

## BIM Implementation Phases / AEC Product Matrix

	<b>Phase 1 – Model</b> <ul style="list-style-type: none"> <li>• 3D, parametric design elements</li> <li>• Design information</li> <li>• Documentation outputs</li> <li>• Conceptual design &amp; analysis</li> </ul>	<b>Phase 2 – Leverage</b> <ul style="list-style-type: none"> <li>• Link models to analysis tools</li> <li>• Visualize real-world appearance</li> <li>• Model-based assessment processes</li> </ul>	<b>Phase 3 – Integrate</b> <ul style="list-style-type: none"> <li>• Convergence of models</li> <li>• Model-based communication between disciplines</li> <li>• Lifecycle model utilization</li> <li>• Model-based fabrication</li> </ul>
<b>Architecture</b>	<b>Revit Architecture, AutoCAD</b> <ul style="list-style-type: none"> <li>✓ Design accuracy and quality</li> <li>✓ Estimating opportunities</li> <li>✓ Productivity increases</li> <li>✓ Accurate, efficient documentation</li> <li>✓ Early evaluation of complex constructability</li> </ul>	<b>3ds Max Design, Ecotect Analysis,</b> <ul style="list-style-type: none"> <li>✓ Assessments of design performance for LEED and other sustainable rating criteria.</li> <li>✓ Performance optimization</li> <li>✓ Cinema-quality design visualization</li> </ul>	<b>Navisworks Manage, Revit Structure, Revit MEP, Maya, Collaborative Project Management, Inventor</b> <ul style="list-style-type: none"> <li>✓ Coordination and clash detection</li> <li>✓ Reduced RFIs and Change Orders</li> <li>✓ IPD opportunities</li> <li>✓ More accurate building components</li> </ul>
<b>MEP Engineering</b>	<b>Revit MEP, AutoCAD</b> <ul style="list-style-type: none"> <li>✓ Leverage arch. data to improve design accuracy and quality</li> <li>✓ Improve systems coordination</li> <li>✓ Achieve productivity increases</li> <li>✓ Facilitate preliminary analysis</li> <li>✓ Accurate, efficient documentation</li> </ul>	<b>Ecotect Analysis</b> <ul style="list-style-type: none"> <li>✓ Assessments of design performance for LEED and other sustainable rating criteria.</li> <li>✓ Performance optimization</li> </ul>	<b>Revit Architecture, Revit Structure, Navisworks Manage, Collaborative Project Management</b> <ul style="list-style-type: none"> <li>✓ Coordination and clash detection</li> <li>✓ Reduced Requests for Information and Change Orders</li> <li>✓ IPD opportunities</li> </ul>
<b>Structural Engineering</b>	<b>Revit Structure, AutoCAD, Structural Detailing</b> <ul style="list-style-type: none"> <li>✓ Leverage arch. data to improve design accuracy and quality</li> <li>✓ Improve systems coordination</li> <li>✓ Achieve productivity increases</li> <li>✓ Facilitate preliminary analysis</li> <li>✓ Accurate, efficient documentation</li> </ul>	<b>Robot Structural Analysis</b> <ul style="list-style-type: none"> <li>✓ Assessments of design performance</li> <li>✓ Performance optimization</li> </ul>	<b>Revit Architecture, Revit MEP, Navisworks Manage, Collaborative Project Management</b> <ul style="list-style-type: none"> <li>✓ Coordination and clash detection</li> <li>✓ Reduced Requests for Information and Change Orders</li> <li>✓ IPD opportunities</li> </ul>
<b>Civil Engineering</b>	<b>Civil 3D, Map 3D, AutoCAD</b> <ul style="list-style-type: none"> <li>✓ Design accuracy and quality</li> <li>✓ Calculate material quantities</li> <li>✓ Improve document coordination</li> <li>✓ Productivity increases</li> <li>✓ Accurate, efficient documentation</li> </ul>	<b>Ecotect Analysis, Robot Structural Analysis, 3ds Max Design</b> <ul style="list-style-type: none"> <li>✓ Assessments of design for LEED, other sustainable performance criteria, structural performance</li> <li>✓ Performance optimization</li> <li>✓ Collaborate with internal teams</li> <li>✓ Cinema-quality design visualization</li> </ul>	<b>Navisworks Manage, Collaborative Project Management</b> <ul style="list-style-type: none"> <li>✓ Coordination and clash detection</li> <li>✓ Reduced RFIs and COs</li> <li>✓ IPD opportunities</li> <li>✓ Collaborate with external companies on building team</li> <li>✓ Reduce risk and liability concerns</li> </ul>
<b>Construction</b>	<b>Revit Architecture, AutoCAD, Civil 3D, Quantity Take-off</b> <ul style="list-style-type: none"> <li>✓ Design accuracy and quality</li> <li>✓ Estimating opportunities</li> <li>✓ Productivity increases</li> </ul>	<b>Navisworks, Revit Structure</b> <ul style="list-style-type: none"> <li>✓ Assessments of design performance for LEED and other sustainable rating criteria.</li> <li>✓ Increase schedule predictability</li> <li>✓ Performance optimization</li> <li>✓ Clash detection</li> </ul>	<b>Navisworks, Collaborative Project Management, Inventor</b> <ul style="list-style-type: none"> <li>✓ Coordination and clash detection</li> <li>✓ Reduced Requests for Information and Change Orders</li> <li>✓ IPD opportunities</li> <li>✓ Collaborate with external companies on the building team</li> <li>✓ Easier integration of fabricated components</li> </ul>