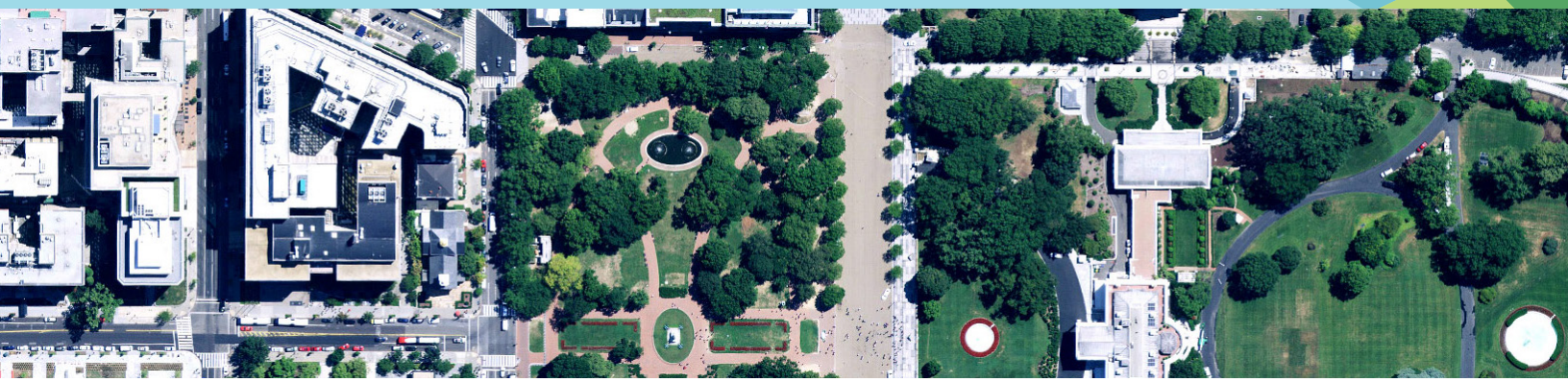

AERIAL IMAGERY SPECIFICATIONS

Specification	Urban Coverage (15 cm)	Wide Area Coverage (15 or 30 cm)
Accuracy	Data is produced to meet ASPRS Positional Accuracy Standards for Digital Geospatial Data (2014) for a 50 (cm) RMSEx /RMSEy Horizontal Accuracy Class which equates to a RMSEr = 71 (cm) and Positional Horizontal Accuracy = +/- 122 (cm) at a 95% confidence level.	Data is produced to meet ASPRS Positional Accuracy Standards for Digital Geospatial Data (2014) for a 120 (cm) RMSEx /RMSEy Horizontal Accuracy Class which equates to RMSEr = 170 (cm) and Positional Horizontal Accuracy = +/- 300 (cm) at a 95% confidence level.
Minimum sun angle	30° minimum, however, every effort should be made to acquire the downtown core as well as any tall building filler lines at the highest solar possible in the day.	30°
Cloud/cloud shadow	Must be less than 5%, per 40 square kilometer block. Obscured details must not include urban areas or housing and roads in rural areas. Every effort will be made to remove cloud using adjoining imagery. In these limited circumstances visible seam lines along cloud edges are acceptable.	10% and not obscuring HVA area or paved roads or other transportation network.
Smoke/fire	See cloud cover	May be cause for rejection
Persistent smoke	Volcano, factory, crop burn, etc.: See cloud cover	Allowable, not cause for rejection
Snow/ice cover	Must be less than 3% per 5 km by 5 km block, and less than 5% per km2 image. Any detail obscured must not be of high significance, e.g. any urban area and housing or roads in rural areas. In mountainous areas this may be relaxed to 10% obscured per 5 km by 5 km block, provided only small amounts of ground detail are affected.	Permanent snow/ice is acceptable
Specular reflection	Must not be detrimental to the image appearance or impede the ability to extract information from the imagery.	Allowable provided shoreline and surrounding features are not obscured.
Maximum allowable image shear	≤ 3 pixels	
Band-to-band pixel misregistration	≤ 0.5 pixel and no perceivable colour fringing	
Sidelap	Urban areas minimum 27% or greater** **See building lean below for supplemental flight lines	Minimum 27%
Non-pixel data	DN value of 0 and 255 reserved for non-data	
Acceptable image blemishes, scratches, artifacts, etc.	Imagery should be blemish and artifact free	

Specification	Urban Coverage (15 cm)	Wide Area Coverage (15 or 30 cm)
Flooding/standing water	Acceptable if obscured details are not of high significance or represent key man-made or cultural features on the ground (e.g. paved roads, agricultural field boundaries, housing, communication routes).	
Radiometry and Color	Dynamic range adjustment to develop 8-bit imagery from digital camera raw images shall preserve feature detail across the full image histogram: in highlights, mid-tones, and shadows. The appearance of the image must be a realistic representation of the color on the ground. Color and radiometry adjustments shall be made to minimize the impact of atmospheric and solar variance within orthomosaic and aerial images. The color and radiometry of images should be consistent across different flights within a block. Neutral color balance shall be preserved on manmade features (asphalt, concrete, rooftops). Neutral color shift as a result of histogram-based image adjustment methods is not permitted. Neutral objects shall have a DN difference of no more than 5 for any RGB triplet. Sample images may be requested to confirm radiometry and color meet expectation.	
Feature warp/smear	Bridge/freeway/causeway warp/smear is not acceptable. Where geometric fidelity of a feature is compromised, or pixel stretch occurs, special care will be taken to insure the ortho image is a realistic representation of real-world details and oversimplification or unrealistic fabrication has been minimized.	
Building seamline sheer	Visible joins between ortho-images and flight lines within each block should be avoided but will be accepted under the following conditions: they do not hide detail or adversely affect the ability to extract information from the image; they do not stretch the entire length of the seamline, e.g. clearly outlining entire images; they do not impact geometric fidelity (no change in shape or alignment between images); there is no positional shift between images along visible lines; and the colour difference is slight and/or well graduated and consistent both within the block and with edgematched blocks in the imagery layer they are along any cloud edges remaining from the cloud cover conformity.	Within HVAs only
Building lean	Supplemental flightlines will be added as required to minimise building lean. Buildings over 60 ft tall that are not at nadir will be assessed for lean. Seamlines will be moved to use the most nadir data. The objective is to have the centre line of roads visible.	

About Hexagon

Hexagon is a global leader in digital reality solutions, combining sensor, software and autonomous technologies. We are putting data to work to boost efficiency, productivity, quality and safety across industrial, manufacturing, infrastructure, public sector, and mobility applications.

Our technologies are shaping production and people-related ecosystems to become increasingly connected and autonomous – ensuring a scalable, sustainable future.

Hexagon (Nasdaq Stockholm: HEXA B) has approximately 21,000 employees in 50 countries and net sales of approximately 3.8bn EUR. Learn more at hexagon.com and follow us @HexagonAB.

About HxGN Content Program

The HxGN Content Program meets the growing demand for high-quality, regularly updated geospatial content which powers intelligent decision making.

Collaborating with the most experienced collection partners, this program offers easy access to high-resolution, professional base map for either download or streaming.

The program provides aerial imagery at 15 cm resolution in urban areas with more than 50,000 population and 30 cm resolution for countries. This level of detail provides a good base to make the most informed decisions.

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