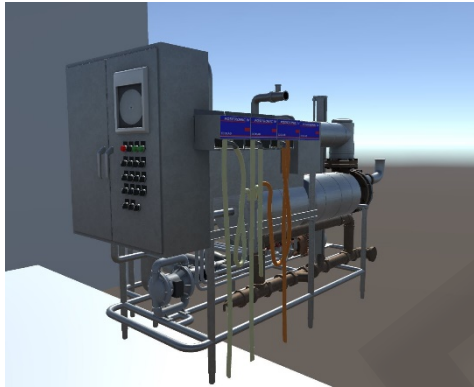


CLEAN IN PLACE (CIP) SYSTEM DRAFT MODEL DESCRIPTION DOCUMENT (MDD)

Version – DRAFT v0.1



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DOCUMENT REVISION HISTORY

Version	Description	Date
0.1	Draft	08/17/16

TABLE OF CONTENTS

DOCUMENT REVISION HISTORY	i
TABLE OF FIGURES.....	iii
TABLE OF TABLES.....	iv
1 MODEL OVERVIEW	1
1.1 DESCRIPTION	1
1.2 REQUIREMENTS	1
1.3 REFERENCES.....	3
1.4 MODEL VERSION AND HISTORY	3
1.5 MODEL SUMMARY	3
2 UNITY PACKAGE.....	5
2.1 IMPORTING THE UNITY PACKAGE.....	5
3 MODEL ATTRIBUTES	6
3.1 POLYGON ALLOCATION	6
3.2 LEVEL OF DETAIL (LODS)	6
3.3 TEXTURE MAPS	6
3.3.1 COLOR MAPS.....	6
3.3.2 NORMAL MAPS	9
3.3.3 AMBIENT OCCLUSION MAPS.....	12
3.4 SENSOR VIEWS.....	15
3.5 MODEL STATES.....	15
3.6 SKELETAL STRUCTURE	15
4 ANIMATIONS	15

5	VERIFICATION APPROACH	15
5.1	RUNTIME SYSTEMS	15
6	LIMITATIONS	15
7	CONTACT INFORMATION	15

TABLE OF FIGURES

Figure 1	CIP System Motive Pump and Wash Tank Reference Image.....	1
Figure 2	CIP System Control Panel and Chemical Boxes Reference Image.....	2
Figure 3	CIP System Shell and Tube Heater Reference Image	2
Figure 4	CIP System Model (Unity Render).....	3
Figure 5	CIP System Origin on Cartesian X, Y, Z Coordinate System (Maya Software Render)	4
Figure 6	CIP System (Unity View)	4
Figure 7	Unity Import Package.....	5
Figure 8	Control Panel Color Map	6
Figure 9	Tube Heater Color Map	7
Figure 10	Wash Tank Color Map	7
Figure 11	Pumps Color Map.....	8
Figure 12	Heater Pipes Color Map	8
Figure 13	Pipes Color Map.....	9
Figure 14	Control Panel Normal Map.....	9
Figure 15	Tube Heater Normal Map.....	10
Figure 16	Wash Tank Normal Map.....	10
Figure 17	Pump Normal Map.....	11
Figure 18	Heater Pipes Normal Map	11
Figure 19	Pipes Normal Map.....	12

Figure 20 Control Panel Ambient Occlusion Map 12

Figure 21 Tube Heater Ambient Occlusion Map 13

Figure 22 Wash Tank Ambient Occlusion Map 13

Figure 23 Pumps Ambient Occlusion Map..... 14

Figure 24 Heater Pipes Ambient Occlusion Map 14

TABLE OF TABLES

Table 1 Model Revision History..... 3

Table 2 Model Summary..... 3

Table 3 Polygon Allocation..... 6

1 MODEL OVERVIEW

1.1 DESCRIPTION

- Cleans the interior surfaces of pipes, vessels, process equipment, filters and associated fittings, without disassembly

1.2 REQUIREMENTS

Requirements for each model are gathered based off of the needs of the customer. Reference images are then found and used to accurately build 3D models. The required components for this model include:

- Motive Pump
- Shell and Heater Tube
- Wash Tank
- Directional Valves
- Control Panel
- Water Fill Line
- Electrical Box



Figure 1 CIP System Motive Pump and Wash Tank Reference Image



Figure 2 CIP System Control Panel and Chemical Boxes Reference Image



Figure 3 CIP System Shell and Tube Heater Reference Image

1.3 REFERENCES

- 3D_Model_Development_Process.docx
 - o The 3D model development process details Dignitas Technologies' procedure for building 3D models.

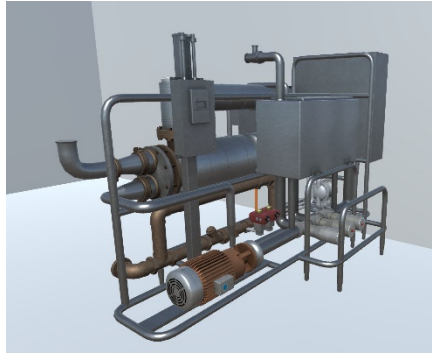


Figure 4 CIP System Model (Unity Render)

1.4 MODEL VERSION AND HISTORY

Information about the model version can be found in the "Model_Version.txt" file located in the model's directory (same directory the model's .fbx file is located).

Table 1 Model Revision History

Version	Description	Date
0.1	Initial release of the draft CIP_System.fbx	08/17/16

1.5 MODEL SUMMARY

Table 2 Model Summary

Model Name	CIP_System.fbx
Model Units	Meters
Coordinate System	Cartesian X, Y, Z (see Figure 2 below)
Model Origin	Origin is located at center mass. (0, 0, 0) (See figure 2 below)
Model Orientation Runtime	Forward: Positive Y Up: Positive Z
Model Orientation Maya	Forward: Positive Z Up: Positive Y

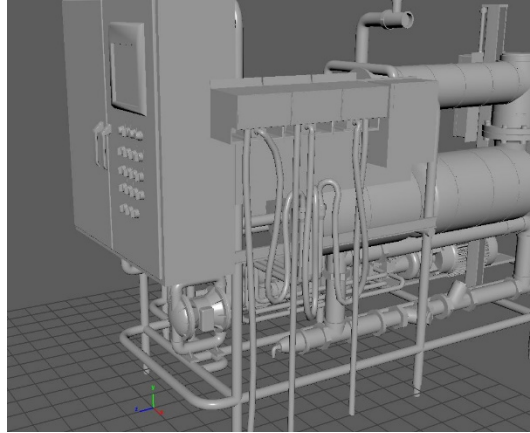


Figure 5 CIP System Origin on Cartesian X, Y, Z Coordinate System (Maya Software Render)

This model was imported into Unity 5.3 to verify the model (see Figure 6 below).

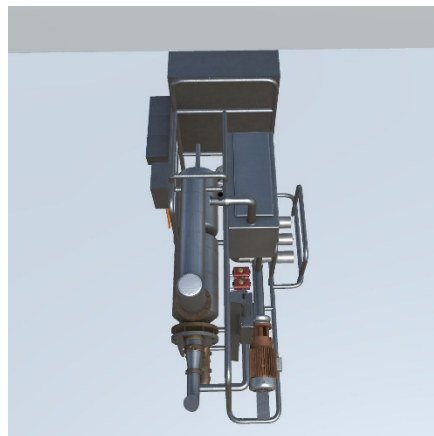


Figure 6 CIP System (Unity View)

2 UNITY PACKAGE

2.1 IMPORTING THE UNITY PACKAGE

1. Download the “CIP_System_08-17-16.unitypackage” file from Google Drive
2. Open the “Milk Factory” Unity Project in Unity 5
3. In the top menu bar go to “Assets → Import Package → Custom Package...”
4. A window should pop up showing you the contents of the Unity Package being imported
 - a. This Unity Package should look like this:

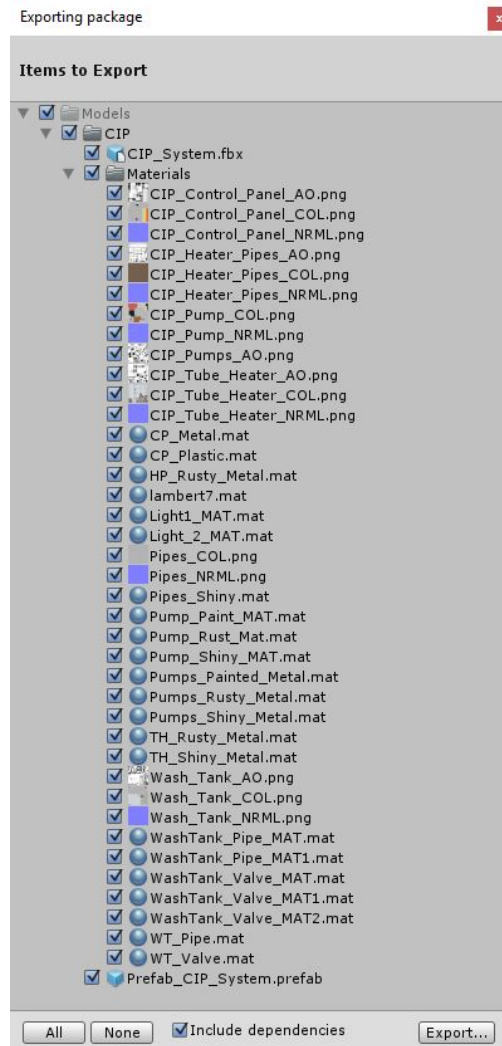


Figure 7 Unity Import Package

5. Press “Import” and the model and materials will be placed into the Assets section.
6. Make sure that when dragging the model into the scene that you select the “Prefab_CIP_System.prefab” instead of the FBX as the prefab has the materials stored on it correctly.

3 MODEL ATTRIBUTES

3.1 POLYGON ALLOCATION

Polygon allocation is the number of triangles and vertices for a given state and Level of Detail (LODs) in the model. The method for calculating the number of polygons is to gather each model state then count the polygons present in each representation. Animations are not included in the polygon allocation. The CIP System model has a single LOD which is labeled LOD0.

Table 3 Polygon Allocation

Model	# of Triangles	# of Vertices
CIP System	51840	29012

3.2 LEVEL OF DETAIL (LODS)

TBD

3.3 TEXTURE MAPS

3.3.1 COLOR MAPS

- File name: CIP_Control_Panel_COL.png (Diffuse)
- Resolution: 2048 x 2048 pixels
- Version: 1.0

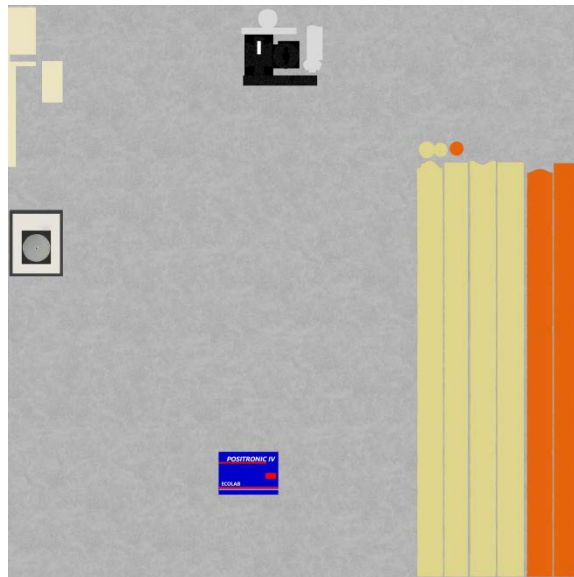


Figure 8 Control Panel Color Map

- File name: CIP_Tube_Heater_COL.png (Diffuse)
- Resolution: 2048 x 2048 pixels
- Version: 1.0

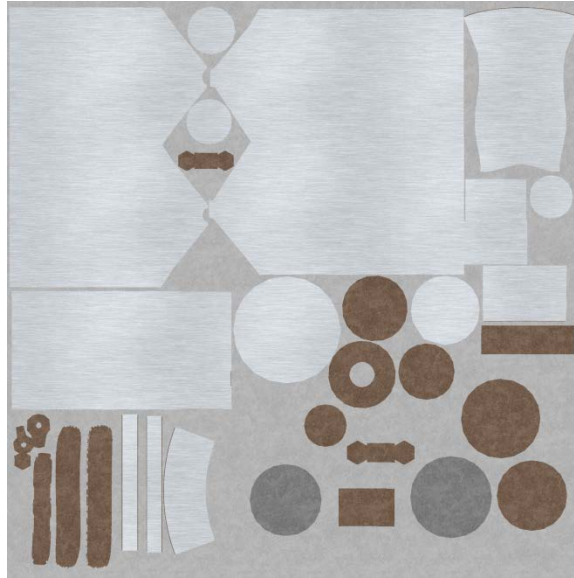


Figure 9 Tube Heater Color Map

- File name: CIP_Wash_Tank_COL.png (Diffuse)
- Resolution: 4096 x 4096 pixels
- Version: 1.0

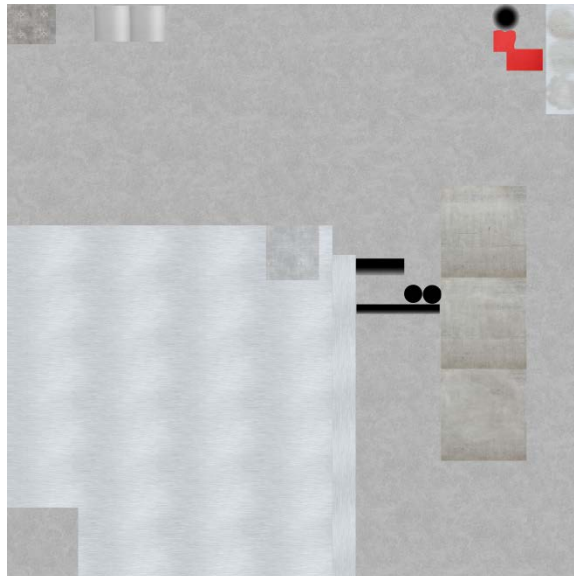


Figure 10 Wash Tank Color Map

- File name: CIP_Pumps_COL.png (Diffuse)
- Resolution: 4096 x 4096 pixels
- Version: 1.0

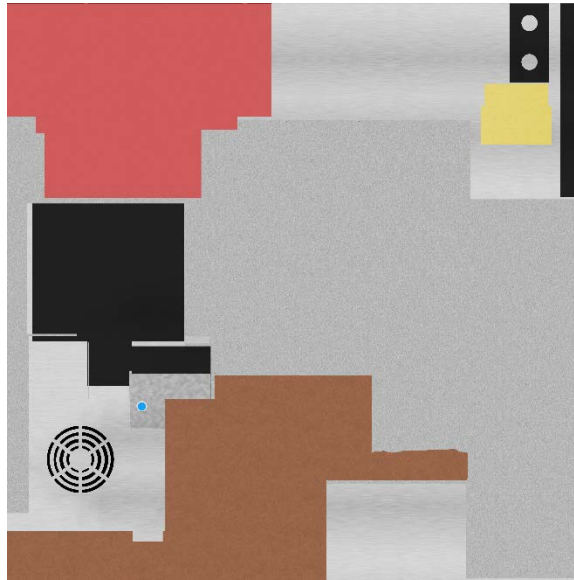


Figure 11 Pumps Color Map

- File name: CIP_Heater_Pipes_COL.png (Diffuse)
- Resolution: 2048 x 2048 pixels
- Version: 1.0

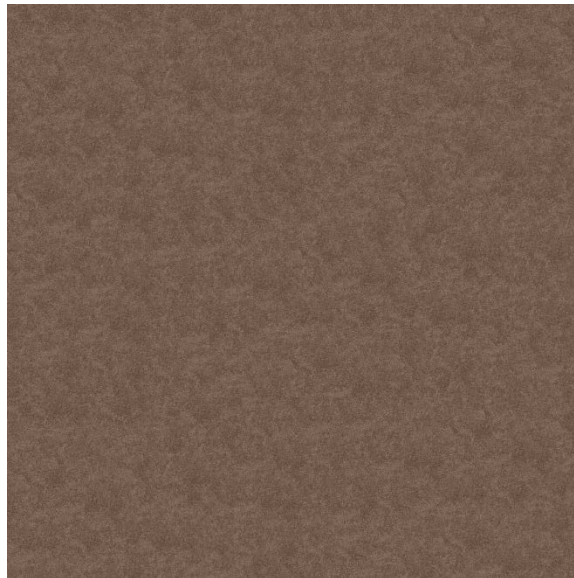


Figure 12 Heater Pipes Color Map

- File name: CIP_Pipes_COL.png (Diffuse)
- Resolution: 4096 x 4096 pixels
- Version: 1.0

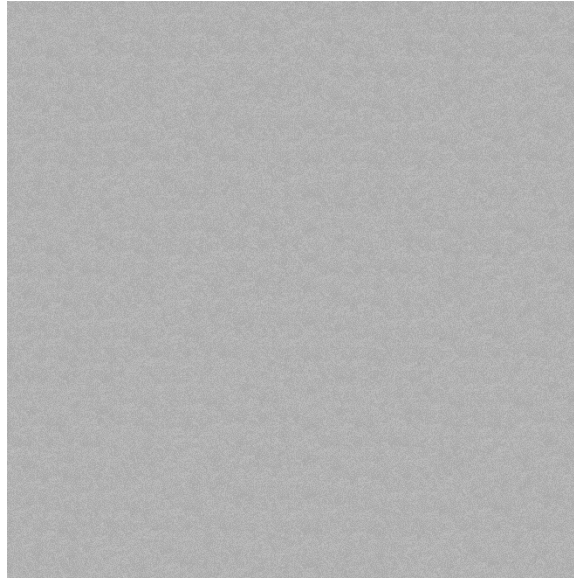


Figure 13 Pipes Color Map

3.3.2 NORMAL MAPS

- File name: CIP_Control_Panel_NRML.png
- Resolution: 2048 x 2048 pixels
- Version: 1.0

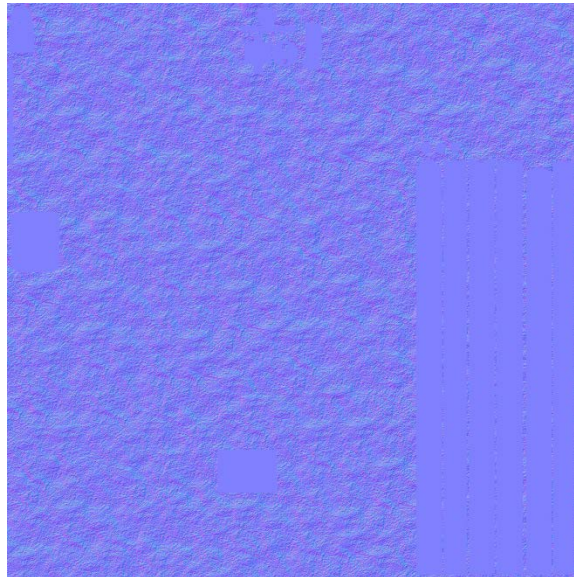


Figure 14 Control Panel Normal Map

- File name: CIP_Tube_Heater_NRML.png
- Resolution: 2048 x 2048 pixels
- Version: 1.0

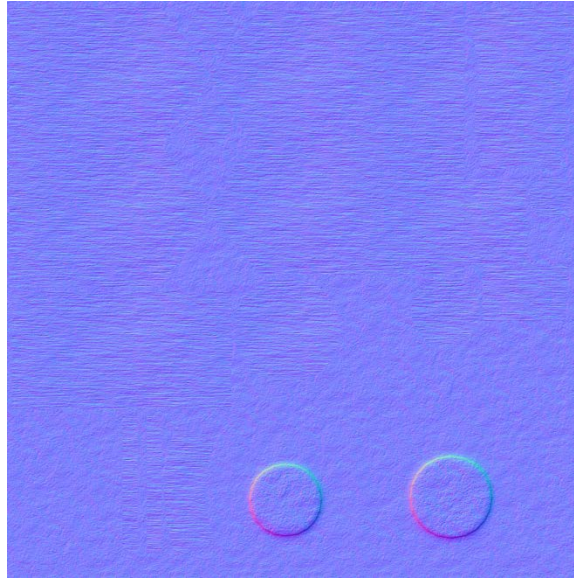


Figure 15 Tube Heater Normal Map

- File name: CIP_Wash_Tank_NRML.png
- Resolution: 4096 x 4096 pixels
- Version: 1.0

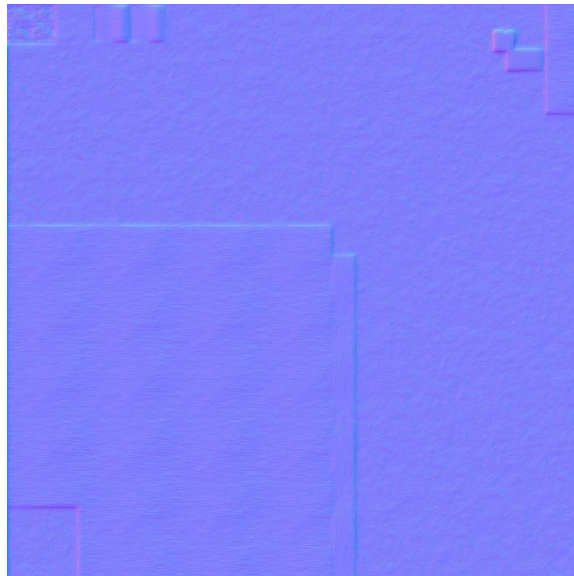


Figure 16 Wash Tank Normal Map

- File name: CIP_Pump_NRML.png
- Resolution: 4096 x 4096 pixels
- Version: 1.0

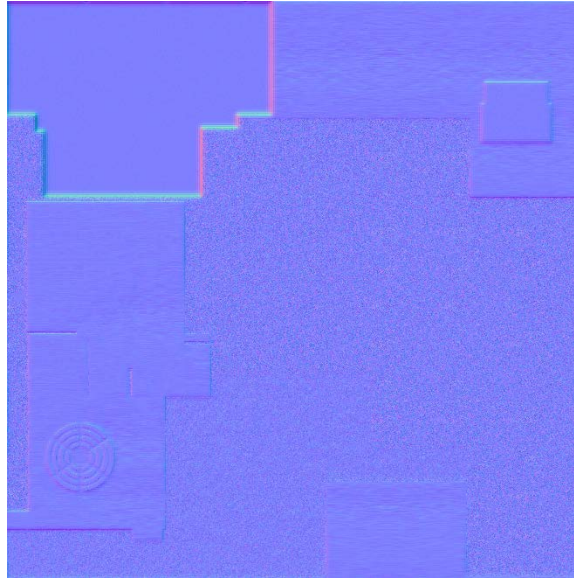


Figure 17 Pump Normal Map

- File name: CIP_Heater_Pipes_NRML.png
- Resolution: 2048 x 2048 pixels
- Version: 1.0

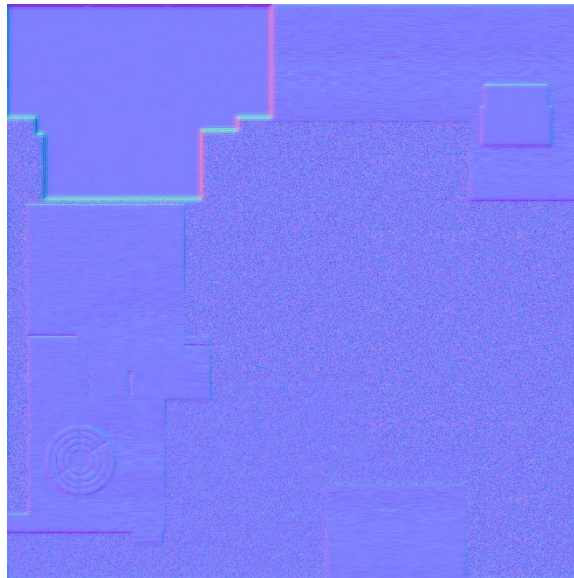


Figure 18 Heater Pipes Normal Map

- File name: CIP_Pipes_NRML.png
- Resolution: 4096 x 4096 pixels
- Version: 1.0

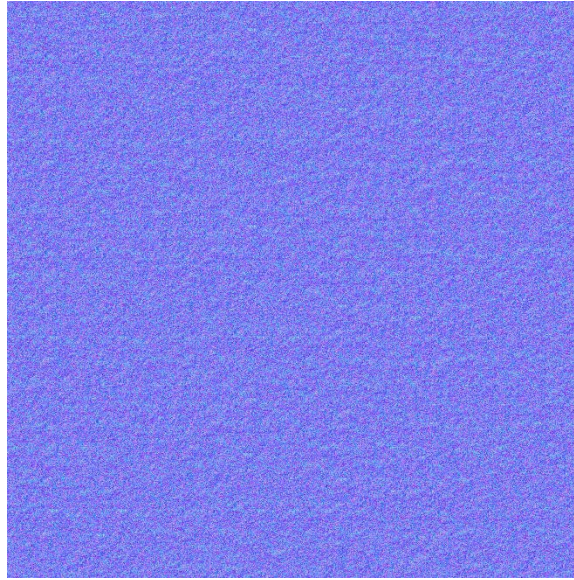


Figure 19 Pipes Normal Map

3.3.3 AMBIENT OCCLUSION MAPS

- File name: CIP_Control_Panel_AO.png
- Resolution: 2048 x 2048 pixels
- Version: 1.0

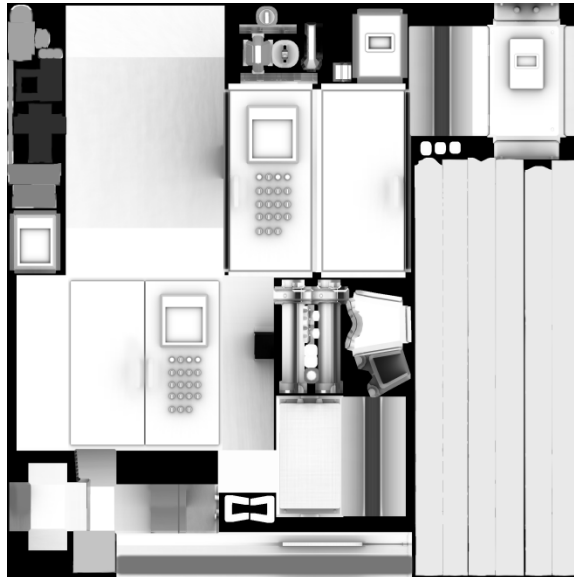


Figure 20 Control Panel Ambient Occlusion Map

- File name: CIP_Tube_Heater_AO.png
- Resolution: 2048 x 2048 pixels
- Version: 1.0

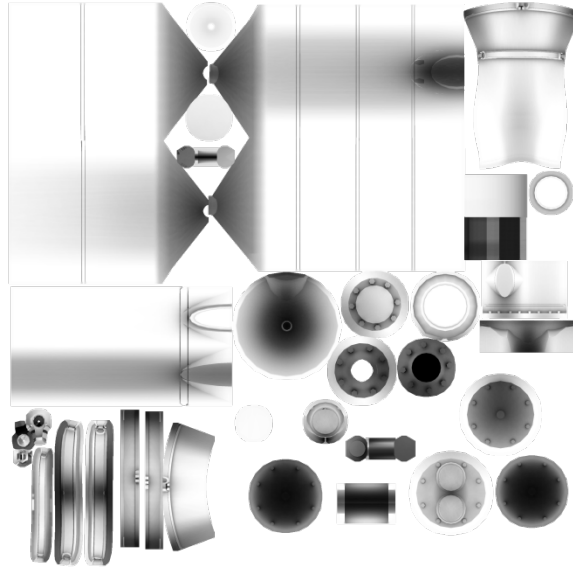


Figure 21 Tube Heater Ambient Occlusion Map

- File name: CIP_Wash_Tank_AO.png
- Resolution: 4096 x 4096 pixels
- Version: 1.0

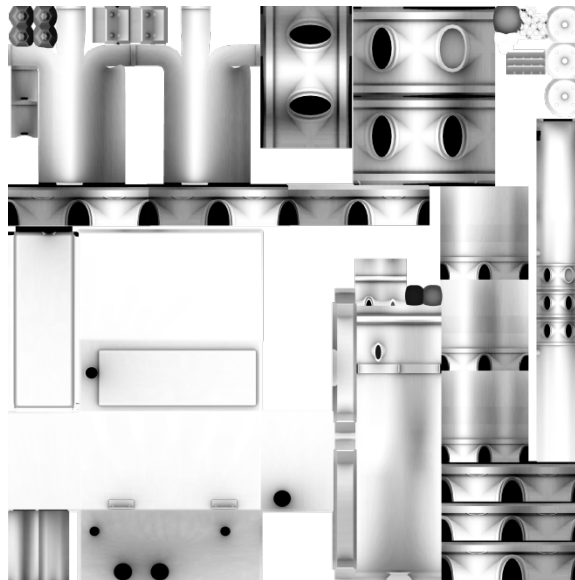


Figure 22 Wash Tank Ambient Occlusion Map

- File name: CIP_Pumps_AO.png
- Resolution: 4096 x 4096 pixels
- Version: 1.0

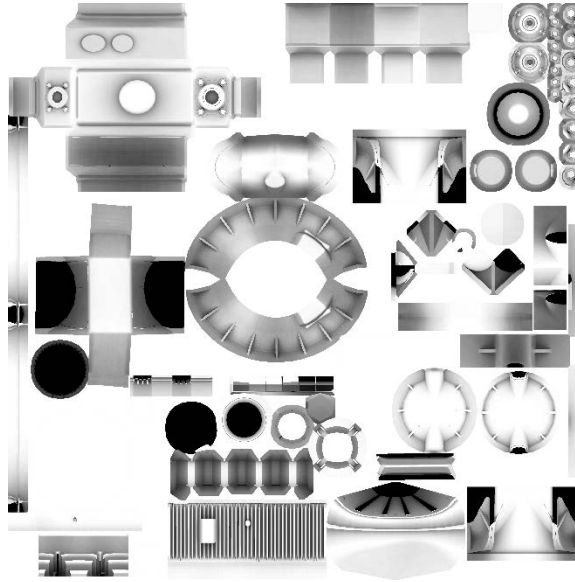


Figure 23 Pumps Ambient Occlusion Map

- File name: CIP_Heater_Pipes_AO.png
- Resolution: 2048 x 2048 pixels
- Version: 1.0



Figure 24 Heater Pipes Ambient Occlusion Map

3.4 SENSOR VIEWS

N/A

3.5 MODEL STATES

N/A

3.6 SKELETAL STRUCTURE

N/A

4 ANIMATIONS

N/A

5 VERIFICATION APPROACH

5.1 RUNTIME SYSTEMS

The 3D model was tested using the following tools:

- FBX Viewer 2013.3
- Maya Mental Ray 2016
- Unity 5.3

6 LIMITATIONS

N/A

7 CONTACT INFORMATION

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