

BCS JTN DESIGN ENGINEER: LFI REVIEWED: RM. ∕¢∕RIAN C.`SCH∕AI∕A DATE: 3-12-24 JOB NO.: 24-0132

SHEET: COVER

















BLOCK PROPERTIES		
	KEYSTONE	
	REGAL STONE PRO	

D DESIGN SOIL PARAMETERS								
	DESCRIPTION	Φ	γ	С				
	DESCRIPTION	(DEGREES)	(PCF)	(PSF)				
	MARL	28	120	0				
	LEAN CLAY	25	120	N/A				
_L	DRAINAGE*	34	105	N/A				

WAL	l prope	ERTIES	
BACKSLOPE	5:1*	H:V DEGREES	
TOESLOPE	5:1**	H:V DEGREES	
BATTER	7.13	DEGREES	
SETBACK	1.0	INCHES	
SURCHARGE			
DEAD LOAD	0	PSF	
LIVE LOAD	50	PSF	





BLOCK TYPE BLOCK STYLE

ASSUMED

FOUNDATION SOIL RETAINED SOIL

REINFORCED BACKFILI

3LOCK PROPERTIES		
	KEYSTONE	
	REGAL STONE PRO	

OUMED DESIGN SOIL PARAMETERS						
		Φ	γ	С		
	DESCRIPTION :	(DEGREES)	(PCF)	(PSF)		
SOIL	MARL	28	120	0		
IL	LEAN CLAY	25	120	N/A		
BACKFILL	DRAINAGE*	34	105	N/A		

DESIGN TYPE I

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	WALL PROPERTIES				
BACKSI	BACKSLOPE		H:V DEGREES		
TOESLO	OPE	5: **	H:V DEGREES		
BATTER		7.13	DEGREES		
SETBAC	CK	1.0	INCHES		
	SURCHARGE				
DEAD L	OAD	0	PSF		
LIVE LO	AD	50	PSF		

* BACKSLOPE VARIES - 5H: I V (11.3°) MAX ** TOE SLOPE VARIES - 5H: I V (I I .3°) MAX

WALL ELEVATION NOTES:

I. GEOGRID DEPTH IS MEASURED FROM THE FRONT FACE OF BLOCK 2. SEGMENT LENGTH IS THE DISTANCE BETWEEN GRID DEPTH TRANSITIONS

3. REINFORCED BACKFILL
3.1. (D)RAINAGE ROCK, SEE DETAIL 1/D1
3.2. (U)NREINFORCED, SEE DETAIL 2/D1

4. REQ'D BEARING CAPACITY IS IN PSF

5. ANGLE POINTS MAY BE CONSTRUCTED AS RADII.

*SEE NOTES FOR ADDITIONAL INFORMATION

TA 10+50.00 V=1184.16	[A +00.00 V= 84.83	TA 11+22.00	
ິດ F	ທ ≓	ώ Γ	1185.00
			1180.00
			1175.00
			70.00
	 		1165.00
 			1160.00
 	[1155.00
	[1150.00
5TA 10+50.00 TF= 1179.83	5TA +00.00 TF= 81.83	5TA +22.00 TF= 83. 6	
- 4'-0"			GEOGRID DEPTH
1,000		KEQ'D BE	ARING CAFACITY
DRAINAGE		REINFO	FGMENT LENGTH
100.00		0	



STRUCTURAL DESIGN HEREIN REPRESENTS A FINISHED STRUCTURE. THE GENERAL CONTRACTOR/OWNER SHALL PROVIDE ALL INTERIM BRACING, SHORING, INTERIM DRAINAGE PROVISIONS, DRAINAGE DIVERSION AND EROSION PROTECTION REQUIRED UNTIL FINAL CAPPING, PAVING, CURBING AND COMPLETION OF FINAL STORM DRAIN SYSTEM IS COMPLETE.





² WALL 3 ELEVATION PG SCALE: I "=20'-0" HORIZONTAL SCALE: I "=5'-0" VERTICAL

BLOCK PROPERTIES			
BLOCK TYPE	KEYSTONE		
BLOCK STYLE	REGAL STONE PRO		

ASSUMED DESIGN SOIL PARAMETERS					
DESCRIPTION		Φ	γ	С	
	DESCRIPTION	(DEGREES)	(PCF)	(PSF)	
FOUNDATION SOIL	MARL	28	120	0	
RETAINED SOIL	LEAN CLAY	25	120	N/A	
REINFORCED BACKFILL	DRAINAGE*	34	105	N/A	

*SEE NOTES FOR ADDITIONAL INFORMATION

DESIGN TYPE I

WALL PROPERTIES					
BACKSLOPE	5:1*	H:V DEGREES			
TOESLOPE	5:1**	H:V DEGREES			
BATTER	7.13	DEGREES			
SETBACK	1.0	INCHES			
	SURCHARGE				
DEAD LOAD	0	PSF			
LIVE LOAD	50	PSF			

* BACKSLOPE VARIES - 5H: I V (| | .3°) MAX ** TOE SLOPE VARIES - 5H: I V (I I .3°) MAX

WALL ELEVATION NOTES:

1220.00

I. GEOGRID DEPTH IS MEASURED FROM THE FRONT FACE OF BLOCK 2. SEGMENT LENGTH IS THE DISTANCE BETWEEN GRID DEPTH TRANSITIONS

3. REINFORCED BACKFILL

3.1. (D)RAINAGE ROCK, SEE DETAIL 1/D1

3.2. (U)NREINFORCED, SEE DETAIL 2/D I 4. REQ'D BEARING CAPACITY IS IN PSF

5. ANGLE POINTS MAY BE CONSTRUCTED AS RADII.

DESIGN TYPE 2

WALL PROPERTIES				
BACKSLOPE	3:1*	H:V DEGREES		
TOESLOPE	5:1**	H:V DEGREES		
BATTER	7.13	DEGREES		
SETBACK	1.0	INCHES		
SURCHARGE				
DEAD LOAD	0	PSF		
LIVE LOAD	25	PSF		

* BACKSLOPE VARIES - 3H: I V (18.4°) MAX ** TOE SLOPE VARIES - 5H: I V (I I .3°) MAX

1215.00	STORM PIPES, STORM ARE SHOWN FOR INFO BASED ON THE INFOR PLANS REFERENCED IN PROJECT CIVIL PLANS INCLUDING BUT NOT L	M STRUCTU ORMATION SH N GENERAL 9 FOR ALL S LIMITED TO	IRES, LIGHT POLES BASES, ETC AL PURPOSES ONLY AND ARE HOWN ON THE PROJECT CIVIL NOTE 1.4. REFER TO CURRENT OPECIFIC INFORMATION SIZE AND LOCATION.	
1210.00			PRESENTS & FINISHED STRUCTURE	ור
1205.00	THE GENERAL CONTRA BRACING, SHORING, I DIVERSION AND EROS CAPPING, PAVING, CL DRAIN SYSTEM IS CO	ACTOR/OWN INTERIM DR BION PROTE JRBING ANE MPLETE.	NESENTS A TINISTIED STRUCTORE NER SHALL PROVIDE ALL INTERIM RAINAGE PROVISIONS, DRAINAGE ECTION REQUIRED UNTIL FINAL D COMPLETION OF FINAL STORM	
1200.00				
1200.00				(
1195.00	REV DA	ATE	DESCRIPTION	
GEOGRID DEPTH REQ'D BEARING CAPACITY	ROS	CH TBPE #1	ROSCH ENGINEERIN 2300 GREENHILL DRIVE, SUITE 800 ROUND ROCK, TX 78664 PHONE: 512-828-4167 FAX: 512-233-0540	IG
RFINFORCED BACKFILL	ł	KINDE	R WEST UNIT 7	
SEGMENT LENGTH		SAN	ΑΝΤΟΝΙΟ ΤΧ	
			$\frac{1}{1}$	
		RL F	TAINING WALL	
		L		BCS
		E OF TE	DRAWN:	JTM
	-5,4		DESIGN ENGINEER:	LFB
	***	X	REVIEWED:	RMJ
	B RIAN	v с.`sснай	DATE: 3-12	2-24

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3-12-2024

JOB NO .: 24-0132

P6

SHEET:

GENERAL NOTES:	
 RETAINING WALL DESIGN: I.I. STRUCTURAL DESIGN HEREIN REPRESENTS A FINISHED STRUCTURE. THE GENERAL CONTRACTOR/OWNER SHALL PROVIDE ALL INTERIM BRACING, SHORING, INTERIM DRAINAGE PROVISIONS, DRAINAGE DIVERSION AND EROSION PROTECTION REQUIRED UNTIL FINAL CAPPING, PAVING, CURBING AND COMPLETION OF FINAL STORM DRAIN SYSTEM. I.I.I. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR/OWNER TO ENSURE THAT THE FINISHED SITE DRAINAGE 	 BASE LEVELING PAD INSTALLATION: 6.1. LEVELING PAD SHALL BE PLACED AS SHOW LEAN CONCRETE (2,000 PSI) - 6" MIN GRAVEL WITH 1-1/2" MAXIMUM PART
IS DIRECTED AWAY FROM THE RETAINING WALL SYSTEM. I.I.2. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR/OWNER TO ENSURE THAT THE SURFACE WATER RUNOFF FROM ADJACENT CONSTRUCTION AREAS IS NOT ALLOWED TO ENTER THE RETAINING WALL AREA OF THE CONSTRUCTION SITE	6.2. SAND OR GRAVEL BASE SHALL BE COMPA LEVEL BEARING PAD.
1.2. THE PROJECT GEOTECHNICAL ENGINEER SHALL REVIEW THESE DRAWINGS TO CONFIRM THE ASSUMPTIONS MEET THE INTENT OF THE GEOTECHNICAL REPORT. ADDITIONALLY, THE PROJECT GEOTECHNICAL ENGINEER SHALL REVIEW	6.3. LEAN CONCRETE SHALL CURE A MINIMUM6.4. LEVELING PAD SHALL BE CONSTRUCTED T
GLOBAL STABILITY OF THE RETAINING WALLS AND PROVIDE RECOMMENDATIONS AS NEEDED.	7. UNIT INSTALLATION:7.1. THE FIRST COURSE OF SEGMENTAL CONC
SEGMENTAL RETAINING WALLS 3RD EDITION AND NCMA'S SEGMENTAL RETAINING WALLS BEST PRACTICES GUIDE AND INCLUDES EXTERNAL STABILITY; SLIDING AND OVERTURNING OF THE REINFORCED MASS, AND INTERNAL STABILITY; PULLOUT, CONNECTION STRENGTH AND TENSILE STRENGTH OF THE GEOGRID AS WELL AS FACIAL STABILITY OF THE	7.2. UNITS SHALL BE PLACED SIDE BY SIDE FC
 I.4. SCOPE OF DESIGN SERVICES ARE LIMITED TO THOSE DEFINED FOR "SRW (RETAINING WALL) ENGINEER" IN THE NCMA BEST PRACTICES MANUAL (2017) AND NCMA TEK 15-03A. ALL OTHER ENGINEERING SERVICES ARE EXCLUDED. I.5. THE DESIGN OF THE SEGMENTAL RETAINING WALLS IS BASED ON THE FOLLOWING DOCUMENTS: 	7.3. PLACE DRAINAGE AGGREGATE WITHIN THE DETAILS. WHERE THE REINFORCED BACKF DRAINAGE FILL. CONSOLIDATE DRAINAGE COMPACTION TESTING OF DRAINAGE AGC
DRAWING C7.00 DATED 11/16/2023 PREPARED BY PAPE-DAWSON ENGINEERS.	TOP OF UNITS PRIOR TO INSTALLATION O 7.4. LAY UP EACH COURSE INSURING POSITIVI
GEOTECHNICAL REPORT DATED 1/5/2023 PREPARED BY INTEC OF SAN ANTONIO. INTEC PROJECT NO. S221476	8. GEOGRID INSTALLATION: 8.1. GEOGRID SHALL BE LAID AT THE PROPER
THE DESIGN OF THE SEGMENTAL RETAINING WALL IS DASED ON THE INDIVIDUAL SOIL PROPERTIES AS LISTED WITHIN THESE PLANS AS WELL AS THE FOLLOWING CRITERIA:	8.2. THE GEOGRID REINFORCEMENT SHALL BE THE BLOCK.
GROUND WATER LOCATION = $2H/3$ BELOW THE TOP OF LEVEL PAD (WHERE H = HEIGHT OF WALL) HYDROSTATIC LOADING = NONE SURCHARGE LOADING = SEE WALL ELEVATION(S)	8.3. PLACE GEOGRID ON CONCRETE WALL UNI GEOGRID TIGHT PRIOR TO BACKFILLING.
 SETTLEMENT: 2.1. SEGMENTAL RETAINING WALLS ARE FLEXIBLE MASSES THAT CAN TOLERATE MINOR SETTLEMENT. SETTLEMENT 	8.4. CORRECT ORIENTATION OF THE GEOGRID 8.5. 3" OF REINFORCED BACKFILL SHALL BE PI
SENSITIVE RIGID MASSES FOUNDED ON OR ABOVE THE SEGMENTAL RETAINING WALL SHOULD BE REVIEWED AND, IF REQUIRED, A SETTLEMENT ANALYSIS SHOULD BE PERFORMED BY THE PROJECT GEOTECHNICAL ENGINEER. SETTLEMENT ANALYSIS IS OUTSIDE OF ROSCH ENGINEERING'S SCOPE OF WORK.	9. BACKFILL PLACEMENT: 9.1. REINFORCED BACKFILL MATERIAL SHALL E
 MATERIAL PROPERTIES: 3.1. SEGMENTAL CONCRETE WALL UNITS SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM C1372 HAVING A 	9.2. COMPACTED ROCK SHALL BE COMPACTE UNLESS NOTED OTHERWISE ON THE INDIV
MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3,000 PSI AND A MAXIMUM MOISTURE ABSORPTION OF 8%. ALL UNITS SHALL BE SOUND AND FREE OF CRACKS OR OTHER DEFECTS THAT WOULD INTERFERE WITH THE PROPER PLACING OF THE UNIT OR SIGNIFICANTLY IMPAIR THE STRENGTH OR PERFORMANCE OF THE CONSTRUCTION.	9.3. DRAINAGE ROCK SHALL BE COMPACTED V DENSITY TESTING WILL NOT BE REQUIRED
3.2. DRAINAGE ROCK SHALL BE A CLEAN CRUSHED STONE OR GRANULAR FILL SUCH AS 1" CLEAN MEETING THE FOLLOWING GRADATION AS DETERMINED IN ACCORDANCE WITH ASTM D 422:	9.4. ONLY LIGHTWEIGHT HAND-OPERATED CON BLOCK.
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	9.5. REINFORCED BACKFILL SHALL BE PLACED, DEVELOPMENT OF WRINKLES AND/OR MO
NO. 40 0-50 NO. 200 0-5	9.6. REINFORCED BACKFILL SHALL BE PLACED EMBANKMENT TO INSURE THAT THE GEOG
3.3. COMPACTED ROCK SHALL BE FREE OF ORGANIC MATERIAL. THE ROCK SHALL BE A WELL GRADED GRAVEL OR LIMESTONE WITH A MAXIMUM PARTICLE SIZE OF 2" AND A MAXIMUM OF 15% PASSING A NO. 200 SIEVE.	9.7. TRACKED CONSTRUCTION EQUIPMENT SH THICKNESS OF G" SHALL BE MAINTAINED TRACKED CONSTRUCTION EQUIPMENT SH
3.4. LOW PERMEABLE SOIL SHALL CONSIST OF MATERIAL HAVING A MINIMUM PLASTICITY INDEX OF TO. NO MORE THAN 10% SHALL BE RETAINED ON A NO. 4 SIEVE AND NO LESS THAN 35% SHALL PASS A NO. 200 SIEVE. MATERIAL WITH A USC DESIGNATION OF ML, CL, OR OL ARE ACCEPTABLE FOR USE AS LOW PERMEABLE SOIL.	9.8. AT THE END OF EACH DAY'S OPERATION, INTERIOR (CONCEALED) FACE OF THE WAL
3.5. THE GEOGRID SHALL BE A HIGH DENSITY POLYETHYLENE EXPANDED SHEET OR POLYESTER WOVEN FIBER MATERIAL, SPECIFICALLY FABRICATED FOR USE AS SOIL REINFORCEMENT. ACCEPTABLE GEOGRID TYPES AND MANUFACTURER AS FOLLOWS: TYPE I: SE35 BY SYNTEEN TECHNICAL FABRICS, INC.	 9.8.1. IT IS THE RESPONSIBILITY OF THE GET AWAY FROM THE RETAINING WALL SY 9.8.2. IT IS THE RESPONSIBILITY OF THE GET ADJACENT CONSTRUCTION AREAS IS CONSTRUCTION SITE.
SGU GO BY STRATA SYSTEMS, INC. MIRAGRID 3XT AS MANUFACTURED BY TENCATE GEOSYNTHETICS. HP200 AS MANUFACTURED BY GEOSTAR TECHNOLOGIES, LLC.	10. DRAIN PIPE INSTALLATION: 10.1. DRAINAGE COLLECTION PIPES SHALL BE II
3.6. GEOTEXTILE FILTER FABRIC SHALL BE A NONWOVEN GEOTEXTILE COMPOSED OF POLYPROPYLENE FIBERS WITH A MINIMUM FLOW RATE OF 140 GPM/FT ² WHEN TESTED ACCORDING TO ASTM D 4491.	DAYLIGHT THROUGH THE FACE OF THE WA
3.7. DRAINAGE PIPE SHALL BE A 4"Ø PERFORATED OR SLOTTED PVC OR CORRUGATED HDPE PIPE.	I I.I. CAP UNITS SHALL BE ADHERED TO THE TO BEADS OF ADHESIVE ON EACH UNIT ALON THE ADHESIVE AND ALLOW TO CURE.
3.9. CONSTRUCTION ADHESIVE SHALL BE EXTERIOR GRADE ADHESIVE AS RECOMMENDED BY THE SEGMENTAL CONCRETE WALL UNIT MANUFACTURER.	12. FIELD QUALITY CONTROL: 12.1. THE OWNER OR OWNER'S REPRESENTATIV
4. EXCAVATION:4.1. THE CONTRACTOR SHALL EXCAVATE TO THE LINES AND GRADES SHOWN ON THE PLANS. THE GENERAL CONTRACTOR	THIRD PARTY INSPECTOR TO OBSERVE AN OF ALL SYSTEM COMPONENTS TO MEET 1
SHALL TAKE PRECAUTIONS TO MINIMIZE OVER-EXCAVATION.4.2. EXCAVATION SUPPORT, INCLUDING THE STABILITY OF THE EXCAVATION AND ITS INFLUENCE ON ADJACENT PROPERTY	T2.2. TESTING METHODS, FREQUENCY AND VER THE INDEPENDENT THIRD PARTY INSPECTO COMPACTION TEST FOR EACH LIFT BUT N
5. FOUNDATION SOIL PREPARATION:	 ABBREVIATIONS: EGE FINISHED GRADE EXTERIOR
EXAMINED BY THE OWNER'S GEOTECHNICAL ENGINEER TO ASSURE THE ACTUAL FOUNDATION SOIL STRENGTH MEETS OR EXCEEDS THE REQUIRED BEARING STRENGTH. SOIL NOT MEETING THE REQUIRED STRENGTH SHALL BE REMOVED AND REPLACED WITH SOIL MEETING THE DESIGN CRITERIA, AS DIRECTED BY THE OWNER'S GEOTECHNICAL ENGINEER.	FGI FINISHED GRADE INTERIOR FL FLOW LINE MAX MAXIMUM
5.2. FOUNDATION SOIL IS DEFINED AS THE SOIL UNDER THE SEGMENTAL RETAINING WALL VOLUME, EXTENDING FROM THE TOE OF THE LEVELING PAD TO THE BACK OF THE REINFORCED MASS.	MIN MINIMUM OC ON CENTER PL PROPERTY LINE
	TF TOP OF FOOTING ELEVATION TW TOP OF WALL ELEVATION
	UNO UNLESS NOTED OTHERWISE
FACE OF WALL	
FINISHED GRADE	FACE OF
LEVELING PAD	
BACK OF REINFORCED ZONE	TRENCH
	COMPAC GEOTEC FLOWAB
	MATERIA REQUIRE AS SHO
UTILITY TRENCH BY OTHERS	BY OTHE
5 UTILITY TRENCH CROSSING DE	ETAIL
DI NIS	

WN ON THE DRAWINGS AND CONSIST OF EITHER:

FICLE SIZE - 6" MINIMUM THICK

ACTED WITH 3 PASSES OF A VIBRATORY COMPACTOR TO PROVIDE A FIRM,

CRETE WALL UNITS SHALL BE PLACED ON THE LEVELING PAD AND CHECKED ACT WITH BASE.

OR FULL LENGTH OF WALL. ALIGNMENT SHALL BE DONE BY MEANS OF A FROM BASE LINE.

E BLOCK CORES DIRECTLY BEHIND AND BETWEEN THE UNITS AS SHOWN IN FILL IS COMPACTED ROCK, PLACE REINFORCED BACKFILL DIRECTLY AGAINST AGGREGATE WITH 2 PASSES OF A VIBRATORY COMPACTOR. GREGATE IS NOT REQUIRED. EXCESS MATERIAL SHALL BE REMOVED FROM OF NEXT COURSE.

ELEVATION AND ORIENTATION AS SHOWN ON THE DRAWINGS.

BE PLACED IN 8" MAXIMUM LIFTS.

VIDUAL WALL PROFILES.

D FOR DRAINAGE ROCK.

, SPREAD, AND COMPACTED IN SUCH A MANNER THAT ELIMINATES THE VEMENT OF THE GEOGRID.

AND COMPACTED FROM THE BACK OF THE WALL REARWARD INTO THE GRID REMAINS TIGHT.

HALL NOT BE OPERATED DIRECTLY ON THE GEOGRID. A MINIMUM BACKFILL TO OPERATE TRACKED VEHICLES OVER THE GEOGRID. TURNING OF HALL BE KEPT TO A MINIMUM TO PREVENT TRACKS FROM DISPLACING THE

SLOPE THE LAST LEVEL OF COMPACTED BACKFILL AWAY FROM THE LL TO DIRECT SURFACE WATER RUNOFF FROM THE WALL FACE. ENERAL CONTRACTOR TO ENSURE THE FINISHED SITE DRAINAGE IS DIRECTED YSTEM ENERAL CONTRACTOR TO ENSURE THE SURFACE WATER RUNOFF FROM

NSTALLED TO MAINTAIN GRAVITY FLOW OF WATER OUTSIDE OF THE COLLECTION PIPE SHOULD CONNECT INTO A STORM SEWER MANHOLE OR

OP UNITS USING MANUFACTURER SUPPLIED ADHESIVE BY PLACING TWO 1/4" NG THE ENTIRE LENGTH OF THE WALL. PRESS THE CAP UNITS FIRMLY INTO

VE IS RESPONSIBLE FOR ENGAGING THE SERVICES OF AN INDEPENDENT ND VERIFY ALL SOIL PROPERTIES AS WELL AS VERIFY CORRECT INSTALLATION THE REQUIREMENTS OF THESE GENERAL NOTES AND DRAWINGS.

OR. AT A MINIMUM, COMPACTION TESTING SHALL INCLUDED ONE NOT LESS THAN ONE TEST FOR EVERY 50 CUBIC YARDS OF COMPACTED FILL













TIRE OR TRACK OF -HEAVY EQUIPMENT



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