

AASHTO DESIGN METHOD

PROJECT IDENTIFICATION

Title: 서해안고속도로 매송휴게소 부지조성공사
Project Number: H=3.9M+3.3
Client:
Designer: (주)동운산업개발
Station Number:

Description:

Company's information:

Name:
Street:

Telephone #:
Fax #:
E-Mail:

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PROGRAM MODE: DESIGN
of a SIMPLE STRUCTURE
using GEOGRID as reinforcing material.

(Multiple type reinforcement)

D A T A	Geogrid type #1	Geogrid type #2	Geogrid type #3	Geogrid type #4	Geogrid type #5
Tult [kN/m]	50.0	65.0	90.0	130.0	170.0
Durability reduction factor, RFd	1.0	1.0	1.0	1.0	1.0
Installation-damage reduction factor, RFid	1.10	1.10	1.10	1.10	1.10
Creep reduction factor, RFC	2.50	2.50	2.50	2.50	2.50
Fs-overall for strength	1.50	1.50	1.50	1.50	1.50
Coverage ratio, Rc	1.000	1.000	1.000	1.000	1.000
Friction angle along geogrid-soil interface, ρ	29.00	29.00	29.00	29.00	29.00
Pullout resistance factor, F*	0.85 $\frac{\rho}{\phi_1}$	0.85 $\frac{\rho}{\phi_1}$	0.85 $\frac{\rho}{\phi_{an}}$	0.85 $\frac{\rho}{\phi_{an}}$	0.85 $\frac{\rho}{\phi_{an}}$
Scale-effect correction factor, α	0.8	0.8	0.8	0.8	0.8

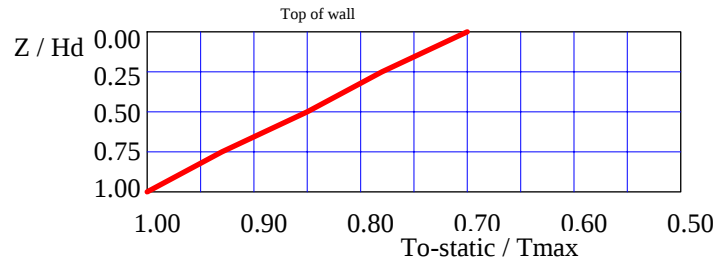
Variation of Lateral Earth Pressure Coefficient With Depth

Z	K / Ka
0 m	1.00
1 m	1.00
2 m	1.00
3 m	1.00
4 m	1.00
5 m	1.00
6 m	1.00

INPUT DATA: Facia and Connection (Design)

FACIA type: Facing enabling frictional connection of reinforcement (e.g., modular concrete blocks, gabions)
 Depth/height of block is 0.30/0.20 m. Horizontal distance to Center of Gravity of block is 0.15 m.
 Average unit weight of block is $\gamma_f = 24.00 \text{ kN/m}$

Z / Hd	To-static / Tmax
0.00	0.70
0.25	0.78
0.50	0.85
0.75	0.93
1.00	1.00



To-static, To-seismic = connection force, static and superimposed dynamic component, respectively.

Geogrid Type #1		Geogrid Type #2		Geogrid Type #3		Geogrid Type #4		Geogrid Type #5	
σ ⁽¹⁾	CRu ⁽²⁾	σ	CRu	σ	CRu	σ	CRu	σ	CRu
50.0	0.90	50.0	0.90	50.0	0.90	50.0	0.90	50.0	0.90
120.0	0.90	120.0	0.90	120.0	0.90	120.0	0.90	120.0	0.90

Geogrid Type #1		Geogrid Type #2		Geogrid Type #3		Geogrid Type #4		Geogrid Type #5	
σ	CRs ⁽³⁾	σ	CRs	σ	CRs	σ	CRs	σ	CRs
0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
50.0	0.90	50.0	0.90	50.0	0.90	50.0	0.90	50.0	0.90

- (1) σ = Confining stress in between stacked blocks [kPa]
 (2) CRu = Tult-connection / Tult-geogrid
 (3) CRs = Tpo-connection / Tult-geogrid

D A T A (for connection only)	Type #1	Type #2	Type #3	Type #4	Type #5
Product Name	50KN	65KN	90KN	130KN	170KN
Durability reduction factor, RF _d	1.00	1.00	1.00	1.00	1.00
Creep reduction factor, RF _c	2.50	2.50	2.50	2.50	2.50
Overall factor of safety: connection break, F _s	1.50	1.50	1.50	1.50	1.50
Overall factor of safety: connection pullout, F _s	1.50	1.50	1.50	1.50	1.50

REINFORCEMENT LAYOUT AND DESIGN CRITERIA

LEGEND: (1) Connection strength ✓ Satisfactory
 (2) Geogrid strength ⊗ Unsatisfactory
 (3) Pullout resistance
 (4) Direct sliding
 (5) Eccentricity

Bearing capacity: $\checkmark$

Foundation Interface: Direct sliding $\checkmark$; Eccentricity $\checkmark$

G e o g r i d								
#	Elevation [m]	Length [m]	Type #	(1)	(2)	(3)	(4)	(5)
1	0.40	3.00	3	√	√	√	√	√
2	1.00	3.00	2	√	√	√	√	√
3	1.60	3.00	2	√	√	√	√	√

G e o g r i d								
#	Elevation [m]	Length [m]	Type #	(1)	(2)	(3)	(4)	(5)
4	2.40	3.00	1	√	√	√	√	√
5	3.20	3.00	1	√	√	√	√	√

#	Geogrid Elevation [m]	Tavailable [kN/m]	Tmax [kN/m]	Tmd [kN/m]	Specified minimum Fs-overall static	Actual calculated Fs-overall static	Specified minimum Fs-overall seismic	Actual calculated Fs-overall seismic	Product name
1	0.40	32.7	18.1	N/A	1.500	1.809	N/A	N/A	90KN
2	1.00	23.6	13.2	N/A	1.500	1.796	N/A	N/A	65KN
3	1.60	23.6	12.6	N/A	1.500	1.872	N/A	N/A	65KN
4	2.40	18.2	10.8	N/A	1.500	1.679	N/A	N/A	50KN
5	3.20	18.2	8.6	N/A	1.500	2.108	N/A	N/A	50KN

#	Geogrid Elevation [m]	Coverage Ratio	Tmax [kN/m]	Tmd [kN/m]	Le [m]	La [m]	Avail.Static Pullout, Pr [kN/m]	Specified Static Fs	Actual Static Fs	Avail.Seism. Pullout, Pr [kN/m]	Specified Seismic Fs	Actual Seismic Fs
1	0.40	1.000	18.09	N/A	2.78	0.22	170.5	2.000	9.427	N/A	N/A	N/A
2	1.00	1.000	13.16	N/A	2.45	0.55	133.0	2.000	10.100	N/A	N/A	N/A
3	1.60	1.000	12.63	N/A	2.12	0.88	100.0	2.000	7.919	N/A	N/A	N/A
4	2.40	1.000	10.83	N/A	1.68	1.32	63.4	2.000	5.856	N/A	N/A	N/A
5	3.20	1.000	8.62	N/A	1.24	1.76	35.1	2.000	4.071	N/A	N/A	N/A

