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- A description of the assumptions that apply to the function.
 - The concept of operations for the function.
 - Assignment of responsibility for annex maintenance, review and updating.
 - Additional requirements established by the Emergency Management and Disaster Administration State Agency (EMDA) must also be addressed.

An Emergency Support Function (ESF) matrix of primary and support functions is to be developed and included in the Plan, which must include the following subsections:

J.4.7.1. Direction and Control

The means, by which, the Concessionaire will direct and control activities during emergency situations.

J.4.7.2. Communications

The means, by which, information will flow between responders, the EOC and the Commonwealth.

J.4.7.3. Warning/Emergency Information

The means, by which, the public will be warned and instructed regarding actual or threatened hazards and emergencies through the public media and other means.

J.4.7.4. Public Information

The means, organization and process by which the Concessionaire will provide timely, accurate and useful information and instructions to Toll Road users, and impacted (or potentially impacted) residential, commercial and industrial parties, under or adjacent to, or near the Toll Roads.

J.4.7.5. Disaster Intelligence/Damage Assessment

The means, by which, the Concessionaire will identify, collect, analyze and disseminate information on the extent and impact of the emergency situation.

J.4.7.6. Evacuation

The means, by which, the Concessionaire will manage, coordinate and conduct the evacuation of persons from the area believed to be at risk, when situations necessitate such action.

J.4.7.7. Mass Care

The means, by which, the Concessionaire will support and assist in mass care activities necessary to be provided as the result of an incident on the Toll Roads.

J.4.7.8. Health and Medical

The means, by which, the Concessionaire will assist and support health and medical services in emergencies and disasters, on or affecting the Toll Roads.

J.4.7.9. Mortuary Services

The means, by which, the Concessionaire will assist and support in the collection, identification and care of human remains resulting from emergencies and disasters on or affecting the Toll Roads.

J.4.7.10. Resource Management


The means, by which, the Concessionaire will manage the people, equipment, facilities, supplies and other resources to satisfy the needs generated by the disaster or emergency.

J.4.7.11. Debris Clearance and Waste Management

The means, by which, the Concessionaire will manage and coordinate the clearance of debris to allow access by emergency response vehicles, collect and remove debris from an incident and how debris will be disposed. Special guidance should be included to address handling debris from a crime scene.

J.4.7.12. Rapid Damage Assessment

The means, by which, the Concessionaire will conduct rapid damage assessments following a major incident, target time frames and priorities.



J.4.8. Hazard Specific Annex Requirements


Hazard-specific annexes offer a means of extending functional annexes to address special and unique response procedures, notifications, protective actions, and other needs generated by a specific hazard.

Hazard-specific annexes are actually supplements to the functional annexes and should not simply repeat the common planning considerations addressed in the functional annexes.

The need for a hazard-specific annex will be determined as a result of the hazard and vulnerability assessments and the development of the functional annexes. Hazard-specific annexes must follow the same structure and similar content as the Basic Plan and the Functional Annexes. There are, however, a number of specific and unique hazards to which the Toll Roads are exposed due to its climate, location and profile.

At a minimum, the following specific hazards are to be addressed:

- Major Traffic Accidents and/or Incidents
- Hazardous Materials Incidents
- Radiological Incidents
- Terrorism Incidents
- Weather Related Events
 - Hurricanes
 - Flooding
 - High winds
- Shipping Incidents: Along sections of the Toll Roads that are paralleled or cross above navigable waterways.
- Railroad Incidents: Along sections of the Toll Roads that are paralleled or cross below, or cross above by passenger and/or freight rail facilities.
- Structural Fires: In such structures under or adjacent to the Toll Roads.
- Structural Failure: Any part of the bridge structures found along the Toll Roads.
- Electrical Power Incidents: Along sections of the Toll Roads that are paralleled or crossed by electrical lines, towers or power generating stations.
- Other Utility Incidents: Along sections of the Toll Roads that are paralleled or crossed by gas, oil, communications, and other utility lines, facilities or stations.

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J.4.9. Recovery Annex Requirements

Following a major emergency or disaster, many critical issues and concerns will need to be addressed requiring coordinated efforts of the Concessionaire, the Commonwealth and Federal governments.

The Recovery Annex is intended to address the methodology and processes that will be implemented during the recovery process and must include, at a minimum the following issues:

- Identifies the agencies with responsibility for recovery efforts.
- Establishes documentation and record keeping requirements following the Disaster.
- Establishes financial, accounting and spending authorities.
- Establishes the initial post disaster priorities and responsibilities (0-12 hours).
 - Preliminary Damage Assessment
 - Walk through or Rapid Damage Assessment
 - Assessing economic injury
 - Damage Survey Reports
 - Written Damage Assessment Document
 - Estimates of Cost
 - Search and rescue and medical needs
 - Damage impact to critical facilities and structures
 - Establish Direction and Control
- Addresses Human Needs
- Develops and Addresses Mitigation Strategies

J.4.10. Training and Exercises

The success of the EOP depends to a significant extent upon the level of training and preparedness of the Concessionaire and agencies identified for involvement in an incident.

This section must identify and address a specific training program and exercise schedule for the Concessionaire. It must address, at a minimum, the following:

- 1) The types of training required for each employee and Concessionaire involved in a particular incident.
- 2) A specific annual training program and schedule for each employee so identified.
- 3) Establish and implement an exercise program that provides both table-top and full-scale training exercises based upon the potential hazards and vulnerabilities to which is the Toll Roads are exposed.

J.4.11. Definitions

This section is to contain a complete listing of all definitions that are unique to the Emergency Management Section of the Plan. It will also contain a listing of commonly used federal acronyms and a glossary of terms.

J.4.12. References

This section is to contain a listing of Federal Department of Homeland Security, Federal Emergency Management Agency, Emergency Management and Disaster Administration State Agency (EMDA), Local agencies, and Reference Documents, Laws and regulations for the Toll Roads and their location. Full copies of all documents are to be included in the Appendices.

J.4.13. Bibliography

This section is to contain a bibliography of the document, as applicable.

J.4.14. Appendices

All appendices referenced within the document shall be listed in a summary, indexed and tabbed.

J.4.15. Forms and Documentation Guidelines

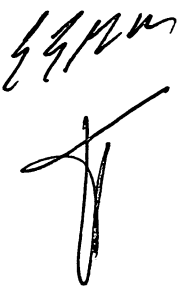
This section is to contain copies of all forms and documentation guidelines currently in use by the Concessionaire. It is also to contain copies of all applicable Commonwealth, DHS, FEMA, EMDA, and other applicable forms for use during and following emergencies.

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K.1. References

All stated references must be the most current version, or the document known to have succeeded or replaced the original stated herein:

- Design Directives, PRHTA
- Guidelines for the Selection and Installation of Orientation Signs, PRHTA
- Highway Design Manual, PRHTA
- Signage Guide, PRHTA
- Standard Drawings, PRHTA
- Standard Specifications for Road and Bridge Construction, PRHTA
- Traffic Sign Manual, PRHTA
- "LRFD Bridge Design Specifications," AASHTO.
 - "Standard Specifications for Highway Bridges," AASHTO.
- "Maintenance and Management of Roadways and Bridges", AASHTO.
- "Guide Specifications and Commentary for Vessel Collision Design of Highway Bridges", AASHTO.
- Guide for Design of Pavement Structures, Volume I", AASHTO.
- "A Policy on Geometric Design of Highways and Streets", AASHTO.
- "Pavement Management Guide", AASHTO.
- Title 23, Code of Federal Regulation, FHWA
- "Interstate System Access Guide", FHWA
- Publication FHWA-EP-00-005: "FHWA Highway Noise Barrier Design Handbook", FHWA.
- Law 136 of June 3, 1976 – Law for the Conservation, the Development and Use of Water Resources in Puerto Rico.
- Law 416 of September 22, 2004 – Environmental Public Policy Law.
- PRPB Regulation #4 - Puerto Rico Zoning Regulation.
- PRPB Regulation #7 - Puerto Rico Special Regulation and Plan for the Tortuguero Lagoon Hydrographic Basin.
- PRPB Regulation #13 - Puerto Rico Regulation on Special Areas at Risk of Flood.
- Regulation for the Erosion Control and Sedimentation Prevention, PREQB.



- Regulation for the Process of Presentation, Evaluation and Procedure of Environmental Documents, PREQB.
- Regulation for the Control of Noise Pollution, PREQB.
- DNER Regulation #6766 – Regulation to Govern Vulnerable and Endangered Species in the Commonwealth of Puerto Rico.
- National Environmental Policy Act (NEPA), USEPA.
- “General National Pollutant Discharge Elimination System (NPDES)”, USEPA.
- Storm Water Pollution Prevention Plan (SWPPP), USEPA.
- International Building Code, IBC.
- “National Fire Codes”, NFPA.
- “National Electrical Code”, NFPA.
- “National Plumbing Code, ANSI.
- “Uniform Plumbing Code”, WPOA.
- “Uniform Heating and Cooling Code”, WPOA.
- Americans with Disabilities Act”, U.S. Department of Justice.
- Occupational Health and Safety Act (OSHA) Guidelines
- OSHA Publications List via Catalog or Website, OSHA
(Website: <http://www.osha.gov/pls/publications/pubindex.list>).

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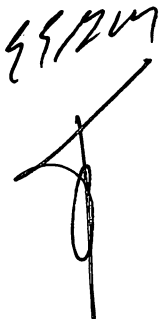
K.2. Policy for Design and Construction Requirements

K.2.1. Objective

The objective of the information within this Chapter is to provide the Concessionaire a series of procedural requirements and guidelines relative to the framework necessary in undertaking capital improvements, renewal projects, capacity improvements and completing major changes within the Toll Roads, as well as describe the required coordination that will be required and expected with PRHTA and the Commonwealth.

The principal objectives in all design and construction work undertaken by the Concessionaire within the Toll Roads must include, but is not limited to, the following:

- Conduct all work in a manner consistent with the policies and procedures adopted and utilized by PRHTA, and other Agencies, so as to conform to the requirements of the Concession Agreement and the Operating Standards.
- Creates and maintains the Toll Roads as a premier transportation corridor to the public and their users.
- Conduct all work in a manner that does not compromise the safety of the workers, public, Toll Road users or the Commonwealth.
- Promotes a spirit of cooperation, communication and partnership with the Commonwealth.
- The value of the Toll Roads is continually maintained and improved such that the assets meet or exceed the requirements of the Concession Agreement and the Operating Standards throughout the Term, with a special focus on the quality of the asset at the termination of the Agreement.
- At times of reconstruction or rehabilitation work; enhance, update and expand the Toll Roads, as necessary, so as to improve the Toll Roads and to create a consistent traveled way in conformance with the most current PRHTA criteria in place at the time of reconstruction or rehabilitation for Toll Road users.



The Toll Roads operate within a Commonwealth framework of many local and Commonwealth organizations which must be understood by the Concessionaire throughout the term of the Agreement. Further, the Concessionaire must conduct all of its work with the understanding that transportation is dynamic and significant changes to the Toll Roads will have impacts to adjoining public and private facilities and operators of said facilities, as well as the Commonwealth. Therefore, the Concessionaire must be part of both the regional and Commonwealth planning process.

Both design and construction have variations across the Commonwealth and this is also true within the Toll Roads. The purpose of the Chapter is to articulate that while the Concessionaire is not necessarily bound to previous means and methods employed on the Toll Roads, an awareness of prior successes and failures must be some of what guides the Concessionaire's work related to Design and Construction. For example, geology, climate, work force, location, population, and similar characteristics each affect the work within Puerto Rico as these characteristics all contribute to how design and construction is accomplished and completed.

It is expected that the Concessionaire will bring its many years of experience, "best practices", "lessons learned" and ingenuity to Toll Roads to create a system that exceeds the requirements of the Concession Agreement and the Operating Standards. Conversely, the Concessionaire must understand that the Toll Roads (PR-20, PR-52, PR-53 and PR-66) are a designated portion of the transportation network of the Commonwealth, and thusly must conform to the design and construction standards established and enforced by the Puerto Rico Highway and Transportation Authority (PRHTA).

It is expected that design and construction projects will vary in size, type and location. Therefore, proactive communication with the PRHTA and the Commonwealth as well as other Agencies and Stakeholders must be undertaken and be continual throughout the term of the Agreement. Establishing guidelines, policies, protocols and procedure that conform to the design and construction requirements of PRHTA are extremely important. In utilizing the contents of this Chapter, the Concessionaire is directed to integrate all of its design and construction work with the requirements of both: Volume II, Chapter B that covers management of projects and discusses some of the coordination efforts needed, and Volume II, Chapter C that covers quality measures that permeate design and construction activities.

K.2.2. Responsibility of Concessionaire

In order to meet the requirements of this Chapter, the Concessionaire is advised PRHTA has utilized numerous Professional Engineering and Construction Firms. The Concessionaire will maintain the right to establish and decide the mix of in-house and contracted work, but responsibility for all work must be clear and accountable. As public safety is involved, the Concessionaire must employ Professional Engineers and Architects Licensed in the Commonwealth of Puerto Rico, qualified for the particular type of work that is to be undertaken. Ultimate responsibility for all work undertaken by the Concessionaire will be solely retained by the Concessionaire.

As required, the Concessionaire may choose to seek and retain the services of Licensed Professional Consulting Engineering Firms or Licensed Construction Firms, to perform the services indicated within this Chapter. Such Firms must conform to all laws, regulations and registrations required by the Commonwealth;

must have individuals Licensed in the Commonwealth appropriate for the work in which they undertake; and will responsible for their work within the Toll Roads.

K.2.3. Performance Time Frames

One of the many functions of Volume II, Chapter L “Annual State of the Toll Roads and Capital Improvement Program Reports” is to assist the Concessionaire in establishing a “rolling” schedule for the planning, design and construction against the needs of the Toll Roads, and to communicate that plan and seek the guidance and approval of PRHTA and the Commonwealth. It is intended that the Concessionaire will correlate its activities with the PRHTA 5-Year Plan where upon the exact execution of projects that require advanced and coordinated Approval and planning are appropriately allotted the necessary time for completion.

The cycle time for construction projects has many variables including location, other projects and the method of delivery. The Concessionaire must understand that due to the various regulatory statutes that exist in the Approval and permitting of projects at the local, Commonwealth and sometimes Federal level, significant impact can occur in the timeframes of both design and construction. To provide assistance and guidance to the Concessionaire through this process the contents of this Chapter and the other Referenced Documents in Section K.1 of this Chapter all are referenced as guidance on executing problem free projects.

The Concessionaire must be aware that PRHTA and the Commonwealth, or its designated agent or department, retains the right and privilege to review, inspect, approve and be mad aware of all planned and on-going work within the Toll Roads at all times.

Prior to the start of both design and construction work the Concessionaire, PRHTA and the Commonwealth, or its designated agent, must hold a joint meeting at which time a mutually agreeable schedule for Plan and document submissions; review of design plans; interface on construction work; and the overall project goals for all work is established and agreed upon. Alterations to the schedule or goals must be conducted at separate meetings and made jointly prior to their enactment. In addition, the Concessionaire must recognize and plan to conduct all of its design and construction work in a manner such that PRHTA and the Commonwealth are provided ample time to consider and review projects prior to rendering an appropriate decision of denial or Approval of the project and its contents.

K.2.4. Acceptance Criteria

The Concessionaire's design and construction of projects must conform to the requirements of the Concession Agreement, Operating Standards, and where applicable, the design and construction standards established by PRHTA. Conversely, it is expected that the Concessionaire will bring its “best practices” and ingenuity to the work such that materials, construction methods and the like are introduced that extend and increase the functionality and useful life of the Toll Roads.

Since the Toll Roads are an asset to the Commonwealth, as a minimum the Concessionaire is obligated to meet the minimum standards established by AASHTO, PRHTA and the FHWA. If a particular project is a non-transportation project, such as work in the Facilities, the International Building Code (IBC) will be the recommended guideline. Additionally, the Concessionaire must incorporate the generally accepted engineering practices in the Commonwealth and PRHTA with respect to employing engineering and construction professionals who will conduct the work on a given project. Finally, all work must be conducted so as to conform to all applicable safety regulations established and regulated by OSHA, and laws at the local, Commonwealth and Federal levels.

While the particular acceptance criteria will vary for each project based upon its purpose and characteristics, the Concessionaire must put forth every effort to achieve the following expected useful life goals:

- The general design life for new Bridge Superstructures and Substructures, and arch culverts should be 100 years.
- The general design life for new Bridge Decks, with epoxy-coated reinforcement, and the appropriate concrete mix, should be 50 years.
- The general design life for new cast-in-place retaining walls should be 100 years.
- The general design life for new proprietary retaining walls (MSE, gabion, soldier Pile walls) should be 75 years.
- The general design life for new ground-mounted Noise Walls or Rockfall Fences should be 40 years.
- The general design life for new roadways and pavement should be 40 years and must including a periodic maintenance and resurfacing program.
- The general design life for new drainage pipes and systems should be 50 years.

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In addition, the Concessionaire must make every effort to conduct all construction work in manner that provides the least amount of disruption to Toll Road users and the public. Therefore, the following goals must be incorporated in all of the Concessionaire's designs, plans and construction:

- Provide and maintain a minimum of two (2) lanes of traffic in each direction at all times, except for times and conditions where traffic levels will not result in delays.
- When undertaking widening or "add-lane" projects, reconstruction shall be undertaken via staged construction with the goal that the above stated two lane requirement is maintained whenever possible; and so that traffic levels will not result in delays. Subsequent stages must also maintain the above

two lane requirement while reconstruction continues across the roadway, except for times where traffic levels will not result in delays.

K.3. Additional Design & Construction Process Guidelines & Requirements

K.3.1. Coordination with PRHTA and FHWA

The Concessionaire is expected to fully communicate, coordinate all of its work and work with the Commonwealth and PRHTA during the planning, design and construction phases of each project. The Concessionaire must also be aware that often their work will require a variety of communications with agencies ancillary or directly connected to the Commonwealth. Of particular note, and as discussed in subsequent sections of this Chapter, utilities, railroads, Commonwealth Departments, and local and Federal agencies all must be considered Stakeholders in the welfare of the Toll Roads, and coordination with those entities is fully expected. The Concessionaire shall also seek approval from the FHWA for every project to be undertaken within the Toll Roads.

K.3.2. Approval of the Commonwealth

All projects, whether initiated by the Concessionaire or by another manner, must be Approved by the Commonwealth. It is recommended that each project be undertaken in a manner such that the requirements of the PRHTA Design and Construction Manuals and AASHTO Guidelines are adhered by.

It is further required that prior to the start of work, the Concessionaire provide a brief summation of the Project that discusses the needs and justification analysis, of which the project location, scope, cost, traffic impact, schedule and duration of the Project be included. Following approval of that submission, the Concessionaire must schedule further meetings with the Commonwealth and PRHTA to seek guidance, maintain communications and gain Approval prior to commencing further preliminary design, final design or construction work.

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K.3.3. Local Agency Coordination

The Concessionaire will be responsible for coordinating with all municipalities, Counties, bridge commissions, U.S. Army Corps of Engineers, U.S. Coast Guard, local municipalities, and other similar agencies and organizations so that these local agencies are informed of the project scope, location and duration at a minimum, and to coordinate other regional activities.

K.3.4. Utility Coordination

Within the Toll Roads are utilities that are located adjacent to, longitudinal with and that cross over and beneath the Toll Roads. The Concessionaire must be aware and coordinate all of its efforts and work with those utilities with the Puerto Rico

Utility Commission (PUC) and all other Agencies that have binding regulatory powers that will require the Concessionaire to insure continued utility operation in accordance with past and future agreements.

The Concessionaire will be responsible for coordinating the location and relocation of all utilities affected by the proposed projects. The Concessionaire must follow the guidelines established by each utility and develop utility relocations designs, agreements and cost sharing for relocations.

K.3.5. Elective Projects

On occasion, the Concessionaire will determine that projects are required that improve its operational efficiencies, reduce congestion, improve the Toll Roads or for a variety of other reasons. These projects will be required to be gain Approval from the Commonwealth and PRHTA prior to the start of work. All work must be in accordance with the Reference Documents noted in Section K.1 of Chapter and the other requirements described in this Chapter.

K.3.6. Projects Resulting from Local Initiative

On occasion, the Concessionaire will be approached by PRHTA, the Commonwealth or a local agency where a crossing or adjacent road and bridge impacts the Toll Roads. The Concessionaire is responsible for working with that local agency, and must not impede their work, so that the project can be accomplished. Further, the Concessionaire will also work with PRHTA and the Commonwealth to coordinate the efforts with the local agencies so that a reasonable structure is established prior to the start of work.

K.3.7. Projects With-in Existing Right of Way

Working within the Right-Of-Way will likely be projects that provide the Concessionaire with the greatest latitude when working with the Commonwealth and PRHTA. The Concessionaire must research and determine if legal agreements exist that provide rights to others to cross the Right-Of-Way or occupy the Right-Of-Way. The Concessionaire will be responsible to coordinate, communicate and comply with all requirements of the adjacent or effected property owners.

K.3.8. Situations When Additional Right-of-Way is Required

On occasion, projects will occur where the existing Right-Of-Way is inadequate to support the project and additional land will be required. The Concessionaire must work with the Commonwealth and PRHTA both prior to and during these projects so that the required land is acquired in a manner consistent with all applicable laws, regulations and requirements. The Concessionaire must follow all PRHTA and Commonwealth processes and requirements for this process.

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In addition, the Concessionaire must understand and work with all governing agencies when encountering projects that involve elements as wetlands, streams and water crossings. The Concessionaire must be aware that Puerto Rico streams are protected by the Puerto Rico Department of Natural and Environmental Resources with exclusion time frames for various classes of stream.

Also the Concessionaire must also be aware that the Commonwealth and local governments operate various roads which cross the Toll Roads, and that full detours of those roads during work on the Toll Roads cannot be assumed nor may be allowed. For example, time restrictions may be impacted based on school schedules, public welfare for emergency services, and impacts to an area resulting from a particular transportation link.

K.3.9. Public Involvement

The Concessionaire must make every effort with the public to inform and involve their input when a particular project may affect their community. The Concessionaire must work with PRHTA and the Commonwealth to conduct meetings and informational sessions, as required, so that its operations and work is viewed as being cooperative and communicative.

K.3.10. Environmental Approvals

All work must conform to the guidelines, criteria and evaluation adopted and utilized by PRHTA, the Commonwealth and NEPA for environmental clearance. Upon submission and Approval of a Project, the appropriate Environmental study, action or exclusion documentation must be produced to support the Project's characteristics.

K.3.11. Construction Management Requirements

The Concessionaire must provide construction management services with internal forces or consultant services to manage, monitor and control all project construction work. This work must be conducted in a manner similar to the requirements of PRHTA during the Construction Phase. All inspection documents, shop drawings and alternate designs will be reviewed and approved by PRHTA and the Concessionaire's Management Team. Project schedules and progress will be reviewed to assure that the work is done in according to schedule with minimal delay to the motoring public.



K.3.12. Construction Inspection

The Concessionaire must retain construction inspectors or firms to provide assurances that all construction work is being done in accordance with the Approved Plans, Specifications and all contract provisions and permits. Completed work must be documented on As-Built Plans and variances so indicated. At the end of construction, electronic copies of As-Built Plans must become part of the project record.

K.3.13. Project Delivery Methods

The Concessionaire is responsible for advertising, soliciting and contracting for project delivery in the manner that best suits its operations, provided that it does not violate the terms and conditions of the Concession Agreement, the Operating Standards or Commonwealth Law. The method employed must be approved by PRHTA prior to advertisement.

K.3.14. Travel Impacts

The Concessionaire must maintain continuous user service on the Toll Roads during all construction and maintenance activities to always provide the best quality service to the motoring public in accordance with the requirements of the Concession Agreement and the Operating Standards.

K.3.15. Quality Control / Quality Assurance

The Concessionaire must develop, manage and maintain a Quality Control and Quality Assurance plan that meets the requirements for its work overall, per the requirements of Volume II, Chapter C; as well as for each Project. Items such as materials, construction quality must be documented in the project record which must also include the results of all testing, sampling and remediation.

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L.1. References

All stated references must be the most current version, or the document known to have succeeded or replaced the original stated herein:

- Design Directives, PRHTA
- Guidelines for the Selection and Installation of Orientation Signs, PRHTA
- Highway Design Manual, PRHTA
- Signage Guide, PRHTA
- Standard Drawings, PRHTA
- Standard Specifications for Road and Bridge Construction, PRHTA
- Traffic Sign Manual, PRHTA
- Bridge Inspection Manual, PRHTA
 - "Guide Specifications for Fatigue Evaluation of Existing Steel Bridges", AASHTO.
 - "Manual for Condition Evaluation of Bridges", AASHTO.
 - "LRFD Bridge Design Specifications", AASHTO.
 - Standard Specifications for Highway Bridges," AASHTO.
 - "The Maintenance and Management of Roadways and Bridges", AASHTO.
- "Guide Specifications and Commentary for Vessel Collision Design of Highway Bridges", AASHTO.
- Title 23 Code of Federal Regulation, Section 650, "National Bridge Inspection Standards (NBIS)", FHWA.
 - "Bridge Inspector's Training Manual," FHWA.
- "Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges," FHWA.
 - Publication FHWA-PL_01_021: "Traffic monitoring Guide", FHWA.
 - "NCHRP Report 299: Fatigue Evaluation", NCHRP/FHWA.
 - "Highway Capacity Manual", TRB.

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L.2. Policy for Annual State of the Toll Roads and Capital Improvement Program Reports

L.2.1. Objective

The objective of the Annual State of the Toll Roads and Capital Improvement Program Reports is to protect the Toll Roads by detecting and correcting weaknesses prior to failure. This objective must be accomplished by the inspections, reports and requirements of this Chapter. The inspections and reports will provide PRHTA and the Commonwealth current and accurate information on the condition and adequacy of the structures, infrastructure and Facilities within the Toll Roads, in part or in whole. Further, the reports must provide a means of communication and assurance to PRHTA and the Commonwealth that the Toll Roads are being adequately maintained and improved.

In addition, the performance of the inspections and the filing of the reports will assist in fulfilling the Commonwealth, PRHTA and Federal requirements stated in Title 23 Code of Federal Regulation, Section 650, commonly known as the National Bridge Inspection Standards (NBIS).

Also, the inspection and report process fulfills the following additional objectives:

- To update and submit the required biennial Commonwealth and Federal reports for bridge structures.
- To maintain the condition databases of the Infrastructure of the Toll Roads.
- To ensure that the Toll Roads are and remain safe for the intended use.
- To develop and prioritize specific maintenance, repair and/or rehabilitation work for bridges along the Toll Roads, roadways and facilities.
- To forecast and plan for anticipated traffic congestion and develop measures to alleviate such projected traffic congestion.

L.2.2. Responsibility of Concessionaire

In order to meet the requirements of this Chapter, the Concessionaire must engage in practices and measures that ensure that all inspections and reports are performed and completed accurately, professionally, independently, and within the Time Frames established in Section L.2.3 of this Chapter. The work must be administered by the Concessionaire and must meet the Approval of PRHTA and the Commonwealth.

The Concessionaire must seek and retain an independent and Licensed Professional Consulting Engineering Firm, not associated, owned or partnered with the Concessionaire, to perform the services indicated within this Chapter. The names, resumes and qualifications of the Engineering Firm and the specific Inspection and Report Team members must be submitted to the Commonwealth

for Approval annually. The same Engineering Firm can be retained only for a maximum four (4) year duration at which time the Concessionaire must seek, retain and employ a different Engineering Firm. The purpose of these requirements is to develop a fair, impartial, independent and objective assessment of the condition of the Toll Roads.

The qualifications of the Inspection and Report Team that will be performing the inspection and report work are stated in Section L.3.1 of this Chapter.

All bridge and structure inspection procedures and frequencies must be in accordance with NBIS from Title 23 CFR, as required by PRHTA or as amended within this Chapter, whichever is the most stringent. Inspection procedures must be in accordance with the FHWA and the relevant approved methods of PRHTA, including the nomenclature, numbering system and the Quality Control/Quality requirements, and must be utilized and implemented by the Concessionaire and the Engineering Firm.

The Concessionaire and the Engineering Firm are responsible for equipment, staffing, traffic control, outside testing services and supervision for all inspections. Material sampling and uncovering of encased members must be performed on a limited basis as recommended by the Engineering Firm.

The Engineering Firm and the Concessionaire are required to coordinate, pay for, and obtain all necessary permits and insurance required for the performance of the work, which may include the following:

- Local Road Closure Permits.
- Railroad Right-of-Entry permit and flagging.
- Railroad Protective and Marine Liability Insurance.

The Concessionaire and the Engineering Firm must perform the following:

- Perform inspections of all bridge (including overpass bridges) and associated structures (High-Mast lighting, culverts, retaining walls, noise walls, etc.) along the Toll Roads within the time frames prescribed in Table L.2.3 of this Chapter (See Section L.3.12 of this Chapter for a listing of the structures).
- Perform Annual inspections of Fracture Critical Bridges and structures (including pins and hinges) within the time frames prescribed in Table L.2.3 of this Chapter (See Section L.3.8 and Table L.3.12.6 of this Chapter for a listing of the structures).
- Perform a fatigue analysis for Fracture Critical Bridges and provide load ratings for all structures, as required based upon the results of the Fracture Critical Inspections.
- Perform inspections of scour critical bridges (See Section L.2.3 and Table L.3.12.8 of this Chapter for a listing of bridges requiring Scour inspections).

- Perform underwater inspections for scour and stability within the time frames prescribed in Table L.2.3 of this Chapter. (See Section L.3.7 and Table L.3.12.5 of this Chapter for a listing of bridges requiring underwater inspection).
- Perform the Roadway/Civil Annual Inspection, including the slopes and rockfall included in Table L.3.12.11
- Perform Architectural/Structural/Electrical/Mechanical inspections of the associated facilities and infrastructure within the Toll Roads.
- Prepare, develop and submit an Annual Capital Improvement Program Report that contains recommendations, schedules and capital improvement work that is planned for the upcoming year(s).
- The Concessionaire must prepare, and keep current, load analysis calculations and tables that indicate both the Inventory Rating and the Operating Rating for every Bridge within the Toll Roads, and share this information with PRHTA and the Commonwealth upon request.

The Concessionaire must retain a nationally recognized Traffic Consultant that must be responsible for conducting measurements of the traffic volumes on the Toll Roads, and prepare an Annual Report on the current and forecasted traffic volume on the Toll Roads. Forecasts of traffic growth must be conducted on a planning horizon of at least ten (10) years. Traffic volumes must be measured and reported annually including truck flows and sample weights. At a minimum traffic monitoring will be conducted within the guidelines established by the FHWA in the Traffic Monitoring Guide. The traffic volumes of the mainline between each interchange must be reported individually in terms of Average Annual Daily Traffic and Average Annual Daily Truck Traffic as a minimum. Sample truck weight distributions must be measured and reported in a format as determined by the Commonwealth and/or PRHTA.

Three unique components of the Toll Roads must be examined annually within the planning horizon:

1. Basic freeway segment (defined as outside the influence of ramps and weaving areas).
2. Freeway Weaving Zones (defined as the locations where crossing of two or more traffic streams that travel in the same direction).
3. Ramp Roadways including junction points, the ramps themselves, and the ramp- to-crossroad junction.

L.2.3. Performance Time Frames

The following table establishes the minimum frequency that a particular Report (based on the appropriate Inspection or Inspections) must be written and updated by the Concessionaire, submitted to the Commonwealth and Approved by the Commonwealth.

Table L.2.3

Report	Minimum Frequency of Occurrence
Bridge and Structure Condition Report	As per NBIS
Underwater Condition Report (*)	As per NBIS or after major event)
Fracture Critical Member Report	As per NBIS
Scour Critical Report	As per NBIS
Roadway/Civil Condition Report	Yearly
Facilities Condition Report	Yearly
Capital Improvement Program Report	Yearly
Report on Current Traffic Volume and Ten Year Forecast of Traffic Growth	Yearly
Certification Letter stating that all Maintenance and Operations within the Toll Roads conform to the guidelines and criteria stated in each Chapter of Volume I – Maintenance Manual, each required Plan of Volume II – Operations and Procedures Manual, and, the requirements of Volume III – Environmental Management Manual.	Yearly

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L.2.4. Acceptance Criteria

The Annual State of the Toll Roads and Capital Improvement Program Reports will be considered acceptable for a particular year when each inspection has been completed by the Concessionaire; each required Condition Report has been written and updated by the Concessionaire, submitted to PRHTA and the Commonwealth, and approved by PRHTA and the Commonwealth; and the Capital Improvement Program Report has been written and updated by the Concessionaire, submitted to PRHTA and the Commonwealth and Approved by PRHTA and the Commonwealth.

In order to receive Approval from PRHTA and the Commonwealth, the following criteria must be met or exceeded:

- All Inspections have been performed in accordance with the requirements of this Chapter, all Reports have been signed and Sealed by a Professional Engineer Licensed in the Commonwealth of Puerto Rico, and all required documentation and Reports have been filed with the appropriate agency.
- The qualifications of the Engineering Firm conducting the inspections conform to the requirements of this Chapter, Volume I – Maintenance Manual, and the Reference Documents, whichever is more stringent.
- Notification has been made to PRHTA and the Commonwealth immediately when inspections determine that one or more of its major components (defined as Deck, Superstructure or Substructure), or elements are at risk of a localized or large scale failure.
- No component, element, segment, feature, system, etc., of the Toll Roads in part or in whole is considered to be unsafe or has the potential to become unsafe.
- The Concessionaire provides a Statement and Certification Letter that Maintenance and Operations within the Toll Roads conform to the guidelines and criteria stated in each Chapter of Volume I – Maintenance Manual, each required Plan of Volume II – Operations and Procedures Manual, and the requirements of Volume III – Environmental Management Manual.
- The Toll Roads must be continually maintained in accordance with the requirements of Section L.3.11 of this Chapter.

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**L.3. Requirements for the Annual State of the Toll Roads Condition
Inspections and Report Submittals**

L.3.1. Inspection and Report Team Qualification Requirements

Role	College Education	Experience	License/ Certification	Minimum Additional Qualifications
Project Manager	B.S./B.A. (Minimum)	10 Years (Related)	P.E. (Minimum)	Equal to Program Manager as defined in Title 23 CFR 650 C.
Bridge Inspection Team Leader	B.S.C.E. (Minimum)	5 Years (Related)	P.E.	As per Title 23 CFR 650 C.
Fracture Critical Member Inspection Team Leader	B.S.C.E. (Minimum)	5 Years (Related)	P.E.	As per Title 23 CFR 650 C.
Underwater Structure Inspection Team Leader	High School Diploma (Minimum)	5 Years (Related)	Certified Diver	As per Title 23 CFT 650 C.
Roadway Inspection Team Leader	B.S.C.E.	10 Years (Related)	P.E.	Previous experience with Roadway/Civil Inspections.
Facility Inspection Team Leader (By Discipline)	B.S. (By Discipline) B.A.	10 Years (Related)	P.E. (By Discipline) A.I.A.	Previous experience with Facility and Building Inspections.
Inspection Team Members	High School Diploma Minimum	5 Years (Related)	N/A	Previous experience on Highway or Railroad bridge structures, Roadways or Facilities, as appropriate.
Structure Evaluation/ Rating Engineer	B.S. (Minimum)	5 Years (Related)	EIT Minimum P.E. Preferred	15 Day NBIS Qualification Course.
Bridge Inspector	B.S. (Minimum)	5 Years (Related)	EIT Minimum P.E. Preferred	FHWA approved comprehensive bridge inspection training.

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L.3.2. Independent Professional Consulting Engineering Firm

The Independent Professional Consulting Engineering Firm must be a registered and licensed Professional Design Firm with the Commonwealth of Puerto Rico – Professional College of Engineers and Land Surveyors of Puerto Rico. In order to maintain true independent Inspections and Reports, the Engineering Firm must not be teamed, owned or partnered with the Concessionaire or be an Affiliate of the Concessionaire. The Concessionaire must engage firms that have exhibited experience with the kinds of structures, Facilities, and conditions within the Toll Roads and that meet all of the requirements of this Chapter.

The same Engineering Firm can be retained only for a maximum four (4) year duration, at which time the Concessionaire must seek, retain and employ a different Engineering Firm. PRHTA and the Commonwealth must approve the Engineering Firm on an annual basis, and retains the right to dismiss firms that do not meet the requirements of this Chapter. The Concessionaire must also annually submit the names, resumes and qualifications of the specific Inspection and Report Team members to PRHTA and the Commonwealth for Approval.

L.3.3. Project Management

A senior engineer, serving as Project Manager, must direct the Inspection Program, review results for conformance with FHWA and Commonwealth requirements and provide Program Management. Elements of the Management Program include:

- 
- Training, mobilization and support of field crews.
 - Development of a bridge inspection schedule and updates, bridge assignments and team scheduling.
 - Meetings with the Concessionaire, and when required, with PRHTA.
 - Major equipment coordination.
 - Ongoing coordination with the Concessionaire.
 - Field reviews of inspection teams.
 - Field inspection of critical structures.
 - Inspection forms review and submittal.
 - Bridge database coordination.

L.3.3.1. Quality Assurance/Quality Control Manual

Prior to the start of inspections, the Concessionaire or the Engineering Firm must create a Quality Assurance/Quality Control (QA/QC) Manual under the supervision of PRHTA. The purpose of the QA/QC Manual is to define the responsibilities of the participants of the Inspection Team, describe the quality of activities to be performed, and define the inspection methodology to be used in the execution of the work. The QA/QC Manual provides the basis by which uniformity of the inspections, ratings and identification of members and their defects is assured.

Sketches and photographs, where available, are used to illustrate and define bridge types, elements, components and their associated defects. The QA/QC Manual contains the checklists and surveillance forms that will be used by PRHTA Quality Assurance personnel to verify that the inspections meet the objectives of the Commonwealth.

L.3.3.2. Nomenclature Manual

The QA/QC Manual defines the structural elements and components, establishes coding and numbering methodology and provides defect, rating, prioritization and other codes that are necessary for the uniform completion of the forms. Requirements for bridge nomenclature can be found in Section G.4.1.1 of Volume I, Chapter G, "Bridge and Structure Maintenance".

L.3.3.3. Safety Manual

Prior to the start of inspections, the Concessionaire or the Engineering Firm must create an inspection Safety Manual under the supervision of PRHTA. The Safety Manual will create a communication tool with the Concessionaire, the Engineering Firm and PRHTA so that the inspections are performed in the safest possible manner. It is understood that multiple crews may be performing inspection work throughout the Toll Roads and that they require a consistent safety format for the performance of the work. The Safety Manual establishes the minimum requirements for the performance of the work that will be expected of each team.

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L.3.4. Mobilization

The Concessionaire must meet the following requirements:

L.3.4.1. Plan Review

Prior to commencement of the fieldwork, the latest report of inspection information for each structure must be reviewed by the Engineering Firm. A location map, and a general plan and elevation drawing of the structure must be provided to each field crew. A review must be made of the critical elements and anticipated problems that will be encountered in performing the inspection.

L.3.4.2. Site Inspections

A variety of physical conditions and other factors may affect the way site inspection is undertaken. Rail traffic, barge traffic and vehicular traffic will affect the scheduling and equipment needs of the inspection. All permits, insurance and/or access requirements must be procured by the Concessionaire and the Engineering Firm.

L.3.4.3. Equipment

The Concessionaire and the Engineering Firm must furnish each field crew with equipment for conducting the inspections. Among such equipment, to the extent necessary, are measuring tapes, chipping hammers, hand tools, ladders, portable lights, cellular phones/pagers, auto-focus cameras (with time and date recorder), traffic vests, traffic cones, arrow-boards, traffic barriers, air-handling equipment for work in enclosed spaces, watercraft, barges, personnel vehicles, man-lifts, bucket-trucks and snoopers. Equipment must be acquired by the Concessionaire and/or the Engineering Firm.

L.3.4.4. Field Team Orientation

The Engineering Firm must conduct orientation meetings to train and standardize the field teams.

L.3.5. Safety

The Engineering Firm must use the Safety Manual described in Section L.3.3.3 above as a basis to complete its work in the safest possible manner, and to ensure safety is implemented as part of its work. The Safety Manual must be used to train and monitor crews performing this work. All crews must be trained in the use of the equipment required by the inspection and condition. Safety will be the responsibility of the Engineering Firm.

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L.3.6. Structures, Roadway and Facilities Condition Inspections

The Engineering Firm must develop a schedule for the inspection of the entire infrastructure contained within the Toll Roads consisting of roadway, structures, civil, architectural, electrical and mechanical elements, and gain the approval of PRHTA prior to the start of work each year. The Concessionaire and PRHTA will jointly review and approve the final schedule and may alter the schedule to meet their needs.

Field teams must consist of a minimum of a two-person crew, or how many required, dependent upon the type and location of the inspection work and other factors. The number of teams is to be dictated by the need to complete all of the inspections.

Traffic control must be provided by the Engineering Firm and the Concessionaire, when required to protect inspection crews and Toll Road users. Inspections at railroad track level must be performed under railroad flagging protection. The Concessionaire and the Engineering Firm must procure all necessary rights-of-entry and protective liability insurance and arrange for all flagging.

The Engineering Firm must perform inspections using aerial bucket trucks, snooper trucks or ladders to gain access for close, visual inspection. The Engineering Firm must use portable lighting to provide necessary illumination. Portable air handling units must be utilized for all inspections of vaulted abutments, or where confined space entry is required.

L.3.6.1. Bridge and Structure Inspections

The Bridge and Structure inspections must include supervision and execution of the intermediate level bridge inspection, and includes all bridges, culverts, high- mast lighting, retaining walls, and noise walls within the Toll Roads. The inspections must involve detailed visual observations by approved and experienced bridge engineers and at times may require detailed bridge condition surveys. The Concessionaire must be aware that some structures may require more frequent inspections to accurately understand the condition of the structure and to produce the Reports. All bridge inspections shall comply with NBIS requirements.

L.3.6.2. Annual Roadway/Civil Inspections

The Annual Roadway/Civil inspections will be a visual inspection of the earth embankments, slopes and rockfall along the Toll Roads, the pavement and shoulders, bridge approach pavements, drainage system, fencing, landscaping, median barrier, guardrails and railings, signage, sign structures and pavement markings.

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An annual inspection of the Roadway Lighting along the Toll Roads must be performed during both daylight hours and during the night. The Concessionaire must accompany the Lighting inspection team to provide access to lighting control cabinets.

L.3.6.3. Annual Facilities Inspections

Structural Engineers, Mechanical Engineers, Electrical Engineers and Architects must perform a detailed inspection of the maintenance and toll collection facilities. The facilities inspection team must be accompanied by the Concessionaire to provide access to all areas of the facilities and equipment. These inspections must be conducted in accordance with the applicable Reference Documents stated in Section N.2 of Volume I and Section G.2 of Volume II.

L.3.7. Underwater Inspections

Bridges with underwater elements must have a separate and independent underwater inspection performed within the time frames prescribed in Table L.2.3 of this Chapter.

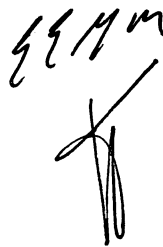
Underwater inspections must be performed by certified divers as per NBIS requirements and must be under the direct supervision of a Licensed Professional Engineer in the Commonwealth of Puerto Rico. (See Table L.3.12.5 for a listing of bridges requiring underwater inspection).

L.3.8. Fracture Critical Inspections

In-depth bridge inspections must be performed on all bridges that are classified in part or in whole as containing members that are fracture critical. The continued inspection, function and maintenance of these types of structures are critical to the stability and durability of the Toll Roads.

Bridges with fracture critical elements must have a separate and independent detailed inspection performed within the time frames prescribed in Table L.2.3 of this Chapter.

Fracture critical inspections must be performed by personnel certified as inspectors of Fracture Critical Bridges so that they are able to identify the specific structural defects and characteristics common to these types of structures. The leader of the Fracture Critical inspection team must be a Licensed Professional Engineer in the Commonwealth of Puerto Rico.



All non-redundant elements of these structures must receive a detailed inspection of conditions. Elements subject to fatigue or catastrophic failure must be non-destructively tested to determine the presence of defects. The tests will include dye-penetrates, ultra-sonic, magnetic particle or radiographic methods appropriate for the items being inspected.

The current bridges designated as Fracture Critical by definition of PRHTA and FHWA and requires fracture critical inspection every 24 months are listed in the Table L.3.12.6 of this Chapter.

L.3.9. Monitoring Critical Structures

Structures with major components (defined as Deck, Superstructure or Substructure) possessing a Condition Rating of 3 (three) or less are defined as Critical Structures, and the frequency of monitoring must be no less than every 6 (six) months for each structure unless the Engineering Firm recommend a more frequent inspection, PRHTA or the Commonwealth.

L.3.10. Report and Form Submission Requirementss

L.3.10.1. Bridge Inspection Forms

The typical FHWA bridge inspection forms required by the PRHTA Bridge Office are to be completed and submitted to PRHTA as described in Volume I – Maintenance Manual, Chapter G, “Bridge and Structure Maintenance”.

When the FHWA inspection forms, in the sole and absolute discretion of the Commonwealth or PRHTA, are found to be incomplete, do not show sound analysis of the conditions, or do not contain sufficient detail to track problems, will be returned to the Concessionaire for revision.

L.3.10.2. Condition Reports

The Concessionaire and the Engineering Firm must submit to PRHTA and the Commonwealth the Bridge and Structure, Roadway/Civil and Facilities Condition Reports on an annual basis, as defined by the requirements of this Chapter. In addition, the Concessionaire and the Engineering Firm must submit to PRHTA and the Commonwealth Fracture Critical and Underwater Inspection Reports, as defined by the requirements of this Chapter. The following requirements must be addressed in all Condition Reports:

- The Concessionaire must submit to PRHTA and the Commonwealth four (4) copies of each Report and all applicable sets of Inspection Forms (including color reproductions of all photographs). These Reports must be collated, by bridge number, facility, and roadway



feature, into tabbed three ring binders with indexes.

- Changes in conditions must be noted in a General Condition and Rating Summary for all bridges, roadway/civil and facilities features, and prepared in a spreadsheet format. For bridge structures, the summary must contain overall ratings for the decks and the superstructure and substructure elements.
- Bridge load ratings must be available for all structures and be current with legal loads allowed in the Commonwealth of Puerto Rico. Any changes in weight restrictions must be reported to PRHTA as outlined in Volume I, Chapter G, "Bridge and Structure Maintenance".
- A draft of each Report must be submitted to PRHTA and the Commonwealth for review prior to finalization, after which the final version of each Report must be submitted to PRHTA and the Commonwealth for final Approval.

L.3.10.3. Capital Improvement Program Report

Upon Approval of the Bridge and Structure, Roadway/Civil and Facilities Condition Reports by PRHTA and the Commonwealth each year, the Concessionaire and the Engineering Firm must compose and submit to PRHTA and the Commonwealth the Annual Capital Improvement Program Report, within two (2) months. This Report will define and describe the planned rehabilitation, replacement and reconstruction capital improvement work scheduled to be addressed and completed in the next year, and planned for the subsequent 10- year window, based upon the inspections and Condition Report findings. The following are the requirements that shall be addressed:

- The Concessionaire must prepare and submit to PRHTA and the Commonwealth four (4) copies of the Annual Capital Improvement Program Report, which must include the following at a minimum:
 - Executive Summary
 - Introduction and discussion of the inspections and Condition Report findings.
 - Approach and Methodology.
 - Recommendations and Planned Capital Improvement Work.
 - Program Schedule.
- A draft of the Annual Capital Improvement Program Report must be submitted to PRHTA and the Commonwealth for review prior to finalization, after which the last version of the Annual Capital Improvement Program Report must be submitted to PRHTA and the Commonwealth for final Approval.

L.3.11. Criteria of Review and Acceptance

The Concessionaire and the Engineering Firm must always use sound engineering judgment in assessing the conditions and deficiencies of the Toll Roads. In particular all components, elements, features, systems, etc. that are deemed unsafe or possess the potential to become unsafe must be clearly identified and noted.

The Concessionaire and the Engineering Firm must be aware that PRHTA and the Commonwealth will review and approve the Annual Condition Reports and the Annual Capital Improvement Program Report taking into account the requirements stated throughout each individual Chapter of the Operating Standards, the requirements of this Chapter, common industry acceptance criteria and the condition classification stated below.

The Commonwealth and PHTA will assess the Condition Reports utilizing the following condition classification terminology to describe the condition of the elements of the Toll Roads. The terminology is consistent with the Record and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges, December 1995 published by the U.S. Department of Transportation/Federal Highway Administration Publication 238: "Bridge Safety Inspection Manual".

The Concessionaire must target (or perform the necessary and required Capital Improvement work to maintain) the overall condition of each of the Bridges, Structures, Roadway/Civil and Facilities features within the Toll Roads at "Good" or better. In addition, the Concessionaire must maintain the condition of each particular item of each Bridge, Structure, Roadway/Civil and Facility feature within the Toll Roads at "Fair" or better, provided, however, that when the overall condition of any particular Bridge, Structure, Roadway/Civil or Facility feature within the Toll Roads declines from "Good" to "Fair", that feature must be placed in the next Annual Capital Improvement Program Report (as approved by PRHTA and the Commonwealth) with a designation and general description of the work to be performed. The duration that a feature within the Toll Roads can remain in the Capital Improvement Program must not exceed ten (10) years from the time such feature is placed in the Program until that feature is brought back to a condition of "Good" or better. In addition, all features (as well as all of the particular items of that feature) placed in the Capital Improvement Program, must continually be maintained in accordance with the guidelines and criteria of Volume I – Maintenance Manual, and the requirements of Volume II – Operations & Procedure Manual.

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The definitions of the condition terms for structures other than bridges are as follows:

Excellent: New condition. No noticeable or noteworthy deficiencies affecting the condition or function of the elements noted.

Good: Minor deficiencies noted. The element is satisfactorily performing its intended function. No corrective repairs or rehabilitation are required.

- Fair: Deficiencies and deterioration present. All primary elements are sound and are satisfactorily performing their intended function. However, the potential exists to justify an improvement program or corrective work.
- Poor: Advanced deterioration present. Primary structural elements are seriously affected and are not satisfactorily performing their intended function. An accelerated improvement program and/or immediate corrective work are required.
- Critical: Major deterioration of primary elements. These elements are not performing adequately and require urgent corrective work or total replacement. These elements require regular, continual monitoring until corrective action is completed.

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The definition of the condition terms for bridges are as follows (items 58- Deck , 59 - Superstructure , 60 – Substructure and 62- Culvert):

<u>Code</u>	<u>Description</u>
N	NOT APPLICABLE.
9	EXCELLENT CONDITION.
8	VERY GOOD CONDITION – no problems noted.
7	GOOD CONDITION – some minor problems.
6	SATISFACTORY CONDITION – structural elements show some minor deterioration.
5	FAIR CONDITION – all primary structural elements are sound but may have minor section loss, cracking, spalling or scour.
4	POOR CONDITION – advanced section loss, deterioration, spalling or scour.
3	SERIOUS CONDITION – loss of section, deterioration, spalling or scour have seriously affected primary structural components. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete may be present.
2	CRITICAL CONDITION – advanced deterioration or primary structural elements. Fatigue cracks in steel or shear cracks in concrete may be present or scour may have removed substructure support. Unless closely monitored it may be necessary to close the bridge until corrective action is taken.
1	“IMMINENT” FAILURE CONDITION – major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stability. Bridge is closed to traffic but corrective action may put back in light service.
0	FAILED CONDITION – out of service – beyond corrective action.

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L.3.12. Structure Inventory Lists of the Toll Roads

Structure Summaries include bridges, retaining walls, noise walls and sign structures. Culverts that require NBIS inspection are also listed. Note that culvert maintenance is addressed in Volume I, Chapter D, "Drainage Maintenance and Erosion Control"

The listed structures are for information only. No expressed or implied representation or warranty is made that the information is correctly shown. The Concessionaire must establish a comprehensive list of structures that require inspection and reporting.

The tables present the various structures in order of Kilometer.

Refer to Section G.4.1 of Volume I, Chapter G, "Bridge Structure Maintenance" for clarification of bridge number and structure ID presented. Structure Numbers noted as TBD (To be determined) where not known at printing. Structure numbers will be assigned to all structures requiring NBIS inspection or inspection and tracking in accordance with PRHTA requirements.

Structure Type and Direction Abbreviations

A	Arch	N	Noise Wall	Tr	Truss
A	Arch	N	Northbound	Tw	s
C	Culvert	B	Overhead	VM	Twin
Adj	Adjacent	O	Plate	S	Variable Message
B	Beam	H		WB	Sign
		P			Westbound
BxB	Box Beam	PP	Pile & Plank		
BC	Box Culvert	P/S	Prestressed		
C	Concrete	Ptr	Pony Truss		
		R	Reinforced		
Ca or	Cantilever	RE	Reinforced Earth		
CAN		RF	Rigid Frame		
T		S	Span(s) w/number		
Co	Continuous	SB	Southbound		
D	Deck	SEG	Segmental Concrete		
Du	Dual	SL	Slant Leg		
EB	Eastbound	T	Thru w/steel; Tied w/RC		
F	Frame	TB	T-Beam		
G	Girder				
I	I-beam				

Handwritten notes:
A large arrow pointing upwards from the bottom left towards the 'Ca or CAN' and 'T' entries in the table.

Examples:

RCS	Reinforced concrete slab	RCRF	Reinforced Concrete Rigid Frame
RCBC	Reinforced concrete box culvert	TPG	Thru-Plate Girde
RCAC	Reinforced concrete arch culvert	DIB	Deck I-Beam
RCTAC	Reinforced Tied Arch Culvert	2SCoDIB	2 Span continuous deck I-beam
RCTB	Reinforced Concrete T- Beam		

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The tables below contain the following information:

Table L.3.12.1	PR-20 Bridge Inventory
Table L.3.12.2	PR-52 Bridge Inventory
Table L.3.12.3	PR-53 Bridge Inventory
Table L.3.12.4	PR-66 Bridge Inventory
Table L.3.12.5	Bridges requiring underwater inspections
Table L.3.12.6	Bridges designated as Fracture Critical
Table L.3.12.7	Culvert Inventory (requiring inspection only)
Table L.3.12.8	Scour Critical Bridges
Table L.3.12.9	Overpass Bridges
Table L.3.12.10	Bridges – Posting Tables
Table L.3.12.11	Slopes and Rockfall in Toll Roads

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TABLE L.3.12.1
PR-20 BRIDGE INVENTORY

#	Agency ID	KM	Spans	Municipality	Feature Carried	Feature Crossed
1	1801	0.50	6	Guaynabo	PR 20	Gonzalez Giusty Ave.
2	1875	4.40	3	Guaynabo	PR 20 Northbound	PR 169 Ramp; Frailes Cre
3	1900	1.20	2	Guaynabo	PR 20	PR 17 (Piñero Ave.)
4	2624	9.60	5	Guaynabo	PR.20	PR.169 Ramp; Guaynabo Ri
5	1874	4.40	3	Guaynabo	PR 20 Southbound	PR 169 Ramp; Frailes Cre
6	2374	1.95	3	San Juan	PR 20	PR 21 Ramp; Railroad
7	2375	1.90	3	San Juan	RAMP PR 20 TO STH	PR 19 Ramp; Railroad
8	2623	7.30	1	Guaynabo	PR-20	Local Road
9	1876	5.00	2	Guaynabo	PR 20 Southbound	PR 199
10	1877	5.20	2	Guaynabo	PR 20 Northbound	PR 199
11	2373	1.60	3	San Juan	RAMP 177 TO PR 20	Local road, Urban Train
12	2376	2.16	1	San Juan	RAMP From PR 20 N	PR 21
13	2377	2.20	1	San Juan	PR 20	PR 21
14	2378	0.60	1	San Juan	RAMP From PR 20 S	PR 21
15	2602	9.10	2	Guaynabo	PR 20	PR 1
16	2622	7.30	1	Guaynabo	PR 20	Local Road
17	2916	0.25	1	Guaynabo	PR 20	Frailes Creek

TABLE L.3.12.2
PR-52 BRIDGE INVENTORY

#	Agency ID	KM	Spans	Municipality	Feature Carried	Feature Crossed
1	2348	104.90	2	Ponce	PR 52	PR -12
2	2369	102.30	2	Ponce	PR 52	Dirt Road
3	1140	92.50	3	Juana Diaz	PR -52 Northbound	Jacaguas River
4	1154	87.80	1	Juana Diaz	PR -52 Northbound	Irrigation Channel
5	1287	25.00	4	Caguas	PR -52 Southbound	PR-765 Ramp; Beatriz CRE
6	2056	57.40	4	Salinas	PR -52 Southbound	Majadas River Ramp; PR -7
7	2269	106.10	10	Ponce	PR 52	Portugues River
8	2368	103.00	2	Ponce	PR 52	Dirt Road
9	1068	98.65	1	Ponce	PR -52 Southbound	Dirt Road
10	1073	95.20	1	Ponce	PR -52 Northbound	PR-506 KM 1.5
11	1141	92.40	3	Juana Diaz	PR -52 Southbound	Jacaguas River
12	1192	71.40	4	Santa Isabel	PR -52 Northbound	PR-543 and Jueyes River
13	1193	71.40	4	Santa Isabel	PR -52 Southbound	PR-543 and Jueyes River
14	1223	67.70	2	Salinas	PR -52 Northbound	HONDA CREEK
15	1233	66.20	2	Salinas	PR -52 Southbound	PR -1
16	1237	63.60	1	Salinas	PR -52 Southbound	Dirt Road
17	1251	1.00	2	San Juan	PR -52 Southbound	PR-177
18	1942	100.50	2	Ponce	PR -52 Northbound	PR-1
19	2036	48.70	11	Cayey	PR -52 Southbound	Depression
20	2039	49.50	7	Salinas	PR -52 Southbound	PR -714 Ramp; La Palma CR
21	2059	57.40	4	Salinas	PR -52 Northbound	Majadas River Ramp; PR-7
22	1078	93.90	4	Juana Diaz	PR -52 Southbound	Inabon River
23	858	16.80	2	Caguas	PR 52	Bairoa River
24	859	17.10	1	Caguas	PR 52	Local City River
25	861	19.40	2	Caguas	PR 52	PR -156
26	907	20.50	2	Caguas	PR 52	PR-34 (Degetau River)
27	927	17.50	3	Caguas	PR 52	Urban City Street
28	1067	98.65	1	Ponce	PR -52 Northbound	Dirt Road
29	1069	97.90	2	Ponce	PR -52 Southbound	PR -10
30	1070	97.90	2	Ponce	PR -52 Northbound	PR-10
31	1074	95.50	1	Ponce	PR -52 Southbound	PR -506 KM 1.5
32	1077	94.30	4	Juana Diaz	PR -52 Northbound	Inabon River
33	1079	93.30	1	Juana Diaz	PR -52 Northbound	PR- 574 KM 1.0
34	1080	93.30	1	Juana Diaz	PR -52 Southbound	PR -574 KM 1.0

#	Agency ID	KM	Spans	Municipality	Feature Carried	Feature Crossed
35	1111	95.20	3	Juana Diaz	PR 52	Unknown Creek
36	1144	91.10	1	Juana Diaz	PR -52 Northbound	PR-149
37	1146	90.70	1	Juana Diaz	PR -52 Northbound	PR-592
38	1147	90.60	1	Juana Diaz	PR -52 Southbound	PR-592
39	1148	89.70	1	Juana Diaz	PR -52 Northbound	PR-510 KM.3.9
40	1149	89.70	1	Juana Diaz	PR -52 Southbound	PR-510 KM.3.9
41	1150	89.10	1	Juana Diaz	PR -52 Northbound	Dirt Road
42	1151	89.10	1	Juana Diaz	PR -52 Southbound	Dirt Road
43	1152	88.10	1	Juana Diaz	PR -52 Northbound	Dirt Road
44	1153	88.00	1	Juana Diaz	PR -52 Southbound	Dirt Road
45	1155	87.70	1	Juana Diaz	PR -52 Southbound	Irrigation Channel
46	1160	81.40	1	Santa Isabel	PR -52 Northbound	PR-536
47	1163	77.60	5	Santa Isabel	PR -52 Southbound	Coamo River Ramp; PR 545
48	1188	77.00	2	Santa Isabel	PR -52 Northbound	PR-153
49	1189	76.80	2	Santa Isabel	PR -52 Southbound	PR 153
50	1190	74.80	1	Santa Isabel	PR -52 Northbound	Dirt Road
51	1191	74.80	1	Santa Isabel	PR -52 Southbound	Dirt Road
52	1209	84.05	1	Juana Diaz	PR -52 Southbound	Future Road (Dirt Road)
53	1210	84.00	1	Juana Diaz	PR -52 Northbound	Future Road (Dirt Road)
54	1211	81.20	4	Juana Diaz	PR -52 Southbound	Descalabrado River
55	1212	81.80	4	Juana Diaz	PR -52 Northbound	Descalabrado River
56	1224	67.75	2	Salinas	PR -52 Southbound	Honda Creek
57	1227	66.60	4	Salinas	PR -52 Northbound	Nigua River
58	1232	66.20	2	Salinas	PR -52 Northbound	PR -1
59	1240	61.00	3	Salinas	PR -52 Northbound	Bridge 1241
60	1252	2.00	2	San Juan	PR -52 Northbound	PR-199
61	1253	2.40	2	San Juan	PR -52 Southbound	PR -199
62	1261	3.20	1	San Juan	PR -52 Southbound	Local road
63	1262	3.20	1	San Juan	PR -52 Northbound	Local road
64	1263	4.10	2	San Juan	PR -52 Southbound	Montehiedra Avenue
65	1264	4.10	2	San Juan	PR -52 Northbound	Montehiedra Avenue
66	1267	5.00	1	San Juan	PR -52 Southbound	Luciano Vazquez Rod
67	1268	5.00	1	San Juan	PR -52 Northbound	Luciano Vazquez Road
68	1269	6.50	1	San Juan	PR -52 Southbound	Pedro Viara Road
69	1270	6.50	1	San Juan	PR -52 Northbound	Local Road
70	1271	7.30	1	San Juan	PR -52 Southbound	Local Road
71	1272	7.30	1	San Juan	PR -52 Northbound	Local Road
72	1273	8.70	1	San Juan	PR -52 Southbound	Local Road
73	1274	8.70	1	San Juan	PR -52 Northbound	Local Road
74	1275	26.70	5	Caguas	PR -52 Northbound	Sonadora Creek
75	1276	26.70	5	Caguas	PR -52 Southbound	Sonadora Creek

#	Agency ID	KM	Spans	Municipality	Feature Carried	Feature Crossed
76	1278	32.20	3	Cayey	PR -52 Northbound	PR -184
77	1280	31.50	1	Cayey	PR -52 Northbound	PR -7786
78	1281	31.50	1	Cayey	PR -52 Southbound	PR -7786
79	1282	23.90	3	Caguas	PR -52 Northbound	Quebradillas Creek
80	1283	23.90	3	Caguas	PR -52 Southbound	Quebradillas Creek
81	1286	25.00	4	Caguas	PR -52 Northbound	PR -765 Ramp; Beatriz Creek
82	1295	0.50	3	Caguas	RAMP PR30 TO PR 52	Urban City Street
83	1458	10.90	2	Caguas	PR -52 Northbound	PR- 175
84	1941	100.50	2	Ponce	PR -52 Southbound	PR -1
85	1970	0.30	3	San Juan	RAMP TO PR 52	Piedras River
86	2018	35.10	3	Cayey	PR -52 Southbound	Guavate River
87	2020	35.45	1	Cayey	PR -52 Southbound	Cattle Pass
88	2022	36.10	3	Cayey	PR -52 Southbound	La Plata River
89	2023	36.15	3	Cayey	PR -52 Northbound	La Plata River
90	2024	36.55	1	Cayey	PR -52 Southbound	PR- 738
91	2025	36.50	1	Cayey	PR -52 Northbound	PR -738
92	2026	38.10	1	Cayey	PR 52	La Ley Street
93	2027	38.10	1	Cayey	PR -52 Southbound	La Ley street
94	2028	38.80	2	Cayey	PR -52 Northbound	Access Road to PR-1
95	2029	38.75	2	Cayey	PR -52 Southbound	Access Road to PR-1
96	2031	40.40	1	Cayey	PR -52 Southbound	PR -15
97	2037	48.70	7	Cayey	PR -52 Northbound	Depression
98	2038	49.50	7	Salinas	PR -52 Northbound	PR -714 Ramp; La Palma CR
99	2040	45.80	8	Cayey	PR -52 Southbound	Lapas River Ramp; Local
100	2041	45.80	8	Cayey	PR -52 Northbound	Lapas River Ramp; Local
101	2042	46.50	3	Cayey	PR -52 Southbound	Depression
102	2043	46.50	3	Cayey	PR -52 Northbound	Depression
103	2051	43.60	7	Cayey	PR -52 Northbound	Maton River
104	2052	43.60	7	Cayey	PR -52 Southbound	Maton River
105	2055	41.10	7	Cayey	PR -52 Southbound	Santo Domingo Creek ,Road
106	2062	12.90	1	Caguas	PR -52 Northbound	PR- 700
107	2063	12.90	1	Caguas	PR -52 Southbound	PR- 700
108	2064	13.80	2	Caguas	PR -52 Northbound	PR -796
109	2065	13.80	2	Caguas	PR -52 Southbound	PR- 796
110	2066	13.90	7	Caguas	Ramp PR 52 TO PR 1	PR- 1
111	2268	107.00	2	Ponce	PR 52 Eastbound	PR- 585
112	2335	103.40	6	Ponce	PR 52	Bucana River
113	2416	107.50	17	Ponce	PR 52 Eastbound	Baramaya ST.Ramp; Matild
114	856	15.80	1	Caguas	PR 52	PR -1 Ramal

#	Agency ID	KM	Spans	Municipality	Feature Carried	Feature Crossed
115	857	16.50	3	Caguas	PR 52	64 A Street
116	860	18.90	3	Caguas	PR 52	Caguaita River
117	909	21.40	4	Caguas	PR -52 Southbound	PR -172
118	1071	96.80	1	Ponce	PR -52 Northbound	Farm Road
119	1072	96.90	1	Ponce	PR -52 Southbound	Farm Road
120	1075	94.60	1	Juana Diaz	PR -52 Northbound	Farm Road
121	1076	94.60	1	Juana Diaz	PR -52 Southbound	Farm Road
122	1145	91.10	2	Juana Diaz	PR -52 Southbound	PR -149
123	1161	81.40	1	Santa Isabel	PR -52 Southbound	PR -536
124	1162	77.60	5	Santa Isabel	PR -52 Northbound	Coamo River Ramp; PR -545
125	1205	86.30	1	Juana Diaz	PR -52 Southbound	PR 535
126	1206	86.20	1	Juana Diaz	PR -52 Northbound	PR 535
127	1207	85.90	4	Juana Diaz	PR -52 Southbound	CA¥As River
128	1208	86.20	4	Juana Diaz	PR -52 Northbound	CAÑAs river
129	1221	67.85	1	Salinas	PR -52 Northbound	Gravel Road
130	1222	67.85	1	Salinas	PR -52 Southbound	Gravel Road
131	1225	67.00	1	Salinas	PR -52 Northbound	Local access Road
132	1226	67.10	1	Salinas	PR -52 Southbound	Dirt Road
133	1228	66.60	4	Salinas	PR -52 Southbound	Nigua River
134	1234	65.40	1	Salinas	PR -52 Northbound	Rural Local Road
135	1235	65.50	1	Salinas	PR -52 Southbound	Rural Local Road
136	1236	63.60	1	Salinas	PR -52 Northbound	Dirt Road
137	1238	62.20	1	Salinas	PR -52 Northbound	Local Road
138	1239	62.25	1	Salinas	PR -52 Southbound	Dirt Road
139	1242	60.30	1	Salinas	PR -52 Northbound	Local Road
140	1243	60.30	1	Salinas	PR -52 Southbound	Local road
141	1250	0.80	2	San Juan	PR -52 Northbound	PR -177
142	1279	32.20	3	Cayey	PR -52 Southbound	PR -184
143	1416	3.90	2	San Juan	PR 52	Piedras River
144	1457	10.90	2	Caguas	PR -52 Southbound	PR -175
145	2014	33.30	1	Cayey	PR -52 Southbound	Rural Local Road
146	2015	33.30	1	Cayey	PR -52 Northbound	Rural Local Road
147	2016	34.60	1	Cayey	PR -52 Southbound	Hucar ST.
148	2017	34.60	1	Cayey	PR -52 Northbound	Hucar Street
149	2019	35.10	3	Cayey	PR -52 Northbound	Guavate River
150	2021	35.45	1	Cayey	PR -52 Northbound	Cattle Pass
151	2030	40.40	1	Cayey	PR -52 Northbound	PR -15
152	2044	47.30	1	Cayey	PR -52 Southbound	Cattle Pass
153	2045	47.30	1	Cayey	PR -52 Northbound	Cattle Pass
154	2049	43.10	1	Cayey	PR -52 Northbound	PR-715
155	2050	43.10	1	Cayey	PR -52 Southbound	PR 715

#	Agency ID	KM	Spans	Municipality	Feature Carried	Feature Crossed
156	2054	41.10	6	Cayey	PR -52 Northbound	S. Domingo Creek, Road
157	2060	12.10	3	Caguas	PR -52 Northbound	Car#165;As River Ramp; L
158	2061	12.70	3	Caguas	PR -52 Southbound	Car#165;As River Ramp; L
159	2267	107.00	2	Ponce	PR 52 Westbound	PR- 585
160	2271	105.80	4	Ponce	PR 52 Westbound	PR- 10
161	2272	105.80	4	Ponce	PR 52 Eastbound	PR -123
162	2370	101.00	1	Ponce	PR -52 Southbound	Local Road
163	2371	101.00	1	Ponce	PR -52 Northbound	Local Road
164	2415	108.20	1	Ponce	PR 52	Del Agua Creek
165	2417	107.50	26	Ponce	Ramp PR 52 - PR 2	PR- 2, Matilde Rv,Creek
166	1601	12.40	3	Caguas	PR 52	Creek
167	2273	106.70	2	Ponce	PR 52	Unknown Creek
168	3097	2.80	1	San Juan	PR 52	Calle Tulip
169	3098	4.10	2	San Juan	PR 52	Montehiedra Avenue
170	3099	5.00	1	San Juan	PR 52	Camino Luciano Vazquez
171	3100	5.90	1	San Juan	PR 52	Access Road
172	3101	6.40	1	San Juan	PR 52	Cam Pedro Vierra
173	3102	7.30	1	San Juan	PR 52	Camino Marcelo
174	3105	12.10	3	Caguas	PR 52	Local Street Rio Ca Ramp;
175	3106	12.50	1	Caguas	PR 52	Access Road
176	3107	12.90	1	Caguas	PR 52	PR-700
177	3108	13.80	2	Caguas	PR 52	PR-796
178	3103	8.70	1	San Juan	PR 52	Camino Los Guayabos
179	3104	10.90	2	San Juan	PR 52	PR-175

ESM


TABLE L.3.12.3
PR-53 BRIDGE INVENTORY

#	Agency ID	KM	Spans	Municipality	Feature Carried	Feature Crossed
1	1956	90.80	2	Salinas	PR 53 Eastbound	PR-706
2	1957	90.80	2	Salinas	PR 53 Westbound	PR-706
3						
3	1954	92.85	1	Salinas	PR 53 Eastbound	Hucar Creek
4	1955	92.85	1	Salinas	PR 53 Westbound	Hucar Creek
5	2251	84.40	1	Guayama	PR 53 Eastbound	Dirt Road
6	2252	83.60	2	Guayama	PR 53 Westbound	PR- 7710
7	2253	83.60	2	Guayama	PR 53 Eastbound	PR- 7710
8	2256	85.30	7	Guayama	PR 53 Westbound	Seco River
9	2279	86.80	5	Guayama	PR 53 Eastbound	PR -713 Ramp; Cimarrona C
10	2280	86.60	5	Guayama	PR 53 Westbound	PR -713 Ramp; Cimarrona C
11	2302	2.80	1	Fajardo	PR 53 Southbound	Future Road
12	2303	2.80	1	Fajardo	PR 53 Northbound	Future Road
13	2304	3.30	1	Fajardo	PR 53	PR -982
14	2308	4.80	2	Ceiba	PR 53	Ceiba Creek & PR 975
15	2311	0.10	1	Ceiba	RAMP PR 975- PR53	Ceiba Creek
16	2312	5.90	1	Ceiba	PR 53	PR- 978
17	2318	82.65	1	Guayama	PR 53 Eastbound	Depresion
18	2319	82.65	1	Guayama	PR 53 Westbound	Depresion
19	2406	39.40	1	Yabucoa	PR 53	Los Pinos Road
20	2428	27.10	7	Humacao	PR 53	Anton Ruiz River
21	2445	6.50	1	Ceiba	PR 53	PR-3
22	2455	11.50	6	Ceiba	PR 53	PR-974 and Daguao River
23	2460	7.90	2	Ceiba	PR 53	Waterway
24	2545	22.10	17	Naguabo	PR 53	Blanco river Ramp; PR 31
25	1241	94.20	1	Salinas	PR 53	PR -52
26	2245	35.40	2	Humacao	PR 53	PR- 906
27	2250	84.40	1	Guayama	PR 53 Westbound	Dirt Road
28	2255	85.50	7	Guayama	PR 53 Eastbound	Seco River
29	2298	0.80	1	Fajardo	PR 53	Mata Redonda Creek
30	2299	3.55	2	Ceiba	PR 53	Aguas Claras Creek
31	2306	3.60	1	Ceiba	PR 53	Dirt Road
32	2349	84.60	2	Guayama	PR 53	Unknown Creek

#	Agency ID	KM	Spans	Municipality	Feature Carried	Feature Crossed
33	2381	31.20	4	Humacao	PR 53 Southbound	PR-3
34	2382	31.20	4	Humacao	PR 53 Northbound	PR- 3
35	2383	31.70	25	Humacao	PR 53 Southbound	PR-923, Hum. River, Creek
36	2384	31.70	25	Humacao	PR 53 Northbound	PR-923, Hum. River, Creek
37	2404	37.00	3	Humacao	PR 53 Eastbound	Candelerio Rive -Dirt Road
38	2405	37.00	3	Humacao	PR 53 Northbound	Candelerio Rive -Dirt Road
39	2429	25.90	1	Humacao	PR 53	PR 927
40	2430	24.70	1	Humacao	PR 53	PR 927
41	2434	28.70	1	Humacao	PR 53	Local Road
42	2446	10.30	1	Ceiba	PR 53	PR- 3
43	2447	17.00	13	Naguabo	PR 53 Southbound	PR- 971 & Unknown Creek
44	2448	17.00	13	Naguabo	PR 53	PR- 971 & Unknown Creek
45	2449	16.40	1	Naguabo	PR 53	Local Road
46	2450	15.30	6	Naguabo	PR 53 W	Botija Creek & Local Road
47	2451	15.30	6	Naguabo	PR 53 Eastbound	Botija Creek & Local Road
48	2452	14.00	1	Naguabo	PR 53	Local Road
49	2453	13.00	17	Naguabo	PR 53	PR 973 & Palmas Creek
50	2494	24.80	2	Humacao	PR 53	Unknown Creek
51	2524	39.90	1	Yabucoa	PR 53	PR -906
52	2528	18.30	1	Naguabo	PR 53 Northbound	Connector PR-53 TO PR-31
53	2530	18.90	1	Naguabo	PR 53 Northbound	Cecilia Street
54	2534	20.60	1	Naguabo	PR 53	Maizalez Creek
55	2539	21.00	1	Naguabo	PR 53	Vaca Creek
56	2540	21.00	1	Naguabo	PR 53	Vaca Creek
57	2542	21.00	1	Naguabo	Ramp PR-53 to PR-970	Vaca Creek
58	2543	21.50	1	Naguabo	PR 53 Southbound	Channel
59	2544	21.50	1	Naguabo	PR 53	Channel
60	2554	22.10	17	Naguabo	PR 53	Blanco River Ramp; PR 31
61	2555	23.10	2	Naguabo	PR 53	Dirt Road Ramp; Channel
62	2300	1.80	1	Fajardo	PR 53	Connector to PR-3
63	2301	9.50	3	Ceiba	PR 53	Quebrada Seca Creek
64	2313	42.81	3	Humacao	PR 53	Colores Creek
65	2380	30.80	1	Humacao	PR 53	Fronteras Creek
66	2385	33.50	1	Humacao	PR 53 Southbound	Dirt Road
67	2386	33.50	1	Humacao	PR 53 Northbound	Dirt Road
68	2389	30.00	1	Humacao	PR 53 Southbound	PR- 925

#	Agency ID	KM	Spans	Municipality	Feature Carried	Feature Crossed
69	2390	30.00	1	Humacao	PR 53 Northbound	PR- 925
70	2402	35.90	3	Humacao	PR 53 Southbound	Channel
71	2403	36.00	3	Humacao	PR 53 Northbound	Channel
72	2436	44.66	0	Humacao	PR 53	Unnamed Creek
73	2459	6.60	3	Ceiba	PR 53	Seca Creek
74	2461	9.30	2	Ceiba	PR 53	Seca Creek
75	2525	40.20	75	Yabucoa	PR 53	Guayanes River
76	2526	43.10	1	Yabucoa	PR 53	Sun Oil Utilities
77	2527	18.30	1	Naguabo	PR 53 Southbound	Connector PR 53 to PR 31
78	2529	18.90	1	Naguabo	PR 53 Southbound	Cecilia street
79	2531	19.60	1	Naguabo	PR 53 Southbound	Dirt road
80	2532	19.60	1	Naguabo	PR 53 Northbound	Dirt road
81	2533	20.60	1	Naguabo	PR 53	Maizales Creek
82	2535	20.60	1	Naguabo	RAMP S PR53 PR970	Maizales Creek
83	2536	20.60	1	Naguabo	RAMP PR970 TO PR53	Maizales Creek
84	2537	20.75	1	Naguabo	PR 53	PR 970
85	2538	20.75	1	Naguabo	PR 53	PR 970
86	2541	21.00	1	Naguabo	RAMP PR970 TO PR53	Vaca Creek
87	2556	23.10	1	Naguabo	PR 53	Dirt Road Ramp; Channel
88	2388	30.40	3	Humacao	PR 53	Fronteras creek

TABLE L.3.12.4
PR-66 BRIDGE INVENTORY

#	Agency ID	KM	Spans	Municipality	Feature Carried	Feature Crossed
1	2791	4.20	9	Carolina	PR-66	Grande de Loiza River
2	2816	4.60	3	Carolina	PR 66	Waterway
3	2826	12.10	7	Canovanas	PR 66	PR-962 & Canovanas River
4	2973	15.10	5	Rio Grande	PR-66	Angola Creek
5	2812	0.20	1	Carolina	PR 66	PR 3
6	2814	0.40	1	Carolina	PR-66	Ramp To PR-3
7	2817	4.90	2	Carolina	PR-66	PR-853 KM. 2.00
8	2820	7.80	1	Carolina	PR-66	Local Road
9	2821	8.40	1	Carolina	PR-66	Local Road
10	2822	8.90	3	Carolina	PR 66	Canovanillas River
11	2823	9.30	1	Canovanas	PR-66	Turpial Street
12	2825	11.73	1	Canovanas	PR-66	Urban Local Road
13	2837	2.90	1	Carolina	PR-66	PR-887 KM 2.0
14	2838	0.90	3	Carolina	PR-66	Blasina Creek
15	2839	1.40	2	Carolina	PR 66	PR 887
16	2965	19.10	1	Rio Grande	PR-66	PR-956
17	2966	19.50	6	Rio Grande	PR-66	PR-3 Km. 19.50
18	2970	13.80	8	Rio Grande	PR-66 Eastbound	Dirt RD Ramp; Calderon C
19	2971	14.30	2	Canovanas	PR-66 Eastbound	Cambalache River
20	2977	16.50	3	Rio Grande	PR-66	Las Lajas River
21	2987	14.30	2	Canovanas	PR-66 Westbound	Cambalache River
22	2988	15.10	5	Rio Grande	PR-66	Angola Creek
23	2989	16.50	3	Rio Grande	PR-66	Las Lajas River
24	2824	10.82	1	Canovanas	PR-66	PR-185
25	2969	14.10	8	Canovanas	PR-66 Westbound	Dirt RD Ramp; Calderon C
26	2974	16.10	7	Rio Grande	PR-66	Herrerias River & Creek
27	2975	16.10	7	Rio Grande	PR-66	Herrerias River & Creek
28	2978	17.50	1	Rio Grande	PR-66	Dirt Road
29	2990	17.50	1	Rio Grande	PR-66	Dirt Road

TABLE L.3.12.5
BRIDGES REQUIRING UNDERWATER INSPECTIONS

Bridge ID	Road	Intercept Area Description	Municipality
2299	PR 53	AGUAS CLARAS CREEK	CEIBA

TABLE L.3.12.6
BRIDGES DESIGNATED AS FRACTURE CRITICAL

Bridge ID	Road	Km	Intercept Area Description	Municipality
2038	PR 52 NORTHBOUND	49.50	PR 714 & LA PALMA CR	SALINAS
2039	PR 52 SOUTHBOUND	49.50	PR 714 & LA PALMA CR	SALINAS

TABLE L.3.12.7
CULVERTS (REQUIRING INSPECTION ONLY)

#	AGENCY ID	KM	SPANS	Municipality	FEATURE CARRIED	FEATURE CROSSED
1	1111	95.2	3	Juana Diaz	PR 52	Unnamed Creek
2	2460	7.9	2	Ceiba	PR 53	Waterway
3	1416	6.276	2	San Juan	PR 52	Piedras River
4	2299	3.55	2	Ceiba	PR 53	Aguas Claras Creek
5	2494	24.8	2	Humacao	PR 53	Unknown Creek
6	2349	84.6	2	Guayama	PR 53	Unknown Creek
7	1601	12.4	3	Caguas	PR 52	Creek
8	2273	106.7	2	Ponce	PR 52	Unknown Creek
9	2459	6.6	3	Ceiba	PR 53	Seca Creek
10	2461	9.3	2	Ceiba	PR 53	Seca Creek
11	2301	9.5	3	Ceiba	PR 53	Quebrada Seca Creek
12	2313	42.809	3	Humacao	PR 53	Collores Creek
13	2436	44.659	0	Humacao	PR 53	Unnamed Creek
14	2910	51.4	2	Maunabo	PR-53 KM 51.0	Waterway
15	2305	0.02	3	Ponce	RAMP PR10 TO PR14	Bucana River
16	2388	30.4	3	Humacao	PR 53	Fronteras Creek

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TABLE L.3.12.8

SCOUR CRITICAL BRIDGES

Bridge ID	Road	Km	Intercept Area Description	Municipality
860	PR 52	18.90	CAGUITAS RIVER	CAGUAS
1077	PR 52 NORTHBOUND	94.30	INABON RIVER	JUANA DIAZ
1078	PR 52 SOUTHBOUND	93.90	INABON RIVER	JUANA DIAZ
1111	PR 52	95.20	UNNAMED CREEK	JUANA DIAZ
1141	PR 52 SOUTHBOUND	92.40	JACAGUAS RIVER	JUANA DIAZ
1207	PR 52 SOUTHBOUND	85.90	CA¥AS RIVER	JUANA DIAZ
1208	PR 52 NORTHBOUND	86.20	CAÑAS RIVER	JUANA DIAZ
1227	PR 52 NORTHBOUND	66.60	NIGUA RIVER	SALINAS
1228	PR 52 SOUTHBOUND	66.60	NIGUA RIVER	SALINAS
1286	PR 52 NORTHBOUND	25.00	PR 765 & BEATRIZ CRE	CAGUAS
1287	PR 52 SOUTHBOUND	25.00	PR 765 & BEATRIZ CRE	CAGUAS
2022	PR 52 SOUTHBOUND	36.10	LA PLATA RIVER	CAYEY
2054	PR 52 NORTHBOUND	41.10	S. DOMINGO CREEK, ROAD	CAYEY
2056	PR 52 SOUTHBOUND	57.40	MAJADAS RIVER & PR 7	SALINAS

45mm


TABLE L.3.12.9
OVERPASS BRIDGES

#	Agency ID	KM	Spans	Municipality	Feature Carried	Feature Crossed
1	844	5.70	003	GUAYNABO	PR 2	PR 20 (MRTNZ. NADAL EXP)
2	1259	15.10	006	SAN JUAN	PR 1	PR 52
3	1260	0.90	003	SAN JUAN	PR 838	PR 52
4	1277	0.08	002	CAYEY	PR 7787	PR 52
5	1284	23.10	002	CAGUAS	PR 1 RAMAL	PR 52
6	1285	37.80	005	CAGUAS	PR 1	PR 52
7	1521	4.30	003	GUAYNABO	PR 177	PR 20 (MRTNZ. NADAL EXP)
8	1848	0.50	002	GUAYNABO	SAN IGNACIO AVENUE	PR 20 (MRTNZ. NADAL EXP)
9	1849	0.40	003	GUAYNABO	PERIFERAL ST.	PR 20 (MRTNZ. NADAL EXP)
10	2228	0.60	002	GUAYNABO	ESMERALDA AVENUE	PR 20
11	2387	30.60	002	HUMACAO	PR 30	PR 53
12	2454	0.10	002	CEIBA	LOCAL ROAD	PR 53
13	2651	1.20	002	CAGUAS	PR 34	PR 52
14	2799	0.03	004	GUAYNABO	RAMP PR-2 TO PR-23	PR-20 Exp Martinez Nadal
15	2815	0.66	002	CAROLINA	PR-858	PR-66
16	2818	0.70	002	CAROLINA	PR 859	PR 66
17	2819	1.00	002	CAROLINA	Off PR 859 At 1.45	PR 66 KM 7.0
18	2939	13.10	002	CANOVANAS	PR-188	PR-66
19	2972	1.30	002	RIO GRANDE	PR-958	PR-66
20	2976	1.15	002	RIO GRANDE	PR-959	PR-66

TABLE L.3.12.10

BRIDGES – POSTING TABLES

#	Agency ID	Highway	Km	Type	Truck #1	Truck #2	Truck #3	item 41
1	909	PR 52 SOUTHBOUND	21.40	R12-1	50	50	50	P
2	927	PR 52	17.50	R12-1	45	45	45	P
3	1111	PR 52	95.20	R12-5	25	45	55	P
4	1148	PR 52 NORTHBOUND	89.70	R12-1	15	15	15	P
5	1163	PR 52 SOUTHBOUND	77.60	R12-1	45	45	45	P
6	1275	PR 52 NORTHBOUND	26.70	R12-1	30	30	30	P
7	1276	PR 52 SOUTHBOUND	26.70	R12-1	30	30	30	P
8	1295	RAMP PR30 TO PR 52	0.50	R12-1	20	20	20	P
9	1601	PR 52	12.40	R12-5	10	15	20	P
10	1874	PR 20 SOUTHBOUND	4.40	R12-1	20	20	20	P
11	2028	PR 52 NORTHBOUND	38.80	R12-1	50	50	50	P
12	2029	PR 52 SOUTHBOUND	38.75	R12-1	50	50	50	P
13	2271	PR 52 WESTBOUND	105.80	R12-5	30	30	45	P
14	2272	PR 52 EASTBOUND	105.80	R12-5	30	30	45	P
15	2306	PR 53	3.60	R12-5	10	15	25	P
16	2459	PR 53	6.60	R12-1	50	50	50	P

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Table L.3.12.11
Slopes and Rockfall in Toll Roads

	Object ID	Hazard Type	Rockfall Slope or Landslide/Erosion Slope ID Number	Road Number	Km	To Km	Municipality	Latitude	Longitude
1	1174	landslide	0052-034	52	29.7	29.85	Caguas	18.16415556	-66.08836389
2	273	landslide	0052-041	52	43.3		Cayey	18.09218226	-66.17480726
3	269	landslide	0052-042	52	59.4		Salinas	18.01995205	-66.24325303
4	305	landslide	0053-003	53	14.8		Naguabo	18.21406009	-65.70598556
5	274	landslide	0066-031	66	3.5		Carolina	18.36778664	-65.96579515
6	275	landslide	0066-032	66	4.2		Carolina	18.36598268	-65.96176908
7	276	landslide	0066-033	66	6.6		Carolina	18.36272099	-65.94045704
8	277	landslide	0066-034	66	7.1		Carolina	18.36217784	-65.9355302
9	278	landslide	0066-035	66	7.3		Carolina	18.3617435	-65.93366695
10	279	landslide	0066-036	66	7.9		Carolina	18.3615113	-65.92854057
11	280	landslide	0066-037	66	8.2		Carolina	18.36168133	-65.92482804
12	281	landslide	0066-038	66	8.5		Carolina	18.36155602	-65.92258567
13	282	landslide	0066-039	66	9.1		Canovanas	18.36115739	-65.91675321
14	283	landslide	0066-040	66	9.4		Canovanas	18.36059232	-65.91347418
15	284	landslide	0066-041	66	10.8		Canovanas	18.3590932	-65.90148165
16	285	landslide	0066-042	66	10.9		Canovanas	18.35919542	-65.89978427
17	286	landslide	0066-043	66	11.7		Canovanas	18.36025095	-65.89301187
18	287	landslide	0066-044	66	12.3		Canovanas	18.36386831	-65.88812632
19	288	landslide	0066-045	66	13.3		Canovanas	18.37089765	-65.88243051
20	296	landslide	0066-046	66	17		Rio Grande	18.36842407	-65.84896135
21	289	landslide	0066-047	66	17.5		Rio Grande	18.36835687	-65.84352054
22	295	landslide	0066-048	66	17.5		Rio Grande	18.36866547	-65.84385547
23	294	landslide	0066-049	66	17.8		Rio Grande	18.36878186	-65.84118863
24	291	landslide	0066-050	66	18.3		Rio Grande	18.36877042	-65.83667087
25	293	landslide	0066-051	66	18.4		Rio Grande	18.36907355	-65.83390021
26	292	landslide	0066-052	66	19.2		Rio Grande	18.37416607	-65.82944897
27	290	landslide	0066-053	66	17.8		Rio Grande	18.36850957	-65.84166452
28	871	rockfall	0052-001	52	1.1	1.56	San_Juan	18.36677109	-66.07044928
29	872	rockfall	0052-002	52	3.4	3.6	San Juan	18.34810754	-66.07045543
30	873	rockfall	0052-003	52	3.8	3.9	San Juan	18.34550305	-66.06991232
31	356	rockfall	0052-004	52	6.35	6.45	San Juan	18.32555395	-66.04737417
32	358	rockfall	0052-005	52	7.35	7.55	San Juan	18.32548523	-66.04486522
33	357	rockfall	0052-006	52	7.5	7.65	San Juan	18.32477447	-66.04451898
34	359	rockfall	0052-007	52	7.7	7.9	San Juan	18.32373191	-66.04237188
35	362	rockfall	0052-008	52	7.78	8.6	San Juan	18.32423721	-66.04219436

	Object ID	Hazard Type	Rockfall Slope or Landslide/Erosion Slope ID Number	Road Number	Km	To Km	Municipality	Latitude	Longitude
36	333	rockfall	0052-009	52	8.15	8.35	San Juan	18.31986248	-66.03667219
37	332	rockfall	0052-010	52	9	9.15	Trujillo Alto	18.31584205	-66.03394273
38	875	rockfall	0052-011	52	9.3	9.62	Trujillo_Alto	18.31340278	-66.03372778
39	876	rockfall	0052-012	52	9.7	10	Trujillo_Alto	18.30951958	-66.03452447
40	877	rockfall	0052-013	52	9.75	9.95	Trujillo_Alto	18.30914214	-66.03389099
41	361	rockfall	0052-014	52	15	15.32	Caguas	18.27073487	-66.03911852
42	360	rockfall	0052-015	52	15.36	15.68	Caguas	18.26772353	-66.03830993
43	341	rockfall	0052-020	52	57		Salinas	18.04022184	-66.24028054
44	342	rockfall	0052-021	52	57		Salinas	18.0402182	-66.2398948
45	343	rockfall	0052-022	52	58		Salinas	18.03036113	-66.2394813
46	349	rockfall	0052-023	52	58		Salinas	18.03066998	-66.23895212
47	345	rockfall	0052-024	52	59.8		Salinas	18.01602848	-66.24423153
48	346	rockfall	0052-025	52	59.8		Salinas	18.01648857	-66.24374453
49	347	rockfall	0052-026	52	58.6		Salinas	18.02626308	-66.24114046
50	348	rockfall	0052-027	52	58.6		Salinas	18.0256832	-66.24079769
51	337	rockfall	0052-029	52	60.5		Salinas	18.0084064	-66.24644792
52	339	rockfall	0052-030	52	68.3		Salinas	17.99612231	-66.30630029
53	338	rockfall	0052-031	52	68.7		Salinas	17.99651445	-66.30966895
54	340	rockfall	0052-032	52	68.3		Salinas	17.9956271	-66.30626437
55	1173	rockfall	0052-033	52	49		Salinas	18.07090556	-66.21676944
56	350	rockfall	0052-035	52	56.4		Salinas	18.04370861	-66.24030269
57	351	rockfall	0052-036	52	56.4		Salinas	18.04369532	-66.2408056
58	352	rockfall	0052-037	52	55.8		Salinas	18.04867504	-66.23686808
59	353	rockfall	0052-038	52	55.4		Salinas	18.04754027	-66.23270046
60	354	rockfall	0052-039	52	55.2		Salinas	18.04640826	-66.22880793
61	355	rockfall	0052-040	52	55.4		Salinas	18.04705723	-66.23356656
62	407	rockfall	0052-043	52	52.3		Salinas	18.04660838	-66.21199883
63	344	rockfall	0053-001	53	94		Salinas	18.00825476	-66.24477408
64	374	rockfall	0053-002	53	81.15		Guayama	17.98862462	-66.13173563
65	375	rockfall	0053-004	53	81.45		Guayama	17.9889064	-66.13467589
66	26	rockfall	0066-001	66	3.39	3.62	Carolina	18.36839659	-65.96754674
67		rockfall	0066-002	66	4.41	4.54	Carolina	18.3652135	-65.96014864

	Object ID	Hazard Type	Rockfall Slope or Landslide/Erosion Slope ID Number	Road Number	Km	To Km	Municipality	Latitude	Longitude
68	28	rockfall	0066-003	66	5.65	5.895	Carolina	18.36302837	-65.94765698
69	33	rockfall	0066-004	66	6.3	6.39	Carolina	18.36276774	-65.94288812
70	34	rockfall	0066-005	66	6.71	6.91	Carolina	18.3626212	-65.93851505
71	381	rockfall	0066-006	66	7.6		Carolina	18.3615119	-65.93127035
72	380	rockfall	0066-007	66	7.9	8.15	Carolina	18.36144125	-65.92772833
73	35	rockfall	0066-008	66	9.85	10.65	Canóvanas	18.35956442	-65.90873834
74	36	rockfall	0066-009	66	12.55	12.91	Canóvanas	18.36675883	-65.88623503
75	51	rockfall	0066-010	66	13.55	13.82	Canóvanas	18.37199199	-65.87942552
76	52	rockfall	0066-011	66	15.57	15.85	Río_Grande	18.36748926	-65.86147253
77	53	rockfall	0066-012	66	17.34	17.44	Río_Grande	18.36826799	-65.8455563
78	54	rockfall	0066-013	66	17.92	18.18	Río_Grande	18.36843743	-65.83935293
79	55	rockfall	0066-014	66	18.6	18.9	Río_Grande	18.37155998	-65.83320545
80	390	rockfall	0066-015	66	19.3	19.6	Río_Grande	18.37491575	-65.82788672
81	56	rockfall	0066-016	66	17.925	18.1	Río_Grande	18.36915245	-65.83803958
82	57	rockfall	0066-017	66	13.6	13.8	Canóvanas	18.37244902	-65.87953631
83	58	rockfall	0066-018	66	12.89	12.96	Canóvanas	18.36890771	-65.88543247
84	59	rockfall	0066-019	66	5.9	6.22	Carolina	18.36280377	-65.94514943
85	60	rockfall	0066-020	66	11.15	11.35	Gurabo	18.35985902	-65.89695334
86	61	rockfall	0066-021	66	10.43	10.8	Canóvanas	18.35966348	-65.90343993
87	62	rockfall	0066-022	66	9.95	10.07	Canóvanas	18.35985597	-65.90796877
88	63	rockfall	0066-023	66	7.55	7.67	Carolina	18.36192285	-65.93119462
89	64	rockfall	0066-024	66	6.73	6.85	Carolina	18.36301009	-65.93822681
90	65	rockfall	0066-025	66	5.9	6.24	Carolina	18.36323574	-65.94454856
91	66	rockfall	0066-025A	66	5.6	5.88	Gurabo	18.36346036	-65.9479643
92	67	rockfall	0066-026	66	5.2	5.5	Carolina	18.36390281	-65.95213363
93	68	rockfall	0066-027	66	4.4	4.5	Carolina	18.36563158	-65.95977892
94	69	rockfall	0066-028	66	3.58	3.7	Carolina	18.36873122	-65.96703533
95	1255	rockfall	0053-040	53	82.25	82.45	Guayama	17.98737948	-66.1422434
96	1256	rockfall	0053-046	53	83.55	84.22	Guayama	17.98654451	-66.15664175