October 6, 2020

Photogrammetry Unit's Products to Support Construction Products with Manned Aircraft – Should be requested by Division Resident Engineers						
Product	**WHAT It Provides**	**WHAT it is used for**	**Typical Scale**	**WHEN is it typically ordered?**	**Units involved**	**How long to deliver product?**
Original Construction Earthwork (OX) (DTM with TIN + supporting ground surveys and preconstruction Final Surveys DTM data)	A Digital Terrain Model (DTM) that includes photogrammetric elevation data with comprehensive break lines that updates the project area after clearing & grubbing. 3-D DTM (.dgn) file with highly detailed elevation points and break lines, and corresponding TIN file. This file may or may not include ground surveyed data from Division Construction staff. This file should include preconstruction Final Surveys DTM data outside of the project's right of way and in areas within the project as directed by the Resident Engineer. Upon completion of the OXDTM, 2-D Cross-Sections (.dgn) of the project are submitted to Resident Engineers for approval of final "original" ground and then an Earthwork Pay Quantity Survey Report calculating the volume difference between the Final Surveys DTM data and the OXDTM is delivered. Digital mosaic of photo mission(s) used to generate OXDTM is also delivered	Used for calculation of earthwork quantities between the preconstruction Final Surveys DTM data and the Original Construction Earthwork DTM Data on active corridor construction sites or borrow pits.	**Standard** 1" =50'	After clearing and grubbing have been completed. **Best Practice** Before major earthwork has been started **When Necessary** Upon Resident Engineer Request	Photogrammetry plans flight and control configuration and acquires photos. Location & Surveys sets, and ground surveys photo identifiable targets called "panels"	OXDTM files are usually completed within 1 year, depending on how many flights are done to collect the original ground.
Intermediates Construction Earthwork (FI) (DTM with TIN + supporting ground surveys, preconstruction Final Surveys DTM data, and OXDTM data)	A Digital Terrain Model (DTM) that includes photogrammetric elevation data with comprehensive break lines that updates the project area where earthwork is in progress. 3-D DTM (.dgn) file with **highly detailed** elevation points and break lines, and corresponding TIN file This file may or may not include ground surveyed data from Division Construction staff. This file should include preconstruction Final Surveys DTM data outside of the project's right of way and OXDTM data in areas where the ground has not changed. Earthwork Pay Quantity Survey Reports calculating the volume difference between the OXDTM data and the FIDTM are delivered as needed. Digital mosaic of photo mission(s) used to generate FIDTM is also delivered.	Used for monitoring and calculation of earthwork quantities between the Original Construction Earthwork DTM Data and the Intermediates Construction Earthwork DTM Data on active corridor construction sites or borrow pits.	**Standard** 1" =50'	As needed by Resident Engineer **Best Practice** After sub grading has been started and before final pavement has been poured **When Necessary** Upon Resident Engineer Request	Photogrammetry plans flight and control configuration and acquires photos. Location & Surveys sets, and ground surveys photo identifiable targets called "panels"	3 to 6 Months after flight. Updates are done throughout the life of the project at the request of the Resident Engineer
Final Construction Earthwork (FX) (DTM with TIN + supporting ground surveys, preconstruction Final Surveys DTM data, OXDTM, and FIDTM data)	A Digital Terrain Model (DTM) that includes photogrammetric elevation data with comprehensive break lines that updates the project area after earthwork is completed. 3-D DTM (.dgn) file with **highly detailed** elevation points and break lines, and corresponding TIN file This file may or may not include ground surveyed data from Division Construction staff. This file should include preconstruction Final Surveys DTM data outside of the project's right of way, OXDTM and FIDTM data in areas where the ground has not changed. Upon completion of the FXDTM, an Earthwork Pay Quantity Survey Report calculating the volume difference between the OXDTM data and the FXDTM is delivered. Digital mosaic of photo mission used to generate FX is also delivered.	Used for calculation of earthwork quantities between the Original Construction Earthwork DTM Data and the Final Construction Earthwork DTM Data on active corridor construction sites or borrow pits.	**Standard** 1" =50'	After construction has been completed **Best Practice** Before Final earthwork payment has been made **When Necessary** Upon Resident Engineer Request	Photogrammetry plans flight and control configuration and acquires photos. Location & Surveys sets, and ground surveys photo identifiable targets called "panels"	1 to 3 months after flight
Emergency Terrain Mapping (graphic planimetric mapping + DTM with TIN)	Situations specific graphic planimetric mapping (SPS) with detailed elevation data. 2-D MicroStation design (.dgn) file with **limited** detail graphic planimetric mapping, 3-D (digital terrain model) DTM (.dgn) file with **10 ft spaced** QL2 LiDAR updated with **10 ft** to **20 ft spaced** photogrammetric derived elevation points in areas of change and detailed break lines, and corresponding TIN file. Digital mosaic of photo mission used to generate mapping is also delivered.	Used for quick response mapping or emergency sites such as rockslides, landslides, or infrastructure damage caused by severe weather events.	**Standard** 1" =50' **Alternative** 1" =30' 1" =20'	As soon as an area of interest has been identified. **Best Practice** First clear weather day **When Necessary** Upon Division Engineer's request	Photogrammetry plans flight and control configuration, acquires photos, and produces mapping. Location & Surveys sets and ground surveys "panels".	1-3 weeks after aerial photography completed and receipt of photo control. Requires receipt of verified mapping limits in advance of photo mission.