

# Using AutoCAD Civil 3D to create a Landscape Architecture BIM Model

Shaun Collins

Associate Landscape Architect, AECOM

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# Introduction

## Shaun Collins

- Associate Landscape Architect
  - 13 years experience, last 3 Years at AECOM
  - Experience with using AutoCAD, and preparing production drawings for commercial projects.
  - NOT an expert, or even really trained in Civil 3D

# Outline

- Introduction to Dubai Expo
- Decision to use Civil 3D
- Development of BIM Capability and Strategy
- Creation of the BIM Model
- End Result
- Issues and Moving Forward



The background of the image is a complex, abstract wireframe mesh. The mesh is composed of numerous interconnected lines forming a series of organic, flowing shapes that resemble a stylized, interconnected network or a series of overlapping, curved planes. The lines are thin and grey, set against a white background. A solid blue horizontal bar spans the bottom portion of the image, providing a contrasting background for the text.

Dubai Expo 2020

# Dubai Expo 2020

40 ha site, 1/3 of the way between Dubai and Abu Dhabi

- 3 Themed areas, including souks, pavilions and arrival plazas
- A Central Plaza, 2 Parks and associated concourses
- Back of House facilities, Security Road, Boulevard and parking



Dubai Expo Site

Source: Google Maps









# Decision to Use Civil 3D



# The Decision

- Site is far too large for Revit
- None of the Landscape Team knew how to use it
- Our UAE Team proposed Civil 3D to the Client
- None of the Landscape Team knew how to use that either
- Civil 3D can handle the size of the site and the Civil Engineers were using it
- Civil 3D doesn't have BIM capability natively, but we were promised it could be done

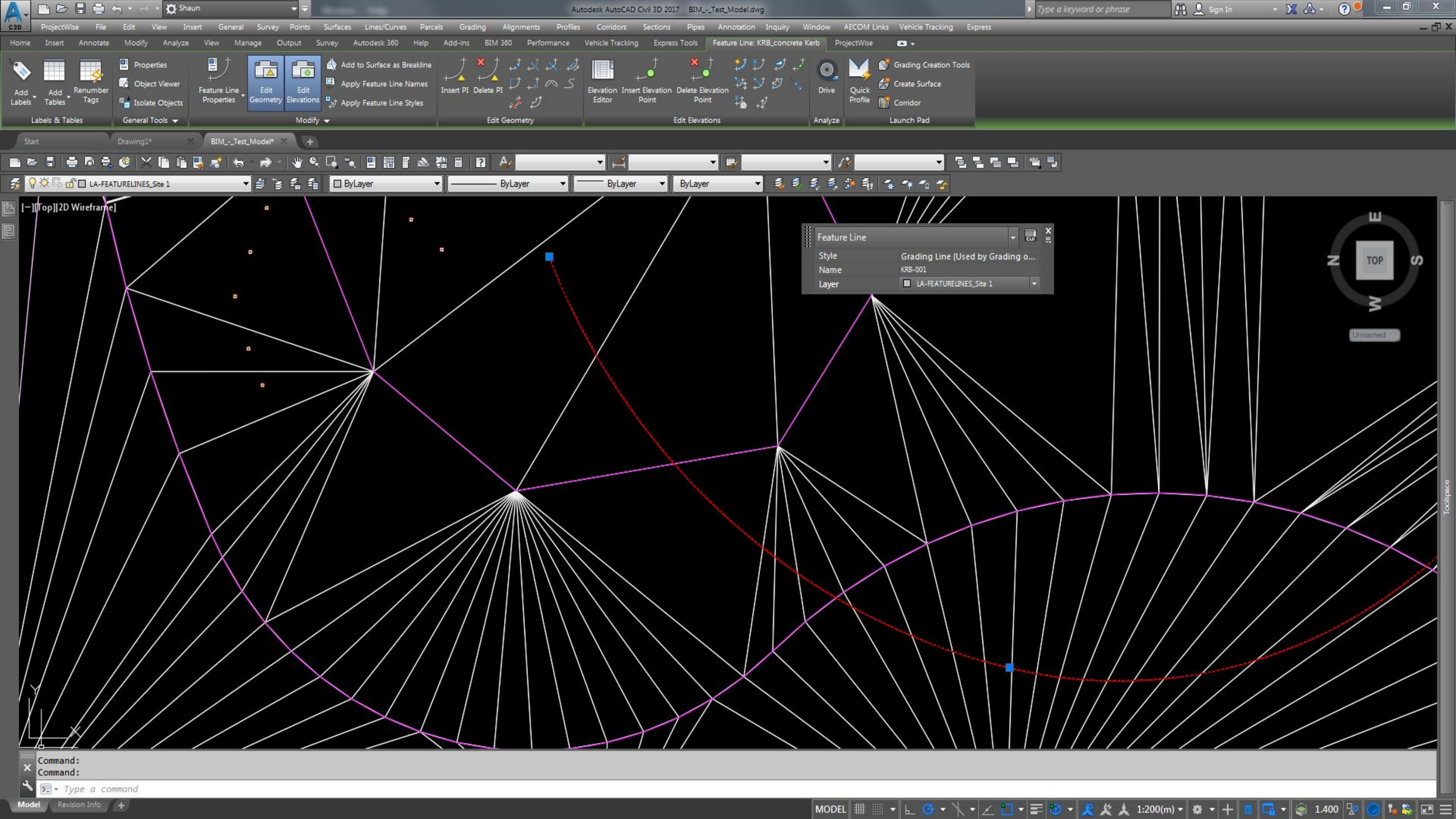


# Development of the Civil 3D Script











PROPERTIES

Tin Surface

DOCUMENTATION

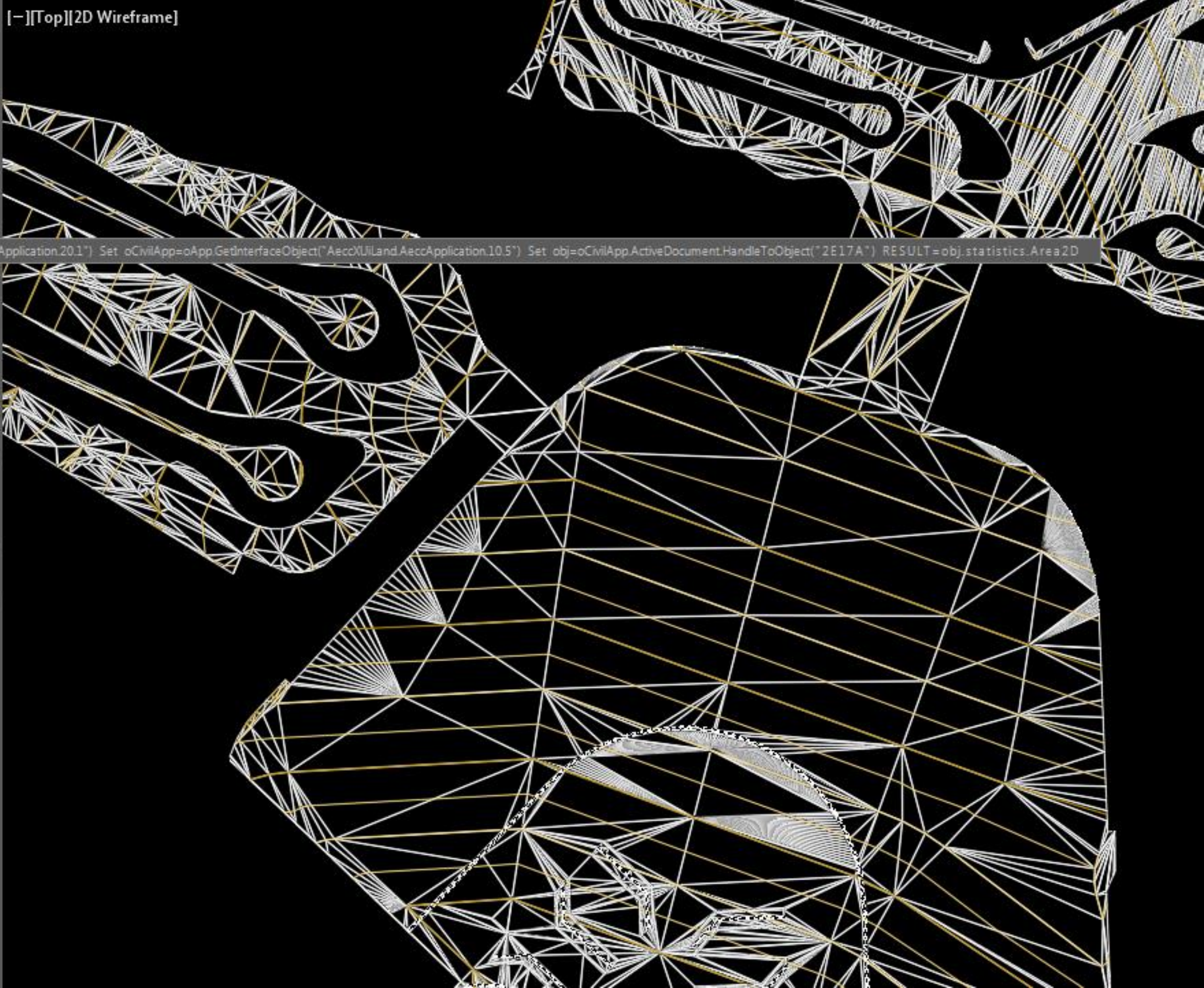
- Hyperlink
- Notes
- Reference documents (0)

PROPERTY SETS

AECOM Attributes\_Paving(PAV)

Area2D	RESULT="error" Set oApp=GetObject( "AutoCAD.Application.20.1") Set oCivilApp=oApp.GetInterfaceObject("AeccXluland AeccApplication.10.5") Set obj=oCivilApp.ActiveDocument.HandleToObject("2E17A") RESULT=obj.statistics.Area2D
Classification	PAV
Colour	brindle
CSICode	321400
Depth	100
Description	Opportunity Concourse Setts
Finish	provided at stage 4
Length	100
LoadingClass	provided at stage 4
Material	Concrete
TypeName	EXH-231
TypeNameCOBie	PAV-013
UserSpec	013
Width	400
AECOM ID	
ID	10002-MDL-H021051-LH-900001_2E17A

[ - ][Top][2D Wireframe]





The background of the slide features a complex, abstract wireframe pattern. This pattern consists of numerous interconnected lines forming a mesh of irregular polygons, creating a three-dimensional, organic structure that resembles a network or a biological form. The lines are thin and grey. A solid blue horizontal bar spans the bottom portion of the image, providing a contrasting background for the white text.

# Development of the BIM Execution Plan



[illegible]

		LOD 200	LOD 300
Hard Landscape: Horizontal	Paving		
	Bound Surfaces		
	Gravel		
Hard Landscape: Vertical	Walls		
	Kerbs		
	Stair		
	Ramp		

		LOD 200	LOD 300
Soft Landscape	Planting: Trees & Palms		
	Planting: Shrubs		
	Planting: Ground Cover		
	Turf		
	Water Features		TBC at next stage
	Lighting		

		LOD 200	LOD 300
Site Furniture	Benches		TBC at next stage
Site Furniture	Bollards		
Site Furniture	Tables		TBC at next stage
Site Furniture	Litter Bins		
	Drinking Fountains		



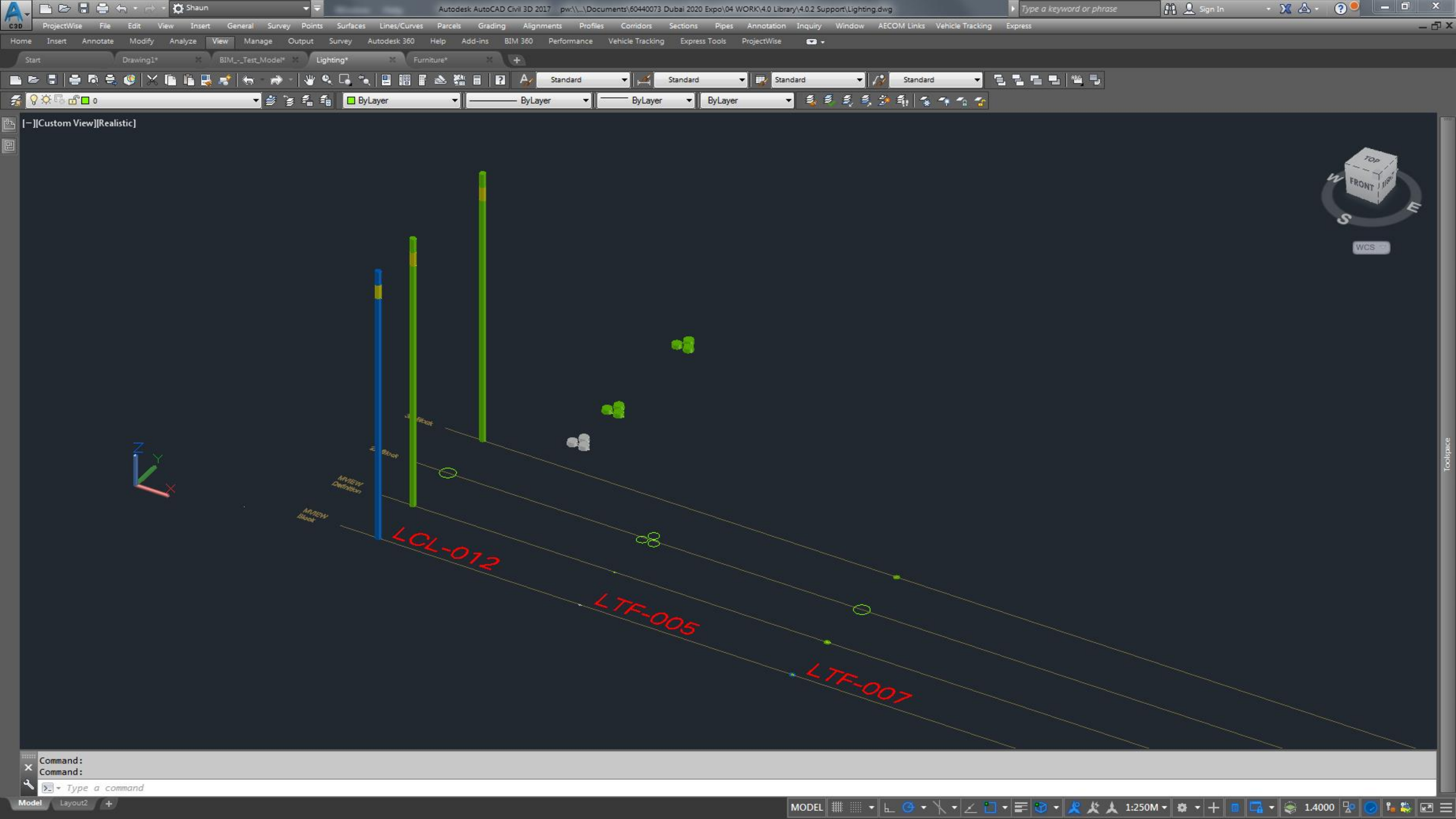
The background of the slide features a complex, abstract wireframe pattern. This pattern consists of numerous interconnected lines forming a mesh of irregular polygons, creating a three-dimensional, organic structure that resembles a network or a series of flowing, interconnected tubes. The lines are thin and light gray. A solid blue horizontal bar spans the width of the slide, positioned in the lower half, providing a contrasting background for the white text.

# Development of the Civil 3D Model

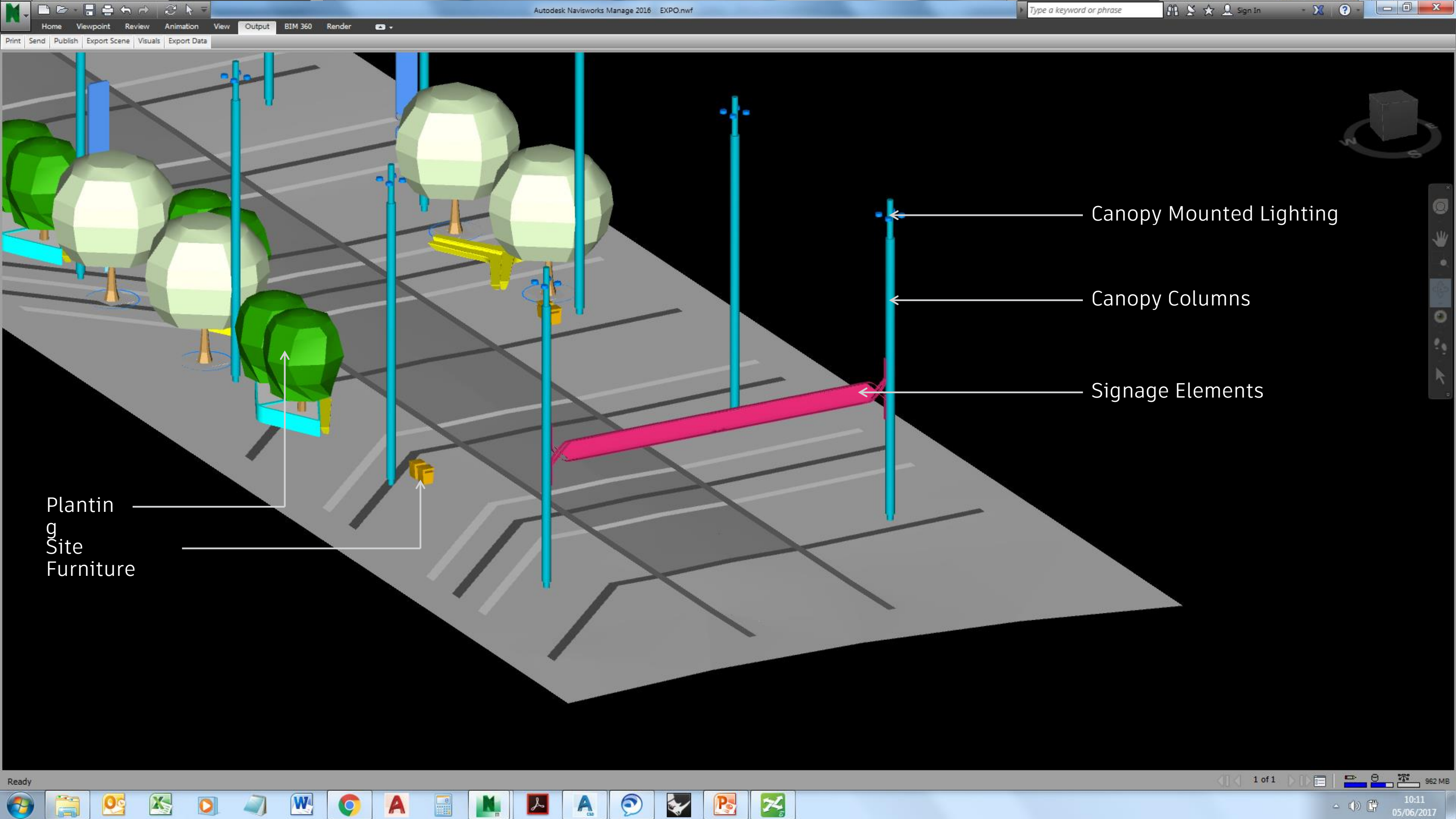












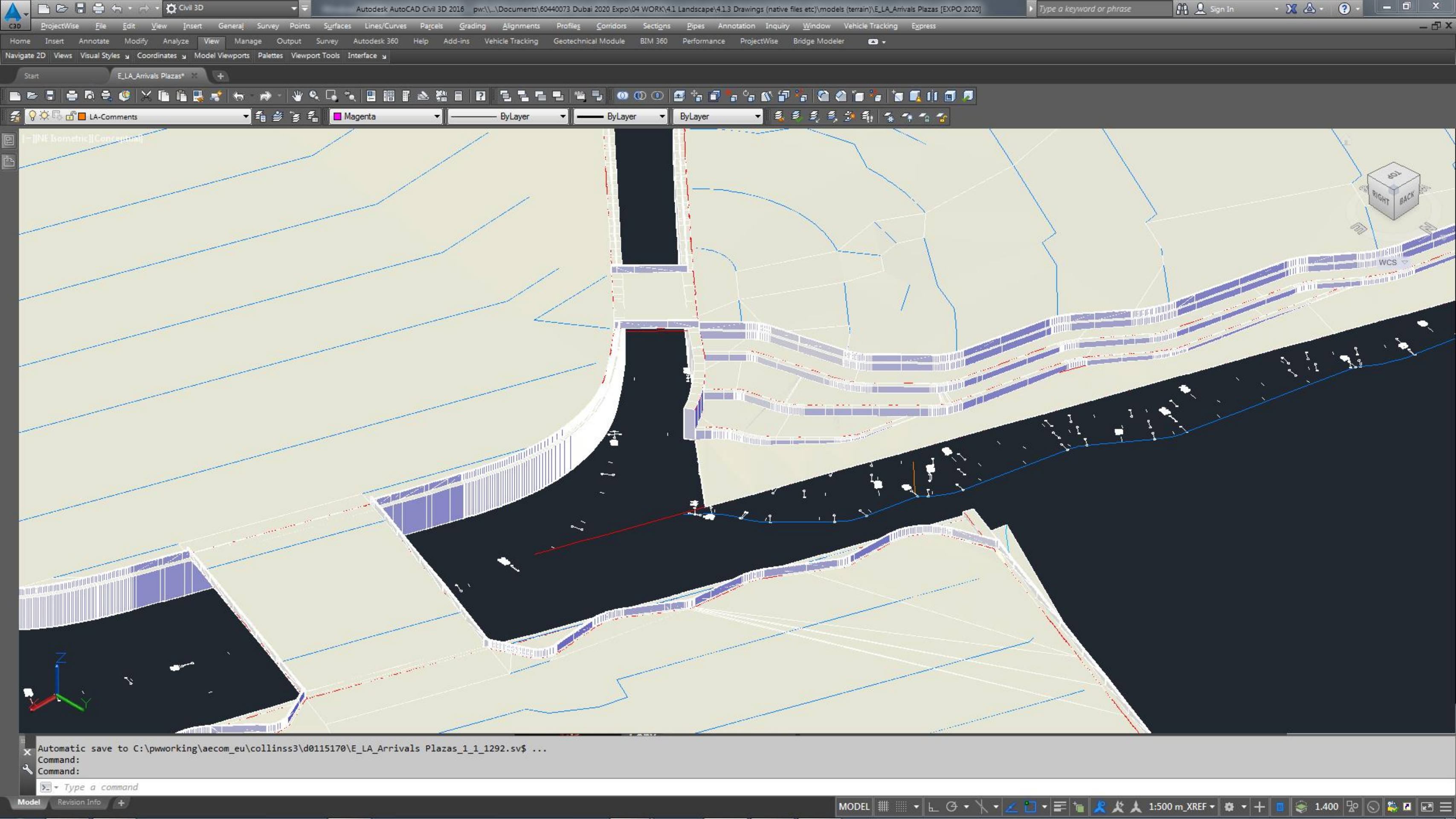
Planting  
Site  
Furniture

Canopy Mounted Lighting

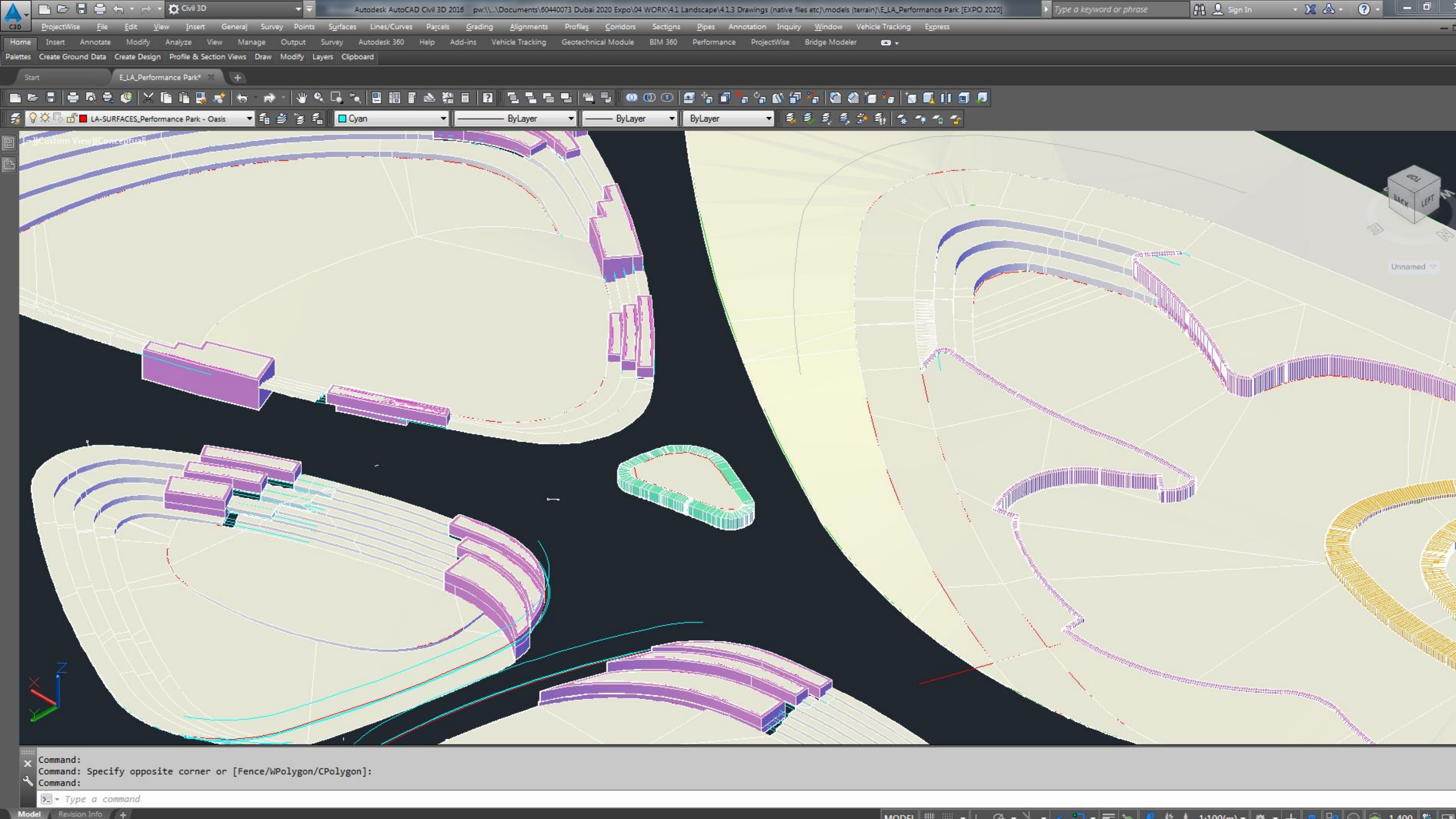
Canopy Columns

Signage Elements











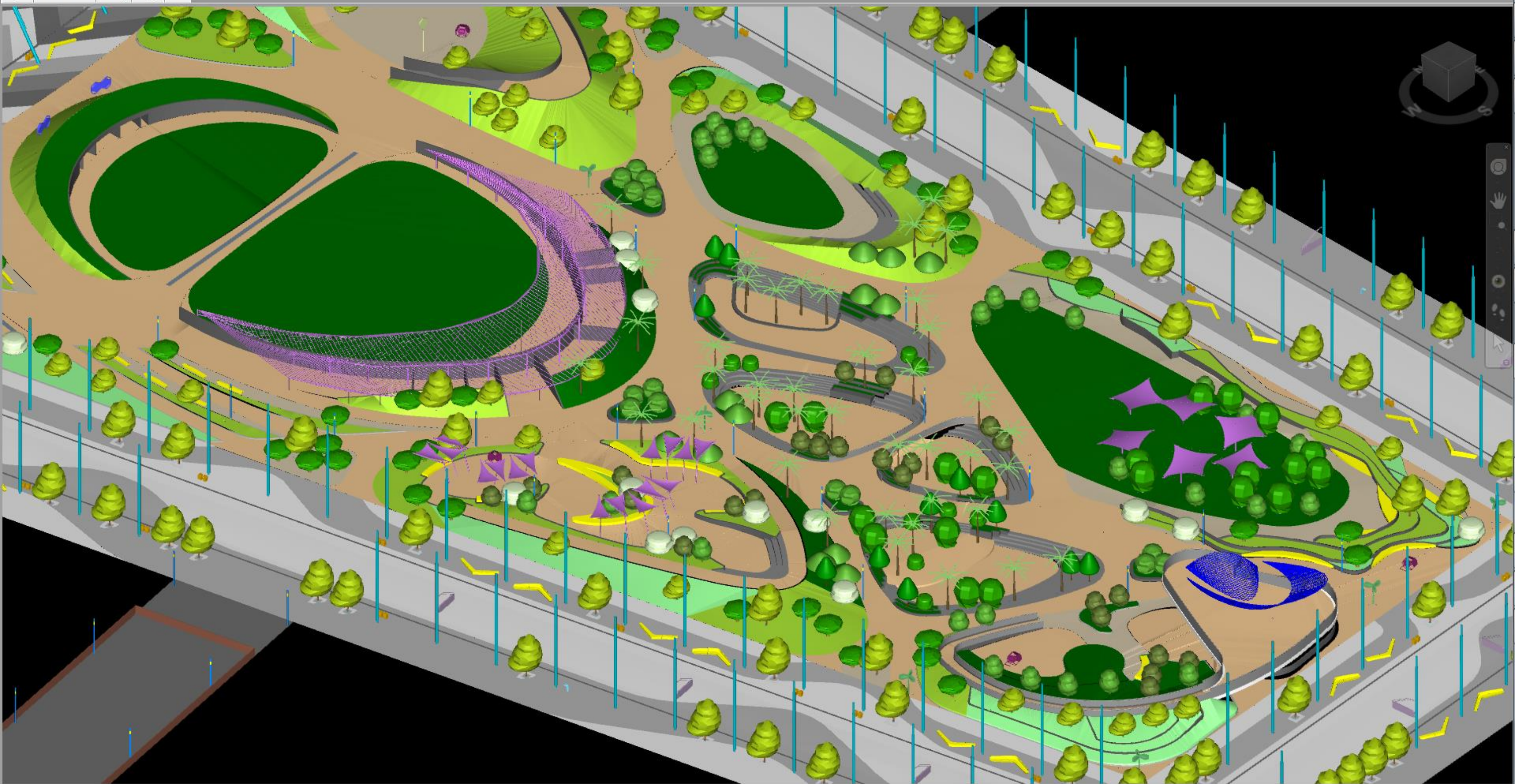
L41													
	A	B	C	D	E	F	G	H	I	J	K	L	M
1	UserSpec	Type	Name	COBie	Type	Name	Description	CS	ICode	LatinName	CommonName	ProcurementSize	InstallationSize
2	001	TRE-001	EXS301			Standard Tree	329300	Zizyphus	Spina cristi	Christs Thorn Jujube	2.0 - 6.0m	130Ltr - 4.0 - 4.5m O.A Ht, 50 - 60mm Dia.	
3	002	TRE-002	EXS301			Standard Tree	329300	Prosopis	cineraria	Ghaf	1.5 - 2.0m	130Ltr - 4.0 - 4.5m O.A Ht, 60 -70mm Dia.	
4	003	TRE-003	EXS301			Standard Tree	329300	Acacia	tortilis	umbrella thorn acacia	1.0 - 5.0m	50Ltr - 2.5m O.A Ht, 30mm Dia.	
5	004	TRE-004	EXS301			Standard Tree	329300	Acacia	nilotica	Arabian Gum	1 -1.5m	130Ltr - 4.0 - 4.5m O.A Ht, 70 -80mm Dia.	
6	005	TRE-005	EXS301			Standard Tree	329300	Ficus	cordata	Namaqua fig	1.5 - 2.0m	Bag - 2.5m C.T Ht, 5.0m O.A Ht,70 - 80mm Dia.	
7	006	TRE-006	EXS301			Standard Tree	329300	Tecomella	undulata	Desert teak	1.5 - 2.0m	35Ltr - 2.5m O.A Ht.	
8	007	TRE-007	EXS301			Standard Tree	329300	Salvadora	persica	toothbrush tree	1m	18Ltr - 1.5 - 2.0m O.A Ht.	
9	008	TRE-008	EXS301			Standard Tree	329300	Coccoloba	uvifera	Seagrape	1.5-2m	70Ltr - 2.0m C.T Ht, 3.0 - 3.5m O.A Ht, 70 - 80mm Dia.	
10	009	TRE-009	EXS301			Standard Tree	329300	Tamarix	arabica	tamarisk	-	-	
11	010	TRE-010	EXS301			Standard Tree	329300	Olea	europaea	Olive tree	6m	70Ltr - 2.0m C.T Ht, 3.5m O.A Ht, 60 - 70mm Dia.	
12	011	TRE-011	EXS301			Standard Tree	329300	Moringa	peregrina	Shou'	1m	50Ltr - 1.5m C.T Ht, 3.0m O.A Ht,40 - 50mm Dia.	
13	012	TRE-012	EXS301			Standard Tree	329300	Peltophorum	inorme	Yellow Poinciana	2.0m	B and B - 2.5 C.T Ht, 6.0m O.A Ht, 150mm Dia.	
14	013	TRE-013	EXS301			Standard Tree	329300	Boswellia	sacra	Frankincense Tree	1-1.5m	4m	
15	014	TRE-014	EXS301			Standard Tree	329300	Maerua	crassifolia	Sarh	1m	130Ltr - 2.0m C.T Ht, 4.0m O.A Ht, 50 - 60mm Dia.	
16	015	TRE-015	EXS301			Standard Tree	329300	Lawsonia	inermis	Henna Plant, Mignonette Tree	1.0m	50Ltr - 2.5 - 3.0m O.A Ht.	
17	016	TRE-016	EXS301			Standard Tree	329300	Tamarix	aphylla	Ethel	1m	2m	
18	017	TRE-017	EXS301			Standard Tree	329300	Conocarpus	erectus	Buttonwood, Button Mangrove	1 m	130Ltr - 2.5m C.T Ht, 5.0m O.A Ht,100mm Dia.	
19	018	TRE-018	EXS301			Standard Tree	329300	Terminalia	catappa	Indian Almond	2.0 - 7.0m	130Ltr - 2.5m C.T Ht, 5.0m O.A Ht, 70 - 80mm Dia.	
20	019	TRE-019	EXS301			Standard Tree	329300	Punica	granatum	Pomegranate	1.5m	2.5m	
21	020	TRE-020	EXS301			Standard Tree	329300	Musa	paradisca	Dwarf Banana	-	25 cm	
22	021	TRE-021	EXS301			Standard Tree	329300	Magnifera	indica	Mango Tree	2.0 - 6.0m	130Ltr - 2.0m C.T Ht, 4.0m O.A Ht, 70 - 80mm Dia.	
23	022	TRE-022	EXS301			Standard Tree	329300	Cordia	myxa	Lasura Tree	seedling or struck cutting	70Ltr - 2.0m C.T Ht, 4.0m O.A Ht, 50 - 60mm Dia.	
24	023	TRE-023	EXS301			Standard Tree	329300	Psidium	guajava	Tropical Guava	1.5m	3.5m	
25	024	TRE-024	EXS301			Standard Tree	329300	Conocarpus	lancifolius	Ghatti Gum, Axlewood or Button Tree	0.5m	130Ltr - 2.5m C.T Ht, 5.0m O.A Ht,100mm Dia.	
26	025	TRE-025	EXS301			Standard Tree	329300	Citrus	limoni	Lemon Tree	1.5m	50Ltr - 1.5 - 2.0m C.T Ht, 3.0m O.A Ht, 70 - 80mm Dia.	
27	026	TRE-026	EXS301			Standard Tree	329300	Acacia	ehrenbergiana	null	null	null	
28	027	TRE-027	EXS301			Standard Tree	329300	Azadirachta	indica	Neem Tree	2.0 - 5.0m	130Ltr - 5.0 - 6.0m O.A Ht, 70 -80mm Dia.	
29	028	TRE-028	EXS301			Standard Tree	329300	Millingtonia	hortensis	Tree Jasmine	2m	130Ltr - 2.0m C.T Ht, 5.0m O.A Ht, 80 - 100mm Dia.	
30	029	TRE-029	EXS301			Standard Tree	329300	Tamarindus	indicita	Tamarind	1.5 -2m	Bag - 2.0m C.T Ht, 3.5 - 4.0m O.A Ht, 50 - 60mm Dia.	
31	030	TRE-030	EXS301			Standard Tree	329300	Morus	alba	White Mulberry	2m	50Ltr - 2.0m C.T Ht, 4.0m O.A Ht, 70 - 80mm Dia.	
32	031	TRE-031	EXS301			Standard Tree	329300	Ziziphus	jujuba	Common Jujube Tree, Chinese Date	2m	70Ltr - 3.5m O.A Ht, 35 - 40mm Dia.	
33	032	TRE-032	EXS301			Standard Tree	329300	Citrus	species	null	null	null	
34	033	TRE-033	EXS301			Standard Tree	329300	Bougainvillea	spectabilis	Bougainvillea, Paper Flower	2m mature plant	2m mature plant	
35	034	TRE-034	EXS301			Standard Tree	329300	Callistemon	citrinus	Bottlebrush	1m	2.5m	
36	035	TRE-035	EXS301			Standard Tree	329300			null	null	null	
37	036	TRE-036	EXS301			Standard Tree	329300			null	null	null	
38	037	TRE-037	EXS301			Standard Tree	329300			null	null	null	
39	038	TRE-038	EXS301			Standard Tree	329300	Ficus	carica	Fig	1.5-2m	Bag - 2.5m C.T Ht, 5.0m O.A Ht,70 - 80mm Dia.	
40	039	TRE-039	EXS301			Standard Tree	329300			null	null	null	
41	040	TRE-040	EXS301			Standard Tree	329300	Parkinsonia	aculeata	Jerusalem thorn	1.5m	130Ltr - 2.0m C.T Ht, 4.0 - 4.5m O.A Ht, 60 - 70mm Dia.	
42	041	TRE-041	EXS301			Standard Tree	329300			null	null	null	
43	042	TRE-042	EXS301			Standard Tree	329300	Hibiscus	tiliaceus	Beach, Sea, or Linden Hibiscus	1.5-2m	Bag - 2.0 - 2.5m C.T Ht, 3.0 - 4.0m O.A Ht, 120mm Dia.	
44	043	TRE-043	EXS301			Standard Tree	329300	Polyalthia	longifolia	False Ashoka	-	-	
45	044	TRE-044	EXS301			Standard Tree	329300	Cinnamomum	Cassia	Chinese Cassia, Chinese Cinnamon	-	-	
46	045	TRE-045	EXS301			Standard Tree	329300	Cinnamomum	zeylanicum	Cinnamon Tree	-	-	
47	046	TRE-046	EXS301			Standard Tree	329300	Kigelia	pinata	-	-	-	
48	101	TRE-101	EXS301			Palm Tree	329300	Phoenix	dactylifera (group)	Date Palm	5-6m multistem	B and B - 2.0m B.T Ht.	
49	102	TRE-102	EXS301			Palm Tree	329300	Zerbert / Doom	sagir	Mazari palm	1m	2.m	
50	103	TRE-103	EXS301			Palm Tree	329300	Phoenix	dactylifera	Date Palm	5m clear trunk	B and B - 2.0m B.T Ht.	
51	104	TRE-104	EXS301			Palm Tree	329300	Washingtonia	robusta	Cotton Palm	6-7m clear stem	B and B - 2.0m B.T Ht.	
52	105	TRE-105	EXS301			Palm Tree	329300	Ravenella	madagascarensis	-	-	-	
53	106	TRE-106	EXS301			Palm Tree	329300	Cycas	revoluta	Cycad	1m	Bag - 1.0m B.T Ht.	
54													
55													
56													



The background of the slide is a complex, abstract wireframe mesh. It consists of a dense network of thin, grey lines that form a series of interconnected, flowing, and undulating shapes. These shapes resemble a liquid surface or a series of interconnected tubes, creating a sense of depth and movement. The mesh is more densely packed in some areas and more sparse in others, highlighting the contours of the underlying forms. The overall effect is a modern, digital, and artistic representation of a 3D space.

End Result









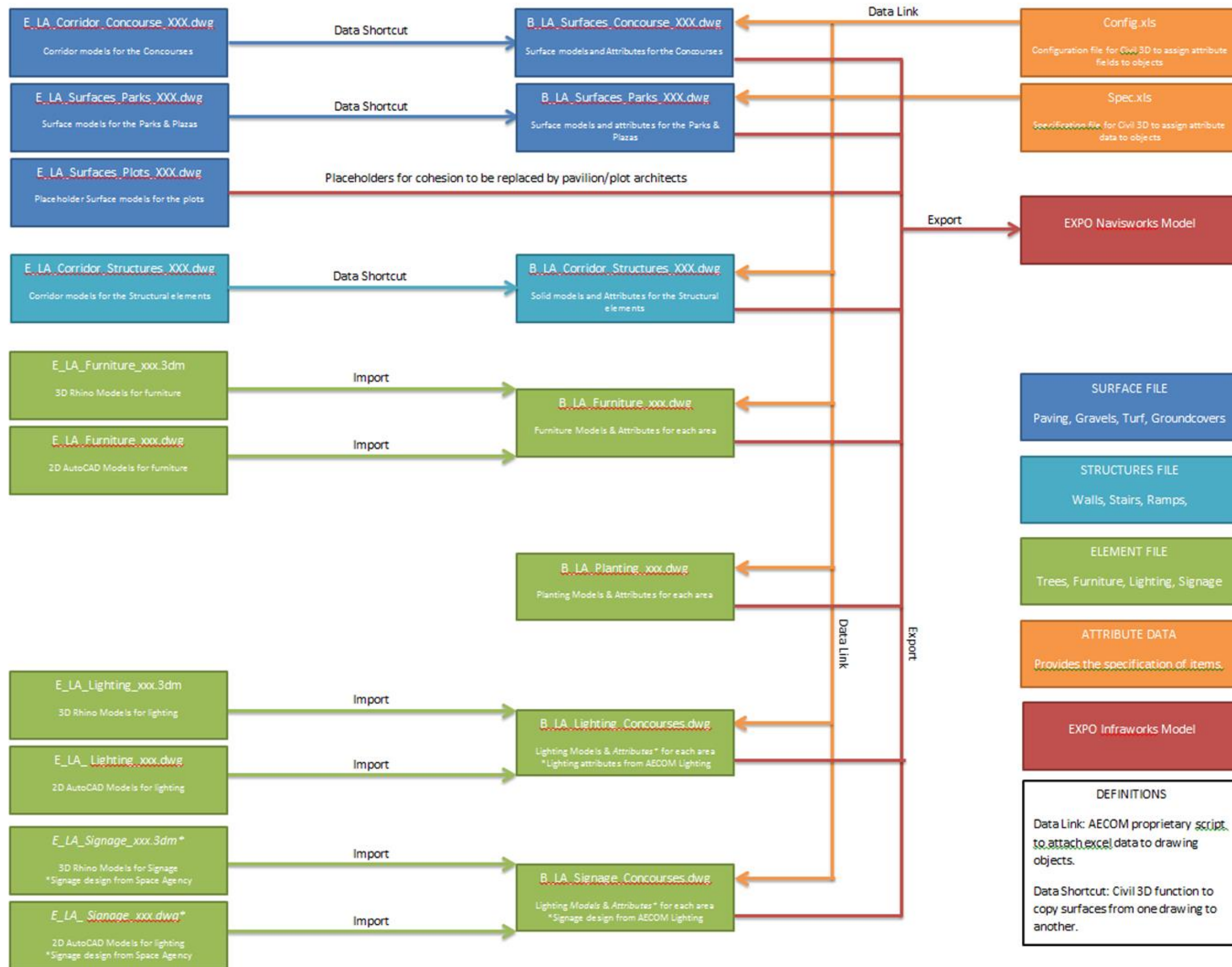
Issues



# Issues

- Limited users with Civil 3D skills
- Client expectation







# Issues

- Limited users with Civil 3D skills
- Client expectation
- Solid Modelling
  - Not dynamically linked to corridors
  - No way to calculate length
- Dynamic Modelling



