Introduction

ODOT's design mapping specifications follow closely the guidelines and recommendations of the American Society of Photogrammetry and Remote Sensing (ASPRS). However, modifications and departures exist in order to conform to ODOT standards.

Any photogrammetric operations not listed shall conform to the ASPRS guidelines.

ODOT reserves the right to modify or depart from these specifications as needed.

1. Flight Mission

1.1. Flightlines

Flightlines shall be planned so that the requested area is fully covered. Sufficient overlap shall be provided:

- Endlap - 60%
- Sidelap - 30%

1.2. Photo Scale

The photo scale shall be approximately 1"=250'.

1.3. Mission Scheduling

The aerial photographs shall be taken under the best possible conditions. The time for the mission shall be selected so that the sun angle shall not be less than 30 degrees. The weather should be clear, free of clouds and atmospheric haze.

1.4. Camera

Recent calibration certificate must be available for the camera.
1.5. Flight Execution

Every flightline shall be extended by one exposure at the beginning and at the end.

Allowed tolerances:
- Flight height: 5%
- Overlap: 5%
- Sidelap: 10%
- Crab: 3 degrees
- Tilt: 3 degrees

2. Photo Processing

2.1. Film

The film shall be free of defects, with sharp image and fiducials, and shall conform to following specifications (as measured by a densitometer with a 0 - 3.00 range):
- Max. base fog: 0.15
- Min. density: 0.40 above base fog
- Optimal density: 0.80 - 1.20

2.2. Photo Identification

Each photo shall be identified by flight, strip, and photo number (no characters are allowed, only digits).

The flight number shall be assigned by ODOT's Office of Aerial Engineering.

If a flightline is flown in several segments (e.g. reflights, extensions, etc.), each segment must be assigned a separate strip number. It is not admissible to piece these segments together into one strip.

The photo numbers in a strip shall follow consecutively.

2.3. Photo Labels

Film labeling shall be done with ink. The film labels shall preferably face the flight direction. Void frames should be left on the film roll; film splicing should be done only if absolutely necessary.
3. Image Processing

3.1. High Resolution Scanning

Photos to be used for photogrammetric processing shall be scanned at approximately 15 micron/pixel. Geometric accuracy of scanned images shall be better than 3 micron.

3.2. Orthophotos

Orthophotos (if requested as a part of a mapping project) shall have the same accuracy as the map.

4. Ground Control

Ground control shall be responsibility of the contractor.

4.1. Coordinate System

Control point coordinates shall be given in the state plane coordinate system NAD83 (1995 Adjustment) and NAVD88 datum.

4.2. Control Point Accuracy

Accuracy of horizontal and vertical points shall conform to the second order, Class II standards as stated in the "Standards and Specifications for Geodetic Control Networks" issued by NOAA.

4.3. Property Rights

The rights of property owners shall be observed at all times. Owners shall be consulted and permission sought prior to the ground control work (e.g. target placement, pavement painting etc.).

5. Mapping

Mapping products shall be in digital form using ODOT's CADD specifications

5.1. Mapping Limits

Mapping limits shall be outlined by the ODOT.
5.2. Mapping Scale

Design mapping shall be done at scale 1" = 50'. The contours shall be shown at 2' interval.

5.3. Planimetry

The planimetric features at scale 1" = 50' shall include:
- Highways, roads, drives, pathways, sidewalks, paved areas
- Railroads
- Buildings, structures, walls, fences
- Bridges, culverts, sewers, pipelines, tunnels, dams
- Rivers, streams, drainage, ditches, lakes, ponds, swamps
- Poles, towers, piers
- Signs, billboards, hydrants, manholes, catch basins, tanks
- Trees, bushes
- Other features of significance depending on the intended use of the map
- Any optional features specified by ODOT.

The symbols used for planimetric features shall conform to the ODOT symbol library.

Areas and features shall be labeled if necessary for clarity purposes.

5.4. Contours

Depression ticks on contours may be omitted.

Obstructed areas may be left out or marked as such.

Spot elevations shall be placed on hill tops, depression bottoms, saddles, and in areas where contours are more than 100' apart. Spot elevations may be added if additional information is desirable, or omitted in uniform slope areas. The distance between spot elevations in flat areas shall not exceed 100'.
5.6. Horizontal Accuracy

At least 90% of well defined planimetric features shall be shown within 6" horizontally; the remainder shall be shown within 1'.

5.7. Vertical Accuracy

At least 90% of contour lines and spot elevations shall be accurate within 4" vertically; the remainder shall be within 8".

Contours which will meet these criteria when moved horizontally less than 2' are acceptable.

6. Deliverables

Following items are to be delivered:

- Film negatives
- Camera calibration certificate
- Control data (ground points, airborne GPS/INS)
- Aerotriangulation data
- Files containing the graphics and the digital terrain model in a format compatible with MicroStation software.
- Any images used during the mapping project
- Other requested data

All deliverable items except for film negatives and calibration certificates shall be in digital form.