Appendix E – Specific Examples of Digital Technologies for Construction

This appendix provides additional comments and identifies specific providers and examples for the five digital technologies identified as part of RRC's *TRM Search and Assessment* that appear to have the most potential to boost the productivity of Manitoba construction sector SMEs.

Building Information Modeling (BIM)

Most of the BIM-related training that has occurred in Manitoba so far has concentrated design professionals, especially in the area of architecture. However, as is shown by the below, there are numerous examples of BIM software suites and components available other segments of the building industry.

(*NOTE: This list below is current as of March 31, 2013. An earlier effort to compile a list tools that support BIM can found in Appendix C.3 of the April 2011 report Environmental Scan of BIM Tools and Standards produced for the Institute for BIM in Canada – see: www.ibcbim.ca/documents/Environmental%20Scan%20of%20BIM%20Tools%20and% andards%20FINAL.pdf*)

Architecture:

- Autodesk Revit Architecture
  www.autodesk.com/products/autodesk-revit-family/overview

- Bentley Architecture
  www.bentley.com/en-US/Products/Bentley+Architecture

- CADSoft Envisioneer
  www.cadsoft.com/v8.php

- 4MSA IDEA Architectural Design (IntelliCAD)
  www.bim-architecture.com

- Gehry Technologies - Digital Project Designer
  www.gehrytechnologies.com/index.php?option=com_content&task=view&id=50&Iter

- Graphisoft ArchiCAD
  www.graphisoft.com/products/archicad

- Nemetschek Allplan Architecture
  www.nemetschek-allplan.eu

- Nemetschek Vectorworks Architect
  www.vectorworks.net/architect/index.php

- Softtech Spirit
  www.softtech.com/index.php?id=21

Sustainability:

- Autodesk Ecotect Analysis
  http://usa.autodesk.com/ecotect-analysis

- Autodesk Green Building Studio
  www.greenbuildingstudio.com/GBS

- Bentley Tas Simulator
  www.bentley.com/en-us/Products/AECOsim%20Energy%20Simulator

- Bentley Hevacomp
  www.bentley.com/en-US/Products/Building+Analysis+and+Design/Hevacomp.htm

- DesignBuilder
  http://www.designbuilder.co.uk

- IES Solutions Virtual Environment VE-Pro
  www.iesve.com/Software/VE-Pro

Structures:

- Autodesk Revit Structure
  www.autodesk.com/products/autodesk-revit-family/features/structure

- Autodesk Robot Structural Analysis
  www.autodesk.com/products/autodesk-simulation-family/features/robot-structural-analysis

- Bentley RAM, STAAD and ProSteel
  www.bentley.com/en-US/Products/Structural+Analysis+and+Design

- Bentley Structural Modeler
  www.bentley.com/en-US/Products/Bentley+Structural

- CypeCAD
  http://cypecad.en.cype.com

- 4MSA Strad and Steel
  www.4msa.com/stradENG.html and www.4msa.com/steelENG.html

- Gratec Advance Design
  www.graitec.com/en/ad.asp

- Nemetschek Scia
  http://www.scia-online.com/en/display-news.php?myframe=http://www.scia-online.com/WWW/websiteUS.nsf/0/322efca3fe73de6ac12576dc002b9738!OpenDocument

- StructureSoft Metal Wood Framer
  www.strucsoftsolutions.com/products.asp#mwf

- Tekla Structures
  www.tekla.com/us/products/Pages/Default.aspx

Mechanical, Electrical and Plumbing:

- Autodesk Revit MEP
  www.autodesk.com/products/autodesk-revit-family/features/mep

- Bentley Hevacomp Mechanical Designer
  www.bentley.com/en-US/Products/Hevacomp+Mechanical+Designer

- Autodesk Fabrication (CADmep, ESTmep and CAMduct)
  www.autodesk.com/products/fabrication-
  products/overview?option=com_content&view=article&Itemid=2&id=52

- 4MSA FineHVAC, FineELEC, FineSANI and FineLIFT
  http://www.4msa.com/FineHvacENG.html

- Gehry Technologies - Digital Project MEP Systems Routing
  www.gehrytechnologies.com/index.php?option=com_content&task=view&id=53&Itemid=225

Construction Simulation, Estimating and Cost Analysis:

- Autodesk Navisworks
  www.autodesk.com/products/autodesk-navisworks-family/overview

- Autodesk Field BIM
  http://bim360field.com/products/field-BIM

- Autodesk BIM 360 Glue
  http://wikihelp.autodesk.com/BIM_360_Glue/enu/Help

- Bentley ConstrucSim
  www.bentley.com/en-US/Products/ConstructSim/Product-Overview.htm

- Innovaya
  www.innovaya.com

- Solibri Model Checker
  www.solibri.com

- Synchro Professional
  http://synchroltd.com

- Tekla BIMSight
  www.teklabimsight.com/index.jsp

- Vico Office Suite
  www.vicosoftware.com/products/Vico-Office/tabid/85286/Default.aspx

Facility Management:

- Bentley Facilities
  www.bentley.com/en-US/Products/Bentley+Facilities

- FM:Interact Workplace Management Suite
  www.fmsystems.com/software/fminteract

- VintoCON and ArchiFM (for ArchiCAD)
  www.vintocon.com/?lang=eng

- Onuma System
  http://onuma.com/products

- EcoDomus
  www.ecodomus.com

Online Document Control and
Innovative Use of Mobile Computing Devices

Although there are an ever expanding number of innovative applications ('apps') for mobile commuting devices (i.e., smartphones and tablets), those that appear to have the widest potential for adoption by Manitoba SMEs are those for online management of construction documents, specifically apps for drawing, annotation and note-taking. The following are several examples of these apps:

Drawing Tools:

- Cartomap
  www.cartomapcad.com/en/index.html

- AutoCAD WS
  www.autocadws.com

Annotation and Note-taking:

- PlanGrid
  www.plangrid.com

- iAnnotate PDF
  www.branchfire.com/iannotate

- Good Reader
  www.goodiware.com/goodreader.html

- Note Taker HD
  www.notetakerhd.com

- Evernote
  http://evernote.com

- Meeting Minutes Pro
  www.srimanapps.com

Automatic Identification and Information Capture

Based on the consultations undertaken by RRC, the use of automatic identification and information capture technology (i.e., RFID tag, barcodes, QR codes) is low among Manitoba construction SMEs. This is despite the relatively low cost, ease of implementation and ability to generate immediate benefits of the technology.

The following are examples of suppliers who produce RFID tag, barcodes, QR code products and software that are suitable for tracking equipment, materials and personnel that may be of interest to Manitoba construction SMEs.

RFID Tags:

- ADR Software
  www.softwareadr.com

- Atlas RFID
  www.atlasrfid.com/Home.aspx

- Intelleflex
  www.intelleflex.com

- Intelliwave Technologies
  www.intelliwavetechnologies.com

- International Coding Technologies, Inc.
  www.ictrfid.com

- GAO RFID
  www.gaorfid.com

- Omni-ID
  www.omni-id.com/products

- SageData
  www.sagedata.com/Barcode-RFID-Designers-Notebook/Managing-Tracking-Maintaining-Construction-Equipment-using-RFID-Barcodes.html

- Silent Partner Technologies
  http://www.silentpartnertech.com/rfid-solutions-applications/rfid-construction-equipment-inventory

- ThingMagic
  www.thingmagic.com

Barcodes and QR codes:

- BarcodesInc
  www.barcodesinc.com/solutions/construction.htm

- GigaTrak
  www.gigatrak.com/software/tool_tracking_system.aspx

- Imprint Emterprises
  http://www.imprint-e.com/construction-barcode-solutions

- N4 Systems
  www.fieldid.com/what-is-field-id

- PanMobil Systems
  http://panmobil.com/?id=147

Automated equipment

Of the five digital technologies judged to potentially have the most potential to boost the productivity of Manitoba's construction sector SMEs, automated equipment generated the least interest during RRC's consultation with industry stakeholders. The high cost and limited options for this technology make this a difficult sell to most SMEs.

However, one area of this technology that does appear to have application by a many SMEs is automated 3D laser scanning to replace traditional methods of surveying site conditions and as-built conditions. The following are a pair of firms who provide this technology to the construction sector:

- LandAir Surveying Company
  http://www.landairsurveying.com/3d-laser-scanning/construction

- Trimble 3D Laser Scanning
  www.trimble.com/3d-laser-scanning