Surveyor General's Act, Chapter 15, Code of Virginia, and the provisions of the Surveyor General's Act, Chapter 15, Code of Virginia.
- 4) The property is located in the City of Fairfax, Virginia, in the County of Fairfax, Virginia, in the State of Virginia, in the United States of America.
- 5) The property is located in the City of Fairfax, Virginia, in the County of Fairfax, Virginia, in the State of Virginia, in the United States of America.
- 6) The property is located in the City of Fairfax, Virginia, in the County of Fairfax, Virginia, in the State of Virginia, in the United States of America.
- 7) The property is located in the City of Fairfax, Virginia, in the County of Fairfax, Virginia, in the State of Virginia, in the United States of America.
- 8) The property is located in the City of Fairfax, Virginia, in the County of Fairfax, Virginia, in the State of Virginia, in the United States of America.
- 9) The property is located in the City of Fairfax, Virginia, in the County of Fairfax, Virginia, in the State of Virginia, in the United States of America.
- 10) The property is located in the City of Fairfax, Virginia, in the County of Fairfax, Virginia, in the State of Virginia, in the United States of America.



Surveyor's Certificate

This is to certify that the above map or plat and the survey on which it was based were made in accordance with the provisions of the Surveyor General's Act, Chapter 15, Code of Virginia, and the provisions of the Surveyor General's Act, Chapter 15, Code of Virginia, and the provisions of the Surveyor General's Act, Chapter 15, Code of Virginia, and the provisions of the Surveyor General's Act, Chapter 15, Code of Virginia.

Surveyed and Certified by
 [Signature]
 Surveyor General, Fairfax County, Virginia

Richard Shockey
 ALTA/SURVEYOR Land Title Survey
 Property of:
Nancy J. Boynton
 Tax Map Parcel #75-4-(71)-20A
 (Deed Book 5504, Page 1894)
 Town of Clifton, Virginia
 October 25, 2005. Scale: 1" = 30'



Kendall Consulting, Inc.
 Land Surveying & Land Planning
 P. O. Box 1564 - Fairfax, Virginia 22036
 Ph: (703) 598-1857 Fax: (703) 591-1518

Town of Clifton

Commercial Parking Tabulation

Property Name: Clifton House

Address: 12644 Chapel Road

Date: 5/26/2020

Building Total Gross Floor Area: #####

SUITE #	TENANT NAME	NET FLOOR AREA	USE (Restaurant/Office/ Retail/Other Commercial Use)	Max. # EMPLOYEES (Retail/Restaurant only)	NUMBER OF CUSTOMER SEATS (Restaurant only)	PARKING SPACES Approved	DATE OF USE PERMIT (or Council approval)
A & B	Motier	936	Retail/Restaurant	4	14	11	3/3/2020
C & D	Wheelhouse Pilates	856	Retail	2	N/A	5	8/7/2018
E	U.S. Post Office	540	Retail	3	N/A	5	2/5/1992
F	Clifton Cleaners	762	Retail	2	N/A	5	7/7/2015
108, 109, 111, 113-112	Market Financial	776				4	
107, 214	Coppermine Realty	1148	Office	N/A	N/A	5	9/4/2018

112 113, 210	Anthony Reid	200	Office	N/A	N/A	1	7/5/2016
114	Advance Janitorial Services	593	Office	N/A	N/A	2	11/11/2013
115	GoldensHill Papercrafts	1,536	Retail	1	N/A	7	6/3/2014
200, 202	Wheelhouse Yoga	885	Retail	2	N/A	5	9/4/2018
204, 206, 208	AG Chem/Waterworks	592	Office	N/A	N/A	3	7/5/2016
209, 211	Kohlmark Flach Architects	392	Office	N/A	0	2	10/2/2018
212	America, Inc.	1,075	Office	N/A	0	5	3/1/2016
110	Creative Counseling	192	Office	N/A	N/A	1	
205, 207	WY Leadership,	425	Office	N/A	N/A	2	5/6/2020
	Total based on Town records/Use Permits					63	

Total Parking Spaces Required:

63

Total Parking Spaces Provided:

63

Town of Clifton

Commercial Parking Tabulation

Property Name: Clifton House

Address: 12644 Chapel Road

Date: 8/03/2020

Building Total Gross Floor Area: 11766

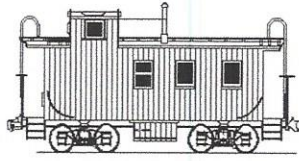
SUITE #	TENANT NAME	NET FLOOR AREA	USE (Restaurant/Office/ Retail/Other Commercial Use)	Max. # EMPLOYEES (Retail/Restaurant only)	NUMBER OF CUSTOMER SEATS (Restaurant only)	PARKING SPACES Approved	DATE OF USE PERMIT (or Council approval)
A & B	Motier	936	Retail/Restaurant	4	14	11	3/3/2020
C & D	Wheelhouse Pilates	856	Retail	2	N/A	5	8/7/2018
E	U.S. Post Office	540	Retail	3	N/A	5	2/5/1992
F	Clifton Cleaners	762	Retail	2	N/A	5	7/7/2015
108, 109, 111, 113	Market Financial	776	Office	N/A	N/A	4	6/2/2020
107, 214	Coppermine Realty	1148	Office	N/A	N/A	5	9/4/2018
112	Anthony Reid	200	Office	N/A	N/A	1	7/5/2016
114	The Hair Garage, LLC	593	Retail	N/A	N/A	4	7/7/2020
115	GoldensHill Papercrafts	1,536	Retail	1	N/A	7	6/3/2014
200, 202	Wheelhouse Yoga	885	Retail	2	N/A	5	9/4/2018
204, 206, 208	AG Chem/Waterworks	592	Office	N/A	N/A	3	7/5/2016
209, 211	Kohlmark Flach Architects	392	Office	N/A	0	2	10/2/2018
212	America, Inc.	1,075	Office	N/A	0	5	3/1/2016
110	Counseling for Creative	192	Office	N/A	N/A	1	6/2/2020
205, 207	WY Leadership,	425	Office	N/A	N/A	2	5/6/2020
	Total based on Town records/Use Permits					65	

Total Parking Spaces Required:

65

Total Parking Spaces Provided:

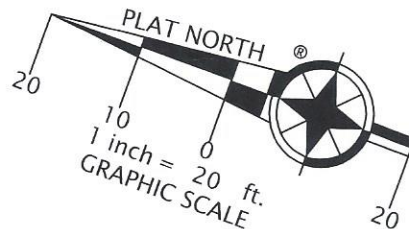
63



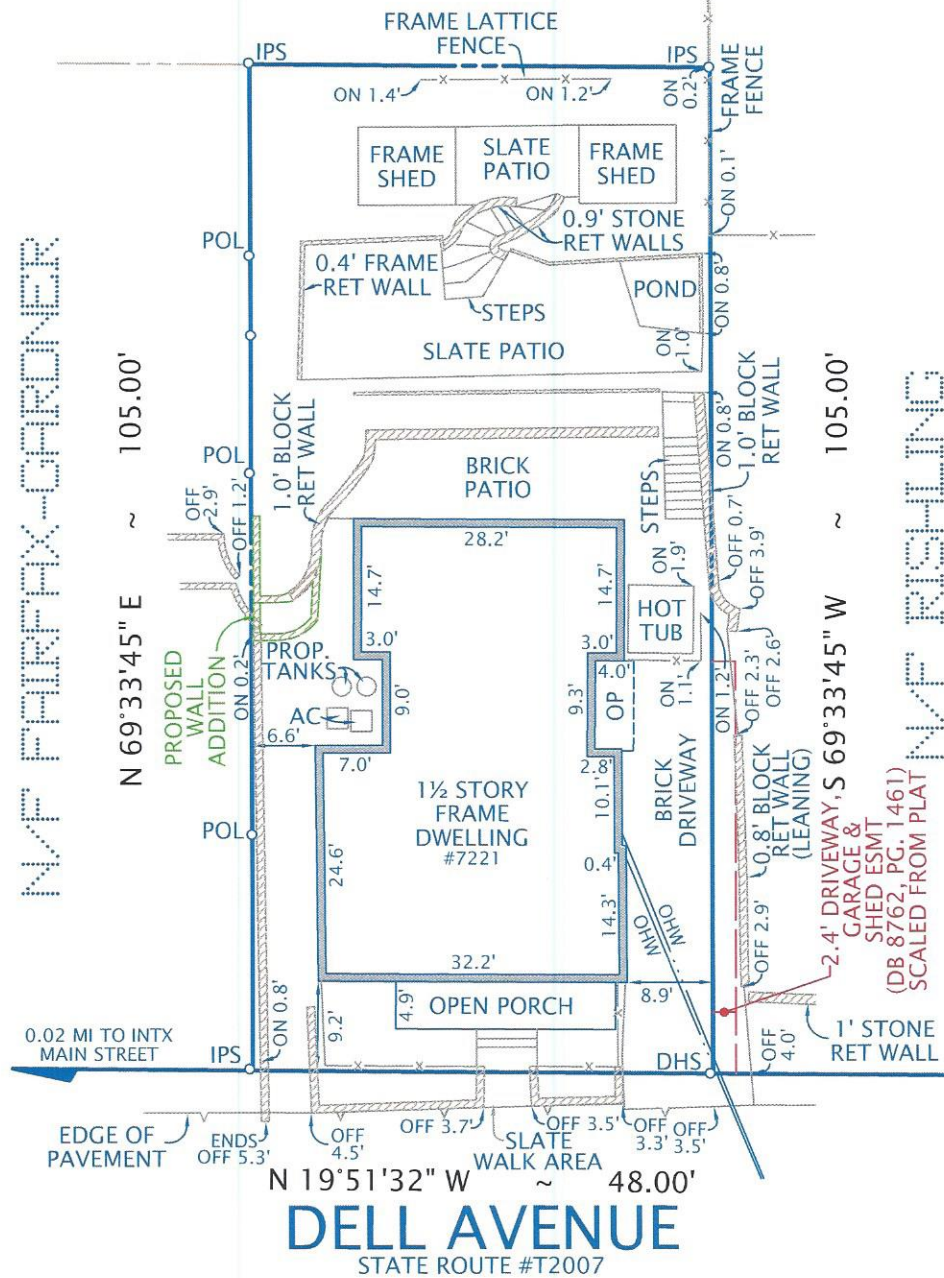
**PRELIMINARY USE PERMIT FOR CONSTRUCTION
TOWN OF CLIFTON, VIRGINIA**

1.	Type of Use Permit:	Preliminary, Residential Construction	
2.	Name of Applicant:	Kimberly Lowell	703-895-8793 kimberlyjlowell@hotmail.com
3.	Owner of Property:	Kimberly Lowell	
4.	Name of Business / Organization:	N/A	
5.	Owner of Business / Organization:	N/A	
6.	Address of Premises:	7221 Dell Avenue	
7.	Tax Map Number:	0852-02-0004	
8.	Attach Copy of Plat for Property:	attached	
9.	Attach Floor Plan (All Non-Residential and Home Business):	N/A	
10.a	Zoning District of Premises:	Residential	
10.b	Type of Use:	Residential	
11.	Purpose of the Application	Construct a retaining wall ranging in height from two to 6.7 feet, comprising approximately 75 square feet of land disturbing activity, constructed of block in accordance with the attached plans and specifications.	
12.	If Commercial, Home Business, Agricultural or Industrial:	N/A	
12.1	Operation Description:	N/A	
12.2	Number of Employees:	N/A	
12.3	Hours of Operation:	N/A	
12.4	Number of Client visits per Day:	N/A	
12.5	Square Footage of Premises:	N/A	
12.6	Number of Off-street Parking Spaces Available	N/A	
12.7	Number of Off-street Parking Spaces Required:	N/A	
12.8	Specific Restrictions:	<ul style="list-style-type: none"> • That the applicant provide the Planning Commission with all permits applied for and received for the construction; • that the applicant return to the Planning Commission and apply for a final use permit when construction is completed and demonstrates that construction was completed in compliance with the ARB approvals and preliminary use permit, and all approvals and permits granted, the Town Code Section 9-10 (d)(2). 	
13.	Fee Enclosed:	\$75	

- NOTES: 1. RETAINING WALLS ARE 0.3' FRAME UNLESS NOTED.
 2. AREA = 5,040 SF.
 3. HELD LOT DIMENSIONS RECORDED IN DEED BOOK 8762 AT PAGE 1461.
 4. IPS DENOTES IRON PIPE SET.
 5. DHS DENOTES DRILL HOLE SET.
 6. POL DENOTES POINT ON LINE SET.



N/F TENNENT
 S 19°51'32" E ~ 48.00'



N/F FAIRFAX-GARDNER

N/F RUSHING

PLAT
 SHOWING HOUSE LOCATION ON
 THE PROPERTY LOCATED AT
#7221 DELL AVENUE

(DEED BOOK 20853, PAGE 1301)

ALSO KNOWN AS
 LOT 4, LOCATED ON DELL AVENUE
TOWN OF CLIFTON, VIRGINIA
 FAIRFAX COUNTY

SCALE: 1" = 20'

MARCH 29, 2012
 MAY 23, 2012 (STAKED LOT)
 JULY 2, 2018 (PROP. WALL)

WOOD GUARDFRAIL

200#

CONTINUOUS
IF POST
SPACING 4' OR
LESS O/C

OR

50 PLF ← + 100 PLF ↓

3.5
2.5 $I_p = 8.93$
 $S_p = 5.10$

42"
= 3.5'

$M = 8400$ "# $\checkmark \rightarrow f_b = 1646$
PSI

$F_b = 1300/1500$
4x4 $S_p = 7.146$

$f_b = 1175$ PSI OK \checkmark

$\Delta_{TL} = 0.282$ "

$E = 1.16$
 $I_p = 12.505$

W/ FULL 4x4
 $f_b = 1322$ \checkmark
STILL NEED #1
SYP

IF SPACE POSTS
@ 54" 4.5' O/C

$M = 9450$ "#

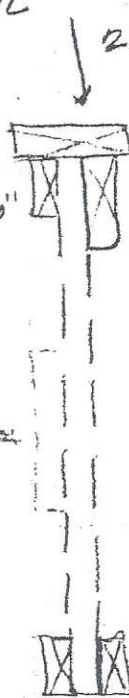
$f_b = 1853$ PSI

$E = 1.17$ ↓

$P = 225$ "# $\Delta = 0.366$ "

3/8"

W/ FULL
SECTION
0.317"



6.25
X 2

12.5/3
= 4.17' O/C
@ 1/3 PTS

Job Name

KEYSTONE WALL

Job Title

GUARDFRAIL -
WOOD

REV. 6/6/97


Date 2/97

Computed RMF

Page 1 of 3


Pg. 8 of 33

150 800 512 2137 870-4451

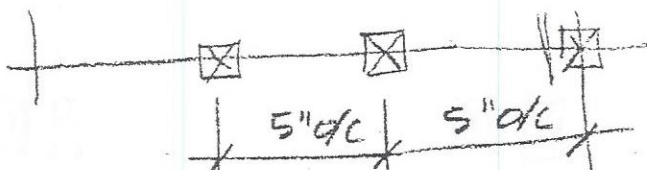
 1 1/2 FLAT I = 0.984 ✓
 3/2 S = 1.313 ✓ Δ_H = 0.24"

LATERAL $\frac{200 \# (l)}{4} = M$ ← $\frac{M_c (12)}{2 (1.313)} = 1200 \sim 1200$
 $l = 5.3'$ M_c = 262.6
 OK ✓

@ 5' 100 PLF M = 313¹# ← TWO 2x4 VERT
 200 PT # → 250¹# > 50 PLF → M = 156.3¹# TOP
 $f_b = 612.1 \text{ PSI OK}$

PICKETS 2x2  1 1/2 x 1 1/2 I = 0.422
 S = 0.563

$\frac{200 \# (3.33)}{4} = 167 \#$



W/ $f_b = 1200$
 $M_c = 61 \#$

$A = 2.25$ $V_c = 135 \#$ ✓
 $f_v = 90$ 2 PICKETS OK FOR SHEAR
 $M_c = 56.3 \#$
 IF $f_b = 1200$ - MUST SPREAD ON 3 PICKETS
 (A" O/C)

Job Name

KEYSTONE WALL

Job Title

GUARDRAIL

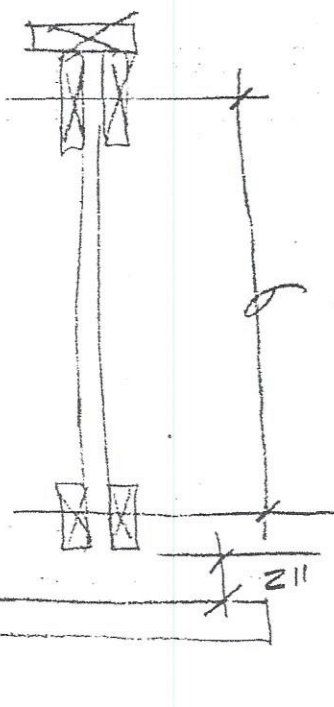
Date 6/6/97 Computed T2MF

Page 2 of 3

pg. 9 of 33

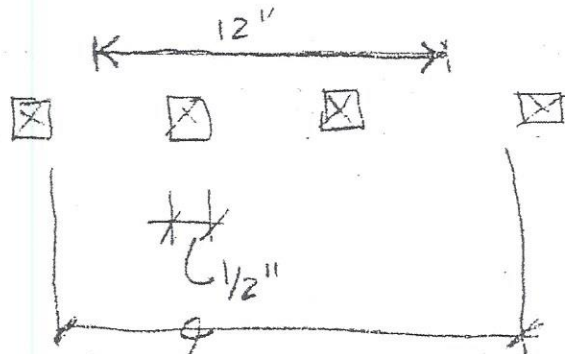
(AK)

42"



$l = 35.5" \approx 36"$ $M = 150\#$

STILL NEED 3 PICKETS



4.5" O/C CUT OFF EXACT

Job Name

KEYSTONE WALL

Job Title

GUARDRAIL

Date 6/6/97 Computed RMP

Page 3 of 3

pg 10 of

33 ~~AND~~



RETAINING WALL DESIGN

KeyWall_2012 Version 3.7.2 Build 10

Project: 7221 DELL AVE CLIFTON

Project No: Project Number

Case: Case 1

Design Method: Rankine-w/Batter (modified soil interface)

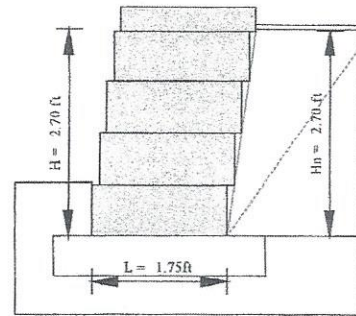
Date: 5/23/2018

Designer: RMF

Design Parameters

Soil Parameters:

	ϕ deg	c psf	γ pcf
Retained Zone	28	0	120
Foundation Soil	28	0	120
Unit Fill:	Crushed Stone, 1 inch minus		



Minimum Design Factors of Safety

sliding:	1.50	pullout:	1.50	uncertainties:	1.50
overturning:	1.50	shear:	1.50	connection:	1.50
bearing:	2.00	bending:	1.50		

Design Preferences

Analysis:

Case: Case 1

PLANTER

Unit Type: Standard 21" / 120.00 pcf

Leveling Pad: Crushed Stone

Wall Ht: 2.70 ft

Level Backfill: Offset: 0.00 ft

Surcharge: LL: 50 psf uniform surcharge
Load Width: 100.00 ft

Wall Batter: 8.00 deg (Hinge Ht N/A)

embedment: 0.70 ft

DL: 0 psf uniform surcharge
Load Width: 100.00 ft

Results:

Factors of Safety:	<u>Sliding</u>	<u>Overtuning</u>	<u>Bearing</u>	<u>Shear</u>	<u>Bending</u>
	2.68	3.38	11.83	N/A	N/A

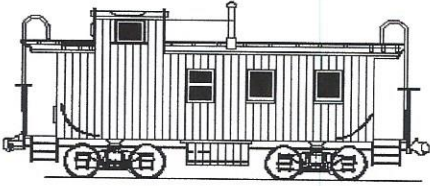
Calculated Bearing Pressure: 349 / 349 psf

Eccentricity at base: 0.13 ft

NOTE: THESE CALCULATIONS ARE FOR PRELIMINARY DESIGN ONLY AND SHOULD NOT BE USED FOR CONSTRUCTION WITHOUT REVIEW BY A QUALIFIED ENGINEER



pg 11 of 33
RMF



CLIFTON ARCHITECTURAL REVIEW BOARD
 TOWN OF CLIFTON, VIRGINIA
 APPLICATION FOR CERTIFICATE OF
 APPROPRIATENESS

DATE OF APPLICATION: 7/26/2018
 NAME OF APPLICANT OR AGENT: Kimberly Lowell
 ADDRESS: 7221 Dell Avenue
 TELEPHONE: 703 895 9793 email kimberlyjlowell@hotmail.com
 LOCATION OF PROPERTY INCLUDING STREET ADDRESS AND TAX MAP
 NUMBER: 7221 DELL AVENUE, CLIFTON VA 08520 20004
 GENERAL DESCRIPTION OF PROPOSAL:
~~Retain~~ Support the hillside
extend retaining wall

ATTACHMENTS:

- APPLICATION FEE*
- Two (2) HARD COPIES AND ONE ELECTRONIC COPY OF APPLICATION WITH PLATS, ARCHITECTURAL DRAWINGS, FLOOR PLANS, ETC.

I UNDERSTAND THAT ALL SUBMISSION REQUIREMENTS MUST BE MET BEFORE THE ARB WILL REVIEW AN APPLICATION

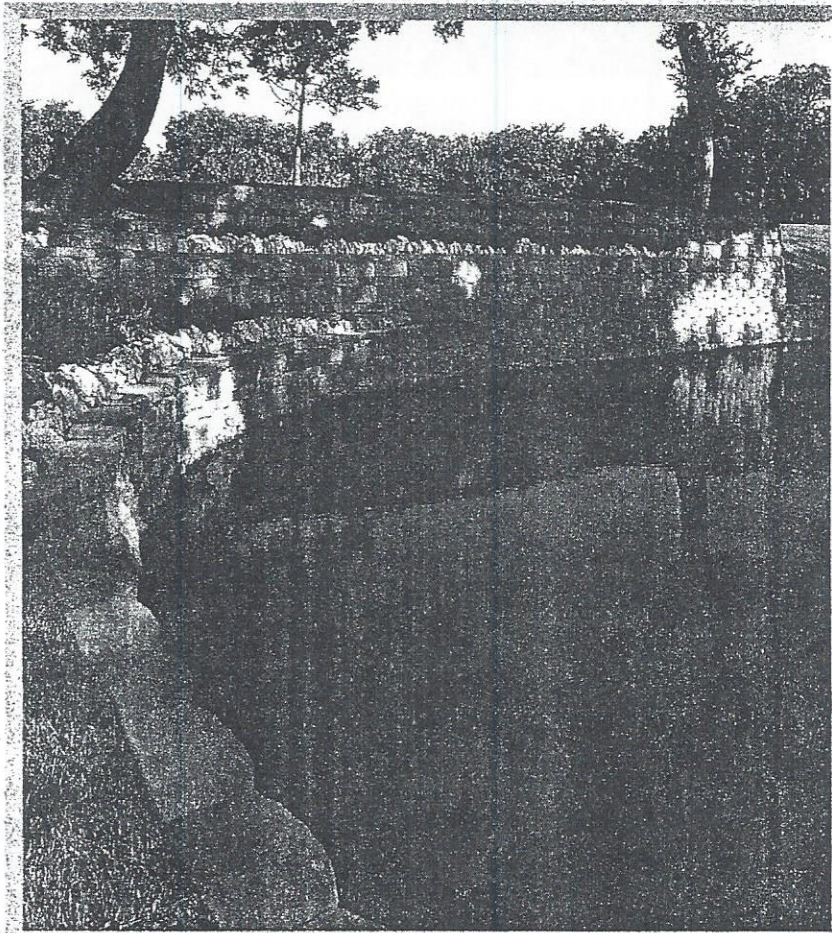
Kimberly Lowell 7/26/2018
 SIGNATURE OF APPLICANT OR AGENT DATE
 CERTIFICATE ISSUED: YES NO
 (When marked "YES" and signed, this document becomes the "certificate of Appropriateness")
 BY: [Signature] 7/26/18
 CHAIRMAN, ARB DATE
 ARB MEMBERS' INITIALS: dd (yes) dm (yes) my (yes) fb (yes)
 CONDITIONS:

IF CERTIFICATE IS NOT TO BE ISSUED, THE ARB SHALL STATE THE BOARD'S REASON:

*Application fee:
 Sign/Fence: \$10.00; if after installation: \$50.00
 Addition/remodeling project up to 200 SF: \$100.00
 Addition/remodeling project exceeding 200 SF \$250.00
 New home construction: \$250.00

The applicant shall also pay any actual costs of any review fees incurred by the ARB, including any consultant's fees and other costs set forth in Virginia State Code Section 15.2-2286.

KEYSTONE



RETAINING WALL SYSTEMS

KEYSTONE.

Designed for inner strength and outer beauty.

With KEYSTONE, distinctive looks start at ground level. Graceful curves. Classic lines. Shadows and textures. Geometric patterns. No matter what the application, KEYSTONE Retaining Wall Systems is the preferred choice among architects, engineers, developers and contractors.

You'll discover that the real beauty of KEYSTONE is its inner strength. KEYSTONE's patented interlocking design gives your walls rock-solid stability and performance. Its strong concrete modules and fiberglass pins create maintenance-free walls.

KEYSTONE protects the environment by using non-corrosive, environmentally safe materials.

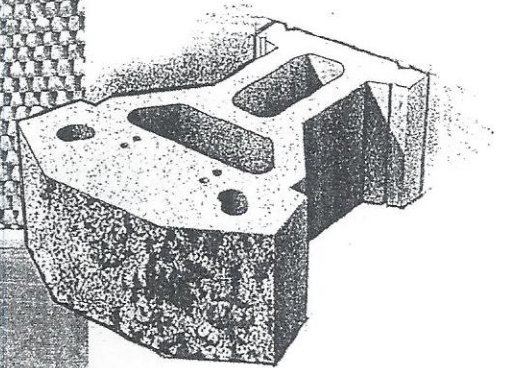
Installing a KEYSTONE Retaining Wall System is fast and easy. Not to mention the economic benefits and cost-effective advantages of KEYSTONE.

Add up the benefits. The beauty of natural stone, the durability of granite, easy installation... it's all yours with KEYSTONE.

KEYSTONE Retaining Wall Systems. The choice for:

- Civil engineering
- Architecture
- Landscaping
- Commercial
- Governmental
- Residential

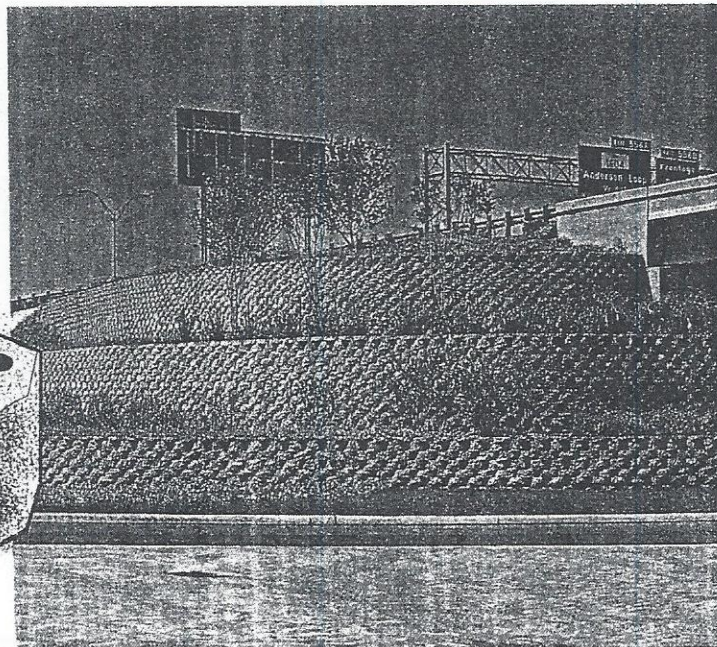
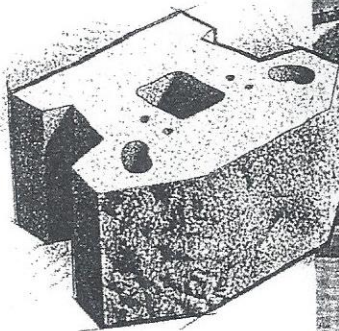
- Compressive strength... 3,000 psi minimum
- Absorption rate 8% maximum
- Composition High-strength, high-density, zero-slump concrete



General Information

- Weight* 95 lbs. (42.75 kg)
- Size* (HxWxD) 8"x18"x21 1/2" (.2032 x .4572 x .5461 m)
- Exposed face area 1 sq. ft. - 8"x18" (.093 sq. m - .2032 x .4572 m)

Standard Unit



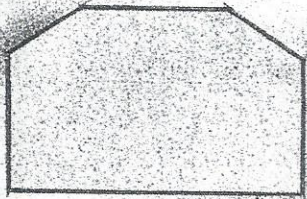
Optional straight face pattern*

- A beautiful choice for building residential steps.
- Available in all unit types.

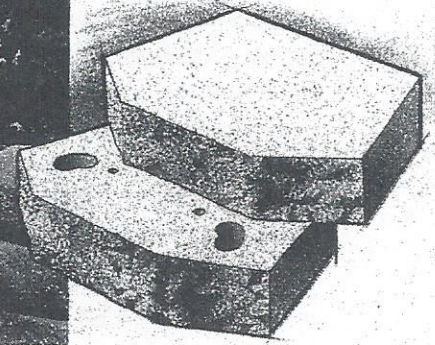
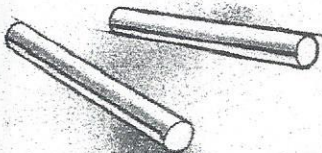
International Compac Unit

- Weight* 85 lbs. (38.45 kg)
- Size* (HxWxD) 8"x18"x12" (.2032 x .4572 x .3048)
- Exposed face area 1 sq. ft. - 8"x18" (.093 sq. m - .2032 x .4572 m)

pg 17 of 33



Discover another aesthetically-pleasing option – the straight side cap. The straight side eliminates the triangular space between cap units on straight walls, and reduces the space on concave curves. Convex curves require angular-sided units.



- Weight* 45 lbs. (20.25 kg)
- Size* (HxWxD) 4"x18"x10 1/2" (1016 x .4572 x .2667 m)
- Exposed face area 1/2 sq. ft.–4"x18" (.046 sq. m – .1016 x .4572m)

Mini Unit and Cap Unit

Fiberglass Pins

- All unit types 1/2" x 5 1/4" (High strength pultrusion fiberglass)
- Tensile strength 110,000 psi
- Tensile modulus 4x10⁶ psi
- Flexural strength 128,000 psi
- Flexural modulus 4x10⁶ psi
- Short beam shear strength ... 6,400 psi
- Specific gravity 1.83 psi

Double pin setback

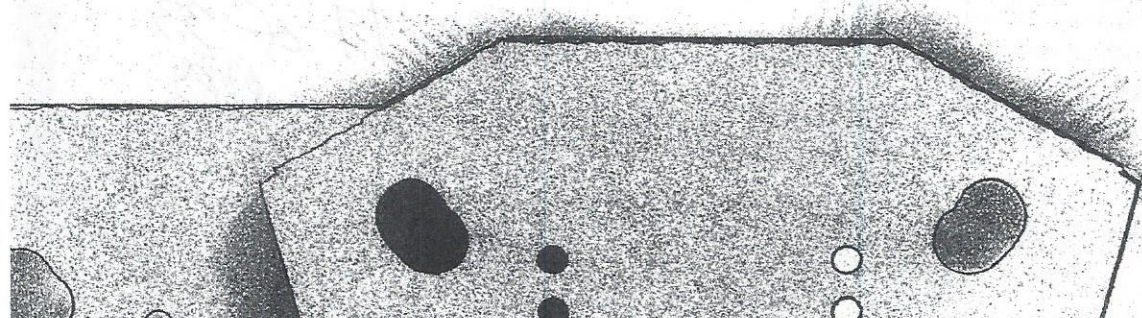
If you're building a near vertical wall, use the front pinholes. The near vertical setback also allows you to build curves with minimal gapping or overlapping. You can also build corners (90° inside and outside) with near vertical setback units.

Use back holes (1" setback) for an increased wall batter (1:8). This works effectively on straight walls.

Integrate the near vertical and 1" setback to produce a 1:16 batter.

* Actual unit weight, size and availability may vary in your region. See your KEYSTONE representative for more information.

Pg. 18 of 33





KEYSTONE MATERIALS

Keystone units are typically manufactured of concrete with a minimum compressive strength of 3000 psi (21MPa) at 28 days and a maximum absorption of 8%. All dimensions are plus or minus 1/8 inch (3mm) except for the unit depth which varies due to the split rock finish. The manufacturing process is automated, so the mixing, compaction, and curing are performed under controlled conditions and provide consistent quality. The units may have a face treatment of molded, corduroy, or split-rock finish in various natural colors. Face shapes can be tri-planar, curved, or straight.

Standard, Compac, and Mini units are vertically interconnected using high-strength pultruded fiberglass pins. The Keystone Standard and Compac units have crushed stone filled cores that provide additional mechanical interlock and internal drainage. The pins assure a running bond configuration of the units and provide significant lateral connection strength between units. The pins improve the connection between the units and the structural soil reinforcement while assuring proper placement of the reinforcement materials.

The connection pins are 5 1/4 inches (133mm) long and 1/2 inch (12.7mm) in diameter. Minimum pin strength is 6,400 psi (44MPa) short beam shear strength and 110,000 psi (750MPa) tensile strength. The pins are manufactured of pultruded fiberglass and will not corrode or deteriorate. In addition, the fiberglass pin does not change properties (soften or become brittle) due to the temperature changes typical in retaining wall applications.

Not all units types, face treatments and colors are available at all manufacturing locations. Please check with your local manufacturer or Keystone supplier for availability.

STANDARD UNIT

The Standard unit varies due to manufacturing considerations from 18 to 24 inches (457 to 600mm) in depth, with a typical face width of 18 inches (457mm) and height of 8 inches (203mm). The geometry yields exactly 1 square foot (0.09 m²) of face area per unit. Units weigh 100 to 125 pounds (45 to 55kg) each, varying with local manufacturing and aggregates. In-place units have approximately one cubic foot (0.03 m³) of aggregate drainage fill per unit. The centroid of the unit is slightly forward of center toward the face, but for design purposes, it is taken at the center. For design purposes, the in-place density of the aggregate filled unit is 120 pcf (18.85 kN/m³).

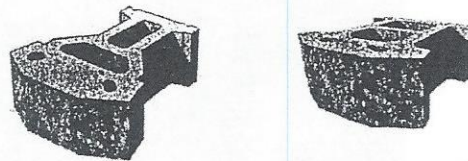


FIGURE 1.1 STANDARD/STANDARD II UNIT

Standard units are manufactured with a dual pin hole configuration. The front pin setting allows the units to be placed at a minimum setback of approximately 1/8-inch (3.2mm) per 8 inch (203mm) unit height (1° batter). The rear pin setting allows placement of the units at a minimum 1 1/4-inch (31.7mm) setback per 8 inch (203mm) unit height (8.8° batter). An alternate placement of front/back pin hole allows a setback of 5/8-inch (15.9mm) per 8 inch (203mm) unit height (4.4° batter).

pg. 19 of 33

PART ONE
Retaining Wall Units

COMPAC UNIT

The Keystone Compac unit is a 12 inch (305mm) deep unit with a typical face width of 18 inches (457mm) by 8 inches (203mm) high. This geometry yields exactly 1 square foot (0.09 m²) of face area per unit. Depth may vary from 11 to 12.5 inches (280 to 317mm) depending upon local manufacturing and splitting requirements. Units weigh 80 to 100 pounds (35 to 45kg) each, varying with local manufacturing and aggregates. For design purposes, the in-place density of the aggregate filled unit is 120 pcf (18.85 kN/m³).

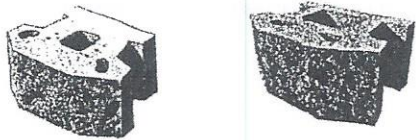


FIGURE 1.2 COMPAC / COMPAC II UNIT

The dual pin hole configuration allows the same 1°, 4.4°, and 8.8° setback as the Standard unit. It is recommended that 12 inches (0.3m) of aggregate be placed behind each unit to provide drainage for the shorter Compac unit. Including this zone, there is approximately 1.3 cubic feet (0.04 m³) of unit drainage fill per unit.

MINI UNIT

The Mini unit is a 10.5-inch (267mm) deep unit with a face width of 18 inches (457mm) wide by 4 inches (102mm) high. This geometry yields 1/2 square foot (0.05m²) of face area per unit. Depth may vary from 10 to 12 inches (254 to 305mm) depending upon local manufacturing and splitting requirements. Units weigh approximately 45 pounds (20kg) each, varying with local manufacturing and aggregates.

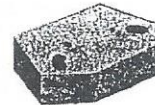


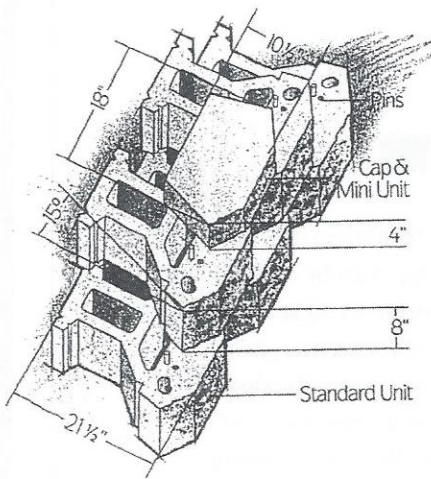
FIGURE 1.3 MINI UNIT

KeyWall does not incorporate the Mini unit into the program due to the specialized use of this product. It is similar to the Compac unit for design purposes, weighing slightly less and providing more batter due to the same pin settings with a 4-inch (102mm) high unit.

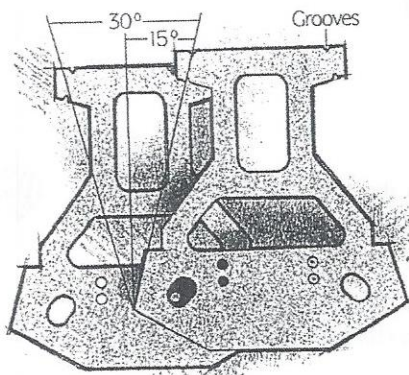
pg. 20 of 33
M

22 40 10 29

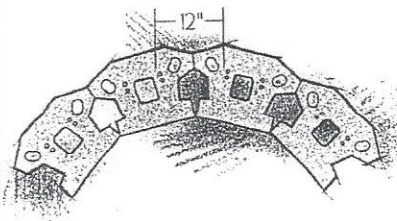
Design criteria



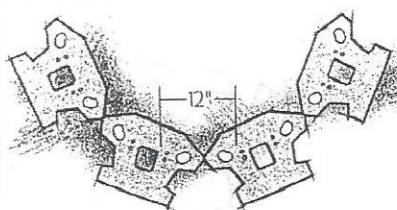
KEYSTONE's patented interlocking system creates a strong, durable retaining wall.



To build extremely tight convex curves, simply remove the extended tail pieces at the grooves. This returns the block shape to its 15° sides.



For convex curves, use near vertical setback. Adjacent units pins should be 12" O.C.



To build concave curves, align units so that pins of adjoining units are 12" O.C. with the near vertical setback procedure.

Concept

Gravity wall systems have been used since the time of the pyramids and rubble stone walls. Gravity and friction resistance (based on material shape) resist lateral earth pressure, which may cause sliding and overturning failure.

KEYSTONE Retaining Wall Systems also resist lateral pressure with their weight and deep embedment shape. KEYSTONE units are connected with pins (not mortar) for a structurally interlocked network. The units also allow drainage to prevent hydrostatic loads.

Non-critical and critical walls

For low, non-critical applications, the KEYSTONE Retaining Wall is effective for gravity wall structures to the following heights:

Maximum wall heights for non-critical walls (without soil reinforcement)

- Standard units6'
- Compac units.....3'
- Mini units3'
- Standard and mini combination5'
(use 4" shims at tails of Standards)
- Compac and mini combination3'

Assumed parameters for non-critical walls:

- Base soil: minimum 2,500 psf bearing capacity (sandy gravel).
- Retained soil: approximately 32° friction angle (sandy gravel).
- Surcharge: no additional surcharge (slopes, structures, roadways, etc.).
- Drainage: site run-off diverted, water table fluctuation or embankment drainage properly considered.
- Geometry: level backfill and one inch set back position.

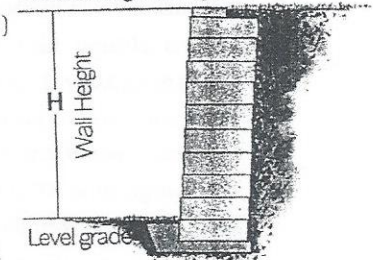
For taller or more critical walls, combine KEYSTONE wall units with soil reinforcement. With this combination, you can build walls over 40' high.

Critical structures include one or more of the following:

- Sloping backfill (steeper than 1 to 4)
- Surcharge loads
- High groundwater table
- Multiple tiers
- Wall built on slope
- Low soil shear strength (less than 25° friction angle)

See *geogrid criteria* on page 7 for further information on critical walls.

No surcharge/level grade



Applications involving water

KEYSTONE is extremely effective for ponds, creeks, lakes, rivers and run-off channels. It is important to evaluate water level, flow velocity, backfill soil type and foundation soils. KEYSTONE recommends that free-draining crushed rock be used within the core and reinforced fill areas. With the benefit of this free-draining system, the main concern is foundation soil, bearing capacity and wall base protection. KEYSTONE recommends that a qualified hydrological engineer evaluate wave action and scouring effects. In addition, critical applications may require erosion-resistant footing design and riprap protection. See your KEYSTONE representative for further details. A water effects video tape is available upon request.

Curves

To incorporate curves into your KEYSTONE Retaining Wall, use the near vertical setback position. This allows you to build near vertical walls and curves with minimal gapping or overlapping of individual KEYSTONE units. If you have a one-pin location system, contact your KEYSTONE representative for guidelines.

Creative options for distinctive looks

- For the dramatic look of shadows and textures, combine KEYSTONE units of different thicknesses (for example, sizes 8"-4"-8").
- To create interesting geometric patterns, combine KEYSTONE colors.
- For unique variations, combine face textures such as rockface and corduroy, or angular and straight face.

Special applications

- Guard rails, highway barriers, fences, etc. (Vertical steel posts, wood or concrete may be integrated with the KEYSTONE System.)
- 90° corners (inside and outside)
- Sound barriers (double wall with gravel core fill)
- Steps (using KEYSTONE units as tread/riser)
- Water applications
- Coping details
- Landscape lighting integration

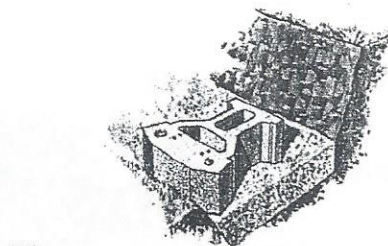
pg. 21 of 33

Basic product installation

The KEYSTONE Retaining Wall System was developed with simplicity of construction in mind. These step-by-step instructions will guide you from start to finish. (Instructions apply to all KEYSTONE unit sizes.)

Step 1. Prepare the base leveling pad

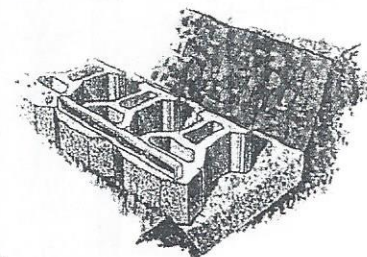
Excavate a shallow trench according to the designed length and width of your KEYSTONE wall. Leave enough space behind the KEYSTONE units for a granular backfill drainage zone. The prepared base should be level, with 6" of well-compacted granular fill (sand, gravel, or $\frac{1}{2}$ " to $\frac{3}{4}$ " crushed stone) at 95% Standard Proctor compaction or greater. KEYSTONE recommends additional trench depth for below grade placement of KEYSTONE units on a ratio of 1" below grade for each 8" of wall height above grade. *Drainage zone may vary due to site, soil or engineering requirements.*



1

Step 2. Install the base course

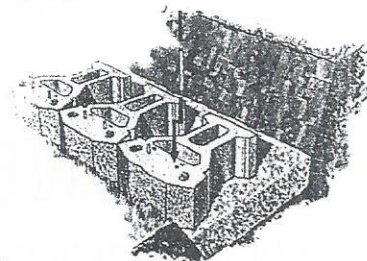
Place the first course of KEYSTONE units side by side (with sides touching) on the prepared base, with the kidney-shaped void facing down and the pin holes facing up. (See illustration.) Make sure each unit is level – side to side and front to back. The first course is critical for accurate and acceptable results. For straight walls, use the pins of the straight back edge of the unit for alignment. For curved walls installation, please see the previous page.



2

Step 3. Install the interlocking pins

Place the reinforced fiberglass pins into the paired holes in each KEYSTONE unit. Each unit requires two pins. (Pins of adjoining units should be 12" on center.) Once in place, the pins create an automatic setback for the additional courses. According to wall requirements and design, place pins in the front holes for near vertical setback and the rear holes for 1" setback.



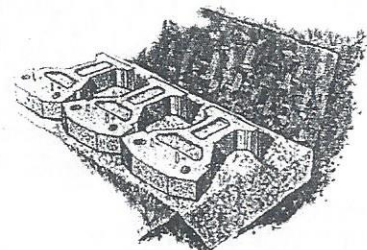
3

Step 4. Install and compact backfill

Fill in all voids – inside, between and behind the KEYSTONE units – using $\frac{1}{2}$ " to $\frac{3}{4}$ " crushed stone or clean, well-draining granular fill. Peagravel is not recommended. Compact the fill to eliminate settling.

Use existing soils for backfill behind the gravel drainage zone. (Heavy clays or organic soils are not recommended due to water-holding properties.) Compact to a minimum of 95% Standard Proctor compaction, placing fill in 8" lifts on a course-by-course basis. (Use only walk-behind mechanical compaction equipment within 3' behind the units.)

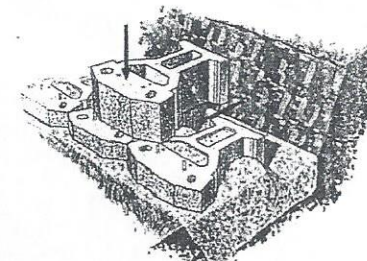
Sweep off any pebbles or debris so the KEYSTONE units rest evenly upon each other.



4

Step 5. Install additional courses

Place the next course of KEYSTONE units over the fiberglass pins, fitting the pins into the kidney-shaped recesses. Center the unit over the two underlying units as shown in diagram 5. Visually sight down in kidney shaped recess for pin positioning. Pull the KEYSTONE module toward the face of the wall until it makes full contact with both pins. For each remaining course, repeat steps 3, 4, and 5.

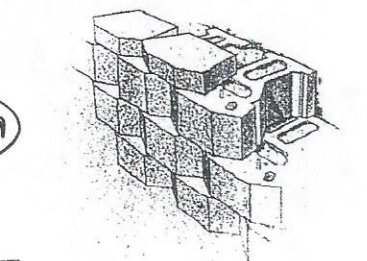


5

Step 6. Install KEYSTONE Caps

Complete your wall with KEYSTONE Caps. In areas of high public usage, apply KapSeal™ Adhesive on the top surface of the last course before applying cap units. Place the KEYSTONE Cap over the pins on the underlying unit. Pull the cap forward to the automatic setback position. Backfill and compact to finish grade.

These guidelines do not take into account geological variations in site and soil conditions. Further engineering considerations may be necessary. None of the information enclosed herein should be construed as a construction detail.

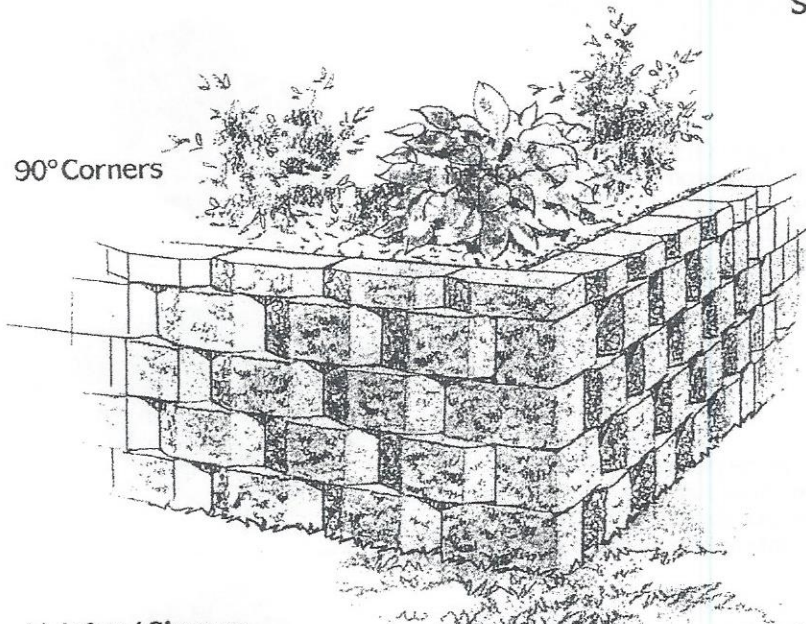


6

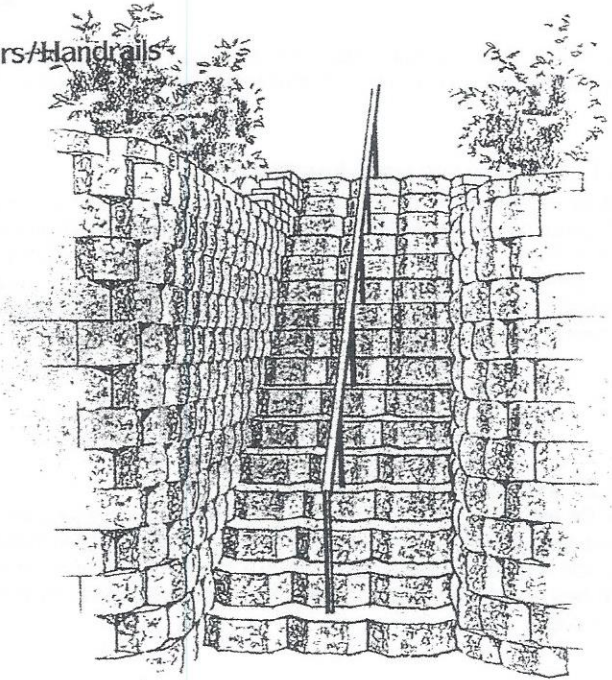
pg. 22 of 33
A/C

Incorporate specialty items
into your design.

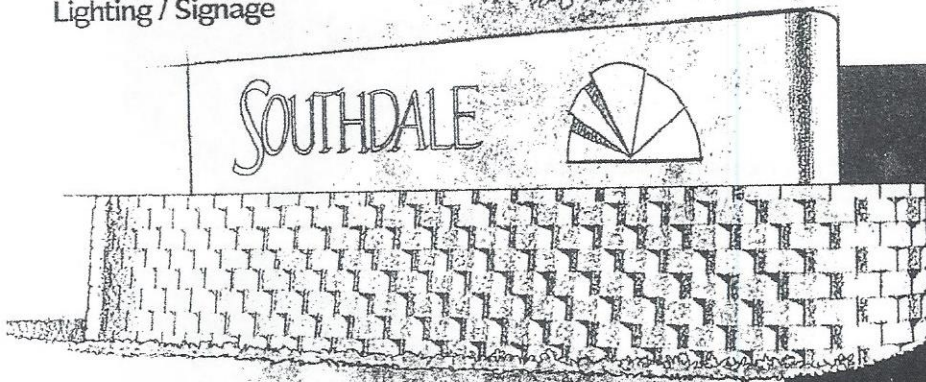
90° Corners



Stairs/Handrails

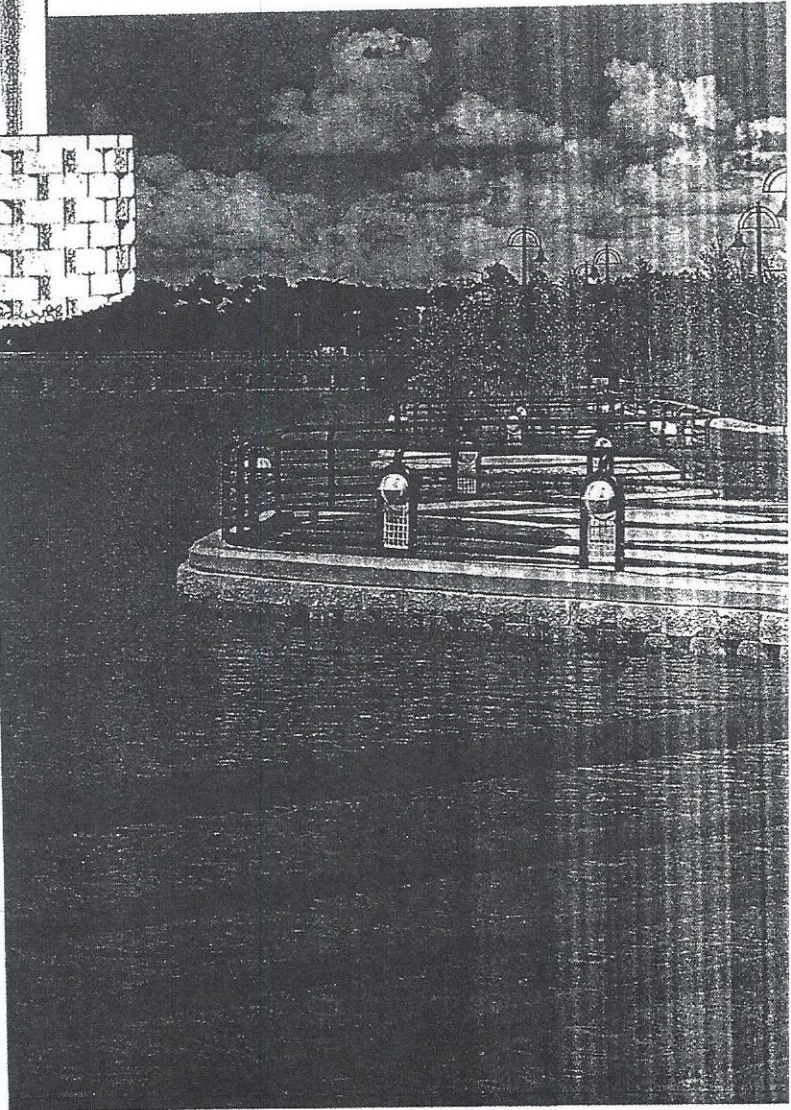
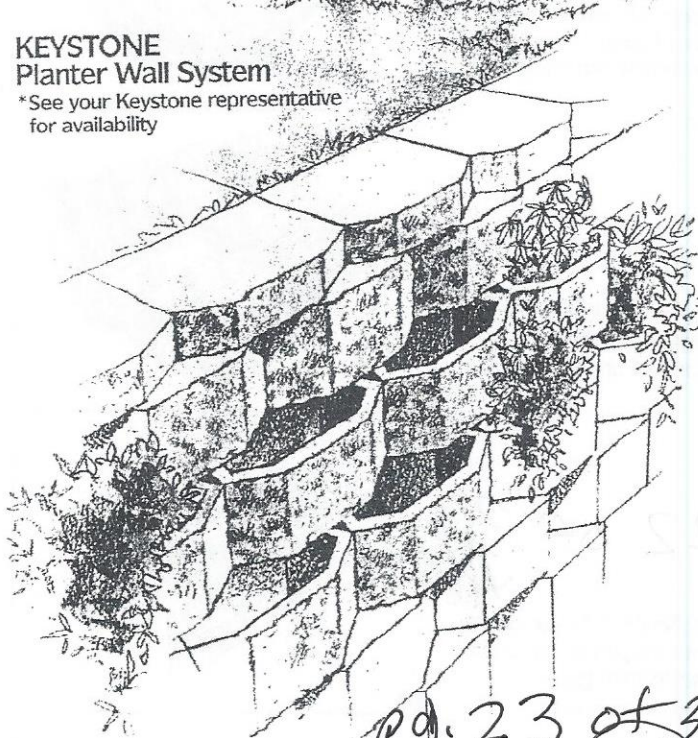


Lighting / Signage



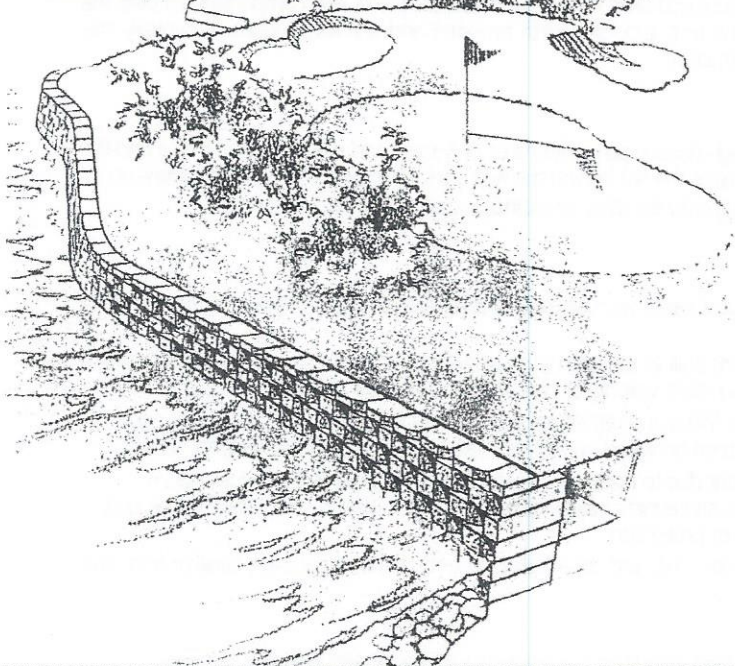
**KEYSTONE
Planter Wall System**

*See your Keystone representative
for availability

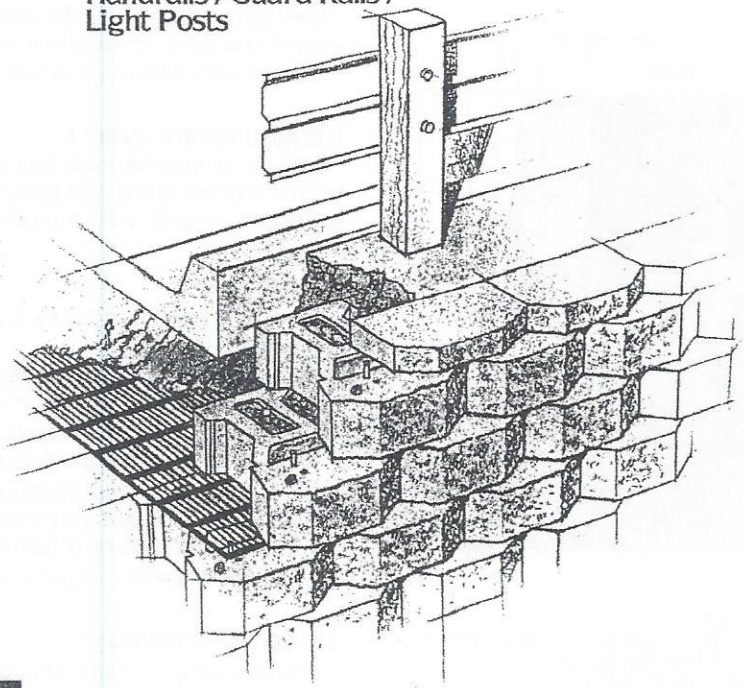


pg. 23 of 33
H.A.

Water Applications

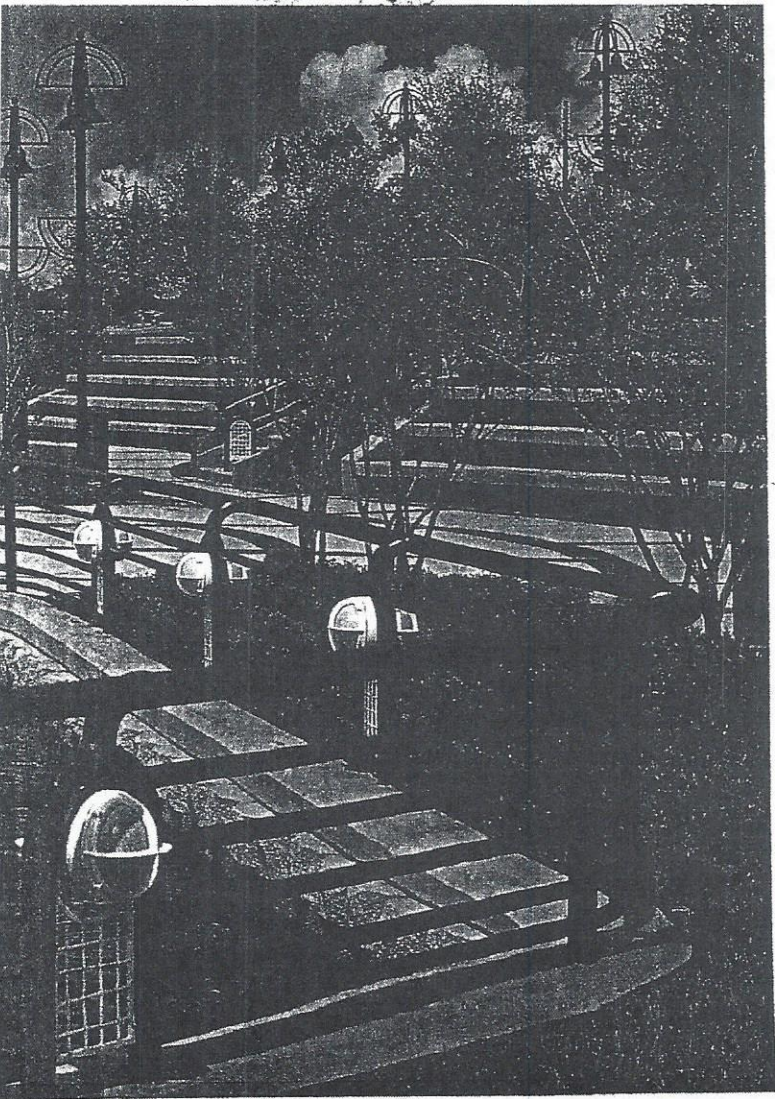


Handrails / Guard Rails / Light Posts



Creative color and texture options

KEYSTONE offers a variety of colors and face textures providing unlimited creative options for your landscaping site. Choose from different face textures including sculptured rockface or corduroy. Or select from Keystone's earthtone colors such as gray, tan or brown. Custom colors are available with special quantity orders. These options may vary by region. See your KEYSTONE representative for details.



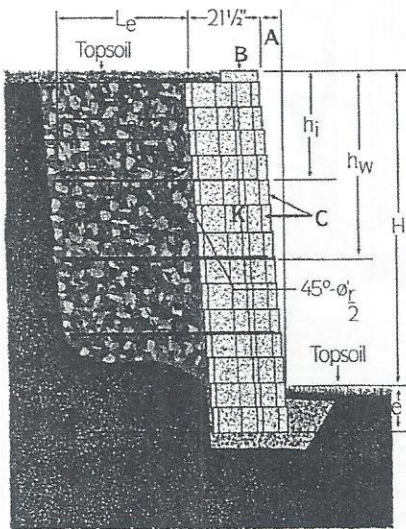
KapSeal™ Adhesive

For long-lasting installation of KEYSTONE Cap units, use KapSeal for professional results. This easy-to-apply adhesive comes in pre-mixed tubes, is water resistant, freeze-thaw stable and cures quickly.

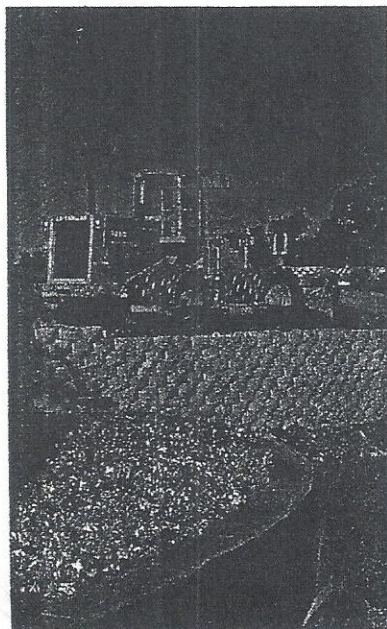
pg. 24 of 33
[Signature]

Geogrid criteria

Typical wall section terms



- A. Setback
- B. KEYSTONE Cap Unit 4"H. x 18"W x 10 1/2"D.
- C. KEYSTONE Standard Unit 8"H. x 18"W x 21 1/2"D.
- D. Varies: 6" minimum, or equal to H/20.
- E. Compacted reinforced backfill zone ϕ_b ϕ_r γ_r
- F. Retained backfill ϕ_b ϕ_r γ_r
- G. Failure planes to be analyzed
- H. Geogrid attached to fiberglass pins at unit
- I. Base leveling pad
- J. Foundation soil ϕ_f ϕ_f γ_f
- K. Core Fill



Concept

When you combine KEYSTONE concrete wall units with geogrid reinforcement and compacted soil over the geogrid, you get a reinforced soil mass that supports earth pressure and surcharge loads. Essentially this composite forms a larger gravity wall structure.

Geogrid reinforcement

Geogrids are materials made from high density polyethylene or polyester, and manufactured into a grid-like pattern. They are placed horizontally within the soil behind the wall units. With their high-strength, high-modulus features, geogrids create a tensile capacity for shear resistance within the reinforced soil mass.

Advantages

- Geogrids help you save money. In most cases you use existing site soils. You don't need to import select backfill soil.
- Geogrids let you build faster. Walls are built at the rate of the backfill and compaction process. No waiting for shop drawings, forms or steel. No more waiting for concrete to reach cure strength.
- Geogrids give you safer construction. Walls and backfill are built simultaneously -- unlike poured-in-place walls, where the walls are built and then backfilled behind the wall, creating a possible landslide hazard.
- Geogrids handle differential settlement due to frost, soil consolidation, etc. They also provide uniform weight distribution over a larger area and avoid localized overstress of foundation soils. Walls can be built without structural footing or base frost protection.
- Geogrids offer continuous performance. They are not affected by water, microorganisms, alkali or acid soils.

Design methodology

When evaluating the design for a geogrid reinforced soil retaining wall, the design engineer analyzes:

• **Soil properties:** Representative shear strength parameters (angle of internal friction) and moist unit weight for each soil zone should be determined: foundation soil, retained embankment soil, reinforced backfill. Cohesion in soil is typically assumed to be zero in structural analysis. A qualified geotechnical engineer should determine soil properties.

• **External stability:** The four standard modes of failure for external stability should be addressed: sliding (1.5 F.S.), overturning (2.0 F.S.), bearing capacity (2.0 F.S.), and global stability (F.S. to be determined by a qualified engineer).

• **Internal stability:** In order to address the three modes of internal stability (pullout, tensile stress and connection strength), these specific geogrid material properties must be known:

- long-term allowable design strength
- service life
- ability to interlock with soil
- ability to interlock with units

Actual design methods, criteria and engineering analysis are beyond the scope of this document. Consult your KEYSTONE representative for specific geogrid engineering analysis, design strengths and product availability. Design of geogrid soil reinforced walls should be specifically analyzed by a qualified engineer.

Geogrid installation

For taller or more critical walls (where geogrid is required to resist greater lateral earth pressures) follow these guidelines:

Step 1. Follow steps 1-4 on product installation (see page 4).

Step 2. Excavate the reinforced soil area to the maximum embedment length.

Step 3. Cut sections of geogrid to the specified length. Roll out geogrid from the wall toward the embankment. Check manufacturer's criteria for biaxial or uniaxial geogrids.

Step 4. Hook geogrid over the KEYSTONE fiberglass pins to ensure a secure connection between the unit and geogrid.

Step 5. Pull pinned geogrid taut to eliminate loose folds. Stake or secure back edge of geogrid before and during backfill and compaction.

Step 6. Install next course of KEYSTONE retaining wall units.

Step 7. Place compacted backfill over geogrid in 8" lifts. Provide minimum 6" soil coverage prior to driving equipment over grid. Avoid driving or turning vehicles directly on grid.

Step 8. Continue steps 3-7 until retaining wall is complete.

pg. 25 of 33

Geogrid installation cont.

Geogrid quantity

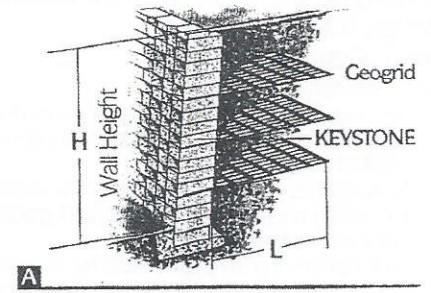
The following factors affect the amount of geogrid required to reinforce the soil behind the wall:

- Wall height (H)
- Geometry (slope above wall and wall batter)
- Geogrid strength properties
- Shear strength of soil
- Hydrostatic loads
- Surcharge loads

Geogrid quantities, embedment lengths (L), and layer frequencies should be adjusted accordingly.

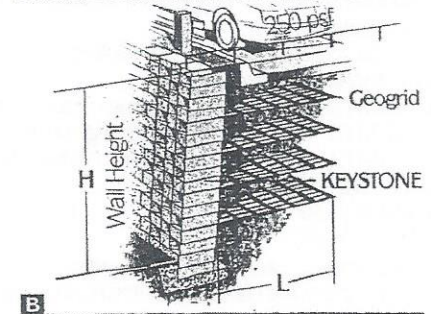
Case A: Basic wall without surcharge

Level grade at top of wall with no surcharge or slope creating additional thrust.



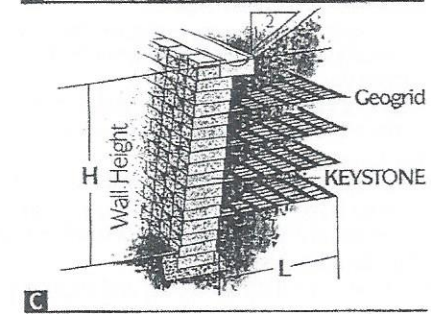
Case B: Constant surcharge load

Parking lots, truck traffic or buildings affect the geogrid design by increasing the load on the reinforced soil mass.



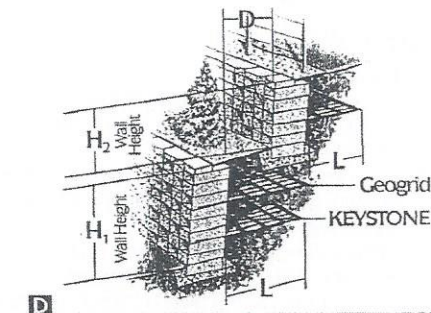
Case C: Sloping hillside surcharge

In most situations, slopes place greater loads on retaining wall than Case B loads. A greater degree of slope may mean an increase in geogrid quantities.



Case D: Tiered walls

Evaluate tiered walls carefully. Closely spaced tiered walls can create stresses on the lower wall section. The designer must determine the pressures exerted by the upper wall. Global stability is the main concern when the total setback is less than 1.5 times the height of the lower wall $D/H_1 < 1.5$.



Drainage considerations

Poor drainage is a leading cause of retaining wall failure. Hydrostatic pressure accumulates, causing a destabilizing force in the reinforced soil mass.

Designers and engineers should provide for external and internal drainage to protect the retaining wall structure. See drainage diagram at lower right for locations of drainage provisions.

Location 1: Basic drainage

With its mortarless, interlocking system, KEYSTONE walls drain naturally. No weep holes are needed.

Location 2: Surface run-off

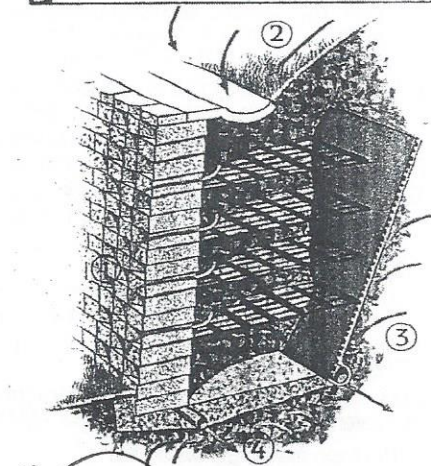
Divert surface drainage with plastic (clay) soil cap or formed swale (soil or concrete). Redirect run-off by site design where possible.

Location 3: Embankment flow

Use an embankment drain system with outflow pipe at base to intercept water flow into reinforced soil zone.

Location 4: Ground water flow

Offset the effects of rising ground water with a drain zone and outflow pipe beneath the leveling pad and reinforced soil zone.



Pg. 26 of 33 *AK*

Specification Guidelines

KEYSTONE Concrete Modular Retaining Wall Section 02276

Part 1: General

1.01 Description

- A. Work includes furnishing and installing modular block retaining wall units to the lines and grades shown on the construction drawings and as specified herein.
- B. Work includes preparing foundation soil, furnishing and installing leveling pad, unit fill and backfill to the lines and grades shown on the construction drawings.
- C. Work includes furnishing and installing all related materials required for construction of the retaining wall as shown on the construction drawings.

1.02 Related work

- A. Section 02246 – Geogrid soil reinforcement.

1.03 Reference standards

- A. ASTM C90 – Hollow load bearing masonry units.
- B. ASTM C140 – Sampling and testing concrete masonry units.
- C. ASTM C145 – Solid load bearing concrete masonry units.
- D. UN-STD 1804
- E. ASTM 2339
- F. FHA UM-60

1.04 Delivery, storage and handling

- A. Contractor shall check the materials upon delivery to assure that proper materials have been received.
- B. Contractor shall prevent excessive mud, wet cement, epoxy and similar materials (which may affix themselves) from coming in contact with the materials.
- C. Contractor shall protect the materials from damage. Damaged material shall not be incorporated into the retaining wall structure.

1.05 Submittals

- A. Samples of all products used in the work of this section.
- B. Latest edition of manufacturer's specifications for proposed materials, method of installation and list of material proposed for use.

1.06 Quality assurance

- A. Owner will supply soil testing and inspection service for quality control testing during earth work operations.

Part 2: Products

2.01 Concrete units

- A. Masonry units shall be KEYSTONE® Retaining Wall Units as manufactured by _____ in accordance with ASTM C-90 and ASTM C-140.
- B. Concrete wall units shall have a minimum 28-day compressive strength of 3,000 psi. The concrete shall have a maximum moisture absorption of 8%.
- C. Exterior dimensions may vary in accordance with ASTM C90. Standard and Compac units shall have a minimum of 1 sq.ft. face area each. Mini units shall have a minimum ½ sq.ft. face area each.
- D. KEYSTONE Standard units shall provide a minimum of 150 psf of wall face area. Fill which is contained within the dimensions of the units may be considered as 80% effective weight.
- E. Units shall have angled sides capable of concave and convex alignment curves with a minimum radius of 3.5 feet (Where applicable, for straight walls, use non-angled straight side cap units.)
- F. Units shall be interlocked with non-corrosive fiberglass pins.
- G. Units shall be interlocked and provide either a near vertical setback or a built-in setback of 1:8. A setback of 1:16 can be achieved by integrating near vertical and 1" setback units.

2.02 Fiberglass connecting pins

- A. Connecting pins shall be ½" diameter thermoset isophthalic polyester resin-pultruded fiberglass reinforcement rods.
- B. Pins shall have a minimum flexural strength of 128,000 psi and short beam shear of 6,400 psi.

2.03 KEYSTONE KapSeal™ construction adhesive

- A. Material conforms to UN-STD 1804, ASTM 2339-70 and FHA UM-60.

2.04 Base leveling pad material

- A. Material shall consist of compacted sand, gravel, crushed rock or unreinforced concrete as shown on the construction drawing. Peagravel shall not be allowed.

2.05 Unit fill

- A. Fill for units shall be free draining crushed stone or coarse gravel, ¾" to 2" with (no more than 5% passing the No. 200 sieve). Gradation of the fill shall be approved by the engineer.
- B. Place recommended fill behind the retaining wall units. Peagravel shall not be used.

2.06 Backfill

- A. Material shall be site excavated soils when approved by the engineer unless otherwise specified in the drawings. Unsuitable soils for backfill (heavy clays or organic soils) shall not be used in the backfill or in the reinforced soil mass.
- B. Where borrow fill is required, contractor shall submit sample and specifications to the engineer for approval.

Part 3: Execution

3.01 Excavation

- A. Contractor shall excavate to the lines and grades shown on the construction drawings. Contractor shall be careful not to disturb embankment materials beyond lines shown.

3.02 Foundation soil preparation

- A. Foundation soil shall be excavated as required for leveling pad dimensions shown on the construction drawings, or as directed by the engineer.
- B. Foundation soil shall be approved by the engineer to confirm that the actual foundation soil conditions meet or exceed assumed design strength. Soils not meeting required strength shall be removed and replaced with acceptable material.
- C. Over-excavated areas shall be filled with approved compacted backfill material.

3.03 Base leveling pad

- A. Leveling pad materials shall be placed as shown on the construction drawings, upon approved foundation, to a minimum thickness of 6"
- B. Material shall be compacted so as to provide a level surface on which to place the first course of units. Compaction shall be to 95% of Standard Proctor for sand or gravel type materials. For crushed rock, material shall be densely compacted.
- C. Leveling pad shall be prepared to ensure complete contact of retaining wall unit with base.
- D. Leveling pad materials shall be to the depth and widths shown. Contractor may opt for using reduced depth of sands, gravel or crushed rock using a concrete topping. Concrete shall be unreinforced and a maximum of 3" thick.

3.04 Unit installation

- A. Place first course of concrete wall units on the base leveling pad. The units shall be checked for level and alignment.
- B. Ensure that units are in full contact with base.
- C. Units are placed side by side for full length of wall alignment. Alignment may be done by means of a string line or offset from base line.
- D. Install fiberglass connecting pins and fill all voids at units with unit fill material. Tamp fill.
- E. Sweep all excess material from top of units and install next course. Ensure each course is completely unit filled, backfilled and compacted prior to proceeding to next course.
- F. Lay up each course ensuring that pins protrude into adjoining courses above a minimum of 1". Two pins required per unit. Pull each unit forward, away from the embankment, against pins in the previous course, and backfill as the course is completed. Repeat procedure to the extent of wall height.
- G. As appropriate where the wall changes elevation, units can be stepped with grade or turned into the embankment with a convex return end. Provide appropriate buried units on compacted leveling pad in area of convex return end.

3.05 Cap installation

- A. Place KEYSTONE Cap units over projecting pins from units below. Pull forward to setback position. Backfill and compact to finished grade.
- B. As required, provide permanent mechanical connection to wall units with KEYSTONE KapSeal construction adhesive. Apply adhesive to top surface of unit below, and place cap unit into position.

3.06 Geogrid installation

- A. Follow the requirements of Section 02246, Geogrid Soil Reinforcement.

*specifications subject to change without notice

pg. 27 of 33 (M)

Specification Guidelines

Geogrid Soil Reinforcement

Section 02246

Part 1: General

1.01 Description

- A. Work includes furnishing and installing geogrid reinforcement, wall fill, and backfill to the lines and grades designated on the construction drawings.
- B. Work includes furnishing and installing all related materials required for construction of the geogrid reinforced soil retaining wall as shown on the construction drawings.

1.02 Related work

- A. Section 02276, KEYSTONE Concrete Modular Retaining Wall.

1.03 Reference standards

- A. See specific geogrid manufacturer's reference standards.

1.04 Delivery, storage and handling

- A. Contractor shall check the geogrid upon delivery to assure the proper material has been received.
- B. Geogrids shall be stored at temperatures above -20°F.
- C. Contractor shall prevent excessive mud, wet cement, epoxy and similar materials (which may affix themselves to the gridwork) from coming in contact with the geogrid material.
- D. Rolled geogrid material may be laid flat or stood on end for storage.

1.05 Submittals

- A. Samples of all products used in the work of this section.
- B. Latest edition of manufacturer's specifications for proposed materials, method of installation and list of material proposed for use.

1.06 Quality assurance

- A. Owner will supply soil testing and inspection services for quality control testing during earthwork operation.

Part 2: Products

2.01 Definitions

- A. Geogrid products shall be high-density polyethylene expanded sheet or polyester woven fiber materials, specifically fabricated for use as soil reinforcement.
- B. Concrete retaining wall units are as detailed on the drawings and are specified under Section 02276, KEYSTONE Concrete Modular Retaining Wall.
- C. Unit fill is a free-draining granular material used within the concrete units.
- D. Backfill is the soil which is used as fill for the reinforced soil mass.
- E. Foundation soil is the insitu soil.

2.02 Geogrid

- A. Geogrid shall be the type as shown on the drawings and shall have the property requirements described within the manufacturer's specifications.

2.03 Acceptable manufacturers

- A. A manufacturer's product shall be approved by the engineer prior to bid opening.

Part 3: Execution

3.01 Foundation soil preparation

- A. Foundation soil shall be excavated to the lines and grades as shown on the construction drawings, or as directed by the engineer.
- B. Foundation soil shall be approved by the engineer to assure that the actual foundation soil strength meets or exceeds assumed design strength.
- C. Over-excavated areas shall be filled with approved compacted backfill material.
- D. Foundation soil shall be proof rolled prior to fill and geogrid placement.

3.02 Wall erection

- A. Wall erection shall be as specified under Section 02276, KEYSTONE Concrete Modular Retaining Wall.

3.03 Geogrid installation

- A. The geogrid soil reinforcement shall be laid horizontally on compacted backfill and connected to the concrete wall units by hooking geogrid over fiberglass pins. Pull geogrid taut and anchor before backfill is placed on it.
- B. Slack in the geogrid at the wall unit connections shall be removed.

- C. Geogrid shall be laid at the proper elevation and orientation as shown on the construction drawings or as directed by the engineer.
- D. Correct orientation (roll direction) of the geogrid shall be verified by the contractor.
- E. Pull pinned geogrid taut to eliminate loose folds. Stake or secure back edge of geogrid prior to, and during backfill and compaction.
- F. Follow manufacturer's guidelines relative to overlap requirements of uniaxial and biaxial geogrids.

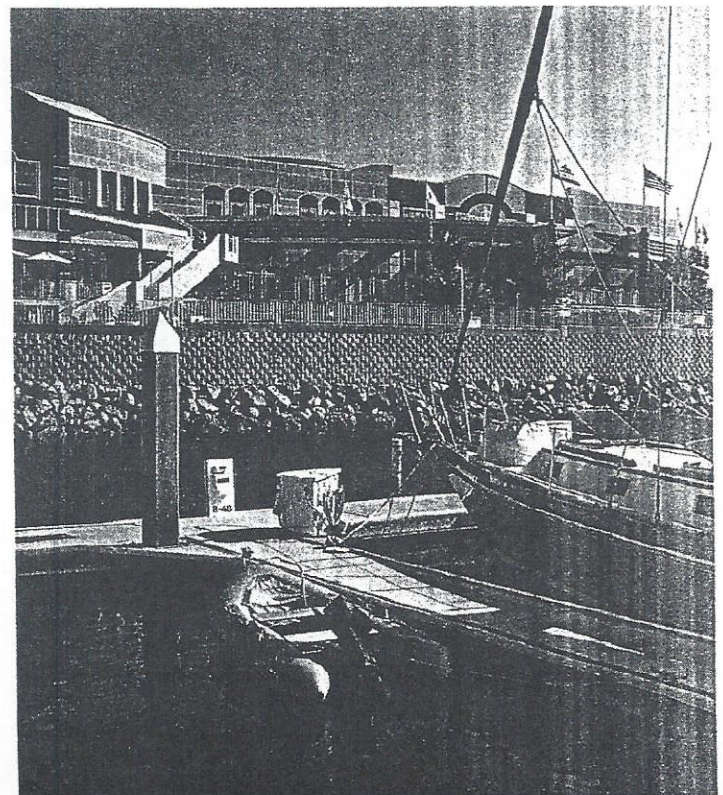
3.04 Fill placement

- A. Backfill material shall be placed in 8" lifts and compacted to 95% of Standard Proctor density.
- B. Backfill shall be placed, spread and compacted in such a manner that minimizes the development of slack or loss of pretension of the geogrid.
- C. Only hand-operated compaction equipment shall be allowed within 3' of the back surface of the KEYSTONE units.
- D. Backfill shall be placed from the wall back into the embankment to ensure that the geogrid remains taut.
- E. Tracked construction equipment shall not be operated directly on the geogrid. A minimum backfill thickness of 6" is required prior to operation of tracked vehicles over the geogrid. Turning of tracked vehicles should be kept to a minimum to prevent tracks from displacing the fill and damaging the geogrid.
- F. Rubber-tired equipment may pass over the geogrid reinforcement at slow speeds, [less than 10 mph.] Avoid sudden braking and sharp turning.

Special considerations

- Geogrid can be interrupted by periodic penetration of column, pier or footing structure.
- If site conditions will not allow geogrid embedment length, consider these alternatives:
 - KEYSTONE can be designed and built as a reinforced masonry unit wall. Cores will accept vertical reinforcing and grout.
 - Deadman-tie-back anchor option reduces or eliminates excavation and backfill requirements.
 - Increase wall batter by sloping leveling pad or footing (8 to 1, 4 to 1, etc.) Consult your KEYSTONE representative for details.

*specifications subject to change without notice



02276/KEY
BuyLine 2802
Pg. 28 of 33
AKC

pg. 29 of 33

(Handwritten initials)



KEYSTONE. Serving retaining wall needs across the U.S.A. and world-wide.

Warranty

Each KEYSTONE unit (when manufactured strictly in accordance with the specifications as provided to the licensed manufacturer) will meet or exceed current ASTM standards on compression strength and absorption for concrete masonry for 15 years after proper installation. If a KEYSTONE unit does not meet this warranty standard, please notify KEYSTONE Retaining Walls, Inc. in writing. We will ship you replacement units (which shall be the manufacturer's sole remedy for breach of this warranty). However, neither the manufacturer or KEYSTONE shall have any obligation to install such replacement units.

This warranty shall not apply to any KEYSTONE unit which is damaged, defective or fails to meet the warranty standard due to improper installation, chemical contact, structural design, or excessive and unforeseen site conditions beyond KEYSTONE Retaining Wall Systems, Inc.'s control.

The above warranty is the exclusive warranty. ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE DISCLAIMED.

Distributed by:



Oldcastle®

BETCO BLOCK & PRODUCTS, INC.
7920 NOTES DRIVE
MANASSAS, VA 20109

PRODUCT HOTLINE:

800-486-4011

KEYSTONE is a registered trademark.

© 1995 KEYSTONE Retaining Wall Systems, Inc.

Corporate headquarters: KEYSTONE Retaining Wall Systems, Inc.

4444 West 78th st • Minneapolis, MN • 55435

612-897-1040 • 1-800-747-8971 • FAX 612-897-3858

L-1200-3

9/94

Printed in USA

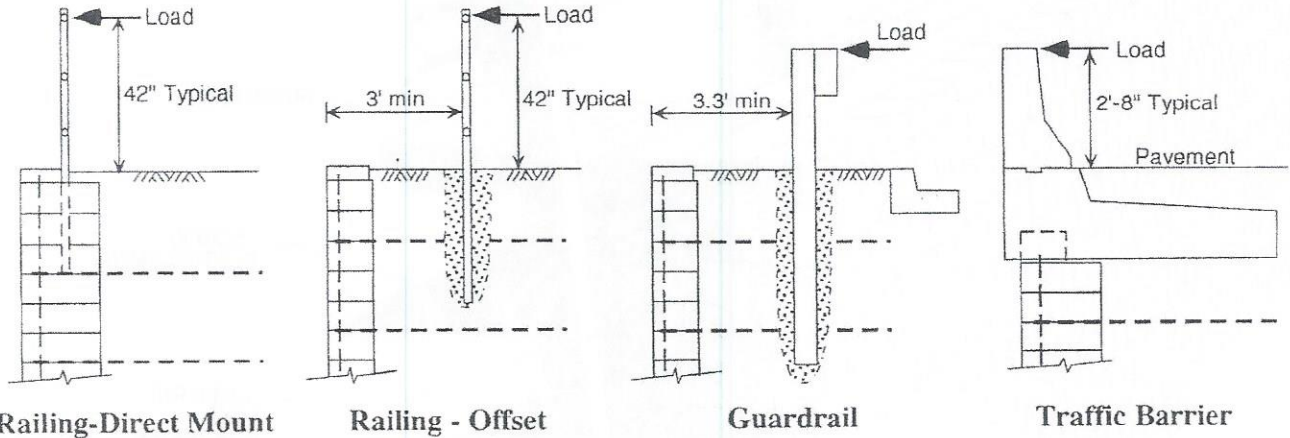
Patented

KEYSTONE Retaining Wall Systems are covered by one or more of U.S. Patent Numbers:

295,790 295,788 296,007 296,365 297,464 297,574 297,767 298,463 299,067 300,253 300,254
301,064 311,444 4,802,320 Re. 34,314 (L.C.B.O. #4599) and Foreign Patents



Railing and Barrier Requirements



Introduction

Railing, guardrail, and traffic barrier requirements for retaining walls are not clearly defined in design codes nor are they properly addressed in many site plans. Many times railings and barriers are added as an afterthought which can become a costly and logistical issue when no provisions are made in the original retaining wall layout and site design.

Guard and barriers require a common sense approach by the site designer considering the proximity of a wall structure to people and traffic. Sufficient space must be reserved for such installations. Some excerpts from design codes may be useful in defining the general intent of barriers:

Guardrail (UBC)

Guardrail is a system of building components located near the open sides of elevated walking surfaces for the purpose of minimizing the possibility of an accidental fall from the walking surface to the lower level.

Railing/Guard Requirements (BOCA)

Where retaining walls with differences in grade level on either side of the wall in excess of 4 feet (1219 mm) are located closer than 2 feet (610mm) to a walk, path, parking lot or driveway on the high side, such retaining walls shall be provided with guards that are constructed in accordance with Section 1021.0 or other approved protective measures.

Railings (AASHTO)

Railings shall be provided along the edges of structures for protection of traffic and pedestrians.

Summary

The railing/barrier issue can be a logistical and structural problem with modular wall systems due to the inability of the small wall units to resist concentrated loads and the need for lateral space at the top of wall to install most barrier systems. Proper planning and design is required.

The design loadings can be quite significant as indicated below:

UBC Railing and Guardrail Loadings

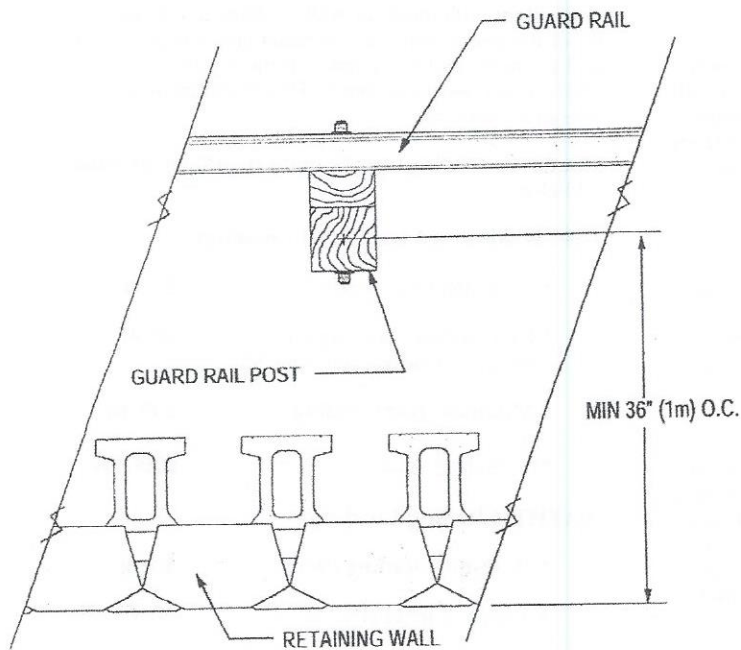
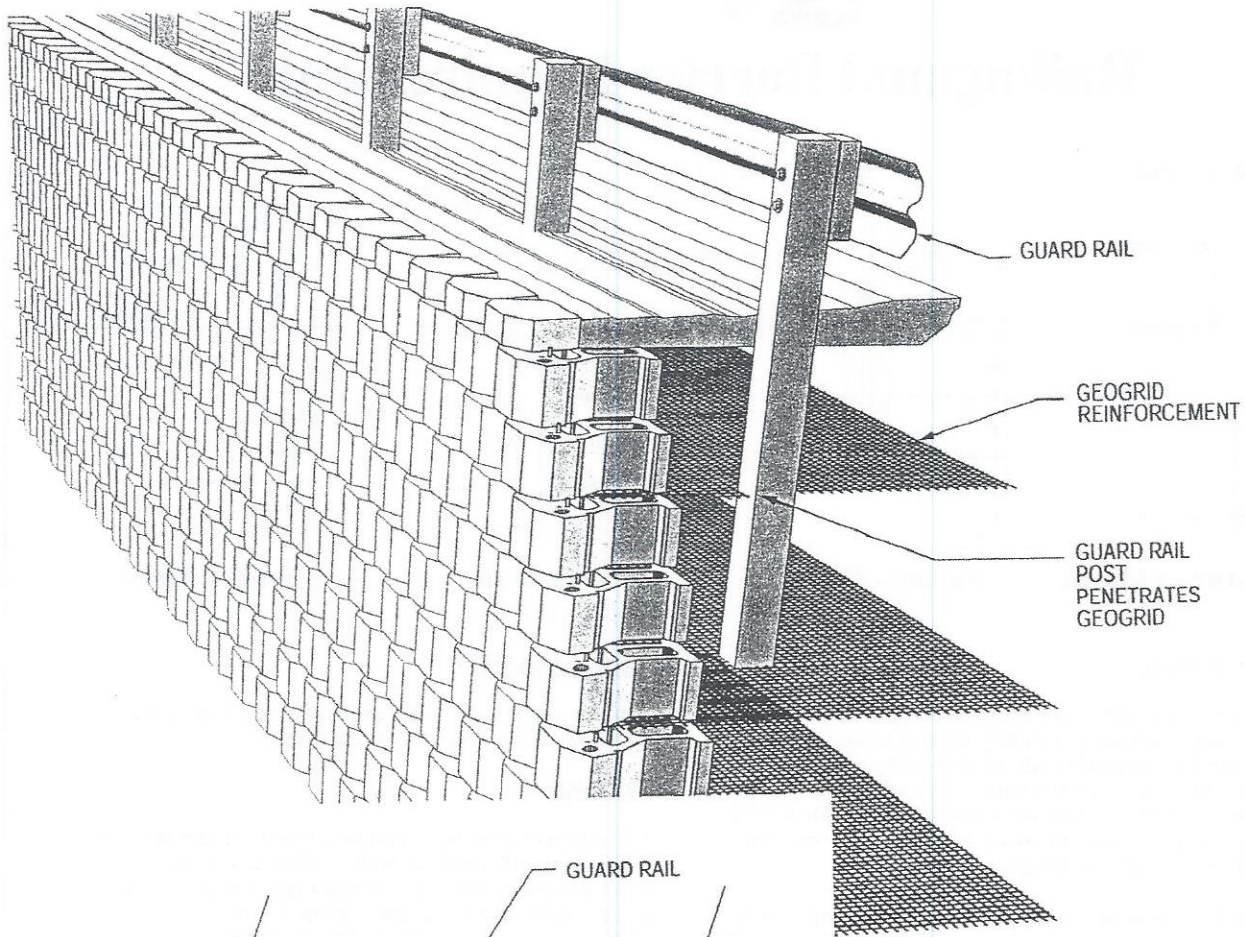
- * Other than exit facilities 20 plf
- * Exit facilities serving an occupant load greater than 50. 50 plf
- * Minimum point loading 200 lbs
- * Vehicle Barrier 6000 lbs

AASHTO Railing Loadings

- * Pedestrian Railing (W) 50 plf
- * Traffic Barrier (P) 10,000 lbs

page 30 of 33 *AKO*

▷ GUARD RAILS



Guard rails can easily be placed along the top of a Keystone® wall using standard procedures. Posts may be of wood or steel sections. Post positions should be a minimum of 36" (0.9m) behind the wall face to provide anchoring of post into the reinforced soil area. If the wall is reinforced with geogrid, the guard rail post may be placed by cutting holes in the geogrid layers as needed per the recommendations of the geogrid manufacturer. Typically, the project engineer will provide design recommendations for this detail.

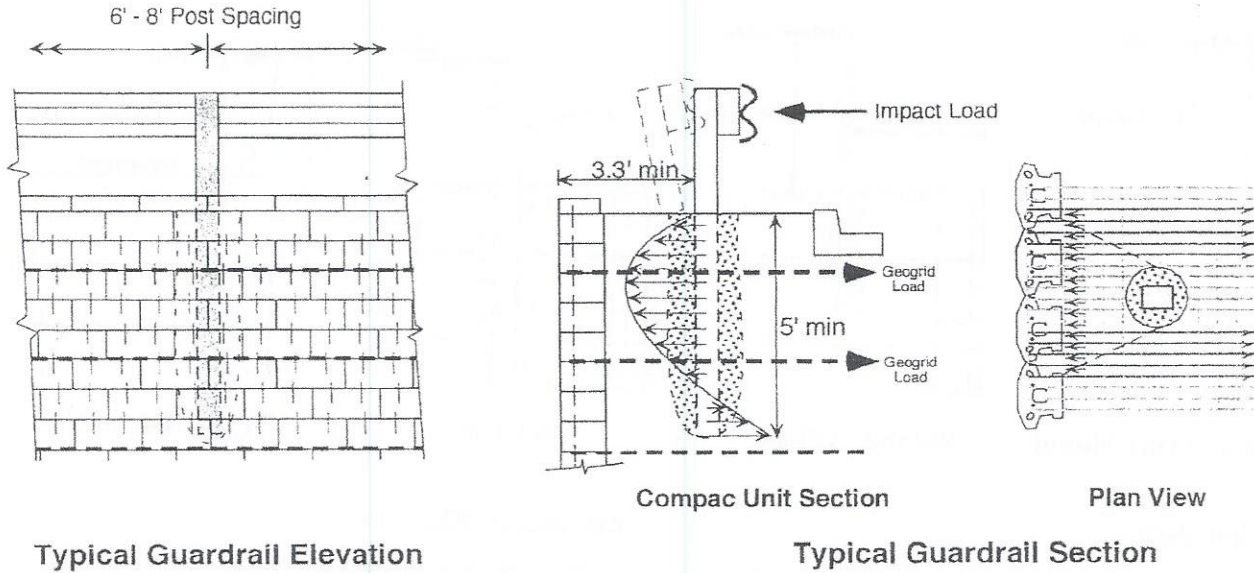
page 31 of 33 *AW*

The information contained herein has been compiled by Keystone® Retaining Wall Systems, Inc. and to the best of our knowledge, accuracy represents the Keystone product use in the applications which are illustrated. Final determination of the suitability for the use contemplated and its manner of use are the sole responsibility of the user. Structural design and analysis shall be performed by a qualified engineer.

© 1997 KEYSTONE RETAINING WALL SYSTEMS, INC.
Minneapolis, Minnesota • (612) 897-1040 • (612) 897-3858-14x



Typical Guardrail Detail



Typical Guardrail Elevation

Typical Guardrail Section

Introduction

Guardrails or flexible post and beam barriers are not "designed" in the conventional sense as a guardrail is not expected to resist traffic impact loadings and remain serviceable like other barriers. The guardrail is designed to be sacrificed during impact and the energy absorbed through resistance and displacement that redirects or halts the vehicle after yielding and failure of the system. Typically, progressive resistance is developed as the first post fails and load is transferred to the adjacent posts through tension on the rail.

There have been numerous guardrail configurations developed over the years by regional transportation agencies and engineers in an attempt to balance cost and performance. They are all similar with varying degrees of stiffness and displacement characteristics exhibited upon impact. The design criteria is relatively simple and only requires that a flexible barrier system be provided sufficient lateral space to displace under impact loading. This space requirement is typically 1m (3.3') minimum (can be up to 1.5m (5') with more flexible rail systems) which can be a problem when not properly accounted for on project site design plans.

Guardrail Analysis

The analysis of a Keystone wall structure with a guardrail placed as shown is problematic in that the guardrail is designed to fail under impact, therefore, there may or may not be some localized displacement of the soil and upper wall units as a result of a major impact. The AASHTO design criteria appears to be a reasonable consideration:

AASHTO '97

Flexible post and beam barriers, when used, shall be placed a minimum distance of 1.0 m (3.3') from the wall face, driven 1.5 m (5') below grade and spaced to miss the reinforcements.... The upper two rows of reinforcement shall be designed for an additional horizontal load of 4.4 kN per lineal meter of wall (300 plf).

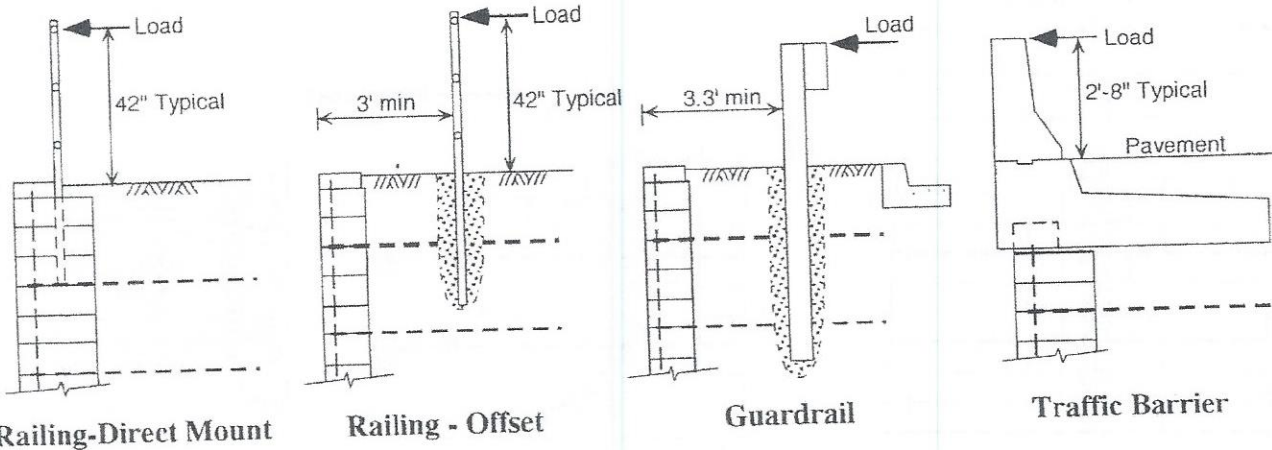
Design Note

Two levels of reinforcement are required in the upper four feet of wall to provide resistance against the loads suggested by AASHTO. Posts holes are either augered through the geogrid reinforcement or the posts placed in tubes previously installed during wall construction unless a drive point is used to cut through the reinforcement.

page 32 of 33 *AK*



Railing and Barrier Requirements



Introduction

Railing, guardrail, and traffic barrier requirements for retaining walls are not clearly defined in design codes nor are they properly addressed in many site plans. Many times railings and barriers are added as an afterthought which can become a costly and logistical issue when no provisions are made in the original retaining wall layout and site design.

Guard and barriers require a common sense approach by the site designer considering the proximity of a wall structure to people and traffic. Sufficient space must be reserved for such installations. Some excerpts from design codes may be useful in defining the general intent of barriers:

Guardrail (UBC)

Guardrail is a system of building components located near the open sides of elevated walking surfaces for the purpose of minimizing the possibility of an accidental fall from the walking surface to the lower level.

Railing/Guard Requirements (BOCA)

Where retaining walls with differences in grade level on either side of the wall in excess of 4 feet (1219 mm) are located closer than 2 feet (610mm) to a walk, path, parking lot or driveway on the high side, such retaining walls shall be provided with guards that are constructed in accordance with Section 1021.0 or other approved protective measures.

Railings (AASHTO)

Railings shall be provided along the edges of structures for protection of traffic and pedestrians.

Summary

The railing/barrier issue can be a logistical and structural problem with modular wall systems due to the inability of the small wall units to resist concentrated loads and the need for lateral space at the top of wall to install most barrier systems. Proper planning and design is required.

The design loadings can be quite significant as indicated below:

UBC Railing and Guardrail Loadings

- * Other than exit facilities 20 plf
- * Exit facilities serving an occupant load greater than 50. 50 plf
- * Minimum point loading 200 lbs
- * Vehicle Barrier 6000 lbs

AASHTO Railing Loadings

- * Pedestrian Railing (W) 50 plf
- * Traffic Barrier (P) 10,000 lbs

page 33 of 33

Permit Status by Address

Permit information for 181790285

Permit Stage: Finalized

Effective: 08/17/2018

Type	Activity Number	Description	Status
Inspection	8152775	RESIDENTIAL BACKFILL #1	Detail Passed
Inspection	8025446	RESIDENTIAL FINAL #1	Detail Passed
Inspection	8025445	RESIDENTIAL FOOTING #1	Detail Cancelled
Inspection	8147012	RESIDENTIAL FOOTING #2	Detail Waived
Inspection	8147013	RESIDENTIAL ROUTINE #1	Detail Passed
Review	2778497	BUILDING REVIEW #1	Detail Approved
Review	2778498	HEALTH REVIEW #1	Detail Approved
Review	2765721	SITE PERMITS REVIEW #1	Detail Approved
Fee		FILING FEE	Paid
Fee		PERMIT FEE	Paid
Condition	1217892	TOWN OF CLIFTON APPROVAL REQUIRED	Detail Approved, APPRVD
Condition	1230610	LOG OUT REQUIRED	Detail No affect on stage
Condition	1217891	WELL OR SEPTIC ON PROPERTY	Detail No affect on stage



BUILDING PERMIT

RETAINING WALL

Permit Number: 181790285

Issued Date: 08/17/2018

Tax Map ID: 085-2 / 02 / 0004

Job Address: 7221 Dell Av
Clifton, VA 20124-0000

Plan No: Q-18-3014

Owner/Tenant:
LOWELL KIMBERLY J
7221 Dell Ave
Clifton, Va 20124
(703)895-8793

Contractor:
OWNER IS CONTRACTOR

Mechanic's Lien Agent: None Designated

Structure: SINGLE FAMILY DWELLING

Code: IRC 2012

GROUP: R5
U

Type of Construction: VB

Has permission, according to approved plans, applications and restrictions of record to:

BUILD CONCRETE BLOCK RETAINING WALL MAXIMUM HEIGHT 6'8"

Site Related Approval Conditions and Alerts

- **Responsible Land Disturber:**
- Walls must be backfilled with non-expansive soils that correspond to the lateral pressure used in the design of the wall as listed below. The top of the backfill shall be adequately sloped to prevent water from accumulating around the structure.
Basement and areaway walls: 60 psf/ft=SC, ML-CL, and Inorganic CL
Basement and areaway walls: 45 psf/ft=GM, GC, SM, SM-SC and ML
Basement and areaway walls: 30 psf/ft=GW, SP, SW, and SP
- Footings and/or piers must be placed on competent undisturbed soils.

BUILDING OFFICIAL

Brian J. Jolley

- A copy of this permit must be posted at the construction site for the duration of the permit.
- This permit does not constitute approval from your homeowners' association and its related covenants.
- This permit will expire if work does not commence in six months, or if work is suspended for six months.
- This permit holder is responsible to contact the county when stages of construction are reached that require inspections.
- To schedule inspections call our Inspection office at 703-631-5101, TTY 711 during business hours. Inspection may also be scheduled online at www.fairfaxcounty.gov/fido.
- For questions regarding this permit call the Permit Application Center at 703-222-0801, TTY 711.
- Call Miss Utility before you dig at 811.



Clifton Clerk <clerk@cliftonva.gov>

Fwd: 7221 Dell Ave

1 message

khk@baberkal.com <khk@baberkal.com>
To: Clifton Clerk <clerk@cliftonva.gov>

Thu, Aug 13, 2020 at 11:19 AM

Sent from my iPhone

Begin forwarded message:

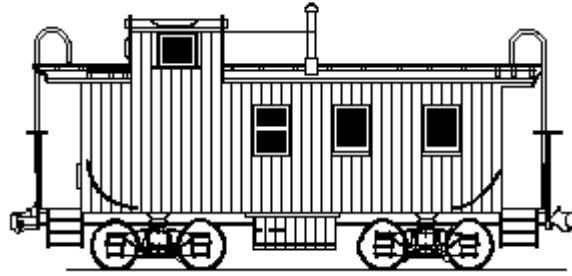
From: Royce Jarrendt <royce.jarr@yahoo.com>
Date: August 13, 2020 at 9:55:19 AM EDT
To: Kathy Kalinowski <khk@baberkal.com>
Subject: 7221 Dell Ave
Reply-To: Royce Jarrendt <royce.jarr@yahoo.com>

Kathy,

The retaining wall at 7221 Dell Ave. is in conformance with the approved drawings reviewed by the ARB.

If you have any questions please let me know.

Royce Jarrendt



**CLIFTON TOWN PLANNING COMMISSION
TUESDAY, AUGUST 25, 2020, 7:30 PM
ELECTRONIC MEETING, VIA ZOOM**

Until further notice from the Mayor of Clifton, and in accordance with the Resolution of the Planning Commission regarding Remote Participation by Electronic Means Policy and the Town Council Continuity of Government Methods, to the Planning Commission and Authorizing Remote Participation by Electronic Means Without a Physical Quorum Being Present Pursuant to Virginia Law, the Town of Clifton Planning Commission is holding all Meetings noticed herein electronically for the purpose of continuity of government of the Town of Clifton.

The meetings will be conducted using Zoom teleconferencing audio and video service, and connection information will be provided to members of the public to afford the opportunity to citizens to witness the operation of the Town of Clifton government. Connection information is available from, and will be provided by, the Town Clerk upon receiving an emailed request directed to clerk@cliftonva.gov.

Order of Business:

1. Approve July 28, 2020 Regular Meeting Minutes.
2. Use Permit Applications:
 - a. 12644 Chapel Road: Anthony Reid & Associates, LLC
 - b. 7221 Dell Avenue: Retaining Wall (Final)
 - c. 12640 School Street: Ext. Structure Repair (Final)
3. Unfinished Business:
 - a. Final Use Permit Application for 7184 Clifton Road – Update.
 - b. DEQ Corrective Action Plan – Update.
4. Adjournment.