

# Larry Bird - Maya/Painter/Designer/Unreal



LArry\_B\_for\_Unreal\_Mult\_Shader\_V001

Taking the Character and its maps into Designer/ Painter and integrating it inside of Unreal.

- Try to achieve a one for one between Maya and Unreal
- Find the best Export method for FBX's going into Unreal
- Work out the Work flow from Substance Designer, the publisher of the Sbsar's into Unreal using the Substance Unreal Plugin
- Test Multi shader Sbsar into Unreal

Please refer to the Document

Vertex Colors - Maya to Substance

For the details on the model prep.

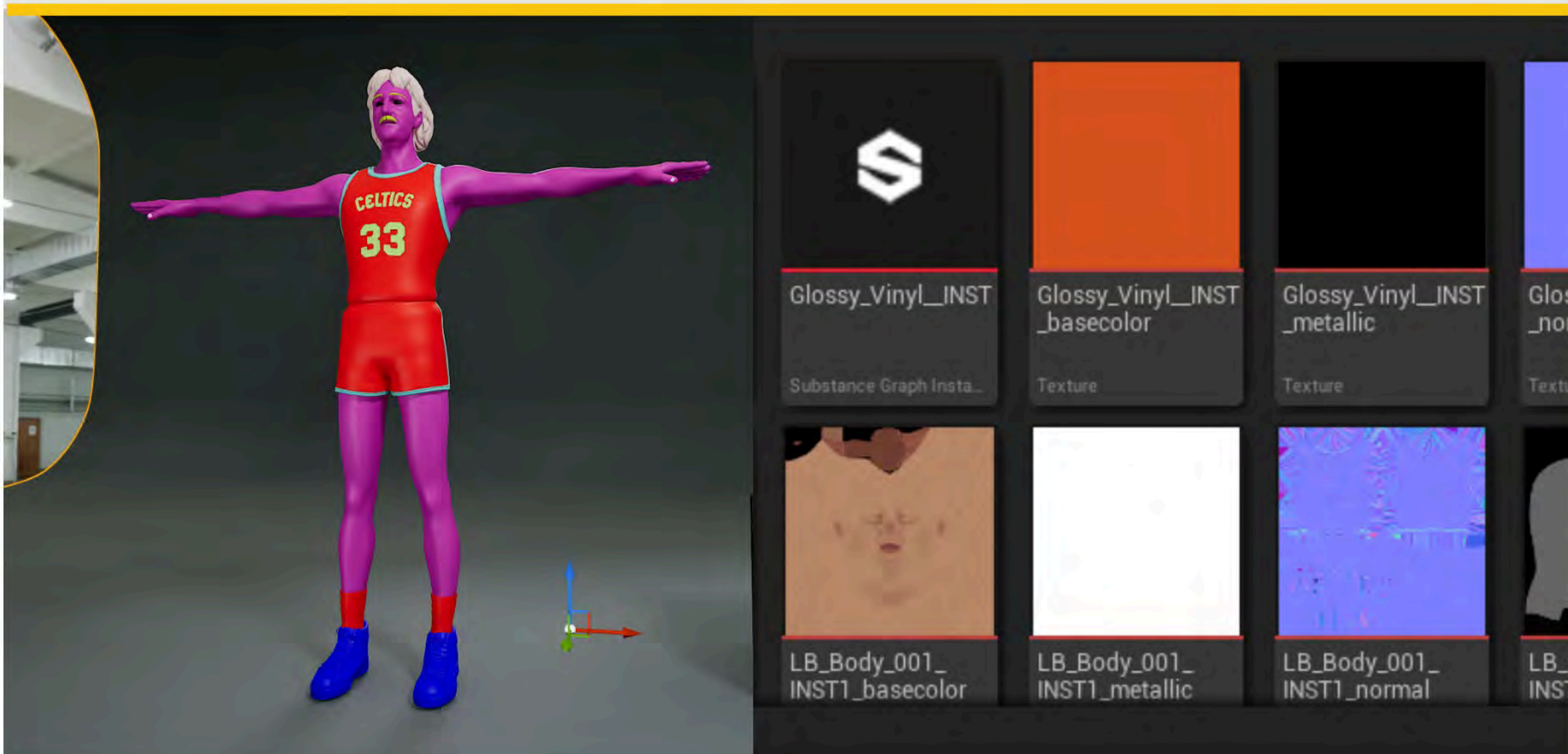
The FBX has vertex shader assignments and each part has it own shader as well as unique ID number.



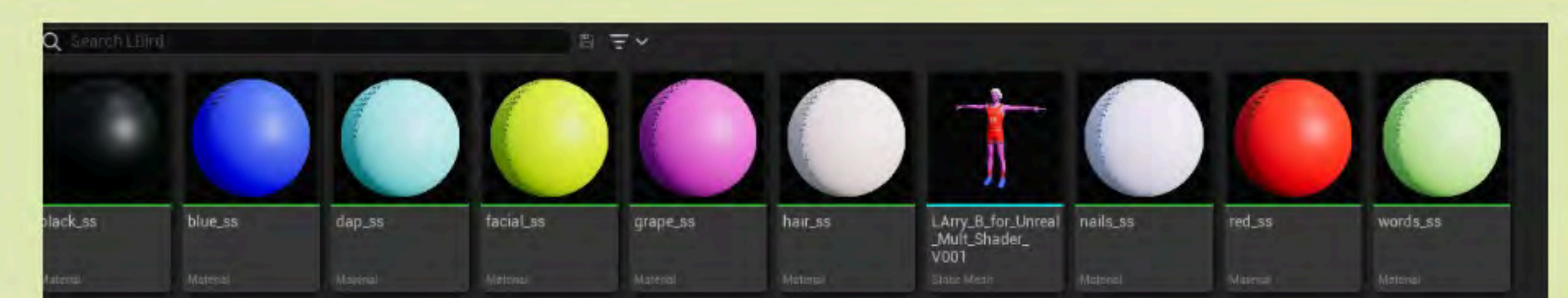
Exported out - FBX into Substance

There are many ways to approach this.

We could ( for example with Larry Bird Character from Portal 2 ) ..



- From Painter - Paint the Maps - go through the approval process via stager and then render the maps out. Then inside UNREAL reassign the maps and rebuild the Master Shader for the character. Assign each



- Connect the maps to the shaders that correspond. Uniform Diffuse, Roughness etc are assigned to the Uniform shader. Do this for each of the materials. Any updated to the maps via photoshop or Painter, the files could be over written and still being referenced inside of unreal.
- This excludes the use of Substance Designer, since **NO SBSAR** is being used. Everything is Compiled and referenced inside of Unreal.

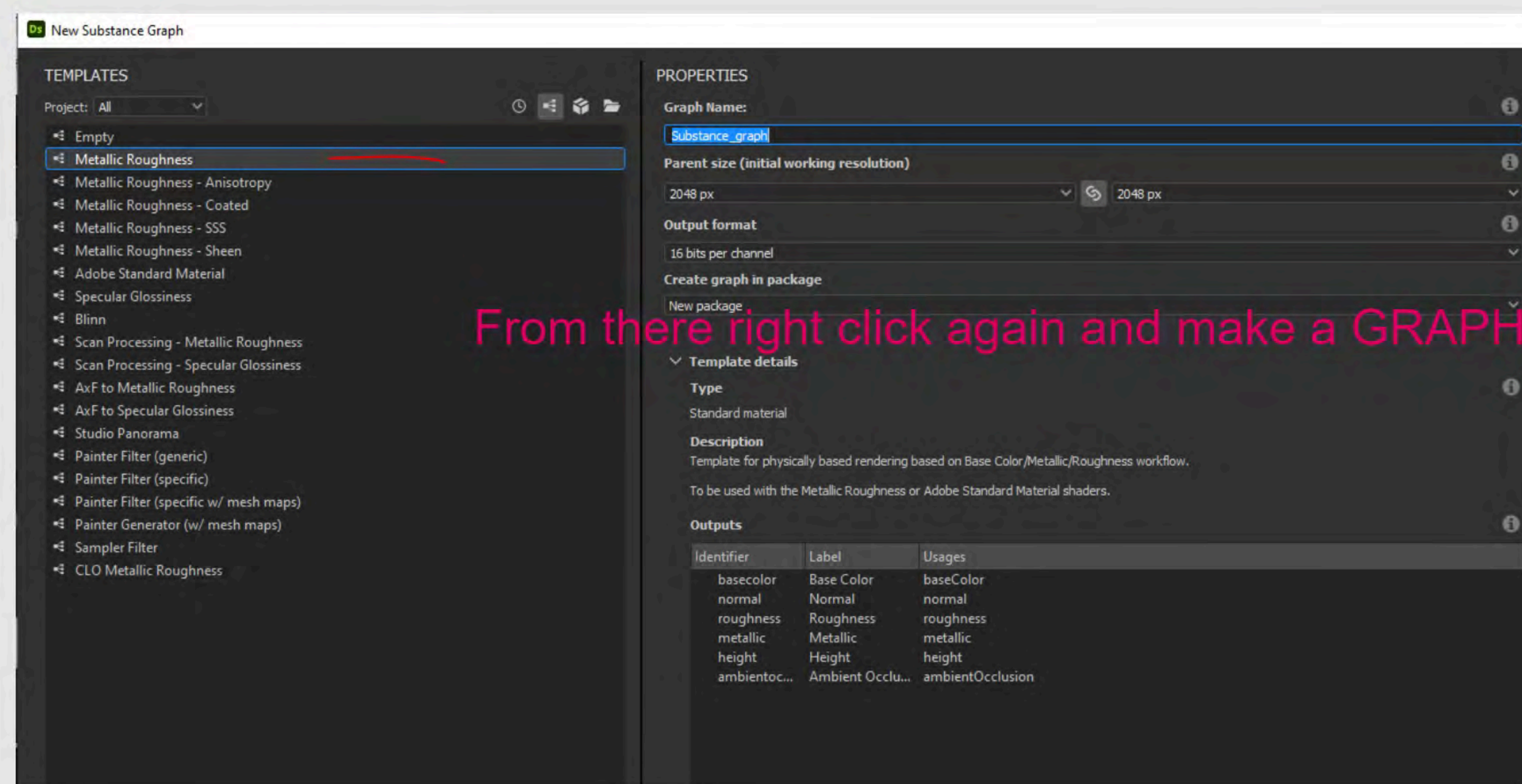


# Larry Bird - Maya/Painter/Designer/Unreal

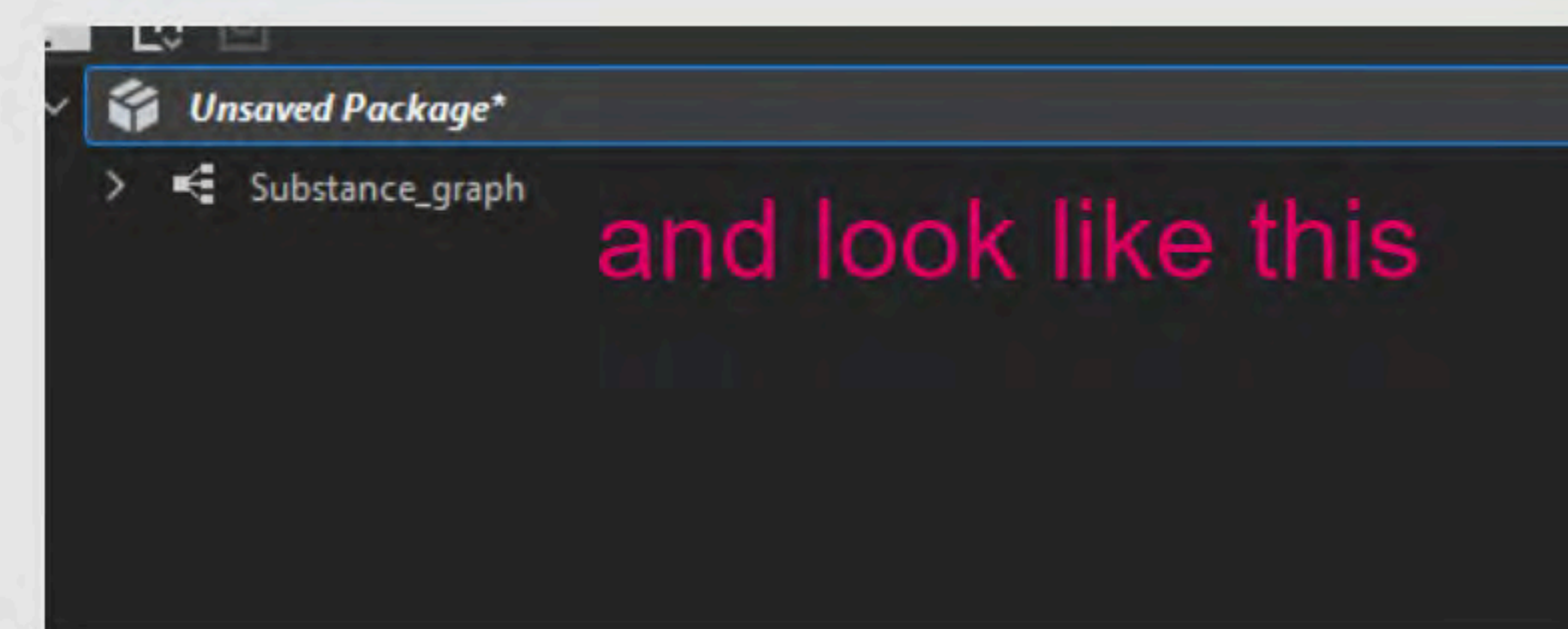
Keep in mind - Substance Designer is really a compiler, getting images and controls together to go out to other DCC's.



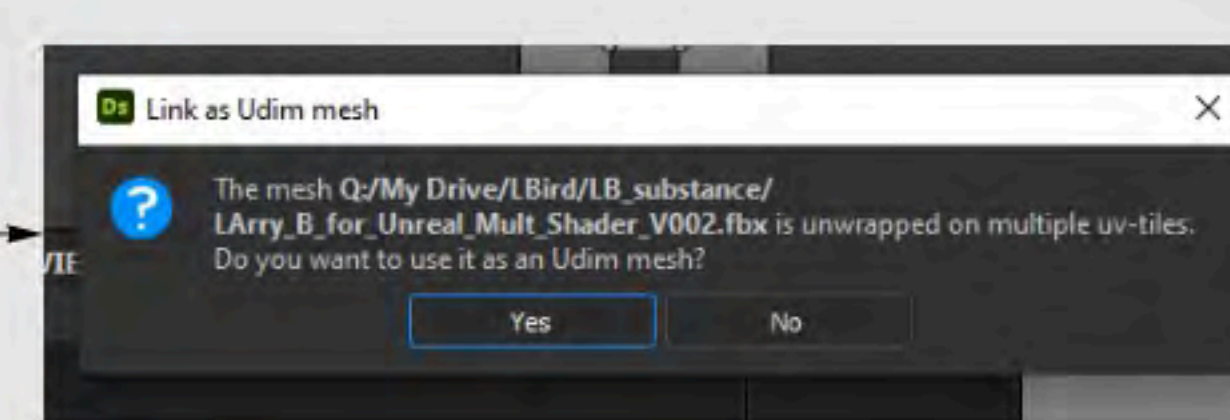
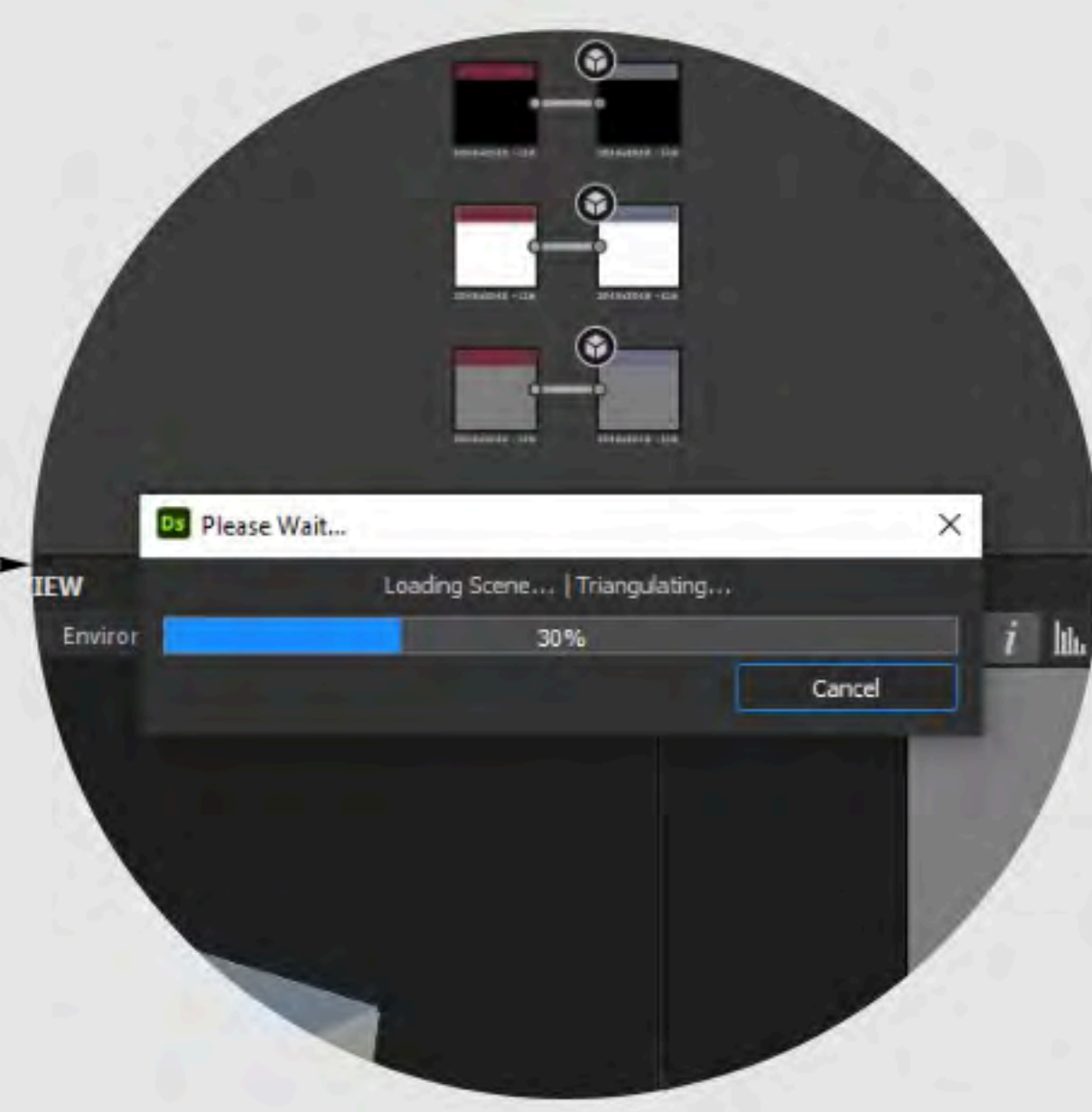
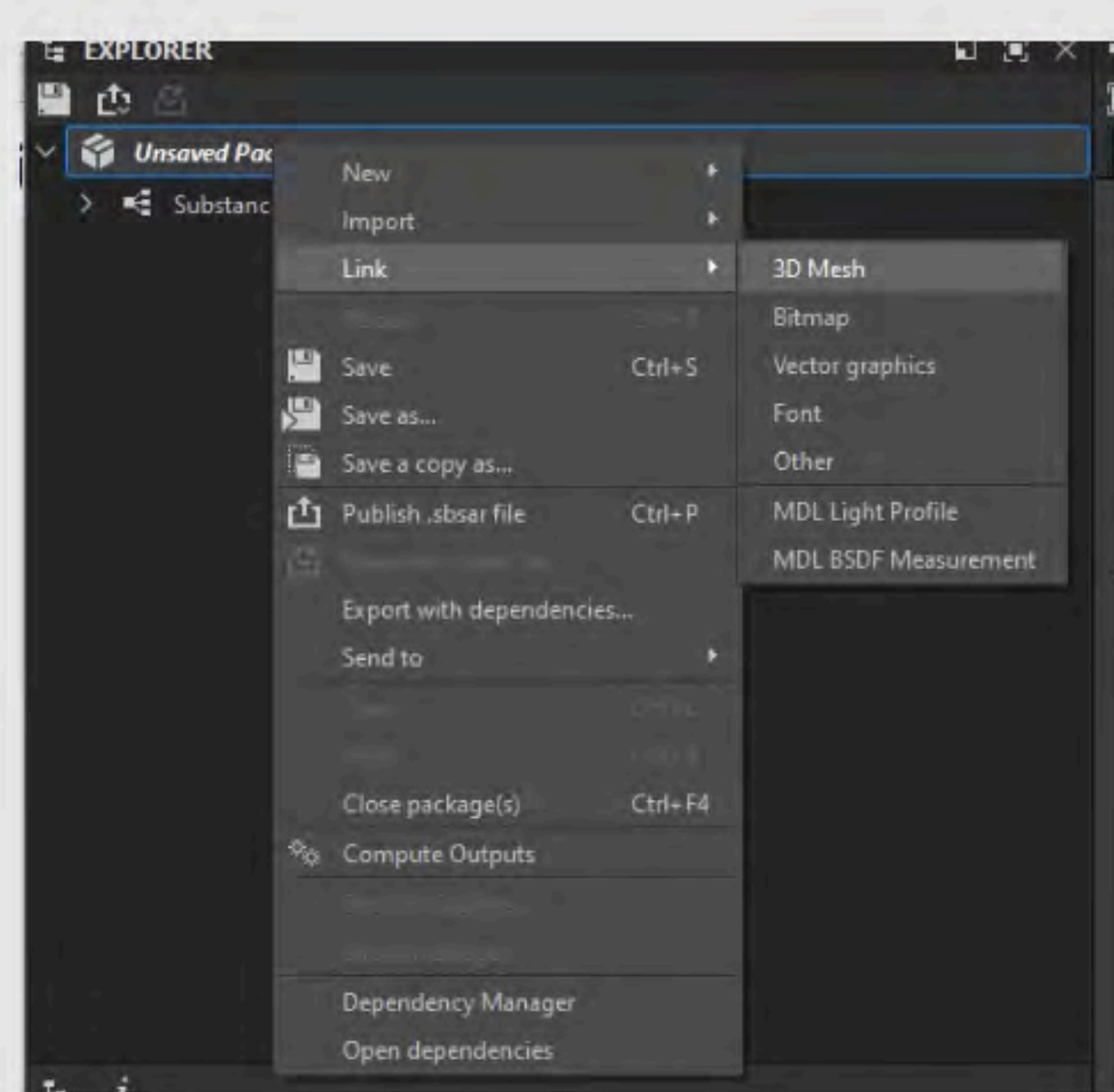
- In substance Designer, create a new package by right clicking in the EXPLORER box.



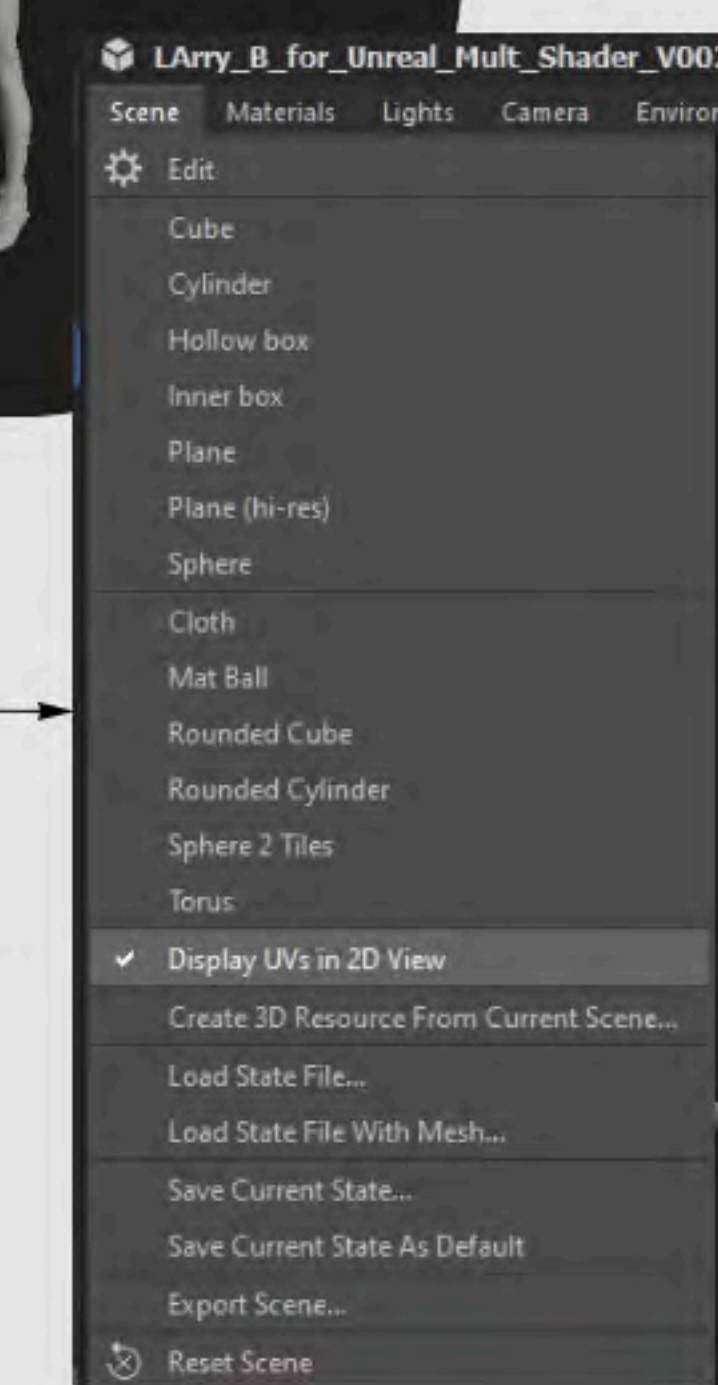
Choose the " Roughness Model"



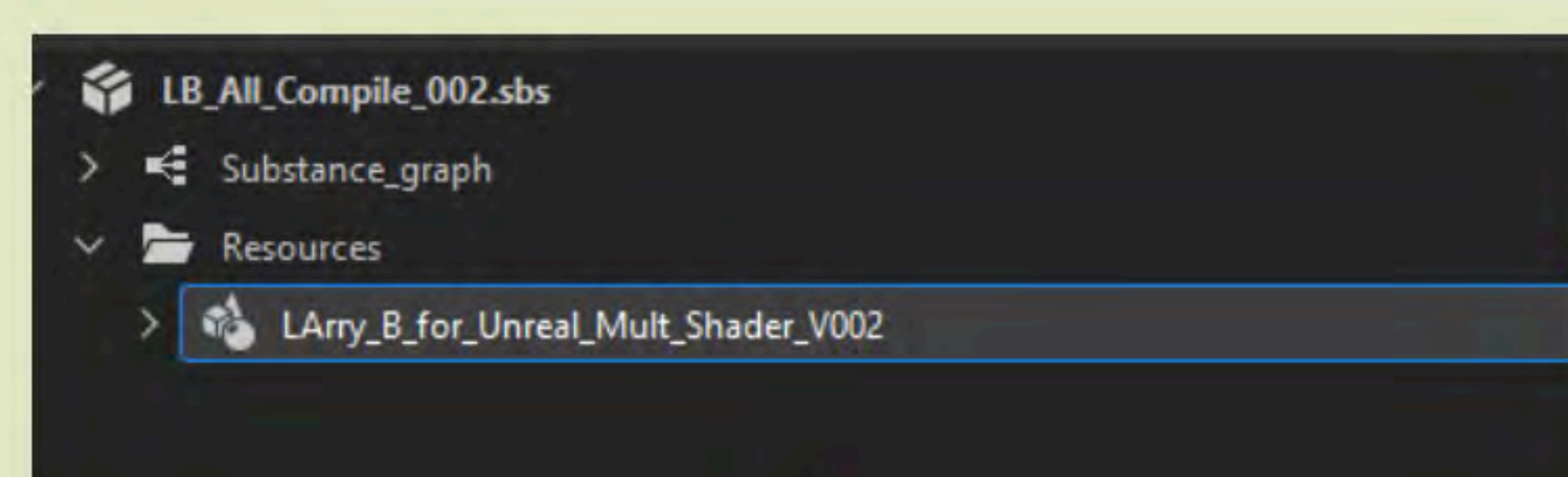
- In the EXPLORER box, right click > Link> 3D Mesh > **LINK 3D MESH**



Click yes to the UDIMS



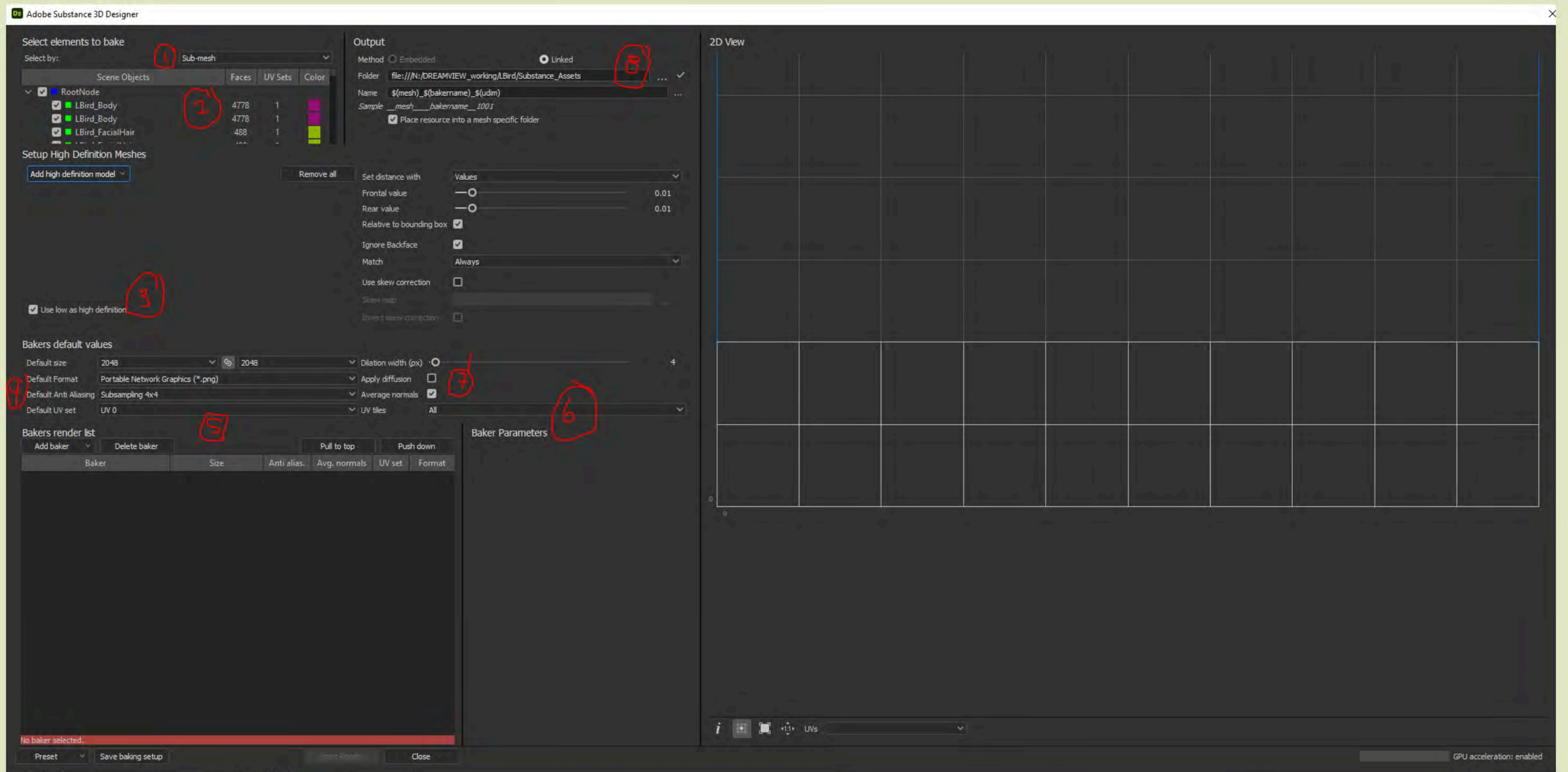
To see the models udim sets - follow the tab above



Right Click the newly imported model and select **BAKE MODEL INFORMATION**



# Larry Bird - Maya/Painter/Designer/Unreal



A baking information dialogue box appears

## 01 -

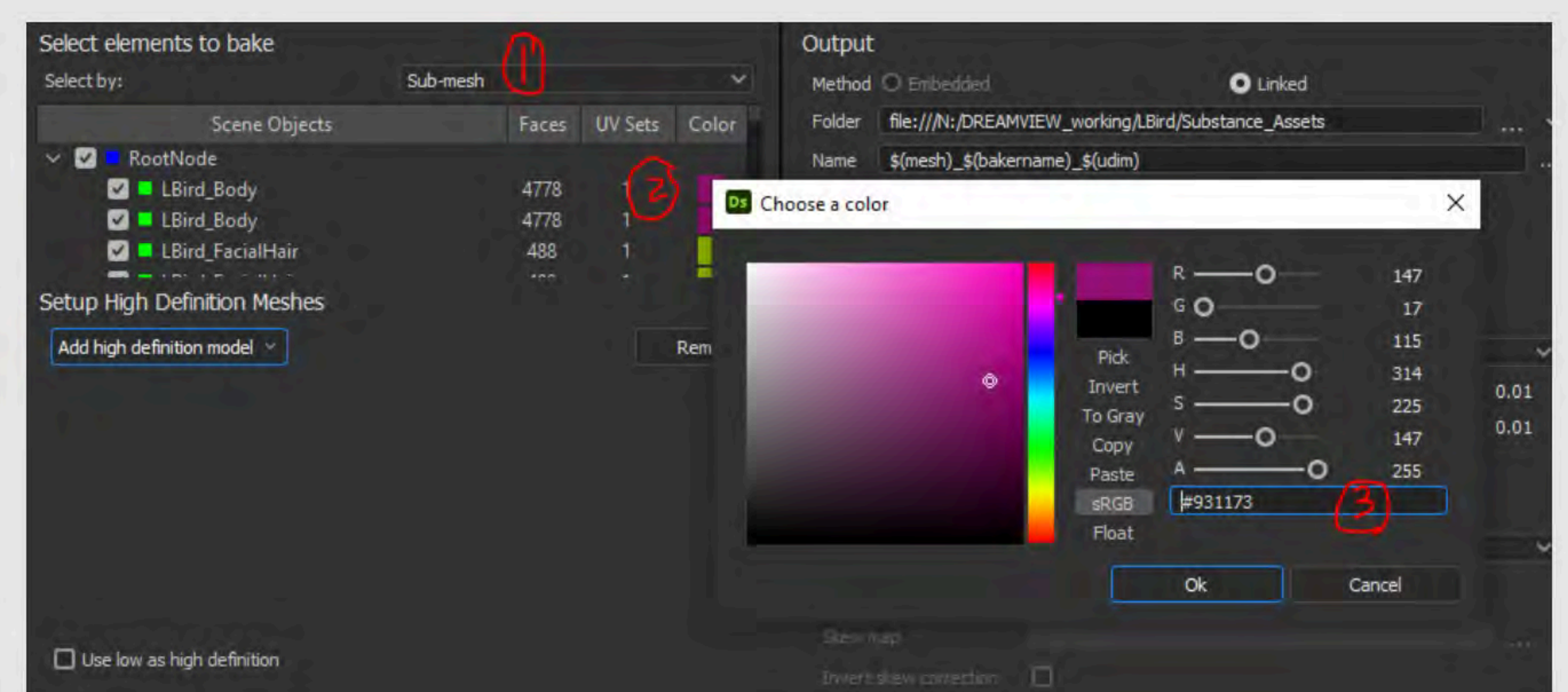
Select sub mesh. If you grouped the model parts together in Maya etc.. Then choose this. The key is to now go in and give a set of color numbers that can be used throughout the application as well as in down the line

## 02-

Assign specific numbers ( colors ) to the pieces. For example, the Jersey is one specific color, but the piping on the jersey is another color.

**keep track of the color numbers for masking - if that is the sub mesh value it can be used down the road**

- Bird Body #931173
- Bird Facial Hair #90b502
- Bird Finger Nails #dbb3f9
- Bird lower teeth #72b7d2
- Bird shirt #ff0000
- Bird shirt piping #2bb5b3
- Bird Shorts #ff0000
- Bird tongue #e9109e
- Bird upper / Lower Teeth #72b7d2
- Bird Hair #f9b5b3
- Bird nametags #7dde34
- Bird Shoes #0000ff
- Bird Eyes - all - #96f0b9



**03-** For this set - Use Low as high Definition

**04-** Choose sampling

**05-** Choose UV set "0"

**06-** Choose UV tiles to ALL

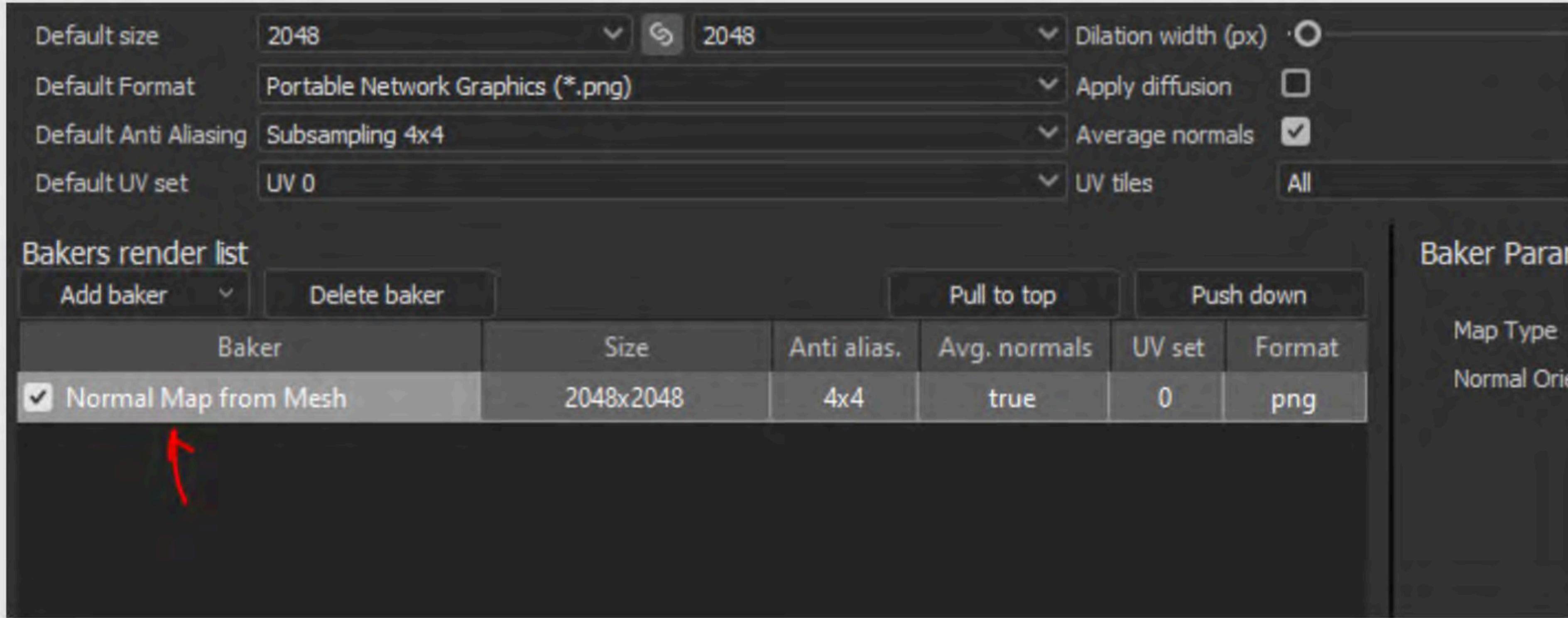
**07-** Turn Off Diffusion

**08-** Save your Paths

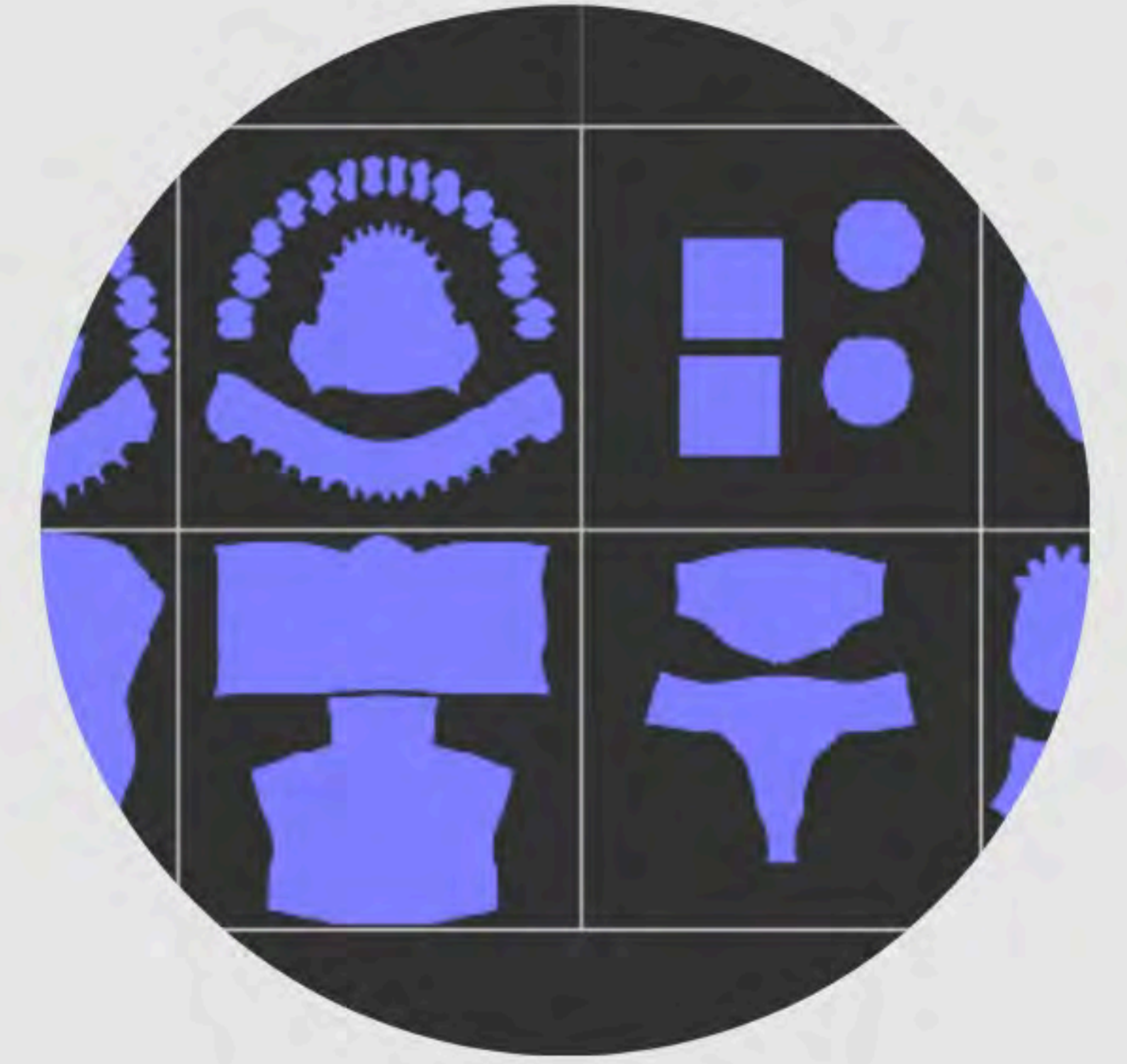


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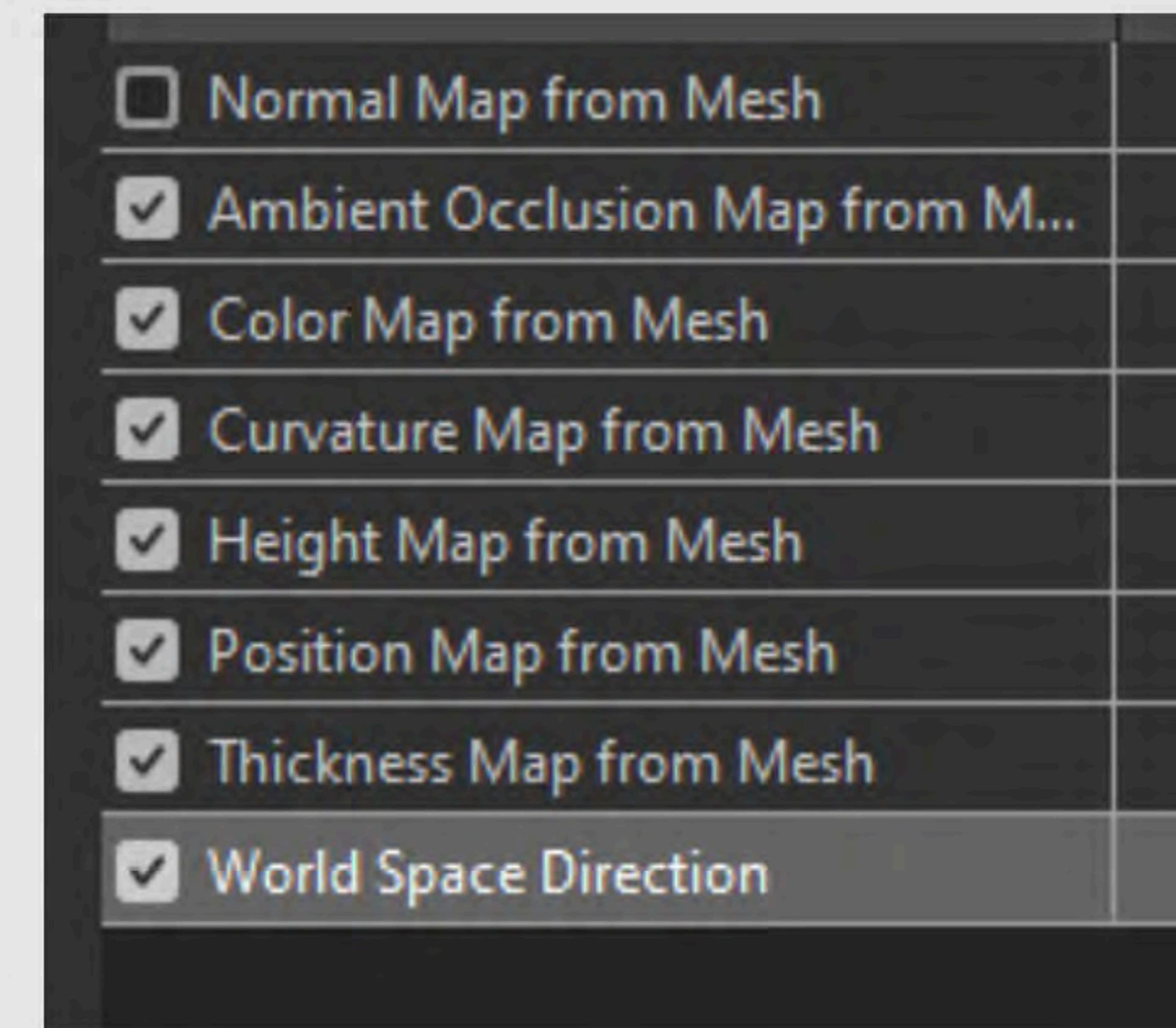
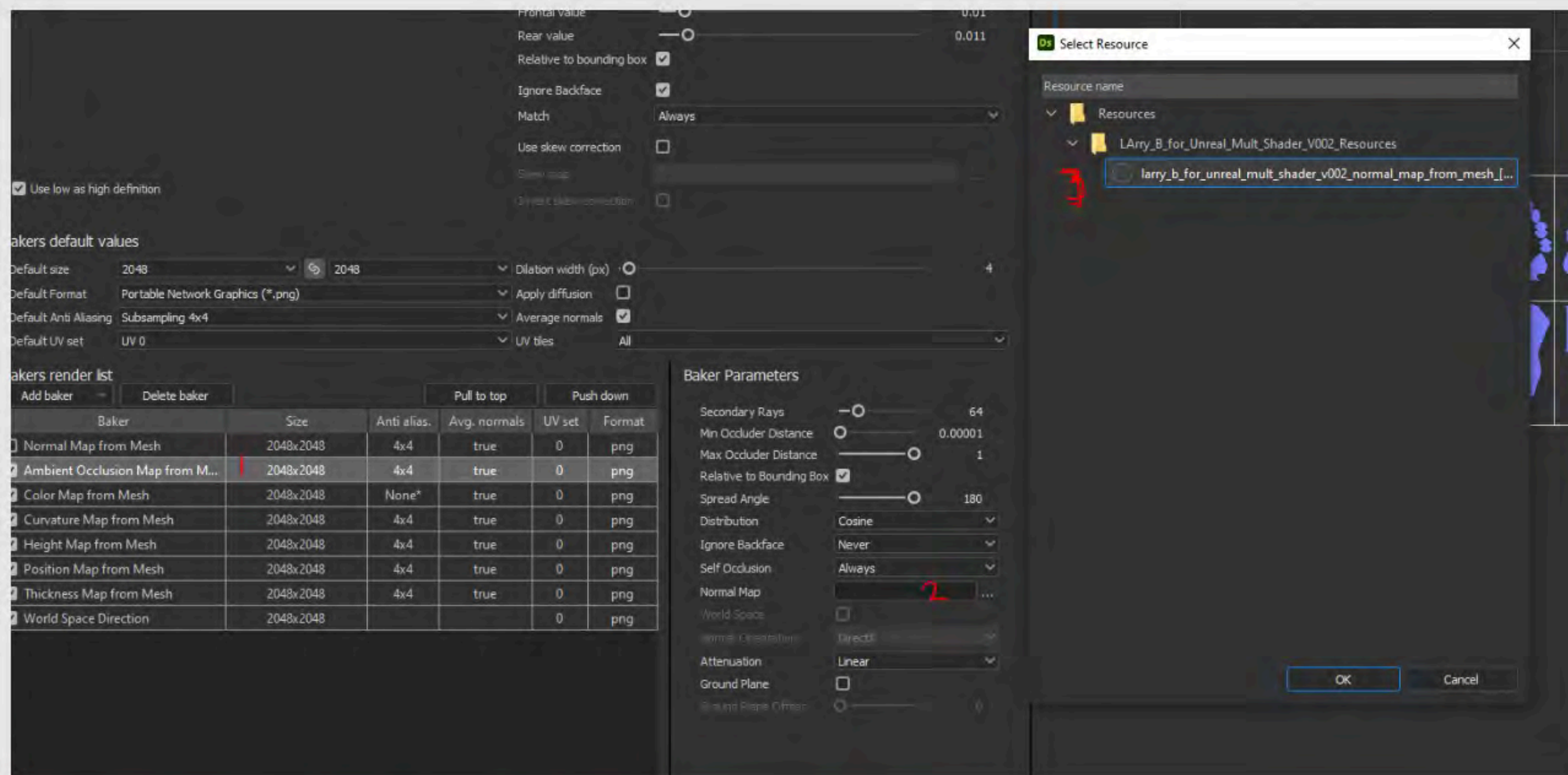
- 09- You first need to bake your normal if you do not have one from painter - or connect it in.  
CLICK Add Normal map from Mesh



Finished Normal Map

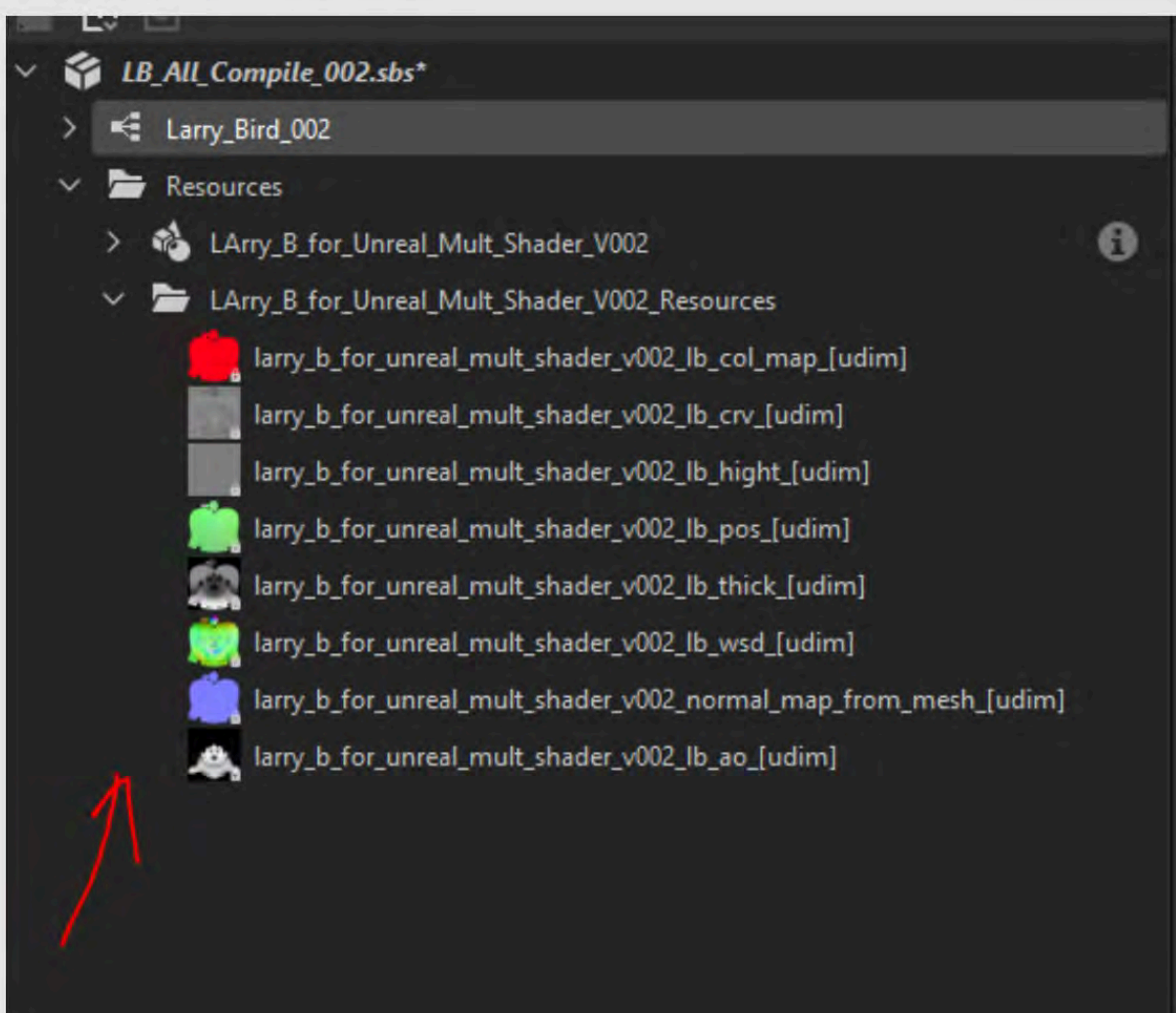
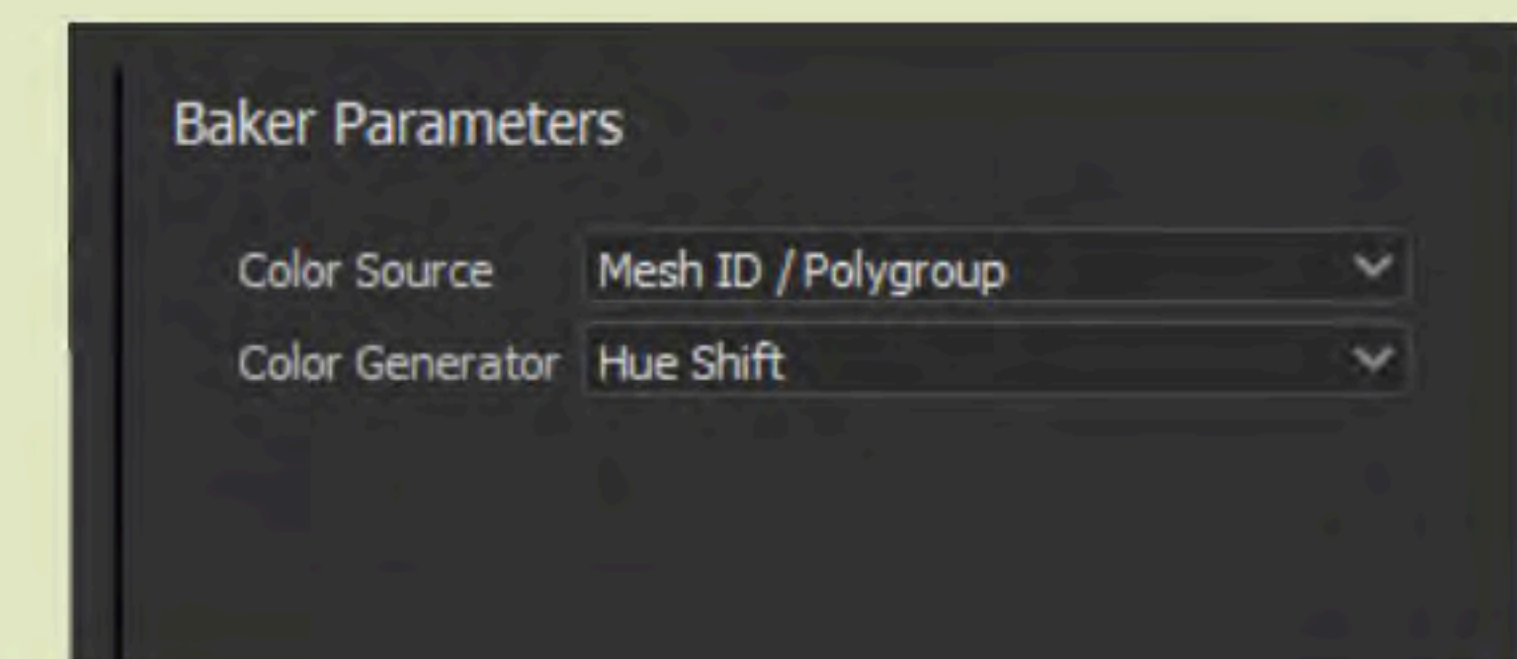
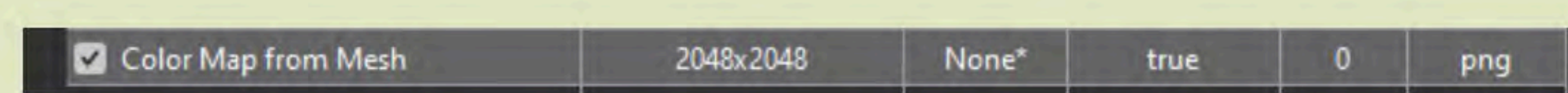


- 10- Once you have a Normal, you can hook the normal map to other baking parameters that rely on it.  
11- Once complete, add the other bakers from the list below, and connect the normal map when needed



1. AO, curvature need the normal map
2. Select Normal Map Reference
3. Select the map you just made OR an imported map from painter.

For "Color Map from Mesh" -  
Choose "Mesh id / Polygroup"

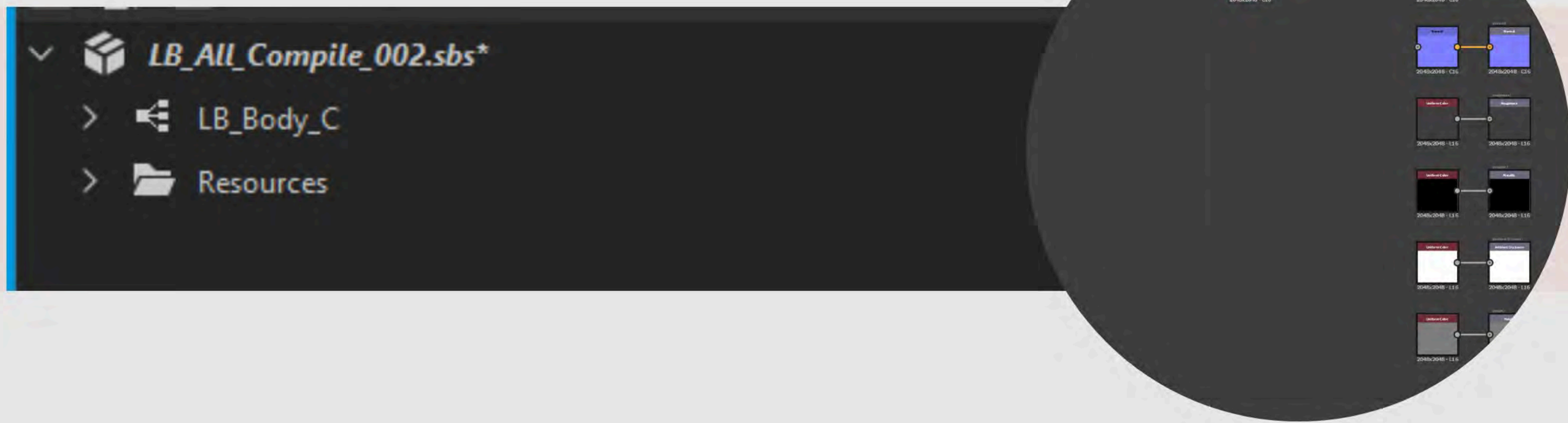


- 01- Your explorer window will look like this  
02- New Geo and maps imported all go into the "Resources" folder. Make sub folders per object maps if need be.  
03- The udim baked maps can be used in the graphs we are about to make per object.

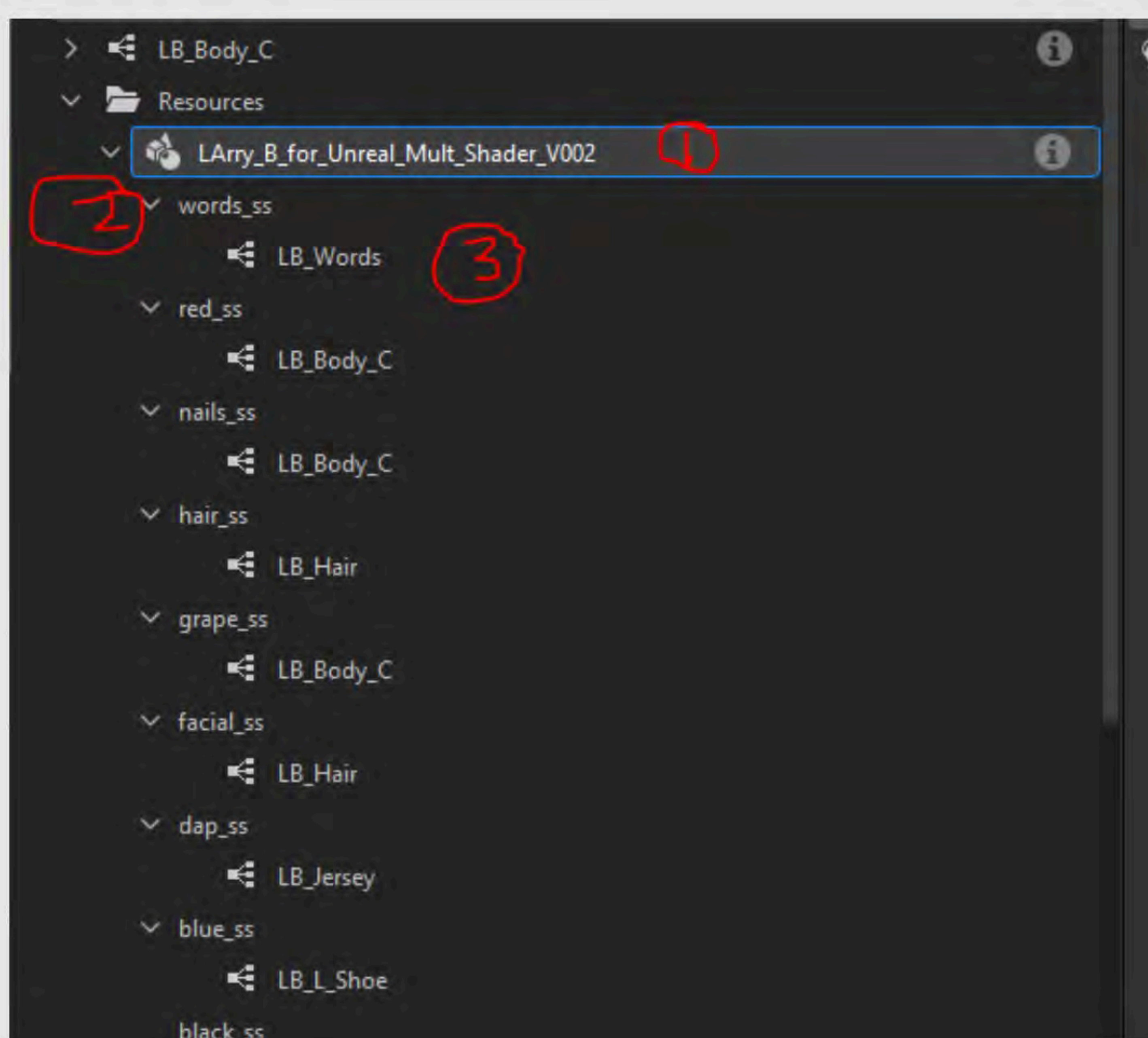


# Larry Bird - Maya/Painter/Designer/Unreal

Right Click the Explorer window and make a new graph, roughness settings like earlier and Name it. The graph will look like the circled image

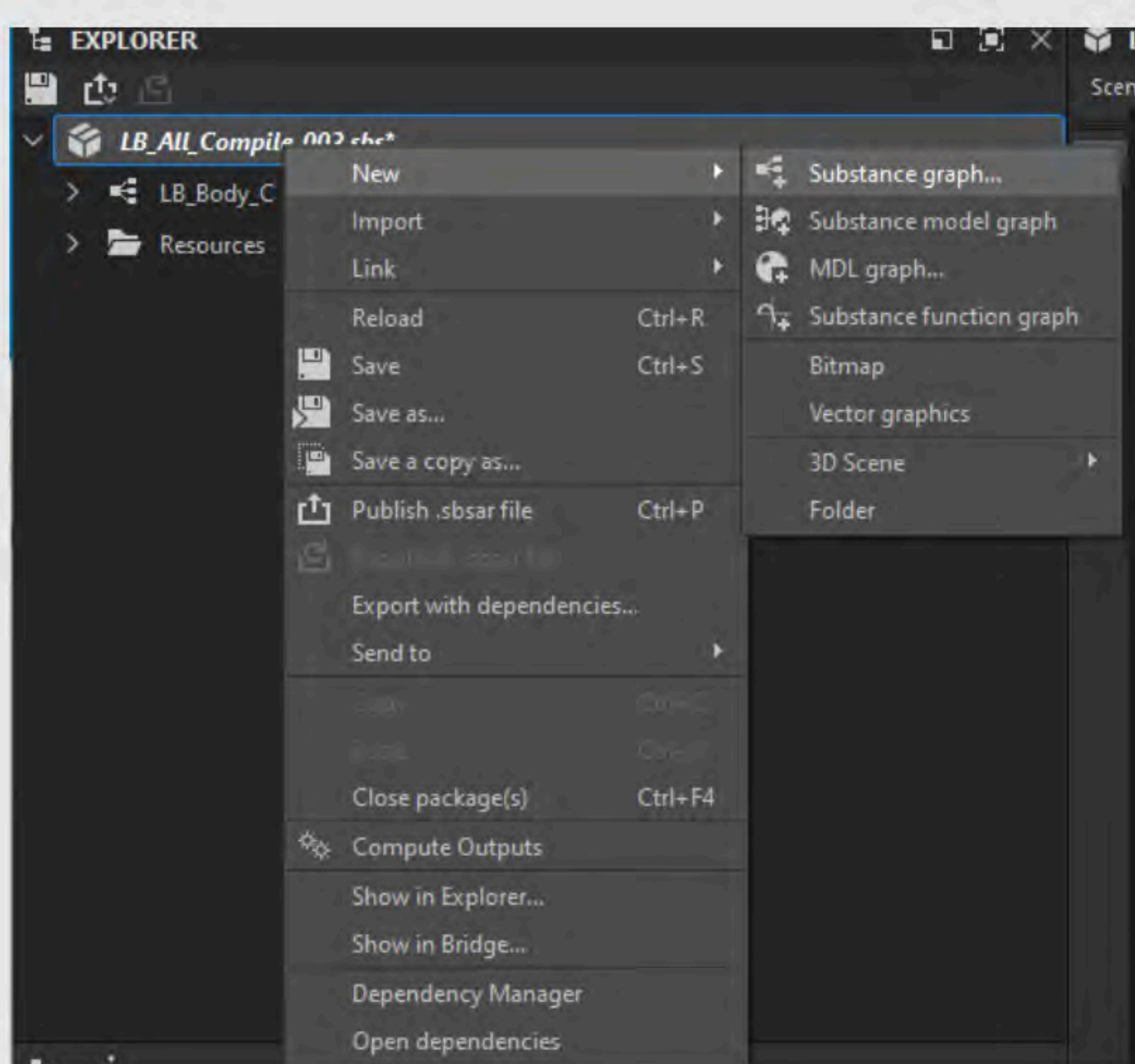


The goal for this exercise is to make a graph or shader for each one of the model parts you see.

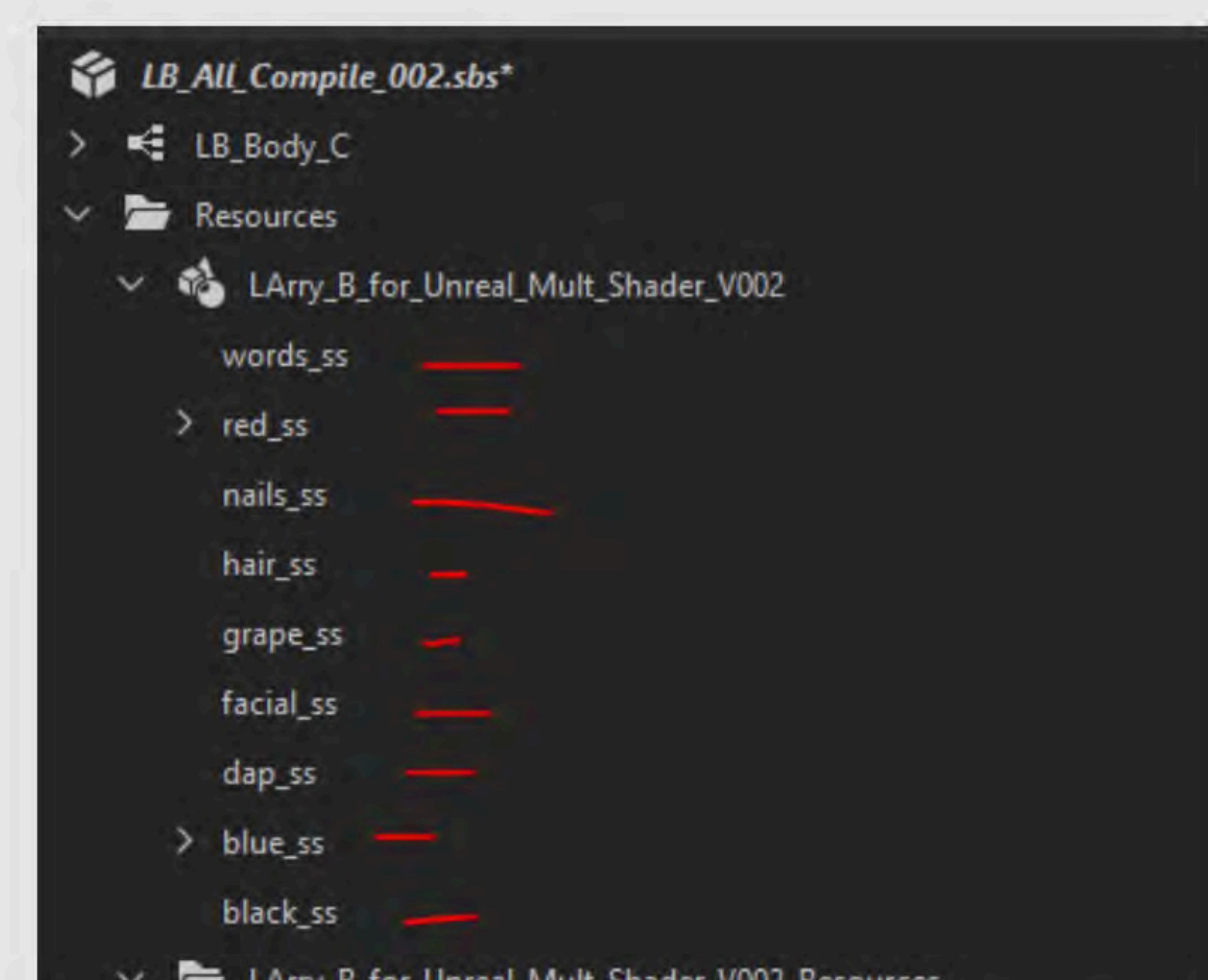


- 01-** the imported model, click arrow to unfold
- 02-** Each one of those is a "Poly Group"
- 03-** This is the Substance Designer Graph or Shader that is assigned to that piece of Geo

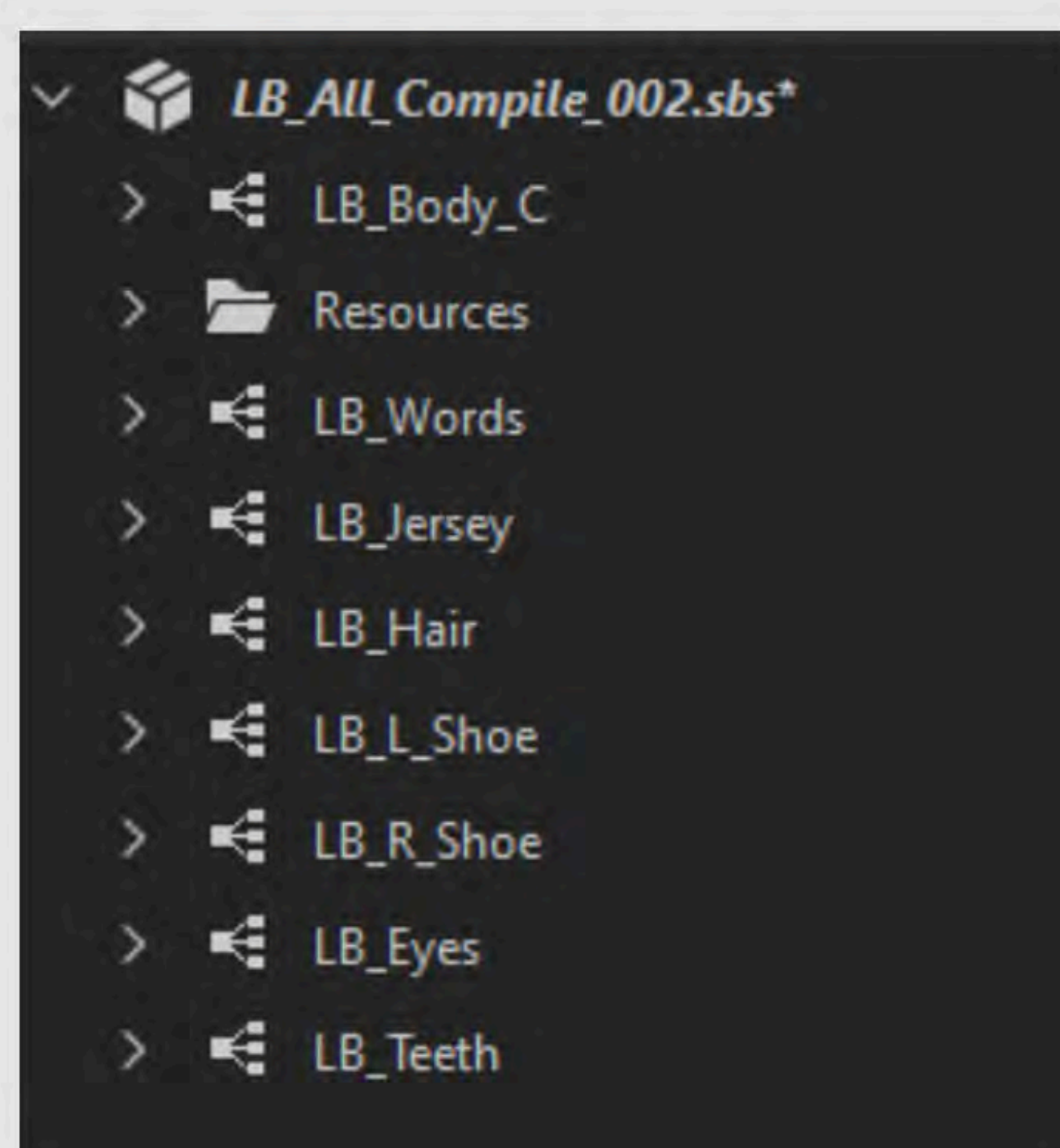
So you can Make the Graphs for each of the pieces. You can make one Graph, give it a name and copy and paste it - rename it and so forth. You do not need to build from scratch every time.



- 01-** Right Click and make a new graph



- 02-** Make one ( or copy and paste ) for each geo piece

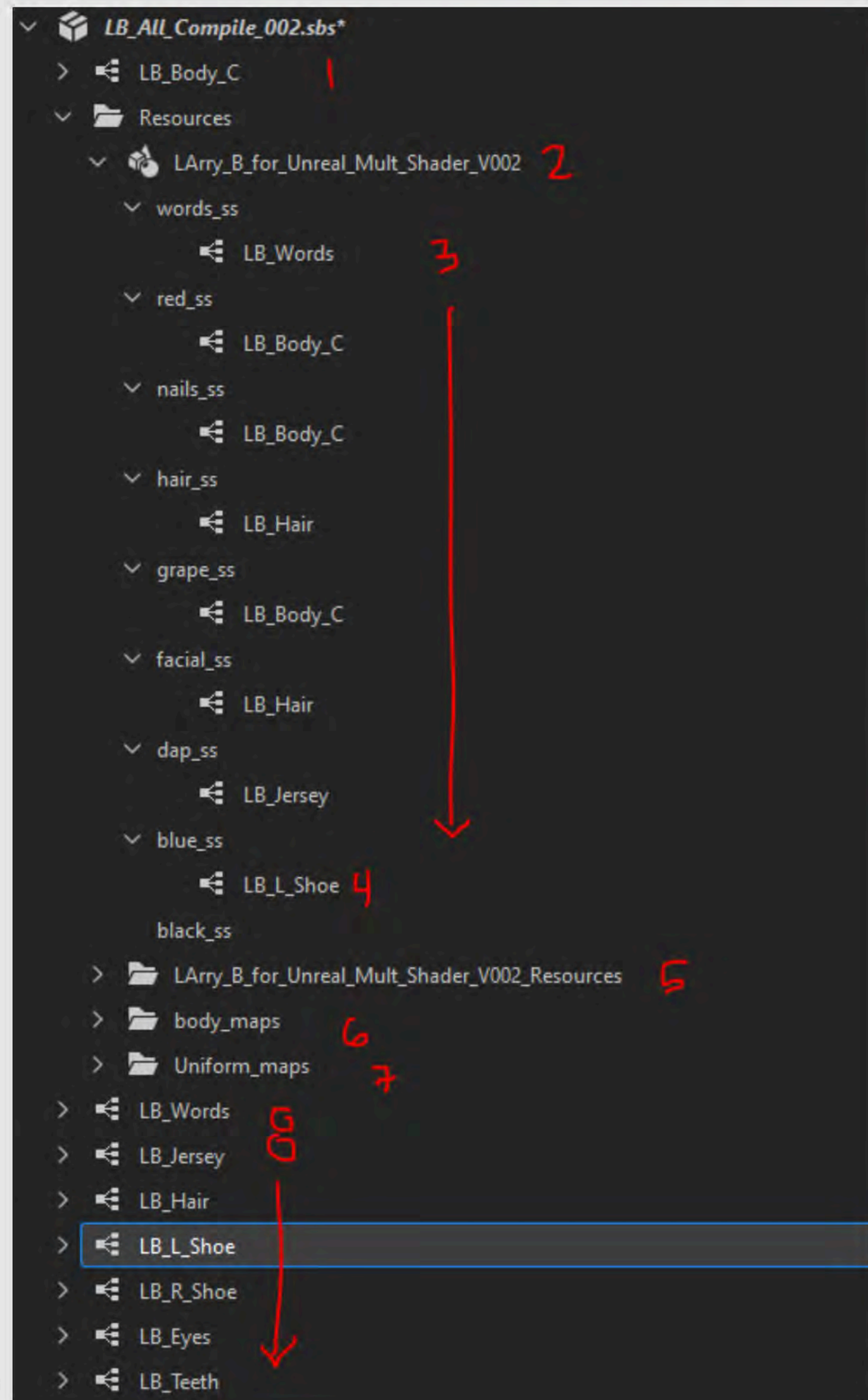


- 03-** It should look like this

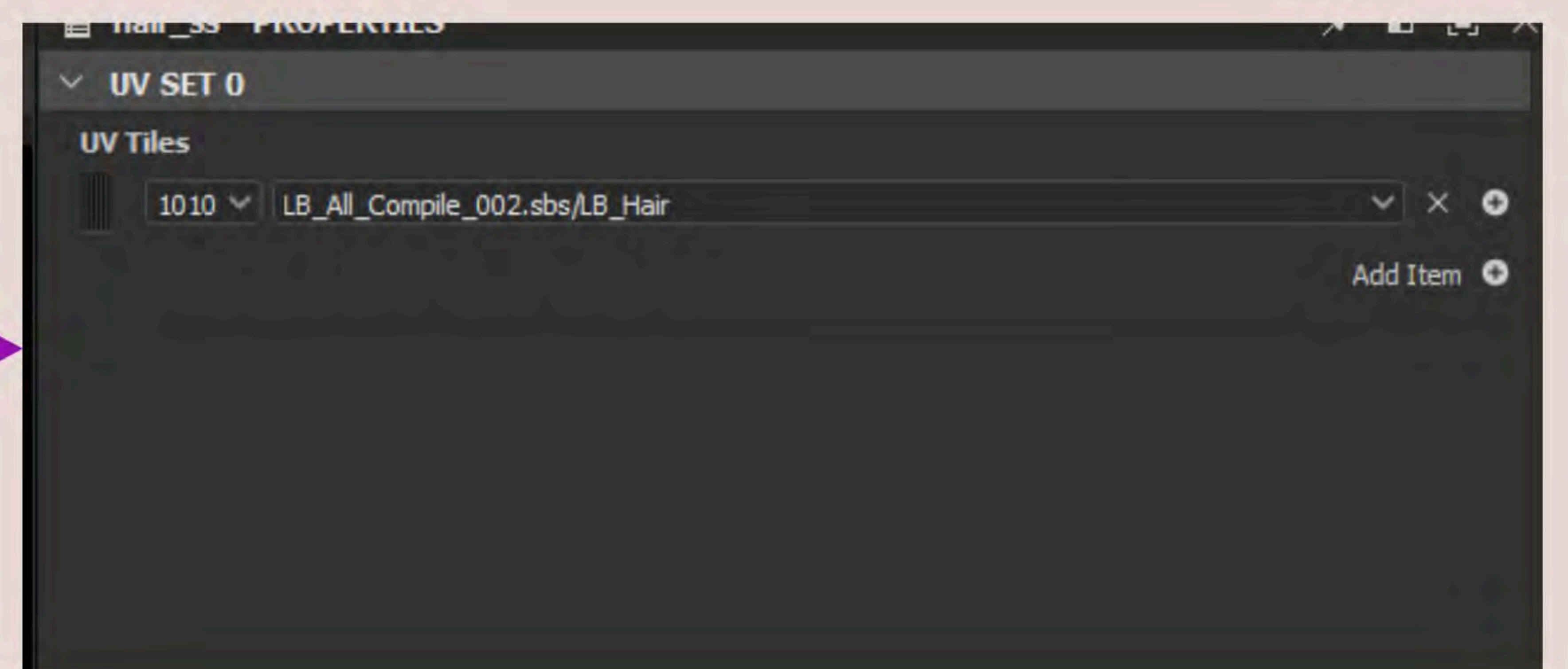
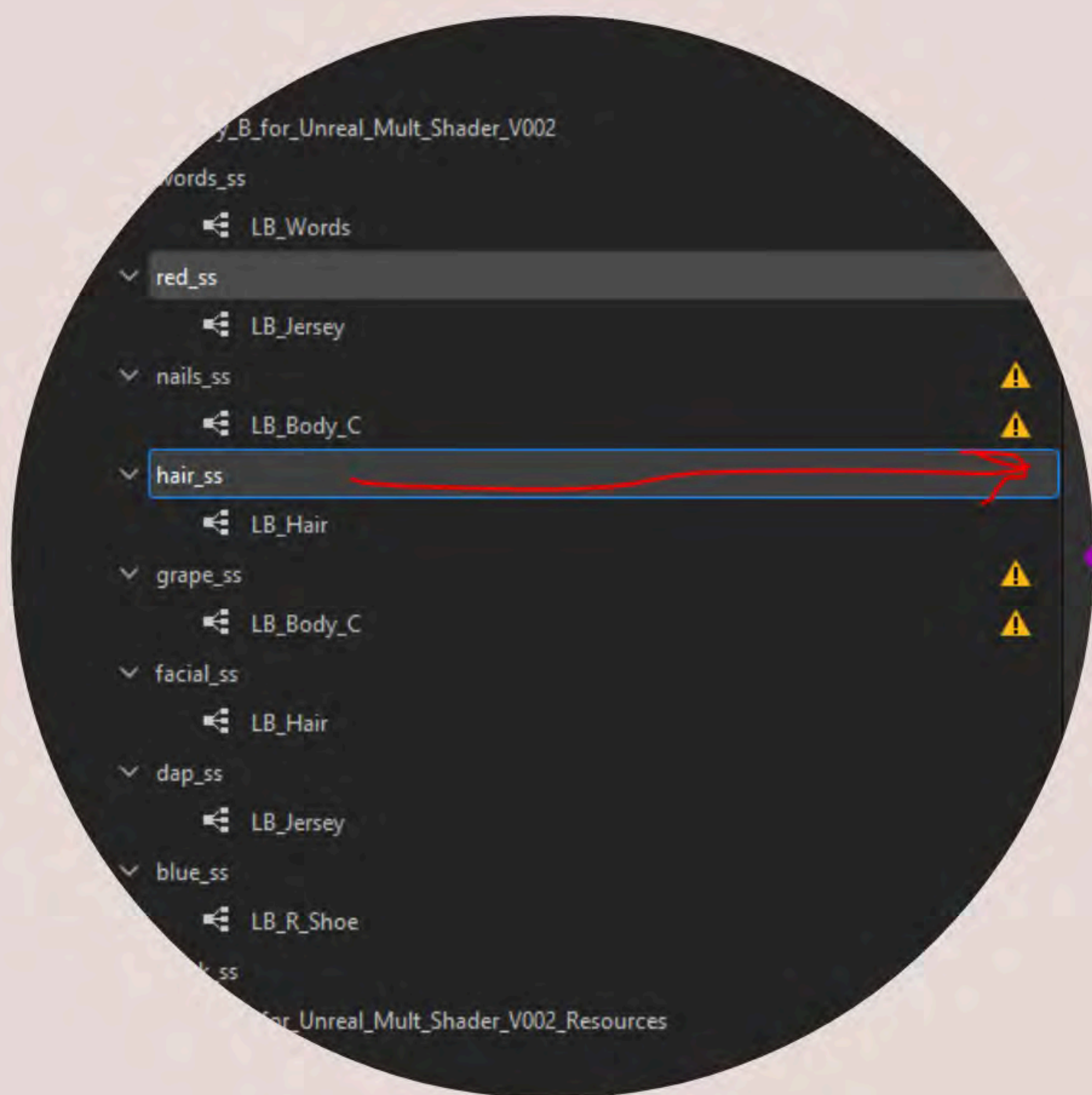


# Larry Bird - Maya/Painter/Designer/Unreal

## ReCap of where we are



- 01- Your Body Shader or Graph
- 02- 3D model you referenced imported ( Link 3D Mesh )
- 03- Poly groups of the 3D Linked Mesh with their Graph or shader assignments on them
- 04- Example of Graph or shader assignment
- 05- Main Resource folder for all of the baked maps you made and can drag and drop into your graphs for effects and color grading.
- 06 / 07- The MAPS FROM PAINTER are Linked Maps that come in. Make a folder for each poly group or assignment for better organization.
- 08- Graphs for each poly group that were made.



- 09- If you select the separate poly group, to your right in the window under properties you can assign the graphs or shaders to each piece and each UDIM.



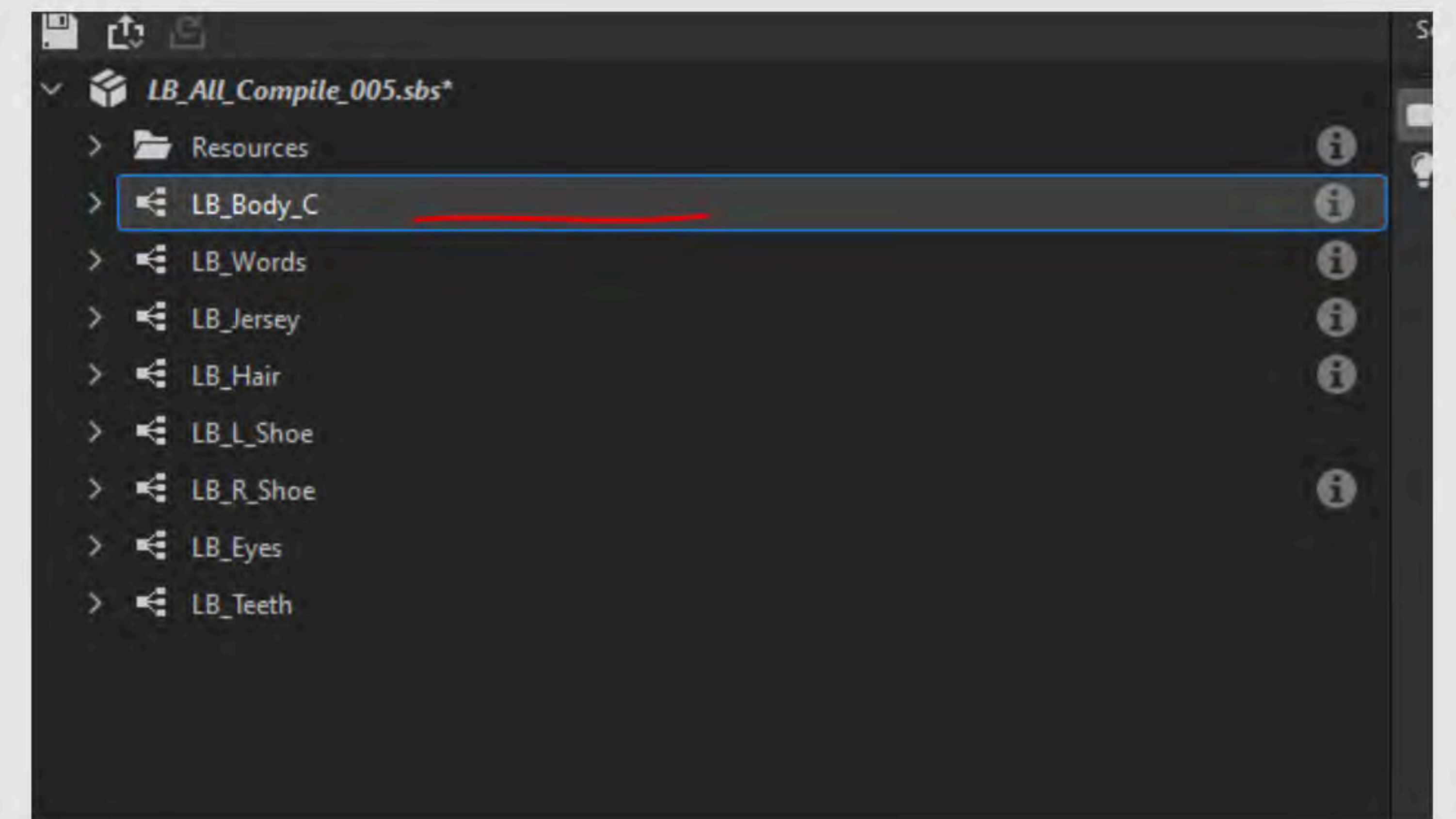
# Larry Bird - Maya/Painter/Designer/Unreal



## Start the Texture Assignment Process

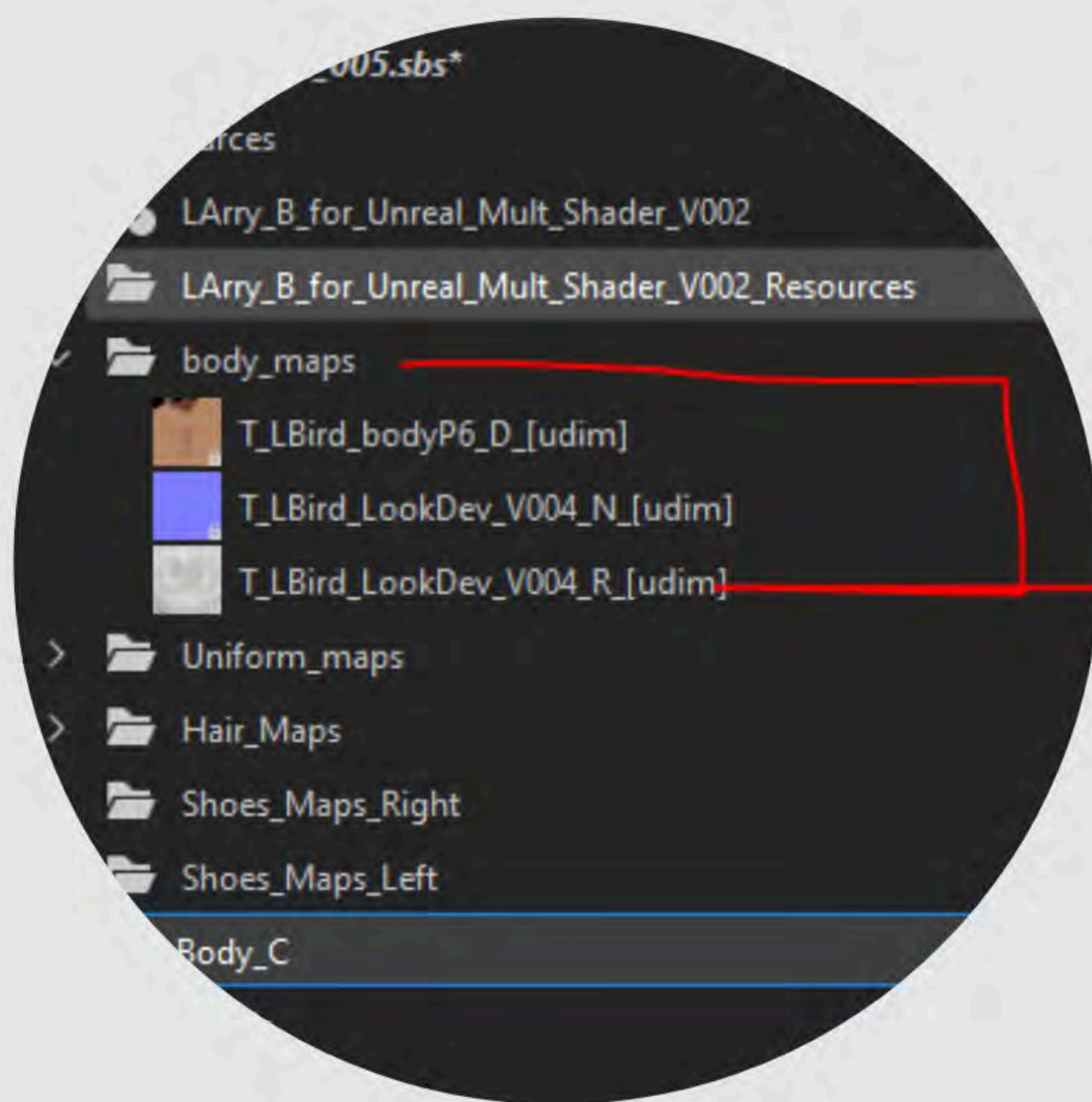
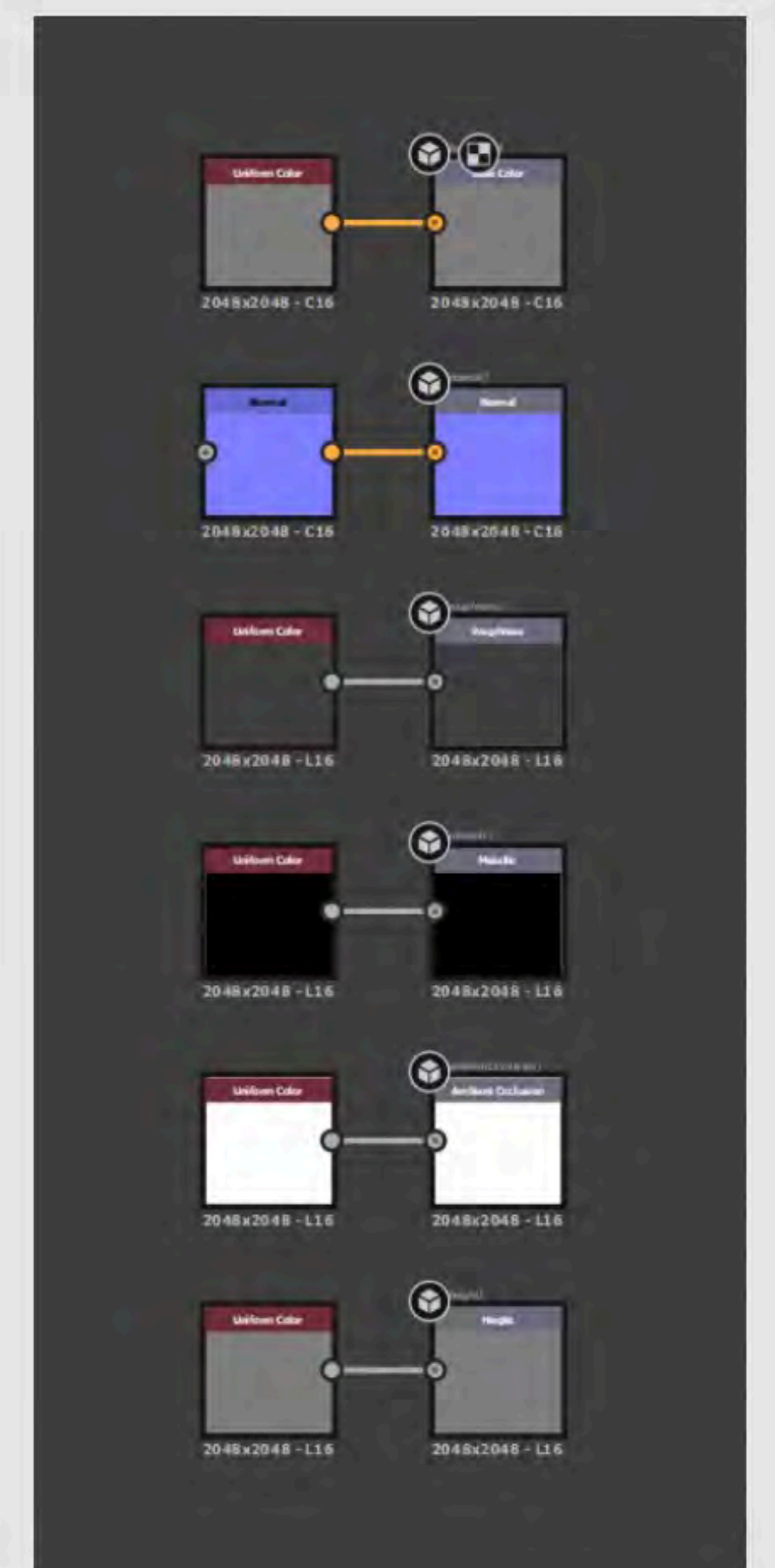
The maps generated by PAINTER were all exported out. Inside your "Resources" folder start to "Link" import your outputs from Painter. "Linking" will for the most part better serve your computers ram. The files themselves must be in the project directory which is more of a pipeline issue. Just keep that in mind.

Starting with "LB\_Body\_C", this graph opens with a double click.

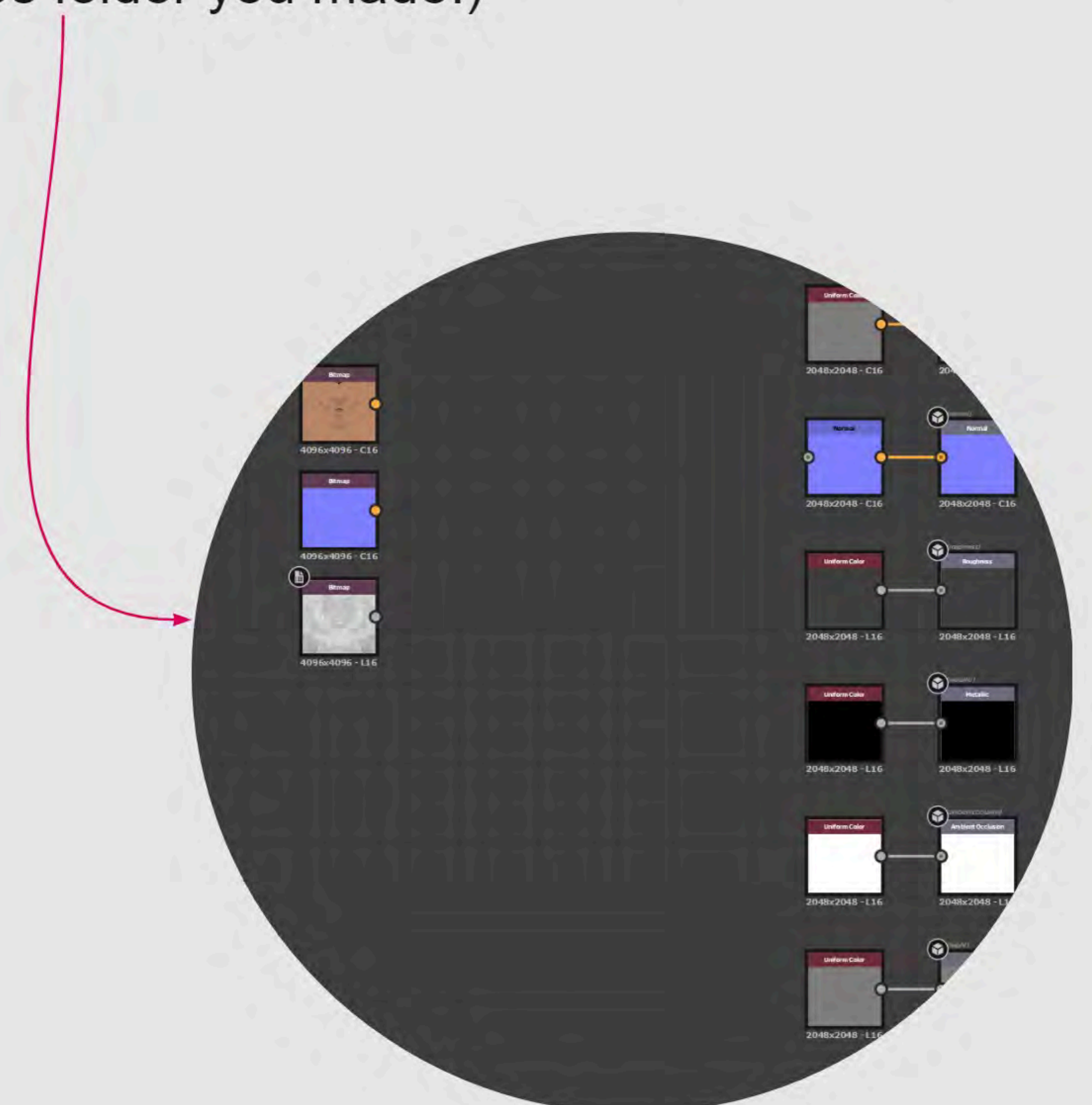


It will create a Graph that has your output nodes. Those output nodes are your main avenue out, for Sbsar's or maps etc.. those are the out points for that shader, which in this case is "LB\_Body\_C".

This graph is where all the work is done. You can drop other sbsar's into it and connect all of the outputs, or like in this case, drag in the material maps made in Substance painter

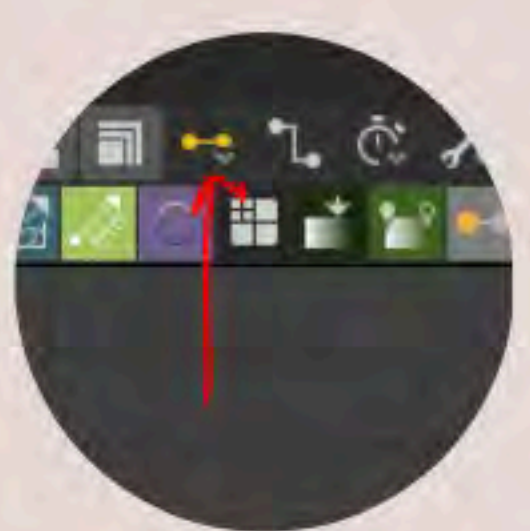


With all of the maps you linked in and placed into their own folders ( EX: all body maps of Larry Bird go into the Body maps folder you made.)

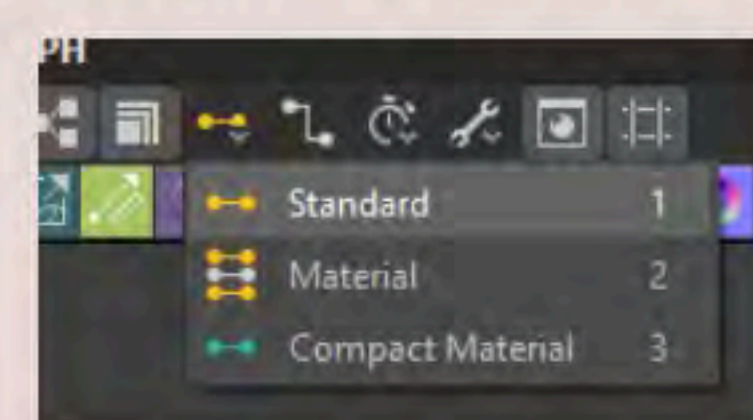


Besides getting paternity insurance for when you are on the road with your basketball team, one other smart thing to make a habit of is using the Substance Design Connectors properly.

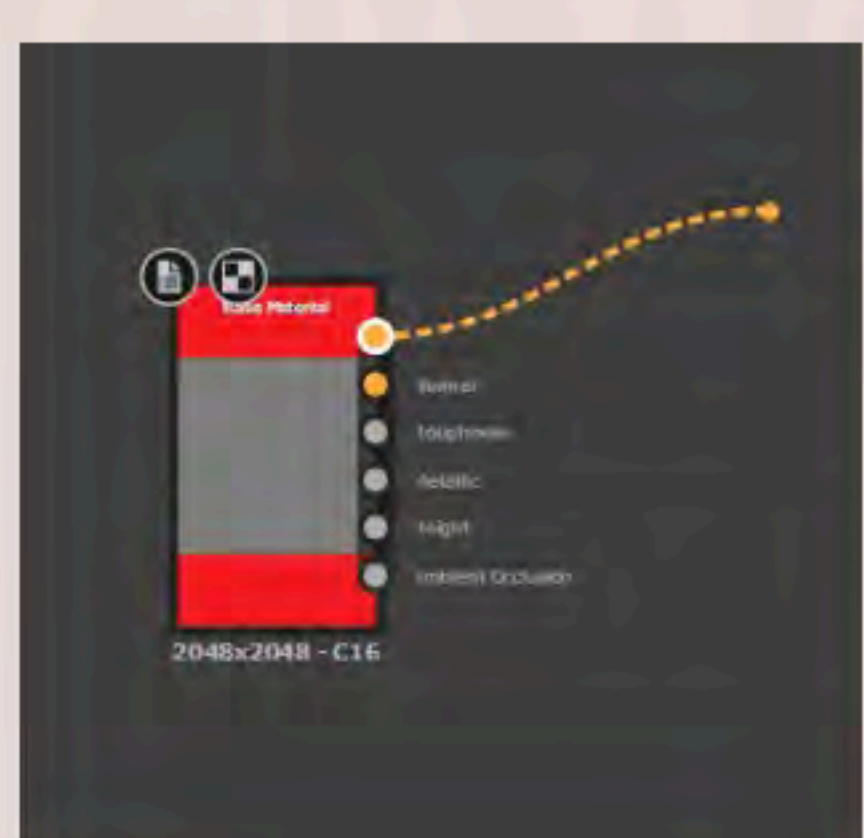
Located Here >



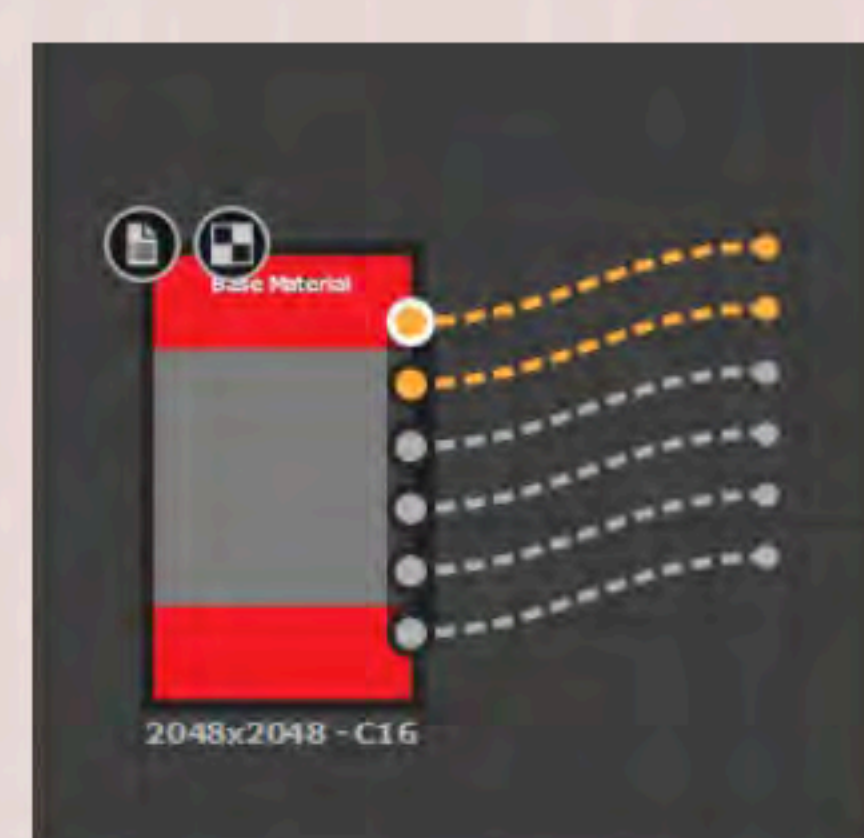
There a few ways to make the nodes connect by hitting 1,2 or 3 on your key pad.



One is single Connection



Two is Multiple Connections



Three is Compact Mode



Larry's Pro Tip !





# Larry Bird - Maya/Painter/Designer/Unreal

Connect each Map to the corresponding output node on the Right

**01 - Base Color or Diffuse Map**

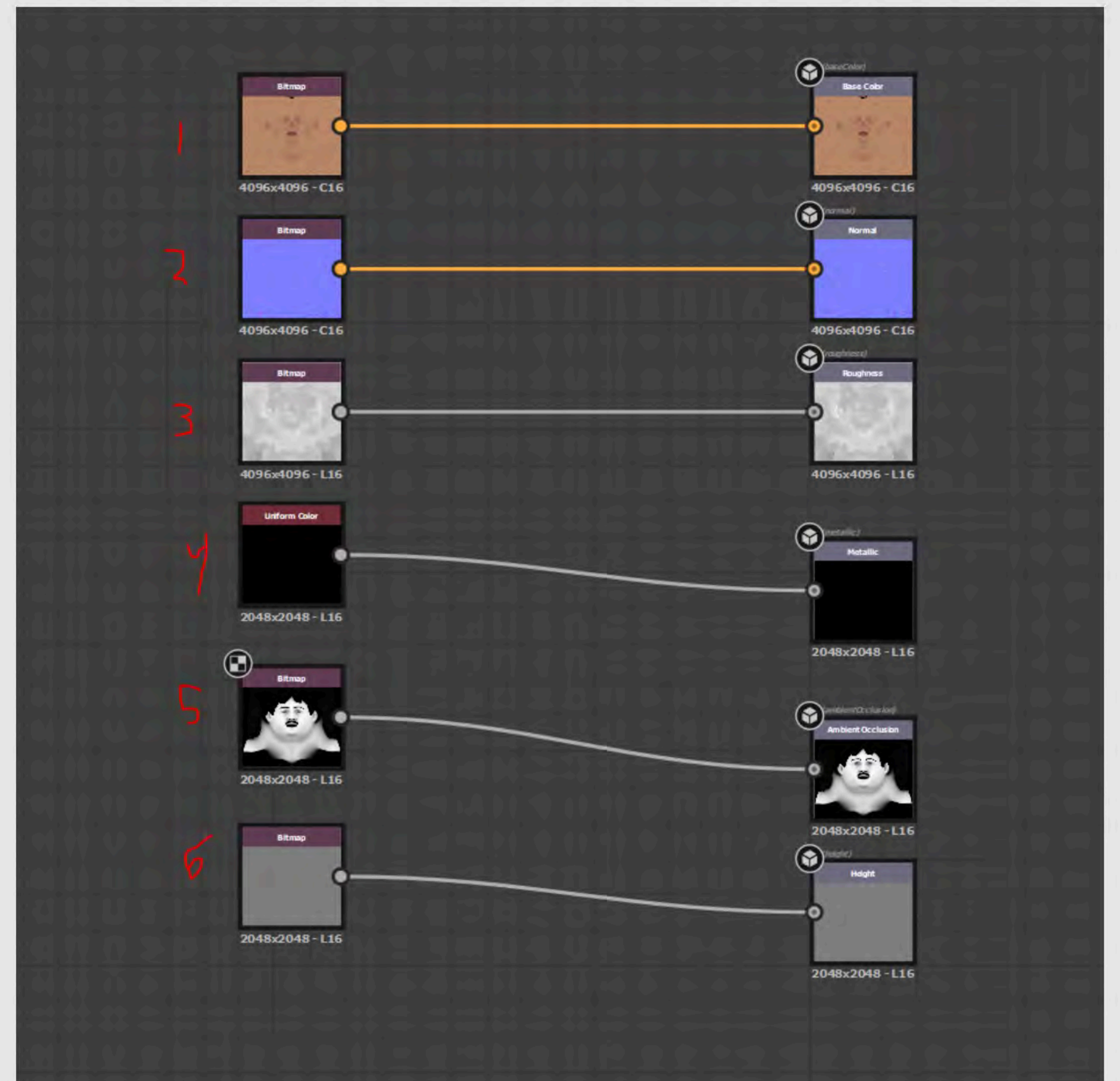
**02 - Normal Map**

**03 - Roughness Map**

**04 - Metallic Map**

**05 - AO Map**

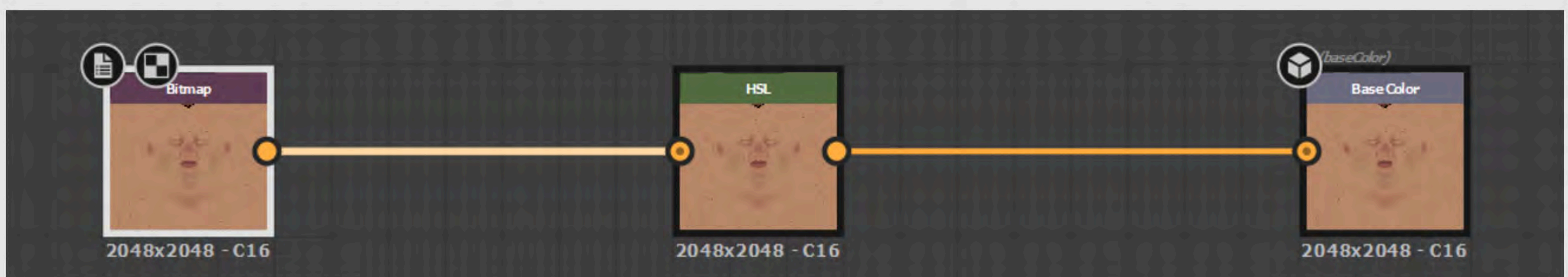
**06 - Hieght Map**



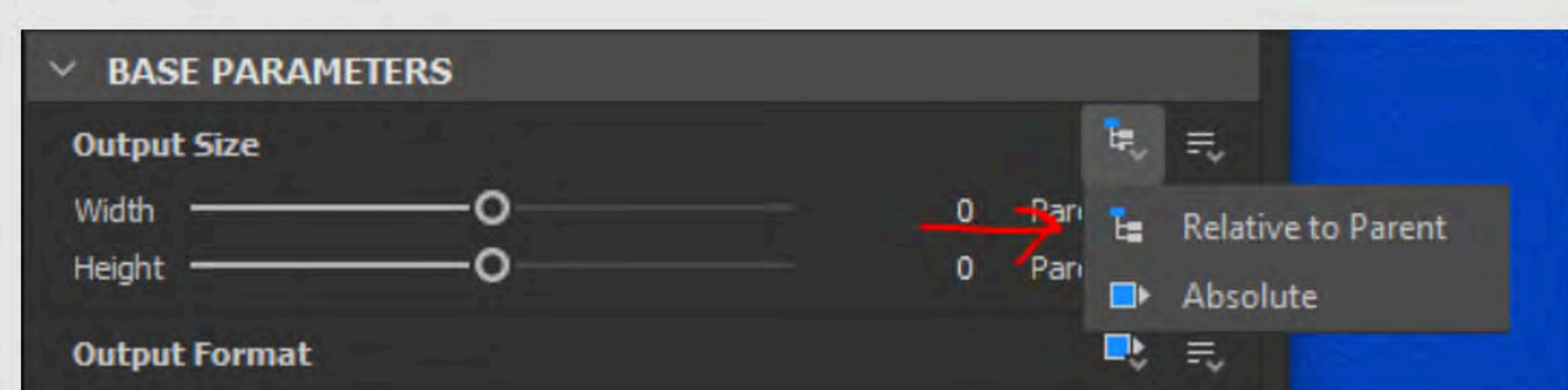
With 05 and 06 - You can use these maps from the maps you baked earlier. If you even bring in to the baking engine a high rez model to bake detail with , you can use the maps as well.

Now that the maps are in - remember that this procedure is going to be done with the other GRAPHS you made for each object part. You can duplicate this one in the explorer and rename and reconnect the maps

Now you want to get this graph prepped for UNREAL Engine

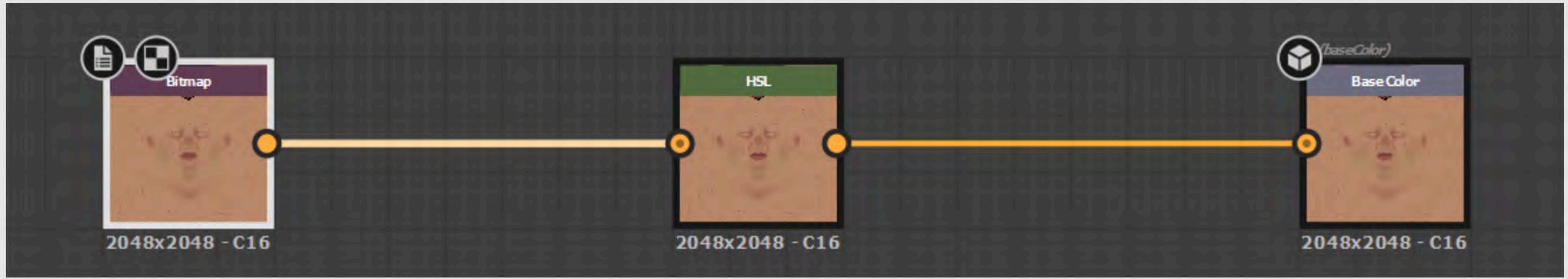


Starting with the diffuse map, select it and in its base parameters section - hit the button displayed on the right and make sure it is set to "Relative to Parent". This will allow the SBSAR in Unreal to be able to change sizes, helping out with Ram issues in Unreal.

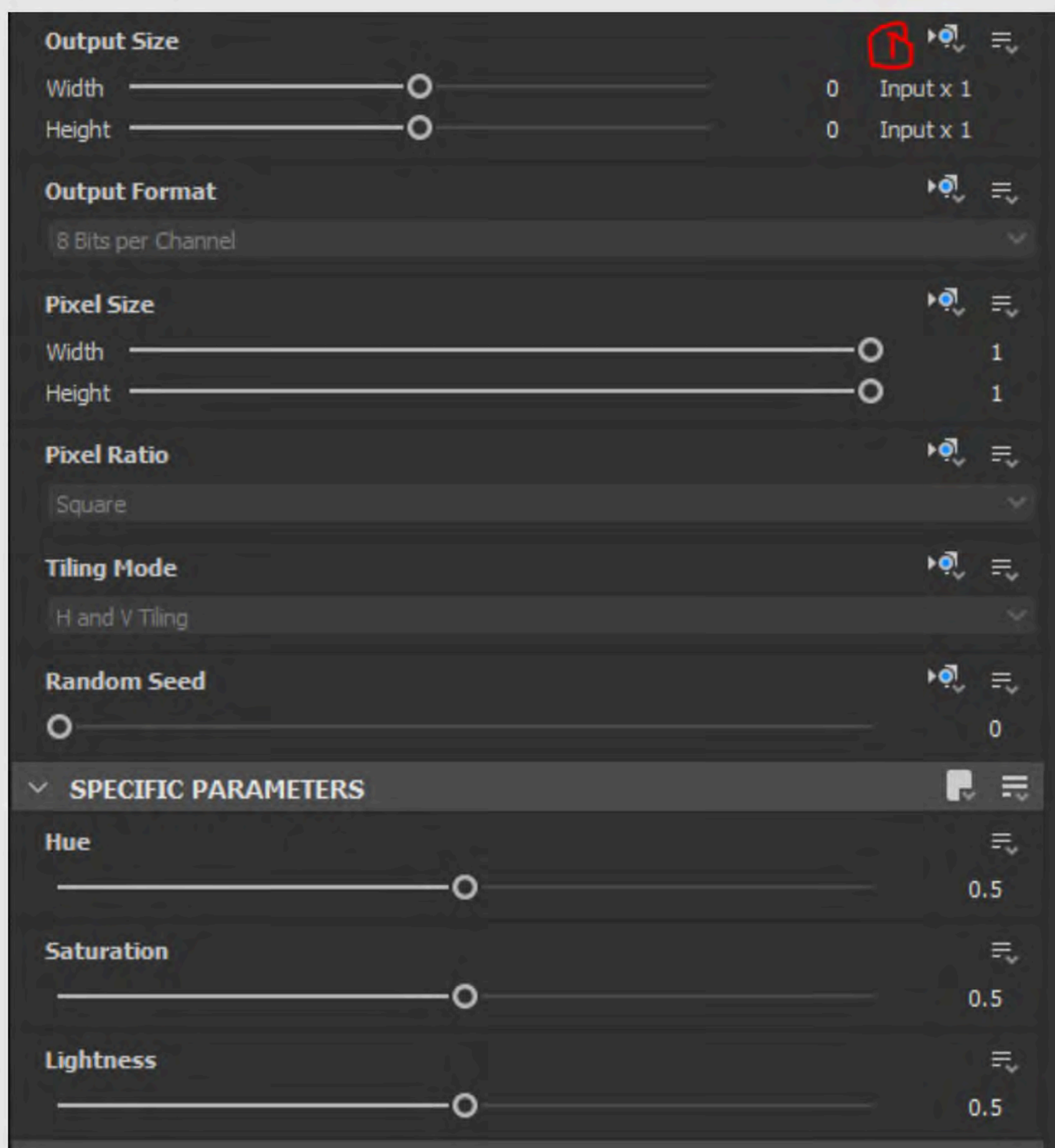




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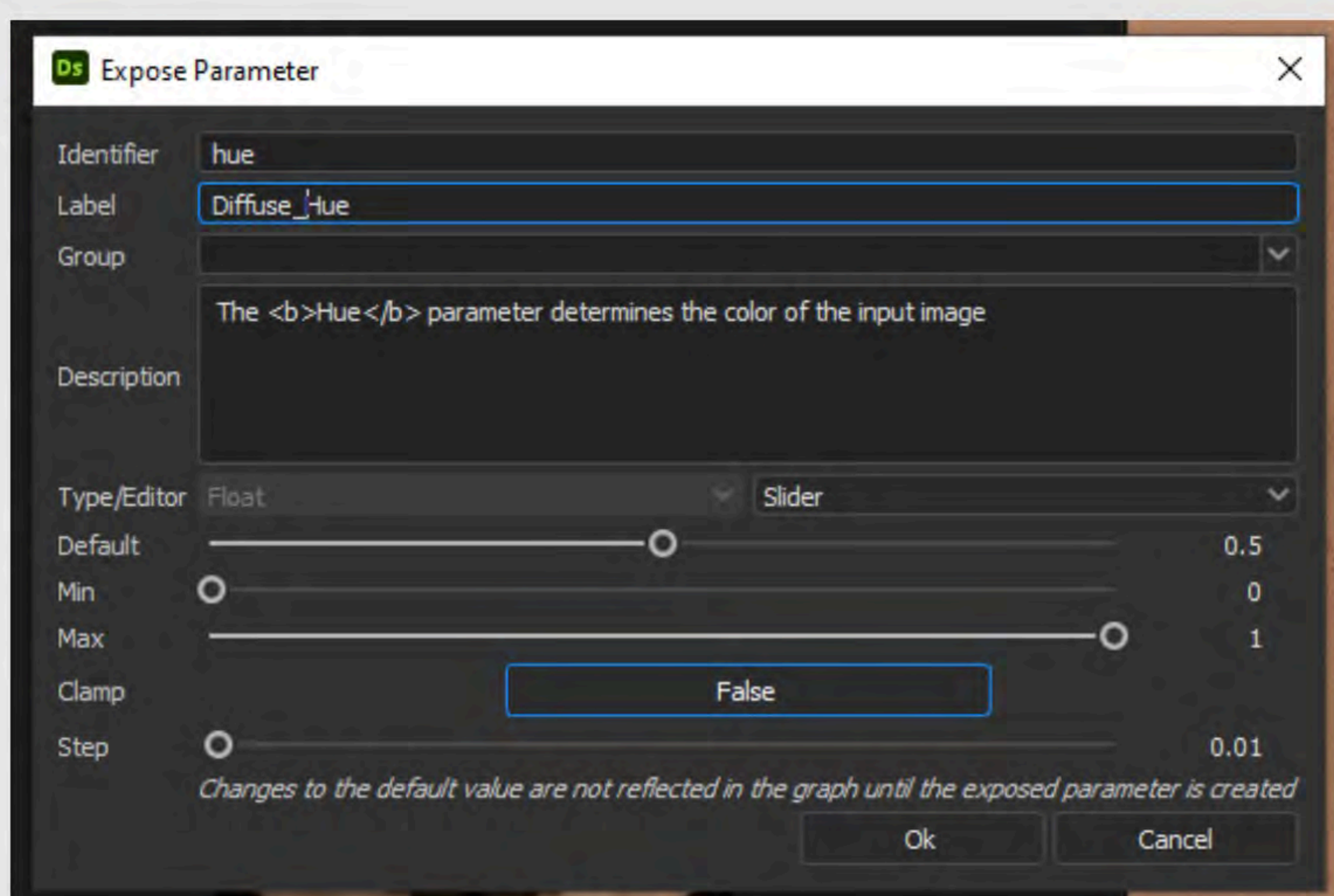
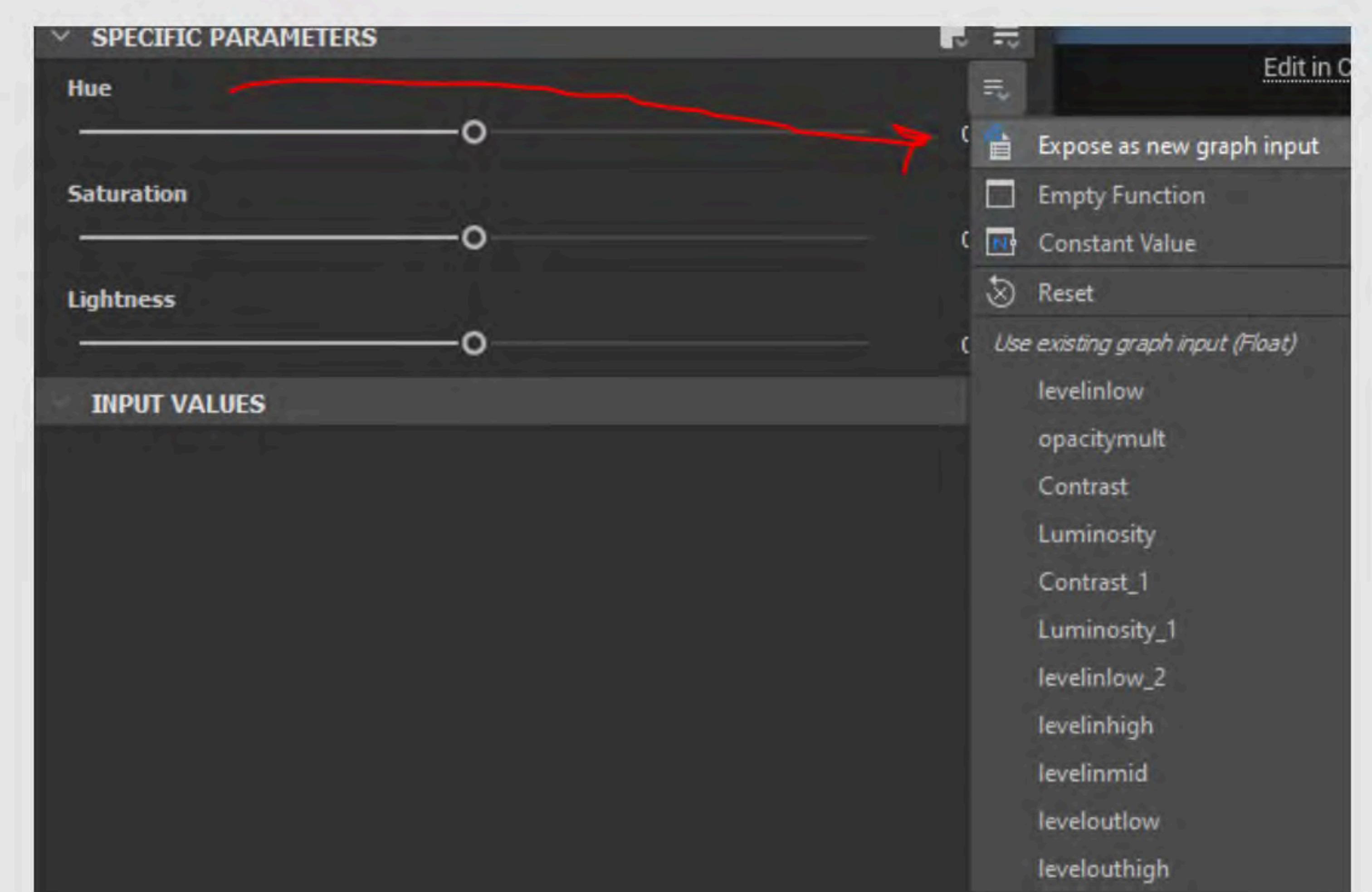
hit the "Tab" button on your keyboard and search for "HSL"



Make sure you set the "Relative to Parent" for this node as well.

< As you can see the controls for HSL on the Left, we want to make these responsive inside of UNREAL , making color adjustments to the Diffuse map easier and at the same time making the commands for materials inside of Unreal less and helping playback.

Right click in the attribute box and select "Expose as a graph input" for the HUE CHANNEL



A dialogue box comes up and make sure under label you label it properly. This is the HUE control for the Diffuse map. the new label is "Diffuse\_Hue"

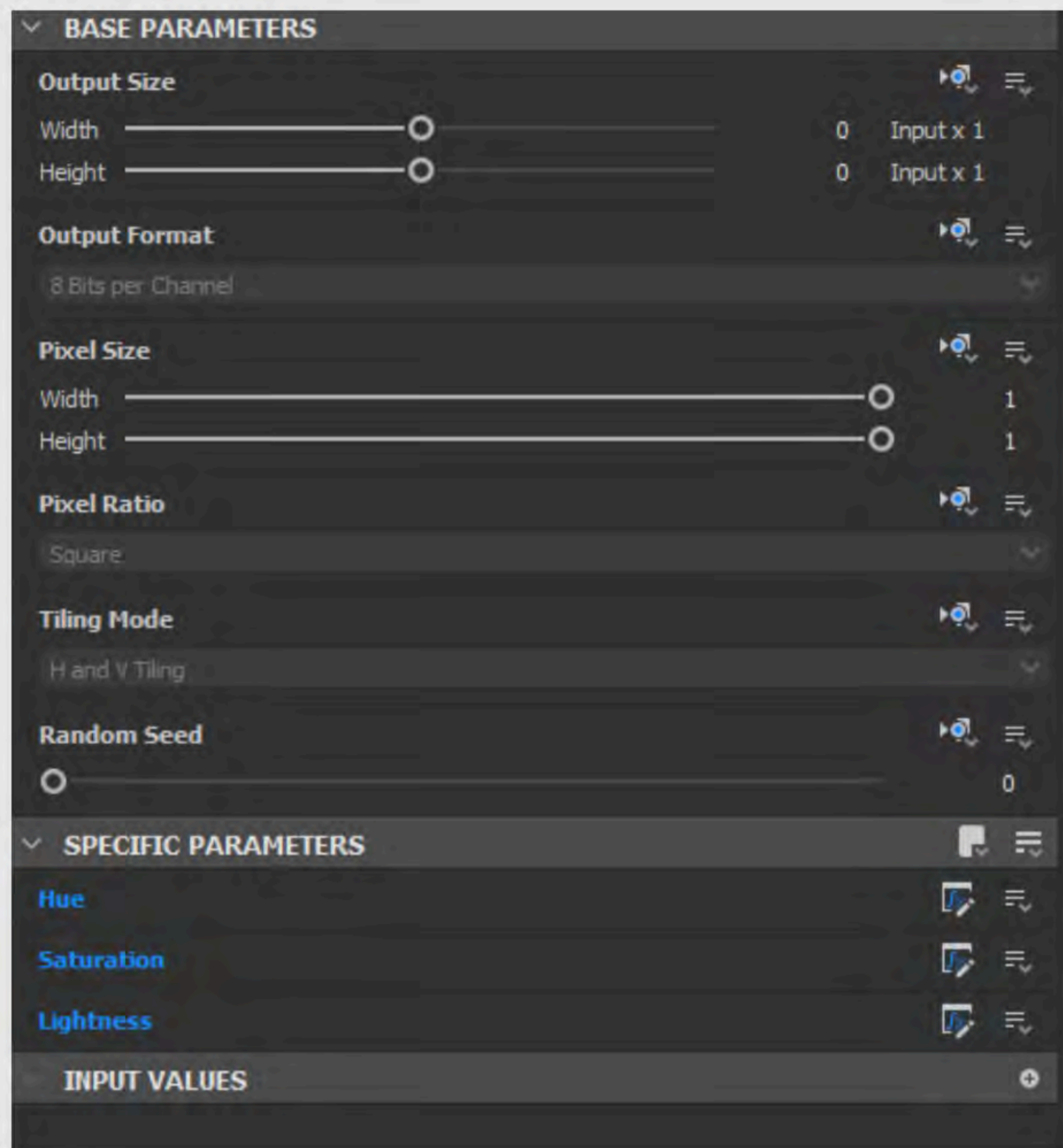
This will make it very easy when it is in another program to recognize what is what in the shader attributes section

**Repeat this for Saturation as well as for Lightness, and label Accordingly !!**

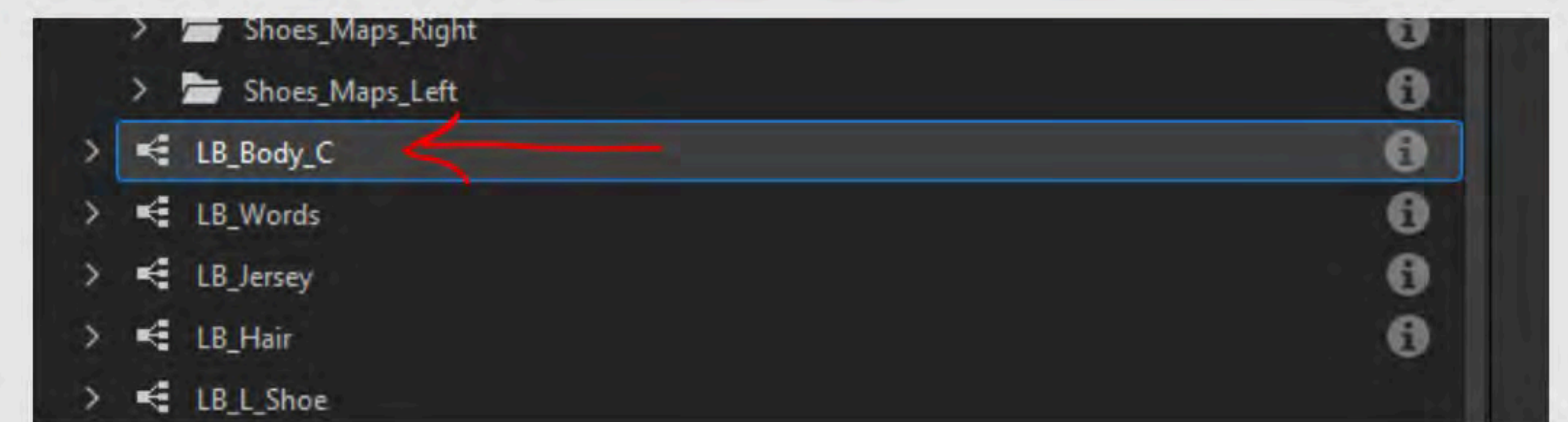


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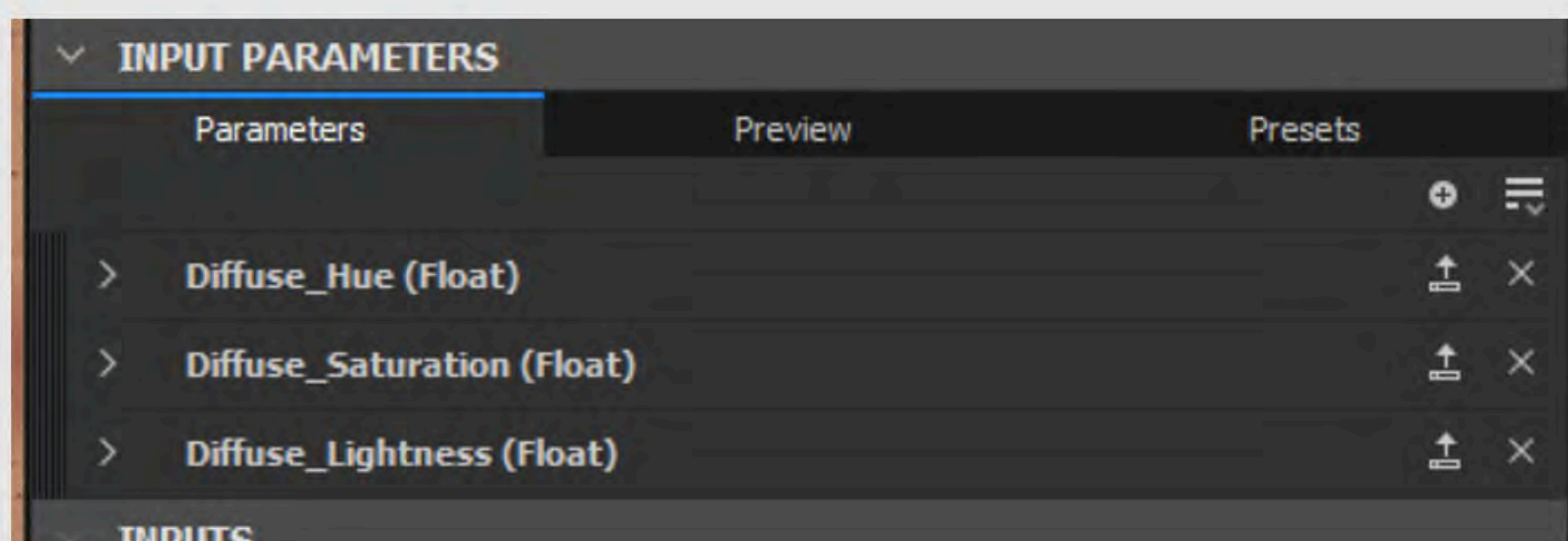
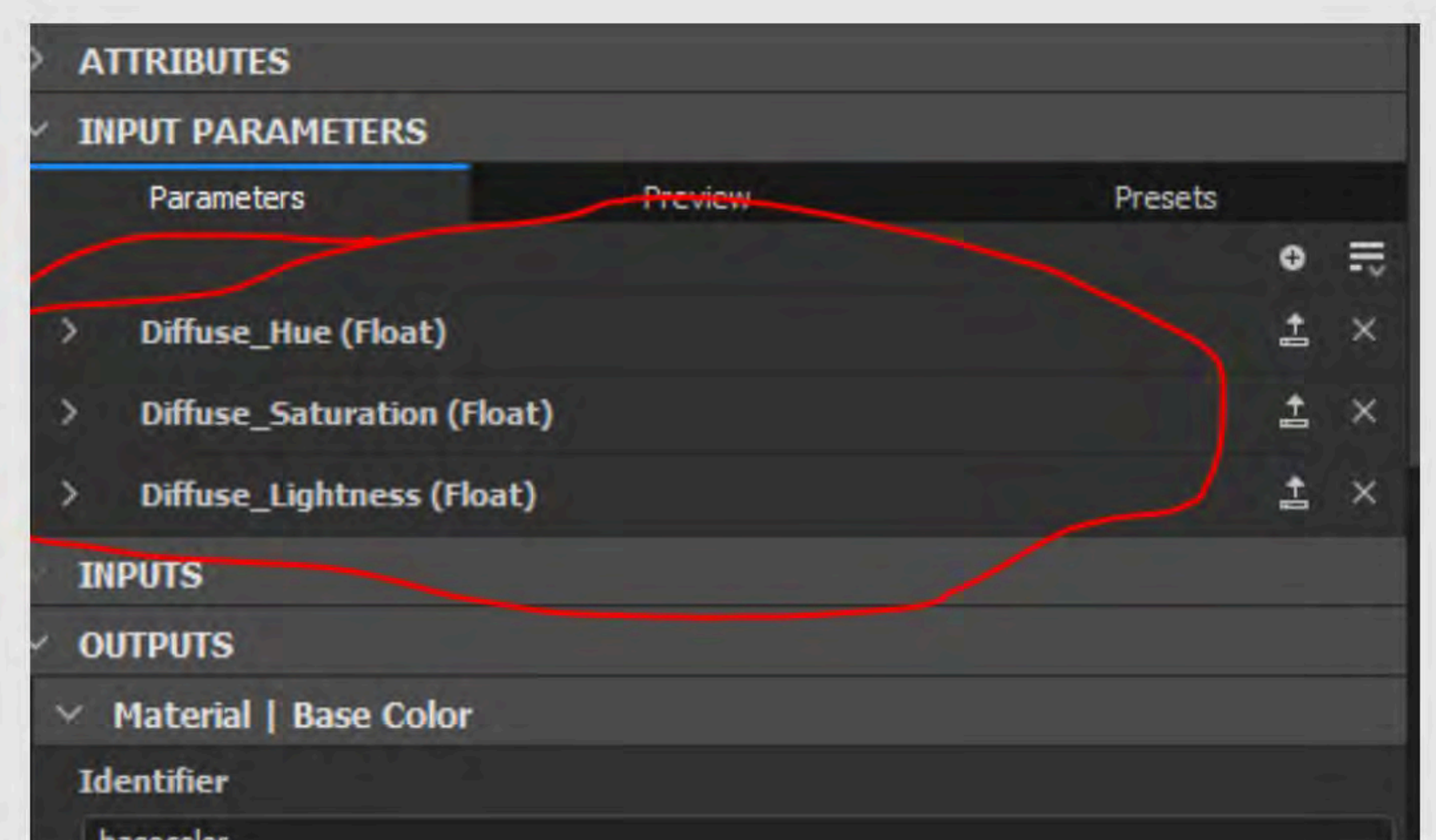
What was just done can be done for most nodes and tools inside of Substance Designer. One way is to look at Designer as a really good Compiler, a compiler of tools and materials that can be exported out ( Via SBSAR ) and used further. These actions were done inside the Body Graph material.



In the end your parameters you added to specifically will be highlighted in BLUE. If you leave the graph and select the graph Body Node



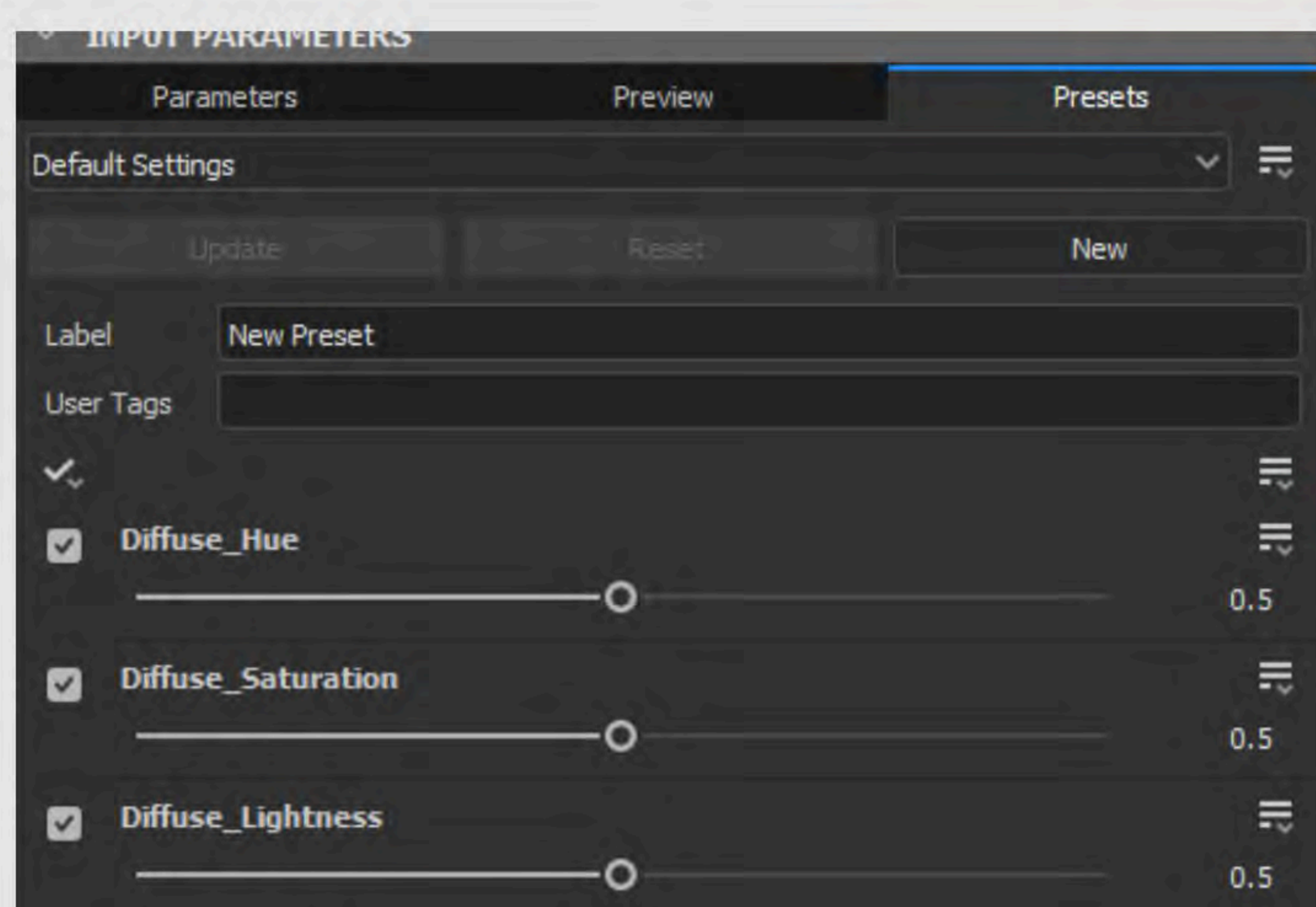
You will see in the input parameters for that graph the channels you just made.



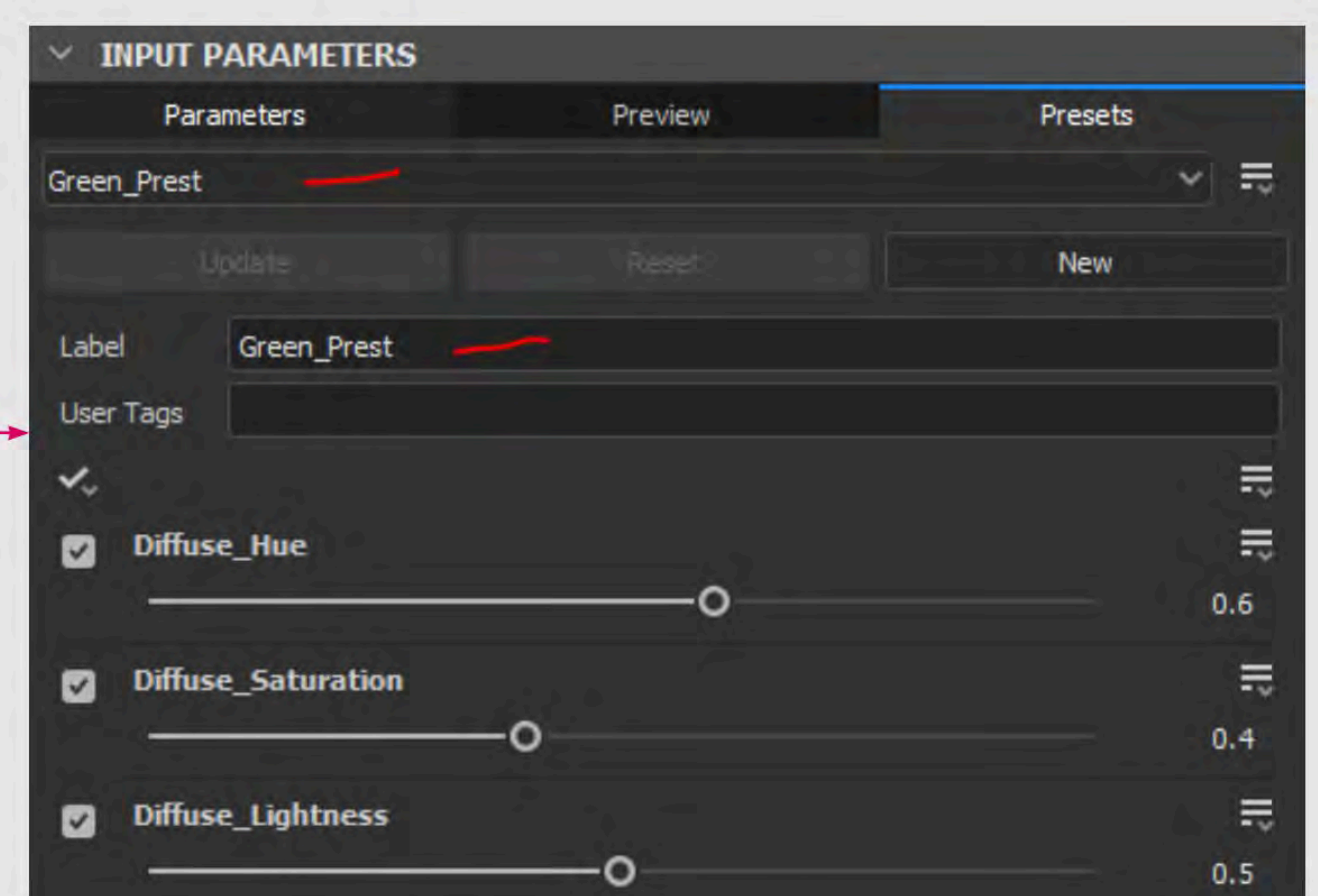
Another Great thing is that if you look at the Parameters Bar, you will see Preview and Presets.

If you go to the presets tab - you can make adjustments using these sliders you just made ,and then save that as another preset that will be carried into another program.

Change the hue > make preset > name that preset and the shader now has extra functionality.



Default shader Settings

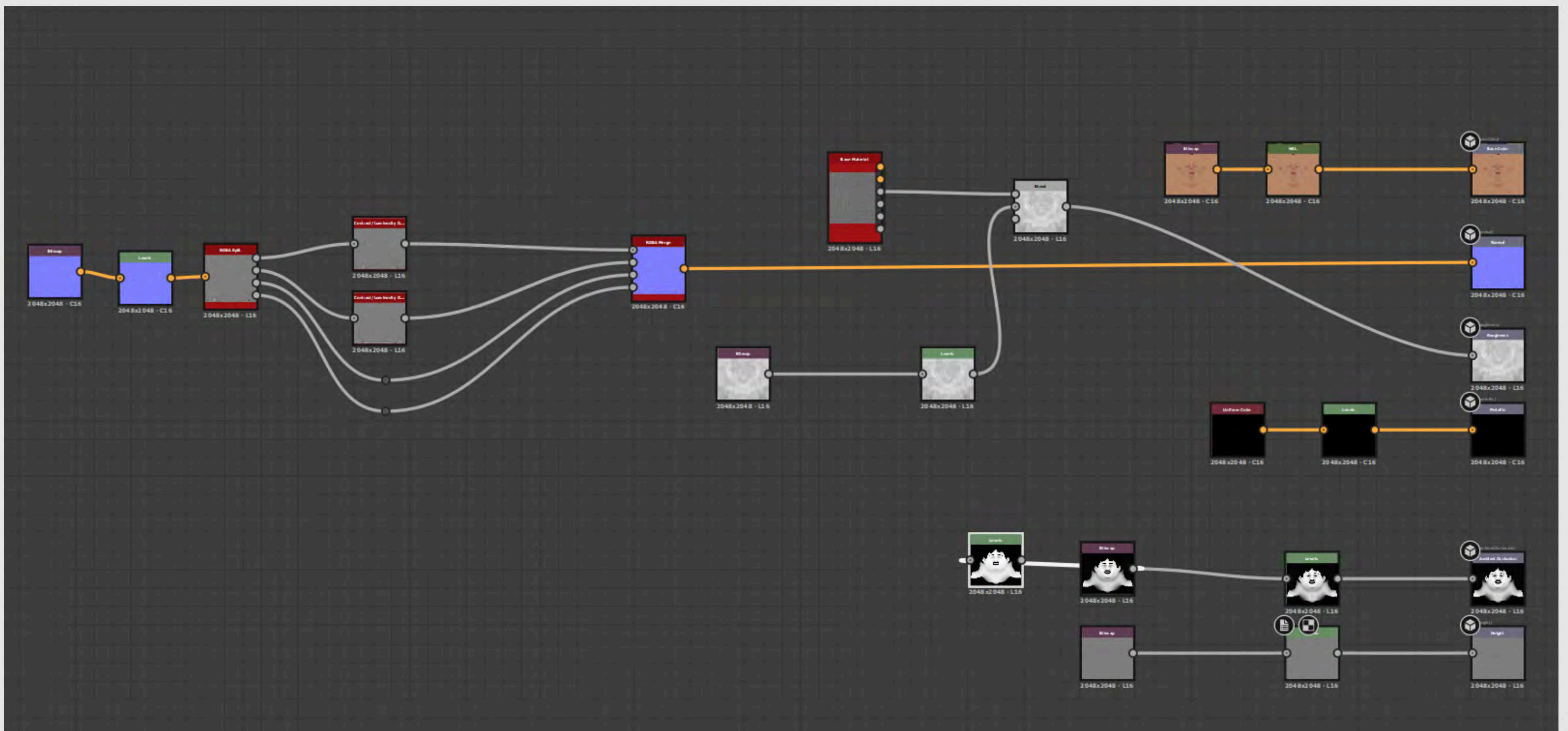
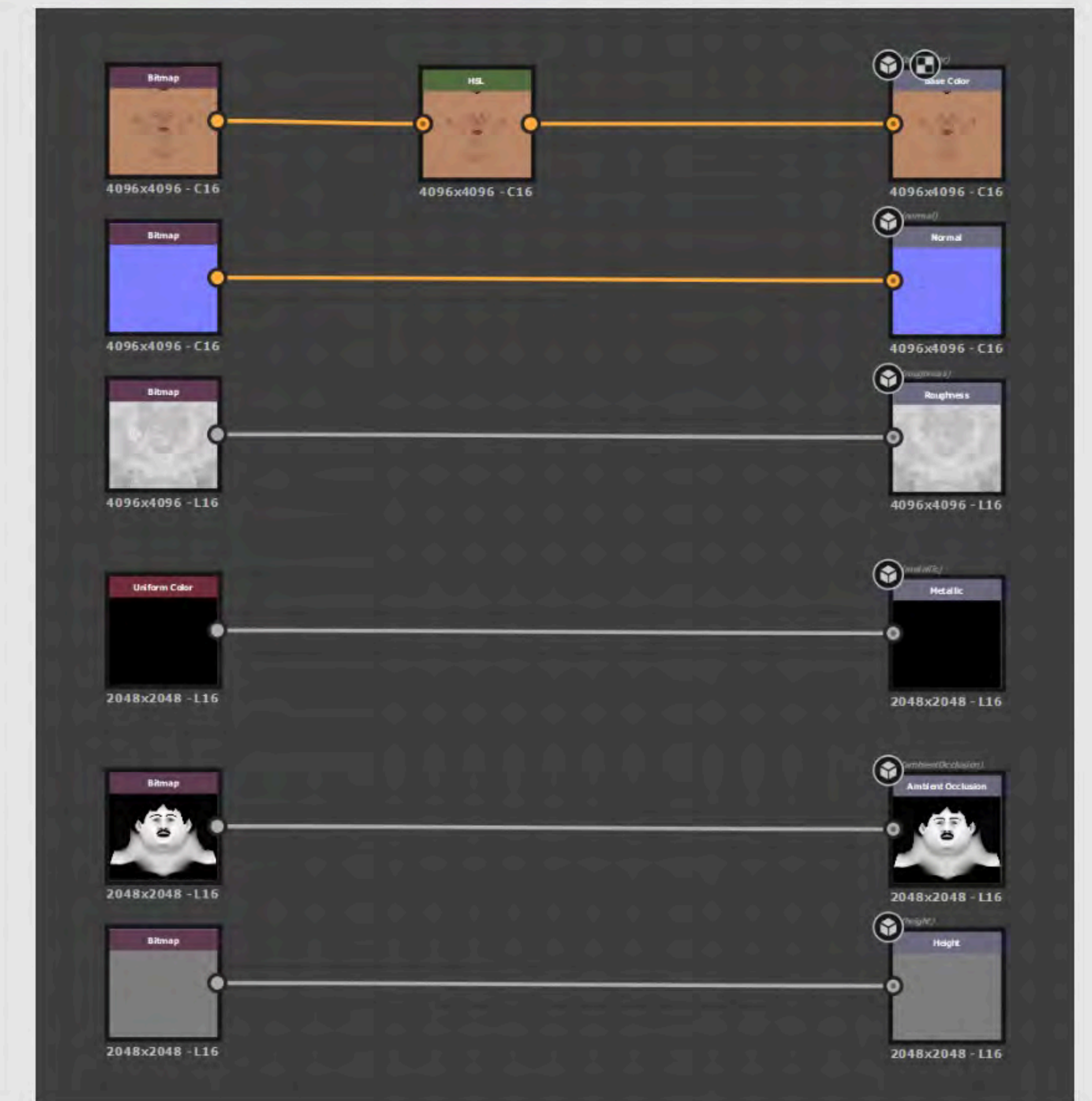


new Preset Settings



# Larry Bird - Maya/Painter/Designer/Unreal

Now that DIFFUSE is complete, start repeating this to other channels. Keep in mind that if no grade is plugged in like we did for the Diffuse Channel, Add a levels node ( Tab button > type search "Levels" ) and add those in between the maps and their output. Make sure to change the size parameters to PARENT like we did earlier, that way inside of Unreal we have those controls.



**Sample of the Graph:** With the Normal Maps, for extra control nodes were put into place to separate the channels and add controls over the RED and GREEN channels. With Normals, the BLUE channel must not be controlled

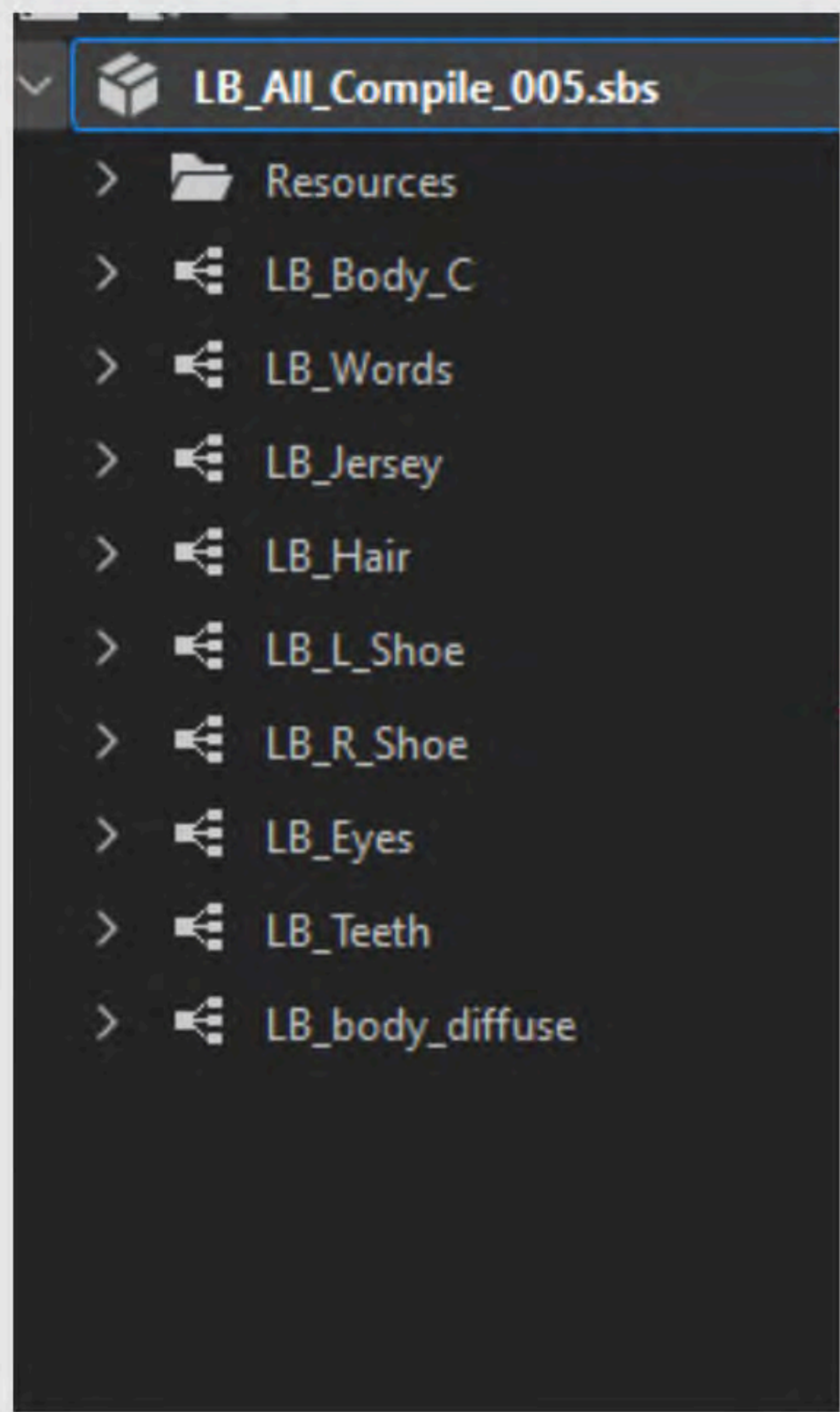
INPUT PARAMETERS		
Parameters	Preview	Presets
> MET_Level In Low (Float)		⬆️ ×
> Level In Low (Float4)		⬆️ ×
> M_Blend_Opacity (Float)		⬆️ ×
> M_Blend_Blending Mode (Integer)		⬆️ ×
> NRM_contrast_top (Float)		⬆️ ×
> NRM_lumin_top (Float)		⬆️ ×
> NRM_contrast_bot (Float)		⬆️ ×
> NRM_lumin_bot (Float)		⬆️ ×
> Rough_Level In Low (Float)		⬆️ ×
> Rough_Level In High (Float)		⬆️ ×
> Rough_Level In Mid (Float)		⬆️ ×
> Rough_Level Out Low (Float)		⬆️ ×
> Rough_Level Out High (Float)		⬆️ ×
INPUTS		
OUTPUTS		

**In the main graph the controls for all of the separate channels can now be seen.**

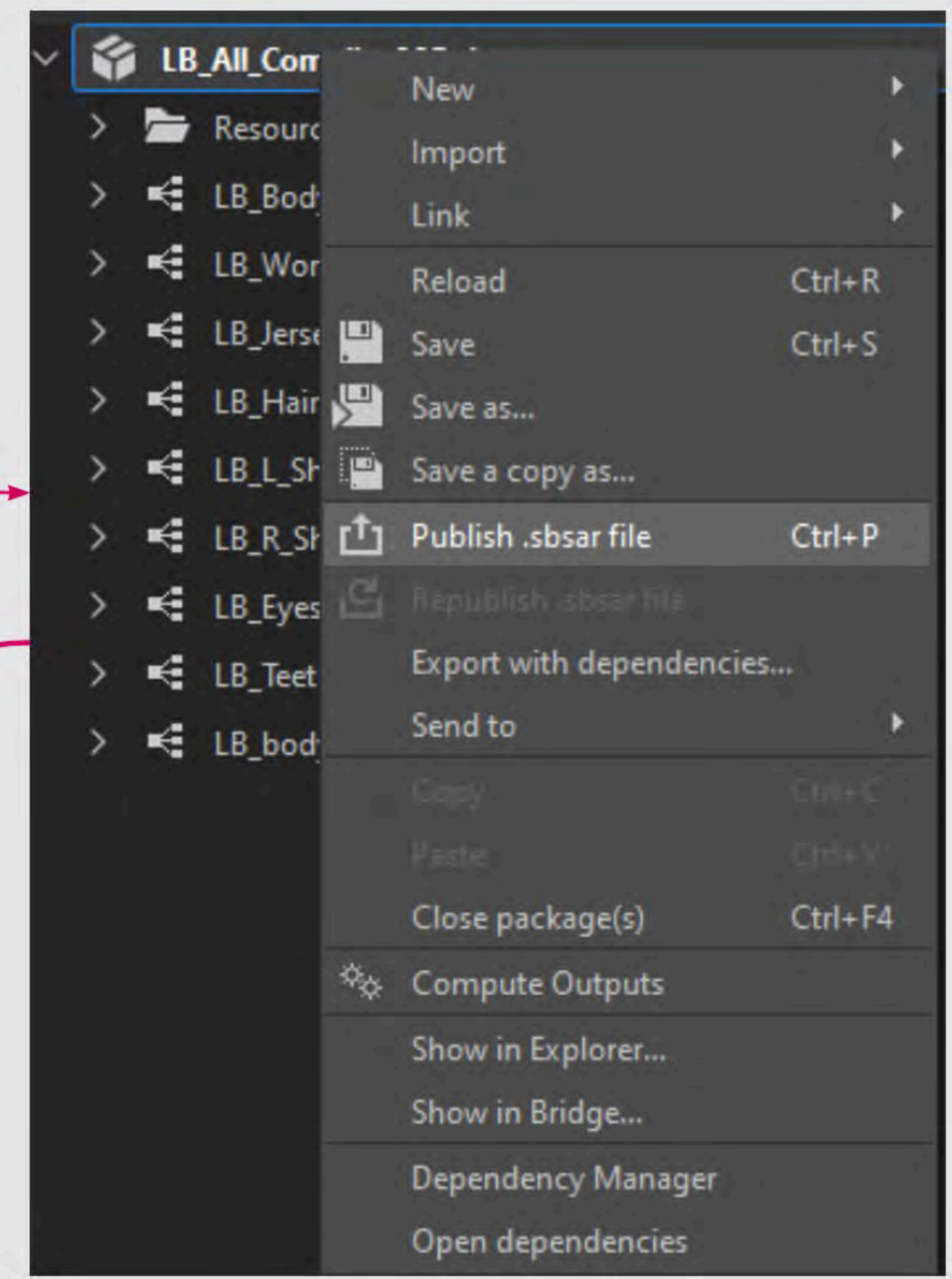


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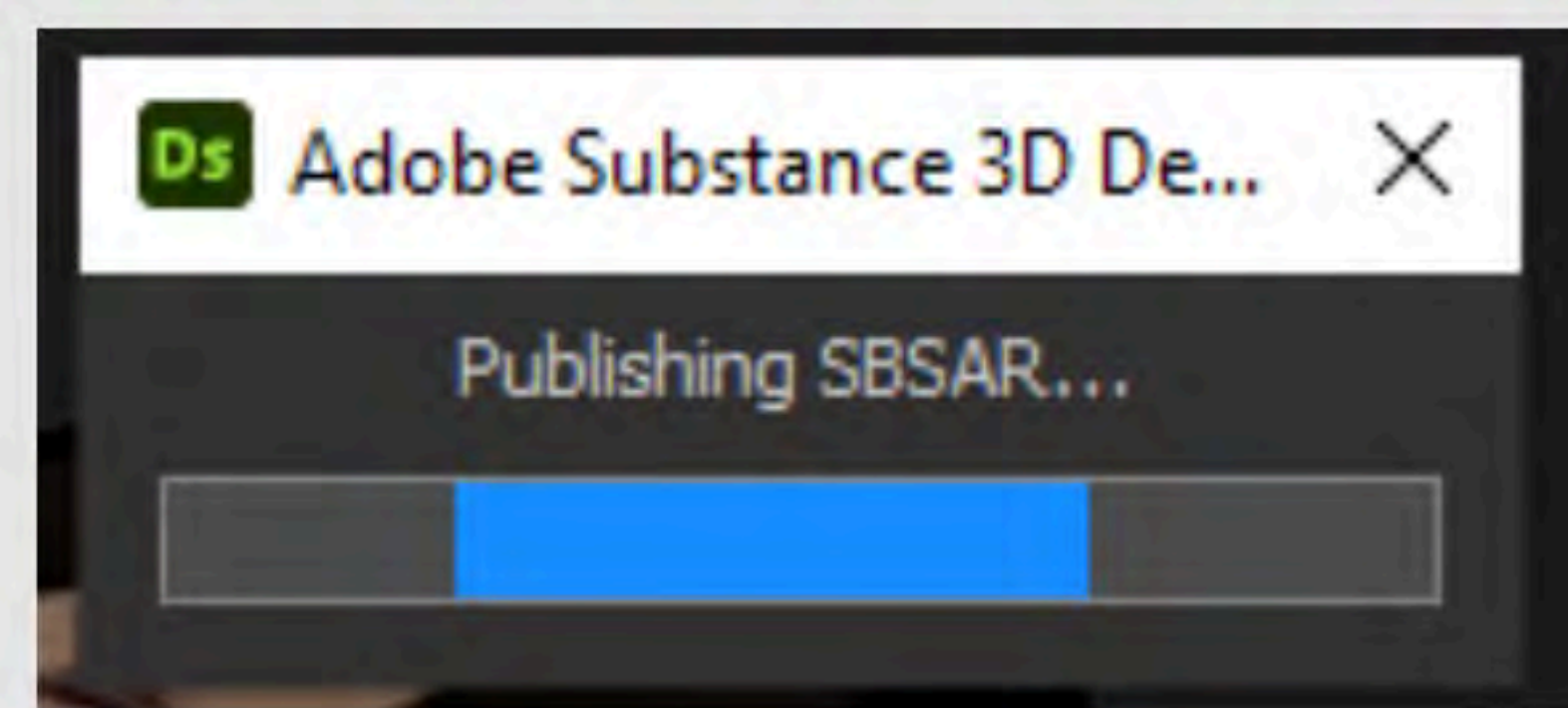
To see these additions show up inside of UNREAL



Right Clicking on  
"LB\_All\_Compile\_005>sbs"

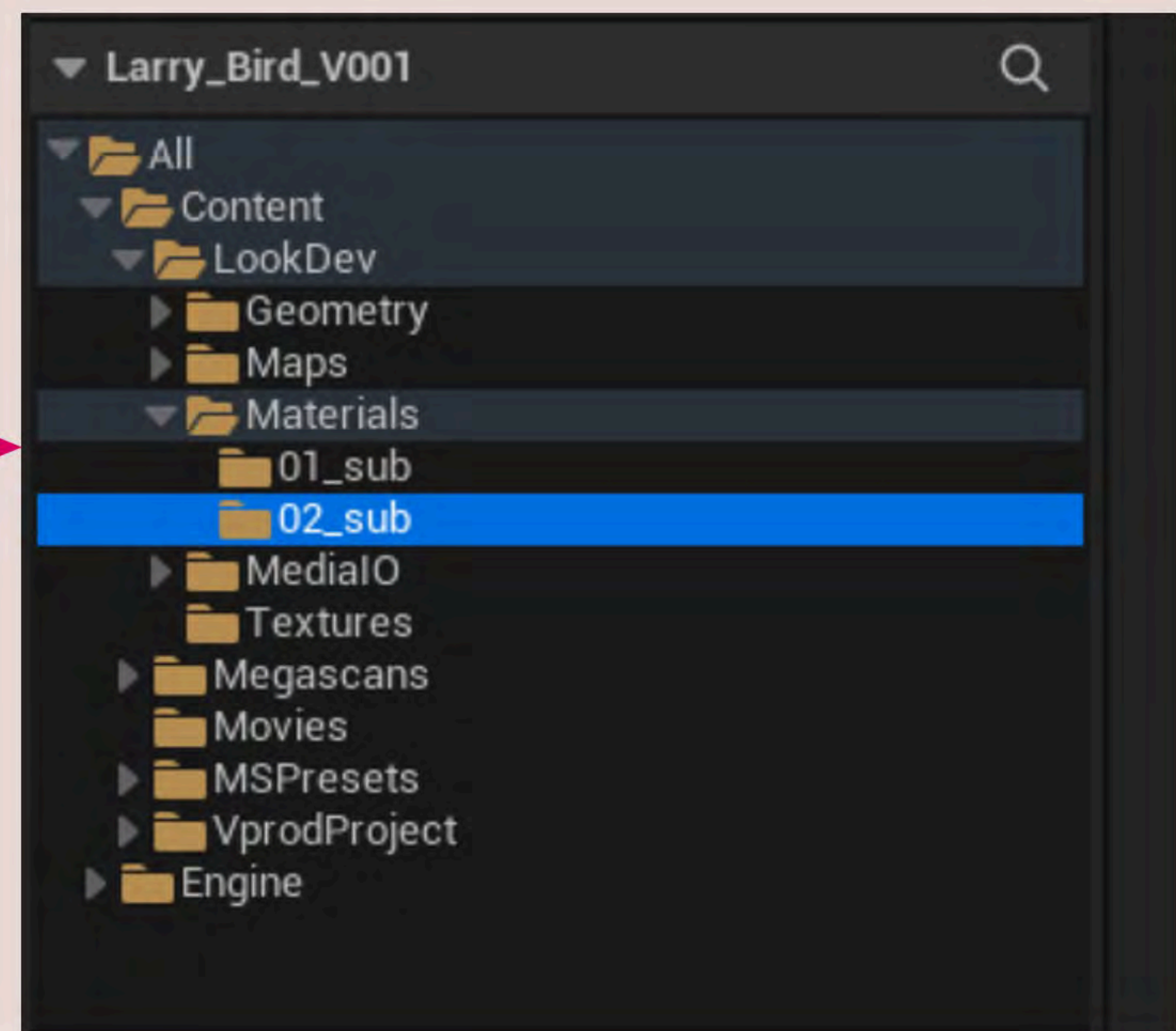


Publish the SBSAR



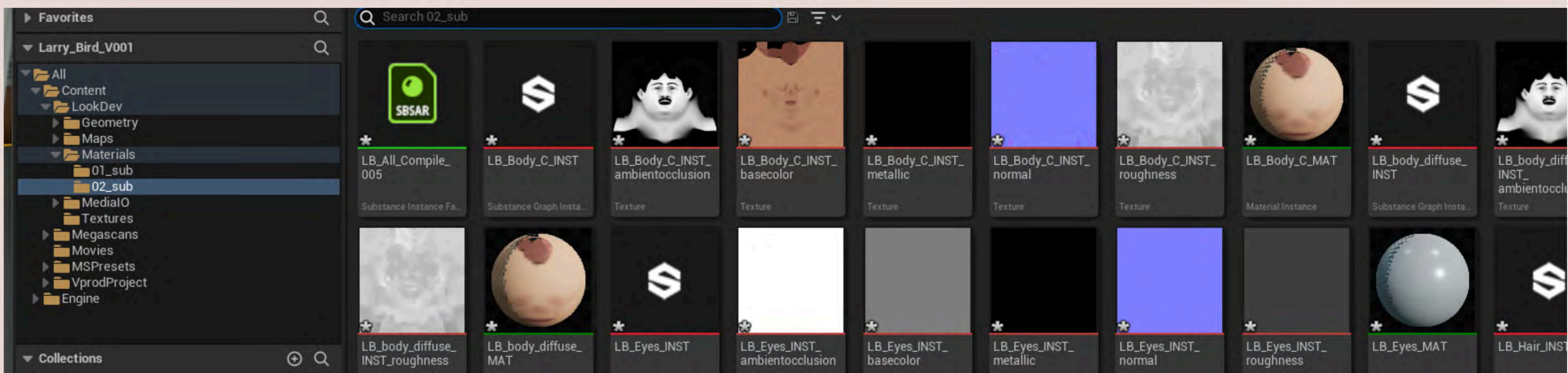
## Inside UNREAL

Make a new Folder to put the new SBSAR in and import or Drag and drop the SBSAR you just made inside of it .



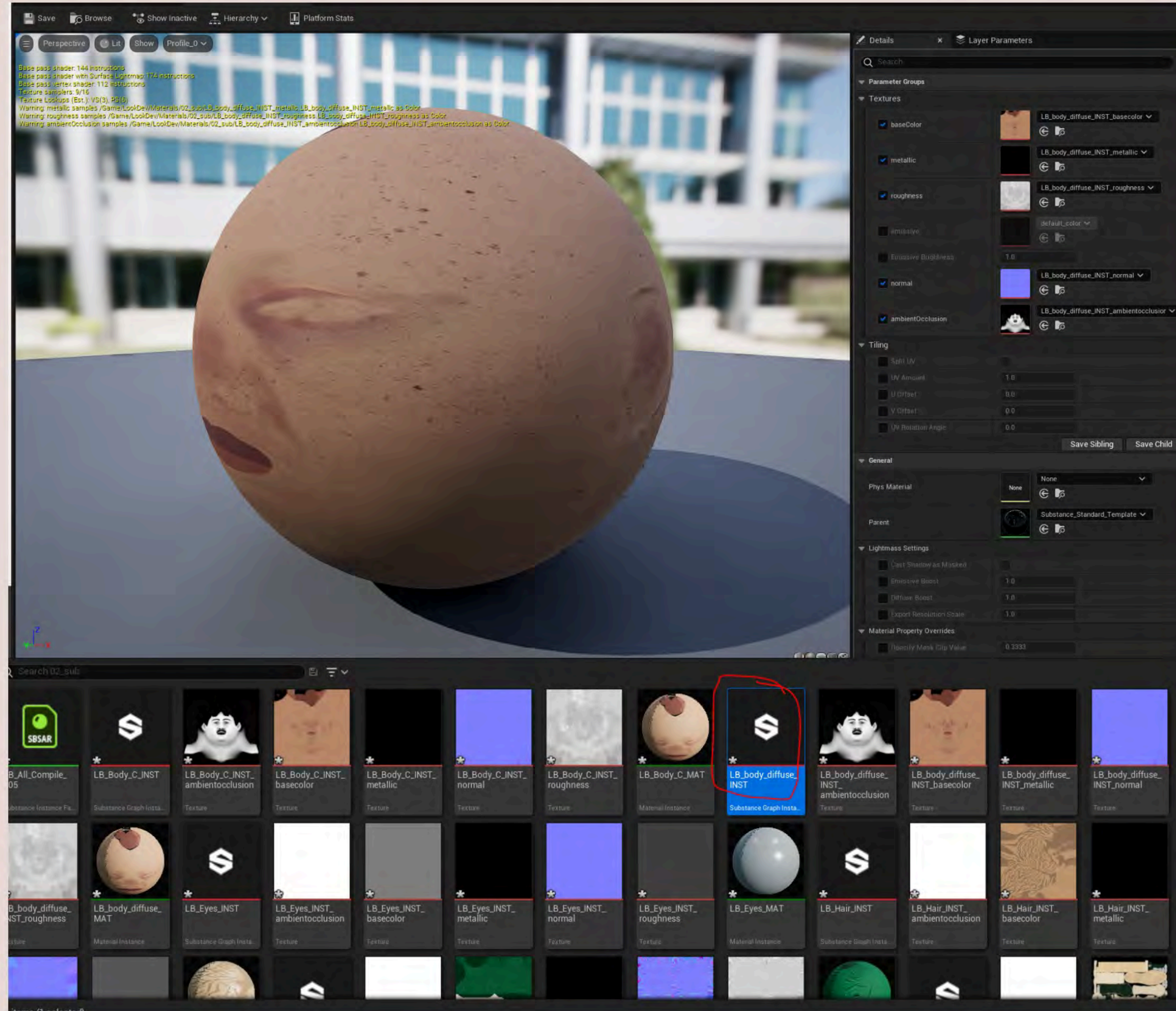
A dialogue box will show up for each of the SBSAR's you imported in . .for now click a default " yes "

## Content Drawer



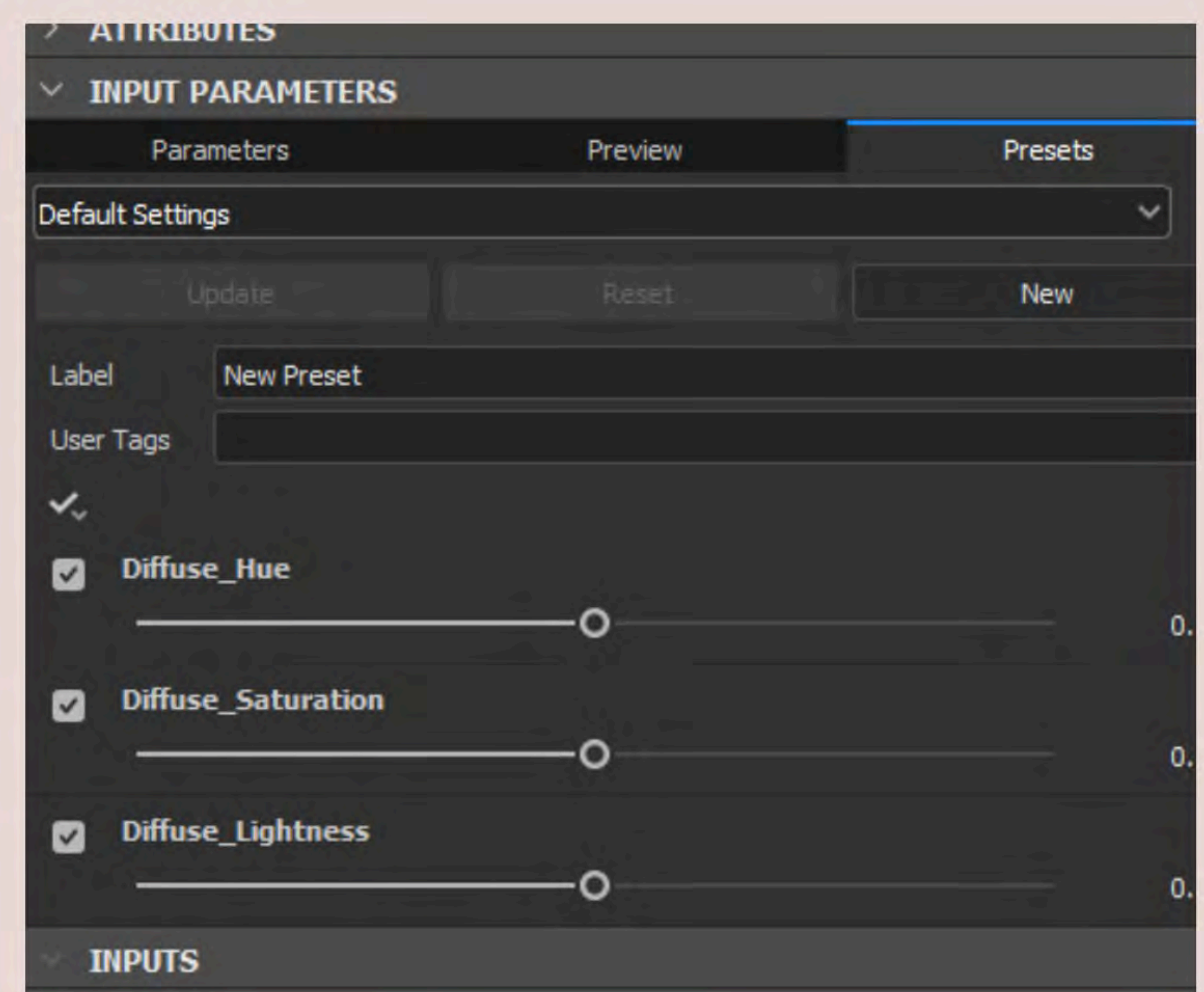
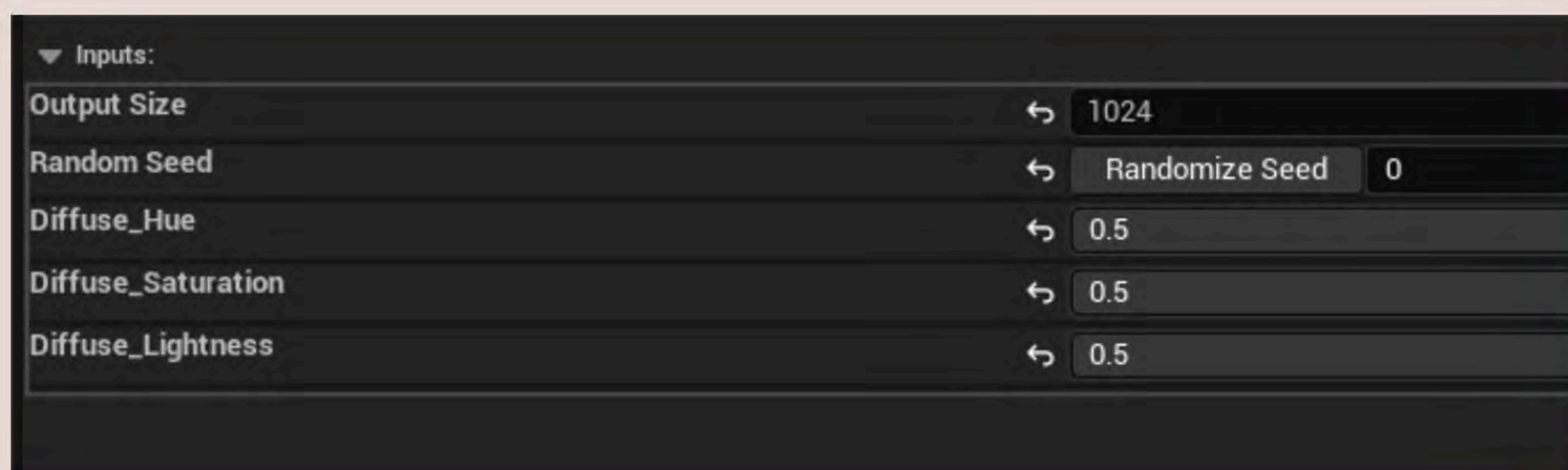


# Larry Bird - Maya/Painter/Designer/Unreal



These attributes show up in Unreal - and can be changed in substance and re published, with all the changes going through to Unreal.

## Comparison of the shader attributes made in Substance now in Unreal





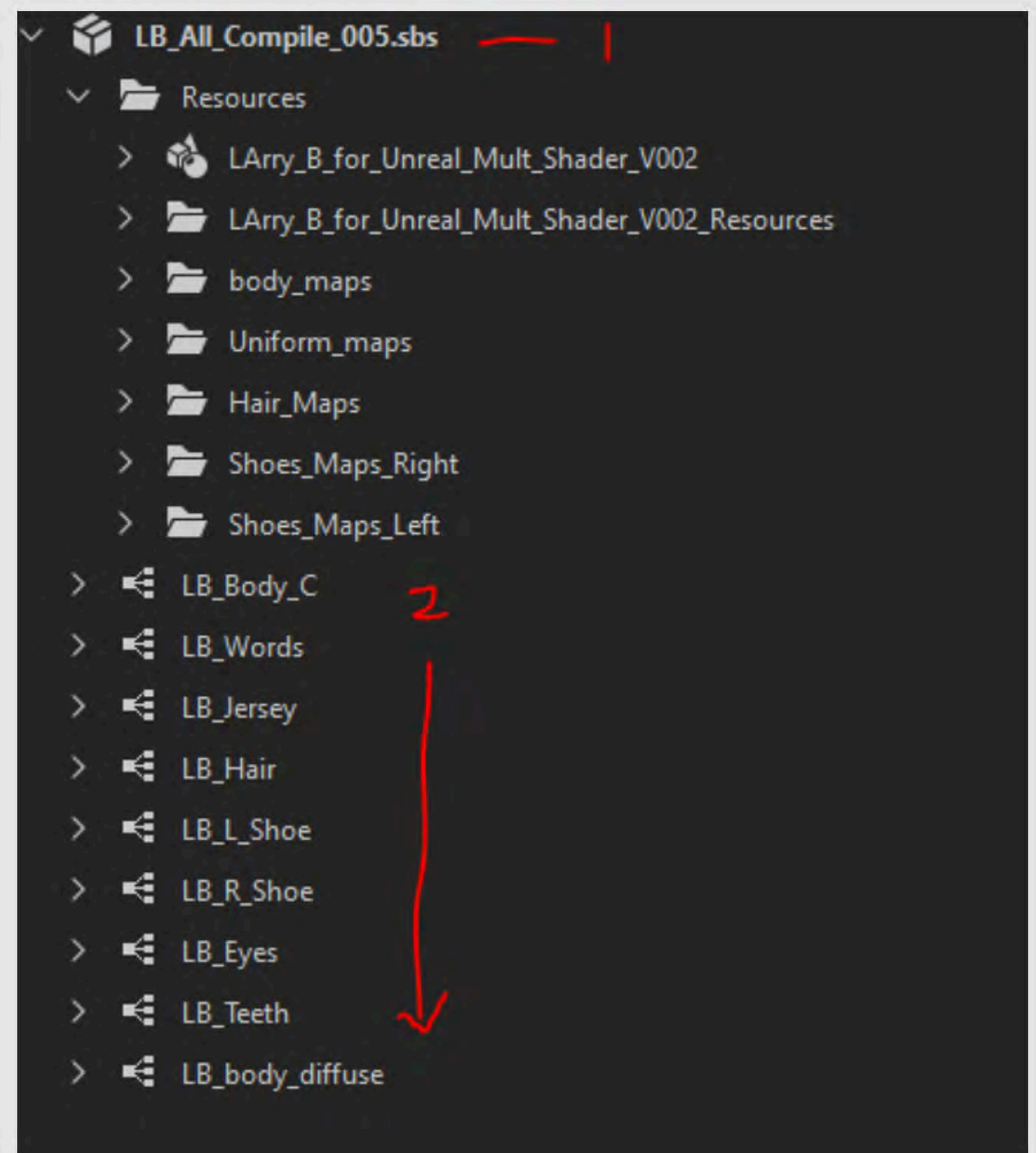
## Back inside Substance Designer

There are a few things to go over and explain. It is really about approaching the Substance shader node with two different types of workflows for the same thing.

Up until now we have been building the Larry Bird graph in one style. Rather than doing another document to explain the other, I will incorporate it into this one.

The way we have building it is building individual GRAPHS ( shaders ) and naming them according to the objects they will be attached to

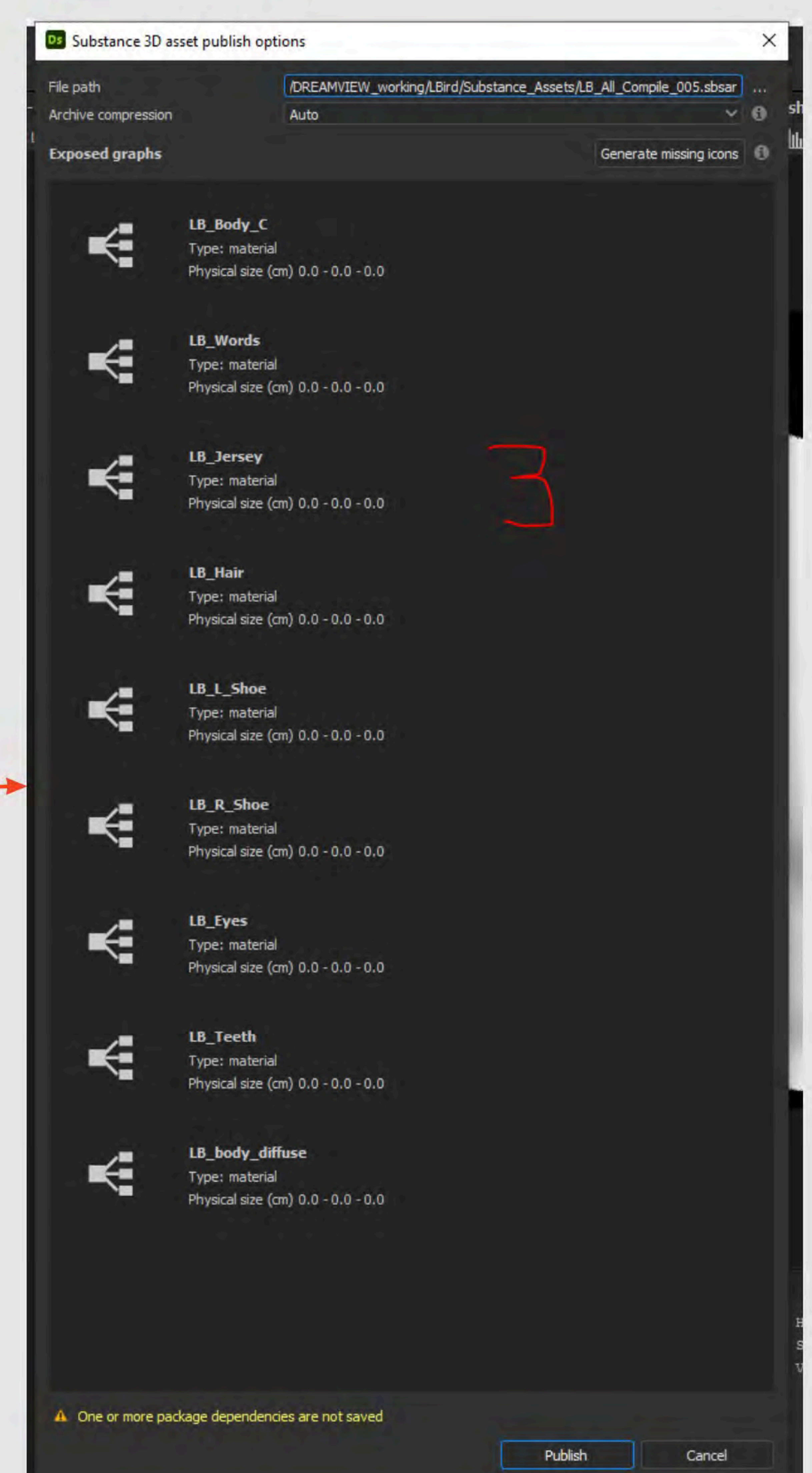
As you can see on the right, each one - LB\_Jersey, LB\_Body, etc.. is attached to the certain parts. When they are compiled inside on substance for an SBSAR, they will publish like this all separately.



To read the Substance file Correctly, **01 - LB\_ALL Compile\_005.SBS** is the master Designer File.

With **02** - these files going down are individual Graphs or shaders. Here each one is worked on separately and then all exported out together. These can each also be exported out individually for a library of elements. These are the SBSARS, so you can also import in the materials from the Substance Source.

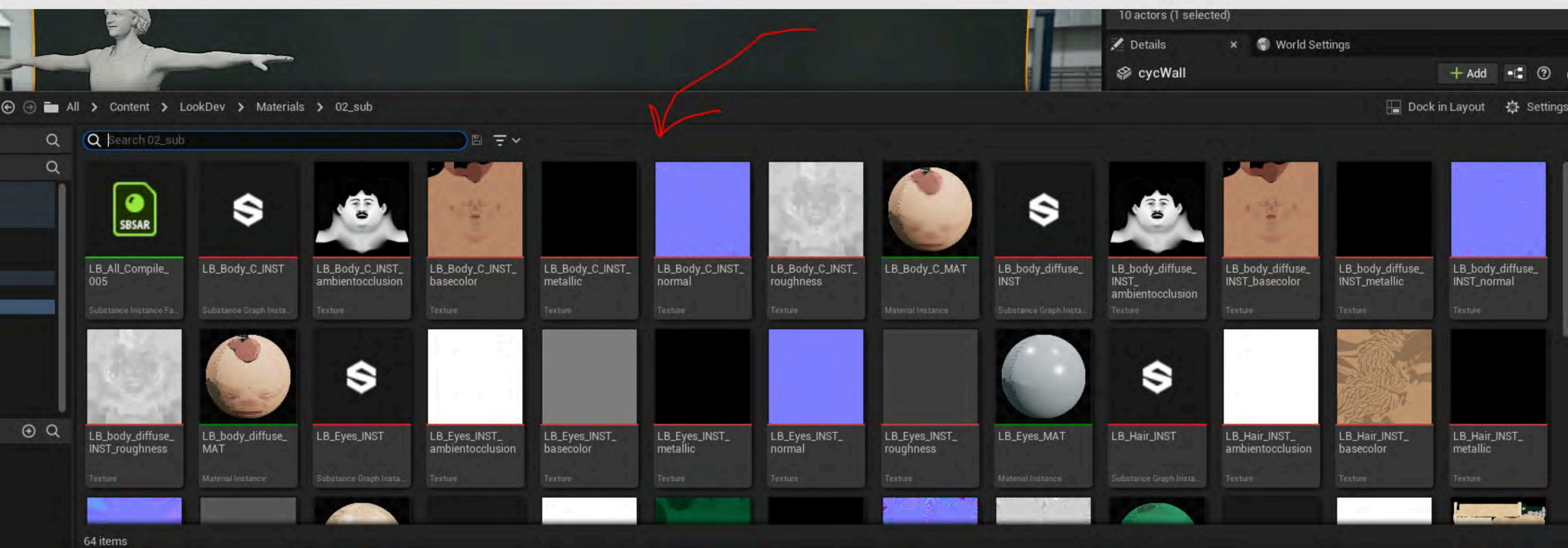
With **03**- When you publish you are going to publish all of them, which means ( depending how you approach your Unreal Project ) that all of them will go in there when you import inside of Unreal.



Go to Next Page



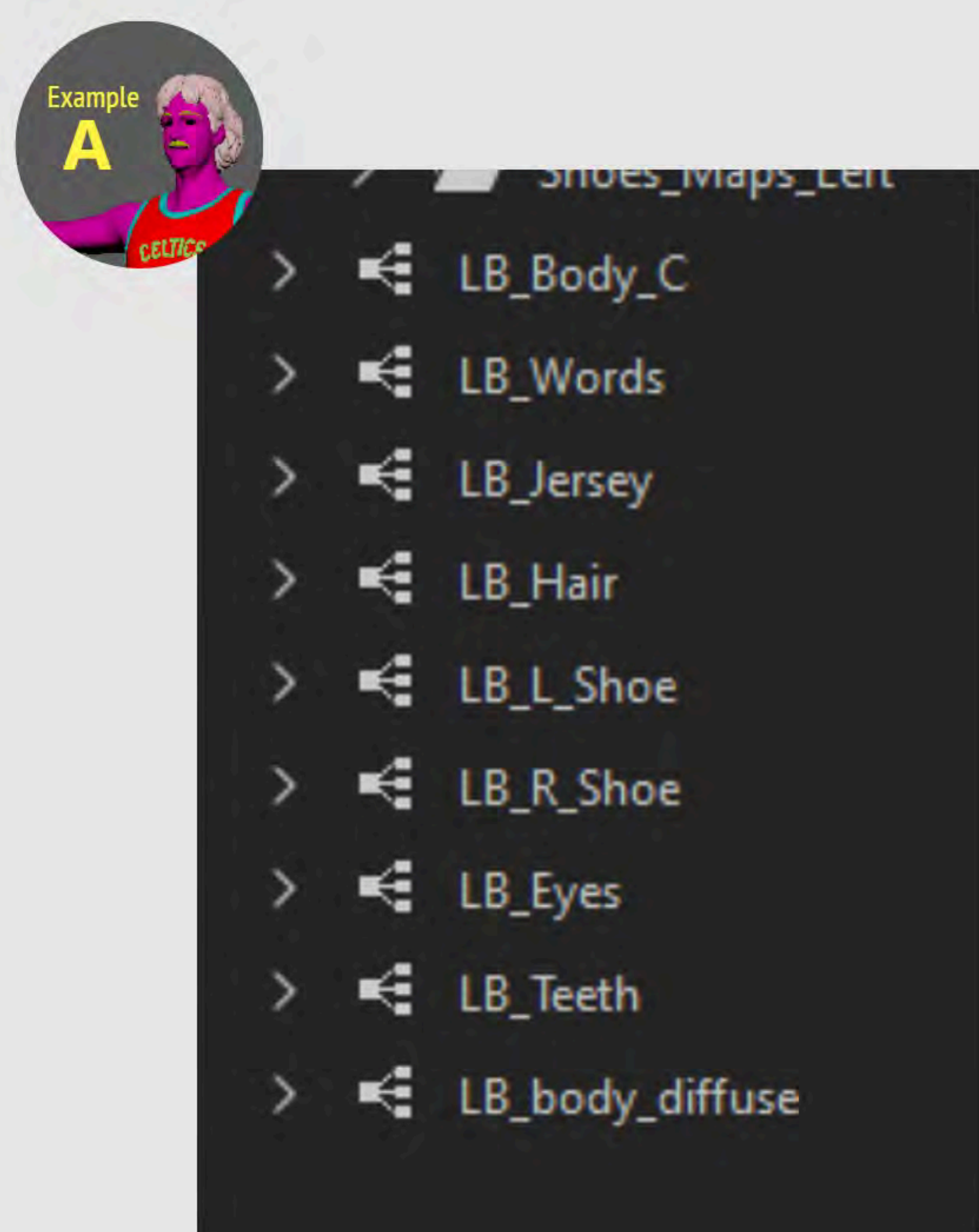
# Larry Bird - Maya/Painter/Designer/Unreal



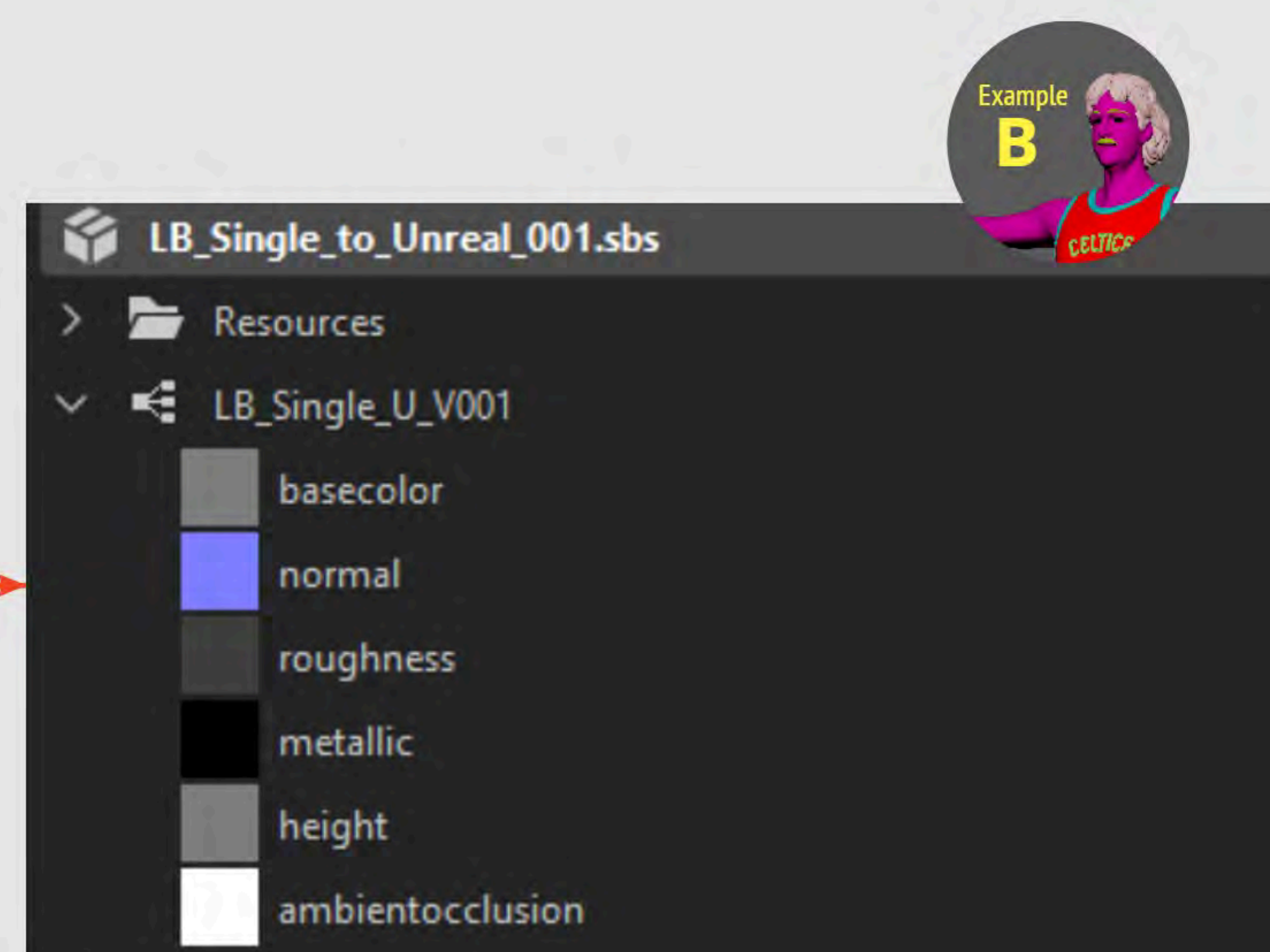
Which can get big ..fast...

Another approach is more efficient but takes some set up time. So instead of a shader for every piece ( Hats, body, uniforms etc.. ) there is ONE shader that goes into Unreal. This shader is COMPILED IN SUBSTANCE DESIGNER by way of ID mats.

All the shaders you saw in example one, have their own Graph - shader Graph. This technique compiles all the shaders in one GRAPH, so when it is published, only ONE SBSAR goes out to UNREAL. you can set up the controls for adjustments, but naming them correctly is a must.



So to the left are the GRAPHS in the First Example and the new technique there is only ONE !!

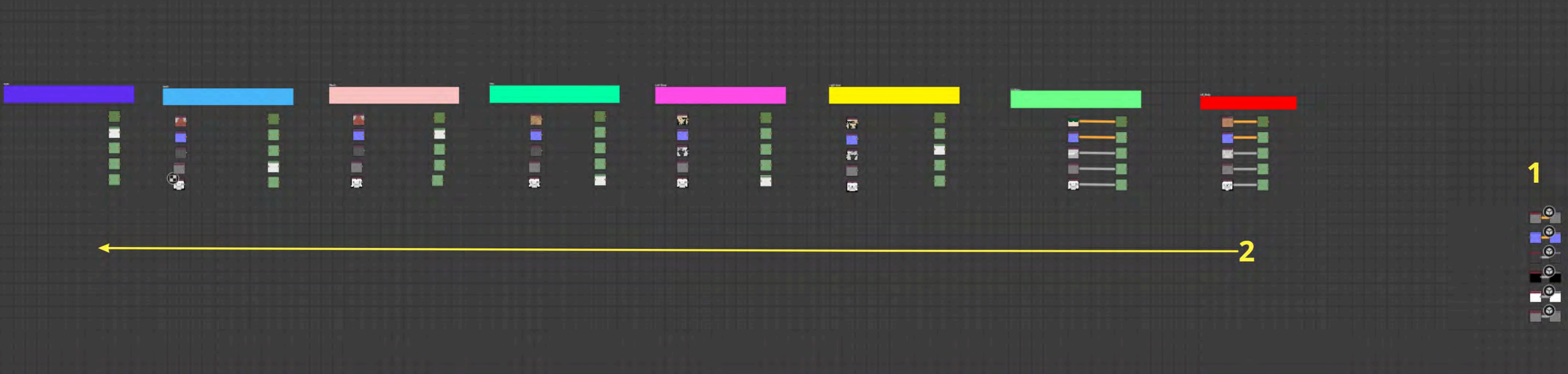


Which means all of the shaders you see above left ( Example A ) all share the SAME GRAPH you see in Example B.



# Larry Bird - Maya/Painter/Designer/Unreal

All of the shaders are on the one Graph



Which means all of the shaders you see above left ( Example A ) all share the SAME GRAPH you see in Example B.

01 - Is the OUTPUT node, everything get published through this.

02 - are all of the shaders sitting in one graph.

With this Technique, IDs generated inside the Baking Engine are used to split up the different materials.

I tend to make the reference note in the scene have the same color as the corresponding matte id color for the material. That way to color pick it is much easier.



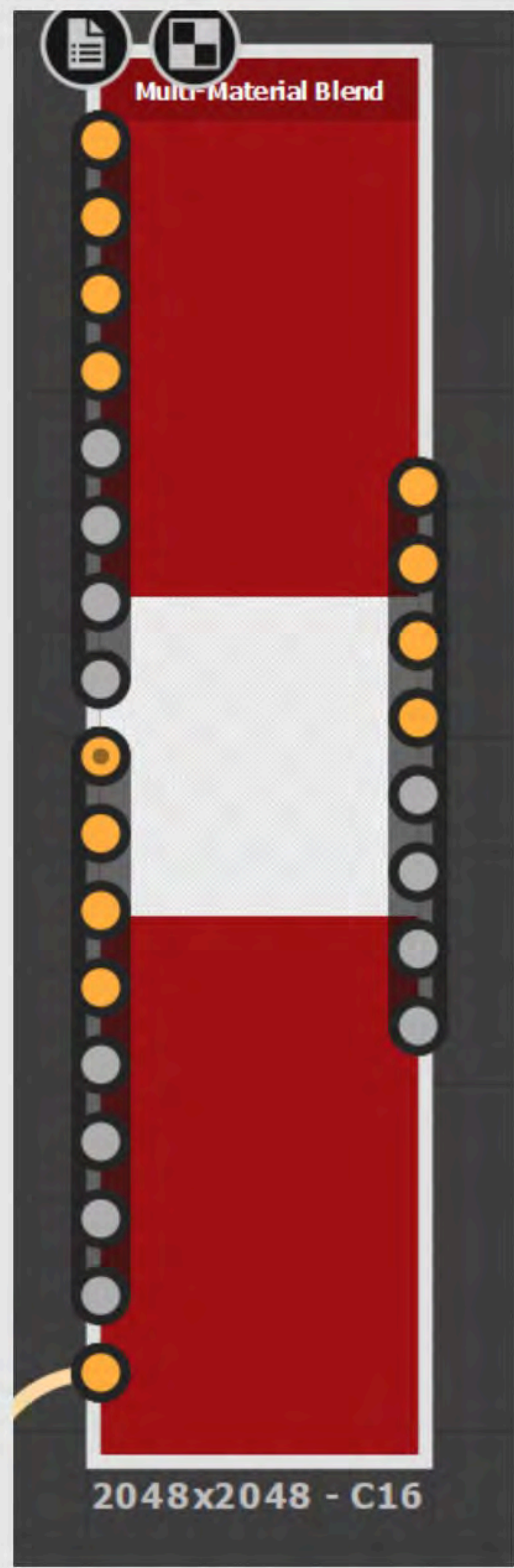
To connect them, drag in a Multi Material Shader



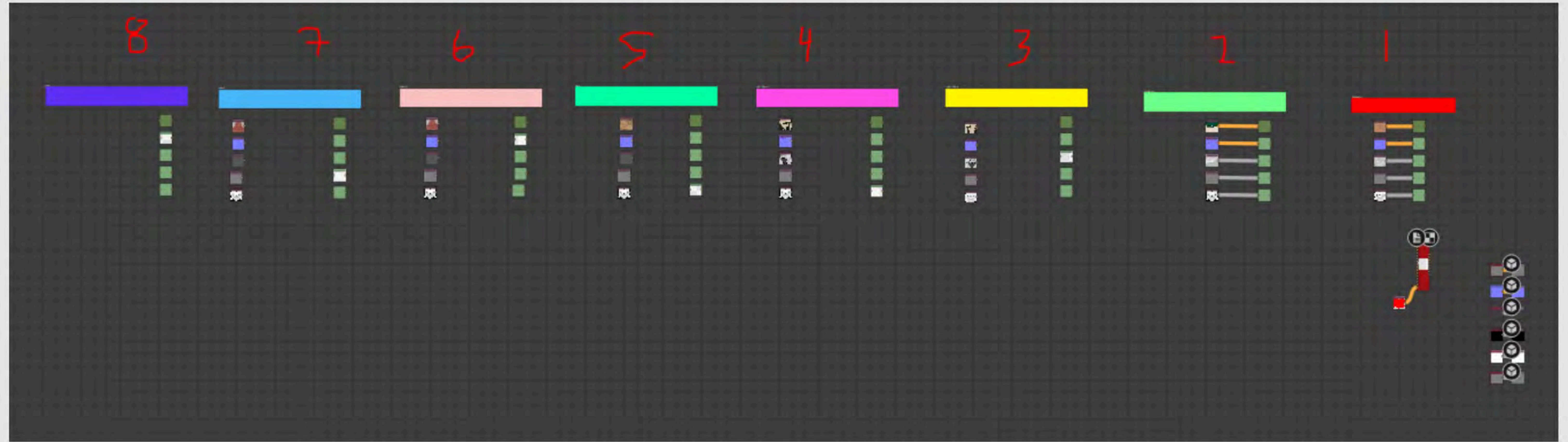


# Larry Bird - Maya/Painter/Designer/Unreal

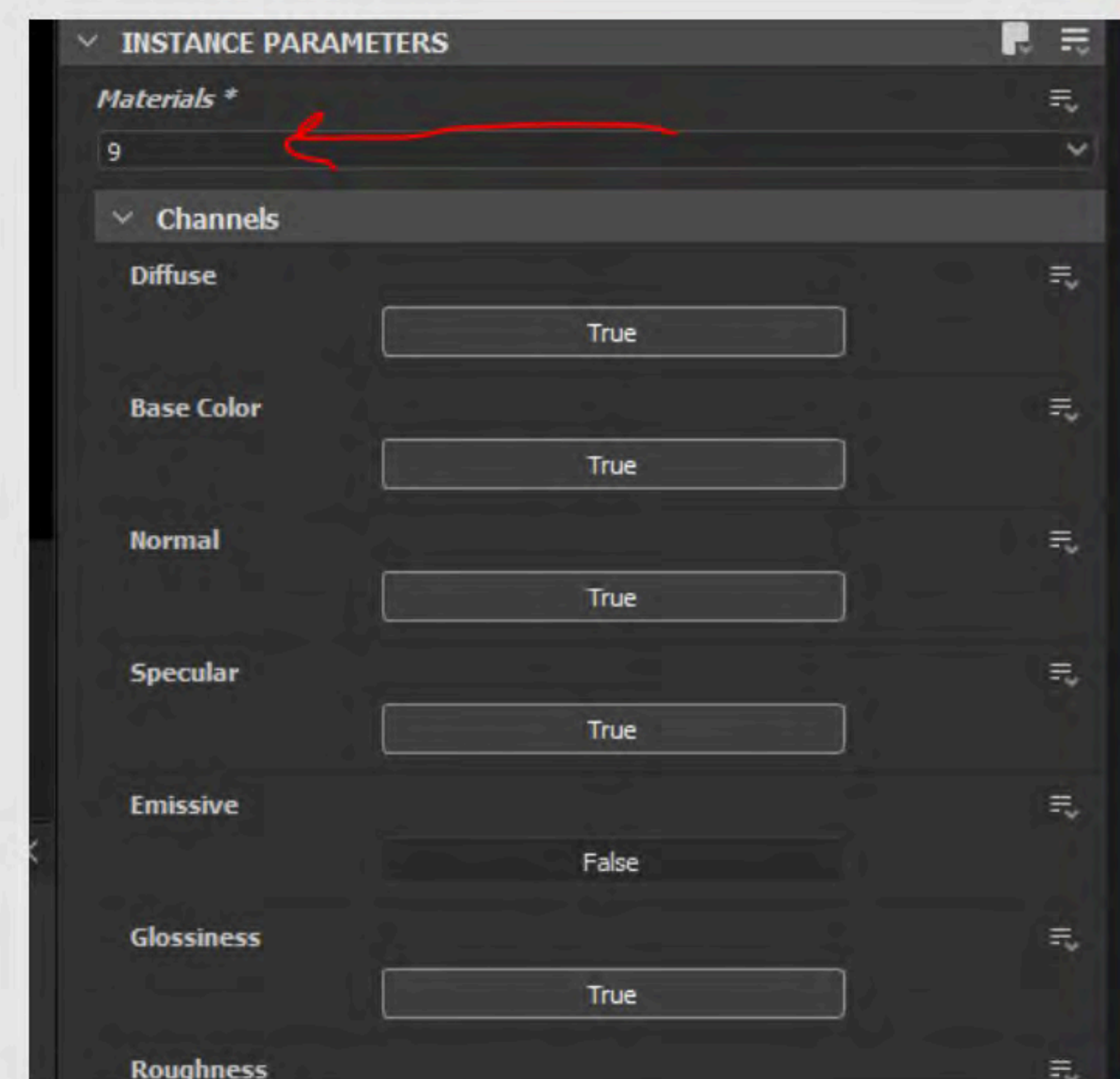
## Multi Material Blend



Keep channel 01 - black by assigning a shader - Always. So with that said,

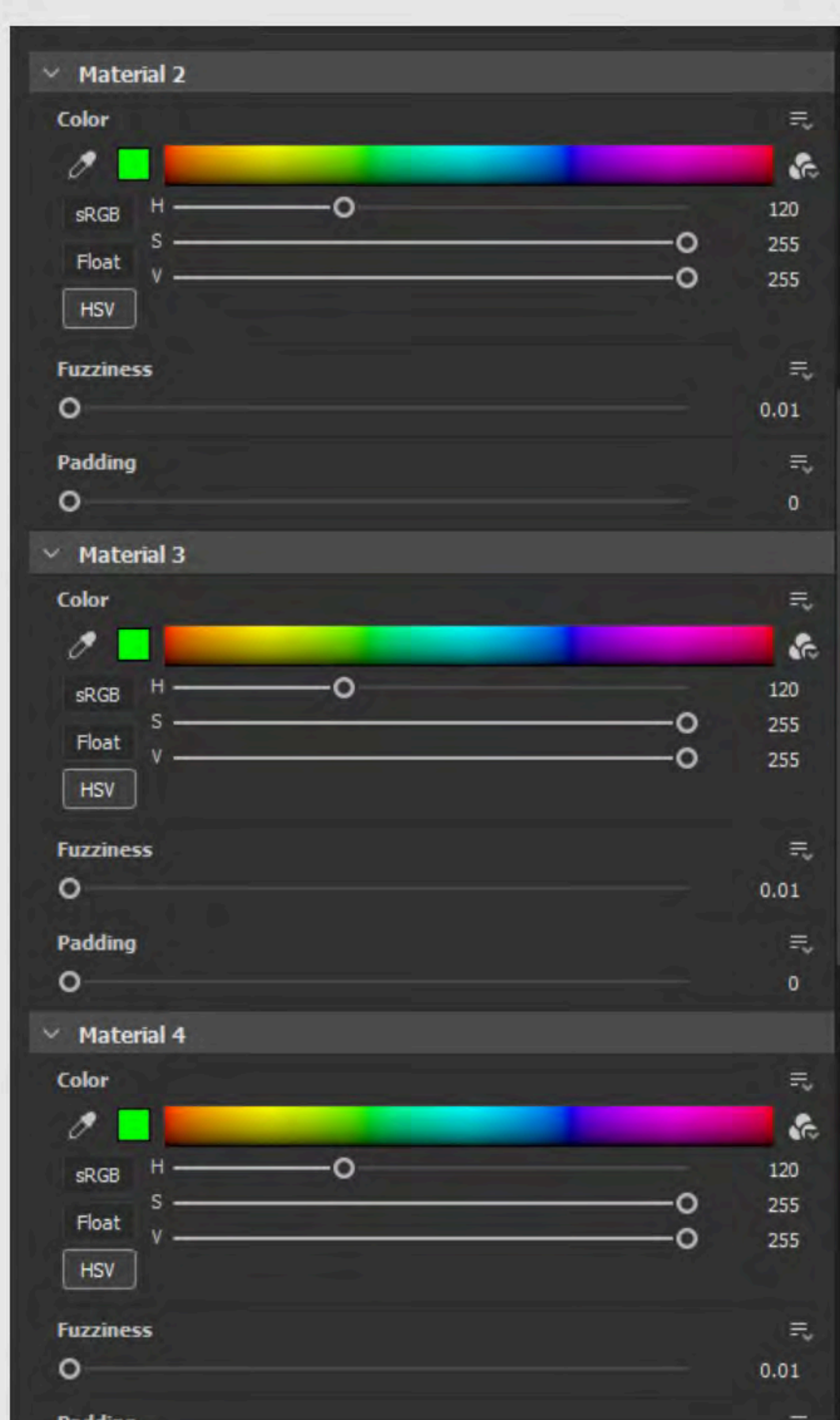
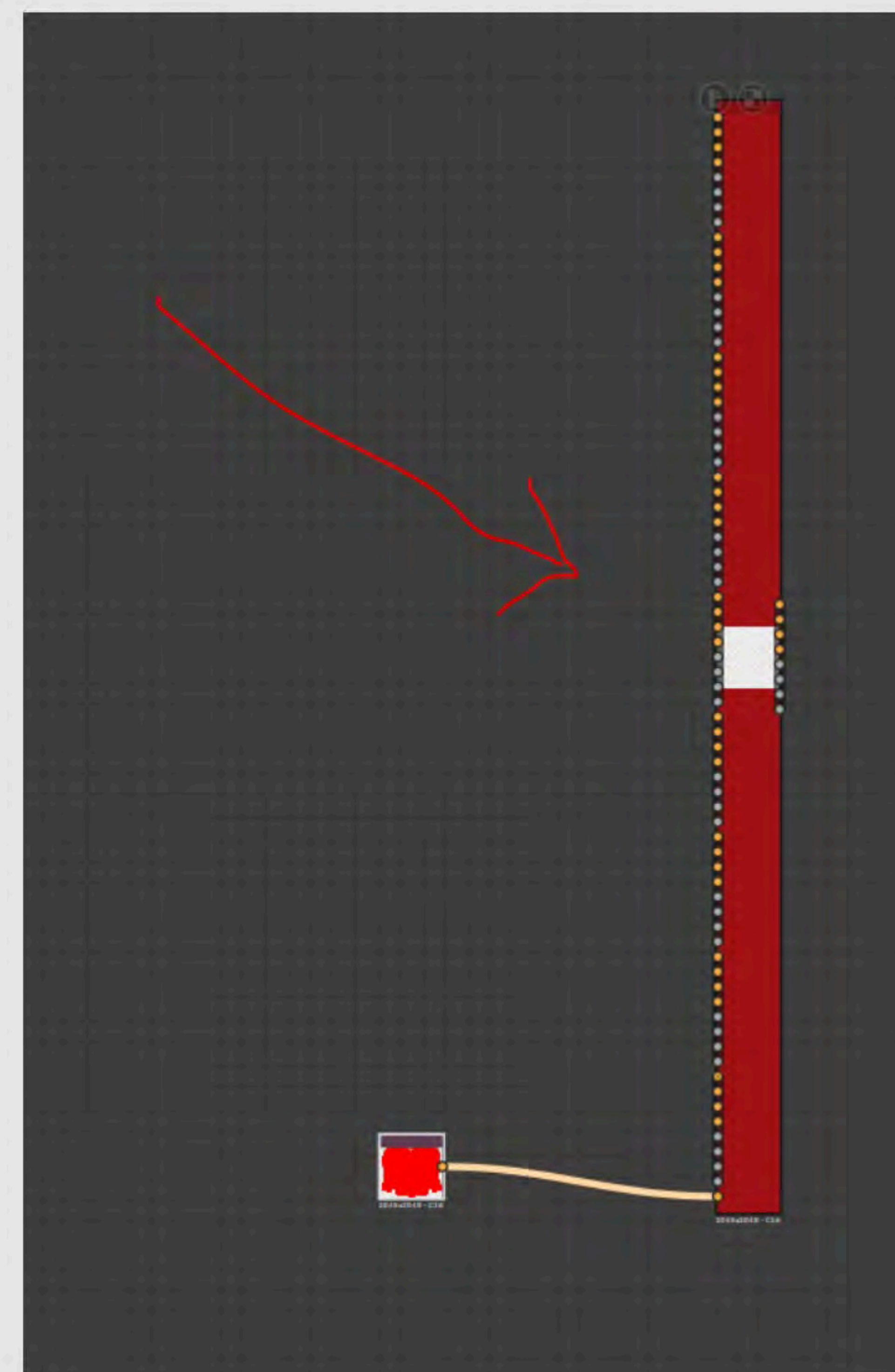


You need to assign the Multi Material Blend + one. Making it 9 total



There is another way to do this, in that you essentially take the blend shader for **Two** shaders only and comp and string them along until you have one output going into the final output nodes.

Because as you can see, your Blend shader will start to look like a Business tower in Tokyo.

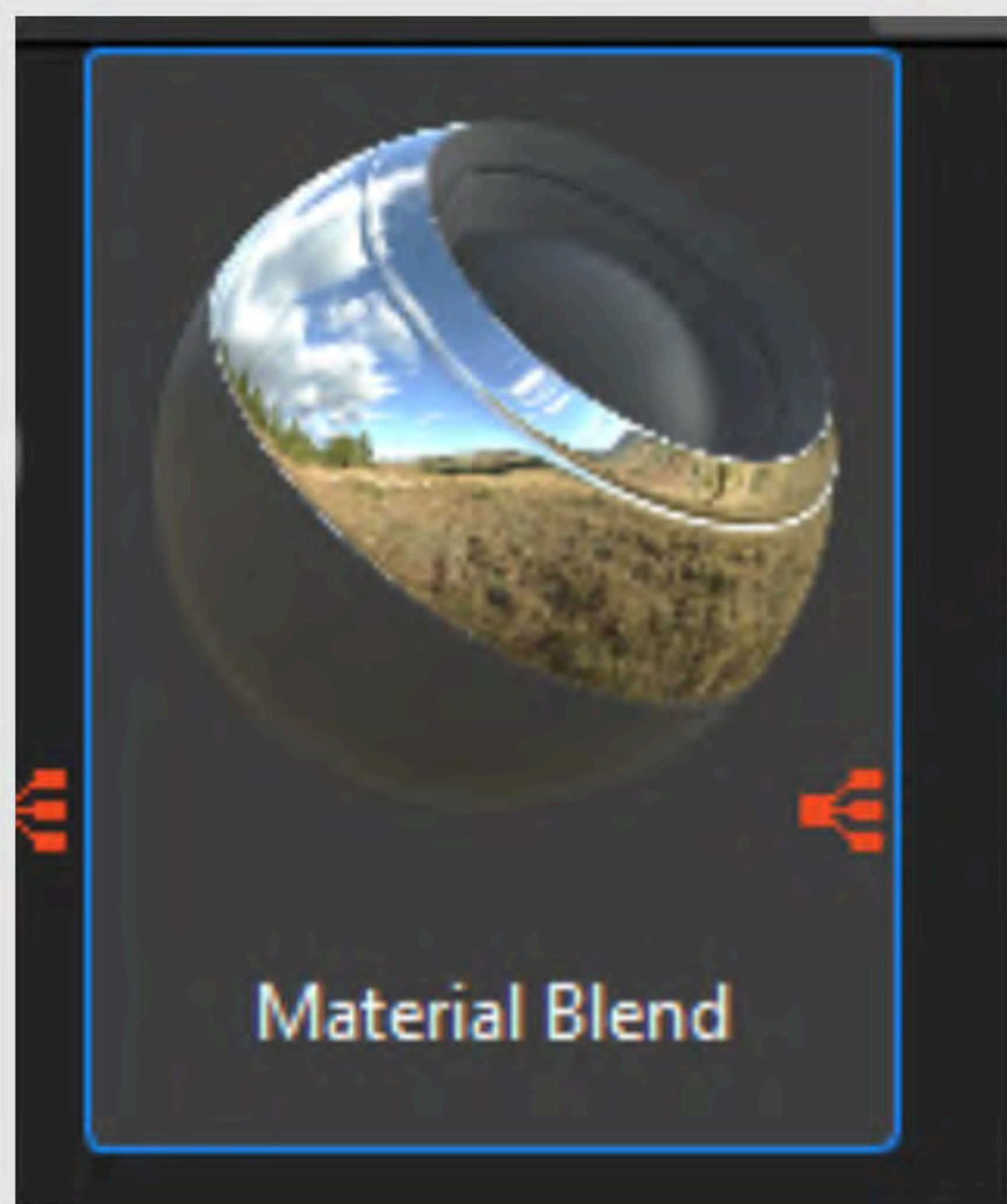


For the one above, you select the proper Id matte for each corresponding material.

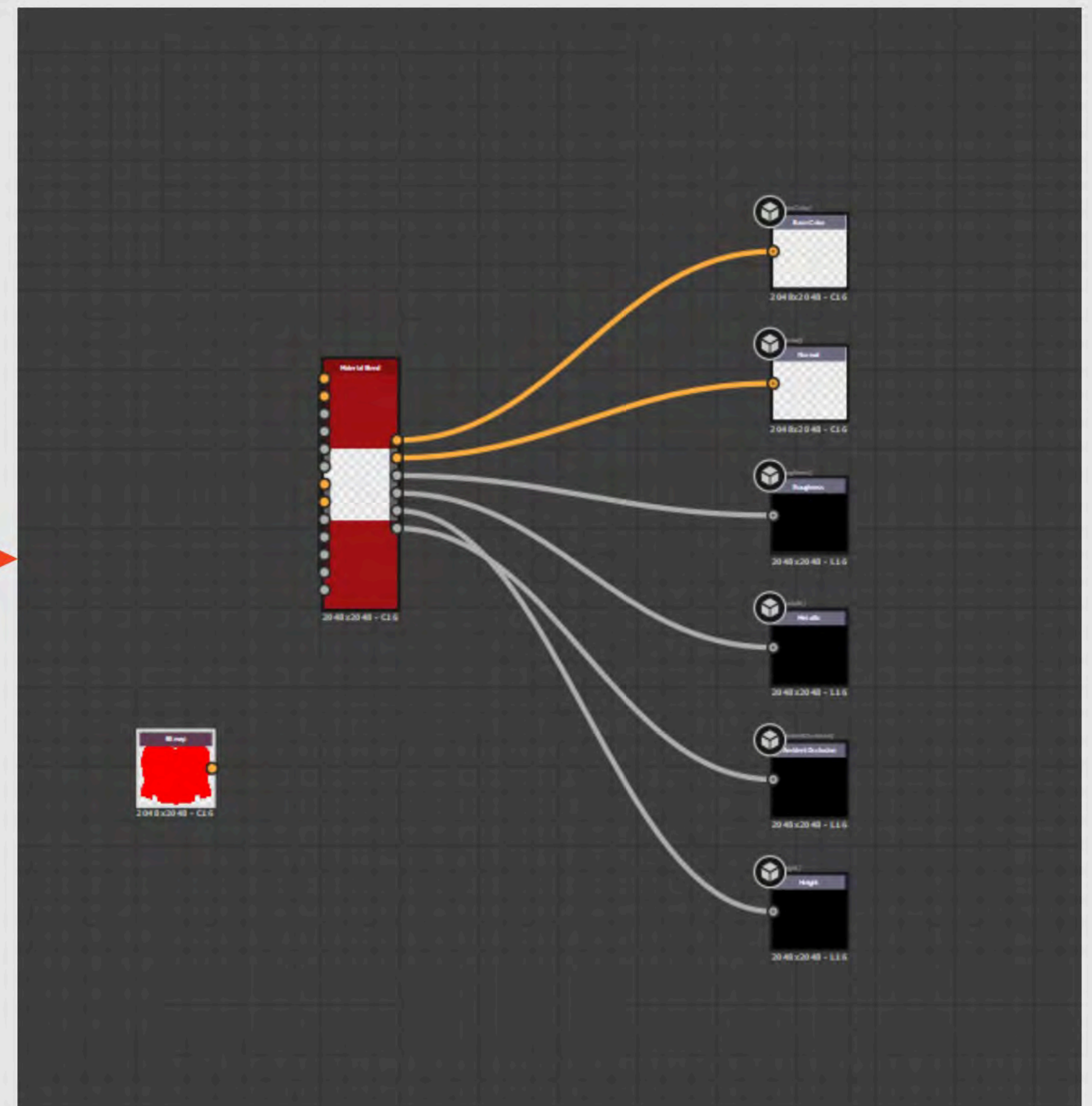


# Larry Bird - Maya/Painter/Designer/Unreal

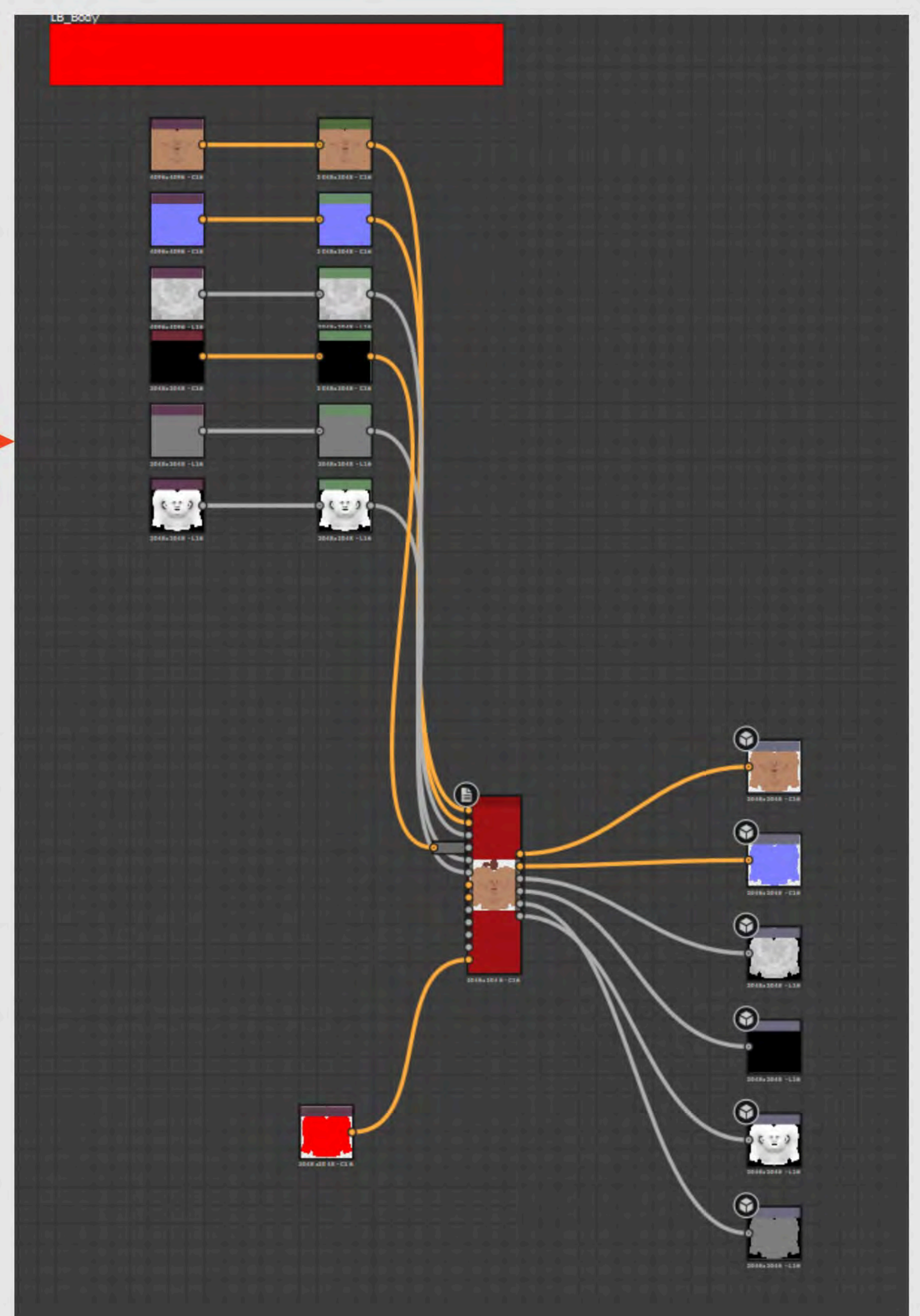
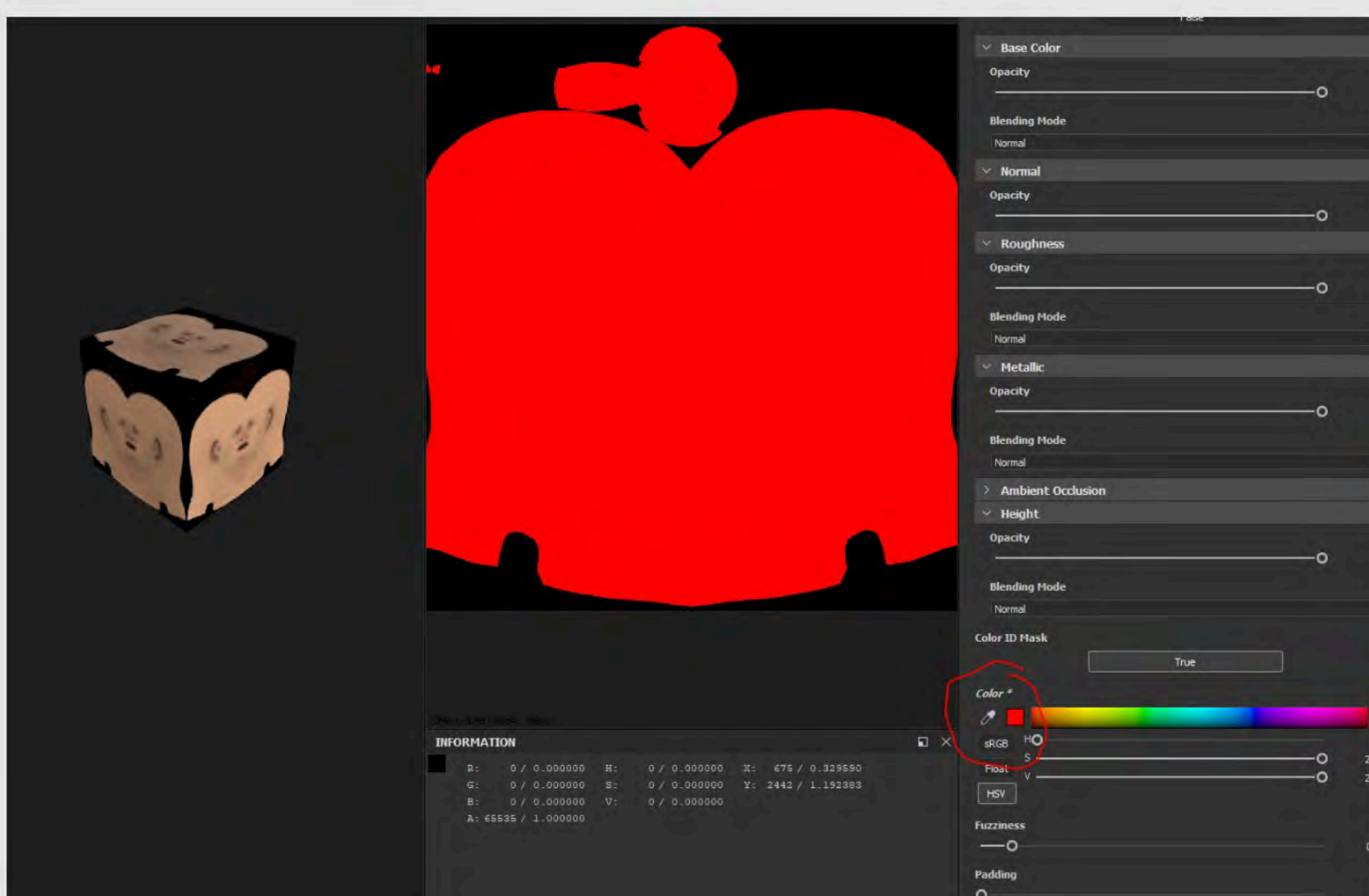
With the Material Blend for Two shaders



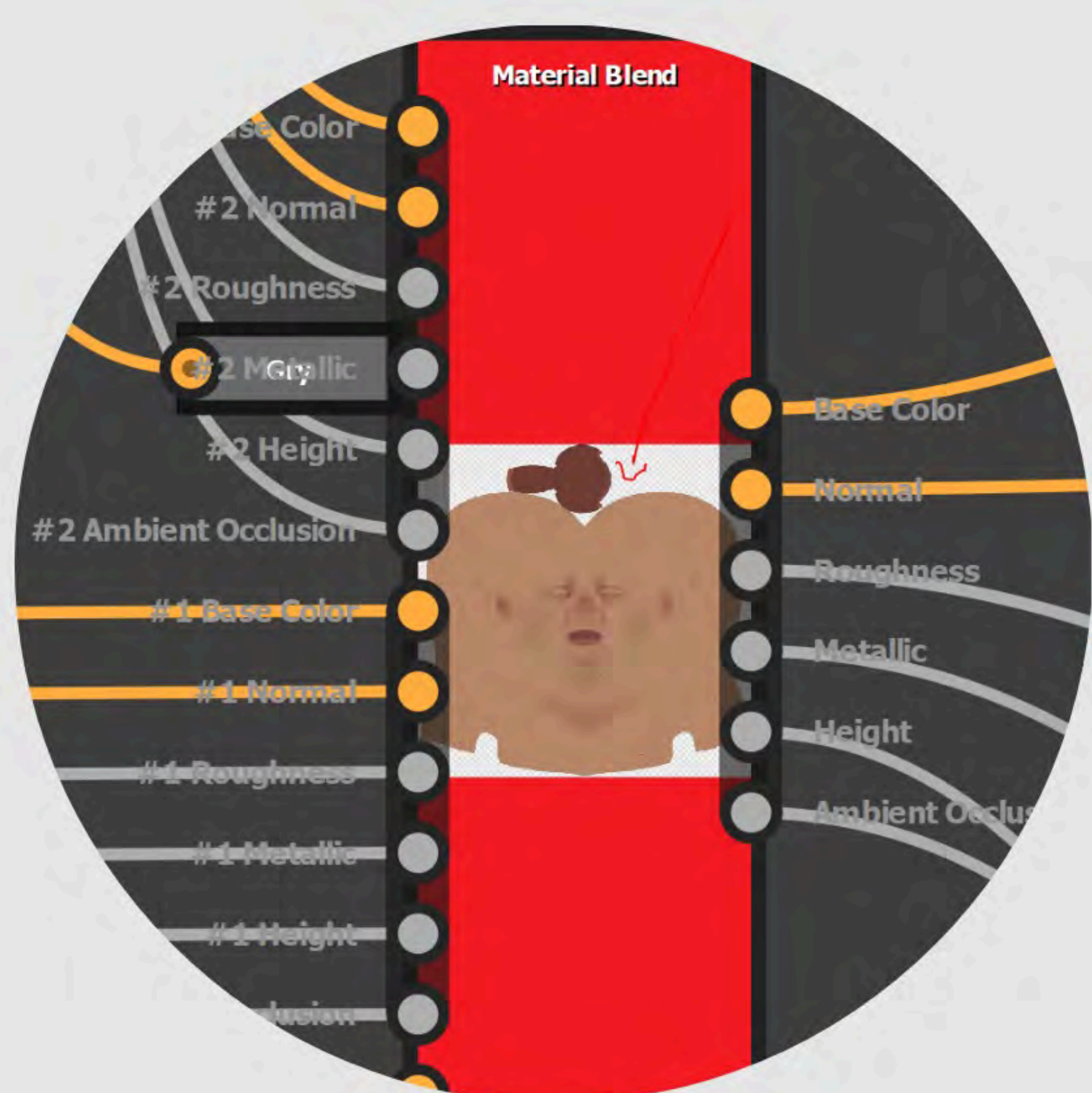
Connected to the Output



With color Id turned on inside the Material Blend, you start keying out the colors per material you need.



Your First Tree connection will look like this.. You need to carefully ( I never said Substance Designer was easy ! But it does help the material pipeline )



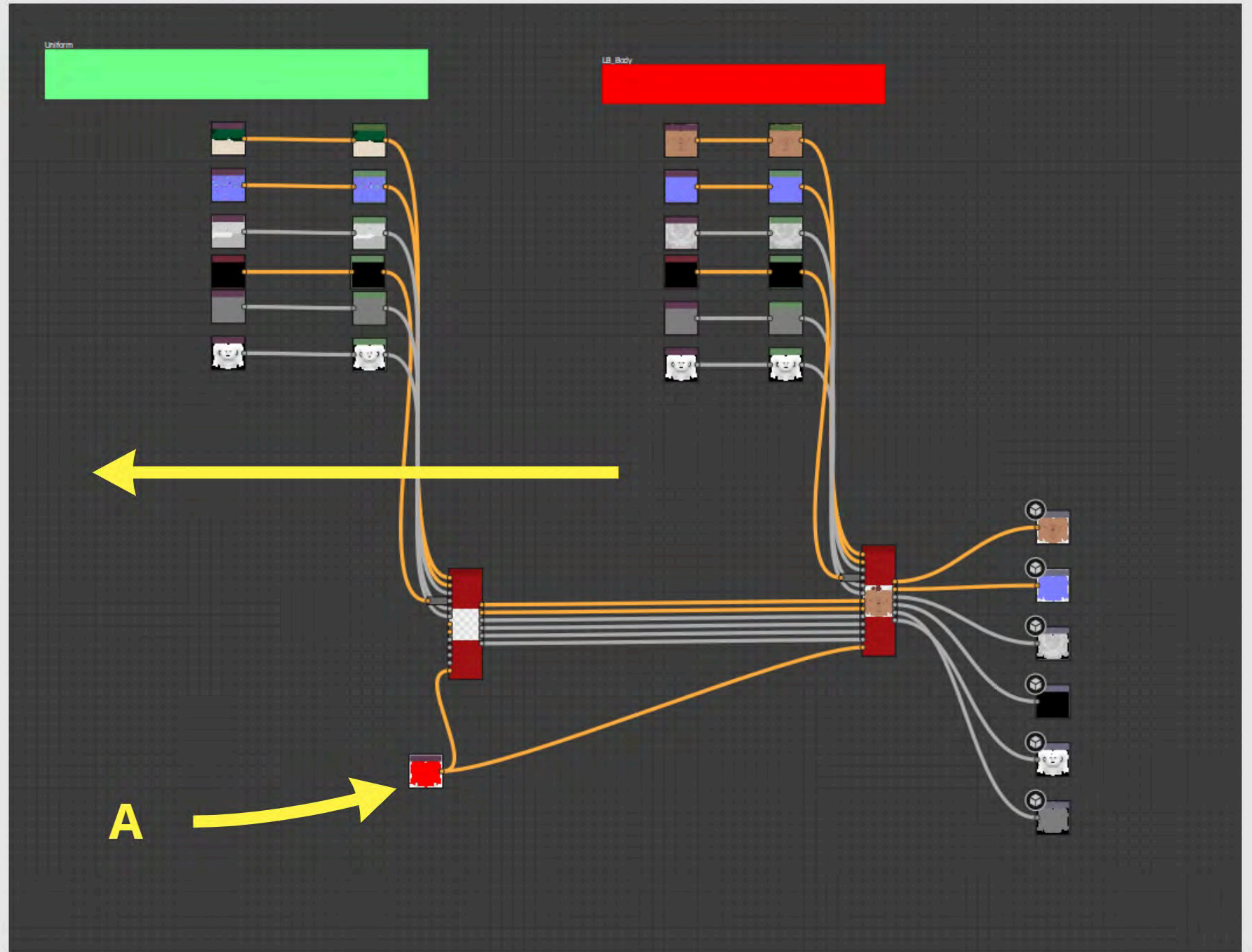
You can see the Keyer work on this UDIM set



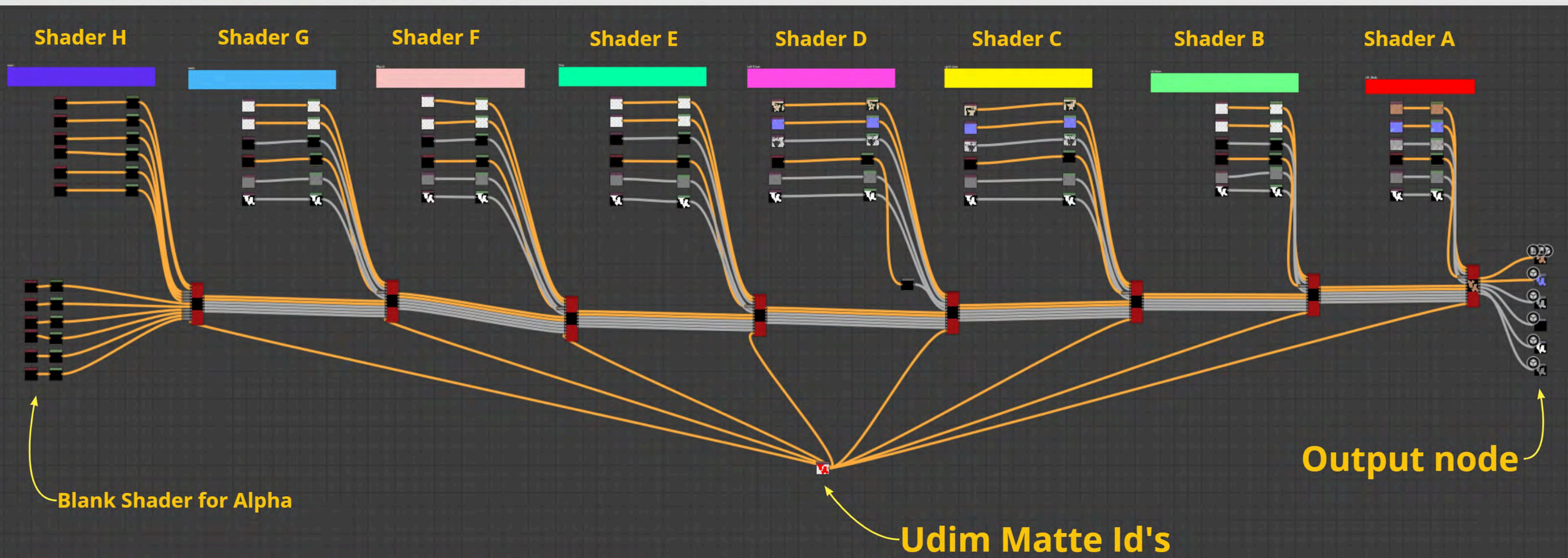
# Larry Bird - Maya/Painter/Designer/Unreal

Now it is about Stringing them along going left, connecting all of the shaders and seperating them by their respective Color Ids

Now it is about Stringing them along going left, connecting all of the shaders and seperating them by their respective Color Ids



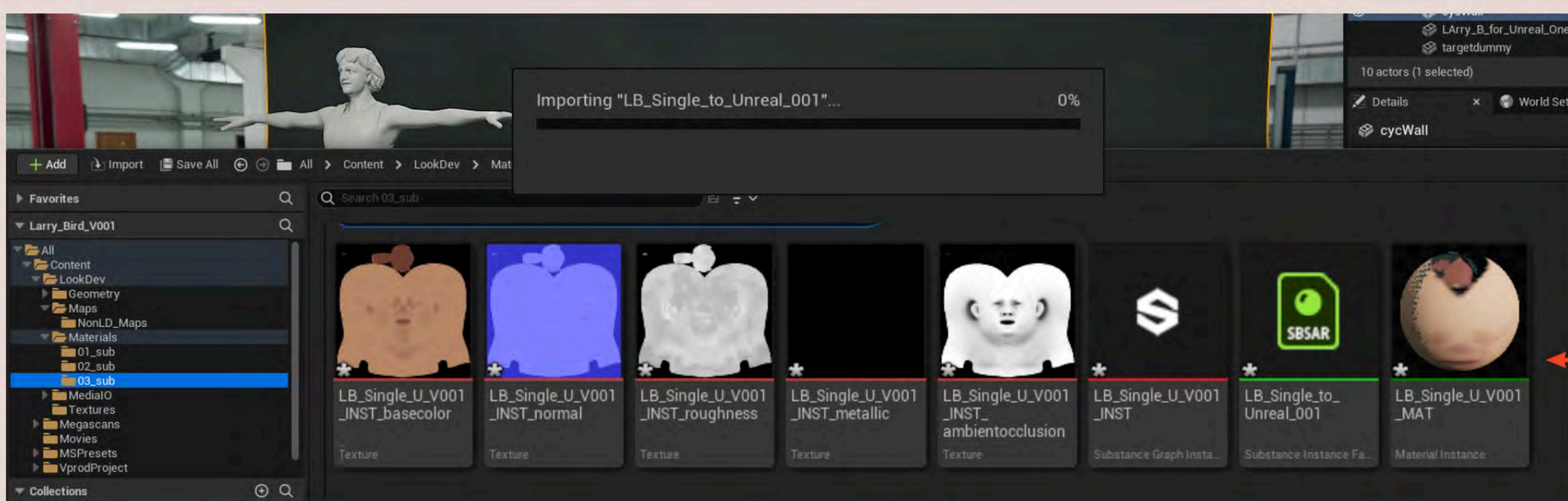
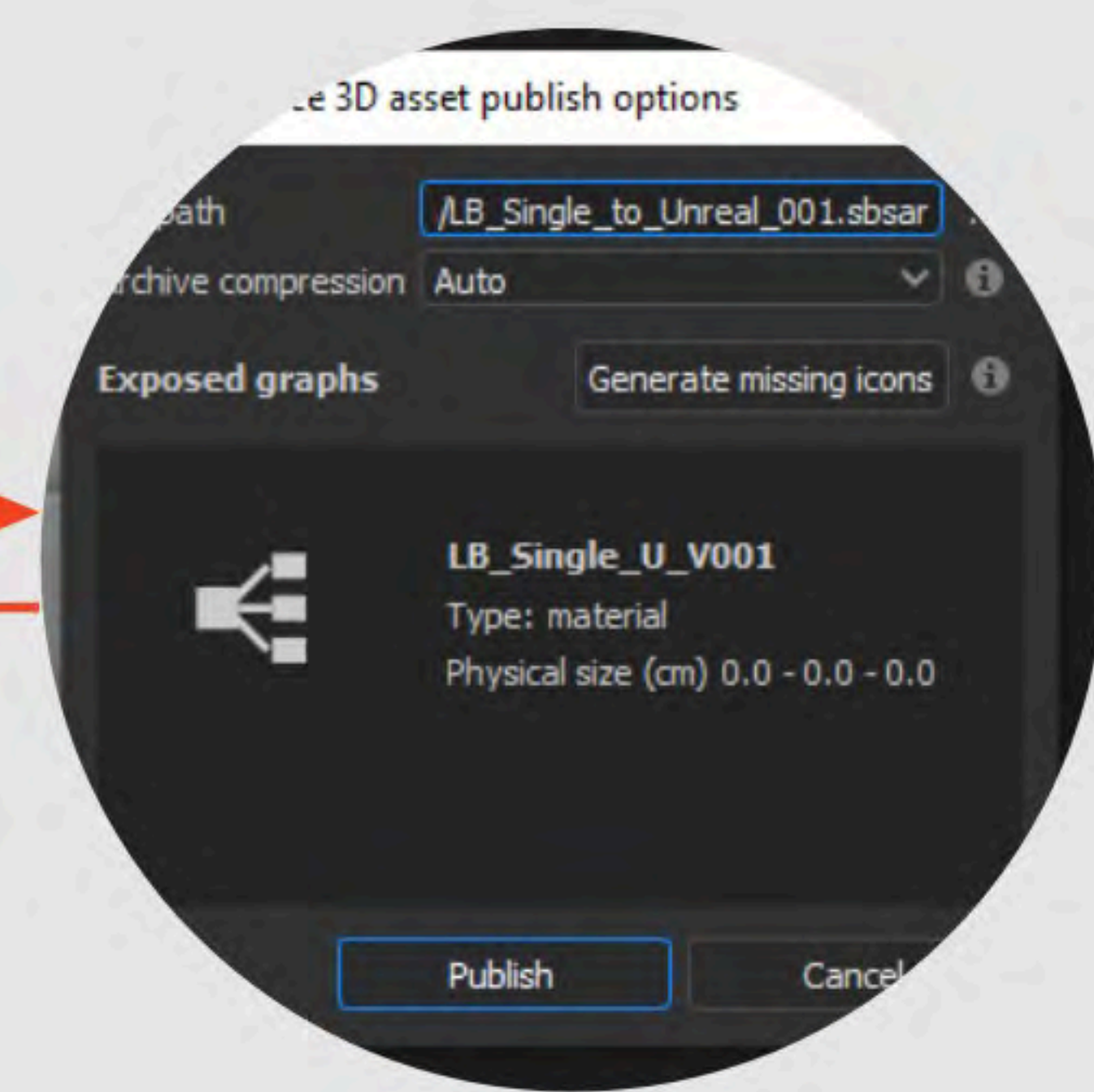
Here it is all strung up together



\*\* Please note - the nodes for CC were not attached for this demo

## Publish the SBSAR out

## To Unreal

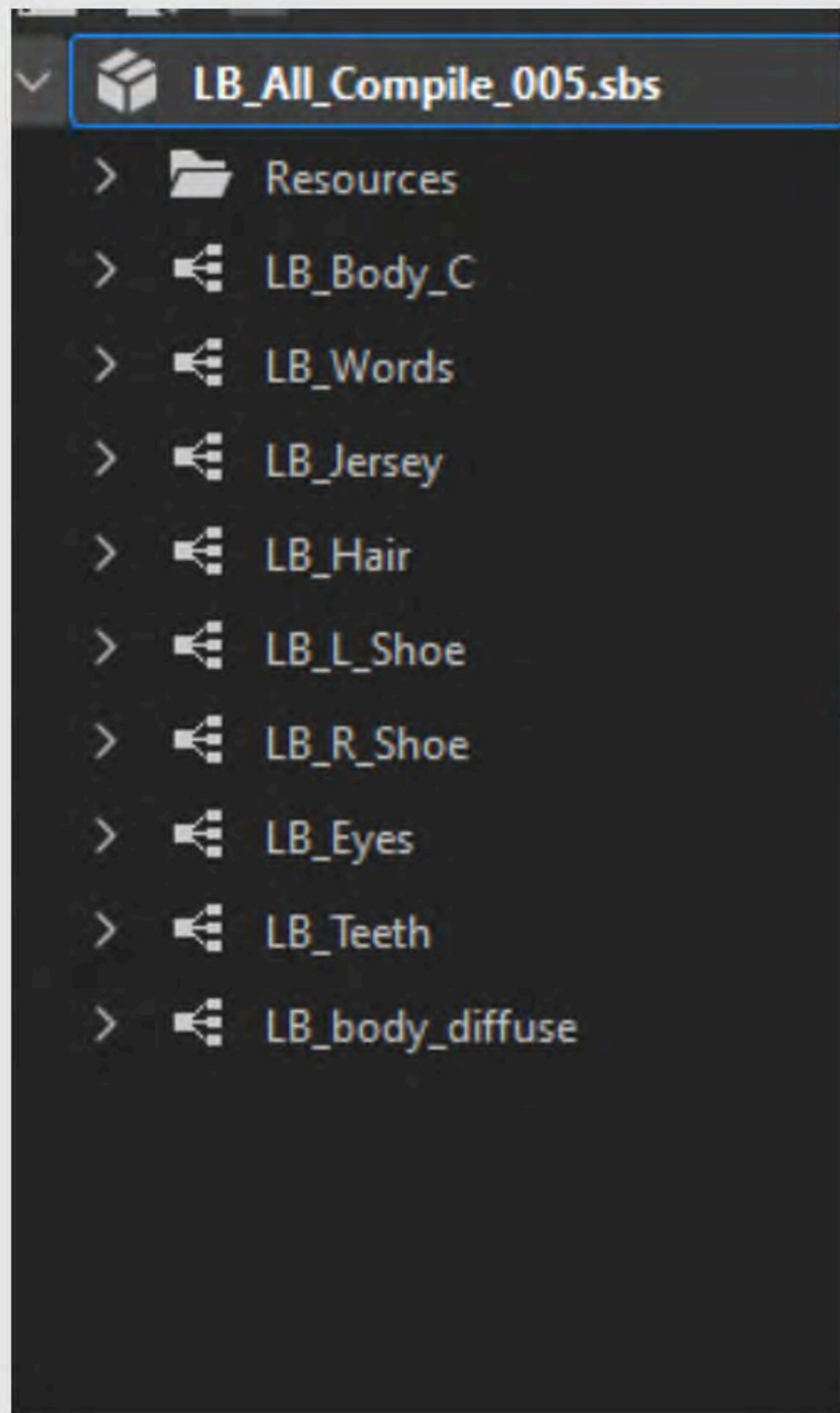


As one Shader

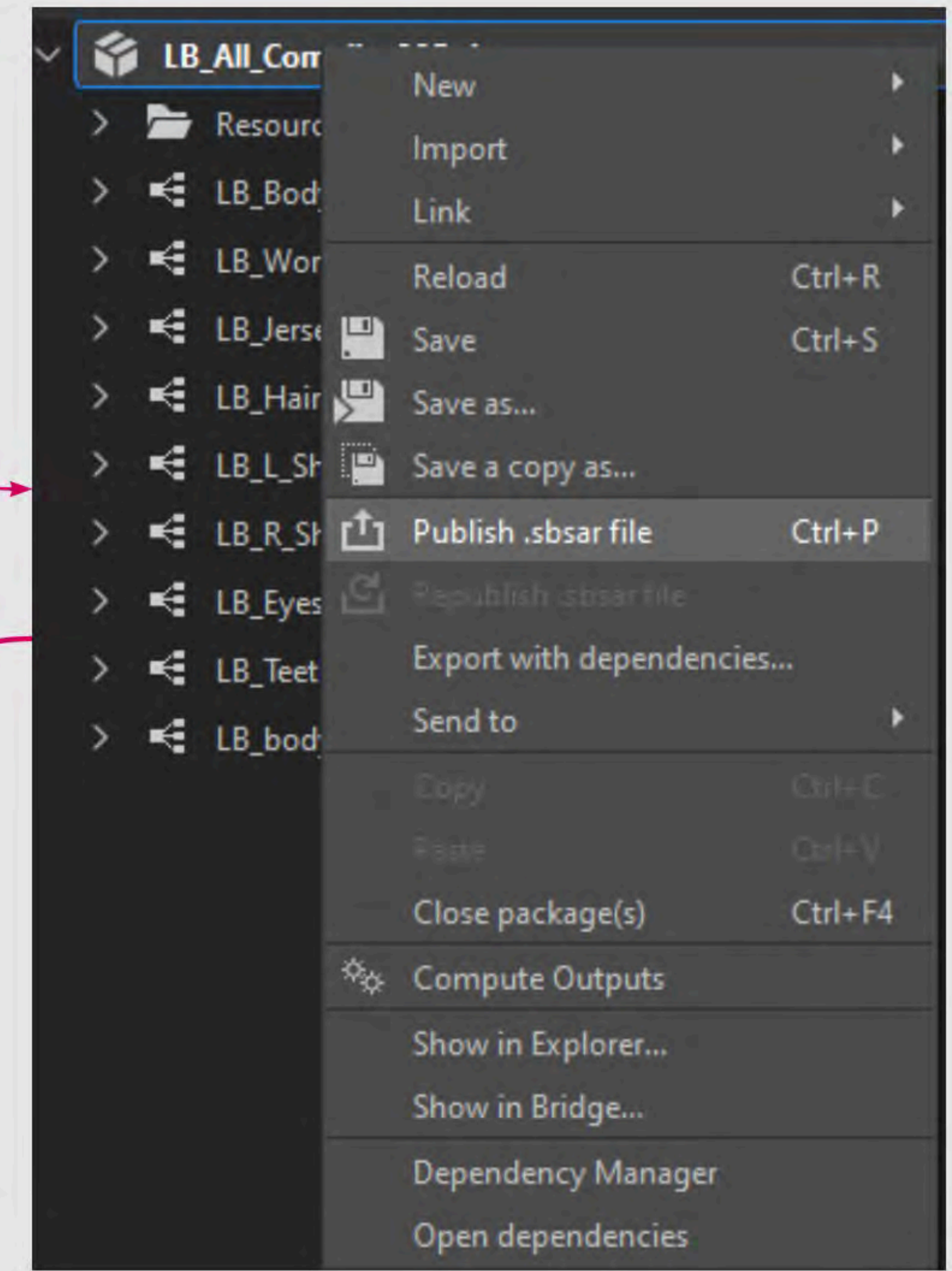


# Larry Bird - Maya/Painter/Designer/Unreal

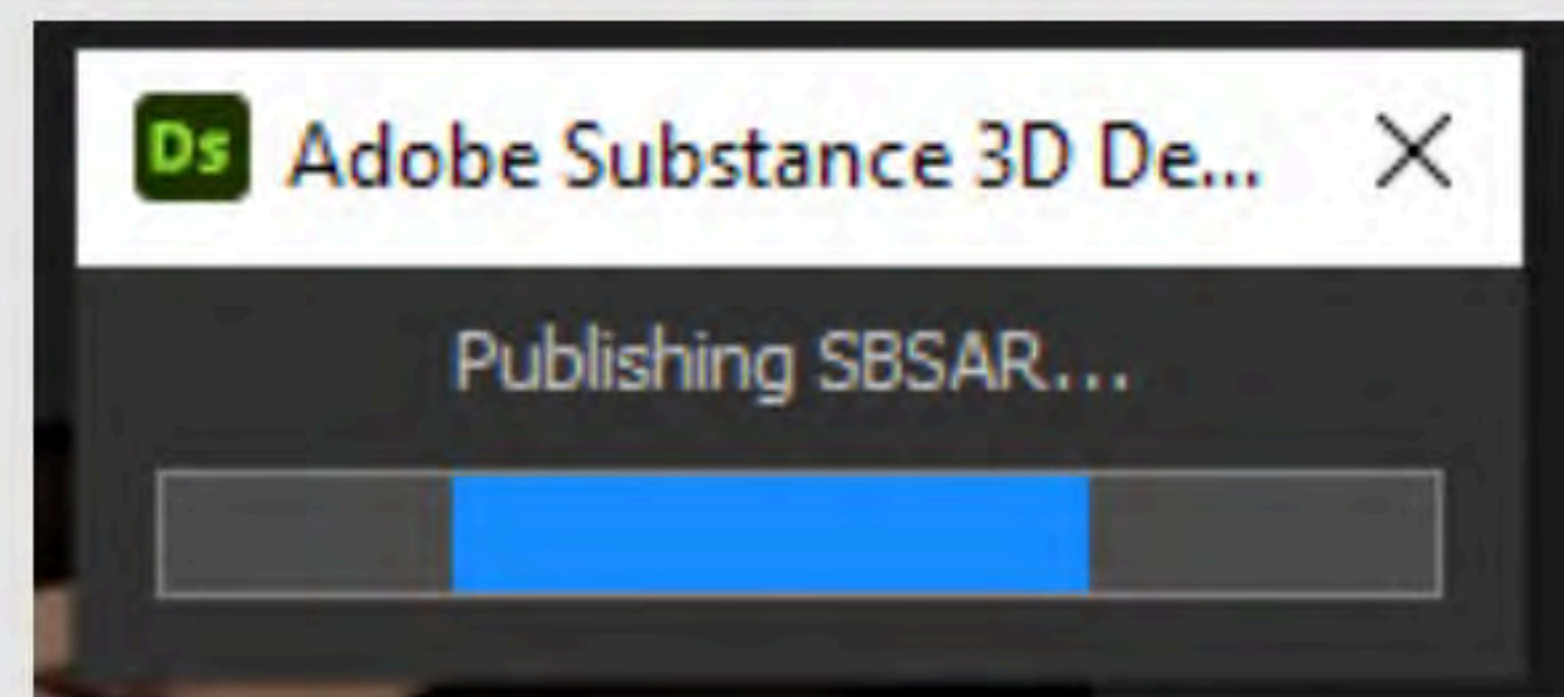
To see these additions show up inside of UNREAL



Right Clicking on  
"LB\_All\_Compile\_005>sbs"

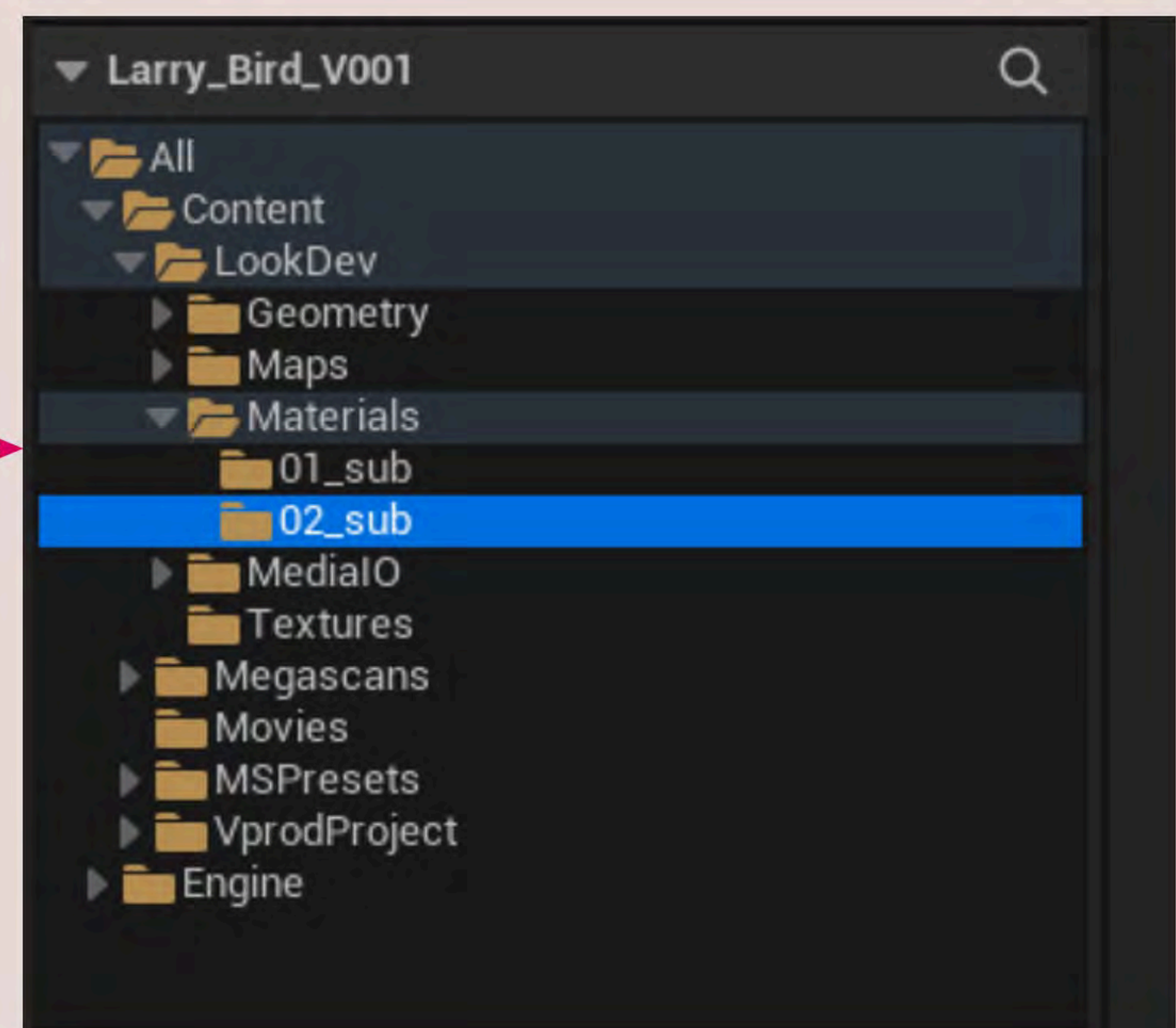


Publish the SBSAR



## Inside UNREAL

Make a new Folder to put the new SBSAR in and import or Drag and drop the SBSAR you just made inside of it .



A dialogue box will show up for each of the SBSAR's you imported in . .for now click a default " yes "

## Content Drawer

