Eco Mark Product Category

Products for Civil Engineering (Draft)

Eco Mark Product Category No.XXX

"Products for Civil Engineering" (Draft)

1. Environmental Background

In civil engineering/construction-related business that is implemented as part of social infrastructure development, ripple effects in the economy are expected, but at the same time a significant environmental load is imposed on the natural environment of the oceans, rivers and land as well as the living environment. New forms of civil engineering-/construction-related business based on the principles of the "Basic Environmental Law," such as through harmonization with the natural environment, formation of a good living environment, prevention of global warming by improving energy efficiency, etc., are therefore being explored.

In addition to these kinds of environmental conservation efforts, it was also determined that in the civil engineering/construction-related business it is necessary to promote the control of waste generation (reduction), secondary uses (reuse) and recovery for further use (recycling) in accordance with the "Waste Disposal and Public Cleansing Law," the "Basic Law for Establishing a Recycling-Based Society," the "Law Concerning Promotion of the Procurement of Eco-friendly Goods and Services by the State and Other Entities (Green Procurement Law)" and the "Law for Recycling Materials for Construction (Construction Recycling Law)." Furthermore, independent efforts by civil engineering/construction enterprises for reduction of the environmental load, the "Guidelines for Green Procurement in the Construction Industry" were formulated in 2002.

In Japan's material balance, the proportion attributable to civil engineering and construction-related business accounts for approximately 40% of new resources (2002 White Paper on a Recycling-Oriented Economic System; FY2001 Major Construction Materials Demand Forecast), approximately 20% of industrial wastes and approximately 40% of wastes collected at final landfill sites (2002 Environmental White Paper). It can therefore be expected that an environmentally-sound materials cycle to promote reduction, reuse and recycling will have a major impact on the structure of society.

The load placed on elements of the environment by the civil engineering and construction-related business varies according to many environmental factors such as the site of the business and the methods and types of materials used. As the environmental load may be reduced by applying Eco Mark Product Certification to construction materials, one of the factors affecting this, the Eco Mark Certification Criteria for newly applied products, shall be established to certify such materials as 'construction products' after organizing and integrating them with products that are already certified.

The new certification criteria, in addition to minimizing the consumption of new

materials and the generation of wastes on the basis of using recycled materials, as has been recommended, and taking into consideration the reduced use of harmful substances, energy saving, the impact on the ecosystem, etc., that are intended to reduce the environmental load imposed by construction work and long-term use, both of which may be characteristic of construction products, aim at the same time to achieve a symbiotic relationship with nature by creating a secondary natural environment. The concept of the life cycle of materials and products will be introduced into the evaluation, taking into consideration the life stage when the construction work is commenced as a construction product, and as many concrete environmental load items as possible have been selected.

Note: This document is a translation of the criteria written in Japanese. In the event of dispute, the original document should be taken as authoritative.

2. Applicable Products

From among construction materials, mainly those for public use as given in Attachment 1 are applicable.

3. Terminology

Terms for the common standard

- Recycle: Materials recycling only; energy recovery (thermal recycling) is not included.
- Recycling: Collecting used materials and putting them into recycling processes for the purpose of reuse, recycle, energy recovery, production of gas or oil, blast furnace reduction, or production of chemical raw materials for coke-oven
- Recycled materials: Post-consumer materials or pre-consumer materials, or a combination of these.
  - Pre-consumer materials: Materials or rejected products generated from a disposal route in a product manufacturing process, excluding those that are recycled within the same process (plant).
  - Post-consumer materials: Materials or products disposed of after they have been used as goods.
- Standard mixture amount: The percentage of recycled materials of each material that is used to manufacture products (as % by mass), and calculated as follows and regulated on a material-by-material basis: Standard mixture amount = recycled materials/each material
- Disposable product: Products that are not intended for repeated use in a field in which durable products exist for repeated use as proper materials.
- Prescribed constituents: Material components added for the intended purpose of giving certain characteristics to the products. Impurities that are technically unavoidable in the manufacturing process are not included.

Terms for paper

- Waste paper: Collected post-consumer waste paper and pre-consumer waste paper.
  - Post-consumer waste paper: Used paper generated in shops, offices, or households.
  - Pre-consumer waste paper: Paper generated during the processing stage after paper-manufacturing (in plants that use paper as a product material, such as in paper processing factories, paper product factories, printing and bookbinding plants) that is not used as part of the products; excluding paper generated in the process of manufacturing original paper and reused as a raw material in the same process.
- Percentage of waste paper in the pulp mixture: The ratio by mass of waste paper pulp to all pulp materials used in the products, which is calculated as follows under the condition that the mass of the pulp shall have a moisture content of 10%: Waste paper pulp/(virgin pulp + waste paper pulp) x 100 (%)

Terms for wood

- ・ Reused/Unused wood: Indicates the following: forest thinnings, waste wood, construction waste wood, and less useful wood.
- ・ Thinned-out log: Wood produced from a reduction in the density of the tree type that is the objective of management based on the intensity of the forest stand.
- ・ Waste wood: Used wood (used packing materials, etc.), remainder materials generated in wood processing plants (shavings generated in plywood/lumber plants, etc., low quality chips not used as raw materials for paper, etc.), and wood and wooden materials such as trimmed branches, bark, etc.
- ・ Construction waste wood: Wood and wooden materials disposed of as waste during construction work such as from the dismantling of buildings, construction of new buildings, building extensions, renovations, and construction related to other work.

- Rarely utilized wood: Abandoned timber in the forest, shrubs, tree roots, wood obtained from timber damaged by disease, pests, or disasters, bent or small diameter logs, etc. This also includes bamboo cut down in bamboo groves for the purpose of maintenance and management for environmental conservation.
  Small caliber logs measuring less than 14 cm in diameter corresponding to “a.” or “b.” below must be certified as being from forests managed in a sustainable manner by an independent third party.
  a. Small diameter logs from logs felled from natural forests.
  b. Small diameter logs from logs produced by clear cutting, patch logging, and strip logging in plantation forests.
  - ・ Waste plant fiber: Agricultural residues generated during harvesting and the manufacturing process such as rice hulls, and used packaging materials such as jute bags, etc.
- Wooden part: Actual wood (including plant fibers)

Terms for glass

- Glass cullet: Waste glass used as materials for making new glass and given recycling treatment (sorting, removal of foreign matter, etc.).
- Percentage of glass cullet usage: The rate of the total amount of glass material used in a product, which is calculated as follows and all materials shall be expressed by mass: Glass cullet/total amount of glass material (per product)

Terms for plastic

- Plastics: Materials composed of a single or multiple polymers, plus additives, fillers, etc. that are added to the polymer(s) to give it(them) specific characteristics.
- Recycled plastic materials: Plastic materials composed of post-consumer materials and pre-consumer materials.

Terms for fiber

- Unused fiber: Cotton linter and short fibers produced during spinning.
- Recycled fiber: Recovered fibers, recycled polymer fibers or recycled chemical fibers.
- Recovered fiber: Fibers of recovered materials such as lint from fabric factories, cutting waste from sewing factories and used clothing (including split-and-weave textiles).
- Recycled polymer fiber: Fibers produced from recycled resin using recycled shreds of post-consumer materials and pre-consumer materials, or pellets.
- Recycled chemical fiber: Fibers composed of polymers produced from polymerized monomers as raw materials that were obtained by depolymerizing/polymerizing used products of nylon or polyester materials or polymers of pre-consumer materials.
- Recycled cloth: Cloth produced by cutting rejected cloth during inspections, used clothing and old cloth.

Other terms

- Waste rubber: Used rubber obtained from used tires, tubes, etc.
- Construction sludge: Construction sludge prescribed in the “Appropriate Disposal of Waste Produced from Construction Work” (Kansantasu No. 26, June 11, 2001).
- Coarse aggregates: Aggregates of which 85% or more remain after passing through a 5 mm mesh sieve.
- Fine aggregates: Aggregates that completely pass through a 10 mm mesh sieve and 85% or more of which pass through a 5 mm mesh sieve.
- Revegetation base materials: Materials intended to improve the base materials used for planting during revegetation, other than ‘fertilizers’ (as determined by the Fertilizer Control Law) and ‘soil amendments’ (as determined by the Improvement of Soil Fertility Law)
- Drainage materials: Granulated solid matter intended to improve permeability.

- Backfill materials: Granulated solid matter used for backfilling.

4. Certification Criteria

4-1. Environmental criteria

4-1-1. Common criteria

(1) The production process shall conform to relevant environmental regulations and agreements on environmental pollution control regarding air pollution, water contamination, noise, odor, emissions of hazardous materials and industrial hygiene.

4-1-2. Material criteria

The constituents of the products shall conform to the following criteria for the respective materials. In this regard, the relevant criteria for the materials shall not be applicable to minor attachments (minor parts necessary for the functioning of the product, such as screws, adhesives, etc.).

A. Wood

(2) Wood preservatives shall be those approved by the Japan Wood Preserving Association.

B. Plastics

(3) Plastic additives shall follow positive lists specified by the industry's own standards. As for products approved by the Japan Fire Retardant Association as 'flame retardant goods' or 'flame retardant agents', excluding PBB (polybromobiphenyl), PBDE (polybromodiphenylether), or short-chain chlorinated paraffin (with 10-13 chain Carbon atoms and a 50% or higher chlorine content) shall be permitted for use. In addition, lead (Pb)-based compounds, cadmium (Cd)-based compounds and organotin compounds including organic tin (Sn), compounds such as tributyl tin compound (TBT), triphenyl tin compound (TPT), etc. shall not be included.

C. Glass cullet

(4) As for the elution of harmful substances from glass cullet, this shall conform to the requirements for specific harmful substances given in Attachment 2, which are provided in the detailed enforcement regulations (Ministry of the Environment Ordinance No. 29, December 26, 2002) of the Soil Pollution Control Law, and standards for cadmium, lead, hexavalent chromium, arsenic, total mercury, selenium, boron and fluorine shall be conformed to.

D. Fibers

(5) In the use of recycled fibers, chemical materials given in Attachment 2 shall conform to the standard values.

4-1-3. Individual product criteria

A. Wooden tiling/blocks

(6) The percentage of reused/unused wood as materials for the wooden part shall be 100% by mass.

Note: The expression "% by mass" means the proportional mass of the product or each material in an air dried state[*1] or at the point of constant weight[*2] at a temperature of 20±2ºC and humidity of 65±5%.

[*1]: Indicates leaving in a well-ventilated room for seven days or more.

[*2]: Change is less than 0.1% when the weight is measured every 24 hours.

(7) As for products in which materials other than forest thinnings/small diameter logs, waste wood, construction waste wood and less useful wood are combined, the wooden portion shall be 70% or more by mass of the entire product, including added materials.

(8) Paints if used for the products shall conform to the criteria of Eco Mark Product Category No. 126, "Paints Version 1.0".

(9) Resins made from halogens shall not be used in the products.

(10) The packaging of products shall give consideration to the ease of recycling. Plastic materials used for packaging shall not be added together with polymers that contain halogens and organic halogenides as prescribed constituents.

B. Steel construction materials

(11) The production stage of the product shall give consideration to the reduction of waste generation.

(12) The production stage of the product shall give consideration to the quantity of new resources used, energy consumption and CO_2 emissions.

(13) The respective products shall conform to the following criteria:

a. Permeable steel sheet piles

Steel sheet piles (permeable steel sheet piles) pre-perforated with percolation holes, which are designed to facilitate hydrological circulation between land and water (groundwater flow) without the loss of structural functions required for revetment, such as vibration proofing, corrosion proofing, durability, etc.

b. Planting fins for steel sheet pile bank revegetation

Planting fins for revegetation, which it shall be possible to mount on steel sheet pile banks and to hold soil to provide a base growing medium for perennial emergent plants; landscaping functions to cover the steel sheet pile surface with plants shall be provided without the loss of structural functions required for revetment, such as vibration proofing, corrosion proofing, durability, etc. and planting on the banks shall be made possible.

c. Low displacement steel piles

Steel piles suitable for construction work with low vibration/low noise, with a displacement volume to the surface at the pile body construction stage which shall be 30% or less of the pile body volume (blocked area x pile length).

C. Aggregates

(14) The percentage of recycled aggregates produced from crushed chunks of concrete from demolished concrete architectural structures shall be 100% or higher by mass of the entire product mass. The percentage of vitrified material aggregates such as non-industrial wastes and sewage sludge shall be 100% by mass of the entire product mass. The percentage of slag aggregates, the respective blast furnace slag, ferro-nickel slag and copper slag shall be 100% by mass of the entire product mass.

(15) The production stage of the product shall give consideration to the quantity of new resources used, energy consumption and CO_2 emissions.

(16) As for the elution of harmful substances from products, these shall conform to the requirements for all specific harmful substances given in Attachment 2, which are provided in the detailed enforcement regulations (Ministry of the Environment Ordinance No. 29, December 26, 2002) of the Soil Pollution Control Law, provided that as for the materials to which the elution standards apply for vitrified material aggregates and slag aggregates, these shall include eight substances, namely: cadmium, lead, hexavalent chromium, arsenic, total mercury, selenium, boron and fluorine. During the certification period, the tests shall be implemented biannually and the test results shall be made available.

(17) As for harmful substances contained in the products, these shall conform to the requirements for all specific harmful substances given in Attachment 3, which are provided in the detailed enforcement regulations (Ministry of the Environment Ordinance No. 29, December 26, 2002) of the Soil Pollution Control Law, provided that as for materials to which the elution standards apply for vitrified material aggregates and slag aggregates, these shall include eight substances, namely: cadmium, lead, hexavalent chromium, arsenic, total mercury, selenium, boron and fluorine. During the certification period, tests shall be implemented annually and the test results shall be made available.

D. Cement

(18) The products shall use “recycled materials” that are defined above, and contain the materials listed in Table 1.

(19) Raw materials (including fuels and mixing materials) used in the process of producing 1 ton of the product shall contain 0.4 ton or more of the above-mentioned recycled materials in total. As for recycled materials containing moisture, including sludge, the raw materials shall be calculated using mass values when received.

Table 1 Recycled materials usable for making cement

Recycled materials
Blast furnace slag
Coal ash
By-product lime
Sludge
Non-steel slag
Steelmaking slag
Combustion residues (excluding coal ash), soot, dust
Coal refuse
Foundry sand
Waste tires
Recycled oil
Waste oils
Waste clay
Waste plastics
Other non-industrial wastes (excluding non-industrial waste requiring special management) and industrial wastes (excluding industrial wastes requiring special management) designated under the “Law Concerning Waste Disposal and Cleansing,” shall be appropriate as cement constituents, fuels or mixing materials

(20) Any production process that includes heat treatment, such as baking, shall give consideration to CO_2 emissions.

(21) Harmful substances contained in the products shall include eight substances, namely: cadmium, lead, hexavalent chromium, arsenic, total mercury, selenium, boron and fluorine, from among the specific harmful substances given in Attachment 3, which are provided in the detailed enforcement regulations (Ministry of the Environment Ordinance No. 29, December 26, 2002) of the Soil Pollution Control Law.

(22) When using cement and cement-type solidification agents in soil improvement, in conformity with “Immediate Measures Concerning the Use of Cement and Cement-Type Solidification Agents in Soil Improvement and the Reuse of Improved Soil” (Ministry of Construction, Gichohatsu No. 48, March 24, 2000), hexavalent chromium elution tests shall be conducted and any necessary measures shall be taken.

(23) An instruction manual shall accompany the product concerning its construction/use/maintenance/management/disassembly/disposal/recycling, and be given to the constructor and the owner of any architectural structure who use the relevant product, and the manufacturer of the product. The instruction manual shall provide the following information:

a. Information regarding the dispersal of the product and the emissions of powdery materials containing harmful substances as a

result of abrasion, etc., during the use/construction of the recycled materials and in the use/maintenance/management of the product, and information regarding Certification Criterion D (21) (clearly stating that details may be obtained upon inquiry).

b. Information regarding construction/use/maintenance/management of the architectural structure and product.

c. Information regarding disassembly/disposal of the architectural structure and product.

d. The requirement to retain the instruction manual (The manual shall be kept until the architectural structure and product is disassembled, disposed of, and/or recycled.)

E. Concrete products

(24) Concrete products shall conform to either a. or b. as follows.

a. As for products using permeable concrete, the coefficient of permeability shall be:
1×10^{-2} cm/sec or higher

b. The "Recycled materials" given in Table 2 shall be used at the standard mixture rate or higher. The combination of recycled materials shall be either aggregates only or aggregates and cement.

Table 2 Recycled materials usable for concrete products

Recycled material	Standard mixture rate
Coarse aggregates in conformity with Criteria C (14) to C (17) for applicable 'aggregates'	50% by mass of coarse aggregates, provided it is 50% by mass of fine aggregates for vitrified material aggregates
Cement in conformity with Criteria D (18) to D (23) for the applicable 'cement'	50% by mass of the cement used

(25) As for the elution of harmful substances from the products, these shall conform to the requirements for all specific harmful substances given in Attachment 2, which are provided in the detailed enforcement regulations (Ministry of the Environment Ordinance No. 29, December 26, 2002) of the Soil Pollution Control Law.

(26) As for harmful substances contained in the products, these shall conform to the requirements for all specific harmful substances given in Attachment 3, which are provided in the detailed enforcement regulations (Ministry of the Environment Ordinance No. 29, December 26, 2002) of the Soil Pollution Control Law.

(27) An instruction manual shall accompany the product concerning its construction/use/maintenance/management/disassembly/disposal/recycling, and be given to the constructor and the owner of an architectural

structure who use the relevant product. The instruction manual shall provide the following information:

a. Information regarding the elution of the harmful substances and the emissions of powdery materials containing harmful substances as a result of abrasion, etc., in the use/construction of the permeable concrete or recycled materials and in the use/maintenance/ management of the product, and information regarding criteria E (25) and (26) (clearly stating that details may be obtained upon inquiry)
b. Information regarding construction/use/maintenance/management of the architectural structure
c. Information regarding disassembly/disposal of the architectural structure
d. Information regarding the recycling of the product
e. The requirement to retain the instruction manual (The manual shall be kept until the architectural structure is disassembled, disposed of, and/or recycled.)

(28) The products shall be recyclable after use, or they should be separable from other products.

F. Pavement materials

(29) The mass ratio of recycled rubber to the total amount of rubber used in the product shall be 100%.
(30) Antifreezing pavement material containing rubber particles shall be adequately recyclable by a modification facility after disposal.
(31) Each stage from resource extraction to the recycling of the product shall give consideration to the quantity of new resources used, energy consumption and CO_2 emissions.
(32) As for the elution of harmful substances from rubber particles, these shall conform to the requirements for all specific harmful substances given in Attachment 2, which are provided in the detailed enforcement regulations (Ministry of the Environment Ordinance No. 29, December 26, 2002) of the Soil Pollution Control Law.
(33) Information regarding criterion F (32) shall be made available.

G. Landscaping/revegetation materials

(34) As for the products, the total mass of “recycled materials” given in Table 3 shall be 70% or more of the entire product mass. Products in which concrete and other materials are combined for use, the ratio of recycled materials to the product mass excluding the concrete portion shall be 70% or more. As for products composed of concrete only, or a portion of concrete, they shall use the standard mixture rates for “recycled materials” given in Table 4 or a higher standard. The combination of recycled materials shall be either aggregates only or aggregates and cement.

As for products whose purpose of use is terminated after a certain period and that may be left in the environment, only Category A recycled materials shall be used.

When using Category C recycled materials, products shall have been baked or vitrified in the pre-treatment processing of the raw materials or the production process of the product.

(35) As for the elution of harmful substances from concrete portions, these shall conform to the requirements for all specific harmful substances given in Attachment 2, which are provided in the detailed enforcement regulations (Ministry of the Environment Ordinance No. 29, December 26, 2002) of the Soil Pollution Control Law.

(36) As for harmful substances contained in the concrete portions, these shall conform to the requirements for all specific harmful substances given in Attachment 3, which are provided in the detailed enforcement regulations (Ministry of the Environment Ordinance No. 29, December 26, 2002) of the Soil Pollution Control Law.

(37) Each stage from resource extraction to the recycling of the product shall give consideration to the quantity of new resources used, energy consumption and CO_2 emissions.

(38) Information regarding Certification Criteria G (35) and (36) shall be made available.

(39) The packaging of the products shall give consideration to ease of recycling. Plastic materials used for packaging shall not have polymers added that contain halogens and organic halogenides as prescribed constituents. When the packaging materials include metals, they shall be designed to allow separation/sorting to facilitate recycling after disposal.

Table 3 Recycled materials usable for landscaping/revegetation materials (excluding concrete portions)

Recycled material			
Category A	Reused/unused wood		
	Waste plant fibers (Rice straw, palms, moss, etc.)		
	Waste paper		
Category B	Coarse aggregates in conformity with Criteria C (14) to C (17) for applicable 'aggregates'		
	Cements in conformity with Criteria D (18) to D (23) for applicable 'cement'		
	Fiber	Unused fibers	
		Recycled fibers	Recovered fibers
			Recycled polymer fibers
			Recycled chemical fibers
		Unused cloth, recycled cloth	
	Mining/quarrying industry wastes		Quarrying and ceramic industry waste soil, micro-silica sand obtained during the water washing of silica sand (mica powder)
	Metal industry wastes		Steel slag, foundry sand, ceramic waste, copper slag, ferro-nickel slag, electric furnace slag
	Other industrial type wastes		Coal ash, waste plastics, shells, waste rubber, glass cullet, gypsum (including desulfurized gypsum), glass wool, rock wool
	Non-industrial wastes and vitrified materials in sewage sludge		
Category C	Living/self-generating sludge		Waterworks sludge, sludge from the bottom of lakes
	Industrial sludge		Paper-manufacturing sludge, aluminum sludge, galvanizing sludge, polishing sludge
	Construction sludge		

Note 1: The percentage mass of wooden parts means the proportional mass of the product or each material in an air dried state[*1] or at the point of constant weight[*2] at a temperature of 20±2ºC and humidity of 65±5%.

[*1]: Indicates leaving in a well-ventilated room for seven days or more.

[*2]: Change is less than 0.1% when the weight is measured every 24 hours.

Note 2: As for recycled plastics, combined use of recycled polymers and virgin polymers shall be permitted. Products using post-consumer materials as raw materials shall be permitted if the proportional mass of plastics composed of post-consumer materials conforms to the requirement in [ ] given in the table.

Table 4 Recycled materials usable for concrete portions

Recycled material	Standard mixture rate
Criteria C (14) to C (17) for applicable 'aggregates	50% by mass of the coarse aggregates used, provided that 50% by mass of fine aggregates are used as 'vitrified material aggregates'
Criteria D (18) to D (23) for applicable 'cement'	50% by mass of the cement used

H. Traffic signs/traffic lane lines

H-1. Traffic sign boards

(40) The board parts of traffic signs, which are composed of a board and a reflective sheet, shall be reused when traffic sign boards are removed.

(41) Materials for reflective sheets shall conform to the requirements of 4-1-2, B (3).

(42) The materials shall be clearly known and designed to allow separation/sorting. Replacement of the parts shall be easily carried out.

H-2. Traffic sign materials

(43) As for products, the total mass of "recycled materials" given in Table 5 shall be 70% or more of the entire product mass, and at the same time, each material product shall conform to the standard mixture rate given in Table 5.

Table 5 Recycled materials usable as traffic sign materials

Recycled material	Standard mixture rate (as % by mass)	
Aggregates	Coarse aggregates in conformity with Criteria C (14) to C (17) for applicable 'aggregates'/total coarse aggregates × 100 ≥ 50; provided that those using vitrified materials shall be as follows: Vitrified material aggregates in conformity with the applicable 'aggregates'/total fine aggregates × 100 ≥ 50	
Cement	Cement in conformity with Criteria D (18) to D (23) for applicable 'cement'/total cements × 100 ≥ 50	
Recycled plastics	Road rivets	Recycled plastics/total plastics × 100 = 100
	Other traffic sign materials	Recycled plastics/total plastics × 100 ≥ 70 [60]
Glass cullet	Glass cullet/total glass materials × 100 ＝100	
Reused/unused wood	(Forest thinnings and small-diameter logs + waste wood + less useful wood)/total wooden materials × 100 = 100	

Note 1: The mass percentage of the wooden portion means the proportional mass of the product or each material in an air dried state[*1] or at the point of constant weight[*2] at a temperature of 20±2ºC and humidity of 65±5%.

[*1]: Indicates leaving in a well-ventilated room for seven days or more.

[*2]: Change is less than 0.1% when the weight is measured every 24 hours.

Note 2: As for recycled plastics, combined use of recycled polymers and virgin polymers shall be permitted. Products using post-consumer materials as raw materials shall be permitted if the proportional mass of plastics composed of post-consumer materials conforms to the requirement in [ ] given in the table.

(44) As for the elution of harmful substances from concrete parts, these shall conform to the requirements for specific harmful substances given in Attachment 2, which are provided in the detailed enforcement regulations (Ministry of the Environment Ordinance No. 29, December 26, 2002) of the Soil Pollution Control Law.

(45) As for harmful substances contained in concrete parts, these shall conform to the requirements for specific harmful substances given in Attachment 3, which are provided in the detailed enforcement regulations (Ministry of the Environment Ordinance No. 29, December 26, 2002) of the Soil Pollution Control Law.

(46) Each stage from resource extraction to the recycling of the product shall give consideration to the quantity of new resources used, energy consumption and CO_2 emissions.

(47) Materials shall be clearly known and designed to allow separation/sorting. Replacement of parts shall be easily carried out.

(48) The products shall not have chromium, cadmium or arsenic added to them as prescribed constituents.

(49) An instruction manual shall accompany the product concerning its construction/use/maintenance/management/disassembly/disposal/ recycling, and be given to the constructor and the owner of an architectural structure who use the relevant product. The instruction manual shall provide the following information:

a. Information regarding hazardous substances in the use/construction of the recycled materials and in the use/maintenance/management of the product (clearly stating that details may be obtained upon inquiry)
b. Information on the product regarding construction/use/ maintenance/management of the architectural structure
c. Information on the product regarding specifications and durability
d. Information on the product regarding disassembly/disposal of the architectural structure
e. Information regarding the recycling of the product
f. The requirement to retain the instruction manual (The manual shall be kept until the architectural structure is disassembled, disposed of, and/or the recycling of the product.)

(50) The packaging of products shall give consideration to ease of recycling. Plastic materials used for packaging shall not have polymers added that contain halogens and organic halogenides as prescribed constituents.

H-3. Traffic lane lines (Glass beads for road marking paint)

(51) As for products, the proportional use of glass cullet shall be 100%.

(52) The packaging of products shall give consideration to ease of recycling. Plastic materials used for packaging shall not have polymers added that contain halogens and organic halogenides as prescribed constituents. When packaging materials include metals, they shall be designed to allow separation/sorting and facilitate recycling after disposal.

(53) As for the elution of harmful substances from the products, these shall conform to the requirements for specific harmful substances given in Attachment 2, which are provided in the detailed enforcement regulations (Ministry of the Environment Ordinance No. 29, December 26, 2002) of the Soil Pollution Control Law, as well as those for cadmium, lead, hexavalent chromium, arsenic, total mercury, selenium, boron and fluorine.

(54) Coloring agents used for products shall not have cadmium, lead, mercury, chromium, arsenic, or selenium added, or chemicals containing these, as prescribed constituents.

(55) An instruction manual accompanying the product shall indicate information concerning H-3 (53) and (54).

I. Materials for temporary structures

(56) As for products, the proportional mixture of "recycled materials" given in Table 6 shall be 70% or more of the entire product mass, and at the same time, each material product shall conform to the standard mixture rate given in Table 6.

Table 6 Recycled materials usable as materials for temporary structures

Recycled material	Standard mixture rate (% by weight)
Aggregate	Coarse aggregates in conformity with Criteria C (14) to C (17) for applicable 'aggregates'/total coarse aggregates × 100 ≥ 50; provided that those using vitrified materials shall be as follows: Vitrified material aggregates in conformity with applicable 'aggregates'/total fine aggregates × 100 ≥ 50
Cement	Cement in conformity with Criteria D (18) to D (23) for the applicable 'cement'/total cement × 100 ≥ 50
Recycled plastics	Recycled plastics/total plastics × 100 ≥ 70 [60]
Glass cullet	Glass cullet/total glass materials × 100 =100
Reused/unused wood	(Forest thinnings and small-diameter logs + waste wood + less useful wood)/total wooden materials × 100 = 100
Waste paper pulp	Waste paper pulp/(virgin pulp + waste paper pulp) × 100 = 100

Note 1: The percentage mass of wooden parts means the proportional mass of the product or each material in an air dried state[*1] or at the point of constant weight[*2] at a temperature of 20±2ºC and humidity of 65±5%.

[*1]: Indicates leaving in a well-ventilated room for seven days or more.

[*2]: Change is less than 0.1% when the weight is measured every 24 hours.

Note 2: As for recycled plastics, the combined use of recycled polymers and virgin polymers shall be permitted. Products using post-consumer materials as raw materials shall be permitted if the proportional mass of the plastics composed of post-consumer materials conforms to the requirement in [ ] given in the table.

(57) As for the elution of harmful substances from concrete parts, these shall conform to the requirements for specific harmful substances given in Attachment 2, which are provided in the detailed enforcement regulations (Ministry of the Environment Ordinance No. 29, December 26, 2002) of the Soil Pollution Control Law.

(58) As for harmful substances contained in concrete parts, these shall conform to the requirements for specific harmful substances given in Attachment 3, which are provided in the detailed enforcement regulations (Ministry of the Environment Ordinance No. 29, December 26, 2002) of the Soil Pollution Control Law.

(59) The products shall not have chromium, cadmium or arsenic added as prescribed constituents.

(60) The products shall not be of a disposable type, however, if they are “disposable products” as defined above, in the cases where a collection and recycling system after disposal has been established and such products are actually recycled, this requirement is not applicable.

(61) Information regarding Certification Criteria I (57) and (58) shall be made available.

J. Road materials

J-1. Road lighting

(62) For low-grade insect-attracting road lighting, high pressure sodium lamps shall be used as light sources and compared with lighting facilities using mercury lamps, and electricity consumption shall be reduced by 35% or more.

(63) As for balustrade lighting, road lighting equipment shall be mounted in an elevated position on the wall balustrades of a bridge, or on sound insulation walls, to reduce light leakage to areas beyond the roadside.

J-2. High-performance noise reduction equipment

(64) The products shall be capable of being installed on the body of the wall and the total height of sound insulation walls shall not be higher after installing the equipment.

(65) It shall be confirmed that by installing the equipment noise has been reduced by 2.0 dB or more.

J-3. Other road materials

(66) As for products, the proportional mixture of “recycled materials” given in Table 7 shall be 70% or more of the entire product mass, and at the same time, each material product shall conform to the standard mixture rate given in Table 7.

Table 7 Recycled materials usable as road materials

Recycled material	Standard mixture rate (% by mass)
Aggregates	Coarse aggregates in conformity with Criteria C (14) to C (17) for applicable ‘aggregates’/total coarse aggregates × 100 ≥ 50; provided that those using vitrified materials shall be as follows: Vitrified material aggregates in conformity with applicable ‘aggregates’/total fine aggregates × 100 ≥ 50
Cement	Cement in conformity with Criteria D (18) to D (23) for applicable ‘cement’/total cement × 100 ≥ 50
Recycled plastics	Recycled plastics/total plastics × 100 ≥ 70 [60]
Glass cullet	Glass cullet/total glass materials × 100 =100
Reused/unused wood	(Forest thinnings and small-diameter logs + waste wood + less useful wood)/total wooden materials × 100 = 100

Note 1: The percentage mass of the wooden parts means the proportional mass of the product or each material in an air dried state[*1] or at the point of constant weight[*2] at a temperature of 20±2ºC and humidity of 65±5%.

[*1]: Indicates leaving in a well-ventilated room for seven days or more.

[*2]: Change is less than 0.1% when the weight is measured every 24 hours.

Note 2: As for recycled plastics, combined use of recycled polymers and virgin polymers shall be permitted. Products using post-consumer materials as raw materials shall be permitted if the proportional mass of plastics composed of post-consumer materials conforms to the requirement in [ ] given in the table.

(67) As for the elution of harmful substances from concrete parts, these shall conform to the requirements for specific harmful substances given in Attachment 2, which are provided in the detailed enforcement regulations (Ministry of the Environment Ordinance No. 29, December 26, 2002) of the Soil Pollution Control Law.

(68) As for harmful substances contained in concrete parts, these shall conform to the requirements for specific harmful substances given in Attachment 3, which are provided in the detailed enforcement regulations (Ministry of the Environment Ordinance No. 29, December 26, 2002) of the Soil Pollution Control Law.

(69) Information regarding Certification Criteria J (67) and (68) shall be provided.

(70) As for concrete products, information regarding treatment methods after disposal shall be able to be provided.

(71) In cases where the wood used for wooden sound insulation walls has been treated with preservatives, when waste wood generated during to the repair of such sound insulation walls is incinerated, it shall be

incinerated in a facility with measures to control the release or dispersal into the air of incinerator ash.

K. Sewage/waterworks materials

(72) As for products, the proportional mixture of “recycled materials” given in Table 8 shall be 70% or more of the entire product mass, and at the same time, each material product shall conform to the standard mixture rate given in Table 8.

Table 8 Recycled materials usable as sewage/waterworks materials

Recycled material	Standard mixture rate (% by mass)
Aggregates	Coarse aggregates in conformity with Criteria C (14) to C (17) for applicable ‘aggregates’/total coarse aggregates × 100 ≥ 50; provided that those using vitrified materials shall be as follows: Vitrified material aggregates in conformity with applicable ‘aggregates’/total fine aggregates × 100 ≥ 50
Cement	Cement in conformity with Criteria D (18) to D (23) for applicable ‘cement’/total cement × 100 ≥ 50
Recycled hard vinyl chloride	Recycled vinyl chloride/total hard vinyl chloride × 100 ≥ 50
Recycled plastics other than recycled hard vinyl chloride	Recycled plastics/total plastics × 100 ≥ 70 [60]

Note 1: As for recycled plastics, the combined use of recycled polymers and virgin polymers shall be permitted. Products using post-consumer materials as raw materials shall be permitted if the proportional mass of plastics composed of post-consumer materials conforms to the requirement in [ ] given in the table.

(73) As for the elution of harmful substances from concrete parts, these shall conform to the requirements for specific harmful substances given in Attachment 2, which are provided in the detailed enforcement regulations (Ministry of the Environment Ordinance No. 29, December 26, 2002) of the Soil Pollution Control Law.

(74) As for contained harmful substances in concrete parts, these shall conform to the requirements for specific harmful substances given in Attachment 3, which are provided in the detailed enforcement regulations (Ministry of the Environment Ordinance No. 29, December 26, 2002) of the Soil Pollution Control Law.

(75) Each stage from resource extraction to the recycling of the product shall give consideration to the quantity of new resources used, energy consumption and CO_2 emissions.

(76) The products shall not have chromium, cadmium or arsenic added as prescribed constituents.

(77) As for products using recycled hard vinyl chloride or recycled plastics, it shall be assured that the recycling route after disposal has been established, 70% or more of the plastic parts contained in the product are collected (50% or more of them are acceptable for two years after

the establishment of the criteria), 60% or more of the collected plastics are material-recycled. The remainder of the collected plastics are to be used for other purposes, including energy recovery.

(78) Information regarding Certification Criteria K (73) and (74) shall be made available.

(79) The packaging of the products shall give consideration to the ease of recycling. Plastic materials used for packaging shall not have polymers added that contain halogens and organic halogenides as prescribed constituents.

L. Materials for bridges/rivers/harbors

(80) As for fenders/rubber ship gangways, the proportional mass of “recycled rubber” shall be 100% of the total rubber used in the products.

(81) Regarding impermeable-type steel erosion control weirs, a double-wall type (weirs structured using steel sheet piles for the wall surface facing upstream/downstream and connection of the wall materials with tie rods) shall be able to utilize earth and sand/gravel generated at the site as hearting materials for 70% or more of the weir volume. A steel frame type (weirs structured by combining shaped steel pieces) shall be able to utilize gravel generated at the site as hearting materials for 70% or more of the weir volume, provided that regarding the hearting materials to be used for the steel frame type, the diameter of the gravel shall be 150 mm or larger, and for the steel frame type using expanded metal for the wall materials, gravel with a diameter of 50 mm or larger shall be used.

(82) Permeable-type steel erosion control weirs shall be weirs equipped for the purpose of trapping avalanches of sand and stone and at normal times to allow water, sand and gravel to flow in order to control the lowering of the river bed or the erosion of beaches, as well as to allow the movement of flora and fauna.

(83) Special-type mat cylinders shall be mat cylinders structured with highly rigid materials such as welded wire mesh or shape steel. Harbor embankment mats, wire-cylinders and special type mat cylinders shall be able to utilize earth and sand/gravel extracted at the site as hearting materials for 70% or more of the mats or cylinders.

(84) As for fenders/rubber ship gangways and harbor embankment mats, the total mass of “recycled materials” given in Tables 3 and 4 of G. shall be 70% or more of the total mass of the product.

M. Other materials

M-1. Drainage materials/backfill materials

(85) As for the products, the proportional mixture of “recycled materials” given in Table 9 shall be 70% or more of the entire product mass. In cases where Category B recycled materials are used, the materials

shall have been baked or vitrified in the pretreatment process for the raw material, or in the manufacturing process of the product.

Table 9 Recycled materials usable as drainage materials/backfill materials

Recycled material		
Category A	Mining/quarrying industry wastes	Quarrying and ceramic industry waste soil, micro-silica sand obtained during the water washing of silica sand (mica powder)
	Metal industry wastes	Steel slag, foundry sand, ceramic waste, copper slag, ferro-nickel slag, electric furnace slag
	Other industrial wastes	Coal ash, shells, glass cullet, gypsum (including desulfurized gypsum), glass wool, rock wool
	Non-industrial wastes and vitrified materials in sewage sludge	
Category B	Living/self-generating sludge	Waterworks sludge, sludge from the bottom of lakes
	Industrial sludge	Paper-manufacturing sludge, aluminum sludge, galvanizing sludge, polishing sludge
	Construction sludge	

(86) Each stage from resource extraction to the recycling of the product shall give consideration to the quantity of new resources used, energy consumption and CO_2 emissions.

(87) As for the elution of harmful substances from products, these shall conform to the requirements for all specific harmful substances given in Attachment 2, which are provided in the detailed enforcement regulations (Ministry of the Environment Ordinance No. 29, December 26, 2002) of the Soil Pollution Control Law, provided that the materials to which the elusion standards apply for cold molding products, vitrified products and baked products that use vitrified recycled materials only, shall be eight substances, namely: cadmium, lead, hexavalent chromium, arsenic, total mercury, selenium, boron and fluorine.

(88) As for harmful substances contained in the products, these shall conform to the requirements for all specific harmful substances given in Attachment 3, which are provided in the detailed enforcement regulations (Ministry of the Environment Ordinance No. 29, December 26, 2002) of the Soil Pollution Control Law, provided that the materials to which the elusion standards apply for cold molding products, vitrified products and baked products that use vitrified recycled materials only, shall be eight substances, namely: cadmium, lead, hexavalent chromium, arsenic, total mercury, selenium, boron and fluorine.

(89) Regarding environmental standards concerning air pollution, water contamination and soil contamination from dioxins (Environmental Agency Notification No. 68, December 27, 1999), the standard values given in the attached table concerning soil shall be conformed to.

(90) Information regarding Certification Criteria M-1 (87) to (89) shall be made available.

M-2. Revegetation base materials

(91) As for products, the proportional mixture of "recycled materials" given in Table 10 shall be 70% or more of the entire product mass. In cases where Category B recycled materials are used, such recycled materials shall have been baked or vitrified in the pretreatment process for the raw material, or in the manufacturing process of the product.

Table 10 Recycled materials usable as revegetation base materials

<table>
<tr><td colspan="3">Recycled material</td></tr>
<tr><td rowspan="4">Category A</td><td>Mining/quarrying industry wastes</td><td>Quarrying and ceramic industry waste soil, micro-silica sand obtained during the water washing of silica sand (mica powder)</td></tr>
<tr><td>Metal industry wastes</td><td>Steel slag, foundry sand, ceramic waste, copper slag, ferro-nickel slag, electric furnace slag</td></tr>
<tr><td>Other industrial wastes</td><td>Coal ash, shells, glass cullet, gypsum (including desulfurized gypsum), rock wool</td></tr>
<tr><td colspan="2">Non-industrial wastes and vitrified materials in sewage sludge</td></tr>
<tr><td rowspan="3">Category B</td><td>Living/self-generating sludge</td><td>Waterworks sludge, sludge from the bottom of lakes</td></tr>
<tr><td>Industrial sludge</td><td>Paper-manufacturing sludge, aluminum sludge, galvanizing sludge, polishing sludge</td></tr>
<tr><td colspan="2">Construction sludge</td></tr>
</table>

M-3. Non-chloride type antifreezing agents

(92) Products shall be acetic acid-based and not contain chlorides.

(93) Instruction manual(s) shall accompany the product concerning its appropriate use and handling as well as an MSDS.

M-4. Slope protection nets (rock fall protectors and slope fall protectors with less impact on the environment)

(94) Rock fall-protectors with less impact on the environment shall be rock fall-protectors structured with wire ropes and anchors that are able to conserve the natural slope without felling trees over 70% or more of the face of the slope within the range of the construction target area.

(95) Slope fall protectors with less impact on the environment shall be slope fall protectors structured with wire ropes, pressure-receiving plates

and anchors that are able to conserve the natural slope without felling trees over 70% or more of the face of slope within the range of the construction target area.

M-5. Buried marker sheets

(96) As for the products, the proportional mixture rate of “recycled materials” given in Table 11 shall be 100% of the entire product mass.

Table 11 Recycled materials usable for buried marker sheets

Recycled plastics	
Recycled fibers	Recycled polymer resin fibers
	Recycled chemical fibers

4-2. Quality criteria

4-2-1. Common criteria

No quality criteria

4-2-2. Material criteria

No quality criteria

4-2-3. Individual product criteria

A. Wooden tiling/blocks

(97) Quality requirements for products, for which JIS, JAS or other equivalent standards have been established, shall conform to the relevant standards.

Other products, for which the JIS or the equivalent has established measuring methods for quality requirement items, shall conform to the relevant similar JIS or its equivalent.

B. Steel construction materials

(98) Quality requirements for products, for which JIS or other equivalent standards have been established, shall conform to the relevant standards.

Other products, for which JIS or the equivalent has established measuring methods for quality requirement items, shall conform to the relevant similar JIS or its equivalent.

C. Aggregates

(99) Blast furnace slag aggregates, ferro-nickel slag aggregates and copper slag aggregates shall conform to the respective JIS.

(100) Vitrified material aggregates shall meet JIS TR A0016 “Fine Aggregates for Concrete such as Non-Industrial Wastes, Sewage Sludge, etc. (Fine Vitrified Slag Aggregates for Concrete).”

(101) Recycled aggregates shall conform to recycled aggregates established in the “Provisional Quality Standards for Applications concerning the Reuse of Concrete By-Products (Draft)” (Ministry of Construction, 1994).

D. Cement

(102) Quality requirements for products shall conform to the respective standard of JIS A5210 “Portland Cement,” JIS A 5211 “Portland Blast-Furnace Slag Cement,” JIS A 5213 “Portland Fly-Ash Cement,” or JIS R 5214 “Eco-Cement”.

E. Concrete products

(103) Quality requirements for products, for which JIS, Minister of Land, Infrastructure and Transport's certification, standards established by local government units, standards of industrial associations or other equivalent standards have been established, shall conform to the relevant standards. Other products, for which the JIS or the equivalent has established measuring methods for quality requirement items, shall conform to the relevant similar JIS or its equivalent.

(104) Concrete products shall not be damaged by harmful cracks, etc.

(105) Measures to control alkali-aggregate reaction shall be taken according to the “Alkali-Aggregate Reaction Control Guidelines” (Ministry of Land, Infrastructure and Transport, August 1, 2002).

(106) In cases where the use of recycled aggregates for concrete in which the chloride ion content is controlled, particular attention shall be given to the chloride ion content in curing the cement paste using recycled aggregates.

F. Pavement materials

(107) The amount of used rubber added to antifreezing pavement materials containing rubber particles shall conform to the traffic volume categories established by the Japan Automobile Tyre Manufacturers Association, Inc. and the Japan Tire Recycle Association.

G. Landscaping/revegetation materials

(108) Quality requirements for products, for which JIS or other equivalent standards have been established, shall conform to the relevant standards.

For other products, based on in-house standards, quality and safety shall have been confirmed using the official test methods of public testing institutions.

H. Traffic signs/traffic lane lines

H-1. Traffic signboards

(109) Quality requirements for signboards shall conform to JIS G 3131 “Hot Rolled Mild Steel Plates and Strips in Coil,” JIS G 3141 “Cold Rolled Steel Plates and Strips in Coil,” JIS K 6744 “Polyvinyl Chloride-Coated Metal Sheets,” JIS H 4000 “Plates and Bars of Aluminum and Aluminum Alloy,” JIS K 6718 “Methacrylic Resin Boards” or JIS K 7011 “Fiber-Glass Reinforced Plastics for Structures” (fiber-glass reinforced plastic boards).

(110) Reflective sheets used for signboards shall be lenticular reflective sheets in which glass beads are enclosed in plastic, or capsular lenticular reflective sheets in which glass beads are covered in a layer of air within the plastic, and the performance shall conform to standards given in Table 12 or higher. Reflective sheets shall not be subject to significant color changes, cracks or splits if exposed outdoors.

(111) Traffic lane lines shall conform to JIS K 5665 Class 1 (Traffic Paint: Ordinary Temperature), Class 2 (Traffic Paint: Heated) and Class 3, No. 1 (Traffic Paint: Vitrified)

Table 12 Reflective performance (Coefficients of retroreflection)

	Observation angle	Angle of incidence	White	Yellow	Red	Green	Blue
Enclosed lenticular type	12 ’	5 °	70	50	15	9.0	4.0
		30 °	30	22	6.0	3.5	1.7
	20 ’	5 °	50	35	10	7.0	2.0
		30 °	24	16	4.0	3.0	1.0
	2 ”	5 °	5.0	3.0	0.8	0.6	0.2
		30 °	2.5	1.5	0.4	0.3	0.1
Capsular lenticular type	12 ’	5 °	250	170	45	45	20
		30 °	150	100	25	25	11
	20 ’	5 °	180	122	25	21	14
		30 °	100	67	14	12	8.0
	2 ”	5 °	5.0	3.0	0.8	0.6	0.3
		30 °	2.5	1.8	0.4	0.3	0.1

H-2. Traffic sign materials

(112) As for glass-concrete mixtures, non-firing products, control measures for alkali-aggregate reactions shall be implemented in conformity with the “Alkali-Aggregate Reaction Control Measures” (Ministry of Land, Infrastructure and Transport, August 2002). As for products that were baked after being mixed with glass and detoxified by coating them, etc. for the purpose of using them for no-firing products, detoxification tests shall not be required.

(113) Traffic signs shall conform to the “Ordinance concerning Traffic Signs, Traffic Lane Lines and Road Signs” (Prime Minister’s Office/Ministry

of Construction Ordinance No. 3, 1960).

H-3. Traffic lane lines (Glass beads for road marking paint)

(114) Quality requirements for products shall conform to JIS R 3301 (Glass Beads for Road Marking Paint).

I. Materials for temporary structures

(115) As for quality requirements for the products, safety shall be confirmed through in-house standards based on official test methods.

J. Road materials

J-1. Road lighting

(116) Quality requirements for products, for which JIS, Minister of Land, Infrastructure and Transport's certification, standards established by local government units, standards of industrial associations or other equivalent standards have been established, shall conform to the relevant standards. Other products, for which the JIS or the equivalent has established measuring methods for quality requirement items, shall conform to the relevant similar JIS or its equivalent.

J-2. High-performance noise reduction equipment

(117) The design strength of structures shall conform to the "Sound Insulation Wall Design Guideline" (Japan Highway Public Corporation).

(118) Problems concerning the road structure due to a significant increase in weight shall not be created compared with the existing types.

J-3. Other road materials

(119) Quality requirements for the products, for which the JIS, Minister of Land, Infrastructure and Transport's certification, standards established by local government units, standards of industrial associations or other equivalent standards have been established, shall conform to the relevant standards. Other products, for which the JIS or the equivalent has established measuring methods for quality requirement items, shall conform to the relevant similar JIS or its equivalent.

(120) Wooden sound insulation walls shall have the strength of wood as regulated by the "Building Standard Law." (Products shall conform to admissible unit stress in the wooden fiber's direction regulated by the Enforcement Ordinance No. 89, and strength against compression, tension, bending and shearing stress regulated by the "JAS for Coniferous Lumber for Structural Use (JAS for Structural Lumber).")

(121) Wooden sound insulation walls shall conform to the "Wooden Sound Insulation Wall Technique Guidelines (Draft)."

(122) As for wooden sound insulation walls, the long-term durability of the wooden parts shall be assured by drying, processing and preservative treatments.

K. Sewage/waterworks materials

(123) Quality requirements for products, for which the JIS, standards of the Japan Sewage Works Association, standards established by local government units, standards of industrial associations or other equivalent standards have been established, shall conform to the relevant standards. Other products, for which the JIS or the equivalent has established measuring methods for quality requirement items, shall conform to the relevant similar JIS or its equivalent.

L. Materials for bridges/rivers/harbors

(124) Quality requirements for the products, for which the JIS, Minister of Land, Infrastructure and Transport's certification, standards established by local government units, standards of industrial associations or other equivalent standards have been established, shall conform to the relevant standards. Other products, for which the JIS or the equivalent has established measuring methods for quality requirement items, shall conform to the relevant similar JIS or its equivalent.

(125) Impermeable-type steel erosion control weirs and permeable-type steel erosion control weirs shall be given type certification from the Sabo Technical Center.

M. Other materials

M-1. Drainage materials/backfill materials

(126) The products shall not turn into sludge when inundated.

(127) Products using construction sludge as a drainage material and a backfill material shall meet the Construction Sludge Recycling Technique Standard Draft (Ministry of Construction, Gicho No. 71, March 1999).

Products shall conform to the Construction Sludge Recycling Guidelines (compiled and written by the Advanced Construction Technology Center, October 1999).

M-2. Revegetation base materials

(128) The products shall not turn into sludge when inundated.

(129) Products using construction sludge as a drainage material and a backfill material shall meet the Construction Sludge Recycling Technique Standard Draft (Ministry of Construction, Gicho No. 71, March 1999).

Products shall conform to the Construction Sludge Recycling

Guidelines (compiled and written by the Advanced Construction Technology Center, October 1999).

M-3. Non-chloride type antifreezing agents

(130) Quality requirements for the products, for which the JIS or other equivalent standards have been established, shall conform to the relevant standards.
For other products, based on in-house standards, the quality and safety shall have been confirmed using the official test methods of public testing institutions.

M-4. Slope protection net (rock fall protectors and slope fall protectors with less environmental impact)

(131) Quality requirements for the products, for which the JIS, Minister of Land, Infrastructure and Transport's certification, standards established by local government units, standards of industrial associations or other equivalent standards have been established, shall conform to the relevant standards. Other products, for which the JIS or the equivalent has established measuring methods for quality requirement items, shall conform to the relevant similar JIS or its equivalent.

M-5. Buried marker sheets

(132) Quality requirements for the products, for which the JIS or other equivalent standards have been established, shall conform to the relevant standards.
For other products, based on in-house standards, quality and safety shall have been confirmed using the official test methods of public testing institutions.

5. Certification Procedures

Any certification verifying conformity with the criteria shall be signed by the applicant and submitted.

5-1. Certification procedures for environmental criteria

5-1-1. Certification procedures for common criteria

(1) For Criterion 4-1-1 (1), a certificate from the manager of the plant manufacturing the product shall be submitted to certify that the relevant local environmental laws, regulations, etc. have been observed with no violation for the previous five years before the filing of the application.

5-1-2. Certification procedures for materials

(2) For Criterion 4-1-2 A (2), the use of wood preservatives shall be

described in the Application Form for Eco Mark Certification with a document stating the reasons for their use and certifying that the preservative agents have been approved by the Japan Wood Preserving Association.

(3) For Criterion 4-1-2 B (3), a certificate issued by the raw materials supplier, or a certificate describing the results of tests carried out by an independent testing institution shall be submitted. In cases where no raw materials contain any of the corresponding chemical substances as a prescribed constituent, a document prepared by the raw materials supplier and the applicant that proves there is no content of the chemical substance shall be acceptable.

(4) For Criterion 4-1-2 C (4), a certificate shall be submitted describing the results of tests carried out by an independent testing institution or a public institution.

(5) For Criterion 4-1-2 D (5), a certificate shall be submitted according to Attachment 2.

5-1-3. Certification procedures for individual products

A. Wooden tiling/blocks

(6) For Criterion 4-1-3 A (6), a document issued by the raw materials supplier certifying that the raw material is reused /unused wood shall be submitted.

If there are multiple suppliers, a list of the suppliers and a list of the certifications from the top 10 suppliers in terms of volume of the materials traded shall be submitted.

If forest thinnings are used as a material, a certificate of origin that includes information on the place of origin, type of tree, quantity and year of planting shall be submitted with photographs of the forest concerned. Information such as the thinning percentage and the thinning period shall be included as far as possible.

If using less useful wood, a certificate stating the following information shall be submitted. In such cases, an official document shall be submitted stating that the forest has been certified as sustainable by a third party.

- Type of forest (natural or artificial), place of origin, type of tree, and year of planting, if artificial forest.
- The conditions under which the wood was produced (damaged by disease/pests/disaster, bent or small diameter logs, etc.) shall be indicated. For small diameter logs, the logging method and tip end diameter shall also be indicated.

If using bamboo as the raw material, a description stating that the felling was carried out as appropriate maintenance and management for environment conservation purposes shall be provided.

For products using certified products such as No. 111 “Boards using wooden materials,” the product name and certification number of the

relevant product can be indicated in the Application Form in place of a statement certifying conformity with the application criteria.

(7) For Criterion 4-1-3 A (7), the applicant shall state the total mass of the product, the respective mass of the wooden parts as well as the materials used other than the wooden parts, stating the percentage of wooden parts and materials other than wooden parts (proportional mass), to certify that wooden parts are 70% or more of the entire product, provided that consumables necessary for the functional operation or use of the product, excluding the wooden parts and materials other than wooden parts, such as varnish and adhesives, shall be excluded from the total product mass.

(8) For Criterion 4-1-3 A (8), products shall conform to the certification procedures prescribed in the "Conformance to Certification Criteria" of Eco Mark Product Category No. 126 "Paints." If using Eco Mark certified paint, the product name and certification number of the relevant paint can be indicated in the Application Form for Certification and Use of the Eco Mark in place of a statement certifying conformity with the application criteria.

(9) For Criterion 4-1-3 A (9), it shall be stated in the Application Form for Certification and Use of the Eco Mark for submission as to whether halogen-containing polymers or organic halogenides have been added.

(10) For Criterion 4-1-3 A (10), the packaging condition of the product and packaging materials shall be specifically described in the Application Form for Certification and Use of the Eco Mark (supplementary pictures, photographs, etc. are acceptable). It shall be stated also in the Application Form for Certification and Use of the Eco Mark as to whether halogen-containing polymers or organic halogenides have been added.

B. Steel construction materials

(11) For Criterion 4-1-3 B (11), a document shall be submitted describing the waste reduction per ton of the crude steel generated in the production process.

(12) For Criterion 4-1-3 B (12), a document shall be submitted stating the quantity of new resources used, energy consumption and CO_2 emissions per ton of the crude steel in the production process.

B-2. For Criterion 4-1-3 B (13) a., the following shall be certified:

(13) A document shall be submitted specifically describing the product specifications, including the dimensions, shape and materials.

(14) A document shall be submitted specifically describing the construction method; if multiple methods are used, each of such methods shall also be indicated.

(15) A document shall be submitted specifically providing evidence that hydrological circulation between land and water is made possible (groundwater flow); if construction methods are used with different evidence, the evidence for each of such methods shall also be indicated.

B-3. For Criterion 4-1-3 B (13) b., the following shall be certified:

(16) A document shall be submitted specifically describing the product specifications, including the dimensions, shape and materials.

(17) A document specifically describing the construction method shall be submitted; if multiple methods are used, each of such methods shall also be indicated.

(18) A document shall be submitted specifically providing evidence that it is possible to cover the steel sheet pile surface with vegetation; if multiple construction methods are used with different evidence, the evidence for each of such methods shall also be indicated.

B-4. For criterion 4-1-3 B (13) c., the following shall be certified:

(19) A document shall be submitted specifically describing the product specifications including the dimensions, shape and materials.

(20) A document shall be submitted specifically describing the construction method; if multiple methods are used, each of such methods shall be indicated.

(21) A document shall be submitted specifically providing evidence that a reduction in earth displacement is made possible; if multiple construction methods are used with different evidence, the evidence for each of such methods shall be indicated.

(22) A document shall be submitted quantitatively confirming earth displacement to the ground in the pile construction process.

C. Aggregates

(23) For Criterion 4-1-3 C (14), a raw materials certificate issued by the supplier shall be attached.

(24) For Criterion 4-1-3 C (15), a document shall be submitted stating the quantity of new resources used, energy consumption and CO_2 emissions per ton of the aggregate in the production process.

(25) For Criteria 4-1-3 C (16) and 4-1-3 C (17), a certificate shall be submitted describing the results of tests carried out by an independent testing institution or public institution.

D. Cement

(26) For Criterion 4-1-3 D (18), a raw materials certificate issued by the recycled materials collector shall be submitted.

(27) For Criterion 4-1-3 D (19), the total mass of materials per ton of the product that are used during the production process, and the total mass of the included recycled materials shall be clearly stated.

(28) For Criterion 4-1-3 D (20), the average CO_2 emissions per ton of the product in the production process shall be presented in comparison with cases in which recycled materials are not used (excluding emissions in the pretreatment process of the raw materials; the parts for comparison may be limited to those that are different from cases in which natural raw materials are used).

(29) For Criterion 4-1-3 D (21), a certificate shall be submitted describing the results of tests carried out by an independent testing institution or public institution.

(30) For Criterion 4-1-3 D (22), a certificate describing the test results shall be submitted.

(31) For Criterion 4-1-3 D (23), the instruction manual for the product shall be submitted (a draft is acceptable).

E. Concrete products

(32) For Criterion 4-1-3 E (24) a., test results regarding the coefficient of permeability shall be submitted.

For Criterion b., the types of recycled materials and the proportional content of the recycled materials and materials other than recycled materials in the mixture shall be stated in the Application Form for Certification and Use of the Eco Mark.

(33) For Criteria 4-1-3 E (25) and 4-1-3 E (26), a certificate shall be submitted describing the results of tests carried out by an independent testing institution or public institution.

(34) For Criterion 4-1-3 E (27), the instruction manual for the product shall be submitted (a draft is acceptable).

(35) For Criterion 4-1-3 E (28), the separation method and the recycling method after termination of the use shall be specifically stated in the Application Form for Certification and Use of the Eco Mark.

F. Pavement materials

(36) For Criterion 4-1-3 F (29), the proportional mass of recycled rubber compared to the total amount of rubber materials shall be stated in the Application Form for Certification and Use of the Eco Mark and raw materials and pretreatment certificates issued by the raw materials supplier shall be attached.

(37) For Criterion 4-1-3 F (30), the possible recycling methods after disposal shall be indicated.

(38) For Criterion 4-1-3 F (31), the average CO_2 emissions per ton of the product from resource extraction to the recycling of the product shall be presented in comparison with cases in which recycled materials are not used (excluding emissions in the pretreatment process of the raw materials; the parts for comparison may be limited to those that are different from cases in which natural raw materials are used).

(39) For Criterion 4-1-3 F (32), a certificate shall be submitted describing

the results of tests carried out by an independent testing institution or public institution.

(40) For Criterion 4-1-3 F (33), the document to be used at the time of information provision shall be submitted (a draft is acceptable).

G. Landscaping/revegetation materials

(41) For Criterion 4-1-3 G (34), a certificate issued by the supplier shall be attached. The types of recycled materials and the proportional content of recycled materials and materials other than recycled materials in the mixture shall be stated in the Application Form for Certification and Use of the Eco Mark.

- Types of recycled materials used
- Proportional content of recycled materials in the mixture
- Proportional content of concrete compared to the product mass
- Mixing conditions of the recycled materials in the concrete (aggregates, cement)
- Purposes of use of the product; as for the products that are potentially left in the environment, an explanatory description that only Category A raw materials are used.
- As for the products for application using Category C raw materials, an explanatory description as to whether there was pretreatment of the raw materials, baking, or vitrification in the production process of the product.

(42) For Criteria 4-1-3 G (35), 4-1-3 G (36), a certificate shall be submitted describing the results of tests carried out by an independent testing institution or public institution.

(43) For Criterion 4-1-3 G (37), the average CO_2 emissions per product from resource extraction to the recycling of the product shall be presented in comparison with cases in which recycled materials are not used (excluding emissions in the pretreatment process of the raw materials; the parts for comparison may be limited to those that are different from cases in which natural raw materials are used).

(44) For Criterion 4-1-3 G (38), the document to be used at the time of information provision shall be submitted.

(45) For Criterion 4-1-3 G (39), the packaging condition of the product and packaging materials shall be specifically described in the Application Form for Certification and Use of the Eco Mark (supplementary pictures, photographs, etc. are acceptable). It shall be stated in the Application Form for Certification and Use of the Eco Mark as to whether halogen-containing polymers or organic halogenides have been added.

H. Traffic signs/traffic lane lines

H-1. Traffic signboards

(46) For Criterion 4-1-3 H-1 (40), an explanatory document shall be

submitted stating that a system has been established to enable used traffic signboards to be collected and that products for reusing them are being manufactured (including the collection system, processing capacity, processing details, etc.).

(47) For Criterion 4-1-3 H-1 (41), this shall be certified in conformity with 4-1-2 B (3).
(48) For Criterion 4-1-3 H-1 (42), a certificate shall be submitted regarding the parts that are separable/sortable and replaceable as well as the method of replacement.

H-2. Traffic sign materials

(49) For Criterion 4-1-3 H-2 (43), a raw materials certificate issued by the supplier shall be attached. The types of recycled materials and the proportional content of recycled materials and materials other than recycled materials shall be stated in the Application Form for Certification and Use of the Eco Mark.
(50) For Criteria 4-1-3 H-2 (44) and 4-1-3 H-2 (45), a certificate shall be submitted describing the results of tests carried out by an independent testing institution or public institution.
(51) For Criterion 4-1-3 H-2 (46), the average CO_2 emissions per product from resource extraction to the recycling of the product shall be presented in comparison with cases in which recycled materials are not used (excluding emissions in the pretreatment process of the raw materials; the parts for comparison may be limited to those that are different from cases in which natural raw materials are used).
(52) For Criterion 4-1-3 H-2 (47), a certificate shall be submitted concerning the parts that are separable/sortable and replaceable as well as the method of replacement.
(53) For Criterion 4-1-3 H-2 (47), a list of the prescribed constituents of the product shall be submitted.
(54) For Criterion 4-1-3 H-2 (48), the instruction manual for the product shall be submitted (a draft is acceptable).
(55) For Criterion 4-1-3 H-2 (50), the packaging condition of the product and the packaging materials shall be specifically described in the Application Form for Certification and Use of the Eco Mark (supplementary pictures, photographs, etc. are acceptable). It shall be stated in the Application Form for Certification and Use of the Eco Mark as to whether halogen-containing polymers or organic halogenides have been added.

H-3. Traffic lane lines (Glass beads for road marking paint)

(56) For Criterion 4-1-3 H-3 (51), a raw materials certificate issued by the supplier shall be attached.
(57) For Criterion 4-1-3 H-3 (52), the packaging condition of the product and

the packaging materials shall be specifically described in the Application Form for Certification and Use of the Eco Mark (supplementary pictures, photographs, etc. are acceptable). It shall be stated in the Application Form for Certification and Use of the Eco Mark as to whether halogen-containing polymers or organic halogenides have been added.

(58) For Criterion 4-1-3 H-3 (53), a certificate shall be submitted describing the results of tests carried out by an independent testing institution or public institution.

(59) For Criterion 4-1-3 H-3 (54), a list of the prescribed constituents of the product shall be submitted.

(60) For Criterion 4-1-3 H-3 (55), the instruction manual indicating the information shall be submitted.

I. Materials for temporary structures

(61) For Criterion 4-1-3 I (56), a raw materials certificate issued by the raw materials supplier shall be attached. The types of recycled materials and the proportional content of recycled materials and materials other than recycled materials shall be stated in the Application Form for Certification and Use of the Eco Mark.

(62) For Criteria 4-1-3 I (57), 4-1-3 I (58), a certificate shall be submitted describing the results of tests carried out by an independent testing institution or public institution.

(63) For Criterion 4-1-3 I (59), a list of the prescribed constituents shall be submitted.

(64) For Criterion 4-1-3 I (60), it shall be specifically explained and described as to whether the product corresponds to a disposable product, as described in 2-1-9 Materials for Temporary Structures E-1, in the Application Form for Certification and Use of the Eco Mark. In cases that require verification that a system for collection and recycling after disposal has been established, materials including an explanatory document shall be submitted.

(65) For Criterion 4-1-3 I (61), the document to be used at the time of information provision shall be submitted (a draft is acceptable).

J. Road materials

J-1. Road lighting

(66) For Criterion 4-1-3 J-1 (62), it shall be verified that electricity consumption has been reduced compared with the lamp efficiencies of the product for application and mercury lamps.

(67) For Criterion 4-1-3 J-1 (63), it shall be confirmable that the product is designed to reduce light leakage beyond the roadside as a result of the configuration of the lighting fixture placement, the elevated structure and the sound insulation wall.

J-2. High-performance noise reduction equipment

(68) For Criterion 4-1-3 J-2 (64), a document shall be submitted specifically describing the product specifications, including the dimensions, shape and materials as well as the construction methods; if multiple methods are used, each of such methods shall be indicated. The height of the sound insulation wall before and after mounting shall be described in the Application Form for Certification and Use of the Eco Mark.

(69) For Criterion 4-1-3 J-2 (65), a document specifically stating the evidence for noise reduction shall be submitted; if multiple construction methods are used with different evidence, the evidence for each of such methods shall be indicated. In addition, a document that quantitatively confirms the noise reduction effect after mounting the equipment shall be submitted and the following test method shall be used as a reference.

<Reference>

Field acoustic test (the acoustic test used by the technology assessment system of the Ministry of Construction according to Ministry of Construction Notification No. 1324 in 1992)

- Method: Confirm that there is higher noise reduction effect compared with the existing type where both walls are the same height (3 m)
- Conditions: Compare the average values for all eight points, i.e., a point at a height of 0 m, 1.2 m, 3.5 m and 5 m above the ground and at a horizontal distance of 5 m and 10 m from the sound insulation wall for each height.
- Assessment: Noise reduction effect (average value of all eight points): 2.0 dB or higher

J-3. Other road materials

(70) For Criterion 4-1-3 J-3 (66), a raw materials certificate issued by the supplier shall be attached. The types of recycled materials and the proportional content of recycled materials and materials other than recycled materials shall be stated in the Application Form for Certification and Use of the Eco Mark.

(71) For Criteria 4-1-3 J-3 (67) and 4-1-3 J-3 (68), a certificate shall be submitted describing the results of tests carried out by an independent testing institution or public institution.

(72) For Criterion 4-1-3 J-3 (69), the document to be used at the time of information provision shall be submitted (a draft is acceptable).

(73) For Criterion 4-1-3 J-3 (70), the document to be used at the time of information provision shall be submitted (a draft is acceptable).

(74) For Criterion 4-1-3 J-3 (71), structural drawings of the incineration facilities to be used shall be submitted.

K. Sewage/waterworks materials

(75) For Criterion 4-1-3 K (72), a raw materials certificate issued by the supplier shall be attached. The types of recycled materials and the proportional content of recycled materials and materials other than recycled materials shall be stated in the Application Form for Certification and Use of the Eco Mark.

(76) For Criteria 4-1-3 K (73), 4-1-3 K (74), a certificate shall be submitted describing the results of tests carried out by an independent testing institution or public institution.

(77) For Criterion 4-1-3. K (75), the average CO_2 emissions per product from resource extraction to the recycling of the product shall be presented in comparison with the case of not using recycled materials (excluding emissions in the pretreatment process of the raw materials; the parts for comparison may be limited to those that are different from cases in which natural raw materials are used).

(78) For Criterion 4-1-3 K (76), a list of the prescribed constituents shall be submitted.

(79) For Criterion 4-1-3 K (78), an explanatory document regarding the route of recycling, and materials stating the collection rate and materials recycling rate shall be submitted.

(80) For Criterion 4-1-3 K (79), the document to be used at the time of information provision shall be submitted (a draft is acceptable).

(81) For Criterion 4-1-3 K (79), the packaging condition of the product and packaging materials shall be specifically described in the Application Form for Certification and Use of the Eco Mark (supplementary pictures, photographs, etc. are acceptable). It shall be stated in the Application Form for Certification and Use of the Eco Mark as to whether halogen-containing polymers or organic halogenides have been added.

L. Materials for bridges/rivers/harbors

(82) For Criterion 4-1-3 L (80), the proportional mass of recycled rubber to the total amount of rubber materials shall be stated in the Application Form for Certification and Use of the Eco Mark and a raw materials certificate and a pretreatment certificate issued by the raw materials supplier shall be attached.

(83) For Criterion 4-1-3 L (81), the following items shall be verified.

a. A document shall be submitted specifically describing the product specifications, including the dimensions, shape and materials.

b. A document shall be submitted specifically describing the construction method; if multiple methods are used, each of such methods shall be indicated.

c. A document shall be submitted specifically stating evidence that for 70% or more of the weir volume, the double-wall type is able to

utilize earth and sand/gravel generated at the site and the steel frame type uses gravel generated at the site as hearting materials; if multiple construction methods are used with different evidence, the evidence for each of the respective methods shall be indicated. The types of products for application with the gravel diameters of the hearting materials shall be stated in the Application Form for Certification and Use of the Eco Mark.

(84) For Criterion 4-1-3 L (82), the following items shall be verified.

a. A document shall be submitted specifically describing the product specifications, including the dimensions, shape and materials.

b. A document shall be submitted specifically describing the construction method; if multiple methods are used, each of such methods shall be indicated.

c. A document shall be submitted specifically stating evidence that the product, under normal conditions, allows water, sand and gravel to flow to control the lowering of the river bed and erosion of the beaches.

d. A document shall be submitted specifically stating evidence that the product does not hinder the movement of flora and fauna; if multiple construction methods are used with different evidence, the evidence for each of such methods shall be indicated.

(85) For Criterion 4-1-3 L (83), the following items shall be verified.

a. A document shall be submitted specifically describing the product specifications, including the dimensions and materials.

b. A document shall be submitted specifically describing the construction method; if multiple methods are used, each of such methods shall be indicated.

c. A document shall be submitted specifically stating evidence that the product is able to utilize earth and sand/gravel extracted at the site as hearting materials for 70% or more of the mats or cylinders; if multiple construction methods are used with different evidence, the evidence for each of such methods shall be indicated.

(86) For Criterion 4-1-3 L (84), a raw materials certificate issued by the recycled materials supplier shall be attached. The types and the proportional content of recycled materials shall be stated in the Application Form for Certification and Use of the Eco Mark.

M. Other materials

M-1. Drainage materials/backfill materials

(87) For Criterion 4-1-3 M-1 (85), a raw materials certificate issued by the supplier shall be attached. The types of recycled materials and the proportional content of recycled materials and materials other than recycled materials shall be stated in the Application Form for Certification and Use of the Eco Mark.

(88) For Criterion 4-1-3 M-1 (86), the average CO_2 emissions per product

from resource extraction to the recycling of the product shall be presented in comparison with cases in which recycled materials are not used (excluding emissions in the pretreatment process of the raw materials; the parts for comparison may be limited to those that are different from cases in which natural raw materials are used).

(89) For Criteria 4-1-3 M-1 (87), 4-1-3 M-1 (88) and 4-1-3 M-1 (89), a certificate shall be submitted describing the results of tests carried out by an independent testing institution or public institution.

(90) For Criterion 4-1-3 M-1 (90), the document to be used at the time of information provision shall be submitted (a draft is acceptable).

M-2. Revegetation base materials

(91) For Criterion 4-1-3 M-2 (91), a raw materials certificate issued by the supplier shall be attached. The types of recycled materials and the proportional content of recycled materials and materials other than recycled materials shall be stated in the Application Form for Certification and Use of the Eco Mark.

M-3. Non-chloride type antifreezing agents

(92) For Criterion 4-1-3 M-3 (92), a list of the prescribed constituents of the product shall be submitted.

(93) For Criterion 4-1-3 M-3 (93), the instruction manual accompanying the product and an MSDS shall be submitted.

M-4. Slope protection net (rock fall protectors and slope fall protectors with less environmental impact)

(94) For Criteria 4-1-3 M-4 (94) and 4-1-3 M-4 (95), the following items shall be verified.

a. A document shall be submitted specifically describing the product specifications, including the dimensions, shape and materials.

b. A document shall be submitted specifically describing the construction method; if multiple methods are used, each of such methods shall be indicated.

c. A document shall be submitted specifically stating evidence that for over 70% or more of the face of the slope within the range of the construction target area the product is able to conserve the natural slope without felling trees; if multiple construction methods are used with different evidence, the evidence for each of such methods shall be indicated.

M-5. Buried marker sheets

(95) For Criterion 4-1-3 M-5 (96), a raw materials certificate issued by the supplier shall be attached. The types of recycled materials and proportional content of recycled materials and materials other than recycled materials shall be stated in the Application Form for

Certification and Use of the Eco Mark.

5-2. Certification procedures for quality

5-2-1 Certification procedures for individual products

A. Wooden tiling/blocks

(96) For Criterion 4-2-3 A (97), a certificate shall be submitted verifying conformity with the relevant quality standards.

B. Steel construction materials

(97) For Criterion 4-2-3 B (98), a certificate shall be submitted verifying conformity with the relevant quality standards.

C. Aggregates

(98) For Criteria 4-2-3 C (99), 4-2-3 C (100) and 4-2-3 C (101), a certificate shall be submitted verifying conformity with the relevant quality standards.

D. Cement

(99) For Criterion 4-2-3 D (102), a certificate shall be submitted verifying conformity with the relevant quality standards.

E. Concrete products

(100) For Criterion 4-2-3 E (103), a certificate shall be submitted verifying conformity with the relevant quality standards.

(101) For Criterion 4-2-3 E (104), for ferroconcrete products, a certificate shall be submitted verifying that the products conform to the “Guidelines for Research/Repair/Reinforcement of Concrete Cracks (Japan Concrete Institute)” and other equivalent standards and that damage from cracks, etc. is inspected. For plain concrete, a certificate shall be submitted verifying that damage from cracks, etc. is inspected.

(102) For Criterion 4-2-3 E (105), a document shall be submitted describing control measures that have been applied and the test results as evidence.

(103) For Criterion 4-2-3 E (106), as to whether the product is concrete in which chloride ion content is controlled shall be stated in the Application Form for Certification and Use of the Eco Mark. For products using concrete in which the chloride ion content is controlled, an explanatory document shall be submitted stating that particular attention is given to chloride ion content in curing the cement paste contained in recycled aggregates.

F. Pavement materials

(104) For Criterion 4-2-3 F (107), a certificate shall be submitted verifying

that used rubber has been added in amounts in conformity with traffic volume categories.

G. Landscaping/revegetation materials

(105) For Criterion 4-2-3 G (108), a certificate shall be submitted verifying conformity with the relevant quality standards, or, if based on in-house standards, that safety has been confirmed.

H. Traffic signs/traffic lane lines

H-1. Traffic signboards

(106) For Criteria 4-2-3 H-1 (109), 4-2-3 H-1 (110) and 4-2-3 H-1 (111), a certificate shall be submitted verifying conformity with the relevant quality standards.

H-2. Traffic sign materials

(107) For Criterion 4-2-3 H-2 (112), results of the detoxification test on measures to control and confirm the alkali-aggregate reaction and descriptions of control measures shall be submitted for glass-concrete mixed non-baked products according to the JIS A 1145 (chemical method), JIS A 1146 or JIS A 5308 (mortar-bar method). For products that were baked after being mixed with glass and detoxified by applying a coating, etc. for the purpose of using non-baked products, these facts shall be described in the Application for Certification and Use of the Eco Mark. For products other than the glass-concrete mixed type, a description to this effect shall also be given in the application.

(108) For Criterion 4-2-3 H-2 (113), a certificate shall be submitted verifying that the product conforms to the “Ordinance concerning Traffic Signs, Traffic Lane Lines and Road Signs”.

H-3. Traffic lane lines (Glass beads for road marking paint)

(109) Criterion 4-2-3 H-3 (114), a certificate shall be submitted verifying conformity with the relevant quality standards.

I. Materials for temporary structures

(110) Criterion 4-2-3 I (115), a certificate shall be submitted verifying that based on in-house standards, safety has been confirmed.

J. Road materials

J-1. Road lighting

(111) For Criterion 4-2-3 J-1 (116), a certificate shall be submitted verifying conformity with the relevant quality standards.

J-2. High-performance noise reduction equipment

(112) For Criterion 4-2-3 J-2 (117), a structural strength calculation in

conformity with the “Sound Insulation Wall Design Guidelines” shall be submitted.

(113) For Criterion 4-2-3 J-2 (118), regarding the standard installation structure, a document including a structural strength calculation shall be submitted.

J-3. Other road materials

(114) For Criteria 4-2-3 J-3 (119) and 4-2-3 J-3 (120), a certificate shall be submitted verifying conformity with the relevant quality standards.

(115) For Criterion 4-2-3 J-3 (121), a certificate verifying conformity with the “Wooden Sound Insulation Wall Technique Guideline (Draft)” shall be submitted.

(116) For Criterion 4-2-3 J-3 (122), long-term durability performance test results shall be submitted.

K. Sewage/waterworks materials

(117) For Criterion 4-2-3 K (123), a certificate shall be submitted verifying conformity with the relevant quality standards.

L. Materials for bridges/rivers/harbors

(118) For Criterion 4-2-3 L (124), a certificate shall be submitted verifying conformity with the relevant quality standards.

(119) For Criterion 4-2-3 L (125), a certificate shall be submitted verifying conformity with the relevant quality standards.

M. Other materials

M-1. Drainage materials/backfill materials

(120) For Criterion 4-2-3 M-1 (126), a certificate shall be submitted verifying that according to the Construction Waste Treatment Manual, (7) Handling of Construction Sludge, the product will not turn into sludge when inundated.

(121) For Criterion 4-2-3 M-1 (127), whether the product has used construction sludge or not shall be stated in the Application Form for Certification and Use of the Eco Mark. For products that have used construction sludge, a certificate shall be submitted verifying conformity with the Draft for Construction Sludge Recycling Technical Standards and the Construction Sludge Recycling Guidelines.

M-2. Revegetation base materials

(122) For Criterion 4-2-3 M-2 (128), a certificate shall be submitted verifying that according to the Construction Waste Treatment Manual, (7) Handling of Construction Sludge, the product will not turn into sludge when inundated.

(123) For Criterion 4-2-3 M-2 (129), whether the product has used

construction sludge or not shall be stated in the Application Form for Certification and Use of the Eco Mark. For products that have used construction sludge, a certificate shall be submitted verifying conformity with the Draft for Construction Sludge Recycling Technical Standards and the Construction Sludge Recycling Guidelines.

M-3. Non-chloride type antifreezing agents

(124) For Criterion 4-2-3 M-3 (130), a certificate shall be submitted verifying conformity with the relevant quality standards.

M-4. Slope protection net (rock fall protectors and slope fall protectors with less environmental impact)

(125) For Criterion 4-2-3 M-4 (131), a certificate shall be submitted verifying conformity with the relevant quality standards.

M-5. Buried marker sheets

(126) For Criterion 4-2-3 M-5 (132), a certificate shall be submitted verifying conformity with the relevant quality standards.

6. Other requirements

The products shall be classified according to each standard and brand of the product as “2. Applicable Products”. No classification shall be made based on the size or the color of the product; provided that products made of different materials shall be applied separately.

The certification number shall be placed near the Eco Mark.

The following environmental information shall be indicated below the mark.

The location and details of the Eco Mark to be indicated shall be submitted when applying for Eco Mark product certification and use. The environmental information indicated shall consist of two lines aligned to the left and enclosed in a rectangular box and indicated according to Attachment 3.

The stocks of certified products produced during the licensing period are exceptional and allowe to use the former statements below the mark and its certification numbers for a year from the date on which the contract is renewed as a basic rule.

(2) The Eco Mark labeling method shall be used in accordance with Eco Mark Use Regulations Article 7 separately prescribed based on the Guidelines for Eco Mark Program Implementation.

(3) In principle, products to be submitted for application shall be free of “flame retardants” and “antibacterial agents”, and shall not be labeled “biodegradable plastic”. When using these materials under special circumstances, however, the

products shall satisfy the provisions contained in the “Guidelines for Eco Mark Program Implementation” concerning the indication of “flame retardant”, “antibacterial agent” or “biodegradable plastic”. Specifically, the use of these materials shall be described in the Application Form for Certification and Use of the Eco Mark with the document stipulated in the form to be attached. (Citation from “A guide to the Eco Mark”: Exclusion equivalent to “Guidelines for Eco Mark Program Implementation” Chapter III, Clause 7)

To be established: Nov. 1, 2004
Term of Validity: Oct. 31, 2009

These certification criteria and/or the product categories may be revised or abolished as when necessary.

Attachment 1　Applicable Products

Classification				Product
Materials	Wood			(1) Wooden tiling/blocks
	Steel construction materials			(2) Permeable steel sheet piles (3) Planting fins for steel sheet pile bank revegetation (4) Low displacement steel piles
	Concrete materials	Aggregates	Vitrified material aggregates	(5) Fine aggregates for concrete using vitrified materials such as non-industrial waste and sewage sludge
			Slag aggregates	(6) JIS A5011-1: Blast furnace slag aggregates (7) JIS A5011-2: Ferro-nickel slag aggregates (8) JIS A5011-3: Copper slag aggregates
			Recycled aggregates	(9) Recycled aggregates
		Cement		(10) JIS A5210: Portland cement (11) JIS A5211: Portland Blast Furnace Slag Cement (12) JIS A5213: Portland Fly Ash Cement (13) JIS R5214: Eco-cement
	Concrete product			(14) JIS A5371 Precast plain concrete products, Category II (Piling blocks, retaining blocks, pasting blocks, linking blocks, incline frame blocks, crossing blocks, staircase blocks, streamed protection/foot protection blocks, special blocks, etc.) (15) JIS A5372 Precast ferroconcrete products (Retaining walls, reinforcing clayey walls, box culverts, etc.) (16) JIS A5373 Precast prestressed concrete products (17) JIS A5409 Prefabricated ferroconcrete fence components (18) JIS A5412 Prestressed concrete double-T slabs (19) JIS A6511 Hollow prestressed concrete panels
	Pavement materials			(20) Rubber pavement materials (21) Rubber particle-containing antifreezing pavement materials
	Landscaping/revegetation materials			(22) Vegetation bags (23) Net with fertilizer bags attached (24) Planters (25) Tree name plates/indication panels (26) Mulching protectors for trees (27) Waterside revegetation materials (28) Tree protector materials/lawn protector materials (29) Artificial trees

Classification			Product
Materials	Landscaping/revegetation materials (cont'd)		(30) Sprinklers (31) Sliding was (32) Jungle gym (33) Seesaws (34) Exercise bars (35) Swings (36) Safety fences around swings (37) Comprehensive playground equipment (38) Concrete playground equipment (39) Spring play equipment (40) Other play equipment and facilities (41) Benches/stools (42) Prefabricated glass greenhouses (43) Trash bins/ashtrays (44) Pergolas (45) Arbors (46) Drinking fountains (47) Shelters (48) Trellises (49) Artificial lawns (50) Street materials (design fences) (51) Rootstock control materials (weed control mats, excavation materials) (52) Artificial landscaping materials (53) Protective materials (elasticity protecting material) (54) Process moss products (vegetation mats) (55) Buffer stops
	Traffic sign/traffic lane lines	Traffic signboards	(56) Traffic signboards
		Traffic sign materials	(57) Road rivets (58) Delineators (snow poles) (59) Delineators (60) Traffic signposts/road reflection mirrors (61) Traffic signboards/guardrail protection materials
		Traffic lane lines	(62) Glass beads for road marking paint
	Materials for temporary structures	Scaffolding, landing bridges, etc.	(63) Lining board
		Molds	(64) Round/rectangular molds (65) Decorative form

Classification			Product
Materials	Road materials	Road lighting	(66) Low-grade insect-trap road lighting (67) Balustrade lighting
		High-performance noise reduction equipment	(68) High-performance noise reduction equipment
		Other road materials	(69) Sound insulation walls (70) Crossing prevention fences for sidewalks (71) Fall prevention fences (72) Concrete road products for local road use (73) Side ditch lids of the former Ministry of Construction standards (74) Long U/new long U (75) Other concrete road products (76) Free inclination side ditches (77) JIS A5345 Ferroconcrete for road use (78) Other side ditch materials (79) Circular waterways (80) Color plates (81) Exterior concrete (82) Water collection/rainwater/wastewater pits (83) Concrete fire fighting water tanks (84) Concrete boundary piles (85) Grating (86) High-performance translucent boards
	Sewage/ waterworks materials	Rainwater-permeable facilities	(87) Penetration pits (88) Penetration manholes (89) Penetration wells (90) Penetration tubes/penetration trench tubes (91) Rainwater storage penetration perforated board trenches (92) Penetration box culverts
		Recycled hard vinyl chloride products	(93) JSWAS K-7/K-8: Hard vinyl chloride pits and lids (94) JSWAS K-9: Small hard vinyl chloride manholes (95) JSWAS K-1: Hard vinyl chloride tubes for sewage (96) JSWAS K-3: Hard vinyl chloride ovoid tubes (97) JSWAS K-13: Ribbed hard vinyl chloride tubes (98) AS-13: Perforated hard vinyl chloride tubes (99) JSWAS K-13: Hard vinyl chloride joints for sewage (100) Metallic footsteps for manholes

Classification		Product
Materials	Materials for bridges/rivers/harbors	(101) Fenders/rubber ship gangways (102) Harbor embankment mats (103) Wire-cylinders (104) Special type mat cylinders (105) Impermeable-type steel erosion control weirs (106) Permeable-type steel erosion control weirs
	Other materials	(107) Drainage materials (108) Revegetation base materials (109) Backfill materials (110) Slope protection nets (rock fall protectors and slope fall protectors with less environmental impact) (111) Non-chloride type antifreezing agents (112) Buried marker sheets

Attachment 2 Criteria for chemicals in fibers

The following chemicals shall conform to certification criteria for the respective applicable products.

As for certification, for substances given in Ref. No. 1, the fact of whether mildew proof finishing is applied shall be stated; the fungicides shall be described for mildew proof finished products. For substances given for Ref. No. 2, the fact of whether the product is a wool product shall be stated; for a wool product, a certification shall be submitted verifying that the relevant product conforms with Ministry of Health and Welfare (MHW) Ordinance No. 34. For substances given in Ref. No. 3, the fact of whether flame proofing is applied shall be stated; for flame proof products, the agents used shall be stated, or a certification shall be submitted verifying that the products are flame retardant goods or flame retardant products.

Ref. No.	Name	Standard value	Test method	Applicable product
1	Organic mercury compounds Triphenyl tin compounds Tributyl tin compounds	Not to be detected	MHW Ordinance No. 34	All the products
2	Dieldrin DTTB	30 ppm or less	MHW Ordinance No. 34	All the products
3	APO TDBPP Bis (2,3-dibromopropyl) phosphate compound	Not to be detected	MHW Ordinance No. 34	All the products

Reference: Law for the Control of Household Products Containing Harmful Substances

It shall be stated whether the following manufacturing process was used or not.

Name of process	Items to be given consideration when processing
Fluorescent whitening	Limited to the required minimum processing and sufficient caution to be given concerning over-processing; application to be avoided for baby and infant products.
Flame proof finishing	Limited to the required minimum processing and sufficient caution to be given concerning over-processing
Softening	
Sanitary finishing	The use of agents whose safety for humans has been questioned is to be avoided.
Product bleaching	If planning to use these agents, apply to the product only after confirming its safety

Reference: 47, Senkyoku No. 569, Director-General, Fibers and General Merchandise Bureau, Ministry of International Trade and Industries
48, Seikyoku No. 289, Director-General, Consumer Goods Industries Bureau, Ministry of International Trade and Industries
63, Seikyoku No. 226, Director-General, Consumer Goods Industries Bureau, Ministry of International Trade and Industries

Plastic color agents given in the following (1), (2) and (3) shall not have been added as prescribed constituents.

In fibers other than wool, chromic color agents shall not have been added as prescribed constituents.

As for certification, a certificate issued by the manager of the plant manufacturing the product shall be submitted.

(1) Azo dyes that may release one or more of the carcinogenetic aromatic amines listed below
(Products in which one or more of the following amines are detected at 30 mg per kg of the product using analysis methods regulated by the official test method corpus based on the German Law on Foods and Sundries Article 35)

Carcinogenicity rank (A1)		
92-67-1	4-aminobiphenyl	C1(EU),1(NTP,IARC)
92-87-5	Benzedrine	C1(EU),1(NTP,IARC)
95-69-2	4-chloro-o-toluidine	2A(NTP,IARC)
91-59-8	2-naphthylamine	C1(EU),1(NTP,IARC)
Carcinogenicity rank (A2)		
97-56-3	o-aminoazotoluene	C2(EU), 2B(NTP,IARC)
99-55-8	2-amino-4-nitrotoluene	3(NTP,IARC)
106-47-8	4-chloroaniline	C2(EU), 2B(NTP,IARC)
615-05-4	2,4-diaminoanisole	2B(NTP,IARC)
101-77-9	4,4'-diaminodiphenylmethane	C2(EU), 2B(NTP,IARC)
91-94-1	3,3-dichlorbenzidine	C2(EU), 2B(NTP,IARC)
119-90-4	o-dianisidine; 3,3'-Dimethoxybenzidine	C2(EU), 2B(NTP,IARC)
119-93-7	o-tolidine; 3,3'-Dimethylbenzidine	C2(EU), 2B(NTP,IARC)

838-88-0	4,4'-diamino-3,3'-dimethyldiphenylmethane	C2(EU), 2B(NTP,IARC)
120-71-8	p-cresidine	2B(NTP,IARC)
101-14-4	4,4'-diamino-3,3'-dichlorodiphenylmethane	C2(EU), 2A(NTP,IARC)
101-80-4	4,4'-diaminodiphenylether	2B(NTP,IARC)
139-65-1	4,4'-diaminodiphenylsulfide	2B(NTP,IARC)
95-53-4	o-toluidine	C2(EU), 2B(NTP,IARC)
95-80-7	2,4-diaminotoluene	C2(EU), 2B(NTP,IARC)
137-17-7	2,4,5-trimethylaniline	
90-04-0	o-anisidine	C2(EU), 2B(NTP,IARC)
95-68-1	2,4-xylidine	3(NTP,IARC)
87-62-7	2,6-xylidine	2B(NTP,IARC)
60-90-3	4amino-azo-benzen	C2(EU)

(2) Carcinogenic dyes

569-61-9	C.I. BASIC RED 9	CI 42500	C2(EU), 2B(NTP,IARC), ECOTEX
2475-45-8	C.I. DISPERSE BLUE 1	CI 64500	C2(EU), 2B(NTP,IARC), ECOTEX
3761-53-3	C.I. ACID RED 26	CI 16150	2B(NTP,IARC),ECOTEX
6459-94-5	C.I. ACID RED 114	CI 23635	2B(NTP,IARC)
2602-46-2	C.I. DIRECT BLUE 6	CI 22610	C2,R3(EU),2A(NTP,IARC), ECOTEX
1937-37-7	C.I. DIRECT BLACK 38	CI 30235	C2,R3(EU), 2A(NTP,IARC),ECOTEX
573-58-0	C.I. DIRECT RED 28	CI 22120	C2,R3(EU) ,ECOTEX
	C.I. DISPERSE YELLOW 3	CI 11855	ECOTEX

(3) Skin sensitizing dyes

2475-46-9	C.I. DISPERSE BLUE 3	CI 61505	ETAD,ECOTEX
	C.I. DISPERSE BLUE 35		ETAD,ECOTEX
	C.I. DISPERSE BLUE 106		ETAD,ECOTEX
	C.I. DISPERSE BLUE 124		ETAD,ECOTEX
2832-40-8	C.I. DISPERSE YELLOW 3	CI 11855	ETAD,ECOTEX
730-40-5	C.I. DISPERSE ORANGE 3	CI 11005	ETAD,ECOTEX
	C.I. DISPERSE ORANGE 37		ETAD,ECOTEX
2872-52-8	C.I. DISPERSE RED 1	CI 11110	ETAD,ECOTEX
	C.I. DISPERSE BLUE 1	CI 64500	ECOTEX
	C.I. DISPERSE BLUE 7	CI 62500	ECOTEX
	C.I. DISPERSE BLUE 26	CI 63305	ECOTEX

	C.I. DISPERSE BLUE 102		ECOTEX
	C.I. DISPERSE ORANGE 1	CI 11080	ECOTEX
	C.I. DISPERSE ORANGE 76		ECOTEX
	C.I. DISPERSE RED 11	CI 62015	ECOTEX
	C.I. DISPERSE RED 17	CI 11210	ECOTEX
	C.I. DISPERSE YELLOW 1	CI 10345	ECOTEX
	C.I. DISPERSE YELLOW 9	CI 10375	ECOTEX
	C.I. DISPERSE YELLOW 39		ECOTEX
	C.I. DISPERSE YELLOW 49		ECOTEX

Reference: International Agency for Research on Cancer (IARC)
National Toxicology Program (NTP)
EU Directive 76/769/EC
EU Directive 2002/61/EC
The Ecological and Toxicological Association of Dyes and Organic Pigments Manufacturers (ETAD) ECOTEX STANDARD 100

Attachment 3 Forestry Certification Provided Based on Definition of Terms

Certification criteria	- While balancing economical, ecological, and social benefits, the criteria shall comply with Agenda 21 and Statement of Principles on Forests, and observe related international agreements and conventions.
	- Including solid requirements, the criteria shall promote sustainable forests.
	- Recognized both domestically and internationally, the criteria shall be recommended as part of the process opened to participation by ecological, economical, and social stakeholders.
Certification system	- Certification systems shall have high transparency, maintain nation-wide or international reliability, and can verify requirements.
Certification body	- With fairness and high reliability, certification organizations and groups shall be able to verify that requirements are satisfied, convey the results, and able to execute requirements effectively.

Attachment 4　Environmental information indication

Applicable product	Environmental information indication	Indication
Permeable steel sheet piles within steel construction materials	(Indication below the Mark) Unrestricted groundwater flow	
Planting fins for steel sheet pile bank revegetation within steel construction materials	(Indication below the Mark) Steel sheet pile bank revegetation device	
Low displacement steel piles within steel construction materials	(Indication below the Mark) Lower displacement steel piles	
Antifreezing pavement materials containing rubber particles within pavement materials	(Indication below the Mark) Freezing resistant paving	
Traffic signboards within Traffic signs/traffic lane lines	(Indication below the Mark) Reusable traffic signboards	
Low-grade insect-trap road lighting within road materials	(Indication below the Mark) Insect repelling road lighting	

Balustrade lighting within road materials	(Indication below the Mark) Non-diffusion road lighting	
High-performance noise reduction equipment within road materials	(Indication below the Mark) Noise reduction without higher sound insulation walls	
Impermeable-type steel erosion control weirs (double-wall type) within materials for bridges/rivers/harbors Special-type mat cylinders within materials for bridges/rivers/harbors	(Indication below the Mark) X% of on-site gravel usable for hearting materials	
Impermeable-type steel erosion control weirs (a steel frame type) within materials for bridges/rivers/harbors	(Indication below the Mark) X% of on-site gravel usable for hearting materials	
Permeable-type steel erosion control weirs within materials for bridges/rivers/harbors	(Indication below the Mark) Embankment that does not separate rivers	
Non-chloride type antifreezing agents within other materials	(Indication below the Mark) Antifreezing agent containing chlorides	
Slope protection net within other materials	(Indication below the Mark) Less than 30% of the trees are felled in the area	

Applicable products using recycled materials other than the above	(Indication below the Mark) Recycle materials used X% of aggregates, cement or Aggregates, cement content more than X% *: The name of the recycled materials used shall be described and the proportional content in X (in integral numbers, dropping the first digits). *: If using multiple types of recycled materials, the top two types in descending order of their proportional content shall be stated, and the total proportional content of recycled materials shall be stated in X (in integral numbers, dropping the first digits). *: When products within the same product category have a different proportional content of the relevant recycled materials, the lowest value within the same product category shall be stated.	 

Draft

Interpretation

Product Certification Criteria for

"Products for Civil Engineering"

Established: X X, 2004

1. Applicable Products

Applicable products in this Product Category are selected by considering and sorting out products and materials from the following three groups: i) materials that are regarded as civil engineering products among those mentioned in the "Standard specifications for civil engineering work (Doboku-koji-hyojun-shiyosho)" compiled by the Ministry of Land, Infrastructure and Transport, "JIS handbook for civil engineering work I and II" edited by the Japan Standards Association, and "Commodity Prices in the construction industry (Kensetsu-bukka)" issued by the Construction Research Institute; ii) proposals submitted as items for the selection of new product categories under the Eco Mark program; and iii) products proposed by the working group.

1-1. Soil

The possibility of applying an Eco Mark certification to soil that is generated in civil engineering sites after it has been treated and improved was considered. As it cannot be actually distributed as a commercial product, it is excluded from this Product Category. However, "cement and concrete products" that were made by processing construction sludge that was regarded as recycled material were included as a Product Category.

1-2. Stone

Stone, which is mainly natural stone, was omitted from this Product Category.

1-3. Aggregates

Aggregate used for concrete was included in this Product Category. Uncommon types of aggregate, including those used mainly for the building process such as lightweight aggregate and those made mainly of pulp ash, were omitted.

1-4. Wood

The products that had been included in Eco Mark Product Category No. 115 "Products Using Waste Wood and Thinned-out and Small Diameter Logs, etc." were to be included in this Product Category so that wood used for civil engineering work can be integrated. It was determined, however, that semi-manufactured products such as rod stock and boards were included in the Product Category No.111 "Board Made of

Wood or the Like" or No. 115 "Products Using Waste Wood, Reused/Unused Wood and etc. Version2.0".

1-5. Steel

As the social system of collecting and recycling steel has already been developed, reused and recycled materials are commonly used. Criteria concerning the use of recycled materials are omitted from the requirements for Eco Mark certification since it was considered that steel products have already been regarded as recyclable materials that can reduce the environmental burden. Regarding added chemical substances and ingredients, no significant difference was found between hazardous products and non-hazardous products. Accordingly, it was also determined that no steel products can be recommended as materials satisfying the requirements for Eco Mark certification from an environmental perspective at the present moment. Consequently, only steel products that pertain to the function of enabling a reduction in the environmental burden generated by external factors other than a characteristic of the steel products themselves could be included in this Product Category.

1-6. Cement

Cement used to be included in Eco Mark Product Category No. 123 "Building Products Using Recycled Materials." However, as a large amount of cement is used in the field of civil engineering, it was included in this Product Category. Cement used mainly for building work, such as lightweight cement and special-purpose cement that is produced in small lots, is exempted. Ready-mixed concrete, which is a product resulting from adding a service to cement, was excluded from this Product Category.

1-7. Concrete admixture

Concrete admixture was excluded from this Product Category since there is no particular concrete admixture product that particularly has less environmental impact than the others. As for hazardous substances that may possibly be added to the admixture, it was determined that criteria should be established concerning the amount contained in the concrete products and the amount of elution.

1-8. Paving materials

Recycled sub-base materials and recycled asphalt composites that were included in the Eco Mark Product Category No. 56 "Recycled Paving Materials" were excluded from this Product Category. This is because these recycled materials have been already widely used through the efforts of the Japanese government and local governments so that it is not necessary to newly apply the Eco Mark Program from the perspective of the composition of recycled materials. Additives in paving materials were excluded from this Product Category since there are no particular additives that have particularly less environmental impact than others.

1-9. Concrete products

Only concrete as a secondary product that is cast in a plant was included in this Product Category. Accordingly, on-site cast concrete was not included. Reinforced

concrete segments were excluded since they need to be evaluated along with the construction method. Products that are included in the Eco Mark Product Category No. 109 “Tile-blocks　Version2.0” were omitted from this Product Category.

1-10. Construction machinery

Construction machinery that is used in civil engineering work was excluded from this Product Category since the product characteristics are significantly different from those of civil engineering materials and such machinery requires evaluation from a different viewpoint. It was determined that construction machinery should be reviewed separately.

1-11. Construction methods

It is considered that among the various construction methods of civil engineering work, those that can reduce the environmental burden should be included in this Product Category. However, if construction methods are to be included in this Product Category, the integration of materials, equipment, and machinery that is necessary to implement the methods needs to be evaluated as part of a whole system of services. Accordingly, construction methods are excluded from this Product Category.

1-12. Landscaping/revegetation materials

Trees, vegetable seeds, agricultural chemicals, fertilizer, and soil conditioners were omitted from this Product Category since they require evaluation from a different perspective than other civil engineering materials. Mowing machines, which were regarded as construction machinery, were also excluded.

1-13. Joint filler

Joint filler was excluded from this Product Category since there is no particular joint filler with less environmental impact than others.

1-14. Adhesive materials

Adhesive materials for civil engineering work were excluded from this Product Category since there are no particular adhesive materials with less environmental impact than others.

1-15. Paints

Coating materials were excluded since these would be included under Eco Mark Product Category No. 126 “Paints Version1.0”.

1-16. Hot-water Supply Systems Using Solar Energy, water saving equipment, and Products Using Solar Battery Modules

The applicable products for the Eco Mark Product Category No. 19 “Hot-water Supply Systems Using Solar Energy” and Eco Mark Product Category No. 26 “Products Using Solar Battery Modules” require separate review, and were excluded from this Product Category. This is because they need a different form of evaluation of their function from other civil engineering products. Sanitary system appliances, which

are already included under No.116 “Water-saving equipment,” were omitted from this Product Category.

1-17. Temporary materials

Metal products were excluded from this Product Category for the same reason as steel. Wood products, such as support pillars, that are versatile, were regarded as being included under the Eco Mark Product Category No. 115 “Wooden Products Using Waste Wood, Thinned-out Wood, Reused/Unused Wood, etc.” In other words, these were omitted from this Product Category. Sheets and other products, which were included in No.105 “Textile Products for Industrial Use Version2.0” were excluded. Temporary facilities, such as temporary toilets, were excluded from this Product Category since they were not categorized under materials.

1-18. Road materials

Metal products such as guard rails were excluded from this Product Category for the same reason as steel. As for products that function as photocatalysts applied for the purpose of improving soil resistance, the methods and criteria for evaluating their functions of environmental purification and soil resistance have not been established. Accordingly, it was determined that establishing product certification criteria for functions concerning this Product Category would be postponed. Among the products that had been included under the Eco Mark Product Category No. 29 “Soundproof and Vibration-proof Mats,” it has been decided that soundproof mats for roads would be included under the Product Category “Products for Civil Engineering”.

1-19. Sewerage/waterworks materials

Metal products were excluded from this Product Category for the same reason as steel. Materials for water and sewerage were excluded from this Product Category since no particular materials had less environmental impact than other materials.

1-20. Materials for environmental conservation

When civil engineering and construction work is undertaken, there has been strong social demand for measures to prevent, reduce, or compensate for the adverse effects on ecosystems from such work. At the same time, operations that aim at the restoration of damaged natural environments will increase in the future. As various civil engineering materials that can respond to the needs of these operations have been developed, they were reviewed if they were effective in conserving ecosystems. As a result, it was determined that these products should be excluded from this Product category and that consideration for a future revision will continue due to the difficulty of verifying the effectiveness of ecosystem preservation functions.

1-21. Other materials

Metal products were excluded from this Product Category for the same reason as steel. Solidification materials, grouting chemicals for soil stabilization, and water bars were excluded from this Product Category since no particular products had less environmental impact than others.

2. Environmental Criteria

2-1. Details of establishing environmental criteria

When setting up the criteria, the environmental impact over the whole life cycle of a product is considered using a Chart for Selecting Environmental Impact at Each Stage of Product Life Cycle. As a result, impact items that are considered to be important for establishing the criteria for Eco Mark certification were selected in view of the environmental impacts over the whole life cycle of the product. For these items, qualitative and quantitative criteria were considered.

As the category “Products for Civil engineering” is positioned as “materials” that are partly finished products, the operation stages or life cycle through which materials are processed into finished structures are important in reviewing the criteria for this category. Depending on the environmental indicators, construction, maintenance and management by the manager of the structure at each of the stages of construction and use in the life cycle of the products can be significant factors determining impact. Accordingly, the stage of Construction has been newly established, and the stage of Use/Consumption has been revised into Use/Maintenance/Management in the Chart for Selecting Environmental Impact at Each Stage of Product Life Cycle prescribed in the implementation outline of the Eco Mark program, so that the chart can match the life cycle of civil engineering products. Environmental impact items considered for the category of “Civil Engineering Products” are as shown in the life stage environmental load items selection table (marked with an X and XX in the table). From these items, the following were finally selected as the environment-related criteria: A-1, A-8, B-1, B-2, D-7, E-2, E-4, E-8, E-9, and G-7 (XX in the table).

The blank columns in the table show items that were beyond the scope of the review or that were reviewed in combination with other items. The following chart shows the details of the establishment of the environment-related criteria.

Table 1: **Chart for Selecting Environmental Impact Items at Each Stage of Product Life Cycle**

Environmental Impact Item	Product Life Stage						
	A. Resource Extraction	B. Manufac-turing	C. Distribu-tion	D. Construc-tion	E. Use/Main-tenance/ Manage-ment	F. Disposal	G. Recycling
1. Resource consumption	XX	XX					
2. Discharge of greenhouse gases		XX	X		XX		
3. Discharge of substances that deplete the ozone layer							
4. Destruction of ecosystems				X	XX		
5. Discharge of atmospheric pollutants			X	X			
6. Discharge of water pollutants							
7. Discharge/disposal of wastes		X		XX	X		XX
8. Use/discharge of hazardous materials	XX				XX	X	X
9. Other environmental impacts				X	XX		

2-1-1. Wooden tiling/blocks

A. Resource Extraction Stage

A-8 Resource consumption

The following point was reviewed under this item:

(1) Ensure the safety of the adhesive materials used and left adhering to the recycled materials

It is necessary to take into consideration the safety of adhesive materials with regard to human health and the environment. However, it is difficult at the moment to evaluate the ease with which adhesive materials can be separated from scrap wood by dissolving the adhesive materials. Accordingly, this item was not selected as an item for which criteria should be established.

D. Construction Stage

D-9 Other environmental impact items

The following point was reviewed under these items:

(1) Compared with products that do not use thinned-out wood, waste wood, construction waste wood or rarely utilized wood, the fact of being maintenance-free and durable should be taken into consideration.

It is not clear what durable and maintenance-free products are since the standard duration of the product life and the criterion for being maintenance-free depend on relative judgment. There were views that confirming the durability of a product after several decades is not practical since the products themselves can be continuously used for a long time. In addition, there is a discrepancy in requiring products that use recycled materials to be durable and maintenance-free since recycled wood and less useful wood are weaker than solid wood. It is possible to prolong the duration of the product life since it is easy to maintain the product through repair, but the proposal was turned down since such repair is not suitable for civil engineering products. Although it is necessary to consider establishing a definition and evaluation criteria for prolonging durability, this item has not been selected as an item for which criteria should be established.

E. Use/Maintenance/Management Stage

E-9 Other environmental impact items

The following point was reviewed under this item:

(1) Comparison with products that do not use recycled materials

This has been already been evaluated in the phase of establishing these criteria, and there is no need to request that each applicant provide an evaluation concerning the environment impacts in comparison with conventional products of the same type. Accordingly, this item has not been selected as an item for which criteria should be established.

F. Disposal Stage

F-8 and G-8 Use/discharge of hazardous materials

The following point was reviewed under this item:

(1) No risk of soil pollution shall be generated at the time of disposal and recycling

The use of hazardous substances as finishing agents, preservatives, moss repellents, and ant repellents is not approved, and measures against soil pollution should be taken. Consequently, it has been determined that the establishment of new criteria concerning soil pollution is not necessary.

G. Recycling Stage

G-7 Release/disposition of wastes

The following point was reviewed under this item:

(1) High feasibility of recycling the products

As wood decays and deteriorates when it is used for a long time, it is difficult to set criteria for the rate of reuse and recycling as a material. Generally, wood is regarded having a use for heat recovery as part of industrial wastes. Consequently, this item has not been selected as an item for which criteria should be established.

2-1-2. Steel for building construction

A. Resource Extraction Stage

A-1 Resource consumption

The following point was reviewed under this item:

(1) Use of recycled materials

A system for the collection and recycling of metals has already been established. The reuse and use of recycled metal materials is common practice. Consequently, this item has not been selected as an item for which criteria should be established.

A-1 to F-1

The following point was reviewed under this item:

(1) Compliance with the laws such as environmental laws at all stages from resource extraction to disposal or recycling

Steel producers, who buy raw materials for steel making from mine operators, are not engaged in the activities of resource extraction. Accordingly, criteria for resource extraction have not been established. This item has been selected as an item for which criteria should be established regarding the activities of the stages from manufacturing to disposal or recycling.

B. Manufacturing Stage

B-1 Resource consumption

The following point was reviewed under this item:

(1) Resource consumption

As large quantities of resources are required in the iron manufacturing process, it is necessary to make continuous efforts to conserve these resources. Accordingly, this item has been selected as an item for which criteria should be established.

B-2 Discharge of greenhouse gases

The following point was reviewed under this item:

(1) Energy consumption and emission of carbon dioxide

As a large amount of energy is consumed and carbon dioxide is emitted in the manufacturing stage of steel production, it is necessary to make continuous efforts to reduce the volume of emissions. Consequently, this item has been selected as an item for which criteria should be established.

D. Construction Stage

D-7 Discharge/disposal of wastes

(1) Waste soil generated during construction (steel pipe piles with low levels of soil waste)

When steel pipe piles are driven into the ground, soil amounting to 0 to 50% of the volume of the pile is generated as waste, depending on the construction method. The amount of soil generated as waste during construction can thus be reduced by developing an appropriate form of steel pipe piles and construction methods. Accordingly, this item has been selected as an item for which criteria should be established.

E. Use/Maintenance/Management Stage

E-9 Other environmental impacts

The following points were reviewed under this item:

(1) Impact on groundwater zones (permeable steel sheet piles)
(2) Consideration for the landscape (steel sheet piles with pots for bank protection and tree planting)

For (1), when steel sheet piles are installed there is a possibility that they will block the existing groundwater circulation. However, this can be alleviated with the use of steel sheet pile with holes that allow for water penetration. Accordingly, this item has been selected as an item for which criteria should be established.

For (2), although bank protection using steel sheet piles may cause problems by rusting over time and have a visual impact on the landscape, installing pots for planting trees on the steel sheet piles allows plants grow, and improves the landscape. Consequently, this item has been selected as an item for which criteria should be established.

In the working group, some strongly recommended ensuring proper management and maintenance of the pots for planting, which may cause silt buildup due to flooding. This is because silt clay may possibly have an adverse impact on the growth of the plants when it is compacted as it dries out, which would lower the moisture content of the soil base in the pots.

2-1-3. Aggregates

A. Resource Extraction Stage

A-1 Resource consumption

The following point was reviewed under this item:

(1) Use of industrial wastes, general wastes, and by-products of construction work as raw materials.

Concrete debris that is generated during the demolition of structures, blast furnace slag that is a by-product of the iron making process, and vitrified residue from the incineration of general wastes can be used as aggregate, which can reduce the discharge of industrial and general wastes. Consequently, this item has been selected as an item for which criteria should be established.

A-8 Use/discharge of hazardous materials

The following point was reviewed under this item:

(1) Clarification of the origin of the raw materials

It is desirable to clarify the origin of “recycled aggregate” since hazardous substances may have been admixed or it may be polluted depending on its history of use. However, it is difficult to identify the origin of concrete debris that was generated at various demolition sites and other materials due to the incomplete separation or mixing in the recycling plant. Consequently, this item has been selected as an item for which criteria should be established under the condition that the recycling plant (intermediate treatment facility) where the material was treated should be clarified. The origins of “slag aggregate” and “fine aggregate for concrete using vitrified materials such as that from general wastes” should also be clarified.

B. Manufacturing Stage

B-2 Discharge of greenhouse gases

The following point was reviewed under this item:

(1) Emission of carbon dioxide

Vitrification of incinerated general wastes and sludge consumes a large amount of energy and emits carbon dioxide. It is necessary to make efforts to reduce the volume of these emissions. Consequently, this item has been selected as an item for which criteria should be established.

B-7 Discharge/disposal of wastes

The following point was reviewed under this item:

(1) Reduction of the amount of waste discharged is taken into consideration

It is proposed that when there are plans and reports concerning the reduction of waste discharge and waste treatment made by manufacturers, they should be submitted with an application to Eco Mark Product Certification and their use indicated. This proposal is a relative indicator, and the results of the evaluation will differ depending on the plant facilities and the amount of production. It does not provide effective criteria unless objectives are set and demonstrated by concrete numerical values. Accordingly, this item has not been selected as an item for which criteria should be established.

D. Construction Stage

D-4 Destruction of ecosystems

The following point was reviewed under this item:

(1) Consideration of ecosystems

As aggregate is a concrete material, it is difficult for the manufacturers of aggregate, as semi-manufactured goods, to take ecosystems into consideration. Accordingly, this item has not been selected as an item for which criteria should be established.

D-5 Discharge of atmospheric pollutants

The following point was reviewed under this item:

(1) Use of machines and vehicles for construction work with less environmental impact

As it is the constructors and transporters that use construction machines and vehicles, the manufacturers of civil engineering materials cannot determine the standards for “machines and vehicles for construction work with less environmental impact.” Consequently, this item has not been selected as an item for which criteria should be established.

E. Use/Maintenance/Management Stage

E-7 Discharge/disposal of waste

The following point was reviewed under this item.

(1) Clarification of the contents of materials, and the ease of separated collection of the materials

As aggregates consist of various materials, it is difficult to separate each material when disposing of the aggregate. The criteria for labeling the contents of materials and the ease of separated collection have not been selected as an item for which

criteria should be established.

E-8 Use/discharge of hazardous materials

The following point was reviewed under this item:

(1) Inclusion of hazardous materials in products and their elution

As it is possible that “recycled aggregate” is contaminated with hazardous substances, depending on its history of usage, this item has been selected in order to set criteria for the level of inclusion of hazardous materials in a product and the level of elution under legislation for the prevention of soil pollution. In addition, it has been concluded that is should be compulsory to conduct an elution analysis twice a year and an inclusion analysis once a year even after obtaining Eco Mark certification, and to require disclosure of the results of these analyses. Consequently, this item has been selected as an item for which criteria should be established.

E-9 Other environmental impacts

The following points were reviewed under this item:

(1) Preparing manuals concerning construction, use, maintenance, management, demolition, disposal, and recycling, and distributing them to constructors who use the products and owners of the structures
(2) Comparison with cases in which recycled resources are not used for the products

For (1), it was considered that product manuals should be submitted along with the application for certification in order to provide information on the origin of the materials contained in “recycled aggregate” and on hazardous substances since recycled materials are used for “recycled aggregate.” However, concrete aggregates are semi-manufactured products, and some problems are that; i) there is ambiguity concerning the effectiveness of the manuals, and ii) the target recipients for distribution are not clear. Accordingly, it is determined that submitting manuals with the application would not be required.

For (2), there should be an evaluation of this criterion during the establishing stage. Accordingly, it is not necessary to require the results of comparison concerning environmental impacts with general products from each applicant. Consequently, this item has not been selected as an item for which criteria should be established.

F. Disposal Stage

F-7 Discharge/disposal of wastes

The following point was reviewed under this item:

(1) High feasibility of re-recycling the products

It is difficult to confirm for the future the “feasibility of re-recycling” of the materials used for construction, since civil engineering materials are generally used for a long time. Consequently, this item has not been selected as an item for which criteria should be established.

2-1-4. Cement

A. Resource Extraction Stage

A-1 Resource consumption

The following point was reviewed under this item:

(1) Use of construction by-products, industrial wastes, general wastes, etc.

Various materials can be used as raw materials for cement, for example, construction by-products, industrial wastes, and general wastes. Many kinds of wastes have already been used as recycled materials for cement, and this is expected to continue. The future task is to technically improve the proportion of recycled materials. Based on the current state of the use of recycled materials (about 0.36 tons of recycled materials as raw materials to 1 ton of the product), the standard value was decided at 0.4 tons of recycled raw materials for 1 ton of the product. Considering the past record of the use of recycled raw materials, it was determined that recycled materials that can be used as raw materials should be general wastes (except those under special management) and industrial wastes (except those under special management) as prescribed in the Waste Disposal and Public Cleaning Law.

B. Manufacturing Stage

B-2 Discharge of greenhouse gases

The following point was reviewed under this item:

(1) Emission of carbon dioxide

A large amount of energy is consumed and carbon dioxide is emitted in the process of calcining raw materials to produce cement in the kiln. It is necessary to make efforts to reduce the volume of these emissions. Consequently, this item has been selected as an item for which criteria should be established.

E. Use/Maintenance/Management Stage

E-8 Use/discharge of hazardous materials

The following point was reviewed under this item:

(1) Inclusion of hazardous materials in products and their elution

As explained in A-1, the product may contain hazardous substances due to the use of various wastes as raw materials for cement. Cement, which is in the form of a powder, may become widely dispersed in the working environment, and may enter the human body through direct contact, inhalation or oral intake. In addition, consideration should be taken of the fact that cement may diffuse into the environment, or it may be deposited in rain. Accordingly it is required that the amount of hazardous substances contained in the products be small. Based on the standard content of hazardous materials designated under the enforcement regulations for the law against soil pollution, it has been decided to control the concentration of hazardous substances in the products. However, as raw materials for cement are calcined during the production process, and as there is a low possibility of the elution of hazardous substances from the raw materials (slag and plaster) that are to be mixed after calcination, it has been decided to designate the following eight hazardous substances as targets for control; cadmium, lead, hexavalent chromium, arsenic, total mercury, selenium, boron, and fluorine.

2-1-5. Concrete products

A. Resource Extraction Stage

A-1 Resource consumption

(1) Use of recycled materials

It is desirable to raise as far as possible the proportion of recycled materials such as cement and aggregate used in producing concrete. The use of recycled materials for cement and aggregate is not reviewed here since it has been discussed separately. It has been determined that criteria should be set for manufacturing concrete products using cement and aggregate that used recycled materials.

C. Distribution Stage

C-2 Discharge of greenhouse gases, C-5 Discharge of atmospheric pollutants

The following point was reviewed under these items:

(1) The transportation distance shall not be longer than for other products

This item was proposed since a limitation had been set for the distance that the concrete is transported to the construction site where it is cast to build a structure. For cast-in-place concrete products, setting such a limitation will lead to the exclusion of imported products. Consequently, this item has not been selected as an item for which criteria should be established.

E. Use/Maintenance/Management

E-4 Destruction of ecosystems

The following points were reviewed under this item:

(1) Consideration of ecosystems (2) The coefficient of permeability of permeable concrete products shall be 10^{-2} or higher

For (1), this item has not been selected as an item for which criteria should be established. This is because it is difficult to demand consideration of ecosystems from a producer of a civil engineering product that is one of the composite materials of a structure, although those ordering the products and the constructor should make efforts to conserve the environment, including protecting ecosystems. Consequently, this item has not been selected as an item for which criteria should be established.

For (2), there was a view stating that "permeation of rainwater into products does not always have a good impact on the environment since rainwater on road surfaces is considered to contain various harmful substances." As a result of this discussion, permeable concrete has been selected as an item for which criteria should be established. The following three reasons led to the conclusion: i) in the Eco Mark Product Category, permeable concrete had been adopted in the past from the perspective of replenishment of the groundwater; ii) it is designated as a specific item for procurement under the Law Concerning the Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities (Law on Promoting Green Purchasing); and iii) there were no prior cases in which hazardous substances that had seeped into rainwater through permeable pavement had significant impacts on the environment.

E-8 Use/discharge of hazardous materials

The following point was reviewed under this item:

(1) High recycling rate of wasted products

Concrete is a target of the Law concerning the recycling of materials related to construction work. Although wastes generated in projects that are larger than a certain scale can be recycled, there are many small scale construction projects to which the law does not apply. In order to raise the recycling rate for construction work other than that subject to the law, it is considered necessary to establish criteria as nonbinding targets in order to raise the collection rate for the purpose of recycling. However, in practice it is difficult to demand that the manufacturers of secondary concrete products collect their products for disposal. Consequently, this item has not been selected as an item for which criteria should be established.

G. Recycling Stage

G-7 Discharge/disposal of waste

The following point was reviewed under this item:

(1) Inclusion of hazardous materials in products and their elution

Concrete products are very often placed in the natural environment. Even after their useful life has finished they are left in the open as recycled paving materials or as products that have been disposed of. Accordingly, it is necessary to ensure a level of safety that is at the same level as that of general soil. Based on the criteria for the contents and the elution of specific hazardous substances prescribed in the enforcement regulations for the law for the prevention of soil pollution, as is the case with aggregates, it has been determined that the concentration of hazardous substances in concrete products should be controlled.

2-1-6. Paving materials

A. Resource Extraction Stage

A-1 Resource consumption

The following point was reviewed under this item:

(1) Use of recycled materials

It has been determined that the use of recycled materials should be promoted and that 100% of rubber materials added to paving materials should be composed of reused rubber. Consequently, this item has been selected as an item for which criteria should be established.

E. Use/Maintenance/Management Stage

E-8 Use/discharge of hazardous materials

The following point was reviewed under this item:

(1) Inclusion of hazardous materials in products and their elution

Used rubber, which is used as a raw material for paving materials, may have been contaminated with hazardous substances, depending on its history of use. In the same way as cement and aggregate, it has been determined that the concentration of hazardous substances in these products should be controlled according to the enforcement regulations of the law for the prevention of soil pollution.

G. Recycling Stage

G-7 Discharge/disposal of wastes

The following point was reviewed under this item:

(1) Recycling of disposed products

Since asphalt that contains rubber particles can be reused after treatment in appropriate reformulation facilities, it has been decided that criteria should be set for this item.

2-1-7. Landscape architecture and tree planting materials

A. Resource Extraction Stage

A-1 Resource consumption

The following point was reviewed under this item:

(1) Use of recycled materials

In order to promote recycling, this item has been included as an item for which criteria concerning the proportional composition of the total amount of recycled materials to the mass of the product should be set. This is because there are products that consist of a combination of various materials. However, as concrete is heavier than other recycled materials, the criteria for proportional composition is set separately for the concrete portion of products that include used concrete products or concrete.

Regarding products that are likely to be left in the open environment, it has been determined that only recycled materials, such as wooden materials, should be used taking into consideration the impact on ecosystems. The expression “left in the open environment” above indicates that products that have been used in the natural environment are not collected after termination of their use. Accordingly, the following three points have been determined as indicators for judgment: a) the products should mainly be used in the natural environment; b) the products are not collected from the natural environment; c) the products cannot be dealt with properly as wastes after termination of their use. The above items a) and b) are premises for disapproval in the Eco Mark Product certification assessment. If the conditions described in b) cannot be confirmed, c) can provide a rough standard as an item to complement b). Among the products used in the natural environment, however, those that function semi-permanently as a part of larger products (structures), such as those that are placed in the ground as part of a structure, cannot be regarded as being those left to stand.

Furthermore, it is determined that there should be a requirement that sludge be burned or vitrified in the pretreatment process of raw materials or during the manufacturing process of products. This is because a distinction between raw materials and products is necessary.

A-8 Use/discharge of hazardous materials

(1) Inclusion of hazardous substances

Regarding each recycled material, items have already been set in order to provide criteria concerning these materials. Consequently, it has been determined that these criteria should be satisfied.

B. Manufacturing Stage

B-1 Resource consumption

The following point was reviewed under this item:

(1) Products shall not be heavier than the same kind of products for which recycled materials have not been used

When a product is manufactured using recycled materials, it may be necessary to make up for the reduced strength in some way. For example, by making the product thicker than one made from new materials the product weight increases, which results in an increase in the amount raw materials and fuel for transportation used in its manufacturing. Accordingly, there is concern that using recycled materials may increase environmental impacts. However, since the form and weight of landscape and tree planting materials varies and setting numerical criteria for weight saving is difficult, it is impossible to set a standard weight for the products. Consequently, this item, which is aimed at reducing the weight of products, has not been adopted due to the difficulty of evaluating weight savings.

E. Use/Maintenance/Management Stage

E-8 Use/discharge of hazardous materials

The following point was reviewed under this item:

(1) Inclusion of hazardous substances

As for the concrete component of the products, it is determined that criteria concerning hazardous substances would be established from the same perspective as in section “E. Concrete products.”

2-1-8. Traffic signs and line markings

2-1-8-1. Traffic signs

A. Resource Extraction Stage

A-1 Resource consumption

The following point was reviewed under this item:

(1) Reuse of used products

The technique of reusing traffic signs by applying a new reflective film over them after peeling off the existing reflective film has been in actual use. Traffic sign products that enable the reuse of used traffic signs have been adopted as products for Eco Mark certification.

E. Use/Maintenance/Management Stage

E-8 Use/discharge of hazardous materials

The following point was reviewed under this item:

(1) Inclusion of hazardous materials in products and their elution

Regarding each recycled material, items have already been set in order to provide criteria concerning these materials. Consequently, it has been determined that these criteria should be satisfied.

2-1-8-2. Materials for traffic signs

A. Resource Extraction Stage

A-1 Resource consumption

The following point was reviewed under this item:

(1) Use of recycled materials

It has been determined that recycled materials should be promoted. Criteria have been set for each recycled material since there are products that consist of several kinds of materials.

E. Use/Maintenance/Management Stage

E-8 Use/discharge of hazardous materials

The following point was reviewed under this item:

(1) Inclusion of hazardous materials in products and their elution

Regarding each recycled material, items have already been set in order to provide criteria concerning these materials. Consequently, it has been determined that these

criteria should be satisfied.

2-1-8-3. Line marking (Glass beads for road marking paint)

A. Resource Extraction Stage

A-1 Resource consumption

The following point was reviewed under this item:

(1) Use of recycled materials

It was determined that recycled materials should be promoted. The proportional composition of glass cullet was decided at 100% of the weight of the recycled product weight.

A-8 Use/discharge of hazardous materials

The following point was reviewed under this item:

(1) Inclusion of hazardous materials

The use of coloring agents and additives that contains heavy metals is assumed. However, in Eco Mark Product Category No. 124 “Glass products version 1.0,” it was confirmed that glass has the characteristic of retaining metals inside the glass in a chemically stable condition. As a result of a survey carried out among related business circles and organizations, the elution of lead, cadmium, chromium, and arsenic from recycled glass was not detected (Detection limit: 10 ppb or less). It has been determined that avoidance of the proliferation of chemical substances and their impacts on the natural environment during the disposal and recycling stages were taken into consideration by avoiding the use and addition of substances that are controlled as prescribed components by the law for the prevention of soil pollution. Consequently, this item has been selected as an item for which criteria should be established.

2-1-9. Temporary materials

A. Resource Extraction Stage

A-1 Resource consumption

The following point was reviewed under this item:

(1) Use of recycled materials

It is determined that recycled materials should be promoted. This item has been selected as an item for which criteria concerning the total proportional composition of recycled materials compared to the overall product weight were set since there are products that consist of several kinds of materials.

A-8 Use/discharge of hazardous materials

(1) Inclusion of hazardous substances

Regarding each recycled material, items have already been set in order to provide criteria concerning these materials. Consequently, it has been determined that these criteria should be satisfied.

E. Use/Maintenance/Management Stage

E-1 Resource consumption

The following point was reviewed under this item:

(1) Products shall not be of the disposable type

Products of the disposable type are referred to as products that were designed assuming that they would be used about only once, even though there are usually alternatives that can be reused repeatedly. It has been determined that among temporary products, products that have the potential to be treated as waste after only being used once should not be approved from the perspective of reducing resource consumption. Consequently, this item has not been selected as an item for which criteria should be established on the basis that the product is of the disposable type.

2-1-10. Road Materials

2-1-10-1. Road lighting

E. Use/Maintenance/Management Stage

E-2 Discharge of greenhouse gases

The following point was reviewed under this item:

(1) Saving of energy

High pressure Natrium lamps consume less electric power than mercury lamps. Consequently, this item has been selected as an item for which criteria should be established.

E-4 Destruction of ecosystems

The following point was reviewed under this item:

(1) Reduction in the destruction of ecosystems caused by road lighting

The characteristics of the spectral distribution show that fewer near-ultraviolet rays that are visible to insects are generated in high pressure natrium lamps than

mercury lamps, which means that high pressure natrium lamp attract fewer insects. However, this lamp can act as insect attractrant depending on the species of insect, the species of the surrounding plants, and developmental stage of the insects. Accordingly, it is necessary to reduce insect attraction and ameliorate the adverse impact on the ecosystem through efforts to raise awareness of the environmental impact on the insect population of each locality where road lighting is installed. From this perspective, this item has been selected as an item for which criteria should be established.

2-1-10-2. High efficiency noise reduction equipment

E. Use/Maintenance/Management Stage

E-9 Other environmental impacts

The following points were reviewed under this item:

(1) High efficiency noise reduction equipment can be installed on existing sound proof barriers, and the height of the barriers shall not increase after the installation of the equipment.
(2) It shall be confirmed that the noise level can be reduced by 2.0 dB or more by the installation of the equipment.

For (1), the higher the sound proof barrier, the greater the sound proofing effect due to diffraction reduction. In such cases, concern over the obstruction of sunlight, the oppressive feeling, and damage to the landscape will increase. If the installation of noise reduction equipment can alleviate these environmental impacts, the height of the sound proof barrier can be set low, and can still effectively reduce noise, thus it has been determined that the equipment should be adopted as a certified Eco Mark product.

For (2), the effectiveness of the noise reduction equipment shall be satisfactory if the average difference in noise level between cases where the equipment has been installed and cases where it has not indicate a reduction in noise levels of 2 dB or more at eight measurement points. Accordingly, this item has been selected as an item for which criteria should be established.

2-1-10-3. Other road materials

A. Resource Extraction Stage

A-1 Resource consumption

The following point was reviewed under this item.

(1) Use of recycled materials

It is determined that recycled materials should be promoted. This item has been selected as an item for which criteria concerning the total proportional composition of

recycled materials to the overall product weight were set since there are products that consist of several kinds of materials.

A-8 Use/discharge of hazardous materials

The following point was reviewed under this item:

(1) Inclusion of hazardous materials in products, etc.

Regarding each recycled material, items have already been set in order to provide criteria concerning these materials. Consequently, it has been determined that these criteria should be satisfied.

E. Use/Maintenance/Management Stage

E-8 Use/discharge of hazardous materials

The following point was reviewed under this item:

(1) Inclusion of hazardous materials

As for the concrete part of these products, it has been determined that criteria concerning hazardous substances should be set in the same way as described in "E. Concrete products."

2-1-11. Water and sewerage materials

A. Resource Extraction Stage

A-1 Resource consumption

The following point was reviewed under this item:

(1) Use of recycled materials

It is determined that recycled materials should be promoted. This item has been selected as an item for which criteria concerning the total proportional composition of recycled materials to the overall product weight were set since there are products that consist of several kinds of materials.

A-8 Use/discharge of hazardous materials

The following point was reviewed under this item:

(1) Inclusion of hazardous materials, etc.

Regarding each recycled material, items have already been set in order to provide criteria concerning these materials. Consequently, it has been determined that these criteria should be satisfied.

G. Recycling Stage

G-9 Other environmental impacts

The following point was reviewed under this item:

(1) As for recycled rigid polyvinyl chloride products and recycled plastic products, a recycling flow should be established. A proportion of 70% (50% is acceptable for two years from the establishment of this criteria) or more of the plastic part of the product shall be collected. It shall be ensured that 60% or more of the collected plastic shall be recycled as raw materials. The remainder of the plastic collected shall be used, for example, for energy recovery.

It is assumed that a large amount of the products are disposed of regularly in the course of water and sewage maintenance and management. As the managers of water and sewage systems clearly know, wastes can be collected efficiently. As for the plastic, the whole of the related business circles are engaged in collection and reuse. In order for the Eco Mark program to promote the use of the recycling flow for this product, this item has been selected as an item for which criteria should be established.

2-1-12. Bridge, river bank, port and harbor materials

A. Resource Extraction Stage

A-1 Resource consumption

The following point was reviewed under this item:

(1) Use of recycled materials

It has been determined that recycled materials should be promoted. This item has been selected as an item for which criteria for each recycled material were set since there are products that consist of several kinds of materials.

D. Construction Stage

D-7 Discharge/disposal of wastes

The following point was reviewed under this item:

(1) Earth, sand, and coarse fragments generated on construction sites shall be used as filling materials

Earth, sand and coarse fragments generated during the construction of dams and other structures are usually discharged as construction waste soil, which is used for landfill in other construction sites, or disposed of as waste when there is no use for it. Direct use of earth, sand, and coarse fragments generated on the construction site as filling material for forming banks and gabions helps to reduce the energy required for

discharging construction waste soil and to reduce waste. Consequently, this item has been selected as an item for which criteria should be established.

2-1-13. Other materials

2-1-13-1. Drainage materials and remblai

A. Resource Extraction Stage

A-1 Resource consumption

The following point was reviewed under this item:

(1) Use of recycled materials

Materials used for drainage systems and backfilling come in various forms and are made of various raw materials, but are mainly granular solid materials. With reference to the recycled materials approved by the Eco Mark Product Category No. 109 “Tile-blocksVersion2.0,” products for which materials with a clear origin are recycled as raw materials, except for organic matter, aggregate, and cement, have been adopted under this item.

Regarding sludge, however, it is necessary to clearly distinguish the raw materials from the products. Accordingly, it has been determined that calcination or vitrification of sludge should be required in the pretreatment of the raw material or in the manufacturing process of the product.

A-8 Use/discharge of hazardous materials

The following points were reviewed under this item:

(1) Clarification of the origin of raw materials (2) Inclusion of hazardous materials

For (1), as products that have used industrial wastes as raw materials are assumed to include hazardous substances that could be contained in the raw material, it is necessary to clarify the origin of the recycled raw materials. However, such clarification can be obtained through certification of the raw materials as recycled materials. Consequently, criteria have not been established here.

For (2), as each recycled material has already been discussed separately, it is determined that they should comply with these criteria.

C. Distribution Stage

C-5 Discharge of atmospheric pollutants

The following point was reviewed under this item:

(1) Preventive measures against spillage during transportation

As granular materials such as drainage materials can be transported without being packed, the need for measures to prevent spillage during transportation was reviewed. However, it is not practical to expect all civil engineering products to be packed. In addition, even if such measures were required of operators who are engaged in such transportation work, they would certainly not always be complied with. For these reasons, it has been determined that criteria for certification cannot be set for this item.

E. Use/Maintenance/Management Stage

E-8 Use/discharge of hazardous materials

The following point was reviewed under this item:

(1) Inclusion of hazardous materials in products and their elution

As these products are to be laid underground or used as a substitute for soil, it is necessary to ensure a certain level of safety so as to prevent soil pollution. Consequently, this item has been selected as an item for which criteria should be established.

2-1-13-2. Base materials for greening

A. Resource Extraction Stage

A-1 Resource consumption

The following point was reviewed under this item:

(1) Use of recycled materials

Materials used as base materials for revegetation come in various forms and are made of various raw materials, but usually concentrate on granular solid materials. Accordingly, recycled materials that can be used as base materials for revegetation are the same as those that can be used for drainage materials and remblai. Considering the features of base materials for revegetation, waste plastic, construction and demolition wastes, waste rubber, glass cullet, and glass wool were excluded. It is desirable that the proportion of recycled materials used should be higher.

It has been determined that calcination or vitrification of sludge in the pretreatment of raw materials or in the manufacturing process of products is required

2-1-13-3. Non chloride antifreeze agents

A. Resource Extraction Stage

A-8 Use/discharge of hazardous materials

The following point was reviewed under this item:

(1) The primary ingredient shall be acetic acid or related materials. Chlorides shall not be included as a prescribed component.

Antifreeze agents whose primary ingredients are calcium acetate, magnesium acetate, potassium acetate, or sodium acetate are less likely to cause metallic or concrete corrosion than the existing antifreeze agents that consist of chlorides such as calcium chloride or natrium chloride. They also have fewer adverse effects on the natural environment, such as on plants, since they quickly decompose in the environment. Conversion to acetic acid related antifreeze agents would reduce environmental impacts. Consequently, it has been determined that criteria for the primary ingredients should be set.

E. Use/Maintenance/Management Stage

E-8 Use/discharge of hazardous materials

The following point was reviewed under this item:

(1) Products shall have instruction manuals and an MSDS attached

Although the methods of using antifreeze agents vary depending on the user, it is desirable that a greater effect should be achieved with a smaller amount of application from the perspective of the emission of chemical substances into the natural environment. It is determined that information on proper usage, such as ways of spraying the agent and the appropriate amount, should be provided to users in order to reduce environmental impacts. It has been also decided to require submission of an MSDS to ensure safe handling. Consequently, this item has been selected as an item for which criteria should be established.

2-1-13-4. Protective netting for slopes (rockfall prevention structures and slope failure prevention structures with less environmental impact)

D. Construction Stage

D-4 Destruction of ecosystems

The following points were reviewed under this item:

(1) Rockfall prevention structures with less environmental impact consisting of wire rope and anchor bolts shall be able to conserve more than 70% of the target slope area without felling any trees.
(2) Slope failure protection structures with less environmental impact, consisting of wire rope and pressure plates, and anchor bolts, shall be able to conserve more than 70% of the target slope area without felling any trees.

Rockfall prevention structures and slope failure prevention structures for slopes usually cover the slopes with concrete and blocks after felling the trees in the area.

However, technology that can be used to apply protective nets while conserving the trees as far as possible by using a more elaborate structure have come into practical use. This item has been selected as an item for determining criteria concerning such slope protection netting involving construction methods with less environmental impact.

2-1-13-5. Warning sheet for underground equipment

A. Resource Extraction Stage

A-1 Resource consumption

The following point was reviewed under this item:

(1) Use of recycled materials

It has been determined that recycled materials should be promoted. This item has been selected as an item for which criteria for each recycled material were set since there are products that consist of several kinds of materials.

A-8 Use/discharge of hazardous materials

The following point was reviewed under this item:

(1) Inclusion of hazardous materials in products and their elution

Regarding each recycled material, items have already been set in order to provide criteria concerning these materials. Consequently, it has been determined that these criteria should be satisfied.

2-2. Details of establishing quality criteria

It has been determined that quality criteria should be based on quality standards such as the Japanese Industrial Standards. If there are no applicable quality standards for certain products, their quality and safety should be evaluated using formal analysis methods by a formal testing body according to the industrial standards or the manufacturer's own standards. For the review of these items reference was made to "Standard specifications for civil engineering work (Doboku-koji-hyojun-shiyosho)," "Concrete using recycled materials (Saiseizairyo-wo Mochiita Konkurito)" JIS TR A 0006, etc.