



Point Cloud Scoping and Acquisition Best Practice Guidelines

Point Cloud Standards Statement of Intent

...the intent is to inform and protect the both the provider and owner, whether private or public, when developing a scope and fee to conduct a survey with point cloud delivery. Whether scanning, photo modeling, or UAS Survey, all parties should be able to verify and stand by the agreed accuracies and best practices.

Establishes a reference for point cloud delivery accuracies, implications, and scope options.

Illustrates potential uses and consideration for point cloud delivery.

Categories/classes of survey and related control methodology to cover schematic through engineering potential scopes.

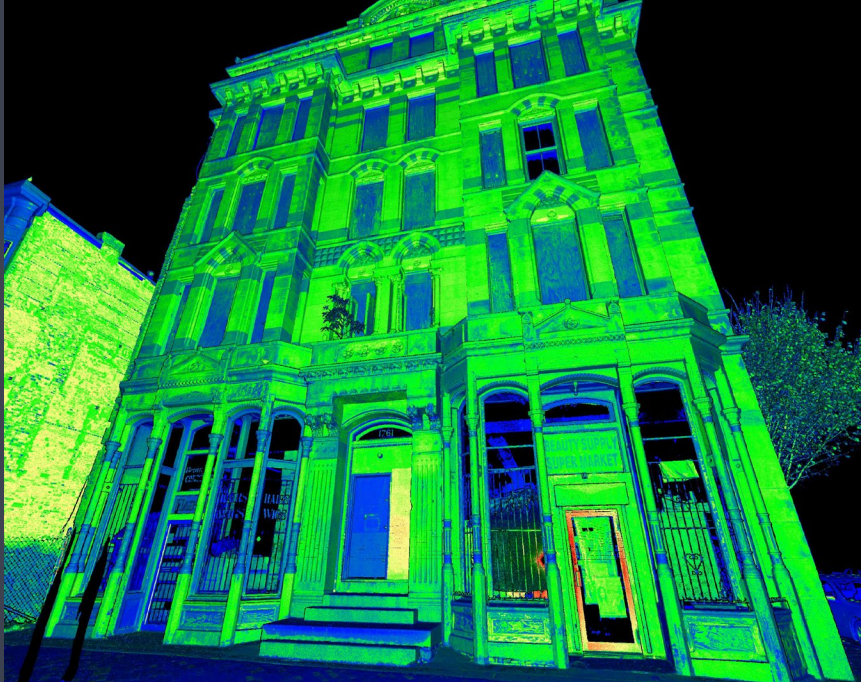
None platform specific to allow for applicability and scalability.

Promote survey standards and best practice as related to point cloud delivery.

Ratified by MALSCE Board of Directors, July 2020

Original Committee: *Stephen Wilkes – Feldman (Chair), Ted Covill – WSP, Dan McIsaac – Massachusetts Port Authority, David Prince – WSP, Bob Staples – DGT*

Point Cloud Standards



A live document enabling updating and revising with technological developments and community input

Industry sector scope development and delivery expectations

Table based standards reference and scope considerations

Industry sector scope development and delivery expectations

Referenced related standards

Glossary of terms and illustrated reference.



Table 1: Point Cloud Project Scoping Guide

Point Cloud Project Scoping Guide					
Class	Focus	Example Uses	Point cloud accuracy	Example Minimum Feature of Interest	Considerations
A	Architectural, MEP and Civil Engineering design, construction documents	Engineering level existing conditions, construction documents, model development	1/4" Level 1 Control Minimum	Small MEP components	Maximum potential for reuse across project lifecycle
		Vertical coordination		Structural relieving joints	Full discipline coordination
		Deformation analysis and monitoring		Verified positional locations	Least likely for required returns if scope develops
		Property relation and site plan coordination		Architectural detailing	Full registration to site control or grid reporting
B	Design	All of the below plus:	1/2" Level 2 Control Minimum	Masonry openings	Lower accuracy & spatial relation, vertical stacking
		Design development		Large MEP systems	
		Initial coordination planning		Site positioning	Likely to require additional survey
		Volume Quantity		Coordination	Limited alternate usage
C	Project Planning, Schematic design	Limited accuracy planning tools	3" Level 3 Control Minimum	Initial design concept coordination Mass modeling	Floors may not stacked
		Demolition phasing			
		Elevation Markups Notation			Will require considerable additional survey for higher end usage.
		Volume estimates			
		Condition assessments			Restricted alternate usage
D	Feasibility / Visualization	Site visualization, Animations, fly through, imagery	Accuracy not verified	General area context capture	Lowest costs for data accuracy. Global accuracy not verifiable Limited value to modeled elements
Notes			Point cloud accuracy: reliability of final point cloud from end to end across multiple scanning locations		

Table 2: Required Quality Control

Survey Quality Control				
Level	Survey Method	Project Control Positional Tolerance	Target Based Registration	Review
1	Closed traverse survey control with total station (differential levels recommended).	For 1/4" point cloud relative to control (survey network minimum accuracy 0.04' + 50 ppm)	Yes	PLS / PE*
2	Survey control via total station and/or Survey Grade Geodetic GPS	For 1/2" point cloud relative to control (survey network minimum accuracy 0.10' + 75 ppm)	Yes	PLS / PE*
3	Basic survey points only for geolocation or QA/QC	For 3" point cloud relative to control (survey network minimum accuracy 0.25' + 200 ppm)	Minimal (Overlap Dependent)	PLS/PE, ASPRS Photogrammetrist
4	No survey control checks		None (Overlap Only)	PLS/PE, ASPRS Photogrammetrist
Notes		To ensure point cloud data longevity, Level 1 or 2 control is recommended. See glossary for implications		*Statement of accuracy from PLS/PE recommended



Point Cloud Standards and Survey

- Part of a robust Geospatial Management plan
- Live document, will include addition of SLAM specific technology and develop over time as platforms change.
- Aims to provide the 'why' to scoping conversations to ensure matching expectations.
- Public education on standards document and the benefits of using them for a basis for project development.

