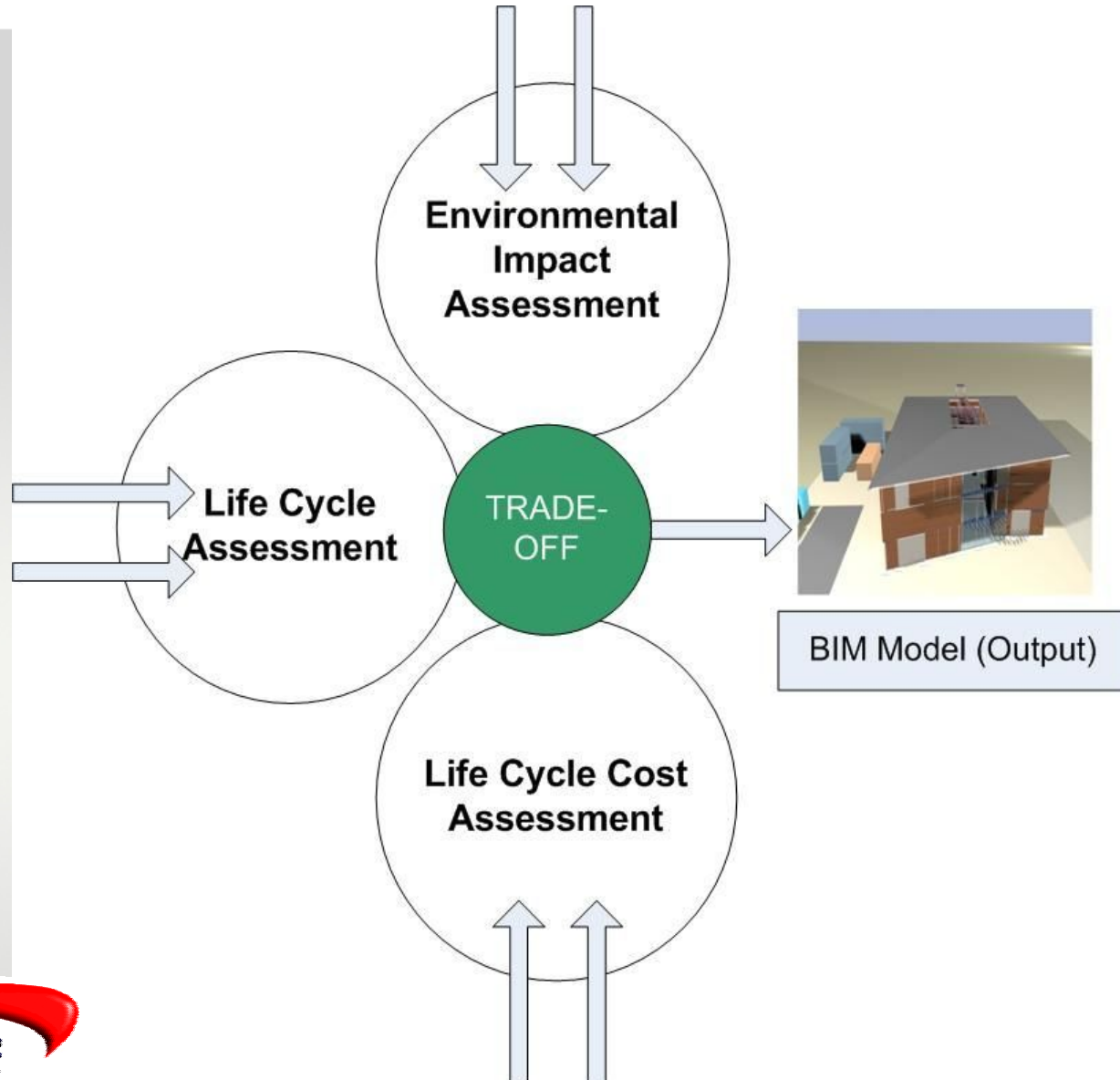


Integration of 3D with Environmental Assessment Trade-off Tool (EATT) – the outline design process

Eugene Loh, Nashwan Dawood

What is 3D-Environmental Assessment Trade-off Tool (3D-EATT)?



1:5:200

1: construction cost

5: maintenance/operation cost

200:business operation cost

Ratio over 20 years of a building life cycle (Barlett, E., 2002)

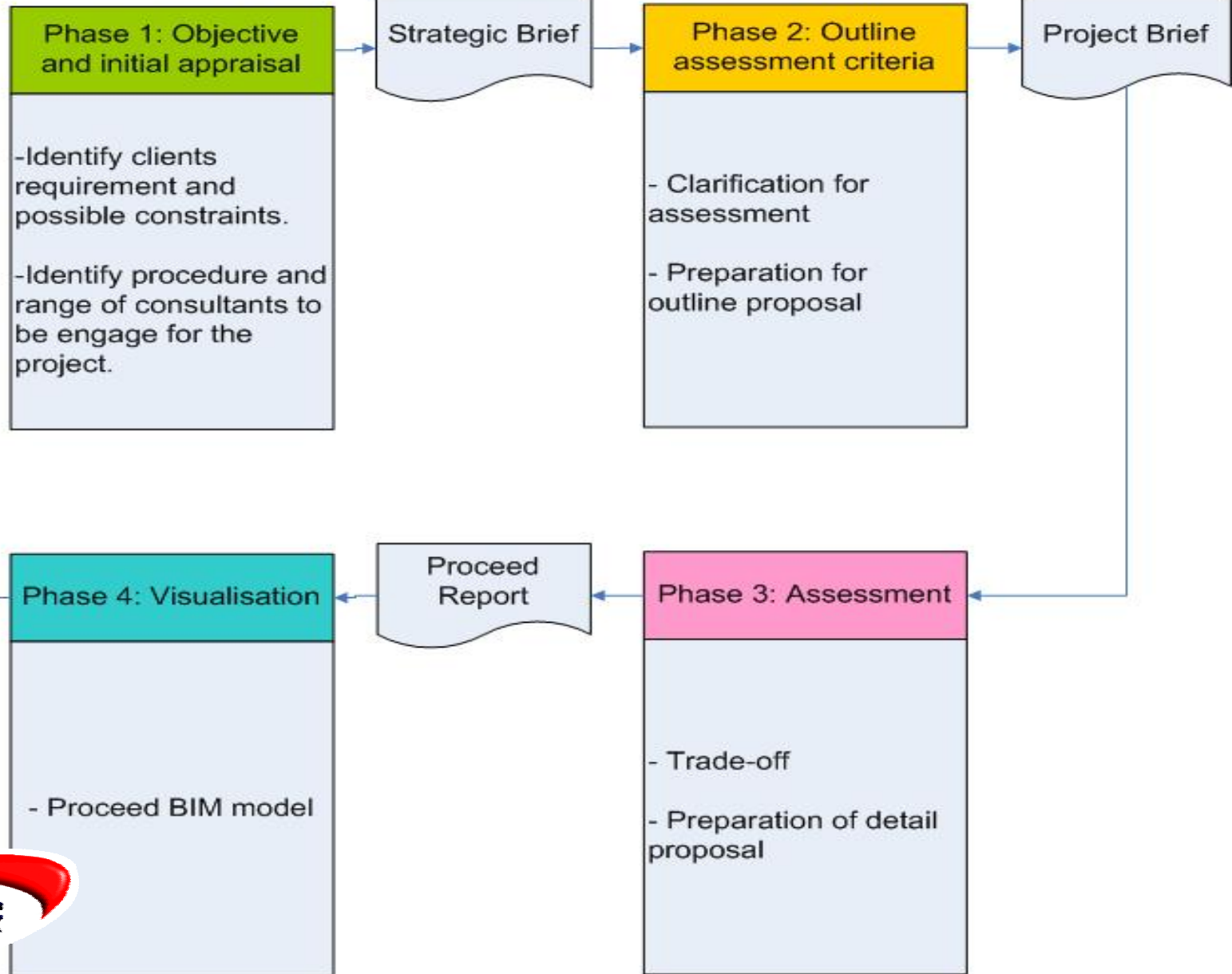


Objective

- Trade off the EIA-LCA-LCCA in order to achieve a hybrid assessment for the outline design process.
- To integrate the use of BIM technology with EATT.
- Close the gap of non-visual assessment tool in the market.



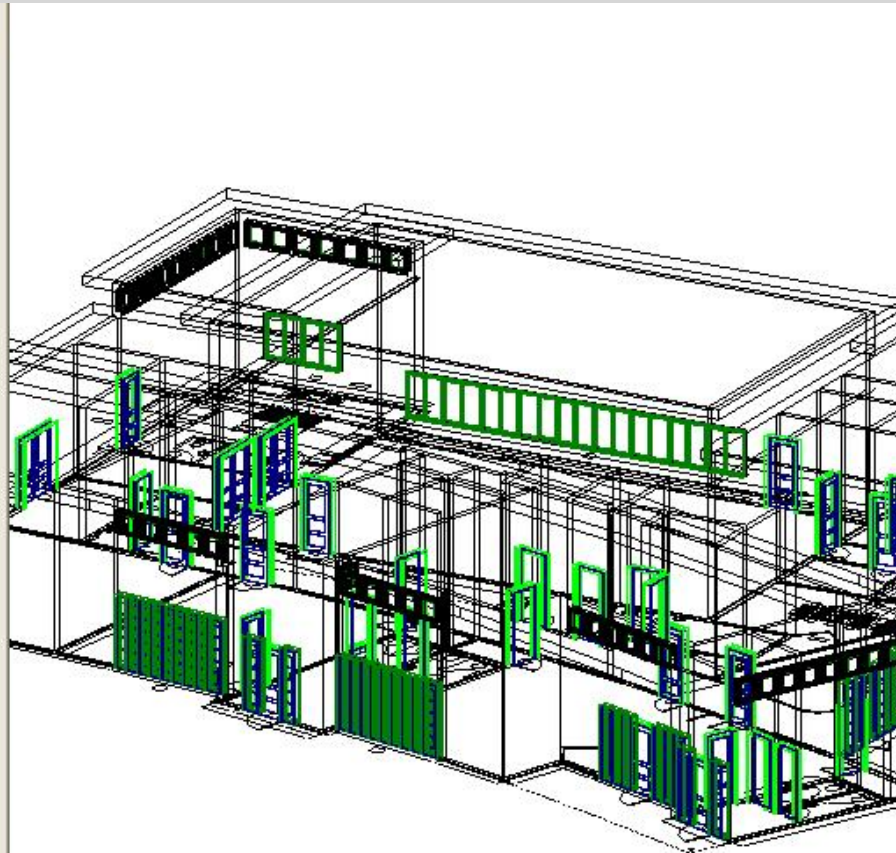
3D-EATT Process Flow Chart For Outline Design



3D-EATT

Byer Green1.0001 - P...

- Views (all)
- Floor Plans
 - Foundation
 - Level 1
- Ceiling Plans
 - Foundation
 - Level 1
- 3D Views
 - 3D View 1
 - {3D}**
- Elevations (Elevatio)
 - East
 - North
 - South
 - West
- Legends
- Schedules/Quantitie
- Sheets (all)
- Families
- Groups



Element Properties

Family: System Family: Basic Wall [v] Load...
Type: Wall 1 [v] Edit / New...

Type Parameters: Control all elements of this type

Parameter	Value
Assembly Description	
Assembly Code	
Type Mark	
Fire Rating	
Cost	

Instance Parameters - Control selected or to-be-created instance

Parameter	Value
Constraints	
Location Line	Finish Face: Exterior
Base Constraint	Foundation
Base Offset	0.0
Base is Attached	<input type="checkbox"/>
Base Extension Distance	0.0
Top Constraint	Unconnected
Unconnected Height	1000.0
Top Offset	0.0
Top is Attached	<input type="checkbox"/>
Top Extension Distance	0.0
Room Bounding	<input checked="" type="checkbox"/>
Related to Mass	<input type="checkbox"/>
Structural	
Structural Usage	Non-bearing

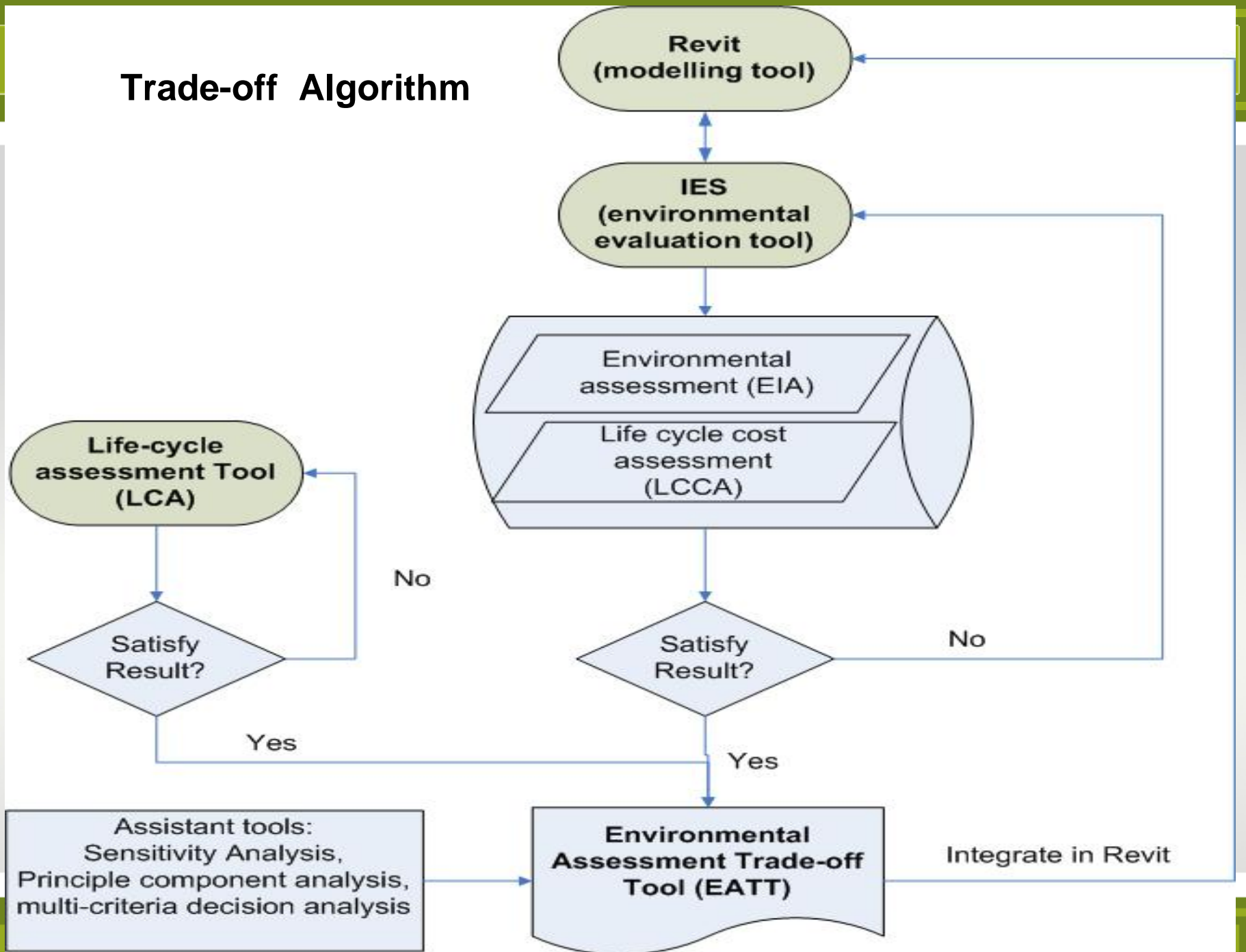
OK

Cancel

1 : 100

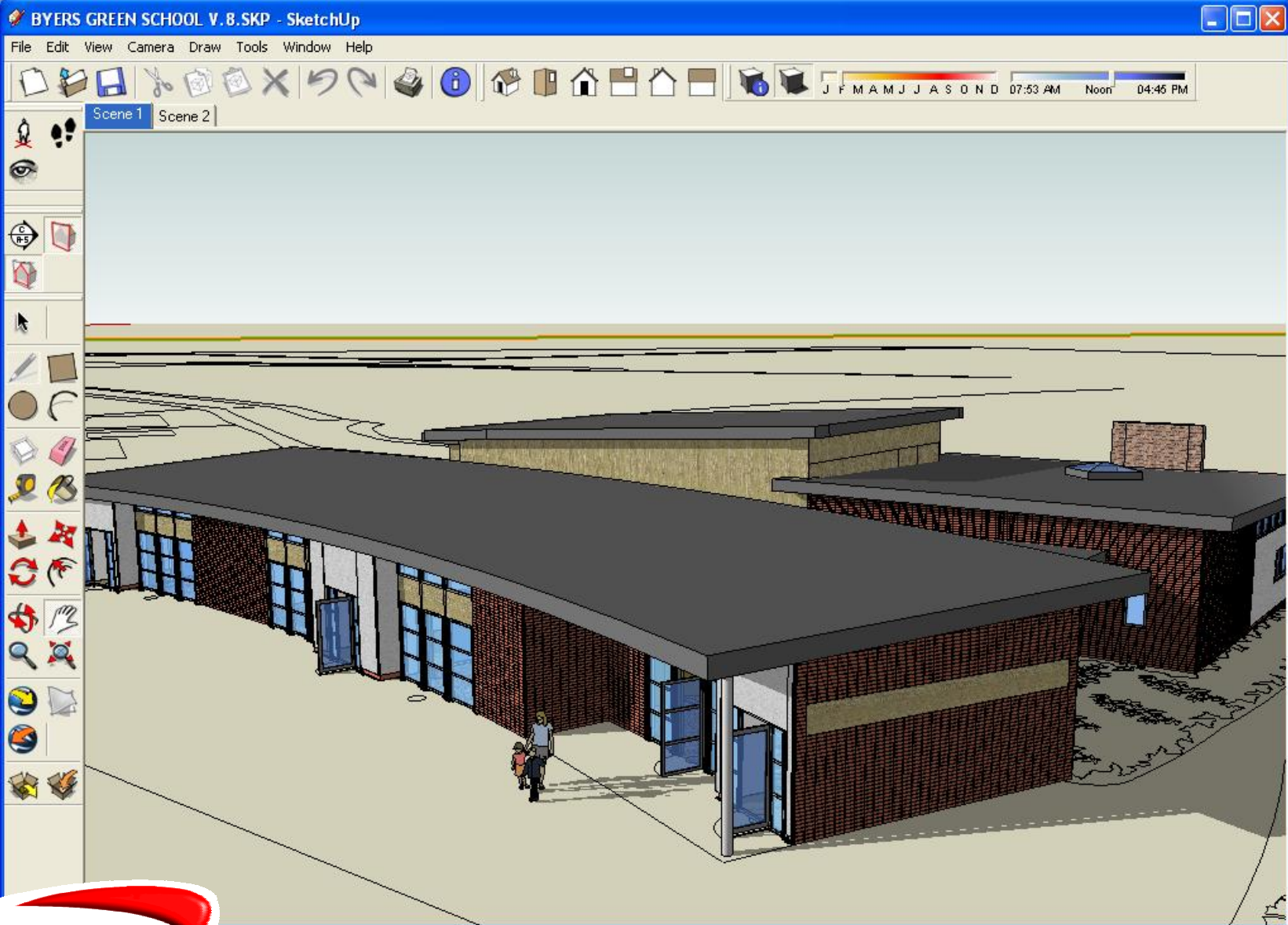


Trade-off Algorithm



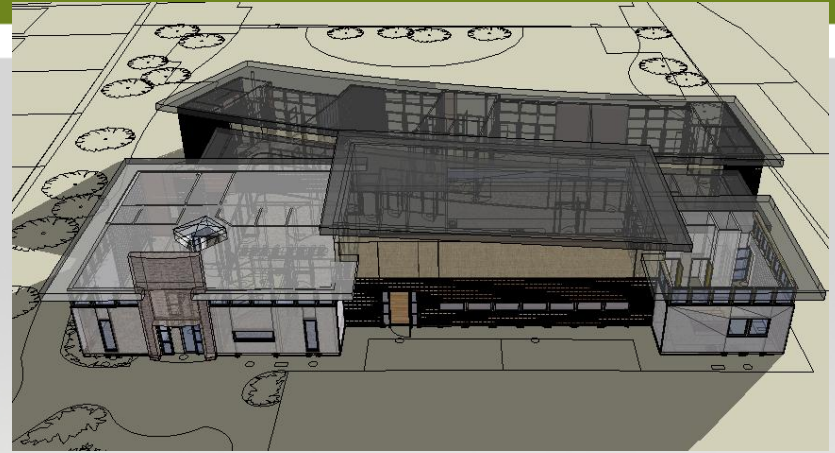
What we have achieved so far...







↑ Entrance
↓ Classroom in February



Top View ↑
Classroom in September ↓





4D Research

Byers Green Primary School Exploration Model

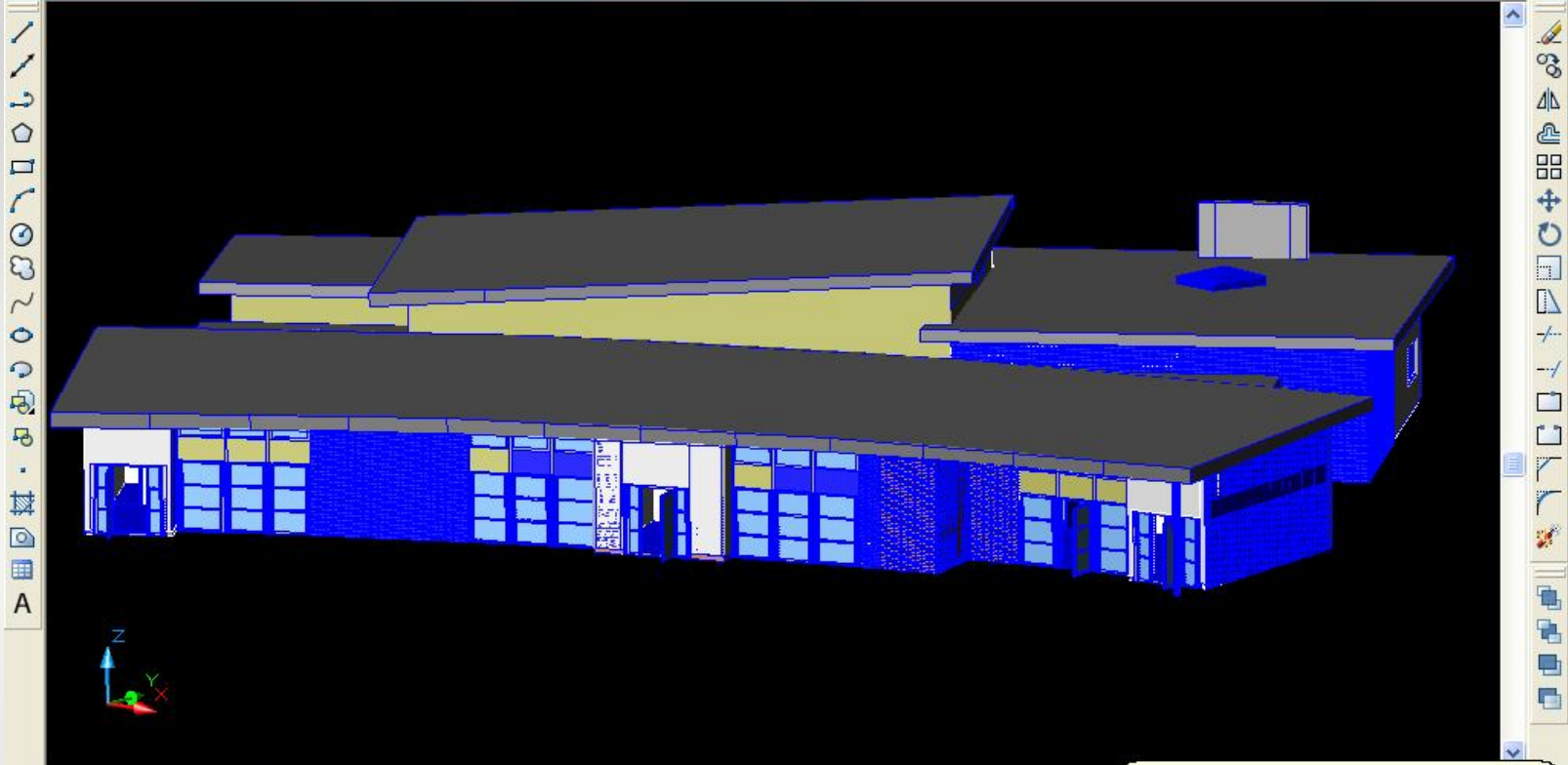


4DSPA :: 4D Space Analysis and Project Planning

Database Connection | 4D Simulator | Space Visualisation (2D Grid) | Space Visualisation (3D Box) | Environmental Impact Analysis

Project Title BYERS GREEN PRIMARY SCHOOL, DURHAM
Project ID BY-D

Space Calculator
Length Width Total



Model / Layout1 / Layout2

Specify first corner: Specify opposite corner:
Command: -vbarun

Communication Center
The easy way to keep you and your software up-to-date.
[Click here.](#)



0.0000 SNAP GRID ORTHO POLAR OSNAP OTRACK LWT MODEL

Environmental Impact Assessment

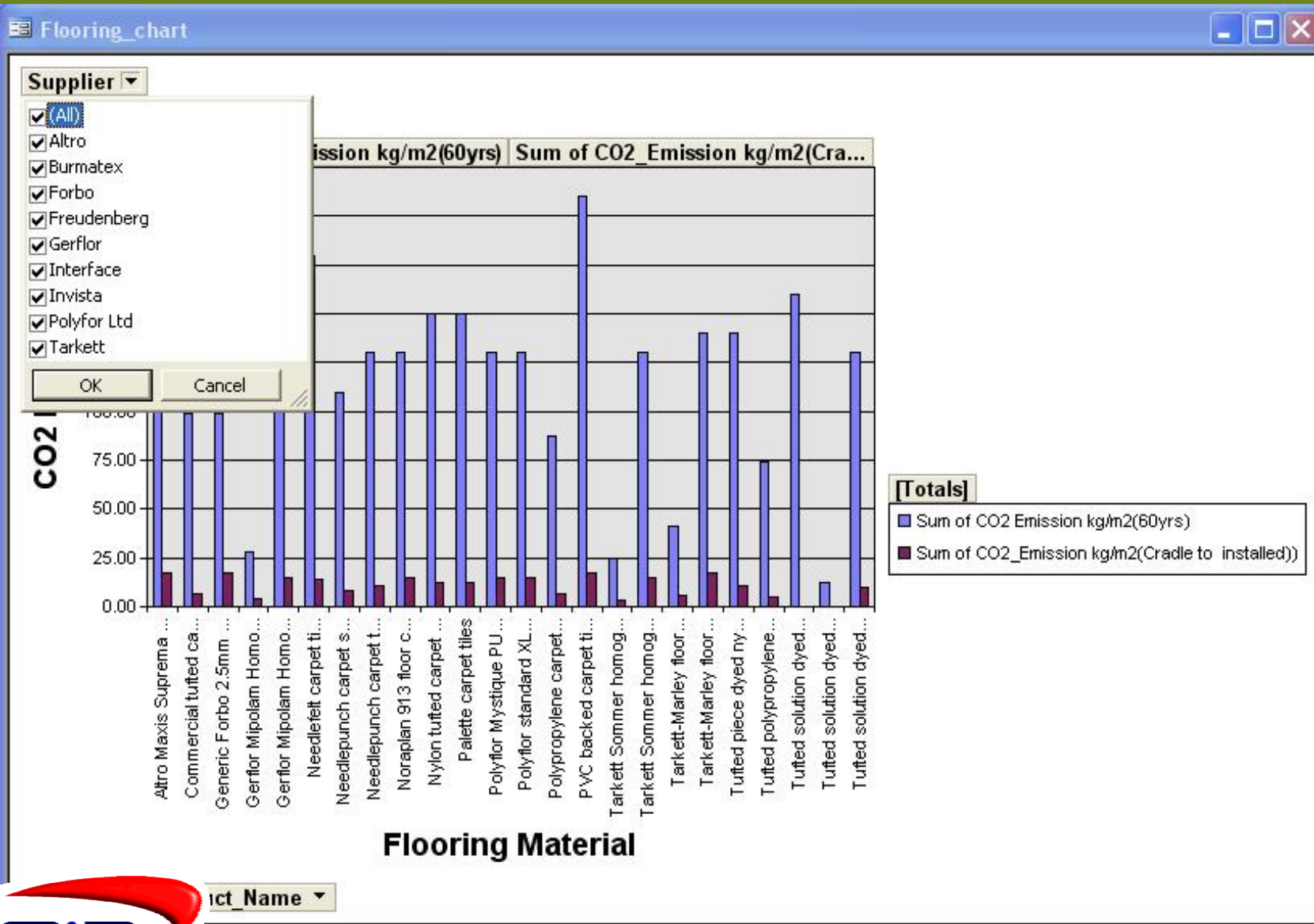
Material Input Transport To Site Waste Management

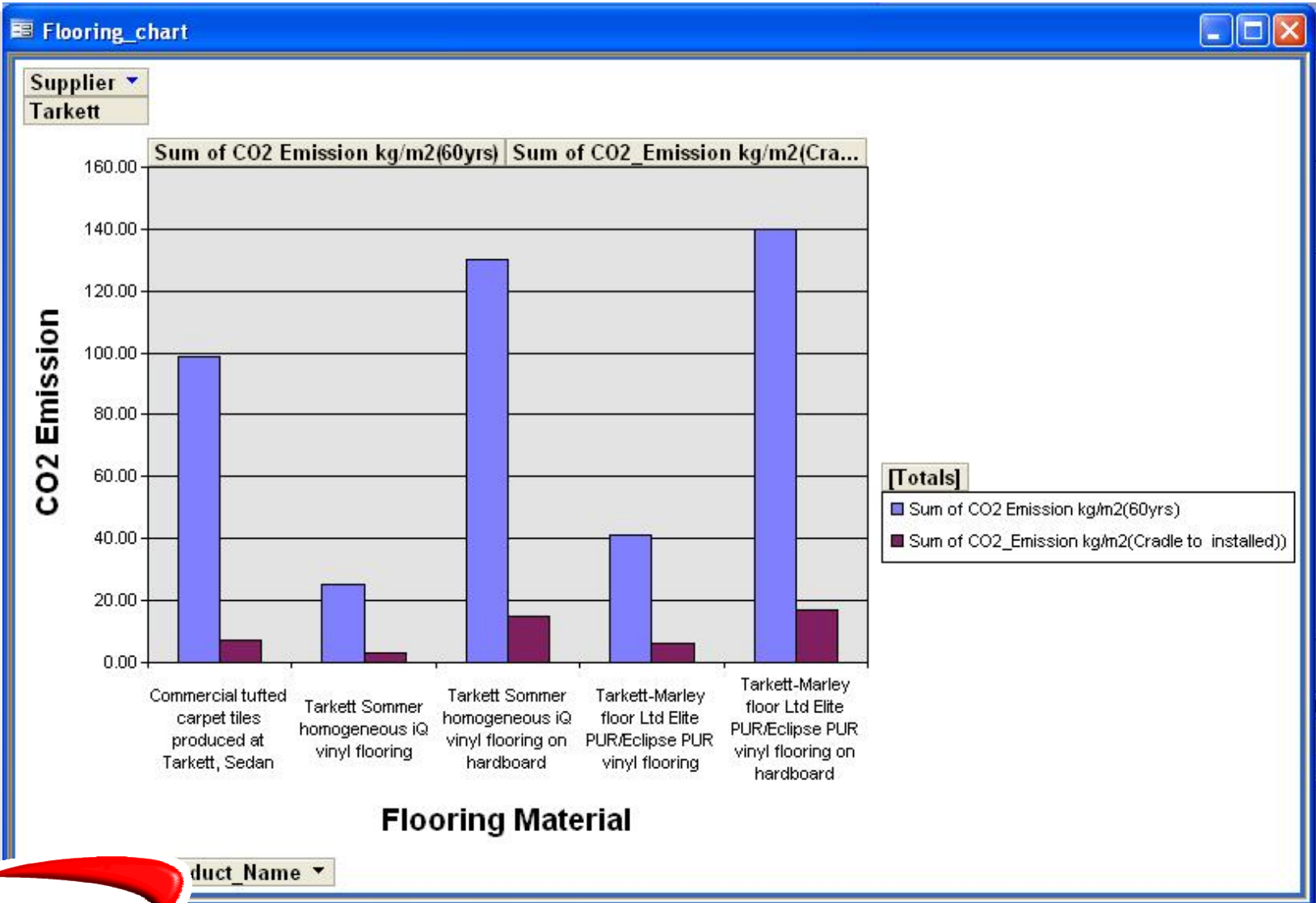
	New Data Input	Area (m2)
Roofing		
16mm plywood decking on BCI-joist(450,241)with insulation, polyester reinforced bitumen felt	<input type="checkbox"/>	70
Flooring		
Generic Forbo 2.5mm Marmoleum sheet with hardboard sheathing 3.2mm	<input type="checkbox"/>	50
Wall Structure		
Brickwork outer leaf, Rock wool insulation, 100mm Star performer 3.5N blockwork innerleaf, plasterboard/plaster, paint	<input type="checkbox"/>	38
Wall Board		
<input type="checkbox"/>	<input type="checkbox"/>	
15.0mm Sound Resistant Wallboard Lafarge	<input type="checkbox"/>	
12.5mm Standard Wallboard Lafarge	<input type="checkbox"/>	
15.0mm Standard Wallboard Lafarge	<input type="checkbox"/>	
19.0mm Standard Wallboard Lafarge	<input type="checkbox"/>	
9.5mm Predeco Wallboard Lafarge	<input type="checkbox"/>	
12.5mm Predeco Wallboard Lafarge	<input type="checkbox"/>	
15.0mm Predeco Wallboard Lafarge	<input type="checkbox"/>	
9.5mm Standard Wallboard Lafarge	<input type="checkbox"/>	

Analyse

Main Menu







Current Progress

- 13 months into 2 years project.
- Databases established
- Programme linked with 4DSPA
- Trade-off algorithm for 3D-EATT is developed.
- Outline design process for 3D-EATT is developed.
- Initial stage of the EATT development.



Thank You!

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