

QUESTIONNAIRE ON REQUESTED BRIDGES

Date of Answer: March / 2 /2006

Name of Respondent: Trn Van Dan

Title of Respondent: Technical Division

| Bridge No. | No. 41 | Bridge Name | Ban An | Province Name | Ha Giang | Road Network around the Bridge (conceptual map) | | | | | | |
|-------------------------------------|--|---|---|--|---|--|---|---|---|------------------------------|--|--|
| Bridge Location | The Road on which the bridge exist | | | Nearest City (with population over 20,000) | | | | | | | | |
| | Road Name | | Station of the Bridge | | Name of the City | | Distance From the Bridge | | | | | |
| | Mau Due - Ngoc Long | | Km 17+250 | | Yen Minh town | | 30km | | | | | |
| Present Condition of Bridge | Bridge Length | 60 m | Span | (| m+ | m+ | m+ | m+ | m) | | | |
| | Bridge Width | 2.5 m | Carriage Way Width | 2.3 m | | | | | | | | |
| | Superstructure Type | Suspension Bridge | | | | | | | | | | |
| | Substructure Type | Suspension Bridge | | | | | | | | | | |
| | Present Condition (Eye Check) | Weak | | | | | | | | | | |
| | Necessity of Reconstruction | Yes Reason refers to reason of priority | | | | | | | | | | |
| Number of Days of Closed to Traffic | Vehicle / Bike etc. : | | days/year. | | pedestrian or Bicycle : | | days/year | | | | | |
| | Information of Villages Beyond the Bridge | | | | | | Information of the Nearest City (with population over 20,000) | | | | | |
| Actual State of Social Economic | Number of Village | 25 villages | Name of Regional Town | Ban An | Name of City | Yen Minh | Access Time from the Bridge | 2 hours by bus | | | | |
| | Population | 8503 persons | Number of Household | 1045 households | Population of City | 4587 persons | Number of Household | 170 households | | | | |
| | Average Income | 190,000 Dong/month | Population Ratio of Minority | 99.28 % | Average Income | 225,000 Dong/month | Access Time from the main village beyond the bridge site (by general means of trip for the residents) | 30 minutes | | | | |
| | Rate of School Attendance (Elementary School) | 13.5 % | Rate of School Attendance (Junior High School) | 18 % | Remarks | | | | | | | |
| | Number of Educational Facilities | | | Junior High School | 1 | Number of Educational Facilities | | | Junior High School | 2 | | |
| | Elementary School | 1 | High School | 0 | Elemental School | 3 | High School | 1 | | | | |
| | Number of Medical Facilities | | | Emergency Hospital (middle size hospital) | 0 | Number of Medical Facilities | | | Emergency Hospital (middle size hospital) | | | |
| | Clinic (small size hospital) | 1 | Hospital for Serious Patients (large size hospital) | 0 | Clinic (small size hospital) | | Hospital for Serious Patients (large size hospital) | | | | | |
| | Number of Daily Life Facilities | | | Bank | | Number of Daily Life Facilities | | | Bank | 1 | | |
| | Post Office | 1 | Market | | Post Office | 1 | Market | 1 | | | | |
| | Bus Stop | | Public Offices (Town Hall branch, etc.) | | Bus Stop | 0 | Public Offices (Town Hall branch, etc.) | 1 | | | | |
| | Main Land Use | Rice Field | | Detail of products sent to markets through the bridge location (Name of the products, total amount/price per year of each product): Rice: 10,370 kg/2,500d/year. Corn: 15,180 kg/2,300d/year | | | | | | | | |
| | Main Production | Agriculture | | | | | | | | | | |
| | Present Condition of Access Road | Road Class | National / Provincial / District / Others () | | | | Road Width: 7m | Average Road Width | 6 m. | Average Carriage Way Width m | | |
| Surface Type | | Soil | | | | Actual Road Condition | Good / Normal / Bad / Poor / Others () | | | | | |
| Average Traffic Volume (car/day) | | Big Bus | Small Bus | Passenger Car | Motor Bike | Big Track | Small Track | Cart (drawn by animals) | Bicycle and pedestrian | Boat | | |
| Place of Bottleneck | | Bridge / Tunnel / Narrow Width Section / Others () | | | | Minimum Width | m | Traffic Control | Up to tone | | | |
| Remarks | | Detail of bottlenecks in the access roads: | | | | | | | | | | |
| Relevant Development Plan | Village Level | Road Network Plan | Traffic Infrastructure | Master Plan | Other Infrastructure | Priority of this bridge among the proposed bridges in this province | | | | | | |
| | | Yes / No | Yes / No | Yes / No | Yes / No | Priority : | | | | | | |
| | District Level | Material No. | Material No. | Material No. | Material No. | 1 2 3 4 5 6 | | | | | | |
| | | Yes / No | Yes / No | Yes / No | Yes / No | X | | | | | | |
| | Province Level | Material No. | Material No. | Material No. | Material No. | Reason of the priority : | | | | | | |
| Yes / No | | Yes / No | Yes / No | Yes / No | Exchange of goods, travelling in easy condition | | | | | | | |
| River Condition | Low Water Level | Depth 1 m | River Width 80 m | River Gradient (Estimate) | 3% | This is pilot commune in poverty reducing campaign | | | | | | |
| | Highest Flood | Depth 6 m | River Width 90 m | Year of the Flood | 2004 | Possible travelling crossing causeway during dry season, impossible travelling in rainy season by vehicle. | | | | | | |
| | | Velocity | m/sec | | Rapid flow / Moderate flow / Slow flow | | | The patients can go to the hospital in easy condition | | | | |
| | Tidal effects | Have / No | | River Bed Material | | | | | | | | |
| | Bridge Surface Elevation | m from Average Height of River Bed | | | | Sand, Gravel, Boulder | | | | | | |
| | Navigation to be considered | No | 0 m | | number and type of ships: | | | 0 | | | | |
| | Up Stream Side | Special Remarks | 0 | | | | | | | | | |
| Down Stream Side | Special Remarks | There is causeway in downstream direction | | | | | | | | | | |
| Bridge Construction | Transportation of Steel Girder from the Provincial Capital | Transportation Route | Yen Minh - Mau Due - Ngoc Long | | | | | | | | | |
| | | Carrying Method | Truck 18 tones | | | | | | | | | |
| | | Road Condition for Transportation | Suitable | | | | | | | | | |
| | Bridge Construction | Any Bottleneck for Transportation: No | | | | | | | | | | |
| | | Coffering for Piers | Earth Bank with Sand Bags / No Need (No water in dry season) | | | | | | | | | |
| | | Steel Girder Erection | Suitable for Bent and Truck Crane Method Yes Required Other Specials Erection Methods () | | | | | | | | | |
| Foundation Type | RC Pile (L < 15m) | | | | | | | | | | | |
| (Assumption) | / Special Foundation () | | | | | | | | | | | |
| Expected Work Hinder | | | | | | | | | | | | |
| Remark | | | | | | | | | | | | |
| | | | | | | Other Additional Information to be Noted | | | | | | |
| | | | | | | 1. Current bridge maintenance budget and system | | | | | | |
| | | | | | | The district budget: 2,000,000d/year | | | | | | |
| | | | | | | 2. Current and expected projects by other donors (WB, ADB, JBIC, etc.) | | | | | | |

QUESTIONNAIRE ON REQUESTED BRIDGES

Date of Answer: March / 7 /2006

Name of Respondent: Ha Van Huong

Title of Respondent: Director of Transportation Management Division

| | | | | | | | | | | | |
|-------------------------------------|---|--|---|---|---|---|--------------------|--|------------------------|----------------------------|-------|
| Bridge No. | No. 42 | Bridge Name | Pac Nam | Province Name | Bac Kan | Road Network around the Bridge (conceptual map) | | | | | |
| Bridge Location | The Road on which the bridge exist | | | Nearest City (with population over 20,000) | | | | | | | |
| | Road Name | Station of the Bridge | Name of the City | Distance From the Bridge | | | | | | | |
| | Boc Bo - Bang Thanh | Km 8+750 | Cho Gia Town, Ba Be District | 45 km | | | | | | | |
| Present Condition of Bridge | Bridge Length | No bridge | m | Span | (| m* | m* | m* | m*) | | |
| | Bridge Width | | m | Carriage Way Width | | m | | | | | |
| | Superstructure Type | No bridge | | | | | | | | | |
| | Substructure Type | | | | | | | | | | |
| | Present Condition (Eye Check) | | | | | | | | | | |
| | Necessity of Reconstruction | Yes Reason () | | | | | | | | | |
| Number of Days of Closed to Traffic | Vehicle / Bike etc. : Dry season | | days/year, | pedestrian or Bicycle : Dry season | days/year | | | | | | |
| Actual State of Social Economic | Information of Villages Beyond the Bridge | | | | Information of the Nearest City (with population over 20,000) | | | | | | |
| | Number of Village | 15 | villages | Name of Regional Town | Ban Khua | Name of City | Ba Be Town | Access Time from the Bridge | 90 minutes by bus | | |
| | Population | 3010 | persons | Number of Household | 502 | households | Population of City | 4500 | persons | | |
| | Average Income | 150,000 | Dong/month | Population Ratio of Minority | 99 | % | Average Income | 350,000 | Dong/month | | |
| | Rate of School Attendance (Elementary School) | 70 | % | Rate of School Attendance (Junior High School) | 60 | % | Remarks | Access Time from the main village beyond the bridge site (by general means of trip for the residents) By | | | |
| | Number of Educational Facilities | | Junior High School | | 10 | Number of Educational Facilities | | Junior High School | | | |
| | Elementary School | 10 | High School | | 0 | Elemental School | 3 | High School | | | |
| | Number of Medical Facilities | | Emergency Hospital (middle size hospital) | | 0 | Number of Medical Facilities | | Emergency Hospital (middle size hospital) | | | |
| | Clinic (small size hospital) | 10 | Hospital for Serious Patients (large size hospital) | | 0 | Clinic (small size hospital) | 1 | Hospital for Serious Patients (large size hospital) | | | |
| | Number of Daily Life Facilities | | Bank | | | Number of Daily Life Facilities | | Bank | | | |
| | Post Office | 0 | Market | | 1 | Post Office | 2 | Market | | | |
| | Bus Stop | 0 | Public Offices (Town Hall branch, etc.) | | 01 - CPC | Bus Stop | 2 | Public Offices (Town Hall branch, etc.) | | | |
| Main Land Use | Rice Field / Vegetable Farm / Fruit Farm / Forest | | | Detail of products sent to markets through the bridge location (Name of the products, total amount/price per year of each product): Corn: 3.000T, Bean: 5.000T, Cattle: 2.500, Wood/Bamboo: 30.000T | | | | | | | |
| Main Production | Agriculture / Forestry / Industry | | | | | | | | | | |
| Present Condition of Access Road | Road Class | District Road - Rural Road (embankment:5m; pavement :3.5m) | | | Road Width | Average Road Width | | 5 m | m, | Average Carriage Way Width | 3.5 m |
| | Surface Type | Gravel | | | Actual Road Condition | Poor | | | | | |
| | Average Traffic Volume | Big Bus | Small Bus | Passenger Car | Motor Bike | Big Track | Small Track | Cart (drawn by animals) | Bicycle and pedestrian | Boat | |
| | (car/day) | Non | Non | Non | 250 | 50 | 50 | 15 | 120 | | |
| | Place of Bottleneck | Bridge / Tunnel / Narrow Width Section / Others () | | | Minimum Width | m | | Traffic Control | Up to | | tone |
| Remarks | Detail of bottlenecks in the access roads: | | | | | | | | | | |

| | | | | | | | | | | | |
|---------------------------|--|--|--------------------------------|-----------------------------------|--|------------------------------|---|---|---|---|---|
| Relevant Development Plan | Road Network Plan | Traffic Infrastructure | Master Plan | Other Infrastructure | Priority of this bridge among the proposed bridges in this province | | | | | | |
| | Village Level | Yes | Yes | Yes | Yes | Priority : | | | | | |
| | District Level | Yes / No | Yes | Yes | Yes / No | 1 | 2 | 3 | 4 | 5 | 6 |
| | Province Level | Yes | Yes | Yes | Yes | Reason of the priority : | | | | | |
| River Condition | Low Water Level | Depth | 20.5 m | River Width | 8 m | River Gradient (Estimate) 2% | Pupils and workers always have to absent in the flood season. | | | | |
| | Highest Flood | Depth | 23.5 m | River Width | 20 m | Year of the Flood | 1981 | | | | |
| | Tidal effects | No | River Bed Material | | It is difficult to transfer the sick people to the health station or hospital. | | | | | | |
| | Bridge Surface Elevation | m from Average Height of River Bed / Sand / Gravel / | | | If no have bridge, the travelling on the road meets the difficulties, dangerous for the local people as well as transportation means | | | | | | |
| | Navigation to be considered | No | m number and type of ships: No | | | | | | | | |
| | Up Stream Side | Special Remarks | | | | | | | | | |
| | Down Stream Side | Special Remarks | | | | | | | | | |
| Bridge Construction | Transportation of Steel Girder from the Provincial Capital | Transportation Route | Carrying Method | Road Condition for Transportation | Other Additional information to be Noted | | | | | | |
| | Any Bottleneck for Transportation: No | | | | 1. Current bridge maintenance budget and system | | | | | | |
| | Coffering for Piers | River Diversion / No Need (No water in dry season) | | | 2. Current and expected projects by other donors (WB, ADB, JBIC, etc.) | | | | | | |
| | Steel Girder Erection | Suitable for Bent and Truck Crane Method (Yes / No) Required Other Specials Erection Methods () | | | | | | | | | |
| | Foundation Type | Spread Foundation / RC Pile (L < 15m) / RC Pile (L > 15m) | | | | | | | | | |
| (Assumption) | / Special Foundation () | | | | | | | | | | |
| Expected Work Hinder | | | | | | | | | | | |
| Remark | | | | | | | | | | | |

QUESTIONNAIRE ON REQUESTED BRIDGES

Date of Answer: March / 7 /2006

Name of Respondent: Ha Van Huong

Title of Respondent: Director of Transportation Management Division

| | | | | | | | | | | | | | | |
|--|--|--|---|--|--|---|--|--|---|---|----------------------------------|-------------------------|------------------------|------|
| Bridge No. | No. 43 | Bridge Name | Khuoi Nung | Province Name | Bac Kan | Road Network around the Bridge (conceptual map) | | | | | | | | |
| Bridge Location | The Road on which the bridge exist | | | Nearest City (with population over 20,000) | | | | | | | | | | |
| | Road Name | | Station of the Bridge | | Name of the City | | Distance From the Bridge | | | | | | | |
| | Boc Bo - Bang Thanh | | Km 4+160 | | Cho Gia - Ba Be Town | | 40 km | | | | | | | |
| Present Condition of Bridge | Bridge Length | No bridge | m | Span | (| m+ | m+ | m+ | m+ | m) | | | | |
| | Bridge Width | | m | Carriage Way Width | | | | | | m | | | | |
| | Superstructure Type | No bridge | | | | | | | | | | | | |
| | Substructure Type | | | | | | | | | | | | | |
| | Present Condition (Eye Check) | | | | | | | | | | | | | |
| | Necessity of Reconstruction | Yes Reason () | | | | | | | | | | | | |
| Number of Days of Closed to Traffic | Vehicle / Bike etc.: Dry season days/year. pedestrian or Bicycle: Dry season days/year | | | | | | | | | | | | | |
| Actual State of Social Economic | Information of Villages Beyond the Bridge | | | | | | Information of the Nearest City (with population over 20,000) | | | | | | | |
| | Number of Village | 20 villages | | Name of Regional Town | | Name of City | Ba Be Town | | Access Time from the Bridge | 70 minutes by bus | | | | |
| | Population | 4510 persons | | Number of Household | 751 households | Population of City | 4500 persons | | Number of Household | 1125 households | | | | |
| | Average Income | 170.000 Dong/month | | Population Ratio of Minority | 99 % | Average Income | 350.000 Dong/month | | Access Time from the main village beyond the bridge site (by general means of trip for the residents) | 180 minutes | | | | |
| | Rate of School Attendance (Elementary School) | 70 % | | Rate of School Attendance (Junior High School) | 60 % | Remarks | By | | | | | | | |
| | Number of Educational Facilities | | | Junior High School | | 0 | Number of Educational Facilities | | | Junior High School | | | | |
| | Elementary School | | | 1 | | High School | 0 | Elementary School | | | 3 | | | |
| | Number of Medical Facilities | | | Emergency Hospital (middle size hospital) | | 0 | Number of Medical Facilities | | | Emergency Hospital (middle size hospital) | | | | |
| | Clinic (small size hospital) | | | 1 | | Hospital for Serious Patients (large size hospital) | 0 | Clinic (small size hospital) | | | 1 | | | |
| | Number of Daily Life Facilities | | | Bank | | 0 | Number of Daily Life Facilities | | | Bank | | | | |
| | Post Office | | | 0 | | Market | 0 | Post Office | | | 2 | | | |
| | Bus Stop | | | 0 | | Public Offices (Town Hall branch, etc.) | 0 | Bus Stop | | | 2 | | | |
| | Main Land Use | Rice Field / Vegetable Farm / Fruit Farm / Forest | | | | Detail of products sent to markets through the bridge location (Name of the products, total amount/price per year of each product): Corn: 4.000T, Bean: 5.5000T, Cattle: 32.000, Wood/Bamboo: 35.000T | | | | | | | | |
| Main Production | Agriculture / Forestry / Industry | | | | | | | | | | | | | |
| Present Condition of Access Road | Road Class | National / Provincial / District / Others (District Road; embankment:4m without pavement) | | | | Road Width | Average Road Width 5 m | | m | | Average Carriage Way Width 3.5 m | | | |
| | Surface Type | Concrete / Asphalt / Bitumen Seal / Gravel / Soil / Others () | | | | Actual Road Condition | Poor | | | | | | | |
| | Average Traffic Volume (car/day) | Big Bus | | Small Bus | | Passenger Car | Motor Bike | Big Track | | Small Track | | Cart (drawn by animals) | Bicycle and pedestrian | Boat |
| | | Non data | | Non data | | Non data | 250 | 50 | | 50 | | 15 | 120 | |
| | Place of Bottleneck | Bridge / Tunnel / Narrow Width Section / Others () | | | | Minimum Width | m | | Traffic Control | | Up to tone | | | |
| | Remarks | Detail of bottlenecks in the access roads: | | | | | | | | | | | | |
| Relevant Development Plan | Road Network Plan | Traffic Infrastructure | | Master Plan | | Other Infrastructure | | Priority of this bridge among the proposed bridges in this province | | | | | | |
| | Village Level | Yes | Yes | Yes | Yes | Priority: | | | | | | | | |
| | | Material No. | Material No. | Material No. | Material No. | 1 2 3 4 5 6 | | | | | | | | |
| | District Level | Yes / No | Yes | Yes | Yes /No | X | | | | | | | | |
| | | Material No. | Material No. | Material No. | Material No. | Reason of the priority: | | | | | | | | |
| Province Level | Yes | Yes | Yes | Yes | Construction of bridge in purpose to the cultural, social and economic development | | | | | | | | | |
| River Condition | Low Water Level | Depth 20.5 m | River Width 8 m | River Gradient (Estimate) 2% | | No transportation of goods and material during flood season. | | | | | | | | |
| | Highest Flood | Depth 23.5 m | River Width 20 m | Year of the Flood 1981 | | Pupils and workers always have to absent in the flood season. | | | | | | | | |
| | | Velocity m/sec | | Moderate flow | | | | It is difficult to transfer the sick people to the health station or hospital. | | | | | | |
| | Tidal effects | No | | | River Bed Material | | If no have bridge, the travelling on the road meets the difficulties, dangerous for the local people as well as transportation means | | | | | | | |
| | Bridge Surface Elevation | m from Average Height of River Bed / Sand / Gravel / | | | | | | | | | | | | |
| | Navigation to be considered | No m number and type of ships: 0 | | | | | | | | | | | | |
| | Up Stream Side | Special Remarks | | | | | | | | | | | | |
| Down Stream Side | Special Remarks | | | | | | | | | | | | | |
| Bridge Construction | Transportation of Steel Girder from the Provincial Capital | Transportation Route NH3 - PR 258 - PR 258B (Embankment: 5m, pavement: 3.5m) | | | | Other Additional Information to be Noted | | | | | | | | |
| | Carrying Method | Trailer Truck | | | | 1. Current bridge maintenance budget and system | | | | | | | | |
| | Road Condition for Transportation | Suitable / Possible / | | | | Nothing | | | | | | | | |
| | Any Bottleneck for Transportation: No | | | | | | 2 Current and expected projects by other donors (WB, ADB, JBIC, etc.) | | | | | | | |
| | Bridge Construction | Coffering for Piers | River Diversion / No Need (No water in dry season) | | | | Forest planting project (Project 661) | | | | | | | |
| | | Steel Girder Erection | Suitable for Bent and Truck Crane Method (Yes / No) | | | | | | | | | | | |
| Required Other Specials Erection Methods () | | | | | | | | | | | | | | |
| Foundation Type | Spread Foundation / RC Pile (L < 15m) / RC Pile (L > 15m) | | | | | | | | | | | | | |
| (Assumption) | / Special Foundation () | | | | | | | | | | | | | |
| Expected Work Hinder | The favourable condition for construction works is in the dry season | | | | | | | | | | | | | |
| Remark | | | | | | | | | | | | | | |

QUESTIONNAIRE ON REQUESTED BRIDGES

Date of Answer: March / 6 /2006

Name of Respondent: Ha Van Huong

Title of Respondent: Director of Transportation Management Division

| | | | | | | | | | | | | | | | | | | | |
|--|--|--|---|---|--|--|--|--|--|--|-------|--|--|--------------------------------|-------|-------------------------------|--|-------------|--|
| Bridge No. | No. 44 | | Bridge Name | Nga Ba | | Province Name | Bac Kan | | Road Network around the Bridge (conceptual map) | | | | | | | | | | |
| Bridge Location | The Road on which the bridge exist | | | | Nearest City (with population over 20,000) | | | | | | | | | | | | | | |
| | Road Name | | Station of the Bridge | | Name of the City | | Distance From the Bridge | | | | | | | | | | | | |
| | Boc Bo - Bang Thanh | | Km 2+300 | | Cho Gia - Ba Be Town | | 38 km | | | | | | | | | | | | |
| Present Condition of Bridge | Bridge Length | No bridge | | m | | Span | | (m+ m+ m+ m+ m) | | | | | | | | | | | |
| | Bridge Width | m | | Carriage Way Width | | | | m | | | | | | | | | | | |
| | Superstructure Type | | | | | | | | | | | | | | | | | | |
| | Substructure Type | | | | | | | | | | | | | | | | | | |
| | Present Condition (Eye Check) | | | | | | | | | | | | | | | | | | |
| | Necessity of Reconstruction | | | | | | | | | | | | | | | | | | |
| Number of Days of Closed to Traffic | Vehicle / Bike etc. : Dry season | | days/year, | | pedestrian or Bicycle : Dry season | | days/year | | | | | | | | | | | | |
| Actual State of Social Economic | Information of Villages Beyond the Bridge | | | | | Information of the Nearest City (with population over 20,000) | | | | | | | | | | | | | |
| | Number of Village | 23 villages | | Name of Regional Town | | Name of City | | Cho Ra - Ba Be Town | | Access Time from the Bridge | | 65 minutes by bus | | | | | | | |
| | Population | 6010 persons | | Number of Household | | 1202 households | | Population of City | | 4500 persons | | Number of Household | | 1125 households | | | | | |
| | Average Income | 170.000 Dong/month | | Population Ratio of Minority | | 99 % | | Average Income | | 350.000 Dong/month | | Access Time from the main village beyond the bridge site (by general means of trip for the residents) | | 160 minutes | | | | | |
| | Rate of School Attendance (Elementary School) | 70 % | | Rate of School Attendance (Junior High School) | | 60 % | | Remarks | | | | By | | | | | | | |
| | Number of Educational Facilities | | | | Junior High School | | 1 | | Number of Educational Facilities | | | | Junior High School | | | | | | |
| | Elementary School | | 3 | | High School | | No | | Elemental School | | 26 | | High School | | | | | | |
| | Number of Medical Facilities | | | | Emergency Hospital (middle size hospital) | | No | | Number of Medical Facilities | | | | Emergency Hospital (middle size hospital) | | | | | | |
| | Clinic (small size hospital) | | 1 | | Hospital for Serious Patients (large size hospital) | | No | | Clinic (small size hospital) | | 16; 4 | | Hospital for Serious Patients (large size hospital) | | 1 | | | | |
| | Number of Daily Life Facilities | | | | Bank | | No | | Number of Daily Life Facilities | | | | Bank | | 4 | | | | |
| | Post Office | | 1 | | Market | | 1 | | Post Office | | 16 | | Market | | 3 | | | | |
| | Bus Stop | | No | | Public Offices (Town Hall branch, etc.) | | Communal People's Committee (CPC) | | Bus Stop | | 4 | | Public Offices (Town Hall branch, etc.) | | 2 | | | | |
| | Main Land Use | Rice Field / Vegetable Farm / Fruit Farm / Forest | | | | | Detail of products sent to markets through the bridge location (Name of the products, total amount/price per year of each product): Corn: 5.500T, Bean: 60.000T, Cattle: 31.000, Wood/Bamboo: 40.000T | | | | | | | | | | | | |
| | Main Production | Agriculture / Forestry / Industry | | | | | | | | | | | | | | | | | |
| Present Condition of Access Road | Road Class | National / Provincial / District / Others (District Road; embankment:4m without pavement) | | | | Road Width | Average Road Width | | 5 m | | m | | Average Carriage Way Width | | 3.5 m | | | | |
| | Surface Type | Concrete / Asphalt / Bitumen Seal / Gravel / Soil / Others () | | | | Actual Road Condition | Poor | | | | | | | | | | | | |
| | Average Traffic Volume (car/day) | Big Bus | | Small Bus | | Passenger Car | | Motor Bike | | Big Track | | Small Track | | Cart (drawn by animals) | | Bicycle and pedestrian | | Boat | |
| | | No | | No | | No | | 250 | | 50 | | 50 | | 15 | | 120 | | | |
| | Place of Bottleneck | Bridge / Tunnel / Narrow Width Section / Others () | | | | Minimum Width | | m | | Traffic Control | | Up to | | tone | | | | | |
| Remarks | Detail of bottlenecks in the access roads: | | | | | | | | | | | | | | | | | | |
| Relevant Development Plan | Road Network Plan | Yes | | Yes | | Yes | | Yes | | Priority of this bridge among the proposed bridges in this province | | | | | | | | | |
| | Village Level | Material No. | | Material No. | | Material No. | | Material No. | | Priority: | | | | | | | | | |
| | | | | | | | | | | 1 2 3 4 5 6 | | | | | | | | | |
| | District Level | Yes | | Yes | | Yes | | Yes | | X | | | | | | | | | |
| | Material No. | | Material No. | | Material No. | | Material No. | | Reason of the priority: | | | | | | | | | | |
| Province Level | Yes | | Yes | | Yes | | Yes | | In purpose to cultural, social and economic development | | | | | | | | | | |
| | Material No. (transport) | | Material No. (transport) | | Material No. (transport) | | Material No. (transport) | | No transportation of goods and material during flood season. | | | | | | | | | | |
| River Condition | Low Water Level | Depth 23.5 m | | River Width 30 m | | River Gradient (Estimate) 2% | | Pupils and workers always have to absent in the flood season. | | | | | | | | | | | |
| | Highest Flood | Depth 25.5 m | | River Width 60 m | | Year of the Flood 1983 | | It is difficult to transfer the sick people to the health station or hospital. | | | | | | | | | | | |
| | | Velocity m/sec | | Rapid flow / Moderate flow / Slow flow | | | | | | If no have bridge, the travelling on the road meets the difficulties, dangerous for the local people as well as transportation means | | | | | | | | | |
| | Tidal effects | Have | | River Bed Material | | | | | | | | | | | | | | | |
| | Bridge Surface Elevation | m from Average Height of River Bed | | Sand / Gravel / | | | | | | | | | | | | | | | |
| | Navigation to be considered | Yes | | m | | number and type of ships: 0 | | | | | | | | | | | | | |
| | Up Stream Side | Special Remarks | | | | | | | | | | | | | | | | | |
| Down Stream Side | Special Remarks | | | | | | | | | | | | | | | | | | |
| Bridge Construction | Transportation Route | NH3 - PR 258 - PR 258B (Embankment: 5m, pavement: 3m) | | | | | | | | | | | | | | | | | |
| | Carrying Method | Trailer Truck | | | | | | | | | | | | | | | | | |
| | Road Condition for Transportation | Suitable / Possible / | | | | | | | | | | | | | | | | | |
| | Any Bottleneck for Transportation: | No | | | | | | | | | | | | | | | | | |
| | Bridge Construction | Offering for Piers | Sheet Pile / Earth Bank with Sand Bags / River Diversion / No Need (No water in dry season) | | | | | | | | | | | | | | | | |
| | | Steel Girder Erection | Suitable for Bent and Truck Crane Method (Yes / No) | | | | | | | | | | | | | | | | |
| | | Required Other Specials Erection Methods () | | | | | | | | | | | | | | | | | |
| Foundation Type | Spread Foundation / RC Pile (L < 15m) / RC Pile (L > 15m) | | | | | | | | | | | | | | | | | | |
| (Assumption) | Special Foundation () | | | | | | | | | | | | | | | | | | |
| Expected Work Hinder | The favourable condition for construction works is in the dry season | | | | | | | | | | | | | | | | | | |
| Remark | Other Additional Information to be Noted 1. Current bridge maintenance budget and system Nothing 2. Current and expected projects by other donors (WB, ADB, JBIC, etc.) Forest planting project (Project 661). | | | | | | | | | | | | | | | | | | |

QUESTIONNAIRE ON REQUESTED BRIDGES

Date of Answer: March / 6 /2006

Name of Respondent: Ha Van Huong

Title of Respondent: Director of Transportation Management Division

| | | | | | | | | | | | |
|---|---|---|---|---|--|---|--|---|---|----------------------------|-------|
| Bridge No. | No. 45 | Bridge Name | Na Lang | Province Name | Bac Kan | Road Network around the Bridge (conceptual map) | | | | | |
| Bridge Location | The Road on which the bridge exist | | | Nearest City (with population over 20,000) | | | | | | | |
| | Road Name | | Station of the Bridge | Name of the City | | Distance From the Bridge | | | | | |
| | NH3 - Quan Binh - Luc Binh | | Km167+200 - Quan Binh | Bac Kan Town | | 14 km | | | | | |
| Present Condition of Bridge | Bridge Length | 19 | m | Span | (| m+ | m+ | m+ | m) | | |
| | Bridge Width | 0.8 | m | Carriage Way Width | 0.8 m | | | | | | |
| | Superstructure Type | Wooden Bridge | | | | | | | | | |
| | Substructure Type | Masonry | | | | | | | | | |
| | Present Condition (Eye Check) | Non Serious Damage | | | | | | | | | |
| | Necessity of Reconstruction | Yes Reason () | | | | | | | | | |
| Number of Days of Closed to Traffic | Vehicle / Bike etc. :4 months in dry season days/year, pedestrian or Bicycle : 4 months in dry season days/year | | | | | | | | | | |
| Actual State of Social Economic | Information of Villages Beyond the Bridge | | | | | Information of the Nearest City (with population over 20,000) | | | | | |
| | Number of Village | 102 | villages | Name of Regional Town | Phiang Mon | Name of City | Bac Kan Town | Access Time from the Bridge | 15 minutes by bus | | |
| | Population | 4800 | persons | Number of Household | 960 households | Population of City | 21,150 persons | Number of Household | households | | |
| | Average Income | 280,000 | Dong/month | Population Ratio of Minority | 89 | Average Income | 450,000 | Dong/month | Access Time from the main village beyond the bridge site (by general means of trip for the residents) | 25 minutes | |
| | Rate of School Attendance (Elementary School) | 95 | % | Rate of School Attendance (Junior High School) | 90 | Remarks | By | | | | |
| | Number of Educational Facilities | | Junior High School | | 1 | Number of Educational Facilities | | Junior High School | | | |
| | Elementary School | 12 | High School | | 0 | Elemental School | 26 | High School | | | |
| | Number of Medical Facilities | | Emergency Hospital (middle size hospital) | | 0 | Number of Medical Facilities | | Emergency Hospital (middle size hospital) | | 4 | |
| | Clinic (small size hospital) | 8 | Hospital for Serious Patients (large size hospital) | | 0 | Clinic (small size hospital) | 16 | Hospital for Serious Patients (large size hospital) | | 1 | |
| | Number of Daily Life Facilities | | Bank | | 0 | Number of Daily Life Facilities | | Bank | | 6 | |
| | Post Office | 4 | Market | | 2 | Post Office | 16 | Market | | 10 | |
| | Bus Stop | 0 | Public Offices (Town Hall branch, etc.) | | Communal People's Committee (CPC) | Bus Stop | 4 | Public Offices (Town Hall branch, etc.) | | | |
| | Main Land Use | Rice Field / Vegetable Farm / Fruit Farm / Forest / Meadow / Swamp / Others () | | | | | Detail of products sent to markets through the bridge location (Name of the products, total amount/price per year of each product): Rice: 15,000T, Wood: 55,000T, Industrial tree: 8,000T, Corn: 20,000; Bean: 10,000T | | | | |
| | Main Production | Agriculture / Forestry / Industry / Commerce / Fishily / Others () | | | | | | | | | |
| Present Condition of Access Road | Road Class | District Road, embankment:4m without pavement | | | | Road Width | Average Road Width | 5.6m | m | Average Carriage Way Width | 3.5 m |
| | Surface Type | Concrete / Asphalt / Bitumen Seal / Gravel / Soil / Others () | | | | Actual Road Condition | Good / Normal / Bad / Poor / Others () | | | | |
| | Average Traffic Volume (car/day) | Big Bus | Small Bus | Passenger Car | Motor Bike | Big Track | Small Track | Cart (drawn by animals) | Bicycle and pedestrian | Boat | |
| | | No | No | No | 2150 | 50 | 60 | 110 | 200 | | |
| | Place of Bottleneck | Bridge / Tunnel / Narrow Width Section / Others () | | | | Minimum Width | m | | Traffic Control | Up to | tone |
| | Remarks | Detail of bottlenecks in the access roads: | | | | | | | | | |
| Relevant Development Plan | Road Network Plan | Traffic Infrastructure | | Master Plan | Other Infrastructure | Priority of this bridge among the proposed bridges in this province | | | | | |
| | Village Level | Yes | Yes | Yes | Yes | Priority : | | | | | |
| | | Material No. | Material No. | Material No. | Material No. | 1 | 2 | 3 | 4 | 5 | 6 |
| | District Level | Yes | Yes | Yes | Yes | X | | | | | |
| | | Material No. | Material No. | Material No. | Material No. | | | | | | |
| Province Level | Yes | Yes | Yes | Yes | Reason of the priority : | | | | | | |
| | Material No. Traffic P | Material No. | Material No. | Material No. | NH3 connecting 4 communes of 01 district in the West of the town to develop cultural, social and economic fields | | | | | | |
| River Condition | Low Water Level | Depth | 30.7 m | River Width | m | River Gradient (Estimate) | 1% | | | | |
| | Highest Flood | Depth | 32.2 m | River Width | m | Year of the Flood | 1945 | | | | |
| | | Velocity | m/sec | | | | Rapid flow / Moderate flow / Slow flow | | | | |
| | Tidal effects | Have | | | River Bed Material | | | | | | |
| | Bridge Surface Elevation | m from Average Height of River Bed / Sand / Gravel / | | | | | | | | | |
| | Navigation to be considered | No m number and type of ships: 0 | | | | | | | | | |
| | Up Stream Side | Special Remarks | | | | | | | | | |
| Down Stream Side | Special Remarks | | | | | | | | | | |
| Bridge Construction | Transportation of Steel Girder from the Provincial Capital | Transportation Route | NH3 - Bridge: NH3 Embankment: 7m, pavement: 5.5m | | | | | | | | |
| | | Carrying Method | Trailer Truck | | | | | | | | |
| | | Road Condition for Transportation | Suitable | | | | | | | | |
| | Bridge Construction | Any Bottleneck for Transportation (No) | | | | | | | | | |
| | | Coffering for Piers | Sheet Pile / Earth Bank with Sand Bags / River Diversion / No Need (No water in dry season) | | | | | | | | |
| | | Steel Girder Erection | Suitable for Bent and Truck Crane Method (Yes / No) | | | | | | | | |
| Foundation Type | Spread Foundation / RC Pile (L < 15m) / RC Pile (L > 15m) | | | | | | | | | | |
| (Assumption) | / Special Foundation () | | | | | | | | | | |
| Expected Work Hinder | | | | | | | | | | | |
| Remark | | | | | | | | | | | |
| | | | | | | Other Additional Information to be Noted | | | | | |
| | | | | | | 1. Current bridge maintenance budget and system | | | | | |
| | | | | | | Nothing | | | | | |
| | | | | | | 2. Current and expected projects by other donors (WB, ADB, JBIC, etc.) | | | | | |
| | | | | | | Construction material product project. | | | | | |
| | | | | | | Forest planting project. | | | | | |

QUESTIONNAIRE ON REQUESTED BRIDGES

Date of Answer: March / 6 /2006

Name of Respondent: Hg Van Huong

Title of Respondent: Director of Transport Management Division

| | | | | | | | | | | | |
|---|---|---|---|--|--|---|---|---|---|----------------------------|---|
| Bridge No. | No. 46 | Bridge Name | Don Phong | Province Name | Bac Kan | Road Network around the Bridge (conceptual map) | | | | | |
| Bridge Location | The Road on which the bridge exist | | | Nearest City (with population over 20,000) | | | | | | | |
| | Road Name | Station of the Bridge | Name of the City | Distance From the Bridge | | | | | | | |
| Present Condition of Bridge | Bridge Length | m | Span | (m+ m+ m+ m+ m) | | | | | | | |
| | Bridge Width | m | Carriage Way Width | m | | | | | | | |
| | Superstructure Type | Suspension bridge | | | | | | | | | |
| | Substructure Type | Masonry ; Bridge gate by steel | | | | | | | | | |
| | Present Condition (Eye Check) | Non Serious Damage | | | | | | | | | |
| | Necessity of Reconstruction | Yes Reason () | | | | | | | | | |
| Number of Days of Closed to Traffic | Vehicle / Bike etc. : whole days/year, pedestrian or Bicycle : All days/year | | | | | | | | | | |
| Actual State of Social Economic | Information of Villages Beyond the Bridge | | | | Information of the Nearest City (with population over 20,000) | | | | | | |
| | Number of Village | 10 | villages | Name of Regional Town | Ban Chieng | Name of City | Bac Kan Town | Access Time from the Bridge | 10 minutes by bus | | |
| | Population | persons | | Number of Household | households | Population of City | 21150 | persons | Number of Household | 5287 | |
| | Average Income | 180.000 | Dong/month | Population Ratio of Minority | 98 | Average Income | 450.000 | Dong/month | Access Time from the main village beyond the bridge site (by general means of trip for the residents) | 20 minutes | |
| | Rate of School Attendance (Elementary School) | 70 | % | Rate of School Attendance (Junior High School) | 65 | Remarks | By | | | | |
| | Number of Educational Facilities | | Junior High School | | 2 | Number of Educational Facilities | | Junior High School | | 8 | |
| | Elementary School | 4 | High School | 0 | Elemental School | 26 | High School | | | | |
| | Number of Medical Facilities | | Emergency Hospital (middle size hospital) | | 0 | Number of Medical Facilities | | Emergency Hospital (middle size hospital) | | | |
| | Clinic (small size hospital) | 1 | Hospital for Serious Patients (large size hospital) | 0 | Clinic (small size hospital) | 16 | Hospital for Serious Patients (large size hospital) | 1 | | | |
| | Number of Daily Life Facilities | | Bank | | 0 | Number of Daily Life Facilities | | Bank | | 6 | |
| | Post Office | 1 | Market | 0 | Post Office | 16 | Market | 10 | | | |
| | Bus Stop | 0 | Public Offices (Town Hall branch, etc.) | Communal People's Committee (CPC) | Bus Stop: 01 Main station; 04 Sub-Stations | Public Offices (Town Hall branch, etc.) | | | | | |
| Main Land Use | Rice Field / Vegetable Farm / Fruit Farm / Forest / Meadow / Swamp / Others () | | | | Detail of products sent to markets through the bridge location (Name of the products, total amount/price per year of each product): Corn: 5.200T; Bean: 10.700T; Potato: 20.115T; Rice: 1.000T; Wood/Bamboo: 50.000T | | | | | | |
| Main Production | Processing forest product | | | | | | | | | | |
| Present Condition of Access Road | Road Class | Provincial and Communal Roads (PR; CR); CR (Embankment:4m; Pavement:3.5m) | | | | Road Width | Average Road Width | | m | Average Carriage Way Width | m |
| | Surface Type | Bitumen Seal (PR); Gravel (CR) | | | | Actual Road Condition | Good / Normal / Bad / Poor / Others () | | | | |
| | Average Traffic Volume (car/day) | Big Bus | Small Bus | Passenger Car | Motor Bike | Big Track | Small Track | Cart (drawn by animals) | Bicycle and pedestrian | Boat | |
| | Place of Bottleneck | Bridge / Tunnel / Narrow Width Section / Others () | | | | Minimum Width | m | | Traffic Control | Up to | tone |
| | Remarks | Detail of bottlenecks in the access roads: No | | | | | | | | | |
| Relevant Development Plan | Road Network Plan | Yes | Traffic Infrastructure | Yes | Master Plan | Yes | Other Infrastructure | | | | Priority of this bridge among the proposed bridges in this province |
| | Village Level | Material No. | Material No. | Material No. | Material No. | Priority: | | | | | |
| | District Level | Material N: Master Plan | Material N: Master Plan | Material N: 172/QD-UB | Material N: Plan | 1 2 3 4 5 6 | | | | | |
| | Province Level | Yes / No | Yes / No | Yes / No | Yes / No | Reason of the priority: | | | | | |
| River Condition | Low Water Level | Depth | 20.6m | River Width | 90m | River Gradient (Estimate) 5% | | | | | |
| | Highest Flood | Depth | 35.7m | River Width | m | Year of the Flood 1986 | | | | | |
| | | Velocity | m/sec | | | | Rapid flow | | | | |
| | Tidal effects | Have / No Yes | | | River Bed Material | | | | | | |
| | Bridge Surface Elevation | 15 m from Average Height of River Bed | | | | Sand / Gravel | | | | | |
| | Navigation to be considered | No m number and type of ships: 0 | | | | | | | | | |
| | Up Stream Side | Special Remarks | River flow/ bed is stable | | | | | | | | |
| Down Stream Side | Special Remarks | River flow/ bed is stable | | | | | | | | | |
| Bridge Construction | Transportation of Steel Girder from the Provincial Capital | Transportation Route | NH3 - PR257 (Width of embankment:6m, Width of pavement:3.0m) | | | | | | | | |
| | | Carrying Method | Trailer Truck | | | | | | | | |
| | | Road Condition for Transportation | Suitable | | | | | | | | |
| | | Any Bottleneck for Transportation: | Nothing | | | | | | | | |
| | Bridge Construction | Coffering for Piers | Sheet Pile / Earth Bank with Sand Bags / River Diversion / No Need (No water in dry season) | | | | | | | | |
| | | Steel Girder Erection | Suitable for Bent and Truck Crane Method (Yes / No) | | | | | | | | |
| Foundation Type | | Spread Foundation / RC Pile (L < 15m) / RC Pile (L > 15m) | | | | | | | | | |
| (Assumption) | / Special Foundation () | | | | | | | | | | |
| Expected Work hinder | Construction during dry season is favourable | | | | | | | | | | |
| Remark | | | | | | | | | | | |
| Other Additional Information to be Noted | | | | | | | | | | | |
| 1. Current bridge maintenance budget and system | | | | | | | | | | | |
| Annual maintenance plan included in project of the town. | | | | | | | | | | | |
| Maintenance cost: 300.000 VND/liner meter/year. | | | | | | | | | | | |
| 2 Current and expected projects by other donors (WB, ADB, JBIC, etc.) | | | | | | | | | | | |
| Periodic maintenance: (Separated cost estimate) | | | | | | | | | | | |
| Project on preliminary treatment of forest product under the provincial project | | | | | | | | | | | |
| Forest Planting Project: Providing paper material | | | | | | | | | | | |

QUESTIONNAIRE ON REQUESTED BRIDGES

Date of Answer: March /7 /2006

Name of Respondent: Ha Van Huong

Title of Respondent: Director of Transportation Management Division

| | | | | | | | | | | | | | |
|-------------------------------------|---|---|--|---|---|---|---|----------------------------------|------------------------|---|--------------------------|---|---|
| Bridge No. | No. 47 | Bridge Name | Quang Chu - Cho Moi | Province Name | Bac Kan | Road Network around the Bridge (conceptual map) | | | | | | | |
| Bridge Location | The Road on which the bridge exist | | | Nearest City (with population over 20,000) | | | | | | | | | |
| | Road Name | | Station of the Bridge | Name of the City | | | | | | | Distance From the Bridge | | |
| | Cho Moi - Quang Chu | | Km 6+800 | Cho Moi Town | | | | | | | 6.8 km | | |
| Present Condition of Bridge | Bridge Length | 90 | m | Span | (m+ m+ m+ m+ m) | | | | | | | | |
| | Bridge Width | 1.4 | m | Carriage Way Width | 1.4 | m | | | | | | | |
| | Superstructure Type | Suspension bridge | | | | | | | | | | | |
| | Substructure Type | Masonry, bridge gate by cement concrete | | | | | | | | | | | |
| | Present Condition (Eye Check) | Non Serious Damage | | | | | | | | | | | |
| | Necessity of Reconstruction | Yes Reason () | | | | | | | | | | | |
| Number of Days of Closed to Traffic | Vehicle / Bike etc. : days/year. pedestrian or Bicycle : every days/year | | | | | | | | | | | | |
| Actual State of Social Economic | Information of Villages Beyond the Bridge | | | | Information of the Nearest City (with population over 20,000) | | | | | | | | |
| | Number of Village | 10 | villages | Name of Regional Town | Nhuan | Name of City | Cho Moi Town | Access Time from the Bridge | 20 minutes by bus | | | | |
| | Population | 4250 | persons | Number of Household | 850 | households | Population of City | 10150 | persons | Number of Household | households | | |
| | Average Income | Dong/month | | Population Ratio of Minority | 95 | % | Average Income | 350 Dong/month | | Access Time from the main village beyond the bridge site (by general means of trip for the residents) | 40 minutes | | |
| | Rate of School Attendance (Elementary School) | | | Rate of School Attendance (Junior High School) | | | Remarks | | By | | | | |
| | Number of Educational Facilities | | | Junior High School | | Number of Educational Facilities | | Junior High School | | 2 | | | |
| | Elementary School | 10 | | High School | | Elementary School | | 3 | | High School | | 1 | |
| | Number of Medical Facilities | | | Emergency Hospital (middle size hospital) | | 1 | | Number of Medical Facilities | | Emergency Hospital (middle size hospital) | | 1 | |
| | Clinic (small size hospital) | 3 | | Hospital for Serious Patients (large size hospital) | | 0 | | Clinic (small size hospital) | | 2 | | Hospital for Serious Patients (large size hospital) | 1 |
| | Number of Daily Life Facilities | | | Bank | | 0 | | Number of Daily Life Facilities | | Bank | | 1 | |
| | Post Office | 0 | | Market | | 0 | | Post Office | | 1 | | Market | 1 |
| | Bus Stop | 0 | | Public Offices (Town Hall branch, etc.) | | 0 | | Bus Stop | | 1 | | Public Offices (Town Hall branch, etc.) | |
| Main Land Use | Rice Field / Vegetable Farm / Fruit Farm / Forest / Meadow / Swamp / Others () | | | | Detail of products sent to markets through the bridge location (Name of the products, total amount/price per year of each product): Tea: 5T; Sugar cane:320T; Corn: 6T; Rice: 10T; Bean: 15T; Cattle: 155 | | | | | | | | |
| Main Production | Agriculture / Forestry / Industry / Commerce / Fishily / Others () | | | | | | | | | | | | |
| Present Condition of Access Road | Road Class | District Road | | | Road Width | Average Road Width 6.5 m | | Average Carriage Way Width 3.5 m | | | | | |
| | Surface Type | Concrete / Bitumen Seal | | | Actual Road Condition | Good / Normal / Bad / Poor / Others () | | | | | | | |
| | Average Traffic Volume (car/day) | Big Bus | Small Bus | Passenger Car | Motor Bike | Big Track | Small Track | Cart (drawn by animals) | Bicycle and pedestrian | Boat | | | |
| | | Non | Non | Non | 350 | 50 (Dry season) | 70 (Dry season) | 90 | 600 | | | | |
| | Place of Bottleneck | Bridge / Tunnel / Narrow Width Section / Others () | | | Minimum Width | 1.4 m | | Traffic Control | Up to tone | | | | |
| | Remarks | Detail of bottlenecks in the access roads: No | | | | | | | | | | | |
| Relevant Development Plan | Road Network Plan | Traffic Infrastructure | | Master Plan | Other Infrastructure | | Priority of this bridge among the proposed bridges in this province | | | | | | |
| | Village Level | Yes | Yes | Yes | Yes | | Priority : | | | | | | |
| | | Material No. | Material N ^o Master Plan | Material N ^o 172QDUB | Material No. | | 1 2 3 4 5 6 | | | | | | |
| | District Level | Yes | Yes / No | Yes | Yes | | X | | | | | | |
| | | Material No. | Material No. | Material No. | Material No. | | Reason of the priority : | | | | | | |
| Province Level | Yes | Yes / No | Yes | Yes / No | | To development the economy in this area. | | | | | | | |
| | Material N ^o Master Plan | Material No. | Material N ^o 172/QD-UB | Material No. | | It is difficult to travel by vehicle | | | | | | | |
| River Condition | Low Water Level | Depth 29.50 m | River Width 30.5 m | River Gradient (Estimate) 1% | | In flood season: No transportation of goods and construction material by vehicle | | | | | | | |
| | Highest Flood | Depth 45.50 m | River Width 98.5 m | Year of the Flood | | At present, the suspension bridge has been deteriorated causing dangerous for transportation means as well as local people (Traffic accident happed, died people) | | | | | | | |
| | | Velocity m/sec | | Moderate flow | | | | | | | | | |
| | Tidal effects | Have / No | | River Bed Material | | | | | | | | | |
| | Bridge Surface Elevation | 20m rom Average Height of River Bed | | Sand / Gravel / Rock | | | | | | | | | |
| | Navigation to be considered | Yes or No | m number and type of ships: | | 0 | | | | | | | | |
| Up Stream Side | Special Remarks | | River flow is straight and stable | | | | | | | | | | |
| Down Stream Side | Special Remarks | | River flow is straight and stable | | | | | | | | | | |
| Bridge Construction | Transportation of Steel Girder from the Provincial Capital | Transportation Route | NH3 - District Road | | | Other Additional Information to be Noted | | | | | | | |
| | | Carrying Method | Trailer Truck | | | 1. Current bridge maintenance budget and system | | | | | | | |
| | | Road Condition for Transportation | Suitable, no requirement for repairing | | | Annual District budge for maintenance activities: 300.000 VND/liner meter/year | | | | | | | |
| | | Any Bottleneck for Transportation: No | | | Periodic Maintenance: 3 years (Having separated cost estimate) | | | | | | | | |
| | Bridge Construction | Coffering for Piers | River Diversion / No Need (No water in dry season) | | | 2. Current and expected projects by other donors (WB, ADB, JBIC, etc.) | | | | | | | |
| | | Steel Girder Erection | Suitable for Bent and Truck Crane Method: Yes | | | WB, ADB | | | | | | | |
| | | Required Other Specials Erection Methods () | | | ODA project: Pilot Junior High School | | | | | | | | |
| | Foundation Type | Spread Foundation / RC Pile (L > 15m) | | | Forest Planting Project - Providing paper material | | | | | | | | |
| | (Assumption) | / Special Foundation () | | | | | | | | | | | |
| | Expected Work Hinder | During rainy season: From April to October every year | | | | | | | | | | | |
| Remark | | | | | | | | | | | | | |

QUESTIONNAIRE ON REQUESTED BRIDGES

Date of Answer: March /12 /2006

Name of Respondent: Nong Minh Tuan

Title of Respondent: Vice Director of Technical- Planning Division

| | | | | | | | | | | | | | | | | |
|---|--|---|---|--|--|--|---|--|---|---|----------------------------|------------|------|--|--|--|
| Bridge No. | No. 48 | Bridge Name | Dong May | | Province Name | Cao Bang | | Road Network around the Bridge (conceptual map) | | | | | | | | |
| Bridge Location | The Road on which the bridge exist | | | | Nearest City (with population over 20,000) | | | | | | | | | | | |
| | Road Name | | Station of the Bridge | | Name of the City | | Distance From the Bridge | | | | | | | | | |
| | Thong Nong - Luong Can | | Km 7 | | Thong Nong | | 7 km | | | | | | | | | |
| Present Condition of Bridge | Bridge Length | 76.5 | m | Span | (76.5 m+ m+ m+ m+ m) | | | | | | | | | | | |
| | Bridge Width | 2.4 | m | Carriage Way Width | 2.2 | | | | | | | | | | | |
| | Superstructure Type | Suspension bridge | | | | | | | | | | | | | | |
| | Substructure Type | RC Column / RC Pile / Wooden Pile / Masonry / Nile / Other () | | | | | | | | | | | | | | |
| | Present Condition (Eye Check) | Old | | | | | | | | | | | | | | |
| | Necessity of Reconstruction | Yes; Reason: socio-economic development; go to hospital for treatment and go to school easily | | | | | | | | | | | | | | |
| Number of Days of Closed to Traffic | Vehicle / Bike etc. : | | days/year, | | pedestrian or Bicycle : | | days/year | | | | | | | | | |
| Actual State of Social Economic | Information of Villages Beyond the Bridge | | | | Information of the Nearest City (with population over 20,000) | | | | | | | | | | | |
| | Number of Village | 9 | villages | Name of Regional Town | Dong May village | Name of City | Thong Nong | Access Time from the Bridge | 30 minutes by bus | | | | | | | |
| | Population | 1709 | persons | Number of Household | 244 | households | Population of City | 7876 | persons | Number of Household | 1125 | households | | | | |
| | Average Income | 148.333 | Dong/month | Population Ratio of Minority | 100 | % | Average Income | 300.000 | Dong/month | Access Time from the main village beyond the bridge site (by general means of trip for the residents) | 20 minutes | | | | | |
| | Rate of School Attendance (Elementary School) | 17.6 | % | Rate of School Attendance (Junior High School) | 17 | % | Remarks | By | | | | | | | | |
| | Number of Educational Facilities | | Junior High School | | 1 | | Number of Educational Facilities | | Junior High School | | 2 | | | | | |
| | Elementary School | | 1 | | High School | | 0 | | Elemental School | | 3 | | | | | |
| | Number of Medical Facilities | | Emergency Hospital (middle size hospital) | | 0 | | Number of Medical Facilities | | Emergency Hospital (middle size hospital) | | 1 | | | | | |
| | Clinic (small size hospital) | | 1 | | Hospital for Serious Patients (large size hospital) | | 0 | | Clinic (small size hospital) | | 2 | | | | | |
| | Number of Daily Life Facilities | | Bank | | | | Number of Daily Life Facilities | | Bank | | 1 | | | | | |
| | Post Office | | | | Market | | | | Post Office | | 1 | | | | | |
| | Bus Stop | | | | Public Offices (Town Hall branch, etc.) | | | | Bus Stop | | 1 | | | | | |
| | Main Land Use | Planting Rice and Corn | | | | Detail of products sent to markets through the bridge location (Name of the products, total amount/price per year of each product): Rice: 22.148kg/2500d/year, Corn: 15.380kg/2400d/year | | | | | | | | | | |
| Main Production | Agriculture | | | | | | | | | | | | | | | |
| Present Condition of Access Road | Road Class | District road | | | | Road Width | Average Road Width | | m, | | Average Carriage Way Width | | m | | | |
| | Surface Type | Gravel | | | | Actual Road Condition | Good / Normal / Bad / Poor / Others () | | | | | | | | | |
| | Average Traffic Volume (car/day) | Big Bus | Small Bus | Passenger Car | Motor Bike | Big Track | Small Track | Cart (drawn by animals) | Bicycle and pedestrian | Boat | | | | | | |
| | | 0 | 0 | 0 | 200 | 12 | 20 | 120 | 400 | 0 | | | | | | |
| | Place of Bottleneck | Bridge / Tunnel / Narrow Width Section / Others () | | | | Minimum Width | m | | Traffic Control | Up to | | | tone | | | |
| | Remarks | Detail of bottlenecks in the access roads: | | | | | | | | | | | | | | |
| Relevant Development Plan | Village Level | Road Network Plan | Traffic Infrastructure | Master Plan | Other Infrastructure | Priority of this bridge among the proposed bridges in this province | | | | | | | | | | |
| | | Yes / No | Yes / No | Yes / No | Yes / No | Priority : | | | | | | | | | | |
| | District Level | Material No. | Material No. | Material No. | Material No. | 1 2 3 4 5 6 | | | | | | | | | | |
| | | Yes / No | Yes / No | Yes / No | Yes / No | X | | | | | | | | | | |
| | Province Level | Material No. | Material No. | Material No. | Material No. | Reason of the priority : | | | | | | | | | | |
| | | Yes / No | Yes / No | Yes / No | Yes / No | It is easy to traveling | | | | | | | | | | |
| River Condition | Low Water Level | Depth | 1.5 m | River Width | 70 m | River Gradient (Estimate) | 4% | | | | | | | | | |
| | Highest Flood | Depth | 10 m | River Width | 40 m | Year of the Flood | Exchange of goods | | | | | | | | | |
| | | Velocity | m/sec | | Rapid flow | | To access to provincial socio-economic center | | | | | | | | | |
| | Tidal effects | Have / No | | | River Bed Material | | Connecting from Hoa An to Thong Nong by Cung bridge | | | | | | | | | |
| | Bridge Surface Elevation | m from Average Height of River Bed | | | | | Sand, Gravel | | | | | | | | | |
| | Navigation to be considered | Yes or No | 0 | m | | number and type of ships: | | 0 | | | | | | | | |
| Up Stream Side | Special Remarks | | | | | | | | | | | | | | | |
| Down Stream Side | Special Remarks | | There is causeway in downstream | | | | | | | | | | | | | |
| Bridge Construction | Transportation of Steel Girder from the Provincial Capital | Transportation Route | Thong Nong - Luong Can | | | | | | | | | | | | | |
| | | Carrying Method | Trailer Truck | | | | | | | | | | | | | |
| | | Road Condition for Transportation | Suitable | | | | | | | | | | | | | |
| | Bridge Construction | Any Bottleneck for Transportation: No | | | | | | | | | | | | | | |
| | | Coffering for Piers | Sheet Pile / No Need (No water in dry season) | | | | | | | | | | | | | |
| | | Steel Girder Erection | Suitable for Bent and Truck Crane Method Yes Required Other Specials Erection Methods () | | | | | | | | | | | | | |
| Foundation Type | RC Pile (L < 15m) | | | | | | | | | | | | | | | |
| (Assumption) | Special Foundation: 0 | | | | | | | | | | | | | | | |
| Expected Work Hinder | | | | | | | | | | | | | | | | |
| Remark | | | | | | | | | | | | | | | | |
| | | | | | | Other Additional Information to be Noted | | | | | | | | | | |
| | | | | | | 1. Current bridge maintenance budget and system | | | | | | | | | | |
| | | | | | | Allocated Budget of province: 4.000.000 VND/year | | | | | | | | | | |
| | | | | | | 2. Current and expected projects by other donors (WB, ADB, JBIC, etc.) | | | | | | | | | | |

QUESTIONNAIRE ON REQUESTED BRIDGES

Date of Answer: March / 12 /2006

Name of Respondent: Nong Minh Toan

Title of Respondent: Vice Director of Technical- Planning Division

| | | | | | | | | | | |
|-------------------------------------|---|--|---|--|----------------------------------|---|---|---|---|----------------------------|
| Bridge No. | No. 49 | Bridge Name | Binh Long | Province Name | Cao Bang | Road Network around the Bridge (conceptual map) | | | | |
| Bridge Location | The Road on which the bridge exist | | | Nearest City (with population over 20,000) | | | | | | |
| | Road Name | | Station of the Bridge | | Name of the City | | Distance From the Bridge | | | |
| | Provincial Road (PR) 203 | | Km 17 | | Nuoc Hai | | 0.5km | | | |
| Present Condition of Bridge | Bridge Length | 77 | m | Span | (60 m+ m+ m+ m+ m) | | | | | |
| | Bridge Width | 1.8 | m | Carriage Way Width | 1.6 | m | | | | |
| | Superstructure Type | Suspension Bridge | | | | | | | | |
| | Substructure Type | Suspension Bridge | | | | | | | | |
| | Present Condition (Eye Check) | Good / Old / Weak / Non Serious Damage / Serious Damage / Flow Out / Other () | | | | | | | | |
| Necessity of Reconstruction | Yes Reason: To Socio-economic developemnt; to go to the hospital; to go to school in fair condition | | | | | | | | | |
| Number of Days of Closed to Traffic | Vehicle / Bike etc.: | | days/year, | | pedestrian or Bicycle: | | days/year | | | |
| Actual State of Social Economic | Information of Villages Beyond the Bridge | | | | | Information of the Nearest City (with population over 20,000) | | | | |
| | Number of Village | 50 | villages | Name of Regional Town | Binh Long commune | Name of City | Nuoc Hai town | Access Time from the Bridge | 15 minutes by bus | |
| | Population | 6971 | persons | Number of Household | 996 households | Population of City | 15752 persons | Number of Household | 2250 households | |
| | Average Income | 157.500 | Dong/month | Population Ratio of Minority | 100 | Average Income | 350.000 | Dong/month | Access Time from the main village beyond the bridge site (by general means of trip for the residents) | 30 minutes |
| | Rate of School Attendance (Elementary School) | 17 | % | Rate of School Attendance (Junior High School) | 16 | % | Remarks | By | | |
| | Number of Educational Facilities | | Junior High School | | 6 | Number of Educational Facilities | | Junior High School | | 3 |
| | Elementary School | | High School | | 0 | Elementary School | | High School | | 1 |
| | Number of Medical Facilities | | Emergency Hospital (middle size hospital) | | 0 | Number of Medical Facilities | | Emergency Hospital (middle size hospital) | | 1 |
| | Clinic (small size hospital) | | Hospital for Serious Patients (large size hospital) | | 0 | Clinic (small size hospital) | | Hospital for Serious Patients (large size hospital) | | 1 |
| | Number of Daily Life Facilities | | Bank | | 0 | Number of Daily Life Facilities | | Bank | | 1 |
| | Post Office | | Market | | 0 | Post Office | | Market | | 1 |
| | Bus Stop | | Public Offices (Town Hall branch, etc.) | | 53 at commune level | Bus Stop | | Public Offices (Town Hall branch, etc.) | | At district level |
| | Main Land Use | Rice Field , Vegetable Farm | | | | Detail of products sent to markets through the bridge location (Name of the products, total amount/price per year of each product): Rice: 90.340kg/2500d/year; vegetable: 30.120kg/2000d/year | | | | |
| | Main Production | Agriculture | | | | | | | | |
| | Present Condition of Access Road | Road Class | National Road | | | Road Width 8m | Average Road Width | 8 | m, | Average Carriage Way Width |
| Surface Type | | Bitumen Seal | | | Actual Road Condition | Good | | | | |
| Average Traffic Volume (car/day) | | Big Bus | Small Bus | Passenger Car | Motor Bike | Big Track | Small Track | Cart (drawn by animals) | Bicycle and pedestrian | Boat |
| | | 2 | 4 | 100 | 1000 | 230 | 310 | 98 | 700 | 0 |
| Place of Bottleneck | | Bridge / Tunnel / Narrow Width Section / Others: 0 | | | Minimum Width | m | | Traffic Control | Up to tone | |
| Remarks | Detail of bottlenecks in the access roads: 0 | | | | | | | | | |
| Relevant Development Plan | Road Network Plan | | Traffic Infrastructure | Master Plan | Other Infrastructure | Priority of this bridge among the proposed bridges in this province | | | | |
| | Village Level | Yes / No | Yes / No | Yes / No | Yes / No | Priority: | | | | |
| | | Material No. | Material No. | Material No. | Material No. | 1 2 3 4 5 6 | | | | |
| | District Level | Yes / No | Yes / No | Yes / No | Yes / No | X | | | | |
| | | Material No. | Material No. | Material No. | Material No. | Reason of the priority: | | | | |
| Province Level | Yes / No | Yes / No | Yes / No | Yes / No | It is easy to travelling | | | | | |
| | Material No. | Material No. | Material No. | Material No. | It is easy to go to the hospital | | | | | |
| River Condition | Low Water Level | Depth | 2 m | River Width | 70 m | River Gradient (Estimate) | 3% | | | |
| | Highest Flood | Depth | 7 m | River Width | 100 | Year of the Flood | | Exchange of goods in good condition | | |
| | | Velocity | m/sec | | Rapid flow | | To access to provincial socio-economic center | | | |
| | Tidal effects | Have / No | | River Bed Material | | Connecting from Hoa An to Thong Nong by Cung bridge | | | | |
| | Bridge Surface Elevation | m from Average Height of River Bed | | Sand, Gravel | | Suspension bridge is old and weak | | | | |
| | Navigation to be considered | Yes or No | 0 m | | number and type of ships: | | 0 | | | |
| | Up Stream Side | Special Remarks | | | | | | | | |
| Down Stream Side | Special Remarks | | There is causeway at downstream | | | | | | | |
| Bridge Construction | Transportation Route | | PR 203 | | | Other Additional Information to be Noted | | | | |
| | Carrying Method | | Trailer Truck | | | | | | | |
| | Road Condition for Transportation | | Suitable | | | | | | | |
| | Any Bottleneck for Transportation | | No | | | 1. Current bridge maintenance budget and system | | | | |
| | Coffering for Piers | | Sheet Pile / No Need (No water in dry season) | | | Provincial budget: 4,000,000 Dong/year | | | | |
| | Steel Girder Erection | | Suitable for Bent and Truck Crane Method Yes | | | 2. Current and expected projects by other donors (WB, ADB, JBIC, etc.) | | | | |
| Foundation Type | | RC Pile (L < 15m) | | | Nothing | | | | | |
| (Assumption) | | Special Foundation: 0 | | | | | | | | |
| Expected Work Hinder | | | | | | | | | | |
| Remark | | | | | | | | | | |

QUESTIONNAIRE ON REQUESTED BRIDGES

Date of Answer: March / 12 /2006

Name of Respondent: Nong Minh Tuan

Title of Respondent: Vice Director of Technical- Planning Division

| | | | | | | | | | | | | | | | |
|-------------------------------------|---|---|---|--|---|---|---|----------------------------------|------------------------------|---|------------|---|---|---|-------------------|
| Bridge No. | No. 50 | Bridge Name | Ban Sac | Province Name | Cao Bang | Road Network around the Bridge (conceptual map) | | | | | | | | | |
| Bridge Location | The Road on which the bridge exist | | | Nearest City (with population over 20,000) | | | | | | | | | | | |
| | Road Name | | Station of the Bridge | | Name of the City | | Distance From the Bridge | | | | | | | | |
| | PR 211 | | Km 18 | | Tra Linh | | 18km | | | | | | | | |
| Present Condition of Bridge | Bridge Length | 60 | m | Span | (60 m+ m+ m+ m+ m) | | | | | | | | | | |
| | Bridge Width | 5 | m | Carriage Way Width | 4.5 | | | | | | | | | | |
| | Superstructure Type | Causeway | | | | | | | | | | | | | |
| | Substructure Type | Causeway with navigi. Clearance | | | | | | | | | | | | | |
| | Present Condition (Eye Check) | Old | | | | | | | | | | | | | |
| Necessity of Reconstruction | Yes Reason: To socio-economic developemt; To go to the hospital for treatment; easy to go to the school | | | | | | | | | | | | | | |
| Number of Days of Closed to Traffic | Vehicle / Bike etc. : 60 | | days/year. | | pedestrian or Bicycle : 60 | | days/year | | | | | | | | |
| Actual State of Social Economic | Information of Villages Beyond the Bridge | | | | Information of the Nearest City (with population over 20,000) | | | | | | | | | | |
| | Number of Village | 30 | villages | Name of Regional Town | Ban Sac | Name of City | Tra Linh town | Access Time from the Bridge | 40 minutes by bus | | | | | | |
| | Population | 3425 | persons | Number of Household | 527 | households | Population of City | 9451 | persons | Number of Household | 1350 | households | | | |
| | Average Income | 153.611 | Dong/month | Population Ratio of Minority | 100 | % | Average Income | 320.000 | Dong/month | Access Time from the main village beyond the bridge site (by general means of trip for the residents) | 20 minutes | | | | |
| | Rate of School Attendance (Elementary School) | 16.5 | % | Rate of School Attendance (Junior High School) | 16 | % | Remarks | | | | | | | | |
| | Number of Educational Facilities | | | | Junior High School | | 3 | Number of Educational Facilities | | | | Junior High School | 3 | | |
| | Elementary School | | | | 5 | High School | | 0 | Elemental School | | | | 3 | High School | 1 |
| | Number of Medical Facilities | | | | Emergency Hospital (middle size hospital) | | 0 | Number of Medical Facilities | | | | Emergency Hospital (middle size hospital) | | 1 | |
| | Clinic (small size hospital) | | | | 2 | Hospital for Serious Patients (large size hospital) | | 0 | Clinic (small size hospital) | | | | 2 | Hospital for Serious Patients (large size hospital) | 0 |
| | Number of Daily Life Facilities | | | | Bank | | 0 | Number of Daily Life Facilities | | | | Bank | | 1 | |
| | Post Office | | | | 2 | Market | | 0 | Post Office | | | | 1 | Market | 1 |
| | Bus Stop | | | | 0 | Public Offices (Town Hall branch, etc.) | | 30 (village level) | Bus Stop | | | | 1 | Public Offices (Town Hall branch, etc.) | At district level |
| | Main Land Use | Rice Field, corn farm | | Detail of products sent to markets through the bridge location (Name of the products, total amount/price per year of each product): Rice: 40.230kg/2500d/year, Corn: 7135kg/2400d/year | | | | | | | | | | | |
| Main Production | Agriculture | | | | | | | | | | | | | | |
| Present Condition of Access Road | Road Class | National Road | | | | Road Width 6.5m | Average Road Width | 6.4 | m | Average Carriage Way Width | 3.5 m | | | | |
| | Surface Type | Gravel | | | | Actual Road Condition | Good / Normal / Bad / Poor / Others () | | | | | | | | |
| | Average Traffic Volume (car/day) | Big Bus | Small Bus | Passenger Car | Motor Bike | Big Track | Small Track | Cart (drawn by animals) | Bicycle and pedestrian | Boat | | | | | |
| | Place of Bottleneck | Bridge / Tunnel / Narrow Width Section / Others () | | | | Minimum Width | m | | Traffic Control | Up to tone | | | | | |
| | Remarks | Detail of bottlenecks in the access roads: | | | | | | | | | | | | | |
| Relevant Development Plan | Village Level | Road Network Plan | Traffic Infrastructure | Master Plan | Other Infrastructure | Priority of this bridge among the proposed bridges in this province | | | | | | | | | |
| | | Yes / No | Yes / No | Yes / No | Yes / No | Priority: | | | | | | | | | |
| | District Level | Material No. | Material No. | Material No. | Material No. | 1 2 3 4 5 6 | | | | | | | | | |
| | | Yes / No | Yes / No | Yes / No | Yes / No | Reason of the priority: | | | | | | | | | |
| | Province Level | Material No. | Material No. | Material No. | Material No. | It is easy to travelling | | | | | | | | | |
| Yes / No | | Yes / No | Yes / No | Yes / No | It is easy to go to the hospital | | | | | | | | | | |
| River Condition | Low Water Level | Depth | 1 m | River Width | 50 m | River Gradient (Estimate) | 5% Easily in agricultural cultivating | | | | | | | | |
| | Highest Flood | Depth | 4.5 m | River Width | 60 m | Year of the Flood | Exchange of goods in good condition | | | | | | | | |
| | | Velocity | m/sec | | Rapid flow | | To access to provincial socio-economic center | | | | | | | | |
| | Tidal effects | Have / No | | | River Bed Material | | This is unique bridge on PR 211 not yet invested for reconstruction | | | | | | | | |
| | Bridge Surface Elevation | m from Average Height of River Bed | | | Sand, Gravel | | | | | | | | | | |
| | Navigation to be considered | Yes or No | 0 m | number and type of ships: | | 0 | | | | | | | | | |
| | Up Stream Side | Special Remarks | | 0 | | | | | | | | | | | |
| Down Stream Side | Special Remarks | | There is causeway at downstream | | | | | | | | | | | | |
| Bridge Construction | Transportation of Steel Girder from the Provincial Capital | Transportation Route | PR 211 | | | | Other Additional Information to be Noted | | | | | | | | |
| | | Carrying Method | Trailer Truck | | | | | | | | | | | | |
| | | Road Condition for Transportation | Suitable | | | | | | | | | | | | |
| | Any Bottleneck for Transportation: No | | | | | | | | | | | | | | |
| | Bridge Construction | Coffering for Piers | Sheet Pile / No Need (No water in dry season) | | | | | | | | | | | | |
| Steel Girder Erection | | Suitable for Bent and Truck Crane Method Yes Required Other Specials Erection Methods () | | | | | | | | | | | | | |
| (Assumption) | Foundation Type | RC Pile (L < 15m) | | | | | | | | | | | | | |
| | Expected Work Hinder | / Special Foundation No | | | | | | | | | | | | | |
| Remark | <p>1. Current bridge maintenance budget and system</p> <p>The causeway was maintained by provincial budget: 5,000,000 dong/year</p> <p>2. Current and expected projects by other donors (WB, ADB, JBIC, etc.)</p> <p>No</p> | | | | | | | | | | | | | | |

QUESTIONNAIRE ON REQUESTED BRIDGES

Date of Answer: March / 12 /2006

Name of Respondent: Nong Minh ToanTitle of Respondent: Vice Director of Technical-Planning Division

| Bridge No. | No. 51 | Bridge Name | Ban Mom | Province Name | Cao Bang | Road Network around the Bridge (conceptual map) | | | | | | | |
|----------------------------------|--|---|---|--|---|--|---|-------------------------|---|---|---|--|-------------------|
| Bridge Location | The Road on which the bridge exist | | | Nearest City (with population over 20,000) | | | | | | | | | |
| | Road Name | | Station of the Bridge | | Name of the City | | Distance From the Bridge | | | | | | |
| | PR 206 | | Km 49 | | Trung Khanh | | 88km | | | | | | |
| Present Condition of Bridge | Bridge Length | No bridge | m | Span | (m+ m+ m+ m+ m) | | | | | | | | |
| | Bridge Width | No bridge | m | Carriage Way Width | No bridge | | | | | | | | |
| | Superstructure Type | No bridge | | | | | | | | | | | |
| | Substructure Type | No bridge | | | | | | | | | | | |
| | Present Condition (Eye Check) | No bridge | | | | | | | | | | | |
| | Necessity of Reconstruction | Yes Reason: To develop economy, society; To go to the hospital; To go to the school) | | | | | | | | | | | |
| | Number of Days of Closed to Traffic | Vehicle / Bike etc. : | | days/year. | | pedestrian or Bicycle : | | days/year | | | | | |
| Actual State of Social Economic | Information of Villages Beyond the Bridge | | | | | Information of the Nearest City (with population over 20,000) | | | | | | | |
| | Number of Village | 6 villages | | Name of Regional Town | | | Name of City | Trung Khanh Town | | Access Time from the Bridge | 90 minutes | | |
| | Population | 3183 persons | | Number of Household | households | | Population of City | 10501 persons | | Number of Household | 2653 households | | |
| | Average Income | 158,000 Dong/month | | Population Ratio of Minority | | | Average Income | 290,000 Dong/month | | Access Time from the main village beyond the bridge site (by general means of trip for the residents) | 30 minutes | | |
| | Rate of School Attendance (Elementary School) | 17 | | Rate of School Attendance (Junior High School) | | | Remarks | | | By | | | |
| | Number of Educational Facilities | | | Junior High School | | Number of Educational Facilities | | | Junior High School | | 3 | | |
| | Elementary School | | | 2 | | Elemental School | | | 4 | | High School | | 1 |
| | Number of Medical Facilities | | | Emergency Hospital (middle size hospital) | | Number of Medical Facilities | | | Emergency Hospital (middle size hospital) | | 1 | | |
| | Clinic (small size hospital) | | | 1 | | Clinic (small size hospital) | | | 3 | | Hospital for Serious Patients (large size hospital) | | 0 |
| | Number of Daily Life Facilities | | | Bank | | Number of Daily Life Facilities | | | Bank | | 1 | | |
| | Post Office | | | 0 | | Post Office | | | 1 | | Market | | 1 |
| | Bus Stop | | | 0 | | Bus Stop | | | 1 | | Public Offices (Town Hall branch, etc.) | | At District level |
| | Main Land Use | Rice, Corn Field | | | | Detail of products sent to markets through the bridge location (Name of the products, total amount/price per year of each product): Rice: 30,120kg/2,500d/year, Corn: 6130kg/2400/year | | | | | | | |
| Main Production | Agriculture | | | | | | | | | | | | |
| Present Condition of Access Road | Road Class | National Road 206 | | | | Road Width: 6.5m | Average Road Width 6.4 m | | Average Carriage Way Width 3.5 m | | | | |
| | Surface Type | Asphalt | | | | Actual Road Condition | Normal | | | | | | |
| | Average Traffic Volume (car/day) | Big Bus | Small Bus | Passenger Car | Motor Bike | Big Track | Small Track | Cart (drawn by animals) | Bicycle and pedestrian | Boat | | | |
| | | 0 | 0 | 12 | 300 | 20 | 30 | 50 | 456 | 0 | | | |
| | Place of Bottleneck | Bridge / Tunnel / Narrow Width Section / Others No | | | | Minimum Width | m | | Traffic Control | Up to tone | | | |
| | Remarks | Detail of bottlenecks in the access roads: | | | | | | | | | | | |
| Relevant Development Plan | Road Network Plan | Traffic Infrastructure | | Master Plan | Other Infrastructure | | Priority of this bridge among the proposed bridges in this province | | | | | | |
| | Village Level | Yes / No | Yes / No | Yes / No | Yes / No | | Priority: 1 2 3 4 5 6 | | | | | | |
| | District Level | Yes / No | Yes / No | Yes / No | Yes / No | | Reason of the priority: X | | | | | | |
| | Province Level | Yes / No | Yes / No | Yes / No | Yes / No | | Easy in travelling | | | | | | |
| | | Material No. | Material No. | Material No. | Material No. | | It is easy to go to the hospital and the school | | | | | | |
| River Condition | Low Water Level | Depth 1.5 m | River Width 150 m | River Gradient (Estimate) 4% | | Easily in agricultural cultivating | | | | | | | |
| | Highest Flood | Depth 8 m | River Width 170 m | Year of the Flood | | Exchange of goods in good condition | | | | | | | |
| | | Velocity m/sec | | Rapid flow | | To access to provincial socio-economic center | | | | | | | |
| | Tidal effects | Have / No | | River Bed Material | | | | | | | | | |
| | Bridge Surface Elevation | m from Average Height of River Bed | | Rock | | | | | | | | | |
| | Navigation to be considered | No | | m number and type of ships: | | 0 | | | | | | | |
| Bridge Construction | Transportation of Steel Girder from the Provincial Capital | Transportation Route | PR 206 | | Other Additional Information to be Noted | | | | | | | | |
| | | Carrying Method | Trailer Truck | | 1. Current bridge maintenance budget and system | | | | | | | | |
| | | Road Condition for Transportation | Suitable | | No bridge | | | | | | | | |
| | | Any Bottleneck for Transportation No | | | | 2. Current and expected projects by other donors (WB, ADB, JBIC, etc.) | | | | | | | |
| | Bridge Construction | Coffering for Piers | Sheet Pile / No Need (No water in dry season) | | Nothing | | | | | | | | |
| | | Steel Girder Erection | Suitable for Bent and Truck Crane Method Yes | | | | | | | | | | |
| Foundation Type | | RC Pile (L < 15m) | | | | | | | | | | | |
| (Assumption) | Special Foundation: No bridge | | | | | | | | | | | | |
| Expected Work Hinder | | | | | | | | | | | | | |
| Remark | | | | | | | | | | | | | |

QUESTIONNAIRE ON REQUESTED BRIDGES

Date of Answer: March / 12 / 2006

Name of Respondent: Nong Minh Toan

Title of Respondent: Vice Director of Technical -Planning Division

| | | | | | | | | | | | | | | | | | | |
|---|---|---|-----------------------|--|------------------|--|---|---|----------------------------------|------------------------------|---|---------------|----------------------------|---|----------------|--|--|--|
| Bridge No. | No. 52 | Bridge Name | Keo Ai | Province Name | Cao Bang | Road Network around the Bridge (conceptual map) | | | | | | | | | | | | |
| Bridge Location | The Road on which the bridge exist | | | Nearest City (with population over 20,000) | | | | | | | | | | | | | | |
| | Road Name | | Station of the Bridge | | Name of the City | | | | | | | | Distance From the Bridge | | | | | |
| | PR 206 | | Km 62 | | Trung Khanh | | | | | | | | 100km | | | | | |
| Present Condition of Bridge | Bridge Length | No bridge | m | Span | (| m+ | m+ | m+ | m+ | m) | | | | | | | | |
| | Bridge Width | No bridge | m | Carriage Way Width | No bridge | | | | | | | | | | | | | |
| | Superstructure Type | No bridge | | | | | | | | | | | | | | | | |
| | Substructure Type | No bridge | | | | | | | | | | | | | | | | |
| | Present Condition (Eye Check) | No bridge | | | | | | | | | | | | | | | | |
| | Necessity of Reconstruction | Yes Reason: To develop economy, society; To go to the hospital; To go to the school | | | | | | | | | | | | | | | | |
| | Number of Days of Closed to Traffic | Vehicle / Bike etc. : days/year. pedestrian or Bicycle : days/year | | | | | | | | | | | | | | | | |
| Actual State of Social Economic | Information of Villages Beyond the Bridge | | | | | Information of the Nearest City (with population over 20,000) | | | | | | | | | | | | |
| | Number of Village | 5 villages | | Name of Regional Town | Ban Suoi | Name of City | Trung Khanh Town | Access Time from the Bridge | 120 minutes | | | | | | | | | |
| | Population | 1400 persons | | Number of Household | 200 households | Population of City | 10501 persons | Number of Household | 2653 households | | | | | | | | | |
| | Average Income | 150,000 Dong/month | | Population Ratio of Minority | 100 % | Average Income | 290,000 Dong/month | Access Time from the main village beyond the bridge site (by general means of trip for the residents) | 20 minutes | | | | | | | | | |
| | Rate of School Attendance (Elementary School) | 18 % | | Rate of School Attendance (Junior High School) | 16 % | Remarks | By | | | | | | | | | | | |
| | Number of Educational Facilities | | | Junior High School | | 0 | | Number of Educational Facilities | | | Junior High School | | 3 | | | | | |
| | Elementary School | | | 1 | | High School | | 0 | | Elemental School | | | 4 | High School | 1 | | | |
| | Number of Medical Facilities | | | Emergency Hospital (middle size hospital) | | 0 | | Number of Medical Facilities | | | Emergency Hospital (middle size hospital) | | 1 | | | | | |
| | Clinic (small size hospital) | | | 0 | | Hospital for Serious Patients (large size hospital) | | 0 | | Clinic (small size hospital) | | | 3 | Hospital for Serious Patients (large size hospital) | 0 | | | |
| | Number of Daily Life Facilities | | | Bank | | 0 | | Number of Daily Life Facilities | | | Bank | | 1 | | | | | |
| | Post Office | | | 0 | | Market | | 0 | | Post Office | | | 1 | Market | 1 | | | |
| | Bus Stop | | | 0 | | Public Offices (Town Hall branch, etc.) | | 5 (Commune level) | | Bus Stop | | | 1 | Public Offices (Town Hall branch, etc.) | District level | | | |
| | Main Land Use | Rice Field, Forest | | | | | Detail of products sent to markets through the bridge location (Name of the products, total amount/price per year of each product): Rice: 38270 kg/2500d/year; Wood: 380m3/1200d/year | | | | | | | | | | | |
| | Main Production | Agriculture, Forestry | | | | | | | | | | | | | | | | |
| Present Condition of Access Road | Road Class | National Road 206 | | | | Road Width: 6.5m | Average Road Width 6.4 m | | Average Carriage Way Width 3.5 m | | | | | | | | | |
| | Surface Type | Gravel | | | | Actual Road Condition | Normal | | | | | | | | | | | |
| | Average Traffic Volume (car/day) | Big Bus 0 | | Small Bus 0 | | Passenger Car 10 | | Motor Bike 120 | | Big Track 3 | | Small Track 8 | Cart (drawn by animals) 28 | Bicycle and pedestrian 328 | Boat 0 | | | |
| | Place of Bottleneck | Bridge / Tunnel / Narrow Width Section / Others: No | | | | Minimum Width | m | | Traffic Control | | Up to tone | | | | | | | |
| | Remarks | Detail of bottlenecks in the access roads: | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| Relevant Development Plan | Road Network Plan | | | | | Priority of this bridge among the proposed bridges in this province | | | | | | | | | | | | |
| | Village Level | Yes / No | Yes / No | Yes / No | Yes / No | Priority: | | | | | | | | | | | | |
| | | Material No. | Material No. | Material No. | Material No. | 1 2 3 4 5 6 | | | | | | | | | | | | |
| | District Level | Yes / No | Yes / No | Yes / No | Yes / No | X | | | | | | | | | | | | |
| | | Material No. | Material No. | Material No. | Material No. | Reason of the priority: | | | | | | | | | | | | |
| | Province Level | Yes / No | Yes / No | Yes / No | Yes / No | Easy in travelling | | | | | | | | | | | | |
| River Condition | Low Water Level | Depth 2 m | River Width 20 m | River Gradient (Estimate) 3% | | In purpose of agriculture and forest developemnt | | | | | | | | | | | | |
| | Highest Flood | Depth 6 m | River Width 30 m | Year of the Flood | | Exchange of goods in good condition | | | | | | | | | | | | |
| | | Velocity m/sec | | Rapid flow | | | | To access to provincial socio-economic center | | | | | | | | | | |
| | Tidal effects | Have / No | | River Bed Material | | | | | | | | | | | | | | |
| | Bridge Surface Elevation | m from Average Height of River Bed | | | Sand, Gravel | | | | | | | | | | | | | |
| | Navigation to be considered | No m number and type of ships: | | | | 0 | | | | | | | | | | | | |
| | Up Stream Side | Special Remarks | | 0 | | | | | | | | | | | | | | |
| | Down Stream Side | Special Remarks | | 0 | | | | | | | | | | | | | | |
| Bridge Construction | Transportation Route | PR 206 | | | | Other Additional Information to be Noted | | | | | | | | | | | | |
| | Carrying Method | Trailer Truck | | | | 1. Current bridge maintenance budget and system | | | | | | | | | | | | |
| | Road Condition for Transportation | Suitable | | | | No bridge | | | | | | | | | | | | |
| | Any Bottleneck for Transportation: No | | | | | 2. Current and expected projects by other donors (WB, ADB, JBIC, etc.) | | | | | | | | | | | | |
| | Coffering for Piers | Sheet Pile / No Need (No water in dry season) | | | | Provincial Road has being upgraded using ADB fund (The end of road). This section is next to the proposed bridge for construction. | | | | | | | | | | | | |
| | Steel Girder Erection | Suitable for Bent and Truck Crane Method Yes | | | | | | | | | | | | | | | | |
| Required Other Specials Erection Methods No | | | | | | | | | | | | | | | | | | |
| Foundation Type | RC Pile (L < 15m) | | | | | | | | | | | | | | | | | |
| (Assumption) | / Special Foundation () | | | | | | | | | | | | | | | | | |
| Expected Work Hinder | | | | | | | | | | | | | | | | | | |
| Remark | | | | | | | | | | | | | | | | | | |

8-3 橋梁評価点の算定

1.(1) 格差のポテンシャル

| Province | Br. No. | Bridge Name (Revised in March 2006) | 社会格差 | 経済格差 | 時間距離 | ポイント | 評価点 | 評価点 |
|-------------|---------|---|--------------|-------------|---------|------------------------|-----|---------------|
| | | | ① 平均施設数の差 | ② 平均月収の比 | ③ Hr | ①×②/(③) ^{1/4} | ④ | ④×4 (重み付け) |
| Bac Can | 46 | Don Phong | 4.5 | 2.5 | 0.17 | 17.52 | 5 | 20 |
| Yen Bai | 18 | Ngoi Thap | 5.0 | 1.7 | 0.75 | 9.13 | 5 | 20 |
| Bac Can | 45 | Na Leng | 4.0 | 1.6 | 0.42 | 7.95 | 5 | 20 |
| Yen Bai | 23 | Ben Cao | 5.0 | 1.7 | 1.50 | 7.68 | 5 | 20 |
| Son La | 3 | Ban Tum | 2.0 | 1.9 | 0.17 | 5.92 | 5 | 20 |
| Son La | 2 | Ban Sai | 2.0 | 1.8 | 0.17 | 5.61 | 4.5 | 18 |
| Ha Giang | 37 | Ta Lang | 2.0 | 2.5 | 0.67 | 5.53 | 4.5 | 18 |
| Son La | 4 | Na Do | 2.5 | 2.0 | 0.83 | 5.24 | 4.5 | 18 |
| Bac Can | 42 | Pac Nam (BC) | 2.5 | 2.3 | 1.50 | 5.20 | 4.5 | 18 |
| Bac Can | 44 | Nga Ba | 2.5 | 2.1 | 1.08 | 5.15 | 4.5 | 18 |
| Bac Can | 43 | Khuoi Nung | 2.5 | 2.1 | 1.17 | 5.05 | 4 | 16 |
| Son La | 5 | Na Tra | 2.5 | 2.0 | 1.00 | 5.00 | 4 | 16 |
| Son La | 6 | Ban Pang | 2.5 | 2.0 | 1.17 | 4.81 | 4 | 16 |
| Lai Chau | 12 | San Thang | 2.0 | 1.5 | 0.20 | 4.49 | 4 | 16 |
| Ha Giang | 38 | Suoi Dau | 1.5 | 1.6 | 0.33 | 3.17 | 4 | 16 |
| Cao Bang | 49 | Binh Long | 1.0 | 2.2 | 0.25 | 3.11 | 3.5 | 14 |
| Ha Giang | 39 | Diec | 1.5 | 1.7 | 0.50 | 3.03 | 3.5 | 14 |
| Yen Bai | 19 | Ngoi That | 1.5 | 1.3 | 0.25 | 2.76 | 3.5 | 14 |
| Ha Giang | 36 | Na Lan | 1.5 | 1.3 | 0.25 | 2.76 | 3.5 | 14 |
| Cao Bang | 52 | Keo Ai | 1.5 | 1.9 | 1.20 | 2.72 | 3.5 | 14 |
| Lao Cai | 25 | Thanh Phu | 1.5 | 1.6 | 0.67 | 2.65 | 3 | 12 |
| Ha Giang | 40 | Lien Hiep | 1.5 | 1.6 | 0.83 | 2.51 | 3 | 12 |
| Tuyen Quang | 30 | Ban Nghien | 1.0 | 2.5 | 1.00 | 2.50 | 3 | 12 |
| Yen Bai | 20 | Lao Chai | 1.0 | 1.7 | 0.25 | 2.40 | 3 | 12 |
| Yen Bai | 21 | Pu Trang | 1.0 | 1.7 | 0.25 | 2.40 | 3 | 12 |
| Cao Bang | 48 | Dong May | 1.0 | 2.0 | 0.50 | 2.38 | 2.5 | 10 |
| Cao Bang | 50 | Ban Sac | 1.0 | 2.1 | 0.67 | 2.32 | 2.5 | 10 |
| Lao Cai | 29 | Soi Chat | 1.0 | 1.6 | 0.25 | 2.26 | 2.5 | 10 |
| Yen Bai | 22 | Ta Tiu | 1.0 | 1.4 | 0.17 | 2.18 | 2.5 | 10 |
| Tuyen Quang | 31 | Trinh | 1.0 | 1.7 | 0.50 | 2.02 | 2.5 | 10 |
| Tuyen Quang | 35 | Dong Ach | 1.0 | 1.7 | 0.58 | 1.95 | 2 | 8 |
| Tuyen Quang | 34 | Ngoi Lien | 1.0 | 1.7 | 0.80 | 1.80 | 2 | 8 |
| Bac Can | 47 | Quang Chu | 1.0 | 1.3 | 0.33 | 1.72 | 2 | 8 |
| Lao Cai | 26 | Ban Xeo | 1.0 | 1.4 | 0.50 | 1.66 | 2 | 8 |
| Lai Chau | 14 | Nam Puc | 1.5 | 1.0 | 0.75 | 1.61 | 2 | 8 |
| Tuyen Quang | 33 | Sung | 1.0 | 1.7 | 1.25 | 1.61 | 1.5 | 6 |
| Lao Cai | 28 | Den Sang | 1.0 | 1.6 | 1.00 | 1.60 | 1.5 | 6 |
| Dien Bien | 9 | Su Lu | 1.0 | 1.0 | 0.17 | 1.56 | 1.5 | 6 |
| Lao Cai | 27 | Muong Hum 2 | 1.0 | 1.4 | 0.75 | 1.50 | 1.5 | 6 |
| Lai Chau | 15 | Huoi Dit | 1.5 | 1.0 | 1.00 | 1.50 | 1.5 | 6 |
| Lai Chau | 16 | Nam Ham | 1.5 | 1.0 | 1.25 | 1.42 | 1 | 4 |
| Lai Chau | 17 | Nam Cum | 1.5 | 1.0 | 1.50 | 1.36 | 1 | 4 |
| Dien Bien | 8 | Pa Bat | 1.0 | 1.0 | 0.50 | 1.19 | 1 | 4 |
| Dien Bien | 10 | Ban Bung | 1.0 | 1.0 | 0.50 | 1.19 | 1 | 4 |
| Dien Bien | 7 | Na Phat | 1.0 | 1.0 | 0.67 | 1.11 | 1 | 4 |
| Ha Giang | 41 | Ban An | 1.0 | 1.2 | 1.50 | 1.08 | 0.5 | 2 |
| Dien Bien | 11 | Pac Nam (DB) | 1.0 | 1.0 | 0.75 | 1.07 | 0.5 | 2 |
| Son La | 1 | Ban Khoang | | | | | | 0 |
| Lai Chau | 13 | Pa Tan | | | | | | 0 |
| Lao Cai | 24 | Trung Do | | | | | | 0 |
| Tuyen Quang | 32 | Na Nham | | | | | | 0 |
| Cao Bang | 51 | Ban Mon | | | | | | 0 |

1.(2) 裨益対象

| Province | Br. No. | Bridge Name (Revised in March 2006) | 裨益面積 | 裨益人口 (千人) | 裨益部落数 | ポイント | 評価点 | 評価点 (重み付け) |
|-------------|---------|-------------------------------------|------|--------------|-------|------------------------|-----|---------------|
| | | | ① | ② | ③ | (①×②×③) ^{1/3} | ④ | ④×4 |
| Dien Bien | 8 | Pa Bat | 95 | 17.0 | 76 | 49.7 | 5.0 | 20.0 |
| Dien Bien | 9 | Su Lu | 180 | 33.4 | 114 | 88.2 | 5.0 | 20.0 |
| Lai Chau | 14 | Nam Puc | 96 | 13.5 | 38 | 36.7 | 5.0 | 20.0 |
| Lai Chau | 15 | Huoi Dit | 91 | 13.6 | 38 | 36.1 | 5.0 | 20.0 |
| Lai Chau | 16 | Nam Ham | 80 | 13.5 | 38 | 34.5 | 5.0 | 20.0 |
| Dien Bien | 10 | Ban Bung | 81 | 8.4 | 26 | 26.1 | 4.5 | 18.0 |
| Lai Chau | 17 | Nam Cum | 39 | 13.5 | 38 | 27.1 | 4.5 | 18.0 |
| Ha Giang | 36 | Na Lan | 75 | 9.7 | 53 | 33.8 | 4.5 | 18.0 |
| Ha Giang | 38 | Suoi Dau | 88 | 11.4 | 32 | 31.8 | 4.5 | 18.0 |
| Bac Can | 44 | Nga Ba | 120 | 6.0 | 23 | 25.5 | 4.5 | 18.0 |
| Lao Cai | 26 | Ban Xeo | 86 | 20.2 | 9 | 25.0 | 4.0 | 16.0 |
| Ha Giang | 39 | Diec | 78 | 7.2 | 16 | 20.8 | 4.0 | 16.0 |
| Ha Giang | 41 | Ban An | 54 | 6.5 | 25 | 20.6 | 4.0 | 16.0 |
| Bac Can | 43 | Khuoi Nung | 117 | 4.5 | 20 | 21.9 | 4.0 | 16.0 |
| Cao Bang | 49 | Binh Long | 30 | 7.0 | 50 | 21.9 | 4.0 | 16.0 |
| Son La | 4 | Na Do | 26 | 7.5 | 19 | 15.5 | 3.5 | 14.0 |
| Dien Bien | 11 | Pac Nam (DB) | 38 | 5.8 | 18 | 15.8 | 3.5 | 14.0 |
| Lao Cai | 27 | Muong Hum 2 | 72 | 13.5 | 5 | 16.9 | 3.5 | 14.0 |
| Ha Giang | 40 | Lien Hiep | 22 | 8.0 | 21 | 15.5 | 3.5 | 14.0 |
| Cao Bang | 50 | Ban Sac Alt. No.1 | 30 | 3.4 | 30 | 14.5 | 3.5 | 14.0 |
| Son La | 5 | Na Tra | 21 | 6.8 | 17 | 13.4 | 3.0 | 12.0 |
| Son La | 6 | Ban Pang | 18 | 6.4 | 16 | 12.3 | 3.0 | 12.0 |
| Dien Bien | 7 | Na Phat | 30 | 8.5 | 10 | 13.7 | 3.0 | 12.0 |
| Bac Can | 42 | Pac Nam (BC) | 53 | 3.0 | 15 | 13.4 | 3.0 | 12.0 |
| Bac Can | 46 | Don Phong | 38 | 5.0 | 10 | 12.4 | 3.0 | 12.0 |
| Son La | 2 | Ban Sai | 27 | 5.2 | 10 | 11.2 | 2.5 | 10.0 |
| Lai Chau | 12 | San Thang | 13 | 3.4 | 15 | 8.7 | 2.5 | 10.0 |
| Yen Bai | 23 | Ben Cao | 26 | 5.0 | 5 | 8.7 | 2.5 | 10.0 |
| Lao Cai | 25 | Thanh Phu | 55 | 8.3 | 4 | 12.2 | 2.5 | 10.0 |
| Ha Giang | 37 | Ta Lang | 32 | 6.1 | 4 | 9.2 | 2.5 | 10.0 |
| Son La | 3 | Ban Tum | 19 | 2.9 | 6 | 6.9 | 2.0 | 8.0 |
| Yen Bai | 20 | Lao Chai | 41 | 3.7 | 2 | 6.7 | 2.0 | 8.0 |
| Tuyen Quang | 31 | Trinh | 25 | 2.2 | 5 | 6.5 | 2.0 | 8.0 |
| Bac Can | 47 | Quang Chu | 15 | 4.3 | 10 | 8.6 | 2.0 | 8.0 |
| Cao Bang | 48 | Dong May | 20 | 1.7 | 9 | 6.7 | 2.0 | 8.0 |
| Yen Bai | 18 | Ngoi Thap | 20 | 2.5 | 3 | 5.3 | 1.5 | 6.0 |
| Yen Bai | 21 | Pu Trang | 15 | 2.1 | 7 | 6.0 | 1.5 | 6.0 |
| Yen Bai | 22 | Ta Tiu | 17 | 5.6 | 2 | 5.8 | 1.5 | 6.0 |
| Lao Cai | 28 | Den Sang | 10 | 6.1 | 3 | 5.7 | 1.5 | 6.0 |
| Lao Cai | 29 | Soi Chat | 5 | 21.5 | 2 | 6.0 | 1.5 | 6.0 |
| Yen Bai | 19 | Ngoi That | 17 | 2.9 | 3 | 5.3 | 1.0 | 4.0 |
| Tuyen Quang | 33 | Sung | 10 | 2.1 | 6 | 5.0 | 1.0 | 4.0 |
| Tuyen Quang | 35 | Dong Ach | 8 | 2.3 | 7 | 5.1 | 1.0 | 4.0 |
| Bac Can | 45 | Na Leng | 6 | 4.8 | 4 | 4.9 | 1.0 | 4.0 |
| Cao Bang | 52 | Keo Ai | 15 | 1.4 | 5 | 4.7 | 1.0 | 4.0 |
| Tuyen Quang | 30 | Ban Nghien | 5 | 1.7 | 6 | 3.7 | 0.5 | 2.0 |
| Tuyen Quang | 34 | Ngoi Lien | 5 | 1.6 | 7 | 3.8 | 0.5 | 2.0 |
| Son La | 1 | Ban Khoang | | | | | 0.0 | 0.0 |
| Lai Chau | 13 | Pa Tan | | | | | 0.0 | 0.0 |
| Lao Cai | 24 | Trung Do | | | | | 0.0 | 0.0 |
| Tuyen Quang | 32 | Na Nham | | | | | 0.0 | 0.0 |
| Cao Bang | 51 | Ban Mon | | | | | 0.0 | 0.0 |

2. 緊急性・必要性

| Province | Br. No. | Bridge Name (Revised in March 2006) | 雨期の増水状況 | | 現橋の状況 ② | | | | 迂回路の状況 ③ | | | | 評価点 ④ | 評価点 (重み付け) ④×4 | |
|-------------|---------|---|---------|------|----------------|---------------------------|-------------|----------------------|----------|-------------------------|------------|------------|----------|----------------------|------------|
| | | | 流域面積 | ポイント | 雨期増水時 に通行不可 | 雨期増水時に通行可能な 吊橋等(洪水時以外) | | | なし | 未整備道路経由 | | 整備済道路経由 | | | |
| | | | | | | 現橋なし 竹橋 木橋 | 人・バイク のみ | 軽自動車 まで (3t程度) | | 小型トラック まで (10t程度) | 10km 以上 | 10km 未満 | | | 30km 以上 |
| | | | | ① | 1.5 | 1.0 | 0.5 | 0.0 | 1.5 | 1.0 | 0.5 | 0.5 | 0.0 | ①+②+③ | ④×4 |
| Tuyen Quang | 30 | Ban Nghien | 207 | 1.5 | 1.5 | | | | 1.5 | | | | | 4.5 | 18 |
| Bac Can | 42 | Pac Nam (BC) | 188 | 1.5 | 1.5 | | | | 1.5 | | | | | 4.5 | 18 |
| Bac Can | 47 | Quang Chu | 1350 | 2.0 | | 1.0 | | | 1.5 | | | | | 4.5 | 18 |
| Son La | 3 | Ban Tum | 164 | 1.5 | | 1.0 | | | 1.5 | | | | | 4.0 | 16 |
| Dien Bien | 9 | Su Lu | 213 | 1.5 | | 1.0 | | | 1.5 | | | | | 4.0 | 16 |
| Dien Bien | 10 | Ban Bung | 290 | 1.5 | | 1.0 | | | 1.5 | | | | | 4.0 | 16 |
| Lai Chau | 16 | Nam Ham | 72 | 1.0 | 1.5 | | | | 1.5 | | | | | 4.0 | 16 |
| Lai Chau | 17 | Nam Cum | 374 | 1.5 | | 1.0 | | | 1.5 | | | | | 4.0 | 16 |
| Yen Bai | 20 | Lao Chai | 293 | 1.5 | | 1.0 | | | 1.5 | | | | | 4.0 | 16 |
| Lao Cai | 27 | Muong Hum 2 | 97 | 1.0 | 1.5 | | | | 1.5 | | | | | 4.0 | 16 |
| Ha Giang | 41 | Ban An | 196 | 1.5 | | 1.0 | | | 1.5 | | | | | 4.0 | 16 |
| Bac Can | 43 | Khuoi Nung | 60 | 1.0 | 1.5 | | | | 1.5 | | | | | 4.0 | 16 |
| Bac Can | 44 | Nga Ba | 104 | 1.0 | 1.5 | | | | 1.5 | | | | | 4.0 | 16 |
| Bac Can | 46 | Don Phong | 249 | 1.5 | | 1.0 | | | 1.5 | | | | | 4.0 | 16 |
| Cao Bang | 49 | Binh Long | 1240 | 2.0 | | 1.0 | | | | 1.0 | | | | 4.0 | 16 |
| Son La | 4 | Na Do | 60 | 1.0 | | 1.0 | | | 1.5 | | | | | 3.5 | 14 |
| Son La | 5 | Na Tra | 74 | 1.0 | | 1.0 | | | 1.5 | | | | | 3.5 | 14 |
| Son La | 6 | Ban Pang | 22 | 0.5 | 1.5 | | | | 1.5 | | | | | 3.5 | 14 |
| Dien Bien | 7 | Na Phat | 150 | 1.0 | | 1.0 | | | 1.5 | | | | | 3.5 | 14 |
| Dien Bien | 8 | Pa Bat | 1585 | 2.0 | | | | 0.0 | 1.5 | | | | | 3.5 | 14 |
| Dien Bien | 11 | Pac Nam (DB) | 80 | 1.0 | | 1.0 | | | 1.5 | | | | | 3.5 | 14 |
| Lai Chau | 12 | San Thang | 38 | 0.5 | 1.5 | | | | 1.5 | | | | | 3.5 | 14 |
| Lai Chau | 14 | Nam Puc | 45 | 0.5 | 1.5 | | | | 1.5 | | | | | 3.5 | 14 |
| Lai Chau | 15 | Huoi Dit | 6 | 0.5 | 1.5 | | | | 1.5 | | | | | 3.5 | 14 |
| Yen Bai | 18 | Ngoi Thap | 42 | 0.5 | 1.5 | | | | 1.5 | | | | | 3.5 | 14 |
| Yen Bai | 19 | Ngoi That | 67 | 1.0 | | 1.0 | | | 1.5 | | | | | 3.5 | 14 |
| Yen Bai | 22 | Ta Tiu | 209 | 1.5 | | 1.0 | | | | 1.0 | | | | 3.5 | 14 |
| Yen Bai | 23 | Ben Cao | 205 | 1.5 | | | 0.5 | | 1.5 | | | | | 3.5 | 14 |
| Lao Cai | 26 | Ban Xeo | 30 | 0.5 | 1.5 | | | | 1.5 | | | | | 3.5 | 14 |
| Lao Cai | 29 | Soi Chat | 62 | 1.0 | | 1.0 | | | 1.5 | | | | | 3.5 | 14 |
| Ha Giang | 36 | Na Lan | 76 | 1.0 | | 1.0 | | | 1.5 | | | | | 3.5 | 14 |
| Ha Giang | 37 | Ta Lang | 58 | 1.0 | | 1.0 | | | 1.5 | | | | | 3.5 | 14 |
| Ha Giang | 38 | Suoi Dau | 104 | 1.0 | | 1.0 | | | 1.5 | | | | | 3.5 | 14 |
| Ha Giang | 39 | Diec | 69 | 1.0 | | 1.0 | | | 1.5 | | | | | 3.5 | 14 |
| Cao Bang | 48 | Dong May | 497 | 1.5 | | 1.0 | | | | 1.0 | | | | 3.5 | 14 |
| Cao Bang | 52 | Keo Ai | 15 | 0.5 | 1.5 | | | | 1.5 | | | | | 3.5 | 14 |
| Lao Cai | 25 | Thanh Phu | 407 | 1.5 | | 1.0 | | | | | | 0.5 | | 3.0 | 12 |
| Lao Cai | 28 | Den Sang | 14 | 0.5 | | 1.0 | | | 1.5 | | | | | 3.0 | 12 |
| Tuyen Quang | 31 | Trinh | 244 | 1.5 | | 1.0 | | | | | 0.5 | | | 3.0 | 12 |
| Tuyen Quang | 35 | Dong Ach | 57 | 1.0 | 1.5 | | | | | | 0.5 | | | 3.0 | 12 |
| Ha Giang | 40 | Lien Hiep | 31 | 0.5 | 1.5 | | | | | 1.0 | | | | 3.0 | 12 |
| Son La | 2 | Ban Sai | 141 | 1.0 | | 1.0 | | | | | 0.5 | | | 2.5 | 10 |
| Yen Bai | 21 | Pu Trang | 120 | 1.0 | | 1.0 | | | | | 0.5 | | | 2.5 | 10 |
| Tuyen Quang | 33 | Sung | 22 | 0.5 | 1.5 | | | | | | 0.5 | | | 2.5 | 10 |
| Tuyen Quang | 34 | Ngoi Lien | 15 | 0.5 | 1.5 | | | | | | 0.5 | | | 2.5 | 10 |
| Bac Can | 45 | Na Leng | 76 | 1.0 | 1.5 | | | | | | | 0.0 | | 2.5 | 10 |
| Cao Bang | 50 | Ban Sac | 13 | 0.5 | 1.5 | | | | | | | 0.5 | | 2.5 | 10 |
| Son La | 1 | Ban Khoang | 11 | 0.0 | | | | | | | | | | 0.0 | 0 |
| Lai Chau | 13 | Pa Tan | 6075 | 0.0 | | | | | | | | | | 0.0 | 0 |
| Lao Cai | 24 | Trung Do | 15 | 0.0 | | | | | | | | | | 0.0 | 0 |
| Tuyen Quang | 32 | Na Nham | 717 | 0.0 | | | | | | | | | | 0.0 | 0 |
| Cao Bang | 51 | Ban Mon | 924 | 0.0 | | | | | | | | | | 0.0 | 0 |

3. 整備効果の発現時期

| Province | Br. No. | Bridge Name (Revised in March 2006) | 橋梁の先の道路状況 ① (アクセス道路整備済みのとき) | | | アクセス道路の整備計画 ② (未整備のとき) | | 評価点 ③ | 評価点 (重み付け) |
|-------------|---------|---|--------------------------------|--------------------------|---------------|---------------------------|------------|----------|---------------|
| | | | 10km以上 整備済み (拡幅不要) | 10km未満 整備済み (拡幅不要) | 未整備 (拡幅必要) | 拡幅計画 あり | 拡幅計画 なし | | |
| | | | 5.0 | 4.0 | 3.0 | 2.0 | 1.0 | ①+② | ③×3 |
| Son La | 3 | Ban Tum | 5.0 | | | | | 5.0 | 15 |
| Son La | 4 | Na Do | 5.0 | | | | | 5.0 | 15 |
| Son La | 5 | Na Tra | 5.0 | | | | | 5.0 | 15 |
| Dien Bien | 8 | Pa Bat | 5.0 | | | | | 5.0 | 15 |
| Dien Bien | 9 | Su Lu | 5.0 | | | | | 5.0 | 15 |
| Dien Bien | 10 | Ban Bung | 5.0 | | | | | 5.0 | 15 |
| Lai Chau | 14 | Nam Puc | 5.0 | | | | | 5.0 | 15 |
| Lai Chau | 15 | Huoi Dit | 5.0 | | | | | 5.0 | 15 |
| Lai Chau | 16 | Nam Ham | 5.0 | | | | | 5.0 | 15 |
| Lai Chau | 17 | Nam Cum | 5.0 | | | | | 5.0 | 15 |
| Yen Bai | 22 | Ta Tiu | 5.0 | | | | | 5.0 | 15 |
| Yen Bai | 23 | Ben Cao | 5.0 | | | | | 5.0 | 15 |
| Lao Cai | 25 | Thanh Phu | 5.0 | | | | | 5.0 | 15 |
| Lao Cai | 26 | Ban Xeo | 5.0 | | | | | 5.0 | 15 |
| Ha Giang | 36 | Na Lan | 5.0 | | | | | 5.0 | 15 |
| Ha Giang | 38 | Suoi Dau | 5.0 | | | | | 5.0 | 15 |
| Bac Can | 43 | Khuoi Nung | 5.0 | | | | | 5.0 | 15 |
| Bac Can | 44 | Nga Ba | 5.0 | | | | | 5.0 | 15 |
| Bac Can | 46 | Don Phong | 5.0 | | | | | 5.0 | 15 |
| Cao Bang | 50 | Ban Sac | 5.0 | | | | | 5.0 | 15 |
| Son La | 2 | Ban Sai | | 4.0 | | | | 4.0 | 12 |
| Son La | 6 | Ban Pang | | 4.0 | | | | 4.0 | 12 |
| Dien Bien | 7 | Na Phat | | 4.0 | | | | 4.0 | 12 |
| Dien Bien | 11 | Pac Nam (DB) | | 4.0 | | | | 4.0 | 12 |
| Lai Chau | 12 | San Thang | | 4.0 | | | | 4.0 | 12 |
| Yen Bai | 18 | Ngoi Thap | | 4.0 | | | | 4.0 | 12 |
| Yen Bai | 21 | Pu Trang | | 4.0 | | | | 4.0 | 12 |
| Lao Cai | 28 | Den Sang | | 4.0 | | | | 4.0 | 12 |
| Lao Cai | 29 | Soi Chat | | 4.0 | | | | 4.0 | 12 |
| Tuyen Quang | 31 | Trinh | | 4.0 | | | | 4.0 | 12 |
| Tuyen Quang | 33 | Sung | | 4.0 | | | | 4.0 | 12 |
| Tuyen Quang | 34 | Ngoi Lien | | 4.0 | | | | 4.0 | 12 |
| Tuyen Quang | 35 | Dong Ach | | 4.0 | | | | 4.0 | 12 |
| Ha Giang | 37 | Ta Lang | | 4.0 | | | | 4.0 | 12 |
| Ha Giang | 39 | Diec | | 4.0 | | | | 4.0 | 12 |
| Ha Giang | 40 | Lien Hiep | | 4.0 | | | | 4.0 | 12 |
| Ha Giang | 41 | Ban An | | 4.0 | | | | 4.0 | 12 |
| Bac Can | 42 | Pac Nam (BC) | | 4.0 | | | | 4.0 | 12 |
| Bac Can | 45 | Na Leng | | 4.0 | | | | 4.0 | 12 |
| Bac Can | 47 | Quang Chu | | 4.0 | | | | 4.0 | 12 |
| Cao Bang | 48 | Dong May | | 4.0 | | | | 4.0 | 12 |
| Cao Bang | 49 | Binh Long | | 4.0 | | | | 4.0 | 12 |
| Yen Bai | 19 | Ngoi That | | | 3.0 | | | 3.0 | 9 |
| Yen Bai | 20 | Lao Chai | | | 3.0 | | | 3.0 | 9 |
| Lao Cai | 27 | Muong Hum 2 | | | 3.0 | | | 3.0 | 9 |
| Tuyen Quang | 30 | Ban Nghien | | | 3.0 | | | 3.0 | 9 |
| Cao Bang | 52 | Keo Ai | | | 3.0 | | | 3.0 | 9 |
| Son La | 1 | Ban Khoang | | | | | | 0.0 | 0 |
| Lai Chau | 13 | Pa Tan | | | | | | 0.0 | 0 |
| Lao Cai | 24 | Trung Do | | | | | | 0.0 | 0 |
| Tuyen Quang | 32 | Na Nham | | | | | | 0.0 | 0 |
| Cao Bang | 51 | Ban Mon | | | | | | 0.0 | 0 |

4. 鋼桁であることの妥当性

| Province | Br. No. | Bridge Name (Revised in March 2006) | コンクリート桁製作・架設ヤード ① | | | 耐震安定性 ② | | | | | 評価点 ③ | 評価点 (重み付 け) |
|-------------|---------|---|----------------------|-------------|------------|--------------|---------------------|--------------------|-------------------|---------------------|----------|-------------------|
| | | | 両側とも 不可 | 橋梁先 でのみ可 | 橋梁手前 で可 | 橋脚高 15m以上 | 橋脚高 12~15m 未満 | 橋脚高 9~12m 未満 | 橋脚高 6~9m 未満 | 橋脚なし または 6m未満 | | |
| | | | 3.0 | 2.0 | 1.0 | 2.0 | 1.5 | 1.0 | 0.5 | 0.0 | ①+② | ①×2 |
| Dien Bien | 8 | Pa Bat | 3.0 | | | 2.0 | | | | | 5.0 | 10 |
| Lai Chau | 16 | Nam Ham | 3.0 | | | 2.0 | | | | | 5.0 | 10 |
| Lai Chau | 17 | Nam Cum | 3.0 | | | 2.0 | | | | | 5.0 | 10 |
| Lao Cai | 26 | Ban Xeo | 3.0 | | | 2.0 | | | | | 5.0 | 10 |
| Dien Bien | 9 | Su Lu | 3.0 | | | | 1.5 | | | | 4.5 | 9 |
| Lai Chau | 14 | Nam Puc | 3.0 | | | | 1.5 | | | | 4.5 | 9 |
| Yen Bai | 20 | Lao Chai | 3.0 | | | | 1.5 | | | | 4.5 | 9 |
| Lao Cai | 25 | Thanh Phu | 3.0 | | | | 1.5 | | | | 4.5 | 9 |
| Ha Giang | 36 | Na Lan | 3.0 | | | | 1.5 | | | | 4.5 | 9 |
| Lao Cai | 27 | Muong Hum 2 | 3.0 | | | | | 1.0 | | | 4.0 | 8 |
| Tuyen Quang | 31 | Trinh | | 2.0 | | 2.0 | | | | | 4.0 | 8 |
| Son La | 4 | Na Do | 3.0 | | | | | | 0.5 | | 3.5 | 7 |
| Dien Bien | 10 | Ban Bung | 3.0 | | | | | | 0.5 | | 3.5 | 7 |
| Dien Bien | 11 | Pac Nam (DB) | 3.0 | | | | | | 0.5 | | 3.5 | 7 |
| Bac Can | 42 | Pac Nam (BC) | 3.0 | | | | | | 0.5 | | 3.5 | 7 |
| Cao Bang | 48 | Dong May | | 2.0 | | | 1.5 | | | | 3.5 | 7 |
| Cao Bang | 49 | Binh Long | | 2.0 | | | 1.5 | | | | 3.5 | 7 |
| Son La | 6 | Ban Pang | 3.0 | | | | | | | 0.0 | 3.0 | 6 |
| Lai Chau | 15 | Huoi Dit | 3.0 | | | | | | | 0.0 | 3.0 | 6 |
| Lao Cai | 28 | Den Sang | 3.0 | | | | | | | 0.0 | 3.0 | 6 |
| Lao Cai | 29 | Soi Chat | | 2.0 | | | | 1.0 | | | 3.0 | 6 |
| Ha Giang | 38 | Suoi Dau | | | 1.0 | 2.0 | | | | | 3.0 | 6 |
| Bac Can | 43 | Khuoi Nung | 3.0 | | | | | | | 0.0 | 3.0 | 6 |
| Bac Can | 47 | Quang Chu | | | 1.0 | 2.0 | | | | | 3.0 | 6 |
| Cao Bang | 52 | Keo Ai | 3.0 | | | | | | | 0.0 | 3.0 | 6 |
| Yen Bai | 23 | Ben Cao | | | 1.0 | | 1.5 | | | | 2.5 | 5 |
| Tuyen Quang | 30 | Ban Nghien | | | 1.0 | | 1.5 | | | | 2.5 | 5 |
| Ha Giang | 37 | Ta Lang | | 2.0 | | | | | 0.5 | | 2.5 | 5 |
| Ha Giang | 41 | Ban An | | | 1.0 | | 1.5 | | | | 2.5 | 5 |
| Son La | 3 | Ban Tum | | | 1.0 | | | 1.0 | | | 2.0 | 4 |
| Dien Bien | 7 | Na Phat | | | 1.0 | | | 1.0 | | | 2.0 | 4 |
| Yen Bai | 19 | Ngoi That | | | 1.0 | | | 1.0 | | | 2.0 | 4 |
| Tuyen Quang | 33 | Sung | | 2.0 | | | | | | 0.0 | 2.0 | 4 |
| Tuyen Quang | 35 | Dong Ach | | | 1.0 | | | 1.0 | | | 2.0 | 4 |
| Ha Giang | 40 | Lien Hiep | | 2.0 | | | | | | 0.0 | 2.0 | 4 |
| Bac Can | 46 | Don Phong | | | 1.0 | | | 1.0 | | | 2.0 | 4 |
| Cao Bang | 50 | Ban Sac | | | 1.0 | | | 1.0 | | | 2.0 | 4 |
| Son La | 2 | Ban Sai | | | 1.0 | | | | 0.5 | | 1.5 | 3 |
| Son La | 5 | Na Tra | | | 1.0 | | | | 0.5 | | 1.5 | 3 |
| Yen Bai | 18 | Ngoi Thap | | | 1.0 | | | | 0.5 | | 1.5 | 3 |
| Yen Bai | 21 | Pu Trang | | | 1.0 | | | | 0.5 | | 1.5 | 3 |
| Yen Bai | 22 | Ta Tiu | | | 1.0 | | | | 0.5 | | 1.5 | 3 |
| Ha Giang | 39 | Diec | | | 1.0 | | | | 0.5 | | 1.5 | 3 |
| Bac Can | 45 | Na Leng | | | 1.0 | | | | 0.5 | | 1.5 | 3 |
| Lai Chau | 12 | San Thang | | | 1.0 | | | | | 0.0 | 1.0 | 2 |
| Tuyen Quang | 34 | Ngoi Lien | | | 1.0 | | | | | 0.0 | 1.0 | 2 |
| Bac Can | 44 | Nga Ba | | | 1.0 | | | | | 0.0 | 1.0 | 2 |
| Son La | 1 | Ban Khoang | | | | | | | | | 0.0 | 0 |
| Lai Chau | 13 | Pa Tan | | | | | | | | | 0.0 | 0 |
| Lao Cai | 24 | Trung Do | | | | | | | | | 0.0 | 0 |
| Tuyen Quang | 32 | Na Nham | | | | | | | | | 0.0 | 0 |
| Cao Bang | 51 | Ban Mon | | | | | | | | | 0.0 | 0 |

5. 少数民族に対する貢献

| Province | Br. No. | Bridge Name (Revised in March 2006) | 少数民族 比率 (%) | 評価点 (重み=1.0) |
|-------------|---------|---|----------------|-----------------|
| Son La | 2 | Ban Sai | 100 | 5 |
| Son La | 3 | Ban Tum | 100 | 5 |
| Son La | 4 | Na Do | 100 | 5 |
| Son La | 5 | Na Tra | 100 | 5 |
| Son La | 6 | Ban Pang | 100 | 5 |
| Lai Chau | 12 | San Thang | 100 | 5 |
| Lai Chau | 14 | Nam Puc | 100 | 5 |
| Lai Chau | 15 | Huoi Dit | 100 | 5 |
| Lai Chau | 16 | Nam Ham | 100 | 5 |
| Lai Chau | 17 | Nam Cum | 100 | 5 |
| Yen Bai | 23 | Ben Cao | 100 | 5 |
| Tuyen Quang | 30 | Ban Nghien | 100 | 5 |
| Cao Bang | 48 | Dong May | 100 | 5 |
| Cao Bang | 49 | Binh Long | 100 | 5 |
| Cao Bang | 50 | Ban Sac | 100 | 5 |
| Cao Bang | 52 | Keo Ai | 100 | 5 |
| Ha Giang | 36 | Na Lan | 99 | 5 |
| Ha Giang | 41 | Ban An | 99 | 5 |
| Bac Can | 42 | Pac Nam (BC) | 99 | 5 |
| Bac Can | 43 | Khuoi Nung | 99 | 5 |
| Bac Can | 44 | Nga Ba | 99 | 5 |
| Yen Bai | 20 | Lao Chai | 98 | 5 |
| Lao Cai | 28 | Den Sang | 98 | 5 |
| Ha Giang | 37 | Ta Lang | 98 | 5 |
| Bac Can | 46 | Don Phong | 98 | 5 |
| Lao Cai | 25 | Thanh Phu | 97 | 5 |
| Lao Cai | 26 | Ban Xeo | 96 | 5 |
| Lao Cai | 27 | Muong Hum 2 | 96 | 5 |
| Lao Cai | 29 | Soi Chat | 96 | 5 |
| Dien Bien | 7 | Na Phat | 95 | 5 |
| Dien Bien | 8 | Pa Bat | 95 | 5 |
| Dien Bien | 9 | Su Lu | 95 | 5 |
| Dien Bien | 10 | Ban Bung | 95 | 5 |
| Dien Bien | 11 | Pac Nam (DB) | 95 | 5 |
| Yen Bai | 21 | Pu Trang | 95 | 5 |
| Bac Can | 47 | Quang Chu | 95 | 5 |
| Ha Giang | 38 | Suoi Dau | 90 | 5 |
| Bac Can | 45 | Na Leng | 89 | 5 |
| Ha Giang | 39 | Diec | 82 | 5 |
| Tuyen Quang | 33 | Sung | 80 | 5 |
| Ha Giang | 40 | Lien Hiep | 80 | 5 |
| Tuyen Quang | 31 | Trinh | 75 | 4 |
| Tuyen Quang | 34 | Ngoi Lien | 60 | 4 |
| Tuyen Quang | 35 | Dong Ach | 60 | 4 |
| Yen Bai | 19 | Ngoi That | 55 | 3 |
| Yen Bai | 22 | Ta Tiu | 55 | 3 |
| Yen Bai | 18 | Ngoi Thap | 45 | 3 |
| Son La | 1 | Ban Khoang | | 0 |
| Lai Chau | 13 | Pa Tan | | 0 |
| Lao Cai | 24 | Trung Do | | 0 |
| Tuyen Quang | 32 | Na Nham | | 0 |
| Cao Bang | 51 | Ban Mon | | 0 |

6. 経済状況

| Province | Br. No. | Bridge Name (Revised in March 2006) | 平均収入/月 (1000VND) | 評価点 (重み=1.0) |
|-------------|---------|---|---------------------|-----------------|
| Dien Bien | 11 | Pac Nam (DB) | 133 | 5 |
| Dien Bien | 10 | Ban Bung | 140 | 5 |
| Lai Chau | 14 | Nam Puc | 140 | 5 |
| Lai Chau | 15 | Huoi Dit | 140 | 5 |
| Lai Chau | 16 | Nam Ham | 140 | 5 |
| Lai Chau | 17 | Nam Cum | 140 | 5 |
| Cao Bang | 48 | Dong May | 148 | 5 |
| Bac Can | 42 | Pac Nam (BC) | 150 | 5 |
| Cao Bang | 52 | Keo Ai | 150 | 5 |
| Cao Bang | 50 | Ban Sac | 154 | 5 |
| Cao Bang | 49 | Binh Long | 158 | 5 |
| Ha Giang | 39 | Diec | 160 | 5 |
| Dien Bien | 7 | Na Phat | 162 | 4 |
| Dien Bien | 8 | Pa Bat | 162 | 4 |
| Dien Bien | 9 | Su Lu | 162 | 4 |
| Ha Giang | 38 | Suoi Dau | 170 | 4 |
| Bac Can | 43 | Khuoi Nung | 170 | 4 |
| Bac Can | 44 | Nga Ba | 170 | 4 |
| Son La | 3 | Ban Tum | 180 | 4 |
| Son La | 4 | Na Do | 180 | 4 |
| Son La | 5 | Na Tra | 180 | 4 |
| Son La | 6 | Ban Pang | 180 | 4 |
| Bac Can | 46 | Don Phong | 180 | 4 |
| Son La | 2 | Ban Sai | 190 | 4 |
| Ha Giang | 41 | Ban An | 190 | 4 |
| Lai Chau | 12 | San Thang | 200 | 4 |
| Tuyen Quang | 30 | Ban Nghien | 200 | 4 |
| Ha Giang | 36 | Na Lan | 200 | 4 |
| Ha Giang | 37 | Ta Lang | 200 | 4 |
| Ha Giang | 40 | Lien Hiep | 250 | 3 |
| Bac Can | 45 | Na Leng | 280 | 3 |
| Bac Can | 47 | Quang Chu | 280 | 3 |
| Yen Bai | 18 | Ngoi Thap | 300 | 3 |
| Yen Bai | 19 | Ngoi That | 300 | 3 |
| Yen Bai | 20 | Lao Chai | 300 | 3 |
| Yen Bai | 21 | Pu Trang | 300 | 3 |
| Yen Bai | 23 | Ben Cao | 300 | 3 |
| Tuyen Quang | 31 | Trinh | 300 | 3 |
| Tuyen Quang | 33 | Sung | 300 | 3 |
| Tuyen Quang | 34 | Ngoi Lien | 300 | 3 |
| Tuyen Quang | 35 | Dong Ach | 300 | 3 |
| Lao Cai | 28 | Den Sang | 310 | 3 |
| Yen Bai | 22 | Ta Tiu | 350 | 2 |
| Lao Cai | 25 | Thanh Phu | 350 | 2 |
| Lao Cai | 26 | Ban Xeo | 350 | 2 |
| Lao Cai | 27 | Muong Hum 2 | 350 | 2 |
| Lao Cai | 29 | Soi Chat | 350 | 2 |
| Son La | 1 | Ban Khoang | | 0 |
| Lai Chau | 13 | Pa Tan | | 0 |
| Lao Cai | 24 | Trung Do | | 0 |
| Tuyen Quang | 32 | Na Nham | | 0 |
| Cao Bang | 51 | Ban Mon | | 0 |

7-1. 現況交通量（交通量データ）

| Province | Br. No. | Bridge Name (Revised in March 2006) | Car | Light truck | Heavy Truck (3 axes) | Minibus | Bus | Tractor | Motorcycle Three- wheeled taxi | Bicycle Pedicab |
|-------------|---------|---|-----|-------------|----------------------------|---------|------|--------------|--------------------------------------|--------------------|
| | | | 乗用車 | 軽トラック | 重トラック (3軸) | ミニバス | 大型バス | トラクター カート | バイク 三輪タク シー | 自転車 |
| | | PCU換算係数 | 1.0 | 2.0 | 2.5 | 2.0 | 3.0 | 0.3 | 0.3 | 0.1 |
| Son La | 1 | Ban Khoang | 2 | 25 | 20 | 0 | 0 | 0 | 70 | 30 |
| | 2 | Ban Sai | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 30 |
| | 3 | Ban Tum | 0 | 12 | 0 | 0 | 0 | 0 | 60 | 40 |
| | 4 | Na Do | 0 | 15 | 3 | 0 | 0 | 10 | 300 | 20 |
| | 5 | Na Tra | 0 | 15 | 3 | 0 | 0 | 10 | 300 | 20 |
| | 6 | Ban Pang | 0 | 15 | 3 | 0 | 0 | 10 | 300 | 20 |
| Dien Bien | 7 | Na Phat | 0 | 5 | 5 | 0 | 0 | 0 | 200 | 0 |
| | 8 | Pa Bat | 2 | 8 | 8 | 0 | 0 | 0 | 500 | 0 |
| | 9 | Su Lu | 4 | 9 | 13 | 0 | 0 | 0 | 500 | 0 |
| | 10 | Ban Bung | 0 | 0 | 0 | 0 | 0 | 0 | 500 | 0 |
| | 11 | Pac Nam (DB) | 0 | 20 | 0 | 0 | 0 | 0 | 400 | 0 |
| Lai Chau | 12 | San Thang | 0 | 40 | 0 | 0 | 0 | 0 | 100 | 0 |
| | 13 | Pa Tan | 0 | 10 | 0 | 0 | 0 | 0 | 200 | 0 |
| | 14 | Nam Puc | 0 | 15 | 0 | 0 | 0 | 0 | 60 | 0 |
| | 15 | Huoi Dit | 4 | 15 | 15 | 0 | 0 | 0 | 55 | 0 |
| | 16 | Nam Ham | 0 | 15 | 20 | 0 | 0 | 0 | 60 | 0 |
| | 17 | Nam Cum | 4 | 15 | 15 | 0 | 0 | 0 | 65 | 0 |
| Yen Bai | 18 | Ngoi Thap | 0 | 31 | 20 | 0 | 0 | 0 | 200 | 0 |
| | 19 | Ngoi That | 0 | 29 | 16 | 0 | 0 | 0 | 280 | 0 |
| | 20 | Lao Chai | 0 | 17 | 5 | 0 | 0 | 0 | 200 | 0 |
| | 21 | Pu Trang | 0 | 0 | 0 | 0 | 0 | 0 | 250 | 0 |
| | 22 | Ta Tiu | 0 | 20 | 10 | 0 | 0 | 0 | 300 | 0 |
| | 23 | Ben Cao | 0 | 0 | 0 | 0 | 0 | 0 | 350 | 0 |
| Lao Cai | 24 | Trung Do | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 25 | Thanh Phu | 0 | 27 | 22 | 0 | 0 | 0 | 450 | 570 |
| | 26 | Ban Xeo | 5 | 45 | 28 | 0 | 0 | 0 | 600 | 570 |
| | 27 | Muong Hum 2 | 5 | 42 | 30 | 0 | 0 | 0 | 400 | 675 |
| | 28 | Den Sang | 5 | 37 | 25 | 0 | 0 | 0 | 300 | 570 |
| | 29 | Soi Chat | 0 | 0 | 0 | 0 | 0 | 0 | 700 | 0 |
| Tuyen Quang | 30 | Ban Nghien | 0 | 0 | 0 | 0 | 0 | 0 | 60 | 0 |
| | 31 | Trinh | 0 | 0 | 0 | 0 | 0 | 0 | 300 | 0 |
| | 32 | Na Nham | 0 | 0 | 0 | 0 | 0 | 0 | 300 | 0 |
| | 33 | Sung | 0 | 0 | 0 | 0 | 0 | 0 | 380 | 0 |
| | 34 | Ngoi Lien | 0 | 0 | 0 | 0 | 0 | 0 | 200 | 0 |
| | 35 | Dong Ach | 0 | 0 | 0 | 0 | 0 | 0 | 300 | 0 |
| Ha Giang | 36 | Na Lan | 4 | 5 | 2 | 0 | 0 | 0 | 120 | 70 |
| | 37 | Ta Lang | 0 | 5 | 3 | 0 | 0 | 0 | 400 | 80 |
| | 38 | Suoi Dau | 0 | 5 | 3 | 0 | 0 | 0 | 300 | 60 |
| | 39 | Diec | 0 | 6 | 3 | 0 | 0 | 0 | 200 | 60 |
| | 40 | Lien Hiep | 5 | 8 | 6 | 0 | 0 | 0 | 360 | 50 |
| | 41 | Ban An | 0 | 10 | 8 | 0 | 0 | 0 | 150 | 50 |
| Bac Can | 42 | Pac Nam (BC) | 0 | 50 | 50 | 0 | 0 | 15 | 250 | 120 |
| | 43 | Khuoi Nung | 0 | 50 | 50 | 0 | 0 | 15 | 250 | 120 |
| | 44 | Nga Ba | 0 | 50 | 50 | 0 | 0 | 15 | 250 | 120 |
| | 45 | Na Leng | 0 | 60 | 50 | 0 | 0 | 110 | 2150 | 200 |
| | 46 | Don Phong | 0 | 60 | 45 | 0 | 0 | 85 | 1000 | 1500 |
| | 47 | Quang Chu | 0 | 70 | 50 | 0 | 0 | 90 | 350 | 600 |
| Cao Bang | 48 | Dong May | 0 | 20 | 12 | 0 | 0 | 120 | 200 | 400 |
| | 49 | Binh Long | 100 | 310 | 230 | 4 | 2 | 98 | 1000 | 700 |
| | 50 | Ban Sac | 20 | 38 | 22 | 0 | 0 | 52 | 290 | 520 |
| | 51 | Ban Mon | 12 | 30 | 20 | 0 | 0 | 50 | 300 | 456 |
| | 52 | Keo Ai | 10 | 8 | 3 | 0 | 0 | 28 | 120 | 328 |

7-2. 現況交通量（PCU換算による評価点の設定）

| Calculation of PCU | | | Car | Light truck | Heavy Truck (3 axes) | Minibus | Bus | Tractor | Motorcycle Three-wheeled taxi | Bicycle Pedicab | PCU | 評価点 (重み=1.0) |
|--------------------|---------|--------------|-------|-------------|----------------------|---------|------|----------|-------------------------------|-----------------|---------|--------------|
| | | | 乗用車 | 軽トラック | 重トラック (3軸) | ミニバス | 大型バス | トラクターカート | バイク三輪タクシー | 自転車 | | |
| PCU換算係数 | | | 1.0 | 2.0 | 2.5 | 2.0 | 3.0 | 0.3 | 0.3 | 0.1 | | |
| Province | Br. No. | Bridge Name | | | | | | | | | | |
| Cao Bang | 49 | Binh Long | 100.0 | 620.0 | 575.0 | 8.0 | 6.0 | 29.4 | 300.0 | 70.0 | 1,708.4 | 5 |
| Bac Can | 45 | Na Leng | 0.0 | 120.0 | 125.0 | 0.0 | 0.0 | 33.0 | 645.0 | 20.0 | 943.0 | 4 |
| Bac Can | 46 | Don Phong | 0.0 | 120.0 | 112.5 | 0.0 | 0.0 | 25.5 | 300.0 | 150.0 | 708.0 | 4 |
| Bac Can | 47 | Quang Chu | 0.0 | 140.0 | 125.0 | 0.0 | 0.0 | 27.0 | 105.0 | 60.0 | 457.0 | 3 |
| Lao Cai | 26 | Ban Xeo | 5.0 | 90.0 | 70.0 | 0.0 | 0.0 | 0.0 | 180.0 | 57.0 | 402.0 | 3 |
| Lao Cai | 27 | Muong Hum 2 | 5.0 | 84.0 | 75.0 | 0.0 | 0.0 | 0.0 | 120.0 | 67.5 | 351.5 | 2 |
| Bac Can | 42 | Pac Nam (BC) | 0.0 | 100.0 | 125.0 | 0.0 | 0.0 | 4.5 | 75.0 | 12.0 | 316.5 | 2 |
| Bac Can | 43 | Khuoi Nung | 0.0 | 100.0 | 125.0 | 0.0 | 0.0 | 4.5 | 75.0 | 12.0 | 316.5 | 2 |
| Bac Can | 44 | Nga Ba | 0.0 | 100.0 | 125.0 | 0.0 | 0.0 | 4.5 | 75.0 | 12.0 | 316.5 | 2 |
| Cao Bang | 50 | Ban Sac | 20.0 | 76.0 | 55.0 | 0.0 | 0.0 | 15.6 | 87.0 | 52.0 | 305.6 | 2 |
| Lao Cai | 25 | Thanh Phu | 0.0 | 54.0 | 55.0 | 0.0 | 0.0 | 0.0 | 135.0 | 57.0 | 301.0 | 2 |
| Lao Cai | 28 | Den Sang | 5.0 | 74.0 | 62.5 | 0.0 | 0.0 | 0.0 | 90.0 | 57.0 | 288.5 | 2 |
| Lao Cai | 29 | Soi Chat | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 210.0 | 0.0 | 210.0 | 2 |
| Cao Bang | 48 | Dong May | 0.0 | 40.0 | 30.0 | 0.0 | 0.0 | 36.0 | 60.0 | 40.0 | 206.0 | 2 |
| Dien Bien | 9 | Su Lu | 4.0 | 18.0 | 32.5 | 0.0 | 0.0 | 0.0 | 150.0 | 0.0 | 204.5 | 2 |
| Dien Bien | 8 | Pa Bat | 2.0 | 16.0 | 20.0 | 0.0 | 0.0 | 0.0 | 150.0 | 0.0 | 188.0 | 2 |
| Yen Bai | 19 | Ngoi That | 0.0 | 58.0 | 40.0 | 0.0 | 0.0 | 0.0 | 84.0 | 0.0 | 182.0 | 2 |
| Yen Bai | 18 | Ngoi Thap | 0.0 | 62.0 | 50.0 | 0.0 | 0.0 | 0.0 | 60.0 | 0.0 | 172.0 | 2 |
| Dien Bien | 11 | Pac Nam (DB) | 0.0 | 40.0 | 0.0 | 0.0 | 0.0 | 0.0 | 120.0 | 0.0 | 160.0 | 2 |
| Yen Bai | 22 | Ta Tiu | 0.0 | 40.0 | 25.0 | 0.0 | 0.0 | 0.0 | 90.0 | 0.0 | 155.0 | 2 |
| Dien Bien | 10 | Ban Bung | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 150.0 | 0.0 | 150.0 | 2 |
| Ha Giang | 40 | Lien Hiep | 5.0 | 16.0 | 15.0 | 0.0 | 0.0 | 0.0 | 108.0 | 5.0 | 149.0 | 2 |
| Ha Giang | 37 | Ta Lang | 0.0 | 10.0 | 7.5 | 0.0 | 0.0 | 0.0 | 120.0 | 8.0 | 145.5 | 2 |
| Son La | 4 | Na Do | 0.0 | 30.0 | 7.5 | 0.0 | 0.0 | 3.0 | 90.0 | 2.0 | 132.5 | 2 |
| Son La | 5 | Na Tra | 0.0 | 30.0 | 7.5 | 0.0 | 0.0 | 3.0 | 90.0 | 2.0 | 132.5 | 2 |
| Son La | 6 | Ban Pang | 0.0 | 30.0 | 7.5 | 0.0 | 0.0 | 3.0 | 90.0 | 2.0 | 132.5 | 2 |
| Tuyen Quang | 33 | Sung | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 114.0 | 0.0 | 114.0 | 2 |
| Ha Giang | 38 | Suoi Dau | 0.0 | 10.0 | 7.5 | 0.0 | 0.0 | 0.0 | 90.0 | 6.0 | 113.5 | 2 |
| Cao Bang | 52 | Keo Ai | 10.0 | 16.0 | 7.5 | 0.0 | 0.0 | 8.4 | 36.0 | 32.8 | 110.7 | 2 |
| Lai Chau | 12 | San Thang | 0.0 | 80.0 | 0.0 | 0.0 | 0.0 | 0.0 | 30.0 | 0.0 | 110.0 | 2 |
| Yen Bai | 20 | Lao Chai | 0.0 | 34.0 | 12.5 | 0.0 | 0.0 | 0.0 | 60.0 | 0.0 | 106.5 | 2 |
| Yen Bai | 23 | Ben Cao | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 105.0 | 0.0 | 105.0 | 2 |
| Lai Chau | 16 | Nam Ham | 0.0 | 30.0 | 50.0 | 0.0 | 0.0 | 0.0 | 18.0 | 0.0 | 98.0 | 1 |
| Lai Chau | 17 | Nam Cum | 4.0 | 30.0 | 37.5 | 0.0 | 0.0 | 0.0 | 19.5 | 0.0 | 91.0 | 1 |
| Tuyen Quang | 31 | Trinh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 90.0 | 0.0 | 90.0 | 1 |
| Tuyen Quang | 35 | Dong Ach | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 90.0 | 0.0 | 90.0 | 1 |
| Ha Giang | 41 | Ban An | 0.0 | 20.0 | 20.0 | 0.0 | 0.0 | 0.0 | 45.0 | 5.0 | 90.0 | 1 |
| Lai Chau | 15 | Huoi Dit | 4.0 | 30.0 | 37.5 | 0.0 | 0.0 | 0.0 | 16.5 | 0.0 | 88.0 | 1 |
| Ha Giang | 39 | Diec | 0.0 | 12.0 | 7.5 | 0.0 | 0.0 | 0.0 | 60.0 | 6.0 | 85.5 | 1 |
| Dien Bien | 7 | Na Phat | 0.0 | 10.0 | 12.5 | 0.0 | 0.0 | 0.0 | 60.0 | 0.0 | 82.5 | 1 |
| Yen Bai | 21 | Pu Trang | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 75.0 | 0.0 | 75.0 | 1 |
| Ha Giang | 36 | Na Lan | 4.0 | 10.0 | 5.0 | 0.0 | 0.0 | 0.0 | 36.0 | 7.0 | 62.0 | 1 |
| Tuyen Quang | 34 | Ngoi Lien | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 60.0 | 0.0 | 60.0 | 1 |
| Lai Chau | 14 | Nam Puc | 0.0 | 30.0 | 0.0 | 0.0 | 0.0 | 0.0 | 18.0 | 0.0 | 48.0 | 1 |
| Son La | 3 | Ban Tum | 0.0 | 24.0 | 0.0 | 0.0 | 0.0 | 0.0 | 18.0 | 4.0 | 46.0 | 1 |
| Son La | 2 | Ban Sai | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 15.0 | 3.0 | 18.0 | 1 |
| Tuyen Quang | 30 | Ban Nghien | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 18.0 | 0.0 | 18.0 | 1 |
| Cao Bang | 51 | Ban Mon | | | | | | | | | | 0 |
| Tuyen Quang | 32 | Na Nham | | | | | | | | | | 0 |
| Lai Chau | 13 | Pa Tan | | | | | | | | | | 0 |
| Son La | 1 | Ban Khoang | | | | | | | | | | 0 |
| Lao Cai | 24 | Trung Do | | | | | | | | | | 0 |

8-4 水文調査結果

1. RESULTS OF HEARING SURVEY (F/S in 2005) (1/2)

| Bridge | | 1st Flood | | 2nd Flood | | 3rd Flood | | Water Level (DL+m) | | |
|--------|------------|-----------|-------------|-----------|-------------|-----------|-------------|--------------------|---------|-------|
| No. | Name | Year | Level(DL+m) | Year | Level(DL+m) | Year | Level(DL+m) | Annual | Minimum | |
| No.01 | Ban Khoang | 1 | 1985 | 19.9 | 1997 | 19.3 | 2000 | 19.2 | 18.6 | 16.4 |
| | | 2 | 1985 | 20.0 | 1997 | 19.4 | 2000 | 18.9 | 18.5 | 16.4 |
| | | 3 | 1985 | 20.0 | 1997 | 19.2 | 2000 | 19.1 | 18.7 | 16.4 |
| No.02 | Ban Sai | 1 | 1985 | 30.0 | 1997 | 27.0 | 2000 | 26.0 | 25.8 | 22.5 |
| | | 2 | 1975 | 39.3 | 2000 | 26.9 | 1995 | 26.0 | 25.8 | 22.0 |
| | | 3 | 1975 | 30.3 | 2000 | 26.9 | 1995 | 25.8 | 25.7 | 22.0 |
| No.03 | Ban Tum | 1 | 1975 | 20.7 | 2000 | 19.9 | 1995 | 16.8 | 16.3 | 13.3 |
| | | 2 | 1975 | 20.7 | 2000 | 19.9 | 1995 | 16.8 | 16.4 | 13.3 |
| | | 3 | 1975 | 20.5 | 2000 | 19.8 | 1995 | 16.8 | 16.4 | 13.3 |
| No.04 | Na Do | 1 | 1975 | 20.4 | 2005 | 20.2 | 1995 | 19.9 | 20.1 | 16.5 |
| | | 2 | | 20.5 | | 20.2 | | 19.6 | 20.2 | 16.5 |
| | | 3 | 1975 | 20.6 | 2005 | 20.1 | 1995 | 19.6 | 20.1 | 16.6 |
| No.05 | Na Tra | 1 | 1975 | 21.2 | 2005 | 20.0 | 1995 | 19.5 | 18.9 | 17.4 |
| | | 2 | 1975 | 21.3 | 2005 | 19.9 | 1995 | 19.6 | 18.8 | 17.3 |
| | | 3 | 1975 | 21.1 | 2005 | 20.0 | 1995 | 19.4 | 18.9 | 17.4 |
| No.06 | Ban Pang | 1 | 1975 | 28.6 | 2005 | 27.3 | 1995 | 27.2 | 26.7 | 24.5 |
| | | 2 | | 28.5 | | 27.4 | | 27.1 | 26.6 | 24.3 |
| | | 3 | | 28.7 | | 27.2 | | 27.1 | 26.6 | 24.3 |
| No.07 | Na Phat | 1 | 1997 | 897.1 | | 896.0 | | 894.0 | | |
| | | 2 | 1997 | 897.1 | | 896.0 | | 894.0 | | |
| | | 3 | 1997 | 897.1 | | 896.0 | | 894.0 | | |
| No.08 | Pa Bat | 1 | 1975 | 892.3 | | 888.2 | | | 888.1 | |
| | | 2 | 1975 | 892.2 | | 888.7 | | | 888.0 | |
| | | 3 | 1975 | 892.2 | | 888.2 | | | 888.2 | |
| No.09 | Su Lu | 1 | 1997 | 890.5 | 1992 | 888.3 | | | 885.2 | |
| | | 2 | 1997 | 890.5 | 1992 | 888.4 | | | 885.4 | |
| | | 3 | 1997 | 890.8 | 1992 | 888.2 | | | 885.3 | |
| No.10 | Ban Pung | 1 | 1958 | 895.8 | 1979 | 895.1 | 1986 | 894.7 | | |
| | | 2 | 1958 | 895.7 | 1979 | 895.0 | 1986 | 894.6 | | |
| | | 3 | 1958 | 895.7 | 1979 | 895.0 | 1986 | 894.5 | | |
| No.11 | Pac Nam | 1 | 1958 | 895.8 | 1979 | 895.5 | 1986 | 894.5 | 894.8 | |
| | | 2 | 1958 | 895.5 | 1979 | 894.3 | | | 894.3 | |
| | | 3 | 1958 | 895.5 | 1979 | 894.3 | 1986 | 894.3 | 894.1 | |
| No.12 | Sa Thang | 1 | 1973 | 100.0 | 1987 | 99.6 | 1984 | 99.3 | | |
| No.13 | Pa Tan | 1 | 1976 | 84.8 | 1970 | 84.4 | 1971 | 84.1 | | |
| No.14 | Nam Puc | 1 | 1963 | 66.7 | 1970 | 66.7 | 1969 | 66.5 | | |
| No.15 | Huoi Dit | 1 | 1963 | 85.0 | 1970 | 84.8 | 1969 | 84.3 | | |
| No.16 | Nam Han | 1 | 1963 | 81.8 | 1970 | 81.5 | 1969 | 81.4 | | |
| No.17 | Nam Cum | 1 | 1963 | 96.8 | 1970 | 96.5 | 1969 | 96.2 | | |
| No.18 | Ngoi Thap | 1 | 2005 | 196.9 | 1996 | 195.7 | 2004 | 195.2 | 193.6 | 190.2 |
| | | 2 | 2005 | 196.8 | 1996 | 195.6 | 2004 | 195.1 | 193.5 | 190.1 |
| | | 3 | 2005 | 196.7 | 1996 | 195.5 | 2004 | 195.0 | 193.4 | 190.0 |
| No.19 | Ngoi That | 1 | 2005 | 297.3 | 1996 | 296.8 | 2004 | 295.4 | 291.3 | 291.1 |
| | | 2 | 2005 | 297.1 | 1996 | 296.6 | 2004 | 295.2 | 291.0 | 290.9 |
| | | 3 | 2005 | 296.9 | 1996 | 296.4 | 2004 | 295.0 | 290.8 | 290.7 |
| No.20 | Lao Chai | 1 | 1992 | 195.4 | 1998 | 194.5 | 2002 | 192.8 | 191.5 | 189.2 |
| | | 2 | 1992 | 195.0 | 1998 | 194.1 | 2002 | 192.4 | 191.1 | 186.7 |
| | | 3 | 1992 | 194.6 | 1998 | 193.7 | 2002 | 192.0 | 190.7 | 186.5 |
| No.21 | Pu Trang | 1 | 1992 | 195.4 | 1998 | 194.5 | 2002 | 192.8 | 191.5 | 189.2 |
| | | 2 | 1992 | 195.0 | 1998 | 194.1 | 2002 | 192.4 | 191.1 | 186.7 |
| | | 3 | 1992 | 194.6 | 1998 | 193.7 | 2002 | 192.0 | 190.7 | 186.5 |
| No.22 | Ta Tiu | 1 | 2005 | 101.6 | 1994 | 99.8 | 1986 | 98.6 | 98.6 | 98.3 |
| | | 2 | 2005 | 101.2 | 1994 | 99.4 | 1986 | 98.3 | 97.9 | 96.9 |
| | | 3 | 2005 | 100.9 | 1994 | 99.1 | 1986 | 97.9 | 97.6 | 96.5 |
| No.23 | Ben Cao | 1 | 2005 | 97.5 | 1994 | 96.3 | 1986 | 96.1 | 94.0 | 92.5 |
| | | 2 | 2005 | 97.3 | 1994 | 96.1 | 1986 | 95.9 | 93.7 | 92.3 |
| | | 3 | 2005 | 97.0 | 1994 | 95.8 | 1986 | 95.6 | 93.4 | 92.0 |
| No.24 | Trung Do | 1 | 1989 | 174.5 | 2001 | 171.3 | 2002 | 170.1 | 169.9 | 196.6 |
| | | 2 | 1989 | 174.4 | 2001 | 171.2 | 2002 | 170.0 | 169.7 | 167.5 |
| | | 3 | 1989 | 174.3 | 2001 | 171.1 | 2002 | 169.9 | 169.6 | 167.3 |

RESULTS OF HEARING SURVEY (F/S in 2005) (2/2)

| Bridge | | 1st Flood | | 2nd Flood | | 3rd Flood | | Water Level (DL+m) | | |
|--------|------------|-----------|-------------|-----------|-------------|-----------|-------------|--------------------|---------|--------|
| No. | Name | Year | Level(DL+m) | Year | Level(DL+m) | Year | Level(DL+m) | Annual | Minimum | |
| No.25 | Thanh Phu | 1 | 1986 | 87.5 | 2003 | 85.9 | 2000 | 84.3 | 82.2 | 80.01 |
| | | 2 | 1986 | 87.8 | 2003 | 86.2 | 2000 | 84.6 | 82.5 | 80.3 |
| | | 3 | 1986 | 88.1 | 2003 | 86.5 | 2000 | 84.9 | 82.8 | 80.59 |
| No.26 | Ban Xeo | 1 | 2001 | 40.9 | 1995 | 40.3 | 1983 | 40.1 | 39.1 | 36.8 |
| No.27 | Muong Hun | 1 | 2001 | 194.6 | 1995 | 194.3 | 1983 | 194.1 | 193.4 | 190.0 |
| No.28 | Den Sang | 1 | 2001 | 94.5 | 1997 | 94.4 | 1983 | 93.8 | 93.4 | 92.3 |
| No.29 | Soi Chat | 1 | 1984 | 199.3 | 2000 | 196.9 | 1991 | 196.1 | 195.9 | 192.8 |
| | | 2 | 1984 | 198.5 | 2000 | 196.1 | 1991 | 195.3 | 195.1 | 192.0 |
| | | 1 | 1971 | 97.6 | 2001 | 96.0 | 1986 | 95.4 | 93.7 | 89.2 |
| No.30 | Ban Nghien | 2 | 1971 | 97.7 | 2001 | 96.0 | 1986 | 95.5 | 93.8 | 90.3 |
| | | 3 | 1971 | 97.6 | 2001 | 95.9 | 1986 | 95.4 | 93.7 | 88.7 |
| | | 1 | 1971 | 100.4 | 2001 | 98.9 | 1986 | 98.4 | 94.1 | 87.3 |
| No.31 | Trinh | 2 | 1971 | 100.5 | 2001 | 98.9 | 1986 | 98.4 | 94.2 | 87.5 |
| | | 3 | 1971 | 100.3 | 2001 | 98.8 | 1986 | 98.3 | 94.1 | 87.2 |
| | | 1 | 1971 | 96.1 | 2001 | 94.5 | 1986 | 94.0 | 90.4 | 83.9 |
| No.32 | Na Nham | 2 | 1971 | 96.1 | 2001 | 94.6 | 1986 | 94.1 | 90.5 | 84 |
| | | 3 | 1971 | 96.0 | 2001 | 94.5 | 1986 | 94.0 | 90.4 | 83.88 |
| No.33 | Sung | 1 | 1971 | 49.7 | | | | | 48.5 | 46.72 |
| No.34 | Ngoi Liem | | 1971 | 51.3 | | | | | 50.2 | 44.02 |
| No.35 | Dong Ach | | 1971 | 46.4 | | | | | 43.1 | 40.18 |
| No.36 | Na Lan | | 1992 | 195.8 | 1999 | 195.2 | 1981 | 194.8 | 194.2 | 188.37 |
| No.37 | Ta Lang | | 1993 | 298.6 | 2000 | 298.2 | 1986 | 298.1 | 297.9 | 296.45 |
| | | 1 | 1966 | 31.6 | 1993 | 30.6 | 2000 | 29.8 | 27.5 | |
| | | 2 | 1966 | 31.2 | 1993 | 30.5 | 2000 | 29.7 | 27.2 | |
| No.38 | Suoi Dau | 3 | 1966 | 31.4 | 1993 | 30.5 | 2000 | 29.7 | 27.3 | |
| | | 1 | 1989 | 21.2 | 1993 | 21.1 | 2005 | 20.8 | 20.6 | |
| | | 2 | 1989 | 21.4 | 1993 | 21.3 | 2005 | 21.0 | 20.7 | |
| No.39 | Diec | 3 | 1989 | 21.6 | 1993 | 21.5 | 2005 | 21.3 | 20.9 | |
| | | 1 | 1987 | 38.8 | 1990 | 38.8 | 2005 | 36.9 | 35.3 | |
| | | 2 | 1987 | 38.8 | 1990 | 38.9 | 2005 | 37.0 | | |
| No.40 | Lien Hiep | 3 | 1987 | 38.5 | 1990 | 38.5 | 2005 | 36.3 | 35.2 | |
| | | 1 | 2004 | 48.2 | 1997 | 45.8 | 2000 | 45.7 | 45.0 | |
| | | 2 | 2004 | 48.5 | 1997 | 46.0 | 2000 | 45.7 | 45.0 | |
| No.41 | Ban An | 3 | 1997 | 45.6 | 2000 | 45.5 | 2004 | 45.2 | 44.7 | |
| No.42 | Pac Nam | | 1971 | 38.6 | | | | | 37.0 | 35 |
| No.43 | Khuoi Nung | | 1971 | 35.8 | | | | | 34.5 | 33.7 |
| No.44 | Nga Ba | | 1971 | 43.9 | | | | | 43.3 | 42.4 |
| No.45 | Na Lang | 1 | 1949 | 42.8 | 1968 | 41.9 | 1989 | 42.2 | | 37.9 |
| | | 2 | 1949 | 42.8 | 1968 | 41.4 | 1989 | 42.2 | | 38.2 |
| | | 3 | 1949 | 42.9 | 1968 | 42.0 | 1989 | 42.3 | | 38.6 |
| No.46 | Don Phong | 1 | 1986 | 45.6 | 1990 | 45.5 | 2002 | 44.5 | | 41.5 |
| | | 2 | 1986 | 45.7 | 1990 | 45.6 | 2002 | 44.6 | | 42.5 |
| | | 3 | 1986 | 45.8 | 1990 | 45.8 | 2002 | 44.6 | | 42.8 |
| No.47 | Quang Chu | 1 | 1992 | 53.4 | 1959 | 53.1 | 1990 | 53.0 | 51.9 | 43.3 |
| | | 2 | 1992 | 53.2 | 1959 | 53.0 | 1999 | 52.8 | 54.7 | 43.2 |
| | | 3 | 1992 | 53.0 | 1959 | 52.7 | 1999 | 52.6 | 51.5 | 44.0 |
| No.48 | Dong May | 1 | 1950 | 46.2 | 1969 | 41.0 | 2001 | 40.2 | 38.0 | 36.1 |
| | | 2 | 1950 | 45.7 | 1969 | 40.5 | 2001 | 40.4 | 37.6 | 36.5 |
| | | 3 | 1950 | 47.1 | 1969 | 41.6 | 2001 | 41.8 | 38.4 | 37.3 |
| No.49 | Binh Long | 1 | 1950 | 51.6 | 2002 | 44.6 | 1999 | 44.5 | 42.4 | 42.1 |
| | | 2 | 1950 | 51.8 | 2002 | 44.8 | 1999 | 44.7 | 42.6 | 42.4 |
| | | 3 | 1950 | 51.4 | 2002 | 44.4 | 1999 | 44.3 | 42.2 | 42.0 |
| No.50 | Bac Sac | 1 | 1968 | 42.0 | 1971 | 40.8 | 1945 | 40.3 | 36.1 | 36.0 |
| | | 2 | 1968 | 41.9 | 1945 | 40.6 | 1971 | 40.5 | 45.6 | 35.1 |
| | | 3 | 1968 | 42.1 | 1945 | 41.1 | 1971 | 41.0 | 36.4 | 36.2 |
| No.51 | Ban Mon | 1 | 1968 | 39.0 | 2001 | 39.0 | 1996 | 38.3 | 30.1 | 36.6 |
| | | 2 | 1968 | 43.6 | 2001 | 43.6 | 1996 | 43.4 | 41.4 | 40.8 |
| | | 3 | 1968 | 41.6 | 2001 | 41.6 | 1996 | 41.4 | 39.4 | 38.6 |
| No.52 | Keo Ai | 1 | 2001 | 41.9 | 1992 | 41.1 | 1986 | 41.0 | 38.6 | 36.9 |
| | | 2 | 2001 | 42.5 | 1992 | 41.7 | 1986 | 41.6 | 39.2 | 38.5 |

2. ANNUAL MAXIMUM DAILY RAINFALL (1/2)

(mm/day)

| | Son La | | | | Dien Bien | | Lai Chau | | Yen Bai | | | |
|------|--------|-----------|-------------|-----------|-----------|-----------|----------|-----------|---------|--------------|-----------|---------|
| | Xa La | Moc Chau* | Quynh Nhai* | Yen Chau* | Dien Bien | Tuan Giao | Muong Te | Tam Duong | Ba Khe | Mu Cang Chai | Ngoi Thia | Van Yen |
| 1955 | | | | | | | | | | | | |
| 1956 | | | | | | | | | | | | |
| 1957 | | | | | | | | | | | | |
| 1958 | | | | | | | | | | | | |
| 1959 | | | | | | | | | | | | |
| 1960 | | | | | | | | | | | | |
| 1961 | | | | | | 162 | 179 | | | | | |
| 1962 | | | | | | 106 | 92 | | | | | |
| 1963 | | | | | | 189 | 319 | | | | | |
| 1964 | | | | | | 76 | 163 | | | | | |
| 1965 | | | | | | 141 | 108 | | | | | |
| 1966 | | | | | | 77 | 142 | | | | | |
| 1967 | | | | | | 128 | 232 | | | | | |
| 1968 | | | | | 55 | 232 | 97 | | | | | |
| 1969 | | | | | 158 | 76 | 251 | | | | | |
| 1970 | | | | | 64 | 125 | 297 | | | | | |
| 1971 | 115 | | | | 128 | 93 | 151 | | | | | |
| 1972 | 64 | | | | 85 | 83 | 181 | | | | | |
| 1973 | 111 | | | | 131 | 153 | 104 | 160 | | | | |
| 1974 | 67 | | | | 54 | 67 | 120 | 89 | | | | |
| 1975 | 276 | | | | 229 | 108 | 61 | 101 | | | | |
| 1976 | 97 | | | | 110 | 132 | 121 | 120 | | | | |
| 1977 | 51 | | | | 114 | 65 | 113 | 104 | | | | |
| 1978 | 98 | | | | 77 | 94 | 148 | 98 | | | | |
| 1979 | 48 | | | | 66 | 84 | 113 | 130 | | | | |
| 1980 | 114 | | | | 110 | 131 | 94 | 114 | | | | |
| 1981 | 76 | | | | 133 | 115 | 123 | 105 | | | | |
| 1982 | 105 | | | | 107 | 109 | 119 | 137 | | | | |
| 1983 | 101 | | | | 98 | 49 | 94 | 121 | | | | |
| 1984 | 67 | | | | 171 | 63 | 183 | 146 | 92 | 143 | 107 | 164 |
| 1985 | 116 | | | | 109 | 71 | 94 | 142 | 155 | 137 | 132 | 102 |
| 1986 | 85 | | | | 65 | 34 | 195 | 132 | 298 | 141 | 155 | 145 |
| 1987 | 55 | | | | 214 | 42 | 131 | 157 | 97 | 96 | 162 | 118 |
| 1988 | 91 | | | | 73 | 80 | 88 | 138 | 125 | 97 | 75 | 118 |
| 1989 | 50 | | | | 114 | 45 | 124 | 113 | 100 | 132 | 128 | 133 |
| 1990 | 89 | | | | 95 | 61 | 100 | 112 | 200 | 77 | 134 | 71 |
| 1991 | 192 | | | | 112 | 106 | 156 | 120 | 140 | 156 | 113 | 126 |
| 1992 | 109 | | | | 121 | 132 | 151 | 134 | 88 | 229 | 94 | 153 |
| 1993 | 146 | | | | 78 | 49 | 108 | 85 | 155 | 66 | 83 | 125 |
| 1994 | 59 | | | | 99 | 104 | 99 | 70 | 298 | 74 | 180 | 135 |
| 1995 | 74 | | | | 97 | 94 | 141 | 121 | 83 | 78 | 112 | 158 |
| 1996 | 80 | | | | 130 | 112 | 161 | 113 | 118 | 102 | 177 | 237 |
| 1997 | 80 | | | | 98 | 176 | 153 | 111 | 100 | 70 | 142 | 158 |
| 1998 | 77 | | | | 110 | 53 | 212 | 124 | 200 | 172 | 104 | 197 |
| 1999 | 46 | | | | 111 | 150 | 99 | 83 | 140 | 52 | 82 | 187 |
| 2000 | 107 | | | | 78 | 110 | 106 | 83 | 93 | 66 | 234 | 157 |
| 2001 | 79 | | | | 62 | 123 | 120 | 97 | 203 | 85 | 107 | 167 |
| 2002 | | | | | 101 | 110 | 100 | 116 | 105 | 168 | 66 | 93 |
| 2003 | | | | | 122 | 111 | 222 | | 240 | 163 | 118 | 138 |
| 2004 | | | | | 67 | 77 | 173 | | 160 | 104 | 169 | 197 |
| 2005 | | | | | | | | | | | | |

PROBABILITY

| % | Son La | | | | Dien Bien | | Lai Chau | | Yen Bai | | | |
|------|--------|-----------|-------------|-----------|-----------|-----------|----------|-----------|---------|--------------|-----------|---------|
| | Xa La | Moc Chau* | Quynh Nhai* | Yen Chau* | Dien Bien | Tuan Giao | Muong Te | Tam Duong | Ba Khe | Mu Cang Chai | Ngoi Thia | Van Yen |
| 0.01 | | | | | 483 | 378 | 640 | 205 | 828 | 404 | 453 | 319 |
| 0.1 | | | | | 375 | 312 | 501 | 190 | 642 | 336 | 373 | 285 |
| 0.2 | | | | | 343 | 291 | 460 | 185 | 586 | 315 | 348 | 274 |
| 0.5 | | | | | 302 | 263 | 406 | 177 | 513 | 287 | 315 | 259 |
| 1 | | 216 | 226 | 212 | 270 | 242 | 365 | 171 | 458 | 265 | 290 | 246 |
| 2 | | 201 | 206 | 193 | 239 | 220 | 324 | 165 | 403 | 242 | 263 | 233 |
| 10 | | | | | 168 | 165 | 229 | 146 | 272 | 183 | 199 | 198 |
| 20 | | | | | 137 | 138 | 187 | 136 | 214 | 155 | 167 | 179 |
| 50 | | | | | 94 | 95 | 128 | 116 | 130 | 108 | 118 | 144 |

ANNUAL MAXIMUM DAILY RAINFALL

(2/2)

(mm/day)

| | Lao Cai | | | | Tuyen Quang | | Ha Giang | | | | Bac Can | | Cao Bang | |
|------|----------|-----------|--------|-----------|-------------|---------|-----------|----------|----------|--------------|---------|--------|----------|-------------|
| | Bao Nhai | Muong Hum | Pho Lu | Thanh Phu | Chiem Hoa | Cau Bam | Bac Quang | Vi Xuyen | Yen Minh | Hoang Su Phi | Cho Moi | Cho Ra | Cao Bang | Trung Khanh |
| 1955 | | | | | | | | | | | | | 130 | |
| 1956 | | | | | | | | | | | | | 51 | |
| 1957 | | | | | | | | | | | | | 154 | |
| 1958 | | | | | | | | | | | | | 183 | |
| 1959 | | | | | | | | | | | | | 84 | |
| 1960 | | | | | | | | 161 | | | 141 | | 150 | |
| 1961 | | | | | 80 | | 214 | | 80 | | 95 | 71 | 66 | 75 |
| 1962 | | | | | 112 | | 170 | 143 | 169 | | 87 | 74 | 40 | 58 |
| 1963 | | | | | 62 | 128 | 241 | 252 | 62 | | 91 | 65 | 40 | 63 |
| 1964 | | | | | 196 | 218 | 224 | 137 | 88 | | 93 | 75 | 64 | 80 |
| 1965 | | | | | 128 | 157 | 172 | 210 | 98 | | 120 | 72 | 100 | 119 |
| 1966 | | | | | 112 | 79 | 258 | | 77 | | 131 | 116 | 121 | 240 |
| 1967 | | | | | 123 | 119 | 157 | 207 | 80 | | 83 | 82 | 84 | 188 |
| 1968 | | | | | 112 | 161 | 170 | 166 | 39 | | 238 | 98 | 116 | 236 |
| 1969 | | | | | 137 | 134 | 289 | 284 | | | 179 | 128 | 89 | 104 |
| 1970 | | | | | 110 | 111 | 315 | 219 | 153 | | 91 | 80 | 100 | 119 |
| 1971 | | | | | 117 | 209 | 396 | 312 | | | 128 | 115 | 103 | 83 |
| 1972 | | | | | 113 | 159 | 402 | 180 | 96 | | 95 | 87 | 99 | 168 |
| 1973 | | | | | 94 | 104 | 221 | 396 | 65 | | 115 | 97 | 127 | 142 |
| 1974 | | | | | 80 | 187 | 322 | 202 | 95 | | 175 | 79 | 97 | 241 |
| 1975 | | | | | 151 | 122 | 303 | 304 | 120 | | 72 | 68 | 66 | 118 |
| 1976 | | | | | 86 | 202 | 188 | 323 | 144 | | 111 | 66 | 138 | 76 |
| 1977 | | | | | 101 | 94 | 333 | 173 | 51 | | 106 | 66 | 153 | 201 |
| 1978 | | | | | 170 | 330 | 224 | 153 | 85 | | 154 | 94 | 80 | 151 |
| 1979 | | | | | 165 | 166 | 255 | 281 | | | 132 | 80 | 73 | 163 |
| 1980 | | | | | 101 | 265 | 285 | 260 | | | 110 | 75 | 68 | 81 |
| 1981 | | | | | 79 | 284 | 361 | 220 | | | 109 | 107 | 49 | 153 |
| 1982 | | | | | 116 | 171 | 173 | 210 | | | 143 | 74 | 119 | 223 |
| 1983 | | 157 | | | 175 | 94 | 231 | 314 | 101 | | 164 | 81 | 92 | 88 |
| 1984 | 81 | 197 | 288 | 48 | 105 | 120 | 262 | 154 | | | 92 | 72 | 126 | 83 |
| 1985 | 120 | 204 | 155 | 56 | 69 | 64 | 207 | 140 | | | 65 | 87 | 112 | 175 |
| 1986 | 76 | 168 | 69 | 216 | 107 | 123 | 418 | 252 | | | 155 | 175 | 152 | 144 |
| 1987 | 75 | 206 | 127 | 86 | 125 | 74 | 343 | 210 | | | 77 | 92 | 92 | 85 |
| 1988 | 47 | 197 | 63 | 50 | 69 | 115 | 280 | 294 | | | 204 | 62 | 158 | 134 |
| 1989 | 198 | 187 | 114 | 55 | 109 | 183 | 341 | 542 | | | 131 | 108 | 64 | 85 |
| 1990 | 66 | 125 | 99 | 54 | 112 | 169 | 279 | 262 | | | 238 | 68 | 70 | 86 |
| 1991 | 72 | 198 | 205 | 48 | 97 | 294 | 248 | 168 | | | 195 | 83 | 98 | 109 |
| 1992 | 78 | 156 | 94 | 67 | 142 | 198 | 205 | 130 | 65 | | 152 | 124 | 70 | 104 |
| 1993 | 58 | 62 | 61 | 92 | 94 | 63 | 206 | 175 | 102 | | 98 | 74 | 142 | 86 |
| 1994 | 61 | 50 | 78 | 82 | 94 | 156 | 355 | 163 | 107 | | 107 | 85 | 77 | 137 |
| 1995 | 108 | 51 | 86 | 64 | 72 | 75 | 203 | 143 | 72 | | 203 | 66 | 84 | 151 |
| 1996 | 131 | 75 | 168 | 70 | 113 | 126 | 245 | 310 | 64 | | 186 | 98 | 116 | 134 |
| 1997 | 88 | 91 | 133 | 84 | 86 | 163 | 294 | 93 | 85 | | 91 | 59 | 120 | 146 |
| 1998 | 122 | 53 | 98 | 142 | 105 | 50 | 351 | 210 | 90 | | 97 | 69 | 89 | 75 |
| 1999 | 67 | 65 | 188 | 98 | 124 | 78 | 427 | 261 | 116 | | 176 | 100 | 92 | 76 |
| 2000 | 92 | 57 | 219 | 148 | 98 | 96 | 352 | 476 | 87 | | 121 | 132 | 190 | 142 |
| 2001 | 149 | 95 | 147 | 61 | 181 | 184 | 247 | 179 | 71 | | 192 | 79 | 93 | 41 |
| 2002 | 145 | 69 | 66 | 65 | 166 | 155 | 376 | 309 | 79 | | 143 | 162 | | 129 |
| 2003 | 81 | 81 | 121 | 204 | 115 | 137 | 346 | 290 | 84 | | 121 | 99 | | 84 |
| 2004 | 117 | 76 | 126 | 87 | 165 | 113 | 189 | 203 | 80 | | 111 | 101 | | 82 |
| 2005 | | | | | | 96.2 | | | | | | 59.9 | | |

PROBABILITY

| % | Lao Cai | | | | Tuyen Quang | | Ha Giang | | | | Bac Can | | Cao Bang | |
|------|----------|-----------|--------|-----------|-------------|---------|-----------|----------|----------|--------------|---------|--------|----------|-------------|
| | Bao Nhai | Muong Hum | Pho Lu | Thanh Phu | Chiem Hoa | Cau Bam | Bac Quang | Vi Xuyen | Yen Minh | Hoang Su Phi | Cho Moi | Cho Ra | Cao Bang | Trung Khanh |
| 0.01 | 433 | 363 | 579 | 468 | 320 | 524 | 652 | 867 | 292 | | 389 | 272 | 298 | 468 |
| 0.1 | 342 | 313 | 461 | 361 | 271 | 435 | 570 | 707 | 243 | | 327 | 224 | 254 | 383 |
| 0.2 | 315 | 297 | 426 | | 256 | 407 | 543 | 658 | 228 | | 308 | 210 | 240 | 357 |
| 0.5 | 279 | 275 | 379 | 287 | 235 | 369 | 508 | 592 | 208 | | 283 | 190 | 222 | 322 |
| 1 | 252 | 257 | 343 | 256 | 219 | 340 | 479 | 541 | 192 | 370 | 262 | 175 | 207 | 294 |
| 2 | 225 | 238 | 306 | 225 | 203 | 310 | 449 | 490 | 175 | 321 | 242 | 160 | 191 | 266 |
| 10 | 159 | 188 | 218 | 153 | 162 | 234 | 373 | 418 | 135 | | 190 | 123 | 170 | 197 |
| 20 | 130 | 164 | 177 | 121 | 142 | 197 | 334 | 304 | 115 | | 165 | 107 | 152 | 164 |
| 50 | 86 | 115 | 115 | 77 | 110 | 137 | 267 | 214 | 85 | | 125 | 83 | 97 | 114 |

3. LIMITED RAINFALL INTENSITY METHOD (22TCN220-95)

This method is adopted for the site of within 100 km² basin.

Waterflow Coefficient (ϕ) according to Table is based on soil type, H and F.

$$\phi = f(\text{Soil Type, H, F})$$

Average length of basin slope (b_s) is calculated as follow.

$$b_s = \frac{1000 \cdot F}{1.8 \cdot (L + \sum l_i)} \quad \text{in case of 2-slope (1.8} \rightarrow 0.9, \text{ in case of 1-slope)}$$

Hydroterrain Coefficient of slope (ϕ_s) is calculated as follow.

$$\phi_s = \frac{b_s}{m_s \cdot l_s^{0.3} \cdot (\phi \cdot H)^{0.4}}$$

Water concentration Period (t_s) according to Table is based on Rain Zone and ϕ_s .

$$t_s = f(\phi_s, \text{Rain Zone})$$

Hydroterrain Coefficient of channel (ϕ_l) is calculated as follow.

$$\phi_l = \frac{1000 \cdot L}{m_l \cdot l_l^{0.3333} \cdot (F \cdot \phi \cdot H)^{0.25}}$$

Module of peak runoff (A_p) according to Table is based on Rain Zone, t_s and ϕ_l .

$$A_p = f(\text{Rain Zone}, t_s, \phi_l)$$

Design discharge (Q_p) is calculated as follow.

$$Q_p = A_p \cdot \phi \cdot H \cdot F \cdot \delta$$

where;

| | |
|------------|--|
| F | : Catchment Area (km ²) |
| L | : River Length (km) |
| $\sum l_i$ | : Total length of sub-basin (km) |
| H | : Daily rainfall (mm/day) |
| m_s | : Roughness Coefficient of slope |
| l_s | : Gradient of slope |
| m_l | : Roughness Coefficient of channel |
| l_l | : Gradient of channel |
| δ | : Reduction Factor by Retention (=1.0) |
| Q_p | : Design Discharge (m ³ /s) |

4. WATERFLOW COEFFICIENT (ϕ)

| Soil Type | Rainfall (mm) | Catchment Area F (km ²) | | | | | | | | | | | | |
|-----------|---------------|-------------------------------------|------|------|------|------|-----------|------|----------|------|------|----------|------|-------|
| | | F<0.1 | | | | | 0.1<F<1.0 | | 1.0<F<10 | | | 10<F<100 | | 100<F |
| II | <100 | 0.96 | 0.96 | 0.93 | 0.90 | 0.88 | 0.85 | 0.81 | 0.78 | 0.76 | 0.74 | 0.67 | 0.65 | 0.60 |
| | 100 ~ 150 | 0.97 | 0.96 | 0.94 | 0.91 | 0.90 | 0.87 | 0.85 | 0.78 | 0.76 | 0.74 | 0.67 | 0.65 | 0.60 |
| | 151 ~ 200 | 0.97 | 0.96 | 0.95 | 0.93 | 0.92 | 0.90 | 0.89 | 0.85 | 0.83 | 0.81 | 0.75 | 0.73 | 0.70 |
| | 201 ~ 250 | 0.97 | 0.96 | 0.96 | 0.95 | 0.94 | 0.93 | 0.89 | 0.89 | 0.89 | 0.85 | 0.85 | 0.85 | 0.85 |
| | 251 ~ 300 | 0.97 | 0.96 | 0.96 | 0.96 | 0.95 | 0.95 | 0.94 | 0.93 | 0.93 | 0.88 | 0.88 | 0.88 | 0.86 |
| | 301 ~ 350 | 0.97 | 0.96 | 0.96 | 0.96 | 0.95 | 0.95 | 0.95 | 0.93 | 0.93 | 0.91 | 0.91 | 0.91 | 0.91 |
| | 400< | 0.97 | 0.96 | 0.96 | 0.96 | 0.95 | 0.95 | 0.95 | 0.93 | 0.93 | 0.91 | 0.91 | 0.91 | 0.91 |
| III | <100 | 0.94 | 0.89 | 0.86 | 0.80 | 0.77 | 0.74 | 0.65 | 0.60 | 0.58 | 0.57 | 0.55 | 0.53 | 0.60 |
| | 100 ~ 150 | 0.95 | 0.93 | 0.90 | 0.85 | 0.81 | 0.77 | 0.72 | 0.63 | 0.62 | 0.60 | 0.56 | 0.55 | 0.55 |
| | 151 ~ 200 | 0.95 | 0.93 | 0.91 | 0.91 | 0.86 | 0.82 | 0.79 | 0.72 | 0.68 | 0.68 | 0.63 | 0.63 | 0.62 |
| | 201 ~ 250 | 0.95 | 0.93 | 0.92 | 0.91 | 0.90 | 0.85 | 0.85 | 0.78 | 0.78 | 0.78 | 0.75 | 0.73 | 0.65 |
| | 251 ~ 300 | 0.95 | 0.93 | 0.92 | 0.91 | 0.90 | 0.85 | 0.85 | 0.78 | 0.78 | 0.78 | 0.76 | 0.75 | 0.67 |
| | 301 ~ 350 | 0.95 | 0.93 | 0.92 | 0.91 | 0.90 | 0.86 | 0.85 | 0.78 | 0.78 | 0.78 | 0.76 | 0.75 | 0.69 |
| | 351 ~ 400 | 0.95 | 0.93 | 0.92 | 0.91 | 0.90 | 0.88 | 0.85 | 0.78 | 0.78 | 0.78 | 0.76 | 0.75 | 0.70 |
| | 401 ~ 450 | 0.95 | 0.93 | 0.92 | 0.91 | 0.90 | 0.89 | 0.89 | 0.80 | 0.80 | 0.78 | 0.76 | 0.75 | 0.71 |
| | 451 ~ 500 | 0.95 | 0.93 | 0.92 | 0.91 | 0.91 | 0.89 | 0.89 | 0.84 | 0.82 | 0.79 | 0.76 | 0.75 | 0.71 |
| | 501 ~ 550 | 0.95 | 0.93 | 0.92 | 0.91 | 0.91 | 0.89 | 0.89 | 0.84 | 0.82 | 0.80 | 0.76 | 0.76 | 0.71 |
| | 551 ~ 600 | 0.95 | 0.93 | 0.92 | 0.91 | 0.91 | 0.89 | 0.89 | 0.84 | 0.82 | 0.80 | 0.76 | 0.76 | 0.71 |
| 600< | 0.95 | 0.93 | 0.92 | 0.91 | 0.91 | 0.89 | 0.89 | 0.84 | 0.82 | 0.80 | 0.76 | 0.76 | 0.71 | |
| IV | <100 | 0.90 | 0.81 | 0.76 | 0.66 | 0.65 | 0.60 | 0.55 | 0.51 | 0.50 | 0.50 | 0.44 | 0.40 | 0.37 |
| | 100 ~ 150 | 0.90 | 0.84 | 0.80 | 0.74 | 0.68 | 0.64 | 0.62 | 0.58 | 0.56 | 0.55 | 0.52 | 0.50 | 0.46 |
| | 151 ~ 200 | 0.90 | 0.88 | 0.87 | 0.82 | 0.78 | 0.75 | 0.72 | 0.66 | 0.63 | 0.63 | 0.60 | 0.57 | 0.55 |
| | 201 ~ 250 | 0.90 | 0.88 | 0.87 | 0.83 | 0.79 | 0.78 | 0.74 | 0.70 | 0.67 | 0.67 | 0.65 | 0.60 | 0.58 |
| | 251 ~ 300 | 0.90 | 0.88 | 0.87 | 0.86 | 0.79 | 0.79 | 0.76 | 0.74 | 0.70 | 0.70 | 0.67 | 0.65 | 0.61 |
| | 301 ~ 350 | 0.90 | 0.88 | 0.87 | 0.86 | 0.80 | 0.80 | 0.78 | 0.76 | 0.72 | 0.71 | 0.69 | 0.67 | 0.64 |
| | 351 ~ 400 | 0.90 | 0.88 | 0.87 | 0.85 | 0.82 | 0.82 | 0.81 | 0.77 | 0.74 | 0.73 | 0.71 | 0.69 | 0.65 |
| | 401 ~ 450 | 0.90 | 0.88 | 0.87 | 0.85 | 0.84 | 0.83 | 0.83 | 0.77 | 0.75 | 0.75 | 0.72 | 0.71 | 0.67 |
| | 451 ~ 500 | 0.90 | 0.88 | 0.87 | 0.85 | 0.84 | 0.84 | 0.83 | 0.78 | 0.76 | 0.77 | 0.73 | 0.72 | 0.68 |
| | 501 ~ 550 | 0.90 | 0.88 | 0.87 | 0.86 | 0.84 | 0.84 | 0.83 | 0.78 | 0.76 | 0.77 | 0.73 | 0.72 | 0.69 |
| | 551 ~ 600 | 0.90 | 0.88 | 0.87 | 0.86 | 0.84 | 0.84 | 0.83 | 0.78 | 0.76 | 0.77 | 0.73 | 0.72 | 0.69 |
| 600< | 0.90 | 0.88 | 0.87 | 0.86 | 0.84 | 0.84 | 0.83 | 0.78 | 0.76 | 0.77 | 0.73 | 0.72 | 0.69 | |
| V | <100 | 0.68 | 0.46 | 0.35 | 0.26 | 0.24 | 0.22 | 0.22 | 0.20 | 0.18 | 0.18 | 0.17 | 0.16 | 0.15 |
| | 100 ~ 150 | 0.71 | 0.56 | 0.46 | 0.41 | 0.40 | 0.34 | 0.32 | 0.28 | 0.27 | 0.25 | 0.23 | 0.22 | 0.20 |
| | 151 ~ 200 | 0.75 | 0.65 | 0.59 | 0.50 | 0.48 | 0.46 | 0.46 | 0.42 | 0.40 | 0.38 | 0.34 | 0.32 | 0.30 |
| | 201 ~ 250 | 0.76 | 0.66 | 0.63 | 0.59 | 0.56 | 0.50 | 0.50 | 0.46 | 0.44 | 0.43 | 0.38 | 0.36 | 0.34 |
| | 251 ~ 300 | 0.77 | 0.71 | 0.66 | 0.59 | 0.58 | 0.54 | 0.54 | 0.49 | 0.48 | 0.46 | 0.41 | 0.40 | 0.36 |
| | 301 ~ 350 | 0.77 | 0.73 | 0.69 | 0.62 | 0.61 | 0.56 | 0.56 | 0.51 | 0.51 | 0.48 | 0.43 | 0.43 | 0.37 |
| | 351 ~ 400 | 0.78 | 0.75 | 0.70 | 0.65 | 0.64 | 0.57 | 0.57 | 0.53 | 0.52 | 0.52 | 0.46 | 0.46 | 0.40 |
| | 401 ~ 450 | 0.79 | 0.76 | 0.72 | 0.67 | 0.67 | 0.58 | 0.58 | 0.54 | 0.54 | 0.53 | 0.47 | 0.47 | 0.41 |
| | 451 ~ 500 | 0.79 | 0.77 | 0.73 | 0.68 | 0.69 | 0.60 | 0.60 | 0.55 | 0.55 | 0.53 | 0.48 | 0.48 | 0.41 |
| | 501 ~ 550 | 0.79 | 0.78 | 0.73 | 0.70 | 0.70 | 0.60 | 0.60 | 0.55 | 0.55 | 0.53 | 0.49 | 0.50 | 0.41 |
| | 551 ~ 600 | 0.79 | 0.78 | 0.73 | 0.70 | 0.70 | 0.60 | 0.60 | 0.55 | 0.55 | 0.53 | 0.50 | 0.50 | 0.41 |
| 600< | 0.79 | 0.78 | 0.73 | 0.70 | 0.70 | 0.60 | 0.60 | 0.55 | 0.55 | 0.53 | 0.50 | 0.50 | 0.41 | |
| VI | | | | 0.25 | | | | 0.20 | | 0.15 | | 0.10 | | 0.10 |

Handbook p-44

5. WATER CONCENTRATION PERIOD (t_c)

(minutes)

| Terrain Coefficient (Fs) | Rain Zone | | | | | | | | | | | | | | | | | |
|--------------------------|-----------|-----|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|-----|------|-------|
| | I | II | III | IV | V | VI | VII | VIII | IX | X | XI | XII | XIII | XIV | XV | XVI | XVII | xviii |
| 1.0 | 9.6 | 9.7 | 9.7 | 9.0 | 9.6 | 9.6 | 16 | 8.4 | 9.7 | 9.8 | 9.5 | 10 | 9.8 | 8.7 | 8.5 | 8.7 | 9.3 | 9.2 |
| 1.5 | 10 | 10 | 10 | 9.0 | 10 | 10 | 18 | 8.5 | 10 | 10 | 10 | 13 | 10 | 9.0 | 8.7 | 9.0 | 9.4 | 9.3 |
| 2.0 | 17 | 15 | 17 | 9.5 | 14 | 10 | 25 | 9 | 13 | 15 | 20 | 20 | 15 | 9.3 | 9.3 | 9.5 | 9.7 | 9.5 |
| 2.5 | 24 | 22 | 20 | 10 | 20 | 15 | 32 | 10 | 15 | 18 | 28 | 23 | 20 | 9.5 | 9.5 | 9.6 | 10 | 9.7 |
| 3.0 | 35 | 28 | 25 | 18 | 30 | 22 | 37 | 20 | 18 | 25 | 35 | 30 | 25 | 11 | 10 | 12 | 20 | 12 |
| 4.0 | 40 | 37 | 32 | 22 | 35 | 30 | 42 | 30 | 25 | 40 | 55 | 35 | 30 | 20 | 20 | 20 | 25 | 20 |
| 5.0 | 53 | 45 | 50 | 30 | 44 | 38 | 50 | 40 | 30 | 45 | 65 | 50 | 40 | 30 | 25 | 30 | 35 | 23 |
| 6.0 | 62 | 60 | 60 | 45 | 60 | 50 | 55 | 55 | 40 | 60 | 72 | 60 | 55 | 35 | 32 | 37 | 40 | 30 |
| 7.0 | 70 | 70 | 72 | 60 | 75 | 70 | 65 | 65 | 65 | 75 | 80 | 75 | 65 | 50 | 50 | 50 | 60 | 40 |
| 8.0 | 75 | 78 | 80 | 68 | 85 | 78 | 75 | 70 | 70 | 85 | 90 | 80 | 70 | 70 | 65 | 65 | 70 | 60 |
| 9.0 | 80 | 87 | 90 | 80 | 90 | 82 | 85 | 80 | 80 | 90 | 95 | 87 | 82 | 80 | 70 | 78 | 80 | 70 |
| 10.0 | 90 | 95 | 100 | 86 | 95 | 88 | 90 | 90 | 95 | 95 | 110 | 105 | 90 | 85 | 80 | 80 | 90 | 80 |
| 12.0 | 100 | 115 | 120 | 95 | 100 | 93 | 100 | 115 | 115 | 110 | 130 | 120 | 100 | 90 | 90 | 90 | 97 | 83 |
| 15.0 | 130 | 150 | 150 | 120 | 120 | 120 | 125 | 135 | 135 | 135 | 160 | 150 | 125 | 115 | 125 | 115 | 120 | 100 |
| 17.0 | 160 | 165 | 180 | 165 | 170 | 150 | 165 | 190 | 170 | 170 | 200 | 190 | 160 | 160 | 150 | 140 | 145 | 130 |
| 20.0 | 200 | 220 | 230 | 200 | 200 | 185 | 205 | 235 | 220 | 220 | 230 | 235 | 200 | 200 | 190 | 175 | 190 | 165 |
| 25.0 | 260 | 280 | 265 | 235 | 260 | 230 | 250 | 305 | 290 | 265 | 300 | 300 | 250 | 250 | 250 | 225 | 240 | 230 |
| 30.0 | 325 | 360 | 365 | 320 | 320 | 310 | 320 | 370 | 370 | 335 | 400 | 380 | 330 | 320 | 320 | 285 | 320 | 300 |
| 35.0 | 370 | 430 | 435 | 400 | 370 | 370 | 400 | 480 | 430 | 345 | 470 | 450 | 400 | 400 | 400 | 355 | 380 | 370 |
| 40.0 | 470 | 530 | 520 | 470 | 480 | 470 | 370 | 495 | 520 | 410 | 560 | 540 | 510 | 480 | 490 | 425 | 465 | 460 |

Handbook p-29

6. MODULE OF PEAK RUNOFF (A_p)

| Rain Zone | t_s (min.) | Terrain Coefficient of Channel (F) | | | | | | | | | | | | | | | |
|-----------|-----------------|------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | 0 | 1 | 5 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 150 | 200 | 220 |
| I | 5 | 0.415 | 0.430 | 0.376 | 0.344 | 0.274 | 0.229 | 0.195 | 0.165 | 0.141 | 0.120 | 0.102 | 0.090 | 0.076 | 0.048 | 0.039 | 0.036 |
| | 10 | 0.332 | 0.316 | 0.276 | 0.245 | 0.201 | 0.168 | 0.144 | 0.122 | 0.104 | 0.088 | 0.075 | 0.066 | 0.058 | 0.035 | 0.029 | 0.027 |
| | 20 | 0.280 | 0.260 | 0.218 | 0.152 | 0.112 | 0.092 | 0.076 | 0.064 | 0.054 | 0.047 | 0.040 | 0.035 | 0.030 | 0.018 | 0.015 | 0.013 |
| | 30 | 0.210 | 0.190 | 0.160 | 0.136 | 0.104 | 0.085 | 0.072 | 0.061 | 0.052 | 0.045 | 0.038 | 0.033 | 0.029 | 0.017 | 0.014 | 0.013 |
| | 60 | 0.150 | 0.143 | 0.125 | 0.111 | 0.091 | 0.076 | 0.065 | 0.055 | 0.047 | 0.040 | 0.034 | 0.030 | 0.026 | 0.016 | 0.013 | 0.012 |
| | 90 | 0.114 | 0.112 | 0.102 | 0.093 | 0.077 | 0.065 | 0.056 | 0.048 | 0.041 | 0.035 | 0.031 | 0.027 | 0.024 | 0.015 | 0.012 | 0.012 |
| | 180 | 0.072 | 0.071 | 0.057 | 0.063 | 0.055 | 0.048 | 0.043 | 0.037 | 0.033 | 0.029 | 0.025 | 0.022 | 0.021 | 0.014 | 0.012 | 0.011 |
| II | 5 | 0.260 | 0.257 | 0.241 | 0.222 | 0.191 | 0.165 | 0.143 | 0.124 | 0.108 | 0.095 | 0.086 | 0.076 | 0.070 | 0.051 | 0.041 | 0.040 |
| | 10 | 0.189 | 0.186 | 0.175 | 0.161 | 0.138 | 0.120 | 0.104 | 0.090 | 0.078 | 0.069 | 0.062 | 0.055 | 0.051 | 0.037 | 0.030 | 0.029 |
| | 20 | 0.117 | 0.114 | 0.104 | 0.093 | 0.087 | 0.065 | 0.055 | 0.047 | 0.040 | 0.034 | 0.030 | 0.026 | 0.024 | 0.018 | 0.015 | 0.014 |
| | 30 | 0.100 | 0.098 | 0.091 | 0.083 | 0.070 | 0.060 | 0.052 | 0.044 | 0.038 | 0.033 | 0.028 | 0.025 | 0.023 | 0.018 | 0.014 | 0.013 |
| | 60 | 0.082 | 0.081 | 0.076 | 0.070 | 0.060 | 0.052 | 0.045 | 0.039 | 0.034 | 0.030 | 0.027 | 0.024 | 0.022 | 0.016 | 0.013 | 0.013 |
| | 90 | 0.067 | 0.066 | 0.063 | 0.059 | 0.052 | 0.046 | 0.040 | 0.035 | 0.031 | 0.027 | 0.025 | 0.022 | 0.020 | 0.015 | 0.012 | 0.012 |
| | 180 | 0.052 | 0.051 | 0.048 | 0.046 | 0.041 | 0.036 | 0.032 | 0.028 | 0.025 | 0.022 | 0.020 | 0.018 | 0.017 | 0.014 | 0.011 | 0.011 |
| III | 5 | 0.260 | 0.252 | 0.238 | 0.216 | 0.190 | 0.167 | 0.145 | 0.136 | 0.122 | 0.112 | 0.104 | 0.096 | 0.089 | 0.069 | 0.054 | 0.047 |
| | 10 | 0.196 | 0.190 | 0.180 | 0.163 | 0.144 | 0.126 | 0.110 | 0.103 | 0.092 | 0.085 | 0.079 | 0.072 | 0.067 | 0.052 | 0.041 | 0.035 |
| | 20 | 0.159 | 0.153 | 0.137 | 0.122 | 0.099 | 0.083 | 0.071 | 0.062 | 0.054 | 0.049 | 0.045 | 0.041 | 0.038 | 0.028 | 0.022 | 0.018 |
| | 30 | 0.132 | 0.129 | 0.116 | 0.104 | 0.087 | 0.074 | 0.065 | 0.057 | 0.051 | 0.046 | 0.042 | 0.039 | 0.036 | 0.027 | 0.021 | 0.018 |
| | 60 | 0.095 | 0.092 | 0.087 | 0.079 | 0.070 | 0.061 | 0.053 | 0.050 | 0.045 | 0.041 | 0.038 | 0.035 | 0.033 | 0.025 | 0.020 | 0.017 |
| | 90 | 0.073 | 0.068 | 0.066 | 0.061 | 0.055 | 0.050 | 0.044 | 0.041 | 0.038 | 0.036 | 0.033 | 0.031 | 0.029 | 0.023 | 0.019 | 0.016 |
| | 180 | 0.058 | 0.054 | 0.052 | 0.049 | 0.045 | 0.042 | 0.038 | 0.036 | 0.033 | 0.030 | 0.030 | 0.027 | 0.026 | 0.021 | 0.017 | 0.015 |
| IV | 5 | 0.385 | 0.370 | 0.349 | 0.319 | 0.269 | 0.236 | 0.205 | 0.177 | 0.165 | 0.141 | 0.127 | 0.114 | 0.105 | 0.076 | 0.060 | 0.052 |
| | 10 | 0.284 | 0.273 | 0.257 | 0.235 | 0.199 | 0.174 | 0.151 | 0.130 | 0.122 | 0.104 | 0.094 | 0.084 | 0.077 | 0.056 | 0.044 | 0.038 |
| | 20 | 0.273 | 0.214 | 0.188 | 0.163 | 0.128 | 0.104 | 0.087 | 0.074 | 0.065 | 0.057 | 0.050 | 0.045 | 0.041 | 0.028 | 0.022 | 0.018 |
| | 30 | 0.200 | 0.184 | 0.163 | 0.142 | 0.115 | 0.095 | 0.082 | 0.070 | 0.062 | 0.055 | 0.048 | 0.043 | 0.039 | 0.027 | 0.021 | 0.018 |
| | 60 | 0.129 | 0.124 | 0.117 | 0.107 | 0.090 | 0.079 | 0.069 | 0.059 | 0.055 | 0.047 | 0.043 | 0.038 | 0.035 | 0.026 | 0.020 | 0.017 |
| | 90 | 0.102 | 0.093 | 0.089 | 0.084 | 0.074 | 0.065 | 0.058 | 0.051 | 0.046 | 0.041 | 0.037 | 0.034 | 0.032 | 0.023 | 0.019 | 0.016 |
| | 180 | 0.072 | 0.071 | 0.067 | 0.063 | 0.056 | 0.050 | 0.046 | 0.041 | 0.038 | 0.033 | 0.032 | 0.031 | 0.028 | 0.021 | 0.018 | 0.016 |
| V | 5 | 0.195 | 0.191 | 0.170 | 0.162 | 0.149 | 0.130 | 0.115 | 0.100 | 0.088 | 0.078 | 0.068 | 0.060 | 0.053 | 0.032 | 0.025 | 0.024 |
| | 10 | 0.161 | 0.157 | 0.140 | 0.134 | 0.123 | 0.107 | 0.095 | 0.083 | 0.073 | 0.064 | 0.057 | 0.050 | 0.044 | 0.027 | 0.021 | 0.020 |
| | 20 | 0.120 | 0.119 | 0.112 | 0.109 | 0.094 | 0.079 | 0.069 | 0.063 | 0.053 | 0.046 | 0.040 | 0.035 | 0.030 | 0.020 | 0.014 | 0.013 |
| | 30 | 0.112 | 0.110 | 0.104 | 0.097 | 0.084 | 0.073 | 0.064 | 0.056 | 0.049 | 0.042 | 0.037 | 0.032 | 0.028 | 0.017 | 0.013 | 0.012 |
| | 60 | 0.098 | 0.097 | 0.086 | 0.082 | 0.075 | 0.066 | 0.058 | 0.051 | 0.045 | 0.039 | 0.035 | 0.030 | 0.027 | 0.016 | 0.013 | 0.012 |
| | 90 | 0.083 | 0.082 | 0.078 | 0.073 | 0.064 | 0.057 | 0.050 | 0.044 | 0.039 | 0.035 | 0.031 | 0.028 | 0.025 | 0.015 | 0.012 | 0.011 |
| | 180 | 0.060 | 0.059 | 0.056 | 0.058 | 0.048 | 0.043 | 0.039 | 0.035 | 0.032 | 0.029 | 0.026 | 0.024 | 0.022 | 0.015 | 0.011 | 0.011 |
| VI | 5 | 0.244 | 0.243 | 0.231 | 0.210 | 0.195 | 0.168 | 0.148 | 0.131 | 0.116 | 0.103 | 0.091 | 0.081 | 0.072 | 0.045 | 0.034 | 0.032 |
| | 10 | 0.185 | 0.190 | 0.180 | 0.164 | 0.152 | 0.131 | 0.116 | 0.102 | 0.080 | 0.080 | 0.071 | 0.063 | 0.056 | 0.035 | 0.027 | 0.025 |
| | 20 | 0.122 | 0.120 | 0.113 | 0.105 | 0.092 | 0.080 | 0.070 | 0.062 | 0.054 | 0.048 | 0.042 | 0.038 | 0.032 | 0.020 | 0.015 | 0.014 |
| | 30 | 0.114 | 0.112 | 0.106 | 0.087 | 0.087 | 0.076 | 0.067 | 0.059 | 0.052 | 0.045 | 0.040 | 0.035 | 0.031 | 0.019 | 0.015 | 0.014 |
| | 60 | 0.105 | 0.100 | 0.091 | 0.086 | 0.080 | 0.069 | 0.061 | 0.054 | 0.047 | 0.042 | 0.037 | 0.033 | 0.030 | 0.018 | 0.014 | 0.013 |
| | 90 | 0.086 | 0.086 | 0.082 | 0.077 | 0.069 | 0.062 | 0.055 | 0.049 | 0.044 | 0.039 | 0.035 | 0.031 | 0.028 | 0.017 | 0.014 | 0.012 |
| | 180 | 0.065 | 0.064 | 0.061 | 0.058 | 0.051 | 0.046 | 0.041 | 0.036 | 0.032 | 0.029 | 0.027 | 0.024 | 0.022 | 0.017 | 0.013 | 0.012 |

Handbook p-71

7. SOKOLOVSKY METHOD (QP.TL C-6-77)

This method is adopted for the site of over 100 km² basin.

Waterflow Factor (**a**) according to Figure is based on Rain Zone.

$$\mathbf{a} = f(\text{Rainfall Zone})$$

Average flood velocity (V_t) is calculated as follow.

$$V_t = 0.65 \cdot V_{\max}$$

V_{\max} means observed flood water velocity. Coefficient is range from 0.6 to 0.7.

Concentration Time (t_c) is calculated as follow.

$$t_c = \frac{L}{3.6 \cdot V_t} \quad (\text{hour})$$

Effective Concentration Time (T) according to Table is based on Concentration Time (t_c).

$$T = f(t_c) \quad (\text{hour})$$

Rainfall Reduction Factor (Ψ_t) according to Table is based on (T*60) and River System.

$$\Psi_t = f(T, \text{River System})$$

Revised Rainfall is calculated Reduction Factor (Ψ_t) multiply by Probable Daily Rainfall.

$$H_r = \Psi_t \cdot H_p$$

Modified Rainfall is calculated as follow.

$$H'_r = \frac{H_r}{1 + K_t \cdot F^m}$$

Kt=0.001 and m=0.80 in case of $t_c \leq 1440$ min.

Kt=0.002 and m=0.60 in case of $t_c > 1440$ min.

Channel Shape Factor (f) according to Table is based on Channel Condition.

Design discharge (Q_p) is calculated as follow.

$$Q_p = \frac{0.278 \cdot \alpha \cdot (H'_r - H_0)}{t_e} \cdot f \cdot F \cdot \delta + Q_{ng}$$

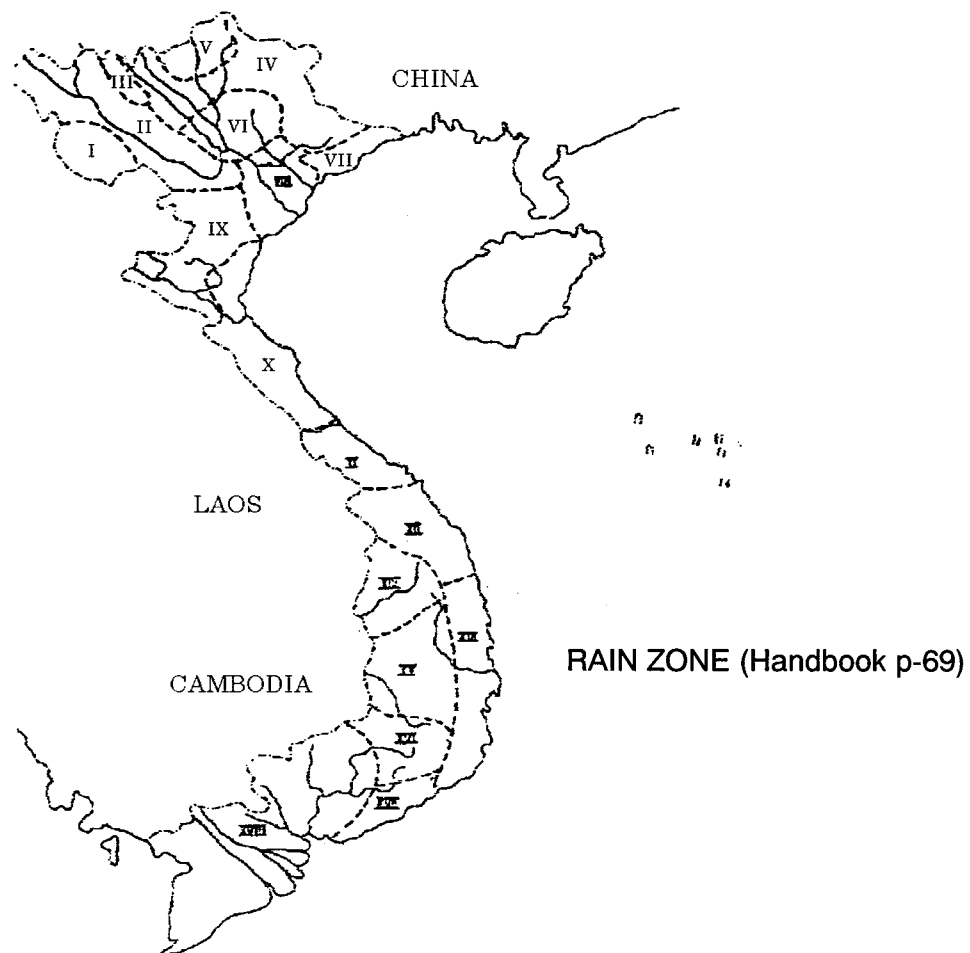
where;

| | |
|-----------------|--|
| F | : Catchment Area (km ²) |
| L | : River Length (km) |
| H ₀ | : Rainfall Loss (mm/day) |
| H _p | : Daily Rainfall with Probability of p% (mm/day) |
| δ | : Reduction Factor by Retention (=1.0) |
| Q _{ng} | : Base Flow (m ³ /s) |

8. WATER FLOW FACTOR (α) AND INITIAL RAINFALL LOSS (H_0)

| No. | Basin System | Water flow factor (α) | Initially Rainfall Loss, H_0 (mm) |
|------|---|--------------------------------|-------------------------------------|
| I | Basins of Nam Ron river and upstream of Ma river | 0.65 | 20 |
| II | Basins of Da and Thao rivers | 0.91 | 22 |
| III | Basins of upstream of Thuong and Chay rivers | 0.82 | 20 |
| IV | Basins of Gam river and downstream of Lo and Pho Day rivers | 0.66 | 26 |
| V | Basins of Cau, Thuong, Trung, Bang Giang, Bac Giang rivers | 0.77 | 22 |
| VI | Basins of Ky Cung and Luc Nam rivers | 0.86 | 19 |
| VII | Basin of Quang Ninh river | 0.89 | 15 |
| VIII | Basins of Chu and Huong rivers | 0.92 | 21 |
| IX | Basins of Thu Bon and Cai rivers | 0.86 | 16 |
| X | Basins of Se San and Srepok rivers | 0.76 | 21 |
| XI | Basins of Dong Nai and Be rivers | 0.64 | 25 |

Handbook p-48



9. RELATIONSHIP OF CONCENTRATION (t_c) TIME AND EFFECTIVE TIME (T)

| | | | | | | | | | | | | | | | | | | | | |
|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|
| te | 1 | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 20 | 22 | 24 | 28 | 32 | 36 | 40 | 44 | 48 | 72 | 120 |
| T | 1.0 | 1.6 | 3.0 | 4.1 | 5.2 | 6.2 | 7.2 | 8.4 | 9.2 | 11.2 | 12.1 | 12.8 | 14.7 | 16.5 | 18.0 | 18.5 | 20.8 | 22.0 | 29.2 | 45.0 |

Handbook p-48

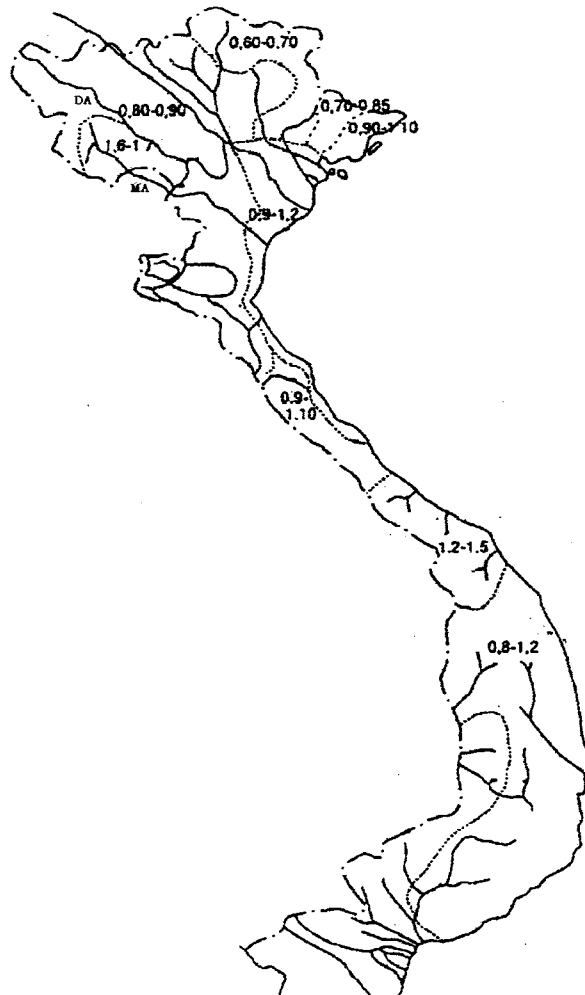
RAINFALL REDUCTION FACTOR (Ψ_t)

| Rain Zone | Basin | Effective water concentration period (T) in minutes | | | | | | | | | | | | | |
|-----------|--|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | 10 | 15 | 20 | 30 | 45 | 60 | 90 | 120 | 240 | 480 | 540 | 720 | 1080 | 1440 |
| I | Basins of upstreams of Ma. Chu. Ca River | 0.180 | 0.220 | 0.260 | 0.340 | 0.430 | 0.490 | 0.610 | 0.660 | 0.800 | 0.940 | 0.950 | 0.960 | 0.980 | 1.070 |
| II | Upstream of Da River from the border to Nghia Lo | 0.130 | 0.180 | 0.220 | 0.250 | 0.330 | 0.350 | 0.400 | 0.440 | 0.580 | 0.770 | 0.790 | 0.880 | 0.900 | 1.090 |
| III | Centre of Hoang Lien Son. the rightside of Thao River. and from the border to Ngoi Hut | 0.070 | 0.090 | 0.120 | 0.140 | 0.200 | 0.220 | 0.270 | 0.300 | 0.440 | 0.630 | 0.680 | 0.780 | 0.830 | 1.070 |
| IV | Basins of Ky Cung. Bang Giang River and upstream of Hong River | 0.150 | 0.210 | 0.240 | 0.320 | 0.380 | 0.470 | 0.550 | 0.600 | 0.920 | 0.820 | 0.830 | 0.880 | 0.930 | 1.060 |
| V | Basin of Gam River and the leftside of Lo River | 0.101 | 0.120 | 0.150 | 0.226 | 0.300 | 0.378 | 0.460 | 0.537 | 0.770 | 0.924 | 0.935 | 0.952 | 0.985 | 1.055 |
| VI | River valley of Thao River. Chay River. and downstream of Lo and Gam Rivers | 0.120 | 0.140 | 0.180 | 0.260 | 0.300 | 0.380 | 0.470 | 0.590 | 0.780 | 0.920 | 0.950 | 0.990 | 1.030 | 1.200 |
| VII | Froom basin of Yen Tu mountain ranges to the sea | 0.098 | 0.110 | 0.176 | 0.214 | 0.240 | 0.322 | 0.419 | 0.508 | 0.682 | 0.857 | 0.890 | 0.120 | 0.950 | 1.110 |
| VIII | From areas near the sea of Hai Phong to Thanh Hoa | 0.125 | 0.160 | 0.200 | 0.268 | 0.320 | 0.408 | 0.504 | 0.594 | 0.734 | 0.890 | 0.920 | 0.994 | 1.040 | 1.160 |

Handbook p-75 *Thao River = Da/Hong River

FLOOD SHAPE FACTOR

(Handbook p-82)



10. SIMILAR BASIN METHOD (22TCN220-95)

This method is adopted for the site of over 100 km² basin and ratio (F_{tt}/F) is within 5.0.

Module of peak flood (M_{tt}) of similar basin is as follow.

$$M_{tt} = \frac{Q_{tt}}{F_{tt}}$$

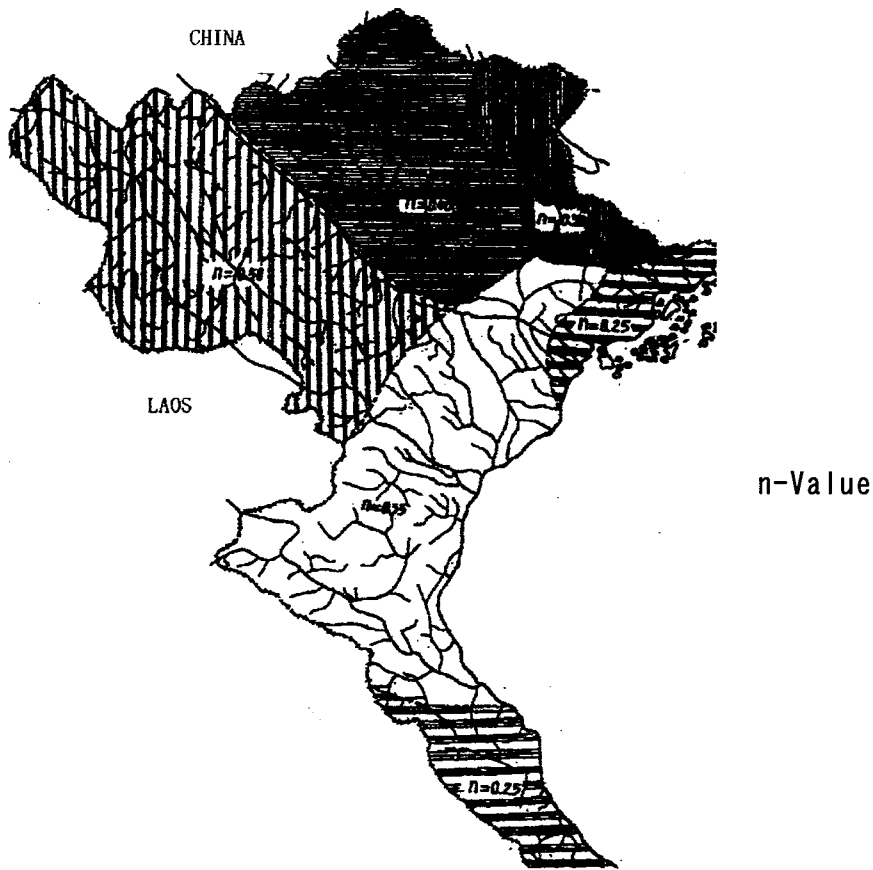
Factor in consideration of lessening the peak flood (n) is derived from Figure.

Design discharge (Q_p) is calculated as follow.

$$Q_p = M_{tt} \cdot \left(\frac{F_{tt}}{F} \right)^n \cdot \frac{\delta}{\delta_{tt}} \cdot F$$

where;

- F_{tt} : Catchment Area of Gauge Station (km²)
- F : Catchment Area (km²)
- Q_{tt} : Discharge of Gauge Station (m³/s)
- δ_{tt} : Reduction Factor of Gauge Station by Retention (=1.0)
- δ : Reduction Factor of Bridge Site by Retention (=1.0)



11. EFFECT OF THE TUYEN QUANG DAM

No.31 (Trinh) 及び No.32 (Na Nham) 橋はそれぞれ Co Linh 川及び Quang 川にあり、本川である Gam 川の背水の影響を受ける。Gam 川には Chiem Hoa 観測所があり水位の設定に関してはこのデータが利用できる。また、本川の Gam 川上流には 2007 年竣工予定の Tuyen Quang Dam があり、この影響を考慮する必要がある (Letter 参照)。

Chiem Hoa 観測所に於ける 2%確率水位と 2001 年洪水水位との差は 0.37m であることから、No.31 (Trinh) 橋の 2001 年洪水水位は 98.86m であるので 2%確率水位は $98.86+0.37=99.23\text{m}$ と推測される。また Letter によれば Tuyen Quang Dam による水位低下は 2m とされるので、計画水位は $99.23-2.00$ となる。

同様に No.32 (Na Nham) 橋の 2001 年洪水水位は 94.51m であるので 2%確率水位は $94.51+0.37=94.88\text{m}$ と推測される。また Tuyen Quang Dam による水位低下 2m を考慮し、計画水位は $94.88-2.00$ となる。

Chiem Hoa 観測所水位

| Location | Water Level (DL+meter) | | |
|----------------------|------------------------|-------|------------------|
| | 2001年 | 2%確率 | 差 (2%確率 - 2001年) |
| Chiem Hoa | 43.00 | 43.37 | 0.37 |
| No.31 Trinh Bridge | 98.86 | 99.23 | |
| No.32 Na Nham Bridge | 94.51 | 94.88 | |

Letter from TECCO2

Transport Engineering Consultants Company 2 (TECCO2)
Bridge Design Division

Socialist Republic of Vietnam
Independence - Freedom - Happiness

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Hanoi, 15 June, 2006

To: JICA Study Team

Pursuant to the Decision No.642/QD-BGTVT dated 15 March, 2006 by Ministry of Transport (MOT) on Project of Improvement for Rural Bridges in Northern Mountainous Provinces of Vietnam under Japanese Grant Aid and counterpart-funds from Vietnamese government.

Pursuant to the survey documents for topography and hydrology of F/S study submitted by Transport Engineering Consultants Company in February, 2006.

Pursuant to the Aide Memoires among PMU18, JICA Study Team, and the local consultants.

We are informing you about considered data of Tuyen Quang dam which effect on Trinh and Na Nham bridges in Chiem Hoa district, Tuyen Quang province as followings:

- According to technical design documents of Tuyen Quang dam, the capacity of reservoir of Tuyen Quang dam is 2.26 billion cubic meter, while the reserved capacity in case of flood happened is from 1 to 1.5 billion cubic meter.
- After construction of Tuyen Quang dam, high water level at Tuyen Quang town is reduced from 1.5 to 3.0 m. This data has been used in Project of Improvement of National Highway No.2, the bypass of Tuyen Quang town (Km 0+00 – Km4+00 and Km4+750 – Km8+224. Design high water level of this project was reduced 1.5m in consideration of dam effect. And, this project has been approved by MOT according to the Decision No. 3062/QD-BGTVT dated 13/10/2004 and it is under construction.

The distance from Tuyen Quang dam to Tuyen Quang town is about 140 km, while Trinh and Na Nham bridges is located in the middle. And, Tuyen Quang town is about 90 km and 98 km far from Trinh and Na Nham bridges, respectively.

In F/S study, TECCO 2 has proposed to use 2 m in reduction of high water level at studied locations of Trinh and Na Nham bridges in consideration of dam effect. Therefore, we would like to inform to JICA Study Team about this issue.

Sent to:

- As mentioned above,
- At the office

Project Manager
(signed)

Pham Van Loi

12. CALCULATION PROCEDURE OF SCOURING (1/3)

Scour depth is estimated at local scour to add to the general scour.

GENERAL SCOUR

To calculate scour of main course, the method developed by O.V. Andreev (1955) was used.

The procedure is as followings:

$$h_{course} = h_{ch}' * \beta_{ch}^{8/9}$$

$$\beta_{ch} = \beta = \frac{Q_{p\%}}{Q_{ch} + Q_b} = \frac{Q_{p\%}}{Q_{ch} + \frac{Q_b}{B_s - B_{ch}} * (L - B_{ch})}$$

where,

h_{ch}' : water depth of main course after scour happened, m

h_{ch} : water depth of main course before scour happened, m

β_{ch}, β : coefficient in consideration of increase in discharge at main course and whole river cross-section respectively.

$Q_{ch}, Q_b, Q_{p\%}$: discharges through main course, plains, and whole river cross-section respectively.

L : length of bridge, m

B_{ch} : width of main course, m

B_s : width of whole cross-section of river, m

LOCAL SCOUR

To calculate scour at piers, the formulation of Hanoi University of Civil Engineering developed by Nguyen Xuan Truc and Nguyen Huu Khai (1982) was used as in the following procedure:

1) $v < v_{ox}$ (usually when pier is at plain ground)

$$h_{cb} = 0.97 * K_d * b^{0.83} * H^{0.17} * (v/v_{ox})^{1.04}$$

2) $v > v_{ox}$ (usually when pier is at main course)

$$h_{cb} = 0.52 * K_d * b^{0.88} * h^{0.12} * (v/v_{ox})^{1.16}$$

where,

h_{cb} : maximum scour depth at the pier, m

K_d : coefficient in consideration of pier shape, $K_d = 0.1 * K_\xi$

CALCULATION PROCEDURE OF SCOURING (2/3)

K_{ξ} : coefficient in consideration of pier shape developed by Iaratslaxev (Table).

h : depth of water at the pier, m

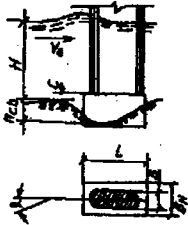
b : width of pier, m

v : water velocity at the pier, m/s

v_{ox} : limit of water velocity that there is no scour due to type of soil (Tables)

m/s

Pier Shape Coefficient developed by Iaratslaxev

| Pier shape  | Iaratslaxev coefficient, K_{ξ} | | | | | | |
|---|------------------------------------|------|------|------|------|-----|-----|
| | C/H α | 0 | 0.2 | 0.4 | 0.6 | 0.8 | 1.0 |
| | 0° | 8.5 | 9.9 | 11.5 | 12.1 | - | - |
| | 10° | 8.7 | 10.1 | 11.8 | 12.1 | - | - |
| | 20° | 9.0 | 10.3 | 11.7 | 12.2 | - | - |
| | 30° | 10.3 | 11.3 | 12.1 | - | - | - |
| | 40° | 11.3 | 12.0 | - | - | - | - |

**)derived from Appendix 4 in Calculation Hydrology for Bridges (Prof. Nguyen Xuan Truc, 2003)*

Limit of water velocity that there is no scour for sandy soils, $v_{ox} = v_{od}/d^{1/6} * h^{1/6}$

| Type of Material | Size | Diameter (mm) | v_{od} (m/s) | $v_{od}/d^{1/6}$ |
|------------------|--------|---------------|----------------|------------------|
| Sand | Small | 0.05 - 0.25 | 0.02 | 0.65 |
| | Middle | 0.25 - 1.00 | 0.02 | 0.65 |
| | large | 1.00 - 2.50 | 0.20 - 0.25 | 0.65 - 0.70 |
| Gravel | small | 2.50 - 5.0 | 0.25 - 0.35 | 0.70 - 0.85 |
| | middle | 5 - 10 | 0.35 - 0.50 | 0.85 - 1.10 |
| | large | 10 - 15 | 0.50 - 0.60 | 1.10 - 1.20 |
| Cobble | small | 15 - 25 | 0.60 - 0.80 | 1.20 - 1.50 |
| | middle | 25 - 40 | 0.80 - 1.00 | 1.50 - 1.70 |
| | large | 40 - 75 | 1.00 - 1.35 | 1.70 - 2.10 |
| Large Cobble | small | 75 - 100 | 1.35 - 1.50 | 2.10 - 2.35 |
| | middle | 100 - 150 | 1.50 - 1.95 | 2.35 - 2.60 |
| | large | 150 - 200 | 1.95 - 2.25 | 2.60 - 2.95 |
| Stone | small | 200 - 300 | 2.25 - 2.75 | 2.95 - 3.35 |
| | middle | 300 - 400 | 2.75 - 3.15 | 3.35 - 3.70 |
| | large | > 400 | > 3.15 | > 3.70 |

CALCULATION PROCEDURE OF SCOURING (3/3)

Limit of water velocity that there is no scour for clay soils, $v_{ox} = v_{oc}/d^{1/6} * h^{1/6}$

| Type of soil | Compaction | Density (T/m ³) | Water depth (m) | | | |
|--------------|------------|-----------------------------|-----------------------|------|------|------|
| | | | 0.4 | 1 | 2 | ≥ 3 |
| | | | v _{ox} (m/s) | | | |
| Clay | Low | 1.2 | 0.35 | 0.40 | 0.45 | 0.50 |
| | Middle | 1.2 – 1.5 | 0.70 | 0.85 | 0.95 | 1.10 |
| | High | 1.65 – 2.05 | 1.00 | 1.20 | 1.40 | 1.50 |
| | Very high | 2.05 – 2.15 | 1.40 | 1.70 | 1.90 | 2.10 |
| Porous soil | Middle | 1.2 – 1.65 | 1.60 | 0.70 | 0.80 | 0.85 |
| | High | 1.65 – 2.05 | 0.80 | 1.00 | 1.20 | 1.30 |
| | Very high | 2.05 – 2.15 | 1.10 | 1.30 | 1.50 | 1.70 |