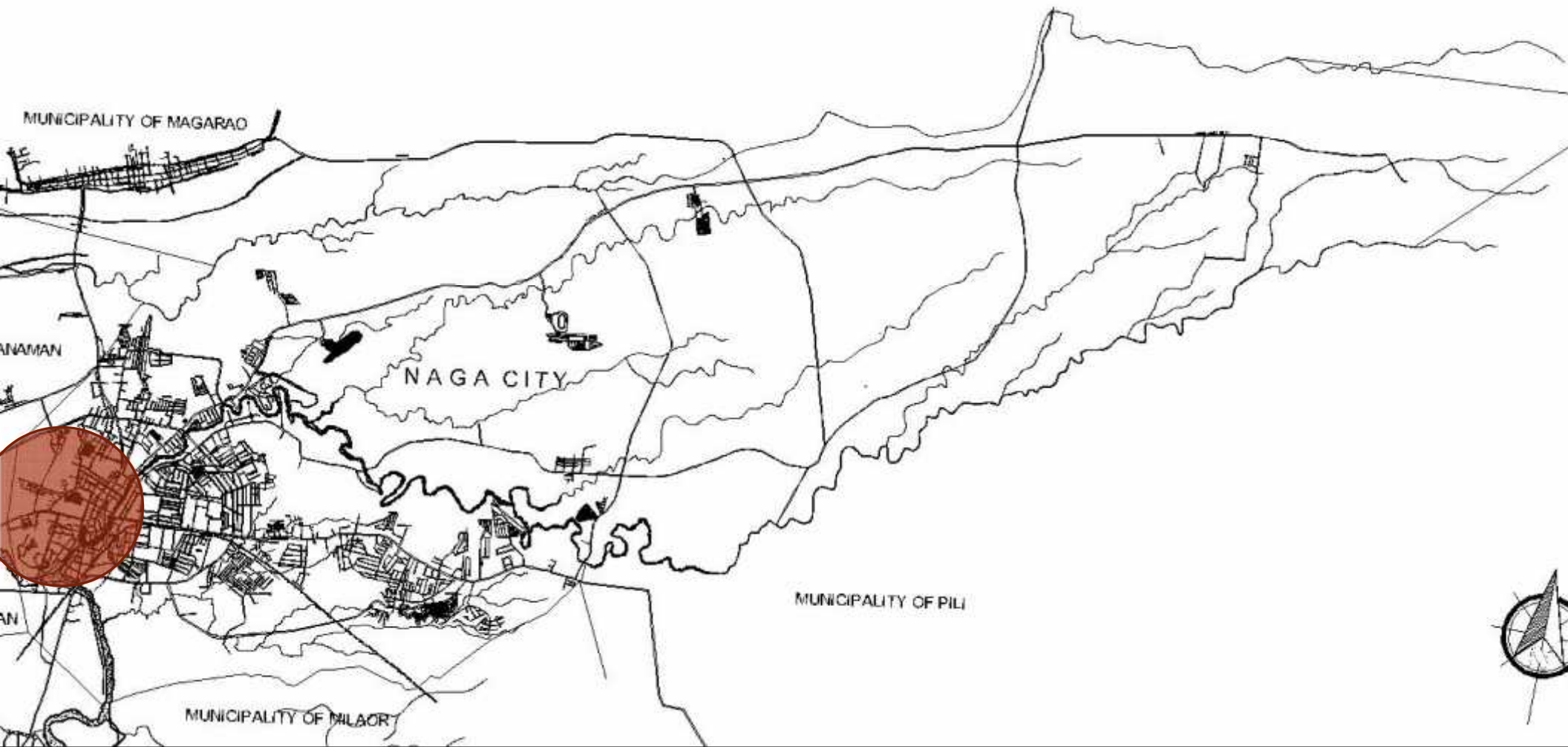




# PROPOSED STORM DRAINAGE & DRAINAGE

OFFICE OF THE CITY ENGINEER

# STORM DRAINAGE & DRAINAGE



# STORM DRAINAGE & DRAINAGE

## Rehab of Drainage

Felix Plazo St., Brgy Abella & Brgy Sabang

Length: 771.00 In.m

Cost: P 19,578,600.00

## Drainage & Road Widening

Abella St., Brgy. Abella

Length: 337.00 In.m

Cost: P 8,491,900.00

## Drainage & Road Widening

Main Road Jolly Neighbors to Corner Abella St., Abella

Length: 341.00 In.m

Cost: P 4,886,800.00

## Drainage

Queborac Relocation Site to Jolly Neighbors., Sta. Cruz

Length: 371.00 In.m

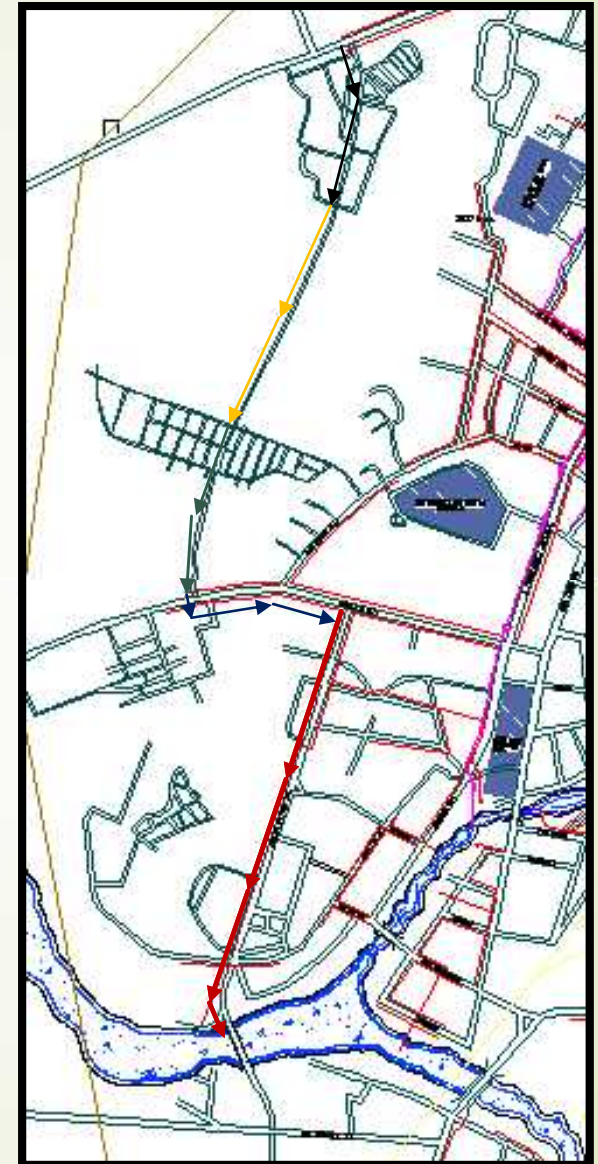
Cost: P 3,482,600.00

## Drainage & Road Widening

Main Road Infront of PISSTON, Queborac Relocation Site,  
Bagumbayan Sur

Length: 380.00 In.m

Cost: P 4,544,900.00



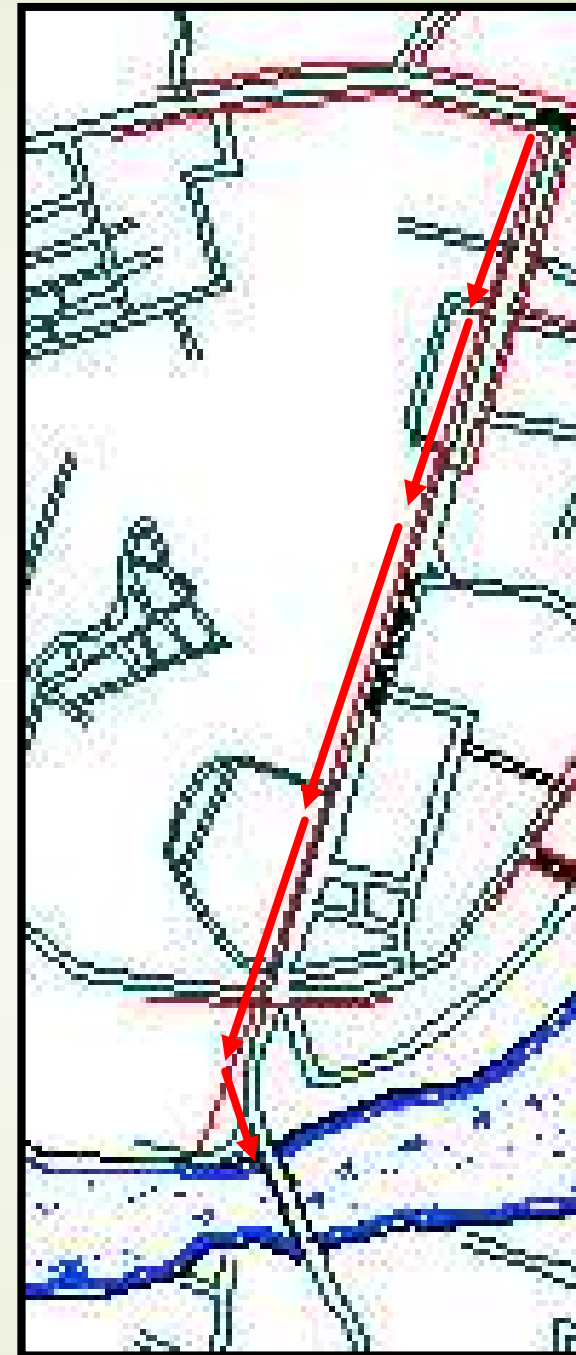
# STORM DRAINAGE & DRAINAGE

## Rehab of Drainage

Felix Plazo St., Brgy Abella & Brgy Sabang

Length: 771.00 In.m

Cost: P 19,578,600.00



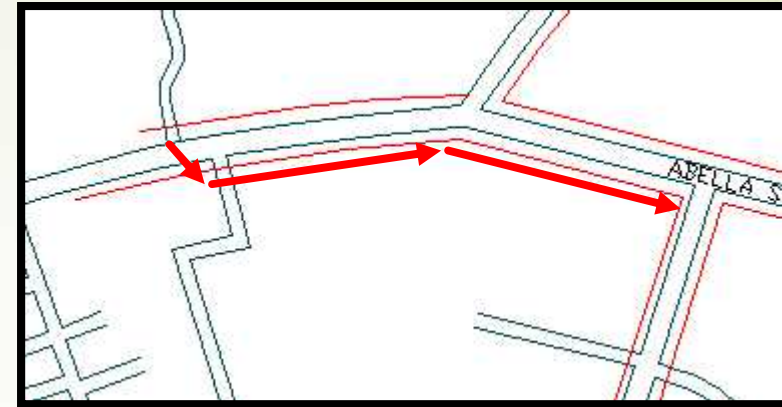
# STORM DRAINAGE & DRAINAGE

## ➤ Drainage & Road Widening

Abella St., Brgy. Abella

Length: 337.00 In.m

Cost: P 8,491,900.00



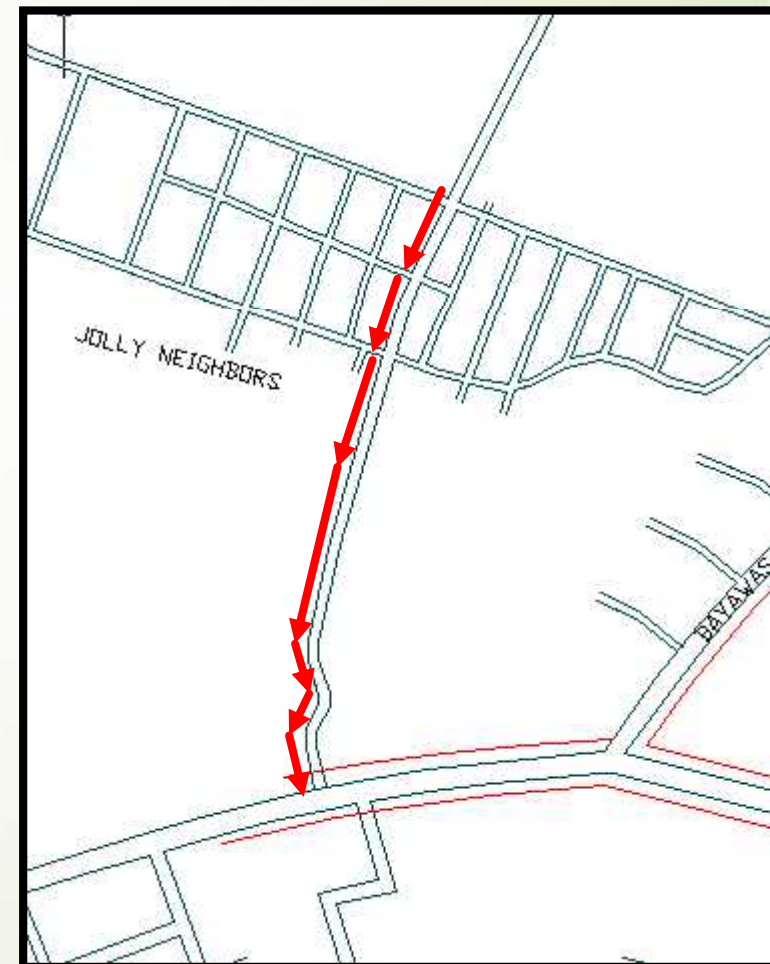
# STORM DRAINAGE & DRAINAGE

## ➤ Drainage & Road Widening

Main Road Jolly Neighbors to  
Corner Abella St., Abella

Length: 341.00 In.m

Cost: P 4,886,800.00



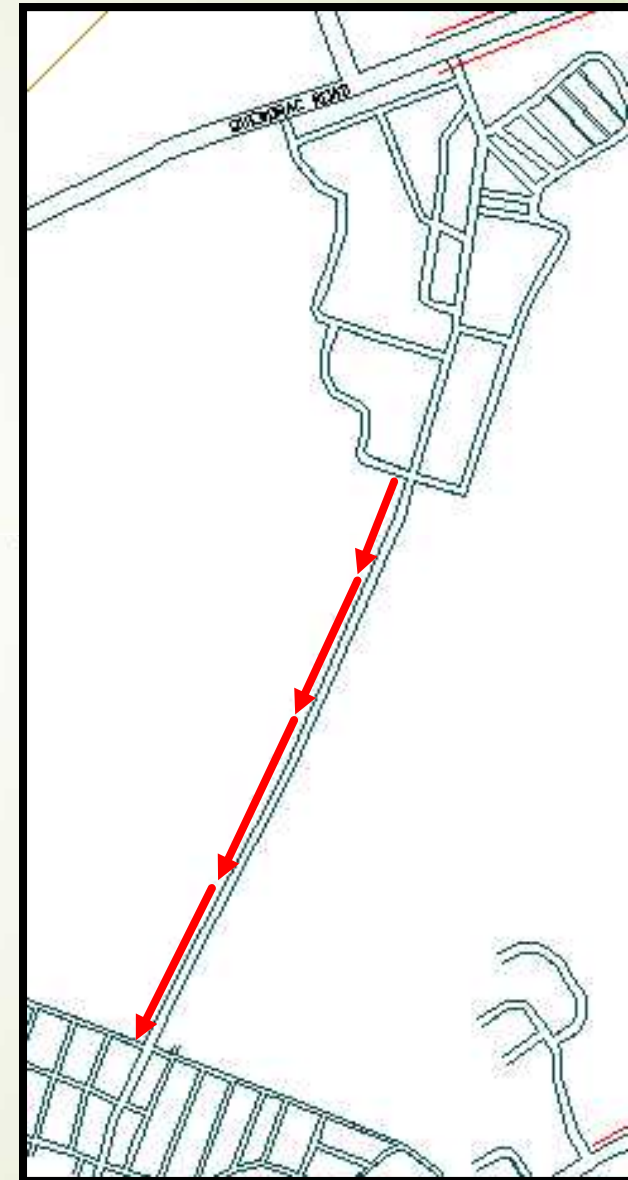
# STORM DRAINAGE & DRAINAGE

## ➤ Drainage

Queborac Relocation Site to Jolly Neighbors.,  
Sta. Cruz

Length: 371.00 In.m

Cost: P 3,482,600.00



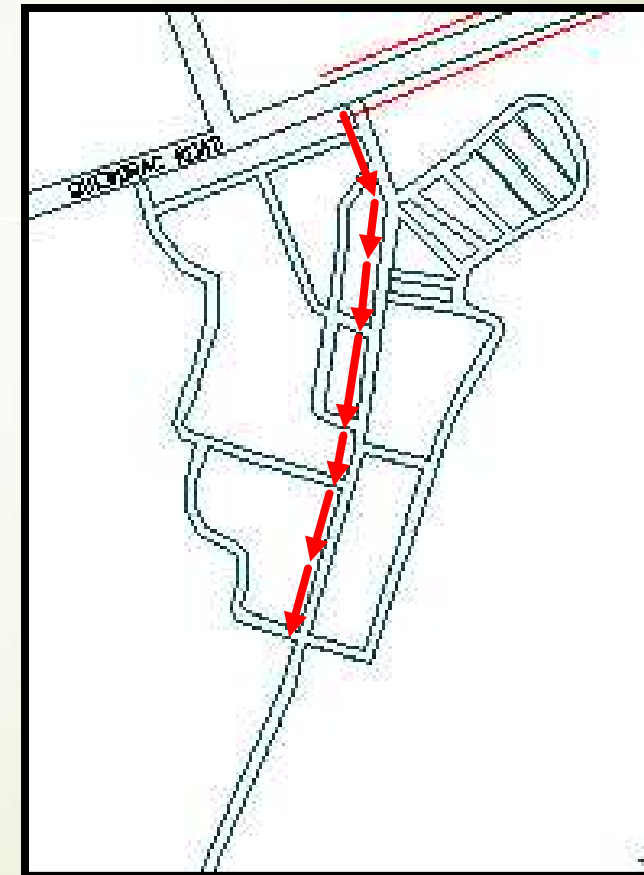
# STORM DRAINAGE & DRAINAGE

## ➤ Drainage & Road Widening

Main Road Infront of PISSTON, Queborac Relocation Site,  
Bagumbayan Sur

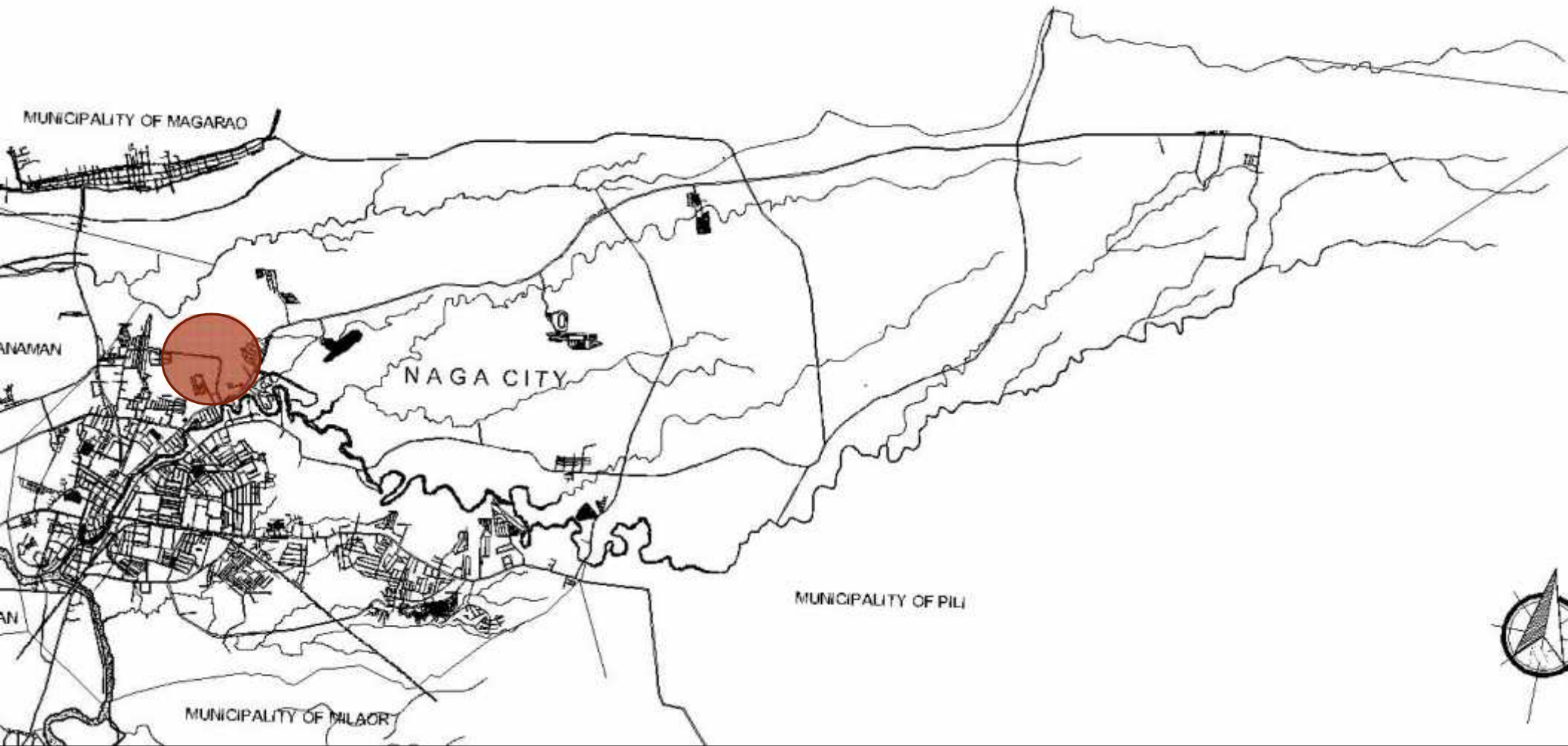
Length: 380.00 In.m

Cost: P 4,544,900.00



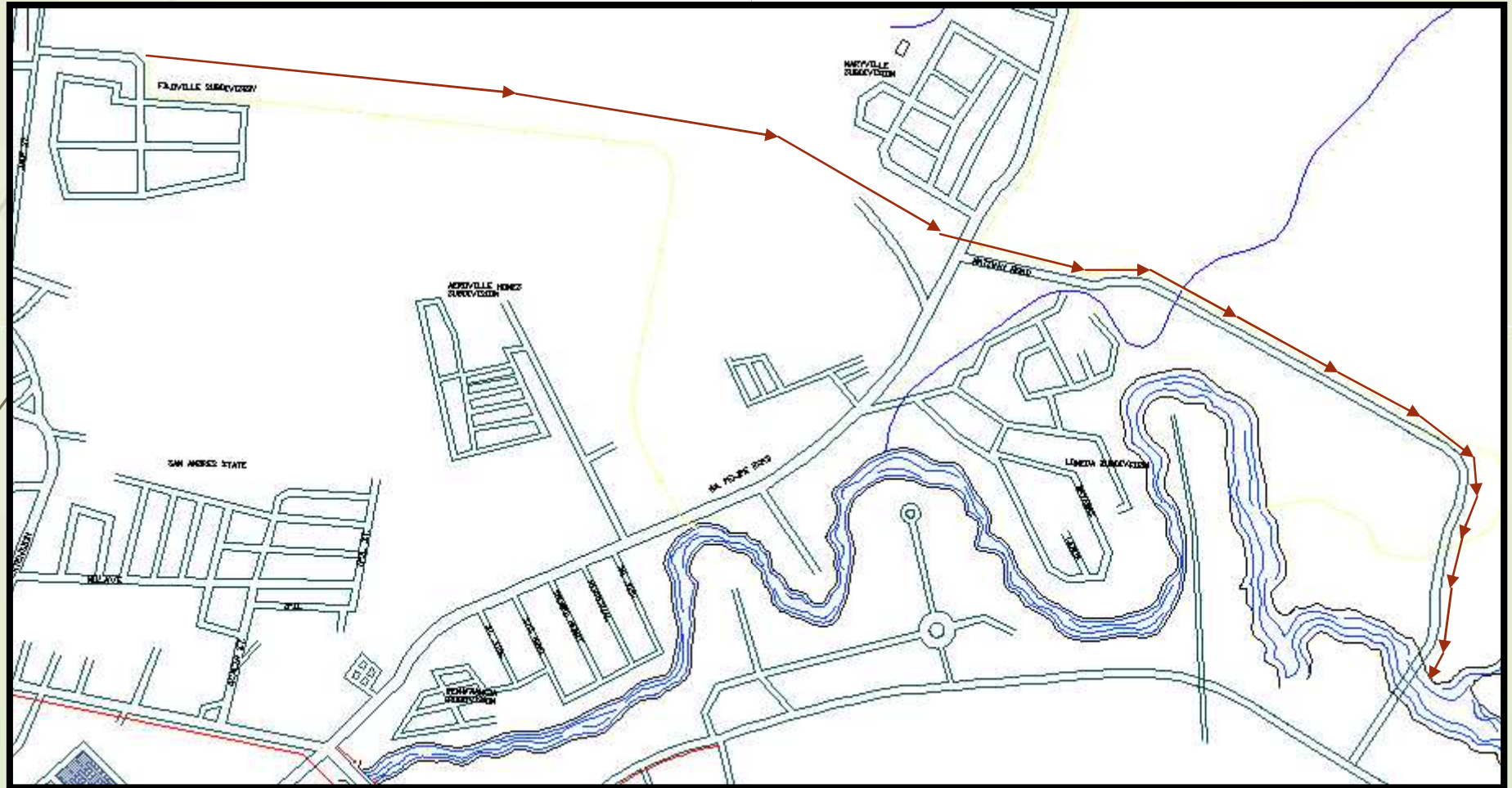


# STORM DRAINAGE & DRAINAGE



# STORM DRAINAGE & DRAINAGE

## CALAUAG SAN FELIPE STORM DRAINAGE

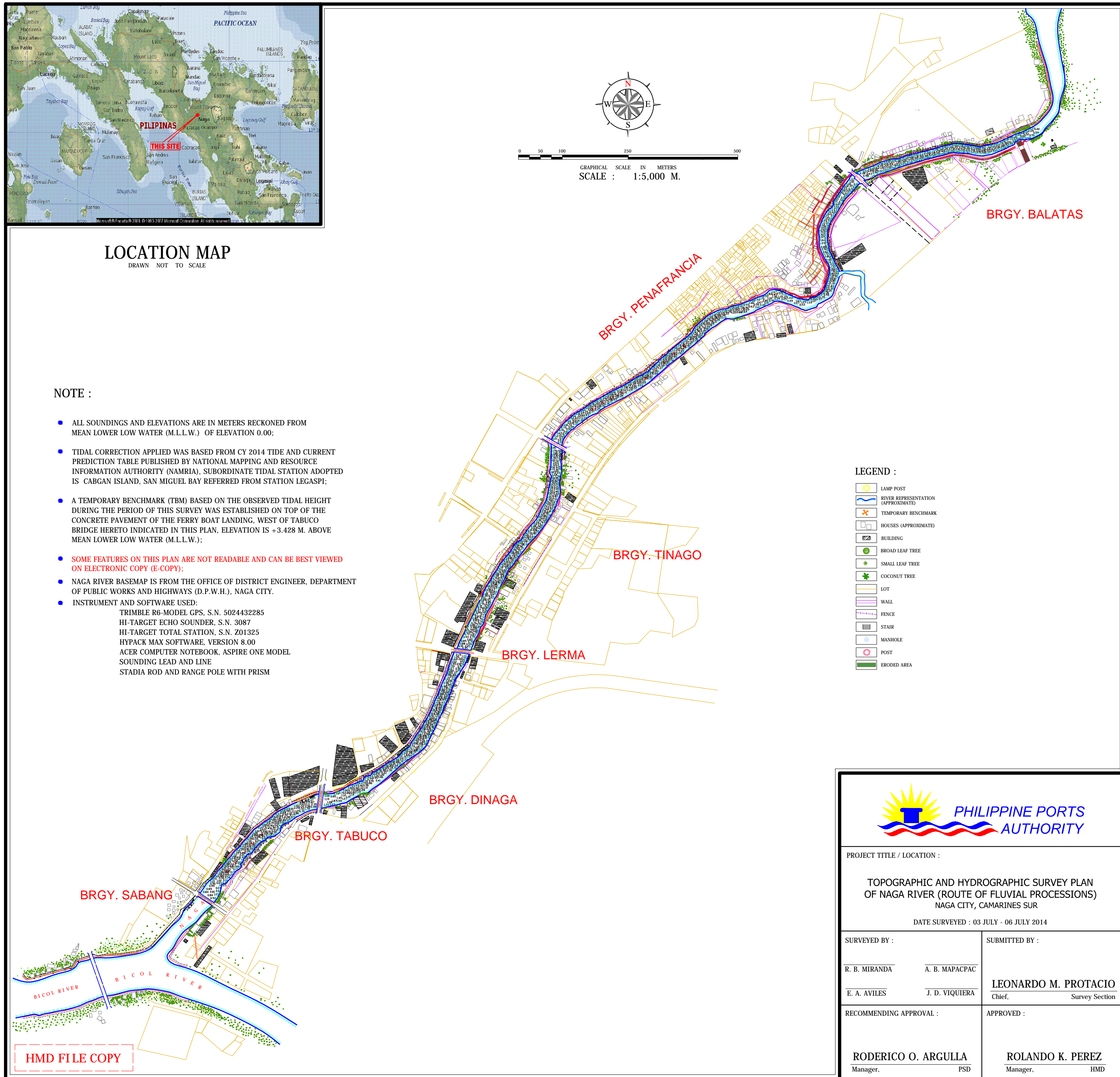
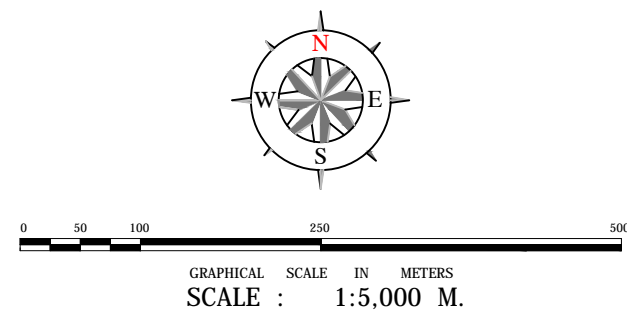




**LOCATION MAP**  
DRAWN NOT TO SCALE


**NOTE :**

- ALL SOUNDINGS AND ELEVATIONS ARE IN METERS RECKONED FROM MEAN LOWER LOW WATER (M.L.L.W.) OF ELEVATION 0.00;
- TIDAL CORRECTION APPLIED WAS BASED FROM CY 2014 TIDE AND CURRENT PREDICTION TABLE PUBLISHED BY NATIONAL MAPPING AND RESOURCE INFORMATION AUTHORITY (NAMRIA). SUBORDINATE TIDAL STATION ADOPTED IS CABGAN ISLAND, SAN MIGUEL BAY REFERRED FROM STATION LEGASPI;
- A TEMPORARY BENCHMARK (TBM) BASED ON THE OBSERVED TIDAL HEIGHT DURING THE PERIOD OF THIS SURVEY WAS ESTABLISHED ON TOP OF THE CONCRETE PAVEMENT OF THE FERRY BOAT LANDING, WEST OF TABUCO BRIDGE HERETO INDICATED IN THIS PLAN, ELEVATION IS +3.428 M. ABOVE MEAN LOWER LOW WATER (M.L.L.W.);
- SOME FEATURES ON THIS PLAN ARE NOT READABLE AND CAN BE BEST VIEWED ON ELECTRONIC COPY (E-COPY);
- NAGA RIVER BASEMAP IS FROM THE OFFICE OF DISTRICT ENGINEER, DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS (D.P.W.H.), NAGA CITY.
- INSTRUMENT AND SOFTWARE USED:  
TRIMBLE R6-MODEL GPS, S.N. 5024432285  
HI-TARGET ECHO SOUNDER, S.N. 3087  
HI-TARGET TOTAL STATION, S.N. 201325  
HYPACK MAX SOFTWARE, VERSION 8.00  
ACER COMPUTER NOTEBOOK, ASPIRE ONE MODEL  
SOUNDING LEAD AND LINE  
STADIA ROD AND RANGE POLE WITH PRISM

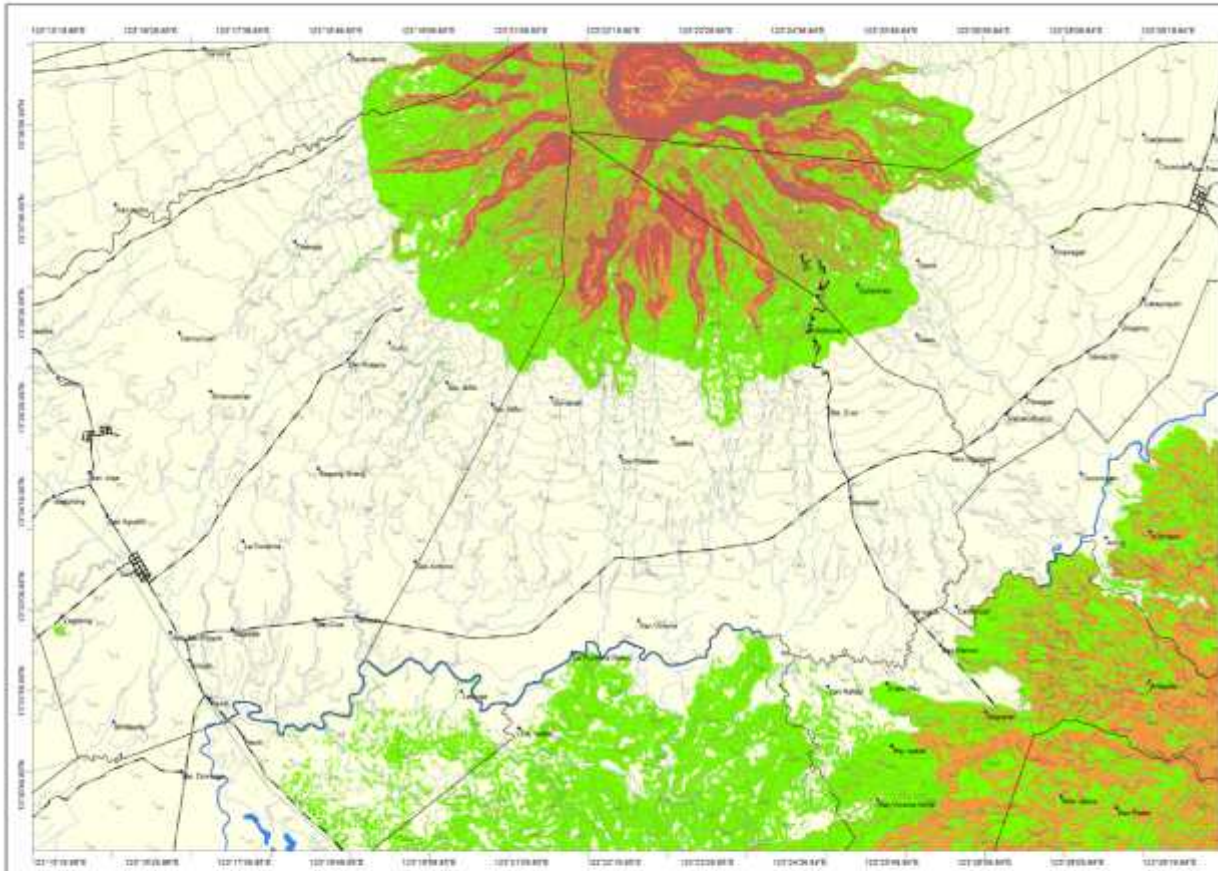


**LEGEND :**

- LAMP POST
- RIVER REPRESENTATION (APPROXIMATE)
- TEMPORARY BENCHMARK
- HOUSES (APPROXIMATE)
- BUILDING
- BROAD LEAF TREE
- SMALL LEAF TREE
- COCONUT TREE
- LOT
- WALL
- FENCE
- STAIR
- MANHOLE
- POST
- ERODED AREA

 <b>PHILIPPINE PORTS AUTHORITY</b>	
PROJECT TITLE / LOCATION :	
<b>TOPOGRAPHIC AND HYDROGRAPHIC SURVEY PLAN OF NAGA RIVER (ROUTE OF FLUVIAL PROCESSIONS)</b> NAGA CITY, CAMARINES SUR	
DATE SURVEYED : 03 JULY - 06 JULY 2014	
SURVEYED BY :	SUBMITTED BY :
R. B. MIRANDA	A. B. MAPACPAC
E. A. AVILES	J. D. VIQUIERA
RECOMMENDING APPROVAL :	APPROVED :
<b>RÓDERICO O. ARGULLA</b> Manager, PSD	<b>ROLANDO K. PEREZ</b> Manager, HMD
	<b>LEONARDO M. PROTACIO</b> Chief, Survey Section

# LANDSLIDE SUSCEPTIBILITY MAP OF ISAROG QUADRANGLE



**MAP LEGEND:**

**Landslide Susceptibility Zones:**

- High susceptibility
- Moderate susceptibility
- Low susceptibility
- Absent

**Symbols:**

- road
- river
- railroad
- contour line
- administrative boundary

**EXPLANATIONS:**

Landslide hazard susceptibility zones were derived through qualitative map combination using lithology, geomorphology, slope gradient, road distance and fault distance. GIS was used in the map combination and subjective weights were assigned to each unit in the parameter map.

**Areas with High Susceptibility to Landslides:**  
Areas with equally high probability of occurrence of mass movements, particularly rockslide/strata slides. These areas located along or near fault lines as well as those with steep to very steep slopes are rated high susceptibility areas and are unsuitable for housing development and human settlement.

**Areas with Moderate Susceptibility to Landslides:**  
Areas having moderate likelihood to landslide occurrence and are recommended for more detailed engineering geological and geohazard assessment prior to housing development.

**Areas with Low Susceptibility to Landslides:**  
Areas where the occurrence of landslides is relatively low.

**Absent:**  
Areas where the likelihood of landslide occurrence is absent.

Field data collection by: A. E. Dayao  
Geomorphological interpretation by: A.E. Dayao  
Digital cartographic processing by: A.E. Dayao  
GIS processing by: A.E. Dayao  
Checked by: R.A. Juan  
Approved by: R.A. Juan

Other source of information:  
1:50,000 MAMWA Topographic Map  
1951 B/W Aerial photos



Published by:  
Department of Environment and Natural Resources  
MINES AND GEOSCIENCES BUREAU  
Rovos, Legaspi City, Albay  
2006

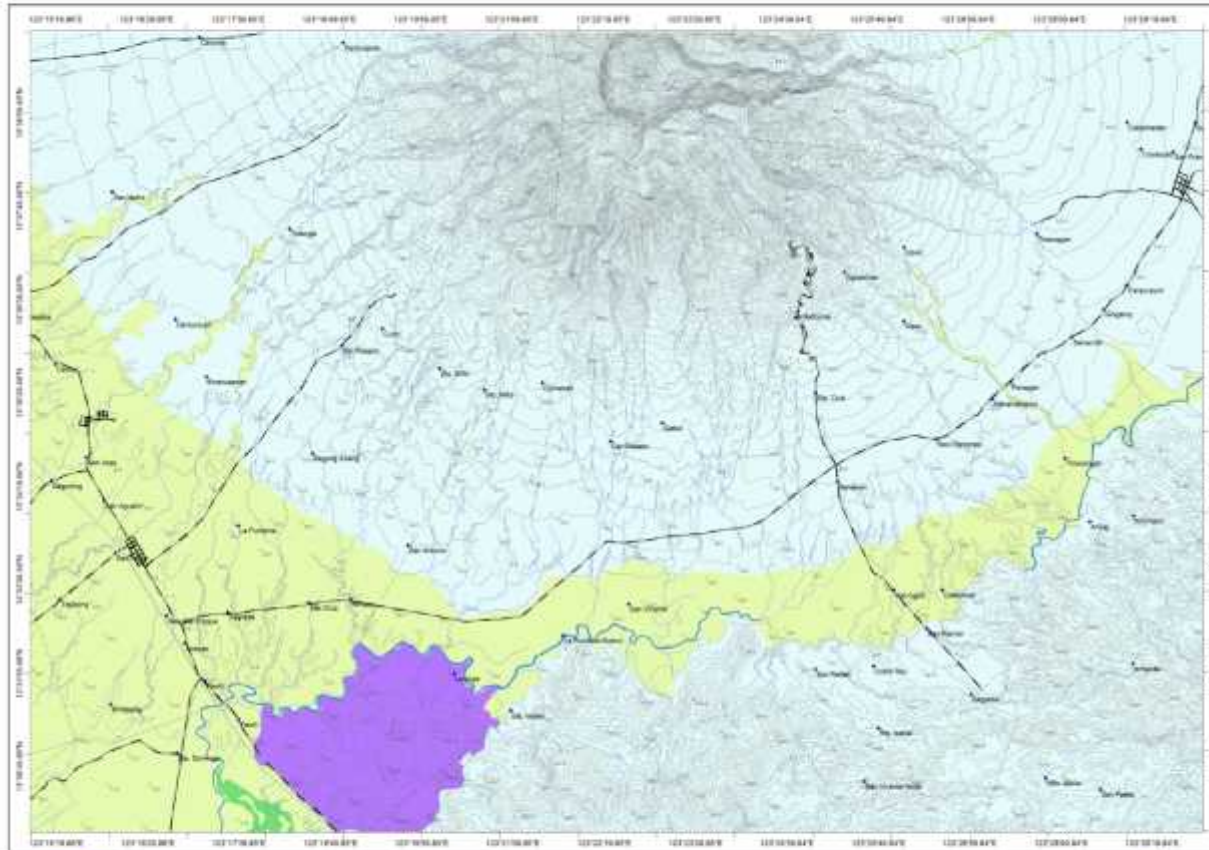
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0 5000 m  
UNIVERSAL TRANSVERSE MERCATOR PROJECTION  
Clarke 1866, Luzon Datum

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# GROUND SUBSIDENCE AND GROUND SETTLEMENT SUSCEPTIBILITY MAP OF ISAROG QUADRANGLE



**MAP LEGEND:**

**Flood Hazard Zones:**

- Areas susceptible to ground subsidence
- Areas susceptible to ground settlement
- Areas not susceptible to ground settlement/subsidence

**Symbols:**

- contour line
- river
- road
- railroad
- administrative

**EXPLANATIONS:**

Susceptibility map for ground subsidence due to karst or solution processes was primarily derived from the lithologic map of the study area. Field observations on ground subsidence observed on concrete roads and damaged houses supported the mapping. Areas of possible ground settlement were delineated through the analysis of the geomorphological of the study area, the sub-surface soils and the ground-water levels.

**Area Susceptible to Ground Subsidence:**  
Areas that are prone to ground cavitation, sinkhole formation and ground subsidence in areas underlain by limestone and calcareous siltstones and shales.

**Area Susceptible to Ground Settlement:**  
Areas where friable sands, silts and clays coupled with shallow ground water table are sites of possible ground settlement. Ground settlement may be reduced through appropriate foundation design. Buildings having 3 storeys or more should be tested for settlement and/or consolidation. Buildings having 5 storeys or more should undergo detailed geotechnical studies.

**Area Not Susceptible to Ground Subsidence or Ground Settlement:**  
Areas where the possibility of ground settlement or ground subsidence is low or absent.

Field data collection by: A. E. Dayao  
Geomorphological interpretation by: A. E. Dayao  
Digital cartographic processing by: A. E. Dayao  
GIS processing by: A. E. Dayao  
Checked by: R. A. Juan  
Approved by: R. A. Juan

Other sources of information:  
1:50,000 NAMRIA Topographic Map  
1971 S/W Aerial photos



Published by:  
Department of Environment and Natural Resources  
MINES AND GEOSCIENCES BUREAU  
Rovina Legaspi City, Albay  
2008

1 : 50000  
UNIVERSAL TRANSVERSE MERCATOR PROJECTION  
Clarke 1866, Luzon Datum



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# FLOOD HAZARD MAP OF ISAROG QUADRANGLE



## MAP LEGEND:

### Flood Hazard Zones:

- Regularly to frequently flooded areas
- Occasionally to rarely flooded areas
- Non flood prone areas
- Areas prone to riverbank erosion

### Symbols:

- road
- river
- railroad
- contour line
- administrative boundary

## EXPLANATIONS:

Flood hazard susceptibility zones were derived based on the geomorphological analysis of landforms and the fluvial system. Information on flood occurrences, flood depths, duration of inundation as well as topographic information supported the geomorphologically-based flood hazard mapping.

**Regularly to Frequently Flooded Areas:**  
Areas that are frequently flooded. More heavy rains of 1 to 2 days could bring about flooding in these areas. Moderate to strong typhoons could submerge these areas 1 to 3 meters or more in flood waters for a few days to a few weeks.

**Occasionally to Rarely Flooded Areas:**  
Areas that become inundated during moderate to strong typhoons. Flood depths vary from a few centimeters to 1 meter. Floods last from a few hours to a few days.

**Non-Flood Prone Areas:**  
Areas with no reported flood occurrences except along low lying areas immediately adjoining rivers or creeks.

**Areas Prone to River Bank Erosion:**  
Areas 0 to 50 meters from river banks of active river channels that are prone to bank erosion and scouring.

Field data collection by: A. E. Dayao  
Geomorphological interpretation by: A. E. Dayao  
Digital cartographic processing by: A. E. Dayao  
GIS processing by: A. E. Dayao  
Checked by: R. A. Juan  
Approved by: R. A. Juan

Other sources of information:  
1:50,000 NAMRIA Topographic Map  
1951 B/W Aerial photos



Published by:  
Department of Environment and Natural Resources  
MINES AND GEOSCIENCES BUREAU  
Ravina, Legaspi City, Albay  
2020

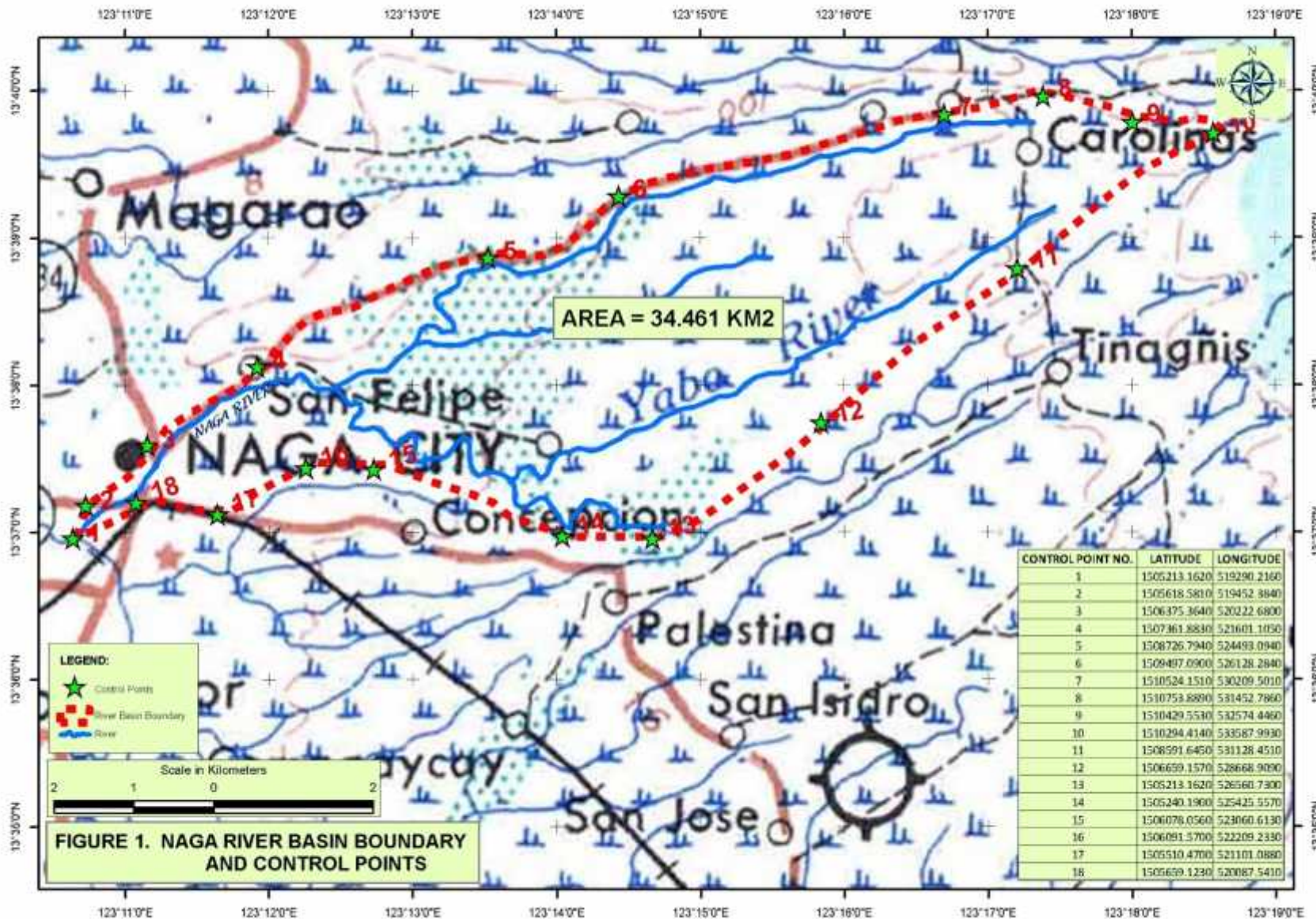
1:50,000  
0 5000 m

UNIVERSAL TRANSVERSE MERCATOR PROJECTION  
Clarke 1866, Luzon Datum

Contour interval: 20 meters with approximation  
between 0.2 and 0.5 meters interval



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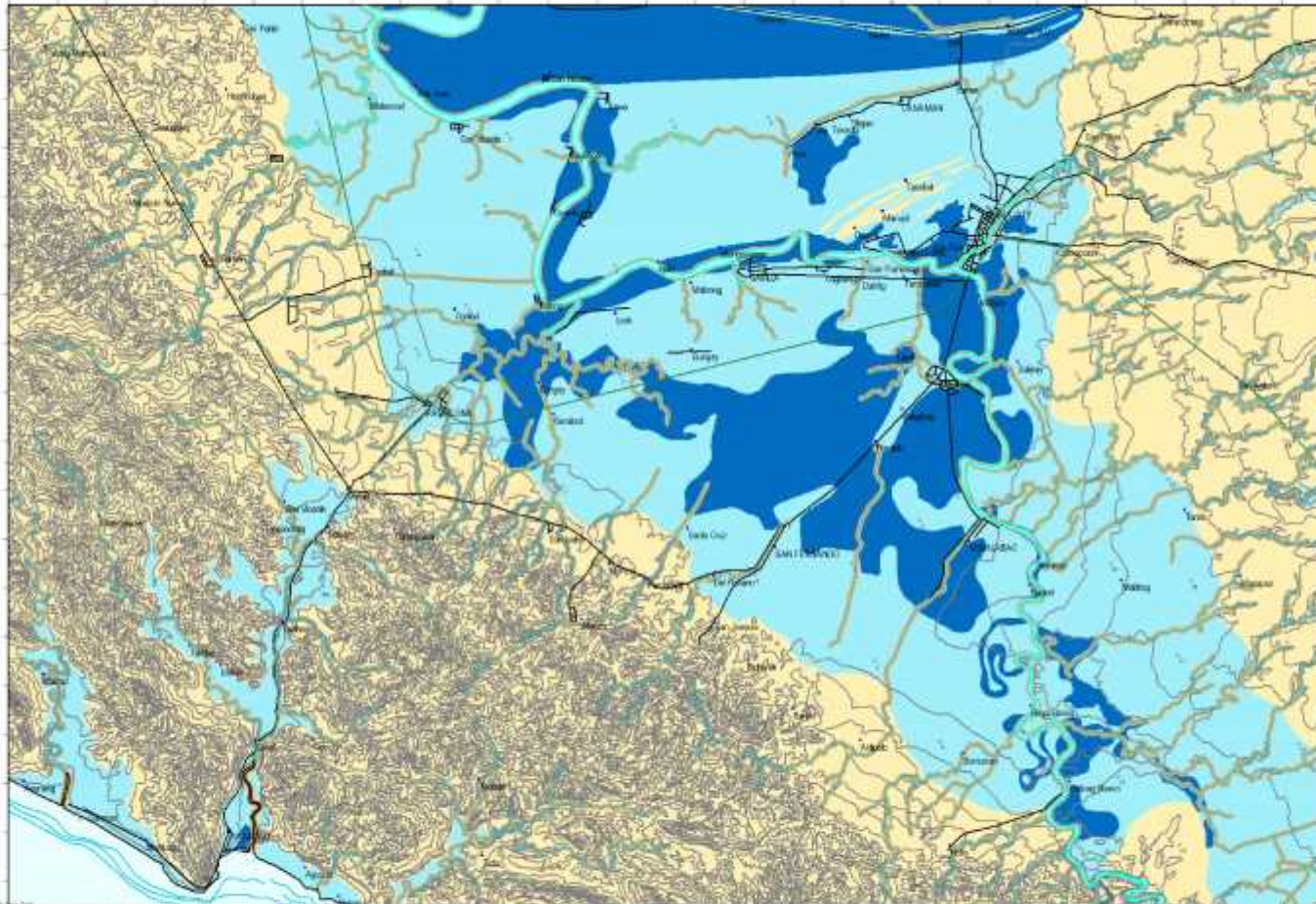




# FLOOD HAZARD MAP OF NAGA CITY QUADRANGLE

12° 47' 00"  
123° 08' 30"

12° 47' 00"  
123° 10' 00"



12° 00' 00"  
123° 08' 30"

12° 38' 30"  
123° 10' 00"

## LEGEND:

### Flood Hazard Susceptibility Zones

- Non flood-prone areas
- Susceptible to rarely flooded areas
- Susceptible to frequently flooded areas
- Sea

### Symbols:

- river
- road
- railroad

## EXPLANATIONS:

Flood hazard susceptibility zones were defined based on the geomorphological analysis of landforms and the flood modes. Information on flood occurrence, flood depths, duration of inundation as well as topographic information supported the geomorphologically based flood hazard mapping.

### Regularly to Frequently Flooded Areas

Areas that are frequently flooded. Mean flood rate of 1 to 2 days could bring about flooding in these areas. Moderate to strong typhoons could outburst these areas 0.5 to 2.0 m. in flood waters for a few days to a few weeks. Development of urban settlements in these areas are not recommended.

### Sometimes to Rarely Flooded Areas

Areas that become inundated during moderate to strong typhoons. Flood depths vary from a few centimeters to 1 m. Floods last from a few hours to a few days.

### Flat Flood-Free Areas

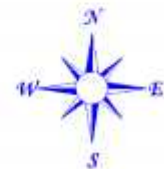
Areas with no reported flood occurrence.

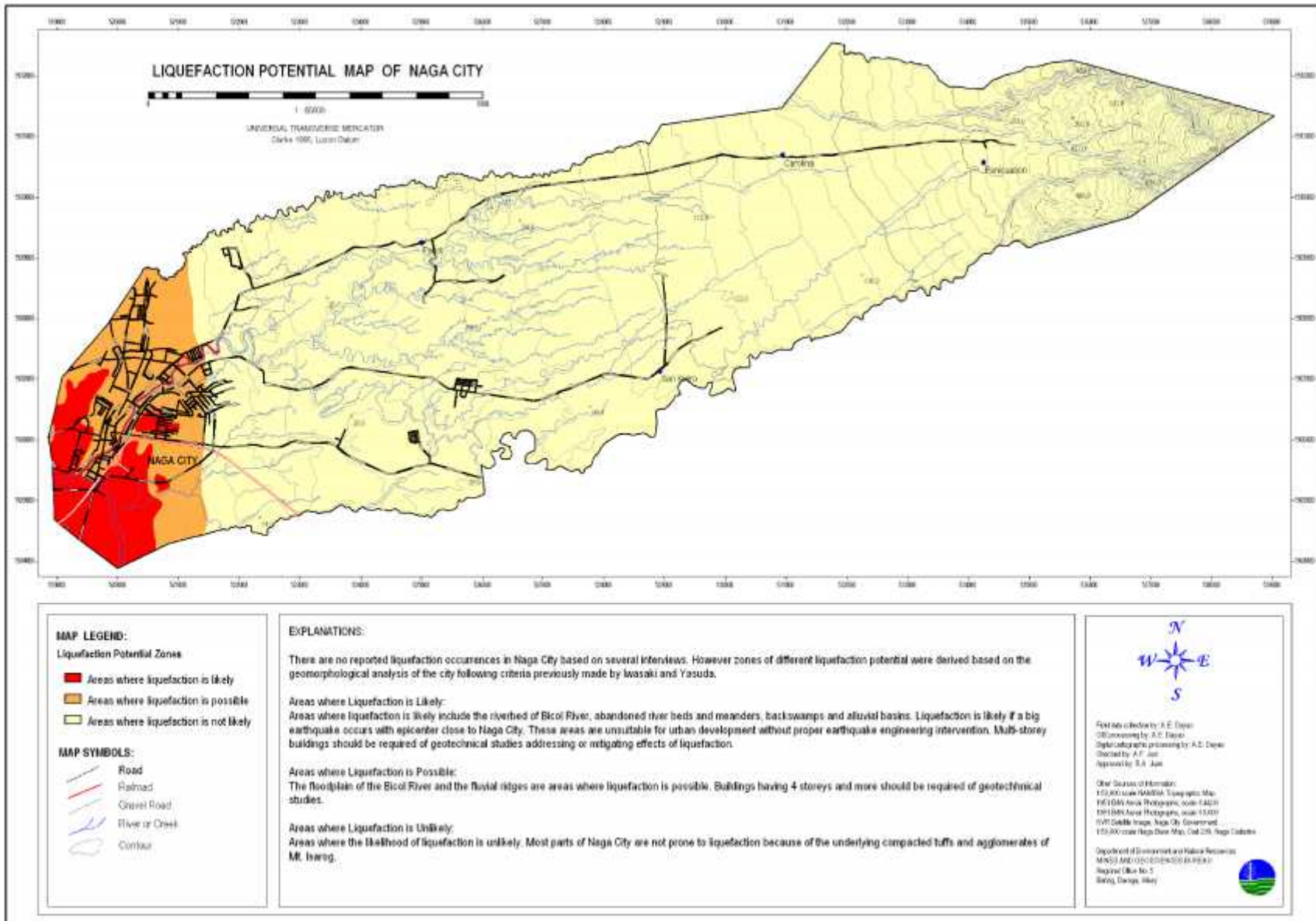
Field data collection by: A. E. Dapao and D.L. Canessa  
 Geomorphological interpretation by: A.E. Dapao  
 Digital cartographic processing by: A.E. Dapao  
 GIS processing by: A.E. Dapao  
 Checked by: A.F. Jail  
 Approved by: R.A. Jara

Other sources of information:  
 1:50,000 NAMRIA Topographic Map  
 10E1 02W Aerial photos  
 10E1 02W Aerial photos



Prepared by:  
 National Science and Technology Center  
 Department of Geosciences and Environmental  
 Sciences, UPD

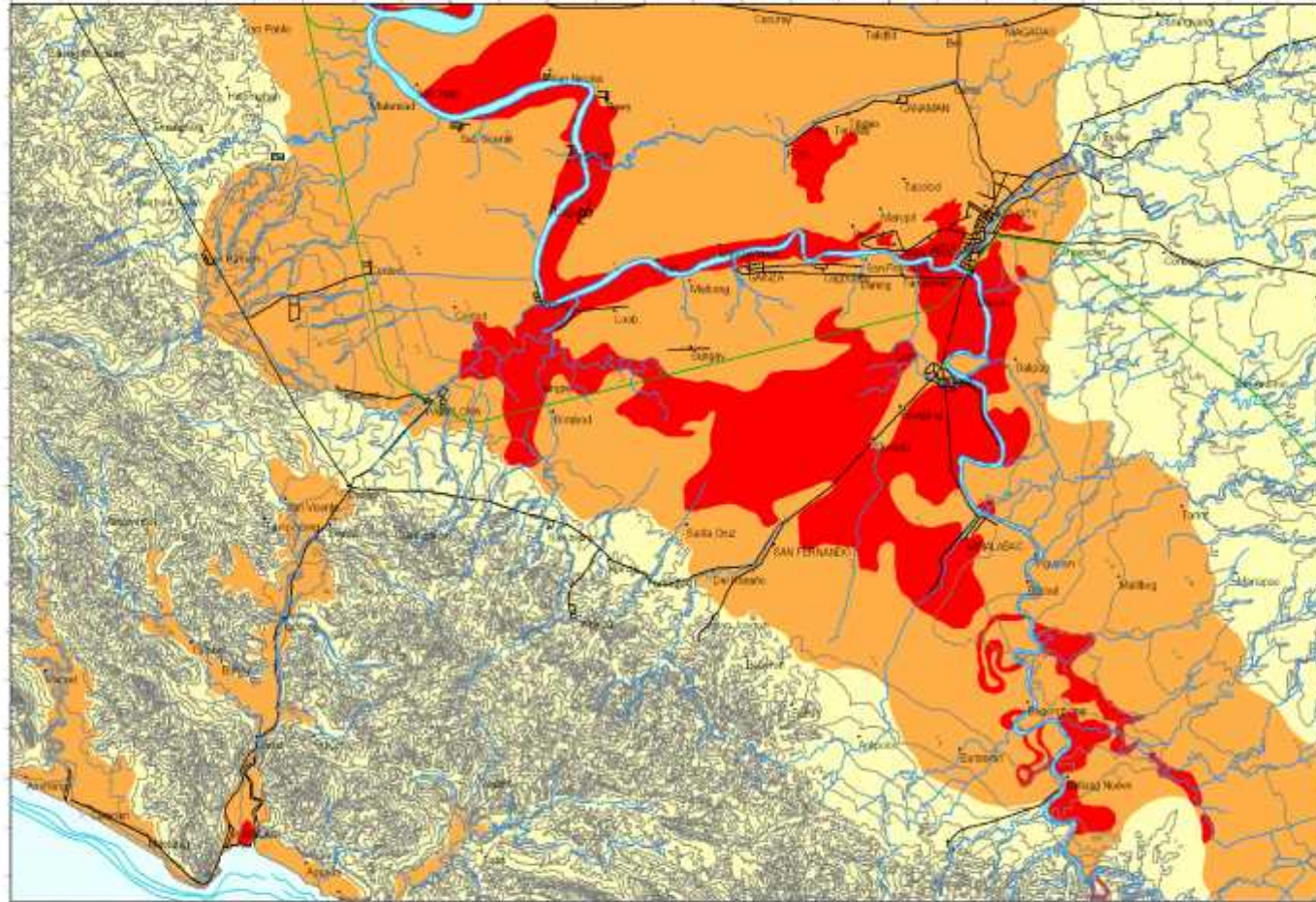




# LIQUEFACTION POTENTIAL MAP OF NAGA CITY QUADRANGLE

12° 42' 00"  
122° 00' 00"

12° 42' 00"  
122° 15' 00"



12° 36' 00"  
122° 00' 00"

12° 30' 00"  
122° 15'

**LEGEND:**

Liquefaction Potential Zones:

- Yellow: Areas where liquefaction is not likely
- Orange: Areas where liquefaction is possible
- Red: Areas where liquefaction is likely

Symbol

- Blue line: river
- Black line: road
- Black line: railroad

**EXPLANATIONS:**

There are no reported liquefaction occurrence based on several field observations. However, zones of different liquefaction potential were derived based on the geomorphological analysis of the study area following previous studies made by Iwawaki and Yasuda.

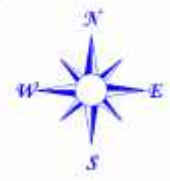
**Area where Liquefaction is Likely:**  
Area where liquefaction is likely include river beds, old or abandoned river beds, swamps and backswamps. These areas are unsuitable for urban development. Multi-story buildings should be required of geotechnical studies addressing or mitigating the effects of liquefaction.

**Area where Liquefaction is Possible:**  
The floodplain of the Berao River, the flood and flow-deficit areas, the flow-deficit plain and the alluvial plains are areas where liquefaction is possible.

**Area where Liquefaction is not Likely:**  
Areas where the likelihood of liquefaction is unlikely.

Field data collection by: A.E. Deyao and O.U. Camarin  
 Geomorphological interpretation by: A.E. Deyao  
 Digital cartographic processing by: A.E. Deyao  
 GIS processing by: A.E. Deyao  
 Checked by: A.F. Jara  
 Approved by: R.A. Jara

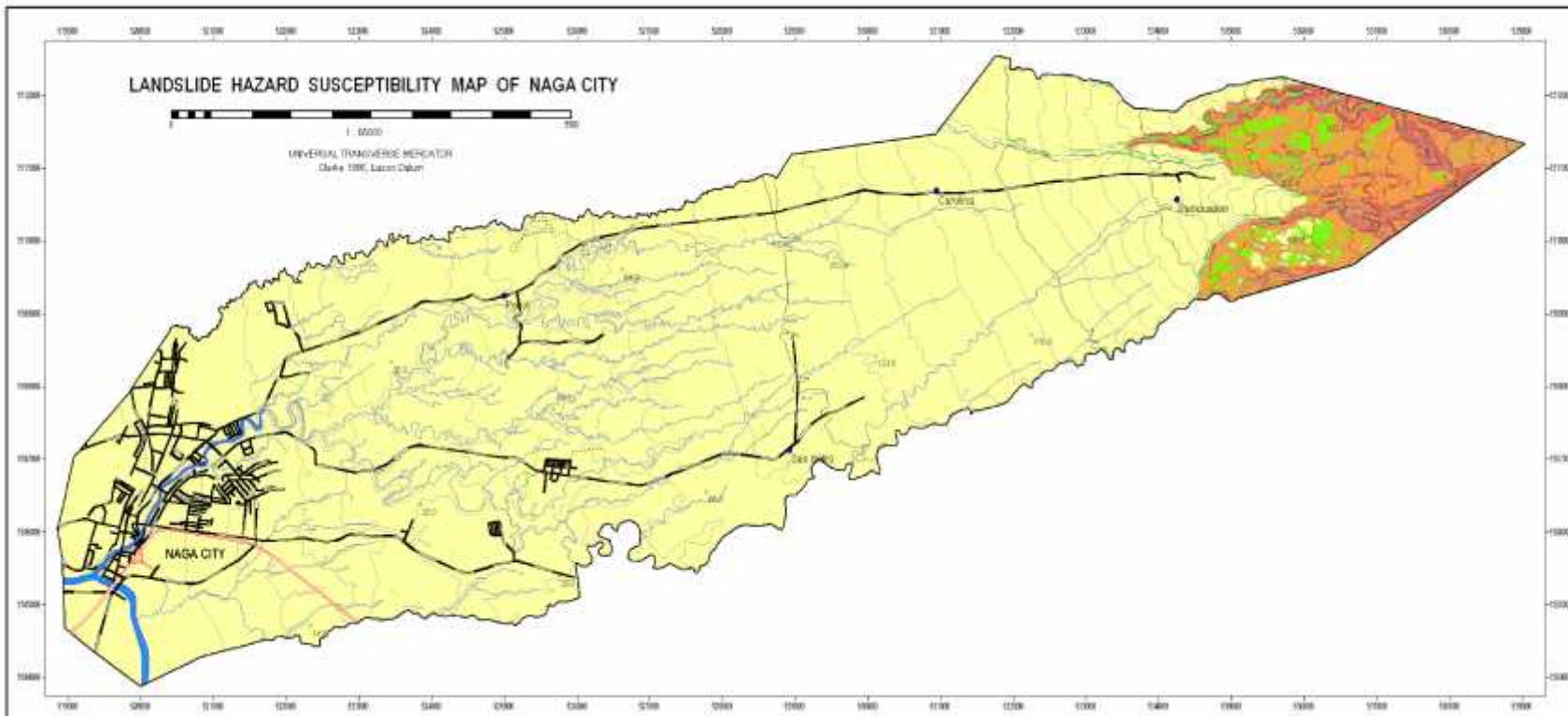
Other sources of information:  
 1:50,000 NAMRIA Topographic Map  
 100:1 Scale Aerial Photo



UNITED NATIONS DEVELOPMENT PROGRAMME  
 UNDP  
 Development of Mitigation Schemes for Geological Hazards Project



Universal Resource Module Project  
 OCHA 2004, Latin Region  
 Publication  
 Department of Geomatics Engineering  
 ARMS AND RESEARCH CENTER  
 Surigao City



- MAP LEGEND:**
- Landslide Hazard Susceptibility Zones**
- Absent
  - Low Susceptibility to Landslides
  - Moderate Susceptibility to Landslides
  - High Susceptibility to Landslides
- MAP SYMBOLS:**
- Road
  - Railroad
  - Gravel Road
  - River or Creek
  - Contour

**EXPLANATIONS:**

Landslide hazard susceptibility zones were derived through qualitative map combination using lithology, geomorphology, slope gradient and road buffer distance as parameters. GIS was used in the map combination and subjective weights were assigned to each unit in the parameter map based on field knowledge.

**Areas with High Susceptibility to Landslides:**  
Areas with equally high probability of occurrence of mass movements particularly rock slides, slumping, debris slides and debris flows. Very steep to extremely steep slopes along volcanic ravines and gullies and on the volcanic cone of Mt. Isarog are rated high susceptibility areas. Areas under high susceptibility are unsuitable for human settlement.

**Areas with Moderate Susceptibility to Landslides:**  
Areas having moderate likelihood of occurrence of landslides. Most lava flows in the volcanic cone have moderate susceptibilities. Any development should first undergo appropriate evaluation.

**Areas with Absent or Low Susceptibility to Landslides:**  
Areas where the threat and likelihood of landslide occurrence is either absent or low. These areas are suitable for habitation as long as other geologic hazards are rated absent or low.

Field data collected by: A.E. Deyan  
 GIS Consulting by: A.E. Deyan  
 Digitizing and data processing by: A.E. Deyan  
 Checked by: A.P. Jain  
 Approved by: R.A. Jain

Other Sources of Information:  
 1:50,000 Scale Map/DEM Topographic Map  
 1:50,000 Scale Photogrammetry, scale 1:40,000  
 1:50,000 Scale Photogrammetry, scale 1:30,000  
 1:50,000 Scale Topographic Map, scale 1:30,000  
 1:50,000 Scale Topographic Map, scale 1:20,000  
 1:50,000 Scale Topographic Map, scale 1:10,000

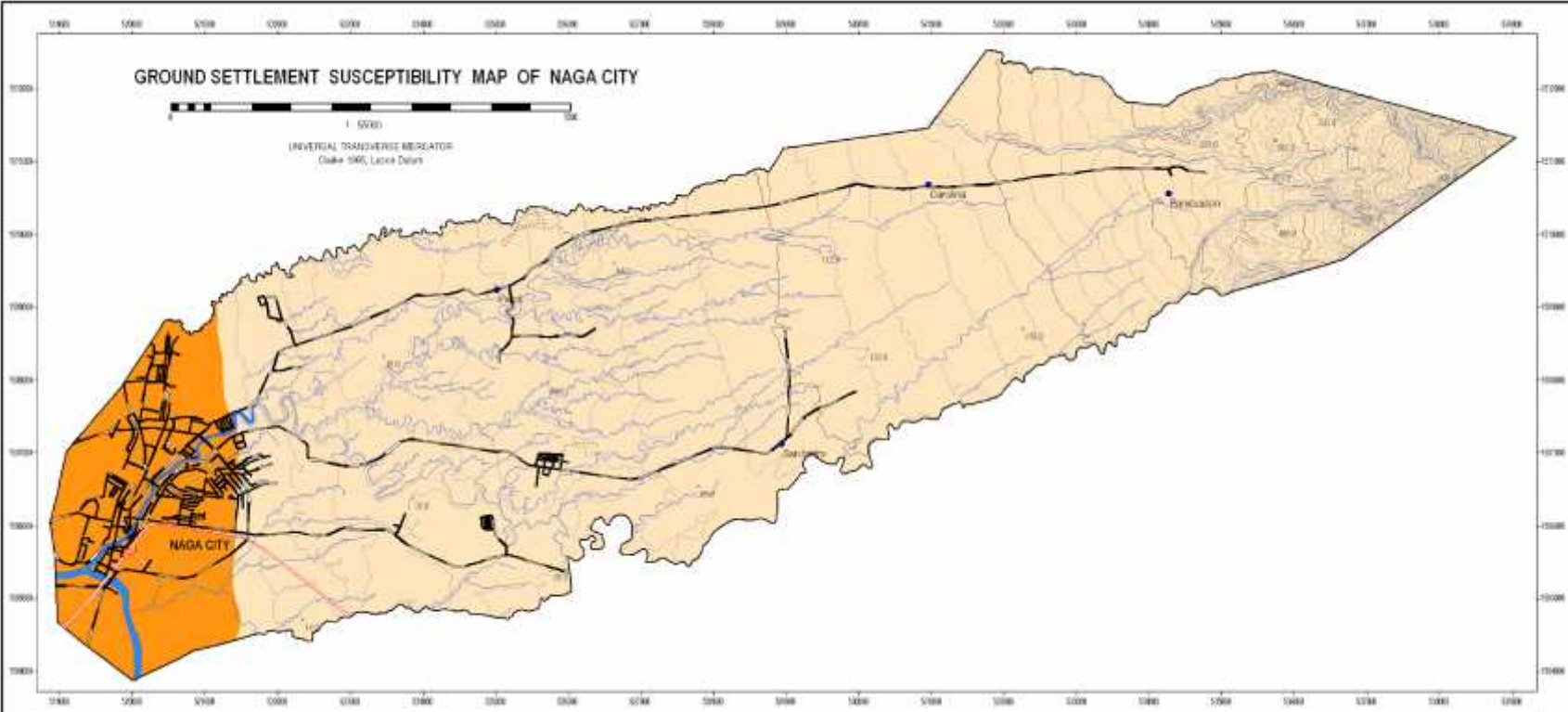
Department of Environment and Natural Resources  
 MANDAWA (MINDANAO DEVELOPMENT REGION)  
 Regional Office No. 5  
 Davao, Davao Region



## GROUND SETTLEMENT SUSCEPTIBILITY MAP OF NAGA CITY



UNIVERSAL TRANSVERSE MERCATOR  
Datum 1985, Lateral Datum



### MAP LEGEND:

#### Ground Settlement Susceptibility

- Areas susceptible to ground settlement
- Areas not prone to ground settlement

#### MAP SYMBOLS:

- Road
- Railroad
- Gravel Road
- River or Creek
- Contour

### EXPLANATIONS:

Areas of possible ground settlement in Naga City were delineated through the analysis of the geomorphological lay of the city and its sub-surface soils.

#### Areas Susceptible to Ground Settlement:

Areas where thick fluvial and fluvio-deltaic sands, silts and clays coupled with shallow ground water table are sites of possible ground settlement. The floodplain and the backswamps of the Bicol River and the fluvial ridges are sites of possible ground settlement. Buildings and structures having 3 storeys should be tested for ground settlement. Buildings having 4 storeys or more should undergo detailed geotechnical studies.

#### Areas not Prone to Ground Settlement:

These are areas where the possibility of ground settlement is either low or absent. Nevertheless, buildings having 4 storeys and more should undergo geotechnical studies. Unlike in Compo and parts of PIA, the lower volcanic footholes in Naga City are not prone to ground settlement because the unconsolidated sediments and soils on top of the compacted tuffs are less thick.



Field data collected by: A. E. Dapin  
 GIS processing by: A. E. Dapin  
 Digital cartography processing by: A. E. Dapin  
 Checked by: A. F. Jato  
 Approved by: P. A. Jato

Other Sources of Information:  
 1:50,000 scale NAMRIA Topographic Map  
 1:50,000 scale Aerial Photographs, scale 1:4000  
 1:50,000 Aerial Photographs, scale 1:10,000  
 USGS Satellite Image, Naga City Government  
 1:50,000 scale High-Data Map, Oct 2006, Naga, Cebu

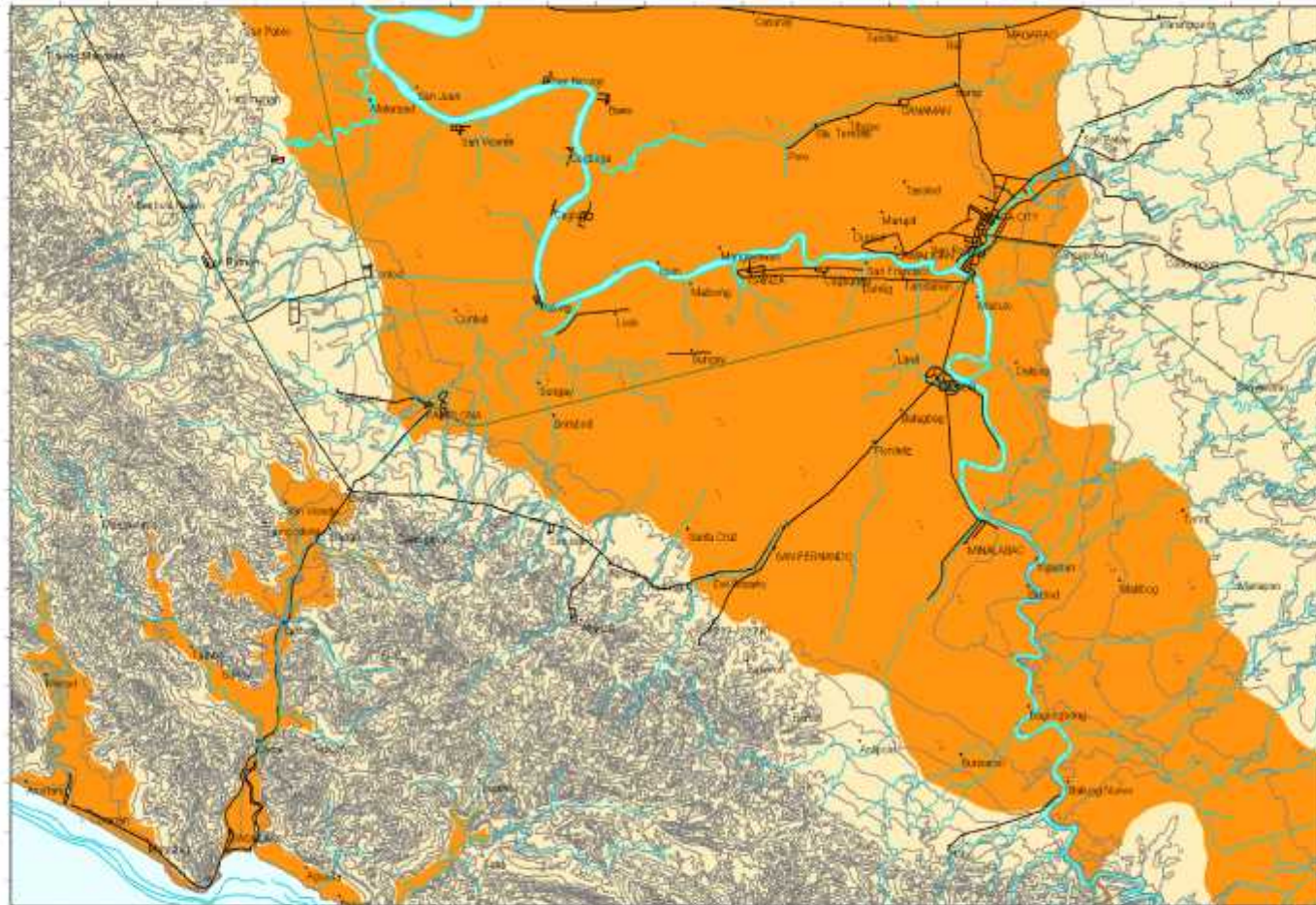
Department of Environment and Natural Resources  
 MMET AND OCCUPATIONAL HEALTH  
 Regional Office No. 5  
 Tuguegarao, Cagayan



# GROUND SETTLEMENT SUSCEPTIBILITY MAP OF NAGA CITY QUADRANGLE

12° 48' 00"  
123° 00' 00"

12° 48' 00"  
123° 00' 00"



12° 36' 00"  
123° 00' 00"

12° 36' 00"  
123° 00' 00"

## LEGEND:

Ground Settlement Susceptibility Zones  
 □ Areas not susceptible to ground settlement  
 □ Areas susceptible to ground settlement

## Symbols:

— River  
 — Road  
 — Railroad

## EXPLANATIONS:

Areas of possible ground settlement were delineated through the analysis of the geomorphological map of the study area, the soil surface soils and the ground water levels.

### Areas Susceptible to Ground Settlement

Areas where fine silt and clayey-silt sand, with and clay coupled with shallow ground water table are sites of possible ground settlement. Settlement may be reduced by correct design of foundation structure. Buildings having 3 stories or more should be tested for settlement and/or consolidation. Buildings having 4 stories or more should undergo detailed geotechnical studies.

### Areas not Susceptible to Ground Settlement

Areas where the possibility of ground settlement is low or absent. SM buildings of 4 stories or more should undergo geotechnical studies.

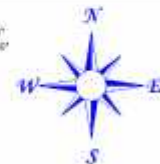
Field data collection by A. E. Dayao and C. U. Canales  
 Geomorphological interpretation by A. E. Dayao  
 Digitized cartographic processing by A. E. Dayao  
 GIS processing by A. E. Dayao  
 Checked by AT, Jose  
 Approved by RA, Jose

Other sources of information:  
 1:50,000 DENR Topographic Map  
 1:62,500 Aerial photos  
 1:62,500 Aerial photos



General Services Research Institute  
 Data: DENR, Lungsod Naga

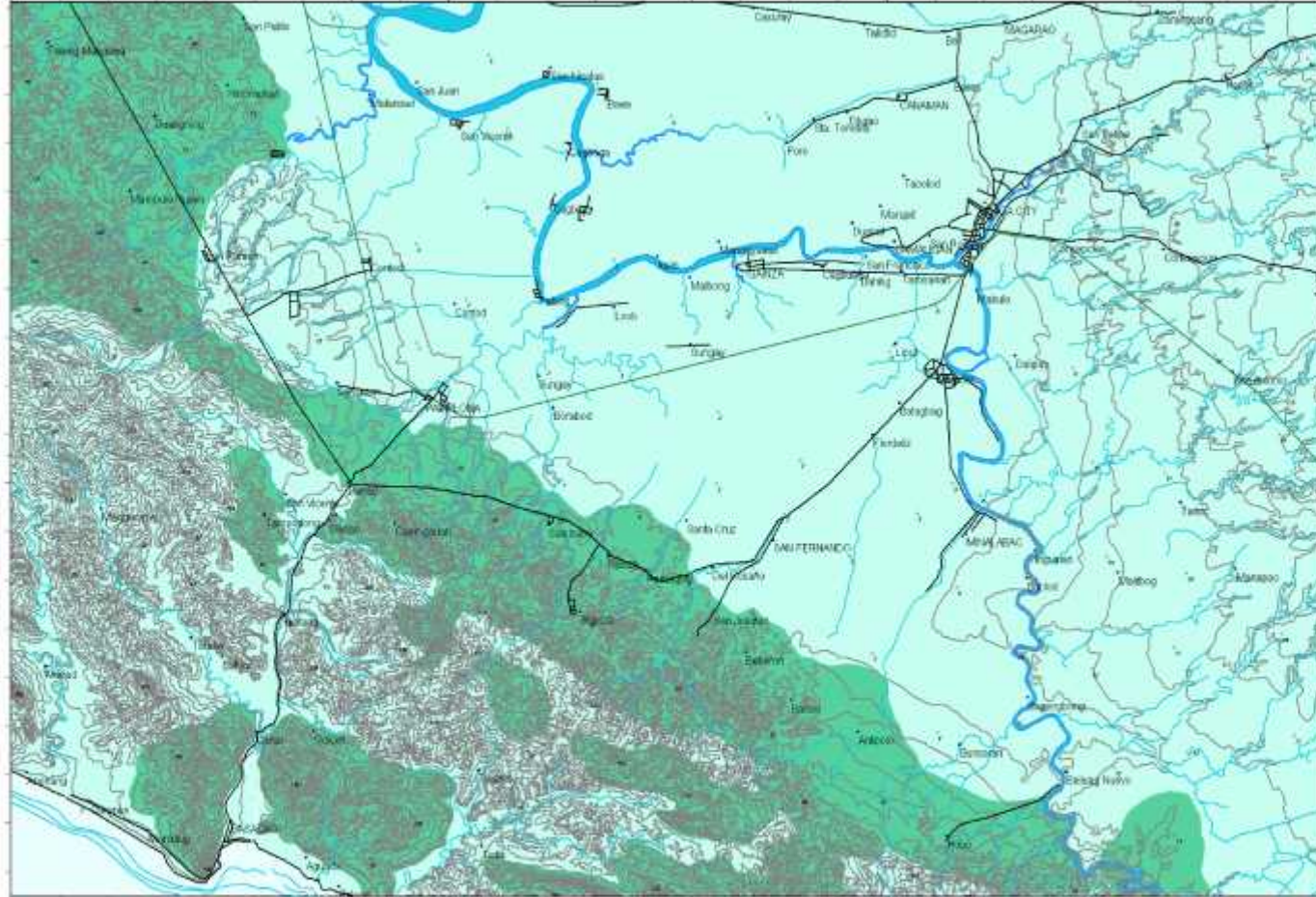
Published by:  
 Department of Environment and Natural Resources  
 MIND AND ORIGIN/CEES, BANGALORE  
 Design: Naga



# GROUND SUBSIDENCE SUSCEPTIBILITY MAP OF NAGA CITY QUADRANGLE

17° 40' 00"  
123° 00' 00"

17° 40' 00"  
123° 10' 00"



**LEGEND:**

Ground Subsidence Susceptibility Zones

- Areas susceptible to ground subsidence
- Areas not susceptible to ground subsidence

**Symbols:**

- river
- road
- railroad

**EXPLANATIONS:**

**Susceptibility map for ground subsidence due to land processes**  
 Susceptibility map for ground subsidence due to land processes was primarily derived from the lithologic map of the study area. Field observations on activities and ground subsidence observed on concrete roads and damaged houses supported the mapping.

**Areas Not Susceptible to Ground Subsidence:**  
 Non-inclined areas that are not prone to ground subsidence due to land.

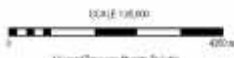
**Areas Susceptible to Ground Subsidence:**  
 Areas that are prone to ground subsidence, artificial formation and ground subsidence in areas underlain by limestone and calcareous substrate and shales.

Field data collector by: A. E. Dapao and O. U. Canales  
 Geomorphological analysis by: A. E. Dapao  
 Digital orthophoto processing by: A. E. Dapao  
 GIS processing by: A. E. Dapao  
 Checked by: R. F. Jua  
 Approved by: R. A. Jua

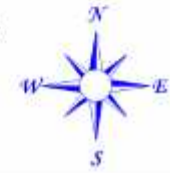
Other sources of information:  
 1:50,000 NAMRIA Topographic Map  
 1:50,000 Aerial photos  
 1:50,000 Aerial photos

17° 30' 00"  
123° 00' 00"

17° 30' 00"  
123° 10' 00"



United Nations Economic Commission for Asia and the Pacific  
 Publication  
 Department of Environment and Natural Resources  
 MIND AND GEOPHYSICAL BUREAU  
 Manila, Philippines





# **Executive Order No. 2012-013**

## **CREATING THE NAGA CITY FLOOD MITIGATION BOARD**

WHEREAS, the City of Naga, being situated along the course of the Naga River and the Bicol River, is always at risk of flooding, especially during rainy season;

WHEREAS, Naga City, aside from having Barangays along the riverbanks of the Naga River and the Bicol River, also has low-lying Barangays that serve as catch basins of rainwater that causes flooding in those particular areas;

WHEREAS, the City Government of Naga, through a special body that will focus on ways and means to mitigate flooding, intends to lessen the effects of flood on lives, property, agriculture, productivity and the environment through preventive and mitigating measures;

WHEREAS, in protecting the public against the ill-effects of flooding, there is a need to create the "NAGA CITY FLOOD MITIGATION BOARD" that shall take the lead in flood prevention and mitigation efforts of the City Government of Naga;

NOW THEREFORE, I, JOHN G. BONGAT, City Mayor of Naga, by virtue of the powers vested upon me by law do hereby order the following:

Section 1. The Naga City Flood Mitigation Board is hereby created to be comprised of the following:

*Chairman* : City Mayor

*Vice Chairman & Presiding Officer* : City Engineer

*Members (Government Sector)* : Asst. City Engineer

*SWMO Head*

*City ENRO Head*

*CPDO Head*

*DPWH Representative*

*Philippine Coast Guard Cam. Sur Representative*

*Liga ng mga Barangay President*

*Members (Private Sector)* : MNCCI Head or Designated Representative

*PICE Naga City Chapter Representative*

*UAP Camarines Sur Chapter Representative*

*NCPC Representative*

*Three (3) other members from the private sector, to be appointed by the City Mayor*

Section 2. The Naga City Flood Mitigation Board's functions and responsibilities are as follows:

1. Identify flood prone areas in the different Barangays;
2. Cause the preparation of topographic map for Naga in relation to the topography of adjoining municipalities, aimed at determining the flow of water in existing natural waterways and man-made drainages;
3. Coordinate with the Naga City Natural Waterways Management Council in integrating programs to preserve and clean-up such waterways and man-made drainages;
4. Serve as a recommending body for infrastructure development that will address flooding problems in the City;
5. Engage the services of the academe and/or flood experts in introducing engineering and scientific solutions to flooding;
6. Conduct public awareness campaign encouraging/engaging people's participation in the maintenance and upkeep of man-made drainages and natural waterways;
7. Cause the posting of notices containing information on high and low tides in public, conspicuous places, barangay halls and zones adjacent to the Naga and Bicol Rivers;
8. Perform such other functions in pursuance of the above.

Section 3. The City Government of Naga shall provide the administrative and necessary logistical support for the Naga City Flood Mitigation Board, that shall meet at least once a month or as often as the need arises, for the performance of its functions and responsibilities.

Section 4. This Executive Order shall take effect immediately.

Issued this 4<sup>th</sup> day of June, 2012 at Naga City, Philippines.

JOHN G. BONGAT  
City Mayor

Attested by:

FLORENCIO T. MONGOSO, JR., CSEE  
Department Head II and Acting City Administrator



REPUBLIC OF THE PHILIPPINES  
**OFFICE OF THE CITY MAYOR**  
*City of Naga*



**Executive Order No. 2015-027**

**AMENDING SECTION OF EXECUTIVE ORDER NO. 2012-014, CREATING THE  
NAGA CITY WATERWAYS MANAGEMENT COUNCIL:**

**WHEREAS**, a group of young community leaders were able to successfully revive the dead Maningning Creek in Taytay, Rizal. The Maningning Creek experiment is now being used as a model for the rehabilitation of waterways in Cambodia, Vietnam, Malaysia, and Laos;

**WHEREAS**, the Maningning Creek model inspired group of students in Ateneo de Naga University to replicate it on the waterways of Naga City;

**WHEREAS**, there is a need to include additional function and responsibility of the council to coordinate with various non-government organizations that are interested to actively participate in the clean-up, rehabilitation, and revival efforts of the Council, of Naga's natural waterways;

Now, therefore, I, JOHN G. BONGAT, Mayor of the City of Naga, by virtue of the powers vested in me by law, do hereby order that the following:

Section 2, as amended, shall now read thus "Section 2. Composition. The Naga City Natural Waterways Management Council's functions and responsibilities are as follows:

- 1. Identify the natural waterways in the different barangays of Naga City;**
- 2. Cause the preparation of topographic map for Naga City indicating all natural waterways in relation to the topography of adjoining municipalities, aimed at determining the flow of water in existing natural waterways;**
- 3. Coordinate with the Naga City Flood Mitigation Board in integrating programs to preserve and clean-up such waterways;**
- 4. Engage the services of the academe and/or flood experts in introducing engineering and scientific solutions to flooding;**
- 5. Conduct public awareness campaign encouraging/engaging people's participation in the maintenance and upkeep of natural waterways;**



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**OFFICE OF THE CITY MAYOR**  
*City of Naga*




6. Organize residents along Naga and Bicol Rivers into "Defenders of Naga River", as the lead, barangay-based organization charged with the function of ensuring cleanliness of riverbanks and the river;
7. Act as coordinating body to various NGOs that are interested and willing to provide support to the clean-up, rehabilitation, and revival efforts of the Council; and
8. Perform such other function in pursuit of the above."

This Executive Order shall take effect immediately.

Issued this 7th day of September, 2015 in the City of Naga, Philippines.

  
**JOENG G. BONGAT**  
City Mayor

Attested by:

  
**FLORENCIO T. MONGOSO, JR., CSEE**  
Department Head II and City Administrator