

# BFME2 Map Design & Beautification Tips

This document is intended to show the philosophy and theories behind why we do what we do. Understanding the concepts in this guide will enable you to solve general problems with maps and help your maps look better, play smoother, and be more fun!

1. Size:
  - a. We usually keep our maps between 250x250 and 500x500. As maps get larger, it creates a greater strain on the older computers. On map larger than 500 x 500 the pathfinder also gets less accurate. If you want lots of people to be able to play your map, keep the map size down.
2. Pathfinding:
  - a. Make sure all choke points are no less than two and a half hordes wide
  - b. Buildings and rocks which block pathfinding should be clustered close together or separated by large gaps. Small gaps between impassable areas (mountain and map edge, rocks and building, etc.) cause pathfinding slowdown. Clearing out unnecessary blockades or tight passages can significantly improve the performance of your map.
  - c. Make sure that your major battle areas are wide and expansive to allow for the giant armies to battle on. Units on the battlefield have plenty of things to worry about, so keep conflict spots clear of unnecessary barricades.
  - d. Avoid stress cases that mess up the unit pathing. Tight ravines, mazes, cul-de-sacs, S-pathing, etc that are incredibly out of scale size-wise can be troublesome. Units need room to move around tactically and the engine performs very effectively with large open battle areas.
3. Terrain elevation:
  - a. Most terrain should be flat to allow structures to be built. When terrain slope is greater than 15°, porters can not build structures.
  - b. Terrain elevation can give units a tactical advantage, choose height carefully. If one player has a lower start location, he is immediately at a disadvantage. The phrase “an uphill struggle” can be very much a reality in BFME2.
  - c. Terrain tessellation occurs when the ground is not flat. This slows down framerate and many large units, like Mumakil, have a hard time pathing over wavy terrain. So try to keep ground flat whenever possible.
  - d. In order to prevent camera issues, the terrain should start as low as possible and be built upwards instead of carving down. Unless your map needs to have deep cavernous rends in the ground (such as Rivendell), maps should start at a “Z” of around 20-30. This leaves plenty of room for oceans and rivers while leaving significant room for mountains.
  - e. In order to keep the camera from either going too high over mountains or clipping into the mountains, there should be a max mountain height of 250 without camera constraints, or max mountain height of 300 with camera

constraints set to 250. We've found that mountains that are tall for the sake of being tall are not cool—they're annoying.

#### 4. Creeps

- a. Creeps are best used when placed next to points of interest such as forests or tech structures.
- b. Resources from destroyed creeps will "pop" out. There should be plenty of cleared terrain around the creep so that these resources don't get tossed onto the side of a mountain, over a cliff, or inside some rocks.

#### 5. Tech Buildings

- a. Placing a capture flag next to a tech building is extremely easy and works automatically with a nearby tech building. Placing tech buildings too close together will cause programming conflicts among their capture flags, so keep them spaced out.
- b. Make sure you place the flag within 100 feet of the tech building. Also make sure the flag does not block units from exiting a production building like the Inn.

#### 6. Triggers

- a. Trigger areas and waypoints should use as few points as possible.
- b. Avoid placing area triggers within each other.
  - i. Be sure to give your trigger areas names that are instantly recognizable and states what exactly this trigger area covers.
  - ii. Any units that don't need to be on the map when the mission starts either get spawned in or built at their appropriate times. The less you have running in the background, the faster the mission will run.
  - iii. If you feel the need to place trigger areas inside each other (called 'Nesting') make sure you do not place more than 8 triggers inside any other trigger.

#### 7. Trees

- a. Trees should be limited to 500-600 trees maximum. Maps with lots of trees will run slower. Smaller maps should have less than 400.
- b. Each map can have no more than 14 different kinds of trees, or else there will be a memory error. It is tempting to add lots of tree types, but it is more realistic and game-friendly if you stay under the limit.

#### 8. Cliffs

- a. Cliffs shouldn't have a 'lip' on them, because lips block units' line of sight.
- b. Cliffs that face the camera can be vertical, but cliffs that face away from the camera should be more sloped so units don't get lost in the valley.

#### 9. Shadows

- a. Sunset lighting is dramatic, but it can also hamper with computer memory. Ultra High graphics use "shadow mapping" technology and is limited by pixel count. This means that the less terrain is covered by shadows, the better the shadows look. When shadows are short, they look much better.
- b. Medium graphics use "shadow volume" technology. It is hard-edged and crisp, but can easily be exploited. Shadow volumes can be very

demanding on the processor when stretched too long. So, again, shadows should be kept short whenever possible.

#### 10. An Artistic Eye

- a. Trees, rocks, grasses, etc. look best when in clumps. We never place objects randomly, which is why the maps are so artistic. Usually, 3 different object types look good together (i.e. a rock clump, a tree, and some grass)
- b. Also, when clumping props, pay attention to whether or not they have collision extents. Placing a clump of rocks that have extents in the middle of a battlefield will create pathing problems. Trees in BFME2 do not have collision extents, so these do not block pathing. To view the collision extents of a selected object, go to View>Influences>Show Bounding Box.
- c. Sinking a building or a rock cluster into the ground is usually a bad idea. It will still block the units' LOS (line of sight) even though only a small tip of the structure is showing. This is because an object's extents do not sink. So even if you think a structure looks better under the terrain, units will path around the location as if the structure was still above it.
- d. Oases of interest are good. Think of little areas like dioramas or memorable landmarks. Little islands of trees, rocks, etc in the sea of terrain.
- e. The player should be able to tell his location on the map just by looking at the game screen. A radar map shouldn't be required to get your bearings. This means that each general region of the map should have a specific "look" that is a variant on the overall theme. Example: if you were creating a city map, one area may be the city square, one might be industrial, one might be the river district, and one might be the suburbs. You do not want a large sprawl because players might get lost.
- f. Use roads or open areas to guide the player toward mission goals or the enemy's base. Also place garrisonable towers, capturable tech buildings, and creeps in central locations so the player isn't drawn toward the edge of the map.

#### 11. Passability

- a. After you've finished, you should clean up the impassables. All mountainous areas should be completely filled in with impassables. Impassability should overlap the river and cliff edges. Make sure the impassable painting is done in "blocky shapes". It is better to go for straight edges instead of creating nooks and crannies. You should also look for stray impassable cells in open areas that should be pathable. Stray impassable cells forces the pathfinder to do unnecessary work. Cleaning up the impassability can really help the pathfinding.

#### 12. Taint and Flammables

- a. The last thing we check is taintability and flammability. Extremely steep cliffs should not be able to have Elven Wood and Taint cast upon them. But give choke points and mountain bases some breathing room. You paint the taintability using the texture brush. You must set it to taintability mode.

- b. Fire can greatly influence the game. If something looks flammable, it should be painted as such. Do not paint wet beaches and rocky cliffs “Highly Flammable” because this will confuse players. Dead grass should not be “Fire Resistant”. Paint flammability logically according to the textures that are on the terrain. You paint the flammability using the texture brush. You must set it to flammability mode.