



KEMENTERIAN PENDIDIKAN TINGGI
JABATAN PENDIDIKAN POLITEKNIK DAN KOLEJ KOMUNITI



eProsiding
PRESS 9.0

EXHIBITION OF PRODUCT INNOVATION,
ENGINEERING RESEARCH AND SOCIAL STUDY

**HARI INOVASI DAN PENILAIAN PROJEK AKHIR
JABATAN KEJURUTERAAN AWAM SESI I: 2026/2027**

“INNOVATION TOWARDS EXCELLENCE”

CREDIT COUNCIL

EX *eProsiding*
PRESS 9.0
EXHIBITION OF PRODUCT INNOVATION,
ENGINEERING RESEARCH AND SOCIAL STUDY

@ Jabatan Kejuruteraan Awam, PMM

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Terbitan 2026

Hak cipta terpelihara. Tiada bahagian daripada terbitan ini yang boleh diterbitkan semula, disimpan untuk pengeluaran atau ditukarkan ke dalam sebarang bentuk atau dengan sebarang alat, sama ada dengan cara elektronik, gambar dan rakaman serta sebagainya tanpa kebenaran penulis.

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PRAKATA

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Assalamualaikum dan salam sejahtera

Syukur ke hadrat Allah SWT atas limpah rahmat dan izin-Nya, penerbitan *e-Prosiding* EXPRESS 9.0 dapat direalisasikan sebagai satu wadah perkongsian ilmu serta dokumentasi hasil akademik dan inovasi pelajar Jabatan Kejuruteraan Awam, Politeknik Premier Merlimau Melaka.

Dalam landskap pendidikan TVET yang sentiasa berkembang, proses pembelajaran perlu melangkaui penguasaan pengetahuan dan kemahiran teknikal semata-mata. Pelajar perlu berupaya mengintegrasikan ilmu, pemikiran kritis, kreativiti dan penyelesaian masalah dalam menghasilkan idea serta penyelesaian yang relevan dengan keperluan industri dan masyarakat. Sehubungan itu, pelaksanaan projek akhir menerusi EXPRESS 9.0 menjadi salah satu manifestasi pembelajaran berasaskan hasil (*Outcome-Based Education*) yang memberi ruang kepada pelajar menterjemahkan pengetahuan dan kemahiran kepada hasil yang bermakna.

Penerbitan *e-Prosiding* ini turut mencerminkan usaha institusi dalam membudayakan penyelidikan, inovasi dan perkongsian ilmu dalam kalangan warga akademik. Diharapkan hasil projek yang didokumentasikan dapat menjadi rujukan, mencetuskan idea baharu serta menggalakkan penghasilan inovasi yang lebih berkualiti dan berimpak pada masa hadapan. Tahniah dan syabas kepada Jabatan Kejuruteraan Awam serta semua pihak yang telah menyumbang kepada kejayaan EXPRESS 9.0 dan penerbitan *e-Prosiding* ini. Semoga usaha ini terus memperkukuh kecemerlangan akademik serta menyokong aspirasi institusi dalam melahirkan graduan TVET yang kompeten, inovatif dan bersedia menghadapi cabaran dunia pekerjaan.

Sekian, terima kasih.

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Assalamualaikum dan salam sejahtera

Alhamdulillah, syukur ke hadrat Ilahi kerana dengan izin dan limpah kurniaNya, Jabatan Kejuruteraan Awam, Politeknik Premier Merlimau Melaka berjaya menganjurkan Program Hari Inovasi dan Penilaian Projek Akhir Jabatan Kejuruteraan Awam (**EXPRESS 9.0**) bagi memenuhi keperluan Kursus Final Year Project 2 (DCC50513) dan Kursus Geomatic Project 2 (DCG50471), serta menerbitkan e-Prosiding ini sebagai rakaman hasil usaha, kreativiti dan inovasi para pelajar semester akhir.

EXPRESS 9.0 yang berlangsung pada 23 September 2026 di Dewan Platinum melibatkan seramai 185 pelajar semester akhir Diploma Kejuruteraan Awam dan Diploma Geomatik. Program ini menjadi platform bagi pelajar mempamerkan hasil Projek Akhir dalam bentuk inovasi, penyelidikan dan reka bentuk. Hasil projek yang dipamerkan turut mencerminkan kreativiti, kemahiran serta keupayaan pelajar mengaplikasikan ilmu yang dipelajari dalam menangani keperluan industri dan masyarakat. Setinggi-tinggi tahniah dan penghargaan dirakamkan kepada semua pelajar atas komitmen, usaha dan dedikasi sepanjang menyiapkan projek masing-masing. Ucapan terima kasih juga ditujukan kepada pensyarah penyelia, panel penilai serta jawatankuasa penganjur atas sumbangan dan kerjasama dalam memastikan EXPRESS 9.0 dapat dilaksanakan dengan jayanya.

Sempena EXPRESS 9.0, beberapa anugerah turut disediakan sebagai penghargaan terhadap kecemerlangan dan usaha pelajar, merangkumi Projek Terbaik Penyelidikan, Projek Terbaik Inovasi/Produk, Anugerah Khas Teknologi Hijau, Kesihatan & Keselamatan, Anugerah Pilihan Ketua Jabatan serta Anugerah Khas Panel Juri (Best of the Best). Semoga e-Prosiding ini menjadi sumber rujukan dan inspirasi kepada pelajar serta komuniti kejuruteraan awam, di samping menyemarakkan semangat inovasi yang dapat diteruskan hingga ke alam pekerjaan.

Sekian, terima kasih.

AB RAZAK BIN AHMAT

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PRAKATA KKJKA

SENARAI JAWATAN KUASA EXPRESS 9.0

ISI KANDUNGAN

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SENARAI PROJEK DAN PINGAT

MUKA SURAT

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PETA DIGITAL BERASASKAN GIS BAGI FASILITI UTAMA JKA

ANALISIS PEMETAAN LITUPAN POKOK DI POLITEKNIK MERLIMAU MELAKA

APLIKASI KAMPUS HIJAU MENGGUNAKAN KAEDAH GIS

ANALISIS PERUBAHAN KEPADATAN PENDUDUK MENGIKUT DAERAH DI NEGERI MELAKA PADA TAHUN 2010 DAN 2020

SURVEY TOOLS HARNESS

KAJIAN ALIRAN AIR DI KAMPUS POLITEKNIK MERLIMAU MELAKA

PENGHASILAN PELAN LANTAI (STRATEGIK) BAGI FIRE EXTINGUISHER DI JKA , PMM MENGGUNAKAN ARCGIS

A PRELIMINARY STUDY OF PAVEMENT CRACKING IN COASTAL ROAD CONDITION

A STUDY ON THE COMBINATION OF COCONUT SHELL ASH AND RICE HUSK ASH IN CONCRETE

E-INSPECTION & DEFECT SYSTEM (E-IDS)

A STUDY ON THE QUALITY OF CLEAN WATER IN THE CAMPUS AREA OF POLITEKNIK MERLIMAU, MELAKA

A STUDY ON FACTORS AFFECTING SAFETY AWARENESS AMONG CONSTRUCTION WORKERS

STUDY ON DRAINAGE PROBLEM IN INDUSTRIAL AREA OF AYER KEROH AT JALAN TUN ABDUL RAZAK

HYDRO-RAINWATER YIELD FOR LIGHTING & TURBINE ELECTRIFICATION (HYDRO-LITE)

TECHNICAL GRAPHIC DESIGN FOR PRECAST CONCRETE SYSTEM COMPONENT INSTALLATION GUIDE

WATER QUALITY AT BUKIT RAMBAI PADDY FIELD

SMART AUTOMATED SIGNAGE STOP-GO FOR WORK ZONES

PORTABLE MANUAL ROOFING SHEET BENDER

STUDY OF COCONUT FIBER AS AN ADDITIONAL MATERIAL IN CONCRETE MIX

DEVELOPMENT OF A SMART FLOOD MONITORING AND EARLY WARNING SYSTEM

SITE SUPERVISOR APPLICATION

HYDRO-RAINWATER YIELD FOR OFF-GRID LIGHT-DUTY INTERACTIVE TERMINAL ELECTRIFICATION (HYDRO-LITE)

ERGONOMIC BRICK LIFTER

PERFORMANCE OF GLASS-MODIFIED INTERLOCKING BLOCKS

ARC (ADJUSTABLE RAIL COATER)

MODIFIED CONCRETE USING CRUMB RUBBER TO IMPROVE THE PERFORMANCE OF CONCRETE

A STUDY ON ENHANCING TRAFFIC SIGN VISIBILITY FOR NIGHTTIME ROAD SAFETY

INVESTIGATION AND ANALYSIS OF ENVIRONMENTAL FACTORS CONTRIBUTING TO STRUCTURAL CRACKING IN RESIDENTIAL BUILDINGS AT KAMPUNG TENGERA PANTAI DUA, MELAKA

IOT-BASED SMART SAFETY VEST WITH GPS AND EMERGENCY ALERT

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HARI INOVASI DAN PENILAIAN PROJEK AKHIR
JABATAN KEJURUTERAAN AWAM SESI I: 2026/2027

“INNOVATION TOWARDS EXCELLENCE”

TENTATIF PROGRAM

TARIKH: 23 SEPTEMBER 2026

TEMPAT: DEWAN PLATINUM , PMM

- 0800 : Taklimat penilaian oleh urusetia
- 0830 : Sesi penilaian projek akhir oleh panel penilai
- 1445 : Ketibaan Jemputan
- Ketibaan VIP
- Bacaan Doa
- Tayangan Video hari Inovasi
- Ulasan Ketua Panel Penilai
- Ucapan Perasmian Penutup Express9.0
- Penyampaian Hadiah
- 1700 : Majlis Bersurai

SENARAI PANEL JEMPUTAN, DIPLOMA KEJURUTERAAN AWAM

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4. TN. HAJI ZAMALI BIN OMAR
Politeknik Melaka
5. EN. MOHAMAD HALID BIN ABU
Politeknik Melaka
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4. NUR HAMIZI BIN HAMSAN
Pejabat FELDA Tun Ghafar Machap

SENARAI PROJEK PELAJAR DIPLOMA KEJURUTERAAN AWAM SESI 1 : 2026/2027

1. A PRELIMINARY STUDY ON PAVEMENT CRACKING IN COASTAL ROAD CONDITIONS				PINGAT
ID PROJEK : 7461				
PENY:	ROSILAWATI BINTI AHMAD KHALIL			GOLD 1ST PENYELIDIKAN
1	14DKA24F1029	DKA5C	NUR AFIZZA AIDA BINTI ABDUL JALIL	
2	14DKA24F1017	DKA5C	NUR AIDA QISTINA BINTI HASSAN NORDIN	
2. A STUDY OF CLEAN WATER QUALITY WITHIN THE CAMPUS AREA OF POLITEKNIK MERLIMAU MELAKA				PINGAT
ID PROJEK : 7361				
PENY:	NORHAYATI BINTI ABD WAHAB @ DUL AHAD			GOLD
1	14DKA24F1106	DKA5B	FILZATUN AIN NAZWA BINTI ZAINI	
2	14DKA24F1072	DKA5B	SITI NOR SYAFIQAH SYAHIRA BINTI JAMIR	
3. A STUDY ON ENHANCING TRAFFIC SIGN VISIBILITY FOR NIGHTTIME ROAD SAFETY				PINGAT
ID PROJEK : 7348				
PENY:	AZAH BINTI ABAS			GOLD 3rd PENYELIDIKAN
1	14DKA24F1070	DKA5A	IRDINA YASMIN BINTI MOHAMMAD FAZARUL FARMİ	
2	14DKA24F1007	DKA5A	PUTERI NURIZZATI BINTI MOHD SAFFI'EE	
4. A STUDY ON FACTORS AFFECTING SAFETY AWARENESS AMONG CONSTRUCTION WORKERS				PINGAT
ID PROJEK : 7385				
PENY:	NURAZIYATI BINTI SUKARDI			SILVER
1	14DKA24F1902	DKA5B	HANI DANIA SORFINA BINTI HALEL	
2	14DKA24F1090	DKA5B	NURUL HUSNINA BINTI MOHD FADIL	
5. A STUDY ON PARKING DEMAND, CAPACITY AND TRAFFIC IMPACT AT JALAN BANDAR BARU MERLIMAU UTARA				PINGAT
ID PROJEK : 7357				
PENY:	RADZIAH BINTI ABD RAHMAN			BRONZER
1	14DKA24F1067	DKA5A	MUHAMMAD AKIF AİMAN BIN ROSDI	
2	14DKA24F1028	DKA5A	SULAIMAN HAQIM BIN ABD JANI	
6. ANALYSIS OF ROAD SURFACE ROUGHNESS USING IRI ON AMJ HIGHWAY (JASIN)				PINGAT
ID PROJEK : 7387				
PENY:	NOOR AZAH BINTI ABDUL RAMAN			BRONZER
1	14DKA24F1043	DKA5A	FATIN SYAHİRA BINTI ZAINUDIN	
2	14DKA24F1019	DKA5A	NUR FATIN SOLEHA BINTI MATNOH	
7. ARC TOOLS (ADJUSTABLE RAIL COATER)				PINGAT
ID PROJEK : 7349				
PENY:	SAFHİFUL RABBİ BIN MUHAMAD NOOR			BRONZER
1	14DKA24F1038	DKA5C	AINURHAIYUNİ BINTİ ABDULLAH	
2	14DKA24F1114	DKA5C	ARİNA FARİSHA BINTİ MOHAMAD KUSAIRİ	
3	14DKA24F1032	DKA5C	FATİMA AZ-ZAHRA BINTİ MADİMİN	
8. ASSESMENT PARKING FOR VISITORS AT HOSPİTAL PAKAR SULTANAH FATİMAH, MUAR.				PINGAT
ID PROJEK : 7485				
PENY:	AYU WİRDAWATİ BINTİ PO'A			SİLVER
1	14DKA24F1002	DKA5C	NUR SYAFİQAH BINTİ RAZALİ	
2	14DKA24F1005	DKA5C	NURUL FARAHANNAH BINTİ SALLEHUDDİN	

9. COCONUT FIBER ROOF TILES AS THERMAL INSULATION FOR HOMES				PINGAT
ID PROJEK : 7358				
PENY:	NURUL NADIAH BINTI OTHMAN			SILVER
1	14DKA24F1050	DKA5C	MUHAMAD RUZAINI HILMI BIN MOHD ROMZI	
2	14DKA24F1111	DKA5C	MUHAMMAD DANIEL HAKIMY SYAFIEE	
3	14DKA24F1071	DKA5C	MUHAMMAD FAISAL BIN ZULHARI	
10. COMPARATIVE ASSESSMENT OF WATER QUALITY AT UTHM LAKE USING WATER QUALITY INDEX (WQI).				PINGAT
ID PROJEK : 7386				
PENY:	HAZILAH BINTI MOHAMAD			SILVER
1	14DKA24F1025	DKA5A	MOHAMAD HADIF BIN RAMZI	
2	14DKA24F1034	DKA5A	MUHAMMAD HARITH FIKRI BIN MOHD AZAHAR	
11. DEVELOPMENT OF AN ERGONOMIC ADJUSTABLE IRON GRIP				PINGAT
ID PROJEK : 7364				
PENY:	ERITA MAZWIN BINTI MAZLAN			TH
1	14DKA24F1064	DKA5A	ADHAM ALFIE BIN ROHAIZAD	
2	14DKA24F1094	DKA5A	MUHAMMAD HAKIM BIN NOR AZMI	
12. DEVELOPMENT OF SMART FLOOD MONITORING AND EARLY WARNING SYSTEM				PINGAT
ID PROJEK : 7475				
PENY:	NORHAYATI BINTI ABD WAHAB @ DUL AHAD			BRONZER
1	14DKA24F1069	DKA5B	MOHAMAD AMIRUL YAZID BIN BUANG	
2	14DKA24F1051	DKA5B	MUHAMMAD AIMAN BIN AZLI	
3	14DKA24F1063	DKA5B	MUHAMMAD KHAIRI ISYRAF BIN AHMAD KAMAL	
13. E-INSPECTION & DEFECT SYSTEM				PINGAT
ID PROJEK : 7365				
PENY:	AYU WIRDAWATI BINTI PO'A			GOLD 3rd INOVASI
1	14DKA24F1053	DKA5C	FARANIESYA ALIEYA BINTI NOOR AMIN	
2	14DKA24F1020	DKA5C	NUR BATRISYIA IZZATI BINTI MOHD NIZAM	
3	14DKA24F1047	DKA5C	NURUL UMIRA BINTI ZULKIFFLI	
14. ERGONOMIC BRICK LIFTER				PINGAT
ID PROJEK : 7346				
PENY:	HAZILAH BINTI MOHAMAD			SILVER
1	14DKA24F1058	DKA5A	ADDINA ALIYAH BINTI MOHD KHAIRUL	
2	14DKA24F1010	DKA5A	ALIFF AKASHA BIN MOHD NASIR	
3	14DKA24F1052	DKA5A	NURADLINA AMANI BINTI NORISMAN	
15. FLEXIBLE PAINT BRUSH				PINGAT
ID PROJEK : 7482				
PENY:	JULIAWATI BINTI JAMA'ON			SILVER
1	14DKA24F1082	DKA5A	ANBU A/L DAVID	
2	14DKA24F1016	DKA5A	MOHAMAD AMIRUL FAZRYN BIN SHA'RI	
3	14DKA24F1104	DKA5A	MUHAMMAD ADAM HARIS BIN MOHD MAZILI	

16. GREENWAVE ACOUSTIC				PINGAT
ID PROJEK : 7355				
PENY:	MAZLINA BINTI ABDUL GHANI			SILVER
1	14DKA24F1085	DKA5A	MUHAMMAD AMIRUDIN BIN ROSADI	
2	14DKA24F1107	DKA5A	MUHAMMAD FAIQ ZHARIF BIN M RAZLEE	
3	14DKA24F1091	DKA5A	MUHAMMAD ISKANDAR SHAHRIL BIN OMAR SHAHRIL	

17. HIGH EARLY STRENGTH CONCRETE INCORPORATING SUPPLEMENTARY CEMENTITIOUS MATERIALS AND SILICA FUME				PINGAT
ID PROJEK : 7377				
PENY:	JUSMINE HANIS BINTI ABDULLAH			SILVER
1	14DKA24F1084	DKA5B	AMIRUL NAJHAN BIN YUSOF	
2	14DKA24F1021	DKA5B	MUHAMMAD AFIQ DANISH BIN ZABUDIN	
3	14DKA24F1003	DKA5B	MUHAMMAD HAZREEL HAIQAL BIN HISHAM	

18. HYDRO-RAINWATER YIELD FOR LIGHTING & TURBINE ELECTRIFICATION (HYDRO-LITE)				PINGAT
ID PROJEK : 7492				
PENY:	SITI ZAWIYAH BINTI HUSAIN			GOLD 1 ST INOVASIF
1	14DKA24F1036	DKA5B	AMERUL HAZIQ BIN HAMIDAN	
2	14DKA24F1048	DKA5B	DHANESH A/L GOPALKRISHNAN	
3	14DKA24F1903	DKA5B	MOHAMAD SAIFUL ASYRAAF BIN SHARULIZAL	

19. INOVATION RAINWATER HARVESTING & SPRINKLER SYSTEM				PINGAT
ID PROJEK : 7388				
PENY:	SITI NOOR ASYIKIN BINTI HJ ALIAS			BRONZER
1	14DKA24F1108	DKA5C	FIRAS HAKIMI BIN MOHD FAUZAN	
2	14DKA24F1008	DKA5C	MUHAMMAD IZZ DANIEL BIN ROSNAN	
3	14DKA24F1102	DKA5C	MUHAMMAD ZULALIF BIN MUHD ZULQARNAIN	

20. INTERLOCKING KERBS DESIGN				PINGAT
ID PROJEK : 7359				
PENY:	NORHAYATI BINTI ABD WAHAB @ DUL AHAD			SILVER
1	14DKA24F1904	DKA5B	HANIS SUFIAH BINTI SHAHIRUN	
2	14DKA24F1015	DKA5B	NIK AFFRIZA YUSRIAH BINTI NIK AFRIZAL	
3	14DKA24F1060	DKA5B	PUTERI NOR HIKMA BINTI PONERAN	

21. INVESTIGATION AND ANALYSIS OF ENVIRONMENTAL FACTORS CONTRIBUTING TO STRUCTURAL CRACKING IN RESIDENTIAL BUILDINGS AT KAMPUNG TENGERA PANTAI DUA, MELAKA				PINGAT
ID PROJEK : 7391				
PENY:	SARINAH BINTI ALI			SILVER
1	14DKA24F1101	DKA5A	FARIS SYAKIRIN BIN NORAZLAN	
2	14DKA24F1097	DKA5A	MOHAMMAD AMEEN SAUFI BIN SALIM	

22. IOT-BASED SMART SAFETY VEST WITH GPS AND EMERGENCY ALERT				PINGAT
ID PROJEK : 7362				
PENY:	SYAHIDAH BINTI SALLEH			SILVER
1	14DKA24F1112	DKA5B	MUHAMMAD AMIR AZIM BIN HISHAMUDDIN	
2	14DKA24F1093	DKA5B	MUHAMMAD ZULOFGY BIN KAIROL	
3	14DKA24F1009	DKA5B	NUR ANIS BINTI AMIRAN	

23. JIGSAW JIG FOR ACCURATE ROUND CUTTING				PINGAT
ID PROJEK : 7484				
PENY:	MUBIN BIN MINHAI			SILVER
1	14DKA24F1115	DKA5B	AMIER DANISH BIN KAMAL ARIFFIN	
2	14DKA24F1045	DKA5B	MOHAMAD NAQUIDDIN BIN MD HANEF	
3	14DKA24F1042	DKA5B	MUHAMMAD SYABIL BIN JUNAIDI	

24. MODIFIED CONCRETE USING CRUMB RUBBER TO IMPROVE THE PERFORMANCE OF CONCRETE				PINGAT
ID PROJEK : 7368				
PENY:	NOOR AZAH BINTI ABDUL RAMAN			GOLD
1	14DKA24F1049	DKA5A	AFIFAH SAHILAH BINTI ABDUL MUTHALIB	
2	14DKA24F1079	DKA5A	NORSYAFIQA ALIEYANA HERLMAN	

25. PERFORMANCE OF GLASS-MODIFIED INTERLOCKING BLOCKS				PINGAT
ID PROJEK : 7480				
PENY:	ZAIDAH BINTI ABD UMAR			SILVER
1	14DKA24F1014	DKA5C	AFHAM BIN SAZALI	
2	14DKA24F1083	DKA5C	AHMAD SYAMIL KHULQI BIN TALHAH	
3	14DKA24F1123	DKA5C	IRFAN BIN ROSLY	

26. PORTABLE MANUAL ROOFING METAL SHEET BENDER (POMAROOFBEND)				PINGAT
ID PROJEK : 7370				
PENY:	NOORHASLIZAH BINTI AHMAD ROSLI			SILVER
1	14DKA24F1065	DKA5C	MUHAMMAD AKMAL BIN HUZAIRI	
2	14DKA24F1105	DKA5C	MUHAMMAD MUZARITH SHAH BIN MOHD HISSHAM	
3	14DKA24F1041	DKA5C	MUHAMMAD RIDUWAN BIN AZMAN	

27. POTENTIAL OF BRICK POWDER AND SUPERPLASTICIZER FOR RAPID STRENGTH CONCRETE				PINGAT
ID PROJEK : 7860				
PENY:	JUSMINE HANIS BINTI ABDULLAH			GOLD 2 ND PENYELIDIKAN
1	14DKA24F1027	DKA5B	NAZHAN SYAKIRIN BIN NAZRI	
2	14DKA24F1024	DKA5B	WAN AQILY IMAN BIN WAN YAHAYA	

28. RAINWATER HARVESTING ROAD SYSTEM (RWHR)				PINGAT
ID PROJEK : 7366				
PENY:	DIAN AINOR BINTI MIZAN			GOLD
1	14DKA24F1073	DKA5A	NURUL ATIQA BINTI ANUAR	
2	14DKA24F1022	DKA5A	NURUL HIDAYAH BINTI MOHD ASRI	
3	14DKA24F1061	DKA5A	PUTERI NUREEN QISTINA BINTI ABDULLAH	

29. REMOVABLE DRAIN FILTER				PINGAT
ID PROJEK : 7491				
PENY:	HASSAN BIN ISMAIL			GOLD
1	14DKA24F1905	DKA5C	NUR FARHANA BINTI MAHMUD	
2	14DKA24F1056	DKA5C	NURAINI BINTI HAZMIN	
3	14DKA24F1117	DKA5C	NURUL NAJWA BINTI ABDULLAH	

30. RICE HUSK STORMWATER FILTRATION SYSTEM				PINGAT
ID PROJEK : 7372				
PENY:	SARINAH BINTI ALI			GOLD 2 ND INOVASI
1	14DKA24F1055	DKA5A	AISYHAFIY PUTRA BIN MOHD NAJIB	
2	14DKA24F1122	DKA5A	MUHAMMAD FUAD BIN ZAIHAN	
3	14DKA24F1040	DKA5A	NUR NAJWA BATRISYA BINTI RUHAIZAM	

31. SITE SUPERVISOR APPLICATION				PINGAT
ID PROJEK : 7373				
PENY:	ANUAR BIN NORDIN			SILVER
1	14DKA24F1001	DKA5B	IZDIHAR YASIN BIN SAIFULNIZAM	
2	14DKA24F1900	DKA5B	MUHAMMAD AIMAN BIN IBRAHIM	
3	14DKA24F1901	DKA5B	NUR FARIS FARQUHAR BIN SHARULNIZAM	

32. SMART AUTOMATED STOP-GO SIGNALING SYSTEM FOR WORK ZONES				PINGAT
ID PROJEK : 7354				
PENY:	SUHAILA BINTI SAFIE			SILVER
1	14DKA24F1033	DKA5B	MUHAMMAD DANIAL HASIF BIN MOHAMMAD JAFRI	
2	14DKA24F1054	DKA5B	NURUL NAJWA DARMAWAN BINTI ABDULLAH	
3	14DKA24F1121	DKA5B	SITI NURHIDAYAH SOFIA BINTI AZMI	

33. SMART SOLAR ROAD STUD				PINGAT
ID PROJEK : 7389				
PENY:	ROSILAWATI BINTI AHMAD KHALIL			SILVER
1	14DKA24F1011	DKA5C	ARIISHVENDRAN A/L MURUGAN	
2	14DKA24F1026	DKA5C	MUHAMMAD ARIF AZHAD BIN ABDULLAH	
3	14DKA24F1095	DKA5C	MUHAMMAD HAFIZUDDIN BIN KHARIZAM	

34. SMART WEB CONCRETE TESTING 360°				PINGAT
ID PROJEK : 7352				
PENY:	MOHD HAZMAN BIN ABDUL AZIZ			SILVER
1	14DKA24F1110	DKA5A	LENIN RAJ A/L VICKNESWARAN	
2	14DKA24F1046	DKA5A	MUHAMMAD ALIEF NAJMI BIN NOR APANDI	
3	14DKA24F1088	DKA5A	MUHAMMAD NASIR MUKMIN BIN AYOB	

35. SPIN COMPOST MINI				PINGAT
ID PROJEK : 7356				
PENY:	MOHD NIZAMUDDIN BIN MOHD DAWANG			SILVER
1	14DKA24F1116	DKA5A	AHMAD ZAHIRULHAQ BIN AHMAD FAUZI	
2	14DKA24F1800	DKA5A	MUHAMMAD ADAM DANISH BIN ROSLEE	
3	14DKA24F1037	DKA5A	MUHAMMAD NABIL BIN KHALIL	

36. STUDY OF BRIDGE PIER CRACKING CAUSES AT JAMBATAN SUNGAI RAMBAI				PINGAT
ID PROJEK : 7392				
PENY:	HASSAN BIN ISMAIL			SILVER
1	14DKA24F1077	DKA5C	NUR IZWANI BINTI ZAMRI	
2	14DKA24F1068	DKA5C	SITI RUQAIYAH BINTI MALEK	

37. STUDY OF FIBER AS AN ADDITIONAL MATERIAL IN CONCRETE MIX				PINGAT
ID PROJEK : 7459				
PENY:	SITI ZAWIYAH BINTI HUSAIN			BRONZER
1	14DKA24F1109	DKA5B	MOHAMAD IQRAM SYAHRIN BIN NOR EFFENDI	
2	14DKA24F1006	DKA5B	NUR SYAFIAH ADAWIYAH BINTI ISMAIL	

38. STUDY OF MAPPING AND ANALYZING FLOOD-PRONE HOTSPOTS IN MELAKA TENGAH USING GIS				PINGAT
ID PROJEK : 7371				
PENY:	SITI NOOR ASYIKIN BINTI HJ ALIAS			SILVER
1	14DKA24F1086	DKA5C	DANISH IRFAN BIN HARITH ISKANDAR RAJ	
2	14DKA24F1080	DKA5C	MUHAMMAD HARITH DANIAL BIN RADI HAIRI	

39. STUDY OF MODIFIED BITUMEN USING CRUMB RUBBER				PINGAT
ID PROJEK : 7369				
PENY:	SITI MARLINNA CHU BINTI MOHD RIZAL CHU			GOLD
1	14DKA24F1081	DKA5B	LUQMAN HYRULLAH BIN MINHAD	
2	14DKA24F1103	DKA5B	MUHAMMAD FARIS BIN NAZRI	

40. STUDY ON DRAINAGE PROBLEMS IN INDUSTRIAL AREAS OF AYER KEROH AT JALAN TUN ABDUL RAZAK				PINGAT
ID PROJEK : 7360				
PENY:	NURUL NADIAH BINTI OTHMAN			SILVER
1	14DKA24F1044	DKA5C	AMMIESYA HAKIMI BINTI AHYALUDIN	
2	14DKA24F1035	DKA5C	PUTRI INTAN FARZANA BINTI ABDUL RAHMAN	

41. STUDY ON IMPROVEMENT OF SOFT SOIL PROPERTIES USING COCKLE SHELL AND EGG SHELL WASTE IN SUNGAI RAMBAI				PINGAT
ID PROJEK : 7390				
PENY:	NOR WARIZA BINTI JUFRI @ JAMIOR			SILVER
1	14DKA24F1031	DKA5A	ASYURA HANA BINTI ABDUL SAMAD	
2	14DKA24F1076	DKA5A	NURUL SYAFIEQA NAJWA FAIZUL IKRAM	

42. STUDY ON THE COMBINATION OF COCONUT SHELL ASH AND RICE HUSK ASH IN CONCRETE				PINGAT
ID PROJEK : 7353				
PENY:	SITI MARLINNA CHU BINTI MOHD RIZAL CHU			GOLD
1	14DKA24F1066	DKA5B	MUNIRAH BINTI SHAHRUL NIZAM	
2	14DKA24F1012	DKA5B	SITI FATIMAH BINTI HASNOL	

43. STUDY ON THE DESIGN OF DRAINAGE SYSTEM AT KG. KILANG BERAPI 3 CAUSING FLASH FLOODS				PINGAT
ID PROJEK : 7363				
PENY:	NOORHASLIZAH BINTI AHMAD ROSLI			GOLD
1	14DKA24F1062	DKA5C	NUR ALEEYA IZNI BINTI ABDULLAH	
2	14DKA24F1089	DKA5C	NUR ALYA QISTINA BINTI ZAMRI	

44. TECHNICAL GRAPHIC DESIGN FOR PRECAST CONCRETE SYSTEM COMPONENT INSTALLATION GUIDE				PINGAT
ID PROJEK : 7486				
PENY:	ANAFIAH BIN HAMZAH			BRONZER
1	14DKA24F1018	DKA5B	MUHAMMAD MUKHRIZ HAZIQ BIN MOHD KHAIRUL	
2	14DKA24F1096	DKA5B	MUHAMMAD SHAHRIN DANISH BIN SHAHRIZAL	

45. THE PERFORMANCE OF LECA BALL AS A PARTIAL COARSE AGGREGATE REPLACEMENT A 1:3:6 CONCRETE MIX				PINGAT
ID PROJEK : 7350				
PENY:	SAFHIFUL RABBI BIN MUHAMAD NOOR			SILVER
1	14DKA24F1120	DKA5C	ERIN WARDINA NATASYA BINTI MOHD NIZAM	
2	14DKA24F1074	DKA5C	NUR AINA SURAYA BINTI MAULANA	

46. WATER QUALITY AT BUKIT RAMBAI PADDY FIELD				PINGAT
ID PROJEK : 7351				
PENY:	MAZLINA BINTI ABDUL GHANI			GOLD
1	14DKA24F1004	DKA5A	NOR IRDINA QISTHI AL DIN BINTI ZAINUDDIN	
2	14DKA24F1013	DKA5A	NUR MARISSA SOFEA BINTI SHAFUL ADLIN	

47. WATER QUALITY STUDY AT SUNGAI LEREH, MELAKA				PINGAT
ID PROJEK : 7404				
PENY:	NURAZIYATI BINTI SUKARDI			SILVER
1	14DKA24F1030	DKA5B	MUHAMMAD AMIR AMSYAR BIN ABD HAMID	
2	14DKA24F1039	DKA5B	NURUL SHAMIMIE BINTI AZIZ	

SENARAI PROJEK PELAJAR DIPLOMA GEOMATIK SESI 1 : 2026/2027

1. ANALISIS KAWASAN BERISIKO BANJIR DI DAERAH JASIN				PINGAT
ID PROJEK : 7797				
PENY:	HASAN BIN YUSOF @ TALIP			
1	14DGU24F1039	DGU5A	MUHAMMAD IRFAN BIN MOHD RASUL	SILVER
2	14DGU24F1052	DGU5A	NUR HIDAYAH BINTI JAAFAR	
3	14DGU24F1012	DGU5A	SYAIDATUL NAJIHAH BINTI SANUSI	

2. ANALISIS PEMETAAN LITUPAN POKOK DI POLITEKNIK MERLIMAU MELAKA.				PINGAT
ID PROJEK : 7881				
PENY:	NORLYDAH BINTI OTHMAN LATPI			
1	14DGU24F1038	DGU5B	AMMAR ARSHAD BIN MD HISAM	SILVER
2	14DGU24F1036	DGU5B	MUHAMMAD ADAM ALFIAN BIN MOHD HASHIM	
3	14DGU24F1800	DGU5B	MUHAMMAD EIMAN HASHRY BIN AMIR	

3. ANALISIS PENENTUAN LOKASI STRATEGIK PEMASANGAN PANEL SOLAR DI POLITEKNIK MERLIMAU MENGGUNAKAN GIS				PINGAT
ID PROJEK : 7802				
PENY:	SURIAWATI BINTI JUSOH			
1	14DGU24F1047	DGU5A	MUHAMMAD AFIQ WAQUIDDIN BIN MOHD ZUKI	GOLD 2 ND PENYELIDIKAN
2	14DGU24F1004	DGU5A	MUHAMMAD AMIRUL BIN ISMAIL	

4. ANALISIS PERUBAHAN KEPADATAN BANGUNAN DI BANDAR MELAKA BAGI TAHUN 2010 DAN 2020				PINGAT
ID PROJEK : 7682				
PENY:	HASAN BIN YUSOF @ TALIP			
1	14DGU24F1008	DGU5A	FATIN IRDINA BINTI THAJUDDIN	BRONZER
2	14DGU24F1011	DGU5B	NUR ARISA BATRISYIA BINTI MOHD ASRAF	
3	14DGU24F1014	DGU5A	NURAINA NAZURAH BINTI MOHD ALLAWI	

5. APLIKASI KAMPUS HIJAU MENGGUNAKAN GIS				PINGAT
ID PROJEK : 7691				
PENY:	SILVER			
1	14DGU24F1033	DGU5A	ALYIA NUR AISHYAH BINTI RUSLI	SILVER
2	14DGU23F2002	DGU5A	NURIN NATASHA BINTI AHMAD ROSTAM	
3	14DGU24F1031	DGU5A	NURUL MASTURINA AUJI BINTI ROSDI	

6. E-GEOFIRM: PETA TEMATIK FIRMA LATIHAN INDUSTRI				PINGAT
ID PROJEK : 7678				
PENY:	NOOR ASMIDA BINTI ABU BAKAR			
1	14DGU24F1001	DGU5B	NORIN NAJIHA BINTI NORAFENDI	SILVER
2	14DGU24F1002	DGU5B	NUR ATIKAH IZZATI BINTI AHMAD JAIS	
3	14DGU24F1034	DGU5B	NURIN AINNUR BALQIS BINTI AZMAN	

7. GEOCALC PRO : DEVELOPMENT OF A DIGITAL SURVEY CALCULATION APPLICATION				PINGAT
ID PROJEK : 7694				
PENY:	NOOR ASMIDA BINTI ABU BAKAR			
1	14DGU24F1042	DGU5B	NUR AFIQAH NAJWA BINTI MOHD ANUAR	GOLD
2	14DGU24F1017	DGU5A	NUR DANIA ELLYSHA BINTI ZAMRI	
3	14DGU24F1019	DGU5A	NURULKARTIKA BINTI AB KARIM	

8. INTELLIGENT SURVEY CONTROL POINT NAVIGATION (INTERSURV)				PINGAT
ID PROJEK : 7686				
PENY:	AHMAD YUSOF BIN SAHDAN			GOLD
1	14DGU24F1054	DGU5A	ARUSHA SELVI A/P MURUGAN	
2	14DGU24F1050	DGU5A	NURIN ALEYA BINTI KAMALROZAMAN	
3	14DGU24F1037	DGU5A	PAVITRA A/P ARASAKUMAR	

9. INTERACTIVE LAND SURVEYING COMIC				PINGAT
ID PROJEK : 7882				
PENY:	NOOR FAIZAH BINTI ZOHARDIN			BRONZER
1	14DGU24F1041	DGU5A	AZMIN HAFIZI BIN HANAPI	
2	14DGU24F1051	DGU5B	MUHAMMAD FUAD BIN SUHAIME	
3	14DGU24F1044	DGU5B	MUHAMMAD NORHADIF BIN NOOR HISHAMMUDIN	

10. KAJIAN ALIRAN AIR BAGI KAMPUS POLITEKNIK MERLIMAU MELAKA				PINGAT
ID PROJEK : 7693				
PENY:	AHMAD YUSOF BIN SAHDAN			GOLD 1 ST PENYELIDIKAN
1	14DGU24F1009	DGU5B	AUNI KHAIRINA BINTI ABD SHUKOR	
2	14DGU24F1022	DGU5B	NUR AFIFAH HUSNA BINTI AB RAZAK	
3	14DGU24F1055	DGU5B	NURUL EZZAIRAH FITRIYA BINTI A.SABRI	

11. KAJIAN PEMETAAN KAWASAN BERISIKO TANAH RUNTUH DI NEGERI MELAKA BAGI TAHUN 2020-2025 MENGGUNAKAN QGIS				PINGAT
ID PROJEK : 7688				
PENY:	SURIAWATI BINTI JUSOH			SILVER
1	14DGU24F1057	DGU5B	NUR BATRISYIA BINTI AMRAN	
2	14DGU24F1026	DGU5B	NUR NATASHA BALQIS BINTI ZAIDI	
3	14DGU24F1005	DGU5B	NUR SUHAILA BINTI ZAKARIA	

12. MAGNETIC PICTORIAL KIT FOR REMOTE SENSING				PINGAT
ID PROJEK : 7692				
PENY:	NOORBEHA BINTI JAMALUDDIN			SILVER
1	14DGU24F1028	DGU5B	FAIZ ZAKWAN BIN KHAIRUL	
2	14DGU24F1032	DGU5B	IMANINA BINTI ZAKARIA	
3	14DGU24F1040	DGU5B	MOHAMMAD AIMAN BIN JOHARI	

13. PEMBANGUNAN BUKU-POP BAGI KURSUS DCG20313 FIELD ASTRONOMY				PINGAT
ID PROJEK : 7697				
PENY:	FIRHAN BIN SALIAN			GOLD 3 RD INOVASI
1	14DGU24F1029	DGU5A	DANIAL FITRI BIN YUSRI	
2	14DGU24F1027	DGU5A	MUHAMMAD AQIL BIN MOHD FAIS	
3	14DGU24F1035	DGU5A	MUHAMMAD DANISH ASYRAFF BIN MOHAMAD FADZIL	

14. PEMETAAN KAWASAN CADANGAN TANGKI TADAHAN AIR HUJAN DI SEKITAR POLITEKNIK MERLIMAU MENGGUNAKAN GIS				PINGAT
ID PROJEK : 7681				
PENY:	HASNIZA BINTI HARUN			SILVER 3 RD PENYELIDIKAN
1	14DGU24F1007	DGU5B	MOHAMAD DANIAL BIN KAMIL	
2	14DGU24F1018	DGU5B	MUHAMMAD DANIEL FIRASH BIN MOHD NAZIM	
3	14DGU24F1015	DGU5B	WAN EIRRFANN MYRZA BIN EIZZUWAN	

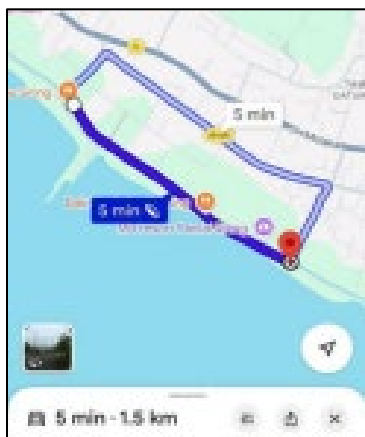
15. PENGHASILAN PELAN LANTAI(STRATEGIC) BAGI FIRE EXTINGUISHER DI JKA,PMM				PINGAT	
ID PROJEK : 7698					
PENY:	ROHAFIZA BINTI MD DARUS			BRONZER	
1	14DGU24F1060	DGU5A	ADIB ATHARI BIN SAHRIEL		
2	14DGU24F1013	DGU5B	MUHAMMAD AQIL FAHMI BIN ISWADI		
3	14DGU24F1023	DGU5A	MUHAMMAD MUIZZUDDIN BIN SAHBUDDIN		
16. PETA DIGITAL BERASASKAN GIS BAGI FASILITI UTAMA JKA					PINGAT
ID PROJEK : 7800					
PENY:	AYATI BINTI PARMEN			GOLD 2 ND INOVASI	
1	14DGU24F1046	DGU5B	AMAR TAUFIQILLAH BIN MOHD ROSDI		
2	14DGU24F1053	DGU5B	MUHAMMAD ARIF AIZAT BIN SHAHRIZAL		
3	14DGU24F1048	DGU5B	MUHAMMAD DANISH ADAM BIN ZULFARHAN		
17. SARUNG KAKI TRIPOD PELBAGAI FUNGSI				PINGAT	
ID PROJEK : 7855					
PENY:	ROHAFIZA BINTI MD DARUS			BRONZER	
1	14DGU24F1056	DGU5A	AZRI ILHAM BIN AZMAN		
2	14DGU24F1021	DGU5A	MUHAMMAD ALIF HAIKAL BIN SUHAINI		
3	14DGU24F1043	DGU5A	MUHAMMAD RIFQI RUSYAIID BIN NOR HAFIZAN		
18. SURVEY TOOL HARNESS				PINGAT	
ID PROJEK : 7720					
PENY:	HASNIZA BINTI HARUN			GOLD 1 ST INOVASI	
1	14DGU24F1030	DGU5B	ADHA SYAFI BIN MOHD ISMAIL		
2	14DGU24F1024	DGU5B	MUHAMMAD HAFIZ AIMAN BIN AHMAD SABRI		
3	14DGU24F1003	DGU5B	MUHAMMAD HAIRIE BIN JASMIN		

A PRELIMINARY STUDY OF PAVEMENT CRACKING IN COASTAL ROAD CONDITION

Nur Afizza Aida Binti Abdul Jalil¹, Nur Aida Qistina Binti Hassan Nordin², Pn Rosilawati Binti Ahmad Khalil³,

Kerosakan turapan jalan merupakan salah satu masalah yang sering berlaku dan boleh menjejaskan keselamatan, keselesaan serta kelancaran pengguna jalan raya. Keadaan ini boleh menjadi lebih ketara bagi jalan yang terletak di kawasan pesisir pantai kerana turapan terdedah kepada persekitaran yang mempunyai kelembapan tinggi, air secara berterusan, garam dan air laut. Sehubungan itu, kajian A Preliminary Study of Pavement Cracking in Coastal Road Condition dijalankan bagi mengenal pasti jenis keretakan jalan dan menentukan tahap keterukan keretakan yang terdapat di kawasan Pantai Siring, Melaka. Kajian ini juga dijalankan untuk mengenal pasti faktor-faktor yang berkemungkinan menyumbang kepada kerosakan turapan di kawasan tersebut. Kaedah pemerhatian tapak digunakan bagi mengenal pasti dan merekod keadaan kerosakan turapan melalui pengambilan gambar serta pemerhatian secara langsung di beberapa lokasi yang dipilih. Kerosakan yang dikenal pasti akan dikategorikan mengikut jenis dan tahap keterukannya, termasuk keretakan serta lubang pada permukaan jalan. Selain itu, sesi soal jawab bersama jurutera atau pegawai yang berkaitan dengan jalanraya dijalankan bagi mendapatkan pandangan profesional mengenai punca kerosakan yang berlaku. Ujian California Bearing Ratio (CBR) turut dijalankan terhadap sampel tanah dari kawasan kajian bagi menentukan kekuatan subgrad jalan. Maklumat berkaitan aduan penduduk, rekod penyelenggaraan dan kekerapan kerja pembaikan jalan juga akan dikumpulkan daripada pihak yang berkaitan. Hasil kajian dijangka dapat mengenal pasti jenis kerosakan turapan yang paling kerap berlaku serta tahap keterukan kerosakan di kawasan Pantai Siring. Kajian ini juga dapat memberikan gambaran awal mengenai faktor yang mungkin mempengaruhi kerosakan turapan seperti beban trafik, keadaan kelembapan, pendedahan kepada air laut dan kekuatan subgrad. Secara keseluruhannya, kajian ini diharapkan dapat memberikan maklumat awal yang berguna kepada pihak berkaitan dalam memahami keadaan turapan jalan di kawasan pesisir pantai serta membantu dalam perancangan penyelenggaraan jalan yang lebih sesuai pada masa akan datang.

Kata kunci: pavement cracking, coastal road, pavement damage, Pantai Siring, CBR test, road deterioration



Rajah 1: Jarak Kajian



Rajah 2: Kerosakan di Pantai Siring

A STUDY ON THE COMBINATION OF COCONUT SHELL ASH AND RICE HUSK ASH IN CONCRETE

Munirah Binti Shahrul Nizam¹, Siti Fatimah Binti Hasnol², Puan Siti Marlina Chu Binti Mohd Rizal Chu³

Concrete is increasingly used in the construction industry, leading to a rising demand for cement as the primary binding agent. However, traditional cement production methods result in significant carbon dioxide emissions and heavy consumption of natural resources such as limestone and clay. Conversely, agricultural wastes like coconut shells and rice husks are often discarded without being fully utilized. In this context, using Coconut Shell Ash (CSA) and Rice Husk Ash (RHA) as partial replacements for cement offers a more sustainable option for concrete production. Previous studies have shown that both materials possess pozzolanic properties and silica content capable of influencing concrete performance. Therefore, this study was conducted to determine the optimal percentage for combining CSA and RHA as partial cement replacements and to evaluate the compressive strength of concrete at various replacement levels. The study employed laboratory experimental techniques using a 1:1 blend of CSA and RHA at replacement rates of 5%, 10%, and 15% by weight of cement. Concrete cube specimens measuring 150 mm × 150 mm × 150 mm were cast using a 1:2:4 mix ratio (cement:sand:coarse aggregate). The specimens were then allowed to cure for 7, 14, and 28 days before compressive strength testing was performed. The results indicated that at 7 days of age, the 15% replacement mix exhibited the highest compressive strength at 11.56 N/mm², followed by the 5% mix at 10.67 N/mm² and the 10% mix at 10.22 N/mm². At 14 days, the 10% mixture exhibited the highest compressive strength at 14.04 N/mm², while the 5% and 15% mixtures showed compressive strengths of 10.22 N/mm² and 8.89 N/mm², respectively. At 28 days, the 5% mixture demonstrated the best compressive strength at 14.40 N/mm², followed by the 10% mixture at 13.87 N/mm² and the 15% mixture at 10.22 N/mm². Based on the 28-day compressive strength results, the 5% replacement rate demonstrated the most suitable performance compared to the other replacement rates. Overall, the study indicates that Coconut Shell Ash (CSA) blended with Rice Husk Ash (RHA) has the potential to serve as a partial cement replacement in concrete. Among the mixtures tested, the 5% replacement level yielded the best compressive strength after 28 days. However, the compressive strength achieved at that stage remained below the 20 N/mm² reference value for Grade 20 (1:2:4) concrete. Therefore, further research is recommended regarding replacement rates, the CSA-to-RHA ratio, and mix design to enhance concrete strength and promote the use of agricultural waste in sustainable construction.

Kata kunci: Coconut Shell Ash (CSA), Rice Husk Ash (RHA), Partial Cement Replacement, Compressive Strength, Sustainable Concrete



Rajah 1: Rice husk ash and coconut shell ash



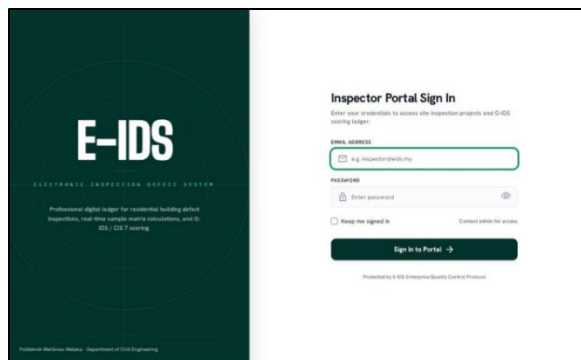
Rajah 2: Compressive strength test

E-INSPECTION & DEFECT SYSTEM (E-IDS)

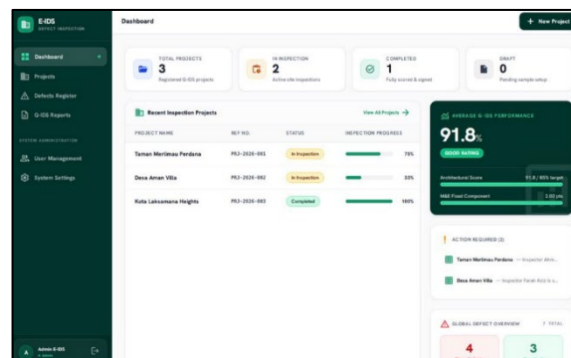
Faraniesya Alieya Binti Noor Amin¹, Nurul Umira Binti Zulkifli², Nur Batrisyia Izzati Binti Mohd Nizam³, Puan Ayu Wirdawati Binti Po'A⁴

E-IDS merupakan sebuah web app yang dibangunkan untuk memudahkan proses pemeriksaan, perekodan dan pengurusan kecacatan bangunan. Proses pemeriksaan kecacatan sebelum ini kebiasaannya dilakukan menggunakan borang secara manual, di mana pengguna perlu mencatat maklumat kecacatan satu per satu. Kaedah ini boleh mengambil masa yang lama, terutamanya apabila terdapat banyak kecacatan yang perlu diperiksa dan direkodkan. Melalui E-IDS, pengguna boleh merekodkan maklumat kecacatan secara terus melalui sistem seperti jenis kecacatan, lokasi, penerangan dan gambar kecacatan sebagai bukti pemeriksaan. Pengguna juga tidak perlu menyimpan gambar dan maklumat secara berasingan kerana semuanya boleh direkodkan dalam satu sistem. Selain itu, sistem ini boleh membantu pengguna melakukan pengiraan secara automatik berdasarkan maklumat yang dimasukkan, sekali gus mengurangkan kesilapan dalam pengiraan secara manual. Penggunaan E-IDS dapat menjadikan proses pemeriksaan lebih cepat, mudah dan sistematik. Semua data kecacatan yang direkodkan boleh disimpan secara digital dan memudahkan pengguna untuk membuat semakan serta mendapatkan semula maklumat apabila diperlukan. Sistem ini juga dapat mengurangkan penggunaan borang dan kertas serta mengelakkan risiko rekod kecacatan hilang atau tersalah simpan. Secara keseluruhannya, E-IDS dibangunkan sebagai satu kaedah digital yang dapat menjimatkan masa, memudahkan kerja pengguna dan meningkatkan kecekapan dalam pengurusan kecacatan bangunan berbanding kaedah pemeriksaan secara manual.

Kata kunci: Electronic Inspection & Defect System, E-IDS, Building Defect, Defect Inspection, Web App, Digital Inspection.



Rajah 1: E-IDS Interface



Rajah 2: Web App

A STUDY ON THE QUALITY OF CLEAN WATER IN THE CAMPUS AREA OF POLITEKNIK MERLIMAU, MELAKA

Filzaton Ain Nazwa Binti Zaini¹, Siti Nor Syafiqah Syahira Binti Jamir², Ts. Dr. Hajah Norhayati Binti Abd Wahab @
Dul Ahad³

Clean water is an essential resource for daily activities and routine uses. Therefore, monitoring water quality is important to identify changes in water characteristics and ensure that the water remains suitable for its intended use. At Politeknik Merlimau, Melaka, clean water is widely used by students and staff for various daily activities. However, the current water quality characteristics within the campus have not been systematically assessed using selected physical and chemical parameters. Therefore, this study is conducted to analyze the variation of selected water quality parameters among sampling locations and to assess the overall water quality condition within the campus area. A total of eight sampling locations were selected to represent different water usage areas within the campus. One water sample was collected from each selected location and tested using appropriate laboratory testing methods. The selected water quality parameters include Total Suspended Solids (TSS), Total Dissolved Solids (TDS), pH, chlorine, Chemical Oxygen Demand (COD), Biochemical Oxygen Demand (BOD), and turbidity. The collected samples are subjected to physical and chemical parameter testing, followed by data analysis and comparison between the selected sampling locations. The results obtained are used to identify variations in water quality characteristics and evaluate the overall water quality condition based on the measured parameters. This study is expected to provide a systematic overview of the current water quality conditions within the campus area of Politeknik Merlimau, Melaka. The findings may also assist in identifying differences in water quality between sampling locations and provide useful information for future water quality monitoring and management. Overall, this study aims to contribute towards better understanding and assessment of clean water quality within the campus based on the selected physical and chemical parameters.

Kata kunci: Clean Water Quality, TSS, TDS, pH, Chlorine, COD, BOD, Turbidity



Rajah 1: pH Measurement Test Using



Rajah 2: Chemical Oxygen Demand (COD) Test
a Digital pH Meter Using a COD Reactor

A STUDY ON FACTORS AFFECTING SAFETY AWARENESS AMONG CONSTRUCTION WORKERS

Nurul Husnina Binti Mohd Fadil¹, Hani Dania Sorfina Binti Halel², Pn. Nuraziyati Binti Sukardi³

The construction industry is known as one of the most hazards industries because workers are exposed to different risks and hazards at construction sites. Construction workers may face dangerous situations that can lead to accidents and injuries. In Malaysia, the number of workplace accidents increased from 34,216 cases in 2022 to 38,950 cases in 2023. In 2023, the construction sector also recorded 203 injury cases and 68 fatalities. Although safety rules and procedures have been implemented, accidents still occur at construction sites. Therefore, safety awareness among construction workers is important to reduce workplace risks, encourage safe working practices, and prevent accidents. This study aims to identify the factors affecting safety awareness among construction workers and to recognize the safety practices adopted by workers at construction sites. This study focuses on construction workers at selected construction sites in Merlimau, Melaka. The scope of this study focuses on three main areas, which are safety awareness, safety practices, and the use of Personal Protective Equipment (PPE). The study is carried out to understand the level of safety awareness among workers and the factors that may affect their attitudes and practices towards safety at the workplace. A quantitative research approach is used in this study to collect data from construction workers at the selected construction sites. A questionnaire is used as the main instrument for collecting data. The questionnaire is prepared based on the objectives and scope of the study. An interview is also used to obtain additional information related to safety practices at the construction site. The research process involves several stages, including research design, literature review, instrument development, questionnaire distribution, data collection, and data analysis. The collected data are analyzed to identify the factors affecting safety awareness and the safety practices followed by construction workers. This study is expected to provide a better understanding of the factors that affect safety awareness among construction workers and the importance of following proper safety practices at construction sites. The findings are also expected to show the importance of using suitable PPE and following safety procedures to reduce the risk of accidents and injuries. Besides that, the study may provide useful information to improve safety management at construction sites through regular safety training, safety briefings, proper site supervision, safety reminders, safety campaigns, and toolbox meetings. These efforts can help workers become more aware of workplace hazards and encourage them to practice safer working methods.

Kata kunci: Safety Awareness, Construction Workers, Safety Practices, Personal Protective Equipment (PPE), Construction Site



Rajah 1: Pembinaan Rumah Mesra Rakvat (SPNB)



Rajah 2: Pembinaan Rumah Secara Tunai (CASH)

STUDY ON DRAINAGE PROBLEM IN INDUSTRIAL AREA OF AYER KEROH AT JALAN TUN ABDUL RAZAK

Ammiesya Hakimi Binti Ahyaludin¹, Putri Intan Farzana Binti Abdul Rahman², Pn. Nurul Nadiah Binti Othman³

Kajian ini dijalankan untuk mengkaji masalah saliran di kawasan perindustrian Ayer Keroh, khususnya di sepanjang Jalan Tun Abdul Razak, Melaka. Masalah saliran di kawasan ini boleh menyebabkan air bertakung dan meningkatkan risiko banjir kilat semasa hujan lebat. Keadaan ini boleh mengganggu pergerakan pengguna jalan raya serta aktiviti di kawasan sekitar. Objektif kajian ini adalah untuk mengenal pasti faktor utama yang menyebabkan masalah saliran, termasuk saliran yang tersumbat dan ketidakcekapan sistem saliran, serta mengkaji keadaan semasa sistem saliran di kawasan kajian. Kajian ini juga bertujuan untuk mencadangkan pemantauan berkala bagi mengurangkan kesan banjir terhadap Jalan Tun Abdul Razak pada masa akan datang. Kaedah kajian yang digunakan ialah pendekatan kualitatif deskriptif melalui pemerhatian di tapak dan temu bual dengan pihak yang mempunyai pengetahuan serta pengalaman berkaitan masalah saliran di kawasan tersebut. Pemerhatian memberi tumpuan kepada keadaan fizikal saliran, kewujudan sisa pepejal, mendapan dan tanda-tanda pengumpulan air. Hasil kajian menunjukkan bahawa penyumbatan akibat sisa pepejal dan mendapan serta penyelenggaraan saliran yang kurang baik merupakan antara faktor yang menyumbang kepada masalah saliran. Oleh itu, pemantauan berkala seperti pembersihan dan penyelenggaraan saliran secara berkala serta pengurusan sisa yang proaktif dicadangkan bagi mengurangkan risiko dan kesan banjir terhadap jalan tersebut.

Kata kunci: masalah saliran, kawasan perindustrian, langkah proaktif, pemantauan berkala, risiko banjir.

HYDRO-RAINWATER YIELD FOR LIGHTING & TURBINE ELECTRIFICATION (HYDRO-LITE)

Dhanesh A/L Gopalkrishnan¹, Mohamad Saiful Asyraf Bin Sharulizal², Amerul Haziq Bin Hamidan³, Siti Zawiyah Binti Husain⁴

Peningkatan permintaan terhadap tenaga boleh diperbaharui telah mendorong pembangunan kaedah alternatif untuk menghasilkan tenaga elektrik menggunakan sumber semula jadi. Air hujan merupakan sumber yang mudah didapati, terutamanya di kawasan yang menerima hujan yang kerap, namun sebahagian besar air hujan dialirkan sebagai air larian tanpa dimanfaatkan untuk penjaan tenaga. Oleh itu, projek Hydro-Rainwater Yield for Lighting & Turbine Electrification dibangunkan untuk mengkaji potensi penukaran aliran air hujan kepada tenaga elektrik menggunakan sistem turbin berskala kecil. Projek ini melibatkan reka bentuk dan pembangunan prototaip yang terdiri daripada sistem pengumpulan air hujan, tangki simpanan air, sistem paip, turbin mikro, penjana elektrik, bateri dan lampu LED. Air hujan yang dikumpulkan akan disalurkan melalui sistem untuk memutar turbin. Tenaga kinetik air kemudiannya ditukarkan kepada tenaga mekanikal dan seterusnya kepada tenaga elektrik melalui penjana untuk kegunaan pencahayaan berkuasa rendah. Prestasi sistem dinilai melalui pengukuran beberapa parameter seperti kadar aliran air, voltan, arus dan kuasa yang dihasilkan. Sepanjang pembangunan projek, beberapa kekangan telah dikenal pasti seperti kerosakan turbin serta pembelian peralatan yang mempunyai spesifikasi voltan dan watt yang tidak sesuai. Masalah tersebut memerlukan penggantian komponen dan penambahbaikan bagi memastikan keserasian serta prestasi sistem yang lebih baik. Secara keseluruhannya, projek ini dijangka dapat menunjukkan potensi penggunaan air hujan sebagai sumber tenaga boleh diperbaharui untuk penjaan elektrik berskala kecil. Projek ini juga dapat menggalakkan penggunaan tenaga lestari, mengurangkan pembaziran sumber semula jadi dan menjadi asas kepada pembangunan sistem penuaian tenaga berasaskan air hujan pada masa hadapan.

Kata kunci: Air Hujan, Tenaga Boleh Diperbaharui, Turbin Mikro, Kuasa Hidro, Penjaan Elektrik, Lampu LED, Tenaga Lestari.



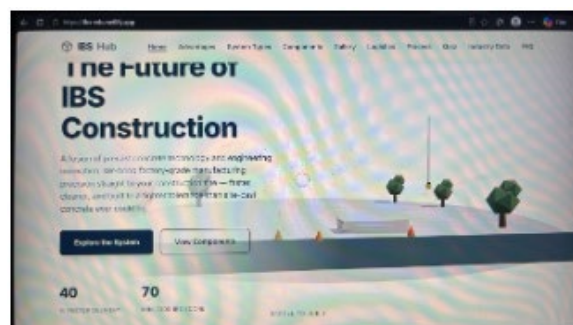
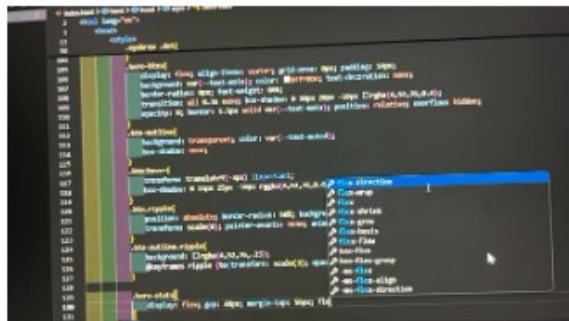
Rajah 1: Pelan HYDRO-LITE

TECHNICAL GRAPHIC DESIGN FOR PRECAST CONCRETE SYSTEM COMPONENT INSTALLATION GUIDE

Muhammad Mukhriz Haziq Bin Mohd Khairul¹, Muhammad Shahrin Danish Bin Shahrizal², Anafiah Bin Amzah³

The development of precast concrete technology has provided an efficient construction method by reducing construction time and improving the quality of building components. However, the installation of precast concrete system components requires proper procedures, accurate information and clear guidance to ensure that the installation process is carried out correctly and safely. Conventional installation guides that mainly depend on written instructions and static images may be difficult for users to understand, especially students and individuals with limited practical experience. Therefore, this project focuses on developing a technical graphic design for a precast concrete system component installation guide. The project integrates technical graphics, visual illustrations and step-by-step installation procedures to provide clearer information about the installation process. An application-based guide is also developed to provide users with easier access to the installation information in a more interactive and systematic way. The project is expected to improve users' understanding of precast concrete component installation, reduce confusion during the installation process and provide a more effective alternative to conventional installation guides. Overall, this project supports the use of digital technology and technical visualisation in improving the presentation and understanding of precast concrete installation procedures

Kata kunci: Technical Graphic Design, Precast Concrete, Installation Guide, IBS, Technical Illustration,



Rajah 1: Technical Graphic Design

WATER QUALITY AT BUKIT RAMBAI PADDY FIELD

Nor Irdina Qisthi Al Din Binti Zainuddin¹, Nur Marissa Sofea Binti Shaiful Adlin², Mazlina Binti Abd Ghani³

Water quality is an important factor in paddy cultivation as poor-quality irrigation water may affect soil conditions, crop growth, and rice production. Therefore, this study was conducted to evaluate the water quality of the paddy field at Bukit Rambai by analysing selected physical and chemical water quality parameters. The physical parameters investigated included colour, odour, temperature, and turbidity, while the chemical parameters consisted of pH, dissolved oxygen (DO), chemical oxygen demand (COD), biochemical oxygen demand (BOD), and heavy metal concentration. The collected water samples were analysed to determine the existing water quality condition and its suitability for paddy cultivation. Based on the initial water quality results, mudball treatment was introduced as a simple and environmentally friendly method to improve the condition of the water. The treatment was carried out on the selected water sample, followed by a second water quality analysis after the treatment process. The results obtained before and after the mudball treatment were then compared based on the selected water quality parameters to determine the effectiveness of the treatment in improving water quality. At the end of this study, the overall water quality status of the paddy field water can be determined together with the changes in water quality before and after the mudball treatment. The findings are expected to provide useful information on the potential application of mudball as a simple treatment method for improving irrigation water quality and may contribute to better water management, environmental conservation, and sustainable paddy cultivation at Bukit Rambai.

Kata kunci: Water Quality, Paddy Field, Bukit Rambai, Mudball Treatment and Irrigation Water.



Rajah 1: Paddy Field Water Sampling



Rajah 2: Mudball Treatment Process for Paddy Field Water

SMART AUTOMATED SIGNAGE STOP-GO FOR WORK ZONES

Nurul Najwa Darmawan Binti Abdullah¹, Muhammad Danial Hasif Bin Mohammad Jafri², Siti Nurhidayah Sofia Bin Azmi³, Pn.Suhaila Binti Safie⁴

Work zones are common on roads in Malaysia due to ongoing construction, maintenance and upgrading activities. These areas require effective traffic control to ensure the safety of both road users and workers. Conventional Stop/Go signs are usually operated manually by traffic controllers, which may expose them to potential hazards, particularly in areas with high traffic flow. Therefore, this project aims to develop a Smart Automated Stop-Go Signaling System for Work Zones as an alternative method for traffic control at road work areas in Malaysia. The system is designed to automatically control the Stop/Go sign using a motor and control system, reducing the need for continuous manual operation. The prototype consists of a solar panel, rechargeable battery, solar charge controller, motor, controller, relay module, warning strobe light and protective enclosure. The system will be tested to evaluate its functionality, visibility and effectiveness in providing clear Stop/Go signals to road users. The effectiveness of the proposed system will be assessed based on the visibility and response distance of drivers compared with conventional traffic control methods. The proposed system is expected to improve traffic control efficiency, enhance the visibility of Stop/Go signals and reduce the exposure of traffic controllers to hazards within road work zones. Overall, this project provides a practical and sustainable approach to improving work zone safety in Malaysia.

Kata kunci: Work zone safety, Stop/Go sign, automated signaling system, traffic control, solar energy, Malaysia.



Rajah 1: Penyediaan Produk



Rajah 2: Hasil Produk

PORTABLE MANUAL ROOFING SHEET BENDER

Muhammad Riduwan Bin Azman¹, Muhammad Akmal Bin Huzairi², Muhammad Muzarith Shah Bin Mohd Hissyam³,
Pn. Noorhaslizah Binti Ahmad Rosli⁴

Penggunaan kepingan zink (zinc sheet) dan logam nipis merupakan komponen utama dalam kerja-kerja pembinaan, terutamanya bagi fabrikasi sistem pengaliran air hujan (gutter), flashing bumbung, serta kemas struktur keluli. Walau bagaimanapun, proses pembengkokan kepingan zink di tapak bina sering menghadapi kesukaran akibat kebergantungan kepada mesin pembengkok mudah alih berkuasa elektrik yang mahal atau penggunaan kaedah manual secara konvensional seperti menggunakan tukul dan kayu penekan. Kaedah manual konvensional ini bukan sahaja memakan masa yang panjang dan memerlukan tenaga fizikal yang tinggi, malah berisiko tinggi menghasilkan lengkungan yang tidak seragam, kecacatan permukaan bahan, serta ketidaktepatan sudut pembengkokan. Sehubungan itu, projek Portable Manual Zinc Sheet Bender dicadangkan sebagai satu inovasi alat pembengkok manual mudah alih yang direka khas untuk meningkatkan ketepatan, kecekapan, dan kemudahan dalam kerja-kerja membengkok kepingan zink di tapak bina. Projek ini mengintegrasikan mekanisme tuasan (lever mechanism) dan bar pengapit berketepatan tinggi yang membolehkan kepingan zink dibengkokkan secara manual dengan daya fizikal yang minima. Reka bentuknya yang padat, ringan, dan ergonomik membolehkan alat ini dibawa dan digunakan dengan mudah di kawasan kerja yang sempit mahupun di tapak pembinaan luar (onsite). Alat ini berkeupayaan membengkokkan kepingan zink pelbagai ketebalan piawai pada julat sudut yang tepat sehingga 90 darjah secara konsisten tanpa merosakkan kemas permukaan bahan. Selain itu, alat ini direka bentuk tanpa kebergantungan kepada sumber bekalan elektrik, sekali gus menjadikannya mesra pengguna, mesra alam, dan sangat praktikal untuk kegunaan di tapak bina yang belum mempunyai fasiliti elektrik asas. Pembangunan Portable Manual Roofing Sheet Bender dijangka dapat meningkatkan produktiviti kerja-kerja fabrikasi logam nipis di samping mengurangkan kos operasi dan kos penyelenggaraan mesin. Alat inovasi ini bukan sahaja mengurangkan masa pembengkokan secara signifikan, malah dapat meminimumkan risiko kesilapan manusia (human error) serta pembaziran bahan akibat kerosakan kepingan zink. Secara keseluruhannya, inovasi ini berpotensi besar untuk memberikan sumbangan berharga dalam industri kejuruteraan awam dan fabrikasi struktur, terutamanya dalam memperkasakan kaedah kerja di tapak pembinaan melalui penyelesaian alat manual yang lebih moden, sistematik, dan berkesan.

Kata kunci: Portable Sheet Bender, Zinc Sheet, Pembengkok Manual, Kejuruteraan Awam, Inovasi Tapak Bina, Fabrikasi Logam Nipis, Alat Mudah Alih.



Rajah 1: Rupa Produk "Portable Manual Roofing Sheet Bender"

STUDY OF COCONUT FIBER AS AN ADDITIONAL MATERIAL IN CONCRETE MIX

Nur Syafiqah Adawiyah Binti Ismail¹, Muhamad Iqram Syahrin Bin Nor Effendi², Puan Siti Zawiyah Binti Husian³

The development of sustainable construction practices has encouraged the use of alternative and natural materials to reduce waste and promote environmentally friendly construction. One of the materials that has the potential to be used in concrete is coconut fiber, a natural fiber obtained from coconut waste. The use of coconut fiber in concrete can help utilise agricultural waste while providing an alternative material for construction applications. In this study, coconut fiber is added to the concrete mix at different percentages of 0%, 2.5%, 3.0% and 3.5%. The concrete mix is prepared using a conventional 1:2:4 mix ratio, consisting of cement, sand and coarse aggregate. Several tests are conducted to evaluate the properties of the concrete mix containing coconut fiber. The slump test is carried out to determine the workability of the concrete, while the compressive strength test is conducted to evaluate the compressive strength of the concrete after the curing process. The addition of coconut fiber may affect the properties of concrete, particularly its workability and compressive strength. The results obtained from the different percentages of coconut fiber will be compared with the control concrete containing 0% coconut fiber to determine the effect of the additional material on concrete performance. The study also aims to evaluate the potential of coconut fiber in reducing agricultural waste and promoting the reuse of natural materials in construction.

Kata kunci: Coconut Fiber, Concrete Mix, Slump Test, Compressive Strength, Sustainable Construction, Natural Fiber



Rajah 1: Compression test



Rajah 2: Coconut fiber

DEVELOPMENT OF A SMART FLOOD MONITORING AND EARLY WARNING SYSTEM

Muhammad Khairi Isyraf Bin Ahmad Kamal¹, Mohamad Amirul Yazid Bin Buang², Muhammad Aiman Bin Azli³,
Norhayati Binti Abd Wahab @ Dul Ahad⁴

The increasing occurrence of floods caused by heavy rainfall and changes in environmental conditions can lead to property damage and threaten the safety of residents. The process of manually monitoring water levels is not only time-consuming but may also result in delays in receiving information regarding rising water levels. Therefore, the project Development of a Smart Flood Monitoring and Early Warning System is proposed as a smart monitoring system that can help monitor flood conditions more quickly, accurately, and systematically. The system integrates water level sensors, a rain sensor, a microcontroller, a power supply, and Internet of Things (IoT) technology to collect and transmit real-time information regarding environmental conditions. The data obtained from the sensors can be monitored through a digital system and used to provide early warnings to users when the water level reaches a predetermined threshold. The system is also designed with a housing that protects the electronic components from environmental factors such as rain, water splashes, dust, and humidity. The development of this system is expected to improve the efficiency of flood monitoring and reduce dependence on manual monitoring methods. In addition, the early warning system can help users receive information more quickly and take appropriate action before flood conditions become more severe. Overall, this innovation has the potential to contribute to the application of smart technology and IoT in improving the effectiveness of flood monitoring and risk management.

Kata kunci: Flood Monitoring, Early Warning System, Water Level Sensor, Rainfall Sensor, IoT, Smart Monitoring, Flood Detection.



Rajah 1: Proses Pembuatan Produk



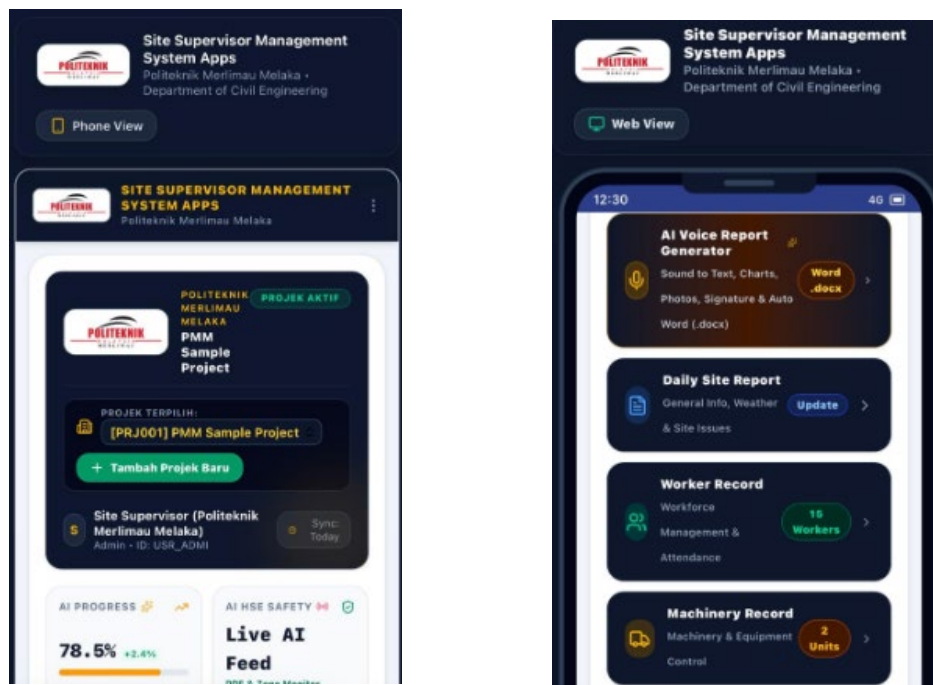
Rajah 2: Housing Product

SITE SUPERVISOR APPLICATION

Nur Faris Farquhar Bin Sharulnizam¹, Muhammad Aiman Bin Ibrahim², Izdihar Yasin Bin Saifulnizam³, Encik Anuar Bin Nordin⁴

The construction industry involves various activities that require effective monitoring, recording, and management to ensure that site operations are carried out smoothly and efficiently. Traditionally, site supervisors rely on manual methods to record daily activities, work progress, incidents, and site conditions. These methods can be time-consuming and may result in data entry errors, loss of information, and difficulties in retrieving previous records. Therefore, this project developed a Site Supervisor Application to assist site supervisors in managing daily construction site activities in a more systematic and efficient manner. The application provides a centralized digital platform that allows site supervisors to record and manage daily site information, including work activities, incidents, progress, and reports. The use of digital technology helps reduce reliance on manual documentation, improve data accessibility, and simplify the process of monitoring and reporting. The system also enables information to be organized and updated more efficiently, allowing users to retrieve recorded data whenever required. The development of this application supports the direction of CIDB's Digital Construction Policy by promoting the adoption of digital technology and digitalization within construction management. Through the implementation of a digital platform for site supervision, the project aims to improve work efficiency, enhance data management, and support better monitoring of construction activities. Overall, the Site Supervisor Application is expected to contribute to a more efficient, systematic, and digitally driven approach to construction site management.

Kata kunci: Site Supervisor Application, Construction Site Management, Digital Construction, Data Management, Digitalization



Rajah 1: Interface Site Supervisor Application

HYDRO-RAINWATER YIELD FOR OFF-GRID LIGHT-DUTY INTERACTIVE TERMINAL ELECTRIFICATION (HYDRO-LITE)

Mohamad Saiful Asyraaf Bin Sharulizal¹, Amerul Haziq Bin Hamidan², Dhanesh A/L Gopalkrishnan³, Puan Siti Zawiyah Binti Husain⁴

Rainwater that falls every day is often left to drain away without being put to any real use. This project takes that wasted resource and turns it into something practical. The idea behind HYDRO-LITE is simple — collect rainwater, use it to spin a micro-hydro turbine, store the electricity produced in a rechargeable battery, and make that energy available through a USB port for everyday device charging. The system works by channeling collected rainwater through a PVC pipe and into a micro-hydro turbine. As the water flows and spins the turbine, electrical energy is generated and stored in a rechargeable battery. That stored energy is then made accessible through a USB output port, allowing users to charge small electronic devices such as mobile phones and other low-power gadgets without needing any connection to the main electricity grid. Key components of the system include a micro-hydro generator, PVC piping of varying diameters, a rechargeable battery and a USB charging port. Several aspects were tested and evaluated, including how pipe diameter affects water pressure and voltage output, how fast the battery charges under different flow rates, and how consistently the USB port delivers stable charging power. The development of HYDRO-LITE is expected to improve energy accessibility and reduce dependence on conventional electricity, particularly in rural and off-grid communities. This system not only makes use of a freely available natural resource that is otherwise wasted, but also provides a simple and affordable solution for everyday device charging needs.

Kata kunci: Micro-Hydro Turbine, Renewable Energy, USB Charging, Off-Grid Power, Energy Storage



Rajah 1: HYDRO-LITE & Power System



Rajah 2: Interior of Weatherproof Box

ERGONOMIC BRICK LIFTER

Aliff Kasha Bin Mohd Nasir¹, Nuradlina Amani Binti Norisman², Addina Aliyah Binti Mohd Khairul³, Puan Hazilah Binti Mohamad⁴

Brick handling is one of the common activities carried out in construction work, particularly during the process of lifting and transporting bricks at construction sites. This activity requires repetitive physical effort and may cause discomfort as well as increase the physical workload on users. Therefore, the Ergonomic Brick Lifter project is proposed as an assistive tool designed to facilitate the lifting and transportation of bricks in a more comfortable, stable and systematic manner. The objectives of this project are to design and fabricate an ergonomic brick lifting tool and to evaluate the convenience and comfort of users when handling bricks. The product development process involved design, material selection, fabrication, improvement and product testing. The Ergonomic Brick Lifter was constructed using mild steel and equipped with an adjustable upright post, anti-slip plate and L-hook extension. The tool has an estimated capacity of 4 to 6 bricks per cycle. Product testing was conducted to evaluate the suitability of the design, ease of use, comfort, stability, efficiency and the ability of the tool to assist in brick handling activities. Data were collected through a questionnaire using a Likert scale ranging from 1 to 5. The analysis results showed that the overall mean score for the 12 evaluation items was 4.86 out of 5, indicating a very high level of user acceptance towards the product. The aspects that achieved the highest mean scores were design suitability and load capacity suitability, with a mean score of 4.90 each. Meanwhile, ease of use and reduction of repetitive movements also recorded high mean scores of 4.88. The comfort aspect recorded a mean score of 4.79, which was the lowest value compared to the other items but remained at a high level. In addition, the majority of respondents gave positive ratings regarding grip stability, load capacity and tool efficiency. In conclusion, the data analysis indicates that the Ergonomic Brick Lifter was well accepted and has the potential to serve as a practical assistive tool for facilitating brick handling activities while improving user comfort and efficiency at construction sites.

Kata kunci: Ergonomic Brick Lifter, Brick Handling, Ergonomic Design, Construction Site, Manual Material Handling.



Rajah 1: Detailed Design



Rajah 2: Demonstration of Ergonomic Brick Lifter Usage

PERFORMANCE OF GLASS-MODIFIED INTERLOCKING BLOCKS

Afham Bin Sazali¹, Ahmad Syamil Khulqi Bin Talhah², Irfan Bin Rosly³, Puan Zaidah Binti Abd Umar⁴

The use of interlocking blocks is increasingly widespread in the construction industry due to their ease of installation, cost-effectiveness, and minimal mortar requirement. These blocks are typically produced from a mixture of cement, sand, and water. However, the high demand for natural sand has led to excessive sand mining, riverbank erosion, and environmental degradation. In addition, conventional interlocking blocks are prone to water absorption, which can weaken their mechanical strength, especially during rain or flood events. At the same time, the accumulation of mismanaged waste glass in landfills has become a source of environmental pollution. Therefore, this project proposes the production of interlocking blocks modified with glass powder as a partial replacement for sand. The main objectives of this study are to develop an interlocking block pedestrian walkway and to evaluate the performance of the blocks in terms of compressive strength and water absorption. Four mixtures will be prepared with different percentages of glass powder, namely 0%, 10%, 20%, and 30% as sand replacement. The methodology involves glass crushing, cleaning and sieving, mould preparation, sample casting, curing, and laboratory testing. The results are expected to determine the optimum percentage of glass powder that can enhance the strength and reduce the water absorption of interlocking blocks. Overall, this innovation has the potential to reduce the consumption of natural sand, minimize waste glass in landfills, and contribute to more environmentally friendly sustainable construction.

Kata kunci: Interlocking Block, Glass Powder, Sand Replacement, Compressive Strength, Water Absorption, Sustainable Construction.



Rajah 1: Types of concrete block



Rajah 2: Interlocking Block,

MODIFIED CONCRETE USING CRUMB RUBBER TO IMPROVE THE PERFORMANCE OF CONCRETE

Afifah Sahilah Binti Abdul Muthalib¹, Norsyafiq Alieyana Herlman², Ts.Dr. Noor Azah Binti Abd Raman³

Concrete is one of the most widely used materials in building construction due to its strength, durability, and workability. Concrete can develop cracking due to shrinkage, temperature changes, and applied loads, which may affect its durability and performance. The increasing amount of waste tires has become an environmental concern due to the difficulties with their disposal and management. The use of crumb rubber as a partial replacement for fine aggregate provides an alternative approach for recycling waste tires in building construction. The objectives of this study are to determine the effect of crumb rubber replacement on the properties of modified concrete and to identify the performance of the concrete. Crumb rubber was prepared from scrap tires and used as a partial replacement for fine aggregate (less than 4.75 mm) at 0%, 7.5%, and 12.5% replacement levels. The modified concrete was tested through slump, density, and compressive strength tests. Compressive strength testing was conducted at three curing periods of 7, 14, and 28 days. Based on the findings, the use of crumb rubber reduced the density and compressive strength of the modified concrete. At 14 days, the replacement resulted in a 6.05% reduction in density and a 36% reduction in compressive strength. Higher crumb rubber replacement levels resulted in greater reductions in compressive strength. The incorporation of crumb rubber demonstrates potential for the sustainable utilization of waste tires in lightweight concrete applications. The study may also support the development of more sustainable and potentially cost-effective concrete for the construction industry in Malaysia.

Kata kunci: Crumb rubber, Scrap tires, Compressive strength, Conventional concrete, Fine aggregate.



Rajah 1: Compression testing machine used to determine the compressive strength of the concrete specimen.



Rajah 2: Manual mixing of concrete materials during the concrete preparation process.

A STUDY ON ENHANCING TRAFFIC SIGN VISIBILITY FOR NIGHTTIME ROAD SAFETY

Irdina Yasmin Binti Mohammad Fazarul Farmi¹, Puteri Nurizzati Binti Mohd Saffi'Ee², Puan Azah Binti Abas³

Traffic sign visibility at night is important for road safety as it helps drivers recognise road directions and changes in road conditions. Conventional chevron signs rely on retroreflective materials and vehicle headlights for visibility. However, their visibility may be reduced in areas with low ambient lighting. Therefore, this study was conducted to develop an LED chevron sign and compare its visibility with a conventional chevron sign at night. A portable prototype was developed using an acrylic board fitted with 26 LED lights and mounted on a steel pole. The prototype features an adjustable height and detachable structure, allowing it to be easily assembled, disassembled, and relocated to different testing locations. Nighttime testing was conducted at distances of 5 m, 10 m, 15 m, 20 m, and 25 m. Three illuminance readings were recorded at each distance, and the average value was used for comparison. The results showed that the LED chevron sign recorded higher illuminance than the conventional chevron sign at every testing distance. The LED sign recorded 85 lux, 42 lux, 25 lux, 16 lux, and 11 lux at 5 m, 10 m, 15 m, 20 m, and 25 m, respectively, while the conventional sign recorded 32 lux, 18 lux, 11 lux, 7 lux, and 4 lux. This comparison shows that the LED chevron sign produced higher illumination throughout the testing. Therefore, LED lighting can be used as an additional illumination system to improve the nighttime visibility of chevron signs and provide clearer guidance for road users, particularly in areas with low ambient lighting.

Kata kunci: LED chevron sign, nighttime visibility, traffic sign, illuminance, road safety



Rajah 1: Portable LED Chevron Sign



Rajah 2: Nighttime Testing of the LED Chevron Sign

INVESTIGATION AND ANALYSIS OF ENVIRONMENTAL FACTORS CONTRIBUTING TO STRUCTURAL CRACKING IN RESIDENTIAL BUILDINGS AT KAMPUNG TENKERA PANTAI DUA, MELAKA

Mohammad Ameen Saufi Bin Salim¹, Faris Syakirin Bin Norazlan², Puan Sarinah Binti Ali³, Puan Sarinah Binti Ali⁴

Structural cracking in residential buildings at Kampung Tengker Pantai Dua, Melaka, raises concerns regarding building safety and property value. The study area is located on reclaimed coastal land underlain by compressible clay, while nearby drainage trench excavation may further disturb soil stability. This study aims to analyze the influence of soil properties and drainage excavation on structural cracking and propose appropriate mitigation measures. A quantitative and experimental approach was adopted through geotechnical field investigations, level surveying, and laboratory testing. Soil investigations were conducted at 5 m, 10 m, and 15 m intervals from the drainage line to assess subsurface conditions and variations in soil properties. Level surveys were also carried out at the affected residential buildings to identify differences in ground and building elevations associated with settlement. Soil moisture content was determined in accordance with BS 1377-2:1990, while field penetration testing was performed to evaluate soil resistance and allowable bearing capacity. The results indicated reduced soil moisture near the drainage trench, suggesting groundwater drawdown caused by excavation activities. Level survey results indicated elevation differences at the affected houses, supporting the occurrence of differential settlement. Subsurface investigations identified very soft coastal clay at shallow depths, with low allowable bearing capacities ranging from approximately 36.4 kN/m² to 78.0 kN/m². These weak soil conditions increase the likelihood of differential settlement and subsequent structural cracking. The findings demonstrate a relationship between drainage-induced environmental disturbance, weak coastal soil conditions, settlement, and structural distress. Recommended mitigation measures include improved drainage management, groundwater-level monitoring, and foundation stabilization under qualified geotechnical supervision.

Kata kunci: Structural Cracking, Geotechnical Soil Properties, Differential Settlement, Water Table Drawdown, Soil Bearing Capacity



Rajah 1: Mackintosh Probe Test Work



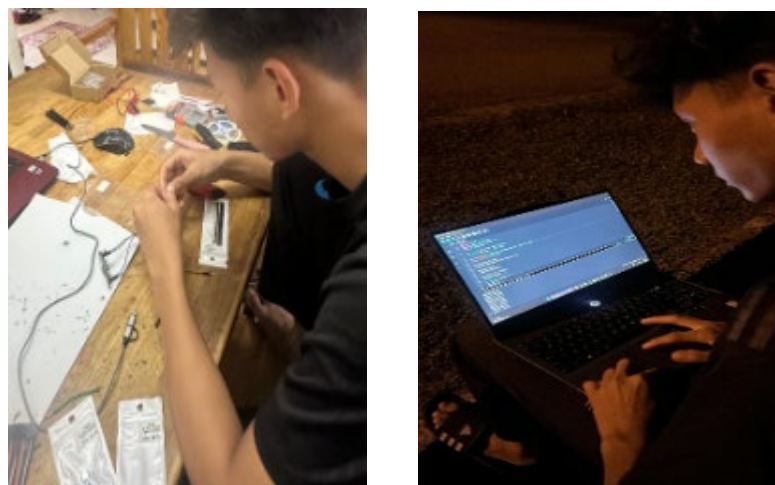
Rajah 2: Soil Levelling Investigation Work

IOT-BASED SMART SAFETY VEST WITH GPS AND EMERGENCY ALERT

Muhammad Amir Azim Bin Hishamuddin¹, Muhammad Zulofy Bin Kairol², Nur Anis Binti Amiran³, Puan Syahidah Binti Salleh⁴

Safety is an important aspect in construction sites, particularly for workers who are exposed to various hazards and potentially dangerous working conditions. Conventional safety vests mainly provide visibility but have limited functions for emergency response and worker monitoring. Therefore, this project focuses on the development of a Smart Safety Vest that integrates several safety features to improve worker protection and emergency response. The smart safety vest is equipped with an LED light strip, GPS tracking system, emergency button and whistle. The LED light strip is designed to improve the visibility of workers, especially in low-light conditions, while the emergency button provides a quick method for workers to indicate an emergency situation. When the emergency button is activated, the LED light flashes to provide a visual emergency indication. The GPS tracking system is incorporated to determine the worker's location, while the whistle provides an additional method of attracting attention during emergencies. The development process involves the design and assembly of the vest, integration of electronic components, programming, and functional testing. The performance and reliability of the prototype are evaluated based on LED visibility, whistle audibility, emergency button response, GPS tracking accuracy and battery performance under real or simulated operating conditions. The project is expected to produce a practical and user-friendly safety vest that can enhance worker visibility, facilitate emergency identification and support location tracking. Overall, the Smart Safety Vest has the potential to contribute to improved safety practices and provide an additional layer of protection for construction workers and other users working in potentially hazardous environments.

Kata kunci: Smart Safety Vest, Construction Safety, LED Visibility, GPS Tracking, Emergency Button, Worker Safety, Whistle.



Rajah 1: Process to develop Smart Safety Vest

JIGAW JIG FOR ACCURATE ROUND CUTTING

Amier Danish Bin Kamal Ariffin¹, Mohamad Naquiddin Bin Md Hanef², Muhammad Syabil Bin Junaidi³, En.Mubin Bin Minhaj⁴

Round cutting is a common process in woodworking and construction activities, especially when producing shapes that require specific dimensions and accuracy. Manual round cutting can often result in problems such as inaccurate measurements, unstable cutting movements, and inconsistent circular shapes. Although a jigsaw can help users perform cutting work more efficiently, achieving an accurate circular cut can still be difficult without a proper guiding device. This may cause uneven cutting results and increase the possibility of errors during the cutting process. Therefore, the Jigsaw Jig Attachment for Accurate Round Cutting was developed as an additional attachment for a jigsaw to assist users in producing more accurate and controlled circular cuts. The jig was designed based on a radius-guiding concept to control the movement of the jigsaw along a predetermined cutting path. The product design considered several factors, including cutting accuracy, stability, ease of use, and production cost, making it suitable for small-scale cutting activities. The product development process involved several stages, including identifying problems related to manual round cutting, developing the jig design, selecting suitable materials and components, fabricating the prototype, and testing the completed product. Testing was conducted to evaluate the ability of the jig to produce circular cuts based on predetermined radius measurements and to compare the cutting results with manual cutting methods. The ease of controlling the jigsaw during the cutting process and time to complete the cutting were also considered during the evaluation. The results of the product development showed that the use of the jigsaw jig helped users produce circular cuts in a more controlled and consistent manner compared to manual cutting. The jig also helped in cutting. Overall, the project successfully developed a practical and easy-to-use attachment for improving the accuracy of circular cutting using a jigsaw. The product has the potential to assist users in cutting applications that require more consistent and accurate circular shapes.

Kata kunci: Jigsaw, Jig Attachment, Round Cutting, Circular Cutting Accuracy, Cutting Guide, Circular Cutting



Rajah 1: Development of Jigsaw Jig



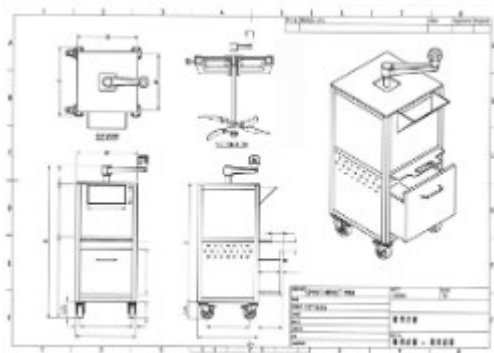
Rajah 2: Jigsaw Jig attach with jigsaw

SPIN COMPOST MINI

Ahmad Zahirulhaq Bin Ahmad Fauzi ¹, Muhammad Adam Danish Bin Roslee ², Muhammad Nabil Bin Khalil ³,
En.Mohd Nizamuddin Bin Mohd Dawang⁴

The management of domestic organic waste remains a critical environmental challenge, particularly in densely populated urban areas where space constraints hinder traditional disposal. Improper food waste disposal significantly increases landfill accumulation and greenhouse gas emissions. Addressing this issue requires sustainable, practical solutions that encourage household participation. To systematically tackle these challenges, the Spin Compost Mini was engineered as a specialized processing system that facilitates the manual shredding, dehydration, and aeration of everyday organic waste without relying on electrical power. Constructed with a robust Mild Steel Flat Bar framework, the machine ensures exceptional structural stability during consistent daily operation. The core mechanical assembly features an intuitive manual rotary system utilizing a heavy-duty hand crank connected to internal crushing blades designed to efficiently break down fibrous kitchen scraps. Furthermore, the product integrates a Stainless Steel Mesh enclosure that guarantees continuous aerobic air circulation while preventing pest intrusion, alongside an ergonomic storage drawer at the base to streamline the final collection of processed materials. The comprehensive project methodology encompassed three distinct developmental phases: initial 3D conceptual design utilizing advanced computer-aided modeling, physical unit fabrication involving precision metalworking techniques such as arc welding and surface finishing, and rigorous mechanical performance testing. Evaluation metrics closely monitored the mechanical efficiency of the shredding blades, physical framework stability under rotational load, and overall user ergonomics. Experimental results conclusively indicate that the Spin Compost Mini effectively reduces organic waste volume and significantly expedites the composting cycle through optimized aeration. By operating completely off-grid, the device offers an environmentally friendly, cost-effective, and easily maintainable alternative to expensive automated digesters. This machine demonstrates enormous potential for widespread implementation in small-scale households, actively promoting sustainable recycling and contributing to localized environmental conservation efforts.

Kata kunci: Organic waste, composting, waste management, manual processing, sustainability.



Rajah 1: Orthographic and isometric



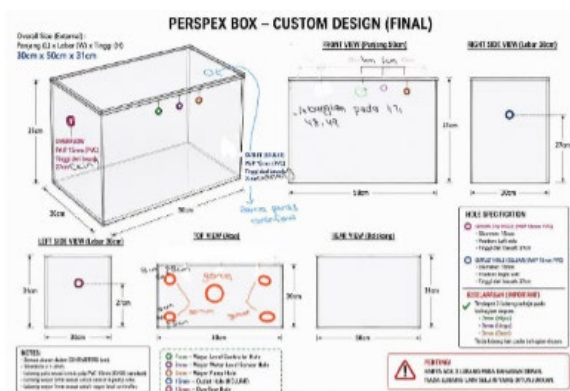
Rajah 2: Welding and assembly of the Spin Compost Mini main structure

SMART RAINWATER HARVESTING ROAD SYSTEM (SRWHRS)

Nurul Hidayah Binti Mohd Asri¹, Puteri Nureen Qistina Binti Abdullah², Nurul Atiqah Binti Anuar³, Puan Dian Ainor Binti Mizan⁴

The increasing development of impervious surfaces such as roads and paved areas has contributed to higher surface runoff during rainfall events. Rainwater flowing from road surfaces is commonly discharged directly into drainage systems without being effectively utilized. This condition not only results in the loss of a potential water resource but may also increase the burden on existing drainage systems, especially during heavy rainfall. In addition, conventional rainwater collection systems generally lack monitoring and control features that allow water conditions to be observed and managed systematically. Therefore, the Smart Rainwater Harvesting Road System (SRWHRS) was developed as a smart system that integrates rainwater collection from road surfaces with sensor technology and electronic control. The project was implemented as a small-scale prototype at the Civil Engineering Department, Politeknik Merlimau Melaka. The system uses a Raindrop Sensor to detect the presence of rainwater and a Water Sensor to detect the water level in the storage tank. An ESP32 microcontroller acts as the main controller to receive and process input from the sensors, while a Relay is used to control the operation of the electrical components according to the programmed conditions. In addition, a Solar Charge Controller and DC-DC Converter are used to manage and provide a suitable power supply to the electronic components. The system is designed to collect and store rainwater for non-potable applications such as watering plants and cleaning road surfaces. Testing was conducted on individual components and the overall system to evaluate sensor detection, ESP32 response, relay operation, and power supply stability. The development of the Smart Rainwater Harvesting Road System (SRWHRS) is expected to improve the efficiency of rainwater management and utilization in a more systematic manner. The system also demonstrates the potential of using sensor technology and electronic control in rainwater management while reducing the need for manual inspection. Overall, this innovation supports smarter, practical, and more sustainable water management practices, particularly in an educational environment such as Politeknik Merlimau Melaka.

Kata kunci: Smart Rainwater Harvesting, Road Runoff, Water Sensor, Smart Water Management, Sustainable Water Management



Rajah 1: Product Sketch



Rajah 2: Smart Rainwater Harvesting

HIGH EARLY STRENGTH CONCRETE INCORPORATING SILICA FUME AS A SUPPLEMENTARY CEMENT MATERIAL

Muhammad Hazreel Haiqal Bin Hisham¹, Muhammad Afiq Danish Bin Zabudin², Amirul Najhan Bin Yusof³, Jusmine Hanis Binti Abdullah⁴

Concrete is one of the main materials used in construction. The use of silica fume as a partial cement replacement can improve the early strength of concrete. This study uses 0%, 10%, 20%, and 30% silica fume. Normal concrete takes time to achieve the required early strength. In addition, a high silica fume content may reduce workability. Therefore, this study aims to determine the suitable silica fume percentage to achieve high early strength and good workability. This project focuses on the development of High Early Strength Concrete incorporating silica fume as a partial replacement for Ordinary Portland Cement (OPC). The main purpose of this project is to investigate the effect of different silica fume replacement levels on the compressive strength and workability of concrete. Four concrete mixes containing 0%, 10%, 20% and 30% silica fume are prepared by replacing a portion of Ordinary Portland Cement (OPC). Superplasticizer is used to improve the workability of the concrete while maintaining a low water-binder ratio. Concrete cubes measuring $150 \times 150 \times 150$ mm are produced and subjected to curing before compressive strength testing at 1, 7, 14, 28 days. A slump test is also conducted to determine the workability of fresh concrete. The compressive strength results are recorded and compared between the different mix proportions to evaluate the effect of silica fume on the strength development of concrete. The results are used to determine the optimum silica fume replacement percentage that provides suitable early strength and workability. In addition, the use of silica fume as a supplementary cementitious material can help reduce OPC consumption and utilise an industrial by-product. This can contribute to the development of a more sustainable and eco-friendly concrete product. Overall, the project aims to produce concrete with improved early-age strength while reducing the environmental impact associated with conventional concrete production.

Kata kunci: High Early Strength Concrete, Silica Fume, Eco-Friendly Concrete, Superplasticizer, Compressive Strength.



Rajah 1: High Early Strength Concrete



Rajah 2: Measure weight

DEVELOPMENT OF ADJUSTABLE BRICKS IRON GRIP

Adham Alfie Bin Rohaizad¹, Muhammad Hakim Bin Nor Azmi², Ts. Dr. Erita Mazwin Binti Mazlan³

The adjustable iron grip is developed to enhance safety and efficiency during material handling tasks specifically in residential renovation projects. In home renovation environments, manually carrying heavy materials such as bricks often leads to severe physical strain, worker fatigue, reduced productivity, and an increased risk of injury. Therefore, this project aims to design a portable adjustable iron grip to improve the stability and control when lifting and transporting bricks over suitable carrying distances. The development process involves conceptual design, material selection, fabrication, and performance evaluation. Particular emphasis is placed on assessing the tool's practical functionality by reducing the required gripping effort, improving handling precision, and ensuring portability for easy movement around tight residential spaces. In addition, the project compares conventional manual carrying with the use of the adjustable iron grip to evaluate its effectiveness in improving work efficiency and safety during brick transportation. The gripping jaws are designed to securely hold bricks and various material shapes, while the locking mechanism ensures consistent and stable gripping throughout operation. The findings are expected to demonstrate that the portable iron grip effectively reduces physical strain and improves overall task completion time. As a result, the proposed tool serves as a practical solution for supporting safer, more mobile, and efficient brick handling in home renovation tasks.

Kata kunci: Adjustable Iron Grip, Residential Renovation, Brick Handling, Portability, Carrying Distance, Work Efficiency.

NATURAL STORMWATER FILTER

Muhammad Fuad Bin Zaihan¹, Nur Najwa Batrisya Binti Ruhaizam², Aisyhafiy Putra Bin Mohd Najib³, Sarinah Binti Ali⁴

Water quality plays an important role in managing stormwater and reducing the impact of pollutants on the surrounding environment. Stormwater runoff may collect various contaminants such as suspended solids, dissolved substances, sediment, organic waste, and other pollutants from surfaces before entering drains and waterways. Therefore, this project proposes the development of a Stormwater Filter to improve stormwater quality through a simple, low-cost, and user-friendly filtration system. The project involves the development of a water filtration system using a PVC pipe installed along the stormwater drainage channel. The filter consists of several filtration layers, including straw, coarse sand, stones, filter cloth, and mesh filter, which function to remove impurities and reduce suspended particles and other contaminants from stormwater. The compact design of the filter allows easy installation and maintenance in stormwater drainage environments. The effectiveness of the filtration system is evaluated by comparing the stormwater quality before and after the filtration process. The collected stormwater samples are analysed based on Total Suspended Solids (TSS), Total Dissolved Solids (TDS), turbidity, and pH. TSS and turbidity represent physical contamination caused mainly by suspended particles and sediment, while TDS indicates dissolved substances in the water and pH indicates the chemical condition of the stormwater. The percentage reduction of TSS, TDS, and turbidity is calculated to determine the filtration performance, while changes in pH are evaluated to assess the improvement in water quality. The collected data are used to determine the reduction of contaminants after filtration and evaluate the overall effectiveness of the developed stormwater filter. A higher percentage reduction in TSS, TDS, and turbidity indicates better removal of pollutants, while a pH value closer to the suitable range indicates improved water quality. Overall, the development of this Stormwater Filter is expected to provide a practical and economical solution for reducing stormwater contamination and supporting sustainable stormwater management.

Kata kunci: Stormwater Filter, Rice Husk, Water Quality, Filtration, Contamination



Rajah 1: Stormwater Filter concept



Rajah 2: Product

A STUDY ON THE QUALITY OF CLEAN WATER IN THE CAMPUS AREA OF POLITEKNIK MERLIMAU, MELAKA

Filzaton Ain Nazwa Binti Zaini¹, Siti Nor Syafiqah Syahira Binti Jamir², Ts. Dr. Hajah Norhayati Binti Abd Wahab @
Dul Ahad³

Clean water is an essential resource for daily activities and routine uses at Politeknik Merlimau, Melaka. However, the water quality characteristics within the campus have not been systematically assessed across different sampling locations using selected physical and chemical parameters. Therefore, this study was conducted to analyze the variation of water quality parameters among selected sampling locations and to assess the overall water quality condition within the campus area. Eight sampling locations were selected to represent different water usage areas, and one water sample was collected from each location. The samples were tested for Total Suspended Solids (TSS), Total Dissolved Solids (TDS), pH, chlorine, Chemical Oxygen Demand (COD), Biochemical Oxygen Demand (BOD), and turbidity using appropriate laboratory testing methods. The results showed that turbidity values ranged from 0.47 to 2.53 NTU, TSS values ranged from 1151 to 1980 mg/L, while TDS values ranged from 120 to 1840 mg/L. The highest TSS concentration was recorded at E10723 (1980 mg/L), while the highest TDS concentration was recorded at E10726 (1840 mg/L). Based on the Malaysian drinking water quality standard, TDS at E10723 and E10726 exceeded the recommended limit of 1000 mg/L, while all turbidity values remained within the acceptable limit of 5 NTU. Overall, the findings indicate variations in water quality characteristics among the sampling locations, particularly for TDS, highlighting the importance of continuous monitoring and proper water quality management within the campus.

Kata kunci: Water Quality Assessment, Water Sampling, Water Characteristics, Physical Parameters, Chemical Parameters



Rajah 1: pH Measurement Test Using pH
Digital Meter



Rajah 2: Vacuum Filtration Apparatus for Total
Suspended Solids (TSS) Analysis

FLEXIBLE PAINT BRUSH

Muhammad Adaam Haris Bin Mohd Mazili¹, Anbu A/L David², Mohamad Amirul Fazryn Bin Shari³, Pn.Juliawati Binti Jama`On⁴

The development of technology and innovation in the construction industry and finishing works has created new opportunities to improve the efficiency and quality of painting activities. Painting in narrow, hard-to-reach areas and on uneven surfaces is often a challenge for users. The use of conventional paint brushes with rigid handles can make it difficult to reach certain areas and may result in uneven paint application. This condition not only requires more time and effort but can also lead to paint wastage and poor finishing quality. Therefore, the Flexible Paint Brush is proposed as an innovation to help users perform painting work more easily, flexibly and effectively. The product is designed with a flexible handle or brush section that allows users to adjust the angle of the brush according to the shape and position of the surface being painted. This design enables the brush to reach difficult areas such as corners, gaps, curved surfaces and narrow spaces without requiring users to make excessive body movements. In addition, the Flexible Paint Brush can improve user control during the painting process, as the flexibility of the brush allows the pressure and direction of the stroke to be adjusted according to the surface condition, helping to produce a more even layer of paint. The easy-to-handle design can also reduce the time and energy required during painting work and potentially minimize paint wastage through better control of the painting strokes. The product is suitable for various painting activities such as painting walls, ceilings, frames, building corners, furniture and areas with limited space. It can also be used by construction workers, contractors, painters and individuals carrying out painting work themselves. The development of the Flexible Paint Brush is expected to improve the productivity and quality of painting work by reducing the difficulties involved in reaching specific areas. This innovation not only helps save time and effort but also has the potential to reduce material wastage and improve the quality of paint finishing. Overall, the Flexible Paint Brush is a practical and user-friendly innovation that improves painting methods through a flexible, ergonomic and easy-to-use design suitable for various painting applications.

Kata kunci: Construction, Ergonomic, Innovation, Flexible Paint Brush, Painting Tools.



Rajah 1: Manufacturing Process



Rajah 2: Process Of Testing The Finished Product

STUDY ON IMPROVEMENT OF SOFT SOIL PROPERTIES USING COCKLE SHELL AND EGGSHELL WASTE IN SUNGAI RAMBAI

Nurul Syafieqa Najwa Faizul Ikram¹, Asyura Hana Binti Abdul Samad², Puan Nor Wariza Binti Jufri @ Jamior³

Soft soil is commonly found in low-lying areas such as former paddy fields and is characterised by high water content, low shear strength, low bearing capacity, and high compressibility, which may lead to excessive settlement and structural problems. Sungai Rambai, Melaka, was previously used for paddy cultivation before being reclaimed and developed into a residential area. Settlement and cracks have been observed in several residential houses within the area, indicating potential soft soil related problems that may affect the stability and serviceability of structures. Therefore, this study focuses on determining the physical and index properties of soft soil collected from Sungai Rambai and evaluating the effect of adding cockle shell and eggshell waste on the soil strength properties. Soil samples were collected from selected locations near residential houses that experienced noticeable settlement. Laboratory tests, including moisture content, sieve analysis, atterberg limit, compaction and Unconfined Compression Test (UCT), were conducted to determine the physical, index, and strength characteristics of the soil. Cockle shell and eggshell wastes were prepared through washing, drying, crushing, and grinding processes to produce fine powder before being incorporated into the soft soil at 4% and 8% replacement levels. The treated soil samples were then compared with untreated soil to evaluate the effectiveness of the additives in improving soil strength. The study is expected to identify a suitable replacement level and provide a better understanding of the potential use of cockle shell and eggshell waste as sustainable additives for soft soil improvement. The utilisation of these waste materials provides an alternative approach to conventional soil improvement methods and promotes the application of innovative materials in civil engineering. This study supports Sustainable Development Goal 9 (SDG 9): Industry, Innovation and Infrastructure by promoting an innovative and sustainable approach to soil improvement that can contribute to stronger and more resilient infrastructure. It also supports Sustainable Development Goal 11 (SDG 11): Sustainable Cities and Communities by contributing to safer and more sustainable residential development, particularly in areas affected by soft soil and settlement problems. Overall, this study highlights the potential of cockle shell and eggshell waste as sustainable additives for improving soft soil strength while supporting innovative construction practices and the development of safer and more resilient communities.

Kata kunci: Soft Soil, Cockle Shell Waste, Eggshell Waste, Soil Improvement, Soil Strength



Rajah 1: Lokasi Kajian



Rajah 2: Lawatan ke Kawasan kajian

ANALYSIS OF ROAD SURFACE ROUGHNESS USING IRI ON AMJ HIGHWAY (MELAKA TENGAH)

Fatin Syahira Bt Zainudin¹, Nur Fatin Soleha Bt Matnoh², Ts.Dr.Noor Azah Binti Raman³

Road surface roughness is an important factor in evaluating pavement condition and driving comfort. This study focuses on analysing the road surface roughness of selected sections of AMJ Highway in Melaka Tengah using the International Roughness Index (IRI). The study was conducted because AMJ Highway carries high daily traffic, including heavy vehicles, which may contribute to pavement deterioration such as potholes and uneven surfaces. The main objectives of this study are to measure pavement roughness using IRI data and to identify the pavement condition based on the IRI values according to standard road performance criteria. Three selected sections, namely KM 20.6–20.7, KM 25.5–25.6 and KM 41.7–41.8, were selected based on differences in their IRI values to represent different levels of pavement roughness. KM 25.5–25.6 represents a relatively smooth pavement section, KM 20.6–20.7 represents an intermediate level of roughness, while KM 41.7–41.8 represents a section with relatively high pavement roughness. The IRI data and related road information were obtained from Selia Selenggara. The collected data were organised and analysed using Microsoft Excel based on the selected road sections and chainage. Relevant journals and references were also reviewed to improve the understanding of IRI and pavement condition assessment. The analysed IRI values were compared with standard road performance criteria to determine the pavement condition of each selected section. This study provides a quantitative assessment of pavement roughness compared with visual inspection and helps identify road sections with different levels of pavement condition. The findings can also assist in identifying road sections that may require further monitoring or maintenance.

Kata kunci: road roughness, IRI, pavement condition, AMJ Highway, chainage



Rajah 1: Road surface roughness

GREENWAVE ACOUSTIC

Muhammad Faiq Zharif Bin M Razlee¹, Muhammad Amirudin Bin Rosadi², Muhammad Iskandar Shahril Bin Omar Shahril³, Puan Mazlina Binti Abd Ghani⁴

The GreenWave Acoustic panel is developed using waste cotton fabric as the main sound-absorbing material, with a plywood frame to provide structural support and maintain the shape of the panel. Based on our study, a 30 mm thickness was selected for the final product because the testing showed suitable sound absorption performance, with the absorption coefficient reaching approximately 0.96 at around 1600 Hz. The production process begins by collecting and cutting the waste cotton fabric into small pieces to improve the mixing process. The latex glue is then prepared by mixing half a large bottle of latex glue with water at approximately one-quarter of the amount of latex glue, giving an approximate 4:1 ratio of latex glue to water. The prepared latex mixture is then mixed thoroughly with the cut cotton fabric until the fabric is evenly coated. The mixture is placed into a 300 mm × 300 mm mould and arranged evenly to achieve a uniform thickness of 30 mm. The sample is then left to dry and harden before being removed from the mould. Finally, the finished cotton acoustic material is placed inside the plywood frame and secured to form the GreenWave Acoustic panel with a final dimension of 300 mm × 300 mm × 30 mm. This production process allows waste cotton fabric to be reused as a sustainable sound-absorbing material while reducing textile waste and providing an alternative acoustic panel for indoor applications.

Kata kunci: GreenWave Acoustic, Waste Cotton Fabric, Acoustic Panel, Sound Absorption, Latex Binder, Sustainable Material.



Rajah 1: Image of the fabric being cut into small pieces



Rajah 2: Product picture

INOVATION RAINWATER HARVESTING & SPRINKLER SYSTEM

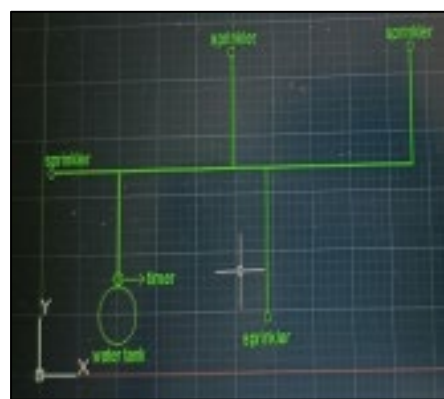
Muhammad Izz Daniel Bin Rosnan¹, Firas Hakimi Bin Mohd Fauzan², Muhammad Zulalif Bin Muhd Zulqarnain³, Siti Noor Asyikin Binti Hj Alias⁴

The Innovation Rainwater Harvesting & Sprinkler System is an innovative project developed to improve the efficiency, reliability, and sustainability of landscape irrigation at the Department of Hospitality Services (JPH), Politeknik Merlimau. Conventional manual irrigation practices may result in inconsistent watering, excessive water consumption, and difficulties in maintaining plants regularly due to the daily work commitments of lecturers and staff. In addition, improper water management around plant areas may contribute to the formation of stagnant water, which can potentially provide suitable breeding sites for mosquitoes. Therefore, this project aims to design and develop an integrated rainwater harvesting and automatic sprinkler system that provides a more systematic, controlled, and efficient method of plant irrigation. The proposed system collects rainwater from the building roof through a gutter system before undergoing filtration and being stored in a sealed storage tank. The collected rainwater is then supplied to the irrigation area using a water pump, piping system, and sprinklers. A digital timer is incorporated to regulate the irrigation duration and frequency, thereby reducing the need for continuous manual intervention and helping to prevent excessive watering. Solar energy is also utilised as the main power source to support the operation of the system and promote the use of renewable energy. The sealed storage tank is designed to minimise exposure of stored water to the surrounding environment and reduce the potential for mosquito breeding. The performance of the developed system will be evaluated based on several parameters, including water usage, irrigation duration, sprinkler distribution, system operation, and user feedback. Observations and questionnaire surveys involving lecturers and staff at JPH will be used to assess the practicality, effectiveness, and user satisfaction towards the system. The project is expected to reduce dependence on treated water, minimise manual irrigation activities, improve the consistency of plant watering, and promote more sustainable water resource management. Overall, the project demonstrates the potential of integrating rainwater harvesting, solar energy, and automated irrigation technology as a practical and environmentally sustainable solution for landscape irrigation.

Kata kunci: Rainwater Harvesting, Automatic Irrigation, Sprinkler System, Solar Energy, Sustainable Water Management.



Rajah 1: Sprinkler irrigation system installed at the JPH



Rajah 2: Floor plan

A STUDY ON PARKING DEMAND, CAPACITY AND TRAFFIC IMPACT AT JALAN BANDAR BARU MERLIMAU UTARA

Muhammad Akif Aiman Bin Rosdi¹, Sulaiman Haqim Bin Abd Jani², Puan Radziah Binti Abd Rahman³

This study was conducted to investigate parking demand, parking capacity, and the impact of parking activities on traffic flow at Jalan Bandar Baru Merlimau Utara, particularly in the area surrounding Politeknik Merlimau Melaka. The increasing number of vehicles in the area has resulted in higher demand for parking spaces, especially during peak periods such as morning hours, lunch breaks, and class transition times. This situation has caused some vehicle users to park outside designated parking boxes, along road shoulders, and in restricted areas. Improper parking activities can reduce the effective road width, disrupt traffic flow, and increase safety risks for drivers, pedestrians, and other road users. Therefore, this study aims to determine the existing parking demand, identify the available parking capacity, and assess the impact of parking activities on traffic flow within the study area. Data collection is carried out through site observations and parking surveys to obtain information such as parking accumulation, parking duration, parking turnover, parking index, and peak parking demand. The collected data are analysed to compare parking demand with the available parking capacity and to identify the effects of improper parking on traffic conditions. The findings of this study are expected to provide a clear understanding of the existing parking conditions at Jalan Bandar Baru Merlimau Utara and identify areas and periods experiencing high parking demand. Based on the findings, recommendations such as improved parking management, better enforcement, and awareness campaigns to encourage vehicle users to utilise designated parking spaces can be proposed to improve parking efficiency, traffic flow, and road safety in the study area.

Kata kunci: Parking Demand, Parking Capacity, Traffic Impact, Parking Accumulation, Parking Duration



Rajah 1: study area

Table 7.1: Vehicle Parking Study Analysis Form

BAY	TIME					TIME				
(0)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	Turnover
	15	30	45	60	75	90	105	120	135	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
Accumulation										

Rajah 2: calculation method

A PRELIMINARY STUDY ON PAVEMENT CRACKING IN COASTAL ROAD CONDITIONS

Nur Aida Qistina Binti Hassan Nordin¹, Nur Afizza Aida Binti Abdul Jalil², Pn. Rosilawati Binti Ahmad Khalil³

Keretakan turapan merupakan salah satu bentuk kerosakan jalan yang sering berlaku dan boleh menjejaskan keselamatan, keselesaan serta prestasi jalan. Masalah ini berpotensi menjadi lebih ketara di kawasan pesisir pantai kerana turapan terdedah kepada keadaan persekitaran seperti kelembapan yang tinggi, air dan garam yang boleh menyumbang kepada kemerosotan turapan. Kajian ini bertajuk A Preliminary Study on Pavement Cracking in Coastal Road Conditions dan dijalankan di kawasan Pantai Siring, Melaka. Kajian ini bertujuan untuk mengenal pasti jenis keretakan turapan yang berlaku serta menentukan faktor yang menyumbang kepada kerosakan jalan di kawasan kajian. Kajian literatur dijalankan bagi mendapatkan maklumat berkaitan keretakan turapan, kerosakan jalan dan penyumbang kepada kegagalan turapan. Kaedah pengumpulan data melibatkan pengambilan gambar kerosakan jalan bagi mengenal pasti jenis keretakan turapan. Selain itu, soal selidik diedarkan kepada penduduk sekitar Pantai Siring dan temu bual dijalankan bersama jurutera jalan daripada Jabatan Kerja Raya (JKR) Jasin serta pegawai Pejabat Daerah dan Tanah Jasin (PDTJ). Ujian makmal California Bearing Ratio (CBR) tidak direndam turut dijalankan terhadap sampel tanah yang diambil berhampiran kawasan jalan bagi menilai kekuatan tanah. Data yang diperolehi dianalisis menggunakan kaedah peratusan, graf dan perbandingan berdasarkan maklumat soal selidik, temu bual serta keputusan ujian CBR. Hasil kajian menunjukkan bahawa keadaan tanah yang lemah merupakan salah satu faktor utama yang menyumbang kepada kerosakan turapan di kawasan kajian. Keputusan ujian CBR digunakan sebagai sokongan dalam menilai kekuatan tanah dan hubungannya dengan keadaan kerosakan jalan. Secara keseluruhannya, kajian ini berjaya mengenal pasti jenis keretakan turapan dan faktor utama yang menyumbang kepada kerosakan jalan di Pantai Siring. Kajian lanjut yang melibatkan pemeriksaan tanah dan turapan secara lebih terperinci serta pemantauan keadaan jalan secara berkala dicadangkan bagi membantu menentukan punca kerosakan dengan lebih tepat dan menyokong perancangan penyelenggaraan jalan pada masa akan datang.

Kata kunci: Pavement Cracking, Coastal Road, Weak Soil, California Bearing Ratio (CBR), Road Damage.

REMOVABLE DRAIN FILTER

Nuraini Binti Hazmin¹, Nur Farhana Binti Mahmud², Ts.Dr.Hassan Bin Ismail³

Drainage blockage is a common problem that can disrupt water flow and increase the risk of water accumulation and flooding, particularly in residential and urban areas. Solid waste such as leaves, small branches, plastic bags, food packaging, and other small debris can enter drainage systems and accumulate within the drain, restricting water flow, reducing drainage efficiency, and increasing maintenance requirements. Therefore, this project focuses on the development of a Removable Drain Filter as a practical solution to intercept and collect solid waste before it enters the main drainage channel. The product consists of a supporting frame and a removable mesh panel that functions as a barrier to capture selected organic and plastic debris while allowing water to flow through the drainage system. The removable design allows the collected debris to be easily removed and facilitates inspection, cleaning, and maintenance without requiring major disruption to the drainage system. The project involves the design, fabrication, and performance evaluation of the prototype. The performance of the Removable Drain Filter is evaluated through a Debris Clogging Test (DCT) by comparing drainage conditions with and without the filter under selected organic and plastic debris conditions. The evaluation focuses on the filter's ability to intercept debris, reduce debris accumulation within the drainage channel, and maintain effective water flow. The prototype is designed with consideration of practicality, durability, ease of installation, and ease of maintenance to support its potential application in drainage systems. The development of the Removable Drain Filter also supports Sustainable Development Goal (SDG) 6: Clean Water and Sanitation, SDG 9: Industry, Innovation and Infrastructure, SDG 11: Sustainable Cities and Communities, and SDG 12: Responsible Consumption and Production by promoting improved drainage management, practical engineering innovation, and more systematic solid waste control. Overall, the Removable Drain Filter is expected to provide a simple, practical, and maintainable approach to reducing drainage blockage while supporting improved drainage system management and contributing to more sustainable and resilient communities.

Kata kunci: Removable Drain Filter ,Drainage Blockage ,Debris Clogging ,Solid Waste Management ,Drainage System



Rajah 1: Site Application



Rajah 2: Product

SMART WEB CONCRETE TESTING 360

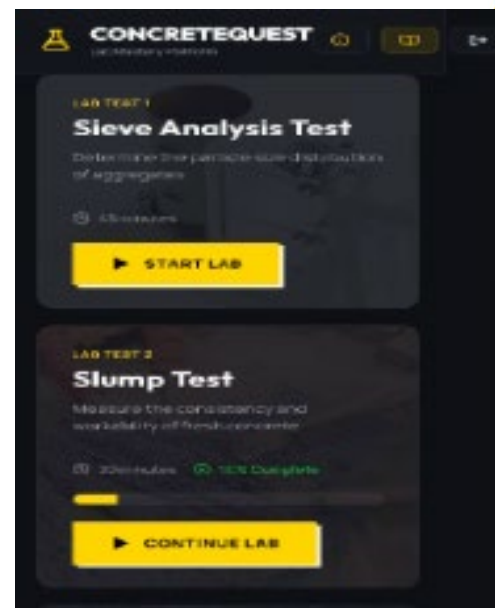
Lenin Raj A/L Vickneswaran¹, Alief Najmi Bin Mohd Apandi², Muhammad Nasir Min Min Bin Ayob³, Mohd Hazman Bin Abdul Aziz⁴

SMART WEB CONCRETE TESTING 360 was developed as an interactive teaching aid (Alat Bantu Mengajar, ABM) for concrete testing practical work. In addition to guiding students through the practical work, it exposes them to the testing procedures and experiments involved. This study was conducted to address the difficulties faced by students in understanding complex testing concepts and work processes within physical laboratories, difficulties that often stem from limited practical training time, large group sizes, and difficulty visualising raw data. As a result, students tend to lose interest during practical sessions in the laboratory. This study aims to develop a website that guides students undergoing concrete laboratory tests, and to test the effectiveness of the website's design and its use as a student learning tool. The design dimension of the website was developed using the Emergent application, featuring content related to concrete laboratory experiments. To address these issues, a web-based product and prototype development approach was adopted, in which a centralised simulation and data analysis system was built to allow students to simulate tests as well as collect and analyse concrete data virtually, either before or during their laboratory sessions. The findings of this project show that the developed prototype successfully increased students' level of understanding of laboratory procedures by [%], while also boosting their confidence and accuracy in analysing concrete test results during practical work.

Kata kunci: Concrete Testing, E-Learning, Interactive Teaching Aid, Virtual Laboratory, Simulation, Website Design, Practical Training.



Rajah 1: Interface



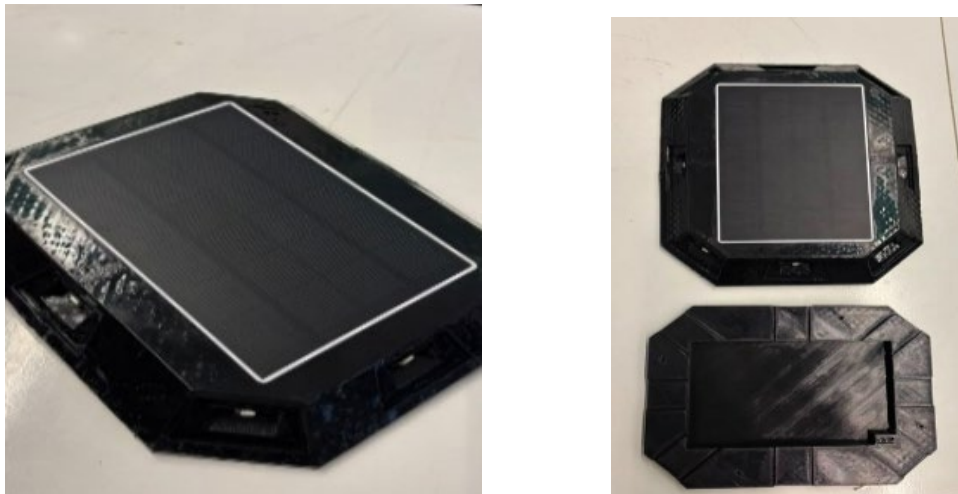
Rajah 2: Method

SMART SOLAR ROAD STUD

Ariishvendran A/L Murugan¹, Muhammad Arif Azhad Bin Abdullah², Muhammad Hafizuddin Bin Kharizam³,
Rosilawati Binti Ahmad Khalil⁴

Road infrastructure safety plays a pivotal role in mitigating traffic accidents, particularly at night and during adverse weather conditions. Conventional road studs are predominantly passive or provide static illumination without adaptive hazard warnings. Therefore, this project was developed with three main objectives: (1) to design a Smart Solar Road Stud product featuring an octagonal structure, (2) to evaluate the visibility efficiency of the 8-LED warning system during clear and rainy weather conditions, and (3) to evaluate the performance of the solar battery life in providing consistent illumination throughout the night. Literature indicates that dynamic visual warning systems significantly enhance driver visibility and reduce reaction time under hazardous road conditions. The methodology involved integrating a microcontroller, a rain sensor, and an 8-LED array inside an octagonal housing structure. Under clear weather, the system illuminates white LEDs for standard lane delineation; upon detecting rainfall, the rain sensor automatically triggers a transition to red LEDs as a visual hazard alert. The system relies entirely on a 3W solar panel and a rechargeable battery. Functional analysis and experimental testing demonstrated high visibility efficiency for both LED color modes under varying weather conditions. Furthermore, energy performance analysis confirmed that the 3W solar battery system successfully provides consistent, uninterrupted illumination throughout the night without relying on external grid power. In conclusion, the project successfully fulfilled all its objectives by improving road safety through dynamic weather alerts while advancing sustainable green infrastructure.

Kata kunci: Smart Solar Road Stud ,Octagonal Structure ,Rain-Sensing LED System (atau Dynamic Visual Warning) ,Visibility Efficiency ,Standalone Solar Energy (atau Solar Battery Performance)



Rajah 1: Smart Solar Road Stud

STUDY OF BRIDGE PIER CRACKING CAUSES AT SUNGAI RAMBAI BRIDGE

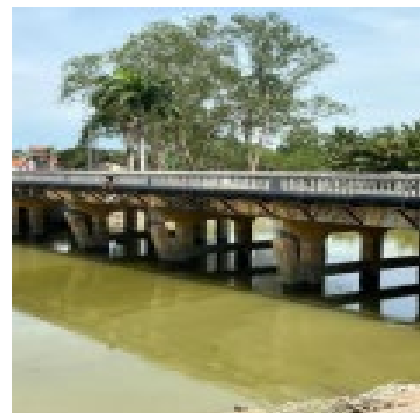
Nur Izwani Binti Zamri¹, Siti Ruqaiyah Binti Malek², Ts. Dr. Hassan Bin Ismail³

Cracking and structural damage at bridge piers pose a significant threat to the safety, serviceability, and economic value of transportation infrastructure. This paper presents a Relative Importance Index (RII) analysis of practitioner perceptions regarding the causes of pier cracking at Sungai Rambai Bridge and the corresponding preventive and remedial actions. A structured questionnaire comprising eight causal factors and six recommended actions, each rated on a five-point Likert scale, was distributed to civil engineering practitioners and completed by 33 valid respondents, comprising Penolong Jurutera (54.5%), Jurutera (27.3%), and Area Managers (18.2%), with 72.7% reporting direct hands-on involvement in bridge construction or maintenance. Scouring, overloading by heavy vehicles, and environmental exposure were jointly ranked as the most significant perceived causes of pier cracking (RII = 0.964), followed by strong river current and material deterioration (RII = 0.909). All six recommended preventive and remedial actions, led by regular inspection, scour protection, and pier strengthening, were rated with equally high importance (RII = 0.964). Reliability analysis using Cronbach's alpha indicated acceptable internal consistency for the causal factors ($\alpha = 0.70$), while a sensitivity check comparing respondents with and without direct bridge experience showed closely aligned perceptions (mean scores of 4.58 and 4.50, respectively), supporting the consistency of the findings across respondent subgroups. These results provide an evidence-based ranking of contributing factors that can guide the prioritisation of inspection and maintenance resources for Sungai Rambai Bridge and similar river-crossing structures.

Kata kunci: Bridge pier cracking, scouring, Relative Importance Index (RII), bridge maintenance, structural deterioration,



Rajah 1: Artikel berkaitan penutupan Jambatan Sungai Rambai



Rajah 2: Keretakan pada tiang (pier) Jambatan Sungai Rambai

WATER QUALITY STUDY OF SUNGAI LEREH MELAKA

Muhammad Amir Amsyar Bin Abd Hamid¹, Nurul Shamimie Binti Aziz², Puan Nuraziyati Binti Sukardi³

River pollution has become one of the major environmental issues that affects water quality and aquatic ecosystems. The Lereh River has experienced pollution activities over the past two years, which may influence the overall condition and usability of the river water. Therefore, continuous monitoring and assessment are important to determine the current status of the river based on the Water Quality Standards (WQS). This study aims to analyze the water quality of the Lereh River of pollution based on WQS classification. Water samples were collected from several selected sampling points along the river and analyzed in the laboratory. The parameters involved in this study include Total Suspended Solids (TSS), Dissolved Oxygen (DO), Chemical Oxygen Demand (COD), Biochemical Oxygen Demand (BOD and Turbidity. The obtained results were compared with the Water Quality Standards (WQS) to determine the current water quality classification of the river. The findings of this study are important in evaluating the level of pollution and the current condition of the river water. This study can also assist the relevant authorities in monitoring water quality and increasing public awareness regarding the importance of protecting river ecosystems from further pollution.

Kata kunci: Sungai Lereh, water quality, WQI, NWQS, river pollution



Rajah 1: Water Sample



Rajah 2: Water Testing

COCONUT FIBRE ROOFTILES AS THERMAL INSULATION FOR HOMES

Muhamad Ruzaini Hilmi Bin Mohd Romzi¹, Muhammad Faisal Bin Zulhari², Muhammad Daniel Hakim Syafiee³, Puan Nurul Nadiah Binti Othman⁴

This study aims to develop and evaluate the thermal insulation performance and water absorption rate of innovative roof tiles based on coconut agricultural waste (coconut roof tiles). The contemporary construction industry faces challenges regarding rising indoor building temperatures and high energy consumption for cooling systems, alongside moisture issues caused by the permeability of conventional roofs. The research methodology involved the fabrication of composite samples using coconut waste (such as coconut fiber) to produce coconut roof tiles. Two different mixing ratios of coconut fiber relative to sand were utilized, namely 1% and 2%. Laboratory tests conducted included thermal conductivity analysis to measure heat insulation capability, as well as water absorption and permeability tests to evaluate moisture resistance. The findings indicate that the innovative coconut roof tiles with the 1% mixing ratio provide excellent thermal insulation performance by reducing heat transfer into indoor spaces, alongside having a low water absorption rate that complies with industry standards. In conclusion, this innovation not only effectively reduces agricultural waste but also produces an energy-efficient, weather-durable green roofing material.

Kata kunci: Coconut roof tiles, thermal insulation, water absorption, green building materials, energy efficiency



Rajah 1: Coconut roof tiles

STUDY OF MAPPING AND ANALYZING FLOOD-PRONE HOTSPOTS IN MELAKA TENGAH USING GIS

Muhammad Harith Danial Bin Radi Hairi¹, Danish Irfan Bin Harith Iskandar Raj², Puan Siti Noor Asyikin Binti Hj Alias³

Flood is one of the natural disasters that frequently occurs in Malaysia, including the Melaka Tengah area, particularly during periods of heavy rainfall. Although flood-related information has been recorded by relevant agencies, the available information needs to be organized and presented systematically to facilitate the identification of areas that frequently experience flooding. Therefore, this study is conducted to analyse the spatial distribution and temporal patterns of flood-prone hotspots in Melaka Tengah from 2023 to 2025 using a Geographic Information System (GIS), particularly QGIS software. Flood occurrence data are obtained from the Department of Irrigation and Drainage (Jabatan Pengairan dan Saliran, JPS), while rainfall data are obtained from the Malaysian Meteorological Department (Met Malaysia). The collected data are organized, cleaned, and processed before being incorporated into the QGIS database. Spatial analysis is used to map flood occurrence locations and identify areas with frequent flood events, while temporal analysis is used to examine flood occurrence patterns throughout the study period. In addition, a questionnaire will be distributed to relevant JPS personnel to obtain feedback on the effectiveness of the developed QGIS database. The findings are expected to produce a systematic flood database and hotspot maps that are easier to understand and use. Overall, the application of QGIS can assist in managing spatial flood information and support the identification of flood-prone areas in Melaka Tengah.

Kata kunci: Flood Hotspot, QGIS, Spatial Analysis, Temporal Analysis, Melaka Tengah.

[illegible]

Rajah 1: Organization and management of flood occurrence data using Microsoft Excel *Location at Bukit Rambai*

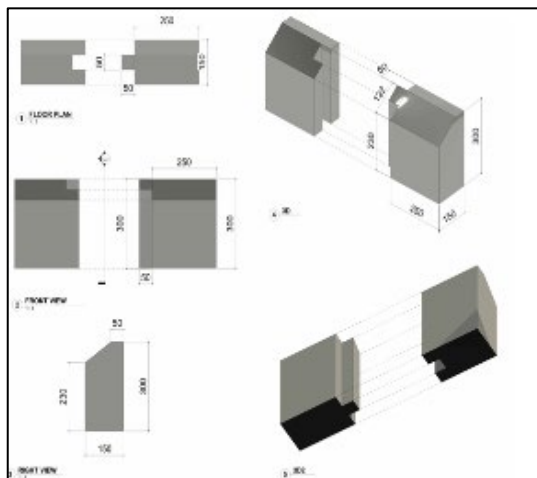
Rajah 2: Mapping of flood occurrence locations

INTERLOCKING MODULAR KERBS

Hanis Sufiah Binti Shahirun¹, Nik Affriza Yusriah Binti Nik Afrizal², Puteri Nor Hikma Binti Poneran³, Ts. Dr. Hjh Norhayati Binti Abd Wahab @ Dul Ahad⁴

Kerbs are an important component in road construction, serving as a boundary between the road surface and surrounding areas while also helping to control surface water flow, improve road safety, and provide a clear separation between different road elements. However, conventional kerb installation methods may require additional joining materials, skilled labour, and more installation time, which can make the installation, replacement, and maintenance processes less efficient. Therefore, this study aims to design and develop an interlocking modular kerb with a male-and-female connection system based on a “Lego” concept to improve installation efficiency, stability, safety, and visibility. The study involved several stages, including the design of the kerb based on suitable road kerb dimensions, fabrication of a steel mould, preparation of the concrete mixture, casting of the full-scale prototype, curing, and performance evaluation. A full-scale concrete kerb prototype was produced using a male-and-female interlocking connection that allows individual kerb units to be connected without relying solely on conventional joining methods. Two performance tests were conducted, namely the installation time test and the photoluminescent lux meter test. The installation time test was conducted once and recorded a total installation time of 7 minutes and 30 seconds for the installation of the interlocking kerb units. Meanwhile, the lux meter test was conducted at different distances from the light source to evaluate the visibility of the photoluminescent feature. The recorded light intensity was 1.58 lx at 0 m, 1.01 lx at 5 m, and 1.36 lx at 10 m from the light source. The results indicate that the interlocking connection system provides a practical installation method by allowing the kerb units to be connected through the male-and-female mechanism. The photoluminescent feature also demonstrated the ability to produce measurable light intensity at different distances after exposure to a light source. Although variations in lux readings were observed between the tested distances, the results demonstrate the potential of the photoluminescent feature to improve the visibility of kerbs under low-light conditions. Overall, the developed interlocking modular kerb demonstrates potential as an alternative to conventional kerbs by providing a simpler connection system, easier replacement of individual units, improved interlocking stability, and an additional visibility feature for road safety. The proposed design may contribute to a more practical and efficient approach to kerb installation and maintenance in road construction.

Kata kunci: Interlocking Modular Kerb, Modular Kerb, Male-and-Female Connection, Installation Efficiency, Photoluminescent Feature



Rajah 1: Interlocking modular kerb design.



Rajah 2: Kerb interlocking modular product

COMPARATIVE ASSESSMENT OF WATER QUALITY AT UTHM LAKES USING THE WATER QUALITY INDEX (WQI)

Muhammad Harith Fikri Bin Mohd Azahar¹, Mohamad Hadif Bin Ramzi², Puan Hazilah Binti Mohamad³

Water quality is an important aspect of environmental sustainability as it directly affects aquatic ecosystems, human activities, and the availability of clean water resources. This study aims to conduct a comparative assessment of water quality at selected sampling locations using the Water Quality Index (WQI). The study focuses on evaluating the existing water quality conditions and identifying differences between the selected locations. Water samples will be collected systematically from the selected sampling points and analysed based on several important water quality parameters, including pH, Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Ammoniacal Nitrogen ($\text{NH}_3\text{-N}$), and Total Suspended Solids (SS). The obtained results will be used to calculate the Water Quality Index according to the established WQI classification system. The WQI values will then be compared between the sampling locations to determine the differences in overall water quality and identify the possible level of pollution. The study will also examine the relationship between the measured water quality parameters and the overall WQI classification. The findings are expected to provide an overview of the current water quality conditions at the selected locations and determine whether the water quality is suitable for its intended use. In addition, the results can provide useful information for identifying areas that may require further monitoring and appropriate environmental management measures. This study is important in increasing awareness of water pollution and the need for proper water resource management. Overall, the study is expected to contribute to a better understanding of water quality conditions through the systematic application of the Water Quality Index and provide useful baseline information for future water quality monitoring and management.

Kata kunci: Water Quality, Water Quality Index (WQI), Water Pollution, Water Quality Assessment, Environmental Monitoring



Rajah 1: Reserch location

THE PERFORMANCE OF LECA BALL AS A PARTIAL COARSE AGGREGATE REPLACEMENT A 1 : 3 : 6 CONCRETE MIX

Nur Aina Suraya Binti Maulana¹, Erin Wardina Natasya Binti Mohd Nizam², Encik Safhiful Rabbi Bin Muhammad Noor³

The use of lightweight concrete has gained increasing attention in the construction industry due to its lower weight compared to conventional concrete. This study aims to investigate the use of Lightweight Expanded Clay Aggregate (LECA) Ball as a partial replacement for coarse aggregate in concrete for non-structural applications. The concrete mix uses a 1:3:6 ratio with LECA replacement percentages of 5%, 10%, 20%, and 30%. The slump test is conducted to determine the workability of the concrete, while compressive strength tests are conducted at 14 and 28 days to evaluate the strength performance of the concrete. The results for each replacement percentage will be compared to identify the LECA percentage that provides the best balance between workability and compressive strength. This study is expected to determine the suitability of LECA as a lightweight aggregate in concrete production for non-structural applications and provide an alternative to conventional coarse aggregate.

Kata kunci: Lightweight Concrete, Lightweight Expanded Clay Aggregate (LECA), LECA Ball, Coarse Aggregate



Rajah 1: Preparation of Concrete Samples Using LECA Balls



Rajah 2: Curing Process of Concrete Samples

GEOCALC PRO : DEVELOPMENT OF DIGITAL SURVEY CALCULATION APPLICATION

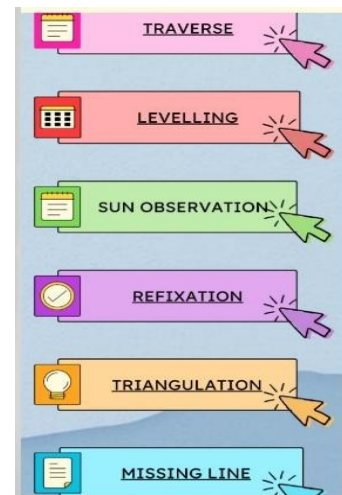
Nurulkartika Binti Ab Karim¹, Nur Dania Ellysha Binti Zamri², Nur Afiqah Najwa Binti Mohd Anuar³, Puan Noor Asmida Binti Abu Bakar⁴

Kerja luar ukur merupakan salah satu komponen penting dalam bidang geomatik yang melibatkan pengumpulan data serta pengiraan bagi mendapatkan maklumat ukur yang tepat. Proses pengiraan seperti jarak, bearing dan koordinat lazimnya dilakukan secara manual menggunakan formula matematik atau perisian tertentu. Kaedah ini boleh mengambil masa dan berpotensi menyebabkan kesilapan pengiraan serta kesalahan semasa memasukkan data. Oleh itu, projek ini dijalankan untuk membangunkan Sistem Digital Pengiraan Kerja Luar Ukur sebagai satu kaedah yang lebih mudah, cepat dan sistematik dalam membantu proses pengiraan kerja ukur. Pembangunan sistem ini melibatkan beberapa fungsi pengiraan asas kerja luar ukur, termasuk pengiraan jarak, bearing dan koordinat serta pengiraan yang berkaitan dengan Terabas (traverse), Triangulasi (triangulation), Cerapan Matahari (sun observation), Garis Hilang (missing line), Penetapan Semula Batu Sempadan (refixation), Ukur Aras (levelling). Sistem ini direka dengan antara muka yang ringkas dan mesra pengguna supaya mudah digunakan terutamanya oleh pelajar bidang geomatik dalam melaksanakan latihan dan tugas pengiraan ukur. Proses pembangunan melibatkan peringkat analisis keperluan, reka bentuk sistem, pembangunan fungsi pengiraan dan pengujian sistem bagi memastikan pengiraan yang dihasilkan adalah tepat dan berfungsi dengan baik. Keberkesanan sistem dinilai melalui perbandingan antara hasil pengiraan sistem dengan kaedah pengiraan konvensional. Hasil yang dijangkakan daripada projek ini adalah sebuah sistem digital yang dapat mengurangkan masa pengiraan, meminimumkan risiko kesilapan dan memudahkan pengguna mendapatkan hasil pengiraan kerja luar ukur. Sistem ini diharapkan dapat menjadi salah satu alternatif kepada kaedah pengiraan secara manual serta membantu meningkatkan kecekapan proses pembelajaran dan kerja luar ukur.

Kata kunci: Kerja Luar Ukur, Automasi Pengiraan, Sistem Digital, Pengurusan Data Ukur, Geomatik.



Rajah 1: Paparan Muka Hadapan Sistem



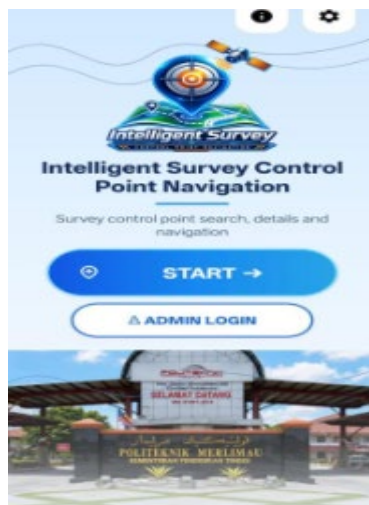
Rajah 2: Sistem Pengiraan Digital

INTELLIGENT SURVEY CONTROL POINT NAVIGATION (INTERSURV)

Nurin Aleya Binti Kamalrozaman¹, Pavitra A/P Arasakumar², Arusha Selvi A/P Murugan³, Ahmad Yusof Bin Sahdan⁴

Perkembangan teknologi geospasial, sistem navigasi dan kecerdasan buatan (Artificial Intelligence, AI) telah membuka peluang baharu dalam meningkatkan kecekapan kerja-kerja ukur dan pemetaan. Kerja ukur dalam mengenal pasti serta mencari lokasi Survey Control Point (SCP) atau titik kawalan ukur di lapangan sering menjadi satu cabaran, terutamanya apabila titik kawalan berada di kawasan yang luas, sukar diakses, mempunyai perubahan persekitaran atau kekurangan maklumat lokasi yang terkini. Proses pencarian secara manual bukan sahaja memerlukan masa yang panjang, malah boleh menyebabkan peningkatan kos operasi dan risiko kesilapan dalam pengenalpastian titik kawalan. Sehubungan itu, projek Intelligent Survey Control Point Navigation (InterSurv) dicadangkan sebagai satu sistem navigasi pintar yang membantu pengguna mengenal pasti, mencari dan menuju ke lokasi titik kawalan ukur dengan lebih tepat, pantas dan sistematik. Sistem ini mengintegrasikan teknologi Global Navigation Satellite System (GNSS), pangkalan data geospasial serta elemen kecerdasan buatan bagi menyediakan maklumat lokasi dan panduan navigasi secara masa nyata. Pengguna dapat mengetahui nama tempat, lokasi titik kawalan yang dituju, jarak, arah dan laluan terbaik untuk menuju ke titik tersebut melalui paparan peta digital yang interaktif. Elemen kecerdasan dalam sistem ini boleh digunakan untuk menganalisis kedudukan pengguna dan keadaan persekitaran bagi mencadangkan laluan navigasi yang lebih sesuai dan efisien. Selain itu, sistem juga berpotensi menyimpan maklumat penting bagi setiap titik kawalan seperti koordinat, ketinggian ortometrik, status fizikal, gambar lokasi, tarikh pemerhatian dan rekod penyelenggaraan. Maklumat ini dapat membantu juruukur atau pengguna mengenal pasti keadaan terkini titik kawalan sebelum menjalankan kerja ukur di lapangan. Pembangunan InterSurv dijangka dapat meningkatkan produktiviti dan ketepatan dalam pengurusan serta penggunaan titik kawalan ukur. Sistem ini bukan sahaja mengurangkan masa pencarian titik kawalan, justeru dapat membantu meminimumkan kesilapan manusia dan meningkatkan keberkesanan pengumpulan data geospasial. Kesimpulannya, inovasi ini berpotensi menyumbang kepada transformasi digital dalam bidang ukur, geomatik dan pemetaan melalui penggunaan teknologi navigasi pintar yang lebih moden, mudah diakses dan mesra pengguna.

Kata kunci: Survey Control Point, Intelligent Navigation, Global Navigation Satellite System (GNSS), Geospasial Technology, Mobile Application,



Rajah 1: Paparan Antaramuka App



Rajah 2: Kaedah penggunaan

PEMBANGUNAN BUKU-POP BAGI KURSUS DCG20313 FIELD ASTRONOMY

Muhammad Aqil Bin Mohd Fais¹, Muhammad Danish Asyraff Bin Mohamad Fadzil², Firhan Bin Salian³

Astronomi merupakan subjek atau bidang yang berkait rapat dengan bidang Geomatik, khususnya dari segi penentuan kedudukan, sistem koordinat, navigasi, dan terutama sekali pengukuran di permukaan bumi. Walau bagaimanapun, konsep tersebut melibatkan pergerakan dan kedudukan objek dalam ruang yang sukar digambarkan melalui nota bertulis mahupun lisan ataupun ilustrasi dua dimensi untuk memahami konsep astronomi, seperti pergerakan Bumi, fasa Bulan, serta kedudukan Matahari dan buruj dan lain-lain. Oleh itu, projek ini dibangunkan untuk menghasilkan buku Pop-Up 3D astronomi sebagai bahan pembelajaran interaktif yang khusus bertujuan membantu pelajar-pelajar Geomatik memahami konsep astronomi dengan lebih mudah dan senang. Buku Pop-Up 3D ini menggunakan elemen visual, model tiga dimensi dan mekanisme yang bergerak untuk menerangkan konsep seperti pergerakan Bumi, fasa Bulan, serta kedudukan Matahari dan buruj dan lain-lain. Projek ini menjana hasil melalui beberapa proses termasuk pengumpulan data, perancangan reka bentuk, pemilihan bahan, pembinaan model reka bentuk dan pengujian mekanisme pop-up. Penggunaan model tiga dimensi membolehkan pelajar dapat melihat pergerakan dan kedudukan objek tentang astronomi dengan lebih jelas serta mengaitkannya dengan konsep-konsep dalam bidang Geomatik. Projek inovasi ini dijangka berpotensi dapat meningkatkan pemahaman, minat dan pengalaman pembelajaran pelajar Geomatik terhadap bidang astronomi melalui penggunaan kaedah yang lebih kreatif, visual dan interaktif terhadap pembelajaran astronomi.

Kata kunci: Astronomi,Projek Inovasi,Buku Pop-Up 3D,Pembelajaran Interaktif,Bahan Bantu Mengajar.

MAGNETIC PICTORIAL KIT FOR REMOTE SENSING

Imanina Binti Zakaria¹, Muhammad Aiman Bin Johari², Faiz Zakwan Bin Khairul³, Noorbeha Binti Jamaluddin⁴

Remote Sensing merupakan subjek yang sangat sukar untuk dipelajari terutama untuk pelajar yang menceburi bidang geomatik. Remote Sensing merupakan salah satu bidang penting dalam geomatik yang digunakan untuk memperoleh maklumat berkenaan permukaan muka bumi tanpa perlu melihat kawasan kajian secara langsung. Namun begitu, proses remote sensing yang melibatkan beberapa komponen dan konsep boleh menjadi sukar difahami oleh pelajar melalui kaedah pembelajaran secara teori sahaja. Oleh itu, projek ini dibangunkan bagi membantu para pelajar memahami topik awal dalam subjek Remote Sensing iaitu Magnetic Pictorial Kit for Remote Sensing sebuah alat bantu mengajar pembelajaran yang menggunakan alat fizikal magnet dan elemen bergambar bagi membantu pelajar memahami proses Remote Sensing dengan lebih mudah dan interaktif. Alat pembelajaran ini memaparkan komponen utama dalam remote sensing seperti sumber tenaga, atmosfera, objek pada permukaan bumi, platform serta raw data yang terhasil. Elemen-elemen tersebut direka bentuk agar boleh disusun dan dipindahkan menggunakan kaedah magnet, membolehkan pelajar menjalankan aktiviti pembelajaran secara interaktif. Projek ini melibatkan proses reka bentuk, penghasilan dan menilai kebolehgunaan alat dalam kalangan pelajar Semester 4 dan Semester 5 yang mempelajari subjek Remote Sensing. Penggunaan alat ini diharap dapat meningkatkan pemahaman pelajar tentang konsep dan urutan proses Remote Sensing serta menjadikan proses pembelajaran lebih interaktif dan berkesan. Secara keseluruhannya, Magnetic Pictorial Kit for Remote Sensing berpotensi menjadi bahan bantu mengajar alternatif yang mudah digunakan dalam menyokong pembelajaran asas Remote Sensing dalam kalangan pensyarah mahupun pelajar geomatik.

Kata kunci: Remote Sensing, bahan bantu mengajar, alat fizikal magnet, pembelajaran interaktif, pelajar geomatik

INTERACTIVE LAND SURVEYING COMIC

Muhammad Fuad Bin Suhaime¹, Muhammad Nor Hadif Bin Noor Shimammudin², Azmin Hafizi Bin Hanapi³, Puan Noor Faizah Binti Zohardin⁴

Komik interaktif dalam bidang Geomatik khususnya berkaitan ukur tanah semakin mendapat perhatian sebagai salah satu pendekatan pembelajaran alternatif yang lebih mudah difahami dan menarik. Hal ini kerana kaedah pembelajaran konvensional sering dianggap sukar dan kurang menarik oleh pelajar serta orang awam. Oleh itu, pembangunan Interactive Land Surveying Comic dilaksanakan bagi memperkenalkan konsep asas ukur tanah melalui pendekatan visual dan penceritaan interaktif. Kajian ini bertujuan untuk membangunkan komik interaktif ukur tanah serta menilai keberkesanannya dalam meningkatkan tahap kefahaman, minat, dan kepuasan pengguna terhadap bidang geomatik. Komik ini dibangunkan dengan menggabungkan elemen visual, dialog ringkas, dan situasi sebenar dalam bidang ukur tanah. Kajian ini melibatkan pelajar serta pengguna awam sebagai responden bagi mendapatkan maklum balas terhadap penggunaan komik tersebut. Dapatan kajian menunjukkan bahawa penggunaan komik interaktif ini berjaya meningkatkan kefahaman pengguna terhadap asas ukur tanah di samping meningkatkan minat terhadap bidang tersebut. Selain itu, maklum balas yang diterima menunjukkan tahap kepuasan yang tinggi dari segi penyampaian maklumat yang lebih mudah difahami, menarik, dan interaktif. Pengguna juga lebih mudah memahami konsep asas ukur tanah berbanding kaedah pembelajaran tradisional. Secara keseluruhannya, kajian ini membuktikan bahawa Interactive Land Surveying Comic berpotensi menjadi salah satu bahan pembelajaran inovatif yang berkesan dalam memperkenalkan bidang geomatik kepada pelajar dan orang awam secara lebih santai dan interaktif.

Kata kunci: Komik Interaktif, Ukur Tanah, Pembelajaran Interaktif, Media Visual, Kefahaman

E-GEOFIRM: PETA TEMATIK FIRMA LATIHAN INDUSTRI

Nur Atikah Izzati Binti Ahmad Jais¹, Norin Najihah Binti Norafendi², Nurin Ainnur Balqis Binti Azman³, Noor Asmida Binti Abu Bakar⁴

Pada masa kini, pemilihan tempat Latihan Industri (LI) dalam kalangan pelajar Diploma Geomatik masih bergantung kepada kaedah konvensional serta sumber maklumat umum yang tidak menyediakan gambaran spatial yang jelas dan terperinci. Situasi ini menyukarkan pelajar untuk mengenal pasti lokasi firma serta membuat perancangan penempatan yang sesuai. Oleh itu, kajian ini memberi tumpuan kepada pembangunan laman web e-GeoFirm yang memaparkan peta tematik bagi membantu pelajar memahami taburan firma Geomatik secara lebih sistematik dan interaktif di negeri Selatan dan Barat Semenanjung Malaysia. Kajian ini menggunakan data primer melalui kaedah kaji selidik serta data sekunder yang melibatkan maklumat lokasi firma berkaitan bidang Geomatik. Proses analisis bermula dengan pengumpulan dan penyaringan data menggunakan Microsoft Excel, diikuti dengan pemprosesan data spatial dalam Qgis serta rujukan lokasi melalui Google Earth Pro. Data yang telah diproses kemudiannya dipetakan dalam bentuk peta tematik sebelum diintegrasikan ke dalam pembangunan laman web menggunakan Canva bagi menghasilkan paparan visual laman web e-GeoFirm ini berjaya memaparkan taburan firma secara jelas melalui penggunaan simbol dan warna tematik, di samping membantu pelajar mengenal pasti lokasi, kategori firma serta membuat keputusan pemilihan tempat Latihan Industri dengan lebih tepat dan efisien. Selain itu, laman web ini juga berfungsi sebagai platform rujukan digital yang tersusun kepada pelajar dan pihak jabatan dalam mengurus maklumat penempatan secara lebih teratur. Secara keseluruhannya, kajian ini membuktikan bahawa penggunaan teknologi geospasial dalam bentuk laman web interaktif mampu meningkatkan kefahaman pengguna serta menyokong proses membuat keputusan yang lebih berkesan.

Kata kunci: e-GeoFirm, Peta Tematik, Latihan Industri, Teknologi Geospasial, Laman Web, Peta Interaktif



Rajah 1: Paparan Antaramuka Laman Web



Rajah 2: Peta Tematik Firma LI

ANALISIS LOKASI STRATEGIK PEMASANGAN PANEL SOLAR DI POLITEKNIK MERLIMAU MENGGUNAKAN GIS

Muhammad Amirul Bin Ismail¹, Muhammad Afiq Waquddin Bin Mohd Zuki², Suriawati Binti Jusoh³

Tenaga solar merupakan salah satu sumber tenaga yang boleh diperbaharui dan mempunyai potensi untuk digunakan di Politeknik Merlimau. Pada masa ini, masih belum terdapat cadangan rasmi bagi pemasangan panel solar di bangunan-bangunan Politeknik Merlimau. Oleh itu, kajian ini dijalankan untuk mengenal pasti lokasi bangunan yang sesuai bagi pemasangan panel solar dengan menggunakan Sistem Maklumat Geografi (GIS) melalui perisian QGIS. Kajian ini memberi tumpuan kepada beberapa faktor seperti keluasan dan kecerunan bumbung, penerimaan cahaya matahari serta halangan seperti pokok dan bangunan di sekeliling. Pengumpulan data diperoleh melalui temu bual, imej Dron, data GNSS serta data Radiasi solar. Data tersebut akan diproses dan dianalisis menggunakan kaedah Overlay Analysis, Proximity Analysis dan Raster Surface Analysis dalam QGIS. Hasil daripada kajian ini dijangka dapat menghasilkan dua peta yang menunjukkan bangunan yang sesuai dan tidak sesuai untuk pemasangan panel solar di Politeknik Merlimau. Kajian ini juga diharapkan dapat membantu pihak politeknik dalam membuat perancangan pemasangan panel solar pada masa akan datang serta menyokong penggunaan tenaga hijau di kawasan kampus.

Kata kunci: Tenaga Solar, GIS, QGIS, Panel Solar, Bumbung Bangunan



Rajah 1: Analisis yang



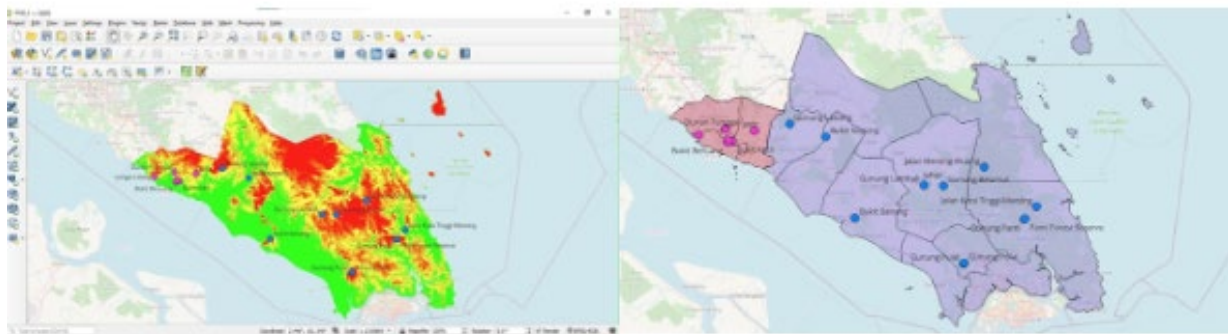
Rajah 2: Jangkaan Hasil Akhir

KAJIAN PEMETAAN KAWASAN BERISIKO TANAH RUNTUH DI NEGERI MELAKA DAN NEGERI JOHOR BAGI TAHUN 2020-2025 MENGGUNAKAN QGIS

Nur Batrisyia Binti Amran¹, Nur Suhaila Binti Zakaria², Nur Natasha Balqis Binti Zaidi³, Puan Suriawati Binti Jusoh⁴

Tanah runtuh merupakan salah satu bencana alam yang boleh memberi kesan kepada kehidupan manusia, infrastruktur, harta benda dan alam sekitar. Di Malaysia, kejadian tanah runtuh dipengaruhi oleh beberapa faktor seperti penilaian kecerunan, jenis tanah, taburan hujan, dan jenis guna tanah. Oleh itu, pemetaan kawasan berisiko tanah runtuh penting bagi membantu perancangan guna tanah, pengurusan bencana dan langkah pencegahan. Kajian ini dijalankan untuk memetakan kawasan berisiko tanah runtuh di negeri Melaka dan Johor bagi tempoh 2020 hingga 2025 dengan menggunakan Sistem Maklumat Geografi (GIS), khususnya perisian Quantum Geographic Information System (QGIS). Objektif kajian adalah untuk menganalisis faktor-faktor kejadian tanah runtuh serta memetakan dan mengenalpasti kawasan yang berpotensi berisiko mengalami tanah runtuh. Data kejadian tanah runtuh bagi tempoh 2020 hingga 2025 dikumpulkan daripada sumber yang berkaitan. Beberapa set data spatial seperti lokasi kejadian tanah runtuh, jenis tanah, kecerunan cerun dan taburan hujan digunakan sebagai faktor dalam penilaian risiko. Data tersebut diproses dan disusun dalam bentuk lapisan spatial menggunakan QGIS. Kaedah tindanan (overlay) digunakan bagi menggabungkan faktor-faktor risiko untuk menghasilkan peta kawasan berisiko tanah runtuh. Kaedah analisis spatial digunakan dengan menggabungkan beberapa lapisan faktor risiko bagi mengenal pasti hubungan antara kejadian tanah runtuh dengan ciri-ciri fizikal kawasan kajian. Kaedah tindanan (overlay) turut digunakan untuk menghasilkan peta risiko tanah runtuh berdasarkan faktor-faktor yang telah ditetapkan. Hasil kajian dipersembahkan dalam bentuk peta yang menunjukkan taburan dan tahap risiko tanah runtuh di negeri Melaka dan Johor. Peta yang dihasilkan dapat memberikan gambaran yang lebih jelas mengenai kawasan yang berpotensi terdedah kepada kejadian tanah runtuh sepanjang tempoh kajian. Maklumat ini diharapkan dapat membantu pihak yang bertanggungjawab dalam perancangan guna tanah, pengurusan alam sekitar dan usaha mengurangkan risiko bencana. Secara keseluruhannya, penggunaan QGIS dapat membantu dalam mengintegrasikan, menganalisis dan memvisualisasikan data spatial bagi menghasilkan pemetaan risiko tanah runtuh yang lebih sistematik.

Kata kunci: Tanah runtuh, Pemetaan risiko, Sistem Maklumat Geografi (GIS), QGIS, Analisis spatial



Rajah 1: Kedudukan lokasi tanah runtuh

SARUNG KAKI TRIPOD PELBAGAI FUNGSI

Azri Ilham Bin Azman¹, Muhammad Rifqi Rusyaidi Bin Nor Hafizan², Muhammad Alif Haikal Bin Suhaini³, Rohafiza Binti Md Darus⁴

Beg kaki tripod merupakan satu beg inovatif yang dihasilkan untuk memudahkan pelajar membawa peralatan tripod ke kawasan kerja ukur. Idea penghasilan beg ini tercetus apabila terdapat masalah dalam kalangan pelajar untuk membawa kaki tripod, terutamanya apabila kaki tripod tersebut sudah rosak atau tidak mempunyai tali untuk mengangkutnya. Keadaan ini menyebabkan pelajar perlu membawa kaki tripod dengan cara yang kurang selesa dan mengambil masa ketika bergerak ke kawasan kerja. Oleh itu, beg ini dihasilkan sebagai satu kemudahan untuk membantu pelajar membawa kaki tripod dengan lebih mudah dan teratur. Beg ini direka khas supaya kaki tripod boleh dimasukkan ke dalam ruang yang disediakan dan dibawa ke kawasan kerja dengan lebih mudah alih. Dengan adanya beg ini, pelajar tidak perlu memegang kaki tripod secara terus sepanjang perjalanan ke kawasan kerja. Selain itu, beg ini juga mempunyai poket pada bahagian sisi yang digunakan untuk penyimpanan peralatan kecil seperti picket, meter dan peralatan ukur yang lain. poket tersebut dapat membantu pelajar menyimpan peralatan kecil di satu tempat supaya lebih mudah dicapai apabila diperlukan semasa menjalankan kerja ukur. Penggunaan beg ini juga dapat membantu pelajar memastikan peralatan yang dibawa lebih tersusun dan tidak mudah tercicir. Selain itu, kaki tripod dan peralatan kecil dapat dibawa bersama dalam satu beg tanpa memerlukan ruang yang berasingan. Reka bentuk beg yang ringkas menjadikannya lebih praktikal untuk digunakan oleh pelajar semasa melakukan kerja ukur di dalam atau di luar kawasan pembelajaran. Beg ini juga boleh membantu mengurangkan kesukaran pelajar ketika membawa peralatan dari satu kawasan ke kawasan yang lain. Secara keseluruhannya, penghasilan beg kaki tripod ini dapat memberikan kemudahan kepada pelajar dalam membawa, menyimpan dan mengurus peralatan ukur. Produk ini diharapkan dapat membantu menjadikan kerja ukur lebih teratur serta memudahkan pelajar ketika menjalankan aktiviti di kawasan kerja.

Kata kunci: Beg inovatif; kaki tripod; mudah alih; penyimpanan peralatan kecil; praktikal. Beg inovatif; kaki tripod; mudah alih; penyimpanan peralatan kecil; praktikal.



Rajah 1: Kaedah penggunaan



Rajah 2: rupa bentuk beg

PEMETAAN KAWASAN CADANGAN TADAHAN AIR HUJAN DI SEKITAR POLITEKNIK MERLIMAU

Muhammad Daniel Firash Bin Mohd Nazim¹, Mohamad Danial Bin Kamil², Wan Eirrfann Myrza Bin Eizzuwan³,
Hasniza Binti Harun⁴

Mengikut kajian pakar negara-negara di asia Tenggara ini akan mengalami krisis air yang teruk dalam masa 5 hingga 6 tahun akan datang. Dengan perbanyakkan tangki tadahan air hujan di sekitar politeknik ia boleh membuat persediaan bagi warga politeknik untuk menghadapi krisis air apabila ia berlaku. Bukan itu sahaja dengan keadaan cuaca sekarang yang tidak menentu serta peningkatan bil air yang agak tinggi, pekara ini pihak pengurusan Politeknik Merlimau yang berkenaan secara tidak langsung boleh menggunakan cara alternatif yang lain bagi menjimatkan kos bil dengan menggunakan insiatif 'Green Campus' bagi melestarikan alam sekitar di Politeknik Merlimau. Antara masalah yang sering dihadapi oleh warga Politeknik Merlimau ialah kebergantungan penuh terhadap bekalan air yang terawat untuk kegunaan harian seperti cucian, penyiraman lanskap dan tandas yang boleh mengakibatkan peningkatan kos dan juga bil. Maka dengan itu kami mengesyorkan pihak Green Campus Politeknik Merlimau untuk melihat dan mengikuti pelan kami agar dapat mengoptimumkan penggunaan 'Green' di sekitar kawasan Politeknik Merlimau. Kami mengenalpasti lokasi startegik yang baharu dengan menggunakan GNSS untuk meletakkan tangki tadahan air hujan yang baharu. Kami mengambil berat dalam semua aspek untuk pemilihan tempat yang sesuai kawasan cadangan tadahan tangka air hujan ini. Antara aspeknya ialah keluasan bumbung, topografi kawasan yang dipilih dan aksesibiliti untuk mengalirkan air hujan tersebut. Secara kesimpulannya, projek kami ini bukan sahaja dapat memastikan bekalan air alternatif yang berterusan untuk kegunaan harian malah memupuk amalan kelestarian alam sekitar di Politeknik Merlimau.

Kata kunci: Tangki tadahan air, GNSS, kos bil, Green Campus, Politeknik Merlimau



Rajah 1: Kawasan Kajian

ANALISIS KAWASAN BERISIKO BANJIR DI DAERAH JASIN

Syaidatul Najihah Binti Sanusi¹, Nur Hidayah Binti Jaafar², Muhammad Irfan Bin Mohd Rasuli³, Hasan Bin Yusof@Talib⁴

Banjir merupakan salah satu bencana alam yang sering berlaku di Malaysia dan boleh memberi kesan terhadap keselamatan manusia, harta benda, infrastruktur serta persekitaran. Daerah Jasin, Melaka turut mempunyai kawasan yang berpotensi mengalami kejadian banjir, khususnya di kawasan rendah dan berhampiran sistem sungai. Oleh itu, projek ini dijalankan bagi menganalisis kawasan berisiko banjir di Daerah Jasin dengan menggunakan maklumat dan data hidrologi yang berkaitan. Objektif projek ini adalah untuk mengumpulkan data hidrologi daripada Jabatan Pengairan dan Saliran Malaysia (JPS) serta menganalisis data tersebut bagi mengenal pasti corak perubahan yang berkaitan dengan kejadian banjir. Kajian ini melibatkan proses penentuan kawasan kajian, kajian awal, pengumpulan data dan maklumat kawasan berisiko, semakan serta pemprosesan data, analisis data dan penilaian hasil. Data yang diperoleh dianalisis bagi mendapatkan gambaran mengenai hubungan antara taburan hujan dan perubahan paras air sungai serta mengenal pasti kawasan yang mempunyai kecenderungan terhadap kejadian banjir. Hasil kajian diharapkan dapat memberikan gambaran awal mengenai kawasan berisiko banjir di Daerah Jasin dan menjadi asas kepada perancangan serta kajian lanjutan berkaitan pengurusan risiko banjir.

Kata kunci: Banjir, Risiko Banjir, Daerah Jasin, Data Hujan, Paras Air Sungai, Jabatan Pengairan dan Saliran



Rajah 1: Kawasan Banjir di Daerah Jasin

HOTSPOT BANJIR JASIN
26 LOKASI

BIL	LOKASI	BIL	LOKASI	BIL	LOKASI
1	KAMPUNG PEKA LENDONG	10	KAMPUNG LUBOK KASU	20	KAMPUNG DATU
2	KAMPUNG MERIMAU PASIR	11	KAMPUNG TOMEI	21	KAMPUNG TASEK, SG. BAMBAN
3	KAMPUNG MASJID BARU	12	KAMPUNG TANJUNG LABUH	22	KAMPUNG LANCHANG
4	PEKAN SELAMENGA	13	KAMPUNG KILANG BERKAS	23	KAMPUNG TERGUSUN SERI-MONGGAT
5	PEKAN BATILMALU	14	KAMPUNG ULU CULONG	24	KAMPUNG PINTU PONDOK BENTENG
6	KAMPUNG BURIT ASAHAN	15	KAMPUNG TEDONG	25	KAMPUNG JANDA BERISIK
7	KAMPUNG KESANG TIA	16	KAMPUNG ASAM KUBANG	26	KAMPUNG PONDOK LAMBAK
8	KAMPUNG TENGAH BERIH	17	KAMPUNG SERIYAN FAKEN		
9	KAMPUNG AIR BAROK	18	KAMPUNG BERANGAN DUNAM		
		19	DUNGAH SERINING		

PETUNJUK:
Kawasan Rawat
Kawasan Tersekitar
Kawasan Baru

Rajah 2: Senarai Kawasan Hotspot Banjir

PETA DIGITAL BERASASKAN GIS BAGI FASILITI UTAMA JKA

Amar Taufiqillah Bin Mohd Rosdi¹, Muhammad Arif Aizat Bin Shahrizal², Muhammad Danish Adam Bin Zulfarhan³, Ayati Binti Parmen⁴

Perkembangan teknologi geospasial dan Sistem Maklumat Geografi (GIS) telah membuka peluang dalam penyediaan maklumat lokasi yang lebih sistematik, interaktif dan mudah diakses. Pengurusan serta pencarian lokasi fasiliti di Jabatan Kejuruteraan Awam (JKA), Politeknik Merlimau boleh menjadi satu cabaran kepada pengguna terutamanya pelajar, pensyarah, kakitangan dan pengunjung yang kurang mengetahui kedudukan serta susun atur fasiliti yang terdapat di kawasan jabatan. Penggunaan peta secara konvensional juga kurang memberikan gambaran menyeluruh mengenai lokasi dan maklumat setiap fasiliti. Sehubungan itu, projek Peta Digital Berasaskan GIS bagi Fasiliti Utama Jabatan Kejuruteraan Awam dibangunkan sebagai satu sistem WebGIS yang dapat membantu pengguna mengenal pasti, mencari dan mendapatkan maklumat berkaitan lokasi fasiliti dengan lebih mudah dan sistematik. Sistem ini mengintegrasikan teknologi Sistem Maklumat Geografi (GIS), pangkalan data geospasial, QGIS, WebGIS serta teknologi pemetaan berasaskan web dalam menghasilkan peta digital yang interaktif. Data spatial bagi bangunan, bilik dan fasiliti utama dikumpulkan, disusun dan dibangunkan dalam pangkalan data sebelum diproses menggunakan perisian QGIS. Data tersebut kemudiannya digunakan dalam pembangunan sistem WebGIS yang membolehkan pengguna melihat lokasi fasiliti secara interaktif serta membuat carian berdasarkan nama bilik atau fasiliti. Selain itu, sistem ini turut menyediakan maklumat aras bagi bilik tertentu, pautan paparan panorama 360° melalui platform Kuula serta fungsi navigasi bagi membantu pengguna mendapatkan arah ke lokasi yang dipilih. Antara fasiliti yang dipaparkan termasuk Bangunan JKA, bilik kuliah, studio senibina, makmal, bengkel, surau, tandas, parking dan Dewan Kuliah JKA. Sistem ini turut direka bentuk secara responsif supaya boleh digunakan melalui komputer dan peranti mudah alih. Pengujian sistem dilaksanakan bagi memastikan fungsi carian, paparan peta, maklumat lokasi, paparan 360° dan navigasi dapat berfungsi dengan baik. Hasil pembangunan menunjukkan bahawa WebGIS yang dihasilkan dapat menyediakan maklumat lokasi fasiliti JKA secara lebih tersusun, interaktif dan mudah dicapai oleh pengguna. Secara keseluruhannya, pembangunan peta digital ini dapat menyokong penggunaan teknologi geospasial dalam pengurusan dan penyampaian maklumat fasiliti serta membantu meningkatkan kemudahan pengguna dalam mengenal pasti lokasi fasiliti utama di Jabatan Kejuruteraan Awam, Politeknik Merlimau.

Kata kunci: Peta Digital, Sistem Maklumat Geografi (GIS), WebGIS, Fasiliti JKA, QGIS.



Rajah 1: Paparan muka hadapan sistem



Rajah 2: Paparan pemuka

ANALISIS PEMETAAN LITUPAN POKOK DI POLITEKNIK MERLIMAU MELAKA

Muhammad Adam Alfian Bin Mohd Hashim¹, Muhammad Eiman Hashry Bin Amir², Ammar Arsyad Bin Md Hisam³, Norlydah Binti Othman Latpi⁴

Perkembangan teknologi geospasial, Sistem Maklumat Geografi (GIS) dan teknologi Unmanned Aerial Vehicle (UAV) atau dron telah membuka peluang baharu dalam pengurusan inventori dan pemetaan sumber alam secara lebih sistematik. Pengurusan data pokok di kawasan kampus memerlukan maklumat yang tepat berkaitan lokasi, spesies, status, ukuran diameter dan ketinggian pokok bagi membantu pihak pengurusan dalam membuat perancangan serta pemantauan aset landskap. Sehubungan itu, projek Analisis Pemetaan Litupan pokok di Politeknik Merlimau Melaka dijalankan bagi menghasilkan pemetaan dan pangkalan data inventori pokok yang lebih tersusun serta menyediakan maklumat berkaitan anggaran serapan karbon oleh pokok di kawasan kajian. Projek ini menggunakan data inventori sedia ada, data lapangan dan imej UAV sebagai sumber utama dalam pengumpulan serta pengemaskinian maklumat pokok. Data UAV diproses menggunakan perisian Agisoft melalui proses fotogrametri bagi menghasilkan orthomosaic, point cloud, model 3D, Digital Elevation Model (DEM), Digital Surface Model (DSM) dan Digital Terrain Model (DTM). Seterusnya, data DSM dan DTM digunakan dalam perisian QGIS untuk menghasilkan Canopy Height Model (CHM) bagi mendapatkan anggaran ketinggian pokok berdasarkan lokasi pokok yang telah dipetakan. Data diameter atau lilitan pokok, ketinggian, spesies dan status pokok kemudiannya disusun dan dianalisis bagi mengenal pasti taburan pokok, status pokok serta anggaran biomass dan serapan karbon. Hasil analisis kemudiannya diintegrasikan ke dalam pangkalan data GIS bagi menghasilkan peta taburan pokok dan sistem maklumat pokok yang membolehkan maklumat setiap pokok dikenal pasti dengan lebih mudah. Sistem ini juga berpotensi membantu Unit Pembangunan dan Selenggara (UPS) dalam proses pemantauan, pengemaskinian inventori dan perancangan pengurusan pokok di kawasan kampus. Secara keseluruhannya, projek ini menunjukkan bahawa integrasi teknologi UAV, GIS dan analisis data dapat meningkatkan kecekapan pengurusan inventori pokok serta menyediakan maklumat spatial yang lebih sistematik untuk menyokong pengurusan landskap dan alam sekitar di Politeknik Merlimau Melaka.

Kata kunci: Pemetaan Pokok, UAV, GIS, Inventori Pokok, Serapan Karbon, QGIS, Politeknik Merlimau Melaka.



Rajah 1: Paparan Antara muka Sistem



Rajah 2: Cara Penggunaan

APLIKASI KAMPUS HIJAU MENGGUNAKAN KAEDAH GIS

Nurin Natasha Binti Ahmad Rostam¹, Nurul Masturina Auji Binti Rosdi², Alyia Nur Aishyah Binti Rusli³, Cik Noor Faizah Binti Zohardin⁴

Projek ini dibangunkan bagi menghasilkan satu aplikasi Kampus Hijau berasaskan Sistem Maklumat Geografi (GIS) untuk memudahkan warga kampus mengenal pasti lokasi dan mendapatkan maklumat berkaitan inisiatif hijau yang terdapat di kawasan kampus. Projek ini mempunyai tiga objektif utama, iaitu mengenal pasti dan mengumpul data lokasi bagi inisiatif Kampus Hijau seperti sistem penuaian air hujan, panel solar dan kawasan pengangkutan menggunakan koordinat geospasial. Aplikasi Kampus Hijau berasaskan GIS dibangunkan untuk memaparkan lokasi dan maklumat berkaitan dalam bentuk peta digital, serta memudahkan warga kampus mengenal pasti lokasi inisiatif hijau dengan lebih cepat dan sistematik melalui aplikasi peta digital yang interaktif. Data koordinat dikumpulkan menggunakan telefon pintar melalui aplikasi GPS sebelum diproses dan dipetakan menggunakan perisian QGIS. Seterusnya, Canva AI digunakan bagi membantu menghasilkan reka bentuk visual dan antaramuka aplikasi yang lebih menarik serta mesra pengguna. Hasil projek ini menyediakan satu platform peta digital yang memaparkan lokasi inisiatif Kampus Hijau secara lebih teratur dan mudah difahami. Aplikasi ini diharapkan dapat membantu warga kampus mendapatkan maklumat lokasi dengan lebih cepat, meningkatkan kesedaran terhadap inisiatif kelestarian, serta menunjukkan penggunaan teknologi GIS sebagai medium yang berkesan dalam pemetaan dan penyampaian maklumat Kampus Hijau.

Kata kunci: Kampus Hijau, Sistem Maklumat Geografi (GIS), QGIS, GPS, Koordinat Geospasial, Peta Digital, Canva AI



Rajah 1: Paparan Antara muka Sistem



Rajah 2: Cara Penggunaan

ANALISIS PERUBAHAN KEPADATAN PENDUDUK MENGIKUT DAERAH DI NEGERI MELAKA PADA TAHUN 2010 DAN 2020

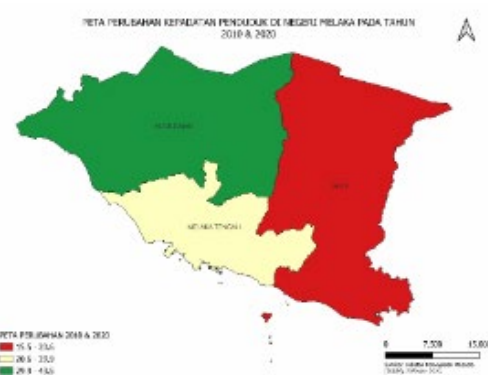
Fatin Irdina Binti Thajuddin¹, Nuraina Nazurah Binti Mohd Allawi², Nur Arisa Batrisyia Binti Mohd Asraf³, Hasan Bin Yusuf @ Talip⁴

Kajian ini dijalankan untuk menganalisis perubahan kepadatan penduduk di negeri Melaka bagi tahun 2010 dan 2020. Perubahan jumlah penduduk merupakan salah satu aspek penting dalam perancangan pembangunan dan pengurusan sesuatu kawasan kerana peningkatan penduduk boleh mempengaruhi tahap kepadatan serta keperluan terhadap kemudahan awam. Kawasan kajian melibatkan tiga daerah pentadbiran di negeri Melaka, iaitu Alor Gajah, Jasin dan Melaka Tengah. Data jumlah penduduk bagi tahun 2010 dan 2020 diperoleh daripada Jabatan Perangkaan Malaysia (DOSM), manakala data keluasan daerah digunakan untuk mendapatkan nilai kepadatan penduduk. Kaedah kajian melibatkan pengumpulan dan penyusunan data, pengiraan kepadatan penduduk serta analisis perubahan antara tahun 2010 dan 2020. Pengiraan dan analisis data dilakukan menggunakan Microsoft Excel, manakala QGIS digunakan untuk menghasilkan paparan peta kepadatan mengikut daerah kajian. Hasil kajian menunjukkan bahawa ketiga-tiga daerah mengalami peningkatan jumlah penduduk dan kepadatan penduduk antara tahun 2010 dan 2020. Alor Gajah mencatatkan peratus peningkatan penduduk yang paling tinggi berbanding daerah kajian yang lain. Secara keseluruhannya, kajian ini memberikan gambaran mengenai perubahan kepadatan penduduk di daerah-daerah terpilih di negeri Melaka dan dapat menjadi maklumat sokongan dalam memahami taburan penduduk serta perancangan pembangunan kawasan.

Kata kunci: Kepadatan Penduduk, Perubahan Penduduk, Melaka, DOSM, QGIS, Sistem Maklumat Geografi.



Rajah 1: Peta Kawasan Kajian di Negeri



Rajah 2: Peta Perubahan Kepadatan Penduduk di Negeri Melaka, 2010 & 2020

SURVEY TOOLS HARNESS

Muhammad Hairie Bin Jasmin¹, Muhammad Hafiz Aiman Bin Ahmad Sabri², Adha Syafi Bin Mohd Ismail³, Hasniza Binti Harun⁴

Kerja ukur di lapangan memerlukan penggunaan pelbagai peralatan seperti kaki tiga, “levelling staff”, “mini prism”, “mini prism pole”, piket, “survey arrow”, tukul dan peralatan kecil yang lain. Penggunaan peralatan yang banyak boleh menyebabkan masalah dari segi pengangkutan, penyusunan, penyimpanan peralatan serta keselesaan pengguna semasa menjalankan kerja lapangan. Oleh itu, projek ini bertujuan untuk membangunkan “Survey Tools Harness”, iaitu satu alat pengangkut alatan ukur yang dapat membantu pengguna membawa dan mengurus peralatan ukur dengan lebih sistematik dan praktikal. Projek ini memberi tumpuan kepada reka bentuk “harness” yang ergonomik, mudah digunakan dan mempunyai ruang atau sokongan yang sesuai untuk membawa peralatan ukur, termasuk kaki tiga di bahagian belakang. Selain itu, bahan kitar semula seperti denim terpakai digunakan sebagai salah satu bahan dalam pembangunan prototaip bagi menyokong konsep kelestarian alam sekitar ataupun hijau. Kaedah pembangunan projek melibatkan kajian keperluan pengguna, reka bentuk produk, pemilihan bahan, pembangunan prototaip serta pengujian terhadap alat yang dihasilkan. Prototaip akan diuji dari aspek had kapasiti yang boleh dibawa, ketahanan bahan yang digunakan, kestabilan dalam membawa alatan ukur, keselesaan kepada pengguna dan kemudahan dalam penggunaan alat yang dihasilkan. Hasil yang dijangkakan ialah sebuah “Survey Tools Harness” yang dapat meningkatkan kecekapan pengguna, mobiliti dan keselesaan pengguna semasa membawa peralatan ukur ke lapangan.

Kata kunci: Survey Tools Harness, peralatan ukur, pengangkutan, ergonomik, bahan kitar semula.



Rajah 1: Pandangan Hadapan

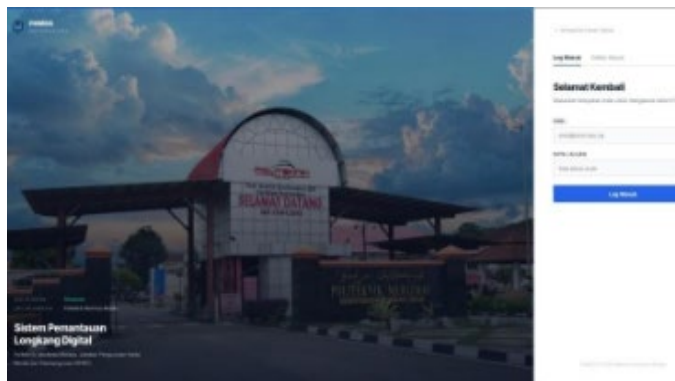
Rajah 2: Pandangan Belakang

KAJIAN ALIRAN AIR DI KAMPUS POLITEKNIK MERLIMAU MELAKA

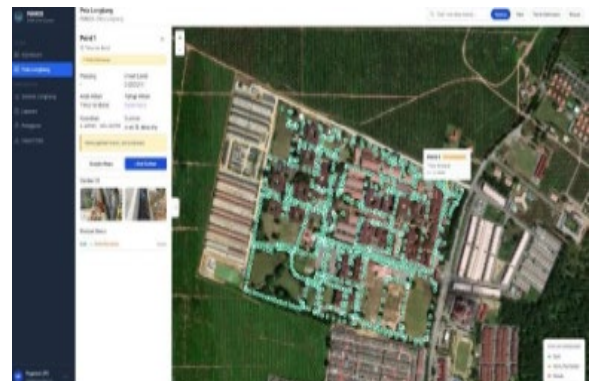
Auni Khairina Bt Abd Shukor¹, Nur Afifah Husna Bt Ab Razak², Nurul Ezzairah Fitriya Bt A. Sabri³, Ahmad Yusof Bin Sahdan⁴

Kajian ini dijalankan bagi menilai keadaan fizikal dan kecekapan sistem saliran di dalam kampus Politeknik Merlimau Melaka (PMM) bagi menangani isu air bertakung serta kelemahan rangkaian saliran sedia ada. Pembangunan kemudahan kampus dan pertambahan kawasan berturap telah mengubah corak aliran air permukaan, sekali gus meningkatkan beban terhadap sistem saliran. Kajian ini melibatkan pengumpulan data lapangan melalui kerja ukur tanah serta pemrosesan dan pemetaan digital menggunakan teknik geomatik bagi menggambarkan keadaan semasa sistem saliran. Hasil analisis membolehkan pengenalpastian kerosakan fizikal, saluran tersumbat dan saliran yang tidak berfungsi dengan baik, seterusnya membantu dalam merangka cadangan penambahbaikan yang bersesuaian. Selain itu, satu sistem pemantauan saliran dicadangkan bagi memudahkan proses pengesanan, perekodan dan pengurusan maklumat saliran secara lebih sistematik. Secara keseluruhannya, kajian ini diharapkan dapat meningkatkan kecekapan pengurusan saliran dan menyokong pembangunan PMM yang lebih terancang serta mampan.

Kata kunci: Sistem saliran, geomatik, pemetaan digital, sistem pemantauan, Politeknik Merlimau Melaka.



Rajah 1: Landing page



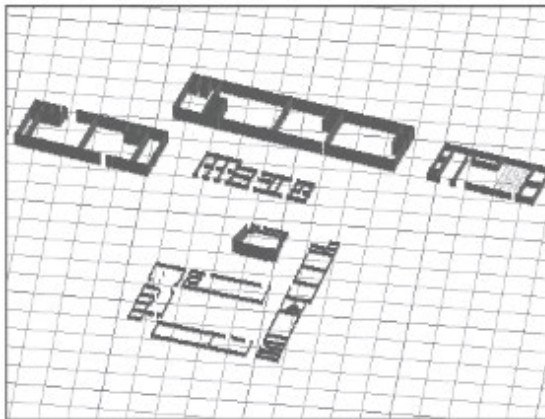
Rajah 2: Admin Panel

PENGHASILAN PELAN LANTAI (STRATEGIK) BAGI FIRE EXTINGUISHER DI JKA , PMM MENGGUNAKAN ARCGIS

Muhammad Muizzuddin Bin Sahbuddin¹, Muhammad Aqil Fahmi Bin Iswadi², Adib Athari Bin Sahriel³, Puan Rohafiza Binti Md Darus⁴

Kajian ini bertujuan untuk membangunkan sistem pemetaan pelan lantai strategik bagi alat pemadam api di Jabatan Kejuruteraan Awam (JKA), Politeknik Merlimau (PMM) dengan menggunakan teknologi Sistem Maklumat Geografi (GIS) melalui perisian ArcGIS Pro. Masalah utama yang dikenal pasti dalam kajian ini ialah ketiadaan pangkalan data visual yang teratur, di mana maklumat peralatan keselamatan kebakaran hanya direkodkan secara manual, sekali gus melambatkan masa tindak balas semasa kecemasan serta menyukarkan pemantauan status penyelenggaraan peralatan. Objektif utama projek ini adalah untuk menghasilkan pelan lantai digital 2D dan pemodelan 3D interaktif yang menggabungkan data spatial (lokasi) dan data atribut peralatan secara masa nyata. Metodologi kajian merangkumi pengumpulan data primer melalui tinjauan lapangan (site visit) di blok-blok bangunan JKA untuk merekodkan koordinat lokasi tepat menggunakan GPS, pengumpulan data atribut (jenis medium seperti CO2 dan Debu Kering, tarikh luput, nombor siri, serta status servis) melalui temubual bersama pihak Unit Pembangunan dan Selenggara (UPS), serta penggambaran udara menggunakan drone bagi tujuan pemodelan. Pemprosesan data dilaksanakan menggunakan perisian AutoCAD dan ArcGIS untuk penghasilan pelan lantai 2D, manakala perisian AutoCad juga digunakan bagi membina model bangunan 3D yang realistik. Hasil kajian selidik menunjukkan bahawa 96.6% responden bersetuju bahawa pelan lantai digital interaktif adalah lebih berkesan berbanding pelan fizikal sedia ada, manakala 96.7% bersetuju akan kepentingannya bagi warga JKA. Kesimpulannya, inovasi pemetaan digital ini mentransformasikan pengurusan keselamatan kebakaran di PMM daripada kaedah tradisional kepada sistem berasaskan digital yang lebih efisien, sistematik, dan mudah diakses bagi urusan audit serta penyelenggaraan berkala.

Kata kunci: Pelan Lantai Digital, Pemodelan 3D, Keselamatan Kebakaran, Sistem Maklumat Geografi (GIS), Alat Pemadam Api



Rajah 1: Pemodelan 3d dalam perisian AutoCad



Rajah 2: Pemodelan 2D dalam perisian ArcGis



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