

# BOUNTIFUL CITY PLANNING COMMISSION

# Tuesday, August 1, 2023 6:30 p.m.

**NOTICE IS HEREBY GIVEN** that the Bountiful City Planning Commission will hold a meeting in the Council Chambers, Bountiful City Hall, 795 South Main, Bountiful, Utah, 84010, at the time and on the date given above. The public is invited. Persons who are disabled as defined by the American with Disabilities Act may request an accommodation by contacting the Bountiful Planning Office at 801-298-6190. Notification at least 24 hours prior to the meeting would be appreciated.

- 1. Welcome
- 2. 1874 East Ridge Point Drive Variance to construct a retaining wall for a single-family dwelling *Senior Planner Amber Corbridge* 
  - Review
  - Public hearing
  - Action
- 3. 3962 South Sunset Hollow Drive Lot Line Adjustment *City Engineer Lloyd Cheney* 
  - Review
  - Recommendation
- 4. Planning Director's report, update, and miscellaneous business
- 5. Adjourn

# **Planning Commission Staff Report**

**Item:** Variance Request to allow a Retaining Wall over 10'

cut/fill Vertically and Encroach on Slopes Thirty

Percent (30%) or Greater

Address: 1874 East Ridge Point Drive
Author: Amber Corbridge, Senior Planner

**Date:** August 1, 2023



#### Background

The Applicant, Chad Snyder, submitted a Variance Request to build a retaining wall to exceed the ten-foot (10') cut and fill requirement and building within a thirty percent (30%) sloped area. The property is located at 1874 East Ridge Point Drive in the Residential Foothill (R-F) Subzone. The requested Variance would allow for a single-family dwelling currently under construction to be completed.

A Variance for the construction of a retaining wall exceeding ten feet (10') feet in height and to allow encroachment on slopes of thirty percent (30%) or greater was approved in October 2020. The approved retaining wall system consisted of one (1) retaining wall located on the sides and rear of the proposed structure. During construction of the single-family dwelling, the retaining wall, which was constructed earlier, suffered a failure which affected the stability of the remaining sections of the retaining wall and the structure foundation and framing. In order to stabilize the site and resume construction on the structure, a modification to the Variance is requested by the applicant. The updated proposal consists of a three tier retaining wall system instead of the single wall.

#### **Analysis**

Land Use Code § 14-4-117(D)(4) requires top or bottom edges of slopes caused by an excavation or fill up to ten (10) vertical feet to be at least three (3) horizontal feet from the property line and/or street right-of-way lines in the R-F Subzone. Additionally, the Land Use Code § 14-4-104 (A) requires development, including retaining walls, to be located on ground of less than thirty percent (30%) slope. Granting a Variance to cut more than ten (10) vertical feet and development on ground thirty percent (30%) sloped or more would allow the dwelling under construction to be completed. The attached site and construction plans show the redesigned retaining wall.

Utah Code 10-9a-702 establishes the criteria for review of a variance request and stipulates the applicant "shall bear the burden of proving that all of the conditions justifying a variance have been met." In order to grant a variance **each** of the following criteria must be met:

(i) <u>Literal enforcement of the ordinance would cause an unreasonable hardship for the applicant that is not necessary to carry out the general purpose of the land use ordinances;</u>

**Applicant:** Yes. Because the lot can be re-engineered to support a home. We have also already had a variance approved for this lot and only need to redesign the retaining wall.

**Staff Response:** The purpose of the Residential Land Use Code is to ensure minimal disturbance to the land, especially in the Residential Foothill Subzone. Literal enforcement would not allow for the single-family dwelling under construction to be completed. A previous variance was approved for a retaining wall which encroached into the thirty percent (30%) sloped area. The City Engineer and Building Official have approved the retaining wall redesign with conditions (noted on the attached plans).

(ii) There are special circumstances attached to the property that do not generally apply to other properties in the same zone;

**Applicant:** This property has already had the variance approved by Bountiful Planning Commission. We only need to adjust the retaining wall design. The original design is not optimal to support the landscape and home.

**Staff Response:** The Applicant's property is unique to most other properties in the R-F Subzone because of the need to reconstruct the retaining wall to support the dwelling. The previous wall approved met the criteria for a variance to building a ten (10) foot tall wall in the thirty percent (30%) sloped area. This wall is slightly different where the retaining wall is required to be cut and terraced to support the construction of the dwelling.

(iii) Granting the variance is essential to the enjoyment of a substantial property right possessed by other property in the same zone;

**Applicant:** Yes. Without the Variance the homeowner cannot complete the process of constructing the home. A variance has already been given to this property for the same reasons we are asking for now.

**Staff Response:** Other properties in the R-F Subzone and in this subdivision have developed single-family dwellings. Properties in the R-F Subzone with buildable lots have been granted reasonable disturbance of the slopes greater than thirty percent (30%). The variance would allow this lot to complete development of a single-family dwelling.

(iv) The variance will not substantially affect the general plan and will not be contrary to the public interest;

**Applicant:** This variance will help the community by allowing the land owner to complete a home that is already under construction. A variance has already been given for this property. Bountiful Planning Commission is forcing another variance application because the retaining wall design has been slightly modified from the original application.

**Staff Response:** Granting the variance for the Applicant will not have a substantial effect on the General Plan as other properties in the R-F Subzone have been treated similarly regarding development on steep slopes. It is an interest to the city to have all buildable lots developed

as opposed to remaining vacant.

(v) The spirit of the land use ordinance is observed and substantial justice done.

**Applicant:** Granting another variance allows the land owner to complete their already partially constructed project. The land is an approved and recorded building lot.

**Staff Response:** The purpose of the Code that requires development to be located on slopes less than thirty percent (30%) is to preserve the hillside and manage runoff and erosion on properties in the foothills. The Code anticipates that there are existing lots within approved subdivisions in the R-F Subzone with special circumstances. The variance process provides a way for these lots to be developed reasonably. Code 14-4-101 states that alteration of sensitive lands should be the minimum necessary to allow for reasonable use of the property. The reconstruction of the retaining wall is designed to preserve the sensitive land as much as physically possible, while supporting the development of the new single-family dwelling (see attached construction plans and notes).

#### **Department Review**

This Variance Request has been reviewed by the City Engineer, Planning Director, and the City Attorney.

#### Recommendation

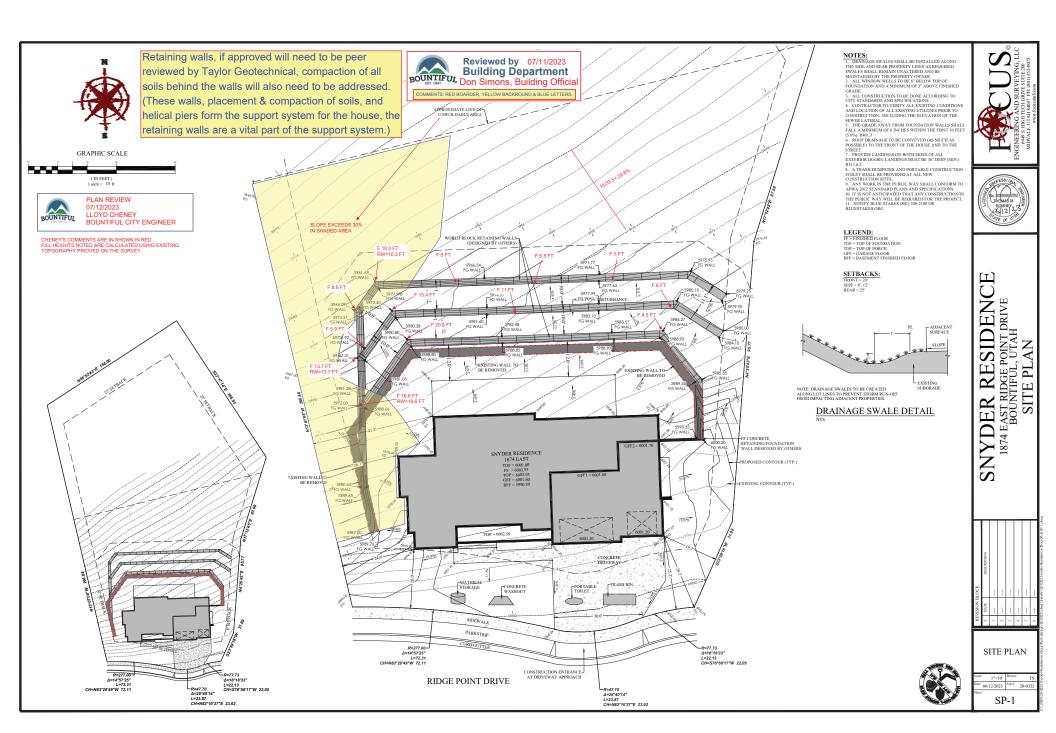
Staff recommends that the Planning Commission review the requested Variance, hold a public hearing, and approve the requested Variance to build a retaining wall exceeding the ten (10) feet vertical cut and fill requirement, as well as to encroach into the slopes thirty percent (30%) or greater, subject to meet the following:

- 1. Meet all staff review comments (see attached).
- 2. Obtain a building permit or Building Official Final Approval within one (1) year of the Variance Approval.

#### **Attachments**

- 1. Aerial Photo
- 2. Site Plan and Construction Analysis
- 3. Applicant's Narrative





August 1, 2023 Bountiful City Planning Commission Page 5 of Page 32



June 14, 2023

Mr. Steven Valle Davies Design Build 240 North 1200 East, Suite 201 Lehi, UT 84043

Re: Block Wall Reconstruction Recommendations (Revised)

Lot 502 Ridge Estates (Snyder Residence)

1874 East Ridge Point Drive

Bountiful, Utah

CMT Project No. 16916

Mr. Valle:

As you requested, this letter presents our recommendations for constructing a new block wall at the site using World blocks placed in tiers. We recently drilled a couple of bore holes at the site, which indicated the soils at the site classify as clayey sand with gravel.

#### **Stability Evaluation**

The properties of the clayey sand with gravel soils at the site were estimated using published correlations and our experience with similar soils. Accordingly, we used the following parameters in the stability analyses:

Material	Internal Friction Angle (degrees)	Apparent Cohesion (psf)	Saturated Unit Weight (pcf)
On-Site Clayey Sand with Gravel	31	100	135
World Blocks	0 (global) 45 (local)	9,000 (global) 0 (local)	150

We utilized the same seismic parameters presented in our previous block wall recommendations (0.29 for global stability and 0.24 for internal block stability).

Using these input parameters and blocks, the internal (block-to-block) stability of the wall was evaluated considering sliding, overturning, and bearing capacity to achieve respective minimum factors of safety of 1.5, 2.0, and 3.0 for static conditions and 1.1, 1.1, and 1.5 for seismic conditions. The results of this analysis for a single tier of World blocks (see attached *Figures 1 and 2*) indicate that maximum total heights of 4 feet can be achieved using 24-inch deep blocks and 10 feet can be achieved using 51-inch deep blocks. Wall heights greater than 4 feet using 24-inch deep blocks will require using geogrid reinforcement, which was analyzed using the computer program *SRWall* to evaluate the required geogrid strength, lengths and vertical spacings. The results of this analysis are attached in the *Appendix*.

We also evaluated the global stability of the block wall using limit equilibrium (Simplified Bishop) methods via the computer program *SLIDE2* (version 9.0). The configuration we analyzed consisted of an approximate 24-

Lot 502 Ridge Estates (Snyder Residence), Bountiful, Utah CMT Project No. 16916

foot high World block wall split into three tiers, each 8 feet in total height, with geogrid extending behind each tier. Typically, the required minimum factors of safety for walls are 1.5 for static conditions and 1.1 for seismic (pseudostatic) slope conditions. The results of our analyses indicate that the proposed block wall with geogrid reinforcement will meet both these requirements, provided our recommendations are followed. The slope stability data are included as *Figures 3 and 4*, attached.

#### **Conclusions and Recommendations**

Based on the results of our analyses, the World block retaining wall at this site will be stable if constructed as follows (also see *Figures 5 through 9*, attached):

- The block wall may be constructed in a single tier without geogrid up to maximum total heights of 4 feet using 24-inch deep blocks and 10 feet using 51-inch deep blocks.
- Taller portions of the block wall will require using geogrid as recommended below, in conjunction with 24-inch deep blocks. Three wall tiers having a total height of 8 feet each (24 feet total height) may be constructed, either with 24-inch deep blocks and geogrid or with 51-inch deep blocks and no geogrid, with the tiers separated by a distance of 8 feet (face-to-face) and an 8-foot deep by 2-foot wide trench (or 4 rows of buried blocks) filled with lean concrete and embedded below the lowest tier. The lean concrete should have a minimum 28-day strength of 100 psi.
- The lowest row of blocks for each tier should be embedded a minimum 6 inches below the lowest adjacent ground surface.
- The bottom row of blocks for the upper two tiers should be placed on a minimum 12 inches of crushed ¾-inch to 2-inch size angular clean gravel material. This material should be compacted until firm.
- Each row of blocks should be set back a minimum 2 inches from the underlying row of blocks.
- The geogrid should consist of Tensar UX1400MSE, or equivalent, with minimum lengths and vertical spacings as shown on *Figures 7 and 8*. Note that UX1400MSE is uni-directional, that is, it is strong in one direction, and thus should be laid out with the strong (long) direction perpendicular to the wall.
- Backfill materials may consist of on-site sandy/gravelly soils. If imported backfill is used in the geogrid zone, we recommend it meet the following criteria:

Maximum particle size: 1½ inches

Percent retained on the 3/4 inch sieve (coarse gravel): 30 maximum

Percent passing the No. 200 sieve (fines): 15 maximum

Liquid Limit of fines: 35 maximum

Plasticity Index of fines: 10 maximum

Lot 502 Ridge Estates (Snyder Residence), Bountiful, Utah CMT Project No. 16916

- Fill/backfill soils should be placed in loose lifts not exceeding a thickness of 8 inches, moisture conditioned to within 2% of optimum, and compacted to between 95% and 98% of the maximum dry density as determined by ASTM D1557 (Modified Proctor).
- Drainage behind the wall is recommended. The drain should consist of a perforated 4-inch minimum diameter pipe wrapped in fabric and placed at the bottom and behind the lowest row of blocks in each tier. The pipe should daylight at one or both ends of the wall and discharge to an appropriate drainage device or area. Clean gravel ¾- to 2-inch in size, with less than 10% passing the No. 4 sieve and less than 5% passing the No. 200 sieve, should be placed around the drainpipes. A fabric, such as Mirafi 140N or equivalent, should be placed between the clean gravel and the adjacent soils.
- The clean gravel and separation fabric should extend up behind the back of the blocks to within 2 feet of the ground surface, with the fabric wrapped over the top of the gravel prior to placing the upper 2 feet of backfill. Immediately behind the blocks, it will be necessary to cut the separation fabric at each geogrid layer.
- Surface drainage at the bottom and top of the walls should also be directed away from the walls as much as
  possible. This should particularly include piping downspouts from the home and all surface drainage around
  the home and discharging the water in an appropriate drainage device well away from the wall. As indicated
  above, not allowing surface water to saturate and infiltrate the soils behind the walls is extremely important
  to provide adequate wall stability.
- We recommend that CMT observe construction of the block walls at the following critical times: (1) when
  the lowest row of blocks has been placed along with the drain pipe and bottom gravel; (2) when the first
  layer of geogrid has been placed; (3) when the block wall is about halfway constructed; and (3) upon
  completion of the block wall construction.

We note that the concept of constructing the new wall in tiers is, in our opinion, the best way to address the situation of stability during construction. Removing the soils adjacent to and near the existing home could be problematic for construction and home stability. Constructing a new tiered wall will allow the existing/failed block wall to remain in place, except for only the upper few rows of existing blocks in order to place the geogrid as outlined above, and is the best method to provide adequate stability during wall construction.

Note that wall movements or even failure can occur if the wall is undermined or the backfill soils become overly-saturated. Therefore, we recommend that irrigation lines not be placed within the backfill or directly on top of the wall. Surface drainage at the bottom and top of the wall should also be directed away from the wall. The property owner and the owner's representatives should be made aware of the risks should these or other conditions occur that could saturate or erode/undermine the soil behind the wall.

Lot 502 Ridge Estates (Snyder Residence), Bountiful, Utah CMT Project No. 16916

#### Closure

The conclusions and recommendations presented in this report are based on the information provided, the soil conditions observed, and our experience with similar conditions. If conditions are different during construction than presented herein, please advise us so that any appropriate modifications can be made. Our observations, analyses, conclusions and recommendations were conducted within the limits prescribed by our client, with the usual thoroughness and competence of the engineering profession in the area. No other warranty or representation, either expressed or implied, is intended in our proposals, contracts or reports.

We appreciate the opportunity to work with you on this project. If we can be of further assistance or if you have any questions regarding this project, please do not hesitate to contact us at (801) 492-4132.

Sincerely,

**CMT Technical Services** 

William G. Turner, P.E.

Senior Geotechnical Engineer

Encl: Figures 1-2, World Block Stability Evaluation

Figures 3-4, Stability Results

Figures 5-9, World Block Wall Details

Appendix (6 pages)

## **World Block Stability Evaluation**

Backfill slope angle:		0	degrees (	β)		Foundation	on soil γ :		135	pcf	
Front batter angle (from vert	rical):	4.76	degrees (	α)		Foundation	on soil φ:		32	degrees	P
Soil/wall interface friction:		21	degrees (	δ)			oil cohesic	on:	150	-	
Surcharge pressure:		0	psf			Retained	•			pcf	
		static	seismic			Retained				degrees	
FS against sliding:		1.5	1.1				soil cohes		150	-	
FS against overturning: FS for bearing:		2.0 3.0	1.1 1.5				it weight, ction angl	•	150	•	
Horizontal seismic coef., k <sub>h</sub> :		0.24		½ of PG	<b>A</b> .)		ent depth:			degrees feet	
Vertical seismic coef., k <sub>h</sub> .		0.24	(typically		A)	Block Wi	•			inches	
· '		0.23554	(typically	(0)	Co.il			10512			
Mononobe-Okabe theta, q =		0.23554		ST	ATIC	Bearing C	араспу –	10513	psf (Mey	emon)	
Wall Ht, H (ft)	2.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00	18.00	20.00	22.00
Block Depth (in)	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Block Depth (ft)	2	2	2	2	2	2	2	2	2	2	2
Back batter angle, y:	0	4.76364	4.76364	4.76364	4.76364	4.76364	4.76364	4.76364	4.76364	4.763642	4.763642
Coulomb K <sub>a</sub>	0.2751	0.2428	0.2428	0.2428	0.2428	0.2428	0.2428	0.2428	0.2428	0.2428	0.2428
F <sub>a</sub> (lbs/ft)	0	0	141	439	864	1414	2090	2892	3820	4874	6054
Wall Wt, W (lbs/ft)	600	1200	1800	2400	3000	3600	4200	4800	5400	6000	6600
Wall x <sub>centroid</sub> (ft)	1.00	1.08	1.17	1.25	1.33	1.42	1.50	1.58	1.67	1.75	1.83
Wall y <sub>centroid</sub> (ft)	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00
F <sub>sliding</sub> (lbs/ft)	0	0	135	422	829	1358	2007	2777	3668	4680	5812
F <sub>resisting</sub> (lbs/ft)	375	750	1149	1576	2026	2497	2990	3505	4042	4601	5182
FS <sub>base sliding</sub>	>100	>100	8.5	3.7	2.4	1.8	1.5	1.3	1.1	1.0	0.9
M <sub>overturn</sub> (ft-lbs/ft)	0	0	270	1125	2764	5431	9366	14811	22008	31199	42625
M <sub>resisting</sub> (ft-lbs/ft)	600	1300	2185	3273	4550	6023	7696	9577	11670	13983	16520
FS <sub>overturn</sub>	>100	>100	8.1	2.9	1.6	1.1	0.8	0.6	0.5	0.4	0.4
Eccentricity, e (ft)	0.00	0.00	0.13	0.40	0.78	1.27	1.85	2.52	3.26	4.09	4.98
Bearing Pressure	300	600	1266	2769	5425	9600	15662	23976	34911	48833	66109
FS <sub>bearing</sub>	35.0	17.5	8.3	3.8	1.9	1.1	0.7	0.4	0.3	0.2	0.2
bearing	23.0	17.0	0.0		ISMIC		0.7	0.1	0.0	0.2	0.2
Mononobe-Okabe Kae	0.4643	0.4237	0.4237	0.4237	0.4237	0.4237	0.4237	0.4237	0.4237	0.4237	0.4237
F <sub>ae</sub> (lbs/ft)	0	67	444	1049	1884	2947	4239	5759	7509	9487	11694
F <sub>sliding</sub> (lbs/ft)	144	352	858	1583	2528	3693	5078	6682	8505	10549	12812
F <sub>resisting</sub> (lbs/ft)	375	762	1202	1683	2204	2764	3365	4006	4686	5407	6167
FS <sub>base sliding</sub>	2.6	2.2	1.4	1.1	0.9	0.7	0.7	0.6	0.6	0.5	0.5
M <sub>overturn</sub> (ft-lbs/ft)	144	730	2614	6240	12239	21210	33748	50452	71920	98747	131533
M <sub>resisting</sub> (ft-lbs/ft)	600	1341	2380	3682	5263	7137	9318	11821	14661	17852	21409
FSoverturn	4.2	1.8	0.9	0.6	0.4	0.3	0.3	0.2	0.2	0.2	0.2
Eccentricity (ft)	0.24	0.58	1.29	2.20	3.31	4.60	6.04	7.61	9.30	11.10	12.99
Bearing Pressure	516	1674	4680	10233	19281	32722	51454	76376	108386	148382	197264
FS <sub>bearing</sub>	20.4	6.3	2.2	1.0	0.5	0.3	0.2	0.1	0.1	0.1	0.1
Max. Recommended Wall											
Lot 502			<u> </u>			MT	TECH	INICA	A L	e	

**Lot 502 Ridge Estates** 

1874 East Ridge Point Drive, Bountiful, Utah

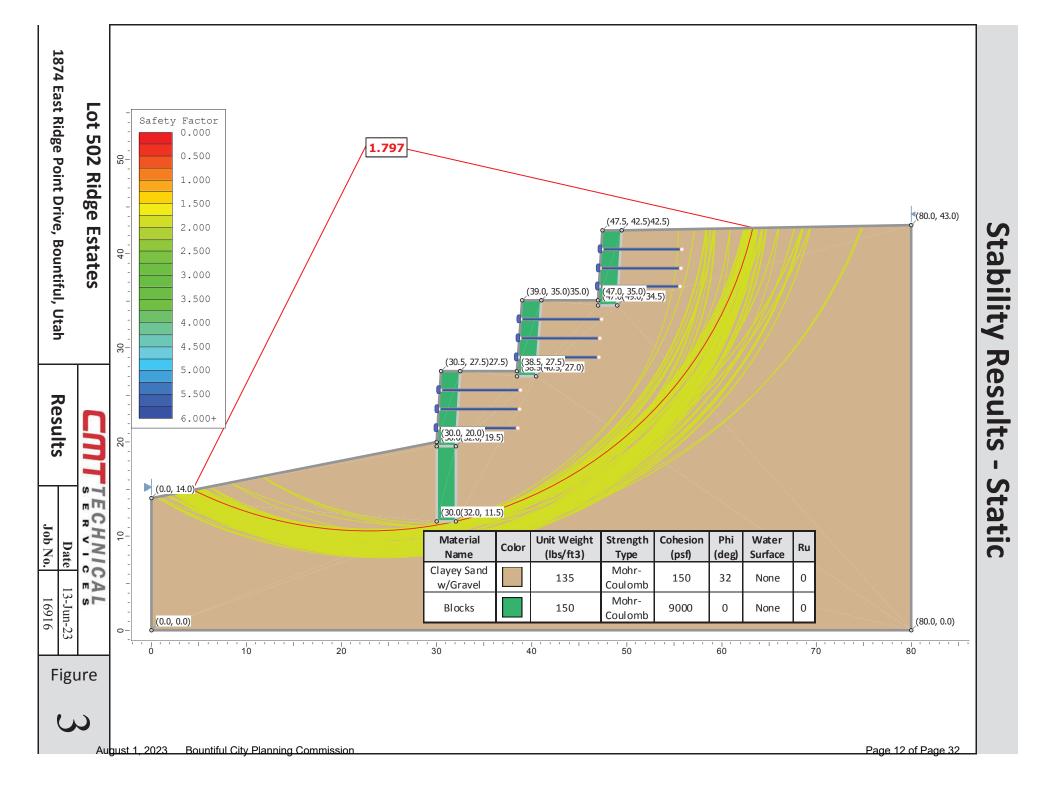
 Evaluation
 Date | 13-Jun-23 | 16916

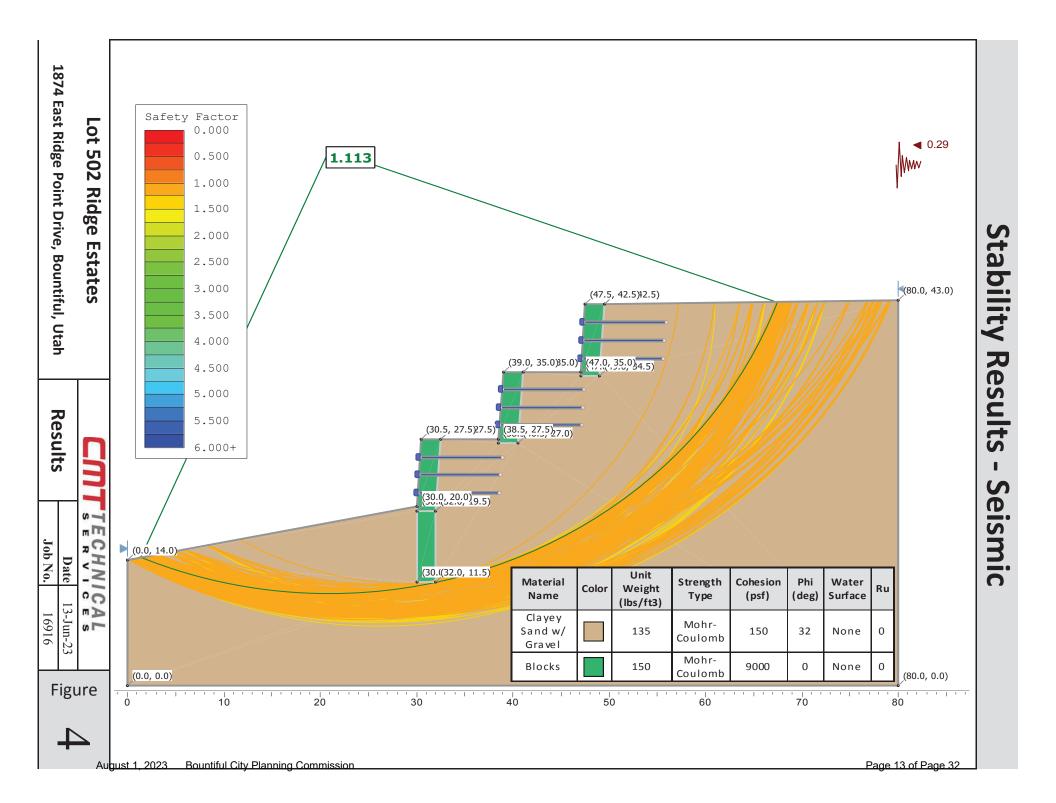
Figure

1

## **World Block Stability Evaluation**

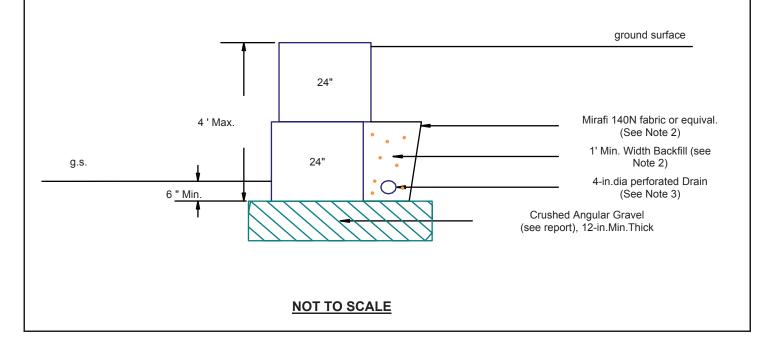
Backfill slope angle:		0	degrees (	β)		Foundatio	on soil γ :		135	pcf	
Front batter angle (from vert	ical):	4.76	degrees (			Foundation				degrees	Pi
Soil/wall interface friction:	,	21	degrees (	*		Found. so			150	_	
Surcharge pressure:		0	psf			Retained	soil γ :		135	pcf	
		static	seismic			Retained	soil φ:		32	degrees	
FS against sliding:		1.5	1.1			Retained			150	psf	
FS against overturning:		2.0	1.1			Block un		•	150	-	
FS for bearing:		3.0	1.5			Block frie	_			degrees	
Horizontal seismic coef., k <sub>h</sub> :		0.24		1/2 of PG	<b>A</b> )	Embedme				feet	
Vertical seismic coef., k <sub>v</sub> :		0	(typically	(0)		Block Wi	dth:		48	inches	
Mononobe-Okabe theta, q =		0.23554				Bearing C	apacity =	17508	psf (Mey	erhoff)	
			1		ATIC	ı		1	1		
Wall Ht, H (ft)	2.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00	18.00	20.00	22.00
Block Depth (in)	51.0	51.0	51.0	51.0	51.0	51.0	51.0	51.0	51.0	51.0	51.0
Block Depth (ft)	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25
Back batter angle, y:	0	4.76364	4.76364	4.76364	4.76364	4.76364	4.76364	4.76364	4.76364	4.763642	4.763642
Coulomb K <sub>a</sub>	0.2751	0.2428	0.2428	0.2428	0.2428	0.2428	0.2428	0.2428	0.2428	0.2428	0.2428
F <sub>a</sub> (lbs/ft)	0	0	141	439	864	1414	2090	2892	3820	4874	6054
Wall Wt, W (lbs/ft)	1275	2550	3825	5100	6375	7650	8925	10200	11475	12750	14025
Wall x <sub>centroid</sub> (ft)	2.13	2.21	2.29	2.38	2.46	2.54	2.63	2.71	2.79	2.88	2.96
Wall y <sub>centroid</sub> (ft)	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00
F <sub>sliding</sub> (lbs/ft)	0	0	135	422	829	1358	2007	2777	3668	4680	5812
F <sub>resisting</sub> (lbs/ft)	797	1593	2415	3264	4134	5027	5942	6879	7838	8819	9822
FS <sub>base sliding</sub>	>100	>100	17.9	7.7	5.0	3.7	3.0	2.5	2.1	1.9	1.7
M <sub>overturn</sub> (ft-lbs/ft)	0	0	270	1125	2764	5431	9366	14811	22008	31199	42625
M <sub>resisting</sub> (ft-lbs/ft)	2710	5631	8939	12662	16765	21256	26139	31422	37108	43205	49719
FSoverturn	>100	>100	33.1	11.3	6.1	3.9	2.8	2.1	1.7	1.4	1.2
Eccentricity, e (ft)	0.00	0.00	0.05	0.17	0.34	0.57	0.86	1.20	1.59	2.02	2.51
Bearing Pressure	300	600	971	1517	2309	3429	4958	6977	9567	12810	16788
FS <sub>bearing</sub>	58.4	29.2	18.0	11.5	7.6	5.1	3.5	2.5	1.8	1.4	1.0
			•	SE	ISMIC			•	•	•	
Mononobe-Okabe K <sub>ae</sub>	0.4643	0.4237	0.4237	0.4237	0.4237	0.4237	0.4237	0.4237	0.4237	0.4237	0.4237
F <sub>ae</sub> (lbs/ft)	0	67	444	1049	1884	2947	4239	5759	7509	9487	11694
F <sub>sliding</sub> (lbs/ft)	306	676	1344	2231	3338	4665	6212	7978	9963	12169	14594
F <sub>resisting</sub> (lbs/ft)	797	1605	2468	3370	4313	5295	6318	7380	8482	9625	10807
FS <sub>base sliding</sub>	2.6	2.4	1.8	1.5	1.3	1.1	1.0	0.9	0.9	0.8	0.7
M <sub>overturn</sub> (ft-lbs/ft)	306	1378	4072	8832	16289	27042	41686	60820	85042	114947	151135
M <sub>resisting</sub> (ft-lbs/ft)	2710	5715	9325	13455	18120	23334	29113	35470	42420	49977	58156
FSoverturn	8.9	4.1	2.3	1.5	1.1	0.9	0.7	0.6	0.5	0.4	0.4
Eccentricity (ft)	0.24	0.52	0.96	1.52	2.19	2.98	3.87	4.85	5.93	7.09	8.33
Bearing Pressure	402	1048	2190	3988	6652	10380	15371	21825	29940	39916	51951
FS <sub>bearing</sub>	43.6	16.7	8.0	4.4	2.6	1.7	1.1	0.8	0.6	0.4	0.3
Max. Recommended Wall	Height: 1	0 feet									
Lot 502	Ridge	Estat	es		U	MT	TECH SER	VICE	S	Figure	7
1874 East Ridge Po	oint Driv	ve, Bour	ntiful, U1	ah	Evalu	ation	Date Job No.		un-23 916	Fig	_





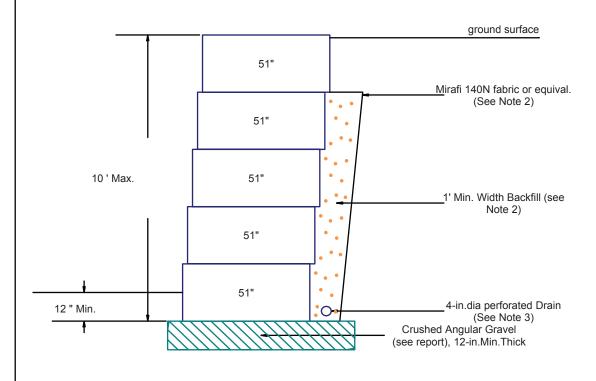
#### NOTES:

- 1. Backfill soils should be placed in loose lifts not exceeding 12 inches thickness, moisture conditioned to within ±2% of optimum, and compacted from 95% to 98% of the maximum dry density per ASTM D 1557 (Modified Proctor).
- 2. Free-draining backfill shall consist of gravel having less than 5% passing the No. 200 sieve. A separation fabric (i.e. Mirafi 140N or equivalent) shall be placed between gravel and backfill.
- 3. Perforated drain shall be wrapped with fabric, sloped to one or more low points, and discharged to an appropriate drainage device or area.
- 4. Block depths shown for individual blocks.



#### NOTES:

- 1. Backfill soils should be placed in loose lifts not exceeding 12 inches thickness, moisture conditioned to within ±2% of optimum, and compacted from 95% to 98% of the maximum dry density per ASTM D 1557 (Modified Proctor).
- 2. Free-draining backfill shall consist of gravel having less than 5% passing the No. 200 sieve. A separation fabric (i.e. Mirafi 140N or equivalent) shall be placed between gravel and backfill.
- 3. Perforated drain shall be wrapped with fabric, sloped to one or more low points, and discharged to an appropriate drainage device or area.
- 4. Block depths shown for individual blocks.



**NOT TO SCALE** 

**Lot 502 Ridge Estates** 

1874 East Ridge Point Drive, Bountiful, Utah

Wall Details Date 13-Jun-23

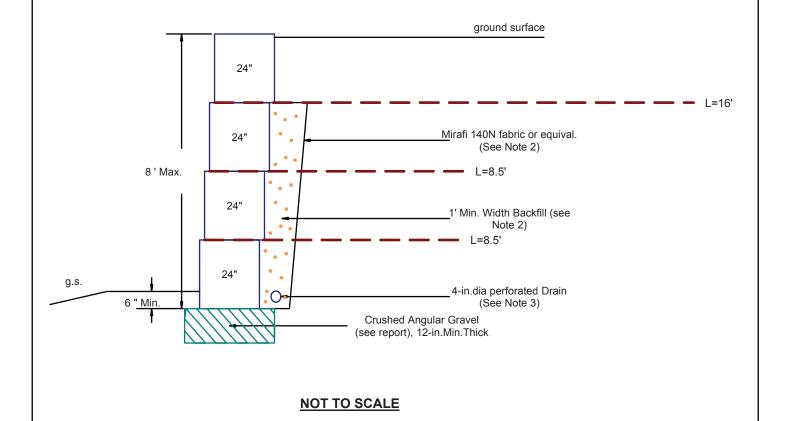
Job No. 16916

Figure

6

#### NOTES:

- 1. Backfill soils should be placed in loose lifts not exceeding 12 inches thickness, moisture conditioned to within ±2% of optimum, and compacted from 95% to 98% of the maximum dry density per ASTM D 1557 (Modified Proctor).
- 2. Free-draining backfill shall consist of gravel having less than 5% passing the No. 200 sieve. A separation fabric (i.e. Mirafi 140N or equivalent) shall be placed between gravel and backfill.
- 3. Perforated drain shall be wrapped with fabric, sloped to one or more low points, and discharged to an appropriate drainage device or area.
- 4. Block depths shown for individual blocks.
- 5. Geogrid shall consist of UX1400MSE, or equivalent, with the lengths and spacings as shown.



**Lot 502 Ridge Estates** 

Wall Details

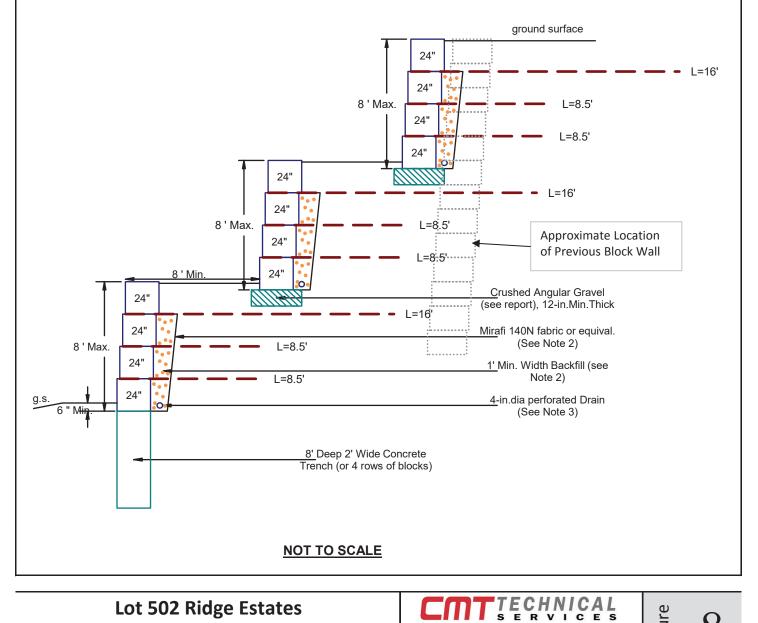
| Date | 13-Jun-23 | Job No. | 16916 |

Figure

7

#### **NOTES:**

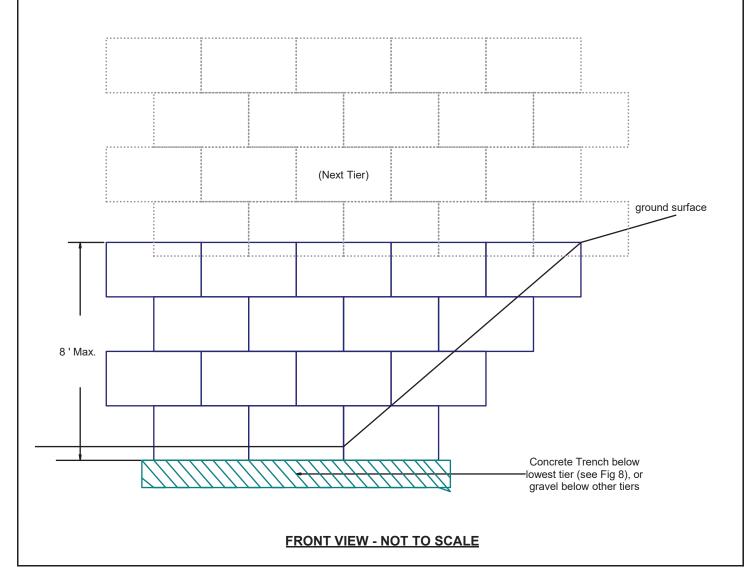
- 1. Backfill soils should be placed in loose lifts not exceeding 12 inches thickness, moisture conditioned to within ±2% of optimum, and compacted from 95% to 98% of the maximum dry density per ASTM D 1557 (Modified Proctor).
- 2. Free-draining backfill shall consist of gravel having less than 5% passing the No. 200 sieve. A separation fabric (i.e. Mirafi 140N or equivalent) shall be placed between gravel and backfill.
- 3. Perforated drain shall be wrapped with fabric, sloped to one or more low points, and discharged to an appropriate drainage device or area.
- 4. Block depths shown for individual blocks.
- 5. Geogrid shall consist of UX1400MSE, or equivalent, with the lengths and spacings as shown.



Job No.

#### NOTES:

- 1. If more than 1 block is needed to match existing slope at ends of wall, the crushed angular gravel or lean concrete trench/buried blocks (see Figure 8) should be placed at the bottom of those blocks, as shown below the main portion of the wall.
- 2. See Figure 8 for free-draining backfill and perforated drain placement behind wall.



**Lot 502 Ridge Estates** 

1874 East Ridge Point Drive, Bountiful, Utah

August 1, 2023 Bountiful City Planning Commission





## **APPENDIX**

SRWall Data (6 Pages)

#### **SRWall (Version 4) Report**

#### **Project Identification**

Project ID : 16916

Project Name : Lot 502 Ridge Estates

Owner

Client : Davies Design Build

Prepared By : Bill Turner

Company : CMT Engineering Laboratories

Address : 2796 S. Redwood Road, West Valley City, UT 84119

Telephone : 801-908-5859

Section

Project File : Lot 502 Ridge Estates - World Block Tiers.prj

Vendor Data File

Date and Time : 01/24/2023 14:49:02

.....

Type of Structure : Reinforced Wall

#### **Seismic Analysis Details**

 Peak Ground Acceleration(PGA Ratio)
 : 0.500

 Displacement Analysis
 : ON

 Deflection(Inches)
 : 3.00

 Seismic Cofficient(Kh(internal))
 : 0.500

 Seismic Cofficient(Kh(external))
 : 0.240

------

#### **Wall Geometry**

Design Wall Height(ft) : 8.00
Embedment Wall Height(ft) : 0.50
Exposed Wall Design Height(ft) : 7.50
Number of Segmental Wall Units : 4
Wall Inclination(degrees) : 4.76

#### <u>Grades</u>

Top Slope(degrees) : 0.00

\_\_\_\_\_

#### **Uniform Distributed Surcharge**

Live Load Surcharge(Psf) : 0.00

Dead Load Surcharge(Psf) : 2400.00

Dead Load Surcharge Setback(ft) : 8.00

.....

#### **Soil Data**

Soil Zone	Description	Cohesion (c) (psf)	Friction Angle(Φ) (degrees)	Unit Weight (γ)(pcf)
Reinforced Soil	Silty Gravel w/Sand	N/A	35.00	135.00
Retained Soil	Silty Gravel w/Sand	N/A	35.00	135.00
Leveling Pad Soil	Gravel	N/A	40.00	135.00
Foundation Soil	Silty Gravel w/Sand	50.00	35.00	135.00

------

#### **Segmental Unit Data**

Segmental Unit Name : World Block

Cap Height (Inches) : 0.00 Unit Height (Hu)(Inches) : 24.00 Unit Width (Wu)(Inches) : 24.00 Unit Length (Inches) : 48.00 Setback (Inches) : 2.00 Weight (Infilled)(lb) : 2400.00 Unit Weight (Infilled)(pcf) : 150.00 Center of Gravity(Inches) : 12

#### **Geosynthetic Reinforcement Type and Number**

Supplier	Product Name	Number
	BX1200	0
	UX1100MSE	0
	UX1400MSE	3
	UX1500MSE	0
	UX1600MSE	0
	UX1700MSE	0

#### **Geosynthetic Properties**

Geosynthetic Product	Tult (lb/ft)	RFcr	RFd	RFid	LTDS (lb/ft)	Ci	Cds
BX1200	1975.00	3.56	1.10	1.10	1632.23	0.80	0.80
UX1100MSE	3970.00	2.60	1.10	1.05	3437.23	0.80	0.80
UX1400MSE	4800.00	2.60	1.10	1.05	4155.84	0.80	0.80
UX1500MSE	7810.00	2.60	1.10	1.05	6761.90	0.80	0.80
UX1600MSE	9870.00	2.60	1.10	1.05	8545.45	0.80	0.80
UX1700MSE	11990.00	2.60	1.10	1.05	10380.95	0.80	0.80

#### **Unit-Unit Interface Properties**

Minimum Shear	Shear Friction	Maximum Shear
Capacity(lb/ft)	Angle	Capacity (lb/ft)
769.00	26.90	2595.00

------

#### **Geosynthetic-SRW Unit Connection Strength properties**

	Minimum	Minimum 1st Inflection Point (lb/ft)		2nd Inflection Point (lb/ft)		
Geosynthetic Product	Geosynthetic Product Conn. Capacity (lb/ft)		Connection Capacity (lb/ft)	Normal Load (lb/ft)	Max Connection Capacity(lb/ft)	
BX1200	485.00	1650.00	1118.38	6000.00	1118.38	
UX1100MSE	1580.00	3300.00	2372.26	6000.00	2372.26	
UX1400MSE	1392.00	3300.00	2792.77	6000.00	2792.77	
UX1500MSE	1679.00	3300.00	3530.87	6000.00	3530.87	
UX1600MSE	3543.00	3300.00	4195.52	6000.00	4195.52	
UX1700MSE	2350.00	3300.00	4635.03	6000.00	4635.03	

------

#### **Geosynthetic-SRW Unit Shear Strength properties**

Geosynthetic Product	Minimum Shear Capacity(lb/ft)	Shear Friction Angle	Maximum Shear Capacity (lb/ft)
BX1200	769.00	26.90	2595.00
UX1100MSE	769.00	26.90	2595.00
UX1400MSE	769.00	26.90	2595.00
UX1500MSE	769.00	26.90	2595.00
UX1600MSE	769.00	26.90	2595.00
UX1700MSE	769.00	26.90	2595.00

#### **Vertical Components**

Vertical Components of Earth Pressures Used : No

------

#### **Cofficients of Earth Pressure and Failure Plane Orientation**

Reinforcement Soil(Static)(Ka)	: 0.212
Reinforcement Soil(Static)(Kah Horizontal Component)	: 0.201
Reinforcement Soil(Static + Dynamic)(Kae)	: 0.750
Reinforcement Soil(Static + Dynamic)(Kaeh horizontal Component)	: 0.710
Internal Modified Back Slope(Bint)	: 0.000
Orientation of failure plane from horizontal(degrees) for Internal Stability	: 57.136
Retained Soil(Static)(Ka)	: 0.215
Retained Soil(Static)(Kah Horizontal Component)	: 0.186
Retained Soil(Static + Dynamic)(Kae)	: 0.399
Retained Soil(Static + Dynamic)(Kaeh horizontal Component)	: 0.345
External Modified Back Slope(Bext)	: 0.000
Orientation of failure plane from horizontal(degrees) for External Stability	: 55.889

.....

#### **Result of External Stability Seismic Analysis**

	Calculated	Design Criteria
FOS Sliding	1.10	> 1.10
FOS Overturning	1.83	> 1.50
FOS Bearing Capacity	7.85	> 1.50
Base Reinforcement Length (L)(ft)	8.40	
Base Reinforcement Ratio (L/H)	1.05	> 0.60

#### **Results of Internal Stability Seismic Analysis**

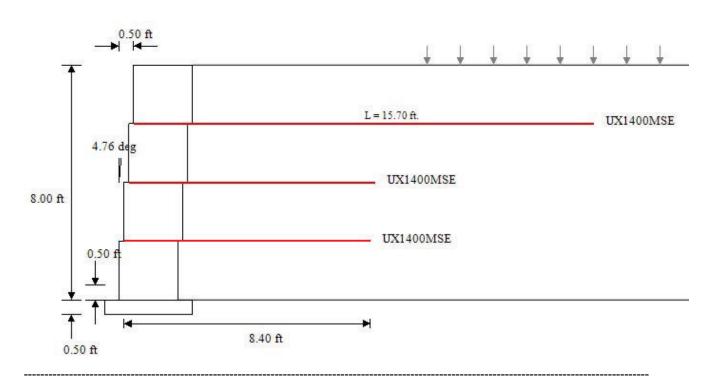
SRW Unit #	Geosynthetic Product	Elevation (ft)	Length (ft)	Anchor Length (ft)	FOS Overstress >=1.10	FOS Pullout >=1.10	FOS Slide >=1.10	Layer Spacing (ft) >=2.67
4	UX1400MSE	6.00	15.70	10.32	1.46	1.10	1.66	ок
3	UX1400MSE	4.00	8.40	4.15	2.04	1.23	1.27	ок
2	UX1400MSE	2.00	8.40	5.27	1.28	1.47	1.11	ок

#### **Results of Facing Stability Seismic Analysis**

SRW Unit #	Heel Elev (ft)	Geosynthetic Product	FOS Crest Toppling >=1.10	FOS Connection >=1.10
4	6.00	UX1400MSE	1.48	1.18
3	4.00	UX1400MSE		1.78
2	2.00	UX1400MSE		1.20

\_\_\_\_\_\_

#### **Wall Reinforcement Layout**



#### **Project Identification**

Project ID : 16916

Project Name : Lot 502 Ridge Estates

Owner :

Client : Davies Design Build

Prepared By : Bill Turner

Company : CMT Engineering Laboratories

Address : 2796 S. Redwood Road, West Valley City, UT 84119

Telephone : 801-908-5859

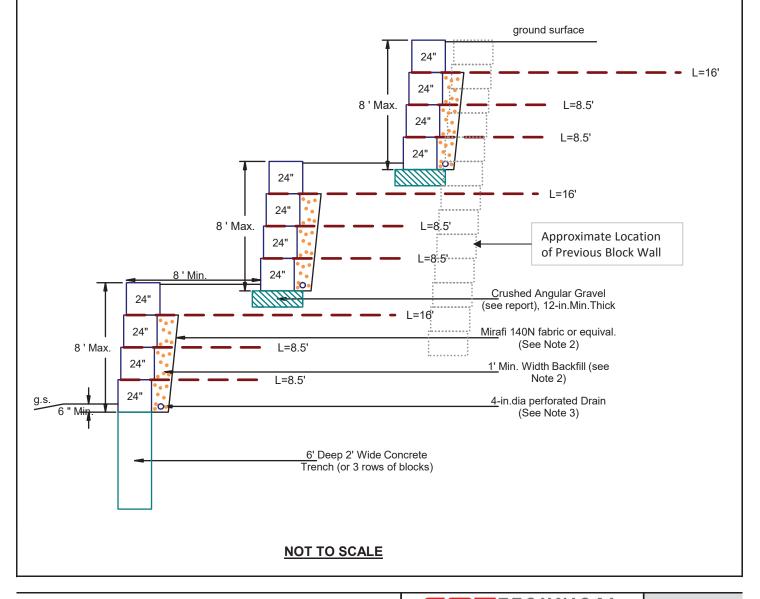
Section : Vendor Data File :

Project File : Lot 502 Ridge Estates - World Block Tiers.prj

Date and Time : 01/24/2023 14:49:02

#### **NOTES:**

- 1. Backfill soils should be placed in loose lifts not exceeding 12 inches thickness, moisture conditioned to within ±2% of optimum, and compacted from 95% to 98% of the maximum dry density per ASTM D 1557 (Modified Proctor).
- 2. Free-draining backfill shall consist of gravel having less than 5% passing the No. 200 sieve. A separation fabric (i.e. Mirafi 140N or equivalent) shall be placed between gravel and backfill.
- 3. Perforated drain shall be wrapped with fabric, sloped to one or more low points, and discharged to an appropriate drainage device or area.
- 4. Block depths shown for individual blocks.
- 5. Geogrid shall consist of UX1400MSE, or equivalent, with the lengths and spacings as shown.



- 1. How does the proposed variance request meet 1) literal enforcement of the ordinance would cause an unreasonable hardship for the applicant that is not necessary to carry out land use ordinance purpose: Yes. Because the lot can be re-engineered to support a home. We have also already had a variance approved for this lot and only need to redesign the retaining wall.
- 2. How does the proposed variance request meet 2) special circumstances attached to the property that do not generally apply to other properties in the same zone?: This property has already had the variance approved by Bountiful Planning commision. We only need to adjust the retaining wall design. The original design is not optimal to support the landscape and home.
- 3. How does the proposed variance request meet 3) granting the variance is essential to the enjoyment of a substantial property right possessed by other properties in the same zone?: Yes. Without the Variance the homeowner cannot complete the process of constructing the home. A variance has already been given to this property for the same reasons we are asking for now.
- 4. How does the proposed variance request meet 4) not substantially affect the general plan and will not be contrary to the public interest?: This variance will help the community by allowing the land owner to complete a home that is already under construction. A variance has already been given for this property. Bountiful Planning commission is forcing another variance application because the retaining wall design has been slightly modified from the original application.
- 5. How does the proposed variance request meet 5) the spirit of the land use ordinance is observed and substantial justice done?: Granting another variance allows the land owner to complete their already partially constructed project. The land is an approved and recorded building lot.
- 6. What City Ordinance(s) do you want a variance from?: Bountiful City
- 7. Statement of Intent: A variance has already been applied for and approved for this building lot. A slight modification in the design of the retaining wall described in the original variance application is warranted. We have been notified by the Bountiful Planning office that we need to re-apply for the variance that includes the modified retaining wall design.

August 1, 2023 Bountiful City Planning Commission Page 27 of Page 32

## **Commission Staff Report**

**Subject:** Lot Line Adjustment for Lot 39 Amended Sunset

Hollow Plat B

Address: 3269 S Sunset Hollow Dr

**Author:** City Engineer

**Department:** Engineering, Planning

**Date:** August 1, 2023



#### **Background**

Boyd and Janelle Bischke, applicants, are requesting approval of a lot line adjustment to the property located at 3269 S Sunset Hollow Dr. The request comes as a prerequisite to receive a building permit for construction of a detached garage on the lot.

#### **Analysis**

<u>General</u>: Lot 39 of the Amended Sunset Hollow Plat B was created in 1985 as a 0.635 ac lot. Since that time, subsequent property transactions have been recorded which have maintained the general "pie shape" of the existing lot, slightly reduced its size, and left the remnants of unreleased utility easements. Past property exchanges are shown in Figure 1, with the resulting final parcel configuration shown in yellow. As proposed, the resulting lot will be 0.61ac (26,658.7 sq ft). Given the current configuration of the property ownership, the existing utility easement is not necessary.

<u>Utilities:</u> No additional utilities are required. No additional utility easements are necessary.

Proposed Right of Way Improvements and Access: No improvements are required.

#### **Department Review**

This memo has been reviewed by the City Attorney and the Planning Director.



**Figure 1 Location of Proposed Lot Line Adjustment** 

#### Recommendation

Staff would support the Planning Commission forwarding a recommendation approval of the Lot Line Adjustment at 3269 S Sunset Hollow Dr to the City Council with the following conditions:

- 1. Prepare a final plat after making any minor corrections identified during the review process.
- 2. Provide a current title report.

#### **Significant Impacts**

None

#### **Attachments**

1. A copy of the preliminary plat.

