B V V Sangha,
Basaveshwara Engineering College, Bagalkot

Scheme of Teaching and Evaluation of 1st year Civil Engineering

(Effective from the academic year 2025-26)

I Semester **(Chemistry Group)**

Sl/ No	Course and Course Code		Course Title	TD/PSB	Teaching Hours/Week			SAAE/Per Sem		Examinations Hours				Credits	Contact Hour Per Sem
					Theory Lecture	Tutorial	Practical/ Drawing	Study Hours	Assig/ Quizes / MCQs etc	Duration in Hours	CIE Marks	SEE Marks	Total Marks		
					L	T	P								
1	ASC	1BMAC101C	Differential Calculus and Linear Algebra for CV stream	Maths Dept	3	2	0	42	8	03	50	50	100	**04**	120
2	ASC(IC)	1BCHC102C	Applied Chemistry for CV stream	CHE Dept	3	0	2	42	8	03	50	50	100	**04**	120
3	ETC	**1BAIA103C**	**Introduction to AI and Applications**	Any Dept	3	0	0	42	8	03	50	50	100	**03**	90
4	ESC-I	**1BEEA104N**	**Introduction to Electrical Engineering**	Respective Engg Dept	3	0	0	42	8	03	50	50	100	**03**	90
5	PLC(IC)	**1BCSA105D**	**Introduction to C Programming**	CSE & allied Dept	3	0	2	42	8	03	50	50	100	**04**	120
6	AEC	1BHSB106C	Communication Skills	Humanities Dept	1	0	0	12	6	02	50	50	100	**01**	30
7	AEC (NCMC)	1BHSC107M	Indian Constitution & Engineering Ethics	Humanities Dept	1	0	0	12	6	--	100	--	100	**PP**	30
8	AEC/SDC	1BCVA108P	Innovation and Design Thinking Lab	Respective Dept	0	0	2	0	2	02	50	50	100	**01**	30
	TOTAL				**17**	**02**	**06**	**234**	**54**	**19**	**450**	**350**	**800**	**20**	**630**
9	AICTE Activity Points (students have to earn 100 activity points between 01 to 08 semesters)				Compulsory requirement for the award of a degree										

Applied Mathematics-I					Applied Chemistry				
Code	Title	L	T	P	Code	Title	L	T	P
1BMAC101C	**Differential Calculus and Linear Algebra for CV Stream**	3	2	0	**1BCHC102C**	**Applied Chemistry for CV stream**	3	0	2
1BMAM101C	Differential Calculus and Linear Algebra: ME Stream	3	2	0	1BCHM102C	Applied Chemistry for (ME stream)	3	0	2
1BMAE101C	Differential Calculus and Linear Algebra: EEE stream	3	2	0	1BCHE102C	Applied Chemistry for (EEE, ECE stream)	3	0	2
1BMAS101C	Calculus And Linear Algebra: CSE stream	3	2	0	1BCHS102C	Applied Chemistry for (CSE stream)	3	0	2
Engineering Science Courses-I (ESC-I)					**Programming Language Courses (PLC)**				
Code	Title	L	T	P	Code	Title	L	T	P
1BCVA104N	**Introduction to Civil Engineering**	3	0	0	**1BCSA105D**	**Introduction to C Programming (For none IT programmes)**	3	0	0
1BEEA104N	**Introduction to Electrical Engineering**	3	0	0	1BBCB105D	Python Programming (for CSE and allied programmes)	3	0	0
1BECA104N	Introduction to Electronics and Communication Engineering	3	0	0					
1BMEA104N	Introduction to Mechanical Engineering	3	0	0					
1BISA104N	Essentials of Information Technology	3	0	0					

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Scheme of Teaching and Evaluation of 1st year Civil Engineering
(Effective from the academic year 2025-26)

II Semester (For those who have studied Chemistry Group in I semester) **(Physics Cycle)**

Sl/ No	Course and Course Code		Course Title	TD/PSB	Teaching Hours/Week			SAAE/ Sem		Examinations Hours				Credits	Contact Hour Per Sem
					Theory Lecture	Tutorial	Practical/ Drawing	Study Hours	Assig/Quizes/ MCQs etc	Duration in Hours	CIE Marks	SEE Marks	Total Marks		
					L	T	P								
1	ASC	1BMAC201C	Differential Calculus and Numerical Methods for CV stream	Maths Dept	3	2	0	42	8	03	50	50	100	**04**	120
2	ASC(IC)	1BPHC202C	Physics for Sustainable Structural Systems	PHY Dept	3	0	2	42	8	03	50	50	100	**04**	120
3	ESC	1BMEA203C	Computer-Aided Engineering Drawing for CV Stream	ME Dept	2	0	2	42	8	03	50	50	100	**03**	90
4	ESC-II	1Bxxx204N	Engineering Science Course-II	Respective Engg Dept	3	0	0	42	8	03	50	50	100	**03**	90
5	PSC	1BxxA205C **1BCVA205C**	Programme Specific Courses **Engineering Mechanics**	Respective Engg Dept	3	0	0	42	8	03	50	50	100	**03**	90
6	AEC (NCMC)	1BHSA206M	Soft Skills	Humanities Dept	1	0	0	12	6	-	100	---	100	**PP**	30
7	HSMC	1BHSA207C/ 1BHSB207C	Samskrutika Kannada/ Balake Kannada	Humanities Dept	1	0	0	12	6	01	50	50	100	**01**	30
8	AEC/SDC	1Bxxx208P 1BCVA208P	Inter disciplinary Project-Based Learning	Combination of Dept	0	0	2	0	2	02	50	50	100	**01**	30
9	PSC/ESC	1BxxA209L **1BCVA209L**	Program-Specific Course Lab **Mechanics and Materials Lab**	Respective Dept	0	0	2	0	2	02	50	50	100	**01**	30
	TOTAL				16	02	08	234	56	20	500	400	900	**20**	630
9	AICTE Activity Points (students have to earn 100 activity points between 01 to 08 semesters)				Compulsory requirement for the award of a degree										

Applied Mathematics-II					Applied Physics				
Code	Title	L	T	P	Code	Title	L	T	P
1BMAC201C	**Differential Calculus and Numerical Methods (CV stream)**	3	2	0	**1BPHC202C**	**Physics for Sustainable Structural Systems (CV stream)**	3	0	2
1BMAM201C	Multivariable Calculus and Numerical Methods: ME stream	3	2	0	1BPHM202C	Physics of Materials (Mech stream)	3	0	2
1BMAE201C	Calculus, Laplace Transform, and Numerical Techniques: EEE stream	3	2	0	1BPHE202C	Quantum Physics & Engineering Materials (EEE stream)	3	0	2
1BMAS201C	Numerical Methods: CSE Stream	3	2	0	1BPHS202C	Quantum Physics and Quantum Computing (CSE stream)	3	0	2
Programme Specific Courses (PSC)					**Programme Specific Courses Lab (PSCL)**				
1BCVA205C	**Engineering Mechanics**	3	0	0	**1BCVA209L**	**Mechanics and Materials Lab**	0	0	2
1BMEA205C	Elements of Mechanical Engineering	3	0	0	1BMEA209L	Elements of Mechanical Engineering Lab	0	0	2
1BEEA205C	Basic Electrical Engineering	3	0	0	1BEEA209L	Basic Electrical Engineering Lab	0	0	2
1BCEA205C	Fundamentals of Electronics & Communication Engineering	3	0	0	1BCEA209L	Fundamentals of Electronics & Communication Engineering Lab	0	0	2
1BCSA205C	Programming in C	3	0	0	1BCSA209L	C Programming Lab	0	0	2
1BBTA205C	Elements of Biotechnology and Biomimetic	3	0	0	1BBTA209L	Elements of Biotechnology Lab	0	0	2
Engineering Science Courses-II (ESC-II)					**Computer-Aided Engineering Drawing**				
1BCVA204N	Introduction to Civil Engineering	3	0	0	Code	Title	L	T	P
1BEEA204N	Introduction to Electrical Engineering	3	0	0	**1BMEA203C**	**Computer-Aided Engineering Drawing for CV Stream**	2	0	2
1BECA204N	Introduction to Electronics & Communication Engineering	3	0	0	1BMEM203C	Computer-Aided Engineering Drawing for ME stream Engineering	2	0	2
1BMEA204N	Introduction to Mechanical Engineering	3	0	0	1BMEE203C	Computer-Aided Engineering Drawing for EEE stream	2	0	2
1BISA204N	Essentials of Information Technology	3	0	0	1BMEA203C	Computer-Aided Engineering Drawing for CSE stream	2	0	2

1BCVA104N	INTRODUCTION TO CIVIL ENGINEERING	03-Credits (3:0:0)
Hrs/Week : 03		CIE Marks:50
Total Hours: 40		SEE Marks:50

UNIT - I	10 Hrs

Introduction to building science: Importance and Scope of various fields of Civil Engineering: Surveying, Structural Engineering, Geotechnical Engineering, Water Resources Engineering, Transportation Engineering, Environmental Engineering, Construction Planning and Project Management.

Basic Materials of Construction: Types and Uses of Bricks, Stones, Cement, Structural Steel, Wood and Concrete.

Structural Elements of a Building: Concept of Foundation, Plinth, Lintel, Chejja, Masonry wall, Column, Beam, Slab, Flooring and Staircase.

UNIT – II	10 Hrs

Force Systems: Concept of idealization, System of forces, Principles of transmissibility of a force, Resolution and composition of forces, Law of Parallelogram of forces, Concurrent and non-concurrent coplanar force systems, Moment of forces, Couple, Varignon's theorem: Numerical examples.

UNIT - III	10 Hrs

Equilibrium and Support Reactions Free body diagram, equations of equilibrium, Lami's Theorem, Equilibrium of Coplanar Concurrent and Non -concurrent force systems: Numerical examples.

Types of loadings, beams and supports, Concept of Statically determinate and indeterminate structures (Definitions with examples only), Support reactions: Numerical examples on Statically determinate beams.

UNIT - IV	10 Hrs

Centroid of Plane areas: Introduction, Locating the centroid of rectangle, triangle, circle, semicircle and quadrant of a circle using method of integration, centroid of composite areas and simple built up sections: Numerical examples.

Moment of Inertia of plane Areas: Introduction, Moment of inertia about an axis, Parallel axes theorem, Perpendicular axes theorem, Polar moment of inertia, Radius of gyration. second moment of inertia of square, rectangular, triangular and circular areas from the method of Integration, Moment of inertia of composite areas and simple built-up sections: Numerical Examples.

Text books:

1. Rangwala, Building Construction,33rd Edition, 2016, Charotar Publishing House Pvt. Ltd., ISBN-10 : 9385039040, ISBN-13 : 978-9385039041
2. Bansal R. K., Rakesh Ranjan Beohar and Ahmad Ali Khan, Basic Civil Engineering and Engineering Mechanics, 3rd Edition, 2015, Laxmi Publications, ISBN: 9789380856674.
3. Kolhapure B K, Elements of Civil Engineering and Engineering Mechanics, 11th Edition, 2018, Eastern Book Promoters Belgaum [EBPB], ISBN: 5551234003896

Reference Books:

1. Beer F.P. and Johnston E. R., Mechanics for Engineers: Statics and Dynamics, 4th Edition, 1987, McGraw Hill, ISBN: 9780070045842
2. Meriam J. L. and Kraige L. G, Engineering Mechanics-Statics, Vol I–6th Edition,2008, Wiley publication.
3. Irving H. Shames, Engineering Mechanics-Statics and Dynamics, 4th Edition, 2002, Prentice-Hall of India(PHI).
4. Hibbler R. C., Engineering Mechanics: Principles of Statics and Dynamics, 2017, Pearson Press, New Delhi.
5. Timoshenko S, Young D. H., Rao J. V., Sukumar Patil, Engineering Mechanics, 5th Edition, 2017,McGraw Hill Publisher, ISBN: 9781259062667
6. Bhavikatti S S, Engineering Mechanics, 4th Edition, 2018, New Age International Publications.
7. Reddy Vijaykumar K and Suresh Kumar K, Engineering Mechanics, 3rd Edition 2013, BS Publications

QUESTION PAPER PATTERN FOR SEE

1. Total of Eight Questions with two from each unit to be set uniformly covering the entire syllabus.
2. Each Question should not have more than four sub divisions.
3. Any FIVE Full questions are to be answered choosing at least one from each unit.

Course Outcomes: After completion of the course students will be able to

1. Explain the fundamental concepts of building science, disciplines of civil engineering, construction materials, and structural elements of buildings.
2. Evaluate the sustainability aspects of the built environment through appropriate selection of green materials and interpretation of rating systems.

3. Apply the principles of force systems and equilibrium to determine support reactions.
4. Locate the centroid of simple and composite plane areas using first principles.

Web links and Video Lectures (e-Resources):

- https://www.youtube.com/watch?v=nGfVTNfNwnk&list=PLOSWwFV98rfKXq2KBphJz95rao7q8PpwT
- https://www.youtube.com/watch?v=nkg7VNW9UCc&list=PLOSWwFV98rfKXq2KBphJz95rao7 q8PpwT&index=2
- https://www.youtube.com/watch?v=ljDIIMvxeg&list=PLOSWwFV98rfKXq2KBphJz95rao7q8P pwT&index=5
- https://www.youtube.com/watch?v=3YBXteL-qY4
- https://www.youtube.com/watch?v=z95UW4wwzSc&list=PLOSWwFV98rfKXq2KBphJz95rao7 q8PpwT&index=10
- https://www.youtube.com/watch?v=ksmsp9OzAsI
- https://www.youtube.com/watch?v=x1ef048b3CE
- https://www.youtube.com/watch?v=l_Nck-X49qc
- https://www.youtube.com/watch?v=R8wKV0UQtlo
- https://www.youtube.com/watch?v=0RZHHgL8m_A
- https://www.youtube.com/watch?v=Bls5KnQOWkY

Activity-Based Learning (Suggested Activities in Class)/ Practical Based learning

- https://www.youtube.com/watch?v=Zrc_gB1YYS0
- https://www.youtube.com/watch?v=Hn_iozUo9m4

CO MAPPING WITH PO'S AND PSO'S

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11		PSO 1	PSO 2	PSO 3
CO 1	3	3	3	--	--	2	--	3	--	--	--		--	2	--
CO 2	3	3	3	--	--	2	--	3	--	--	--		--	2	--
CO 3	3	3	3	--	--	2	--	3	--	--	--		--	2	--
CO4	3	3	3	--	--	2	--	3	--	--	--		--	2	--
AVG.	3	3	3	--	--	2	--	3	--	--	--		--	2	--

1BCVA205C	ENGINEERING MECHANICS	03-Credits (3:0:0)
Hrs/Week : 03		CIE Marks:50
Total Hours: 40		SEE Marks:50

UNIT – I	10 Hrs

Introduction to Engineering Mechanics: Particle, continuum, rigid body, laws of motion, law of parallelogram, forces, polygon forces, classification of force system, resolution and addition of forces, Principle of transmissibility of force. Resultant of co-planar concurrent force system. Lami's theorem, Equilibrium of a particle, Numerical problems.

Forces in Space: Resultant of non-coplanar concurrent forces. Equilibrium of non-coplanar concurrent forces. Numerical Problems.

UNIT – II	10 Hrs

Moment and couple: Definition of moment, moment of a couple, characteristics of a couple, equivalent force and couple system, Varignon's principle, resultant of coplanar non concurrent force system. Numerical problems.

Support reactions: Types of loadings, beams and supports, Concept of Statically determinate and indeterminate structures, Support reactions: Numerical examples on Statically determinate beams subjected to various loads.

UNIT - III	10 Hrs

Analysis of Trusses: Introduction, Classification of trusses, analysis of plane perfect trusses by the method of joints and method of sections, Numerical examples.

Friction: Introduction, laws of Coulomb friction, equilibrium of blocks on horizontal plane, equilibrium of blocks on inclined plane, Numerical examples.

UNIT - IV	10 Hrs

Centroid of plane areas: Introduction, Locating the centroid of rectangle, triangle, circle, semicircle and quadrant of a circle using method of integration, centroid of composite areas and simple built up sections: Numerical examples.

Moment of Inertia of plane areas: Introduction, Moment of inertia about an axis, Parallel axes theorem, Perpendicular axes theorem, Polar moment of inertia, Radius of gyration. second moment of inertia of square, rectangular, triangular and circular areas from the method of Integration, Moment of inertia of composite areas and simple built-up sections: Numerical Examples.

Text books:

1. Rangwala, Building Construction,33rd Edition, 2016, Charotar Publishing House Pvt. Ltd., ISBN-10 : 9385039040, ISBN-13 : 978-9385039041
2. Bansal R. K., Rakesh Ranjan Beohar and Ahmad Ali Khan, Basic Civil Engineering and Engineering Mechanics, 3rd Edition, 2015, Laxmi Publications, ISBN: 9789380856674.
3. Kolhapure B K, Elements of Civil Engineering and Engineering Mechanics, 11th Edition, 2018, Eastern Book Promoters Belgaum [EBPB], ISBN: 5551234003896

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3. Irving H. Shames, Engineering Mechanics-Statics and Dynamics, 4th Edition, 2002, Prentice-Hall of India(PHI).
4. Hibbler R. C., Engineering Mechanics: Principles of Statics and Dynamics, 2017, Pearson Press, New Delhi.
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6. Bhavikatti S S, Engineering Mechanics, 4th Edition, 2018, New Age International Publications.
7. Reddy Vijaykumar K and Suresh Kumar K, Engineering Mechanics, 3rd Edition 2013, BS Publications

Question paper pattern for SEE

1. Total of Eight Questions with two from each unit to be set uniformly covering the entire syllabus.
2. Each Question should not have more than four sub divisions.
3. Any FIVE Full questions are to be answered choosing at least one from each unit.

Course Outcomes: After completion of the course students will be able to

1. Understand the concept of coplanar and non-coplanar concurrent force system.
2. Apply the principles of force systems and equilibrium to determine support reactions.
3. Analyze the truss and frictional resistance offered by different planes.

4. Locate the centroid of simple and composite plane area using first principles.

Web links and Video Lectures (e-Resources):

1. https://www.youtube.com/watch?v=nGfVTNfNwnk&list=PLOSWwFV98rfKXq2KBphJz95rao7q8 PpwT
2. https://www.youtube.com/watch?v=nkg7VNW9UCc&list=PLOSWwFV98rfKXq2KBphJz95rao 7q8PpwT&index=2
3. https://www.youtube.com/watch?v=ljDIIMvxeg&list=PLOSWwFV98rfKXq2KBphJz95rao7q 8PpwT&index=5
4. https://www.youtube.com/watch?v=VQRcChR9IkU&list=PLOSWwFV98rfKXq2KBphJz95r ao7q8PpwT&index=18
5. https://www.youtube.com/watch?v=3YBXteL-qY4
6. https://www.youtube.com/watch?v=z95UW4wwzSc&list=PLOSWwFV98rfKXq2KBphJz95r ao7q8PpwT&index=10
7. https://www.youtube.com/watch?v=lheoBL2QaqU&list=PLOSWwFV98rfKXq2KBphJz95rao 7q8PpwT&index=7
8. https://www.youtube.com/watch?v=atoP5_DeTPE
9. https://www.youtube.com/watch?v=ksmsp9OzAsI
10. https://www.youtube.com/watch?v=x1ef048b3CE
11. https://www.youtube.com/watch?v=I_Nck-X49qc
12. https://play.google.com/store/apps/details?id=appinventor.ai_jgarc322.Resultant_Force 3
13. https://www.youtube.com/watch?v=RIBeeW1DSZg
14. https://www.youtube.com/watch?v=R8wKV0UQtlo
15. https://www.youtube.com/watch?v=0RZHHgL8m_A
16. https://www.youtube.com/watch?v=Bls5KnQOWkY

CO MAPPING WITH PO'S AND PSO'S

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO 1	3	3	3	--	--	2	--	3	--	--	--	--	2	--
CO 2	3	3	3	--	--	2	--	3	--	--	--	--	2	--
CO 3	3	3	3	--	--	2	--	3	--	--	--	--	2	--
CO4	3	3	3	--	--	2	--	3	--	--	--	--	2	--
AVG.	3	3	3	--	--	2	--	3	--	--	--	--	2	--

1BCVA209L	MECHANICS AND MATERIALS LABORATORY	01-Credits (1:0:0)
Hrs/Week : 02		CIE Marks:50
Total Hours: 26		SEE Marks:50

PART A

PART – A COVENTIONAL EXPERIMENTS

1. Verification of Lami's Theorem.
2. Equilibrium of concurrent forces.
3. Parallel force system- Simply supported beam.
4. Verification of Varignon's theorem.
5. Specific Gravity of a) Fine aggregates. b) Coarse aggregates. c) Cement. d) Soil.
6. Sieve analysis of soil-Graphical representation of the gradation curve and Visual identification of building materials: Bricks, Stones, Tiles, M-Sand, Bitumen, Fly-Ash, GGBS, Steel Bars of Various Sizes

PART B

PART – B TYPICAL OPEN-ENDED EXPERIMENTS

Open-ended experiments are a type of laboratory activity where the outcome is not predetermined, and students are given the freedom to explore, design, and conduct the experiment based on the problem statements as per the concepts defined by the course coordinator. It encourages creativity, critical thinking, and inquiry-based learning.

1. Reactions.
2. Field tests on cement.
3. Particle size distribution.
4. Gap graded.
5. Uniformly graded.
6. Well graded.

Text books:

Suggested Learning Resources: (Text Book/ Reference Book/ Manuals):

1. M. L. Gambhir : Concrete Manual : Dhanpat Rai & sons New – Delhi, ISBN-135551234001965.
2. Bansal R. K., Rakesh Ranjan Beohar and Ahmad Ali Khan, Basic Civil Engineering and Engineering Mechanics, third edition, 2015, Laxmi Publications, ISBN: 9789380856674
3. Ramamrutham.S, Engineering Mechanics, Dhanpat Rai Books, 2013,ISBN: 9789352164271.
4. Soil Mechanics and foundation Engineering by B C Punmia, Ashok kumar jain, Arun kumar jain, 18th edition, 2023, Laxmi Publications New Delhi..

Reference books / Manuals:

1. Meriam J. L. and Kraige L. G, Engineering Mechanics-Statics, Vol I–sixth Edition,2008, Wiley publication.
2. Rattan S.S., Strength of Materials, Third edition, 2017, McGraw Hill Education; New Delhi. ISBN 13978-9385965517.
3. Bansal R K, Strength of Materials, Laxmi Publications. 2023, 4th Edition, ISBN:978-8131808146.
4. IS 4031 (Part 11):1988 – Specific gravity test for hydraulic cement.
5. IS 383:1970 – Specification for coarse and fine aggregates from natural sources for concrete.
6. IS 2386(Part 3):1963 Methods of test for aggregates for concrete: Part 3 Specific gravity, density, voids, absorption and bulking.
7. IS 2720 (Part 3/Sec 1):1980 – Determination of specific gravity of soil.

Web links and Video Lectures (e-Resources):

1. https://www.nptel.ac.in/courses/122104015/
2. https://nptel.ac.in/courses/112103109/
3. http://vlab.co.in/

Teaching-Learning Process (Innovative Delivery Methods):

The following are sample strategies that educators may adopt to enhance the effectiveness of the teaching learning process and facilitate the achievement of course outcomes.

1. Active Learning Techniques
2. Problem-Based Learning (PBL)
3. Team-Based Learning (TBL)
4. Hands-On Experiments and Simulations

Assessment Structure:

The assessment for each course is equally divided between Continuous Internal Evaluation (CIE) and the Semester End Examination (SEE), with each component carrying 50% weightage (i.e., 50 marks each). The CIE

Theory component will be 25 marks and CIE Practical component will be 25 marks. The CIE marks awarded shall be based on the continuous evaluation of the laboratory report using a defined set of rubrics. Each experiment report can be evaluated for 30 marks. The laboratory test (duration 03 hours) at the end of the last week of the semester /after completion of all the experiments (whichever is early) shall be conducted for 50 marks and scaled down to 20 marks. For both CIE and SEE, the student is required to conduct one experiment each from both Part A and Part B.

Course Outcomes: After completion of the course students will be able to

1. Analyse coplanar force systems by analytical and graphical methods and verifying Lami's theorem.
2. Compute support reactions in simply supported beams experimentally and analytically.
3. Identify and understand the properties of various construction materials.