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(ACE Paper 23/97)
for information

Briefing Paper on the Environmental Impact of RPIS Projects

1. Purpose

1.2. This paper serves to advise members of our normal practice dealing with the environmental issues in river training project under the Rural Planning & Improvement strategy (RPIS) Minor Works Programme, with particular reference to the RPIS project at Lo Wai Hang, Pui O, Lantau.

2. Background

2.3 Rural Planning & Improvement Strategy was endorsed by ExCo in 1989 to formulate a coherent strategy to improve the rural areas in the New Territories. In Nov 1994, Home Affairs Departments (HAD) took up the management role of RPIS Minor Works from Territory Development Department (TDD).

2.4 RPIS Minor Works are small scale projects focusing to improve the living quality and environment of localised rural areas.

2.5 RPIS Minor Works projects in all district have to be endorsed by the respective RPIS District Working Groups (RPIS DWG) before implementation. Members of the RPIS DWG include local representatives and representatives from EPD who would provide input from the environmental protection perspective during the inception stage of RPIS projects.

3. Normal Practice

3.1. Normally, we receive the request for improvement works from the locals through their representatives on RPIS DWG or the respective District Board. Once we receive the request, we would conduct an investigation to identify the cause and the extent of the problem. If the improvement works are justified, we would recommend to RPIS DWG for endorsement.

3.2. In the early planning stage, we would work closely with EPD and AFD regarding the environmental issues. We would check with AFD whether there are special species in the vicinity, animals or plants, which we have to preserve. So far, no special species have been endangered by any RPIS Minor Works. In addition, we would check if there are any restrictions which we have to observe and seek necessary approval, e.g. we need to seek the consent of the Country Park Board for works to be executed within the Country Park.

3.3. Most RPIS Minor Works projects are simple in design and small in scale. With proper design and proper pollution control during construction, environmental impact of the projects during the construction and operation are envisaged to be minimal. EPD has produced a set of Recommended Pollution Control Clauses (RPCC) for incorporation in our works contracts where appropriate. It aims at minimizing inconvenience and environmental nuisance to nearby residents and other sensitive receivers by exercising tight control to prevent noise pollution, dust nuisance and contamination. A copy of the RPCC is attached at Appendix 1.

3.4. For those environmental sensitive projects, such as river training projects, we would consult EPD, AFD and other interest bodies at the conceptual design stage and incorporate their advice in the detail design as far as possible.

3.5. Where appropriate, we would incorporate landscaping works to alleviate visual impacts and provide compensatory replanting.

3.6. We would consult District Board and post notice prior to the commencement of the works.

3.7. Concrete U-channel is not the standard solution in river training project. In 1996, HAD employed 4 different types of design on river training projects and their distribution is as follows:-

Desilting	70
Gabion Walls	12
Shotcreting	2
Channelisation	38

3.8 The effectiveness of each engineering solution in respect of hydraulic efficiency, bank protection, environmental friendly, effective land use and maintenance are given in the following table. It ranges from very effective (*****) to not effective (*).

Design types	Effectiveness				
	hydraulic efficiency	bank protection	environmental friendly	land use	maintenance free
Desilting	*	*	*****	**	*
Gabion Wall	**	****	****	**	***
Shotcreting	****	***	**	***	**
Channelisation	*****	*****	*	*****	*****

3.9 The choice of our design depends very much on the problem, environmental impact and the constraint pertaining to the project. We attempt to strike a balance between the cost and effect for every project while we address the cause and solve the problem. Desilting is best from environmental perspective. Its use, in 1996, is highest among all solutions even it is less effective than others.

4. <u>RPIS project at Lo Wai Hang, Pui O, Lantau</u>

4.1. This is a typical river training project under the RPIS Minor Works Programme.

4.2. Lo Wai Hang Stream meanders at its lower course and wild growth and deposition at the stream bed obstructs the water flow. Water overflows to the adjacent private land during rainy season. Besides, some sections of the stream bank are also eroded and become unstable. The design of the project is to improve a section of the river of approximately 250m in length that can facilitate water flow and stabilize the stream bank.

4.3. As far as the Lo Wai Hang river training project is concerned, the existence of mangrove at the stream mouth and the designation of the concerned area as Coastal Protection Area (CPA) in the South Lantau Outline Zoning Plan have been noted and taken into consideration in the inception stage.

4.4. In the planning stage, we consulted EPD, AFD, Planning D, Green Lantau Association and Friends of the Earth and there was a site visit in February 1997. Their advice has been taken into account in our present design.

4.5. In the present design, the channelisation of Lo Wai Hang stream will stop before a weir that separates the mangrove habitat from the upper portion of the stream. It was confirmed by AFD that such design will only have negligible impact on the mangrove.

4.6. U-channel is only used at the sections which are circumscribed by private lots. At the lower portion of the stream where larger works areas are available, gabion walls and L-shape retaining wall, which are generally considered to be having less environmental impact, are applied instead.

4.7. From the planning perspective, the present design of the works will not alter the watercourse along the stream and therefore compatible with the requirement of CPA.

Home Affairs Department
April 1997

RECOMMENDED POLLUTION CONTROL CLAUSES for CONSTRUCTION CONTRACTS

The Recommended Pollution Control Clauses (RPCC) are generally good engineering practice to minimize inconvenience and environmental nuisance to nearby residents and other sensitive receivers. Some modifications may be necessary to suit specific site conditions.

1. AVOIDANCE OF NUISANCE

(a) All works are to be carried out in such a manner as to cause as little inconvenience as possible to nearby residents, property and to the public in general, and the Contractor shall be held responsible for any claims which may arise from such inconvenience.

(b) The Contractor shall be responsible for the adequate maintenance and clearance of channels, gullies etc. and shall also provide and maintain such pedestrian and vehicular access as shall be directed within the works site.

(c) Water shall be used to prevent dust rising and the Contractor shall take every precaution to prevent the excavated materials from entering into the public drainage system.

(d) The Contractor shall carry out the Works in such a manner as to minimize adverse impacts on the environment during execution of the Works.

2. NOISE POLLUTION CONTROL

Clauses that should be included in the contract

To comply with Environmental Protection Legislation

(a) The Contractor shall comply with and observe the Noise Control Ordinance and its subsidiary regulations in force in Hong Kong.

To provide sound level meter

(b) The Contractor shall provide an approved integrating sound level meter to IEC 651 : 1979 (Type 1) and 804 : 1985 (Type 1) and the manufacturer's recommended sound level calibrator for the exclusive use of the Engineer at all times. The Contractor shall maintain the equipment in proper working order and provide a substitute when the equipment are out of order or otherwise not available.

The sound level meter including the sound level calibrator shall be verified by the manufacturers every two years to ensure they perform the same levels of accuracies as stated in the manufacturer's specifications. That is to say at the time of measurements, the equipment shall have been verified within the last two years.

Non-statutory noise control

(c) In addition to the requirements imposed by the Noise Control Ordinance, to control noise generated from equipment and activities for the purpose of carrying out any construction work other than percussive piling during the time period from 0700 to 1900 hours on any

day not being a general holiday (including Sundays), the following requirements shall also be complied with:

(i) The noise level measured at 1m from the most affected external facade of the nearby noise sensitive receivers from the construction work alone during any 30 minute period shall not exceed an equivalent sound level (Leq) of 75 dB(A).

(ii) The noise level measured at 1m from the most affected external facade of the nearby schools from the construction work alone during any 30 minute period shall not exceed an equivalent sound level (Leq) of 70 dB(A) [65 dB(A) during school examination periods].

The Contractor shall liaise with the schools and the Examination Authority to ascertain the exact dates and times of all examination periods during the course of the contract.

(Guidance note :-

Sub-clause (c) (ii) can be deleted if the schools are either :-

1) more than 800m away from the Construction Site with no obstructions between.

2) more than 300m away from the Construction Site with obstructions in between that can effectively screen off the construction noise.)

(iii) Should the limits stated in the above sub-clauses (i) and (ii) be exceeded, the construction shall stop and shall not recommence until appropriate measures acceptable to the Engineer that are necessary for compliance have been implemented.

Any stoppage or reduction in output resulting from compliance with this clause shall not entitle the Contractor to any extension of time for completion or to any additional costs whatsoever.

Housekeeping clauses to promote noise consciousness at site

(d) Before the commencement of any work, the Engineer may require the methods of working equipment and sound-reducing measures intended to be used on the Site to be made available for inspection and approval to ensure that they are suitable for the project.

(e) The Contractor shall devise, arrange methods of working and carry out the Works in such a manner so as to minimise noise impacts on the surrounding environment, and shall provide experienced personnel with suitable training to ensure that these methods are implemented.

(Guidance note:-

The noise reduction methods include scheduling of works; Siting of facilities; Selection of quiet equipment; and Use of purpose-built acoustic panels and enclosures.)

(f) The Contractor shall ensure that all plant and equipment to be used on site are properly maintained in good operating condition and noisy construction activities shall be effectively sound-reduced by means of silencers, mufflers, acoustic linings or shields, acoustic sheds or screens or other means to avoid disturbance to any nearby noise sensitive receivers.

(g) Notwithstanding the requirements and limitations set out in clause (c) above and subject to compliance with clauses (e) and (f) above, the Engineer may upon application in writing by the Contractor, allow the use of any equipment and the carrying out of any construction activities for any duration provided that he is satisfied with the application which, in his opinion, to be of absolute necessity and adequate noise insulation has been provided to the educational institutions to be affected, or of emergency nature, and not in contravention with the Noise Control Ordinance in any respect.

<u>Contract clauses to be considered when the construction site is not far away from noise sensitive receivers</u>

(h) No excavator mounted breaker shall be used within 125m from any nearby noise sensitive receivers. The Contractor shall use hydraulic concrete crusher whenever applicable.

(Guidance note :-

This should be encouraged for demolition contracts where the site is less than 125m from nearby noise sensitive receivers. Quieter hydraulic concrete crushers will be expected to meet the relevant noise limits in the contracts.)

(i) The only equipment that shall be allowed on the Site for rock drilling works will be quiet drilling rigs with a sound power level not exceeding 110 dB(A). Conventional pneumatically driven drilling rigs are specifically prohibited.

(Guidance note :-

This should be encouraged for site formation contracts where the site is less than 250m from nearby noise sensitive receivers. The 110 dB(A) sound power level specified for the drilling rigs may be relaxed if the site is more than 141m from nearby noise sensitive receivers.)

(j) Do not operate the _____ during the period from _____ to _____ in locations _____.

(Guidance notes :-

1) Whatever equipment or processes to be inserted in the first blank shall be determined by the Engineer who is aware of the constraints involved in the site conditions and the specific method of construction.

2) This clause will be particularly useful in situations where there are many schools around the site.)

(k) Provide air-conditioners to _____.

(Guidance notes :-

1) The blank is there for specific premises identified for each site. It is very likely that educational institutes will be considered most often.

2) A judgement need to be made having regards to the cost of providing air-conditioning and the delay to the project that would have otherwise resulted due to the imposition of other controls. It is therefore appropriate that this clause be used in conjunction with clause (h).)

(l) For the purposes of the above clauses, any domestic premises, hotels, hostel, temporary

housing accommodation, hospital, medical clinic, educational institution, place of p... worship, library, court of law, performing arts centre or office building shall be consid... a noise sensitive receiver.

Other useful contract clauses related to noise control

(m) The Contractor shall, when necessary, apply as soon as possible for a construction noise permit in accordance with the Noise Control (General) Regulations, display the permit as required and copy to the Engineer.

(Guidance note :-

This clause is suitable where percussive piling or nightwork is anticipated.)

** Note:*

Clauses (a), (b), (c)(i), (c)(iii), (d) to (g) and (m) should be incorporated. The remaining ones should be incorporated where appropriate.

3. DUST SUPPRESSION MEASURES

(a) The Contractor shall undertake at all times to prevent dust nuisance as a result of his activities. The air pollution control system installed shall be operated whenever the plant is in operation.

(b) The Contractor shall at his own cost, and to the satisfaction of the Engineer, install effective dust suppression equipment and take such other measures as may be necessary to ensure that at the Site boundary and any nearby sensitive receiver the concentration of air-borne dust shall not exceed 0.5 milligrams per cubic meter, at standard temperature (25°C) and pressure (1.0 bar) averaged over one hour, and 0.26 milligrams per cubic metre, at standard temperature (25°C) and pressure (1.0 bar) averaged over 24 hours.

(c) In the process of material handling, any material which has the potential to create dust shall be treated with water or sprayed with wetting agent.

(d) Where dusty materials are being discharged to vehicle from a conveying system at a fixed transfer point, a three-sided roofed enclosure with a flexible curtain across the entry shall be provided. Exhaust should be provided for this enclosure and vented to a fabric filt... system.

(e) Any vehicle with an open load carrying area used for moving materials which have the potential to create dust shall have properly fitting side and tail boards. Materials having the potential to create dust shall not be loaded to a level higher than the side and tail boards, and shall be covered by a clean tarpaulin. The tarpaulin shall be properly secured and shall extend at least 300mm over the edges of the side and tail boards.

(f) Stockpiles of sand and aggregate greater than $20m^3$ shall be enclosed on three sides, with walls extending above the pile and 2 meters beyond the front of the pile. In addition, water sprays shall be provided and used both to dampen stored materials and when receiving raw material.

(g) The Contractor shall frequently clean and water the site to minimize the fugitive dust emissions.

(h) The Contractor shall restrict all motorized vehicles to a maximum speed of 8 km per hour

and confine haulage and delivery vehicles to designated roadways inside the site. Areas of roadway longer than 100m where movement of motorized vehicles exceeds 100 vehicular movements/day or as directed by the Engineer shall be furnished with a flexible pavement surfacing.

(i) Wheel washing facilities shall be installed and used by all vehicles leaving the site. No earth, mud, debris, dust and the like shall be deposited on public roads. Water in the wheel cleaning facility shall be changed at frequent intervals and sediments shall be removed regularly. The Contractor shall submit details of proposals for the wheel cleaning facilities to the Engineer prior to construction of the facility. Such wheel washing facility shall be usable prior to any earthworks excavation activity on the Site. The Contractor shall also provide a hard-surfaced road between washing facility and the public road.

(j) Conveyor belts shall be fitted with windboards, and conveyor transfer points and hopper discharge areas shall be enclosed to minimize emission of dust. All conveyors carrying materials which have the potential to create dust shall be totally enclosed and fitted with belt cleaners.

(k) Cement or pulverised fuel ash delivered in bulk shall be stored in closed silos fitted with high level alarm indicator. The high level alarm indicators shall be interlocked with the filling line such that in the event of the hopper approaching an overfull condition, an audible alarm will operate, and after 1 minute the pneumatic line to the filling tanker will close.

(l) All air vents on cement silos shall be fitted with fabric filters provided with either shaking or pulse-air cleaning mechanisms. The fabric filter area shall be determined using the air to cloth ratio (0.01 - 0.03 m/s) or the filtering velocity.

(m) Weigh hoppers shall be vented to suitable filter.

(n) The filter bags in the cement silo dust collector must be thoroughly shaken after cement is blown into the silo to ensure adequate dust collection for subsequent loading.

(o) For dry mix batching, the process should be done in total enclosure with exhaust to fabric filter.

(p) All cement and concrete trucks are to be effectively washed down after loading and prior to leaving the works.

(q) The Contractor shall provide and operate two high volume air samplers and associated equipment and shelters in accordance with the USA standard Title 40, Code of Federal Regulations, Chapter I,(Part 50) Appendix B. Sampling shall be carried out 1 day in every 6 days at 10 No. sampling points on the Site boundary for such periods and in a manner as instructed by the Engineer. The samplers, equipment and shelters shall be constructed so as to be transferable between sampling points to enable monitoring of "dust in air" levels at any sampling point required by the Engineer. The Contractor shall provide all necessary protection fences and the like at sampling points. Testing and analysis of sampled materials shall be carried out by a laboratory approved by the Engineer.

NOTES :

1) Discretion should be exercised to select the appropriate clauses from above for different situations. The following are some suggestion :

i)	*Construction sites without concrete batching*	*delete 3(k) to 3(q)*

ii)	*Small works area and storage of material*	*delete 3(h) to 3(q)*
iii)	*Very simple case*	*delete 3(b) to 3(q)*

2) *Item 3(c) is not applicable to the handling of cement and the like.*

3) *Item 3(q) should only be used in cases where there is likely to be dust impact for a considerable period of time e.g. reclamation, borrowing activities etc.*

4) *The Contractor should note that concrete batching in the main urban area is not normally allowed.*

4. CONSENT TO EQUIPMENT AND PROCESSES

(a) The Contractor shall not install any furnace, boiler or other plant or equipment or use any fuel that might in any circumstance produce smoke or any other air pollutions without the prior consent of the Engineer. Unless specifically instructed by the Engineer, the Contractor shall not light fires on site for the burning of debris or any other matter.

(b) The Contractor's attention is drawn to the Air Pollution Control Ordinance and its subsidiary legislation, particularly the Air Pollution (Furnaces, Ovens and Chimneys) (Installation and Alteration) Regulations and the Air Pollution Control (Smoke) Regulations.

5. REMOVAL OF WASTE MATERIAL

(a) The Contractor shall not permit any sewage, waste water or effluent containing sand, cement, silt or any other suspended or dissolved material to flow from the site onto any adjoining land or allow any waste mater or refuse to be deposited anywhere within the site or onto any adjoining land and shall have all such matter removed from the site.

(b) The Contractor shall be liable for any damages caused to adjoining land through his failure to comply with clause 5(a).

(c) The Contractor shall be responsible for temporary training, diverting or conducting of open streams or drains intercepted by any works and for reinstating these to their original courses on completion of the Works.

(d) The Contractor shall be responsible for adequately maintaining any existing site drainage system at all times including removal of solids in sand traps, manholes and stream beds.

(e) Any proposed stream course and nullah temporary diversions shall be submitted to the Engineer for agreement one month prior to such diversion works being commenced. Diversions shall be constructed to allow the water flow to discharge without overflow, erosion or washout. The area through which the temporary diversion runs is to be reinstated to its original condition or as agreed by the Engineer after the permanent drainage system has been completed.

(f) The Contractor shall furnish, for the Engineer's information, particulars of the Contractor's arrangements for ensuring that material from any earthworks does not wash into the drainage system. If at any time such arrangements prove to be ineffective the Contractor shall take such additional measures as the Engineer shall deem necessary and shall remove all silt which may have accumulated in the drainage system whether within the Site or not.

(g) The Contractor shall segregate all inert construction waste material suitable for reclamation

or land formation and shall dispose of such material at such public dumping area(s) as may be specified from time to time by the Director of Civil Engineering Services.

(h) All non-inert construction waste material deemed unsuitable for reclamation or land formation and all other waste material shall be disposal of at a public landfill.

(i) The Contractor's attention is drawn to the Waste Disposal Ordinance, the Public Health the Municipal Services Ordinance and the Water Pollution Control Ordinance.

Any dredged material shall be disposed of at an approved marine dumping ground. One of the approved marine dumping grounds is the Gazetted Marine Dumping Ground at the _____. The Contractor shall apply to relevant authorities under the Dumping at Sea Act for a marine dumping licence.

6. DISCHARGE INTO SEWERS AND DRAINS

(a) The Contractor shall not discharge directly or indirectly (by runoff) or cause or permit or suffer to be discharged into any public sewer, storm-water drain, channel, stream-course or sea any effluent or foul or contaminated water or cooling or hot water without the prior consent of the Engineer who may require the Contractor to provide, operate and maintain at the Contractor's own expense, within the premises or otherwise, suitable works for the treatment and disposal of such effluent or foul or contaminated or cooling or hot water. The design of such treatment works shall be submitted to the Engineer for approval not less than one month prior to the commencement of construction or as agreed by the Engineer.

(b) If any office, site canteen or toilet facilities is erected, foul water effluent shall be directed to a foul sewer or to a sewage treatment facility either directly or indirectly by means of pumping or other means approved by the Engineer.

(c) The Contractor's attention is drawn to the Buildings Ordinance and to the Water Pollution Control Ordinance.

7. GENERAL PROCEDURES FOR THE AVOIDANCE OF POLLUTION DURING DREDGING, TRANSPORTING AND DUMPING

(a) All Contractor's equipment shall be designed and maintained to minimise the risk of silt and other contaminants being released into the water column or deposited in other than designated locations.

(b) Pollution avoidance measures shall include but not be limited to the following :

(i) Mechanical grabs shall be designed and maintained to avoid spillage and seal tightly while being lifted;

(ii) Cutterheads of suction dredgers shall be suitable for the material being excavated and designed to minimise overbreak and sedimentation around the cutter;

(iii) Where trailing suction hopper dredgers for dredging of marine mud are in use, overflow from the dredger and the operation of lean mixture overboard systems shall not be permitted, unless expressly approved by the Engineer in consultation with Environmental Protection Department;

(iv) All vessels shall be sized such that adequate clearance is maintained between vessels and the seabed at all states of the tide to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash;

(v) All pipe leakages are to be repaired promptly and plant is not to be operated with leaking pipes;

(vi) Marine works shall cause no visible foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site or dumping grounds;

(vii) Barges and hopper dredgers shall be fitted with tight-fitting seals to their bottom openings to prevent leakage of material;

(viii) Excess material shall be cleaned from the decks and exposed fittings of barges and hopper dredgers before the vessel is moved;

(ix) Loading of barges and hoppers shall be controlled to prevent splashing of dredged material into the surrounding water, and barges or hoppers shall not be filled to a level that will cause overflowing of material or polluted water during loading or transportation; and

(x) Adequate freeboard shall be maintained on barges to ensure that decks are not washed by wave action.

(8) <u>SPECIAL PROCEDURES FOR THE AVOIDANCE OF POLLUTION DURING DREDGING, TRANSPORTATION AND DISPOSAL OF DESIGNATED CONTAMINATED MARINE MUD)</u>

(a) Uncontaminated mud shall not be dumped other than in dumping grounds as may be approved for the purpose by the Director of Environmental Protection and in accordance with the Dumping at Sea Act (Overseas Territories) Order 1975. Contaminated mud shall not be dumped in gazetted dumping grounds. If it cannot be left in situ, it should be disposed of by specific methods as directed by the Director of Environmental Protection. The Contractor shall be responsible for obtaining all necessary licences for these operations.

Notes : The Engineer shall ensure that the Contractor has access to Works Branch Technical Circular No. 22/92 "Marine Disposal of Dredged Mud"; EPD Technical Circular No. 1.1.92 "Classification of Dredged Sediments for Marine Disposal"; and Fill Management Committee Paper FMC/58 (6.10.92) "General Allocation Conditions for Marine Borrow Areas and Mud Disposal Sites".

(b) When dredging, transporting and disposing of designated contaminated marine mud, the Contractor shall implement additional special procedures for the avoidance of pollution which shall include but not be limited to be following :

(i) Dredging of designated contaminated marine mud shall only be undertaken by a suitable grab dredger using a closed watertight grab; and

(ii) Transport of designated contaminated marine mud shall be by split barge of not less than 750 m^3 capacity well maintained and capable of rapid opening and discharge at the disposal site.

(iii) Discharge from split barges shall be placed in the designated special dumping pit by bottom dumping, at a location within the pit to be specified, from time to time, by the Secretary of the Fill Management Committee (FMC) and Geotechnical Engineering Office of Civil Engineering Department;

(iv) The dumping vessel shall be stationary throughout the dumping operation, discharges shall be undertaken rapidly, and the hoppers shall then immediately be

closed; any material adhering to the sides of the hopper shall not be washed out of the hopper and the hopper shall remain closed until the barge next returns to the disposal site;

(v) Any substance which is found dumped by the Contractor outside the designated dumping ground shall be removed.; and

(vi) providing and maintaining functional marker buoys at the corners of the pit.

(c) Silt Curtains

(i) The Contractor will be responsible for designing, agreeing with the Engineer, and installing silt curtains where required to achieve the water quality requirements and the protection of water quality at any water intakes;

(ii) Silt curtains shall be formed from tough, abrasion-resistant permeable membranes suitable for the purpose, supported on floating booms in such a way as to ensure that the ingress of turbid waters to the enclosed water shall be restricted;

(iii) The boom of the curtain shall be formed and installed in such a way that tidal rise and fall are accommodated and that the ingress of turbid waters is limited. The removal and reinstallation of such curtains during typhoon conditions shall be as agreed with the Director of Marine; and

(iv) The Contractor shall regularly inspect the silt curtains and shall ensure that they are adequately moored and marked to avoid danger to marine traffic.

9. PREVENTION OF EROSION

Sections of permanent cut slope excavation at final cut face grade larger than 100 sq.m. shall be hydroseeded within one week of completion or as agreed by the Engineer.

Environmental Assessment Division
Environmental Protection Department
Prepared on 10.3.94

[ID.STD-CON.D] {E(RA)1(STANDARD) disk}