CITY OF MADISON
ZONING BOARD OF APPEALS
VARIANCE APPLICATION

$300 Filing Fee

Ensure all information is **typed** or legibly **printed** using blue or black ink.

Address of Subject Property: 708 W. Brittingham Pl

Name of Owner: Sue Alioto

Address of Owner (if different than above): _____

Daytime Phone: 608-255-8488 Evening Phone: _____

Email Address: salioto@hotmail.com

Name of Applicant (Owner's Representative): _____

Address of Applicant: _____

Daytime Phone: _____ Evening Phone: _____

Email Address: _____

Description of Requested Variance: My houses have severely settled, from at least 12" in the front to around 6" in the back, and I would like to replace the failing foundations. Due to the high water table and negative soil grade towards the houses I want to raise them 12". Rasing the houses 12" will help me address the negative soil grade, help in preventing water in the basements and return the houses to their orginal elevations

(See reverse side for more instructions)

FOR OFFICE USE ONLY

Amount Paid:	AB 300	Hearing Date:	5/2/13
Receipt:	141895	Published Date:	5/2/13
Filing Date:	4/17/13	Appeal Number:	050913-2
Received By:	JK	GQ:	
Parcel Number:	0709-234-0832-6	Code Section(s):	28.045 (2)
Zoning District:	TR-C4		
Alder District:	13 - Sue Ellingson		

Application Requirements

Please provide the following Information (Please note any boxes left uncheck below could result in a processing delay or the Board's denial of your application):

☑	**Pre-application meeting with staff**: Prior to submittal of this application, the applicant is strongly encouraged to discuss the proposed project and submittal material with Zoning staff. **Incomplete applications could result in referral or denial by the Zoning Board of Appeals.**
☑	**Site plan**, drawn to scale. A registered survey is recommended, but not required. Show the following on the site plan (Maximum size for all drawings is 11" x 17"): ❑ Lot lines ❑ Existing and proposed structures, with dimensions and setback distances to all property lines ❑ Approximate location of structures on neighboring properties adjacent to variance ❑ Major landscape elements, fencing, retaining walls or other relevant site features ❑ Scale (1" = 20' or 1' = 30' preferred) ❑ North arrow
☑	**Elevations** from all relevant directions showing existing and proposed views, with notation showing the existing structure and proposed addition(s). (Maximum size for all drawings is 11" x 17")
☐	**Interior floor plan of existing and proposed structure,** when relevant to the variance request and required by Zoning Staff (Most additions and expansions will require floor plans). (Maximum size for all drawings is 11" x 17")
☐	**Front yard variance requests only.** Show the building location (front setback) of adjacent properties on each side of the subject property to determine front setback average.
☐	**Variance requests specifically involving slope, grade, or trees.** Approximate location and amount of slope, direction of drainage, location, species and size of trees.
☑	**CHECK HERE.** I acknowledge any statements implied as fact require supporting evidence.
☑	**CHECK HERE.** I have been given a copy of and have reviewed the standards, which the Zoning Board of Appeals will use when reviewing applications for variances.

Owner's Signature: Susan Alioto **Date:** 4/17/13

----------(Do not write below this line/For Office Use Only)----------

DECISION

The Board, in accordance with the findings of fact, hereby determines that the requested variance for _____ _____ **(is) (is not)** in compliance with all of the standards for a variance. Further finding of fact is stated in the minutes of this public hearing.

The Zoning Board of Appeals: ☐ **Approved** ☐ **Denied** ☐ **Conditionally Approved**

Zoning Board of Appeals Chair:

Date:

Standards for Variance

1. There are conditions unique to the property of the applicant that does not apply generally to other Properties in the district.

   According to the geotechnical report performed by CGC, my houses have severely settled since they were built, from at least 12" or more in the front to around 4" to 6" in the back. In the years I have owned both houses I have personally seen several inches of settlement. We would like to raise the houses close to the original elevations. By returning the houses to their original elevations I can also correct the negative soil grade towards the houses, which will help in preventing water problems in the basements. At the current elevation my houses do not meet Madison residential code since the existing framing is too close to the ground (code requires a minimum of 8" from ground level to framing). See pictures 1- 4.

2. The variance is not contrary to the spirit, purpose and intent of the regulations in the zoning district and is not contrary to the public interest.

   We are not changing any of the exterior of houses all we want to do is restore them to their original heights. Both houses as they currently stand are lower in stature than neighboring houses. See pictures 5-12.

3. For an area variance, compliance with the strict letter of the ordinance would unreasonably prevent use of the property for a permitted purpose or would render compliance with the ordinance unnecessarily burdensome.

   Not applying for use variance.

4. The alleged difficulty or hardship is created by the terms of the ordinance rather than by a person who has a present interest in the property.

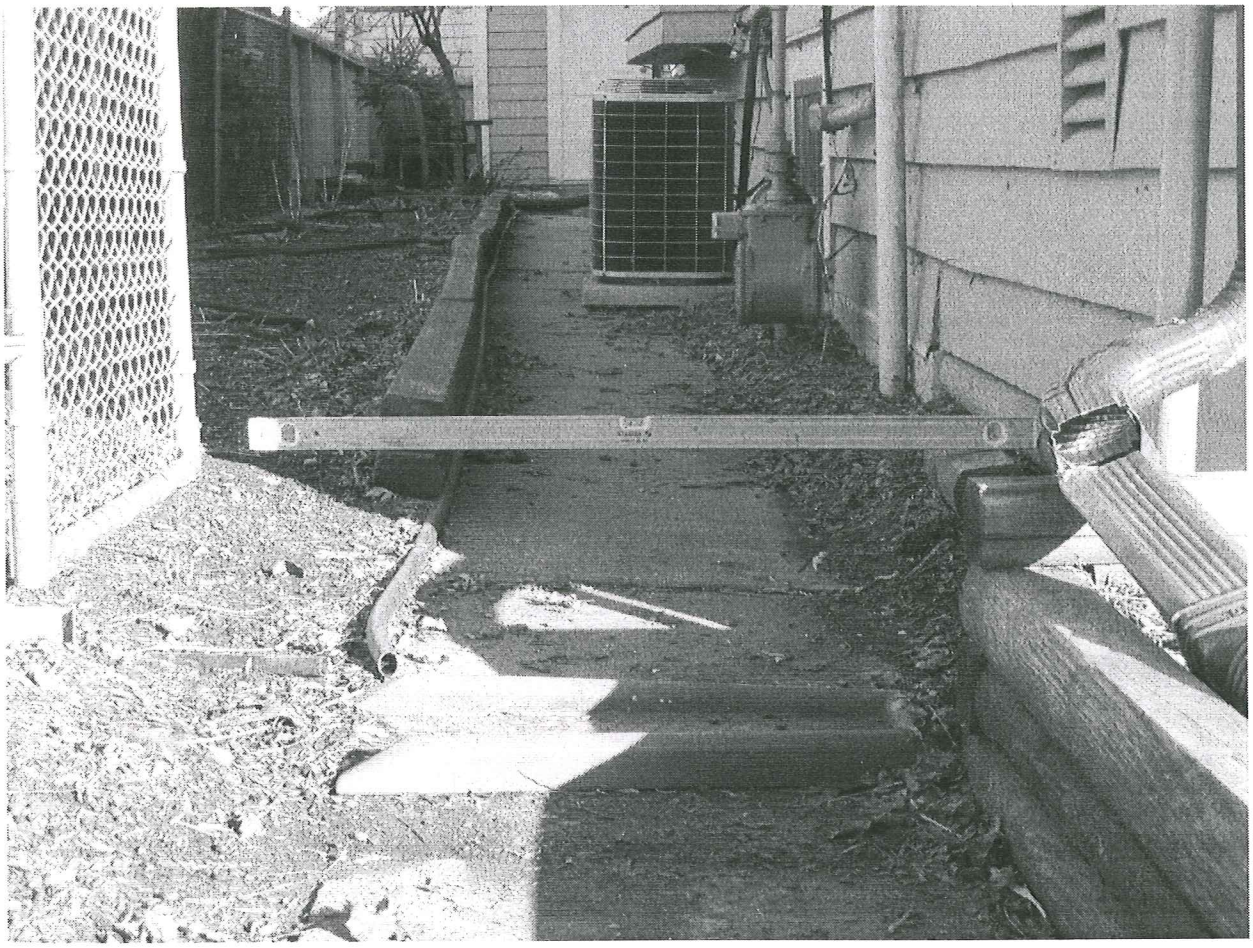
   Being that the ground water table is so high in this area making the basements lower would likely cause seasonal flooding and a constant pumping of water to keep the basements dry. During a rain event and power outage I would have flooding problems. I also couldn't grade the property correctly if I couldn't raise the elevation of the basements. *See picture 1.

5. The proposed variance shall not create substantial detriment to adjacent property.

   I'm not altering the grade other than to create suitable drainage. Proper drainage from my property will not impact adjacent houses.

6. The proposed variance shall be compatible with the character of the immediate neighborhood.

   Currently the scale of my houses is smaller and lower than the houses on both sides. Raising the elevations will put them back to their original matching scale. *See pictures 13, 14.



#1

710 W Brittingham Pl

#2

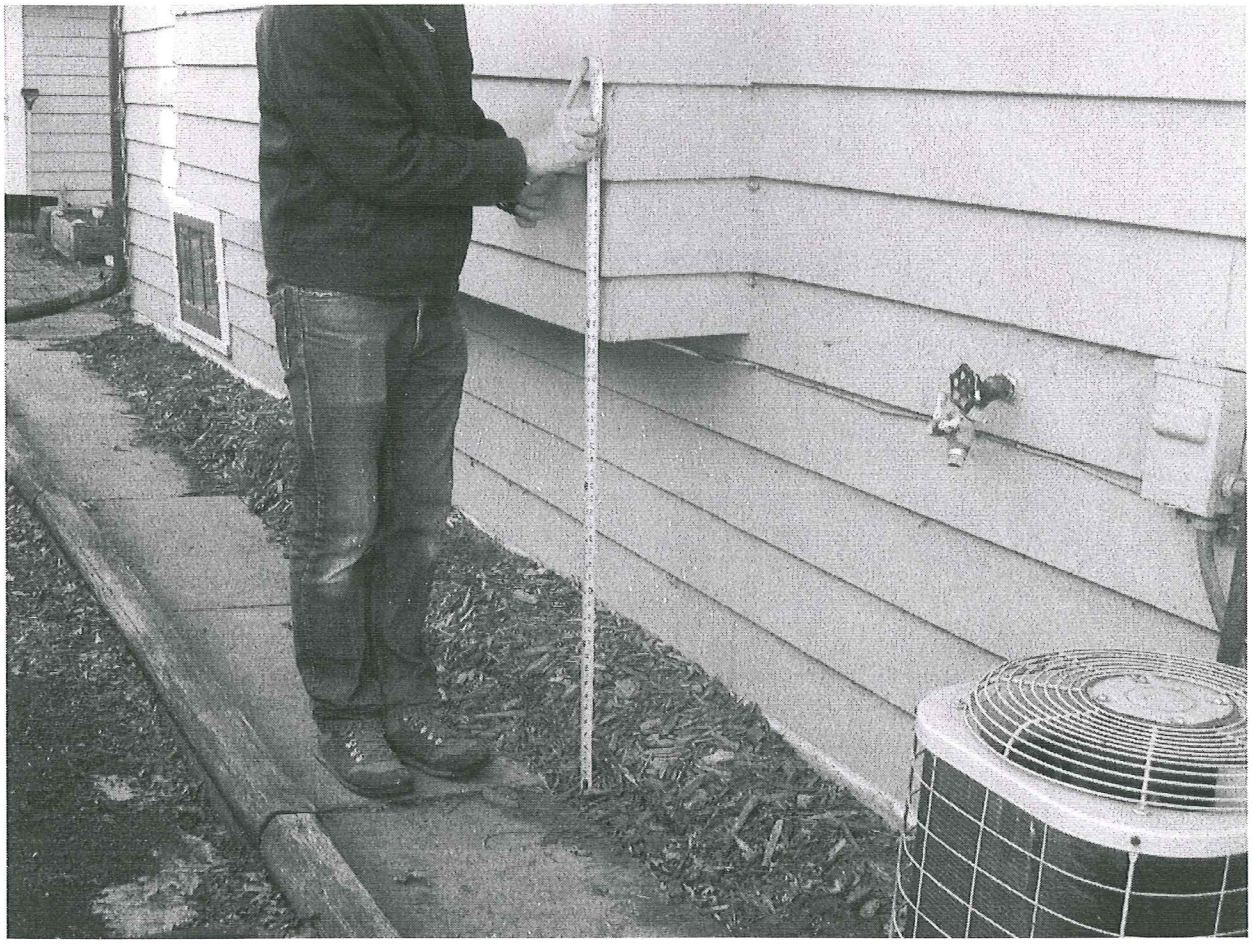
710 W Brittingham Pl

#3

708 W Brittingham Pl

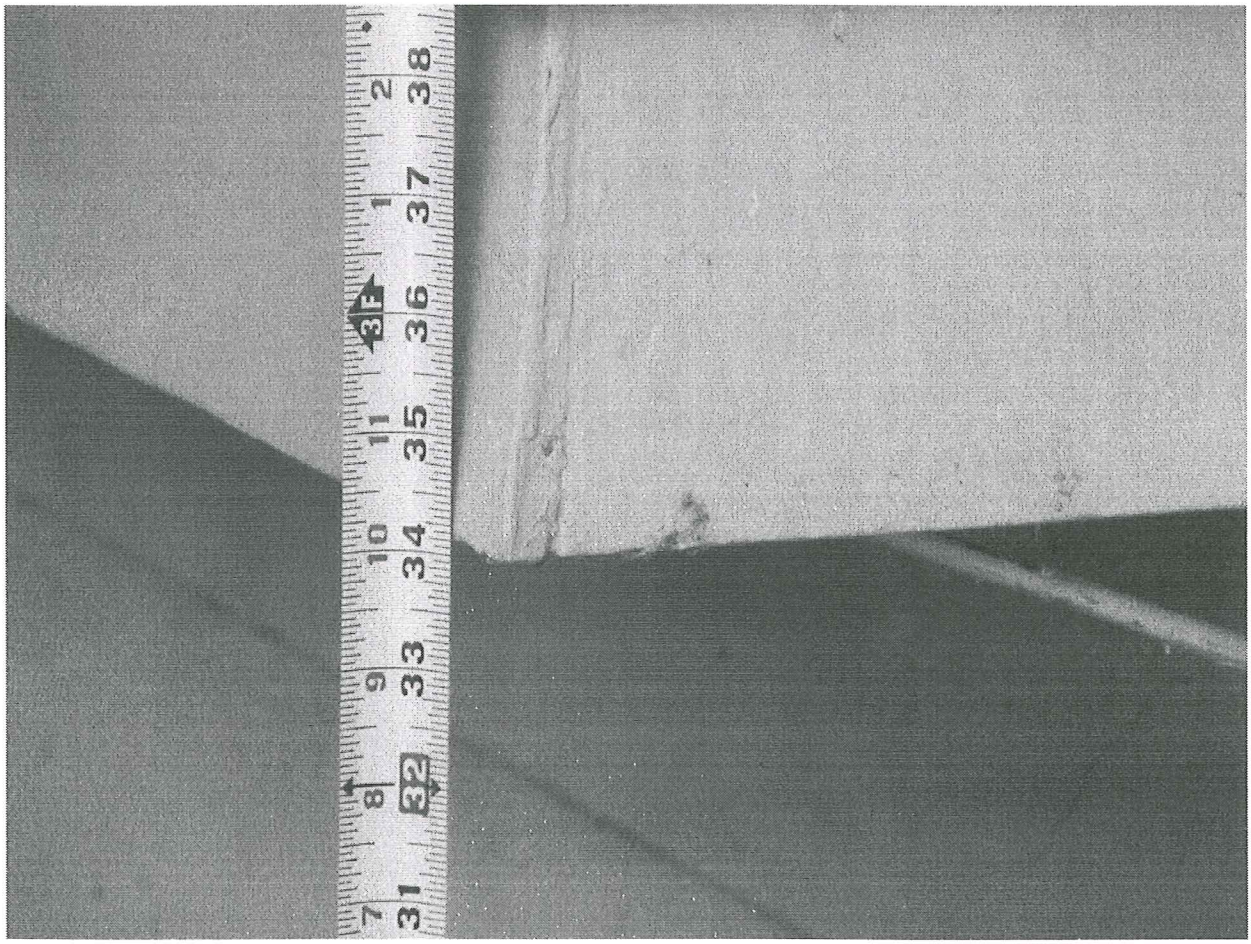
#4

708 W Brittingham Pl



#5

710 W Brittingham Pl

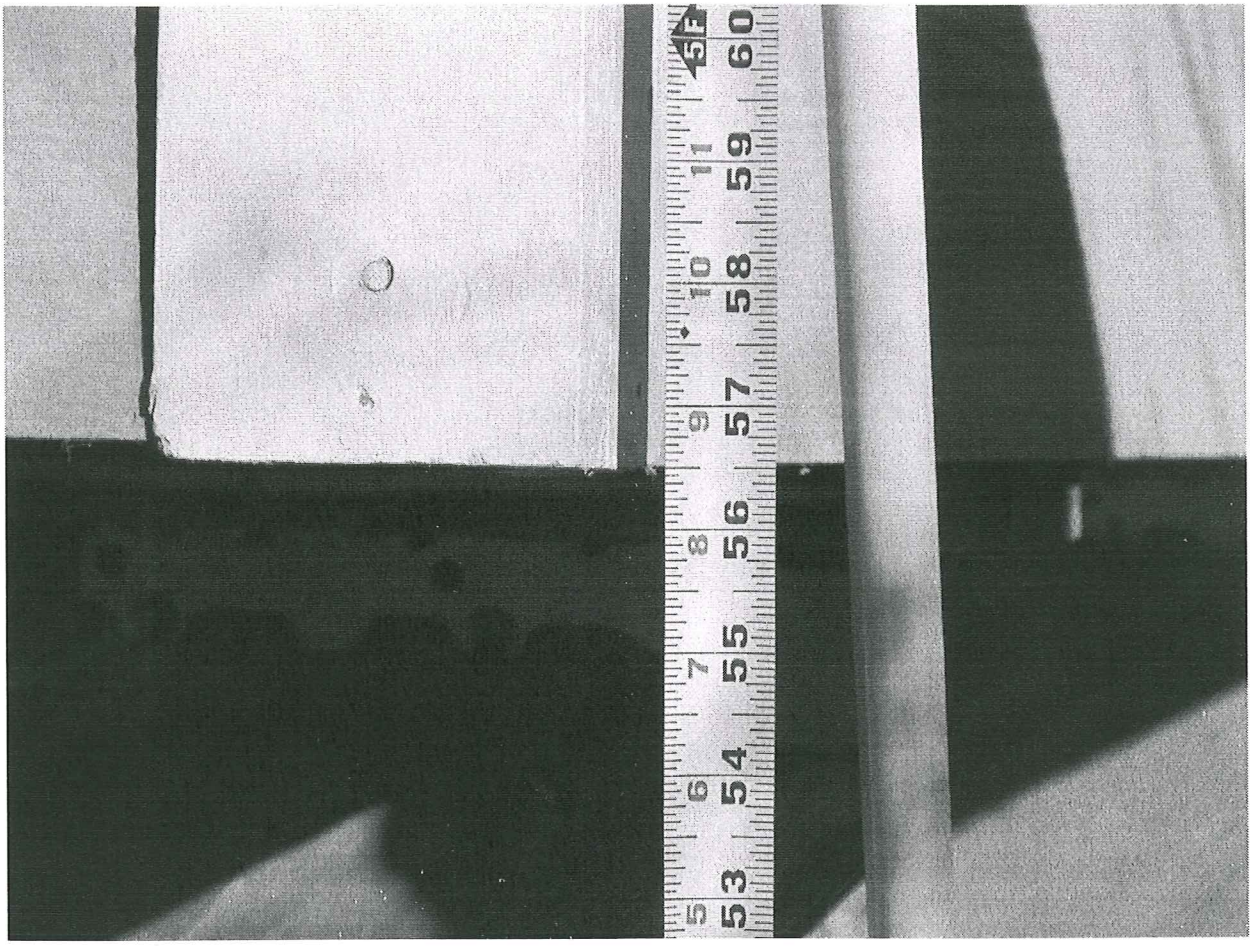


#6

710 W Brittingham Pl

#7

718 W Brittingham Pl



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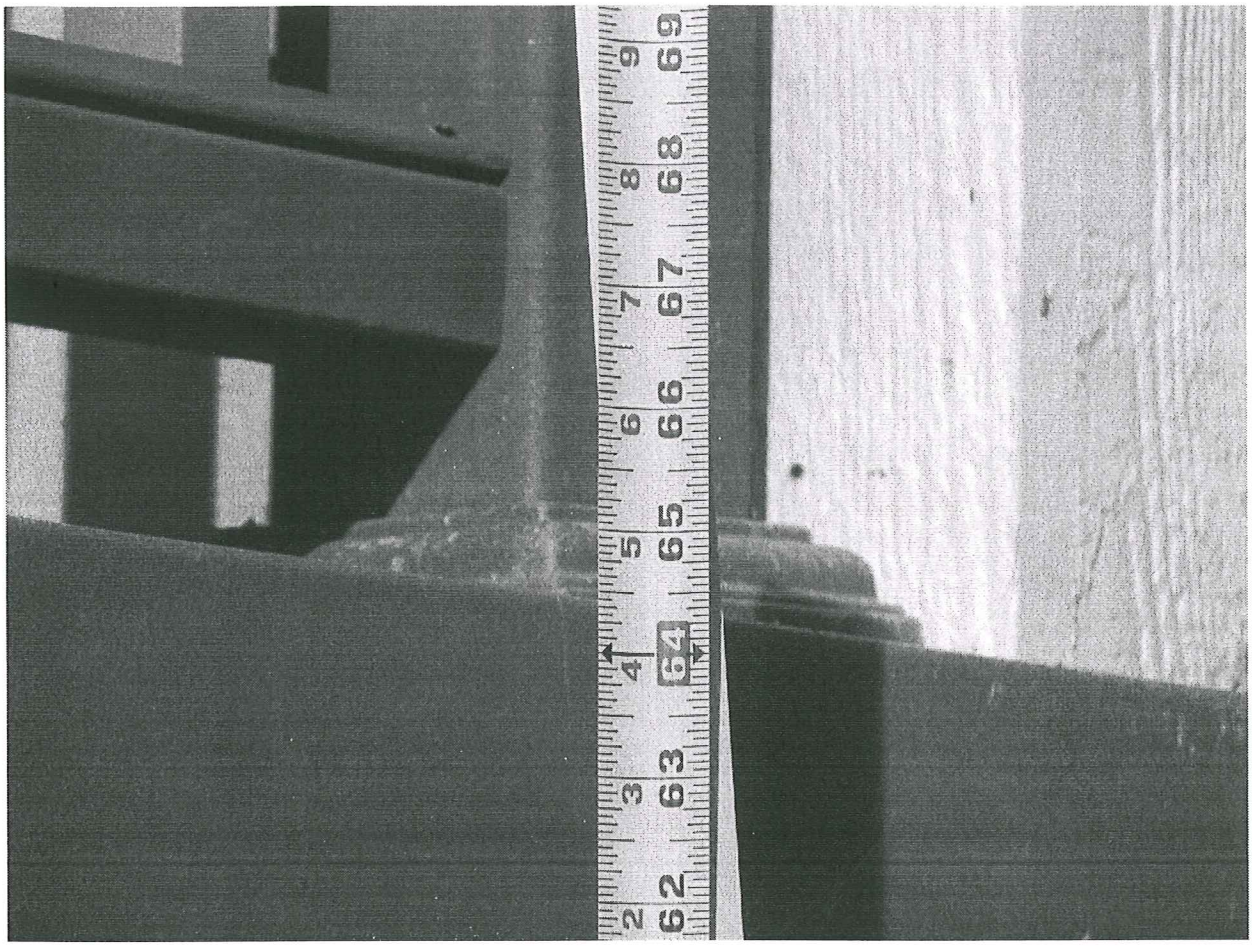
718 W Brittingham Pl

#9

722 W Brittingham Pl

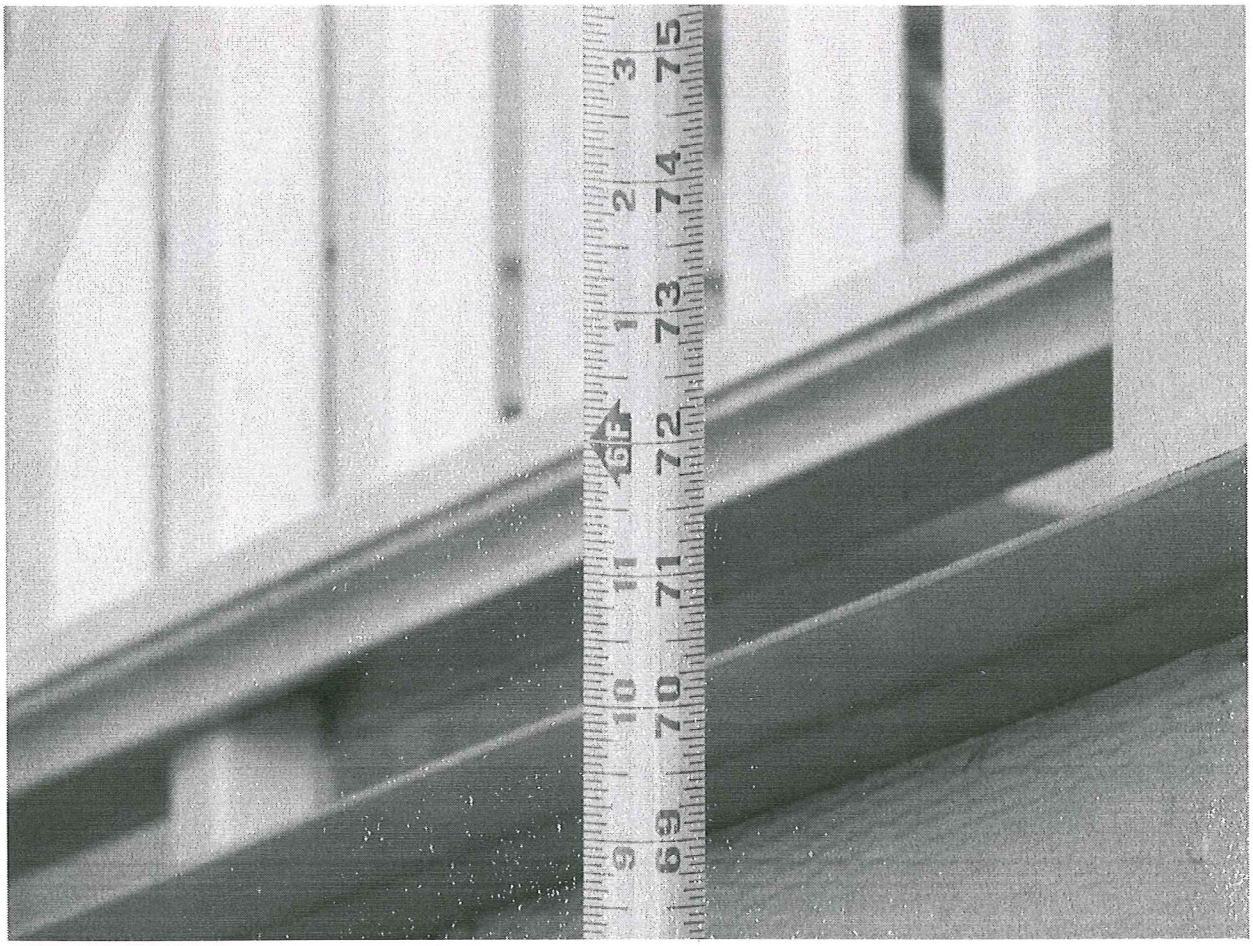


#10

722 W Brittingham Pl

#11

155 S Brittingham Pl



#12

155 S Brittingham Pl

#13

W Brittingham Pl

#14

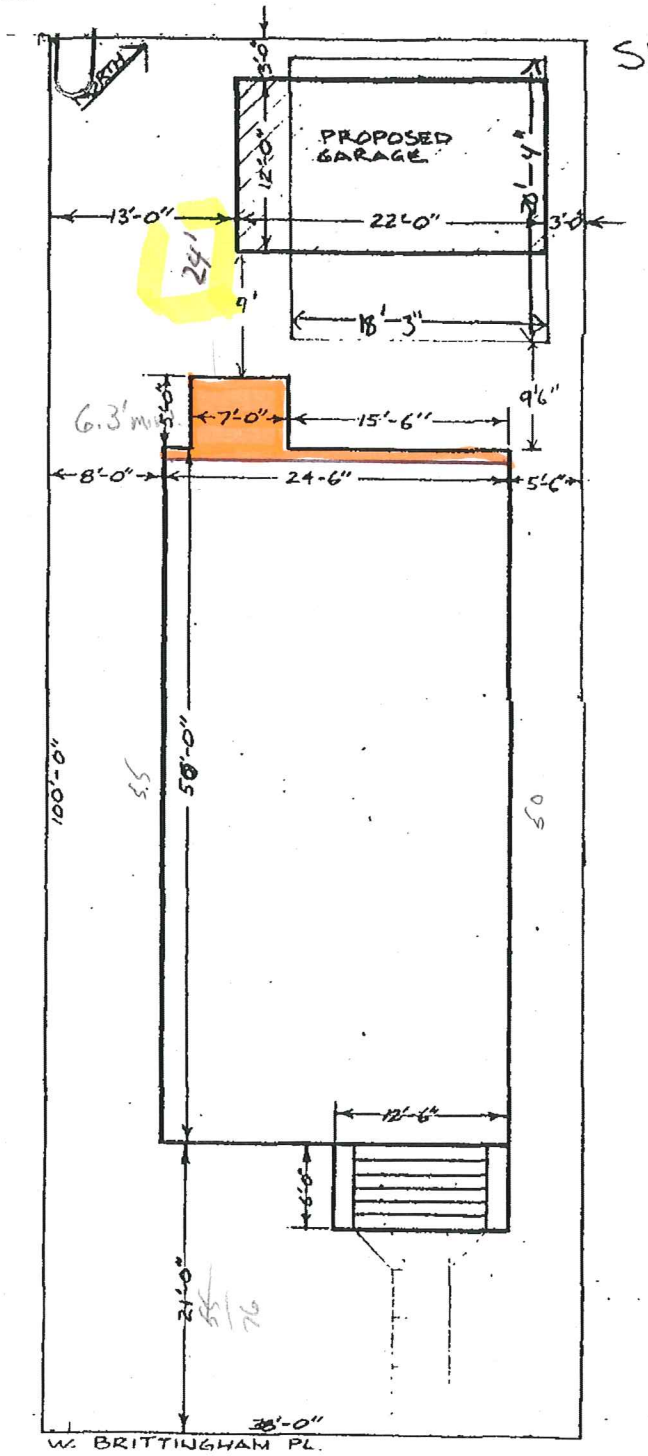
W Brittingham Pl

2 Stry 2 family home

Reconstruct basement, Raise Height of Building

Rear Yard
30'-0" Required
24'-0" Provided
6'-0" VARIANCE

rear yard set back

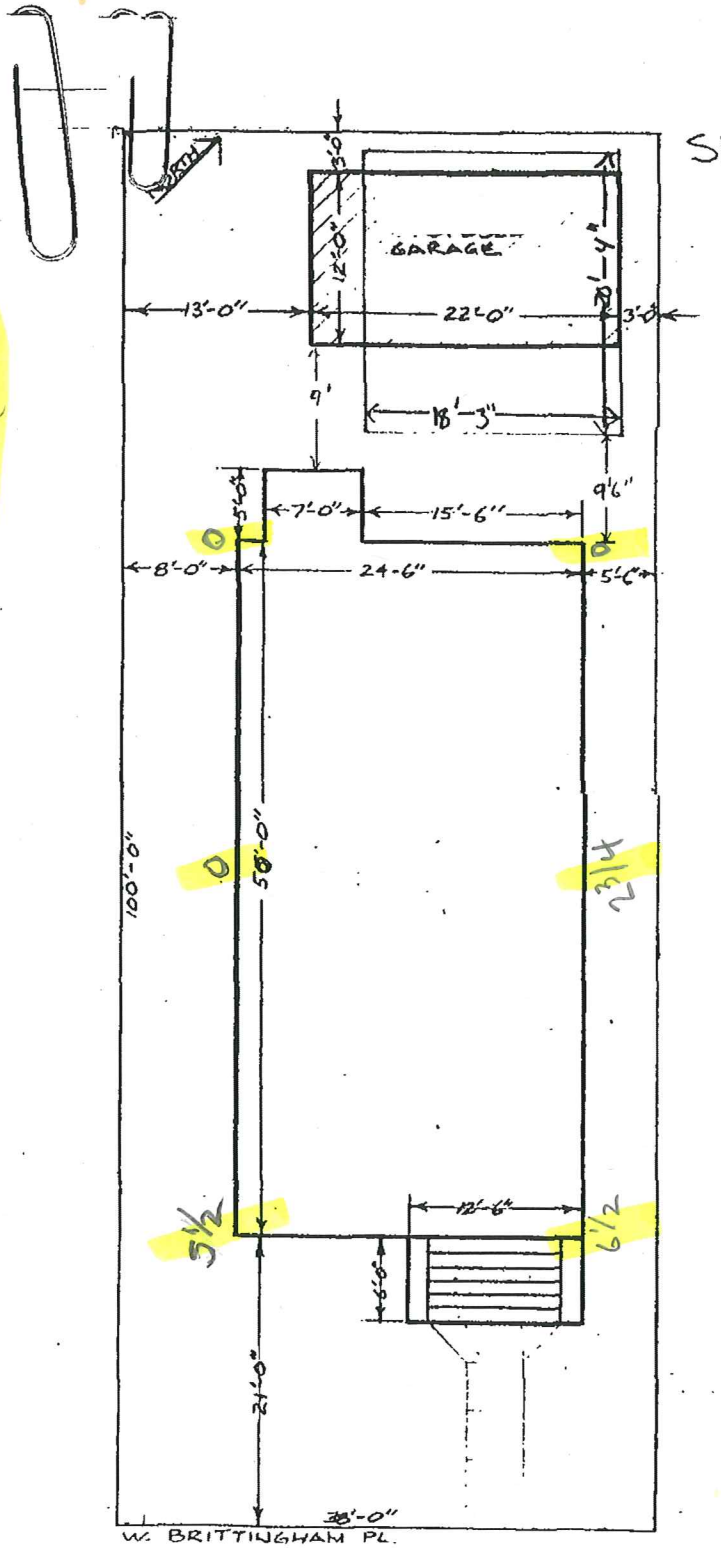


SITE PLAN

708 W. BRITTINGHAM P
SUE ALIOTO - OWNE

SCALE: 1" = 10'-0"

708 W. Brittingham Pl

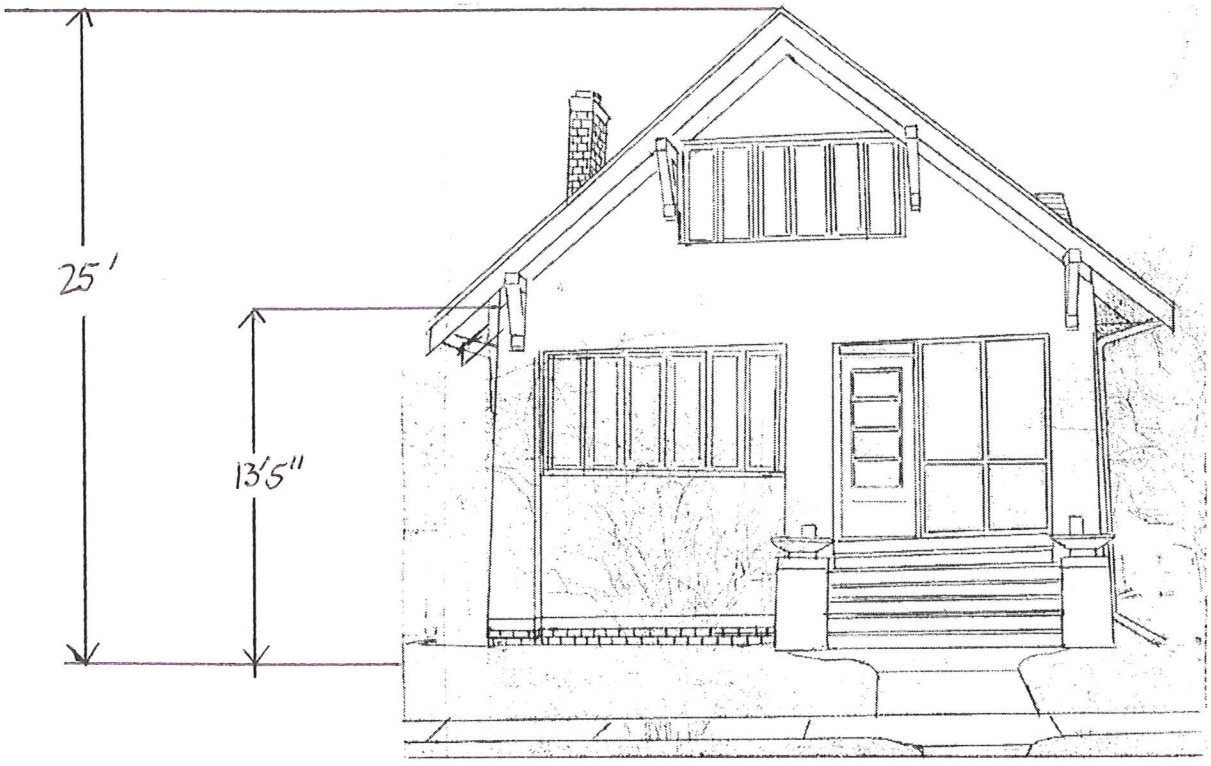


Showing the settling of the foundation

708 W. BRITTINGHAM P
SUE ALIOTO - OWNE

SCALE: 1" = 10'-0"

708 W. Brittingham Pl
Front

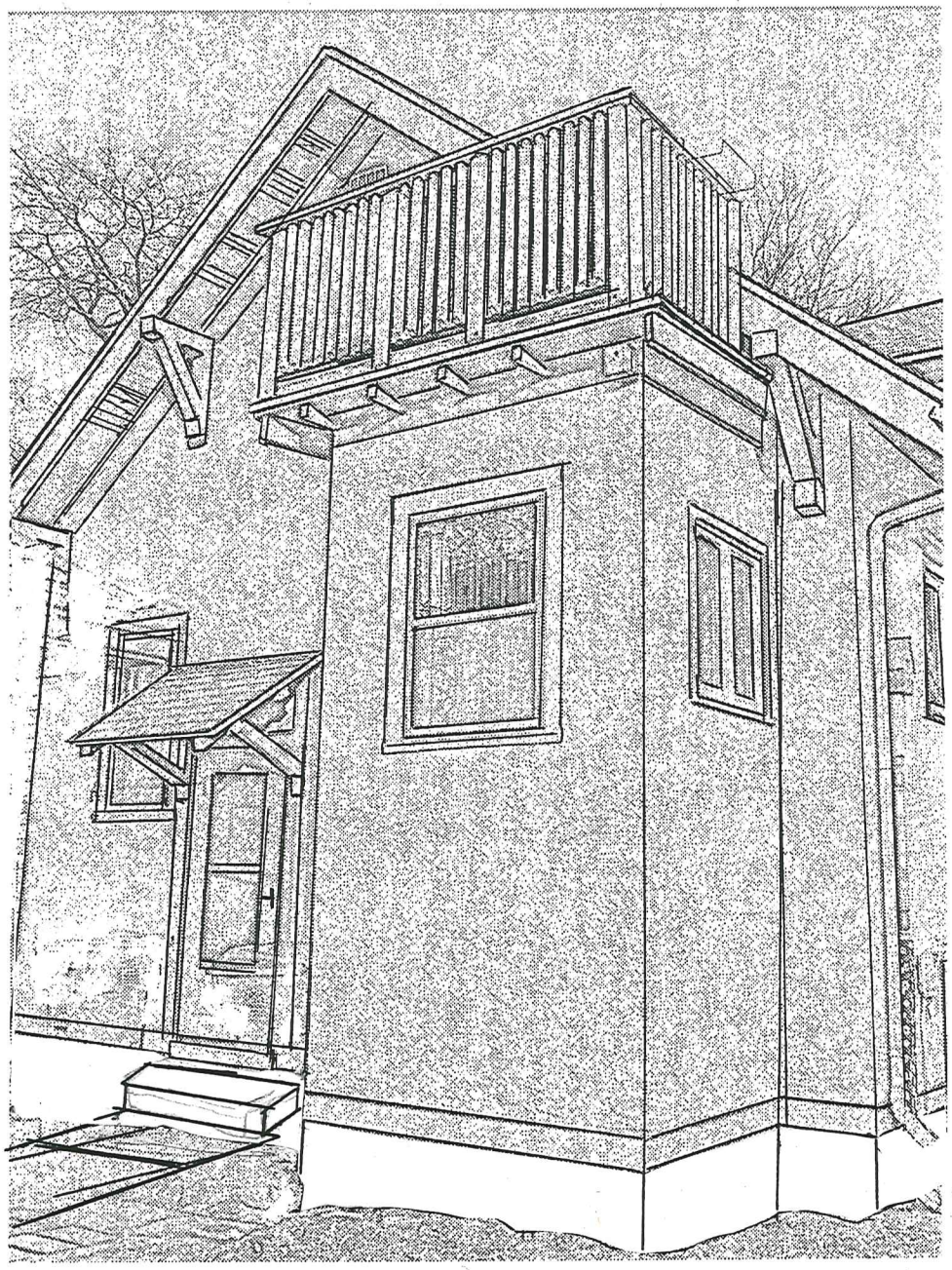


current

purpose

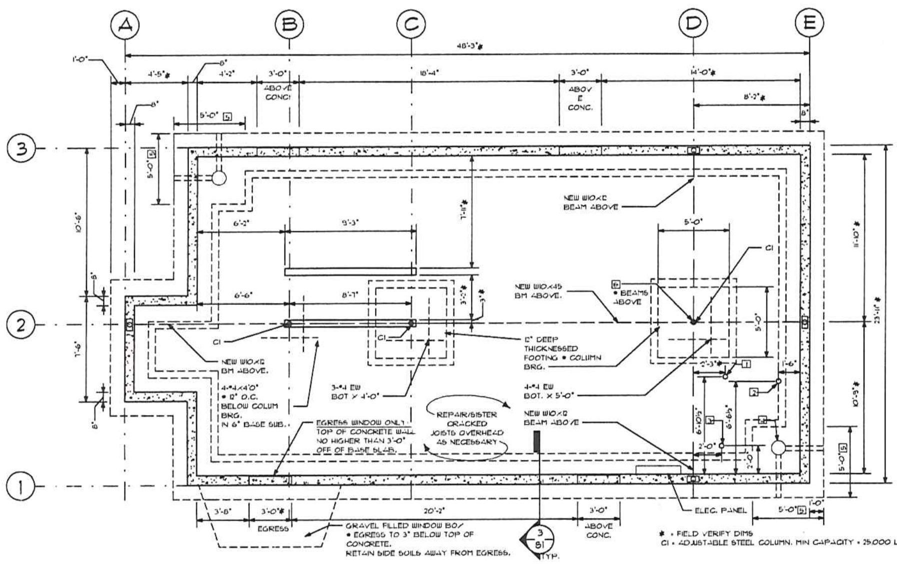
708 W. Brittingham Pl.
Back

Current



purpose

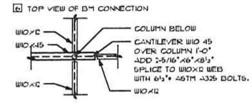
Proposed Basement Floor Plans



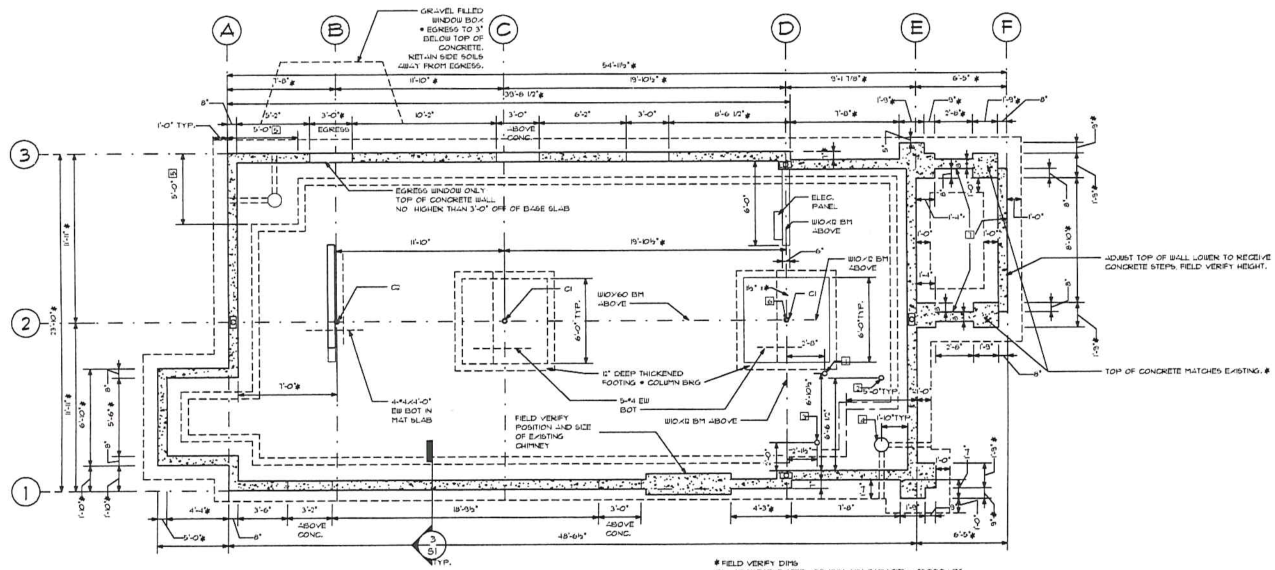
1 710 BRITTINGHAM PLACE
1/4" = 1'-0"

PLAN NOTES:

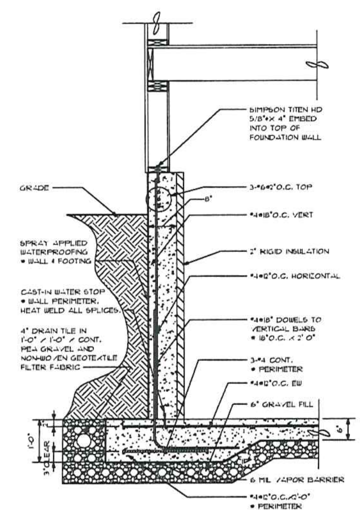
1. SHOWER DRAIN
2. TOILET FLANGE
3. FLOOR DRAIN
4. SUMP PIT - 12"⌀×12" DEEP WITH BLEEDERS.
5. THICKEN SLAB • SUMP TO 16"
6. TOP VIEW OF BM CONNECTION



7. CONNECT WOOD STEPS TO SIDEWALL



2 708 BRITTINGHAM PLACE
1/4" = 1'-0"



3 WALL DETAIL
3/4" = 1'-0"

Design Loads

Snow	30 psf
Wind	20 psf
Floor Live Loads (residential)	40 psf
Material Strengths	
Concrete (F'c @ 28 days)	4,000 psi
Reinforcing Steel (Fy)	
Rebar	60,000 psi
Welded Wire Fabric	65,000 psi
Structural Steel	
All Steel Shapes	50,000 psi
Hollow Structural Steel Shapes	46,000 psi
High Strength Bolts	ASTM A325-N
Threaded Anchor Rods	ASTM F1554, GR 55
Welding Electrodes	E70XX
Wood Framing	
Joists	S-P-F #1/#2
Studs	S-P-F Stud Grade
APA Rated Sheathing	Structural I Exterior
Engineered Lumber	
Laminated Veneer Lumber (LVL)	Fb=2,950; 1.9E
Soil Bearing Pressure: (To be verified in field by CGC, Inc.)	Varies from 500 psf to 1,500 psf

General Notes
Design and construction shall be in accordance with provisions of the latest edition of the Wisconsin Uniform Dwelling Code.

Coordinate with civil, plumbing, mechanical, and electrical trades for project requirements not shown on structural drawings.

All contractors shall verify and coordinate dimensions and details as shown on the drawings.
Foundations and Earthwork
Bottom of footings shall be 4' minimum below exterior finish grade.

For detailed description of soils and recommendations, refer to the soils report prepared by CGC, Inc.

All structural steel below slab on grade shall have a minimum of three inches concrete protection all around.

All footing top reinforcement shall be adequately supported by steel supports from grade below.

Slab on grade shall be underlain by a vapor barrier and six inches minimum of coarse granular (compacted) fill material.

Maintain gravel thickness, slab depth, reinforcement, and reinforcement position at dropped or thickened slab on grade.

Contractor to keep excavations dry and protected from frost at all times during the foundation construction.

Notify architect if nature of soil at depths shown is not suitable for foundations.

Concrete (Cast-in-Place, Non-Prestressed)
Concrete Reinforcing shall have the following minimum protective cover.

Concrete poured to earth or ground	3"
Concrete exposed to earth or weather	
#5 bar and smaller	1 1/2"
Concrete with interior exposure	
#11 bar and smaller	3/4"

No conduits, pipes, ducts, or fixtures shall be placed in concrete columns, piers or beams (unless specific review and approval is made by the engineer).

Sleeves, conduits, or pipes through slabs and walls shall be placed so that they are not closer than three diameters on center and they do not displace reinforcing.

Do not cut or place holes in concrete slabs, beams, columns or walls without prior approval of the architect/engineer.

Bars shall be spliced per details where provided. Otherwise bars shall be class "B" lap spliced in longest convenient lengths with adjacent laps staggered 3'-0" minimum. Bars shall be contact spliced or spaced a minimum distance apart of the lesser of 1/5th the lap length or six inches.

Clear spacing between rebars (unless shown to be contact lap spliced) shall be a minimum of 1 1/2 bar diameter, 1 1/2", or 1 1/3 times the diameter of the aggregate, whichever is greater.

Embedment lengths, compression splice lengths and lap lengths for tension splices class "A" and "B" shall conform to those of CRSI "Reinforcement Anchorage and Splices" current edition.

All hooks not noted shall be ACI standard hooks.

Limits of dropped and depressed slabs shall be located from plans.

Provide 2 #4 bars around all openings and 2 #4 diagonally at all opening corners unless otherwise specified. Extend 2'-6" past opening, typical.

Provide #4x2'x2' corner bars at all building corners and wall intersections. Match horizontal bar spacing.

Allow at least 24 hours between pouring adjacent wall sections between construction joints.

Wood Framing
Sills and members exposed directly to moisture or in direct contact with concrete or masonry shall be pressure treated.

Plywood shall conform to the latest edition of U.S. Product Standard PS-1. Install in staggered pattern.

Framing connections shall be Simpson Company or equal, of the catalog designations indicated. Install manufactures standard nails in all holes provided unless otherwise noted.

Nails shall be stronghold, galvanized common nails of the sizes indicated, except that galvanized siding nails shall be used for the attachment of exterior plywood siding.

Where not noted specifically otherwise, nailing shall be according to fastening schedule found in the Wisconsin Enrolled Building Code, Table 2304.9.1.

Design, fabrication, and construction shall conform to the "National Design Specification for Wood Construction", and its supplement, current edition as recommended by the National Lumber Manufacturer's Association.

Sheathing shall be nailed with 8d nails at 6" on center around the edge supports, and 12" on center for interior supports.

STRUCTURAL integrity
7702 Terrace Ave. Suite 1
Middleton, WI 53562
phone 608.833.8830

708 & 710 WEST BRITTINGHAM PLACE

Project No.	2012094
Plans	
Scale:	As indicated
Drawn By:	Author
Date:	2-1-13
Rev. Date:	
Rev. Date:	
Rev. Date:	
Rev. Date:	
Rev. Date:	
SHEET	S1

2/21/2013 2:51:56 PM

STRUCTURAL integrity INC.
7702 Terrace Ave. Suite 1
Middleton, WI 53562
phone 608.833.8830

April 1, 2013

Susie Alioto
708 W. Brittingham Place
Madison, WI 53715

Regarding: Replacement Foundations
708 and 710 Brittingham Place

Dear Susie:
We understand that you are being asked by the City of Madison to submit for a variance in the zoning based on the original intent to raise the house 12" higher than its present position during the replacement of the foundations.

These two properties may be considered unique in that they have both have had significant long term settlement relative to the adjacent soils. The settlements range from at least 12" at the fronts of the buildings to approximately 4 to 6 inches at the rear of the buildings. One way to visualize the position of the building is that we are proposing to raise the fronts of the buildings 12" and the backs of the buildings 4 to 6 inches. Our goal for the exterior is really just to restore the buildings height to approximately the same elevation that the building was at when it was originally constructed. We understand that other properties in the district have had some issues with settlements; but that these two buildings have some of the most severe.

We don't believe that the variance is contrary to the spirit, purpose, and intent of the regulations in the zoning district and is not contrary to the public interest because of the number of two story homes adjacent to your relatively smaller, one and one and a half story buildings. We don't believe that restoring the original heights will make the massing of the building appear any more significant or dramatically change the proportion of the building relative to the neighboring buildings.

My understanding is that you are not applying for a use variance.

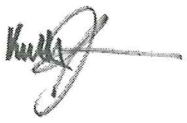
Both of the properties have basements with extremely low and uncomfortable ceiling heights. Placing new basements in these buildings will require us to provide code compliant headroom at the stairs and in the basements. In addition, these two properties also have the unfortunate position of being very close to ground water (approximately the level of Lake Monona). Lowering the basement level would likely cause seasonal flooding in the basement and render compliance with the ordinance unnecessarily burdensome; a hardship created by the terms of the ordinance rather than by a person who has a present interest in the property.

STRUCTURAL integrity INC.
7702 Terrace Ave. Suite 1
Middleton, WI 53562
phone 608.833.8830

We don't believe that the proposed variance will create a detriment to adjacent property since the buildings will appear almost exactly as they currently appear, we are not asking for any more above ground space to be added, only new underground foundations for existing buildings. For this reason, the proposed variance is also compatible with the character of the immediate neighborhood.

We hope that this letter appropriately addresses your concerns. Please call if we can be of further assistance.

Sincerely;



Kurtis J. Straus, P.E.
Structural Integrity, Inc.

CGC, Inc.
Construction • Geotechnical
Consulting Engineering/Testing

December 26, 2012
C12362

Ms. Susan Alioto
708 W. Brittingham Place
Madison, WI 53715

Re: Geotechnical Exploration
708 & 710 W. Brittingham Place
Madison, WI

Dear Ms. Alioto:

Construction • Geotechnical Consultants, Inc. (CGC) has completed the subsurface exploration program for the above-referenced project. The purpose of this program was to evaluate the subsurface conditions within the vicinity of the two houses and to provide geotechnical recommendations regarding foundation and floor slab design/construction. We are sending you a paper copy by mail and are also emailing an electronic copy to you, Mr. Kurt Straus, the project structural engineer, and Mr. Dan Thome, your building contractor.

PROJECT DESCRIPTION

We understand that the two adjacent houses that you own on Brittingham Place have undergone a considerable degree of settlement (on the order of 6 in. or more) to the extent that you now are planning to repair the foundations of both structures and re-level them. This type of structural distress is common in the Brittingham neighborhood as a result of the soft, loose and/or organic lacustrine (lakeshore) deposits found in the area. Both structures have basements which extend about 4 ft below grade, such that the first floors are about 3.5 to 4 ft above the ground surface. Based on conversations with Kurt Straus, the structural engineer you have engaged for the project, we understand that the proposed concept for repair involves jacking up each structure, constructing a new foundation (perimeter foundation walls possibly resting on a mat slab), and then lowering each structure back onto its new supports. We also understand that you may be considering increasing the height of the basements to make the space more functional.

SUBSURFACE CONDITIONS

Subsurface conditions on site were explored by drilling one Standard Penetration Test (SPT) soil boring to a depth of 50 ft below existing site grades in the driveway midway between the two structures. The general location was selected by CGC and was field-located by the drillers in consultation with you. The boring was drilled on December 14, 2012 by Soil Essentials, Ltd (under subcontract to CGC) using a Geoprobe 7822 DT track-mounted ATV rotary drill rig equipped with hollow-stem augers and an automatic SPT hammer. The approximate boring

2921 Perry Street, Madison WI 53713
Telephone: 608/288-4100
FAX: 608/288-7887

location is shown in plan on the Soil Boring Location Map attached in Appendix B. The ground surface elevation was surveyed by the drillers using the first floor at 710 W. Brittingham Place as benchmark at an assumed elevation of 100.0 ft.

The subsurface profile at the boring locations can generally be described by the following strata (in descending order):

- 6 ft of mixed soil ***fill*** or ***possible fill***, including a gravel layer at the surface and layers of very loose sand and very stiff clay, underlain by
- 17.5 ft of loose to medium dense ***sand*** with varying percentages of silt, gravel and clay seams, followed by
- 25.5 ft of very soft to medium stiff ***lean clay*** with silt seams; underlain by
- Loose ***sand*** with minor silt content extending to the maximum depth explored.

Groundwater was encountered at a depth of 8.5 ft during or shortly after drilling. Groundwater levels are expected to fluctuate with seasonal variations in precipitation, infiltration, evapotranspiration, the level of nearby Lake Monona, and other factors. A more detailed description of the site soil and groundwater conditions is presented on the Soil Boring Logs attached in Appendix B.

DISCUSSION AND RECOMMENDATIONS

1. Overview

Overall, the subsurface conditions found in the soil boring between the two structures are somewhat more favorable than originally anticipated. There are layers of very loose sand near the surface and very soft clay with depth, but little to no organic material was encountered aside from the shell fragments in the sand layer near the ground surface. The anticipated bearing stratum for foundations is a medium dense sand layer. However, it is important to note that while conditions appear somewhat better than expected, the possibility of variations in the subsurface profile should be expected across the two building footprints. The fact that the buildings have settled more than would be predicted based solely on the findings of the soil boring suggests that conditions may vary across the two building footprints. In view of this and the relatively lightweight nature of the structures, we are recommending a fairly conservative allowable bearing pressure to reduce the extent of subgrade remediation required should variations be encountered during excavation.

We briefly considered the feasibility of underpinning the existing foundations on helical piers, a commonly used method for repairing foundations that have settled. However, the soil profile is such that helical piers would likely need to extend quite deep to develop adequate capacity. Therefore, it is our opinion that helical piers would not be economically practical for this application.

Regarding the potential for increasing the height of the basement level in one or both structures, this can be accomplished by raising the first floor elevation, lowering the basement grade or a combination of the two. Because of the potential for fluctuations in the groundwater level, we caution against dropping the basement grade significantly below its current elevation *if conventional spread footings are proposed.* However, if a mat slab is proposed below the entire structure, a lower basement grade can be accommodated *provided waterstops and other appropriate waterproofing measures* are incorporated in the design of the foundation and basement walls. The advantage of being able to lower the basement grade under this option may compensate for some of the extra costs involved in the greater volume of concrete required.

Please note that additional information regarding the conclusions and recommendations presented in this report is discussed in Appendix C.

2. Foundation Design

We anticipate that the exterior foundations for the structures will extend below the shallow sand and clay layers (possible fill) to about 5 to 7 ft below grade. At these depths, the foundations are generally expected to bear within the medium dense fine to medium sand stratum. In our opinion, the proposed structure can be supported on reinforced concrete spread footing foundations bearing on this layer, and the following parameters should be used for foundation design:

- Maximum allowable bearing pressure: 1,500 psf
- Minimum foundation widths:
  - -- Continuous wall footings: 18 in.
  - -- Column pad footings: 30 in.
- Minimum footing depths:
  - -- Exterior/perimeter footings: 4 ft
  - -- Interior footings: no minimum requirement

Undercutting below footing grade will be required where non-engineered fill, loose sands or clays with pocket penetrometer readings (an estimate of the unconfined compressive strength of cohesive soil) of less than 0.75 ton/sq ft are observed at or slightly below footing grade. If excavations encounter or extend just above groundwater, we recommend a minimum 6-in. undercut below foundation or mat slab grade. Where undercutting is required, the base of the undercut excavation should be widened beyond the footing edges at least 0.5 ft in each direction for each foot of undercut depth for stress distribution purposes. Grade should be restored using nominal ¾ to 1 in. clear stone which is compacted into the base of the excavation until no further consolidation is evident. The clear stone layer can be used as a drainage layer during construction. If the mat slab option is chosen, the 6-in. thick gravel layer should be included below the entire slab, and it should be underlain by a non-woven geotextile layer (Mirafi 160N or equivalent).

CGC should be present during footing excavations to verify adequate soil conditions exist or recommend corrective measures, specifically the depth of undercut required. Provided the foundation design/construction recommendations discussed above are followed, we estimate that total and differential settlements should not exceed 1.0 and 0.5 in., respectively. Note that with a mat foundation, higher total settlements can be accommodated, with differential settlements expected to be in the same range.

3. Floor Slab

We anticipate that the floor slabs for the new basements, whether conventional slabs or mat slabs, will rest on the medium dense, dark gray sand stratum. A 6-in. thick gravel drainage blanket underlain by a non-woven geotextile layer as described above is recommended below the slab in either case. Prior to slab construction, the gravel subgrades should be recompacted to densify soils that may become disturbed or loosened during construction activities. The gravel drainage blanket should be connected to perimeter sump(s). To further minimize the potential for moisture migration, a plastic vapor barrier could also be utilized.

4. Basement Walls

We anticipate that basement walls will be laterally restrained by the floor slab and ground level framing. Therefore, *at-rest* lateral earth pressures should be used during design. To minimize the development of such pressures, granular backfill should be placed within 4 to 6 ft of the walls. Unless the basement is designed as a 'bathtub' with a structural mat slab, water stops below all foundation walls and other appropriate waterproofing measures, we recommend that perimeter drainage systems be installed to intercept potential surface water infiltration and that the granular backfill placed behind the walls be continuously connected to this system. The perimeter drainage system should be sloped to drain to a sump pit for discharge to the appropriate sewer system. To impede the inflow of surface moisture, the final 2 ft of backfill placed along the basement walls should consist of a clayey fill cap or other semi-impermeable material such as asphaltic or concrete pavement. The clay cap or pavement should be graded in a manner which promotes positive drainage away from the walls. Recommended perimeter drain details are attached to this report in Appendix E.

Before placing the wall backfill, the exterior walls should be damp-proofed with a spray-applied or mopped-on rubber or bituminous sealer. Compaction of the backfill within 3 to 5 ft of the walls should be performed with lightweight compaction equipment. The granular backfill should be compacted to a minimum of 90% modified Proctor (ASTM D1557) following Appendix D guidelines.

Walls constructed in accordance with the above recommendations may be designed for an equivalent *at-rest* fluid pressure of 55 psf per foot of depth. An equivalent fluid pressure of 200 psf per foot of depth can be used for calculating *passive* resistance, which includes a factor of

safety of 2.0 to reduce lateral deflection. The basement wall design should also take into account surcharge effects which could be applied during or after construction.

CONSTRUCTION CONSIDERATIONS

Due to variations in weather, construction methods and other factors, specific construction problems are difficult to predict. Soil related difficulties which could be encountered on the site are discussed below:

- Due to the potentially sensitive nature of the on-site soils, we recommend that final site grading activities be completed during dry weather, if possible. Construction traffic should be avoided on prepared subgrades to minimize potential disturbance.

- Contingencies in the project budget for subgrade stabilization with breaker run stone in floor slab areas should be increased if the project schedule requires that work proceed during adverse weather conditions.

- Earthwork construction during the early spring or late fall could be complicated as a result of wet weather and freezing temperatures. During cold weather, exposed subgrades should be protected from freezing before and after footing construction. Fill should never be placed while frozen or on frozen ground.

- Excavations extending greater than 4 ft in depth below the existing ground surface should be sloped or braced in accordance with current OSHA standards.

- Based on observations made during the field exploration, the possibility of groundwater infiltration into basement/footing excavations should be expected. However, we anticipate that water accumulating at the base of excavations as a result of precipitation or seepage can be controlled and quickly removed using pumps operating from filtered sump pits connected to the gravel drainage blanket below the slab, as discussed earlier in this report.

RECOMMENDED CONSTRUCTION MONITORING

The quality of the foundation and floor slab subgrades will be largely determined by the level of care exercised during site development. To check that earthwork and foundation construction proceeds in accordance with our recommendations, the following operations should be monitored by CGC:

- Foundation excavation/subgrade preparation;
- Fill/backfill placement and compaction; and
- Concrete placement.

* * * * *

It has been a pleasure to serve you on this project. If you have any questions or need additional consultation, please contact us.

Sincerely,

CGC, Inc.

William W. Wuellner, P.E.
Senior Geotechnical Engineer

Michael N. Schultz, P.E.
Principal/Consulting Professional

Encl: Appendix A - Field Exploration
Appendix B - Soil Boring Location Plan
Log of Test Boring (1)
Log of Test Boring-General Notes
Unified Soil Classification System
Appendix C - Document Qualifications
Appendix D - Recommended Compacted Fill Specifications
Appendix E - Perimeter Drain Details

APPENDIX A

FIELD EXPLORATION

APPENDIX A

FIELD EXPLORATION

Subsurface conditions on site were explored by drilling one Standard Penetration Test (SPT) soil borings to a depth of 50 ft below existing site grades in the driveway midway between the two structures. The general location was selected by CGC and was field-located by the drillers in consultation with you. The boring was drilled on December 14, 2012 by Soil Essentials, Ltd (under subcontract to CGC) using a Geoprobe 7822 DT track-mounted ATV rotary drill rig equipped with hollow-stem augers and an automatic SPT hammer. The approximate boring location is shown in plan on the Soil Boring Location Map attached in Appendix B. The ground surface elevation was surveyed by the drillers using the first floor at 710 W. Brittingham Place as benchmark at an assumed elevation of 100.0 ft.

In each boring, soil samples were obtained at 2.5 foot intervals to a depth of 10 ft and at 5 ft intervals thereafter. The soil samples were obtained in general accordance with specifications for standard penetration testing, ASTM D 1586. The specific procedures used for drilling and sampling are described below.

1. Boring Procedures between Samples

   The boring is extended downward, between samples, by a hollow-stem auger.

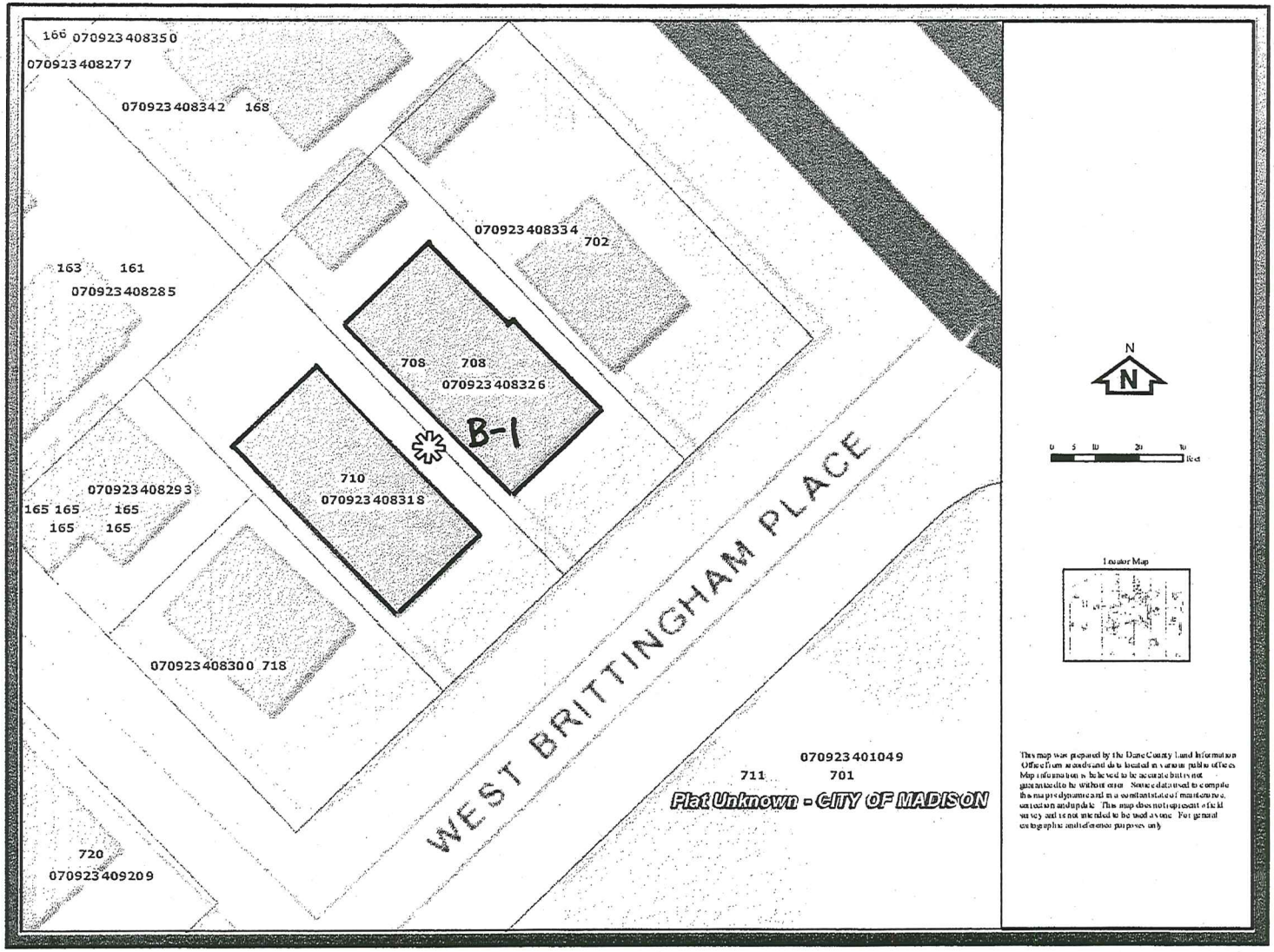
2. Standard Penetration Test and Split-Barrel Sampling of Soils
   (ASTM Designation: D 1586)

   This method consists of driving a 2-inch outside diameter split-barrel sampler using a 140-pound weight falling freely through a distance of 30 inches. The sampler is first seated 6 inches into the material to be sampled and then driven 12 inches. The number of blows required to drive the sampler the final 12 inches is recorded on the log of borings and is known as the Standard Penetration Resistance.

During the field exploration, the driller visually classified the soil and prepared a field log. *Field screening of the soil samples for possible environmental contaminants was not conducted by the drillers as these services were not part of CGC's work scope.* Water level observations were made in each boring during and after drilling and are shown at the bottom of each boring log. Upon completion of drilling, the borings were backfilled with bentonite (where required) to satisfy WDNR regulations and the soil samples were delivered to our laboratory for visual classification and laboratory testing. The soils were visually classified by a geotechnical engineer using the Unified Soil Classification System. The final logs prepared by the engineer and a description of the Unified Soil Classification System are presented in Appendix B.

APPENDIX B

SOIL BORING LOCATION MAP
LOG OF TEST BORING (1)
LOG OF TEST BORING - GENERAL NOTES
UNIFIED SOIL CLASSIFICATION SYSTEM



Legend

Denotes Soil Boring Location and Number

Scale: As shown

Notes

1. Base map obtained from Dane County DCI map.
2. Soil borings performed by Soil Essentials in December 2012.
3. Boring location is approximate.

Date: 12/2012	CGC, Inc.	**SOIL BORING LOCATION MAP** **Alito Residences** **708 & 710 W. Brittingham** **Madison, Wisconsin**
Job No. C12-[illegible]		

CGC Inc.

LOG OF TEST BORING

Project: Alioto Residences
708-710 Brittingham Place
Location: Madison, Wisconsin

Boring No. 1
Surface Elevation (ft) 96.2
Job No. C12362
Sheet 1 of 2

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	W	LL	PL	LI
						FILL: Tan Crushed Limestone					
1		10	M	2		Very Loose, Gray Fine to Medium SAND, Little Silt with Shells - Possible Fill (SP-SM)					
2		6	M	6	5	Very Stiff to Hard, Dark Gray-Brown Silty CLAY (CL-ML - Possible Fill)	(4.0)	18.8			
3		10	M	12		Medium Dense, Gray to Dark Gray Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles (SM)					
4		7	W	14	10	▼					
5		8	W	11	15		(<0.1)				
6		7	W	4	20	Loose to Very Loose, Gray Fine to Medium SAND, Some Silt (SM) with Thin Seams of Very Soft Gray Lean Clay	(<0.1)				
7		10	W	2	25	Very Soft, Dark Gray to Gray Lean CLAY (CL) with Thin Silt and Sand Layers	(<0.1)	25.3			
8		14	W	2	30			23.2			
9		10	W	4	35	Medium Stiff, Light Gray-Brown Lean CLAY (CL) with Thin Silt Seams, Grading Sandy with Depth	(0.75)	21.8			
10		14	W	4	40		(1.0)	23.1			

WATER LEVEL OBSERVATIONS

While Drilling ▽ Upon Completion of Drilling
Time After Drilling 1 hr
Depth to Water 8.5' ▼
Depth to Cave in

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 12/14/12 End 12/14/12
Driller SE Chief DAP Rig 7822DT
Logger DAP Editor WWW
Drill Method 2 1/4" HSA

CGC Inc.

LOG OF SEDIMENT CORE

Project: Alioto Residences
708-710 Brittingham Place
Location: Madison, Wisconsin

Boring No. 1
Surface Elevation 96.2
Job No. C12362
Sheet 2 of 2

2921 PERRY STREET, MADISON, WIS. 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI
					Medium Stiff, Light Gray-Brown Lean CLAY (CL) with Thin Silt Seams, Grading Sandy with Depth					
11	■	12	W	6	45	(<0.1)	24.5			
					Loose, Light Gray-Brown Fine to Medium SAND, Trace to Little Silt (SP/SP-SM)					
12	■	14	W	6	50					
					End Boring at 50 ft Borehole backfilled with bentonite chips					
					55					
					60					
					65					
					70					
					75					
					80					
					85					

APPENDIX C

DOCUMENT QUALIFICATIONS

APPENDIX C
DOCUMENT QUALIFICATIONS

I. GENERAL RECOMMENDATIONS/LIMITATIONS

CGC, Inc. should be provided the opportunity for a general review of the final design and specifications to confirm that earthwork and foundation requirements have been properly interpreted in the design and specifications. CGC should be retained to provide soil engineering services during excavation and subgrade preparation. This will allow us to observe that construction proceeds in compliance with the design concepts, specifications and recommendations, and also will allow design changes to be made in the event that subsurface conditions differ from those anticipated prior to the start of construction. CGC does not assume responsibility for compliance with the recommendations in this report unless we are retained to provide construction testing and observation services.

This report has been prepared in accordance with generally accepted soil and foundation engineering practices and no other warranties are expressed or implied. The opinions and recommendations submitted in this report are based on interpretation of the subsurface information revealed by the test borings indicated on the location plan. The report does not reflect potential variations in subsurface conditions between or beyond these borings. Therefore, variations in soil conditions can be expected between the boring locations and fluctuations of groundwater levels may occur with time. The nature and extent of the variations may not become evident until construction.

II. IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL ENGINEERING REPORT

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. *No one except you* should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one - not even you* - should apply the report for any purpose or project except the one originally contemplated.

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A GEOTECHNICAL ENGINEERING REPORT IS BASED ON A UNIQUE SET OF PROJECT-SPECIFIC FACTORS

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, *do not rely on a geotechnical engineering report* that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or project ownership.

As a general rule, , *always* inform your geotechnical engineer of project changes - even minor ones - and request an assessment of their impact. *CGC cannot accept responsibility or liability for problems that occur because our reports do not consider developments of which we were not Informed.*

SUBSURFACE CONDITIONS CAN CHANGE

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

MOST GEOTECHNICAL FINDINGS ARE PROFESSIONAL OPINION

Site exploration identifies subsurface conditions only at those points where surface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgement to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ - sometimes significantly - from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A REPORT'S RECOMMENDATIONS ARE NOT FINAL

Do not over-rely on the construction recommendations included in your report. *Those recommendations are not final*, because geotechnical engineers develop them principally from judgement and opinion, geotechnical engineers can finalize their recommendations only by observing actual subsurface conditions revealed during construction. *CGC cannot assume responsibility or liability for the report's recommendations if we do not perform construction observation.*

A GEOTECHNICAL ENGINEERING REPORT IS SUBJECT TO MISINTERPRETATION

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having CGC participate in prebid and preconstruction conferences, and by providing construction observation.

DO NOT REDRAW THE ENGINEER'S LOGS

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

GIVE CONTRACTORS A COMPLETE REPORT AND GUIDANCE

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

READ RESPONSIBILITY PROVISIONS CLOSELY

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce such risks, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineer's responsibilities begin and end, to help others recognize their own responsibilities and risks. Read these provisions closely. Ask questions. Your geotechnical engineer should respond fully and frankly.

GEOENVIRONMENTAL CONCERNS ARE NOT COVERED

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

OBTAIN PROFESSIONAL ASSISTANCE TO DEAL WITH MOLD

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

RELY ON YOUR GEOTECHNICAL ENGINEER FOR ADDITIONAL ASSISTANCE

Membership in ASFE exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with CGC, a member of ASFE, for more information.

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881 Colesville Road, Suite G 106
Silver Spring, MD 20910

APPENDIX D

RECOMMENDED COMPACTED FILL SPECIFICATIONS

APPENDIX D

CGC, INC.

RECOMMENDED COMPACTED FILL SPECIFICATIONS

General Fill Materials

Proposed fill shall contain no vegetation, roots, topsoil, peat, ash, wood or any other non-soil material which by decomposition might cause settlement. Also, fill shall never be placed while frozen or on frozen surfaces. Rock, stone or broken concrete greater than 6 in. in the largest dimension shall not be placed within 10 ft of the building area. Fill used greater than 10 ft beyond the building limits shall not contain rock, boulders or concrete pieces greater than a 2 sq ft area and shall not be placed within the final 2 ft of finish subgrade or in designated utility construction areas. Fill containing rock, boulders or concrete pieces should include sufficient finer material to fill voids among the larger fragments.

Special Fill Materials

In certain cases, special fill materials may be required for specific purposes, such as stabilizing subgrades, backfilling undercut excavations or filling behind retaining walls. For reference, WisDOT gradation specifications for various types of granular fill are attached in Table 1.

Placement Method

The approved fill shall be placed, spread and leveled in layers generally not exceeding 10 in. in thickness before compaction. The fill shall be placed at a moisture content capable of achieving the desired compaction level. For clay soils or granular soils containing an appreciable amount of cohesive fines, moisture conditioning will likely be required.

It is the Contractor's responsibility to provide all necessary compaction equipment and other grading equipment that may be required to attain the specified compaction. Hand-guided vibratory or tamping compactors will be required whenever fill is placed adjacent to walls, footings, columns or in confined areas.

Compaction Specifications

Maximum dry density and optimum moisture content of the fill soil shall be determined in accordance with modified Proctor methods (ASTM D1557). The recommended field compaction as a percentage of the maximum dry density is shown in Table 2. Note that these compaction guidelines would generally not apply to coarse gravel/stone fill. Instead, a method specification would apply (e.g., compact in thin lifts with a vibratory compactor until no further consolidation is evident).

Testing Procedures

Representative samples of proposed fill shall be submitted to CGC, Inc. for optimum moisture-maximum density determination (ASTM D1557) prior to the start of fill placement. The sample size should be approximately 50 lb.

CGC, Inc. shall be retained to perform field density tests to determine the level of compaction being achieved in the fill. The tests shall generally be conducted on each lift at the beginning of fill placement and at a frequency mutually agreed upon by the project team for the remainder of the project.

Table 1
Gradation of Special Fill Materials

Material	WisDOT Section 311	WisDOT Section 312	WisDOT Section 305			WisDOT Section 209		WisDOT Section 210
	Breaker Run	Select Crushed Material	3-in. Dense Graded Base	1 1/4-in. Dense Graded Base	3/4-in. Dense Graded Base	Grade 1 Granular Backfill	Grade 2 Granular Backfill	Structure Backfill
Sieve Size	Percent Passing by Weight							
6 in.	100							
5 in.		90-100						
3 in.			90-100					100
1 1/2 in.		20-50	60-85					
1 1/4 in.				95-100				
1 in.					100			
3/4 in.			40-65	70-93	95-100			
3/8 in.				42-80	50-90			
No. 4			15-40	25-63	35-70	100 (2)	100 (2)	25-100
No. 10		0-10	10-30	16-48	15-55	75 (2)		
No. 40			5-20	8-28	10-35	15 (2)	30 (2)	
No. 200			2-12	2-12	5-15	8 (2)	15 (2)	15 (2)

Notes:

1. Reference: Wisconsin Department of Transportation *Standard Specifications for Highway and Structure Construction.*
2. Percentage applies to the material passing the No. 4 sieve, not the entire sample.
3. Per WisDOT specifications, both breaker run and select crushed material can include concrete that is 'substantially free of steel, building materials and other deleterious material'.

Table 2
Compaction Guidelines

Area	Percent Compaction (1)	
	Clay/Silt	Sand/Gravel
Within 10 ft of building lines		
Footing bearing soils	93 - 95	95
Under floors, steps and walks		
- Lightly loaded floor slab	90	90
- Heavily loaded floor slab and thicker fill zones	92	95
Beyond 10 ft of building lines		
Under walks and pavements		
- Less than 2 ft below subgrade	92	95
- Greater than 2 ft below subgrade	90	90
Landscaping	85	90

Notes:

1. Based on Modified Proctor Dry Density (ASTM D 1557)

APPENDIX E

PERIMETER DRAIN DETAILS

General Notes

1. This system's primary function is to intercept infiltrating surface water. These Alternates are not appropriate for use in situations of high groundwater (i.e., cases where the water table approaches floor slab elevation).

2. Grade surface cap to slope away from structure.

3. Exterior surface of walls below grade should be damp-proofed.

4. A plastic vapor barrier should be installed below the slab.

5. Recommended types of drain pipes:

Specification	Description
ASTM D2729	Polyvinyl Chloride (PVC) Drain Pipe
ASTM F405	Corrugated Polyethylene Drain Pipe
ASTM D2852	Styrene-Rubber Plastic Drain Pipe
AASHTO M136	Corrugated Metal Underdrain Pipe

6. Minimum slope of drain pipes should be 2 in. per 100 lin ft.

7. Place drain pipe below basement floor level and orient the perforations toward the bottom.

8. Clean-outs should be provided to service the pipe.

9. Collected field water should be discharged to a sump, storm sewer or drainage field.

10. The geotextile for Alternative Nos. 2 and 3 may be eliminated if filter requirements are satisfied between the wall and pipe backfill, as well as between backfill materials and natural soils.

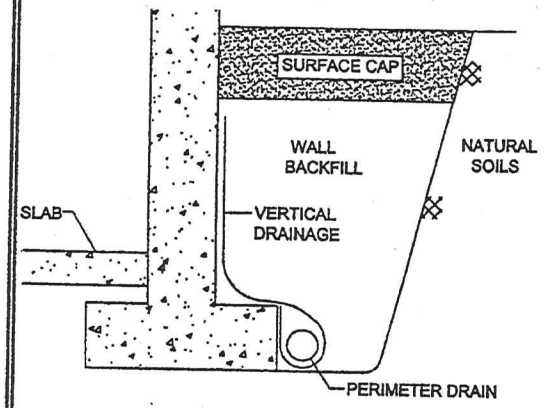
11. Pipe backfill materials should satisfy filter requirements for the slot width or hole diameter of the perforated pipe.

12. Care should be taken during backfilling not to damage the integrity of the system. For compaction requirements, refer to geotechnical report.

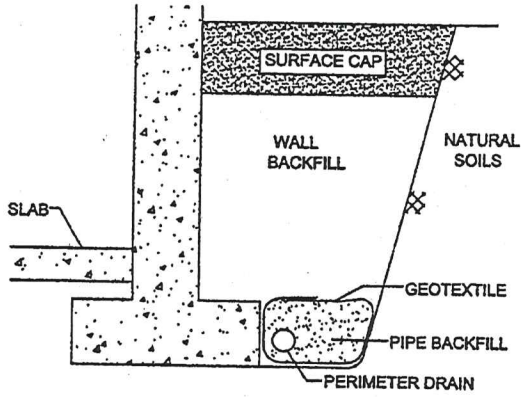
13. Pipe, geotextile, and geocomposite should be installed according to manufacturer specifications.

CGC, Inc.

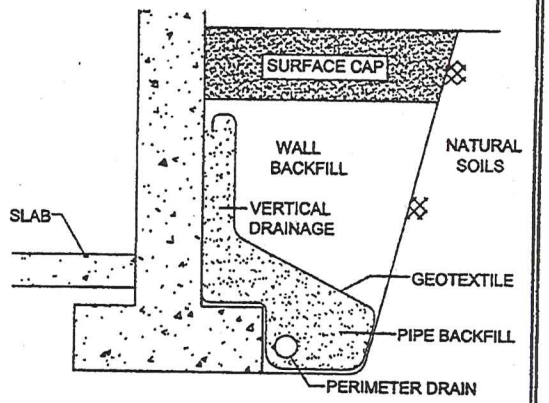
Typical Perimeter Drain Detail
General Notes



ALTERNATE NO. 1



ALTERNATE NO. 2



ALTERNATE NO. 3

DRAINAGE SYSTEM COMPONENTS

Component	Alternate No. 1	Alternate No. 2	Alternate No. 3
Surface Cap	1 to 2 ft. of clayey soils. Minimum 1 ft. thick if overlain by pavement	Refer to Alternate No. 1	Refer to Alternate No. 1
Vertical Drainage	3-dimesional drainage geocomposite hydraulically connected to perimeter drain.	Relatively Free-draining granular soils with P200 (% fines) ≤12%.	MinImum 6-in. wide zone of free-draining granualr soils with P200 ≤5% hydraulically connected to perimeter drain. Provide geotextile as required (see note 10).
Perimeter Drain	Perforated pipe encapsulated in geocomposite.	Perforated pipe surrounded by free-draining granular pipe backfill with P200≤5%. Provide geotextile as required (See Note 10).	Refer to Alternate No. 2
Wall Backfill	Excavation spoils or imported materials (granular soils prefe[illegible]).	Relatively Free-draining granular soils with P200≤12%.	Refer to Alternate No. 1

CGC, Inc.

Typical Perimeter Drain Detail