

# Typical Geogrid Specifications and Connection Testing Results



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Table 3: Geogrid Engineering Properties

AB Full-Size Units							
Geogrid Type	Long Term Allowable Design Strength, LTDS, lb/ft (kN/m)			Reduction Factor Creep, RFcr	Peak Connection Strength Equations, P, lb/ft (kN/m)		Normal Load Intercept lb/ft (kN/m)
	Sand-Silt-Clay	Sand-Gravel	Gravel		Segment 1	Segment 2	
<b>Strata Systems, 380 Dahlonega Road, Cummings, GA 30040 800-680-7750</b>							
Strata 150	1008 (14.70)	962 (14.10)	882 (12.90)	1.610	$T_u = 930 \text{ lb/ft} + N \tan(24^\circ)$ ( $T_u = 13.5 \text{ kN/m} + N \tan(24^\circ)$ )	-	-
Strata 200	1613 (23.60)	1540 (22.50)	1412 (20.60)	1.610	$T_u = 948 \text{ lb/ft} + N \tan(31^\circ)$ ( $T_u = 13.8 \text{ kN/m} + N \tan(31^\circ)$ )	-	-
Strata 350	2259 (33.00)	2156 (31.50)	1976 (28.90)	1.610	$T_u = 900 \text{ lb/ft} + N \tan(23^\circ)$ ( $T_u = 13.1 \text{ kN/m} + N \tan(23^\circ)$ )	-	-
Strata 500	2796 (40.80)	2669 (39.00)	2447 (35.70)	1.610	$T_u = 848 \text{ lb/ft} + N \tan(30^\circ)$ ( $T_u = 12.4 \text{ kN/m} + N \tan(30^\circ)$ )	-	-
<b>Tencate Nicolon, 365 South Holland Drive, Pendergrass, GA 30567 888-795-0808</b>							
Miragrid 2XT	949 (13.80)	839 (12.20)	727 (10.60)	1.670	$T_{u1} = 125.6 \text{ lb/ft} + N \tan(58.48^\circ)$ ( $T_{u1} = 1.8 \text{ kN/m} + N \tan(58.48^\circ)$ )	$T_{u2} = 1623.5 \text{ lb/ft}$ ( $T_{u2} = 23.65 \text{ kN/m}$ )	918.6 (13.40)
Miragrid 3XT	1558 (22.70)	1423 (20.80)	1309 (19.10)	1.670	$T_u = 1047 \text{ lb/ft} + N \tan(33^\circ)$ ( $T_u = 15.3 \text{ kN/m} + N \tan(33^\circ)$ )	-	-
Miragrid 5XT	2234 (32.60)	2040 (29.80)	1876 (27.40)	1.670	$T_{u1} = 983 \text{ lb/ft} + N \tan(37^\circ)$ ( $T_{u1} = 14.3 \text{ kN/m} + N \tan(37^\circ)$ )	$T_{u2} = 1756 \text{ lb/ft} + N \tan(20^\circ)$ ( $T_{u2} = 25.6 \text{ kN/m} + N \tan(20^\circ)$ )	1984.2 (28.95)
Miragrid 7XT	2961 (43.20)	2704 (39.40)	2487 (36.30)	1.670	$T_u = 1065.4 \text{ lb/ft} + N \tan(25.62^\circ)$ ( $T_u = 15.52 \text{ kN/m} + N \tan(25.62^\circ)$ )	-	-
Miragrid 8XT	3089 (45.07)	3007 (43.87)	2719 (39.87)	1.670	$T_{u1} = 1063 \text{ lb/ft} + N \tan(40^\circ)$ ( $T_{u1} = 15.51 \text{ kN/m} + N \tan(40^\circ)$ )	$T_{u2} = 2872 \text{ lb/ft}$ ( $T_{u2} = 41.90 \text{ kN/m}$ )	2155.9 (31.45)
Miragrid 10XT	4116 (60.05)	4006 (58.45)	3622 (52.84)	1.670	$T_{u1} = 513 \text{ lb/ft} + N \tan(52^\circ)$ ( $T_{u1} = 7.48 \text{ kN/m} + N \tan(52^\circ)$ )	$T_{u2} = 1426 \text{ lb/ft} + N \tan(23^\circ)$ ( $T_{u2} = 20.81 \text{ kN/m} + N \tan(23^\circ)$ )	1067.3 (15.57)
<b>Huesker - 11107 - A South Commerce Blvd, Charlotte, NC 28273 800-942-9418</b>							
Fortrac 35/20-20	1322 (19.30)	1300 (19.00)	1243 (18.10)	1.572	$T_{u1} = 728 \text{ lb/ft} + N \tan(18^\circ)$ ( $T_{u1} = 10.6 \text{ kN/m} + N \tan(18^\circ)$ )	$T_{u2} = 958 \text{ lb/ft} + N \tan(8^\circ)$ ( $T_{u2} = 14.0 \text{ kN/m} + N \tan(8^\circ)$ )	1247.4 (18.20)
Fortrac 55/30-20	1936 (28.30)	1882 (27.50)	1783 (26.00)	1.655	$T_{u1} = 1090 \text{ lb/ft} + N \tan(27^\circ)$ ( $T_{u1} = 15.9 \text{ kN/m} + N \tan(27^\circ)$ )	$T_{u2} = 1906 \text{ lb/ft} + N \tan(4^\circ)$ ( $T_{u2} = 27.8 \text{ kN/m} + N \tan(4^\circ)$ )	1856.2 (27.08)
Fortrac 80/30-20	2815 (41.10)	2815 (41.10)	2615 (38.20)	1.655	$T_{u1} = 680 \text{ lb/ft} + N \tan(57^\circ)$ ( $T_{u1} = 9.92 \text{ kN/m} + N \tan(57^\circ)$ )	$T_{u2} = 2143 \text{ lb/ft} + N \tan(14^\circ)$ ( $T_{u2} = 31.27 \text{ kN/m} + N \tan(14^\circ)$ )	1133.6 (16.54)
<b>AB Fieldstone Units</b>							
Geogrid Type	Long Term Allowable Design Strength, LTDS, lb/ft (kN/m)			Reduction Factor Creep, RFcr	Peak Connection Strength Equations, P, lb/ft (kN/m)		Normal Load Intercept lb/ft (kN/m)
	Sand-Silt-Clay	Sand-Gravel	Gravel		Segment 1	Segment 2	
<b>Strata Systems, 380 Dahlonega Road, Cummings, GA 30040 800-680-7750</b>							
Strata 150	1008 (14.70)	962 (14.10)	882 (12.90)	1.610	$T_u = 853 \text{ lb/ft} + N \tan(10^\circ)$ ( $T_u = 12.4 \text{ kN/m} + N \tan(10^\circ)$ )	$T_{u2} = 1200 \text{ lb/ft}$ ( $T_{u2} = 17.5 \text{ kN/m}$ )	-
Strata 200	1613 (23.60)	1540 (22.50)	1412 (20.60)	1.610	$T_u = 784 \text{ lb/ft} + N \tan(35^\circ)$ ( $T_u = 11.4 \text{ kN/m} + N \tan(35^\circ)$ )	$T_{u2} = 1875 \text{ lb/ft}$ ( $T_{u2} = 27.3 \text{ kN/m}$ )	-
Strata 350	2259 (33.00)	2156 (31.50)	1976 (28.90)	1.610	$T_u = 761 \text{ lb/ft} + N \tan(32^\circ)$ ( $T_u = 11.1 \text{ kN/m} + N \tan(32^\circ)$ )	$T_{u2} = 1908 \text{ lb/ft} + N \tan(5^\circ)$ ( $T_{u2} = 27.8 \text{ kN/m} + N \tan(5^\circ)$ )	-
<b>Tencate Nicolon, 365 South Holland Drive, Pendergrass, GA 30567 888-795-0808</b>							
Miragrid 2XT	949 (13.80)	839 (12.20)	727 (10.60)	1.670	$T_{u1} = 893 \text{ lb/ft} + N \tan(31^\circ)$ ( $T_{u1} = 13.0 \text{ kN/m} + N \tan(31^\circ)$ )	$T_{u2} = 1516 \text{ lb/ft} + N \tan(5^\circ)$ ( $T_{u2} = 22.1 \text{ kN/m} + N \tan(5^\circ)$ )	1213.5 (17.70)
Miragrid 3XT	1558 (22.70)	1423 (20.80)	1309 (19.10)	1.670	$T_u = 829 \text{ lb/ft} + N \tan(39^\circ)$ ( $T_u = 12.1 \text{ kN/m} + N \tan(39^\circ)$ )	$T_{u2} = 1715 \text{ lb/ft} + N \tan(6^\circ)$ ( $T_{u2} = 25.0 \text{ kN/m} + N \tan(6^\circ)$ )	1257.3 (18.34)
Miragrid 5XT	2234 (32.60)	2040 (29.80)	1876 (27.40)	1.670	$T_{u1} = 778 \text{ lb/ft} + N \tan(43^\circ)$ ( $T_{u1} = 11.3 \text{ kN/m} + N \tan(43^\circ)$ )	$T_{u2} = 2066 \text{ lb/ft} + N \tan(18^\circ)$ ( $T_{u2} = 30.1 \text{ kN/m} + N \tan(18^\circ)$ )	2119.8 (30.93)
<b>Huesker - 11107 - A South Commerce Blvd, Charlotte, NC 28273 800-942-9418</b>							
Fortrac 35/20-20	1322 (19.30)	1300 (19.00)	1243 (18.10)	1.572	$T_{u1} = 769 \text{ lb/ft} + N \tan(6^\circ)$ ( $T_{u1} = 11.2 \text{ kN/m} + N \tan(6^\circ)$ )	-	-
Fortrac 55/30-20	1936 (28.30)	1882 (27.50)	1783 (26.00)	1.655	$T_{u1} = 1444 \text{ lb/ft} + N \tan(3^\circ)$ ( $T_{u1} = 21.0 \text{ kN/m} + N \tan(3^\circ)$ )	-	-

The information in this chart has been taken from published literature and is believed to be accurate. Consult the Allan Block Engineering Department for details at 800-899-5309.

## ALLAN BLOCK GEOGRID DESIGN PARAMETERS

ALLAN BLOCK TYPE: AB Stone, AB Classic, AB Three, AB Rocks  
 GEOGRID TYPE: Stratagrid 150  
 TESTING METHOD: NCMA SRWU-1, ASTM D 6638  
 TESTING FACILITY: Bathurst Clarabut Geotechnical Testing  
 TEST DATE: November 29, 2004

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### CONNECTION STRENGTH TEST DATA

Test Number	Normal Load, lb/ft	Ultimate Connection, lb/ft
1	716	1362
2	234	908
3	475	1142
4	695	1211
5	908	1245
6	1163	1569
7	1534	1493
8	695	1355

### DESIGN EQUATIONS

Ultimate Connection Strength

$$T_u = 930 \text{ lb/ft} + N \tan(24^\circ)$$

$$(T_u = 13.5 \text{ kN/m} + N \tan(24^\circ))$$

### GEOGRID STRENGTH PARAMETERS

Long Term Allowable Design Strength

Sand-Silt-Clay: 1008 lb/ft (14.7 kN/m)

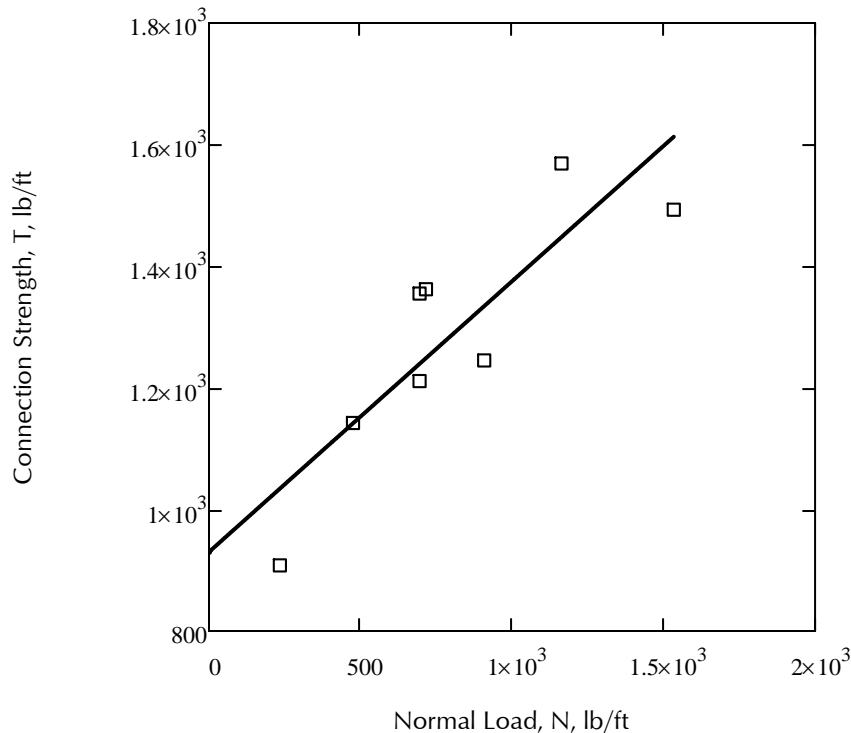
Sand-Gravel: 962 lb/ft (14.1 kN/m)

Gravel: 882 lb/ft (12.9 kN/m)

Reduction Factor Creep  $RF_{cr} = 1.61$



### ALLAN BLOCK & STRATAGRID 150 CONNECTION STRENGTH



Updated - June 8, 2010

## ALLAN BLOCK GEOGRID DESIGN PARAMETERS

ALLAN BLOCK TYPE: AB Stones  
 GEOGRID TYPE: Stratagrid 200  
 TESTING METHOD: NCMA SRWU-1, ASTM D 6638  
 TESTING FACILITY: Bathurst Clarabut Geotechnical Testing  
 TEST DATE: May 26, 2010

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### CONNECTION STRENGTH TEST DATA

Test Number	Normal Load, lb/ft	Ultimate Connection, lb/ft
1	1112	1692
2	369	1060
3	2481	2367
4	1119	1699
5	747	1369
6	1477	1885
7	1112	1679
8	1862	2119

### DESIGN EQUATIONS

Ultimate Connection Strength

$$T_u = 948 \text{ lb/ft} + N \tan(31^\circ)$$

$$(T_u = 13.8 \text{ kN/m} + N \tan(31^\circ))$$

### GEOGRID STRENGTH PARAMETERS

Long Term Allowable Design Strength

Sand-Silt-Clay: 1613 lb/ft (23.6 kN/m)

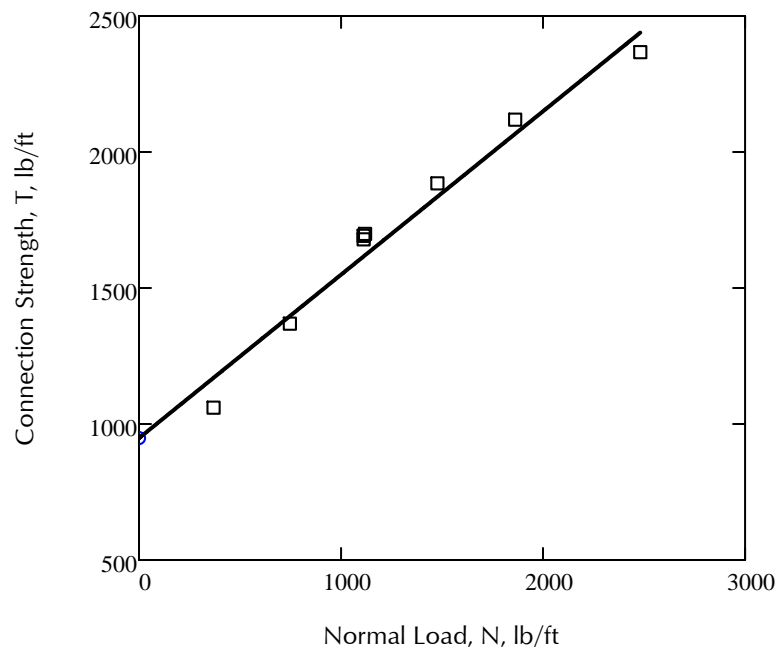
Sand-Gravel: 1540 lb/ft (22.5 kN/m)

Gravel: 1412 lb/ft (20.6 kN/m)

Reduction Factor Creep  $RF_{cr} = 1.61$



### ALLAN BLOCK STONES & STRATAGRID 200 CONNECTION



Updated - May 28, 2010

## ALLAN BLOCK GEOGRID DESIGN PARAMETERS

ALLAN BLOCK TYPE: AB Stones  
 GEOGRID TYPE: Stratagrid 350  
 TESTING METHOD: NCMA SRWU-1, ASTM D 6638  
 TESTING FACILITY: Bathurst Clarabut Geotechnical Testing  
 TEST DATE: April 10, 2010

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### CONNECTION STRENGTH TEST DATA

Test Number	Normal Load, lb/ft	Ultimate Connection, lb/ft
1	1848	1672
2	617	1101
3	3706	2401
4	1883	1734
5	1236	1383
6	2481	2002
7	1855	1775
8	3094	2195

### DESIGN EQUATIONS

Ultimate Connection Strength

$$T_u = 900 \text{ lb/ft} + N \tan (23^\circ)$$

$$(T_u = 13.1 \text{ kN/m} + N \tan (23^\circ))$$

### GEOGRID STRENGTH PARAMETERS

Long Term Allowable Design Strength

Sand-Silt-Clay: 2259 lb/ft (33.0 kN/m)

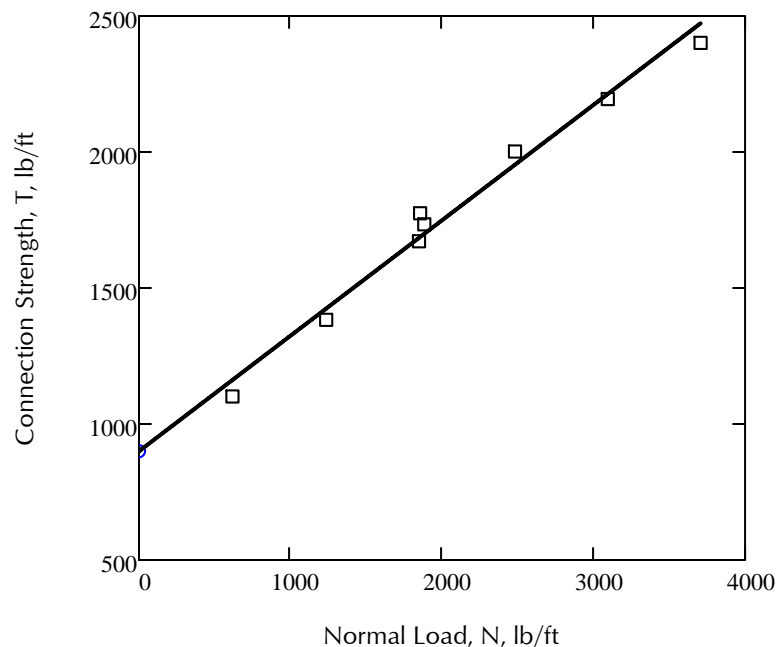
Sand-Gravel: 2156 lb/ft (31.5 kN/m)

Gravel: 1976 lb/ft (28.9 kN/m)

Reduction Factor Creep  $RF_{cr} = 1.61$



### ALLAN BLOCK STONES & STRATAGRID 350 CONNECTION



Updated - May 28, 2010

## ALLAN BLOCK GEOGRID DESIGN PARAMETERS

ALLAN BLOCK TYPE: AB Stone, AB Classic, AB Three, AB Rocks  
 GEOGRID TYPE: Stratagrid 500  
 TESTING METHOD: NCMA SRWU-1, ASTM D 6638  
 TESTING FACILITY: Bathurst Clarabut Geotechnical Testing  
 TEST DATE: January 25, 2005

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### CONNECTION STRENGTH TEST DATA

Test Number	Normal Load, lb/ft	Ultimate Connection, lb/ft
1	1156	1431
2	399	984
3	2298	2030
4	1149	1486
5	777	1335
6	1534	1871
7	1913	1981
8	1149	1569

### DESIGN EQUATIONS

Ultimate Connection Strength

$$T_u = 848 \text{ lb/ft} + N \tan(30^\circ)$$

$$(T_u = 12.4 \text{ kN/m} + N \tan(30^\circ))$$

### GEOGRID STRENGTH PARAMETERS

Long Term Allowable Design Strength

Sand-Silt-Clay: 2796 lb/ft (40.8 kN/m)

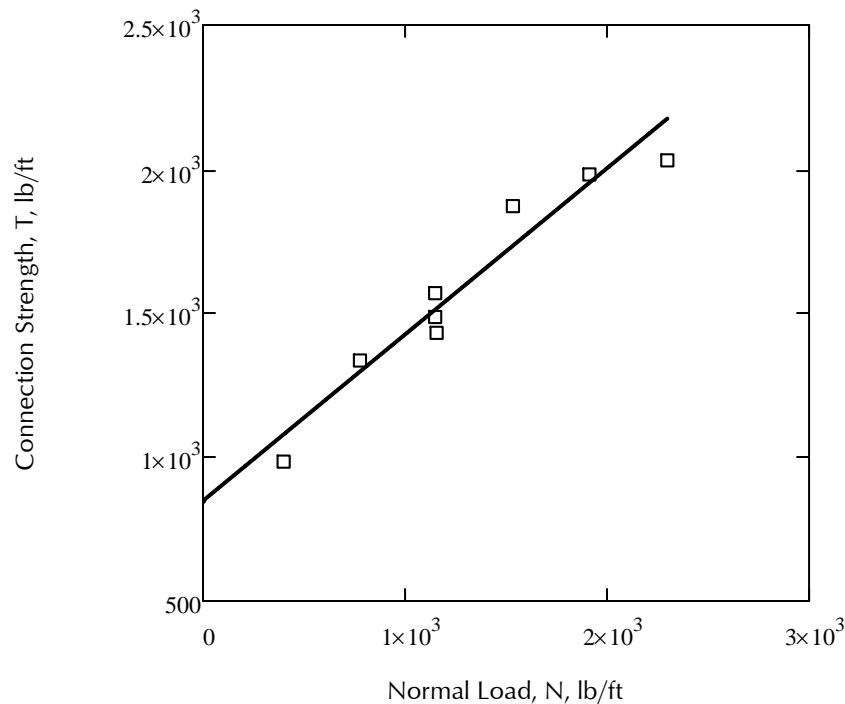
Sand-Gravel: 2669 lb/ft (39.0 kN/m)

Gravel: 2447 lb/ft (35.7 kN/m)

Reduction Factor Creep  $RF_{cr} = 1.61$



### ALLAN BLOCK & STRATAGRID 500 CONNECTION STRENGTH



Updated - June 8, 2010

## ALLAN BLOCK GEOGRID DESIGN PARAMETERS

ALLAN BLOCK TYPE: AB Stone, AB Classic, AB Three, AB Rocks  
 GEOGRID TYPE: Miragrid 2XT  
 TESTING METHOD: NCMA SRWU-1, ASTM D 6638  
 TESTING FACILITY: NCMA Testing Lab  
 TEST DATE: September 27, 2004

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### CONNECTION STRENGTH TEST DATA

Test Number	Normal Load, lb/ft	Ultimate Connection, lb/ft
1	105.7	300.0
2	428.4	819.7
3	916.5	1622.2
4	1371.6	1663.4
5	918.5	1529.5
6	917.8	1642.1

### DESIGN EQUATIONS

Ultimate Connection Strength

$$\text{Segment 1: } T_{u1} = 125.6 \text{ lb/ft} + N \tan (58.48^\circ)$$

$$(T_{u1} = 1.8 \text{ kN/m} + N \tan (58.48^\circ))$$

$$\text{Segment 2: } T_{u2} = 1623.5 \text{ lb/ft} + N \tan (0^\circ)$$

$$(T_{u1} = 23.65 \text{ kN/m} + N \tan (0^\circ))$$

### GEOGRID STRENGTH PARAMETERS

Long Term Allowable Design Strength

Sand-Silt-Clay: 949 lb/ft (13.8 kN/m)

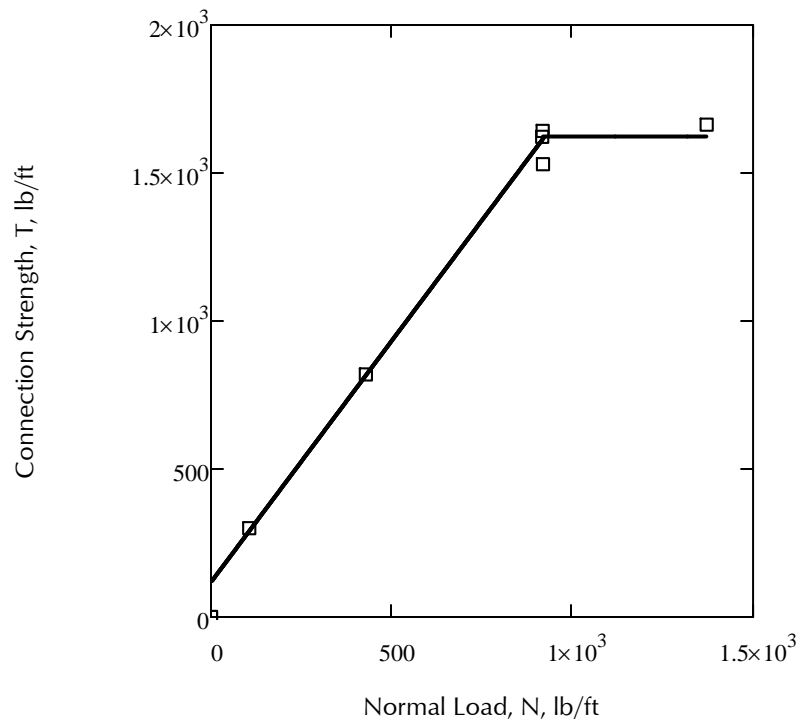
Sand-Gravel: 839 lb/ft (12.2 kN/m)

Gravel: 727 lb/ft (10.6 kN/m)

Reduction Factor Creep  $RF_{cr} = 1.67$



### ALLAN BLOCK & MIRAGRID 2XT CONNECTION STRENGTH



Updated - June 8, 2010

## ALLAN BLOCK GEOGRID DESIGN PARAMETERS

ALLAN BLOCK TYPE: AB Stones  
 GEOGRID TYPE: Mirafi 3XT  
 TESTING METHOD: NCMA SRWU-1, ASTM D 6638  
 TESTING FACILITY: Bathurst Clarabut Geotechnical Testing  
 TEST DATE: May 27, 2010

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### CONNECTION STRENGTH TEST DATA

Test Number	Normal Load, lb/ft	Ultimate Connection, lb/ft
1	1119	1844
2	376	1094
3	2467	2525
4	1112	1782
5	741	1589
6	1484	2085
7	1112	1885
8	1862	2339

### DESIGN EQUATIONS

Ultimate Connection Strength

$$T_u = 1047 \text{ lb/ft} + N \tan(33^\circ)$$

$$(T_u = 15.3 \text{ kN/m} + N \tan(33^\circ))$$

### GEOGRID STRENGTH PARAMETERS

Long Term Allowable Design Strength

Sand-Silt-Clay: 1558 lb/ft (22.7 kN/m)

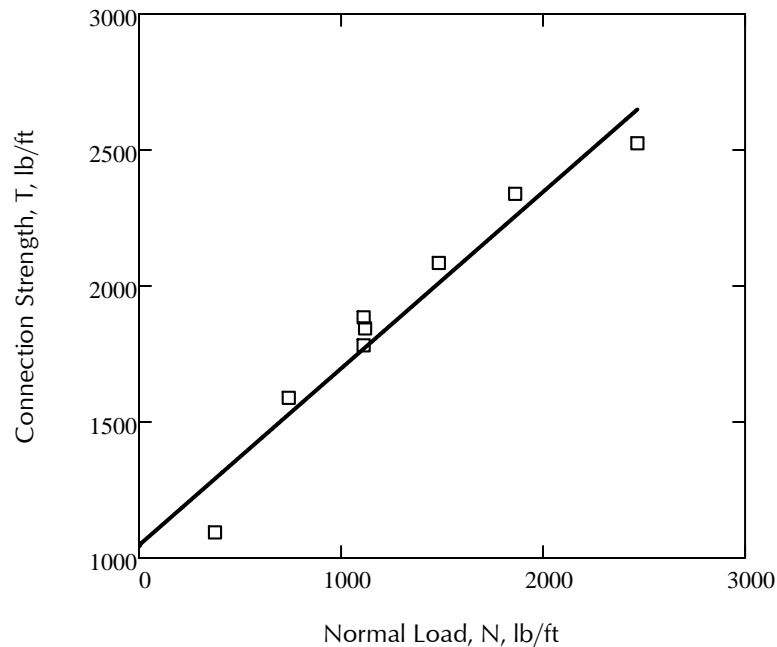
Sand-Gravel: 1423 lb/ft (20.8 kN/m)

Gravel: 1309 lb/ft (19.1 kN/m)

Reduction Factor Creep  $RF_{cr} = 1.67$



### ALLAN BLOCK STONES & MIRAFI 3XT CONNECTION



Updated - June 9, 2010

## ALLAN BLOCK GEOGRID DESIGN PARAMETERS

ALLAN BLOCK TYPE: AB Stones  
 GEOGRID TYPE: Mirafi 5XT  
 TESTING METHOD: NCMA SRWU-1, ASTM D 6638  
 TESTING FACILITY: Bathurst Clarabut Geotechnical Testing  
 TEST DATE: May 27, 2010

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### CONNECTION STRENGTH TEST DATA

Test Number	Normal Load, lb/ft	Ultimate Connection, lb/ft
1	1855	2367
2	624	1376
3	3720	3048
4	1862	2298
5	1243	2105
6	2474	2924
7	1855	2470
8	3100	2855

### DESIGN EQUATIONS

Ultimate Connection Strength

Segment 1:  $T_{u1} = 983 \text{ lb/ft} + N \tan(37^\circ)$   
 $(T_{u1} = 14.3 \text{ kN/m} + N \tan(37^\circ))$

Segment 2:  $T_{u2} = 1756 \text{ lb/ft} + N \tan(20^\circ)$   
 $(T_{u2} = 25.6 \text{ kN/m} + N \tan(20^\circ))$

### GEOGRID STRENGTH PARAMETERS

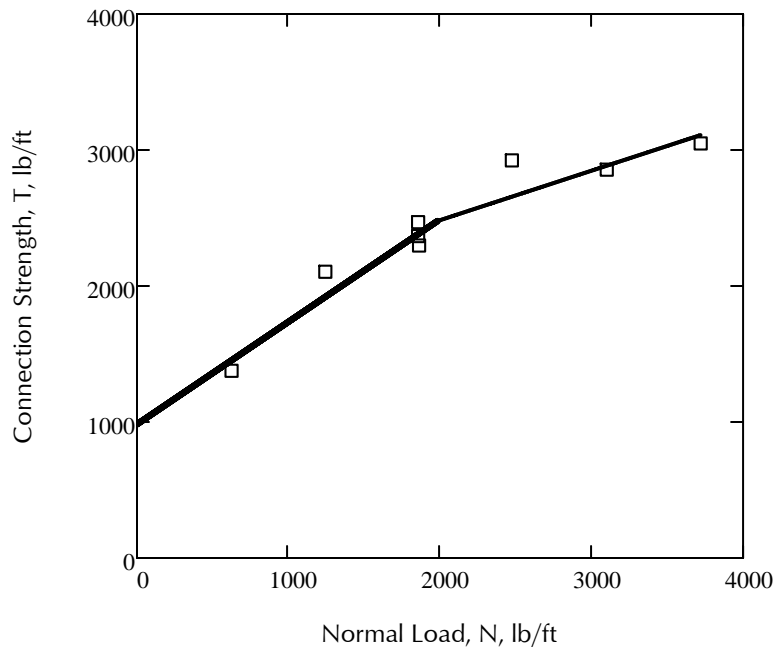
Long Term Allowable Design Strength

Sand-Silt-Clay: 2234 lb/ft (32.6 kN/m)  
 Sand-Gravel: 2040 lb/ft (29.8 kN/m)  
 Gravel: 1876 lb/ft (27.4 kN/m)

Reduction Factor Creep  $RF_{cr} = 1.67$



### ALLAN BLOCK STONES & MIRAFI 5XT CONNECTION



Updated - May 28, 2010



## ALLAN BLOCK GEOGRID DESIGN PARAMETERS

ALLAN BLOCK TYPE: AB Stones  
 GEOGRID TYPE: Miragrid 7XT  
 TESTING METHOD: NCMA SRWU-1, ASTM D 6638  
 TESTING FACILITY: National Concrete Masonry Association  
 TEST DATE: June 25, 2003

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### CONNECTION STRENGTH TEST DATA

Test Number	Normal Load, lb/ft	Ultimate Connection, lb/ft
1	500	1221
2	1236	1842
3	2099	1904
4	2099	2048
5	2099	2125
6	3081	2570

### DESIGN EQUATIONS

Ultimate Connection Strength

$$T_u = 1065 \text{ lb/ft} + N \tan (25.6^\circ)$$

$$(T_{u2} = 15.5 \text{ kN/m} + N \tan (25.6^\circ))$$

### GEOGRID STRENGTH PARAMETERS

Long Term Allowable Design Strength

Sand-Silt-Clay: 2961 lb/ft (43.2 kN/m)

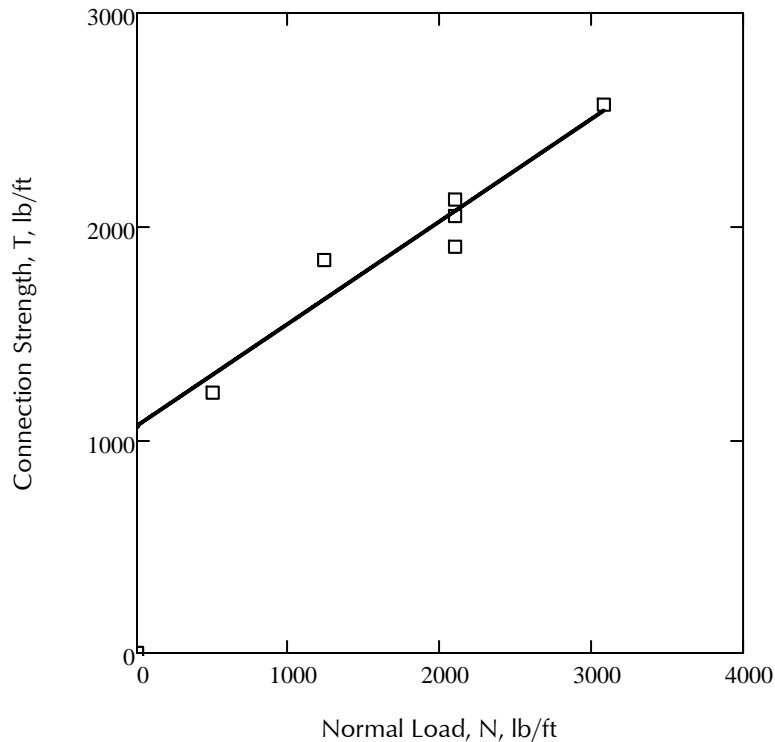
Sand-Gravel: 2704 lb/ft (39.4 kN/m)

Gravel: 2487 lb/ft (36.3 kN/m)

Reduction Factor Creep  $RF_{cr} = 1.67$



### ALLAN BLOCK & MIRAGRID 7XT CONNECTION STRENGTH



Updated - September 15, 2011

# ALLAN BLOCK GEOGRID DESIGN PARAMETERS

ALLAN BLOCK TYPE: AB Stone, AB Classic, AB Three, AB Rocks  
 GEOGRID TYPE: Miragrid 8XT  
 TESTING FACILITY: Bathurst Clarabut Geotechnical Testing  
 TEST DATE: April 25, 2000

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## CONNECTION STRENGTH TEST DATA

Test Number	Normal Load, lb/ft	Ultimate Connection, lb/ft
1	358	1245
2	709	1734
3	1170	1975
4	1713	2456
5	1211	2153
6	1156	2112
7	2277	2924
8	2910	2821

## DESIGN EQUATIONS

Ultimate Connection Strength

Segment 1:  $T_{u1} = 1063 \text{ lb/ft} + N \tan(40^\circ)$   
 ( $T_{u1} = 15.51 \text{ kN/m} + N \tan(40^\circ)$ )

Segment 2:  $T_{u2} = 2872 \text{ lb/ft}$   
 ( $T_{u2} = 41.90 \text{ kN/m}$ )

## GEOGRID STRENGTH PARAMETERS

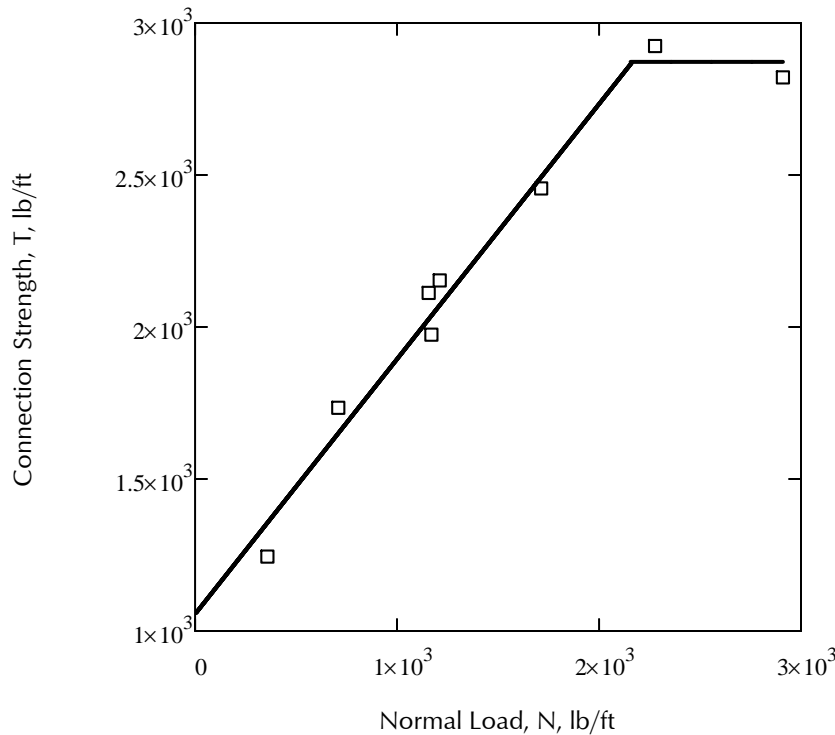
Long Term Allowable Design Strength

Sand-Silt-Clay: 3089 lb/ft (45.07 kN/m)  
 Sand-Gravel: 3007 lb/ft (43.87 kN/m)  
 Gravel: 2719 lb/ft (39.67 kN/m)

Reduction Factor Creep  $RF_{cr} = 1.67$



## ALLAN BLOCK & MIRAGRID 8XT CONNECTION STRENGTH



Updated - June 8, 2010

## ALLAN BLOCK GEOGRID DESIGN PARAMETERS

ALLAN BLOCK TYPE: AB Stone, AB Classic, AB Three, AB Rocks  
 GEOGRID TYPE: Miragrid 10XT  
 TESTING METHOD: ASTM D 6638  
 TESTING FACILITY: Bathurst Clarabut Geotechnical Testing  
 TEST DATE: April 25, 2000

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### CONNECTION STRENGTH TEST DATA

Test Number	Normal Load, lb/ft	Ultimate Connection, lb/ft
1	406	1032
2	716	1465
3	1163	2023
4	1720	2105
5	2291	2374
6	2869	2683
7	1734	2064
8	1851	2140

### DESIGN EQUATIONS

Ultimate Connection Strength

Segment 1:  $T_{u1} = 513 \text{ lb/ft} + N \tan(52^\circ)$   
 $(T_{u1} = 7.48 \text{ kN/m} + N \tan(52^\circ))$

Segment 2:  $T_{u2} = 1426 \text{ lb/ft} + N \tan(23^\circ)$   
 $(T_{u2} = 20.81 \text{ kN/m} + N \tan(23^\circ))$

### GEOGRID STRENGTH PARAMETERS

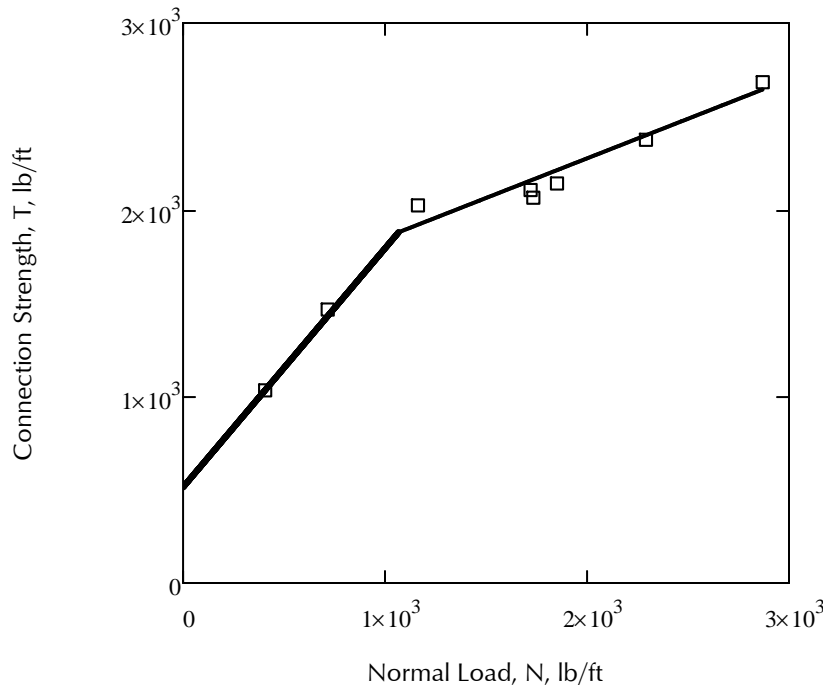
Long Term Allowable Design Strength

Sand-Silt-Clay: 4116 lb/ft (60.05 kN/m)  
 Sand-Gravel: 4006 lb/ft (58.45 kN/m)  
 Gravel: 3622 lb/ft (52.84 kN/m)

Reduction Factor Creep  $RF_{cr} = 1.67$



### ALLAN BLOCK & MIRAGRID 10XT CONNECTION STRENGTH



Updated - June 8, 2010

## ALLAN BLOCK GEOGRID DESIGN PARAMETERS

ALLAN BLOCK TYPE: AB Stones  
 GEOGRID TYPE: Fortrac 35  
 TESTING METHOD: NCMA SRWU-1, ASTM D 6638  
 TESTING FACILITY: Bathurst Clarabut Geotechnical Testing  
 TEST DATE: May 31, 2010

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### CONNECTION STRENGTH TEST DATA

Test Number	Normal Load, lb/ft	Ultimate Connection, lb/ft
1	1112	1066
2	376	826
3	2474	1232
4	1098	1080
5	741	1011
6	1112	1080
7	1484	1280
8	1862	1307

### DESIGN EQUATIONS

Ultimate Connection Strength

Segment 1:  $T_{u1} = 728 \text{ lb/ft} + N \tan(18^\circ)$   
 $(T_{u1} = 10.6 \text{ kN/m} + N \tan(18^\circ))$

Segment 2:  $T_{u1} = 958 \text{ lb/ft} + N \tan(8^\circ)$   
 $(T_{u1} = 14.0 \text{ kN/m} + N \tan(8^\circ))$

### GEOGRID STRENGTH PARAMETERS

Long Term Allowable Design Strength

Sand-Silt-Clay: 1322 lb/ft (19.3 kN/m)

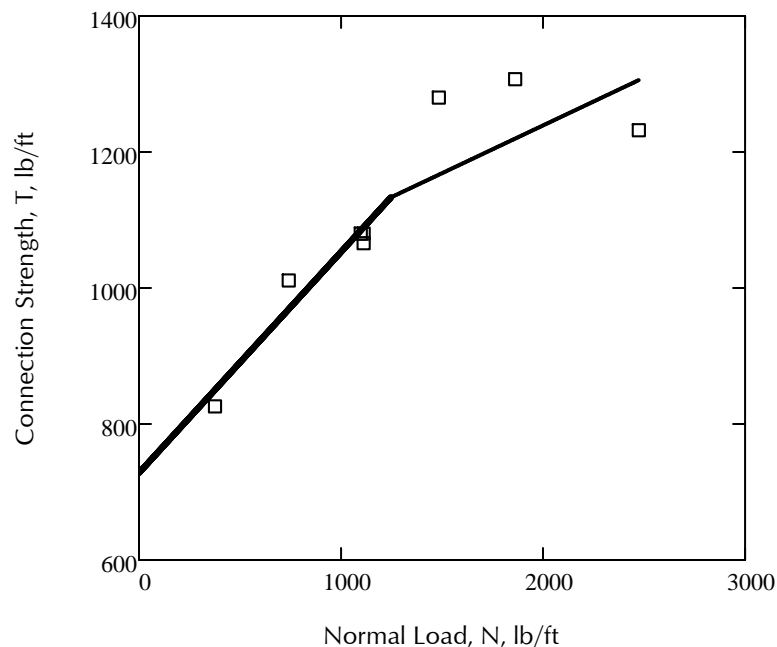
Sand-Gravel: 1300 lb/ft (19.0 kN/m)

Gravel: 1243 lb/ft (18.1 kN/m)

Reduction Factor Creep  $RF_{cr} = 1.572$



### ALLAN BLOCK STONES & FORTRAC 35 CONNECTION



Updated - June 04, 2010

## ALLAN BLOCK GEOGRID DESIGN PARAMETERS

ALLAN BLOCK TYPE: AB Stones  
 GEOGRID TYPE: Fortrac 55  
 TESTING METHOD: NCMA SRWU-1, ASTM D 6638  
 TESTING FACILITY: Bathurst Clarabut Geotechnical Testing  
 TEST DATE: May 31, 2010

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### CONNECTION STRENGTH TEST DATA

Test Number	Normal Load, lb/ft	Ultimate Connection, lb/ft
1	1855	1981
2	617	1335
3	3713	2140
4	1855	1940
5	1236	1864
6	2474	2229
7	1848	2126
8	3100	2147

### DESIGN EQUATIONS

Ultimate Connection Strength

Segment 1:  $T_{u1} = 1090 \text{ lb/ft} + N \tan(27^\circ)$   
 $(T_{u1} = 15.9 \text{ kN/m} + N \tan(27^\circ))$

Segment 2:  $T_{u2} = 1906 \text{ lb/ft} + N \tan(4^\circ)$   
 $(T_{u2} = 27.8 \text{ kN/m} + N \tan(4^\circ))$

### GEOGRID STRENGTH PARAMETERS

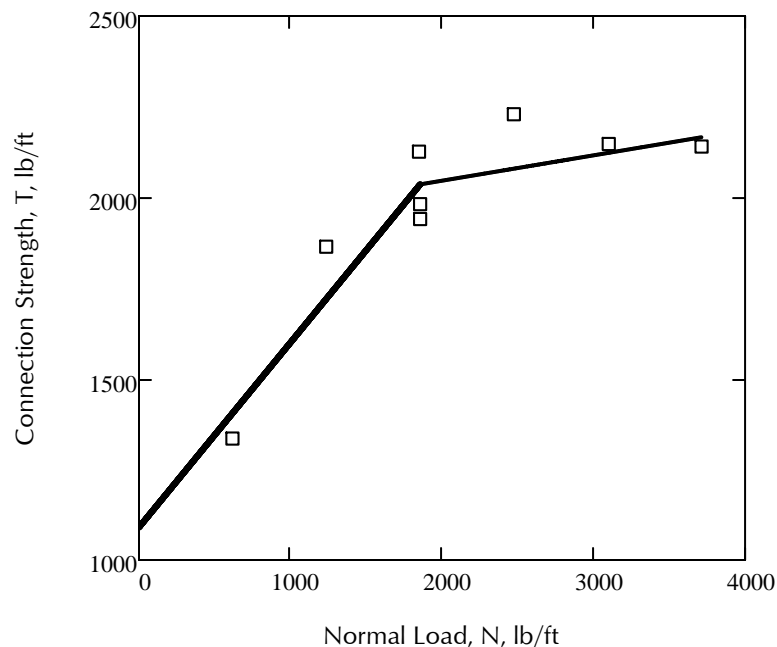
Long Term Allowable Design Strength

Sand-Silt-Clay: 1936 lb/ft (28.3 kN/m)  
 Sand-Gravel: 1882 lb/ft (27.5 kN/m)  
 Gravel: 1783 lb/ft (26.0 kN/m)

Reduction Factor Creep  $RF_{cr} = 1.655$



### ALLAN BLOCK STONES & FORTRAC 55 CONNECTION



Updated - June 4, 2010

## ALLAN BLOCK GEOGRID DESIGN PARAMETERS

ALLAN BLOCK TYPE: AB Stone, AB Classic, AB Three, AB Rocks  
 GEOGRID TYPE: Fortrac 80/30-20 PET  
 TESTING METHOD: NCMA SRWU-1  
 TESTING FACILITY: Bathurst Clarabut Geotechnical Testing  
 TEST DATE: September 5, 2001

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### CONNECTION STRENGTH TEST DATA

Test Number	Normal Load, lb/ft	Ultimate Connection, lb/ft
1	392	1300
2	736	1816
3	1115	2429
4	1823	2649
5	2456	2697
6	3020	2938
7	1851	2566
8	1837	2614

### DESIGN EQUATIONS

Ultimate Connection Strength

Segment 1:  $T_{u1} = 680 \text{ lb/ft} + N \tan(57^\circ)$   
 $(T_{u1} = 9.92 \text{ kN/m} + N \tan(57^\circ))$

Segment 2:  $T_{u2} = 2143 \text{ lb/ft} + N \tan(14^\circ)$   
 $(T_{u2} = 31.27 \text{ kN/m} + N \tan(14^\circ))$

### GEOGRID STRENGTH PARAMETERS

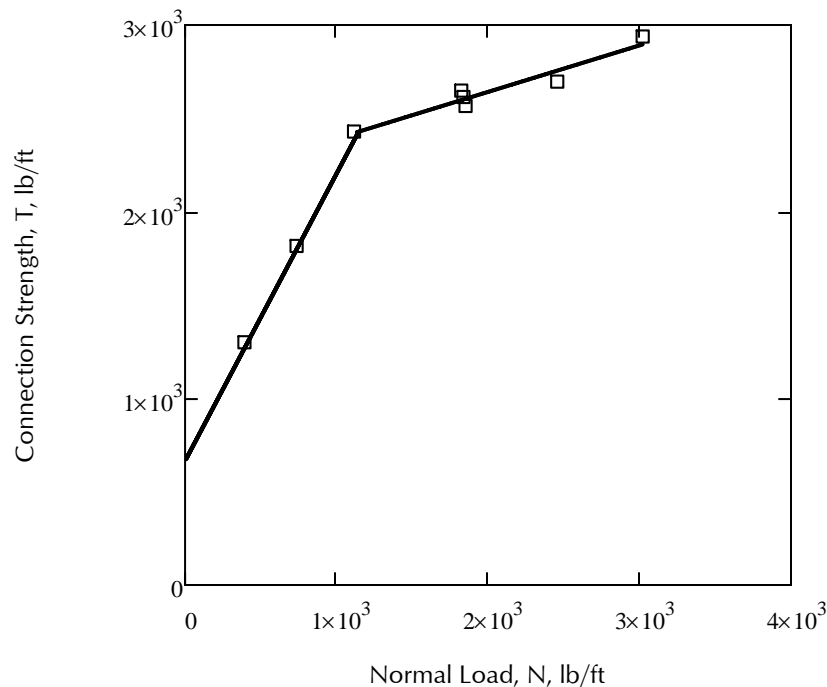
Long Term Allowable Design Strength

Sand-Silt-Clay: 2815 lb/ft (41.1 kN/m)  
 Sand-Gravel: 2815 lb/ft (41.1 kN/m)  
 Gravel: 2615 lb/ft (38.2 kN/m)

Reduction Factor Creep  $RF_{cr} = 1.655$



### ALLAN BLOCK & FORTRAC 80/30-20 PET CONNECTION STRENGTH



Updated - June 8, 2010

## ALLAN BLOCK GEOGRID DESIGN PARAMETERS

ALLAN BLOCK TYPE: AB Fieldstone  
 GEOGRID TYPE: Stratagrid SG 150  
 TESTING METHOD: NCMA SRWU-1, ASTM D6638  
 TESTING FACILITY: Bathurst Clarabut Geotechnical Testing  
 TEST DATE: May 4, 2009

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### CONNECTION STRENGTH TEST DATA

Test Number	Normal Load, lb/ft	Ultimate Connection, lb/ft
1	1223.0	998.0
2	411.0	908.0
3	817.0	1046.0
4	1223.0	1121.0
5	1643.0	1142.0
6	2042.0	1218.0
7	1223.0	1046.0
8	2723.0	1225.0

### DESIGN EQUATIONS

Ultimate Connection Strength

Segment 1:  $T_{u1} = 853 \text{ lb/ft} + N \tan(10^\circ)$   
 $(T_{u1} = 12.4 \text{ kN/m} + N \tan(10^\circ))$

Segment 2:  $T_{u2} = 1200 \text{ lb/ft} + N \tan(0^\circ)$   
 $(T_{u2} = 17.5 \text{ kN/m} + N \tan(0^\circ))$

### GEOGRID STRENGTH PARAMETERS

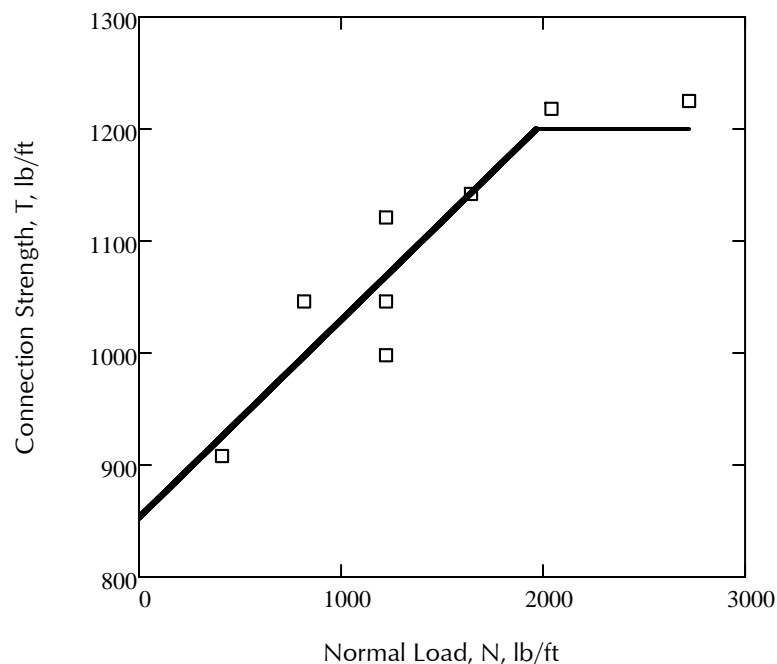
Long Term Allowable Design Strength

Sand-Silt-Clay: 1008 lb/ft (14.7 kN/m)  
 Sand-Gravel: 962 lb/ft (14.1 kN/m)  
 Gravel: 882 lb/ft (12.9 kN/m)

Reduction Factor Creep  $RF_{cr} = 1.61$



### AB FIELDSTONE & STRATAGRID SG 150 CONNECTION STRENGTH



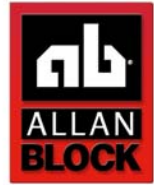
Intercepting Normal Load for Segment 1 and Segment 2 for Ultimate curve:  $N_i = 1967.9$

Updated - June 10, 2009

# ALLAN BLOCK GEOGRID DESIGN PARAMETERS

ALLAN BLOCK TYPE: AB Fieldstone  
 GEOGRID TYPE: Stratagrid SG 200  
 TESTING METHOD: NCMA SRWU-1, ASTM D6638  
 TESTING FACILITY: Bathurst Clarabut Geotechnical Testing  
 TEST DATE: May 5, 2009

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## CONNECTION STRENGTH TEST DATA

Test Number	Normal Load, lb/ft	Ultimate Connection, lb/ft
1	1230.0	1686.0
2	404.0	1004.0
3	817.0	1424.0
4	1230.0	1665.0
5	1636.0	1871.0
6	2042.0	1878.0
7	1223.0	1651.0
8	2730.0	1878.0

## DESIGN EQUATIONS

Ultimate Connection Strength

Segment 1:  $T_{u1} = 784 \text{ lb/ft} + N \tan(35^\circ)$   
 $(T_{u1} = 11.4 \text{ kN/m} + N \tan(35^\circ))$

Segment 2:  $T_{u2} = 1875 \text{ lb/ft} + N \tan(0^\circ)$   
 $(T_{u2} = 27.3 \text{ kN/m} + N \tan(0^\circ))$

## GEOGRID STRENGTH PARAMETERS

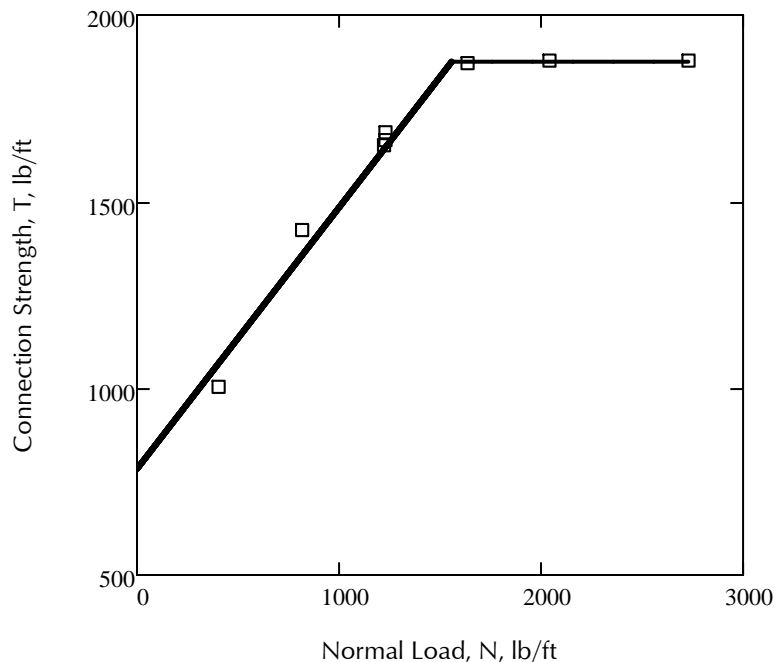
Long Term Allowable Design Strength

Sand-Silt-Clay: 1613 lb/ft (23.6 kN/m)  
 Sand-Gravel: 1540 lb/ft (22.5 kN/m)  
 Gravel: 1412 lb/ft (20.6 kN/m)

Reduction Factor Creep  $RF_{cr} = 1.61$



## AB FIELDSTONE & STRATAGRID SG 200 CONNECTION STRENGTH



Intercepting Normal Load for Segment 1 and Segment 2 for Ultimate curve:  $N_i = 1558.1$

Updated - June 10, 2009



# ALLAN BLOCK GEOGRID DESIGN PARAMETERS

ALLAN BLOCK TYPE: AB Fieldstone  
 GEOGRID TYPE: Stratagrid SG 350  
 TESTING METHOD: NCMA SRWU-1, ASTM D6638  
 TESTING FACILITY: Bathurst Clarabut Geotechnical Testing  
 TEST DATE: August 18, 2010

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## CONNECTION STRENGTH TEST DATA

Test Number	Normal Load, lb/ft	Ultimate Connection, lb/ft
1	2049.0	2016.0
2	679.0	1170.0
3	4078.0	2174.0
4	2042.0	2016.0
5	1374.0	1672.0
6	2730.0	2394.0
7	2042.0	2105.0
8	3411.0	2305.0

## DESIGN EQUATIONS

Ultimate Connection Strength

Segment 1:  $T_{u1} = 761 \text{ lb/ft} + N \tan(32^\circ)$   
 $(T_{u1} = 11.1 \text{ kN/m} + N \tan(32^\circ))$

Segment 2:  $T_{u2} = 1908 \text{ lb/ft} + N \tan(5^\circ)$   
 $(T_{u2} = 27.8 \text{ kN/m} + N \tan(5^\circ))$

## GEOGRID STRENGTH PARAMETERS

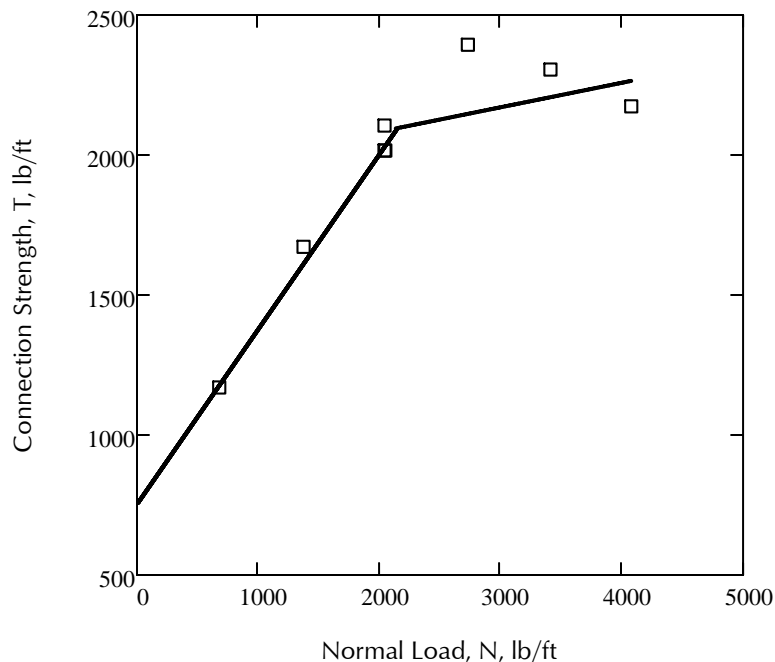
Long Term Allowable Design Strength

Sand-Silt-Clay: 2259 lb/ft (33.0 kN/m)  
 Sand-Gravel: 2156 lb/ft (31.5 kN/m)  
 Gravel: 1976 lb/ft (28.9 kN/m)

Reduction Factor Creep  $RF_{cr} = 1.61$



## AB FIELDSTONE & STRATAGRID SG 350 CONNECTION STRENGTH



Intercepting Normal Load for Segment 1 and Segment 2 for Ultimate curve:  $N_i = 2134.4$

Updated - August 30, 2010

# ALLAN BLOCK GEOGRID DESIGN PARAMETERS

ALLAN BLOCK TYPE: AB Fieldstone  
 GEOGRID TYPE: Miragrid 2XT  
 TESTING METHOD: NCMA SRWU-1, ASTM D 6638  
 TESTING FACILITY: Bathurst Clarabut Geotechnical Testing  
 TEST DATE: May 8, 2009

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## CONNECTION STRENGTH TEST DATA

Test Number	Normal Load, lb/ft	Ultimate Connection, lb/ft
1	1223.0	1686.0
2	411.0	1066.0
3	817.0	1555.0
4	1230.0	1610.0
5	1636.0	1665.0
6	2035.0	1713.0
7	1223.0	1569.0
8	2723.0	1748.0

## DESIGN EQUATIONS

Ultimate Connection Strength

Segment 1:  $T_{u1} = 893 \text{ lb/ft} + N \tan(31^\circ)$   
 $(T_{u1} = 13.0 \text{ kN/m} + N \tan(31^\circ))$

Segment 2:  $T_{u2} = 1516 \text{ lb/ft} + N \tan(5^\circ)$   
 $(T_{u1} = 22.1 \text{ kN/m} + N \tan(5^\circ))$

## GEOGRID STRENGTH PARAMETERS

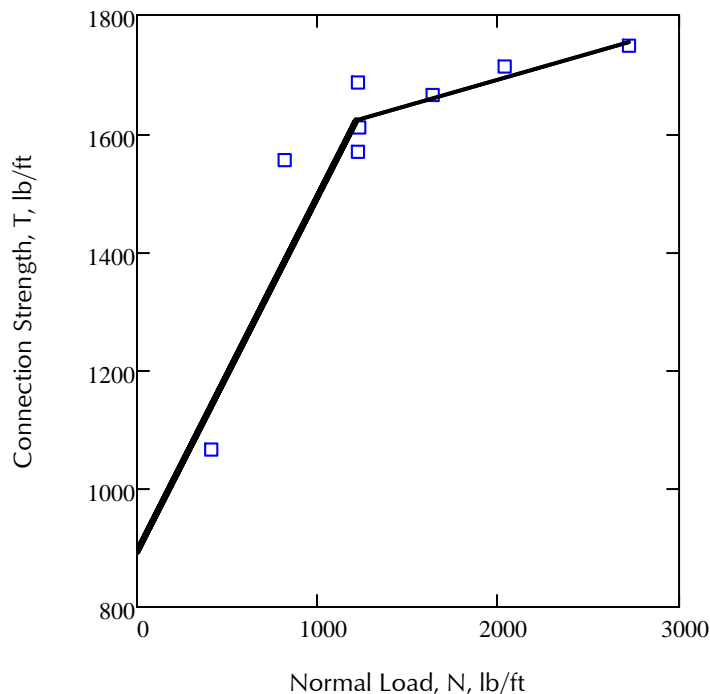
Long Term Allowable Design Strength

Sand-Silt-Clay: 949 lb/ft (13.8 kN/m)  
 Sand-Gravel: 839 lb/ft (12.2 kN/m)  
 Gravel: 727 lb/ft (10.6 kN/m)

Reduction Factor Creep  $RF_{cr} = 1.67$



## AB FIELDSTONE & MIRAGRID 2XT CONNECTION STRENGTH



Intercepting Normal Load for Segment 1 and Segment 2  $N_i = 1213.5$

Updated - June 10, 2009

# ALLAN BLOCK GEOGRID DESIGN PARAMETERS

ALLAN BLOCK TYPE: AB Fieldstone  
 GEOGRID TYPE: Miragrid 3XT  
 TESTING METHOD: NCMA SRWU-1, ASTM D 6638  
 TESTING FACILITY: Bathurst Clarabut Geotechnical Testing  
 TEST DATE: May 8, 2009

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## CONNECTION STRENGTH TEST DATA

Test Number	Normal Load, lb/ft	Ultimate Connection, lb/ft
1	1230.0	1706.0
2	404.0	1135.0
3	824.0	1527.0
4	1223.0	1789.0
5	1629.0	1988.0
6	2055.0	1968.0
7	1223.0	1926.0
8	2723.0	1940.0

## DESIGN EQUATIONS

Ultimate Connection Strength

Segment 1:  $T_{u1} = 829 \text{ lb/ft} + N \tan(39^\circ)$   
 $(T_{u1} = 12.1 \text{ kN/m} + N \tan(39^\circ))$

Segment 2:  $T_{u2} = 1715 \text{ lb/ft} + N \tan(6^\circ)$   
 $(T_{u1} = 25.0 \text{ kN/m} + N \tan(6^\circ))$

## GEOGRID STRENGTH PARAMETERS

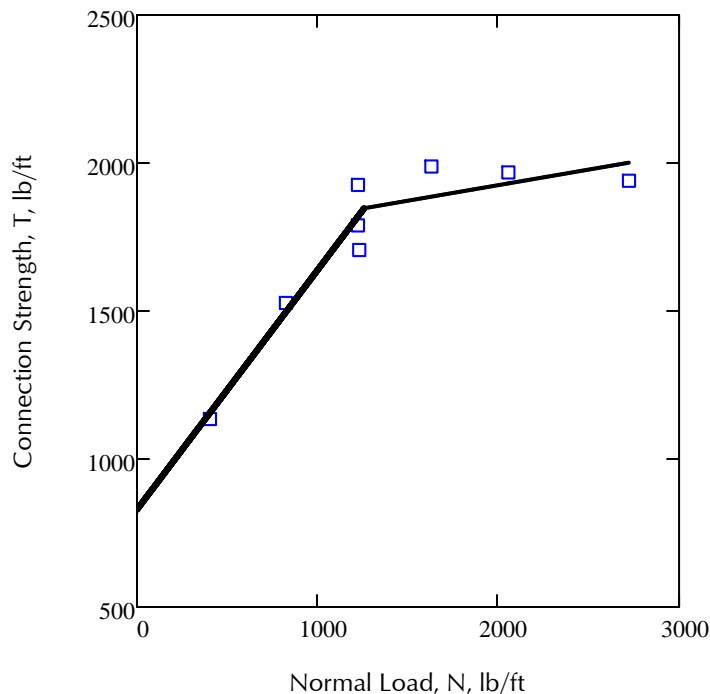
Long Term Allowable Design Strength

Sand-Silt-Clay: 1558 lb/ft (22.7 kN/m)  
 Sand-Gravel: 1423 lb/ft (20.8 kN/m)  
 Gravel: 1309 lb/ft (19.1 kN/m)

Reduction Factor Creep  $RF_{cr} = 1.67$



## AB FIELDSTONE & MIRAGRID 3XT CONNECTION STRENGTH



Intercepting Normal Load for Segment 1 and Segment 2  $N_i = 1257.3$

Updated - June 10, 2009

# ALLAN BLOCK GEOGRID DESIGN PARAMETERS

ALLAN BLOCK TYPE: AB Fieldstone  
 GEOGRID TYPE: Miragrid 5XT  
 TESTING METHOD: NCMA SRWU-1, ASTM D 6638  
 TESTING FACILITY: Bathurst Clarabut Geotechnical Testing  
 TEST DATE: July 28, 2010

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## CONNECTION STRENGTH TEST DATA

Test Number	Normal Load, lb/ft	Ultimate Connection, lb/ft	Service Connection, lb/ft
1	2034.0	2745.0	1869.0
2	700.0	1410.0	1196.0
3	4085.0	3240.0	2390.0
4	2041.0	2559.0	1933.0
5	3404.0	3337.0	2097.0
6	1367.0	2126.0	1526.0
7	2048.0	2786.0	1864.0
8	2709.0	3000.0	1991.0

## DESIGN EQUATIONS

Ultimate Connection Strength

Segment 1:  $T_{u1} = 778 \text{ lb/ft} + N \tan(43^\circ)$

$(T_{u1} = 11.3 \text{ kN/m} + N \tan(43^\circ))$

Segment 2:  $T_{u2} = 2066 \text{ lb/ft} + N \tan(18^\circ)$

$(T_{u2} = 30.1 \text{ kN/m} + N \tan(18^\circ))$

## GEOGRID STRENGTH PARAMETERS

Long Term Allowable Design Strength

Sand-Silt-Clay: 2234 lb/ft (32.6 kN/m)

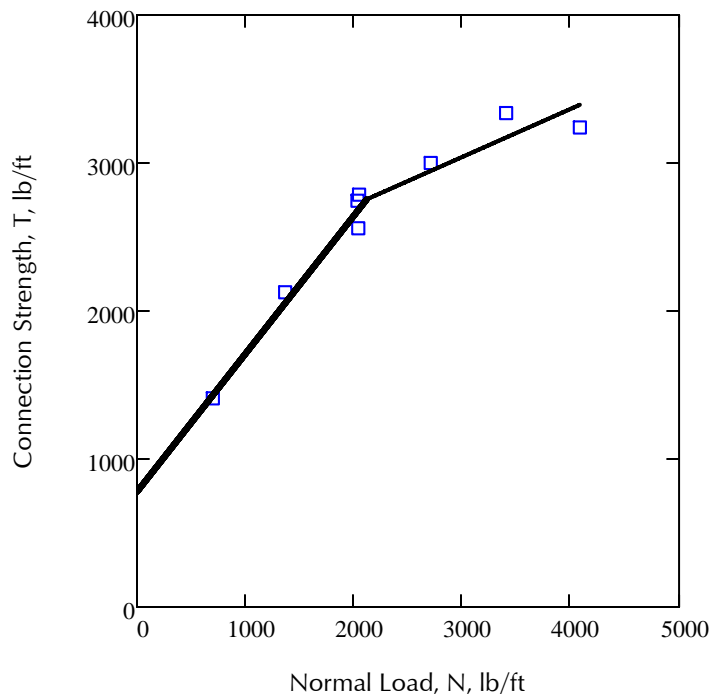
Sand-Gravel: 2040 lb/ft (29.8 kN/m)

Gravel: 1876 lb/ft (27.4 kN/m)

Reduction Factor Creep  $RF_{cr} = 1.67$



## AB FIELDSTONE & MIRAGRID 5XT CONNECTION STRENGTH



Intercepting Normal Load for Segment 1 and Segment 2  $N_i = 2119.8$

Updated - July 30, 2010

## ALLAN BLOCK GEOGRID DESIGN PARAMETERS

ALLAN BLOCK TYPE: AB Fieldstone  
 GEOGRID TYPE: Fortrac 35  
 TESTING METHOD: NCMA SRWU-1, ASTM D 6638  
 TESTING FACILITY: Bathurst Clarabut Geotechnical Testing  
 TEST DATE: June 24, 2009

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### CONNECTION STRENGTH TEST DATA

Test Number	Normal Load, lb/ft	Ultimate Connection, lb/ft
1	1223.0	894.0
2	404.0	826.0
3	817.0	757.0
4	1230.0	888.0
5	1636.0	984.0
6	2042.0	1025.0
7	1216.0	922.0
8	2723.0	970.0
9	824.0	839.0

### DESIGN EQUATIONS

Ultimate Connection Strength

$$T_u = 769 \text{ lb/ft} + N \tan(6^\circ)$$

$$(T_u = 11.2 \text{ kN/m} + N \tan(6^\circ))$$

### GEOGRID STRENGTH PARAMETERS

Long Term Allowable Design Strength

Sand-Silt-Clay: 1322 lb/ft (19.3 kN/m)

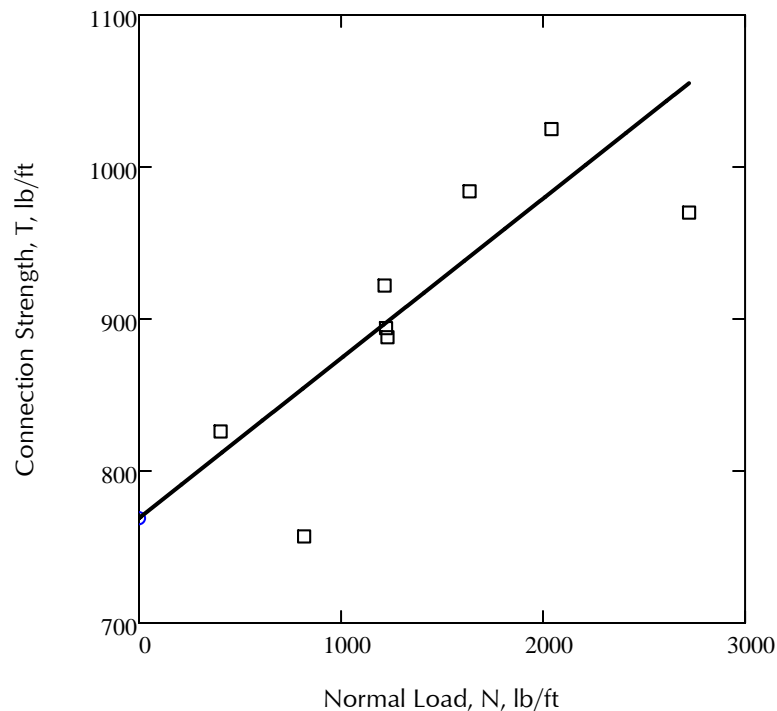
Sand-Gravel: 1300 lb/ft (19.0 kN/m)

Gravel: 1243 lb/ft (18.1 kN/m)

Reduction Factor Creep  $RF_{cr} = 1.572$



### AB FIELDSTONE & FORTRAC 35 CONNECTION STRENGTH



Updated - June 10, 2009

## ALLAN BLOCK GEOGRID DESIGN PARAMETERS

ALLAN BLOCK TYPE: AB Fieldstone  
 GEOGRID TYPE: Fortrac 55  
 TESTING METHOD: NCMA SRWU-1, ASTM D 6638  
 TESTING FACILITY: Bathurst Clarabut Geotechnical Testing  
 TEST DATE: June 24, 2009

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### CONNECTION STRENGTH TEST DATA

Test Number	Normal Load, lb/ft	Ultimate Connection, lb/ft
1	2049.0	1569.0
2	679.0	1376.0
3	1361.0	1603.0
4	2042.0	1644.0
5	2730.0	1507.0
6	3404.0	1569.0
7	2042.0	1713.0
8	4099.0	1830.0
9	2737.0	1500.0
10	4085.0	1610.0

### DESIGN EQUATIONS

Ultimate Connection Strength

$$T_u = 1444 \text{ lb/ft} + N \tan(3^\circ)$$

$$(T_u = 21.0 \text{ kN/m} + N \tan(3^\circ))$$

### GEOGRID STRENGTH PARAMETERS

Long Term Allowable Design Strength

Sand-Silt-Clay: 1936 lb/ft (28.3 kN/m)

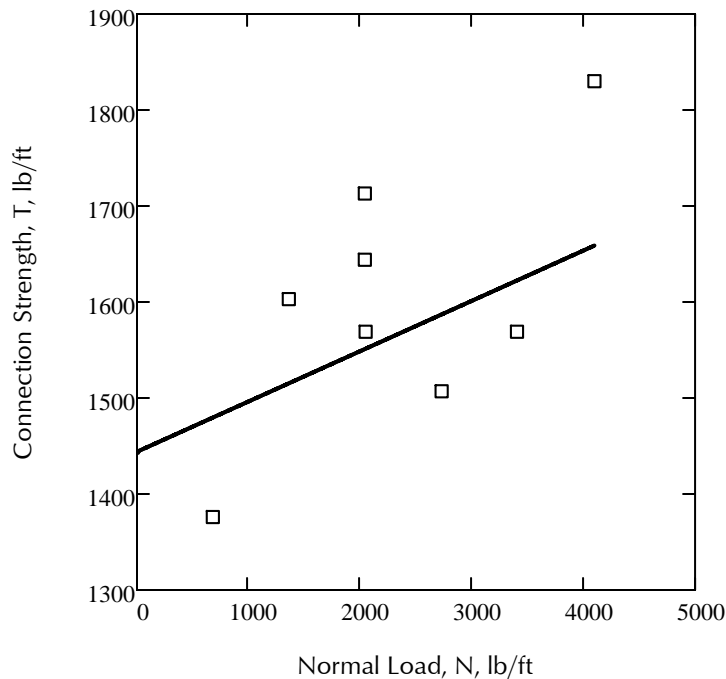
Sand-Gravel: 1882 lb/ft (27.5 kN/m)

Gravel: 1783 lb/ft (26.0 kN/m)

Reduction Factor Creep  $RF_{cr} = 1.655$



### AB FIELDSTONE & FORTRAC 55 CONNECTION STRENGTH



Updated - June 10, 2009