

A list of countries for the principle projects for **Highways and Construction Materials** includes:

- # *United Kingdom: Dartford and Ramsgate Ferry Terminals, M1 and M62 motorway interchange Geotechnical Investigations and Foundations Report, Salisbury A36 Bypass and Structure Foundation Design, Oxford A40 By Pass Geotechnical Investigations, M4-Bryn Glas Relief Road Scheme Geotechnical Investigations, North Devon Link Road (IIB) Geotechnical Investigations.*
- # *India: Reconstruction and Four Lining of National Highway No.2 , Bihar Plateau Development Project.*
- # *Hong Kong: Ting Kau Bridge Project*
- # *Pakistan: Indus Highway Project*
- # *Botswana: Jwaneng to Sekoma & Mogishane to Kanye Road Projects.*
- # *Abu Dhabi: Baniyas Sector Roads Project.*
- # *Bangladesh: Daulatida to Kushtia Road Improvement Project.*
- # *Nepal: Naubise to Mugling Road re-construction Project.*
- # *Saudi Arabia: Taif Airfield Facilities Project.*

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Highways and Construction Materials

Highway construction is a problem of logistics. The earthwork materials and aggregates for the highway construction will often be taken en route.



It is essential that proper control procedures are established, particularly in undeveloped countries. As part of a program of materials control the following aspects must be satisfied:

- # *mapping and location of quarries and borrow areas,*
- # *negotiation of extraction rights,*
- # *physical investigation of quality and extent of the source deposit,*
- # *field and laboratory testing*



After an evaluation of the available earthworks and aggregate materials, Antonio Associates can design or review the designs of the embankments and pavements. Varying the thickness of the embankment and pavements layers, with consideration given to the improvement of these materials by physical or chemical stabilisation methods.



In many countries, the quality of most construction materials are guaranteed by the manufacturer or supplier; however inspection, vetting of their quality systems and monitoring these suppliers are all part of Antonio Associates services.

- # *natural and synthetic rubber for waterproofing, bearings and gaskets.*
- # *other manufactured products for general construction use including: lime, paints, non-ferrous metals, glass, plastics, adhesives, fabrics (geo-textiles) road furniture, components of mechanical and electrical items.*

Antonio Associates has extensive experience in the management of the materials aspects of feasibility studies and construction projects which have been located both in congested urban areas and remote rural environments.



Antonio Associates recognises the need to control the materials used in various facets of all construction projects:

- # *earthwork materials: soil, rock and manmade; processed or unprocessed for use as filter media, embankments, and backfill to structures.*
- # *aggregates: natural, manmade, crushed and uncrushed for use in unbound and bound pavement layers, filter media, concretes and asphalt.*
- # *cement for use in mortars, concretes, and stabilisation.*
- # *water and additives principally for use in mortars and concretes.*
- # *bricks and tiles for use in buildings and paving.*
- # *steel: plate, reinforcing elements, cable and wires for structures.*
- # *bitumen, asphalt and tars for bituminous and asphaltic pavement layers, tack coats, stabilisation, and waterproofing.*
- # *stone for masonry and gabions.*
- # *timber for temporary works and structures.*



Services include:

- # *design of asphalt, batched products and concrete mixes.*
- # *supervision of all on-site testing both in the field and in the laboratory.*
- # *analysis and proposing solutions to difficult or unforeseen ground conditions.*
- # *locating sources of all construction materials, relevant inspection and the arrangement of necessary independent testing.*
- # *earthworks and pavement design.*
- # *establishment of the appropriate Quality systems for the size and nature of the Project.*
- # *establishing on-site laboratories.*
- # *training of local personnel.*

