October 7, 2020

Photogrammetry and Location & Surveys Units Products to Support Construction Products with Unmanned 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?**
UAS Original Construction Earthwork Mapping (UOX) (raster digital image mapping, + DEM with TIN, and optional point cloud)	Project specific georeferenced raster digital image product with photogrammetric elevation data that updates the project area after clearing & grubbing that aligns with existing project geospatial datasets. 2-D raster digital image (.sid) file, 3-D (digital elevation model) DEM (.dgn) file with 1' and 2.5' spaced elevation points generated from a classified point cloud, and corresponding triangulated irregular network (.tin) file. Debris piles, rock piles, and any other areas designated by the Resident Engineer will be shown as voids and excluded from elevation data.	Used for developing original ground elevation data. Best utilized in areas of bare earth with minimal vegetation. Best suited for borrow pits.	Standard Raster GSD 0.11 ft Standard Mapping Scale (1" = 50')	After clearing and grubbing have been finalized. Best Practice Before any major earthwork has commenced. When Necessary Upon Resident Engineer's request.	Photogrammetry plans flight and control configurations, acquires imagery, and produces mapping. Location & Surveys sets and ground surveys "panels".	2-3 weeks after aerial photography completed and receipt of ground control. Requires receipt of verified mapping limits in advance of photo mission.
UAS Intermediate Construction Earthwork Mapping (UFI) (raster digital image mapping, + DEM with TIN, and optional point cloud)	Project specific georeferenced raster digital image product with photogrammetric elevation data that updates the project area where earthwork is in progress that aligns with existing project geospatial datasets. 2-D raster digital image (.sid) file, 3-D (digital elevation model) DEM (.dgn) file with 1' and 2.5' spaced elevation points generated from a classified point cloud, and corresponding triangulated irregular network (.tin) file. Debris piles, rock piles, and any other areas designated by the Resident Engineer will be shown as voids and excluded from elevation data.	Used for monitoring and calculation of earthwork quantities on active construction sites. Best utilized in areas of bare earth with minimal vegetation. Best suited for borrow pits.	Standard Raster GSD 0.11 ft Standard Mapping Scale (1" = 50')	In between monthly estimates. Best Practice After any major earthwork has commenced. When Necessary Upon Resident Engineer's request.	Photogrammetry plans flight and control configuration, acquires photos, and produces mapping. Location & Surveys sets and ground surveys "panels".	2-3 weeks after aerial photography completed and receipt of ground control. Requires receipt of verified mapping limits in advance of photo mission.
UAS Final Construction Earthwork Mapping (UFX) (raster digital image mapping, + DEM with TIN, and optional point cloud)	Project specific georeferenced raster digital image product with photogrammetric elevation data that updates the project area where earthwork has been completed that aligns with existing project geospatial datasets. 2-D raster digital image (.sid) file, 3-D (digital elevation model) DEM (.dgn) file with 1' and 2.5' spaced elevation points generated from a classified point cloud, and corresponding triangulated irregular network (.tin) file. Debris piles, rock piles, and any other areas designated by the Resident Engineer will be shown as voids and excluded from elevation data.	Used for monitoring and calculation and finalization of earthwork quantities on active construction sites. Best utilized in areas of bare earth with minimal vegetation. Best suited for borrow pits.	Standard Raster GSD 0.11 ft Standard Mapping Scale (1" = 50')	Before final earthwork estimate has been payed. Best Practice After earthwork has been finalized. When Necessary Upon Resident Engineer's request	Photogrammetry plans flight and control configuration, acquires photos, and produces mapping. Location & Surveys sets and ground surveys "panels".	2-3 weeks after aerial photography completed and receipt of ground control. Requires receipt of verified mapping limits in advance of photo mission.
UAS Emergency Terrain Mapping (UDTM) (raster digital image mapping, + DEM with TIN, and optional point cloud)	Situations specific georeferenced elevation data that aligns with existing statewide geospatial datasets. 2-D raster digital image (.sid) file, 3-D (digital elevation model) DEM (.dgn) file with 1' and 2.5' spaced elevation points generated from a classified point cloud, and corresponding triangulated irregular network (.tin) file. An ArcMap GIS On-Line (AGOL) swipe map is available upon request	Used for rapid response mapping, monitoring, and quantities for emergency sites such as rock or landslides and infrastructure damage caused by acts of nature.	Standard Raster GSD 0.11 ft Standard Mapping Scale (1" = 50')	As soon as a target area 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".	2-3 days after aerial photography completed and receipt of ground control. Requires receipt of verified mapping limits in advance of photo mission.
UAS Emergency Orthophotography (UOP) (raster digital image mapping + AGOL swipe map)	Project specific georeferenced raster digital image product that aligns with existing statewide geospatial datasets. 2-D raster digital image (.sid) file and ArcMap GIS On-Line (AGOL) swipe map	Used for rapid response monitoring for emergency sites such as rock or landslides and infrastructure damage caused by acts of nature.	Standard Raster GSD 0.11 ft	As soon as a target area 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".	2-3 days after aerial photography completed and receipt of ground control. Requires receipt of verified mapping limits in advance of photo mission.