

EROSION AND SEDIMENT CONTROL PLAN SUBMISSION

To:

JABATAN PENGAIRAN DAN SALIRAN MALAYSIA

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I hereby certify that the details in the plan(s), viz

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On Lot (s)

Section

Jalan

Land Title No.

for

are in accordance with the Urban Stormwater Management Manual for Malaysia and I accept full responsibility accordingly.

I'm herewith enclosed the following;

- | | | |
|----|--|-----|
| 1. | Relevant Site Plans | { } |
| 2. | Detailed Erosion and Sediment Control Drawings | { } |
| 3. | ESCP Report and Calculations | { } |
| 4. | ESCP Submittal Checklist | { } |

Signature:

Professional Engineer (M) and Seal

Name:

Address:

Registration No:

EROSION AND SEDIMENT CONTROL PLANS SUBMISSION REVIEW CHECKLIST

Project Title: _____ Engineering Firm: _____

Property Address: _____ Address: _____

Land Title No: _____ Phone No: _____

Contact Person: _____

DID USE ONLY

Submittal Date: _____ Review Date & Initials: _____

Submission Acceptable/Approval Date: _____ Approved by: _____

Legend:

- { / } Complete
 { x } Incomplete/Incorrect
 { - } Not Applicable

This checklist has been developed to provide specific instructions to engineers. The purpose of this checklist is to expedite and facilitate the review process. This checklist gives the minimum requirements needed for review. All items are expected to be addressed in the first submittal, unless indicated otherwise. All items shall be checked as included or marked NA. Failure to do so will result in rejection of the submittal without review. Consultant shall review the entire check list, prior to first submittal, and check the box in the left-hand column ("Consultant's Initial Submission") to indicate compliance. Consultant must sign the last page.

TO THE CONSULTANT

Your submission for Erosion and Sediment control approval has been reviewed. The review was made per the following checklist. Please return the checklist and Plans comment sheets with your resubmittal. If you do not address a checklist item, including comments on the plan sheets, explain your reasoning.

I, the undersigned, acknowledge by signature that these documents meet or exceed the design standards of the Department of Irrigation and Drainage Malaysia and that they were prepared under my supervision. I, the undersigned, further acknowledge that to the best of my knowledge and belief, the products resulting from these documents will function as intended.

Engineer's Signature_____
Professional Seal_____
Date_____
Title_____
Company Name

SUBMISSION REQUIREMENTS

Initial Submission	Items	
	1	GENERAL
{ }	1.1	Name of proposed project development and address.
{ }	1.2	Name of developer with address, and telephone number on first sheet.
{ }	1.3	Name, address and telephone number of engineering firm or individual who prepared the plans.
{ }	1.4	Seal, signature and license number of a Malaysian Professional Engineer on all sheets.
{ }	1.5	Name and signature of License Surveyor on plans prepared by the surveyor.
	2	SITE PLANS MINIMUM REQUIREMENTS
{ }	2.1	Location plan with appropriate scale. A map showing the general location of the project and the state boundary where the project is located.
{ }	2.2	Key plan with 1:50,000 scale showing the general vicinity of the project within 10 km radius and the river/main drain catchment.
{ }	2.3	Site plan with 1:3,000 or 1:6,000 scale showing the lot to be developed and the surrounding lots showing existing developments if any, standard sheet no, name of Mukim, district, rivers and streams, roads and infrastructure for rivers and drains.
{ }	2.4	Topography Survey plan 1:500 or 1:1000 scale. The survey should be based on Ordinance Survey Datum and the datum (Bench Mark or Temporary Bench Mark) must be clearly shown. The contour line shall be at 0.5 m interval and site spot levels not more than 10m distance. (with extensions into adjoining properties to cover additional distance of 30 m for development < 10 hectares; 50m for development 10 - 50 hectares; 100 m for development > 50 hectares).
{ }	2.5	Proposed layout plan 1:500 or 1:1000 scale showing the proposed main drain reserves, existing outlet drain/river reserve (if applicable) .
{ }	2.6	A similar plan as per item 2.5 but superimposed with existing topography survey.
{ }	2.7	Plans of the river/main drains if the land is crossed by the river/main drain. The plan comprises Cross-section Survey at every 20m intervals (at scale of 1:100 vertical, 1:100 horizontal) and Longitudinal Survey (at scale of 1:100 vertical, 1:1,000 horizontal) The survey should extend up to at least 150m at upstream and downstream of the lot boundary.
{ }	2.8	Hydrographic survey of existing pond/lakes/sea if applicable (1:500 or 1:1000 scale) with spots level at 10m interval
{ }	2.9	All plans submission shall be in hardcopy and digital format in RSO or CASSINI coordinate.

	3	EROSION AND SEDIMENT CONTROL PLAN (ESCP) REPORT MINIMUM REQUIREMENTS
{ }		A loose leaf binder containing the erosion and sediment control report. The report shall include the minimum coverage of the following information:
	3.1	Project Location and Site Descriptions
	A	<i>Report Requirements;</i>
{ }	3.1.1	Description of the location of the proposed development. Include legal description of the site and a reference to adjacent properties and landmarks.
{ }	3.1.2	Description of the site such as
{ }		– general topography (slopes and slope lengths within the site)
{ }		– vegetation
{ }		– extent and nature of development
{ }		– drainage patterns
{ }		– critical areas within and in the vicinity of the proposed development site that have potential for serious stormwater problems
{ }	3.1.3	Identification of neighbouring features that might be affected by the land disturbance. Examples of these features are streams, lakes, residential and commercial areas, reserves, parks and roads.
{ }	3.1.4	Identification of existing drainage (pre-development) patterns and flowpaths (together with flow direction) throughout the site with their catchment boundary and catchment area in Ha.
{ }	3.1.5	Description of site soil characteristics (soil names, erodibility, permeability, depth, texture, and hydrologic group of each soil).
	B	<i>Mapping Requirements</i>
{ }	3.1.6	Provide location plan showing:
{ }		- legal land description; and
{ }		- adjacent properties (streams, lakes, residential and commercial areas, reserves, parks and roadways).
{ }	3.1.7	Show the kinds of development on adjacent properties.
{ }	3.1.8	Provide the plan showing the river basin boundary where the project is located.
{ }	3.1.9	Provide land survey plan showing
{ }		– existing topography showing contours of the site
{ }		– existing drainage pattern and flowpaths (together with flow direction) through out the site
{ }		– any other main features such as drains, culverts, bridges, building, roads, lakes, ponds, or any others services with their invert level and soffit levels in detail.

Consultant's Initial Submission	Items	SUBMISSION REQUIREMENTS	DID Remarks
{ }	3.1.10	<p>Describe the areas that have the potential to present erosion or water quality problems due to the land disturbance from the proposed site. Show critical areas within or near the development such as:</p> <ul style="list-style-type: none"> - Public Water Supply / Raw Water Intake - Reservoir - Swimming Beach - Recreational/Tourism area - Flood prone area - Fishing area/aquaculture - Mangrove Land Forest 	
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	3.2	Proposed Project Development	
	A	Report Requirements;	
{ }	3.2.1	The total project area that will be developed in Ha.	
{ }	3.2.2	Provide a general description of the proposed development, which should include the breakdown details of project components, the development area in Ha of each component and percentage to total development area.	
{ }	3.2.3	The proposed project implementation periods and stages/phases of project development with timing and duration.	
{ }	3.2.4	Indicate the area and amount of grading volume that were proposed for each stage/phase.	
{ }	3.2.5	Describe the permanent stormwater management system and the use of these facilities for sediment control during the construction period.	
	B	Mapping Requirements	
{ }	3.2.6	Show the boundary of each project component, the area in Ha and their project development stages/phases.	
{ }	3.2.7	Show the limits of clearing and grading for each phase of the development. Each boundary line should be identified as to the <u>timing</u> and <u>duration</u> of disturbances.	
{ }	3.2.8	Proposed layout plan with 1:500 or 1:1000 scale which clearly shows the proposed main drain reserve, outlet drain reserve and river reserve (if applicable).	
{ }	3.2.9	Proposed layout plan of 1:500 or 1:1000 scale superimposed with topography survey details.	
{ }	3.2.10	Show the drainage divides and flow directions for each drainage area after the development and show the changes resulting from grading. Include a contour plan of the finished grades using an appropriate scale (1:2000).	
{ }	3.2.11	Indicate the location and sizes of permanent storm drain inlets, pipes, outlets and other permanent drainage facilities such as swales, waterways, detention ponds, etc.	

Consultant's Initial Submission	Items	SUBMISSION REQUIREMENTS	DID Remarks
	3.3	Erosion and Sediment Controls	
	A	Report Requirements;	
{ }	3.3.1	Determine runoff quantities for pre-development and during construction stage for 3 and 6 months ARI (ie 40 mm and 50 mm rainfall depth for water quality control facilities) and 1, 2 and 10 year ARI (for water quantity control structure and erosion/scour protection).	
{ }	3.3.2	The design flows for the water quality facilities within the construction site shall be based on the following criteria;	
{ }		– 3 month ARI (ie 40 mm rainfall depth to capture and detain at least 90% of 24 hours storm events runoff volume) for construction projects that will take 2 years or less to complete	
{ }		– 6 month ARI (ie 50 mm rainfall depth to capture and detain at least 95% of 24 hours storm events runoff volume) for construction projects that will take longer than 2 years to complete.	
{ }	3.3.3	Each drainage area before and after development must be shown together with the respective dividing lines, sizes in ha, and the direction of flow.	
{ }	3.3.4	The development schedule must be clearly defined, the completion date for each phase of development shall be indicated and a detailed sequence of construction must be documented.	
{ }	3.3.5	Identification of critical areas; areas which have the potential to present serious erosion and sedimentation within the site, during pre-bulk grading stage and post-bulk grading stage.	
{ }	3.3.6	Erosion and Sediment Control Plans (ESCP) shall be developed for pre-bulk grading stage and post-bulk grading stage.	
{ }	3.3.7	Pre-Bulk Grading Plan shall include;	
{ }		– Grading phasing.	
{ }		– Quantity cuts and fills.	
{ }		– Specify where excess cut is to be stockpiled and where additional fill is to be obtained.	
{ }		– Plan shall be based on existing topography (based on appropriate datum) and shall not show the proposed development.	
{ }		– Perimeter controls based on existing drainage pattern of the site.	
{ }		– Delineation of drainage areas for controls.	
{ }		– Identify areas for soil stockpiles. Locate stockpiles on areas with little or no slope. Stockpiles must be surrounded by silt fence or other suitable sediment control practice.	
{ }		– Identify areas from where material required to construct perimeter controls will be obtained (include sediment controls for these areas as necessary).	
{ }		– Delineate areas intended for infiltration to ensure that such areas are not compacted during construction.	
{ }	3.3.8	Post-Bulk Grading Plan shall include;	
{ }		– Proposed contours (based on appropriate datum) and proposed project development.	
{ }		– Project development phasing.	
{ }		– Modified and/or new sediment controls based on proposed drainage patterns.	

Consultant's Initial Submission	Items	SUBMISSION REQUIREMENTS	DID Remarks
{ }	3.3.9	Transition from pre-bulk grading controls to post-bulk grading controls shall be consistent with the specified phasing of the project and reflected in the construction sequence.	
{ }	3.3.10	Existing vegetation shall be maintained as filters along contours to reduce velocity and improve water quality and act as buffers to minimise erosion.	
{ }	3.3.11	Stream buffers shall be retained. For small streams within a development site, the following could be used as a guide: – Intermittent watercourse (slope<15°; 10m and slope>15°; 20m) – Permanent watercourse (slope<15°; 20m and slope>30°; 30m)	
{ }	3.3.12	All excavated topsoil shall be stockpiled and later used for re-vegetation. Describe how such stockpile will be protected during construction and the intentions for final stabilization of such areas.	
{ }	3.3.13	All access roads to the site shall be stabilised and paved for a distance of at least 10 m from where these access roads join the existing paved roads. All vehicles should enter and leave the development site at a limited number of points. The exit points should provide for the washing of vehicles as they leave.	
{ }	3.3.14	Determine a drainage system (diversion channel) so that it does not flow across disturbed and unstable areas.	
{ }	3.3.15	Sediment controls (such as sediment pond or sediment trap) shall be proposed to intercept sediment from disturbed areas prior to release of the flow from the site.	
{ }	3.3.16	For hillside areas, slope drains must be constructed, such drains include berm drains, cascading drains, and sumps at the toes of the cascading drains to reduce the velocity of flow.	
{ }	3.3.17	Adequate velocity reduction control measures (e.g. check dam) are to be provided to reduce the flow velocity to less than 0.6 m/s.	
{ }	3.3.18	Soil stabilization should be the first line of defense and shall be completed within 2 weeks time. Describe how each portion of the site will be stabilized after construction is completed and during construction by using either permanent or temporary soil stabilization (vegetative and non-vegetative measures).	
{ }	3.3.19	Identify temporary and permanent control methods.	
{ }	3.3.20	List down good housekeeping practices.	
{ }	3.3.21	List down the types and scheduling of individual erosion control measures, including <u>interim</u> or <u>short-term</u> measures (less than 45 days duration).	
{ }	3.3.22	The locations of the erosion and sediment control and stormwater management practices to be used on the site must be shown clearly in drawing.	
{ }	3.3.23	Erosion and sediment control practices must be shown using appropriate symbols as illustrated in MSMA.	
{ }	3.3.24	CALCULATIONS used in designing all structural practices must be included.	
{ }	3.3.25	Any structural practices used must be illustrated with detailed drawings and specifications.	

Consultant's Initial Submission	Items	SUBMISSION REQUIREMENTS	DID Remarks
{ }	3.3.26	Sediment retention facilities shall be installed prior to the grading or disturbance of any contributing area. Allowance must be made for sediment removal.	
{ }	3.3.27	Permanent water quality control measures such as ponds can be temporarily used as sediment basins during construction.	
{ }	3.3.28	Sediment basins shall be sized in accordance with MSMA to retain a minimum of 70% of coarse sediments greater than or equal to 0.02 mm for all storms of 3 month ARI and 6 month ARI	
{ }	3.3.29	Adequate detention storage shall be provided to store the design runoff (3 month ARI and 6 month ARI) from the catchment. No overflow is allowed through the sediment basin for flows less than the design flow.	
{ }	3.3.30	The design of sediment trap shall at least comply with the following criteria:	
{ }		– It is intended for use on small catchment areas which disturbed area less than 2 ha.	
{ }		– The trap is a temporary measure with a design life of approximately 6 months.	
{ }		– The length to width ratio should be greater than 2:1.	
{ }		– The outlet of the trap must be stabilised with rock, vegetation, or another suitable material.	
{ }		– The fill material for the embankment must be suitable material and shall be compacted during construction.	
{ }		– A stable emergency spillway must be installed to safely convey flows up to and including 10 year ARI.	
{ }		– Remove sediment when the sediment storage zone is no more than 300 mm from being full.	
{ }	3.3.31	For areas greater than 2 ha, provide sediment basin at every outlet complying with the following criteria;	
{ }		– An overall particle removal target of 85% has been adopted.	
{ }		– Construct before clearing and grading work begins.	
{ }		– A stable emergency spillway must be installed to safely convey flows up to and including 10 year ARI.	
{ }		– The basin length to settling depth ratio should not be less than 200:1.	
{ }		– The basin length to width ratio should be greater than 2:1.	
{ }		– Side slopes should not be steeper than 2(H):1(V).	
{ }		– Sediment basin shall be capable of trapping smaller sediment particles with sufficient detention time more than 24 hours.	
{ }		– The settling zone shall be at least 0.6 m deep to contain runoff and allow suspended sediment to settle.	
{ }		– The sediment storage zone shall be at least 0.3 m deep to store settled sediment until the basin is cleaned out. In some cases, basins may be sized to trap sediment for the life of the construction activity.	
{ }		– Temporary sediment basins should be kept in service until the works for which they were designed are completed and the contributing catchment has been stabilised.	

SUBMISSION REQUIREMENTS

4 **FINAL EROSION AND SEDIMENT CONTROL PLANS AND
DETAILING MINIMUM REQUIREMENTS**

General

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|-----|------|---|
| { } | 4.1 | Plan view of the entire site at a reasonable scale (entire site appears on one sheet) showing limits of disturbance, wetlands, floodplains, steep slopes, other environmentally sensitive areas, project phasing, sediment controls by symbols, lot numbers, street addresses, a north arrow and names of adjacent property owners. |
| { } | 4.2 | Location plan shall include a North Point indicator and the names of a minimum of two roads leading to the site. |
| { } | 4.3 | A copy of the approved layout plan together with copy of the planning permission shall be submitted. |
| { } | 4.4 | Proposed finished site levels on topographic plan with contours at intervals of 2 meters for gradients greater than 1:2 and there under, at intervals of 3 meters. |
| { } | 4.5 | A key plan showing the contour together with proposed layout and existing natural watercourse and proposed main drains shall be submitted. |
| { } | 4.6 | The topographic plan should show existing drainage patterns and flow paths (together with flow direction) throughout the site with their catchment boundary and catchment area in Ha. |
| { } | 4.7 | Drawings of proposal including location and layout plan, relevant longitudinal and cross-section and details. |
| { } | 4.8 | A suitable index or key plan showing the reference sheet no for each portion of the development area shall be provided if the various portions of layout are shown on separate drawings. |
| { } | 4.9 | Structural details, if any, shall be indicated on separate drawings as these are submitted for record purposes only. |
| { } | 4.10 | Drawings shall not be bound together. All drawings submitted shall be neatly folded to A4 size, the title block on the front face and in a manner where the drawings can be opened from left to right. |
| { } | 4.11 | Title block shall be provided at the bottom right hand corner of all drawings and properly completed. Title of drawings must indicate the exact nature of works for which approval is sought. There should be a margin of at least 50mm all round the drawing. |
| { } | 4.12 | All drawings submitted must bear the signature of the submitting Engineer/Architect/Surveyor with his full name, address and relevant professional qualifications. |
| { } | 4.13 | All documents submitted for approval shall be certified by the submitting Engineer as following;
"I hereby certify that these works have been designed by me in accordance with sound engineering practice and that I take full responsibility for the design and proper performance of the same." |
| { } | 4.14 | All drawings must be countersigned by the owner. The full name and address of the owner must be indicated. |
| { } | 4.15 | Adequate empty space shall be allowed on all drawings for the Approval stamp. |
| { } | 4.16 | Specify whose responsibility it will be to repair and stabilize erosion and sediment controls practices during construction, including areas disturbed. |

Consultant's Initial Submission	Items	SUBMISSION REQUIREMENTS	DID Remarks
{ }	4.17	Specify whose responsibility it will be to inspect and perform maintenance and/or repairs of the erosion and sediment control practices.	
{ }	4.18	Specify inspection schedule and procedure for inspection and maintenance of erosion and sediment controls practices.	
{ }	4.19	Legend for all symbols of sediment control devices shall be chosen as recommended in MSMA.	
{ }	4.20	Provide the detail layout of erosion and sediment control plan which clearly shows the location and sizes of proposed diversion drains and their outlets and erosion and sediment control facilities such as waterways, check dam, sediment trap, sediment basin, temporary crossing culvert, etc.	
{ }	4.21	Plan shall be prepared using appropriate scales as shown below; <ul style="list-style-type: none"> - Location plan (1:1000) - Site and layout plan (1:1000) - Longitudinal section; Horizontal (1:1000), Vertical (1:100) - Cross- section and other details (1:100). 	
{ }	4.22	All sheets of final Sediment Control package shall be numbered consecutively.	
{ }	4.23	Match lines corresponding sheet to sheet shall be shown.	
		<i>Plans</i>	
{ }	4.24	Show property lines, owners/legal description, and site owner name for adjacent properties.	
{ }	4.25	Show and label existing and proposed improvements (utilities, streets, buildings, etc.).	
{ }	4.26	Show existing and proposed topography (0.5m contour intervals maximum).	
{ }	4.27	Pre- and post-development drainage areas - Dividing lines, number of Hectare, and the direction of flow for each drainage area before and after development must be shown. Use separate plan sheets for clarity.	
{ }	4.28	Existing features to be lighter or screened from proposed improvements in CAD submission.	
{ }	4.29	Limits of disturbance shall be outlined and labeled.	
{ }	4.30	The boundaries of different soil types must be delineated.	
{ }	4.31	Critical areas - Areas which have the potential to present serious erosion or water quality problems must be delineated.	
{ }	4.32	Any designated wetlands (including 10m buffer) shall be delineated and labeled.	
{ }	4.33	Proposed slopes shall not exceed 2:1; (3:1 on lawn maintenance areas)	
{ }	4.34	No sediment control devices are to be located within 10m of building foundations.	
{ }	4.35	Protection of existing interior trees that to be save and undisturbed areas as the buffer as shown on plans.	
{ }	4.36	Protection of property adjacent to excavations shall be shown on plans.	
{ }	4.37	The locations of the <i>erosion and sediment control practices and proposed sediment control devices</i> to be used on the site must be shown.	
{ }	4.38		

Consultant's Initial Submission	Items	SUBMISSION REQUIREMENTS	DID Remarks
{ }	4.40	Sediment trap(s): Provide safety fences; inflow point protection; proper outlet location (maximizing flow length from inflow points); dewatering as necessary (include dewatering device detail); Provide trap data information on the sediment control plan as follows: trap type; existing drainage area; developed drainage area; storage required; storage provided; weir crest elevation; weir crest detailing; storage depth; top storage dimensions; bottom dimensions; cleanout elevation (1/2 design depth); channel depth of flow; maximum side slopes (specify cut and/or fill); bottom elevation; embankment elevation; riser dimensions; barrel dimensions.	
{ }	4.41	Sediment basin(s): Include sediment basin design and construction information as required by MSMA, Low Hazard Class assured; barrel outfall cross-section; dewatering device detail; inflow point protection; safety fence; and baffles as necessary. Show and address construction access and stockpiling on sediment control plan and address sediment control during basin installation. Limit initial disturbance to installation of principle spillway. If there is a base flow, provide a clean water diversion; if there is no base flow, provide diversion dikes above disturbed area.	
{ }	4.42	Earth dikes for off-site diversion of runoff must have channel treatment at a minimum.	
{ }	4.43	Temporary storm drain diversion: Include in sequence of construction, show profile, give invert elevations of temporary pipe into trap on plan view, profile, and details, and show the diversion on the storm drain plan.	
{ }	4.44	Sequence of construction. (Include pre-construction meeting and consider all stages of site conditions with regard to sediment control).	
{ }	4.45	Off-site grading requires documentation of permission from owner (letter of permission on plan or grading easement document submitted).	
{ }	4.46	Plan of storm drain system with topography for each outfall.	
{ }	4.47	All outfalls must release runoff to an existing system, adequate receiving channel, or grounds having slope less than or equal to 2%.	
{ }	4.48	Provide outfall cross-section detail(s) with the following information specific to each outfall: outfall dimensions, rip-rap or gabion slope, length, size and class; and filter cloth underneath.	
{ }	4.49	Standard detail for sediment control devices shall be shown.	
{ }	4.50	Detail drawings and specifications for structural practices - Any structural practices used must be illustrated with DETAILED DRAWINGS CONTAINING ALL DIMENSIONS AND SPECIFICATIONS.	
{ }	4.51	Practices must conform to the specifications indicated in MASMA. Soil stockpiles and borrow areas - The locations of stockpiles and borrow areas must be shown with adequate protection measures included. If these locations are off-site, an addendum to the plan must be submitted to show the areas.	

ADDITIONAL REQUIREMENTS

COMMENTS
