# rFactor 2 Track Creation Cheat Sheet

## RealRoad
**Instance**
- Name: RaceSurface prefix
- Deformable, HATTarget and CollTarget

**Material**
- Name: TDF prefix (e.g. road, asph, rdcp, ...)
- Name: _WET suffix
- Reflection Mapper: REFLECTEDENV

**Vertex Color**
- Unavailable (used by RealRoad technology)

## Terrain (Multi Layer grass/dirt)
**Instance**
- HATTarget and CollTarget (drivable areas)

**Material**
- Name: TDF prefix (e.g. gras, grvl, ...)

**Vertex Color**
- Black: Zero state (T1)
- Green: Mix in T2
- Red: Mix in T3
- Blue: Blend T4.A
- Alpha: Greyscale shading

## VisGroups
**Most common**
- A: Removed from High detail and lower (1)
- B: Removed from Medium detail and lower (2)
- C: Removed from Low detail (4)
- F: Removed from RearView mirror (32)
- G: Removed from Practice (64)
- H: Removed from Qualifying (128)
- I: Removed from Race (256)

Numbers are added up in the SCN Instance
Example: VisGroups C (4) and F (32) = 36

## Shadows
**Set Shadow Out Distance for optimization**

**Types**
- Object: only renders the casted shadow
- Caster: preferred type for solid objects
- Textured Caster: fences, vegetation (slower!)

**Shadow Groups:** additive A (1|Max) to D (8|Low)

SunBlocker Object, prevents glitches when sun is below horizon

## Reflection Maps
**RefMap0** – car reflections
- include terrain, barriers, buildings, and vegetation

**ReflectedEnv** – wet surface reflections
- aim to include barriers, key buildings and structures

**Static##** – non-movable CubeMap reflections
- automatically contains everything within LOD distance of specified coordinates

Include at least one instance in RefMap0 and ReflectedEnv

## Marshals
**Instance Names**
- CornerWorker_## (unbroken sequence)
- DigiFlag_## (match CornerWorker ##)
- StarterWorker_## (unbroken sequence)
- PitOfficial_## (unbroken sequence)

Distribute as group including bones
Export ungrouped distributed meshes with Fix Bone Names

## Vegetation and Crowds
**Bump Spec Map T1 Stamp Vertex / Stamp Normal (Treelines)**

**Material**
- Chroma; check Blend Pixels with XPAA OFF

**Vertex Color**
- Alpha: 99.9999
- Exporting Vertex Alpha requires Vertex Color to be set to *a* value – even (255,255,255)

Set up Screen-Aligned Quads in Exporter
Check triangulation on test export before distribution
Object Scale 100% – Reset Transform

## Animations
**Always animate at world zero (0,0,0)**

Root Bone at (0,0,0) with 0.01 weight for all vertices
Always export .anm at (0,0,0) and time index 0
Exports bones only, do not include the mesh
Select skinned mesh as Root Bone
Group skinned mesh and bones for distribution
Export ungrouped distributed meshes with Fix Bone Names

## Night Lighting
**Omni**
- Name: Nightlight##
- Lights Omni-tagged objects
- Object receives light from 20 closest omni lights

Glow object
- Name: NightLight##Glow

## Numbers are added up in the SCN Instance
Example: VisGroups C (4) and F (32) = 36
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Start Lights
Instance
- Name: StartLight
GDB
- NumStartingLights = number of lights + 1
Material
- Name: rdlta, b, c, d, e for five lights
- Animation Data
  - Name: rdl.dds
  - Frames: 2
  - Sequence example for two lights (brackets!)
    - rdlta: (0,1,1,0)
    - rdltb: (0,0,1,0)

Pit Lights
Instance
- Name: PitLightOut and/or PitLightIn
Material
- Name: rdptla, grptla, yloptla
- Animation Data
  - Name: rdlt.dds, grlt.dds, yolt.dds
  - Frames: 2
  - Sequence – don’t forget (brackets)
    - rdptla: (0,0,1)
    - grptla: (1,1,0)
    - yloptla: (0,1,0)

Timing Lines
Instance
- Names
  - XSector1, XSector2, XFinish
  - XPitOut, XPitIn
- No Render
- ColTarget
- Response
  - Sectors: VEHICLE,TIMING
  - Pit: VEHICLE,PITSTOP
Oriented in such a way that cars ‘collide’ with the polygon

NoRain Zones
Object in 3D space where rain particles are not rendered
- Box Primitive with placeholder material: 1 SubMat
Instance
- Name: NoRainZone_##
- No Render
- Export with gMotor Normals

Albedo Map
Diffuse reflectivity of material surface
Absolutely vital for correct HDR output
Basic simplified rule of thumb
- Albedo Map = Diffuse Map @ neutral, overcast sky
Extensive information
- AlbedoMap on Wiki

SunBlocker
Object
- Low poly hemisphere facing down
- Connect to edges of terrain/skybox
Instance
- Shadow Object
- Shadow Groups A+B+C+D = (15)

Typical Object Workflow (3ds Max)
Export
- Detach Smoothing Groups to Elements (MaxScript on Wiki)
- Export with gMotor Normals
- Tweak Albedo, Normal and Specular Maps and ...
  - ... check/tweak material values in gJED/Viewer
Optimization
- Atlas textures that share similar material values
- Batch objects that use share submaterials
- Set LOD Out and Shadow Out Distances
- Set VisGroups and Shadow Groups

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gMotor Viewer Keyboard Shortcuts
U: Toggle shadows
G: Toggle ground tracking
S: Cycle performance information
C: Cycle anisotropic levels
O: Toggle outlines
W: Toggle wireframe front face / all
Ctrl + T: Toggle Transparency Anti-Aliasing (XPAA)
Ctrl + +: Increase Vertical FOV
Ctrl + -: Decrease Virtual FOV
Alt + W: Hide/Show Tweak Bar interface
Alt + R: Toggle Reflection Maps
- Use T and Shift + T to cycle

http://www.rfactor.net

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More in-depth info available on http://wiki.rfactor.net