Modular Integrated Landscaping System (I)

One of the goals of the HispaBrick Magazine® community is to build large dioramas about different LEGO® themes. In order to be able to make those dioramas all together, in an organised way, we decided to establish a set of rules. Those rules are going to be described here and in the next issues of the HispaBrick Magazine.

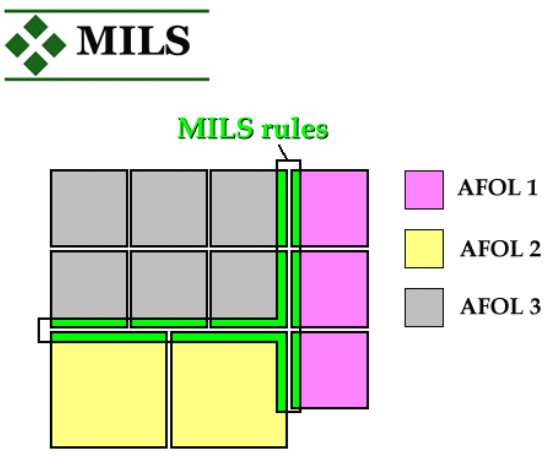
By Legotron (A. Bellón)

The development of this set of rules has been called **MILS**, acronym for Modular Integrated Landscapes System. As the name suggests it is based on a group of modules that are integrated to build a common diorama. The **MILS** rules specify the way we want to carry out this integration and the elements that are expected to be built by everyone who wants to collaborate with us.
Among the objectives of the **MILS** rules the most important is to establish a way to integrate the elements of different builders in a proper way, by using only a handful of rules. These rules must be very easy to carry out and explain. Another important task is to integrate the elements that are not under these rules with the ones that are covered by **MILS** rules. This is a important guideline in order to allow non **MILS** elements to stay in our dioramas without any kind of modification.

To sum up, when all our thoughts were mixed in order to build up the **MILS** rules to carry out our dioramas, the next premises were taken in account:

- It should be modular and flexible.
- The basic terrain unit should have known measures in order to plan the dioramas.
- The system should be compatible with other elements that are not under the criteria of the rules we want to define.
-It should be as simple as possible.

Moreover, we want to make a real demonstration of our rules.



So we, the members of the HispaBrick Magazine team, are going to prepare all the needed elements to build our modules and use them in our dioramas. That is a nice way to check the efficiency of the **MILS** rules. We will try to show this progress in the next issues of the magazine.

Basic rules.

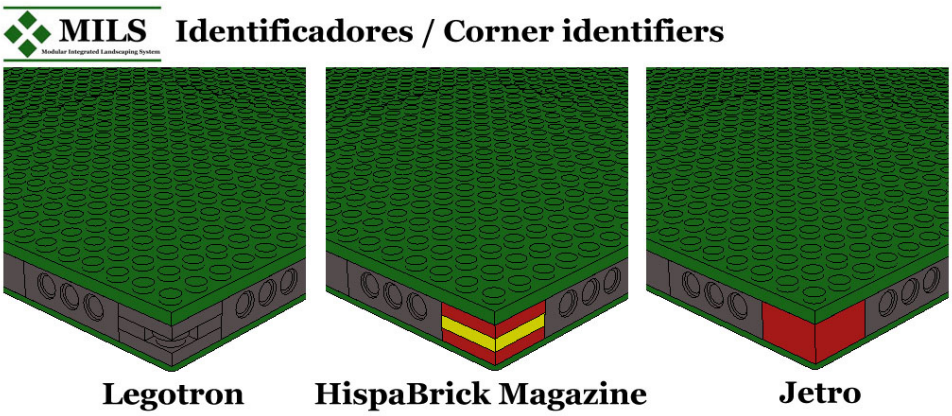
+ Modular System: **MILS** rules are based on modules. These modules will be in different categories that will be reviewed later.

+ Flexibility and simplicity: in order to simplify the rules the **MILS** modules will have very few limitations. **MILS** rules aren't about the content, quantity or quality of the MOCs built on these modules. They are written to describe the ways to get a proper connection between the different elements of a diorama, and to ease the planning of that diorama..

+ The basic size of the **MILS** modules: In concordance with the above mentioned premises, we have to define the basic size of a **MILS** module. This size will be 32x32 studs. All the modules under the **MILS** rules must have this measure. This 32x32 sized modules will be called BTU (Basic Terrain Unit) in order to simplify concepts.

It is very important to highlight that this idea doesn't mean that modules of other measures than 32x32 are going to be banned of our dioramas. This just states that the elements that anyone wants to integrate in our dioramas must have some way to connect its sides to our 32x32 modules. And this doesn't apply to all the non **MILS** elements, just to those that will be in contact with our **MILS** modules. Furthermore, there is no need for all the elements of the diorama to be 32x32 or multiples of this measure. This restriction is applied only on the sides where the elements of different builders are connected.

+ Concept of applicability: Every diorama built under **MILS** rules can be composed of **MILS** modules and non **MILS** modules. The minimum requirement under these rules are that any elements that will serve to connect modules from different builders should follow the **MILS** rules, in order to ensure the proper connection of the different parts. Elements that are not going to be in contact with those of other builders can be built according to the criteria of each participant.



The next step in the description of **MILS** rules is about the definition of the specific elements that are in agreement with the **MILS** rules:

● BTU modules (Basic Terrain Unit), with a fixed size of 32x32 studs.

○ BTM (Basic Terrain Module). These are 32x32 modules with all 4 sides compatible with the **MILS** rules system, so that they can be oriented in any direction in the same place without breaking the continuity of the adjacent elements or modules. For example, a green module inside a meadow, or a water module in the middle of the sea. They are not intended to be a mere plain modules, they can have many constructions on them, unless those features require a counterpart in the other side of an adjacent module, like a road or railway.

○ CTM modules (compatible terrain module). These are 32x32 modules that are built with at least one of their sides compatible with **MILS** rules. They cannot be freely oriented because they affect the coherence of adjacent modules or they contain a feature that surpasses the size of the module. For example, a module with a seashore, a mountain that is larger than 32x32 studs, a road or a railway

● TTU modules (Transition Terrain Unit): of variable size.

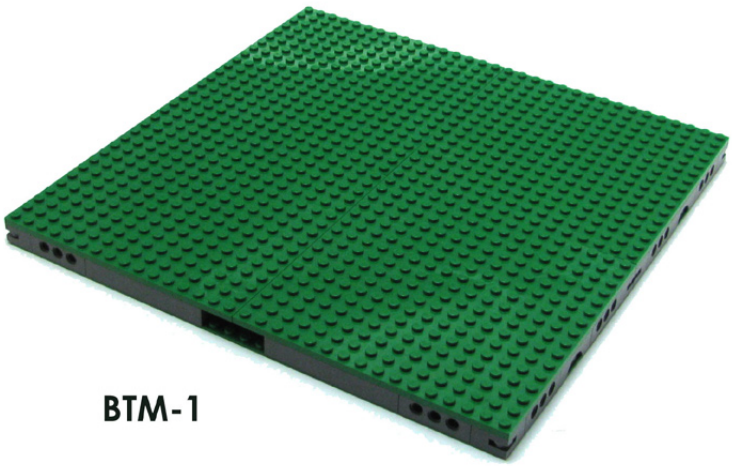
○ The TTMs (Transition Terrain Module) are modules of different sizes that can be used to connect BTM modules with other modules that do not follow MILS rules. For example, you can use 6 16x8 baseplates to connect 3 **MILS** modules with 2 48x48 baseplates of 4 bricks height.

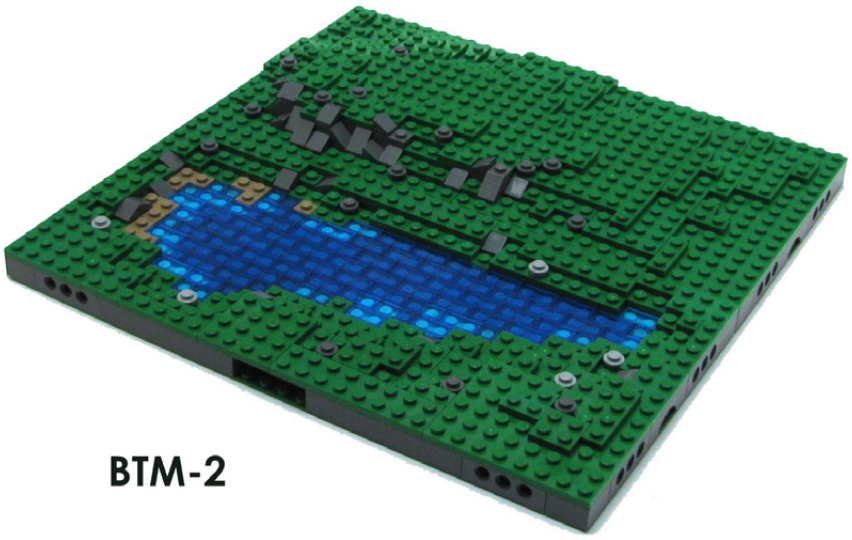
In this first instalment of the articles about MILS rules we will focus on defining the BTM module. All the other **MILS** modules will be reviewed in later articles that will appear in future issues of HispaBrick Magazine®.

The BTM module (Basic Terrain Module).

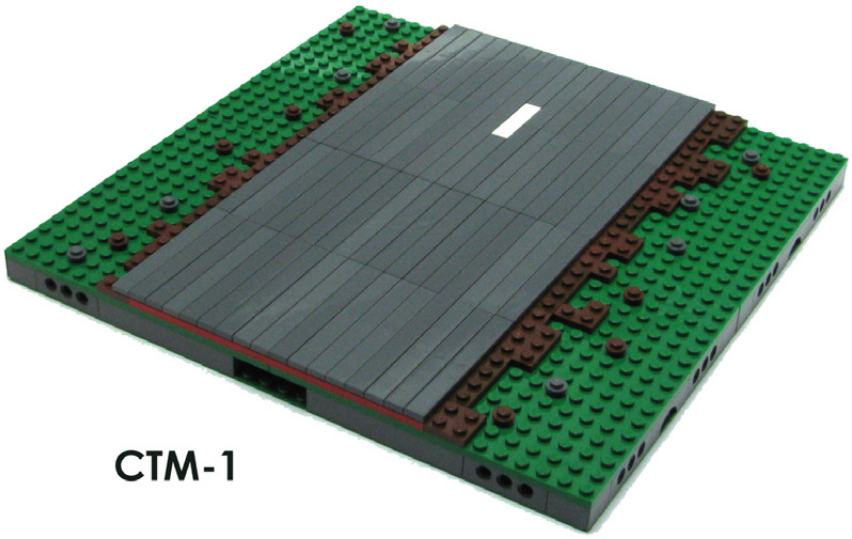
As has been commented above, the size of a BTM module is 32x32 studs and all its 4 sides are compatible with the **MILS** rules. The BTM is built on baseplates and has a height of 4 plates. To achieve the 32x32 studs size any combination of baseplates can be used, for example one 32x32 baseplate, two 16x32 baseplates or eight 16x8 baseplates. The 4 outer sides of the BTM can be made of any combination of bricks, but each corner is required to have 2 studs free on each side to put a piece, and next to this a 1x4 technic brick on either side. The rest of the side can be completed as the builder wants. One of the reasons why this part is used in the corner is to identify the owner of the BTM, so its design and colours can identify the owner in a simple way. The technic bricks can be used to connect all the modules with adjacent MILS sides, to prevent shifting. The remaining elements of the side of a BTM module can be built as the builder wants. To cover all these parts it is recommended to use big plates, as that is the buildable surface of the BTM module. The height of a simple BTM is of one baseplate plus 4 plates, and this will be the reference height on the sides of the module. However **MILS** rules allow for any unevenness on a side that is within the range of one plate height. Hence, any element of the diorama that is positioned on just a baseplate may be raised to the height of the BTM simply by placing it over a group of pieces that have a height of 3 plates plus 1 tile.

The BTM module is a very simple element without any kind of construction on its surface. It can be built with many features as any other module, but it has always to be kept in mind that a BTM module must be able to be oriented in any direction without affecting other adjacent modules. We assume that in the previous planning of any diorama the permanent elements of the terrain, like valleys, hills, rivers, roads, mountains, shore and so on will be taken into account. Other features such as trees, fences, minifgs, vegetation, etc. that can be added after





BTM-2



CTM-1

the planning are not considered part of the BTM. As was said before, any permanent feature built on the BTM module must be made in a way that it will never constrain the free orientation of the module or exceed the size of the module. For example, a stretch of river isn't suitable to be part of a BTM module, because the river needs some kind of continuity in both sides of the river extreme on each module. A BTM module can be as simple as a plain surface, built with plates. But it can also be a BTM with small lagoons, buildings, rocks, a trench or whatever that can fit on a 32x32 surface.

As you can see, a BTM can be used as joining elements between modules or elements of different builders, but another of the important functions of BTM modules is to provide builders of the diorama with some extra elements, in order to be used under exceptional circumstances to cover empty gaps or replace forgotten elements. Evidently BTM modules are not expected to be part of large features like mountains or cliffs, those will be covered by the CTM modules. But they can be used to be placed in the gap between mountains, or to build great plains. The way to use a BTM in a diorama depends on the skill of the builder. A talented builder will be able to build a very nice BTM module and have a perfect compliance with the **MILS** rules at the same time. Although we are talking about "green" elements, everything stated before can be applied to desert terrains, artic lands or city dioramas. Although a BTM may sound like a simple element and, apparently devoid of any construction, it can be as complicated as any other element. The only limitation is that it should be possible to place it in any of its four orientations without disrupting the continuity of the display.

With a few BTM modules we have a good starting point to move on to CTMs, but that is a matter for the next issue.
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LDraw Tutorial Part 12

Managing MILS with BlueBrick

by Jetro

In HispaBrick Magazine® 005 I presented BlueBrick, a visual management application for layouts and displays that can be very useful for teamwork on displays for events. Since the collaborative concept of MILS has been presented in this issue I will dedicate this part of the LDraw tutorial to show you how to use BlueBrick to organise collaborative displays with MILS.

Why BlueBrick?

The concept of MILS serves two purposes:

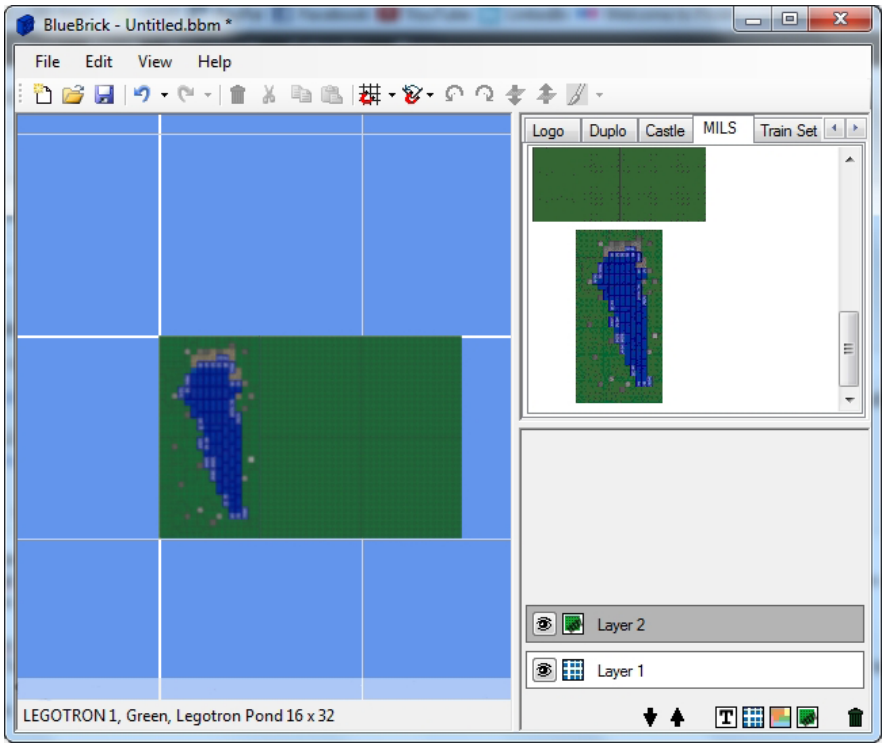
1) it is modular, which means it can be built in different sizes and configurations
2) it makes collaborating easier; otherwise there would be no need for a common standard.

This means that a display created with the aid of MILS can be easily adapted to the available space and allows for the collaboration of several people in a single display. Using BlueBrick, this collaboration can be planned easily, without the need of a physical meeting of everyone involved.

Creating MILS for BlueBrick

Let's start with the simplest module: a flat BTM[1] Since the top view of a BTM is identical to a 32x32 baseplate we can use the existing image from BlueBrick to create our first BTM.

If you don't have the program installed you can download it from the BlueBrick website[2] The program doesn't require any installation as it runs from the same folder you extract it in [3]. To simplify matters, in this tutorial all file locations will be indicated starting from the "BlueBrick" folder.
The elements contained in the BlueBrick parts library are located under \BlueBrick\parts. You will see there are a number of folders inside this folder for each type of element (for example \BlueBrick\parts\Baseplate). These folders determine the names and number of tabs that appear in the BlueBrick parts panel in the top right corner of the BlueBrick window. Since in this tutorial we will be creating a new type of element we should start by creating a new folder called MILS (\BlueBrick\parts\MILS - the folder will show up as a tab the next time you start BlueBrick). From the folder \BlueBrick\parts\Baseplate we will copy the files 3811.2.gif and 3811.2.xml and paste them into the folder \BlueBrick\parts\MILS you created previously. Since the file will be used for a Basic Terrain Module, we will rename them to BTM.2.gif and BTM.2.xml respectively[4].
Next we will modify the XML file that is associated with the image. In order to modify the XML file you need to open it in a text editor like Notepad (in windows you can do so by right clicking on the file and choosing one of the programs from the "open with" entry in the contextual menu that appears). You will notice the file contains the name of the element/module. Between the tags <Description></Description> there are two



pairs of language tags. For now only the tags <en> for English and <fr> for French are available. If you wish to prepare your file for possible future translations you can add a language pair, e.g. <es></es> for Spanish. The text between these tags is the name that is shown in the bottom bar of BlueBrick when you place the cursor over the miniature of the element in the MILS tab of BlueBrick. Change the text between both pairs of tags to BTM.
The information that appears further down in the XML file is specific to remapping the file for Track Designer (TD). Since TD does not have and BTUs, but the shape and colour of this one is identical to a 32x32 baseplate we can leave the information as is for better compatibility.

Creating a personalised module

The next step is to create a representation of one of your own modules. Among the images shown in the MILS article there is one with a pond. How can we make this module available in BlueBrick? There are different ways of doing this and for this tutorial I will describe only one that has given me good results.
The first step is to recreate a top view of the module in an LDraw editor (MLCad, LeoCAD,LDCad, Bricksmith...). For this tutorial I recreated the module in MLCad. Since we need a top view with minimal distortion and neutral lighting, a simple method of obtaining one is to make a screen capture of the top view directly from MLCad. To this end, maximize the MLCad window and make the top view take up the biggest area you can. Next open the context menu (right click) and select the zoom level “fit” to see the module as big as possible in this windows size.
Pressing the “Prnt Scr” button you take a screen capture from which you will have to cut out the module. To this end I have used the free image editor GIMP which has a GNU license. Open a new file in GIMP with a size that is equal or bigger than your screen resolution. Now paste the screen capture you made into the file (Ctrl+V or Edit > Paste). Next choose the rectangle select tool (top left in the left floating panel) and roughly select the module, making sure there is only white around it. Under the menu “Image” you will find three very useful tools we will use now. The first one is “Crop to selection” which will leave only the area you selected previously. Now that you only have white borders around the image you can use the option “Autocrop Image” which will automatically eliminate this white border. Finally you will need to adjust the size of the image to the size BlueBrick needs: the image should be 8 pixels for each stud in width or length. In the case of a 32x32 baseplate the image size should be (8x32) 256x256. You can do this with the option “Scale image...”. Now you need to change the image to GIF format. You can do this from File > Save as and selecting the file type you need.
What’s left is creating the corresponding XML file. Just like we did for the BTM above, it is convenient to look for an existing element that is as similar in size as possible and use a copy for the module we have just created. After that you need to follow the same steps as for the BTM described above. In order to make it easier to work as a group it would be convenient to use a module name that identifies its author as a first element of that name. Since BlueBrick shows elements in alphabetical order, this way you make sure that all modules from the same author are grouped together.
This is as far as the MILS article went and so this is where I finish this part of the LDraw tutorial. In the next issue I will continue explaining how to adapt what is explained in the MILS article to managing modules with BlueBrick.

[1] The following example is a simple way to create a BTM from an existing element. You can download a BTM specifically created for the MILS group (image and XML file) from the HispaBrick Magazine® website.

[2] http://bluebrick.lswproject.com/

[3] The most recent version of BlueBrick at the time of writing this article is 1.7.1. This version includes some changes with respect to earlier versions to make it fully compatible with Mono and so be able to use the program under Linux as well as Windows. If you have an earlier version it is highly recommended to update to the latest version to make sure all elements are fully compatible.

[4] BlueBrick extracts information about an element from different places. The colour of the element is indicated in the name of the file. A 32x32 baseplate (BL code 3811) has an element name plus a suffix to indicate its colour (both in the GIF and the XML). In this way a blue 32x32 baseplate would be named 3811.1, a green one 3811.2 and a tan one 3811.19. The colour code corresponds to the LDraw colour numbering. To distinguish a green BTM (for a field) from a white one (for snow) this suffix can also be used in the names for these elements.
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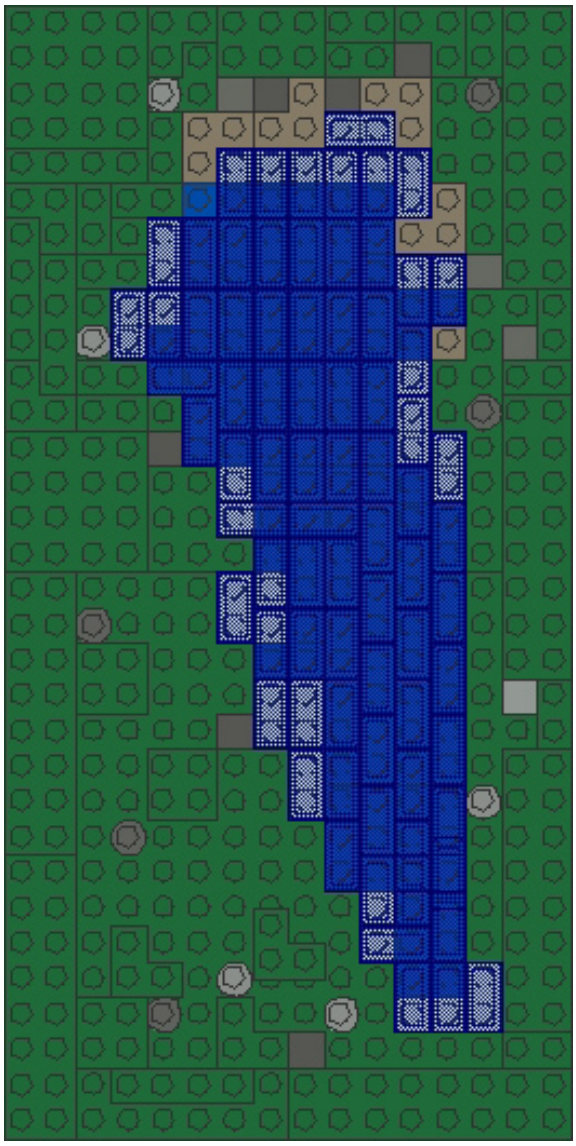


Modular Integrated Landscaping System (II)

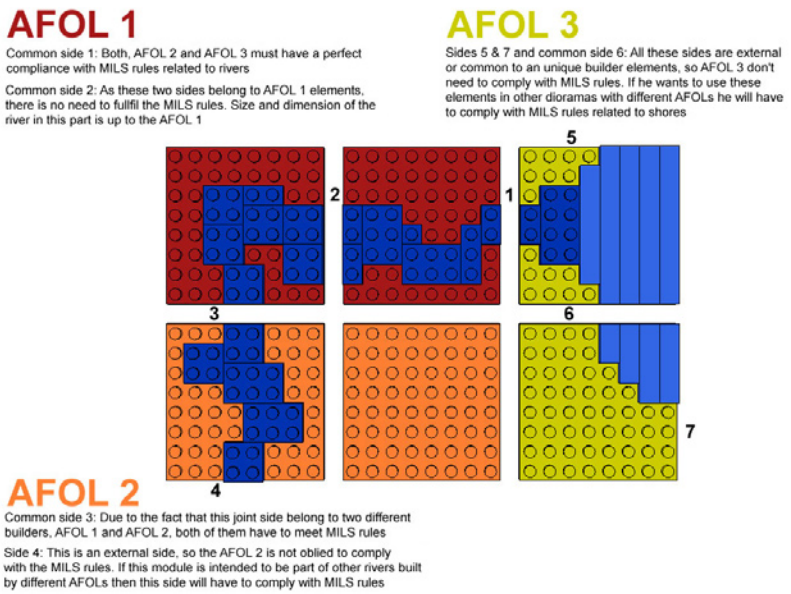
In this second article we will start with the MILS rules related to the compatible terrain modules (CTM), so we can add new elements to the basic terrain modules (BTM) of the previous article.

By Legotron (A. Bellón)

Continuing with the explanation of the modular integrated landscaping system with LEGO® pieces started in Hispabrick Magazine® 013, we will start with some clarifications concerning some doubts people have voiced about this system.

- Firstly, the MILS system does not imply or require that all the modules in a diorama have to be MILS modules. MILS rules emphasize the need that these rules are to be satisfied in elements that will be adjacent to those of different builders within a diorama. The rest of the elements of the diorama can be built as their owners want. We in HispaBrick Magazine® decided to build as many MILS modules as possible in order to exploit and test the efficiency of the rules, so the dioramas in our examples will contain a majority of MILS modules.

- Non MILS compatible elements also have a place in this system and this will be analysed in the last article in this series. As one of the ideas was to show the development of the modules explained in each article, we want to describe all the elements of the MILS rules in order to build and test them before we explaining how to integrate non MILS elements.



- We have tried to make the rules describing the MILS system as simple as possible, in order to make it easy to work with them; this does not mean that no additional module types or details can be developed. But in the construction of a diorama in which many people participate with different qualities and parts, it is important to lay down some common rules that all participants can follow as the idea is to allow the easy integration of modules from anyone who wishes to participate in the joint diorama.

CTM (Compatible Terrain Module)

As mentioned in the first article, the CTM modules are 32x32 studs in size and at least one of their sides must be compatible with the MILS rules. Unlike BTMs (Basic Terrain Modules), CTMs do not have a predefined height as that can change depending on the type. CTMs should be built as similar as possible to BTMs, especially on their compatible sides, with 2x2 stud corners for identifying the builder and the adjacent 1x4 Technic bricks.

The first reference for the purpose of CTM modules is in the elements that are represented with them, and whose main characteristic is the need for continuity along several consecutive modules. This continuity means that CTM modules lose coherence with adjacent modules when their orientation is changed. The clearest examples would be rivers, roads, coasts, mountains etc. Why? Well, it's evident that a module with a part of a river will always need other modules with other parts of that river connected to its sides to make sense in a diorama, and on the end of that stretch of river there will have to be yet another one, which in addition needs to coincide in width and depth in order to create a consistent whole.

In the MILS system a number of groups have been defined to describe each type of element the CTM have been divided into.

- Roads and paths
- Rivers
- Coasts
- Hills and mountains
- Transitions between different types of terrain.

There are many more elements that could be included in CTM modules, like railway tracks, city streets, bridges, etc. but due to the complexity of describing all possible variations we have preferred to leave those outside the MILS system for now.

CTM: Roads and paths

CTM modules related to roads are intended to be used to represent any type of track, path, paved road and so on. These modules will contain a section of road or path inside their 32x32 stud size. In most cases the section will have 2 ends (opposing for straight sections and adjacent for curved sections) to link to other roads of the same size, although it is possible to create modules with 1 (end of road), 3 (T-junction) or 4 (crossing) sides with a road end. MILS rules are compulsory on the edges of the module, but the dimensions described below may vary within the module. It is necessary to emphasize that not all the parts of a road are subject to the MILS rules; these rules are intended to be used for elements adjacent to those of different builders. You can build all your road elements as MILS modules if you want, but you are not required to.

In order to simplify the great variety of existing roads that can be built, this classification has been reduced to 3 types:

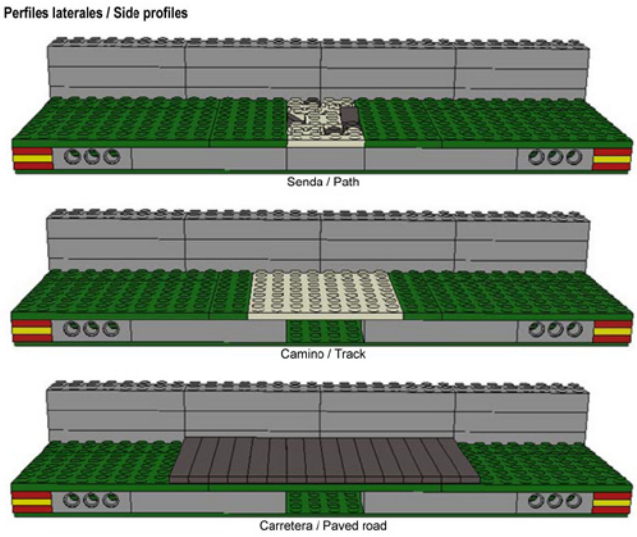
Paths: CTM modules related to paths are intended to represent small rough roads, of stone or earth surface. Paths will be integrated at the same height that the rest of the module surface (4 plates over the baseplate). On the module edge, the paths must be located in the middle, with a width of 4 studs. This type of roads can be built with brown/reddish brown, dark bluish gray, light bluish gray or tan parts and do not need to be uniform or levelled as they represent irregular paths. The height variation on the sides will be restricted to 1 plate difference from the standard height of the module.

Tracks: CTM modules related to tracks are intended to represent regular roads of earth, larger and more regular than paths. Tracks will be integrated at the same height that the rest of the module surface (4 plates over the baseplate). On the module edge, tracks must be located in the middle, with a width of 8 studs. This type of roads can be built mainly with brown/reddish brown or tan parts. The height variation on the sides will be restricted to 1 plate difference from the standard height of the module.

Paved roads: CTM modules for roads are designed to represent paved roads with a regular surface. These roads are built on top of the surface of the module (at a height of 5 plates). In order to make them look like a road they are built with Dark Bluish Gray tiles. These roads will be 16 studs wide and start at the centre of the edge of the module. Variations in height are restricted to 1 plate, but only above standard height as a difference of two plates would be inconsistent with a road.

The restrictions of the MILS rules involving the types of edges built in the modules don't mean all the modules must be built as a straight segments or 90º curves. A builder can make a road with the desired course using several modules, as long as those elements are adjacent one each other and not intended to be adjacent to modules of a different builder. Each builder has to have on his mind that MILS rules are only mandatory for elements that he wants to connect with modules of other builders.

CTM: Rivers

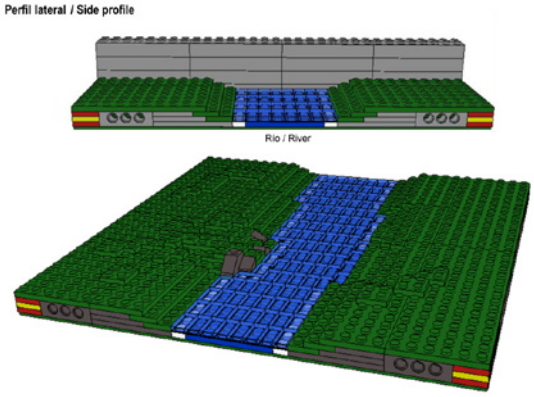


CTM modules related to rivers are intended to be used to represent parts of a river or watercourse. These modules will contain a section of road or path inside their 32x32 stud size. In most cases the section will have 2 ends (opposing for straight sections and adjacent for curved sections) to link to other parts of the river, although it is possible to crate modules with 1 (start or end of river) or 3 (incorporation of tributary). Although there can be many sizes of river, in order to simplify the connection of different parts of the river it will be built in a single size. On the module edge, the course of the river must be 8 studs wide and located in the middle. This width may be made up of blue, white and brown plates in order to create different shades of water. They will be covered with Trans Dark Blue tiles. This does not mean the whole surface of the river must be covered with this kind of tiles, but it will be the main element. The height therefore will be two plates over the baseplate. On either side of the river, the riverbanks will rise one plate per stud with the stud adjacent to the river at 2 plates and increasing to the level of the module (4 plates). There may be variations of 1 plate in this height.

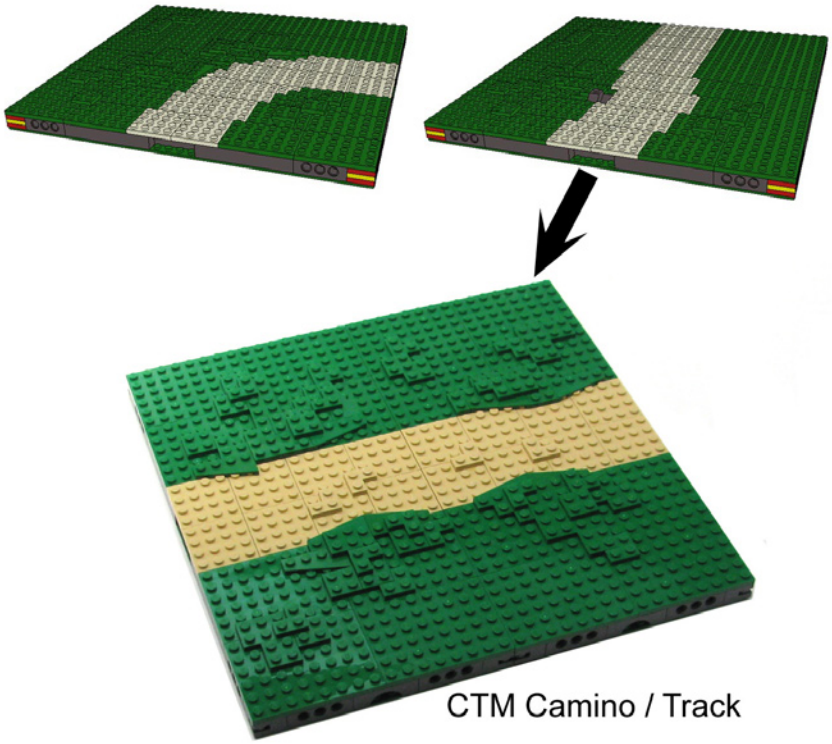
Any kind of element used to decorate the river bed, like slopes to represent stones or small white or trans clear plates to simulate foam on the river can be used on the edges without any problem.

No reference has been made to the slope of the river as under MILS rules the whole river will be at the same level. The complexity of making modules at different heights makes it infeasible for simple rules so this aspect is reserved for non standard constructions that can be connected to MILS modules.

CTM: Coasts

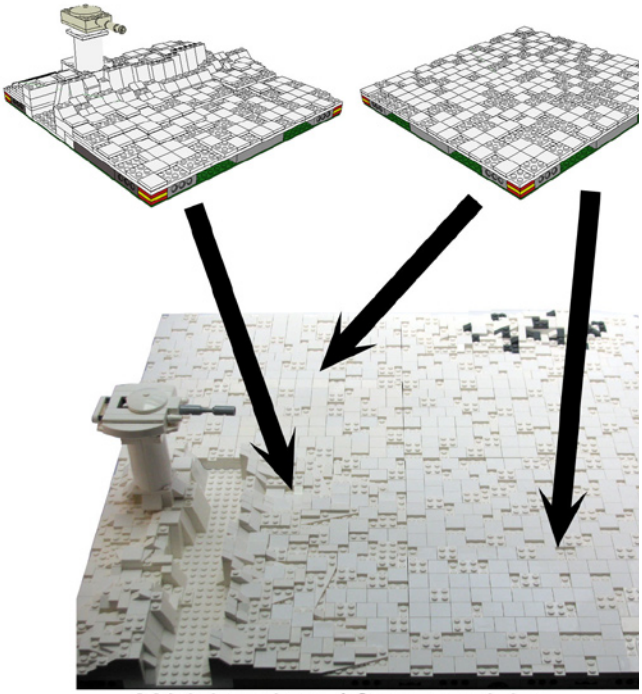


CTM modules for coast are those used to create a shoreline between land and the see or a lake. In both cases the same rules apply, with the exception that for the water of the sea blue tiles will be used and for that of lakes trans dark blue tiles. Transition modules between land and see must have at least one side on which there is stretch of land, which must comply with the conditions that will be explained below. The area that separates land and sea will be placed at 16 studs from either side (in the centre). In this way endless combinations of modules can be made, with edges that are all land, all sea or half sea half land. Looking at the area where land and sea meet, the sea should be made with tiles on the baseplate (a height of 1 plate) Where the land starts the parts representing land should be at a height of one plate above sea level and rising one plate per stud till the standard height of the modules. There can be variations of one plate in height at these edges. In modules that have corners with sea, one stud can be left free on each corner to allow joining adjacent modules with sea by means of a tile or plate. The fact that there is a type of piece that represents the bulk of a sea - blue tiles - or of the water of a lake - trans dark blue tiles - doesn't mean the entire surface must be made up of these elements. Trans clear or white tiles can be used to simulate waves or foam and can be included in these kinds of modules without any problem.

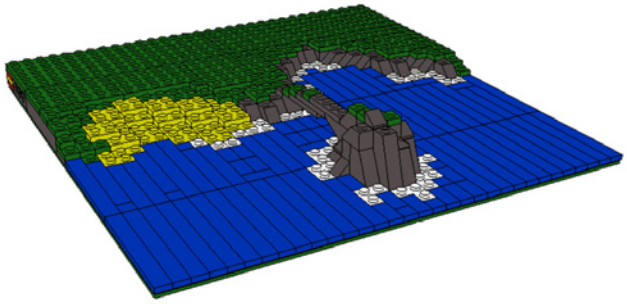


CTM Camino / Track

In addition to the described CTM types it is also possible to make combinations of types, like a river flowing into the sea, roads that cross a river or a path that leads to a paved road, etc. In these cases it is important that each edge follows the MILS rules corresponding to the type of terrain it has.



Módulos nieve / Snow modules



Work on modules at Hispabrick Magazine®.

On of the goals of this series of articles was to create physical versions with LEGO® bricks of our digital designs. As examples and in order to coordinate our work, over thirty different designs have been made which, little by little, those involved in the MILS project are building. At the time of writing of this article more than 30 modules have been finished or are being built (mostly BTMs related to the previous article) and by the time this article is published we will have finished another 30 (mostly related to the material from this article). For this reason, and in order to show our work, solve doubts, compile all the rules and show different examples as they are finished, the following website has been created: http:www.abellon.net/MILS/index.html.

In the next issue we will continue with the last CTM elements, hills and mountains, in order to finish the description of all the groups of CTM modules.
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LDraw Tutorial Part 13

MILS with BlueBrick (II)

By Jetro

In the first part we saw how to create an image of a module and prepare it for use in BlueBrick. In this second part we will see how to add functionality to these modules.

Connection points

One of the strong points of BlueBrick is that it allows for inclusion of connection points in a module. In the second article on the MILS system which is published in this edition, several elements have been introduced that can benefit from these connection points.

BlueBrick already has several types of connections points (for roads on baseplates, train tracks, DUPLO tracks and monorail tracks) and the system can be easily expanded. To this end the following steps must be taken:

1 - Define a connection type

Connection types are defined in the file ConnectionTypeList.xml which is located in the Config folder of your BlueBrick installation. The file can be easily edited using any text editor, like notepad in Windows (to open it right click on the file and select “open with” or open it directly from the program of your choice. If you open it in a browser - usually the default option - you won’t be able to edit it).

Between the tags <ConnectionTypeList> and </Connection TypeList> you will find several blocks of code that look (approximately) like this:

```
<ConnectionType name=”1”>
        <ColorARGB>FFFFFF00</ColorARGB>
        <Size>1</Size>
</ConnectionType>
```

The first field, <ConnectionType name=”1”> contains the name of the connection type. In this case it is “1” which corresponds to train tracks, but you can use a descriptive name for the connection type, as long as you place it between quotes, for example “MILS River”.

The second field, <ColorARGB>, indicates the colour of the dot that will indicate the connection point in ARGB format. This format is similar to RGB which you may already know, but is preceded by two digits indicating the opacity of the colour. To simplify things, you can use an RGB colour and precede it with “FF”. In this way the LEGO colour Dark Blue, represented by 0A3463[1] would become FF0A3463.

The third field, <Size>, indicates the size of this dot.

In order to create a connection type for MILS Rivers, we could add the following code to the list:

```
<ConnectionType name=”MILS River”>
        <ColorARGB>FFFFFF00</ColorARGB>
        <Size>1</Size>
</ConnectionType>
```

Repeat the process for all the connection points you are going to need and save the file in its original location[2]

2 - Adding connection points to a module

To include these connection points in the corresponding modules some lines need to be added to the XML file that goes with the module. This file is located in the same folder as the .gif image of the module, as was explained in the previous article.

After the description of the module the tag <ConnexionList> is added, after which the connection points of the module are described.

The block of code will look like this:

```
<connexion>
        <type>MILS River</type>
        <position>
                <x>0</x>
                <y>-16</y>
        </position>
        <angle>-90</angle>
        <angleToPrev>-90</angleToPrev>
        <angleToNext>0</angleToNext>
        <nextConnexionPreference>1</
nextConnexionPreference>
</connexion>
```

Although it may look complex, it is actually quite simple. Between the tags <type></type> the type of connection is indicated. In this case it’s a MILS River Next the location of the connection point is indicated. This is calculated from the centre of the module, with X increasing from left to right and Y from top to bottom. In this way the centres of the four edges of the module have the following coordinates (starting at the top and going clockwise). X=0, Y=-16; X=16, Y=0; X=0, Y=16 y X=-16, Y=0. To make identifying these points easier I will call them A, B, C and D [Table 1]

The field <angle> indicates the direction of each point. Since in MILS this angle is always perpendicular to the border and the 0º angle is in the direction of the X axis, the values are as follows: A= -90, B=0, C=90, D=180.

	X	Y	Angle
A	0	-16	-90
B	16	0	0
C	0	16	90
D	-16	0	180

The next fields, <angleToPrev> and <angleToNext> depend on the number and location of the connection points. In this example the values are always -90 and 90 respectively, but you need to look at the angle between one point and the next in each case and remember positive values are clockwise.

Finally there is the field <nextConnexionPreference>. This serves to indicated which point is selected by default and in what order the other points are selected. Keeping in mind that this list begins with he number 0, if we want to follow the order A, B, C, D we will have to indicate 1, 2, 3 and 4 respectively, but of course this order can be changed to fit your preferences. [3]

Why make connection points?

Connection points make it easier to place different elements in the layout. After placing the first element you can rotate it using the space bar until placing it in the desired orientation. After that, using the enter key, you can select the next connection point. Now with a simple click on any module in the Parts pane on any module that can connect to this point it will do so automatically. If you now use the space bar, the module will only turn in such a way as to leave a valid connection (it will never allow for the connection of two different types of points).

A second way to (re)create a module

In addition to creating an DLraw version of a module, it is possible to create an image of a module with a different, less time consuming process, although there are some disadvantages

If you take a picture of the top view of a module and crop it (using the process described in the first part to create an image from a virtual module) you can get a representation of an existing module with relatively little work.

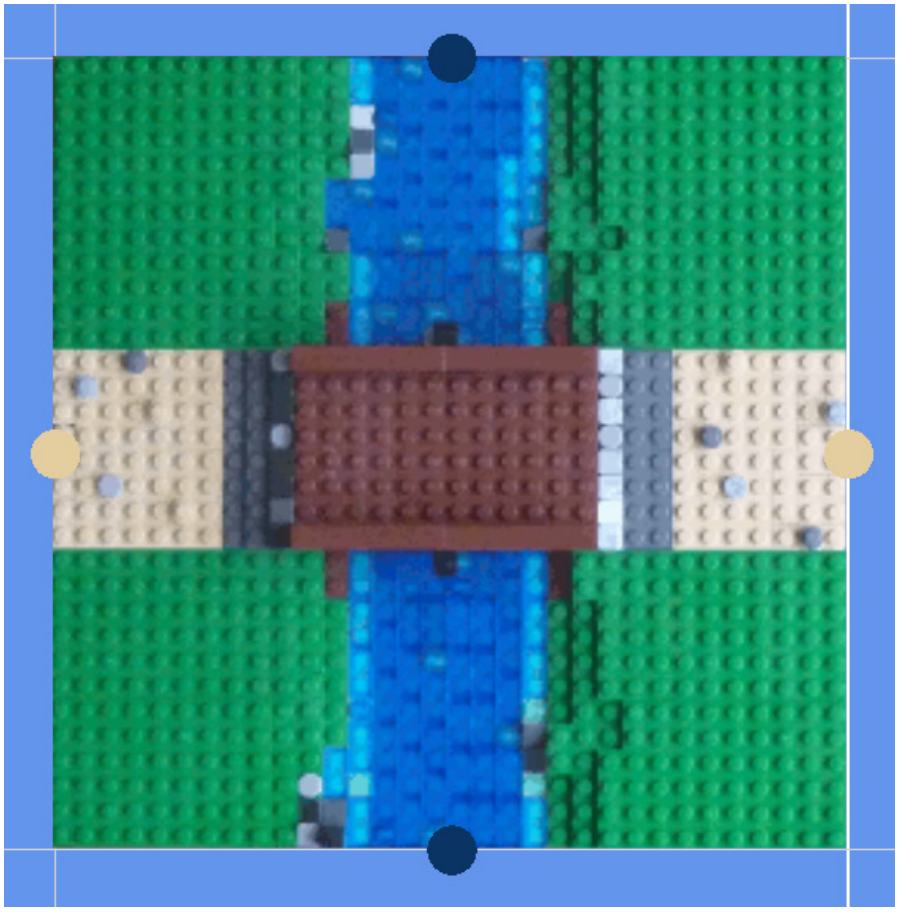
However, you should keep in mind the following inconveniences of this method. In the first place, taking a picture from a “bird’s eye view” of a module isn’t as simple as it sounds. The first hurdle is taking the picture perfectly perpendicular to the centre of the module. Otherwise, the picture of the module will not be perfectly square; if for example you take the picture perpendicular to the base of the module, the opposite side will look considerably shorter.

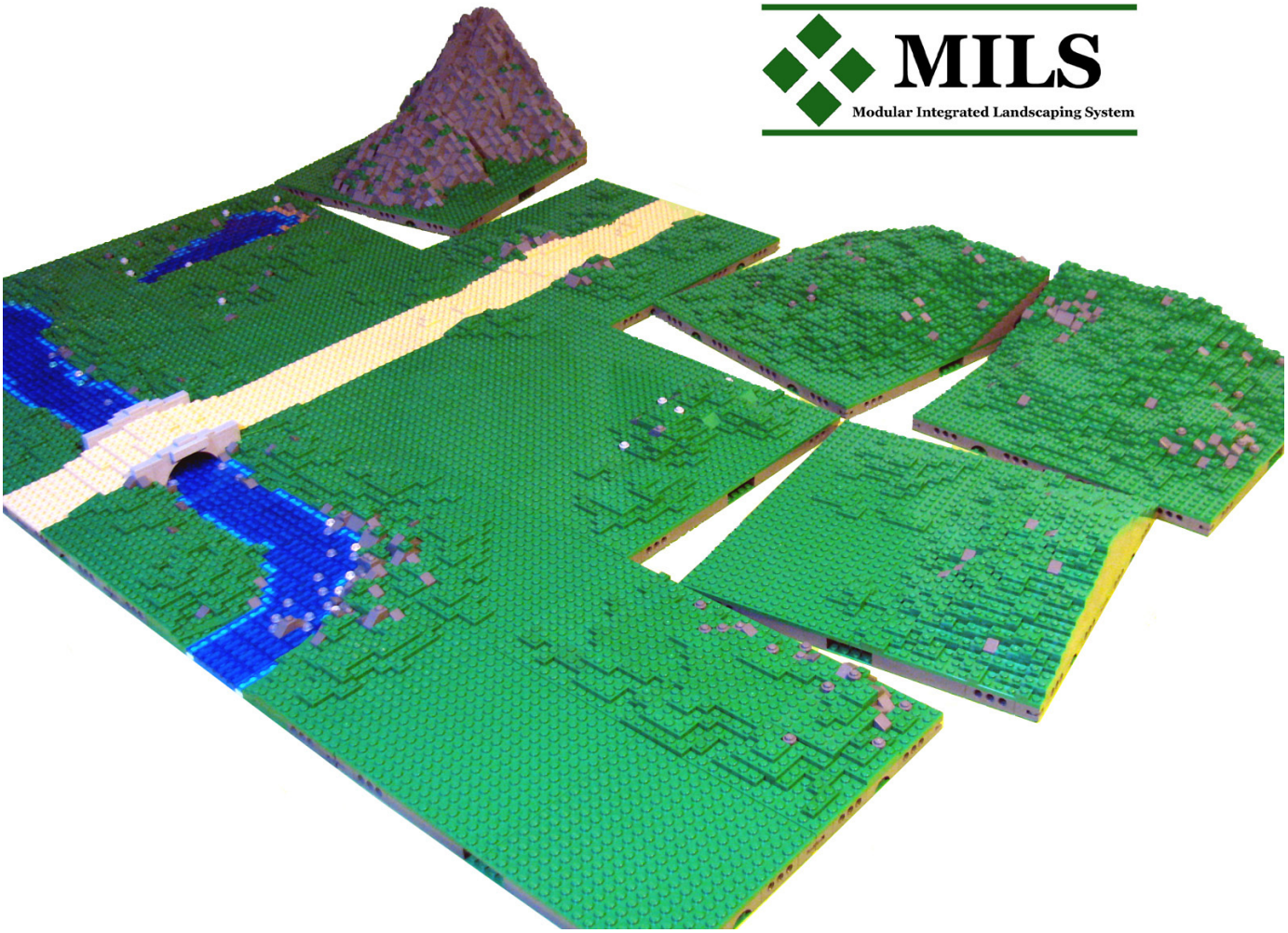
Another factor to keep in mind is the distance to the module. The closer you get to the module, the more deformation there will be at the edges of the picture, so it is a good idea to take the picture from some distance and at a high resolution so later you can crop the image and still get enough resolution for a BlueBrick image.

Finally you should take into account the lighting. If the module has some elevated parts it will be hard to avoid shadows in the picture. At the same time, the colour of the module will almost certainly be different from the ones made using LDraw and, unless you manage to recreate the exact same circumstances, modules photographed at different moments will also have colour divergences.

The big advantage of this method, however, is that keeping these factors in mind you can create a BlueBrick module in a relatively short time.

[1] There is a complete list of RGB values for LEGO® colours at http://beta.ldraw.org/article/547.html
[2] At the dedicated MILS website: www.abellon.net/MILS/index.html there is a section where you can download a modified file that contains the connection points explained in this issue.
[3] At the dedicated MILS website: www.abellon.net/MILS/index.html there is a section where you can download several MILS modules and their corresponding XML files which may serve as a basis for any other module.
#





Modular Integrated Landscaping System (III)

In this third article we will see new elements within the category of Compatible Terrain Modules (CTM). These new elements are hills and mountains.

By Legotron (A. Bellón)

All modules seen so far were related to landscape with borders at surface level. But now, we are going to see a new type of construction with hills and mountains, as their respective modules need to be compatible in different height configurations.

CTM modules (Compatible terrain module).

First of all, we are going to remember some of the things seen in past articles. The CTM modules have a measure of 32x32 studs, and they are intended to fulfil some conditions: they must have at least one side compatible with MILS rules but not all. And it is not compulsory that they can be oriented freely inside the diorama.

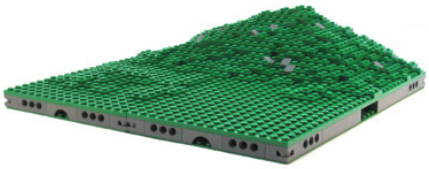
These modules are intended to be used to build rivers, roads, shores, hills or mountains. The first ones were reviewed in the last issue, so it is time to see the hill and mountain modules.

CTM: Hills

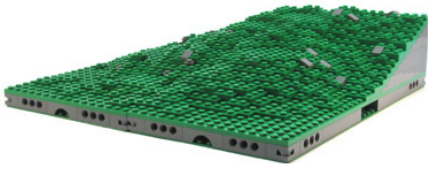
These modules are intended to be part of hills or undulating landscape with soft slopes. When these types of terrain take up in a surface larger than 32x32 studs, it is time to use the hills modules. A hill can be constructed with an undetermined number of modules. These modules will contain in its 32x32 surface part of the hill, and they can have one, two three or the four sides as part of the hill. The number of different possibilities to build a hill is very large, because hills can have many different heights, different slopes and different shapes.

Examples of hill modules

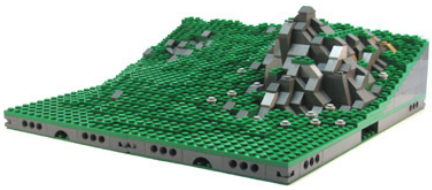
Hill null-null-short-short step



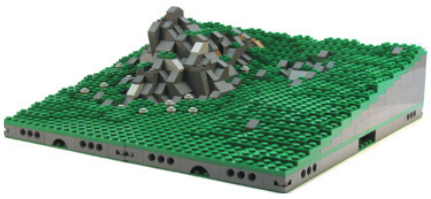
Hill null-null-double short-null step



Hill null-null-short & full-short step



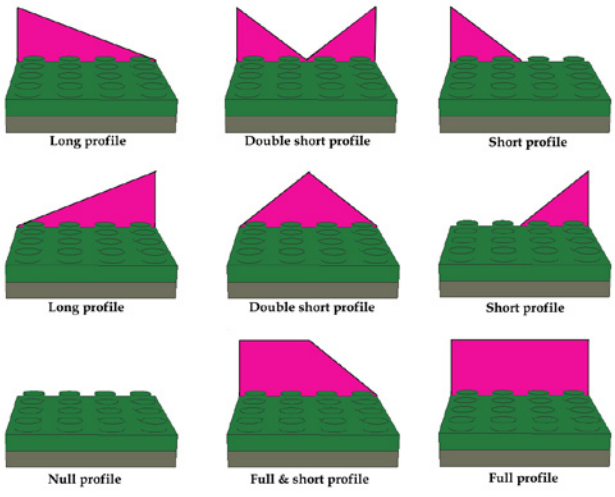
Hill null-short-full-short step



Hill null-long-full-long step

In order to have an easy compendium of rules, in the MILS system all the variants have been simplified to a few options. It is very important to remark that MILS rules are applied in the joining sides of the modules, so the rest of the module can have different sloping or height. This means that whenever a builder wants to build his own hill, with measures, height or slopes that are not compatible with MILS rules, he can do it. And if he wants to join that hill to constructions of other builders he only needs to change the sides intended to be the common joining part. The changes will consist on making those common sides compatible with MILS rules, but there is no need to change the rest of the hill. The same can be said for the rest of the elements shown in the articles of MILS system.
As an explanation, the reason why all the modules of the HispaBrick Magazine® team shown in the pictures are MILS compatible, is because we are trying to develop the system of landscaping as a reference to show the efficiency of the MILS system, one of the main objectives of the MILS system is to be used with other landscaping elements which are not related with MILS rules.

We want to make the MILS rules as simple as possible. So we have defined a new concept: the profile. A profile is the shape that the side of a module must have. The MILS rules reduce the available profiles to a few options, so it is very easy to know all the possibilities to make a hill module that is compatible with MILS system. These profiles will be the templates to mold all the sides of hill modules. When two different hill modules are going to be joined they must have the same profile in the common sides. This is a key factor to get a continuous landscape without gaps or inconsistent jumps.



These are the four profiles that have been defined:
- Null profile, this means that the module side has the same height as the surface of the module.
- Long profile, this means that there is a line climbing up 1 plate for every 2 studs. It starts at the level of the module surface in one corner and reaches a height of 5 bricks at the other corner of the side. This theoretical line will be the limit of the height the hill must have on that side. Under that line it is possible to build a solid construction or a gap, depending on the criteria of the builder.
- Short profile, this means that there is a line climbing up 1 plate for every stud. It starts at the level of the module surface in one corner and reaches a height of 5 bricks on the other corner of the side. This line covers only half of the side of the module, and will always have one extreme in one end of the side and the other extreme in the center of the side. It is possible to have two short profiles with one sloping line ascending and another sloping line descending.
- Full profile, this means that the whole side has a height of 5 bricks over the surface of the module.

As seen, the maximum height of the hill in the sides is 5 bricks over the standard height of a MILS module. This does not mean that all the hills have to be 5 bricks high, they may be higher or lower than this measure in the rest of the module, but in the sides that will be in contact with other modules they will have to fulfil the height of his type of profile. This height may have a variation of 1 plate above or below in the sides of the module.

Each hill module can have any combination of these profiles. The easiest modules will be constructed with some sides at surface level, and another two sides with a sloping profile, such as the corner of a hill. The most complex modules will have four sides with sloping profiles and full profiles. In order to get a common way to identify the different types of modules used to form a hill we have defined a nomenclature based on the type

of profiles of the module. To start the definition of the module we begin with the nearest side, usually the lowest side, and we choose the most appropriate term: short, long, null,... and then we continue with the rest of the sides clockwise, labelling the four sides. This is the way to ease the identification of the type of hill module we are talking about.
For example, if we want to build a hill null-short-long-null, this means we want to build a corner of a hill.

The process of building a hill consists of make some modules with sides that are compatible between them. The simplest hill is made up of only one module, a corner part of the hill. With many modules it is possible to construct complex hills, of a great variety of shapes.

For the hill we have chosen to use green parts in order to be very compatible with the modules we have explained in past issues. It is also recommended to add some parts in gray and tan to create a more varied landscape.

CTM: Mountains

These modules will be used to build mountains that need more than one 32x32 studs module. The mountains are similar to the hills, but with more inclination and with a more rough and rocky look.
These modules will contain a part of the mountain in their 32x32 surface, with one, two, three or the four sides as part of that mountain. The number of possibilities to build a mountain is very high, so that MILS rules are simplified to a few options in order to be easier to apply. This does not imply that all the mountains have to be the shapes defined by the MILS rules. Any mountain with a geometrical design not related to MILS rules can be compatible with those ones that fulfil the rules just by making some of its sides compatible with the rules we are going to define.

In order to simplify the MILS rules, the system chosen to depict the way of building the mountain modules is very similar to that used in hill modules. This means everything stated in the hills section can be applied to the description of the rules for mountain modules. In the case of mountains these are the types of profiles we have:
- Null profile, this means that the module side has the same height of the surface of the module.
- Long profile, this means that there is a line climbing up 1 brick for every 2 studs. It starts with one brick above the level of the module surface in one corner and reaches a height of 16 bricks in the other corner of the side. This theoretical line will be the limit of the height that the mountain must be on that side. Under the line it is possible to build a solid construction or a gap, depending on the criteria of the builder.

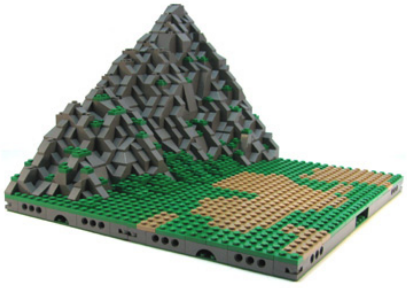
- Short profile, this means that there is a line climbing up 1 brick for every stud. It starts at one brick over the level the module surface in one corner and reaches a height of 16 bricks in the other corner of the side. This line covers only half of the side of the module, and will always have one extreme in one end of the side and the other extreme in the center of the side. It is possible to have two short profiles with one sloping line ascending and another sloping line descending.
- Full profile, this means that the whole side has a height of 16 bricks over the surface of the module.

As can be seen these are the same criteria applied to the hills modules. The main differences are the inclination, which is more sloped in the mountains, and the starting height, which is placed at 1 brick above the surface of the module in the case of mountains. All these things mean that the maximum height in the joining area will be 16 bricks. This by no means should be taken as a maximum height for the mountains. This is the height in the sides compatible with MILS rules, in the rest of the module the mountains could be higher. In the case of mountains, the deviation for this rule is 1 brick below or over the theoretical height line of the corresponding profile.

The same nomenclature system for the hills modules is valid for the mountains modules. The hill word is changed for mountain, and beginning with the lower side, which is oriented nearest, the profile of the sides is described clockwise. This is the same system explained with the hills. For example: Mountain null-short-long-null could be a module with a corner of a mountain.

We only need to construct the appropriate modules to create a mountain. Each mountain can be built in many different ways, some very simple and some others very complex. The simplest mountain can be made with a single module of null-short-short-null steps type to be located in a corner of a diorama, and the most intricate mountain full of ravines and canyons will need dozens of modules to be done. That's the builder choice to decide what he wants to do.

Example of mountain modules



Mountain
null-long-short-null step

Mountain
null-short-long-null step

Mountain
null-null-double short-null step

The main parts used to build and represent the rocky aspect the mountains are the dark bluish gray slopes and dark bluish gray bricks. In order to avoid a symmetric or artificial look the use of green and dark tan pieces is highly recommended. The green part could be used in the less sloped parts of the mountain. There is no need to make all the mountains in the same color, but to prevent strange color effects in the layouts in the mountains is highly recommended to use mainly dark bluish gray in the common sides. The addition of mottled elements in green and dark tan will result in more realistic mountains.

Multilevel Hills and mountains

Although the rules described seem to limit the height of the MILS compatible hills and mountains, this is all but true. There is the possibility to build hills and mountains in several height levels. Enough modules with a “Full” profile on at least one of their sides are needed to delimit an area of the diorama. This area can be elevated to the level of its surrounded modules and be used to put new hill modules or mountain modules above it. This is the way to increase the height of the hills and mountains.
There are no rules for this type of constructions, for the moment, because these constructions involve many different possibilities, and it is something against the simplicity of the MILS rules. This could be a future development for an advanced set of MILS rules.

Mixing different types of terrain

Until now all types of modules have been described to reflect a unique type of terrain. We have modules for rivers, modules for hills, modules for roads and so on. But MILS rules also allow the combination of different types of terrain in one module. There is no problem to mix them, you just have to apply the sum of the rules for every type of terrain in that module. For example, a module with a hill can contain a path, and the path must have its ends in the middle of the module side, with the width designated for that kind of way, but the height is determined by the hill shape at the edges of the module. Of course, the union of different types of land will have to be done in a consistent manner, in order to avoid crazy land layouts.

The builder does not need to make a strict interpretation of the rules, he can use them when he needs. As an example, if one person wants to build two adjacent modules to create a hill, in order to use them in cooperative dioramas, he is only required to respect the MILS rules in the perimeter of his hill, but he is free to do whatever he wants inside those two modules. That is the reason why we are always emphasising the fact that the MILS rules are mainly intended to be used in the joining areas between modules of different builders.

We have prepared a web site in order to show a compendium of these rules, some examples of our modules and displays built to test the MILS system, and resolve any questions. You can it at: http:www.abellon.net/MILS/index.html.

In the next issue we will talk about the transition modules (TTM) and a little about mixed modules. Furthermore, we will show detailed pictures of our MILS dioramas that will be shown at the HispaBrick Magazine® Event 2012.
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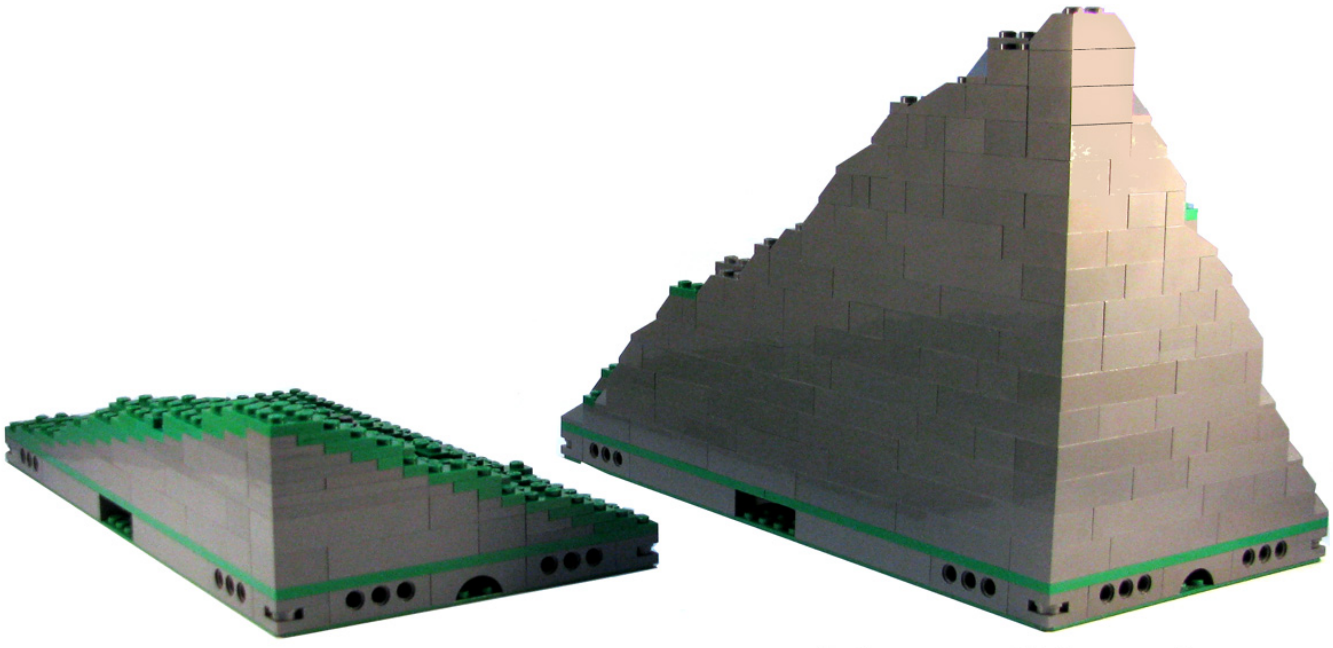


Colina / Hill

Montaña / Mountain

Modular Integrated Landscaping System (IV)

By Legotron (A. Bellón)

In this article there will be a deeper development of the multilevel elements to build higher hills and mountains, the rules of which were briefly described in the previous article. Furthermore, we will see the last elements of the MILS rules that were pending to be shown: the Transition Terrain Modules (TTM). The last part of the article will describe our effort to build 3 MILS dioramas at the last HispaBrick Magazine Event 2012 and some reflections.

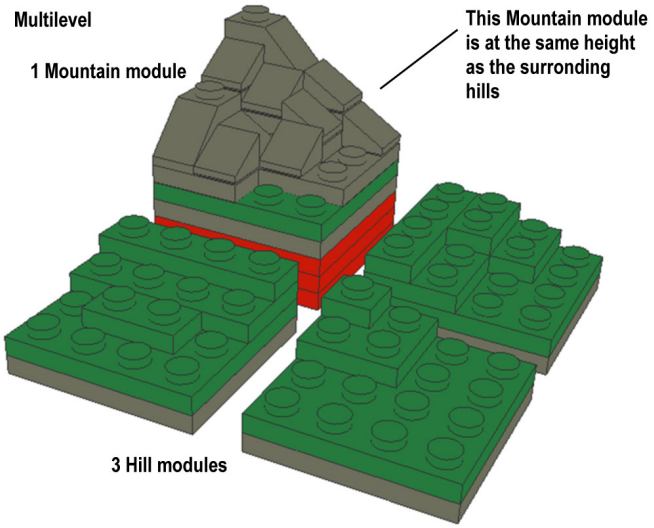
Multilevel hills and mountains (expansion)

As was written in the last article, the height of the hills and mountains could be more than the height specified for a single module. In order to achieve this, we defined the multilevel system, that was intended to create larger mountains by placing some modules with their base surface at the same height as the top borders of the surrounding hills or mountains. It is not mandatory that builders choose all the modules of the same type. The lower modules can be of hill type and the upper modules can be mountains, or the mountain modules can be placed on the lower part with plain modules in the upper part, and of course there is always the option to make a multilevel element with modules of an single type.

We can see this with an easy example: a corner of a diorama with a multilevel element with a mountain module at the top (level 1) and three hill modules at the base (level 0). As the higher module is placed just in the corner, the other three modules are placed forming an 'L'. The three hill modules of the base (level 0) are composed of 2 modules with a full profile side facing the hole in the corner of the diorama, on each side of the 'L', and one corner module to join the two modules in the correct way to have a consistent terrain. In the resulting gap, the mountain module is placed on some supports, so that it has the same height at its surface as the highest borders of the hill modules. These supports must be 4 bricks + 2 plates + 1 tile high to get the correct height. The supports can be made in many ways, there isn't any specific shape, but it is recommended to have good stability using X shaped surfaces. The mountain module, in this case, is intended to be a corner shape module, in order to have a consistent landscape without gaps. In this way you can have a small multilevel element with MILS modules in a diorama.

This example could also be done with a single BTM module instead of the mountain module, like a small tableland. If we decide to build the multilevel element in the middle of the diorama, with 2 modules at the top level (Level 1), we will need at least 10 modules of the type selected to form the base (Level 0) and of course enough supports to hold the upper modules.

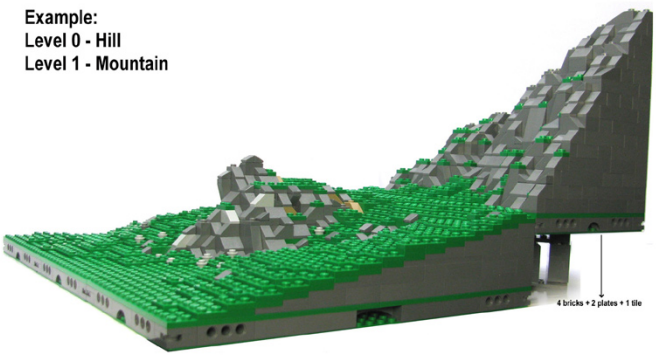
This system also can be used to build cliffs, with a row of mountain modules dividing the lower part of the diorama,



with modules placed on the table, and the top elements with modules placed on any kind of support of 15 bricks + 2 plates + 1 tile high. A simple pile of bricks is not enough, this type of supports needs more contact surface, as the higher it is, the more likely it is to fall down. Is better to have several supports instead of one to have a better distribution of the weight and to avoid damage to the baseplates of the modules.

The MILS system needs a lot of modules to build the base, or lower part of the multilevel items, and many of them must contain FULL profile sides to have a continuous landscape. These are some of the reason why they have a very high piece count, so they are really expensive to build.

This technique could be used 2, 3 or more times in order to get more levels, to form great and very high mountains, but

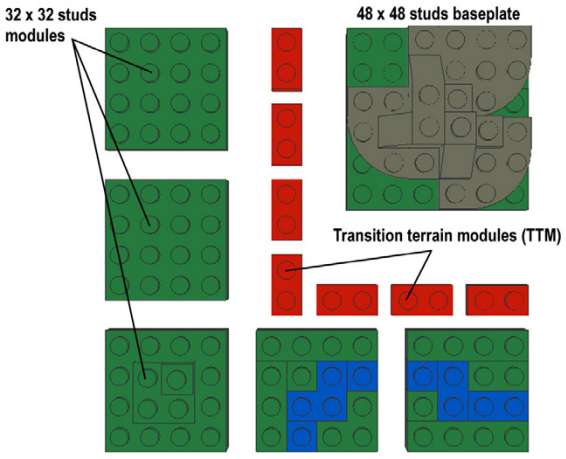


this type of construction is very difficult and complex to carry out without a careful planning, and due to the high number of modules they may be unstable. So it is recommended to use another type of construction, with less elements and stronger foundations, with compatible sides with the MILS system, or using transition elements, that we are going to describe in the next point.

TTM (Transition terrain module)

This is the last group of elements to be described in this series of articles. These elements don't need to be 32x32 studs. These elements are often used as transition parts between MILS modules and other elements which have no compatible sides or which due to different height or dimensions cannot otherwise be used with the MILS modules. The form, height or size of these TTM items depends on what the builder needs to join non-MILS elements with other MILS modules in the diorama.

The most common example of these elements can be seen when a single baseplate is placed in a MILS diorama. The baseplate element of the landscape has a different height from that on the surface of the MILS modules. You can place the baseplate on several supports of 1 brick + 1 tile to have them at the same height, but this is not always possible. Another way, using TTM elements can be carried out by adding some small baseplates with one side with the same height of the aforementioned baseplate, and the other side with the elevation of the MILS part of the diorama. In other cases, a builder who wants to include a 48x48 element in the middle of a diorama, surrounded by MILS modules, will have gaps. The gaps are different from the standard 32x32 studs



of the MILS modules, so there is a need of smaller elements like 16x8 baseplates, to be placed in the gaps between the MILS modules and the 48x48 baseplate. These elements are constructed when they are needed, so there are no specific features or sizes for them, just the surface needed to cover all the gaps and get a homogenous terrain.

This type of element is also very useful to include different building techniques with MILS dioramas. For example, a road built with a SNOT (Studs not on top) technique with a thickness of 1 brick can be placed on a baseplate with two more plates to have the same height of a road module. So it is possible to combine SNOT roads with MILS modules with roads. Furthermore, these elements do not need to be simple baseplates between MILS modules and other types of landscape elements, they can be used to add some special features in MILS dioramas. For example they can be used to reproduce a vertical ramp of 60 bricks height in 8 studs to divide two areas of the diorama. And of course, if there is no place to add more 32x32 modules you can always fill the gap with these elements. Se we can think of these elements as complements to get more connection possibilities in our MILS dioramas, or to fill the gaps that appear when we want to include some other landscape elements of sizes different from 32x32 studs.

Construction of MILS dioramas at the HispaBrick Magazine® Event 2012

We made 3 different dioramas with MILS modules at our HispaBrick Magazine Event 2012, with modules built by different participants.

The first diorama, which had been planned at previous events, was based on the Battle of Hoth of the Star Wars™ saga. It contained 23 modules, with snow terrain, the trench and the shield generator. The main effort in this diorama was to build as many basic modules as possible to have enough space to place all the war machines, troops and elements of the diorama. The diorama also contained some BTMs with small reliefs, or a crashed snowspeeder, and some CTMs with the trench. The final result was a very nice diorama to depict the battle. Furthermore, we were able to include a white baseplate placed over supports to fill the gap of some missing modules, and the result was perfect. This is a diorama we can build in many sizes and configurations, depending on the available space and modules. For future events we want to add the hill with the Echo base, with the main door entrance, so we hope we can build it for the next HispaBrick Magazine Event.

The diorama of Hobbiton was built around the new LEGO® set 79003 An Unexpected Gathering. Bilbo's house was placed

directly over some basic modules. Then we placed some other modules containing a road and a river to form a small diorama of a typical hobbit village. We prepared some decorative elements for this diorama, like trees, a small orchard and farmland. These type of things were a nice addition, because they were very easy to place on the diorama and had a great visual impact. One of the things we realized when we built the diorama was that the final aspect of the road with the irregular borders was far better than the roads with straight borders. This is a detail we have to work on in our road modules, adding more irregular borders to create a more realistic look. We also included a little river mouth, although we didn't have enough modules to complete the bank of the lake. But it was a nice addition too, and the lack of additional lake elements was not too bad.

The castle diorama was improvised. We had prepared many modules but we didn't plan any specific diorama. Once we had the place of the diorama assigned, we gathered all the modules and we began to move them as if they were the pieces of a puzzle. We needed a large plain area to place the castle, so all the basic modules were used for that purpose. We used 4 straight river modules and another river mouth on one side of the diorama in order to leave the middle of the diorama for the castle. In one corner we placed the shore modules to form a very irregular coastline, with the river mouth. The hill and mountain modules were placed on the opposite side, in a narrow fringe because we needed all the space in the middle to put the castle, so we could not built a great hill or mountain. One of the advantages of the modular system was that we were able to adapt our diorama to the available space, as we had to use the last available place in the exhibition. Unfortunately, at that stage we didn't have any decorative elements like trees or shrubs left, so the diorama seemed to be empty. Nevertheless this was a great opportunity to realize how useful the MILS modular system could be to build an improvised diorama in only 20 minutes. Contrary to the diorama of Hobbiton, the look of the roads in this diorama was a little ugly, because the borders of the road were straight. So these modules will need a rebuilding process to get a more realistic appearance.

After building these dioramas we could draw some conclusions. We had no problem to replace some missing or forgotten modules, we just replace them with another one of the same type and the building process continued without any problem. The corner identification system was a great advantage in the building and disassembling process. Each builder could identify his own modules very fast. The comprehension of the MILS rules and the different types of modules,except for the absence of certain types of modules, was perfect, and we had no problems to connect the modules of different builders. There were some problems with the ratio of module types, because we need more space to put large structures and buildings over the surface of the diorama, and we didn't have enough plain modules. On the other hand we had plenty of modules with hills or small reliefs, so we need to build more plain modules to display a city or a big castle. We had a good quantity of road and river modules, but in the case of the river modules we had too many straight elements and only one curved section, that we couldn't use. The opposite happened with the roads, we had more curved sections than straight ones, so we couldn´t make a decent road between the castle and shore. One type of module that could be very useful in dioramas with villages and roads is a T junction, which allows you to have several roads in the same diorama. Another key factor with MILS modules are the curved sections of the roads and rivers. The MILS rules say that a single curved element of a river or road is required to be 90 degree curve. The concatenation of two of these modules to form a zigzag takes up a lot of space, so this type of landscape feature needs careful planning. Other landscape features like the hill and mountain modules were used in the rear part of the castle in separate groups to fill the gaps in the diorama, so nothing can be said about these elements, as they were not used to their full potential. One final, but not less important detail was the shortage of trees or other small decorative elements. They have a huge visual impact, and without them our dioramas maybe give the impression of being empty. We need to make an effort to bring along more trees, plants or small things to put on the dioramas.
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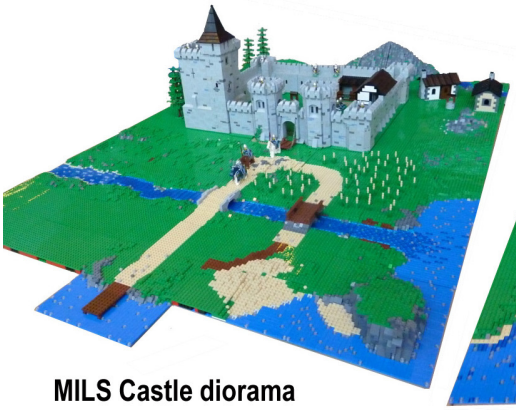


MILS Castle diorama

MILS Hobbiton diorama

MILS Hoth diorama

Modular Integrated Landscaping System (V)

By Legotron (A. Bellón)

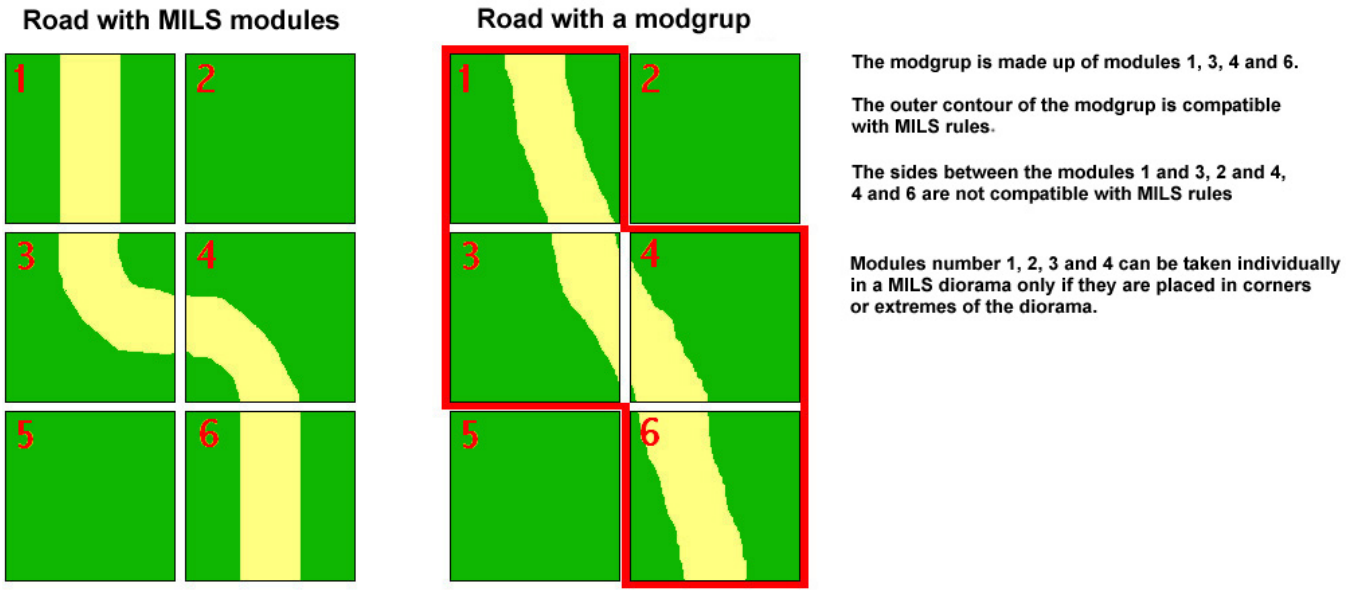
We now have many basic elements – modules - to build our dioramas. We can display many terrain features, but now we need to build more complex elements to get better terrain features. We want to get a more realistic display and to have new elements that are compatible with the MILS modules we built in past articles.

Modgrups

One of the main problems with modular landscapes is the final appearance. They look like a chessboard. This is critical with elements or features that need several modules to be carried out, as can be seen with roads or rivers. To preserve the simplicity of the MILS rules, the terrain elements must have very restricted dimensions at the borders of the modules. The more simple the rules are the less diversity of terrains can be displayed in a diorama. We can have a section of a road with many curves, but they are always 90 degrees. So we need a new element to confront this problem. That element must be compatible in some way with MILS rules, but with more options to display terrain features different from those described by our rules. So the idea is to join several modules, with many sides that are not compatible with MILS rules, to combine them into a bigger element, in such way that the final outer border is MILS compatible. Sets of modules with these characteristics will be called “modgrups”. There is no size or shape to delimit a modgrup, but they must always be made up of multiples of 32x32 studs.

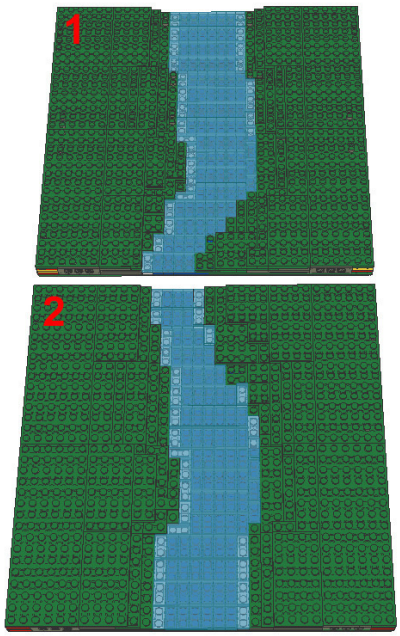
The main idea of a modgrup is that it is made up of different modules or elements of 32x32 studs. The outer border of all the modules packed in a modgrup have to fulfill the MILS rules. Internal border between different elements of the modgrup don’t need to comply with MILS rules, they just must be consistent with the modules around them. When these elements or modules are taken out of their modgrup they are not consistent with the rest of MILS modules, because the have some sides with different measures for the terrain features on them, than modules built following MILS modules. In order to use these elements out of a modgrup you need to create a good design, so you can place them in corners or sides of the diorama, where this element doesn’t need to have all its sides connected with other terrain modules. If the module has any side that is compatible with MILS rules, these sides can be faced towards the other MILS modules, and the other sides, with no MILS elements, can be oriented to the side of the diorama.

The modgrups are a set of modules, whose main characteristic is that the outer contour of the modules of that modgrup are compatible with MILS rules. The shape and size of a modgrup can be anything, but it must be made up of elements of 32x32 studs. A modgrup can be formed by only two elements, or may contain a multitude of modules with a very complex shape. Within the borders of a modgrup there is no limitation to its content.



Example of how to change a regular layout with a modgrup.

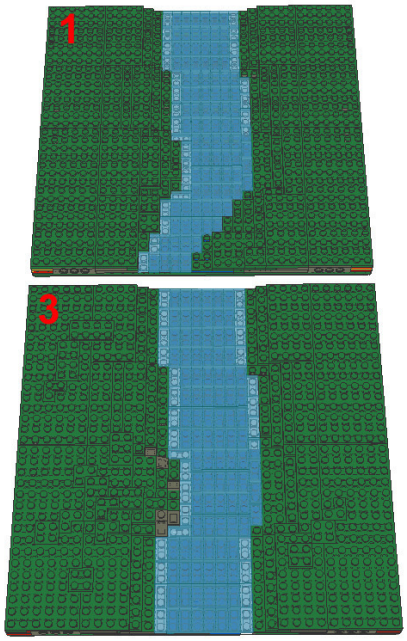
Modgrup



This a simple modgrup with two modules with a section of a river with different wide in the borders of the modules that the mandatory size of the MILS rules.

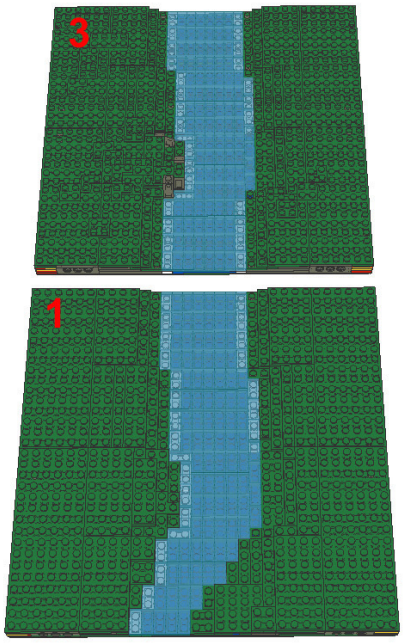
This river modgrup can be place between two other MILS river modules, because the outer extremes of the modgrup are compatible with MILS rules.

Incorrect conection



In this case, the module 1 can not be placed with another river section compatible with MILS rules because the have different wide, so they are not consistent.

Correct conection



Some of the modules of the modgrup can be used individually in MILS dioramas. If they have a side compatible with MILS rules, they can be placed in the border of the diorama, with the MILS side facing other modules. This is a way to have more way to build terrains with our modules.

The modgrups can be very useful if they are used to construct river sections or road sections with different width, or with a curved run that is too complicated to be built with MILS modules. There is a opportunity to use this type of elements to get a better appearance, with more realistic terrain features. The modgrups can be seen as an extension to the simplicity of the rules of the MILS system, that are intended to be as simple as possible, in order to get an easy way to have common terrain elements made by different builders for the same diorama.

You can use the modules of the modgrups individually with other MILS modules under some circumstances. They need to have a good design to do so. But they are not restricted to use within a modgrup.
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Modgrups examples