



## Condition Inspection of Two Special Bridges and One Road Slope Protection Work Using Drone Technology

November 22, 2016/ May 24, 2017

JICA introduced the use of Drone Technology to the DPWH, under DPWH-JICA TCP III. Last November 2016 and May 2017 the Special Bridge Condition Inspection using Drone were conducted for two special bridges namely; Diosdado Macapagal Bridge at RO XIII and Magapit Bridge at RO II. For the road slope protection work the tentative schedule will be on January 2018. The participants of the actual demonstration of Drone at Diosdado Macapagal Bridge is 148 attendees and for the Magapit Bridge is 134 attendees, from JICA Bridge Expert Team, DPWH Central Office, Regional Offices XIII and II, District Engineering Offices of Region XIII and II, SRDP Consulting Inc. and a Local Media.

The scope of work are;

1. Control Point Survey
2. Aerial Inspection Using Unmanned Aerial Vehicle (UAV)
  - a) Image Acquisition for Area Mapping
  - b) Video and Photo Survey of Points of Interest
3. Orthophoto and 3D Point Clouds
  - a) Image processing to create an orthophoto mosaic and 3D point clouds of bridge sites and slope protection areas
4. Area Mapping
  - a) Feature extraction to produce map of bridge sites and slope protection area

For the outputs;

1. Videos
2. Point of Interest Photos
3. Photomosaic and 3d Point Clouds
4. Area Maps

Advantages of using drone in Bridge Inspections;

1. No need for bridge inspection vehicle
2. Reduced inspection time.
3. Provides high resolution geotagged photos and videos
4. Close-up photos of damage inaccessible parts of structure.
5. Technology used in Japan and in the world already
6. Risk to inspectors are reduced
7. Traffic disturbance are minimized.

To conduct special bridge condition inspection using drone technology, we need to comply with the following required permits;

1. Permit from Department of National Defense
2. Permit from CAAP



Diosdado Macapagal Cable Stayed



Participants from different regions during the actual demonstration of drone



Engr. Joel Cruz of SRDP, explained the function and advantages of drones



THE PROJECT FOR IMPROVEMENT OF QUALITY MANAGEMENT  
FOR HIGHWAY AND BRIDGE CONSTRUCTION AND MAINTENANCE,  
PHASE III



After the bridge condition inspection using Drone, generated images of photos from the bridge structures shows some defects at tower cable, saddle, and girder. The noted defects are subject for further evaluation for appropriate corrective/mitigation measures that should be undertaken.



Team Leader of JICA Expert Team, Mr. Hideo Nagao and Engr. Joel Cruz of SRDP, interviewed by the local



Drone used during Condition inspection of Special Bridge (Rotary type drones)



Drone used during Condition inspection of Special Bridge (Fixed Wing type drones)



Magapit Suspension Bridge



DPWH Region II Director Melanio C. Briosos, explained the importance of the drone to their Region



Participants during the actual demonstration of drone