

4000 Knights Trail Rd.  
Nokomis, FL 34275

**941-861-5000**  
**scgov.net**

February 27, 2017

Ms. El Kromhout, P.G.  
Mr. Cory Dilmore, P.E.  
Florida Department of Environmental Protection  
Permitting and Compliance Assistance Program  
2600 Blair Stone Road, MS 4565  
Tallahassee, FL 32399



Mr. Nolin Moon  
Florida Department of Environmental Protection  
South District  
Permitting and Engineering, Solid Waste  
2295 Victoria Avenue, Suite 364  
Fort Myers, FL 33902-2549

Re: Sarasota County  
Central County Solid Waste Disposal Complex – Phase II Subcell 3  
Protective Layer Thickness Verification – Grid Sections J1-J4  
WACS ID No. 51614  
Permit No. 0130542-022-SO/01 with MOD - 027MM

In accordance with Permit No. 0130542-022-SO/01 MOD-027MM specific condition C.3 and Section K.7.b of the approved Operations Plan dated August 2016, Sarasota County has verified the 24-inch protective layer thickness of the Phase II Subcell 3 to ensure compliance with Rule 62-701.400(3)(d)(3). The 100 foot by 100 foot grid system is shown in the figure provided in Attachment A. This figure and grid system was established as part of the initial depth verification study performed by Ardaman and Associates, Inc. in March 2016. This grid system will continue to be used to determine additional sand needed for each grid section and the same locations will be used for the protective cover sand depth verifications.

Grid sections J1 through J4, as shown on the figure provided in Attachment A, were field verified as having 24 inches of sand by Jason Timmons, P.E. and are certified as meeting the 24-inch depth requirement. These sections of Phase II Subcell 3 are therefore ready for waste placement operations.

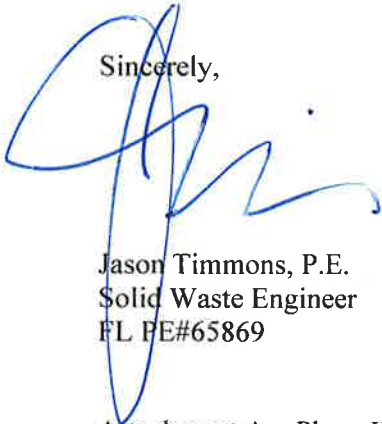
In addition, gradation testing reports for the imported sand are taken for every 1,500 tons of material delivered for the project. These reports, provided in Attachment B, demonstrate that the sand meets the original gradation specifications for the Phase II protective cover sand layer.

A summary table documenting the initial sand depth measurement by Ardaman and Associations, Inc. in March 2016 and the final sand depth verifications performed by Jason Timmons, P.E. with

Sarasota County Solid Waste for each grid section and the date of the verification is provided in Attachment C. This summary table will be continuously updated as the grid sections are prepared and the sand depth verified.

Please contact me anytime at 941-861-1572 or 941-400-2370 if you have questions or require additional information regarding this correspondence or the information contained therein.

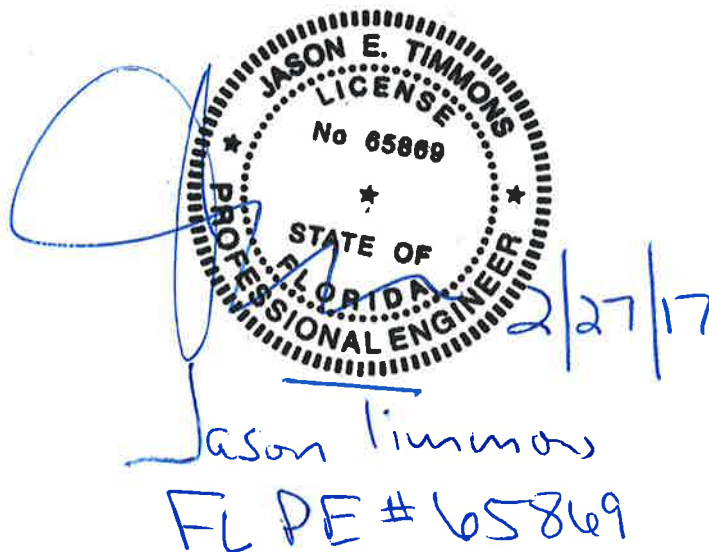
Sincerely,



Jason Timmons, P.E.  
Solid Waste Engineer  
FL PE#65869

Attachment A – Phase II Subcell 3 Sand Depth Verification Grid System  
Attachment B – Sand Testing Reports  
Attachment C – Sand Depth Verification and Approval Summary Table

Cc: File



Jason Timmons  
FL PE # 65869

ATTACHMENT A

PHASE II SUBCELL 3  
SAND DEPTH VERIFICATION  
GRID SYSTEM





Base Aerial From Google Earth Pro

**Sections Ready for Waste Placement**

**\* See Sand Depth Verification Summary Table**

**Ardaman & Associates, Inc.**  
Geotechnical, Environmental and Materials Consultants

Thickness & Sample Locations  
Protective Cover Sand  
CCSWDC, Phase II, Subcell 3  
Sarasota County, Florida

DRAWN BY: KGS CHECKED BY: DATE: 3/31/16  
FILE NO. APPROVED BY: FIGURE: 1  
15-7534

## ATTACHMENT B

### SAND TESTING REPORTS



**Ardaman & Associates, Inc.**

Geotechnical, Environmental and  
Materials Consultants

October 4, 2016  
File No. 15-7534

**TO:** Sarasota County, Environmental Services  
Solid Waste Operations  
4000 Knights Trail Road  
Nokomis, FL 34275

**Attention:** Jason Timmons, P.E.

**SUBJECT:** Testing of Proposed Protective Cover Sand  
CCSWDC, Phase II, Subcell 3  
4000 Knights Trail Road, Nokomis  
Sarasota County, Florida

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Dear Jason:

As requested and authorized, Ardaman & Associates has completed laboratory testing of five (5) samples of proposed "protective cover sand" for possible use in Subcell 3 of the Phase II landfill area at the site referenced above. The subject samples were delivered to us on September 1, September 8 and September 16, 2016. The test results are considered representative of the samples, as received.

#### **Specification Review**

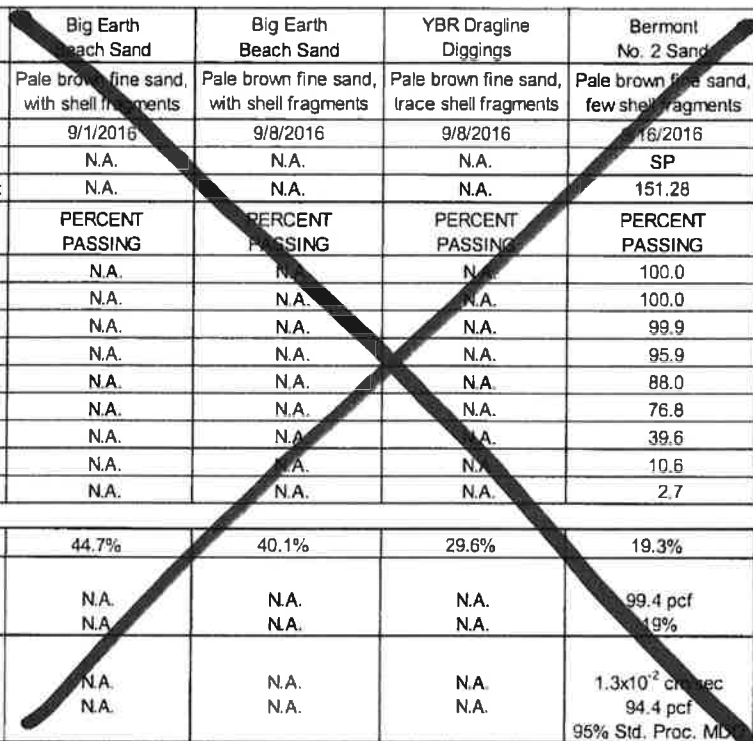
Based upon review of our file, the project's construction specifications required the protective cover sand (overlying the leachate collection geocomposite) to meet the following:

- Saturated hydraulic conductivity (ASTM D2434) of no less than  $1.0 \times 10^{-3}$  cm/sec, on a test specimen compacted to no less than 95 percent of Standard Proctor maximum density (ASTM D698).
- 100 percent passing the ¼-inch sieve and less than 10 percent passing the No. 200 sieve (ASTM D422).
- Carbonate content (ASTM D4373) less than 15 percent.

#### **Laboratory Test Results**

The laboratory tests listed above were performed on representative test specimens obtained from the sample provided. The test results are summarized in the following table:

Sarasota County Environmental Services, Solid Waste Operation  
 File No. 15-7534  
 October 4, 2016



SAMPLE I.D.:	Big Earth Beach Sand	Big Earth Beach Sand	YBR Dragline Diggings	Bermont No. 2 Sand	Bermont Perc Sand
SOIL DESCRIPTION:	Pale brown fine sand, with shell fragments	Pale brown fine sand, with shell fragments	Pale brown fine sand, trace shell fragments	Pale brown fine sand, few shell fragments	Pale brown fine sand
DATE SAMPLE RECEIVED:	9/1/2016	9/8/2016	9/8/2016	9/16/2016	9/16/2016
UNIFIED SOIL CLASS.:	N.A.	N.A.	N.A.	SP	SP
TOTAL DRY WEIGHT (grams):	N.A.	N.A.	N.A.	151.28	154.10
U.S. SIEVE SIZE	PERCENT PASSING	PERCENT PASSING	PERCENT PASSING	PERCENT PASSING	PERCENT PASSING
1/4 inch	N.A.	N.A.	N.A.	100.0	100.0
No. 4	N.A.	N.A.	N.A.	100.0	100.0
No. 10	N.A.	N.A.	N.A.	99.9	99.7
No. 20	N.A.	N.A.	N.A.	95.9	99.5
No. 40	N.A.	N.A.	N.A.	88.0	94.7
No. 60	N.A.	N.A.	N.A.	76.8	67.9
No. 100	N.A.	N.A.	N.A.	39.6	14.5
No. 140	N.A.	N.A.	N.A.	10.6	2.9
No. 200	N.A.	N.A.	N.A.	2.7	0.6
CARBONATE CONTENT =	44.7%	40.1%	29.6%	19.3%	0.7%
STANDARD PROCTOR					
- maximum dry density =	N.A.	N.A.	N.A.	99.4 pcf	100.1 pcf
- optimum moisture content =	N.A.	N.A.	N.A.	19%	14%
PERMEABILITY					
- hydraulic conductivity =	N.A.	N.A.	N.A.	1.3x10 <sup>-2</sup> cm/sec	2.5x10 <sup>-2</sup> cm/sec
- test specimen dry density =	N.A.	N.A.	N.A.	94.4 pcf	95.1 pcf
				95% Std. Proc. MDD	95% Std. Proc. MDD

The tests were performed in accordance with the applicable ASTM standards. The sample descriptions are based on the laboratory test results and a classification procedure in general accordance with the Unified Soil Classification System (ASTM D-2487 or D-2488).

Based upon our specification review, the only sample for which the laboratory test results complied with the specification requirements was the "Bermont Perc Sand." The test results for the remaining four samples indicated carbonate contents that were greater than the specified maximum.

We appreciate the opportunity to be of service on this project. Please contact us if you should have any questions or if we may be of further assistance.

Very truly yours,

ARDAMAN & ASSOCIATES, INC.  
 Certificate of Authorization No. 5950

Jerry H. Kuehn, P.E. No. 35557  
 Senior Project Engineer  
 Fl. License No. 35557

JHK/ABH:ly



Ardaman & Associates, Inc.

Ashby B. Hoover, P.E.  
 Branch Manager  
 Fl. License No. 49942



Ardaman & Associates, Inc.

Geotechnical, Environmental and  
Materials Consultants

October 27, 2016

File No. 15-7534

TO: Sarasota County, Environmental Services  
Solid Waste Operations  
4000 Knights Trail Road  
Nokomis, FL 34275

Attention: Jason Timmons, P.E.

SUBJECT: Testing of Proposed Protective Cover Sand  
CCSWDC, Phase II, Subcell 3  
4000 Knights Trail Road, Nokomis  
Sarasota County, Florida

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Dear Jason:

As requested and authorized, Ardaman & Associates has completed laboratory testing of one (1) sample of proposed "protective cover sand" for use in Subcell 3 of the Phase II landfill area at the site referenced above. The subject sample was delivered to us on October 4, 2016 and was identified as "Bermont Perc Sand." The test results are considered representative of the sample, as received.

#### **Specification Review**

Based upon review of our file, the project's construction specifications required the protective cover sand (overlying the leachate collection geocomposite) to meet the following:

- Saturated hydraulic conductivity (ASTM D2434) of no less than  $1.0 \times 10^{-3}$  cm/sec, on a test specimen compacted to no less than 95 percent of Standard Proctor maximum density (ASTM D698).
- 100 percent passing the ¼-inch sieve and less than 10 percent passing the No. 200 sieve (ASTM D422).
- Carbonate content (ASTM D4373) less than 15 percent.

#### **Laboratory Test Results**

As requested, the laboratory test performed included determining the grain size distribution by sieve analysis (ASTM D422). Hydraulic conductivity and carbonate content were not determined for this sample. The test results are summarized in the following table:



Sarasota County Environmental Services, Solid Waste Operation  
 File No. 15-7534  
 October 27, 2016

SAMPLE I.D.:	Bermont Perc Sand
SOIL DESCRIPTION:	Pale brown fine sand
DATE SAMPLE RECEIVED:	10/4/2016
UNIFIED SOIL CLASS.:	SP
TOTAL DRY WEIGHT (grams):	306.6
U.S. SIEVE SIZE	PERCENT PASSING
1/4 inch	100.0
No. 10	99.7
No. 20	99.3
No. 40	94.7
No. 60	70.6
No. 100	15.4
No. 140	2.4
No. 200	0.6

The sample description is based on the laboratory test results and a classification procedure in general accordance with the Unified Soil Classification System (ASTM D-2487 or D-2488).

Based upon our specification review, the test results for this sample complied with the specification requirement for grain size.

We appreciate the opportunity to be of service on this project. Please contact us if you should have any questions or if we may be of further assistance.

Very truly yours,

ARDAMAN & ASSOCIATES, INC.  
 Certificate of Authorization No. 5950

Jerry H. Kuehn, P.E.  
 Senior Project Engineer  
 Fl. License No. 35557\*

JHK/GSS:ly



Gregory S. Stevens, P.E.  
 Project Engineer  
 Fl. License No. 71511



Ardaman & Associates, Inc.

PROJECT:	Geotechnical Testing and Services for Solid Waste
CLIENT:	Sarasota County Government Utilities Solid Waste Division
DATE PERFORMED:	11/29/16
DATE REPORTED:	12/12/16
FILE NUMBER:	SAL163226
REPORT NUMBER:	01
PAGE NUMBER:	1 of 2

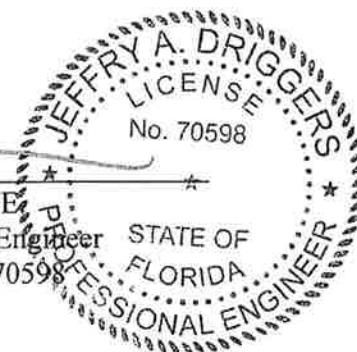
As requested, a sample of the "Bermont Perc SAND" for use at the Sarasota County Solid Waste Landfill Phase II Sub-Cells was delivered to our laboratory for Grainsize analysis testing on this date. The results of that test are attached.



Robert L. Iliff  
Construction Services Manager  
Sarasota



Jeffrey A. Driggers, P.E.  
Senior Geotechnical Engineer  
FL Registration No. 70598



Tech/RLI/JAD/rs

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Copies: (1 org) Sarasota County Government Utilities Solid Waste Division

Email: Jason Timmons / [jtimmons@scgov.net](mailto:jtimmons@scgov.net)

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**Clearwater**

Phone: 727.571.1313  
Fax: 727.471.6653  
[clwoffice@driggers-eng.com](mailto:clwoffice@driggers-eng.com)

**Sarasota**

6185 Danner Drive • Sarasota, Florida 34240  
Phone: 727.471.6655 • Fax: 941.371.8962  
[saroffice@driggers-eng.com](mailto:saroffice@driggers-eng.com)

**Spring Hill**

Phone: 727.471.6657  
Fax: 727.471.6653  
[sphilloffice@driggers-eng.com](mailto:sphilloffice@driggers-eng.com)

File Number: SAL163226  
Report Number: 1  
Page 2 of 2

**Sample ID: Sarasota County Solid Waste Phase II Sub-cells.**

**Sample Origin: Bermont Perc SAND / Pit #01794**

**Soil Description: Pale Brown to Light Tan Fine SAND**

**Unified Soil Classification: SP**

**Date Received:**

**Date Tested:**

**Procedure: ASTM D422**

**Dry Weight of Sample Tested: 501.7 grams**

<u>US Sieve Size</u>	<u>% Retained</u>	<u>% Passing</u>
¼"	0	100
No. 10	.06	99.9
No. 20	.22	99.8
No. 40	9.51	90.5
No. 60	51.7	48.3
No. 100	92.1	7.9
No. 140	98.7	1.3
No. 200	99.92	.08

The sample description is based on the laboratory test results and a classification procedure in accordance with the Unified Soil Classification System (ASTM D-2487 or D-2488).

Grainsize Specification: 100 percent passing the ¼ inch sieve and less than 10 percent pushing passing the #200 sieve.

This sample meets project specifications for grainsize.



February 09, 2017

Sarasota County Government  
Utilities Solid Waste Division  
4000 Knights Trail  
Sarasota, Florida

Attn: Mr. Jason Timmons

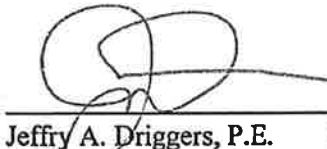
**RE: Utilities Solid Waste Division  
4000 Knights Trail  
Permeability and Gradation  
Sarasota County, Florida  
File Number: SAL163226  
Report Number: 02**

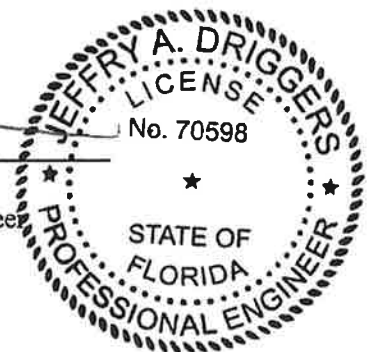
Dear Jason:

As requested DRIGGERS ENGINEERING SERVICES, INC. has performed a Permeability test and Gradation test on the material obtained from the above referenced location as requested by the client. See attached data sheet for results and specifics of testing performed.

If you have any questions, please do not hesitate to contact our office for further assistance.

  
Robert L. Iliff  
Construction Services Manager  
Sarasota

  
Jeffry A. Driggers, P.E.  
Senior Geotechnical Engineer  
FL Registration No. 70598



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Email: [jtimmons@scgov.net](mailto:jtimmons@scgov.net)

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**Clearwater**  
Phone: 727.571.1313  
Fax: 727.471.6653  
[cwoffice@driggers-eng.com](mailto:cwoffice@driggers-eng.com)

**Sarasota**  
6185 Danner Drive • Sarasota, Florida 34240  
Phone: 727.471.6655 • Fax: 941.371.8962  
[saroffice@driggers-eng.com](mailto:saroffice@driggers-eng.com)

**Spring Hill**  
Phone: 727.471.6657  
Fax: 727.471.6653  
[sphiloffice@driggers-eng.com](mailto:sphiloffice@driggers-eng.com)

## DATA SUMMARY SHEET

**Project:** Utilities Solid Waste Division, 4000 Knights Trail  
**Client:** Sarasota County Government

### CONSTANT HEAD PERMEABILITY ASTM D2434

#### Sample No. 1 (Bermont)

**Visual Description:** Grey to Very Light Tan SAND  
**Grainsize:** N/A  
**Proctor Value:** 102.0 pcf

#### Permeability Specimen Parameters:

**Dry Weight of Specimen:** N/A  
**Height:** 6.00 inches = 15.24 centimeters  
**Diameter:** 3.020 inches = 7.671 centimeters  
**Area:** 7.163 square inches (in<sup>2</sup>) = 46.213 square centimeters (cm<sup>2</sup>)  
**Volume:** 42.978 cubic inches (in<sup>3</sup>) = .02487 cubic feet (ft<sup>3</sup>) = 704.79 cubic centimeters (cm<sup>3</sup>)  
**Wet Unit Weight of Specimen:** 108.5 pcf  
**Dry Unit Weight of Specimen:** 98.4 pcf  
**Moisture Content of Specimen after Test:** 10.3%  
**Degree of Compaction:** 96.5%

#### Hydraulic Test Parameters:

**Hydraulic Conductivity:**  $1.1 \times 10^{-2}$  cm/sec

**Sample ID: Sarasota County Solid Waste Phase II Sub-cell #3**

**Sample Origin: Bermont Perc SAND / Pit #01794**

**Soil Description: Grey to Very Light Tan SAND**

**Unified Soil Classification: SP**

**Date Received: 01/23/17**

**Date Tested: 02/08/17**

**Procedure: ASTM D422**

**Dry Weight of Sample Tested: 373.18 grams**

<u>US Sieve Size</u>	<u>% Retained</u>	<u>% Passing</u>
<b>No. 4</b>	<b>0</b>	<b>100</b>
<b>No. 10</b>	<b>0</b>	<b>100</b>
<b>No. 20</b>	<b>.12</b>	<b>99.8</b>
<b>No. 40</b>	<b>5.98</b>	<b>94.02</b>
<b>No. 60</b>	<b>56.46</b>	<b>43.54</b>
<b>No. 100</b>	<b>93.09</b>	<b>6.91</b>
<b>No. 140</b>	<b>98.83</b>	<b>1.17</b>
<b>No. 200</b>	<b>99.94</b>	<b>0.06</b>

The sample description is based on the laboratory test results and a classification procedure in accordance with the Unified Soil Classification System (ASTM D-2487 or D-2488).

Grainsize Specification: 100 percent passing the ¼ inch sieve and less than 10 percent pushing passing the #200 sieve.

This sample meets project specifications for grainsize.

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DRIGGERS ENGINEERING SERVICES, INC.  
Clearwater, Florida



## ATTACHMENT C

### SAND DEPTH VERIFICATION AND APPROVAL SUMMARY TABLE

**Sarasota County Solid Waste Division**  
**Phase II Subcell 3 Protective Cover Sand Depth Verification Approval Summary Table**

Grid Section	March 2016 Sand Depth (inches)	Date of Final Sand Depth Verification	Final Sand Depth (inches)	Approved for Waste Operations
A1	22	10/31/2016	24+	YES
A2	20	10/31/2016	24+	YES
A3	23	10/31/2016	24+	YES
A4	22	10/31/2016	24+	YES
B1	23	10/31/2016	24+	YES
B2	23	10/31/2016	24+	YES
B3	24	10/31/2016	24+	YES
B4	23	10/31/2016	24+	YES
C1	22	11/10/2016	24+	YES
C2	20	11/10/2016	24+	YES
C3	25	11/10/2016	24+	YES
C4	24	11/10/2016	24+	YES
D1	23	12/05/2016	24+	YES
D2	24	12/05/2016	24+	YES
D3	25	11/29/2016	24+	YES
D4	24	11/29/2016	24+	YES
E1	19	12/13/2016	24+	YES
E2	24	12/13/2016	24+	YES
E3	24	12/13/2016	24+	YES
E4	23	12/13/2016	24+	YES
F1	24	01/19/2017	24+	YES
F2	19	01/19/2017	24+	YES
F3	14	01/19/2017	24+	YES
F4	22	01/19/2017	24+	YES
G1	23	01/31/2017	24+	YES
G2	14	01/31/2017	24+	YES
G3	22	01/26/2017	24+	YES
G4	24	01/26/2017	24+	YES
H1	21	02/07/2017	24+	YES
H2	25	02/07/2017	24+	YES
H3	25	02/07/2017	24+	YES
H4	22	02/07/2017	24+	YES
I1	23	02/14/2017	24+	YES
I2	25	02/14/2017	24+	YES
I3	24	02/14/2017	24+	YES
I4	20	02/14/2017	24+	YES
J1	22	02/27/2017	24+	YES
J2	21	02/27/2017	24+	YES
J3	24	02/27/2017	24+	YES
J4	22	02/27/2017	24+	YES
K1	19			NO
K2	23			NO
K3	22			NO
K4	19			NO
L1	24			NO
L2	22			NO
L3	25			NO
L4	21			NO
M1	24			NO
M2	25			NO
M3	25			NO
M4	21			NO