097.13 DPWH
10-06-2015

Republic of the Philippines
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
OFFICE OF THE SECRETARY
Manila

OCT 02 2015

DEPARTMENT ORDER NO. 151 Series of 2015 10-06-15

SUBJECT : MANDATING YOLANDA-AFFECTED REGIONAL OFFICES TO IMMEDIATELY INSTALL VISIBLE WARNING SIGNS ON AREAS IDENTIFIED AS HIGH HAZARD ZONES

Pursuant to the provisions of Section 5 of the Joint DENR-DILG-DND-DPWH-DOST Memorandum Circular No. 2014-01 dated November 05, 2014, defining the roles and responsibilities of agencies signatory to the Circular, and to promote safety and protection of people in the Yolanda (Haiyan) affected areas, the DPWH Regional Offices/District Engineering Offices in Regions IV-B; VI; VII; VIII; and XIII, are hereby mandated to strictly install visible warning signs on areas identified as high hazard zones.

Criteria for Hazard Zone Classification:

Landslide: Areas with steep to very steep slopes and underlain by weak materials, recent landslides, escarpments and tension cracks, as well as numerous old/inactive landslides; also includes areas that can be affected by landslide debris (debris flow path/possible accumulation zones);

Flood: Areas likely to experience flood heights of greater than one (1) meter and/or flood duration of more than three (3) days. These areas are immediately flooded during heavy rains of several hours; includes landforms of topographic lows, such as active river channels, abandoned river channels and areas along river banks; also areas prone to flashfloods;

Storm Surge: Areas that are likely to experience storm surge flood heights greater than one and a half (1.5) meters. These include low-lying coastal regions, coastlines with concave shape, wide and shallow-sloped continental shelves and shallow bays.

Note: Other hazards such as earthquakes, volcanic activities, and ground subsidence, are not considered in this Order as the same shall be provided by the mandated agencies concerned. Hazard Maps can be downloaded from www.philippinegeoportal.gov.ph.

Installation of Warning Signs

In installing warning signs (i.e., storm surge warning signages; signs on landslide prone areas; falling rocks symbols, etc) the concerned field offices should be guided by the following instructions:

1) Specifications for warning signs (type, background color, letter size selection, letter series, sign face designs, symbols, etc) should conform with those shown under Annex "1", herein, the details of which are based on the Mines and Geosciences Bureau (MGB) Specifications. For guidance on installation costs, please refer likewise to the attached detailed estimates shown under Annex "2;

2) Giving utmost consideration to safety, warning signs should therefore be strategically located on areas within ample distance where passing motorists and pedestrians, residents within the area and other concerned entities/citizens may visibly notice the same.

Restrictions:

1) Under no circumstances should dwelling within the hazard zone areas is to be allowed;

2) Evacuation centers should not be established in this zone. However, critical facilities may be allowed provided that appropriate engineering intervention measures are implemented coupled with continuous monitoring.

Coordination with concerned Local Government Units should always be conducted, not only for information dissemination but likewise to ensure that this Order is strictly followed.

The Regional Offices are strictly enjoined to provide this Office (copy furnished the Director, Bureau of Maintenance, this Department) beginning **15 October 2015** until completion of the warning signs installation (which should **not be later than 30 November 2015**) the status of the activities under this Department Order, and further providing in the process the exact locations (District Engineering Office concerned; road name and station limits), of the signages and the pictures evidencing compliance.

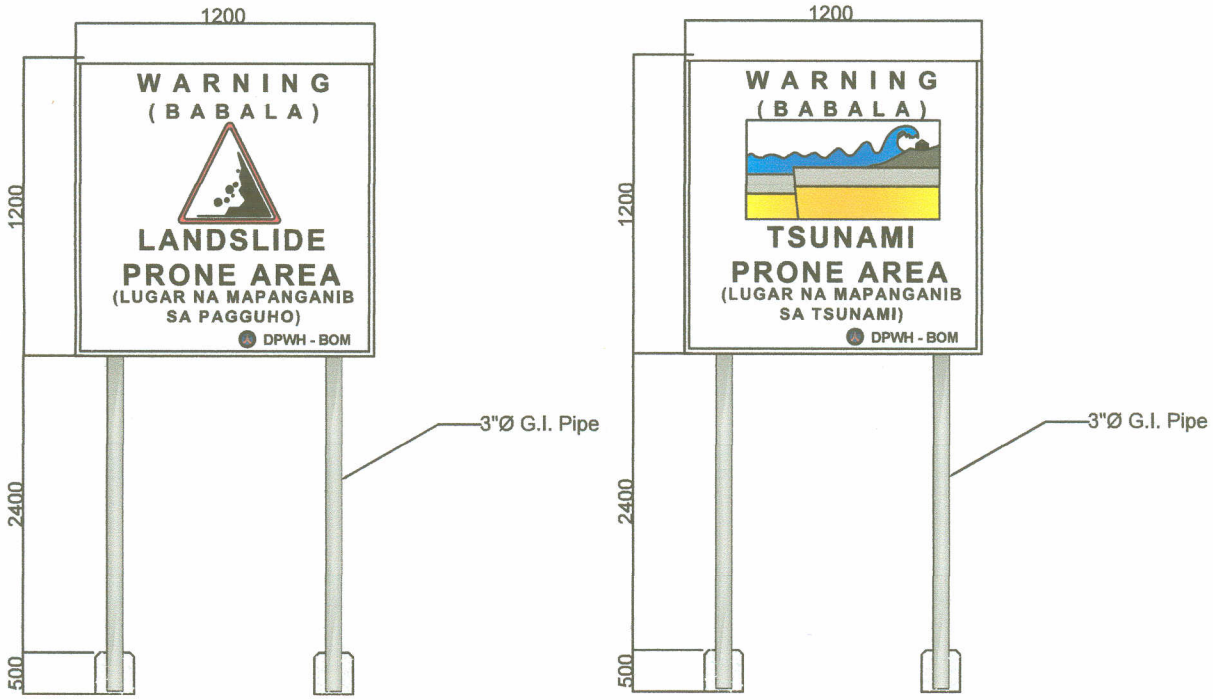
ROGELIO L. SINGSON
Secretary

5.3.2 DFR/ESGJR/RCA

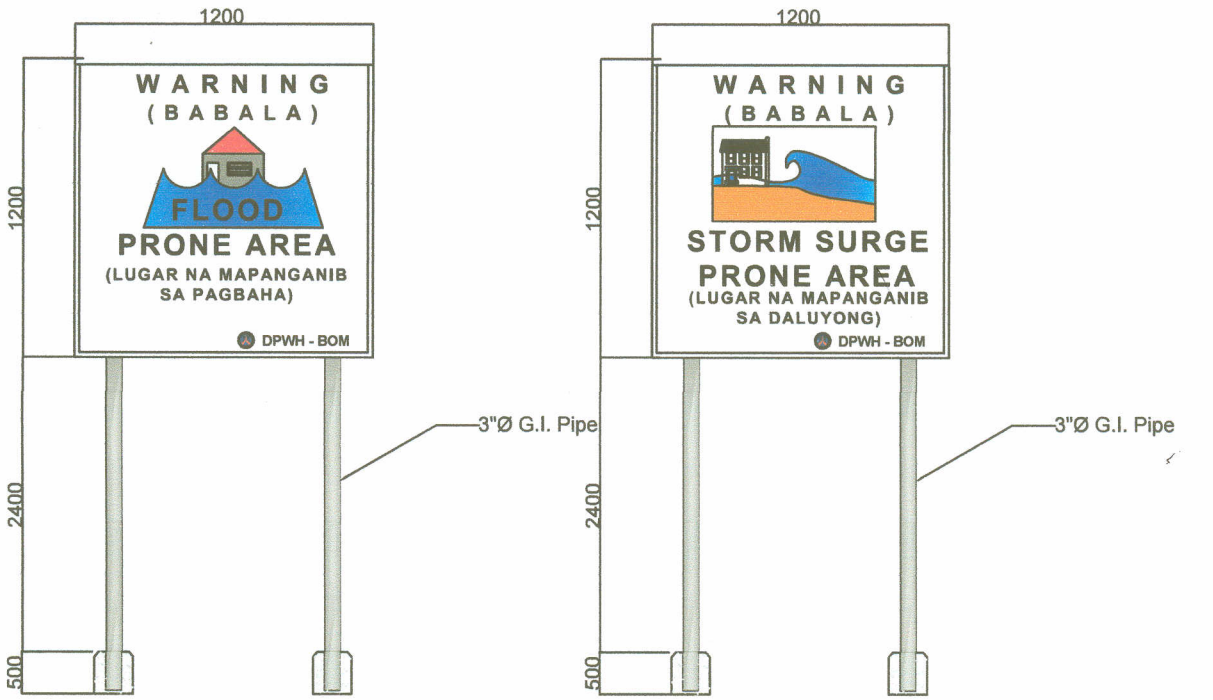
Department of Public Works and Highways
Office of the Secretary
WIN5S02409

Annex "1"
D.O. 151, s. 2015

PROPOSED WARNING SIGNS WHEREIN DIMENSION OF SIGNAGES BASED ON MINES & GEOSCIENCES BUREAU (MGB) SPECIFICATIONS



OPTION 2



Annex "2"
D.O. 151, s. 2015

DETAILED ESTIMATES

DESCRIPTION: **Warning/ Hazard Sign** QUANTITY: **1 unit**

1.20 x 1.20m with 2-pc G.I pipe 3" Dia.

Area = 1.44 sq.m.

MATERIALS/QUANTITY		DESCRIPTION	UNIT	UNIT COST	AMOUNT
A. MATERIALS					
1. 1.44 -sq.m.		Aluminum Sheet	1.20 x 1.20		
		3mm Thickness	A = 1.44 sq.m.	763.89 /sq.m.	1,100.00
	Php 2,200.00	/Sheet			
2. 1.44 -sq.m.		Retro-Reflective Materials	(High Intensity)		
		Green/Red Background	0.61m x 45.7m	4,735.09 /sq.m.	6,818.53
	Php 132,000.00	/roll	A=27.877 sq.m.		
			High Intensity		
3. 0.32410 -sq.m.		Letters and Boarders	(High Intensity)		
		Background	0.61m x 45.7m	4,735.09 /sq.m.	1,534.17
	Php 132,000.00	/roll	A=27.877 sq.m.		
			High Intensity		
4. 3meters GI Pipe		2- 75mm Dia. /3m Length		2,400.00 /pc	4,800.00
		GI Steel Pipe Sch.20			
5. 4.00 - /pcs.	1.8	12mm Dia. X 250mm Dowel		38.00 /kgs.	68.40
6. 0.300 - /pcs.		Welding Rod		90.00 /kgs.	27.00
7. 0.09 - /liter		Red Lead Paint		130.65 /liter	11.76
8. 0.09 - /liter		Yellow Paint Enamel		141.30 /liter	12.72
9. 1.00 - /pc		2" Brush		65.75 /pcs.	65.75
10. 1.20 - /pc. (6m)		Flat Bar (6.35mm x 38.10mm > 2400mm		185.00 /pcs.	222.00
11. 12.00 - /pcs.		Stainless Rivets (3.175mm x 6.35mm)		10.00 /pcs.	120.00
12. 0.96 - /bag		Cement		220.00 /bag	211.20
13. 0.08 - /cu.m.		Sand		352.00 /cu.m.	28.16
14. 0.16 - /cu.m.		Gravel		562.00 /cu.m.	89.92
Sub-Total for Materials				**Php**	**15,109.61**

DESCRIPTION	QUANTITY	DAY	RATE	AMOUNT
B. LABOR				
Foreman	1	1.0	664.00	664.0
Illustrator	1	1.0	480.00	480.0
Helpers Laborer	4	1.0	368.00	1,472.0
Welder	1	1.0	480.00	480.0
Painter	1	1.0	480.00	480.0
Driver	1	0.5	480.00	240.0
Total Man-Days	9			3,816.00
OUTPUT 4.0	pcs./day			
Sub-Total for Labor for 1 pc				**954.00**

DESCRIPTION	QUANTITY	DAY	RATE	AMOUNT
C. EQUIPMENT				
Electric Generator	1	1.0	664.00	664.0
Steel Cutter	1	1.0	480.00	480.0
Binder	4	1.0	368.00	1,472.0
Welding Machine	1	1.0	480.00	480.0
Service Vehicle	1	1.0	480.00	480.0
Compressor with Jackhammer	1	0.5	480.00	240.0
Minor Tools (10% of Labor)				40.0
Total Man-Days	9			3,856.00
OUTPUT 4.0	pcs./day			
Sub-Total for Labor for 1 pc				**964.00**
TOTAL (Materials+Labor+Equipment)				**17,027.61**

NOV 0 5 2014

JOINT DENR-DILG-DND-DPWH-DOST
MEMORANDUM CIRCULAR
No. 2014-01

SUBJECT : **ADOPTION OF HAZARD ZONE CLASSIFICATION IN AREAS AFFECTED BY TYPHOON YOLANDA (HAIYAN) AND PROVIDING GUIDELINES FOR ACTIVITIES THEREIN**

In line with the Government's effort to promote safety and protection of its people, particularly in the Yolanda (Haiyan) affected areas, the classification of hazard zones susceptible to the onslaught of typhoons, flooding, landslides, and other hydro-meteorological hazards is hereby adopted and the guidelines for activities therein are hereby issued for the information and guidance of all concerned.

Section 1. Basic Policy

1.1 It is the policy of the state to maintain peace and order, protect life, liberty, and property, and promote the general welfare of the people as essential for the enjoyment by all the people of the blessings of democracy.

1.2 It is also the policy of the State to serve, protect and promote the right of the people to a balanced and healthful ecology in accord with the rhythm and harmony of nature.

1.3 It is the policy of the state to uphold the people's constitutional rights to life and property by addressing the root causes of vulnerabilities to disasters, strengthening the country's institutional capacity for disaster risk reduction and management and building the resilience of local communities to disaster including climate change impact.

Section 2. Legal Basis

2.1. Republic Act 386 known as the Civil Code of the Philippines

Art. 638. The banks of rivers and streams, even in case they are of private ownership, are subject throughout their entire length and within a zone of three meters along their margins, to the easement of public use in the general interest of navigation, floatage, fishing and salvage.

2.2 Presidential Decree No. 1067 known as the Water Code of the Philippines

Article 51. The banks or rivers and streams and the shores of the seas and lakes throughout their entire length and within a zone of three (3) meters in urban areas, twenty (20) meters in agricultural areas and forty (40) meters in forest areas, along their margins, are subject to the easement of public use in the interest of recreation, navigation, floatage, fishing and salvage. No person shall be allowed to stay in this zone longer than what is necessary for recreation, navigation, floatage, fishing or salvage or to build structures of any kind.

2.3 Presidential Decree No. 1096, the National Building Code of the Philippines

Section 105. Site Requirements.

The land or site upon which will be constructed any building or structure, or any ancillary or auxiliary facility thereto, shall be sanitary, hygienic or safe. In the case of site or buildings intended for use as human habitation or abode, the same shall be at a safe distance, as determined by competent authorities, from streams or bodies of water and or sources considered to be polluted; from a volcano or volcanic site and/or any other building considered to be a potential source of fire or explosion.

2.4 Presidential Decree No. 705, the Revised Forestry Code of the Philippines

Section 16. Areas needed for forest purposes. The following lands, even if they are below eighteen per cent (18%) in slope, are needed for forest purposes, and may not, therefore, be classified as alienable and disposable land, to wit:

2.4.1 Twenty-meter (20) strips of land along the edge of the normal high waterline of rivers and streams with channels of at least five (5) meters wide.

2.4.2 Strips of mangrove or swamplands at least twenty (20) meters wide, along shorelines facing oceans, lakes, and other bodies of water, and strips of land at least twenty (20) meters wide facing lakes.

2.5 Republic Act No. 10121, the Philippine Disaster Risk Reduction and Management Act of 2010

Section 2 (g). Mainstream disaster risk reduction and climate change in development processes such as policy formulation, socio-economic development planning, budgeting and governance, particularly in the areas of environment, agriculture, water, energy, health, education, poverty reduction, land use and/or urban planning, and public infrastructure and housing, among others.

Section 3. Objectives

3.1 To regulate the activities in hazard-prone areas, particularly those that are within the immediate vicinity of oceans, seas, lakes, rivers and other bodies of water, and unstable slopes;

3.2 To provide guidelines and mechanisms in the determination of appropriate activities and development in hazard prone areas; and

3.3. To provide guidance in the issuance of early warning to residents during typhoons, flooding, and landslides.

Section 4. Definition of Terms

DENR – the Department of Environment and Natural Resources

DILG – the Department of the Interior and Local Government

DND – the Department of National Defense

DPWH – the Department of Public Works and Highways

DOST – the Department of Science and Technology

LGU – the Local Government Units

MGB – the Mines and Geosciences Bureau

NAMRIA – the National Mapping and Resource Information Authority

OCD – the Office of Civil Defense

Yor Info Center - the Yolanda Rehabilitation Scientific Information Center established by the DENR and DOST based at the National Engineering Center, University of the Philippines-Diliman. It is the repository of Yolanda-related scientific information, imageries and maps.

Flood – rise in water level or overflow of a body of water beyond its confines causing inundation of water onto a normally dry area.

Hazard zones – areas identified in the hazard maps as susceptible to natural hazards, such as flooding, rain-induced landslides and storm surges; maybe Low, Moderate or High.

Hydro-meteorological hazard – process or phenomenon of atmospheric, hydrological, or oceanographic nature that may cause loss of life, injury or other health impacts, property damage, loss of livelihood and services, social and economic disruption, or environmental damage. These include: 1) floods; 2) storm surge and; 3) rainfall-induced landslides.

Hydro-meteorological hazard map – map indicating the level of susceptibility of areas to natural hazards, such as flood, landslides, storm surge, etc.

Landslide (rain-induced) – downward movement of a mass of earth, rock, or debris due to gravity and triggered by rainfall.

No-Build Zone – the easement areas defined by the Water Code, Civil Code and Revised Forestry Code of the Philippines excluding areas for critical government infrastructure in support of economic development (i.e., ports, fish landings, etc.).

No Dwelling Zone –areas not recommended for human habitation.

Safe Zone – areas identified outside hazard zones and not covered by existing laws (i.e., Water Code, Civil Code, Revised Forestry Code) on human activity and use.

Storm surge – abnormal rise of sea water over and above the astronomical tide due to the presence of a storm. This rise in water level can cause heavy flooding in coastal areas, particularly when extreme storm surges coincide with high tide reaching twenty (20) feet or six (6) meters in some cases.

Section 5. Roles and Responsibilities

5.1 Department of Environment and Natural Resources

5.1.1 Prepare and make available, through the Mines and Geosciences Bureau in coordination with the DOST, the geohazard (rain-induced landslide and flood) maps of the 171 cities and municipalities affected by Typhoon Yolanda (Haiyan), at a scale of 1:10000;

5.1.2 Integrate, through the National Mapping and Resource Information Authority (NAMRIA), all hazard maps and make available to all government agencies concerned the multi-hazard maps at the scale of 1:10000;

5.1.3 Establish, through NAMRIA, a segment in the Geoportal for the multi-hazard maps for access of all concerned;

5.1.4 Demarcate on the ground, through the Regional Offices in coordination with DND, DILG and DPWH, the easements for all water bodies provided and required by law;

5.1.5 Establish, together with DND, DILG, DOST and DPWH, visible warning signages on areas identified as high hazard zones.

5.2 Department of the Interior and Local Government

5.2.1 Issue instructions to the LGUs for the adoption of the hydro-meteorological hazard maps as basis for declaration of Safe, No-Dwelling and No-Build Zones through the issuance of local ordinance/s;

5.2.2 Consider hydro-meteorological hazard maps in the preparation of the Comprehensive Land Use Plan (CLUP) of the LGUs concerned;

5.2.3 Strictly implement the allowable activities within the legal easements;

5.2.4 Provide the DENR-NAMRIA with the CLUPs and zoning maps of all LGUS, in GIS ready format;

5.2.5 Provide security during the demarcation of easement and installation of warning signages, particularly on areas with peace and order problem; and

5.2.6 Pursue Information, Education and Communication (IEC) campaign on the multi-hazard maps together with DND-OCD and other government agencies.

5.3 Department of National Defense

5.3.1 The DND, through the Office of Civil Defense (OCD), shall develop and ensure implementation of standard operating procedures in carrying out disaster risk reduction programs including preparedness, mitigation, response and rehabilitation works, relative to the provisions herein;

5.3.2 Ensure that the LGUs, through the Local Disaster and Risk Reduction and Management Offices (LDRRMO) are properly informed and adhere to the national standards and programs;

5.3.3 Ensure that government agencies and LGUs give top priority and take adequate and appropriate measures in disaster risk reduction and management;

5.3.4 Pursue IEC campaign on the multi-hazard maps together with DENR, DILG, DND-OCD, DOST, and other government agencies; and

5.3.5 Assists the DILG in the monitoring of the adoption of this JMC by the LGUs.

5.4 Department of Public Works and Highways

5.4.1 Provide guidelines, criteria and standards on structural engineering measures for infrastructure in areas identified as hazard zones;

5.4.2 Approve design plans for government infrastructures proposed to be constructed on hazard prone areas; and

5.4.3 Provide DENR-NAMRIA with all the maps of road networks, bridges and flood control and drainage systems along national roads.

5.5 Department of Science and Technology

5.5.1 Prepare and make available the hazard maps of the 171 cities and municipalities affected by Typhoon Yolanda (Haiyan) involving storm surge, and other natural hazards at a scale of 1:10000 or better;

5.5.2 Provide DENR-NAMRIA with all hazard maps for integration into a multi-hazard map and inclusion in the Geoportal;

5.5.3 Provide DENR-NAMRIA with the raw very high resolution images and LiDAR DTMs and DSMs; and

5.5.4 Conduct continuing science-based assessment and modeling of hydro-meteorological hazards zones/areas for integration with DENR-MGB maps.

Section 6. Hazard Zone Classification and Recommended Activities

6.1 Hazard Zone Classifications and Recommended Actions

HAZARD	HAZARD ZONE		
	LOW	MODERATE	HIGH
FLOOD	During impending flood events, people may stay in their dwellings and workplace provided that these are structurally sound and early warning system and preparedness plans are in place. Evacuation centers should not be established in this zone unless these are structurally sound and have vertical evacuation capabilities.	During impending flood events, all people except disaster response personnel should not be in this zone. Evacuation centers should not be established in this zone.	During impending flood events, all people except disaster response personnel should not be in this zone. Evacuation centers should not be established in this zone.

HAZARD	HAZARD ZONE		
	LOW	MODERATE	HIGH
FLOOD	Dwelling and development may be allowed provided possible flood heights and structural integrity are considered in the design	Dwelling and development may be allowed provided that possible flood heights and structural integrity are considered in the design.	Floodplains should be used as retention basins to accommodate swelling of rivers. These places may be transformed into recreational areas, such as parks, etc., provided possible flood heights are considered in the design. Appropriate flood control mitigation structures, i.e., dikes, revetments, spur dikes, detention tanks, may be recommended and approved by DPWH Recommended as not suitable for commercial, industrial, residential (subdivisions), and institutional developments. Flood warning signages should be installed in this zone.
LANDSLIDE	Dwelling and development may be allowed provided that continuous monitoring of the slope (upslope and on site) is conducted. Evacuation centers should not be established in this zone unless appropriate engineering intervention measures are implemented with continuous monitoring.	Dwelling and development may be allowed provided that appropriate engineering intervention measures are made with continuous monitoring. Evacuation centers should not be established in this zone.	Dwelling should not be allowed. Critical facilities may be allowed provided that appropriate engineering intervention measures are implemented with continuous monitoring. Evacuation centers should not be established in this zone Landslide warning signages should be installed in this zone.

HAZARD	HAZARD ZONE		
	LOW	MODERATE	HIGH
STORM SURGE	Dwelling may be allowed and residents may stay in their homes during impending storm surge events provided that their houses have a second floor, and are structurally sound Evacuation centers should not be established in this zone unless it has vertical evacuation capabilities	Dwelling may be allowed but during impending storm surge events, all residents should not be in this zone Evacuation centers should not be established in this zone	During impending storm surge events, all people should not be in this zone. Evacuation centers should not be established in this zone. Natural and man-made coastal defences, such as mangroves (soft interventions), break water (hard interventions), etc. should be established. Recommended as not suitable for commercial, industrial, residential (subdivisions), and institutional developments Storm surge warning signages should be installed in this zone.

6.2 Limitations

As provided for by existing laws, no building activities, except for critical facilities, shall be allowed in the following

6.2.1 Legal easements

6.2.1.1 Urban areas - three (3) meters easement from riverbanks or shorelines;

6.2.1.2 Agricultural areas - twenty (20) meters easement from riverbanks or shorelines

6.2.1.3 Forest areas - forty (40) meters easement from riverbanks or shorelines

6.2.2 Areas for forest protection purposes

6.2.2.1 Twenty-meter (20) strips of land along the edge of the normal high waterline of rivers and streams with channels of at least five (5) meters wide; and

6.2.2.2 Strips of mangrove or swamplands at least twenty (20) meters wide, along shorelines facing oceans, lakes, and other bodies of water, and strips of land at least twenty (20) meters wide facing lakes.

Section 7. Criteria for Hazard Zone Classification

The hazard zone classification is based on the following criteria as provided by the agencies concerned:

7.1 Landslide

7.1.1 High landslide susceptibility – areas with steep to very steep slopes and underlain by weak materials, recent landslides, escarpments and tension cracks, as well as numerous old/inactive landslides; also includes areas that can be affected by landslide debris (debris flow path/possible accumulation zones).

7.1.2 Moderate landslide susceptibility – areas with moderately steep slopes. Soil creep and other indications of possible landslide occurrence are present.

7.1.3 Low landslide susceptibility – gently sloping areas with no identified landslide

7.2 Flood

7.2.1 High flood susceptibility - areas likely to experience flood heights of greater than one (1) meter and/or flood duration of more than three (3) days. These areas are immediately flooded during heavy rains of several hours; includes landforms of topographic lows, such as active river channels, abandoned river channels and area along river banks; also prone to flashfloods.

7.2.2 Moderate flood susceptibility - areas likely to experience flood heights greater than 0.5 up to one (1) meter and/or flood duration of more than one (1) to three (3) days. These areas are subject to widespread inundation during prolonged and extensive heavy rainfall or extreme weather condition. Fluvial terraces, alluvial fans and in-filled valleys are areas moderately subjected to flooding.

7.2.3 Low flood susceptibility - areas likely to experience flood heights of 0.5 meter or less and/or flood duration of less than one (1) day. These areas include low hills and gentle slopes. They also have sparse to moderate drainage density.

7.3 Storm Surge

7.3.1. High storm surge susceptibility – areas that are likely to experience storm surge flood heights greater than one and a half (1.5) m. These include low-lying coastal regions, coastlines with concave shape, wide and shallow-sloped continental shelves and shallow bays.

7.3.2 Moderate storm surge susceptibility – areas that are likely to experience storm surge flood heights of 0.5 to one and a half (1.5) meters. These include coastlines with convex shape and narrow and steep-sloped continental shelves.

7.3.3 Low storm surge susceptibility – areas likely to experience storm surge with flood heights of 0.5 meters or less. This includes inland areas that are not adjacent to the sea and have elevations generally higher than the mean sea level.

7.4 Other Hazards

Other hazards not considered in this Joint Memorandum Circular, such as earthquakes, volcanic activities, and ground subsidence shall be provided by the mandated agencies concerned.

Section 8. Implementation

8.1 Production of Hazard Maps

8.1.1 Standardization of the format of existing maps of DOST and DENR for easier understanding of target clientele, particularly the LGUs;

8.1.2 Integration of hydro-meteorological hazard model simulations with DENR-MGB data to maximize use of high resolution topographic data (i.e., LIDAR and IFSAR);

8.1.3 Completion of the hydro-meteorological hazard maps for the 171 municipalities and cities affected by Typhoon Yolanda by DENR and DOST by December 2014; and

8.1.4 Use of the DENR-MGB and DOST integrated hazard maps in determining areas susceptible to flooding, landslides and storm surges.

8.2 Implementation Strategy

8.2.1 Provision of the standardized maps to the LGUs and other stakeholders by the Yolanda Rehabilitation Scientific Information Center (YoR Info Center);

8.2.2 Refinement and updating of hazard maps and corresponding action plans and inclusion in the Disaster Risk Reduction Management (DRRM) plans of each LGU with technical information from DENR and DOST;

8.2.3 Development of hazard assessment training module and map appreciation exercises for the Information, Education Campaign (IEC);

8.2.4 Conduct of IEC by DENR, DILG, DOST, DPWH, and DND-OCD as lead agency;

8.2.5 Monitoring of the implementation of this Joint Memorandum Circular by the Inter-Agency Committee with DILG as Lead Agency; and

8.2.6 Provisions of fund by the respective agencies for the effective implementation of JMC.

To ensure the development of the standardized maps and understanding by the target clientele, especially the LGUs, an Inter-agency Committee and Technical Working Group composed of representatives of DENR, DILG, DPWH, DOST and DND shall be created. The Inter-Agency Committee shall define the functions of the TWG and supervise its activities.

This Joint Memorandum Circular shall take effect immediately.

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
SENR038297

DILG-OSEC OUTGOING
14-05347

RAMON J. P. PAJE
Secretary, DENR

MANUEL ROXAS II
Secretary, DILG

ROGELIO L. SINGSON
Secretary, DPWH

Department of Public Works and Highways
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OUT4$59717

MARIO G. MONTEJO
Secretary, DOST

Department of Science and Technology
Office of the Secretary (OSEC)
OSEC-14-04411
26 November 2014 10:10:22 am

VOLTAIRE T. GAZMIN
Secretary, DND

SECRETARY OF NATIONAL DEFENSE
VTG-147157