TOWN OF JACKSON
PLANNING & BUILDING DEPARTMENT

TRANSMITTAL MEMO

Town of Jackson
- ☒ Public Works/Engineering
- ☐ Building
- ☐ Title Company
- ☒ Town Attorney
- ☐ Police

Joint Town/County
- ☐ Parks and Recreation
- ☐ Pathways
- ☐ Housing Department

Teton County
- ☐ Planning Division
- ☐ Engineer
- ☐ Surveyor- *Nelson*
- ☐ Assessor
- ☐ Clerk and Recorder
- ☐ Road and Levee

State of Wyoming
- ☐ Teton Conservation
- ☐ WYDOT
- ☐ TC School District #1
- ☐ Game and Fish
- ☐ DEQ

Federal Agencies
- ☐ Army Corp of Engineers

Utility Providers
- ☐ Qwest
- ☐ Lower Valley Energy
- ☐ Bresnan Communications

Special Districts
- ☐ START
- ☐ Jackson Hole Fire/EMS
- ☐ Irrigation Company

Date: May 15, 2020

Item #: P20-097

Planner: Brendan Conboy

Phone: 733-0440 ext. 1302

Email: bconboy@jacksonwy.gov

Owner:
Arts District Development
PO 1569
Jackson, WY 83001

Applicant:
Abigail Moore
PO Box 1569
Jackson, WY 83001

REQUESTS:

The applicant is submitting a request for an Encroachment Agreement for the property located at 175 S. Glenwood Street, legally known as, Lots 11-12, BLK 2, WORT-2.

For questions, please call Brian Lenz at 733-3097, x1410 or email to the address shown below. Thank you.

Please respond by: June 5, 2020 (with Comments)

RESPONSE: For Departments not using Trak-it, please send responses via email to:
tstolte@jacksonwy.gov

ENCROACHMENT AGREEMENT APPLICATION

Planning & Building Department
Planning Division

150 E Pearl Ave.
P.O. Box 1687
Jackson, WY 83001

ph: (307) 733-0440
fax: (307) 734-3563
www.townofjackson.com

OWNER OF PROPERTY:

Name: Arts District Development, LLC Phone: 307-690-1211

Mailing Address: PO Box 1569, Jackson, WY ZIP: 83001

E-mail: jsv@jhdevelopment.net

APPLICANT/AGENT:

Name: Abigail Moore Phone: 307-690-1211

Mailing Address: PO Box 1569, Jackson, WY ZIP: 83001

E-mail: abigailmoore@jhlaw.com

DESIGNATED PRIMARY CONTACT:

Owner_____ Applicant/Agent X

PROPERTY:

Physical Address of Property: 175 S. Glenwood Street, Lots 11-12, Blk 2, Wort-2

Lot, Subdivision: Lots 11-12, Blk 2, Wort-2

PIDN: 22-41-16-33-1-08-004

Description of Public Right-of Way: Encroachment onto TOJ property to install shoring - 3' on east side, 3' on south side, 3' on north side, 1'-10" on west side

SUBMITTAL REQUIREMENTS. Three (3) hard copies and one (1) digital copy of the application package (this form, plus all applicable attachments) should be submitted to the Planning Department. Please ensure all submittal requirements are included. The Planning Department will not hold or process incomplete applications. Partial or incomplete applications will be returned to the applicant.

Have you attached the following?

N/A **Application Fee.** Fees are cumulative. Applications for multiple types of permits, or for multiple permits of the same type, require multiple fees. See the currently adopted Fee Schedule in the Administrative Manual for more information.

10/29/15

Town of Jackson has letter on file

__X__ **Notarized Letter of Authorization**. A notarized letter of consent from the landowner is required if the applicant is not the owner, or if an agent is applying on behalf of the landowner. If the owner is a partnership or corporation, proof that the owner can sign on behalf of the partnership or corporation is also required. Please see the Letter of Authorization template in the Administrative Manual for a sample.

__X__ **Narrative Description of the Request.** Provide a detailed narrative description explaining the use of the noted public right-of-way.

__X__ **Exhibit.** Provide an exhibit (picture, drawings, maps, plans) of the use of the noted public right-of-way including dimensions of requested encroachment.

FORMAT:

The main component of any application is demonstration of compliance with all applicable Land Development Regulations (LDRs) and Resolutions.

Note: Information provided by the applicant or other review agencies during the planning process may identify other requirements that were not evident at the time of application submittal. Staff may request additional materials during review as needed to determine compliance with the LDRs.

Under penalty of perjury, I hereby certify that I have read this application and state that, to the best of my knowledge, all information submitted in this request is true and correct. I agree to comply with all county and state laws relating to the subject matter of this application, and hereby authorize representatives of the Town of Jackson to enter upon the abovementioned property during normal business hours, after making a reasonable effort to contact the owner/applicant prior to entering.

_____ 5/15/20

Signature of Owner or Authorized Applicant/Agent — Date

Abigail S Moore _____ Agent/Attorney

Name Printed — Title

new west
building company

SHORING NARRATIVE
for
GLENWOOD + SIMPSON MIXED USE BUILDING
175 South Glenwood Street

May 11, 2020
Town of Jackson
150 East Pearl Avenue
Jackson, WY 83001

G2B Company - Shoring Plan

The team requests an encroachment permit for the installation of soilnail shoring on the western side of the site located at 175 S. Glenwood Street. The encroachment will reach past the property boundary 1'-10" on the west side, 3' on the east side, 3' on the north side and 3' on the south side.

1. Provide Gordon Geotech with as much detail as possible regarding utility location and elevation. This includes as-built drawings, pot holing for utility elevations, and video of existing stormwater and sewer utility locations. Information will allow G2B to determine soilnail location and inclination during design.

2. Consult with Contractor and Excavation Subcontractor to review all data regarding utility location, utility elevation and proximity of utility to planned shoring installation. Team to review data and confirm appropriate soilnail placement.

3. Following Contractor and Excavation subcontractor review, G2B will review any potential soilnail/utility conflict concerns with Gordon Geotech to adjust placement and batter of soilnails.

4. After the initial excavation, G2B Company will denote the utility elevations on the excavation face using paint. The design team will then review the soilnail locations with the installation team, pointing out location markers to the installation team and making any necessary adjustments.

5. Soil nails will be placed at between 12 and 15 degree inclination on a 6'-8' grid per stamped and approved shoring design. The soil nails will be capped and shotcrete in place to provide stabilization for the adjacent lots and safety for the duration of the project. Soil nails are commonly used below and adjacent to helical piers.

6. The team will then install shoring on the first lift per the plan outlined in steps four and give. Shoring will begin on the northwestern side of the site, moving to the southwest before proceeding to the north and south sides of the site. North and south sides will be done simultaneously.

7. The team will repeat steps four and five on all successive lifts until entire site has been properly shored per shoring plans.

8. The final step of shoring will be the review post installation video to confirm successful installation.

GORDON GEOTECHNICAL ENGINEERING, INC.

Design Memorandum

Temporary Shoring

Glenwood & Simpson Mixed Use Building

175 South Glenwood Street

Jackson, Wyoming

Prepared for:

G2B Company, Inc.
P.O. Box 3402
Nampa, Idaho 83653

(Attention: Mr. Dan Turner)

Job No. 223-017-20
May 15, 2020

Gordon Geotechnical Engineering, Inc. 4426 South Century Drive Suite 100 Salt Lake City, Utah 84123 (801) 327-9600 phone

Project Description

Prepare the design of the temporary soil nail wall for ground support during construction of the new Glenwood & Simpson Mixed Use Building located at 175 South Glenwood Street in Jackson, Wyoming. The temporary shoring will be installed around the perimeter of the site. On the east and south sides, the shoring will extend from approximately existing grade to the bottom of the footing (approximately 17 feet maximum in exposed height). On the north side, the presence of numerous utilities require that the upper approximately 5 feet of the excavation be sloped so that the first row nails can be installed below the utility level based upon currently available information. On the west side of the site, the eastern portion of the existing parking structure appears to be supported on helical piers based upon provided record set drawings. From the base of the pile caps to the bottom of the new construction, the exposed height is approximately 10 feet or less in height.

Professional Statements

Supporting data upon which our design and plan preparation are based are presented in subsequent sections of this design memorandum. If subsurface conditions other than those described in the geotechnical report are encountered and/or if design, layout, or loading changes are implemented, Gordon Geotechnical Engineering Inc. (G^2) must be informed so that our design and plans can be reviewed. No warranty is expressed or implied, only that these designs were prepared in general accordance with design principles and practices in use at the time the work was performed.

Design References

The design of the shoring will be in conjunction with standard practice as outlined in many texts. The following is a partial list of references used for the project.

Design References:

- Lateral Support Systems and Underpinning, Volume II - Design Fundamentals, FHWA-RD-75-129, Goldberg, et al, April 1976.
- Geotechnical Engineering Circular No. 7, FHWA Publication No FHWAO-IF-03-017, dated March 2003
- “Manual for Design & Construction Monitoring of Soil Nail Walls”, FHWA Publication No. FHWA-SA-96-069, dated November 1996.
- Earth Support Systems & Retaining Structures, Pile Buck, 1975.
- Project Drawings entitled “Record Set, Tow of Jackson Parking Garage, 160 South Milward Street, Jackson, Wyoming Bid Documents,” by Highland Associates, dated March 30, 2007.
- Project Drawings entitled “Glenwood + Simpson Mixed Use Building (Phase II of the Milward + Simpson PMD),” by Harger Architects, dated January 10, 2020 (Permit Review Response Set).
- “Geotechnical Review, Lot at Simpson and Glenwood, Jackson, Wyoming,” by Womack & Associates, Inc., dated June 30, 2008.

Subsurface Soil and Groundwater Conditions

From the geotechnical report, the site soils typically consist dense to very dense gravels and cobbles with sand silty and clay. It would appear that no borings were performed at the site but adjacent boring logs were used as a basis of recommendations. Based upon the provided information, the following soil parameters will be utilized in the soil nail design:

Sands and Gravels
Moist Unit Weight (γ) = 135 pcf
Friction Angle = 36 degrees
Cohesion = 50 psf (interlock)

Groundwater was not encountered in the borings and will not be included in the analysis.

If soils encountered during site grading operations are different than projected or groundwater is encountered, G^2 must be notified immediately to review the shoring design. Modifications to the shoring may be required.

Surcharge

The soil nail walls will be designed for surcharge of 250 psf area surcharge to approximate conventional vehicular traffic around the perimeter of the site and within the parking structure.

Additionally, the parking structure finished floor appears to be approximately 7.5 feet above the bottom of the pile cap / top of the temporary soil nail wall which will be treated as a surcharge in addition to the traffic loading. The record set of drawings of the parking structure indicate that the easternmost portion of the building is supported upon helical pier foundations (assumed extending below the base of the new building excavation) and no foundation loads will be included in the shoring design.

Lastly, the north wall will be designed for the sloping ground surface at the upper part of the wall.

Other than the surcharges noted, the shoring has not been designed for large surcharges such as cranes, etc., and would have to be evaluated on a case by case basis. Higher loading may require modification to the shoring.

Anchor Adhesion

Hollow core soil nails will be used for the project. For design, an ultimate anchor adhesion of 4.0 kips/ft of anchor (26.5 psi) will be utilized with a working adhesion of 2.67 kips/ft based upon a factor of safety of 1.5. Verification nails will be included to verify the adhesion. Additionally, periodic proof nail tests will be conducted during wall construction to confirm capacities.

Summary of Results

The design was performed using the computer program SNAILWin (version 4.10) by Caltrans. The results of the analyses are attached and summarized below.

The results of the analyses indicate that the factors of safety exceed 1.5 for all cases the temporary soil nail walls. The soil nails will consist of AGL R32S soil nails (or equivalent) installed on a typical 6 feet horizontal by 5 feet vertical spacing. Nail lengths will be generally be 18 feet for the upper part of the wall and 13 feet on the lowest nail level. Under the parking structure, a tighter vertical spacing will be used based upon geometry and spans around existing helical pier foundations.

Lateral and vertical movements are projected to be on the order of one-half to one inch. Actual movements will vary based upon construction techniques, consistency of the site soils at the wall location, face stability, etc.

Design Complete.

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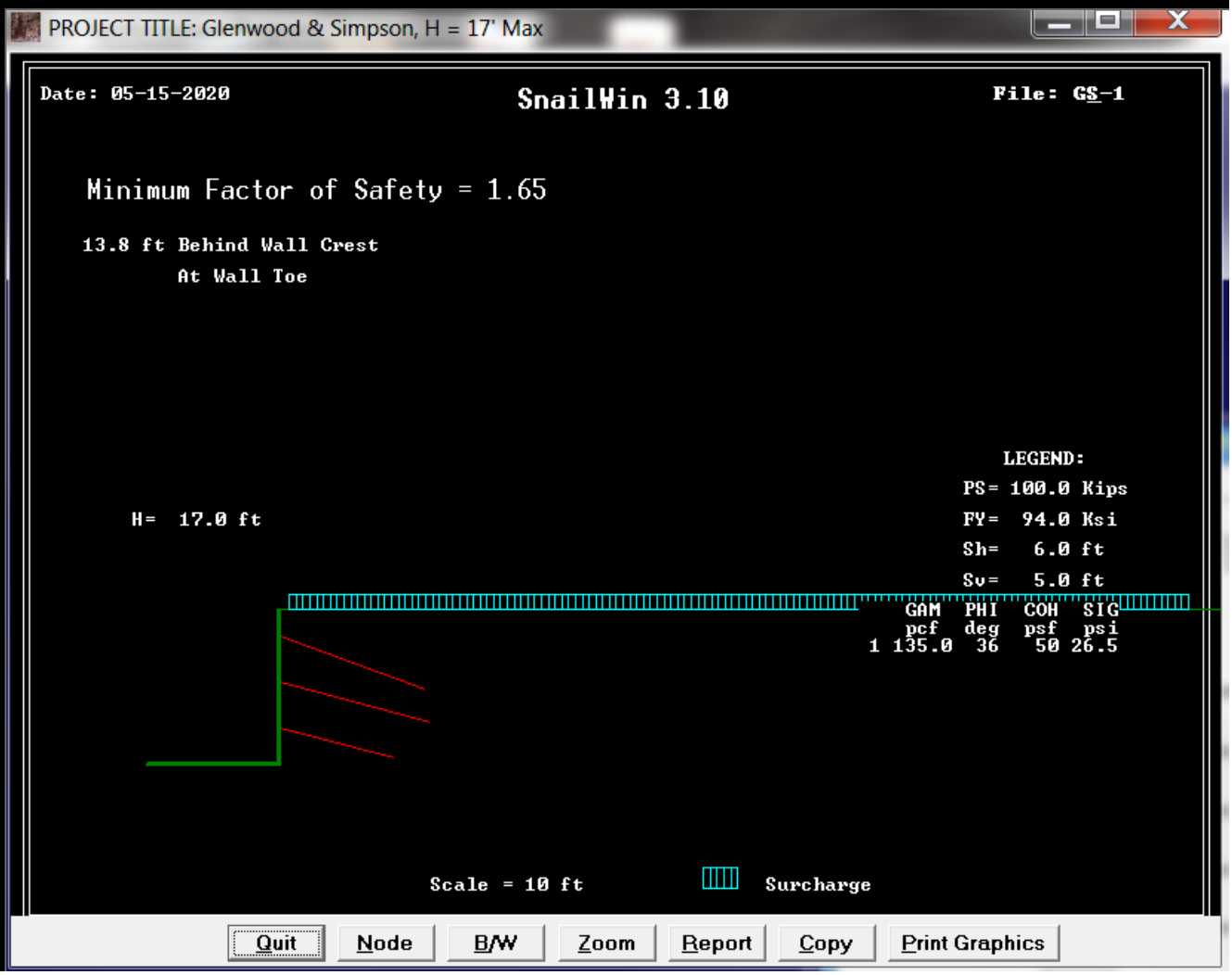
PROJECT TITLE: Glenwood & Simpson, H = 17' Max
Date: 05-15-2020
SnailWin 3.10
File: GS-1
Minimum Factor of Safety = 1.65
13.8 ft Behind Wall Crest
At Wall Toe
LEGEND:
PS= 100.0 Kips
FY= 94.0 Ksi
Sh= 6.0 ft
Sv= 5.0 ft
H= 17.0 ft
GAM PHI COH SIG
pcf deg psf psi
1 135.0 36 50 26.5
Scale = 10 ft
Surcharge
Quit
Node
B/W
Zoom
Report
Copy
Print Graphics

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*************************************************
*    CALIFORNIA DEPARTMENT OF TRANSPORTATION    *
*          ENGINEERING SERVICE CENTER           *
*     DIVISION OF MATERIALS AND FOUNDATIONS     *
*   Office of Roadway Geotechnical Engineering  *
*    Date: 05-15-2020          Time: 08:17:48   *
*************************************************
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Project Identification - Glenwood & Simpson, H = 17' Max

--------- WALL GEOMETRY ---------

Vertical Wall Height	=	17.0	ft
Wall Batter	=	0.0	degree
		Angle (Deg)	Length (Feet)
First Slope from Wallcrest.	=	0.0	50.0
Second Slope from 1st slope.	=	0.0	0.0
Third Slope from 2nd slope.	=	0.0	0.0
Fourth Slope from 3rd slope.	=	0.0	0.0
Fifth Slope from 3rd slope.	=	0.0	0.0
Sixth Slope from 3rd slope.	=	0.0	0.0
Seventh Slope Angle.	=	0.0	

--------- SLOPE BELOW THE WALL ---------

There is NO SLOPE BELOW THE TOE of the wall

--------- SURCHARGE ---------

THE SURCHARGES IMPOSED ON THE SYSTEM ARE:

Begin Surcharge - Distance from toe	=	1.0 ft
End Surcharge - Distance from toe	=	100.0 ft
Loading Intensity - Begin	=	250.0 psf/ft
Loading Intensity - End	=	250.0 psf/ft

--------- OPTION #1 ---------

Ultimate Punching shear, Bond & Yield Stress are used.

--------- SOIL PARAMETERS ---------

Soil Layer	Unit Weight (Pcf)	Friction Angle (Degree)	Cohesion Intercept (Psf)	Bond* Stress (Psi)	Coordinates of Boundary XS1 (ft)	YS1 (ft)	XS2 (ft)	YS2 (ft)
1	135.0	36.0	50.0	26.5	0.0	0.0	0.0	0.0

* Ultimate bond Stress values also depend on BSF (Bond Stress Factor.)

--------- WATER SURFACE ---------

NO Water Table defined for this problem.

--------- SEARCH LIMIT ---------

The Search Limit is from 3.0 to 30.0 ft

You have chosen NOT TO LIMIT the search of failure planes to specific nodes.

--------- REINFORCEMENT PARAMETERS ---------

Number of Reinforcement Levels	=	3
Horizontal Spacing	=	6.0 ft
Yield Stress of Reinforcement	=	94.0 ksi
Diameter of Grouted Hole	=	4.0 in
Punching Shear	=	100.0 kips

---------- (Varying Reinforcement Parameters) ---------

Level	Length (ft)	Inclination (degrees)	Vertical Spacing (ft)	Bar Diameter (in)	Bond Stress Factor
1	17.0	20.0	3.0	0.92	1.00
2	17.0	15.0	5.0	0.92	1.00
3	13.0	15.0	5.0	0.92	1.00

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
Toe	1.817	5.7	68.1	9.2	75.0	8.8

Reinf. Stress at Level 1 = 40.538 Ksi (Pullout controls...)
2 = 45.043 Ksi (Pullout controls...)
3 = 38.030 Ksi (Pullout controls...)

NODE 2

MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
1.712	8.4	55.3	10.3	73.5	8.9

Reinf. Stress at Level 1 = 34.355 Ksi (Pullout controls...)
2 = 40.591 Ksi (Pullout controls...)
3 = 37.154 Ksi (Pullout controls...)

NODE 3

MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
1.676	11.1	47.6	11.5	68.6	9.1

Reinf. Stress at Level 1 = 27.828 Ksi (Pullout controls...)
2 = 36.446 Ksi (Pullout controls...)
3 = 35.731 Ksi (Pullout controls...)

NODE 4

MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
1.647	13.8	46.6	14.0	58.7	8.0

Reinf. Stress at Level 1 = 23.975 Ksi (Pullout controls...)
2 = 36.356 Ksi (Pullout controls...)
3 = 36.028 Ksi (Pullout controls...)

NODE 5

MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
1.648	16.5	37.7	8.3	50.2	15.5

Reinf. Stress at Level 1 = 20.288 Ksi (Pullout controls...)
2 = 31.617 Ksi (Pullout controls...)
3 = 32.911 Ksi (Pullout controls...)

NODE 6

MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
1.666	19.2	33.6	9.2	45.9	16.6

Reinf. Stress at Level 1 = 15.071 Ksi (Pullout controls...)
2 = 27.363 Ksi (Pullout controls...)
3 = 30.877 Ksi (Pullout controls...)

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           MINIMUM    DISTANCE    LOWER FAILURE   UPPER FAILURE
           SAFETY      BEHIND         PLANE           PLANE
           FACTOR     WALL TOE    ANGLE  LENGTH   ANGLE  LENGTH
                        (ft)      (deg)   (ft)    (deg)   (ft)

NODE 7
     1.696        21.9       30.2   10.1     42.2   17.7

  Reinf. Stress at Level  1 =  10.246 Ksi (Pullout controls...)
                          2 =  23.260 Ksi (Pullout controls...)
                          3 =  28.817 Ksi (Pullout controls...)

           MINIMUM    DISTANCE    LOWER FAILURE   UPPER FAILURE
           SAFETY      BEHIND         PLANE           PLANE
           FACTOR     WALL TOE    ANGLE  LENGTH   ANGLE  LENGTH
                        (ft)      (deg)   (ft)    (deg)   (ft)

NODE 8
     1.735        24.6       27.4   11.1     38.9   19.0

  Reinf. Stress at Level  1 =   5.862 Ksi (Pullout controls...)
                          2 =  19.385 Ksi (Pullout controls...)
                          3 =  26.792 Ksi (Pullout controls...)

           MINIMUM    DISTANCE    LOWER FAILURE   UPPER FAILURE
           SAFETY      BEHIND         PLANE           PLANE
           FACTOR     WALL TOE    ANGLE  LENGTH   ANGLE  LENGTH
                        (ft)      (deg)   (ft)    (deg)   (ft)

NODE 9
     1.782        27.3       25.0   12.1     36.0   20.2

  Reinf. Stress at Level  1 =   1.931 Ksi (Pullout controls...)
                          2 =  15.786 Ksi (Pullout controls...)
                          3 =  24.841 Ksi (Pullout controls...)

           MINIMUM    DISTANCE    LOWER FAILURE   UPPER FAILURE
           SAFETY      BEHIND         PLANE           PLANE
           FACTOR     WALL TOE    ANGLE  LENGTH   ANGLE  LENGTH
                        (ft)      (deg)   (ft)    (deg)   (ft)

NODE10
     1.836        30.0       29.5   34.5     89.9    0.0

  Reinf. Stress at Level  1 =   3.244 Ksi (Pullout controls...)
                          2 =  19.104 Ksi (Pullout controls...)
                          3 =  26.313 Ksi (Pullout controls...)


      ****************************************************************
      *                For Factor of Safety = 1.0                    *
      *         Maximum Average Reinforcement Working Force:         *
      *                     12.799 Kips/level                        *
      ****************************************************************
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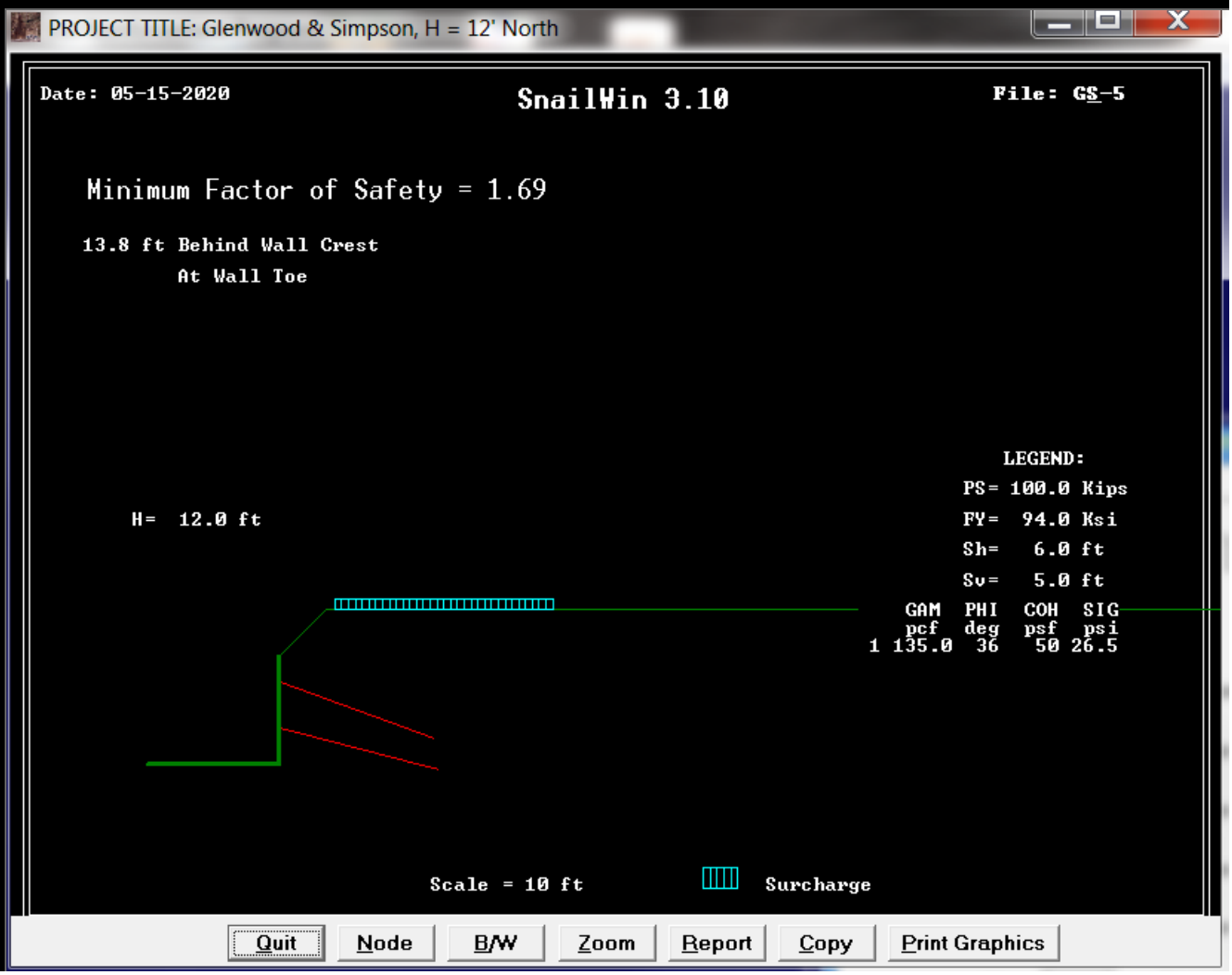
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Date: 05-15-2020
SnailWin 3.10
File: GS-5
Minimum Factor of Safety = 1.69
13.8 ft Behind Wall Crest
At Wall Toe
LEGEND:
PS= 100.0 Kips
FY= 94.0 Ksi
Sh= 6.0 ft
Sv= 5.0 ft
H= 12.0 ft
GAM PHI COH SIG
pcf deg psf psi
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               *          ENGINEERING SERVICE CENTER          *
               *     DIVISION OF MATERIALS AND FOUNDATIONS    *
               *   Office of Roadway Geotechnical Engineering *
               *    Date: 05-15-2020          Time: 08:19:22  *
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Project Identification - Glenwood & Simpson, H = 12' North

--------- WALL GEOMETRY ---------

Vertical Wall Height	=	12.0 ft	
Wall Batter	=	0.0 degree	
		Angle (Deg)	Length (Feet)
First Slope from Wallcrest.	=	45.0	7.1
Second Slope from 1st slope.	=	0.0	30.0
Third Slope from 2nd slope.	=	0.0	0.0
Fourth Slope from 3rd slope.	=	0.0	0.0
Fifth Slope from 3rd slope.	=	0.0	0.0
Sixth Slope from 3rd slope.	=	0.0	0.0
Seventh Slope Angle.	=	0.0	

--------- SLOPE BELOW THE WALL ---------

There is NO SLOPE BELOW THE TOE of the wall

--------- SURCHARGE ---------

THE SURCHARGES IMPOSED ON THE SYSTEM ARE:

Begin Surcharge - Distance from toe	=	6.0 ft
End Surcharge - Distance from toe	=	30.0 ft
Loading Intensity - Begin	=	250.0 psf/ft
Loading Intensity - End	=	250.0 psf/ft

--------- OPTION #1 ---------

Ultimate Punching shear, Bond & Yield Stress are used.

--------- SOIL PARAMETERS ---------

Soil Layer	Unit Weight (Pcf)	Friction Angle (Degree)	Cohesion Intercept (Psf)	Bond* Stress (Psi)	Coordinates of Boundary XS1 (ft)	YS1 (ft)	XS2 (ft)	YS2 (ft)
1	135.0	36.0	50.0	26.5	0.0	0.0	0.0	0.0

* Ultimate bond Stress values also depend on BSF (Bond Stress Factor.)

--------- WATER SURFACE ---------

NO Water Table defined for this problem.

--------- SEARCH LIMIT ---------

The Search Limit is from 3.0 to 30.0 ft

You have chosen NOT TO LIMIT the search of failure planes to specific nodes.

--------- REINFORCEMENT PARAMETERS ---------

Number of Reinforcement Levels	=	2
Horizontal Spacing	=	6.0 ft
Yield Stress of Reinforcement	=	94.0 ksi
Diameter of Grouted Hole	=	4.0 in
Punching Shear	=	100.0 kips

---------- (Varying Reinforcement Parameters) ---------

Level	Length (ft)	Inclination (degrees)	Vertical Spacing (ft)	Bar Diameter (in)	Bond Stress Factor
1	18.0	20.0	3.0	0.92	1.00
2	18.0	15.0	5.0	0.92	1.00

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
Toe	2.012	5.7	60.8	5.8	76.5	12.3

Reinf. Stress at Level 1 = 42.728 Ksi (Pullout controls...)
2 = 46.729 Ksi (Yield Stress controls.)

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 2						
	1.764	8.4	26.9	3.8	71.8	16.1

Reinf. Stress at Level 1 = 42.689 Ksi (Pullout controls...)
2 = 48.004 Ksi (Pullout controls...)

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 3						
	1.692	11.1	27.1	3.7	63.1	17.2

Reinf. Stress at Level 1 = 41.496 Ksi (Pullout controls...)
2 = 49.379 Ksi (Pullout controls...)

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 4						
	1.690	13.8	22.3	4.5	57.8	18.1

Reinf. Stress at Level 1 = 37.118 Ksi (Pullout controls...)
2 = 46.427 Ksi (Pullout controls...)

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 5						
	1.707	16.5	27.3	3.7	49.2	20.2

Reinf. Stress at Level 1 = 36.037 Ksi (Pullout controls...)
2 = 47.754 Ksi (Pullout controls...)

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 6						
	1.745	19.2	23.9	4.2	44.9	21.7

Reinf. Stress at Level 1 = 32.044 Ksi (Pullout controls...)
2 = 44.740 Ksi (Pullout controls...)

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)

NODE 7

1.798	21.9	21.2	4.7	41.2	23.3	

Reinf. Stress at Level 1 = 28.214 Ksi (Pullout controls...)
2 = 41.620 Ksi (Pullout controls...)

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)

NODE 8

1.862	24.6	19.1	5.2	37.9	24.9	

Reinf. Stress at Level 1 = 24.645 Ksi (Pullout controls...)
2 = 38.537 Ksi (Pullout controls...)

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)

NODE 9

1.934	27.3	17.3	5.7	35.0	26.7	

Reinf. Stress at Level 1 = 21.401 Ksi (Pullout controls...)
2 = 35.609 Ksi (Pullout controls...)

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)

NODE10

2.012	30.0	15.8	6.2	32.5	28.5	

Reinf. Stress at Level 1 = 18.475 Ksi (Pullout controls...)
2 = 32.859 Ksi (Pullout controls...)

****
* For Factor of Safety = 1.0 *
* Maximum Average Reinforcement Working Force: *
* 13.918 Kips/level *
****

PROJECT TITLE: Glenwood & Simpson, H = 10' West

Date: 05-15-2020

SnailWin 3.10

File: GS-11

Minimum Factor of Safety = 1.87

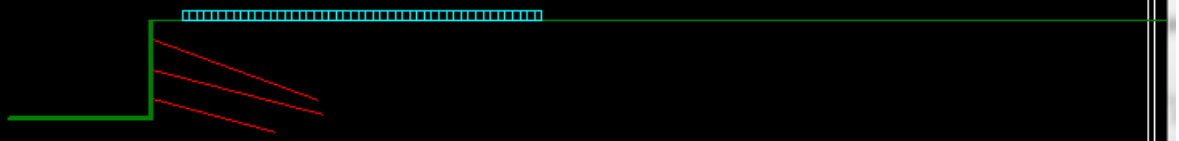
8.4 ft Behind Wall Crest
At Wall Toe

H= 10.0 ft

LEGEND:

PS= 100.0 Kips
FY= 94.0 Ksi
Sh= 8.0 ft
Sv= 3.0 ft

GAM	PHI	COH	SIG
pcf	deg	psf	psi



Scale = 10 ft

Surcharge

Quit | Node | B/W | Zoom | Report | Copy | Print Graphics

```
*************************************************
*    CALIFORNIA DEPARTMENT OF TRANSPORTATION    *
*          ENGINEERING SERVICE CENTER           *
*     DIVISION OF MATERIALS AND FOUNDATIONS     *
*   Office of Roadway Geotechnical Engineering  *
*    Date: 05-15-2020          Time: 07:58:05   *
*************************************************
```

Project Identification - Glenwood & Simpson, H = 10' West

--------- WALL GEOMETRY ---------

Vertical Wall Height = 10.0 ft
Wall Batter = 0.0 degree

	Angle (Deg)	Length (Feet)
First Slope from Wallcrest.	0.0	120.0
Second Slope from 1st slope.	0.0	0.0
Third Slope from 2nd slope.	0.0	0.0
Fourth Slope from 3rd slope.	0.0	0.0
Fifth Slope from 3rd slope.	0.0	0.0
Sixth Slope from 3rd slope.	0.0	0.0
Seventh Slope Angle.	0.0	

--------- SLOPE BELOW THE WALL ---------

There is NO SLOPE BELOW THE TOE of the wall

--------- SURCHARGE ---------

THE SURCHARGES IMPOSED ON THE SYSTEM ARE:

Begin Surcharge - Distance from toe = 3.0 ft
End Surcharge - Distance from toe = 40.0 ft
Loading Intensity - Begin = 1263.0 psf/ft
Loading Intensity - End = 1263.0 psf/ft

--------- OPTION #1 ---------

Ultimate Punching shear, Bond & Yield Stress are used.

--------- SOIL PARAMETERS ---------

Soil Layer	Unit Weight (Pcf)	Friction Angle (Degree)	Cohesion Intercept (Psf)	Bond* Stress (Psi)	Coordinates of Boundary XS1 (ft)	YS1 (ft)	XS2 (ft)	YS2 (ft)
1	135.0	36.0	50.0	26.5	0.0	0.0	0.0	0.0

* Ultimate bond Stress values also depend on BSF (Bond Stress Factor.)

--------- WATER SURFACE ---------

NO Water Table defined for this problem.

--------- SEARCH LIMIT ---------

The Search Limit is from 3.0 to 30.0 ft

You have chosen NOT TO LIMIT the search of failure planes to specific nodes.

--------- REINFORCEMENT PARAMETERS ---------

Number of Reinforcement Levels	=	3
Horizontal Spacing	=	8.0 ft
Yield Stress of Reinforcement	=	94.0 ksi
Diameter of Grouted Hole	=	4.0 in
Punching Shear	=	100.0 kips

---------- (Varying Reinforcement Parameters) ---------

Level	Length (ft)	Inclination (degrees)	Vertical Spacing (ft)	Bar Diameter (in)	Bond Stress Factor
1	18.0	20.0	2.0	0.92	1.00
2	18.0	15.0	3.0	0.92	1.00
3	13.0	15.0	3.0	0.92	1.00

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
Toe	1.937	5.7	19.3	3.0	72.4	9.4

Reinf. Stress at Level 1 = 40.848 Ksi (Pullout controls...)
2 = 43.659 Ksi (Pullout controls...)
3 = 30.959 Ksi (Pullout controls...)

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 2	1.870	8.4	16.6	3.5	60.8	10.3

Reinf. Stress at Level 1 = 37.176 Ksi (Pullout controls...)
2 = 41.659 Ksi (Pullout controls...)
3 = 30.447 Ksi (Pullout controls...)

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 3	1.904	11.1	16.7	3.5	49.2	11.9

Reinf. Stress at Level 1 = 32.874 Ksi (Pullout controls...)
2 = 38.832 Ksi (Pullout controls...)
3 = 29.919 Ksi (Pullout controls...)

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 4	2.025	13.8	19.9	2.9	39.2	14.2

Reinf. Stress at Level 1 = 28.651 Ksi (Pullout controls...)
2 = 35.698 Ksi (Pullout controls...)
3 = 29.368 Ksi (Pullout controls...)

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 5	2.120	16.5	16.9	3.4	34.3	16.0

Reinf. Stress at Level 1 = 24.351 Ksi (Pullout controls...)
2 = 31.724 Ksi (Pullout controls...)
3 = 26.818 Ksi (Pullout controls...)

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 6	2.307	19.2	14.6	7.9	34.8	14.0

Reinf. Stress at Level 1 = 17.210 Ksi (Pullout controls...)
2 = 23.543 Ksi (Pullout controls...)
3 = 23.662 Ksi (Pullout controls...)

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 7						
	2.443	21.9	16.9	6.9	27.6	17.3

Reinf. Stress at Level 1 = 16.420 Ksi (Pullout controls...)
2 = 23.556 Ksi (Pullout controls...)
3 = 23.086 Ksi (Pullout controls...)

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 8						
	2.589	24.6	15.2	7.6	24.9	19.0

Reinf. Stress at Level 1 = 13.676 Ksi (Pullout controls...)
2 = 20.698 Ksi (Pullout controls...)
3 = 21.264 Ksi (Pullout controls...)

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 9						
	2.743	27.3	13.7	8.4	22.7	20.7

Reinf. Stress at Level 1 = 11.351 Ksi (Pullout controls...)
2 = 18.206 Ksi (Pullout controls...)
3 = 19.632 Ksi (Pullout controls...)

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE10						
	2.902	30.0	6.3	9.1	23.2	22.8

Reinf. Stress at Level 1 = 7.087 Ksi (Pullout controls...)
2 = 13.093 Ksi (Pullout controls...)
3 = 15.611 Ksi (Pullout controls...)

****
* For Factor of Safety = 1.0 *
* Maximum Average Reinforcement Working Force: *
* 9.519 Kips/level *
****

Project :	**Glenwood & Simpson Mixed Use**
Location :	**175 S Glenwood St, Jackson, WY**
Job Number :	**223-017-20**
Date :	**5/14/20**
Case :	**Max Soil Nail Loading**

Gordon Geotechnical Engineering, Inc
4426 South Century Drive, Suite 100
Salt Lake City, Utah 84123
801-327-9600

Shotcrete Evaluation

LOADS

Maximum Static Nail Load		16	kips
Maximum Seismic Nail Load		0	kips
Static Nail Head Load		12.3	kips
Seismic Nail Head Load		0.0	kips

NAIL SPACING

Horizontal nail spacing	S_H	6	ft
Vertical nail spacing	S_V	5	ft

SHOTCRETE & REINFORCING

Shotcrete overall thickness	h	0.333	ft	4-inches
Concrete compressive strength	f'c	4000	psi	
Reinforcing yield strength	f_y	60	ksi	
Wire Mesh Reinforcing		0.12	in^2/ft	(double 6x6-W2.9xW2.9)
Vertical Walers		0.4	in^2	2 #4 bars
Horizontal Walers		0.4	in^2	2 #4 bars

Plate

Square Plate Width	Lbp	8	in
Plate Thickness	tp	0.5	in

FACTORS

Soil pressure factor (Table 5.1)	C_F	2

Table 5.1: Factors C_F.

Type of Structure	Nominal Facing Thickness mm (in.)	Factor C_F
Temporary	100 (4)	2.0
	150 (6)	1.5
	200 (8)	1.0
Permanent	All	1.0

Punching shear correction	Cp	1

FLEXURAL

STATIC

R_{FFv}=	55.9 kips	F.S. =	4.5	> 1.50 = OK
R_{FFh}=	40.5 kips	F.S. =	3.3	> 1.50 = OK

SEISMIC

F.S. =	#DIV/0!	#DIV/0!	
F.S. =	#DIV/0!	#DIV/0!	

REINFORCING RATIO

Horizontal reinforcing, middle	a_{hm}	0.120	in^2/ft
Horizontal reinforcing, nail head	a_{hn}	0.200	in^2/ft
Vertical reinforcing, middle	a_{vm}	0.120	in^2/ft
Vertical reinforcing, nail head	a_{vn}	0.187	in^2/ft

Minimum Ratio =	0.253	percent
Maximum Ratio =	2	percent

Allowable

As_{Max} =	0.480	in^2/ft	
As_{Min} =	0.061	in^2/ft	

Actual

As_{Max} =	0.200	in^2/ft	OK	[0.83 percent]
As_{Min} =	0.120	in^2/ft	OK	[0.5 percent]
Rn/Rm_H =	1.7		OK	
Rn/Rm_V =	1.56		OK	

PUNCHING SHEAR

D'c =	12.00	in		
hc =	4.00	in	STATIC	
R_{Fp} =	38.40	kips	F.S. =	3.1 > 1.50 = OK

SEISMIC

F.S. =	#DIV/0!	#DIV/0!

ACI PUNCHING SHEAR

STATIC

Equation 11-37	30.4	kips	Nail Load	12.3 OK

SEISMIC

34.7	Nail Load	0.0	OK

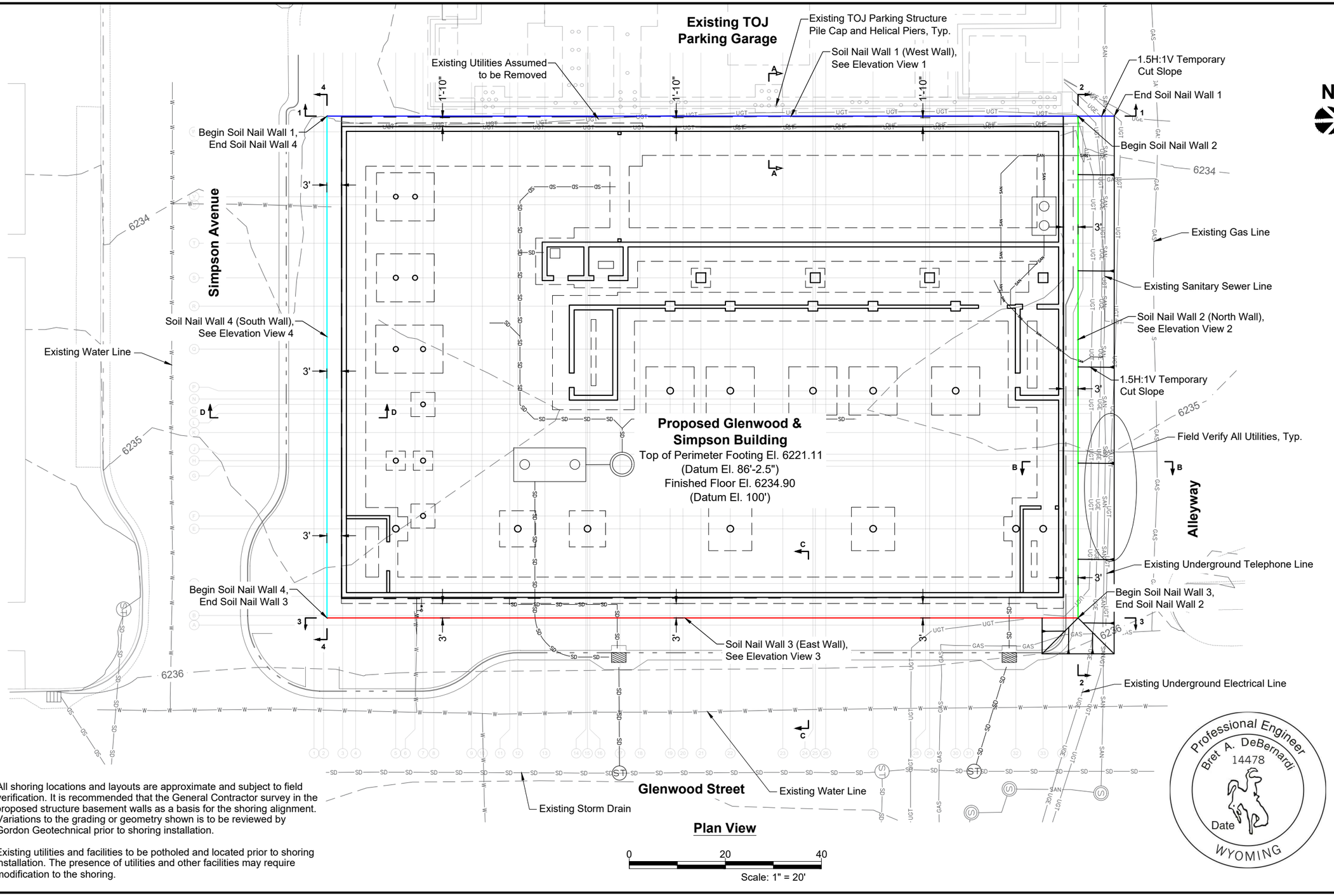
LRFD Checks

Facing Flexure

Strength Limit State 1, ϕ_{FF}	0.9	(Vertical) CDR =	3.02	> 1.0 = OK
Strength Limit State 1, γ_{FF}	1.35	(Horizontal) CDR =	2.19	> 1.0 = OK
Extreme Event Limit State 1, ϕ_{FF}	0.9	(Vertical) CDR =	#DIV/0!	#DIV/0!
Extreme Event Limit State 1, γ_{FF}	1.0	(Horizontal) CDR =	#DIV/0!	#DIV/0!

Punching Shear

Strength Limit State 1, ϕ_{FF}	0.9	CDR =	2.08	> 1.0 = OK
Strength Limit State 1, γ_{FF}	1.35			
Extreme Event Limit State 1, ϕ_{FF}	0.9	CDR =	#DIV/0!	#DIV/0!
Extreme Event Limit State 1, γ_{FF}	1.0			



Plan View

0 20 40

Scale: 1" = 20'

Notes:

1) All shoring locations and layouts are approximate and subject to field verification. It is recommended that the General Contractor survey in the proposed structure basement walls as a basis for the shoring alignment. Variations to the grading or geometry shown is to be reviewed by Gordon Geotechnical prior to shoring installation.

2) Existing utilities and facilities to be potholed and located prior to shoring installation. The presence of utilities and other facilities may require modification to the shoring.

Professional Engineer
Bret A. DeBernardi
14478
Date
WYOMING

REFERENCE:
Y2 Consultants, Art's District Development, LLC., Glenwood & Simpson Mixed Use Buildings Permit RESP. Rev.1, Basement Plan C2.2, Project Code/No.: 17429, Dated 01/13/2020

Harger Architects, Y2 Consulting, Engineering System Solutions, Glenwood + Simpson Mixed Use Building, Foundation Plan S100, Dated 01/10/2020

DATE	DESCRIPTION
05.15.20	Submitted for Review

DESIGNED FOR:
G2B Company Inc.
PO Box 3402, Nampa, Idaho

DESIGNED BY:
GORDON GEOTECHNICAL ENGINEERING, INC.
4426 South Century Drive, Ste 100, Salt Lake City, UT 84123
801-327-9600

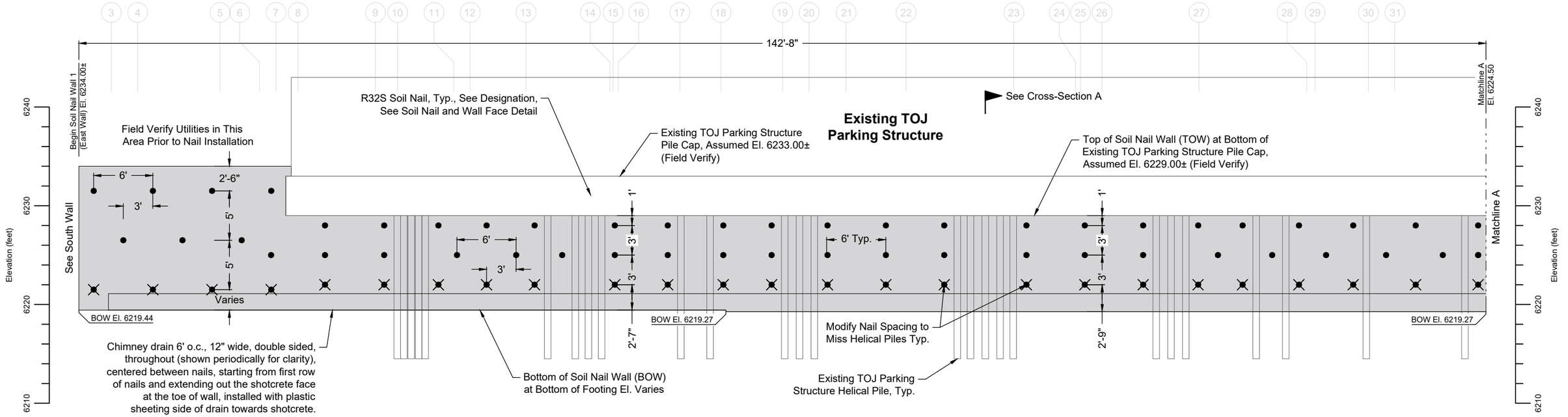
Glenwood & Simpson Mixed Use
175 South Glenwood Street,
Jackson, Wyoming

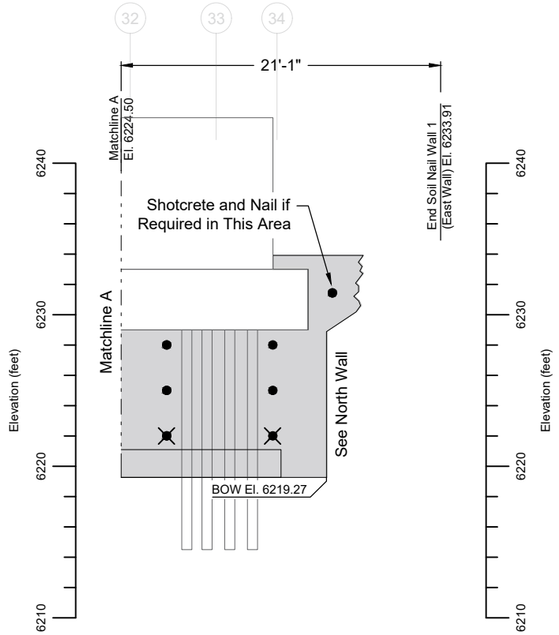
DESIGN BY: **BD** DRAWN BY: **TT** CHECKED BY: **BD** APPROVED BY: **BD**

Temporary Soil Nail Walls
Plan View

G² PROJECT NO.: **223-017-20**

SHEET NO.: **1 of 8**





Soil Nail Key	
●	R32S Hollow Bar Soil Nails, 18' Long, Typ.
✱	R32S Hollow Bar Soil Nails, 13' Long, Typ.

Elevation View 1 (West Wall)

0 10 20

Scale: 1" = 10'

Approximately 1,051 Square Face Feet of Soil Nail Wall 1 (West Wall) Installed

Note: Nail layout is approximate subject to field verification, typical horizontal spacing is 6' on center., however up to 8' may be used to span zones of numerous helical piers. The use of 8' horizontal spacing should be minimized.

*** The record drawings indicate that the east wall of the parking structure is supported on helical piers. The layout shown is based on the drawings, however there are no as-builts or deferred submittal indicating layout or installation depth. It has been assumed that the piers have been installed to depth below the base of the excavation and will not impose loading on the shoring.**

Professional Engineer
Bret A. DeBernardi
14478
Date
WYOMING

REFERENCE:

DATE	DESCRIPTION
05.15.20	Submitted for Review

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801-327-9600

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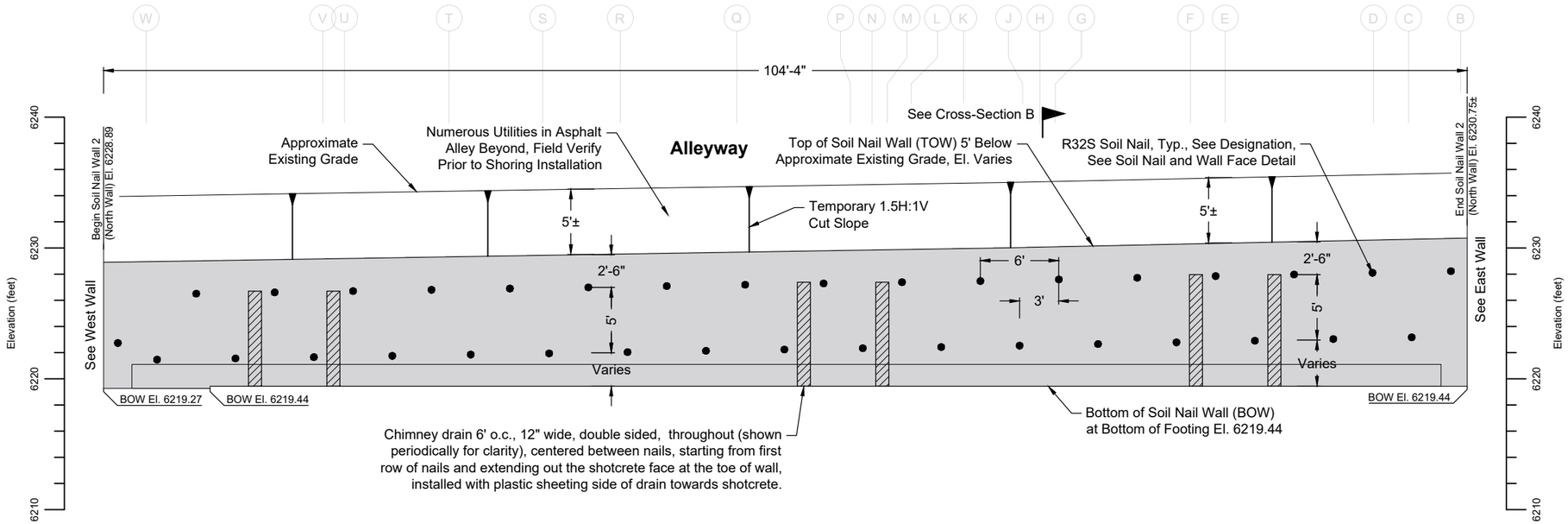
175 South Glenwood Street,
Jackson, Wyoming

DESIGN BY: **BD** DRAWN BY: **TT** CHECKED BY: **BD** APPROVED BY: **BD**

Temporary Soil Nail Walls
Elevation View 1 (West Wall)

G² PROJECT NO.: **223-017-20**

SHEET NO.: **2 of 8**



Soil Nail Key
● R32S Hollow Bar Soil Nails, 18' Long, Typ.

Elevation View 2 (North Wall)

0 10 20

Scale: 1" = 10'

Approximately 1,086 Square Face Feet of Soil Nail Wall 2 (North Wall) Installed

REFERENCE:

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05.15.20	Submitted for Review

DESIGNED FOR:

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PO Box 3402, Nampa, Idaho

DESIGNED BY:

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4426 South Century Drive, Ste 100, Salt Lake City, UT 84123
801-327-9600

Glenwood & Simpson Mixed Use
175 South Glenwood Street,
Jackson, Wyoming

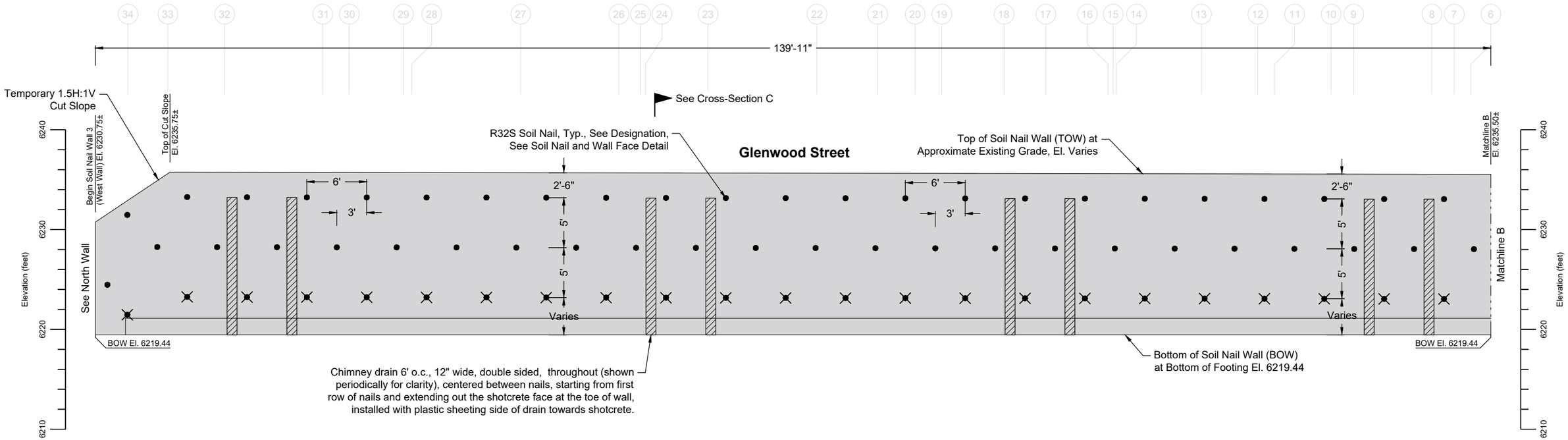
DESIGN BY: **BD** DRAWN BY: **TT** CHECKED BY: **BD** APPROVED BY: **BD**

Temporary Soil Nail Walls

Elevation View 2 (North Wall)

G² PROJECT NO.: **223-017-20**

SHEET NO.: **3 of 8**



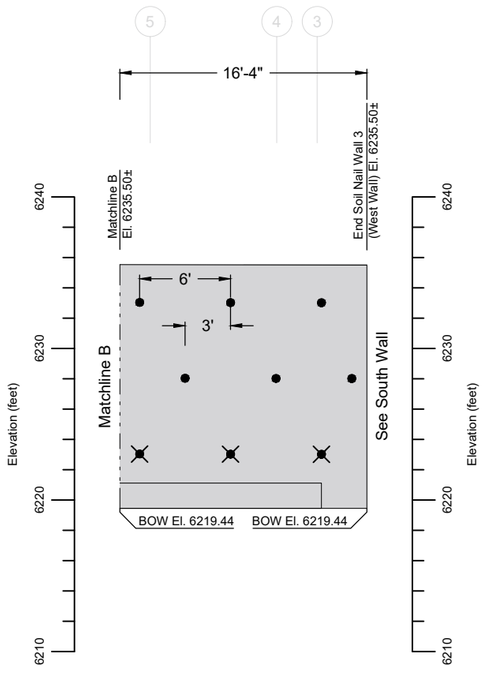
Soil Nail Key	
●	R32S Hollow Bar Soil Nails, 18' Long, Typ.
✕	R32S Hollow Bar Soil Nails, 13' Long, Typ.

Elevation View 3 (East Wall)

0 10 20

Scale: 1" = 10'

Approximately 2,510 Square Face Feet of Soil Nail Wall 3 (East Wall) Installed



Professional Engineer
Bret A. DeBernardi
14478
Date
WYOMING

REFERENCE:

DATE	DESCRIPTION
05.15.20	Submitted for Review

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PO Box 3402, Nampa, Idaho

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4426 South Century Drive, Ste 100, Salt Lake City, UT 84123
801-327-9600

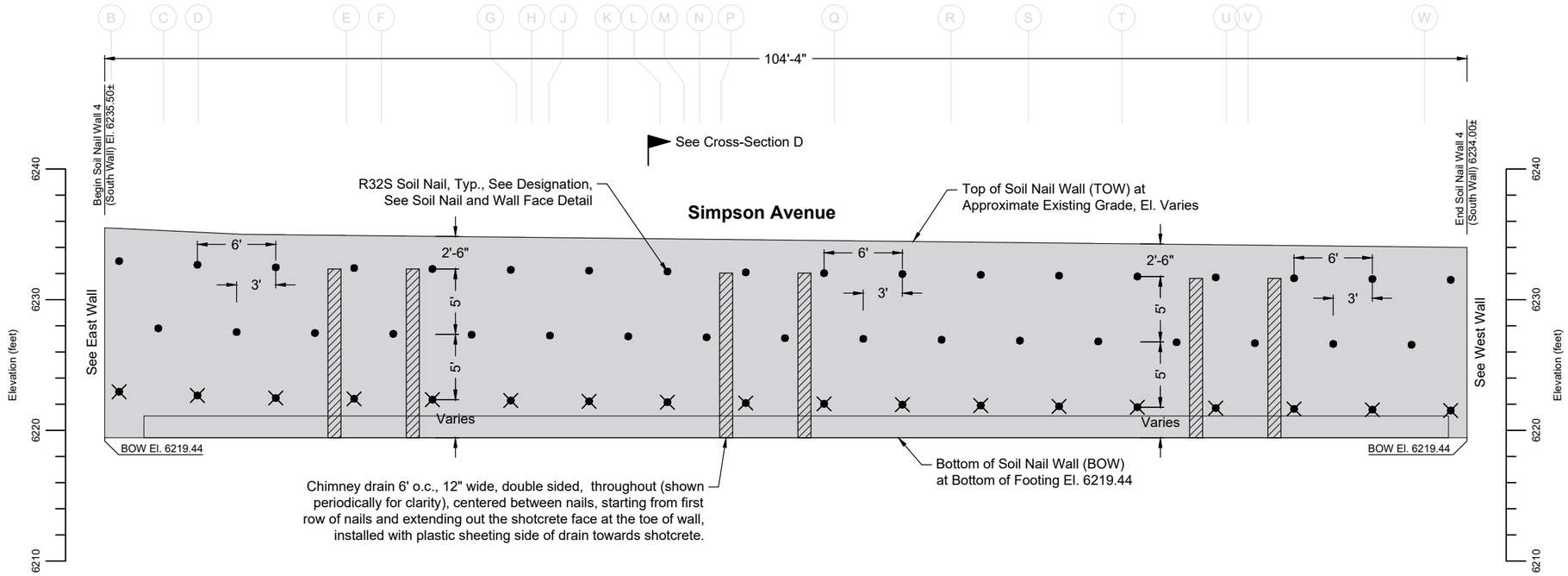
Glenwood & Simpson Mixed Use
175 South Glenwood Street,
Jackson, Wyoming

DESIGN BY: **BD** DRAWN BY: **TT** CHECKED BY: **BD** APPROVED BY: **BD**

Temporary Soil Nail Walls
Elevation View 3 (East Wall)

G² PROJECT NO.: **223-017-20**

SHEET NO.: **4 of 8**



Soil Nail Key	
●	R32S Hollow Bar Soil Nails, 18' Long, Typ.
✕	R32S Hollow Bar Soil Nails, 13' Long, Typ.

Elevation View 4 (South Wall)

0 10 20

Scale: 1" = 10'

Approximately 1,580 Square Face Feet of Soil Nail Wall 4 (South Wall) Installed

Professional Engineer
Bret A. DeBernardi
14478
Date
WYOMING

REFERENCE:

DATE	DESCRIPTION
05.15.20	Submitted for Review

DESIGNED FOR:
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PO Box 3402, Nampa, Idaho

DESIGNED BY:
GORDON GEOTECHNICAL ENGINEERING, INC.
4426 South Century Drive, Ste 100, Salt Lake City, UT 84123
801-327-9600

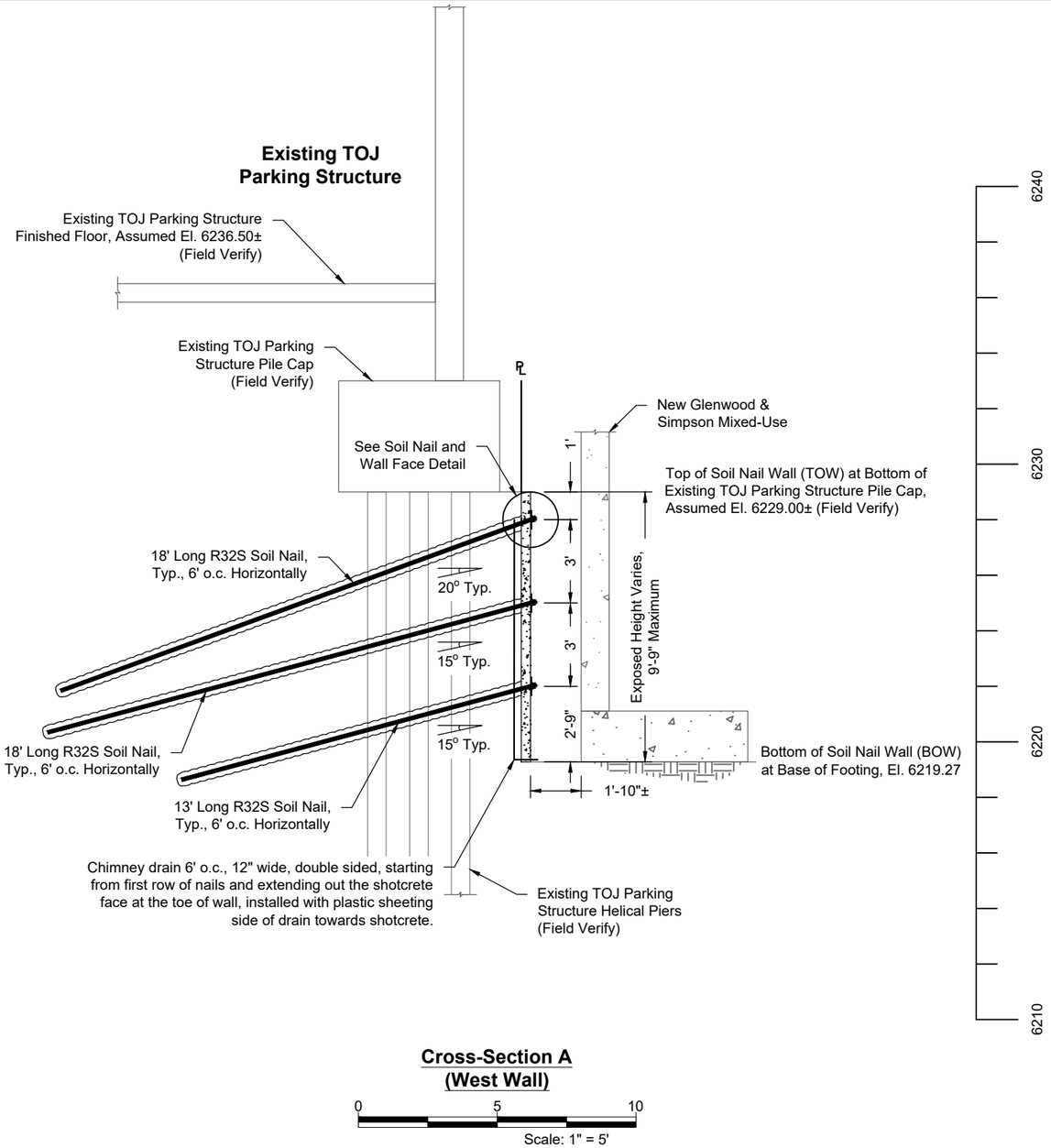
Glenwood & Simpson Mixed Use
175 South Glenwood Street,
Jackson, Wyoming

DESIGN BY: **BD** DRAWN BY: **TT** CHECKED BY: **BD** APPROVED BY: **BD**

Temporary Soil Nail Walls
Elevation View 4 (South Wall)

G² PROJECT NO.: **223-017-20**

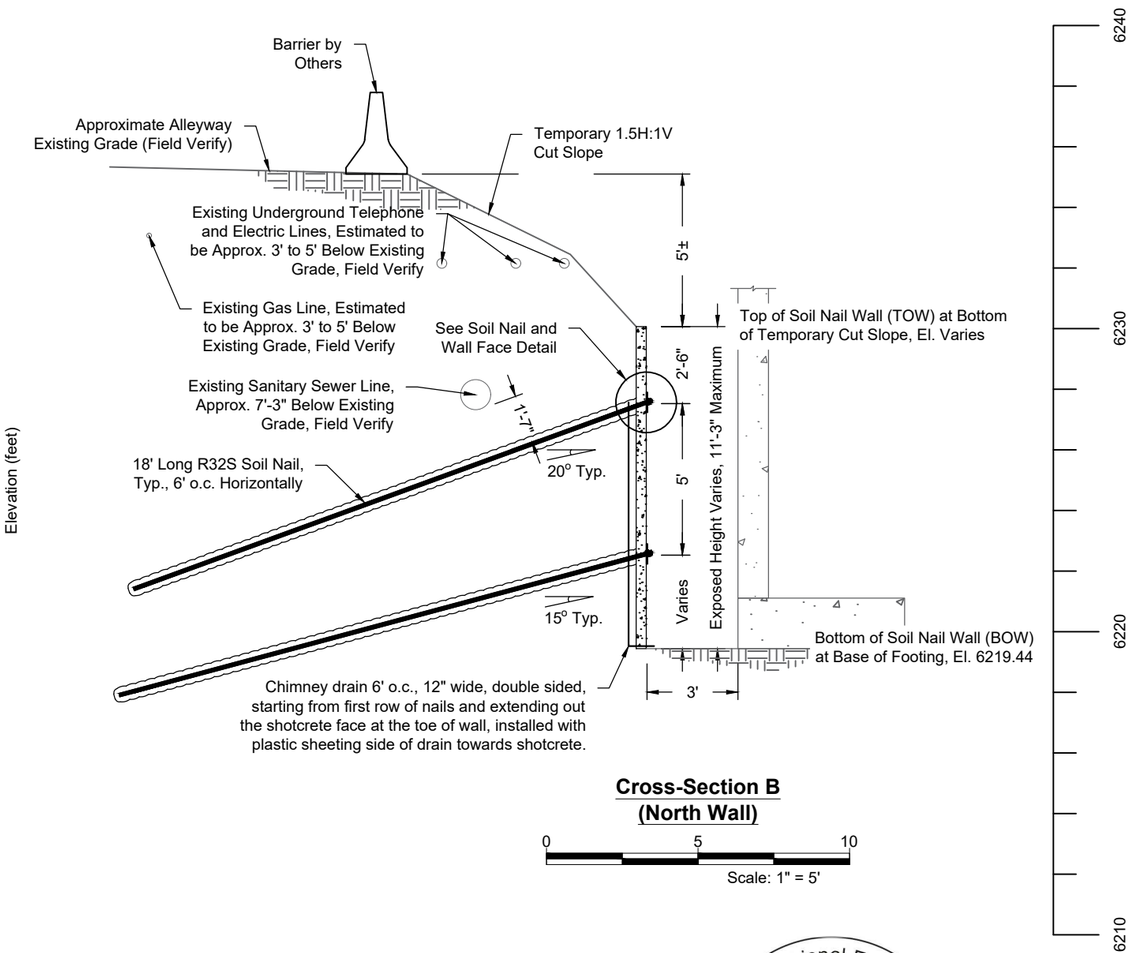
SHEET NO.: **5 of 8**



Cross-Section A
(West Wall)

0 5 10

Scale: 1" = 5'



Cross-Section B
(North Wall)

0 5 10

Scale: 1" = 5'

Professional Engineer
Bret A. DeBernardi
14478
Date
WYOMING

REFERENCE:

DATE	DESCRIPTION
05.15.20	Submitted for Review

DESIGNED FOR:

G2B Company Inc.
PO Box 3402, Nampa, Idaho

DESIGNED BY:

GORDON GEOTECHNICAL ENGINEERING, INC.
4426 South Century Drive, Ste 100, Salt Lake City, UT 84123
801-327-9600

Glenwood & Simpson Mixed Use
175 South Glenwood Street,
Jackson, Wyoming

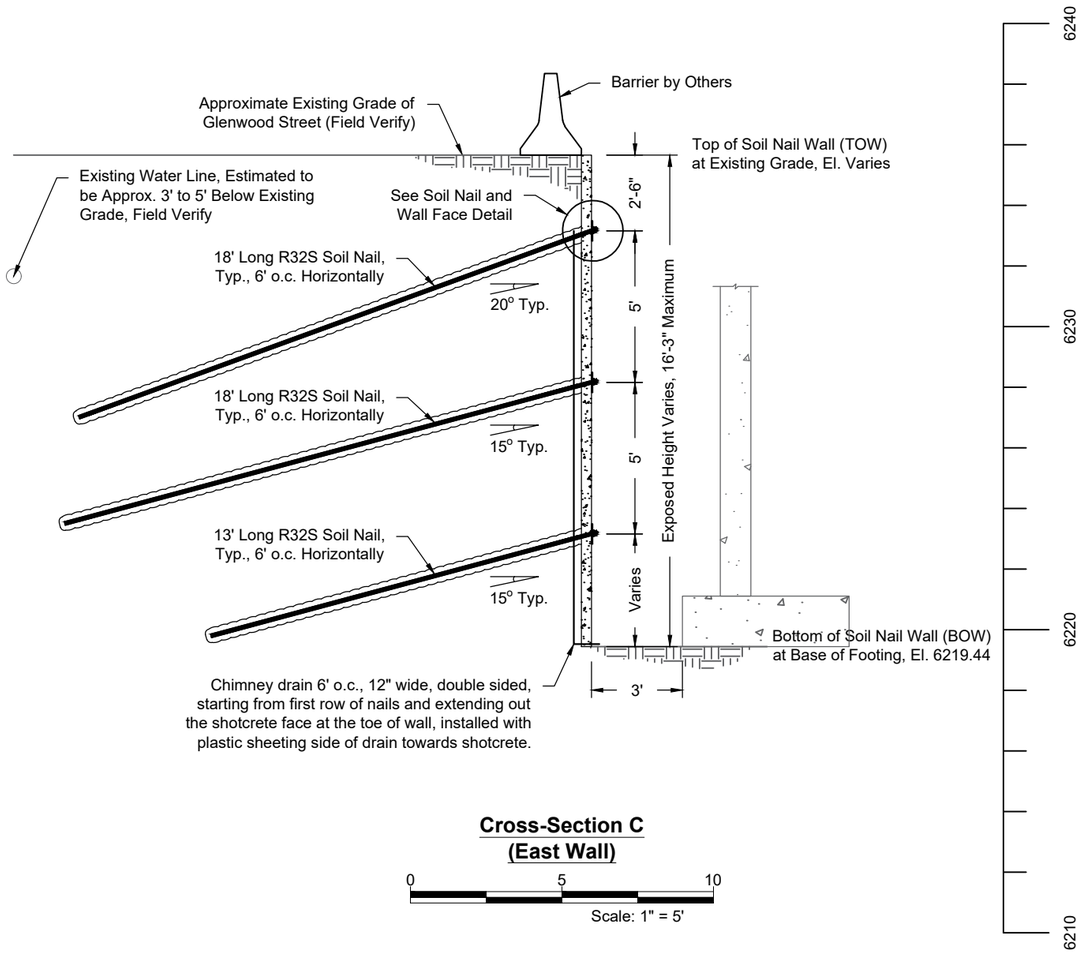
DESIGN BY: **BD** DRAWN BY: **TT** CHECKED BY: **BD** APPROVED BY: **BD**

Temporary Soil Nail Walls

Cross-Section A (West Wall) and Cross-Section B (North Wall)

G² PROJECT NO.:
223-017-20

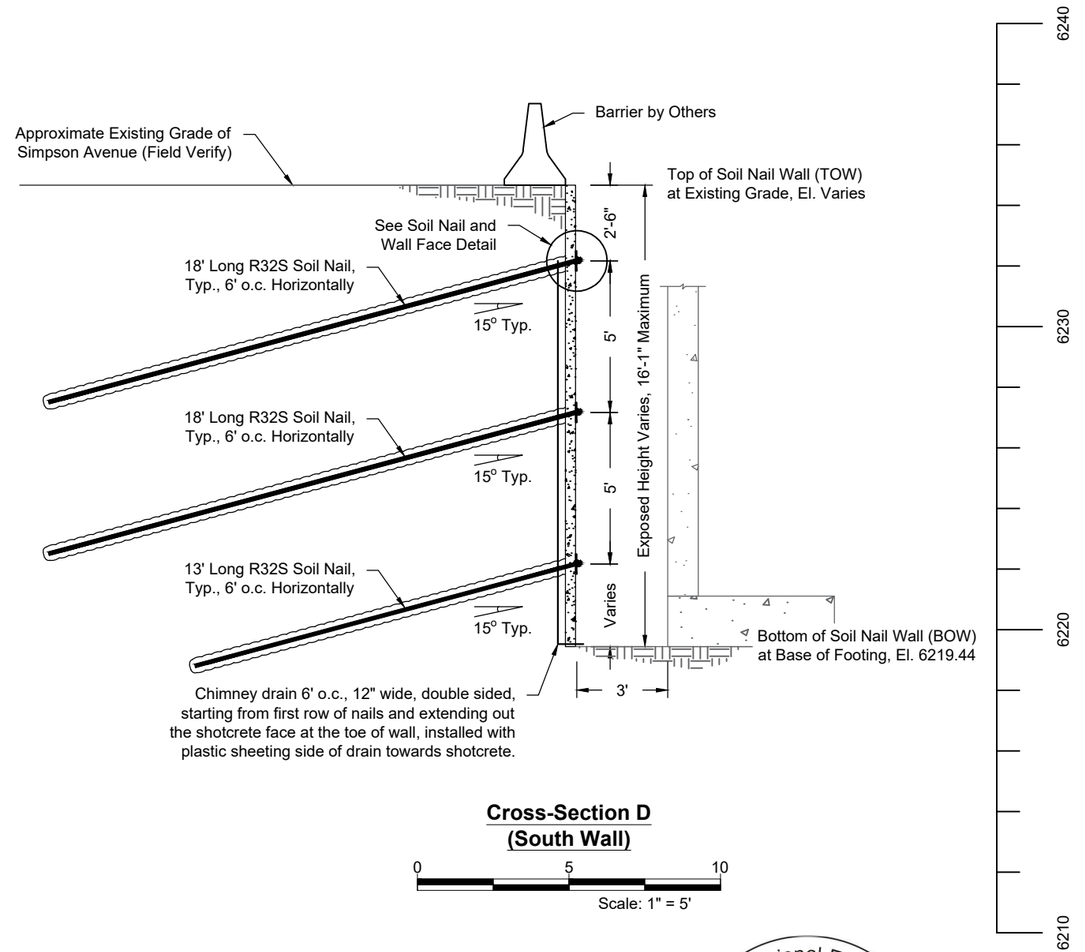
SHEET NO.:
6 of 8



Cross-Section C (East Wall)

0 5 10

Scale: 1" = 5'



Cross-Section D (South Wall)

0 5 10

Scale: 1" = 5'

REFERENCE:

DATE	DESCRIPTION
05.15.20	Submitted for Review

DESIGNED FOR:

G2B Company Inc.
PO Box 3402, Nampa, Idaho

DESIGNED BY:

GORDON GEOTECHNICAL ENGINEERING, INC.
4426 South Century Drive, Ste 100, Salt Lake City, UT 84123
801-327-9600

Glenwood & Simpson Mixed Use
175 South Glenwood Street,
Jackson, Wyoming

DESIGN BY: **BD** DRAWN BY: **TT** CHECKED BY: **BD** APPROVED BY: **BD**

Temporary Soil Nail Walls

Cross-Section C (East Wall) and Cross-Section D (South Wall)

G² PROJECT NO.: **223-017-20**

SHEET NO.: **7 of 8**

General Notes

Introduction

1. Preliminary shoring layout and design are based upon the following documents and information:

   a. Project Drawings entitled "Record Set, Town of Jackson Parking Garage, 160 South Millward Street, Jackson, Wyoming Bid Documents," by Highland Associates, dated March 30, 2007.

   b. Project Drawings entitled "Glenwood + Simpson Mixed Use Building (Phase II of the Millward + Simpson PMD)," by Harger Architects, dated January 10, 2020 (Permit Review Response Set).

   c. "Geotechnical Review, Lot at Simpson and Glenwood, Jackson, Wyoming," by Womack & Associates, Inc., dated June 30, 2008.

   d. General shoring arrangement by Contractor.

2. The soil nail walls are to be installed to the approximate lines and grades indicated in these drawings subject to field verification. Layout and limits of the walls to be determined in the field by General Contractor in keeping with the intent and overall objectives of these plans. It is recommended that the new footings be surveyed in to provide the basis for the shoring layout. Utilities and existing parking structure footings to be potholed and field verified prior to soil nail wall installation. Gordon Geotechnical Engineering Inc. (G^2) to be notified immediately of potential conflicts with the shoring layout as shown. G^2 assumes no responsibility for damage to utilities or other structures. Shoring location and geometry is approximate, subject to field verification.

3. Contractor is responsible for construction of the shoring as detailed on these plans. Variations from the layouts and details as shown hereon may not be made except with the express written consent of the design engineer (G^2). Changes made in the field made without this consent shall be done solely at the risk of the contractor. Conflicts between these plans and the general project plans to be resolved by Gordon Geotechnical Engineering Inc., whose decision shall be final. No warranty is expressed or implied, only that these designs were prepared in general accordance with design principles in use at the time this work was performed.

Soil Nail Wall Materials

1. Soil Nails to be DSI hollow core anchors as designated on these plans equipped with 3-inch nominal bit size. All bars shall be free of mill scale and rust at the time of installation.

2. Grout for soil nails to be Portland Cement Type I-II with a 28-day compressive strength of 3,000 psi. Mix to occur on-site and shall have the lowest practical water content for pumping (water to cement ratio of 0.4 to 0.5). Mix and installation to conform to all applicable ACI specifications.

3. All plate steel to be A36 mild steel or better, and shall be detailed according to AISC Standards.

4. Shotcrete layers for facing shall consist of an approved, pumpable mix having a 28 day strength of 4000 psi using Type I-II Portland Cement. Shotcrete shall be mixed and placed in accordance with applicable ACI specifications.

5. Welded Wire Mesh to conform to ASTM A 82 and A 185. Minimum wire mesh overlap is 12 inches.

6. Rebar to have a yield strength of 60 ksi. Minimum No. 4 rebar overlap is 37 inches.

Soil Nail Wall Installation

1. The face of the excavation shall be cut to within 1'-2' of the lines and grades as shown on these drawings for nail installation. After successful nail installation, the face may cut to the lines and grade shown on the plans and immediately shotcreted to the base of excavation. If excessive spalling or sluffing of soil from the face occurs during anchor installation, a flash coat of shotcrete shall be immediately sprayed to the base of the excavation immediately after the excavation is performed or the shotcrete lifts can be reduced. If site soils are sufficiently stable, the excavation may be cut to the lines and grades shown. Alternatively, "splines" or micropiles using #4 bar on 18" centers may be utilized to provide additional face stability. G^2 is to be contacted immediately if face stability problems occur to provide site specific recommendations.

2. Allowable tolerances for nail and shotcrete placement shall be:

   Nail Position: +/- 6 inches in any direction.
   Nail Length: no less than length shown.
   Nail Inclination: +/- 2 degrees.
   Shotcrete thickness (where applicable): no less than shown.
   Nail Horizontal Splay Angle: +/- 0 to 10 degrees.

3. Nails shall be installed in a horizontal sequence as shown on the plans. Nails to be continuously grouted as it is advanced into the hole. Nails not to advance more than 5 feet per minute and shall be worked back and forth in the hole at least 5 times during continuous grout feed, for each 10 feet it is advanced. Grout return to be maintained.

4. 4-inch thick shotcrete to be placed.

5. Excavation shall not extend more than 2 feet below the soil nail level until nail grout and shotcrete have been in place for two days. Vertical lifts shall not exceed 6 feet.

Soil Nail Testing

1. Sacrificial Verification Nails: Four verification nails shall be installed at the site, preferably one on each of the four walls between the first and second row of nails. The verification test nails shall utilize the same installation methods as the production nails. The verification test nails shall be 15 feet in length with the outer 5 feet unbonded. Nail testing shall occur after the grout has set for 3 days. Contractor to utilize jack and pressure gauge calibrated within one year. Design load (DL) can be computed by multiplying the actual installed bond length by a working adhesion of 2.67 kips per lineal foot in soils (i.e. for 10' bond, DL = 10' x 2.67 kips/ft = 27 kips). Additional verification nails, may be required at the discretion of the design engineer based upon different soil conditions or test results.

   The load increments and load sequence shall be:

   Seating load (2%-4% DL), 25% DL, 50% DL, 75% DL, 100% DL, 150% DL, with a Creep Test. Each incremental load up shall be held until stable with the deflection recorded. At 150% DL, a 10 minute creep test shall be performed with deflection measurements taken at 1, 3, 5, 6, 8, and 10 minutes. If the creep rate (movement between 1 and 10 minute readings) is less than or equal to 0.04 inches, the nail is considered acceptable. If creep movement exceeds 0.04 inches, the nail shall be held for an additional 50 minutes with readings taken at 20, 30, 40 and 60 minutes. If creep movement taken over a log cycle of time (movement between 6 and 60 minute readings) is less than 0.08 inches, the nail is considered acceptable. After creep test, the nail shall be further tested in increments of 25% DL to failure. Maximum load shall not exceed 56 kips for R32S bar. All test results shall be forwarded to G^2 for review.

   Verification testing will determine if the nails achieve the assumed design adhesion. If nails do not achieve necessary values, the nails may need to be lengthened, utilize larger bits, or other modifications as determined by the contractor and wall designer.

2. Proof Testing: A minimum of 5 percent of the production soil nails to be prooftested to 150% of the design load. The nails to be randomly placed throughout the wall. Nail length of nails shall be according to the appropriate production lengths indicated on the elevation view. All test nails shall utilize a 5 foot long PVC bondbreaker at the top of the shotcrete to extend the bar through the shotcrete. Cribbing to support the reaction plate and jack will be required. Nail testing shall occur after the grout has set for 3 days. Contractor to utilize jack and pressure gauge calibrated within one year. Design load (DL) can be computed by multiplying the actual installed bond length by a working adhesion of 2.67 kips per lineal foot in soils (i.e. for 10' bond, DL = 10' x 2.67 kips/ft = 27 kips). Additional verification nails, may be required at the discretion of the design engineer based upon different soil conditions or test results.

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Other

1. Projected movements are approximately 0.5" to 1" laterally and vertically. Actual movements will vary based upon installation techniques, soil consistency, etc.

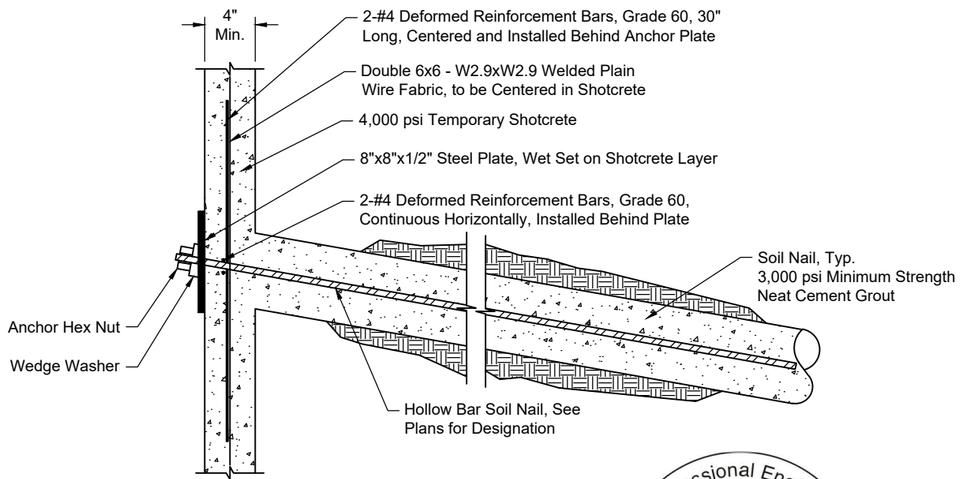
2. Fall protection on top of shoring and slopes to be provided by others.

3. The site soils are anticipated to consist of gravels and cobbles with sand, silt and clay. The following average parameters have been assumed in the design:

   Unit Weight = 135 pcf, Friction Angle = 36 degrees, Cohesion = 50 psf (interlock)

   No groundwater was included in the design. If groundwater is encountered or soils other than those assumed are encountered during mass excavation, G^2 is to be notified immediately to review the design. Additional nails or further modifications to the shoring may be required.

4. The record set of drawings for the existing parking structure indicate that the easternmost part of the building is supported upon helical piers. No other deferred submittal was noted. The helical pier layout shown on theses drawings was taken from the record set of drawings and was assumed to be accurate. With the relatively small shoring height in the area, it is assumed that the helical piers extend to depth and support the building. No parking structure foundation loads have been included in the design.



Soil Nail and Wall Face Detail
Not to Scale

REFERENCE:

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