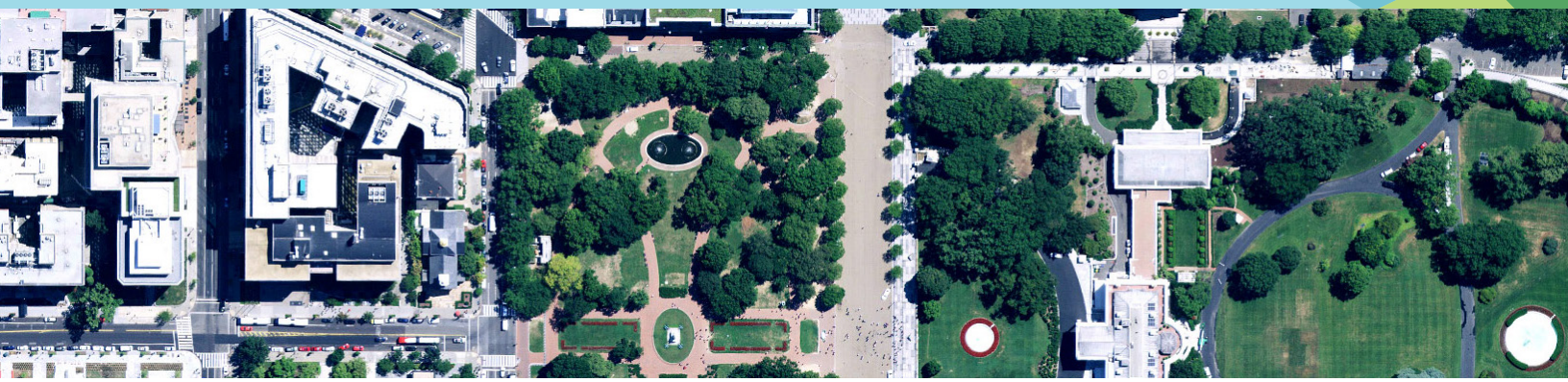

PROGRAM ACQUISITION SPECIFICATIONS

Specification	15 cm Resolution	30 cm Resolution
Allowable GSD	0.2 m nominal GSD with ADS100 HR mode	Maximum 0.4 m
Accuracy	RMSE x/y = 0.5 m RMSEr = 0.71 m CE90 = 1.07 m CE95 = 1.22 m	RMSE x/y = 1.2 m RMSEr = 1.7 m CE90 = 2.6 m CE95 = 3.0 m
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	**Cloud cover:** Must be less than 3% per 5 km by 5 km block, and less than 5% per square kilometre image. Any detail obscured must not include urban areas and housing or roads in rural areas. In mountainous areas these criteria may be relaxed to 10% obscured per 5 km by 5 km block provided housing and roads are not obscured. Provided the above criteria have been met, in instances where small areas of cloud remain and providing every effort has been made to remove cloud using adjoining imagery, there is no further requirement to manually edit remaining cloud. For the avoidance of doubt, in these limited circumstances, visible lines along cloud edges are acceptable. **Cloud shadow:** 6% per 5 km by 5 km is acceptable providing that real-world detail, such as road markings and street furniture, can be clearly viewed throughout the imagery.	≤ 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 km^2 image. Any detail obscured must not be of high signifcance, 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 when viewed at true scale (that is 1:1).	Allowable provided shoreline and surrounding features
Maximum allowable image shear	≤ 3 pixels	≤ 3 pixels
Band-to-band pixel misregistration	≤ 0.5 pixel and no perceivable colour fringing	≤ 0.5 pixel and no perceivable colour fringing
Sidelap	Urban areas minimum 30% or greater with Leica ADS100 SH100 Urban areas minimum 15% or greater with Leica ADS100 SH120 See building lean below for supplemental flightlines	Minimum 27%

Specification	15 cm Resolution	30 cm Resolution
Non-pixel data	DN value of 0 and 255 reserved for non-data	DN value of 0 and 255 reserved for non-data
Acceptable image blemishes, scratches, artifacts, etc.	Imagery should be blemish and artifact free	Imagery should be blemish and artifact free
Flooding/standing water	Must be less than 3% per 5 km by 5 km, and less than 1% per km^2 image. Any detail obscured must not be of high significance or represent key features on the ground, e.g. urban areas, housing, communication routes and field boundaries.	Acceptable as long as paved roads or agricultural field boundaries are not obscured.
Occlusions	Smearing from DEM inaccuracies or occlusions that exceed 3% of a 5 km x 5 km area are not acceptable	No stated policy but subject to call-out
Smearing	Smearing caused by turbulence is not acceptable	No stated policy but subject to call-out
Clipping	Cumulative luminosity pixel count for bins 0-5 and 250-255 shall not be less than 98%, preferably > 99%.	Cumulative luminosity pixel count for bins 0-5 and 250-255 shall not be less than 98%, preferably > 99%
Contrast	Must be consistent across the block. The appearance of too much contrast where shadows become too dark or too little contrast where the appearance is of a flat nature must be avoided. This applies to all topography, including monotone.	Difference between cumulative pixel counts containing 99% and 1% of the data shall be greater than 59% of the bit depth, ±4% Target: 150 Minimum: 140 Maximum: 160
Brightness	Mean pixel count within ±7.5% of the middle DN value Minimum: 108 Maximum: 147	Mean pixel count within ±7.5% of the middle DN value Minimum: 108 Maximum: 147
Color balance	Neutral objects shall have a DN difference of no more than 5 for any RGB triplet. Should be consistent across the supplied block with minimal banding caused by vignetting or hot spots due to excessive light. The appearance of the image must be a realistic representation of the true colour on the ground. Pre-delivery samples may be requested.	Neutral objects shall have a DN difference of no more than 5 for any RGB triplet
Bridge warp/smear	Bridge/freeway/causeway warp/smear is not acceptable. Modifications undertaken to reduce pixel stretch must ensure that the resultant ortho image is a realistic representation of real-world features. Pixel stretch on man-made features, building, bridges, and other elevated features, where the geometric fidelity of the feature is compromised, may be reduced using image manipulation software provided there is no over simplification or unrealistic fabrication of real-world detail (for example buildings, roads and railways).	Bridge/freeway/causeway warp/smear is not acceptable
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 leading global provider of information technologies that drive productivity and quality across geospatial and industrial enterprise applications.

Hexagon's solutions integrate sensors, software, domain knowledge and customer workflows into intelligent information ecosystems that deliver actionable information. They are used in a broad range of vital industries.

Hexagon (Nasdaq Stockholm: HEXA B) has more than 16,000 employees in 46 countries and net sales of approximately 3.4bn USD. Learn more at **hexagon.com** and follow us @HexagonAB. Hexagon is a leading global provider of information technologies that drive productivity and quality across geospatial and industrial enterprise applications.