Department of the Environment Supplementary Planning Guidance

Technical Guidance Note: 11b

States of Jersey

Technical Guidance for submitting a 3D model

Version 1 - February 2013

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1.   PURPOSE OF DOCUMENT

1.1   This practice note is designed to help applicants determine whether a 3D digital model of their proposed development is required and if so, to what standard, when submitting a planning application to the Department of the Environment.

1.2   This document is not a tutorial on how to use Sketchup but assumes the reader already has a basic understanding of the modelling package. Links to suggested online tutorials are given at the end of the document to assist architects and technicians should they wish to learn the basics. This document instead outlines the necessary modelling approach to ensure that your submitted models will be acceptable to the SoJ planning department for assessment. If you do not follow these steps, you risk having your model rejected and the planning application delayed until you can submit a model in the correct format.

1.3   This document outlines a number of common practices when modelling in Trimble Sketchup, to address model organisation, editing, processing memory efficiencies and the interchange model formats required for other 3D software packages.

2.   **BACKGROUND**

2.1   The States of Jersey now has a computer generated three dimensional (3D) model of St Helier and the airport areas. The models currently provide accurate representations by using 3D imagery to depict the built form of buildings relative to topography (contours of the land).

2.2   An accurate as-built 3D model enables the Minister, Planning Applications Panel members, planners, developers and architects to make better design development decisions and for the public to make more informed commentary on the future development and regeneration of the town. In summary it will:

- ✓ **Improve the handling of planning applications**
- ✓ **Enhance the understanding of the built environment**
- ✓ **Improve design quality and standards**
- ✓ **Integrate with the department's 'Planning Online' initiative**

2.3   The States of Jersey 3D model will, over time, extend to all parts of the Island as planning applications are submitted and approved through the planning applications process. The current model areas are outlined in Appendix C.

2.4   3D models for development schemes that are approved and subsequently built will be used to update the States of Jersey 3D model data for future reference by the States of Jersey and external consultants/users.

3.   WHEN IS A 3D MODEL REQUIRED?

3.1   A 3D digital model will be required to be submitted for applications involving any scheme for;

- a new building over 2,500 sq.ft within the States of Jersey 3d Model area;

- any scheme that proposes more than one building in any location; or,

- significant major alterations or additions to the exterior of existing buildings within the St Helier 3D model area (see Appendix 1).

3.2   For the purposes of the 3D model, the definition of a significant change to the front elevation or roof profile/height is regarded as adding one storey in height or having a potential material impact upon the immediate area (by either the loss of light or a significant visual impact), as defined in Island Plan policy GD5 skyline, views and vistas.

Table 1: Requirement criteria for submitting a 3D Model

Proposal	Within St Helier 3D model area	Outside St Helier 3D model area
Internal alterations to an existing building	No	No
External alterations to an existing building	Yes - if involves significant change to front elevation or roof profiles/increase in building height.	No
Any scheme for a new building over 2,500 sq.ft and any scheme that proposes more than one building	Yes	Preferred
Revised development application (where changes are requested to an application that provided a 3D model previously approved or under consideration.	Yes	Yes

3.3   There will be cases where the Minister may agree that a 3D model is not required depending upon the individual case or indeed under some circumstances where additional information may also be required, such as the need for a physical model (e.g. public enquiry).

3.4   It is recommended the applicant contact the Department prior to submitting an application if they are unsure as to whether a 3D model is required.

Planning applications outside the St. Helier Model area

3.5   Initially, where submitted planning applications fall outside of the St Helier 3D model area, there will be no formal requirement for a 3d model and a physical

model can still be submitted if requested. For guidance purposes, it is recommended that all neighbouring properties that have a material impact upon the context of the proposed site area should be captured as part of any model.

36.   There will be cases where the Minister may agree that a 3D model is not required depending upon the individual case or indeed under some circumstances where additional information may also be required, such as the need for a physical model (e.g. public enquiry).

3.7   It is recommended the applicant contact the Department prior to submitting an application if they are unsure as to whether a 3D model is required.

3.8   Through the natural development process, the creation and availability of models of existing buildings outside of the model area will benefit all users of the 3D model.

3.9   It is hoped that even where a model is not required, but where one has been produced by the applicant, it is still made available to the department in order to keep the 3D model up to date as much as possible, for the benefit of all.

4.   ACCESS TO THE 3D MODEL

4.1   The 3D Model is designed for use by the public as well as providing applicants with assistance in the preparation of each applicant's model and applicant's drawings.

4.2   The 3D Model will:

- **be freely available for the public to view only via the States of Jersey web[1] site;**

- **be licensed to architects and developers in order to allow full editing access to the 3D model to assist them with their own developments;**

- **Integrate each applicant's model into the States of Jersey 3D model; and**

- **be an assessment tool for staff and elected members of the States of Jersey in decision making.**

4.3   Before you start modelling the proposed new building or development, you should request a base model or base map from SoJ Planning Department. If the planning application is within the city of St Helier, you will be able to avail of a 3D model of the existing buildings and terrain for your area of interest, in to which you can place the proposed building and return to the planning office with your planning submission.

4.4   If you are already a states of Jersey digital (DXF) mapping license holder then this will be included as part of that agreement, otherwise you will either need to subscribe to the annual or purchase the relevant individual DXF tile mapping license.

4.5   The fees for mapping data are listed in the current mapping fee schedule on the States of Jersey web site[2].

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[1] https://www.mygov.je/Planning/Pages/planning.aspx
[2] http://govje/PlanningBuilding/JerseyMappingService/Pages/PriceList.aspx

5.   MODELLING SPECIFICATION

5.1   The basic requirements for application models are detailed below.

MODEL SCALE / UNITS

5.2   The 3D digital model should be created at a scale of 1:1 that is an accurate representation of the exterior detail of the proposed development. All models should be modelled in metres: To do this in Sketchup go to (Window/Preferences/ Template/ Sample template-Meters)
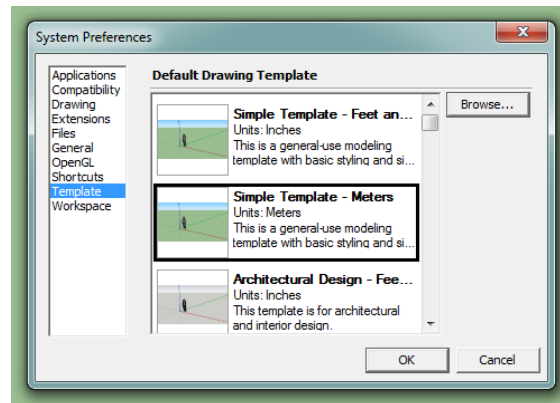
POSITION AND HEIGHT VALUES

5.3   All submitted models must be accurately located within the current States of Jersey 3d model and/or mapping data sets.

5.4   If there are significant changes to the existing site levels (ground level contour), the model should include the amended site levels as part of the model itself.

ACCURACY

5.5   Models are required to meet the current minimum terrain and building heights accuracy standard which is;

- within 20cm vertical and horizontal accuracy within the 3D model area
- within 40cm vertical accuracy for terrain outside of the 3D model area.

DETAIL LEVEL

5.6   The Department requires only the external elements for its development application process. Internal fit outs are not required. Some of the details listed below.

The model should include:
- Ground level detail deemed to be of major design significance such as doors, access and awnings;
- General detail of shop front design (i.e. areas of glazing and doors) if applicable;
- Elevation detail for all elevations including sizes and rear:
- Solid to void and opening relationships, glazing, mullion and transoms deemed of significance to the building design;

- Balcony elements such as balustrades, detail of any protrusions or indents to facade and any expression of structure;

- Roof detail including pitch, plant enclosures, service and fire stair protrusions, terraces, shade and signage structures;

- If there are significant changes to the existing site levels (ground level contour), the model should include the amended site levels as part of the model itself;

- Floor levels (as a flat plane) be positioned in the location of each floor. All other internal detail is not required and must be stripped out of the model prior to submission.

- External ancillary features of significance such as large landscaping planter boxes, canopies;

- Indications of vegetation should be kept to an absolute minimum - a separate model of prominent trees is preferred;

- Objects such as seating can be shown as simple block forms;

- Objects to have correct colours applied as a minimum standard.

The model does not need to include:
- Lighting

- Loose furniture such as umbrellas.

- Moving objects such as cars and people.

POLYGON COUNT
5.7   Look for opportunities to use the least number of segments on curved work. Models with a lot of curved surfaces will invariably have a large polygon count and can make the model difficult to work with in terms of memory capacity. An effort should be made to minimise unnecessary curved surface, by excluding things like internal door handles. Images can effectively take the place of geometry. Figure 3.0 shows a music studio with an acoustic wall system. The wall is a 2d texture rather than geometrically modelled in 3d thus saving the need to process thousands of polygons. **Lines should not be included in the final sketchup file as these will not be exported into the States of Jersey Model.**

COMPONENTS
5.8   If you are using the same entity multiple times (for example, a window or a door frame), make it a component, and then use copies of the component. Save a copy of a model in Component Libraries/Collections to readily retrieve it for future use. Using components will,

- Improve computer performance.

- Reduce the overall drawing time. Every component can be copied several times, so you don't have to draw it more than once.

- Reduce the file dimension. There can be a significant reduction in file size when using components.

- Allow you to easily isolate model elements enabling you to edit the model without adversely affecting adjacent geometries.

- Allow you to automatically modify all instances of that component, whether it's a geometry or texture change.

LAYERS

5.9   By default, a SketchUp model has one layer, Layer 0 (zero), which is the base layer. You can't delete or rename Layer 0, and you should always draw your individual entities on Layer 0 and leave them there.

5.10   The main difference is that entities associated with different layers in SketchUp still intersect each other. For this reason, it's almost always best to draw all your individual entities on Layer 0 and leave them there. If you want to use layers to organize your model, you can turn individual entities into groups or components, and then associate different layers with those groups or components.

To add additional layers:

1.   Open the "Window" menu.
2.   Click "Layers."
3.   In the "Layers" dialog box, click "+" button
4.   Optionally, you can rename a layer (other than Layer 0).
5.   Optionally, you can delete a layer (other than Layer 0). If the layer you are deleting isn't empty, a message asks if you want to move its contents to another layer or delete the contents.
6.   Optionally, you can make another layer active by clicking its option button. When you draw individual entities, they are always drawn on the active layer, so you should typically have Layer 0 selected, unless you need to hide it, in which case, you need to select a different layer.

5.11   You can easily turn on or off the visibility of various parts of your model, for example, you could make all of your wall and roof entities different groups, associate layers with those groups, and then hide those layers so as to display just the floor plan in the model. To control the visibility of layers:

1.   In SketchUp open the "Window" menu.
2.   Click "Layers."
3.   Click the check box in the "Visible" column: when it has a check mark, the layer is visible, otherwise it will be hidden.

TEXTURES AND MATERIALS

5.9   Ensure base material colours are used to represent the object's real world colour.

5.10   NOTE: If special treatments are to be applied to building facades, it is recommended to include these in the model submission to assist with the planning process.

Photo Facades

5.11   Photo facades have been applied within the States 3D model within area level 2 (see appendix C) and this provides greater context when assessing applications. All Models submitted outside of this area will need to include photo facades for all neighbouring buildings. A user guide on how to capture façade photos in your model is outlined in appendices A & B of this document.

Texture Format

5.12   This is an important element of the model and textures should adhere to the following rules;

- use only .JPEG images for texture materials

- textures should be have one or more combinations of the following pixel size;
  - 128, 256, 512,1024.

5.13   You can do this in PhotoShop or some other image editor to resize your chosen texture image to the closest fit dimension.

5.14   Texture names should be 8 characters or less and not contain any special characters

Face orientation.

5.15   Faces need to be properly oriented towards the viewer. You can check the orientation of the face by switching to monochrome mode (View→Face Style→*Monochrome*); tan faces are oriented correctly and blue/grey faces need to be reversed. In order to reverse a face, right click on it and select "Reverse Face".

FILE FORMAT

5.16   Models submitted are to be optimised for efficiency in real-time visualisation. NOTE interior detail is not required and should not form part of any submitted model.

- Trimble SketchUp (.SKP) is the preferred format.

- .FBX or Collada (.DAE) formats are also supported.

5.17   The States of Jersey 3D model has been compiled in Trimble Sketchup, as it is a platform which most architects are familiar with. It is also relatively easy to use and a standard license for the software can be downloaded for free from http://sketchup.google.com/

5.18   All 3D models should therefore be submitted with a Sketchup model of the proposal. There are a number of simple guidelines which should be followed to ensure that submitted models conform to a set standards thus ensuring consistency in model quality and format. The guidelines assume you have a working knowledge of Sketchup or that you can call upon the services of somebody who does. The Department of the Environment can provide a list of recommended suppliers.

File Size

5.19   File size is important. Care should be given to the number of polygons and the size of model textures. There is no need to use very detailed high polygon (1000+) models of window frames or door handles. This will severely reduce the performance handling of the model. A suitably detailed representation of the structural elements of a building should be possible for no more than a few hundred polygons. Particular attention should be given to curved surfaces where a lot of polygon detail can be unnecessarily added.

File Name

5.20   Named according to street address or site name and model type/level.

6   POSITIONING MODEL AT REAL WORLD COORDINATES

6.1   If you have not created your building model in the Sketchup file provided by the planning office or created it in a third party package and have imported the model into Sketchup, your model will probably be located in what is called 'local space', close to the 3D scene origin and not located at real world Jersey coordinates. All models must be supplied in real world coordinates, to facilitate the accurate placement of the proposed building or development in to the existing 3D base model. We will now show you how to accurately place local spaced buildings in to a real world spaced Sketchup model, using a proposed building for Val Plaisant as an example.

Figure 6.1

6.2   Include one or more existing buildings that will be unchanged in to your local spaced Sketchup file with your proposed building, as reference buildings. Below in figure 3.3 we can see the locally positioned proposed new building highlighted with a black box and existing reference building highlighted in red.
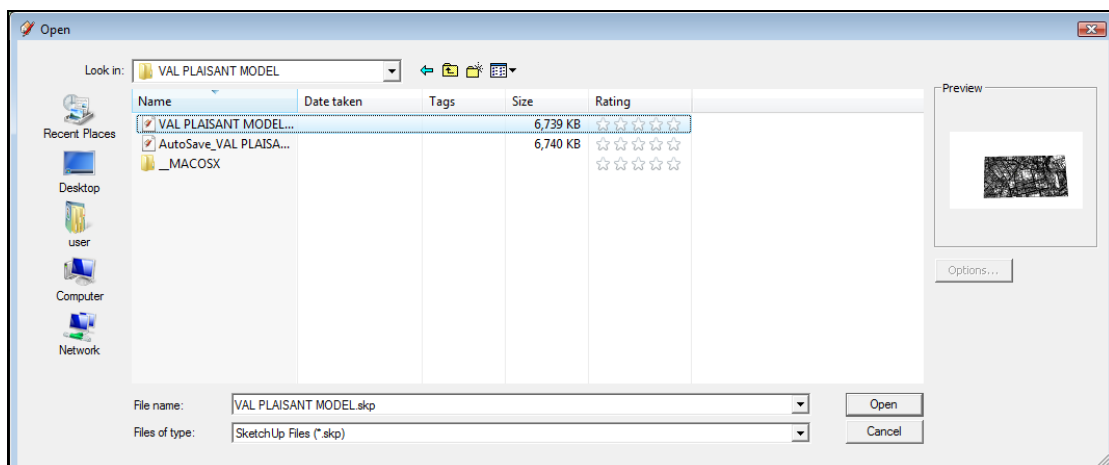

Figure 6.2

6.3   Next open the real world existing building model Sketchup file provided and locate the area where we wish to position the new proposed building along with reference building, this can be seen in figure 3.4 below, highlighted with a red box.
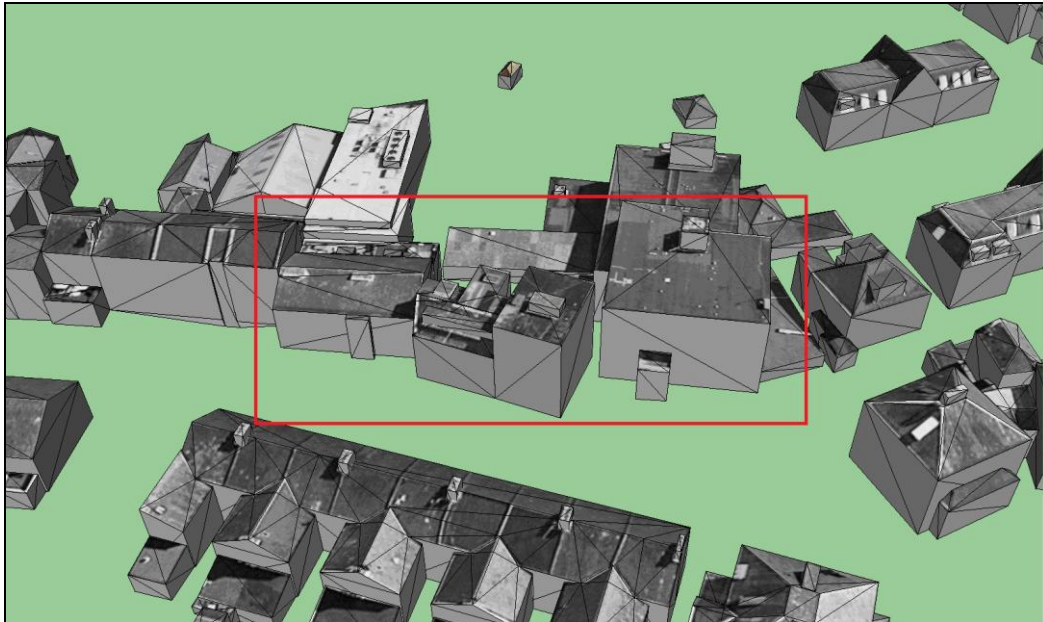

Figure 36.3

6.4   Select "File/Import/3d model" navigate to file destination of locally positioned proposed building and select open. Place this model into an empty space close to area highlighted in red in figure 3.4 with a single click.
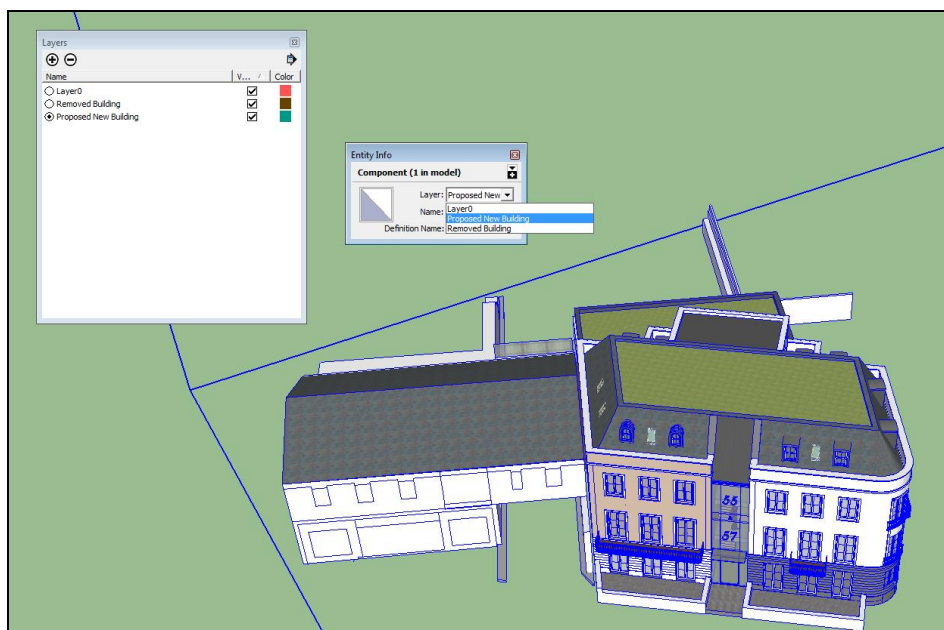

Figure 6.5

6.5   We will now use layers so that once we position the proposed building at real world coordinates we can toggle it off and on. To do this select "Window/layers", the following dialogue box will be displayed (Figure 3.6). By default there will only be one layer "Layer0". Create two new layers by clicking the add layer button seen below. I named the two new layers "Removed

Building" and "Proposed New Building". We must now assign the Val Plaisant model to "Proposed New Building" Layer.
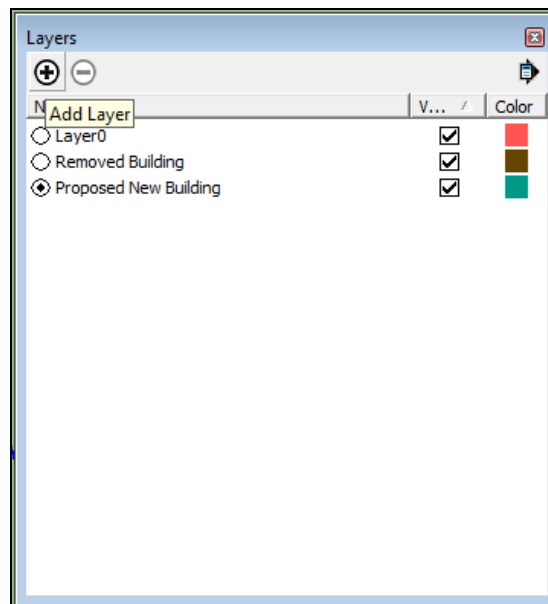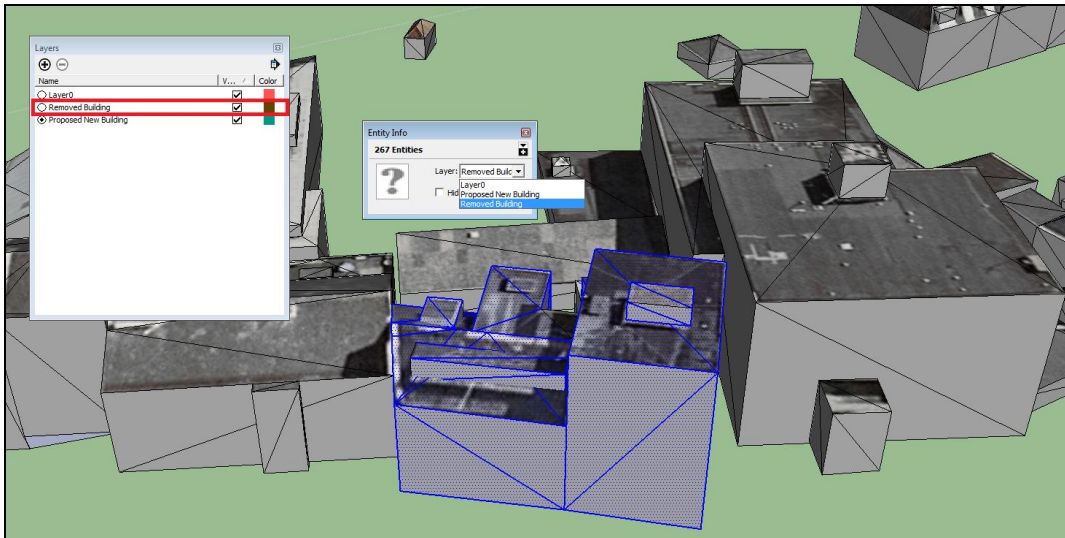

Figure 6.5

6.6   This is achieved by right clicking the Val Plaisant model, Selecting "Entity Info". This will open the entity info dialogue box, click the "Layers" drop down menu and select the proposed new building layer. Close the dialogue box. The Val Plaisant model is now assigned to the "Proposed new Building" layer. This can be seen in figure 3.7.
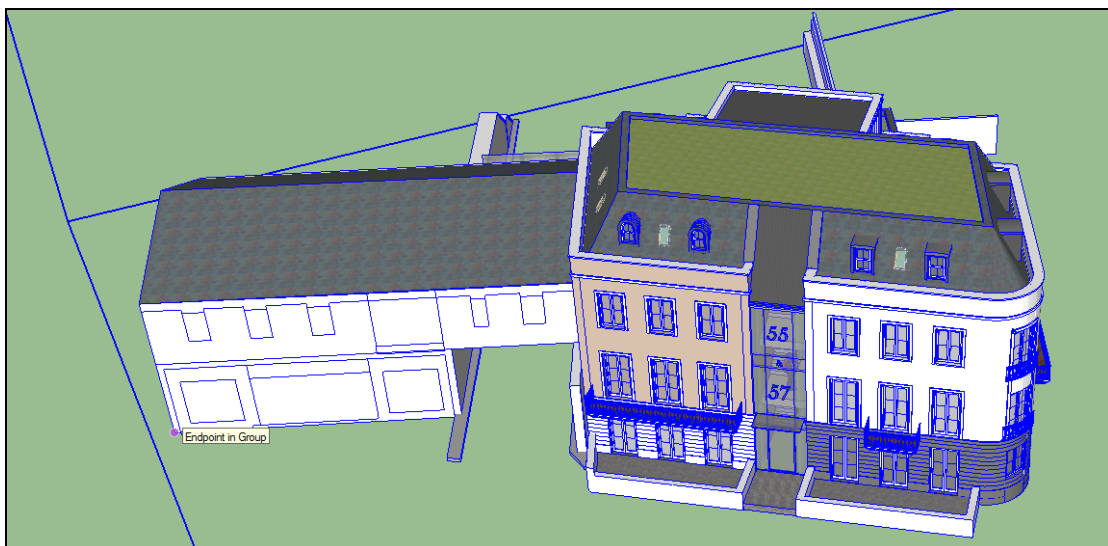

Figure 6.6

6.7   The same must be done to the building that is going to be replaced by our Val Plaisant model. Press the space bar to select the "Select" tool. Select the building by holding CTRL and click all the faces that make up the building.

Note: Orbit tool (click and hold scroll wheel) will need to be used to make sure all building faces are selected. Next right click the selected building and select "Entity Info" inside the entity info dialogue box, select "Removed building" from Layer drop down box, and then close Entity info. Note: to make sure that all faces/edges have been selected, after building has been assigned to "Removed building" layer toggle it off by clicking the tick box corresponding to the "Removed building" layer listed in the "Layers" tab (highlighted with red rectangle in figure 3.8). When layer is turned off, if there are any edges/faces that belong to the building that were missed in the assigning to "Removed Building" layer process, as before select them, right click, entity info, select "Removed building" layer from Layers drop down menu.
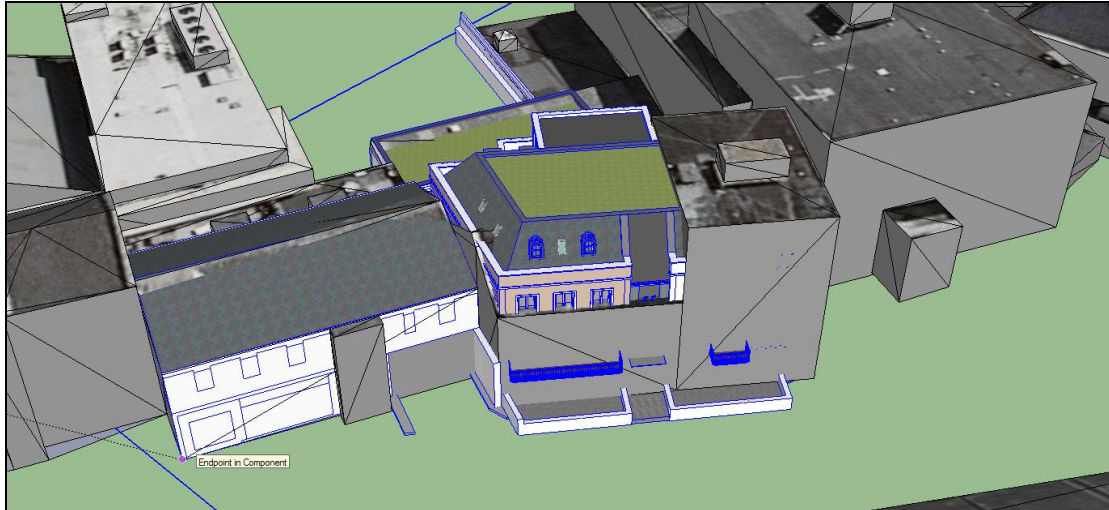

Figure 6.7

6.8   We now need to position the Val Plaisant model at its correct real world coordinates. Press "M" to select the move tool. Using this tool, single click a prominent corner of an existing reference building. Below in figure 3.9, I have selected the bottom corner of an existing building on the left hand side. This is highlighted by a purple circle and the words "Endpoint in group".
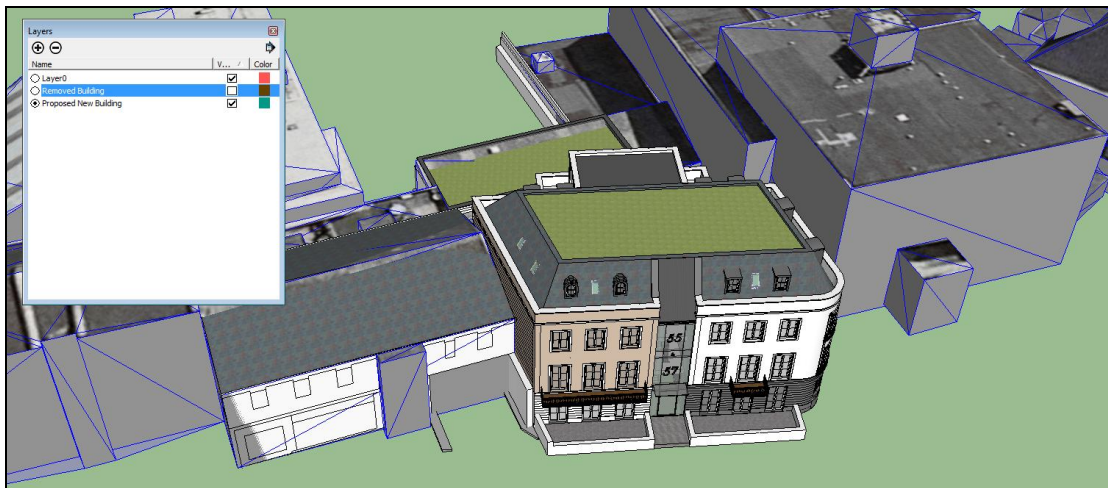
Figure 6.8

6.9   Now that the model above is locked to the curser, use zoom (scroll wheel)/pan (shift + scroll wheel)/orbit to locate the corresponding building corner in the real world existing building model provided. Hover curser over this point, the word "Endpoint in Component" should appear, finally single click this point.

Figure 6.9

6.10   Our Proposed Val Plaisant model is now position at its real world coordinates and can be toggles on and off by ticking or un-ticking the "Proposed New Building" tickbox in the Layers tab. The same can be done for the existing building that we assigned to the "Removed Building layer"

Figure 6.10

Select "File/Save as" and save as a new Sketchup file.

7.   <u>EXPORTING 3D MODELS</u>

7.1   As part of the presentation of a given planning application scheme, the Department will need up to 3 models;

1. **a model of the 'existing as built' environment (if within the States of Jersey model area boundary this will not be needed)**

2. **a 'vacant' model of the site with all existing site buildings removed and levels re-modelled to match proposed scheme**

3. **a model of the proposed scheme positioned correctly within the site.**

FBX and .3ds formats

7.1   As well as a supplying your Sketchup Model to the planning office, the same model should be supplied in .fbx and .3ds formats to allow the model be viewed in other 3D applications. Before exporting the Sketchup file to these formats the model should first be merged in to one component. To do this, perform the following steps;

1.   Select every component in the Sketchup model, right click and select explode.

2.   Repeat this until there are no components left in the model.

3.   Select all (CTRL + A) and right click the model, select "Make Component".

4.   Give the component a name and click Create.

7.2   Instead of a model consisting of a number of separate components, this process sets the model as a single component. This make the model much easier and efficient to work with once imported into unity.

7.4   To export your Sketchup file to .3ds and .fbx formats, please note you will require the Pro Version of Sketchup.
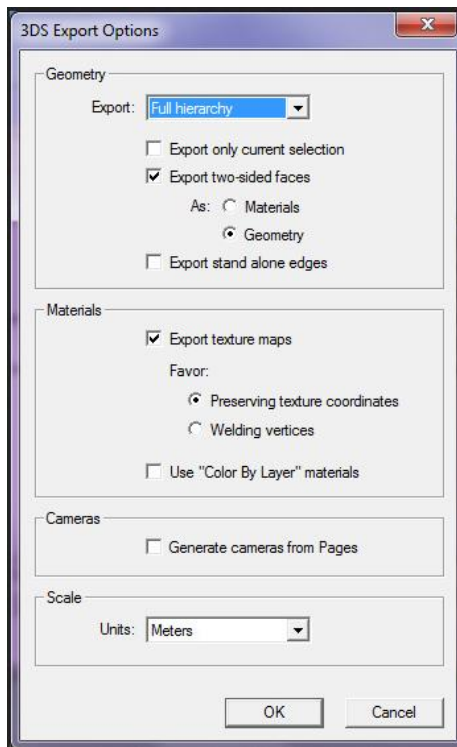
7.5   To export a Sketchup model as an FBX file select "File/ export 3d model", select .fbx as export type, inside export options select the following options:

Figure 7.0

3ds format

7.6   To export a Sketchup model as 3ds file select "File/ export 3d model", select 3ds as export type, inside export options select the following:

Figure 7.1

8.   **CONFORMANCE**

8.1   It is the applicant's responsibility that the model is complete and represents the proposed development accurately. Best practice modelling techniques and layering standards should also be applied.

8.2   The Department reserves the right to reject the model if it does not conform to the above standards, which may lead delay the determination of the application. The Mapping Service will make all efforts to incorporate the submitted model into the States of Jersey 3D Model.

8.3   If the model cannot be supplied in the above mentioned standard the applicant must seek the services of an organization that can ensure that their model conforms to the States of Jersey model.

9   MODEL SUBMISSION

As part of the presentation of a given planning application scheme, the Department will need;

1. a model of the 'existing as built' environment (if within the states of Jersey model area boundary this will not be needed)

2. a model of the site with all existing site buildings removed and levels re-modelled to match proposed scheme

3. **a model of the proposed scheme positioned correctly within the site.**

Models will be submitted at the same time as the full planning application being received by the Department and subject to the terms of submission in appendix D. Failure to submit a model within this timeframe will delay the application being determined.

Before submitting the digital model, please take the time to complete the checklist to ensure that all requested information has been provided;

GENERAL MODEL DETAILS	
Models Scaled at 1:1	
No line features to be included – polygons and components only	
EXISTING (AS BUILT) MODEL	
A mass outline of the main building envelope, including roof shape and basic exterior design (if outside the States of Jersey model area)	
Proposed site cleared of existing buildings and terrain amended to reflect proposed scheme details (if relevant)	
Photo textures of context 3d building models (if outside of Level detail 2 of the states of Jersey 3d model	
PROPOSED DETAILED BUILDING MODEL	
Ground level detail deemed to be of major design significance such as doors, access and awnings	
General detail of shop front design (ie. Areas of glazing and doors) if applicable	
Elevation detail for all elevations including sides and rear: - Solid to void and opening relationships, glazing, mullion and transoms - Balcony elements such as balustrades, detail of any protrusions or indents to façade and any expression of structure.	
Floor surface perimeter positioned at calculated floor level for each floor	
Roof detail including pitch, plant enclosures, service and fire stair protrusions, terraces, shade and signage structures	
External features of significance, e.g. landscaping planter boxes, canopies	
If there are significant changes to the existing site levels (ground level contour), the model should include the amended site levels as part of the model itself	
MODEL EXPORT SPECIFICATIONS	
Preferred format: .SKP (.DAE) & .FBX formats are also supported)	
textures should have combinations of the following pixel sizes; 128, 256,512,1024	
Recommended file type: .JPG	
Named according to street address or site name and model type/level	

10   HOW WILL THE MODEL BE USED?

10.1   The States of Jersey Environment Department has developed 3d modelling software to realistically view and analyse proposed schemes.
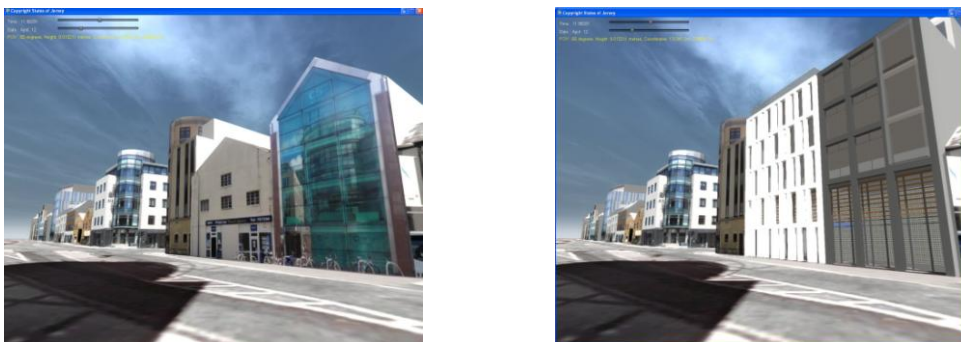

Figure 10.1 – 3D Model Player

10.2   The software is based upon the UNITY platform, which is extensively used by the gaming industry, and enables a number of variables to be input into the model such as sun angles and shadowing.

Figure 10.2 – Adjusting sun angles by Time of year/day

10.3   The 3d model player also enable proposed schemes to be 'switched on' and switched off' in order to see their potential impact.

Figure 10.3 – Viewing existing and proposed scenes

10.4   Web enabled 3d model player files will be made freely available for use on the States of Jersey web site, in order for the public to view 3d models. More detailed executable 3D player files will be available for viewing at the Environment Department, South Hill offices, or for purchase in both PC and Mac formats.

11   <u>WHAT IS THE FEE?</u>

11.1   The States of Jersey 3D and associated terrain models are provided freely to all existing States of Jersey mapping licence holders.

11.2   For those applicants that do not hold a current mapping license with the States of Jersey, the Department requires the payment of a mapping license fee to access the States of Jersey data required to input the proposed development into the 3D model.

11.3   If a modification is made to the application which alters the external appearance of the building or significantly alters the external appearance of the building once it is submitted with the Department, a new model will be required but no additional fee applied.

11.4   The fees for mapping data are listed in the current mapping <u>fee schedule</u> on the States of Jersey web site[3].

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[3] http://govje/PlanningBuilding/JerseyMappingService/Pages/PriceList.aspx

APPENDIX A - Street Photography Guidelines for Texturing 3D Model

Here is a list of simple guidelines to help get the best photography for your city model.

1. Use a minimum 7megapixal camera. A compact camera is fine but if you have a digital SLR camera, this is even better as it will be allow you to get wider angled shots for tall buildings in narrow streets and has less image distortion than compact cameras
2. Stand back and zoom in. Always stand as far away as possible from the building in question

Figure 1: Stand back and zoom

3. Lighting Considerations. If possible, photograph north facing facades on cloudy days. The shadows associated with bright days are often too severe to lend themselves to effective photo textures for 3D city models. Photographing south facing facades on bright sunny days is fine and can help in adding depth to models as the shadows associated with. If shadows on a building are not an issue and its simply a matter of strong background light, then you should overexpose a shot facing in to the sun, to brighten the façade.
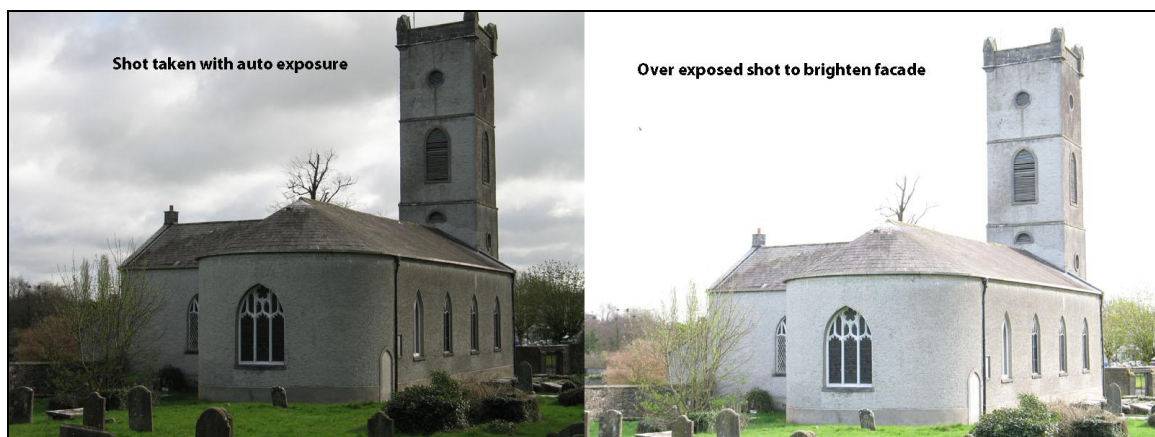

Figure 2: Adjust exposure

4. Large buildings and obstacles. Although its preferable to photograph a building straight on, this is not always possible. The building may be too large and the street too narrow to get within the field of view of the camera standing directly in front of the building. In this case move to one side or the other until the building does fit in to view. Beyond 45 degrees from the building it is preferable to split the building in to a lower image and an upper image, as the resulting image may become too oblique to create a satisfactory texture from. Streets are full of obstacles such as cars, trees, lamp posts and people. These should be avoided as much as possible as they obscure buildings and their inclusion will lower the quality of a textured 3d model. Photographing buildings at an angle can get around most obstacles. Parked cars can be hard to avoid and in busy city centre areas it may be preferable to take photography when the streets are at their quietest, e.g. Sunday morning.

Figure 3: Stand to the side and adjust camera orientation until façade fits within camera view
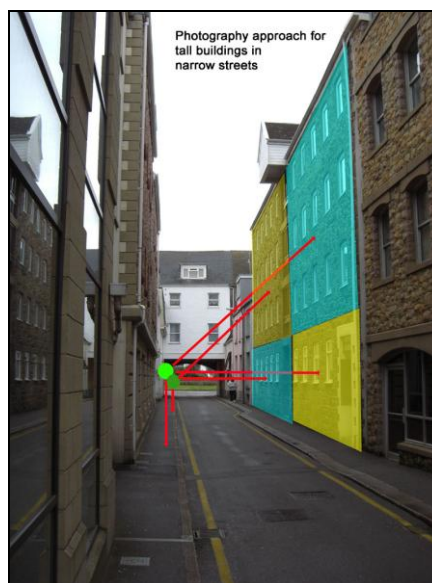
Figure 4: Split building façade in to contagious sections. If these sections do not fit in to the field of view in your camera, then stand slightly to one side until they do.

An important thing to note when taking multiple photos of the same building façade is that you will see differences in the façade colour in photos taken using auto exposure. This is because the scene composition changes between each photo, particularly if one photo includes sky and the other does not

Figure 5: Variable exposure on façade when using auto exposure.

Figure 5 highlights the issue of variable exposure between multiple shots on the one building façade when using auto exposure. This effect will be most severe between shots which include some bright sky in the scene and those which do not have any sky. This is the case in Figure 5 above.

The process of taking a photo is a two step process within the camera. When you depress the shoot button half way down you will hear an adjustment of the lense within the camera. This is the camera assessing the scene and choosing the appropriate exposure. Two numbers should appear in your view finder before you press the shoot button all the way down to take the photo. These are the aperture and shutter speed. When taking multiple shots of a building with a regular façade such as figure 5 follow these steps;
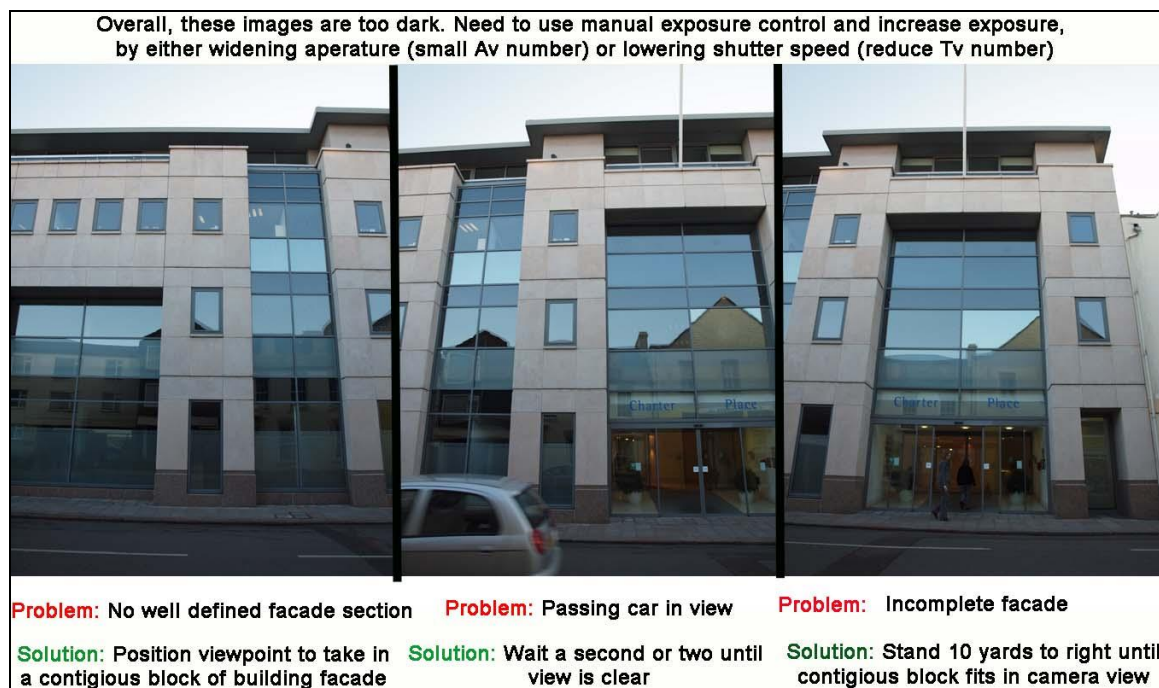
1. Using the auto mode in the camera, frame your first picture in the view finder and depress the shoot button half way down. Take a mental note of the two numbers (Av and Tv) you see in the viewfinder.

2. Depress the shoot button all the way down to take the photo. Review the photo in the LCD display using the playback function on your camera.

3. If you are happy with the photo taken in terms of general exposure of the façade, then adjust your camera to manual (M) or Program (P) model. Depending on what type of camera you have, these modes allow you to manually set the Aperture (Av) and Shutter speed (Tv). Choose the same numbers as you saw on the screen when taking your first shot in auto mode. By doing this, every subsequent façade you take will have the same exposure. This exposure might be sufficient for most if not all façade photos, but

changes in the lighting conditions of the day or very or dark or bright streets will force you to adjust this.

You should constantly review all your photos to insure they are appropriately exposed and as consistent as possible with the exposure of adjacent buildings

Standing a little to the left would remove the truck from the facade

Figure A.6: Adjust viewpoint to avoid obstacles and achieve a 'clean' façade image

Overall, these images are too dark. Need to use manual exposure control and increase exposure, by either widening aperature (small Av number) or lowering shutter speed (reduce Tv number)

Problem: No well defined facade section

Solution: Position viewpoint to take in a contigious block of building facade

Problem: Passing car in view

Solution: Wait a second or two until view is clear

Problem: Incomplete facade

Solution: Stand 10 yards to right until contigious block fits in camera view

Figure A.7: Positioning and exposure issues

APPENDIX B - Applying Textures to the 3D Model

We will use a building located on Saville Street, St Helier as an example.
Preparation of textures for placement on building facades involves two steps;

1. Image crop and perspective correction
2. Image size optimisation.

When creating textures it is best to keep their dimensions in pixels to the power of 128. This is a common practice when modelling for game technology and allows for more efficient compression. Pixel dimensions suitable are 128, 256, 512 and 1024, use a combination of these when sizing an image (e.g. 256 *512).
First use the crop tool in Photoshop. Make sure the "perspective" option is selected (highlighted with red box below). To select an area to be cropped, just click and drag in your image. When you let go, the crop marquee will appear. Now you can edit your selection before committing to the crop by clicking and dragging any of the corners or edges highlighted in green below. Once happy with cropped section press enter to apply changes to image.

Resize the new cropped street photography tile to optimal dimensions, in this case (512 * 512). Holding Ctrl + Alt and pressing inside Photoshop will display "Image Size" options.
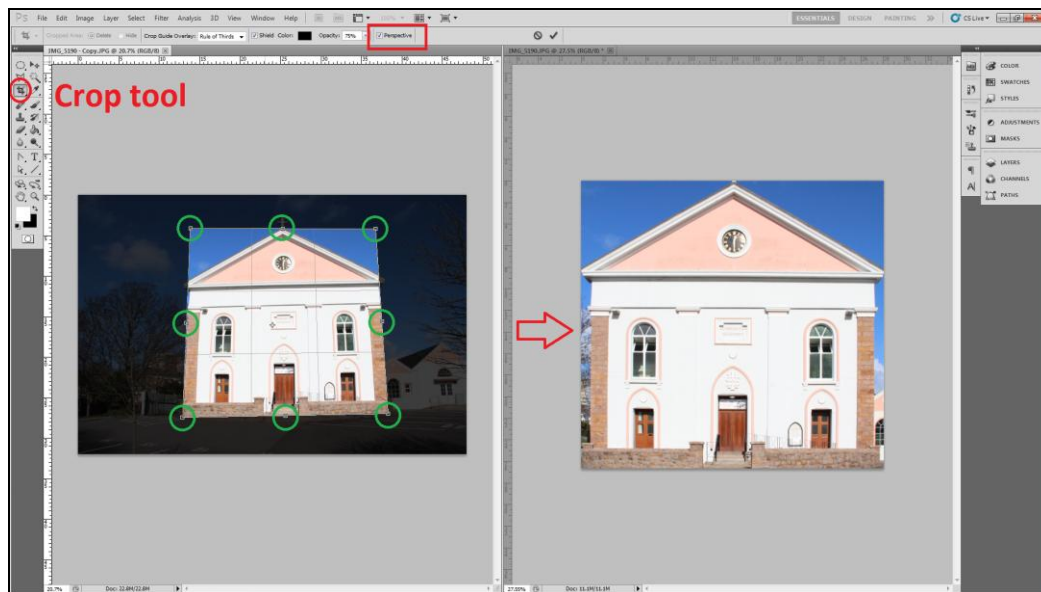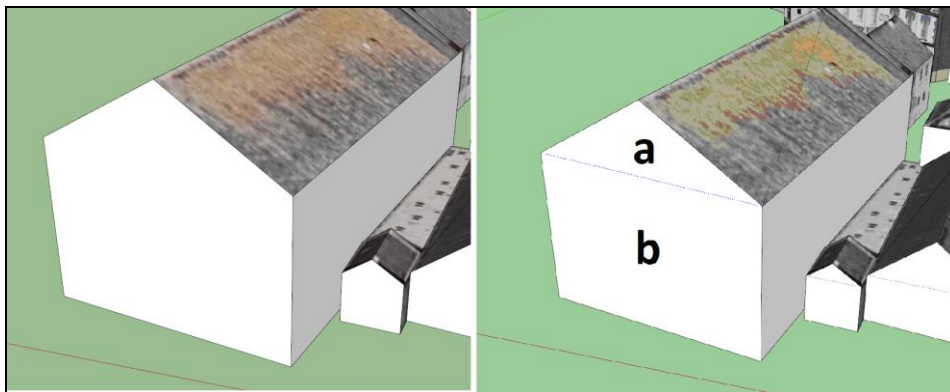

Figure B.1

Façade Texturing - Flat surfaces

SketchUp "components" are groups of geometry (edges and faces) in SketchUp. Single clicking the building will display a blue rectangle highlighting the selected component. Before applying a texture to a facade you must double click inside the component, making it editable and selecting the face you wish to texture.
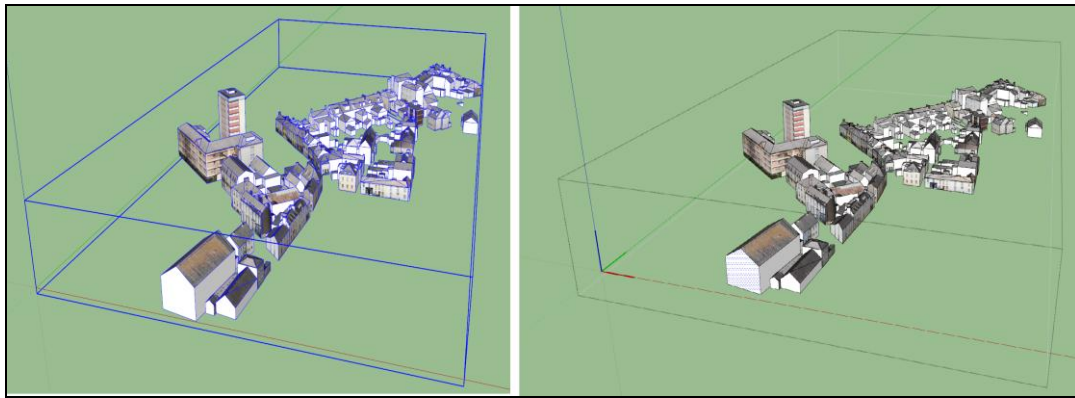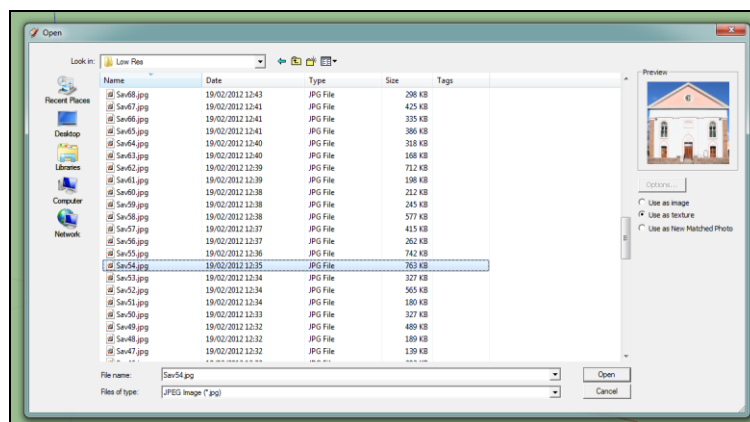
Figure B.2

Hidden geometry can be displayed by selecting "View" and ticking the "hidden Geometry" option. Below we see the same building face with Hidden Geometry turned off on the left and turned on, on the right. When hidden geometry is turned on we can see that this front face is actually two separate polygons, a and b, each of which will need to be textured separately.
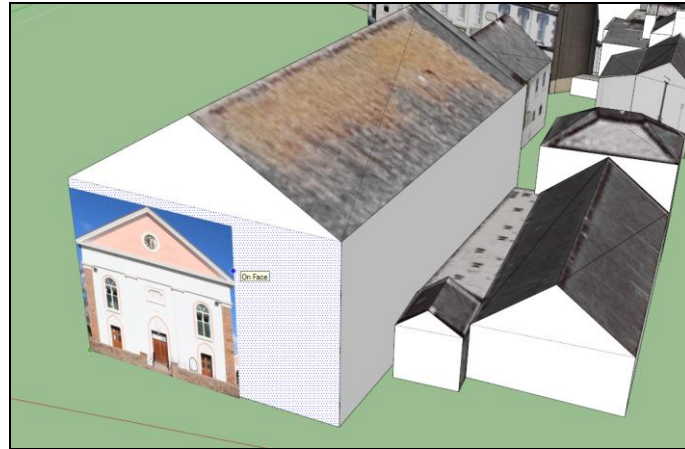

Figure B.3

To import texture tiles into Sketchup, select "File/Import", make sure the "use as texture" option is selected.

Figure B.4

Once imported, place the texture using a single click on the bottom right corner of the building, and dragging the curser towards the top left corner. Pressing enter will then apply the texture.
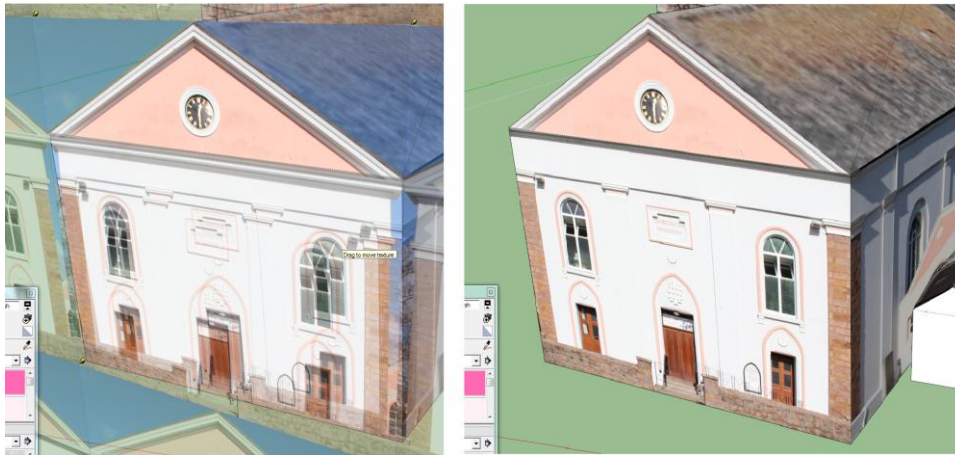

Figure B.5

Right click the texture and select "Texture/ Position". This will allow you to adjust/ scale/position the texture. Once in positioning mode, make sure that "fixed pins" is not active by right clicking the texture again and un-checking the fixed pins option:
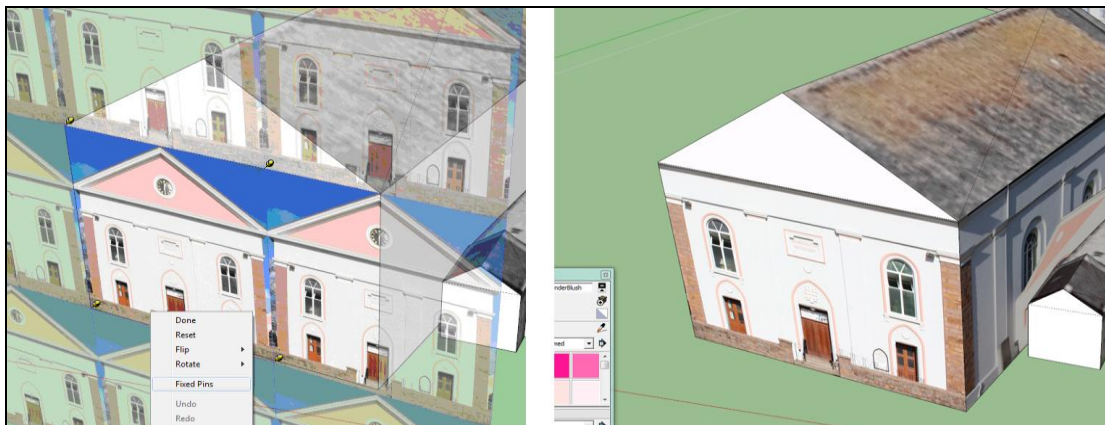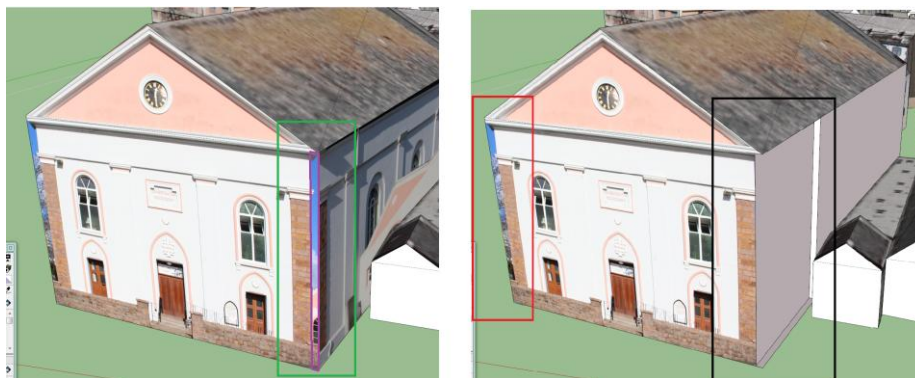

Figure B.6

Click and drag any of the four corner pins and stretch the texture to its correct position. To pan the texture, click and drag. To exit texture positioning mode, press enter or right click and select done. The same texture should then be applied using the same method to the triangular section "A". However since the building extends from the eaves of the roof the position of the texture will have to be adjusted accordingly to make up for these inaccuracies in the model.

Figure B.7

The final result can be seen on the right in Figure 3.7 above. Alternatively this building can be textured by taking the same original street image and cropping two separate textures, one for area "A" and another for area "B". These separate textures, again should be placed using the same steps as outlined above.

To correct inaccuracies like this in the model, buildings can be adjusted, in this case, by using the rectangle tool (shortcut key R) and the Push/Pull tool (shortcut key P). In figure 3.8 below I have applied the same texture in the same position to both sections A and B of this building model. However you can see on the left, highlighted in green there is a slight error in the model. The texture does not fully cover the building face and the sky is visible in the background. To correct this, I selected the rectangle tool and drew a rectangle on the building face (highlighted in purple. Use the push/pull too to remove this section highlighted in black on the right. The same process can be applied on the other side of the building.
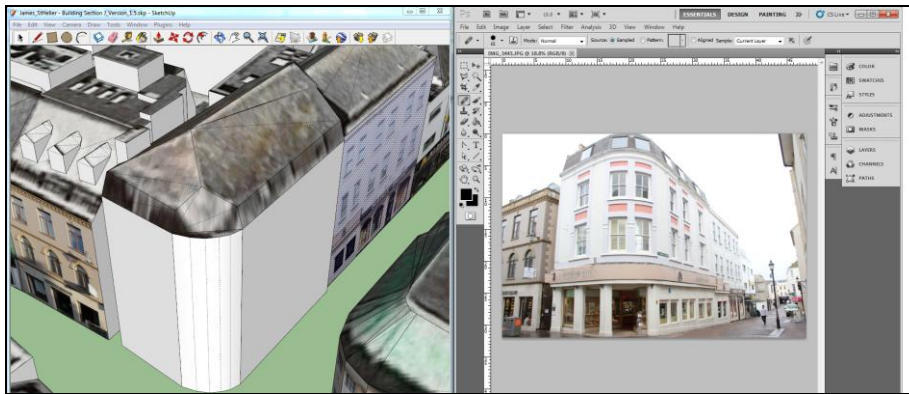

Figure B.8

Curved Surfaces

To texture rounded facades we use projected textures. The following YouTube tutorial explains the concept of Projected textures:
http://www.youtube.com/watch?v=HHsRRLCAOm8

Below we see an un-textured building located on Queen Street, St Helier. With hidden geometry visible we can see that the rounded corner of this building has five

separate polygons. The first step is to crop out the rounded section from the original street photography in Photoshop.
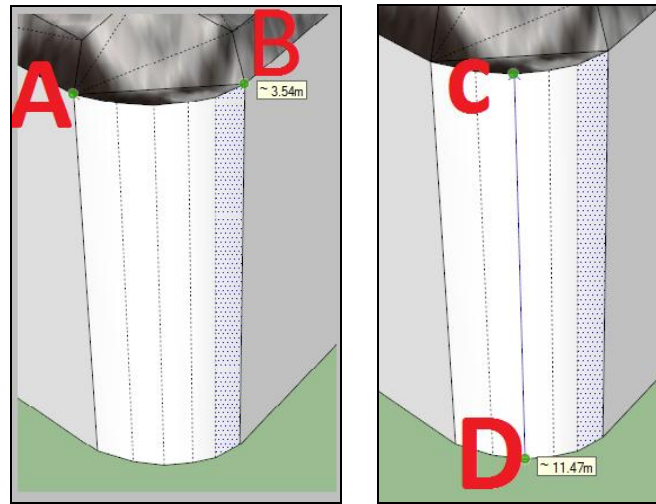

Figure B.9

Once the rounded corner has been cropped we need to use to "rectangular marquee too (m)" and a number of "skew transforms (Edit/Transform/ Skew)" to correct/ straighten the roof and base of the building. Below, from left to right, we see the original cropped tile, the marquee tool + skew transform being applied to one half of the building, and finally, after a number of skew transforms, the resulting flat roof.
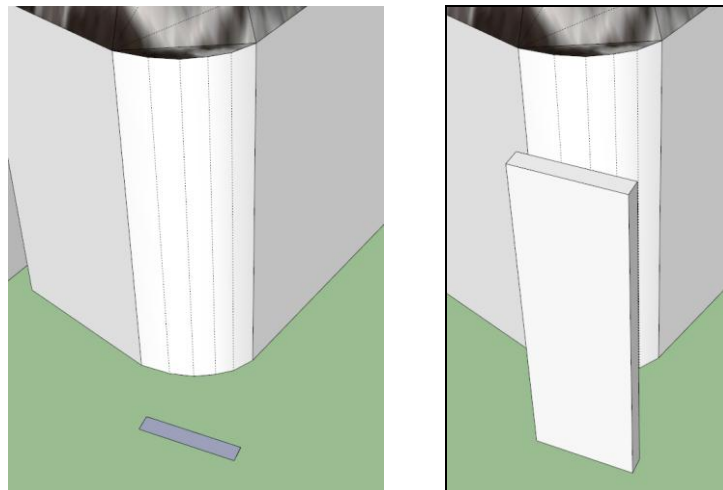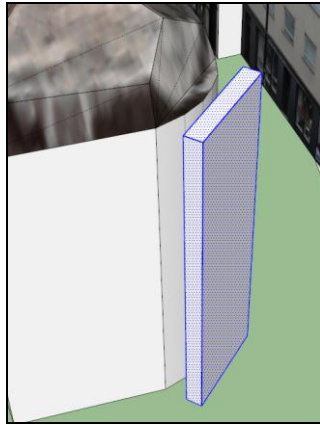

Figure B.10

Inside sketchup we must now create a flat surface, the same width and height as the rounded corner we wish to texture. First select the tape tool by pressing "T". Single click the top left corner (A) and move the curser to the far right corner (B) . Doing this will display green circles to highlight the two points and display the distance between them, in this case 3.54 m. The same method should be use to find the height of the rounded surface (the distance between C and D, 11.47m)
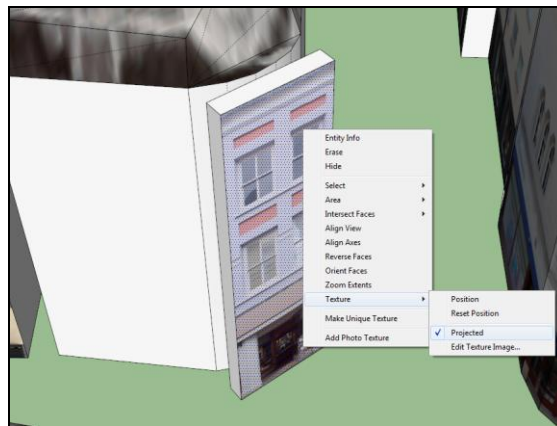
Figure B.11

Next Select the rectangle tool by pressing "R". Create a rectangle beside the base of the building (single click, drag curser), to set the width of the rectangle, simply type 3.54 and press enter. Now we need to adjust the height of the rectangle, to do this first select the "Push/Pull" tool (shortcut key P). Single click the rectangle previously created and move the curser upwards. Again to set the correct height, key in the previously measured height (in this case 11.47) and press enter.

Figure B.12

This rectangle must now be positioned directly in front of the curved corner . A combination of the rotate tool (Q) and move tool (M) should be used. Before using these tools the entire rectangle must be selected. This is done by triple clicking any face of the rectangle. Triple clicking an object will display every surface/edge connected to that object in blue.
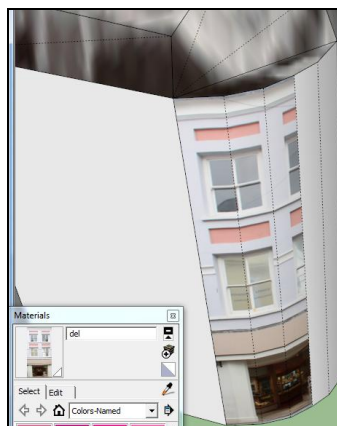
Figure B.13

The texture must now be applied to the front face of this rectangle and positioned correctly by adjusting the four corner pins (described previously). Right click the texture and select "projected".

Figure B.14

Select the "paint bucket" tool by pressing B. Take a sample of the texture by holding ALT and clicking the building texture. Once a sample is taken, triple click the rectangle and delete it. Use the paint bucket to fill in the five faces that make up this curved corner.

If the texture is not lining up correctly, undo the moves (Ctrl + Z) until the rectangle reappears. Reposition, take another sample using the bucket tool and reapply to corner building.

Figure B.15

APPENDIX C – Current Model Areas
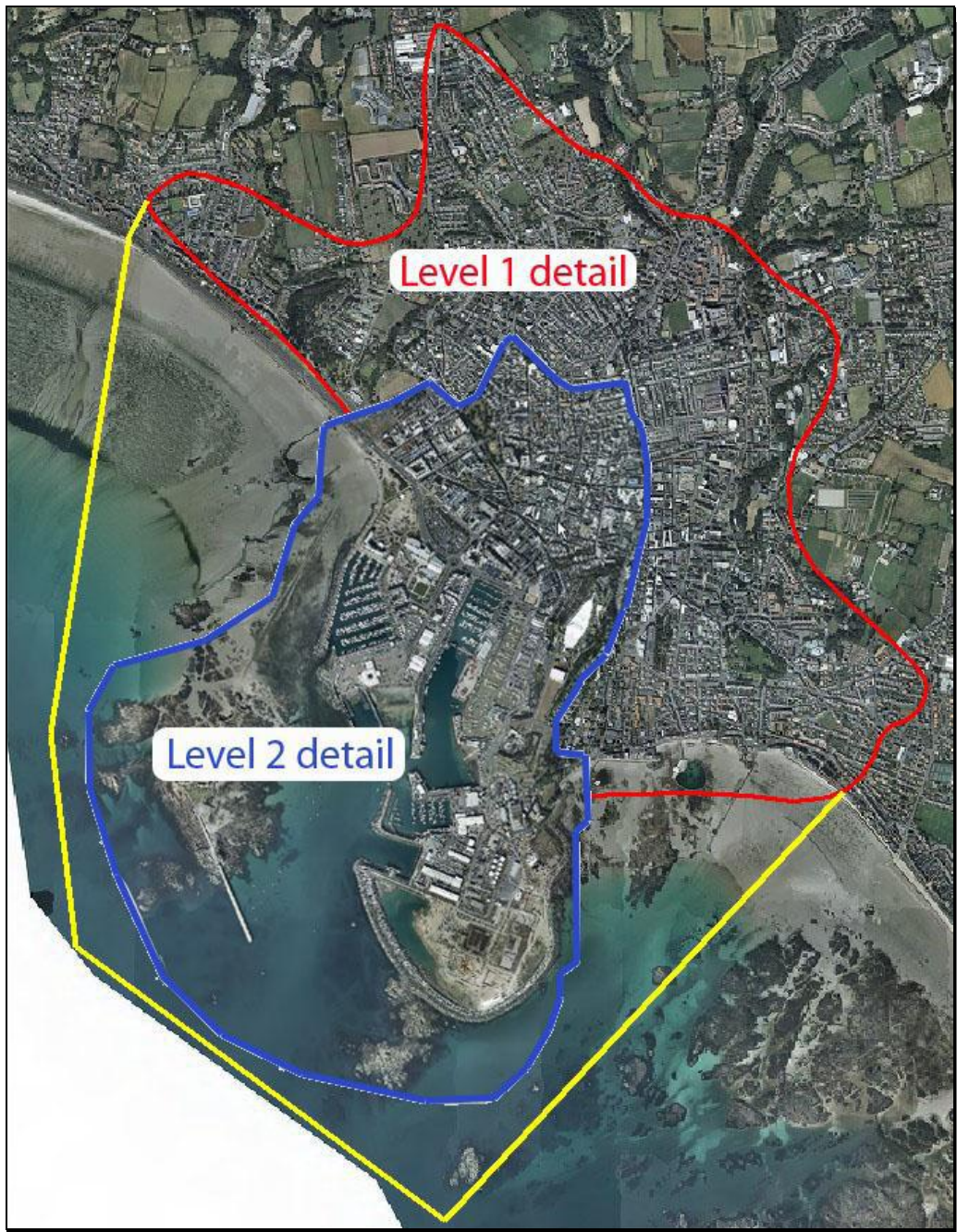

Figure C1 - St Helier Model

- **Level 1 Detail - building blocks with roof textures applied from air photography.**

+

- **Level 2 Detail - building with façade textures applied from street photography.**

In addition to the St Helier model, a model also exists of the airport and surrounding buildings, as depicted n figure C2

Figure C2 - The Airport Model

The extent of the States of Jersey model will increase over time, and so it is recommended that potential users contact the Department prior to embarking upon any 3d model development outside of these areas, as 3d model data may already be available.

APPENDIX D – Terms of submission

Licence

Where plans are provided in support of an application for planning permission and building bye-law consent, the applicant is taken to have authority to allow the States of Jersey Department of the Environment to copy and take extracts of those plans for the purpose of considering the application.

Digital management

The States of Jersey Department of the Environment hosts a 3D model of Jersey and asks an applicant seeking planning permission to provide a 3D model in electronic format, where the development proposal meets the thresholds set out in this guidance.

The Applicant should then ensure that an electronic edition matches the application plans, and take reasonable steps to ensure the electronic edition is free of viruses or other harmful elements. If the plans later change, updated electronic editions of the model will be required.

The States of Jersey Department of the Environment will incorporate the plans in the 3D model, which will be able to be accessed by the States of Jersey Department of the Environment and also (via the Internet) by members of the public for viewing.

Ownership

All intellectual property rights, including the copyright, in the 3D Model remains the property of the States of Jersey at all times.

An architect or other drafter of building plans may hold copyright / moral rights in those plans. The Applicant is taken to have requisite consents for the use of those plans as contemplated above, and to agree to indemnify the States of Jersey Department of the Environment against all losses, expenses, damages and costs resulting from any lack of such consents.

In the future, the States of Jersey Department of the Environment may also licence the use the 3D model or information it contains to third parties.

Licence

The States of Jersey Department of the Environment provides a licence to use the 3D Model for non-commercial use or for the purpose of preparing and submitting an application to submit to the States of Jersey Department of the Environment.

The Copyright Owner grants the States of Jersey Department of the Environment a perpetual, irrevocable, royalty-free licence which allows the States of Jersey Department of the Environment to:

- Use the Applicant's Model and Applicant's Drawings (or extracts of these) without charge as the States of Jersey deems necessary, including without limitation for the purpose of considering the application;

- Incorporate the applicant's model into the States of Jersey 3D Model. This includes permitting the States of Jersey to use and license the applicant's model as part of the States of Jersey 3D Model.

Liability

The 3d Model is provided for public information purposes only. Each applicant should not rely upon any information in the 3d Model without obtaining the specific advice of a qualified architect, planner or other professional as applicable.

The 3d Model is provided 'as is'. No claim is made as to the accuracy or completeness of the 3d Model. The Minister for Planning and Environment and the Department endeavour to ensure that content provided in the 3d Model is complete, accurate and up-to-date and does not contain errors and omissions, but provide no warranty that this will be the case or that access to the 3d Model will always be uninterrupted, timely or secure.

The Minister for Planning and Environment excludes to the extent lawfully permitted all liability for any loss or damage of whatever kind (including consequential or incidental damage) and however arising (including due to negligence) that may be suffered, directly or indirectly, in connection with use of the 3d Model.

In this section, "Minister for Planning and Environment" includes any Departmental staff, representatives, agents, contractors and employees.

<u>USEFUL LINKS</u>

          <u>http://www.realsim.ie/home</u>

          <u>http://www.fugro-bks.com/</u>

          <u>http://sketchup.google.com/3D warehouse/</u>

<u>FURTHER INFORMATION</u>

If you have any further queries:

Visit <u>http://govje/PlanningBuilding/JerseyMappingService/Pages/StHelier3D .aspx</u>

Tel: 01534 445508

Email: <u>mapping@gov.je</u>

Or visit us at:
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Weekdays 0830 - 1700

Please note the department is not fully accessible for those with mobility difficulties. If you require assistance please call us in advance so that we can make suitable arrangements to meet you and discuss your issues.

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