Additive Manufacturing, Virtual Collaboration, and the Digital Thread at EXWC
Range of Efforts

• Past Efforts
  – Remote Collaborative 3D Printing - Process Investigation

• Ongoing Efforts
  – Unmanned Inspection for Facilities Applications
  – 3D Model Translation workflow analysis
  – Additive Manufacturing for Facilities Applications

• Efforts of interest
  – Additive Manufacturing of Facilities
  – Facilities Requirements for Additive Manufacturing systems
  – Expeditionary Additive Manufacturing
• Preliminary evaluation of the 3D printing digital thread
• Send/receive files in various formats, process/translate, print
• 30+ models
• 10+ file formats
• 13 software packages
• 5 computers
• 2 printers
Ongoing Efforts

• Unmanned Inspection for Facilities Applications
  – Determine the primary applications, feasibility, utility, and capability gaps of small, unmanned systems to augment facilities inspection and design reconstruction operations

• Additive Manufacturing for Facilities Applications
  – Determine primary candidates for additive manufacturing
  – Test and Evaluation of select parts
  – Business case analysis and AM system distribution model

• Model Translation
  – Evaluate typical model translation needs, workflows, and costs
    • 3D models are ubiquitous in the modern technical environment
    • Core to CAD/CAM, GIS, Virtual Planning, Simulation, etc.
    • Specialized software, expertise, and workflows are required to translate
Efforts of Interest

• Additive Manufacturing of Facilities
  – Maintain awareness of ongoing Army and USMC efforts in additive manufacturing of expeditionary facilities
  – Large gantry or boom-mounted concrete extruders, capable of printing structures in place

• Facilities Requirements for Additive Manufacturing systems
  – Evaluate/codify facilities requirements for advanced AM systems
  – Advanced (metal) AM systems require
    • Specialized raw-material storage and handling (metal powders)
    • Appropriate environmental conditioning and HVAC
    • Appropriate power and grounding systems
    • Appropriate floor stability
    • Supporting machine shop capabilities

• Expeditionary Additive Manufacturing
  – Everything discussed above – in the Expeditionary context