MINISTRY OF EDUCATION

Republic of Ghana

TEACHING SYLLABUS FOR BUILDING CONSTRUCTION (SENIOR HIGH SCHOOL 1 - 3)

Enquiries and comments on this syllabus should be addressed to:

The Director
Curriculum Research and Development Division (CRDD)
P. O. Box 2739
Accra
Ghana.

Tel: 0302-683668
0302-683651

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TEACHING SYLLABUS FOR BUILDING CONSTRUCTION
(SENIOR HIGH SCHOOL)

RATIONALE FOR TEACHING BUILDING CONSTRUCTION

As a developing nation with the capacity for rapid growth in the near future, Ghana needs trained human resource capable of producing housing and related physical infrastructure and services to meet the needs of industry and individuals in the country. Meeting these needs requires persons trained at high levels in the knowledge, skills and processes in Building Construction.

The Building Construction course is based on knowledge, skills and processes already acquired at the JHS Basic Design and Technology programme. The course equips students with more knowledge, skills and processes to enable them fit into middle level manpower positions in the Building and allied Industries.

The course has been designed in such a way as to cater for the needs of students who wish to go on for further education as well as those who wish to exit the school system after SHS 3. For students who wish to go on to higher levels of education and training in the University, Polytechnics and Colleges of Education and Technology, the course provides adequate knowledge and skills for success at such levels. Students who wish to terminate their course at SHS 3 would also have had adequate level of skills and knowledge of materials, processes and procedures for building and construction that will help them get into employment.

GENERAL AIMS

The Building Construction syllabus is designed to help students to:

1. acquire knowledge and skills for the building construction trade and related professions.
2. appreciate the use of local materials for building construction.
3. develop respect for the abilities of the craftsmen in the building industry.
4. develop the capacity for providing solutions for constructional problems.
5. use safety precautions and safe practices in the building industry
6. appreciate the need for maintenance of buildings
7. develop the sense of morality and trustworthiness in the use of materials and other input resources supplied for projects.

SCOPE OF CONTENT

The content of the course covers the following areas:

1. Materials
2. Safety precautions
3. Maintenance work
4. Simple building drawings
5. Walls and their construction.
6. Designing and making simple building components using appropriate skills.

PRE-REQUISITE SKILLS AND ALLIED SUBJECTS

Students offering the course in Building Construction should have had satisfactory knowledge in English, Mathematics and Science at the Basic Education level. Building Construction is based on the course in Basic Design and Technology at the Junior High School and students who wish to take this course should have done quite well in that course.

ORGANISATION OF THE SYLLABUS

The Building Construction Syllabus has been structured to cover three years of the Senior High School programme. The structure and organization of the syllabus is shown on the next page.

STRUCTURE AND ORGANISATION OF THE SYLLABUS

YEAR ONE (SHS 1)	YEAR THREE (SHS 2)	YEAR THREE (SHS 3)
SECTION 1: **INTRODUCTION TO BUILDING CONSTRUCTION (Pg. 1 - 4)** Unit 1: Buildings Unit 2: Materials Unit 3: Construction Teams Unit 4: Documents of Building Projects Unit 5: Working Drawings	**SECTION 1**: **WALL CONSTRUCTION (Pg. 17 – 22)** Unit 1: Walls Unit 2: Structural Requirements Unit 3: Columns and Beams in Walls Unit 4: Bridging of Openings in Walls Unit 5: Retaining Walls Unit 6: Practical Work (Walling)	**SECTION 1**: **STAIRS (Pg.45 - 47)** Unit 1: Types of stair Unit 2: Timber Stair Construction Unit 3: Concrete Stair Construction Unit 4: Construction of Metal Stairs
SECTION 2: **WORKSHOP PRACTICE (Pg. 5 - 6)** Unit 1 : Safety Precautions Unit 2: Safe Practices Unit 3: Basic First Aid Procedures	**SECTION 2: SUPERSTRUCTURE WORK (Pg. 23 – 27)** Unit 1: Floors Unit 2: Ground Floors Unit 3: Suspended Floors Unit 4: Formwork and Supports Unit 5: Scaffolds and Scaffolding	**SECTION 2**: **BUILDING SERVICES (48 - 52)** Unit 1 : Drainage Unit 2: Laying of Pipes in Drainage Unit 3: Discharge Units in Drainage Unit 4: Domestic Water Supply Unit 5: Electrical Installation Unit 6: Practical Work (Jointing of Pipes)
SECTION 3 : **PRELIMINARY SITE OPERATIONS (Pg. 7 - 11)** Unit 1: Preliminaries Unit 2: Site Work Unit 3: Site Clearance and Leveling Unit 4: Hoarding Unit 5: Site layout and organization Unit 6: Setting-out Unit 7: Classification of soils	**SECTION 3**: **ROOFS (Pg. 28 - 29)** Unit 1: Types of Roof Unit 2: Roof Covering Materials Unit 3: Roof Construction	**SECTION 3: MAINTENANCE PRACTICE (Pg. 53 - 54)** Unit 1: Types of Maintenance Work Unit 2: Shores and Shoring
SECTION 4 : **SUBSTRUCTURE WORK (Pg. 12 - 16)** Unit 1: Excavation and Earthwork Unit 2: Practical Work (Setting-out) Unit 3: Foundations Unit 4: Substructure Walls Unit 5: Damage Protection to Substructure Work	**SECTION 4: BUILDING AND CONSTRUCTION MATERIALS (Pg.30 - 34)** Unit 1: Building Materials Unit 2: Damp Proof Materials Unit 3 Metals Unit 4: Concrete Works Unit 5: Timber Unit 6: Local Materials Unit 7: Practical Work (Manufacture of Blocks)	

YEAR ONE (SHS 1)	YEAR TWO (SHS 2)	YEAR FOUR (SHS 4)
	SECTION 5: FINISHES AND FITTINGS (Pg.35 - 40) Unit 1: Floors Finishes Unit 2: Wall Finishes Unit 3: Doors and Door Frames Unit 4: Windows and Window Frames Unit 5: Ironmongery Unit 6: Ceiling Unit 7: Paint and Painting	
	SECTION 6: PRACTICAL WORK (Pg. 41 - 42) Unit 1: Fixing Doors/Window Frames Unit 2: Hanging a Door Unit 3: Laying Floor and Wall Tiles	
	SECTION 7: SIMPLE BUILDING DRAWINGS (Pg. 43 - 44) Unit 1: Dimensioning Unit 2: Building Drawing symbols Unit 3: Presentation of Simple Building Drawings Unit 4: Detailed Drawings of a Building **Note:** *This section should be treated by students who are not offering Elective Technical Drawing)*	

TIME ALLOCATION

Year One (1): 6 periods per week: four (4) periods for theory and two (2) periods for practicals
Year Two (2): 6 periods per week: three (3) periods for theory and three (3) periods for practicals
Year Three (3): 6 periods per week: four (4) periods for theory and two (2) periods for practicals

SUGGESTIONS FOR TEACHING THE SYLLABUS

A variety of teaching methods including demonstration, supervised practice, project work, site visits, etc. has been suggested for teaching this syllabus.

The reason for such an approach is to emphasize the need for extensive practical exposure to the students. The instructional method should emphasize practical skills while laying a sound foundation for further academic pursuit. It is essential that each school should have workshops for students to acquire the necessary skills and attitudes for successful building and maintenance work.
In addition to practical training in the workshop, teachers should arrange to send students on field trips. Such visits will expose students to a wide range of current research and practical development in building construction. Where possible, use should be made of resource persons from the building industry, related professional Institutes, Environmental Protection Agencies, etc. Teacher should ensure that students keep proper records of all practical activities.

General Objectives

General Objectives have been listed at the beginning of each section of the syllabus, that is, just below the theme of the section. The general objectives specify the skills and behaviours the student should acquire after learning the units of a section. Read the general objectives very carefully before you start teaching. After teaching all the units, go back and read the general aims and general objectives again to be sure you have covered both of them adequately in the course of your teaching.

Sections and Units: Each section of the syllabus is divided into units, where a unit consists of a body of knowledge and skills that form a logical aspect of the section.

Column I - Units: The Units in Column 1 provide the major topics of the section. You are expected to follow the unit topics according to the linear order in which they have been presented. However, if you find at some point that teaching and learning of a unit will be more effective, if you skipped to another unit before coming back to the unit in the sequence you are encouraged to do so.

Column 2 - Specific Objectives: Column 2 shows the Specific Objectives for each unit. The specific objectives begin with numbers such as 1.2.2 or 2.2.1. These numbers are referred to as "Syllabus Reference Numbers". The first digit in the syllabus reference number (SRN) refers to the section; the second digit refers to the unit, while the third digit refers to the rank order of the specific objective. For instance, 1.2.2 means: Section 1, Unit 2 (of Section 1) and Specific Objective 2. In other words, 1.2.2 refers to Specific Objective 2 of Unit 2 of Section 1. Similarly, the syllabus reference number 2.2.1 simply means Specific Objective number 1, of Unit 2 of Section 2.

You will note also that specific objectives have been stated in terms of the student i.e. "*what the student will be able to do after instruction and learning in the unit.* Each specific objective hence starts with the following: "The student will be able to." This in effect, means that you have to address the learning problems of each individual student. It means individualizing your instruction as much as possible such that the majority of students will be able to master the objectives of each unit of the syllabus.
As has been said already, the order in which the unit topics appear should not necessarily be the teaching order. There should however, be a linkage in the order in which the units and specific objectives are treated. The teacher will have to study the syllabus carefully and plan ahead the activities the students will carry out during a particular lesson. Knowing the requirements of a lesson, the teacher should assemble the tools and materials required for the activities well in advance. The collection of tools and materials must be done by both the teacher and students. Other regular materials may be continually collected and stored to be used when needed. When materials are not available in the school or in the immediate environment, the teacher should try to contact persons in higher institutions and in the community for help.

As students begin work on the activities of each lesson, the teacher should serve as a facilitator and motivate the students in various ways to sustain their interest. As much as possible, resource persons may be invited to carry out demonstrations and talk about their work to the class. Field trips may be organized to observe particular buildings in the community.

Column 3 - Content: The "content" in the third column of the syllabus presents a selected body of information that you will need to use in teaching the particular unit. In some cases, the content presented is quite exhaustive. In some other cases, you could add more information to the content presented. In any case, try to find more information through reading and personal investigations to add to the content provided. The use of resource persons will in many cases, help to provide your class with more practical information and skills. The column also suggests tools and materials that can be used for the unit or lesson.

Column 4 -Teaching and Learning Activities (T/LA): T/LA that will ensure maximum student participation in the lessons is presented in Column 4. The teaching of this subject should be activity oriented. The major portion of class work and other assignments should emphasize practice. Group work and other participatory methods should be emphasized in the teaching and learning process. In this particular subject, students are expected to acquire valuable basic practical skills to serve as a foundation for further skill development. Observe and also ensure that students exhibit skills and values in their behaviour and in creative activities.

Column 5 - Evaluation: Suggestions and exercises for evaluating the lessons of each unit are indicated in Column 5. Evaluation exercises can be in the form of oral questions, quizzes, class assignments, project work; etc. Ask questions and set tasks and assignments that will challenge your students to apply their knowledge to issues and problems, and that will engage them in creating new and original solutions and items, and developing positive attitudes as a result of having undergone instruction in this subject. Evaluation should also include observation of processes students go through in performing various activities, and the products students make. Processes and products are both equally important and need observation and correction. The suggested evaluation tasks are not exhaustive. You are encouraged to develop other creative evaluation tasks to ensure that students have mastered the instruction and behaviours implied in the specific objectives of each unit.

Lastly, bear in mind that the syllabus cannot be taken as a substitute for lesson plans. It is therefore necessary that you develop a scheme of work and lesson plans for teaching the units of this syllabus.

PROFILE DIMENSIONS

Profile dimensions describe the underlying behaviours or abilities students are expected to acquire as a result of having gone through a period of instruction. Each of the specific objectives in this syllabus contains an action verb that specifies the type of learning or skill that the student should acquire by the end of the instructional period. A specific objective as follows: The student will be able to describe …etc. contains an action verb "describe" that indicates what the student will be able to do after teaching and learning have taken place. Being able to "describe" something after the instruction has been completed means that the student has acquired "knowledge". Being able to explain, summarise, give examples, etc. means that the student has understood the lesson taught. Similarly, being able to develop, plan, construct etc, means that the student has learnt to create, innovate or synthesize knowledge. Each of the action verbs in the specific objectives of the syllabus describes the behaviour the student will be able to demonstrate after the instruction.

The profile dimensions required in Building Construction and their respective weights are as follows:

Knowledge and Understanding	10%
Application of Knowledge	40%
Attitudes and Practical Skills	50%

Each of the dimensions has been given a percentage weight that should be reflected in teaching, learning and testing. The weights, indicated on the right of the dimensions, show the relative emphasis that the teacher should give in the teaching, learning and testing processes. Combining the three dimensions in the teaching and learning process will ensure that Building Construction is taught and studied not only at the cognitive level, but will also lead to the acquisition of practical skills in the subject.

The explanation and words involved in each of the dimensions are as follows:

Knowledge and Understanding (KU)

Knowledge	The ability to: remember, recall, identify, define, describe, list, name, match, state principles, facts and concepts. Knowledge is simply the ability to remember or recall material already learned. Knowledge constitutes the lowest level of learning.

Understanding	The ability to: explain, summarize, translate, rewrite, paraphrase, give examples, generalize, estimate or predict consequences based upon a trend. Understanding is generally the ability to grasp the meaning of some material that may be verbal, pictorial, or symbolic.

Application of Knowledge (AK)

Ability to use knowledge or apply knowledge, as implied in this syllabus, has a number of learning/behaviour levels. These levels include application, analysis, innovation or creativity, and evaluation. These may be considered and taught separately, paying attention to reflect each of them equally in your teaching. The dimension "Use of Knowledge" is a summary dimension for all four learning levels. Details of each of the four sub-levels are as follows:

Application	The ability to: apply rules, methods, principles, theories, etc. to concrete situations that are new and unfamiliar. It also involves the ability to produce, solve, operate, demonstrate, discover etc.
Analysis	The ability to: break down material into its component parts; to differentiate, compare, distinguish, outline, separate, identify significant parts etc, recognize unstated assumptions and logical facilities, recognize inferences from facts etc.
Innovation/Creativity	The ability to: synthesize or put parts together to form a new whole. It involves the ability to combine, compile, compose, devise, suggest a new idea or possible ways, plan, revise, design, organize, create, and generate new solutions. The ability to create or innovate is the highest form of learning. The world becomes more comfortable because some people, based on their learning, bring new ideas, design and create new things.
Evaluation	The ability to: appraise, compare features of different things and make comments or judgments, contrast, criticize, justify, support, discuss, conclude, make recommendations etc. Evaluation refers to the ability to judge the worth or value of some materials, ideas etc., based on some criteria. Evaluation is a constant decision making activity. We generally compare, appraise and select throughout the day. Every decision we make involves evaluation. Evaluation is a high level ability just as application, analysis and innovation or creativity since it goes beyond simple knowledge acquisition and understanding.

Practical Skills (PS)

Practical skills involve demonstration of manipulative skills using tools/equipment and materials to carry out practical operations, pre-imaging to solve practical problems, and produce items. The teaching and assessment of practical skills should involve projects, case studies and creative practical tasks. Skills required for effective practical work are the following:

1. Handling Tools/Equipment/Materials
2. Observation
3. Craftsmanship/Draftsmanship
4. Perception
5. Creativity
6. Communication

Tools/Equipment/Material Handling: Students should be able to handle and use tools/equipment/materials properly for practical work to acquire the needed manual skills.

Observation: The student should be able to use his/her senses to make accurate observation of skills and techniques during demonstrations. The student in this case should be able to imitate the techniques he/she has observed for performing other tasks.

Craftsmanship/Draftsmanship: This involves the skilful and efficient handling of materials and tools for accomplishing specific tasks according to the level of the students.

Perception: The student should be able to respond to their environment using all the senses i.e. seeing, hearing, smelling, touching and tasting. The student should be encouraged to apply these senses to every project he/she undertakes.

Originality/Creativity Students should be encouraged to be creative or original and be able to use new methods in carrying out projects. Encourage them to be original in their practical work. You can help them to be creative and original by encouraging any little creative effort or technique they may use or develop.

Communication: Students should be guided to develop effective oral and written communication skills necessary for group work, reporting and appreciation etc.

COMPETENCY BASED LEARNING

Competency learning is a combination of knowledge, skills, and the ability to use tools and equipment for accomplishing work to acceptable standards in the industry. A competent person performs tasks using appropriate knowledge, skills and tools to achieve high level quality of output or process. Competency includes cognitive and practical skills as well as attitudinal and other personality characteristics. These characteristics include principles of social orientation that is, the core values of honesty, fairness, reliability, trustworthiness, cooperation and support as well as the ability to relate well with people.

Competency Based Learning requires students to perform tasks by using relevant knowledge, skills, and tools to achieve specified targets within specified times and at specified levels of quality. The case study approach in teaching and learning is particularly suitable in providing students with situations which they could emulate to reach high levels of practice. Collaboration with others perhaps through membership of a work group or team may be desirable for the performance of some tasks. Competence is however, assessed on individual basis and personal accountability for analysis, diagnosis, design, planning, execution and evaluation of task is a requirement. Competency Based Learning is useful for teaching and learning in practical subjects. Teachers are encouraged to use the competency learning approach to help their students achieve competence in a number of areas in their studies in Building Construction.

COMPETENCY ASSESSMENT

The quality of the product or outcome, and the speed used in performing the task are crucial. A two level grading system is normally used. For practical work assessment in class, you could adopt the competency approach to ensure that your students reach appropriate levels of competence in certain selected vital skills.

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The action verbs provided on page (viii) should help you to structure your teaching to achieve the effects needed. Different verbs are needed for teaching and assessing “knowledge”, “understanding”, “application of knowledge” and “attitudes and process skills”. Select from the action verbs provided for your teaching under the various profile dimensions and for developing various assessment processes. This will ensure that you give your students the chance to develop good thinking skills as well as good practical skills and the capacity for excellent performance in their work and in examinations. Check the weights of the profile dimensions to ensure that you have given the required emphasis to each of the dimensions in your teaching and assessment.

FORM OF ASSESSMENT

In developing assessment procedures, select specific objectives in such a way that you will be able to assess a representative sample of the syllabus objectives. Each specific objective in the syllabus is considered a criterion to be achieved by the student. When you develop a test that consists of items or questions that are based on a representative sample of the specific objectives taught, the test is referred to as a "Criterion-Referenced Test". In many cases, a teacher cannot test all the objectives taught in a term, in a year etc. The assessment procedure you use i.e. class tests, home work, projects etc. must be developed in such a way that it will consist of a sample of the important objectives taught over a period.

Building Construction should be tested using two papers indicated below and the School Based Assessment (SBA). The structure for the two test papers is indicated as follows:

PAPER 1	A:	Objective test	-	10 percent
PAPER 1	B:	Short essay	-	15 percent
PAPER 1	C:	Structured essay	-	25 percent
PAPER 2:	A:	External Practical work	-	30 percent
PAPER 2:	B:	Project work (school based)	-	20 percent
TOTAL Weighting:			-	100 percent

The two papers have equal weights in the examination.

Paper 3 will be the School Based Assessment (SBA) which is not indicated above. Paper 1 has three sections, A, B and C, the components of which are indicated above. Paper 2 will consist of a practical test and project work. The SBA will be based on all three dimensions. The distribution of marks for the objective test items, structured questions and the practical test should be in line with the weights of the profile dimensions already indicated.

PRACTICAL TEST

The student is to take an external three (3) hour on-the-spot practical test to be assessed by an external assessor/examiner at the school.

GUIDELINES FOR SCHOOL-BASED ASSESSMENT (SBA)

A new School Based Assessment system (SBA) will be introduced into the school system in 2011. The new SBA system is designed to provide schools with an internal assessment system that will help schools to achieve the following purposes:

- Standardize the practice of internal school-based assessment in all Senior High Schools in the country
- Provide reduced assessment tasks for subjects studied at SHS
- Provide teachers with guidelines for constructing assessment items/questions and other assessment tasks
- Introduce standards of achievement in each subject and in each SHS class
- Provide guidance in marking and grading of test items/questions and other assessment tasks
- Introduce a system of moderation that will ensure accuracy and reliability of teachers' marks
- Provide teachers with advice on how to conduct remedial instruction on difficult areas of the syllabus to improve class performance.

The arrangements for SBA may be grouped in categories as follows: Folio preparation, Project, Mid-Term Examination, Group Exercise, and End of Term Examinations.

1. Folio Preparation: These are tasks assigned to students to be completed in extended time. Folio preparation may include the following:
   i) Specific Designs
   ii) Investigative Study and Field visit reports.

2. Project: This will consist of a selected topic to be carried out by groups of students for a year. Segments of the project will be carried out each term toward the final project completion at the end of the year,

   The projects may include the following:
   i) experiment
   ii) investigative study (including case study)
   iii) practical work assignment

   A report must be written for each project undertaken.

3. Mid-Term Test: The mid-term test following a prescribed format will form part of the SBA

4. Group Exercise: This will consist of written assignments or practical work on a topic(s) considered important or complicated in the term's syllabus

5. End-of-Tem Test: The end –of-term test is a summative assessment system and should consist of the knowledge and skills students have acquired in the term. The end-of-term test for Term 3 for example, should be composed of items/questions based on the specific objectives studied over the three terms, using a different weighting system such as to reflect the importance of the work done in each term in appropriate proportions. For example, a teacher may build an End-of-Term 3 test in such a way that it would consist of the 20% of the objectives studied in Term 1, 20% of objectives studied in Term 2 and 60% of the objectives studied in Term 3.

GRADING PROCEDURE

To improve assessment and grading and also introduce uniformity in schools, it is recommended that schools adopt the following WASSCE grade boundaries for assigning grades on students' test results. The WASSCE grading system is as follows:

Grade A1:	80 - 100%	-	Excellent
Grade B2:	70 - 79%	-	Very Good
Grade B3:	60 - 69%	-	Good
Grade C4:	55 - 59%	-	Credit
Grade C5:	50 - 54%	-	Credit
Grade C6:	45 - 49%	-	Credit
Grade D7:	40 - 44%	-	Pass
Grade D8:	35 - 39%	-	Pass
Grade F9:	34% and below	-	Fail

In assigning grades to students' test results, you are encouraged to apply the above grade boundaries and the descriptors which indicate the meaning of each grade. The grade boundaries i.e., 60-69%, 50-54% etc., are the grade cut-off scores. For instance, the grade cut-off score for B2 grade is 70-79% in the example. When you adopt a fixed cut-off score grading system as in this example, you are using the criterion-referenced grading system. By this system a student must make a specified score to be awarded the requisite grade. This system of grading challenges students to study harder to earn better grades. It is hence a very useful system for grading achievement tests.

Always remember to develop and use a marking scheme for marking your class examination scripts. A marking scheme consists of the points for the best answer you expect for each question, and the marks allocated for each point raised by the student as well as the total marks for the question. For instance, if a question carries 20 marks and you expect 6 points in the best answer, you could allocate 3 marks or part of it (depending upon the quality of the points raised by the student) to each point , hence totalling 18 marks, and then give the remaining 2 marks or part of it for organisation of answer. For objective test papers you may develop an answer key to speed up the marking.

SENIOR HIGH SCHOOL – YEAR 1

SECTION ONE

INTRODUCTION TO BUILDING CONSTRUCTION

General Objectives: The student will:

1. appreciate types of building in Ghana
2. acquire knowledge of building materials
3. acquire the skills and expertise involved in building construction
4. appreciate the degree of preparation and documentation carried out before site work

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1	The student will be able to:		Teacher to:	Students to:
BUILDINGS	1.1.1 define the term "building".	Explanation of building.	group and guide students to brainstorm to come out with the meaning of building.	define the term "building".
	1.1.2 state the purpose of a building.	Purpose of building e.g. accommodation, keep off inclement weather, social, commercial, industrial, etc.	group students to discuss the purpose of building.	state the purpose of a building.
	1.1.3 describe types of building.	Types of building: - domestic building - public building e.g. bungalow, hospital, market, office	Use models/charts to discuss with students types of building (discussion should be done in groups).	describe types of building.
	1.1.4 distinguish between types of building.	Differences in the types of building. - Timber - Sandcrete - Landcrete - Pisé - Wattle and Daub	use models to assist students compare the various types of building.	distinguish between types of building.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 2	The student will be able to:		Teacher to:	Students to:
MATERIALS	1.2.1 identify materials used for the types of building.	Materials for building, e.g. Wood, cement, bricks tiles, iron sheet, louvers.	Show various types of building materials to students.	identify materials for types of building.
	1.2.2 compare the merits and demerits of materials used for types of building.	Comparison of materials for domestic and public buildings.	group students to discuss the differences between the materials.	compare the merits and demerits of materials used for types of building.
UNIT 3				
CONSTRUCTION TEAM	1.3.1 state the teams involved in the building process.	Teams in the building process - client team - contractor's team - statutory personnel	group students to discuss various teams in the building process.	state various teams in the building process.
	1.3.2 identify the members involved in each team.	Members in the building teams: <u>Client's team</u>: client, architect/engineer, quantity surveyor, clerk of work. <u>Contractor's team</u>: Builder/site engineer, general foreman, gang leader, tradesmen/craftsmen (mason, carpenter, welder, plumber, gateman, watchman / security officer, painter, iron binder, time keeper) <u>Statutory personnel</u> : building inspector, town planner, public health inspector, inspector of factory, city engineer.	use charts to show members involved in the teams.	identify the members involved in the building teams.
	1.3.3 describe the duties of each member of the teams.	Duties of each member of the teams	group students to discuss the duties of members involved in the teams.	describe the duties of each member of the teams.
	1.3.4 outline the relationship(s) between the various teams that make the construction team.	Relationship(s) between teams in the building process. - Client organization - Architect/ Engineer - client organization - Architect/Contractor - Statutory Organs - Public - Site Organization	group students to discuss the relationship(s) within the various teams. group students to discuss the importance of the contribution of each team.	outline the relationship(s) between the various teams in the building process.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 3 (CONT'D)	The student will be able to:		Teacher to:	Students to:
CONS-TRUCTION TEAM	1.3.5 distinguish between the roles and relationships of the members of each team.	Roles of team members: - Client - Contractor - Statutory Personnel	i. group students to discuss the role each member plays in the construction tasks ii. discuss with students members with direct and indirect relationships	distinguish between the roles and relationships of the members of each team.
UNIT 4 **DOCUMENTS OF BUILDING PROJECTS**	1.4.1 outline the items involved in building permit documents.	The building permit documents e.g. building drawings, site plan, block plan etc.	use illustrations to show items involved in the building permit documents to students.	outline items involved in the building permit documents.
	1.4.2 explain the purpose of each of the items in building permit documents.	Purpose of building permit document items. - development approval - development regulation - quality of construction	discuss with students, the purpose of items of building permit document.	explain the purpose of each of the items in building permit documents.
	1.4.3 describe the processes involved in the preparation of the application for building development permit.	Processes of applying for the building development permit - preparation of drawing - completion of proposal jacket	discuss with students the processes involved in the preparation of the application for building development permit. **Note:** Invite a Building Inspector to talk to the class on procedures for acquiring a building development permit.	describe the processes involved in the preparation for building development permit. write group report and discuss in class
	1.4.4. describe features of the BILLS OF QUANTITIES.	Features of Bills of Quantities - function - article of association - bill item specification	group students to discuss the features of the bills of quantities and their functions. - discuss the samples of bills of quantities with students.	describe the features of the Bills of Quantities.
	1.4.5 describe material schedules in building construction.	Materials schedule - timber - steel reinforcement - drainage pipe - sanitary items etc.	1. group students to discuss materials schedule in building construction. 2. demonstrate with samples of material schedule and assist students to practise.	explain the material schedule in building construction and give an example of schedule of material.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 4 (CONT'D)	The student will be able to:		Teacher to:	Students to:
DOCUMENTS OF BUILDING PROJECTS	1.4.6 explain the term Labour Schedule	Labour schedule - Carpenter and Joiner - Mason and bricklayer - Concrete gang	use a table to discuss the term labour schedule as applied in building construction work.	explain the meaning of labour schedule using a table involving the labour types.
UNIT 5				
WORKING DRAWINGS	1.5.1 define the term "working drawings".	Working drawings:	group students and assist them to brainstorm to come out with the meaning of working drawings.	define the term "working drawing" .
	1.5.2 outline the items in the working drawings.	Items in the working drawings: - elevations - plans - sections	use illustrations to show items in the working drawings	outline items in the working drawings.
	1.5.3 explain the purposes of items involved in working drawings.	Purposes of items in working drawing.	discuss with students the purposes of items in working drawings.	explain the purposes of items in the working drawings.
	1.5.4 explain the functions of grid line on a site plan.	Functions of Grid lines. - ground formation	group students and assist them to discuss functions of grid lines on a site plan. Use chart to discuss with students the functions of grid lines.	explain the functions of grid lines on site plan.
	1.5.5 sketch a Block Plan of a proposed building.	Block Plan – Sketch.	guide students to sketch a block plan.	sketch a block plan of a proposed building.
	1.5.6 explain the functions of types of plan.	Types of plan: - site plan - block plan - foundation plan - ground floor plan	use models to discuss functions of types of plan	explain the functions of each type of plan.

SENIOR HIGH SCHOOL - YEAR 1

SECTION TWO

WORKSHOP PRACTICE

General Objectives: The student will:

1. acquire skills in workshop practices
2. be aware of Site Welfare Procedures

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1	The student will be able to:		Teacher to:	Students to:
SAFETY PRE-CAUTIONS	2.1.1 state the safety conditions to be observed at the worksite.	Workshop safety: - precautions at work - personal safety and attitudes e.g. carefulness; attentiveness, intake of balance diet etc. - tools and equipment - safe manual lifting of objects	Use charts to help students discuss safety conditions to be observed at worksite.	state the safety conditions to be observed at worksite.
	2.1.2 explain the need for observing health and welfare regulations at worksite.	Health and Welfare Regulations at Work site. - minimize accidents on site - ensure welfare of site workers - public safety	discuss with students the need for observing health and welfare regulations at worksite.	explain the need for observing health and welfare regulations at worksite.
	2.1.3 demonstrate care and maintenance of tools and equipment.	Care and maintenance of tools and equipment: - maintenance schedule - type of maintenance: regular, crisis, etc.	demonstrate care and maintenance of tools and equipment and assist students to practise.	explain how to care and maintain tools and equipment.
	2.1.4 use equipment at construction sites.	Safety equipment: - fire fighting appliances e.g. hydrants, fire alarms, etc	demonstrate the use of safety equipment at construction site and assist students to practise.	describe safety equipment at the construction site.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 2	The student will be able to:		Teacher to:	Students to:
SAFE PRACTICE	2.2.1 explain the reasons for involving related agencies in building projects.	Reasons for Involvement of related agencies: - Health agencies - Fire service department - Security Services	discuss the reasons for involving related agencies in building projects.	explain the reasons for involving related agencies in building projects.
	2.2.2 explain the causes of accidents at the building site.	Causes of accidents at building site e.g. fire, fall, defective tools, horse-play, carelessness etc.	discuss with students causes of accident and their prevention.	explain causes of accidents at the building site.
	2.2.3 demonstrate the methods of accident prevention at building sites.	Accident Prevention methods e.g. - site working rules - appoint safety officer for site - inspection of tools and equipment prior to start of work - sensitize workers of accident regulations	demonstrate the accidents prevention methods and help students to practise.	explain methods of accident prevention at building site.
UNIT 3				
BASIC FIRST AID PRO-CEDURES	2.3.1 identify First Aid equipment at the worksite.	First Aid equipment e.g. - sand, bucket. - asbestos cloth/blanket. - fire extinguishers and types. - wet and dry pipe fire fighting systems.	show first aid equipment to students.	identify first aid equipment at worksite.
	2.3.2 demonstrate the procedures to be taken for treatment of an accident victim on site.	Procedure for treatment : - first aid - permanent treatment	demonstrate the procedures to be taken for treatment of an accident victim on site and guide students to practise. **Note:** invite a resource person from the local hospital or clinic to talk to students on the topic.	demonstrate the procedure to be taken for treatment of an accident victim on site.

SENIOR HIGH SCHOOL – YEAR 1

SECTION THREE

PRELIMINARY SITE OPERATIONS

General Objectives: The student will:

1. acquire practical site work skills
2. acquire knowledge in ground work

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1	The student will be able to:		Teacher to:	Students to
PRELI-MINARIES	3.1.1 explain the term 'Preliminaries" as used in building construction.	Preliminaries: - site clearance - site huts and shops, offices, etc - site services e.g. water, electricity - site roads and access	group students to brainstorm to come out with the meaning of preliminaries and follow up with discussions on the need for the site to be set up prior to actual production work.	explain the term "preliminaries" as used in building construction.
	3.1.2 explain the items of work needed before the construction work begins on site.	Items of work before actual work: - site investigation - site clearance etc	i. group students to discuss the items of work. ii. take students on a trip to new sites to observe preliminary works.	write report in groups and discuss in class after visit.
UNIT 2				
SITE WORK	3.2.1 explain the term "Site work ".	Site work.	group students to brainstorm to come out with the meaning of site work.	explain the term site work.
	3.2.2 explain the importance of boundary lines.	Importance of boundary lines.	discuss the importance of boundary lines with students.	explain the importance of boundary lines.
	3.2.3 explain the need for site investigation.	Need for site investigation. - for the selection of foundation type. - building types and structural decision. - identification of soil types and nature.	discuss with students the need for site investigation.	explain the need for site investigation.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 2 (COND)	The student will be able to:		Teacher to:	Students to:
SITE WORK	3.2.4 explain the items of information expected from site investigation.	Items of site investigation. - site visit - soil investigation - service lines/routes etc	discuss items required in site investigation and their usefulness to site work.	explain items of information expected from site investigation.
	3.2.5 describe the types of test for soil investigation.	Soil investigation tests. e.g. trial pit	group students to discuss the types of test used for soil investigation.	describe types of test for soil investigation.
	3.2.6 describe the types of access road to site.	Types of access road to site. - sleeper - patent fabric - hoggings etc	discuss types of access road to site using sketches and the construction methods to avoid failures in their use	explain types of access roads with sketches of construction.
UNIT 3				
SITE CLEARANCE AND LEVELLING	3.3.1 explain the term "site clearance".	Site clearance.	discuss with students the term "site clearance".	explain the term "site clearance"
	3.3.2 explain the purpose of site clearance.	Purpose of site clearance. - removal of shrubs, etc. - equipment - disposal of spoils	group students and assist them to discuss purpose of site clearance. Visit sites to observe tools and equipment and discuss how spoils are disposed of.	explain the purpose of site clearance; listing the equipment used and stating how spoils are disposed of.
	3.3.3 demonstrate site leveling and its importance.	Site levelling. - tools and equipment - shaping site - methods of levelling	group students to demonstrate site leveling and discuss its importance. Demonstrate site leveling using site leveling equipment.	explain site leveling and its importance and state the leveling equipment.
	3.3.4 apply methods of exterminating termites.	Extermination of termites-methods - chemical - destruction of colonies	demonstrate with students methods of destroying termites with the use of chemicals. , destruction of colonies	explain the method of exterminating termites.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 4	The student will be able to:		Teacher to:	Students to:
HOARDING	3.4.1 explain the term "hoarding of site".	Hoarding of site.	discuss types of hoarding of sites with students	explain the term "hoarding of site".
	3.4.2 explain forms of Hoarding	Forms of Hoarding - Vertical Hoarding - Fan Hoarding	discuss forms of hoarding with students.	explain forms of hoarding
	3.4.3 sketch forms of Hoarding	Forms of Hoarding	guide students to sketch forms of Hoarding with the use of charts	sketch forms of Hoarding
UNIT 5				
SITE LAYOUT AND ORGANI-SATION	3.5.1 explain the term "site layout".	Site layout. - site roads - location of services runs - siting of buildings - siting of temporary structures	group students to discuss site layout using:- - sample site layout plans - site visits.	explain the term "site layout"
	3.5.2 explain the purpose of site layout.	Purpose of site layout e.g. to avoid delays, confusions, construction in disorganized manner	i. discuss purpose of site layout ii. group students to discuss the problems of not laying out the site with examples.	explain the purpose of site layout.
	3.5.3 describe the items to be considered in site layout.	Items in site layout. - site boundary - access roads - temporary structures e.g. site hut etc - site services e.g. water, electricity, telephone and gas	Use charts to discuss with students items in site layout	describe the items in the site layout.
	3.5.4. sketch a simple layout of a site.	Site lay-out: Location of site layout. - site plan - access roads - temporary huts - site services.	i. guide students to sketch a simple site layout ii. visit sites with students to see site layouts.	sketch a simple site layout. write group report and discuss in class after visit

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 6	The student will be able to:		Teacher to:	Students to:
SETTING-OUT	3.6.1 explain the term "setting-out".	Setting out: of building: Using: - 3.4.5 method, - builders square - survey equipment	group students to discuss the term "setting-out"	explain the term "setting-out"
	3.6.2 describe tools and equipment used for setting-out.	Tools and Equipment used for setting-out - site square - tape measure - builders' square - line and pins - hammer	i. show tools and equipment used for setting-out to students for identification. ii. visit new site to see the use and types of setting out tools or equipment.	describe the tools and equipment used in setting-out. write group report on setting-out after visit and discuss it in class.
	3.6.3 describe the precaution to be taken before setting-out operations.	Precautions to be taken during setting-out: - checks for accuracy of tools and equipment.	discuss the precautions to be taken before setting out.	explain the precautions to be taken prior to setting-out.
	3.6.4 differentiate a building line from a boundary line.	Building line and boundary line: - distance of building line from boundary line and from road edge	discuss with students the difference between a building line and a boundary line. display pictures or sketches of building and boundary lines to students and assist them to discuss the differences and similarities	explain the difference between a building line and a boundary line.
	3.6.5 demonstrate the procedure for erecting timber profile.	Procedure for erecting timber profile. - space of pegs from corner pegs. - fixing of profile boards to profile pegs. - check for alignment and level of profile board.	demonstrate the procedure involved in erecting profile and assist students to practise	explain the procedure for erecting timber profile
	3.6.6 demonstrate the method of establishing a datum level	Procedure for datum level. - location of existing datum - establishing datum on site	Demonstrate the method of establishing a datum level and assist them to practise. - take students to visit a site to see how a datum is fixed	describe the method of establishing a datum level write group report and discuss in class after visit.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 6 (CONT'D.) **SETTING-OUT**	The student will be able to: 3.6.7 demonstrate setting out a simple rectangular building.	Setting out of a simple rectangular building on flat or gentle slope using - levelling instrument; (e.g. site square) - triangulation method (3.4.5. method) - builder's square	Teacher to: demonstrate the setting out of simple building using - leveling instrument - triangulation - builder's square students to practice setting out of simple building.	Students to: demonstrate the setting out of a simple building.
UNIT 7 **CLASSIFI-CATION OF SOILS**	3.7.1 identify types of soil.	Types of soil e.g. gravels, sand, silt, clays, peat, made-up soil, rock, laterite etc.	show samples of soil for students to observe and identify the types.	identify types of soil.
	3.7.2 describe the characteristics of types of soil.	Characteristics of types of soil:- - cohesive soil - non-cohesive soil	use chart to discuss the characteristics of types of soil with the students	describe the characteristics of each type of soil.

SECTION FOUR

SUBSTRUCTURE WORK

General Objectives: The student will:

1. acquire knowledge in ground work
2. acquire skills in ground work protection

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1	The student will be able to:		Teacher to:	Students to:
EXCAVATION AND EARTH-WORK	4.1.1 state the purpose(s) of excavation.	Purpose of Excavation. - to remove top soil/organic material - shape site to formation level, remove excess material.	discuss with students the purpose(s) of excavation.	state the purpose(s) of excavation.
	4.1.2 identify the types of equipment for excavation.	Types of excavation equipment e.g. drag-line, face shovel, backactor, bulldozer, skimmer etc.	show excavation equipment to students for identification	state the types of equipment for excavation.
	4.1..3 state uses of the types of excavation equipment.	Use of excavation equipment e.g. - trench - pits - grading - skimming	discuss with students the uses of the types of excavation equipment.	state the uses of the types of excavation equipment.
	4.1.4 describe the types of excavation.	Types of excavation - trenches - pits - site clearance	use charts to show types of excavation to students.	describe the types of excavation.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1 (CONT'D)	The student will be able to:		Teacher to:	Students to:
EXCAVATION AND EARTH-WORK	4.1.5 demonstrate the procedure for supporting the sides of trenches.	Supports two sides of trenches e.g. timber support and sheet pinning.	i. demonstrate to students the procedure for supporting trench sides and assist them to practise. ii. illustrate with sketches ways of supporting trench sides take students to site to observe and report on how a trench is supported.	explain the procedure for supporting the sides of a trench write group report and discuss in class after visit.
	4.1.6 sketch a typical timber supports to trenches in various types of soil.	Supports to sides of trenches in - firm soil - moderately firm soil - loose soil - wet soil	guide students to sketch typical supports to the sides of a trench excavation.	sketch timber supports to trenches in the various types of soil.
	4.1.7 demonstrate the methods of ensuring safety when digging a trench.	Safety methods in trench works. Causes of collapse of trench sides. - locating heavy plant and spoils close to trench - non-supports for sides of trenches	demonstrate with students the methods of ensuring safety in the digging of a trench discuss with students the causes of collapse of trench sides	demonstrate the methods of ensuring safety when digging a trench. explain the causes of the collapse of trench sides.
UNIT 2				
PRACTICAL WORK (SETTING OUT A SIMPLE BUILDING RECTANGULAR)	4.2.1 establish a building line.	Building line.	guide students to establish building line with the aid of site and block plans.	establish a building line.
	4.2.2 establish frontage line.	Frontage line.	guide students to establish frontage line.	establish frontage line.
	4.2.3 establish an adjacent line to the frontage line.	Adjacent corner line to frontage line. - triangulation method - builders square - site square	demonstrate how to establish an adjacent line to a frontage line at 90°. assist students to establish an adjacent line to a frontage line at 90°.	establish an adjacent corner line to frontage line.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 2 (CONT'D.) **PRACTICAL WORK (SETTING-OUT A SIMPLE BUILDING RECTANGULA)**	The student will be able to:		Teacher to:	Students to:
	4.2.4 measure the length of the building on the frontage line.	Measurement of length on frontage line of building.	demonstrate with students the measuring of the frontage line from Peg 1 to establish Peg 2.	measure the length of the building on the frontage line.
	4.2.5 establish an adjacent corner at 90°.	Establishment of an adjacent corner.	demonstrate how to establish other adjacent corner of the building at 90° to the frontage line for students to practice.	establish an adjacent corner at 90°.
	4.2.6 complete the outline of the rectangular building.	Completion of outline of building.	guide students to complete the corners of rectangular buildings.	complete the outline of the rectangular building .
	4.2.7 erect profiles at the corners and intersections of the walls of the building.	Erection of profile boards.	demonstrate the method of establishing profiles boards at the corners and at the intersections of walls for students to practice	erect profile at the corners and intersections of the walls of the building
UNIT 3 **FOUNDATIONS**	4.3.1 identify types of foundation	Types of foundation - strip - raft - pile - pad	use models and illustrations to show types of foundation to students. <u>Field Trip</u>:- Students to go out and observe different types of foundation.	identify types of foundation. write group report and discuss in class
	4.3.2 state the functions of the foundation	Functions of the foundation	group students to discuss the functions of foundation.	state the functions of foundation.
	4.3.3 describe the sizes of types of foundation	Sizes of types of foundation. - narrow trenches - deep trench - water logged site - subsidence soils	use diagrams or pictures to discuss the sizes of foundations.	describe the sizes of the types of foundation.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 3 (CONT'D.) FOUNDATIONS	The student will be able to: 4.3.4. explain the factors which affect the bearing capacity of a subsoil.	 Factors determining the bearing capacity of subsoil e.g. - nature of soil - type of soil - load of building - underground streams - mined site	Teacher to: discuss the factors which affect the bearing capacity of subsoil with students	Students to: explain factors for determining the bearing capacity of a subsoil.
UNIT 4				
SUB-STRUCTURE WALLS	4.4.1 describe types of substructure wall.	Types of wall at substructure level: - foundation wall - cavity wall - honey-comb wall	group students and use models to discuss types of substructure wall.	describe types of substructure wall.
	4.4.2 describe materials for types of wall.	Materials for types of walls: - bricks/ blocks - wattle and daub - soil wall - compressed block - cement slab - pisé construction	show materials used for types of walling to students. guide students to discuss types of walling materials.	describe materials for types of wall.
	4.4.3 explain the functions of substructure walls.	Functions of substructure walls: - support to ground floor	discuss with students the functions of sub-structure walls.	explain functions of substructure walls.
	4.4.4 explain types of bonding for walls.	Bonding for walls - stretcher bond - English bond - header bond - Flemish bond	group students to discuss the types of bonding and the principles involved using sketches.	explain types of bonding for walls.
	4.4.5 demonstrate ways of erecting walls in different bonds	Erection of walls	assist students to erect walls in different bonds.	erect walls in different bonds.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 4 (CONT'D.) **SUB-STRUCTURE WALLS**	The student will be able to: 4.4.5 describe types of mortar for walls	Description of types of mortar for walls: - cement-sand mortar - cement – soil mortar - soil mortar - lime mortar - cement, lime, sand mortar	Teacher to: group students to discuss types of mortar for walls.	Students to: describe types of mortar for walls.
UNIT 5 **DAMAGE TO SUBSTRUCTURE WORK**	4.5.1 describe some of the defects in substructure work.	Defects in substructure work: e.g. collapse to sides of trench, settlement crack, etc.	discuss with students defects in substructure work.	explain defects in substructure work.
	4.5.2 demonstrate the methods of protection against damages to substructure work.	Protection against damage to substructure work. - support to sides of trenches - damp-protection - dewatering water logged trenches - site freezing of soil, etc.	demonstrate methods of protection against damages to substructure work.	demonstrate the methods of protections against damages to substructure work.

SENIOR HIGH SCHOOL – YEAR 2

SECTION ONE

WALL CONSTRUCTION

General Objectives: The student will:

1. recognize load and non-load bearing wall
2. acquire skills in the use of columns and beams

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1 **WALL**	The student will be able to:		Teacher to:	Students to:
	1.1.1 explain the term "wall" in super structure.	Explanation of a wall in super structure.	discuss with students the term wall in building construction	explain wall in building construction .
	1.1.2 describe types of wall.	Types of wall: - non load bearing - load bearing wall - traditional walls	use charts to discuss types of walls to students	describe types of wall.
	1.1.3 explain the functions of types wall.	Functions of walls: - moisture penetration - space enclosure - support roof and other loads - keep off adverse weather effects - improve beauty of building - thermal resistance - sound resistance	guide students to discuss the functions of walls.	explain the functions of walls.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1 (CONT'D) WALL	The student will be able to:		Teacher to:	Students to:
	1.1.5 describe methods of wall construction of each type of wall.	Methods of wall construction. - Atakpame - Wattle and daub - Pisé construction - Concrete wall - Precast concrete wall - Timber wall - Block/brickwalls	discuss the methods of wall construction.	describe methods of construction of each type of wall
	1.1.6 demonstrate the methods of protecting wall surface against weather erosion and physical damage.	Protection of wall surface against weather degradation: - rendering e.g. cement-sand, lime- cement, sand/soil, bitumen-soil, lime-pozzolana- soil, pozzolana- cement sand - tiling - oil based paint - painting e.g. oil and water	- discuss with students methods of protecting wall surface against weather degradation and physical damage. - assist students to render wall surface against weather. - assist students to paint wall surface against weather	explain the methods of protecting wall surface against weather erosion and physical damage
	1.1.6 compare the differences between load bearing and non-load bearing walls.	Comparison of load and non-load bearing walls	use chart to guide students compare load bearing and non-load bearing walls	compare the differences between load bearing and non load bearing walls
	1.1.7 describe the materials for load and Non-load bearing wall.	Materials for load and non load bearing wall: - timber - metal - block/brick	use real materials and guide students to discuss materials for wall construction	describe the materials for wall construction
	1.1.8 describe free standing wall.	Free standing wall - fence wall - parapet wall	group students to discuss free standing wall	describe free standing wall
	1.1.9 explain the methods used to prevent free standing wall from moisture penetration.	Preventive methods e.g. use of coping, damp proof course and flashing.	discuss the methods of preventing moisture penetration in free standing wall using sketches	explain the methods used to prevent moisture penetration in free standing wall with the aid of sketches

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 2	The student will be able to:		Teacher to:	Students to:
STRUCTURAL RE-QUIREMENTS	1.2.1 explain the structural requirements of walls.	Structural requirements of walls: - load bearing - non-loading bearing walls	discuss the structural requirements of load bearing and non-load bearing walls	explain the structural requirements of walls
	1.2.2 explain the stresses that load-bearing wall support.	Stresses supported by load bearing wall: - buckling - tension - compression - shearing - bending	use models to discuss the stresses supported by load bearing wall	explain the stresses that the load bearing wall support
UNIT 3				
COLUMNS AND BEAMS IN WALLS	1.3.1 define the terms “column” and “beam”.	Column and beam:	group students and use models to discuss column and beam	define column and beam
	1.3.2 state the materials for columns and beams.	Materials for columns and beams: - timber - stone - blocks & bricks - reinforced concrete - metal	show real materials for columns and beams for students to observe.	state the materials for columns and beams
	1.3.3 explain the functions of column and beam.	Functions of column and beam - transmit load.	guide students to discuss the functions of column and beam	explain the functions of column and beam
	1.3.4 apply reinforcement steels to column and beam.	Reinforcement to columns and beams.	demonstrate the reinforcement steel to columns and beams and assist students to practise.	place/fix steel reinforcement in columns and beams.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 4	The student will be able to:		Teacher to:	Student to:
BRIDGING OF OPENINGS IN WALLS	1.4.1 outline types of arch.	Arch: - flat - semi-circular - segmental - elliptical	show models and sketches of types of arch and assist students to draw different types of arch using geometrical method of drawing.	outline types of arch.
	1.4.2 describe types of arch.	Description of types of arch.	group students to discuss the types of arches using sketches and charts	describe the types of arch with the aid of sketches.
	1.4.3 describe types of lintel.	Types of lintel: - wooden - boot - reinforced concrete - steel	use sketches or models and group students to discuss types of lintel	describe types of lintel.
	1.4.4 bridge wall opening in walls .	Methods of bridging wall - openings: - arches - lintels	demonstrate with students the following: i. methods of bridging an opening in walls ii. use of centres in arch work iii. positioning of reinforcement in concrete lintel	bridge an opening with the aid of sketches.
UNIT 5				
TYPES OF RETAINING WALL	1.5.1 explain the “retaining walls”.	Retaining walls.	discuss with students retaining walls.	explain the term “retaining walls”.
	1.5.2 describe types of wall used for retaining walls .	Types of wall - brick - stones - concrete e.g. mass and reinforced.	discuss with students types of wall used for retaining walls.	describe types of wall for retaining walls.
	1.5.3 sketch cross section through retaining walls.	Sections through retaining walls: - show construction methods.	guide students to sketch retaining walls in section.	sketch cross section through types of wall in retaining walls.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 5 (CONT'D) TYPES OF RETAINING WALL	The student will be able to: 1.5.4 explain the effects of overloading in retaining walls.	Overloading effects.	Teacher to: use models to discuss with students the effect of over-loading.	Students to: explain the effects of overloading in retaining walls.
UNIT 6 **PRACTICAL WORK (WALLING)**	1.6.1 set out the outline for the length of a corner brick/ block wall.	Setting out for a corner brickwall with builders square.	demonstrate method of setting-out using straight edges measuring tape, builders chalk etc. for students to practice	set out the outline for the length of a corner brick wall/blockwall.
	1.6.2 batch materials for preparing clay/ lime- sand mortar.	Batching of materials - use of gauge box.	guide students to batch materials correctly for mortar.	batch materials for preparing lime-sand mortar.
	1.6.3 mix materials for mortar.	Mixing of materials: - hand mixing of cement/clay/ lime, sand and water.	demonstrate mixing of materials using spade, watering can etc. for students to practise	mix materials for mortar.
	1.6.4 pick and spread mortar.	picking and spreading of mortar.	demonstrate the correct use of trowel to pick and spread mortar for students to practise	pick and spread mortar.
	1.6.5 lay brick for the first course.	Laying of bricks - using trowel, straight edge spirit level, guage rod, builder's square, brick hammer, club hammer bolster, builder's line	demonstrate methods of brick laying by placing the first and the end bricks. demonstrate the method of gauging, top leveling, plumbing and checking face alignment of the corner bricks for students to practise.	lay bricks for the first course.
	1.6.6 fill in between the end bricks to complete the first course.	Filling in of bricks.	guide students to fill in between the end bricks and align them correctly and fill the vertical joints. guide students to repeat the processes of: i. picking and spreading mortar on the previous course. ii. gauging, top leveling, plumbing iii. checking horizontal and vertical alignment.	fill in between the end bricks to complete the first course.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 6 (CONT'D.)	The student will be able to:		Teacher to:	Students to:
PRACTICAL WORK (WALLING)	1.6.7 lay subsequent courses to complete the required number of courses	Laying other courses.	guide students to use the builder's square where return corners are involved and complete the laying of other courses.	lay subsequent courses to complete the required number of courses.

SENIOR HIGH SCHOOL – YEAR 2

SECTION TWO

SUPERSTRUCTURE

General Objectives: The student will:

1. be aware of types of floors
2. acquires skills in the construction of types of floor

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1	The student will be able to:		Teacher to:	Students to:
FLOOR	2.1.1 explain the term "floor."	Floor.	group students to brainstorm to come out with the meaning of floor.	explain the term " floor".
	2.1.2 describe types of floor.	Types of floor.: - ground floor - suspended floor etc.	use charts and models to discuss with students types of floor.	describe types of floor.
UNIT 2				
GROUND FLOOR	2.2.1 explain the term "ground floor".	Ground floor.	guide students to use models and sketches to discuss ground floor.	explain the term "ground floor".
	2.2.2 describe types of ground floor and their uses.	Types and uses of ground floor. - solid ground floor - suspended ground floor - timber ground floor	discuss with students types of ground floor and their uses. guide students to sketch types of ground floor.	describe types of ground floor and their uses
	2.2.3 explain the functions of types of floor in relation to their characteristics.	Functions of floor types with regards to their characteristics.	discuss with students functions of ground floor and their characteristics.	explain the functions of types of floor in relation to their characteristics.
	2.2.4 differentiate between formation level and ground level.	Formation level and Ground level.	guide students to use models to discuss formation level and ground level with minimum height of 150 mm above ground level.	differentiate between formation level and ground level.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 2 (CONT'D)	The student will be able to:		Teacher to:	Students to:
GROUND FLOOR	2.2.5 describe the methods of constructing ground floors.	Construction of ground floors. - solid ground floor - timber ground floor - suspended ground floor	group students to discuss the methods of constructing ground floors using sketches	describe the methods of constructing ground floors with the aid of sketches.
	2.2.6 select ground floor materials for use.	Selection of ground floor materials: - selected soil/laterite material - sand - rock dust waste - sand reinforced clay rammed in-place - (cement, sand, stone)	demonstrate to students how to select and use materials for ground floor construction.	select materials for ground floor construction.
	2.2.7 explain factors for selecting materials for ground floor construction.	Factors for selecting materials: - types of floor use e.g. domestic, factory, conference hall, institutional etc.	discuss factors for selecting materials for ground floor construction.	explain the factors for selecting materials for ground floor construction.
	2.2.8 select appropriate floor materials depending upon their characteristics and the functions of the floor	Characteristics of floor materials: - hard wearing - inert and stable - strong - chemical resistant - water resistant etc	use models or sketches to discuss the characteristics of the materials required for floors that serve different functions	i. state the functional requirements of a floor. ii. explain the effect that the characteristic of a material has on the functional requirements of the floor.
UNIT 3				
SUSPENDED FLOOR	2.3.1 explain the term "suspended floor" in building construction	Suspended floors	with the aid of sketches discuss the suspended floor types with students	explain the term "suspended floor" with the aid of sketches.
	2.3.2 explain the structural requirements of suspended floors.	Structural requirements of suspended floors:- - tension and compression reinforcement bars - surface finish - vibrating forces - sound and thermal resistance - fire resistance	discuss with students the structural requirements of suspended floors.	explain the structural requirements of a suspended floors.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 3 (CONT'D) **SUSPENDED FLOOR**	The student will be able to: 2.3.3 state types of suspended floor	Types of suspended floor: - solid floor - timber floor - suspended precast hollow floors - corridors and balconies etc	Teacher to: use sketches and models to show types of suspend floor. Illustrate the types of suspended floor for students to observe.	Students to: state types of suspended floor and sketch them.
	2.3.4 explain the functions of suspended floors.	Functions of suspended floors. - provide surface for finishes - provide for service runs	discuss with students functions of suspended floors.	explain the function of suspended floors.
	2.3.5 explain the uses of corridors and balconies of suspended floors.	Corridors and balconies.	discuss the uses of corridors and balconies. show suspended corridors and balconies to students and discuss their safety precautions.	explain the uses and safety precautions to be taken for suspended corridors and balconies.
	2.3.6 describe materials used for suspended floor construction.	Materials for suspended floor construction e.g. reinforced, concrete, timber, earth, hollow blocks, etc.	discuss with illustrations materials used for constructing suspended floors.	describe materials for constructing suspended floors with the aid of sketches.
	2.3.7 demonstrate the methods of constructing suspended floors with the aid of sketches.	Methods for constructing suspended. floors; - solid - timber - hollow	demonstrate to students methods of constructing suspended floors using sketches and charts and assist them to practise.	explain the methods of constructing suspended floors with the aid of sketches.
UNIT 4 **FORMWORK AND SUPPORTS**	2.4.1 explain the term 'formwork".	Formwork.	discuss the term "formwork" with students.	explain the term "formwork".
	2.4.2 select the materials used for the types of formwork.	Materials for formwork: - bamboo - timber - steel - made woods, plywood, hard board; - plastic sheets - mould oil	discuss with students the criteria for the selection of material for formwork.	select materials for the types of formwork.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 4 (CONT'D.) **FORMWORK AND SUPPORTS**	The student will be able to: 2.4.3 describe the types of formwork in building construction.	Types of formwork: - columns - beams	discuss types of formwork with students.	describe the types of formwork in building construction.
	2.4.4 explain the factors to be considered in constructing timber formwork.	Factors involved in constructing timber formwork: - strength - stability - load - shape of concrete - blow holes - uneven colour	discuss with students the factors to be considered in constructing timber formwork.	explain the factors to be considered in constructing timber formwork.
	2.4.5 describe the erection of types of formwork with the aid of sketches.	Erection of formwork.	group students to discuss erection of formwork with the aid of sketches.	describe the erection of types of formwork with the aid of sketches.
	2.4.6 demonstrate method of striking formwork	Striking of formwork.	demonstrate to students the methods of striking formwork and assist them to practise.	explain method of striking formwork.
UNIT 5 **SCAFFOLDS AND SCAFFOLDING**	2.5.1 explain the term 'scaffold" .	Explanation of scaffold.	discuss with students the term "scaffold".	explain the term "scaffold".
	2.5.2 outline the types of scaffold.	Types of scaffold: - putlog - independent	use model and sketches to show types of scaffold to students.	outline the types of scaffold.
	2.5.3 describe scaffolding with the aid of sketches	Scaffold fittings. e.g. base plate, couplers, putlog, etc	use sketches and models to discuss with students types of scaffold fittings and scaffolding.	describe scaffolding with the aid of sketches
	2.5.4 explain the uses of scaffolds.	Uses of scaffolds.	discuss with students the uses of scaffolds	explain the uses of scaffolds.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 5 (CONT'D.) **SCAFFOLDS AND SCAFFOLDING**	The student will be able to:		Teacher to:	Students to:
	2.5.5 describe materials used for the construction of scaffolds.	Materials for scaffolding: - bamboo - timber - metal	discuss with students materials used for constructing scaffolds.	describe the materials for constructing scaffolds.
	2.5.6 demonstrate the methods of constructing scaffolds.	Scaffolds construction.	demonstrate the construction of scaffold with students.	explain the methods of constructing scaffolds.
	2.5.7 apply precautions necessary in the use of scaffolding.	Precautions in scaffolding.	demonstrate the precautionary measures in scaffolding and assist students to practice.	explain the precautions necessary in the use of scaffolds.

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SECTION THREE

ROOFS

General objectives: The student will:

1. recognize types of roofs in building construction
2. acquire skills in roof construction
3. determine materials used for roof construction

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1 **TYPES OF ROOFS**	The student will be able to: 3.1.1 describe types of roofs with the aid of sketches.	Types of roofs: - lean-to roofs - flat roofs - pitch roofs	Teacher to: discuss types of roofs with the aid of sketches and charts.	Students to: describe types of roofs with the aid of sketches.
	3.1.2 explain parts of roofs and their functions.	Parts of types of roofs: e.g. wall plates rafter, ridge piece, tie, roof battens, struts, roofs covering, gable, fascia, etc.	use models and sketches to discuss with students parts of roofs and their functions.	explain parts of roofs and their functions.
	3.1.3 explain the terms in roofs construction.	Terms in roofs construction: - pitch - rise - run - span - overhang, etc.	use models and sketches and guide students to discuss the terms in roofs construction using sketches. visit site with students to observe construction.	explain the terms in roofs construction with sketches. write group report and discuss in groups after visit

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 2	The student will be able to:		Teacher to:	Students to:
ROOFS COVERING MATERIALS	3.2.1 identify roofs covering materials.	Roof covering materials: - thatch - corrugated metal/plastic sheets - corrugated asbestos sheets - concrete reinforced slab; - tile, etc.	Show models of roof covering materials and discuss with students	Identify roof covering materials.
	3.2.2 apply safety precautions to be observed during fixing of roofs covering.	Safety precautions: i. during fixing of roof covering: - slope stay ladder - scaffold, etc - safety net. ii. during handling and lifting of roof covering material - lifting machine within limits.	demonstrate safety measures during fixing and handling of roof materials.	explain safety precautions to be observed during fixing of roof covering.
UNIT 3				
ROO CONSTRUC-TION	3.3.1 demonstrate the methods of constructing roofs.	Construction of roofs: - lean-to - couple - close couple - collar - flat - truss	demonstrate to students the methods of constructing pitch and flat roofs.	explain the construction of roofs with the aid of sketches.
	3.3.2 apply measures for preventing uplift of roofs.	Measures for preventing uplift of roofs: - adequate pitch - proper anchorage - fascia board - eaves boarding etc.	discuss measures of checking roof uplift during storm with students.	explain measures for preventing uplift of roofs.

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SECTION FOUR

BUILDING AND CONSTRUCTION MATERIALS

General objectives: The student will:

1. acquire knowledge of building materials
2. acquire knowledge of the processes in the manufacture of building materials
3. develop interest in the use of local building materials

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1	The student will be able to:		Teacher to:	Students to:
BUILDING MATERIALS	4.1.1 identify building materials	Identification of building materials: - sand, stones, binding materials, damp proof materials, timber, metals, local building materials .	display building materials for students to observe.	identify building materials
	4.1.2 select the materials for making blocks/bricks.	Block/brick materials e.g. sand/soil/clay, Sandust, cement, bitumen, lime/ pozzolana etc.	discuss with students the materials for making different types of block/bricks.	list materials for making blocks and bricks.
	4.1.3 state the mix ratios for types of blocks/bricks.	Mix ratios: - blocks/bricks - sandcrete - landcrete	discuss with students the mix ratios for types of blocks/ bricks.	state mix ratios for types of blocks/bricks.
	4.1.4 state the recommended sizes of blocks/bricks.	Sizes of blocks/bricks	group students to discuss the recommended sizes of blocks and bricks.	state the recommended sizes of blocks/bricks.
	4.1.5 describe manufacture of blocks/bricks.	Manufacture of blocks/bricks: - manual method - machine method	discuss the process for manufacturing blocks/ bricks. demonstrate using both methods.	describe manufacture of block/bricks.
	4.1.6 distinguish between bricks and blocks	Difference between bricks and blocks	show bricks and blocks and group students to discuss their differences	distinguish between bricks and blocks

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1 (CONT'D) **BUILDING MATERIALS**	The student will be able to: 4.1.7 explain the advantages in the of manufacture of sandcrete blocks by hand and machine methods 4.1.8 explain the fundamental properties of blocks/ bricks. 4.1.9 identify binding materials. 4.1.10 explain types of binding Material. 4.1.11 explain the manufacture of Ordinary Portland Cement. 4.1.12 explain the properties of Ordinary Portland Cement.	Advantages and disadvantages of making blocks/bricks - manual method - machine method Fundamental properties of blocks/bricks. Binding materials. Types of binding material: - cement types: i) ordinary Portland cement ii) sulphate resisting, low heat, iii) blast furnace - lime, clay, etc. Ordinary Portland Cement. Properties of cement: - soundness - fineness - hardness - setting, etc.	Teacher to: group students to discuss the advantages and disadvantages of making blocks/bricks using manual and machine methods. discuss fundamental properties of blocks/bricks with students. Show types of binding materials to students. discuss types of binding materials and their uses with students. discuss with students the manufacture of Ordinary Portland Cement using sketches/charts. discuss with students the properties of Ordinary Portland Cement.	Students to: explain the advantages and disadvantages of the manufacture of sandcrete blocks by hand and machine methods. explain fundamental properties of blocks/bricks. explain binding material. explain the types of binding material. explain the manufacture of Ordinary Portland Cement. explain the properties of Ordinary Portland Cement

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 2	The student will be able to:		Teacher to:	Students to:
DAMP PROOF MATERIALS	4.2.1 explain the term "damp-proofing".	Damp-proofing.	group students to brainstorm to come out with the meaning of damp proofing.	define the term "damp proofing".
	4.2.2 describe materials used for damp- proofing.	Damp proof materials.	discuss materials for damp-proofing with the use of real materials	describe materials for damp-proofing.
	4.2.3 explain the purpose for using damp proofing in buildings.	Purpose for damp proofing.	discuss with students the purpose for damp-proofing in buildings.	explain the purpose for damp-proofing in building.
UNIT 3				
METALS	4.3.1 describe types of metal used in building construction.	Description of metals used in buildings: - aluminum - copper - zinc - lead, etc.	discuss with students types of metal used in building. show samples of metals to students.	Describe types of metal used in building.
	4.3.2 explain the characteristics of metals used in building construction .	Characteristics and uses of metals	guide students to use real materials and discuss the characteristics and uses of metals in building construction.	explain the characteristics of metals used in building construction and their functions.
UNIT 4				
CONCRETE WORKS	4.4.1 explain the constituents of concrete.	Concrete e.g. cement, sand, stones, water.	discuss with students the constituents of concrete.	explain the constituents of concrete.
	4.4.2 explain the term "water/ cement ratio".	Water/cement ratio.	group students to discuss term "water/cement ratio".	explain the term "water cement ratio".
	4.4.3 demonstrate methods of batching concrete materials .	Batching: - volume - weight.	guide students to demonstrate methods of batching concrete materials by volume and weight for students to practice ".	describe methods of batching concrete materials.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 4 (CONT'D.)	The student will be able to:		Teacher to:	Students to:
CONCRETE WORKS	4.4.4 explain the properties of concrete.	Properties of concrete: - fresh - hardened.	use charts and group students to discuss the properties of concrete.	explain the properties of concrete.
	4.4.5 demonstrate stages in concreting operation.	Concreting operations: - batching - mixing - transporting - placing - compacting - curing.	guide students to demonstrate the stages in concreting operation.	explain the stages in concreting operation.
	4.4.6 demonstrate the methods used in testing concrete.	Concrete tests: - slump test - compacting factor test - cube test.	use sketches and charts to illustrate methods of testing concrete guide students to demonstrate methods of testing concrete.	explain the methods used in testing concrete with the aid of sketches.
UNIT 5				
TIMBER	4.5.1 identify types of timber and their uses.	Types of timber - uses	show samples of timber to students. group students to discuss the uses of timber.	identify types of timber and their uses.
	4.5.2 describe the methods involved in processing timber.	Timber processing methods: - conversion - seasoning - preservation	guide students to demonstrate the methods involved in processing timber. visit timber industry to observe the processing of methods.	describe the methods involved in processing timber. write group report and discuss in class after visit
	4.5.3 explain the properties of timber.	Properties of timber.	group students to discuss the properties of timber.	explain the properties of timber.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 6	The student will be able to:		Teacher to:	Students to:
LOCAL BUILDING MATERIALS	4.6.1 identify local building materials.	Local building materials - stone, sand, soil/laterite, bamboo, raffia, timber e.g. borassious palm, thatch, etc.	show real local materials or charts to students.	identify local building materials.
	4.6.2 demonstrate the methods of reinforcing earth walls.	Reinforcing earth walls: - reinforcement materials e.g. bamboo, bush stick, sand, lime, cement etc.	demonstrate the various ways of reinforcing earth walls and assist students to practice. illustrate with students the fixing of reinforcement materials.	explain methods of reinforcing earth walls.
UNIT 7				
PRACTICAL WORK (MANU-FACTURE OF BLOCKS)	4.7.1 batch materials for making Blocks.	Batching of materials.	Demonstrate the following with students: i. batch sand using gauge box. ii. spread out sand using spade.	batch materials for making blocks.
	4.7.2 mix the batched materials to a required state.	Mixing.	iii. batch cement and spread on sand. iv. mix to obtain uniform colour. v. spread out the mix and sprinkle water on it. vi. mix to obtain a uniform semi-dry mixture.	mix batched material to a required state.
	4.7.3 mould blocks.	Moulding of blocks Tools required e.g. mould box, tamping rod, trowel, spade, etc.	vii. prepare the mould box for use viii. mould blocks by filling, tamping and leveling the top. ix. demonstrate how to remove mould box from blocks.	mould blocks.
	4.7.4 cure blocks.	Curing.	demonstrate different methods of curing blocks: e.g. covering with hessian sheet, plastic sheet sprinkling of water, covering with damp sand/ sawdust, etc.	cure blocks.
	4.7.5 stack blocks.	Stacking.	guide students to stack blocks in interlocking pattern.	stack blocks.

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SECTION FIVE

FINISHES AND FITTINGS

General objectives: The student will:

1. acquire knowledge of finishes and fittings
2. acquire skills in applying finishes and fittings

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1	The student will be able to:		Teacher to:	Students to:
FLOOR FINISHES	5.1.1 identify types of floor finish.	- Floor finishes - screed - terrazzo - floor tiles - wood blocks - tongue and groove board - paints.	use models and sketches to discuss with students types of floor finishes.	Identify types of floor finishes.
	5.1.2 describe types of floor finish.	Types of floor finish.	show charts with types of floor finish to students. group students to discuss types of floor finish. take students to completed buildings and guide them to observe types of floor finish.	describe types of floor finish. write report after visit and discuss in class
	5.1.3 describe the materials for types of floor finish.	Floor finish materials.	discuss with students the materials for types of floor finish.	describe the materials for types of floor finish.
	5.1.4 describe the procedures for laying floor finishes.	Laying procedures.	i. discuss with students the procedure for laying floor finishes. ii. demonstrate methods of laying floor finishes.	describe the procedures for laying floor finishes.
	51.5 explain the advantages and disadvantages of types of floor finish	Advantages and disadvantages of types of floor finish.	discuss with students the advantages and disadvantages of types of floor finish.	explain the advantages of and disadvantages types of floor finish.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 2	The student will be able to:		Teacher to:	Students to:
WALL FINISH	5.2.1 identify types of wall finish.	Types of wall finish: - cement/sand stone - terrazzo - wall tiles - plaster of Paris (POP) - lime/cement/sand etc - bitumen/soil.	show types of wall finish to students, and assist them to identify them.	Identify types of wall finish.
	5.2.2 describe the characteristics of types of wall finish.	Characteristics of types of wall finish.	use chart to discuss with students the characteristics of types of wall finish.	describe the characteristics of types of wall finish.
	5.2.3 explain the factors to consider in selecting wall finishes.	Factor for selecting wall finishes.	discuss with students the factors for selecting wall finishes.	explain the factors for selecting wall finishes.
	5.2.4 demonstrate the methods of applying wall finishes.	Application of wall finishes.	guide students to demonstrate methods of applying wall finishes.	describe the methods of applying wall finishes.
UNIT 3				
DOOR AND DOOR FRAMES	5.3.1 describe types of door frame.	Types of door frame: - plain frame - rebated frame - door linings.	guide students to discuss types of door frame with the aid of sketches.	describe types of door frame with the aid of sketches
	5.3.2 describe types of door.	Door types: - battens - panel - flush - glazed.	use charts and sketches to show types of door to students.	explain the types of door with the aid of sketches.
	5.3.3 explain the functions of doors.	Functions of door.	discuss with students the functions of doors.	explain the functions of doors

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 3 (CONT'D)	The student will be able to:		Teacher to:	Students to:
DOOR AND DOOR FRAMES	5.3.4 select type of door for a particular use.	Selection of door types: - uses e.g. bathroom, kitchen, bedroom, etc.	guide students to select doors for particular uses.	select a type of door for particular use.
	5.3.5 demonstrate the methods of constructing doors.	Construction of doors: - batten doors - panel doors - flush doors, etc. - glazed.	i. demonstrate with students the construction of types of door. ii. guide students to sketch details in constructing doors.	describe the methods of constructing doors.
	5.3.6 describe the methods of fixing door frames into wall openings.	Methods of fixing door frames: - use of breeze block, 150mm nail, wood plug.	- illustrate with students methods of fixing door frame into wall openings. - take students on site visits to see how doors are fixed.	describe the methods of fixing door frames into wall openings with the aid of sketches. write report in groups and discuss in class
	5.3.7 demonstrate the methods of fixing doors to door frames.	Methods of fixing doors e.g. use of ironmongery.	illustrate and demonstrate the methods of fixing doors to door frames.	describe with the aid of sketches methods of fixing doors to door frames.
UNIT 4 **WINDOWS AND WINDOWS FRAMES**	5.4.1 identify types of window.	Window types: - batten - casement - louvered - jealousy - glazed.	show real windows or models to students	identify types of window.
	5.4.2 describe types of window and their frames .	Window and window frames parts .	i. with the aid of charts, group students to discuss types of window and their frames. ii. illustrate with sketches types and parts of window.	describe types of window and window frame with the aid of sketches.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 4 (CONT'D)	The student will be able to:		Teacher to:	Students to:
WINDOWS AND WINDOWS FRAMES	5.4.3 explain the functions of windows.	Functions of windows: - ventilation - lighting, etc.	discuss with students functions of windows.	explain the functions of windows.
	5.4.4 describe the methods of constructing windows.	Windows and window frames construction.	illustrate the construction of windows and window frames.	describe the methods of construction of windows with the aid of sketches.
	5.4.5 demonstrate the methods of preventing entry of moisture at joints in windows and window frames.	Moisture Prevention: - sills/cills - water bar - DPC.	i. demonstrate to students how to prevent moisture from entering the joints	describe the methods of moisture exclusion from the joints of windows and window frames.
UNIT 5				
IRONMON-GERY	4.5.1 explain the term "ironmongery".	Ironmongery.	group students to discuss the term ironmongery.	explain Ironmongery.
	4.5.2 describe types of ironmongery.	Types of Ironmongery; e.g. hinges, nails, locks, catches, stays, bolts, latches, etc.	- display ironmongery. for students to observe - discuss with students the criteria for selecting ironmongery.	describe types of ironmongery.
	4.5.3 sketch types of ironmongery.	Types of ironmongery.	guide students to sketch types of ironmongery.	sketch types of ironmongery.
	4.5.4 demonstrate the uses of types of ironmongery.	Uses of types of ironmongery: - hinging - catches - lock secure	- discuss with students the uses of types of ironmongery. - assist students to hinge a door.	explain the uses of types of Ironmongery. fix a door/using hinges.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 6	The student will be able to:		Teacher to:	Students to:
CEILING	5.6.1 explain the term "Ceiling".	Ceiling.	group students to discuss the term "ceiling".	explain the term "ceiling ".
	5.6.2 describe materials for ceiling.	Ceiling materials e.g. plywood, plastic sheet glass fibre, fibre board , concrete, Plaster of Paris (POP), timber	discuss materials for ceiling with students	describe materials for ceiling.
	5.6.3 explain purpose of ceiling.	Purposes of Ceiling: e.g. create level, finish, as decoration, intercept dust from roof space, etc.	group students to discuss purposes of ceiling	explain the purposes of ceiling.
	5.6.4 explain the functions of the parts in ceiling construction.	Parts of ceiling: e.g. noggings, sheeting/ ceiling covering, cove mouldings, battens, joist, hangers, cornice, etc.	group students to discuss the functions of the parts using charts and sketches.	explain functions of parts in ceiling construction.
	5.6.5 describe the methods of constructing ceiling.	construction of ceiling.	group students to discuss methods of constructing ceiling.	describe the methods of constructing ceiling.
			illustrate the details of ceiling construction for students to practice	
			take students to site to observe ceiling construction	write group report and discuss in class after visit
UNIT 7				
PAINT AND PAINTING	5.7.1 explain the term: "painting".	Painting.	use chart to discuss painting with students.	explain the term "painting".
	5.7.2 describe types of paint.	Types of paint - oil paint - emulsion paint, etc.	show types of paint and discuss them with students	describe types of paint.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 7 (CONT'D) **PAINT AND PAINTING**	The student will be able to:		Teacher to:	Students to:
	5.7.3 explain functions of paints.	Functions of paints. - spraying	group students to discuss functions of paints.	explain functions of paints.
	5.7.4 explain the procedures for preparing surfaces to receive paint.	Preparation of surfaces : - timber - plaster board - cement/sand finish - metal.	demonstrate the methods of preparing surfaces for painting. guide students to prepare background surface to receive paints	explain the procedure for preparing surfaces to receive paints.
	5.7.5 explain the purpose of priming in painting.	Purpose of priming in painting.	guide students to discuss the purpose of priming surfaces	explain the purpose of priming in painting.
	5.7.6 demonstrate the use of tools/equipment for painting.	Types of tool/equipment.	demonstrate the use of tools/equipment for painting	describe the uses of the types of tool/equipment for painting.
	5.7.7 explain the defects in painting.	Defects in painting: - blisters - flaking - cracks, etc.	group students to discuss defects in painting take students to existing buildings to identify defects in painting	explain the defect in painting.
	5.7.8 explain the remedies for defects in painting.	Remedies in painting.	discuss the remedies for defects in painting.	explain the remedies for defects in painting.
	5.7.9 demonstrate the methods of painting.	Methods of painting: - brushing - rolling	guide students to demonstrate methods of painting.	describe methods of painting.

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SECTION SIX

PRACTICAL WORK

General objectives: The student will:

1. acquire skills in fixing door/window frames
2. acquire skills in installing fittings
3. acquire skills in applying finishes

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1 **PRACTICAL WORK (FIXING OF DOOR /WINDOWS FRAME)**	The student will be able to: 6.1.1 brace the frame to keep frame Square 6.1.2. stand frame in position, level, support with struts 6.1.3. fix door/window frame to block/brick wall opening.	Fixing of door/window frame: - use of breeze block - wood plug - galvanized clamps	Teacher to: demonstrate methods of fixing door/window frame to wall opening for students to practice	Students to: fix door/window frame to block/brick wall opening.
UNIT 2 **PRACTICAL WORK (HANGING OF DOOR)**	6.2.1 mark out position of hinges 6.2.2 hang a door to door frame.	Hanging of doors	demonstrate the techniques in hanging door to door frame and assist for students to practise	hang a door to a door frame.
UNIT 3 **PRACTICAL WORK (LAYINNG OF FLOOR AND WALL TILE)**	6.3.1 prepare the surface to be tiled.	Preparation for tiling. - keying - cleaning - dampening, .	demonstrate preparations involved before tiling.	prepare surface to receive tiles.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 3 (CONT'D)	The student will be able to:		Teacher to:	Students to:
PRACTICAL WORK (LAYINNG OF FLOOR AND WALL TILE)	6.3.2 use correct methods for laying/fixing tiles.	Fixing and laying of tiles: - adhesives - cement mortar etc	demonstrate the correct methods for laying/fixing tiles for students to practice	use correct methods for laying/ fixing tiles.
	6.3.3 finish of the tiled surface.	Finishing to tiled surface	demonstrate finishing of tiled surface for students to practice	finish of tiled surface.

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SECTION SEVEN

SIMPLE BUILDING DRAWING

General objectives: The student will:

1. acquire skills and techniques in building drawing.
2. recognize simple interpretation of building plans and their detailed drawing.
3. apply building drawing to actual building processes.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1	The student will be able to:		Teacher to:	Student to:
DIMENSIONING	7.1.1 dimension views using appropriate scales.	Dimensioning.	guide students to assign dimensions using appropriate scales. demonstrate how to dimension views of building plans.	dimension views of plan using appropriate scales.
	7.1.2 assign letters and figures to views and details correctly.	Lettering.	illustrate methods of lettering views and details of simple building plan with students.	assign letters and figures to views and details correctly.
UNIT 2				
BUILDING DRAWING SYMBOLS	7.2.1 identify electrical and plumbing symbols.	Electrical/plumbing symbols. e.g. sockets, fans, bells, switches, water closet, showers etc.	use sketches and charts to discuss with students, simple electrical and plumbing symbols guide students to identify simple electrical and plumbing symbols.	identify electrical and plumbing symbols.
	7.2.2 use symbols in building drawings.	Use of symbols.	guide students to use symbols with chart, illustrating how to represent electrical and plumbing symbols correctly.	use symbols in building drawing.

Note: *This section should be treated by students who are not offering Elective Technical Drawing)*

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 3	The student will be able to:		Teacher to:	Student to:
PRESENTATION OF SIMPLE BUILDING DRAWINGS	7.3.1 explain the principles of orthographic projection in building drawing.	Principle of orthographic projection.	illustrate with the aid of charts and models the principles of orthographic projections.	explain the principles of orthographic projection in building drawing.
	7.3.2 explain the principles of freehand sketching.	Principles of freehand sketching.	guide students to discuss the principles of freehand sketching.	explain the principles of freehand sketching.
	7.3.3 sketch a simple building in orthographic projection in freehand.	Elevations e.g. front, end, plan - 1st angle - 3rd angle	illustrate drawing of elevations in orthographic projection for students to practice guide students to use orthographic principles in detail drawing.	sketch in first angle and third angle projections the: i. front view ii. plan iii. end view of a simple building in freehand.
UNIT 4				
DETAILED DRAWING OF A BUILDING	7.4.1 explain detailed drawing of a building.	Detailed drawing: - foundation plan - ground floor plan - sectional elevations - foundation footings - columns - beams	discuss with students the purpose of detailed drawing. illustrate with students the detail drawings of a building.	explain detailed drawing of a building.
	7.4.2 produce detailed drawings in orthographic projection of a simple building.	Detailed elevation drawings: - 1st angle projection - 3rd angle projection	guide students to produce detailed drawings of simple building using charts and sketches.	produce detailed drawings of a simple building in first and third angle orthographic projections.
	7.4.3 sketch simple building details in freehand.	Freehand sketching of - sectional views e.g. foundations, footings, doors, windows, sills, roof details, etc.	use charts and models to discuss the freehand sketching. illustrate with students freehand sketching of various details.	sketch simple building drawing details using freehand.

SENIOR HIGH SCHOOL - YEAR 3

SECTION ONE

STAIRS

General objectives: The student will:

1. acquire knowledge in stairs.
2. understand the fundamentals of stair construction.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1	The student will be able to:		Teacher to:	Student to:
TYPES OF STAIR	1.1.1 explain the term "stairs".	Definition of stair.	group students to brainstorm to come out with the meaning of the term "stair"	explain the term stairs.
	1.1.2 explain types of stair.	Types of stair: - straight flight, quarter, half-turn, dog-legged, spiral, tapered.	discuss with students types of stair. take students to an upstairs building to observe stairs and their details.	explain types of stair. write group report after visit and discuss in class.
	1.1.3 determine parts of stairs.	Parts of stairs e.g. tread, riser, newel string balustrades, etc.	discuss parts of stairs and assist students to sketch types of stairs with their details.	determine the parts of stairs. sketch types of stair with details.
	1.1.4 describe the parts of stairs.	Parts of stairs.	discuss parts of stairs using charts, and models.	describe the parts of stairs.
	1.1.5 explain the functional requirements of stair construction.	Functional requirements of stair construction. - uniform steps, - strength, - durability, etc.	discuss with students the functional requirements of stair construction.	explain the functional requirements of stair construction.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 2 **TIMBER STAIR CON-STRUCTION**	The student will be able to: 1.2.1 demonstrate the methods of setting out a timber stairs.	Setting out of timber stairs.	Teacher to: demonstrate the procedures for setting out timber stairs with students. show models of setting out to students. demonstrate to students the act of setting out timber stairs.	Student to: demonstrate the method of setting out timber stairs.
	1.2.2 sketch the layout of stairs.	Layout of timber stairs e.g. tread, riser, nosing, landing, skirting, etc.	demonstrate to students the preparation of layout of stairs using sketches.	sketch the layout of stairs.
	1.2.3 demonstrate the methods of constructing timber stairs.	Timber stair construction: - joint between tread and riser with nosing. - joint between tread with riser and strings - fixing handrails and balusters in stairs.	demonstrate to students methods of constructing timber stairs with sketches and models of joints.	demonstrate the construction of timber stairs.
	1.2.4 explain the problems associated with timber stairs.	Problems in timber stair construction: - materials defects - constructional defects	i. discuss with students defects of materials used for timber stairs. ii. discuss constructional defects with students.	explain the problems associated with timber stairs
UNIT 3 **CONCRETE STAIR CON-STRUCTION**	1.3. 1 describe formwork construction for concrete stairs.	Formwork for concrete stairs.	i. discuss with students the steps involved in erecting formwork. ii. demonstrate to students using models.	describe the construction of formwork for concrete stairs.
	1.3.2 demonstrate methods of placing reinforcement in concrete stairs	Placement of reinforcement bars: - tension - compression	i. demonstrate to students the methods of placing reinforcements in concrete stairs. ii. take students on guided tour to observe stairs reinforcement placing.	describe the method of placing reinforcement in concrete stairs.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 3 (CONT'D) **CONCRETE STAIR CONSTRUCTION**	The student will be able to: 1.3.3 demonstrate methods of fixing balustrade to concrete stairs.	Fixing of balustrade: - timber - metal - concrete	Teacher to: demonstrate to students the methods of fixing balustrade in concrete stairs using sketches.	Student to: describe the methods of fixing balustrade in concrete stairs.
	1.3.4 explain the functional characteristics of the balustrade materials.	Functional characteristics of materials for balustrade. Construction: - timber - metals, - concrete	discuss with students the functional characteristics of balustrade materials: - rotting effect of moisture on timber - rusting iron/steel due to dampness - concrete cracks, decomposition due to poor mixing, poor design, etc.	explain functional characteristics of balustrade materials.
UNIT 4 **CONSTRUCTION OF METAL STAIRS**	1.4.1 identify types of metal used for metal stair.	Metal stairs: - steel - aluminum - alloy metals	use models to discuss with students types of metal for stair construction.	identify types of metal used for metal stair.
	1.4.2 demonstrate the method of fixing Balustrade in metal stairs.	Fixing balustrade - bolts and nuts - welding	demonstrate to students the methods of fixing balustrade using sketches. demonstrate to students the various methods of fixing stairs.	describe the methods of fixing balustrade in metal stairs.

SECTION TWO

BUILDING SERVICES

General Objectives: The student will:

1. be aware of the type of services provided in buildings.
2. recognise the provision of building services.
3. appreciate the importance of safety precautions.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1	The student will be able to:		Teacher to:	Students to:
DRAINAGE	2.1.1 explain "drainage".	Drainage.	group students to discuss drainage, stating its importance to health and sanitation	explain drainage.
	21.2 explain the principles of Drainage.	Principles of Drainage.	discuss the principles of drainage.	explain the principles of drainage.
	2.1.3 explain the types of drainage scheme.	Types of drainage system: - combined - separate - partially separate	group students to discuss the types of drainage using sketches.	explain the types of drainage scheme using sketches.
	2.1.4 explain the factors to consider in selecting a type of drainage scheme.	Factors for selecting a type of drainage scheme.	discuss with students the factors for selecting a type of drainage scheme.	explain the factors to consider in selecting types of drainage scheme.
	2.1.5 describe the materials for a drainage system .	Materials for drainage: - clay pipe - asbestos - PVC - ceramic - fibre glass, etc	discuss materials for drainage with students showing samples.	describe the materials for drainage system.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 2 **LAYING IN DRAINAGE**	The student will be able to: 2.2.1 explain with the aid of sketches the methods of joining pipes.	Methods of joining pipes.	Teacher to: discuss the methods of joining different types of pipes using sketches.	Students to: explain the methods of joining pipes with the aid of sketches.
	2.2.2 describe the functions of Traps.	Functions of traps: e.g. create siphonic action to empty effluent, seal off foul air from back flows.	discuss with students the functions of traps. use models of trap to discuss the functions of a trap to students.	describe the functions of traps using sketches to illustrate.
	2.2.3 explain the functions of an inspection chamber.	Functions of an inspection chamber e.g: rodding, inspection maintenance	i. discuss with students the functions of an inspection chamber. ii. assist students to make sketches and illustrations	explain the function of an inspection chamber.
	2.2.4 demonstrate the measures for protecting against flooding.	Protection against flooding: - storm drain	demonstrate measures of preventing flooding in drainage.	describe the measures taken to protect drainage against flooding.
	2.2.5 demonstrate the methods of laying and bedding drain pipes .	Methods of laying and bedding drains: - rigid and flexible materials - rigid and flexible joints	demonstrate the methods of laying and bedding drain pipes with charts and sketches.	describe the methods of laying and bedding drain pipe.
	2.2.6 demonstrate methods of testing drains.	Methods of testing drains: - water test - smoke test - air test - mirror test - ball test	demonstrate to students the methods of testing drains.	describe methods of testing drains.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 3	The student will be able to:		Teacher to:	Students to:
DISCHARGE UNITS IN DRAINAGE	2.3.1 explain the term cesspool	Cesspool.	idiscuss with students cesspool using sketches	explain cesspool with the aid of sketches.
	2.3.2 explain the functions of Soakaway.	Functions of soakaway.	discuss the functions of soakaway using sketches	explain the functions of soakaway.
	2.3.3 demonstrate the methods of constructing manholes.	Construction of manholes.	i. demonstrate to students the methods of constructing manhole using sketches. ii. take students to site to observe manhole construction	describe the method of constructing manhole. write group report after visit
	2.3.4 demonstrate the method of constructing septic tank.	Construction of septic tank: - compartmentation - baffle provision	demonstrate to students methods of constructing septic tank using sketches. differentiate cesspool from septic tanks with students using sketches.	explain the method of constructing septic tank with the aid of sketches.
UNIT 4				
DOMESTIC WATER SUPPLY	2.41 explain the types of pipe used in cold water supply.	Cold water pipes: - communication pipes - service pipes - distribution pipes	discuss with the students pipes used in cold water supply.	explain the pipes used in cold water supply.
	2.4.2 explain types of joint in cold water supply.	Types of joint: - manipulative - non-manipulative - capillary	group students to discuss types of joint using sketches.	explain the types of joint in cold water supply with the aid of sketches.
	2.4.3 explain the differences between direct and indirect cold water supply systems.	Differences between cold water supply system: - direct - indirect	discuss the differences between direct and indirect cold water supply systems with the aid of sketches and charts.	explain the differences between direct and indirect cold water supply systems.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 4 (CONT'D)	The student will be able to:		Teacher to:	Students to:
DOMESTIC WATER SUPPLY	2.4.4 describe direct hot water supply system.	Direct hot water supply system.	discuss with students the direct hot water supply system using sketches.	describe direct hot water supply system with the aid of sketches.
	2.4.5 describe indirect hot water supply system.	Indirect hot water supply.	i. group students to discuss the indirect hot water supply system using sketches. ii. discuss the difference between direct and indirect hot water supply systems.	describe indirect hot water supply system with the aid of sketches.
UNIT 5				
ELECTRICAL INSTALLATION	2.5.1 identify types of representative symbols used in electrical installation works.	Electrical representative symbols, - accessories and fitting e.g. switches, sockets, fuses, meter, consumer unit, etc,	use sketches to show types of electrical representative symbols.	identify types of electrical representative symbol.
	2.5.2 identify types of materials for electrical installation work.	Materials for electrical installation e.g. steel, PVC, copper, aluminum, etc.	i. show samples of real materials for electrical installation to students ii. discuss with students the specific characteristics of each material	explain the types of materials for electrical installation work with their characteristics.
	2.5.3 explain types of electric lamp used in building.	Types of lamps used in buildings e.g. incandescent lamp, fluorescent lamps, compact florescent lamps	i. discuss with students types of lamp showing samples. ii. explain to students the factors that differentiate them.	explain types of electric lamps used in buildings.
	2.5.4 demonstrate methods of electrical wiring systems used in building.	Methods of wiring: - trucking - surface wiring - conduit wiring	i. demonstrate to students the methods used in electrical wiring system. ii. discuss with students the difference between the electrical wiring systems.	explain the methods used in electrical wiring systems.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 5 (CONT'D) **ELECTRICAL INSTALLATION**	The student will be able to: 2.5.5 explain the functions of electrical fittings.	Electrical fittings e.g. switches, wall sockets, main switches, meter, lamp holders.	Teacher to: discuss the functions of electrical fittings.	Students to: explain the functions of electrical fittings.
	2.5.6 apply the safety measures to be observed in electrical installation system.	Safety measures: - fuses - arresters - earthling, - insulated tools, etc.	demonstrate to students the safety measures to be observed in electrical installation system.	explain the safety measure in electrical installation system.
UNIT 6 **PRACTICAL WORK (JOINTING OF PIPES)**	2.6..1 join pipes.	Jointing of pipes.	guide students to join pipes of same diameter. guide students to join pipes of different diameter. guide students to join pipes using simple fitting.	join pipes.
	2.6.2 bend pipes.	Bending of pipes.	guide students to bend pipes to required shape.	bend pipes.
	2.6.3 fix simple electrical accessories.	Accessories: - shower rose - taps, etc.	guide students to fix simple accessories using appropriate tools.	fix simple electrical accessories.

SENIOR HIGH SCHOOL - YEAR 3

SECTION THREE

MAINTENANCE PRACTICES

General Objectives: The student will:

1. appreciate the importance of maintenance work.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1	The student will be able to:		Teacher to:	Students to:
TYPES OF MAINTENANCE WORK	3.1.1 explain the term "maintenance" in building construction.	Maintenance work.	discuss the term "maintenance" with students.	explain ` the term "maintenance" in building construction.
	3.1.2 explain types of maintenance work.	Types of maintenance work: - repair - alteration - improvement - demolition	discuss the types of maintenance work. take students on study tour of some neglected buildings in locality to sensitize them on maintenance.	explain types of maintenance work. write group report after the study tour and discuss in class
	3.1.3 describe works involved in maintenance.	Works involved in maintenance: - replacement - renovation - refurbishment, etc.	discuss with students the work involved in maintenance.	describe the details of works involved in maintenance.
	3.1.4 analyse the importance of maintenance work.	Importance of maintenance work e.g. preservation, beauty change of design, use, etc.	discuss with students the importance of maintenance to: - property owner - user - preservation of national built- environment.	analyse the importance of maintenance work.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 2 **SHORES AND SHORING**	The student will be able to: 3.2.1 explain the term 'shoring'.	Shoring.	Teacher to: group students to brainstorm to come out with the meaning of the term 'shoring'.	Students to: explain the term 'shoring'.
	3.2.2 describe the types of shore used in building construction.	Shores used in building construction - dead shore - raking shore - flying shore	discuss with students the types of shore used in building construction. Illustrate with sketches and models.	describe types of shores used in building construction.
	3.2.3 demonstrate the methods of erecting each type of shore.	Methods of erecting shore.	demonstrate the methods of erecting shore with students using sketches.	describe the methods of erecting shore.
	3.2.4 demonstrate the precautions to be taken when installing shores.	Precautions of shoring: - protection to third parties - protection of workmen	discuss with students the precautions in shoring works: - protection to third parties. - protection of workmen. demonstrate to students the precautions to be taken when installing shores.	explain the precautions to be taken when installing shores.

BUILDING CONSTRUCTION PRACTICAL WORK

RECOMMENDED TOOLS

A. WOODWORK WORKSHOP TOOLS

1. Folding Rule/tape measure
2. Marking/mortice gauge/Marking knife
3. Pair of dividers/compasses
4. Cross-cut saw
5. Rip Saw
6. Tenon Saw/Dovetail Saw
7. Firmer Chisels
8. Jack Plane/Rough Plane
9. Try Plane
10. Smoothing Plane
11. Brace and bits
12. Hand drills and Twist drills
13. Woodwork bench vices
14. Bench Holdfast
15. G-Clamp and Sash clamps
16. Screw drivers
17. Pincers
18. Crowbars
19. Try Square
20. Sliding Bevel
21. Warrington Hammer
22. Grinding stone
23. Oil can
24. Mallet (wood)

B. BLOCKWORK/BRICK WORK TOOLS

Measuring Tape
Lines and pins
Builder's Square
Laying Trowel
Pointing Trowel
Plastering Trowel
Bolster
Brick Hammer
Club Hammer
Spirit Level
Boat Level
Gauge Rod
Straight edge
Shovel
Spade
Pick Axe

Float (Steel/Wood)
Hawk (Steel/Wood)
Site Square
Mortar Board
Cold Chisel
Quickset
Sitesquare
Tingle plate
Plumb rule
Ranging poles
Boning rods
Gauge Box

C. PLUMBING TOOLS

1. Pipe Wrench
2. Mallet (rubber)
3. Blow Lamp
4. Pipe Wrench
5. Screw driver
6. Bench Vice/Metalshop Vice
7. Dices
8. Ballpein Hammer
9. Screw driver
10. Folding Bar
11. Hack Saw Frame and blades
12. Files

D. **ELECTRICAL TOOLS**

Tester
Screwdrivers
Ballpein Hammer
Plier
Side cutter
Jumping bit and holder
Rubber gloves

SHS BUILDING CONSTRUCTION

RECOMMENDED BASIC MATERIALS

1. Different Types of Wood
2. Bamboo
3. Plastics
4. Steel rods
5. Cement
6. Lime
7. Sand/stones
8. Clay
9. Laterite
10. Raffia
11. Borrasius Palm
12. Aluminum Roofing Sheet
13. Corrugated galvanized steel sheel
14. Corrugated plastic roofing sheet
15. Plaster of Paris (POP)
16. Conduit pipes
17. Electrical Cables and Wires
18. Tiles
19. Pipes: Drains/Water supply
20. Electrical Accessories
21. Plumbing Accessories

SHS BUILDING CONSTRUCTION: RECOMMENDED BOOKS

S/NO.	AUTHORS	TITLES	PUBLISHERS
1.	NASH, W. G.	BRICKWORK. VOLUMES 1,2,3	HUTCHINS ON EDUCATIONAL - LONDON
2.	CHUDLEY, R.	CONSTURCTION TECHNOLOGY Vol. 1,2,3	LONGMAN, LONDON, ESSEX CM20 2 JE ENGLAND
3.	GRUNDY, J. T.	CONSTRUCTION TECHNOLOGY Vol. 1,2,3	ARNOLD INTERNATIONAL – LONDON
4.	IVOR H. SEELEY	BULDING TECHNOLOGY 3RD Ed	MACMILLIAM EDUCATION, NOTTINGHAM
5.	BARRY	BUILDING CONSTRUCTION Vol. 1-4	AFFILIATED EAST-WEST PRESS PVE LTD., NEW DELHI
6.	MCKAY	BUILDING CONSTRUCTION vol. 1-4	
7.	BART JOHN & PAUL DETTEN-MAIAR	OFFSITE CONSTRUCTION	
8.	ANNA SCHRACKENBURG & ANOTHER	BUILDING CONSTRUCTION IN WARM CLIMATE	
9.	VINCENT B. AMEVORDZIE	BUILDING CONSTRUCTION FOR SSS	LONGMAN GROUP UK LTD., ESSEX ENGLANG
10.	MITCHELL	BUILDING CONSTRUCTION SERIES 1-4	
11.	TOMLINSON, M. J.	FOUNDATION DESIGN & CONSTRUCTION	
12.	OXLEY & POSKITT	MANAGEMENT TECHNIQUES APPLIED TO CONSTRUCTION	
13.		WEBSITE FROM THE INTERNET	
14.	WALTON, D.	BUILDING CONSTRUCTION PRINCIPLES AND PRACTICES	MACMILLAN EDUCATION LIMITED, LONDON
15.	CHUDLEY, R AND GREENO, R.	BUILDING CONSTRUCTION HANDBOOK	ELSEVIER BUTTERWORTH - HERNEMANN LIMITED, LINACRE HOUSE JORDAN HILL, OXFORD, BURLINGTON