

Construction I





Construction I Buildings





Scope and Sequence

Unit	Topic	Reading context	Vocabulary	Function
1	Hand Tools 1	Equipment purchase request	claw hammer, flathead screwdriver, hacksaw, hand saw, level, needle nose pliers, Phillips screwdriver, slip joint pliers, tape measure, tool box, utility knife	Describing importance
2	Hand Tools 2	Advertisement	adjustable wrench, box-end wrench, chalk line reel, open-end wrench, plumb bob, sledgehammer, socket, socket wrench, speed square, snips	
3	Power Tools	Magazine article	air compressor, cement mixer, circular saw, compactor, hammer drill, jackhammer, nail gun, power drill, reciprocating saw, sander	Describing uses
4	Fasteners	Website	anchor, bolt, brad, grade, metric thread, nail, nut, screw, staple, UTS thread, washer	Disagreeing with a suggestion
5	Safety Equipment	Email	dust mask, earplugs, face shield, first aid kit, goggles, grip gloves, hard hat, kneepads, leather gloves, safety glasses, steel-toe boots Giving a warning	
6	Basic Actions 1	Instruction guide	ction cut, drill, lift, mark, measure, nail, place, push, repeat, screw Giving instruction	
7	Basic Actions 2	Instruction guide	center, check, insert, line up, loosen, remove, slide, support, tighten, turn, twist	Giving instructions
8	Basic Math	Email	add, come to, divide by, equal, minus, multiply, plus, remainder, round up, subtract, total	
9	Decimals, Fractions, and Percents	Conversion guide	convert, decimal, denominator, fraction, mixed number, numerator, percent, percentage, reduce, whole number	Correcting an error
10	Measurements	Instructions	centimeter, foot, gallon, imperial, inch, kilogram, liter, meter, metric, pound, yard	Identifying an error
11	Materials	Flyer	brick, cinder block, concrete, drywall, flooring, glass, lumber, plastic, rebar, rubber, steel	Checking information
12	Properties and Dimensions	Website	depth, dimensions, height, jamb, length, sill, strength, thickness, weight, width	Describing a change in plans
13	Site Communication	Website	communication, confirm, consult, contact, email, fax, PDF, scan, smartphone, two-way radio	Offering options
14	Parts of a Residence	Advertisement	bathroom, bedroom, garage, kitchen, living room, master bedroom, patio, roof, utility room, walk-in closet	Agreeing with an opinion
15	Parts of a Commercial Building	Email	elevator, emergency, entrance, exit, exit sign, fire escape, floor, hallway, lobby, office, stairwell	Checking items on a list

Table of Contents

Unit 1 – Hand Tools 1
Unit 2 – Hand Tools 2
Unit 3 – Power Tools
Unit 4 – Fasteners
Unit 5 – Safety Equipment
Unit 6 – Basic Actions 1
Unit 7 – Basic Actions 2
Unit 8 – Basic Math
Unit 9 – Decimals, Fractions, and Percents
Unit 10 – Measurements
Unit 11 – Materials
Unit 12 – Properties and Dimensions
Unit 13 – Site Communication
Unit 14 – Parts of a Residence
Unit 15 – Parts of a Commercial Building
Glossary



Construction I Buildings





Scope and Sequence

Unit	Topic	Reading context	Vocabulary	Function
1	Careers	Job listings	carpenter, contractor, electrician, foreman, HVAC technician, laborer, mason, painter, roofer, semiskilled, skilled, subcontractor, unskilled	Describing experience
2	Worksite Safety	Worksite safety poster	4:1 rule, accident, class, closed space, fall, ground, ladder, Material Safety Data Sheet, pump jack, scaffold, toxic, trench safety, ventilation	Expressing dissatisfaction
3	Site Investigation	Letter	clay, drill rig, gravel, level, sand, silt, soil profile, subsurface investigation, surface evaluation, test pit, topographic survey	Asking about requirements
4	Site Layout	Email	batter board, bench mark, builder's level, grade rod, horizontal, monument, property line, run, site plan, stake, utilities, wire	
5	Cranes	Brochure	crawler crane, disassembly, mobile crane, operator's cab, outrigger, secure, stabilizer, stationary crane, tower crane, advice truck mounted crane	
6	Rigging	birdcage, chain sling, charred, core, fatigue, kink, knot, lay, link, rigging, sling, strand nicking, web sling, wire rope damage		
7	Excavation 1	Email	dewatering system, drill, excavation, extract, groundwater, pump, runoff, sump, water table, well-point an option	
8	Excavation 2	Website	concrete slurry, deposit, dig, general excavation, haul, interlocking sheet piling, payline, sloping, soil swell, special excavation, steel soldier piles, tieback, timber lagging	
9	Foundations 1	Website	building load, footing, foundation, freeze, grade beam, monolithic foundation, pier, residential, shallow foundation, pros and spread foundation, stem wall, thaw	
10	Foundations 2	Textbook	bearing pile, caisson, cast-in-place pile, deep foundation, drilled foundation, driven foundation, friction pile, friction plus bearing pile, pile, pile driver, sheet pile	
11	Formwork 1			
12	Formwork 2	Article	brace, footing form, line, modular system, permanent insulated formwork, plywood, sheathing, stay-in-place, stud, tie-spreader unit, wale, wall form Asking about chronological order	
13	Floor Plans	Website	appliance, bird's-eye-view, building layout, diagram, dimensions, fixture, floor plan, function, indicate, interior, placement, specify Asking for more detained.	
14	Floors 1	Email	beam, diaphragm, floor, joist, joist connection, mudsill, parallel, platform framing, span, subfloor, support, truss a problem	
15	Floors 2	Textbook	above grade, anchor, beam-and-slab, concrete floor, construction joint, cross-braced, drop panel, high-rise, lateral stability, one-way joist slab, one-way solid slab, post-tensioned, span, structural slab, tendon, two-way flat plate slab, two-way solid slab	Reacting to good news

Table of Contents

Unit 1 – Careers
Unit 2 – Worksite Safety
Unit 3 – Site Investigation
Unit 4 – Site Layout
Unit 5 – Cranes
Unit 6 – Rigging
Unit 7 – Excavation 1
Unit 8 – Excavation 2
Unit 9 – Foundations 1
Unit 10 – Foundations 2
Unit 11 – Formwork 1
Unit 12 – Formwork 2
Unit 13 – Floor Plans
Unit 14 – Floors 1
Unit 15 – Floors 2
Glossary



Construction I Buildings





Scope and Sequence

Unit	Topic	Reading context	Vocabulary	Function
1	Prints 1	Email	complex, cross section, elevation, horizontally, irregular, isometric drawing, oblique drawing, orthographic projection, plan view, section, sketch, vertically	Introducing a problem
2	Prints 2	Textbook	architect's scale, centerline, cutting-plane line, dimension line, extension line, hidden line, leader, object line, scale, scale drawing	Asking for clarification
3	Concrete Work 1	Webpage	aggregate, air entrainment, bind, cement paste, coarse aggregate, concrete, fine aggregate, heavyweight concrete, insulating concrete, lightweight concrete, normal-weight concrete, set, shrink, void	Correcting an assumption
4	Concrete Work 2	Website	air content test, cleanliness, collapse, colorimetric test, gradation, moisture test, organic impurity, shear, silt test, slump test, soundness, specific gravity, true slump, water:cement ratio	
5	Concrete Work 3	Website	Website belt conveyor, bucket, buggy, chute, countercurrent mixer, drum mixer, finish, float, mixing, place, screed, strike off, trowel, uniformity, wheelbarrow	
6	Timber Frames	Construction manual	dead load, deflection, glued-laminated timber, glulam rivet, live load, pin-type connection, shear plate, split-ring connector, timber connectors, transfer, truss plate timber	
7	Steel Frames	Safety guidelines	anchor bolt, ASTM designation, bearing plate, bearing-type connection, bolting, column, erection mark, fillet weld, friction-type connection, gauge, girder, groove weld, member, open-web steel joist, pitch, section shape, steel frame	
8	Concrete Frames	Website	brittle, concrete frame, coupler, cover, lap splice, mechanical splice, precast, prestressed, reinforcement, splice, tensile strength, welded splice, welded wire reinforcement, wire mesh	Stating an opinion
9	Doors and Windows	Product descriptions	automatic door, awning, bifold door, casement, double-hung, fire door, fixed, frame sash, hopper, pane, pocket door, revolving door, sliding	Describing options
10	Insulation	Work order	asbestos, batt, building envelope, glass wool blanket, insulating concrete form (ICF),insulation, loose fill, natural fiber, R-value, rigid panel, spray polyurethane foam (SPF), vapor retarder	Expressing doubt
11	Stairs	Instructions	baluster, balustrade, banister, flight, going, landing, newel, nosing, riser, riser height, spandrel, stairs, stringer, tread, tread depth	Making an apology
12	Masonry	Advertisement	bearing wall, cavity wall, curtain wall, grout, mason, masonry, masonry unit, mortar, multiwythe, single wythe, veneer	Describing benefits
13	Roofs 1	Article	drain, elements, flashing, gravel stop, gutter, parapet, rain, roof, roof deck, roof frame, roof membrane, scupper, slope, snow, vapor barrier, walk	Giving assurances
14	Roofs 2	Advertisement	eave, flat roof, gable, gambrel, hip, low slope roof, mansard, purlin, rafter, rake, shake, shed, shingle, vent	Describing attributes
15	Finishing	Email	cladding, cornice, drop ceiling, exterior finishing,finish, install, interior finishing, painting, partition, plaster, siding, tile, trim	Discussing options

Table of Contents

Unit 1 – Prints 1
Unit 2 – Prints 2
Unit 3 – Concrete Work 1
Unit 4 – Concrete Work 2
Unit 5 – Concrete Work 3
Unit 6 – Timber Frames14
Unit 7 – Steel Frames
Unit 8 – Concrete Frames
Unit 9 – Doors and Windows
Unit 10 – Insulation
Unit 11 – Stairs
Unit 12 – Masonry
Unit 13 – Roofs 1
Unit 14 – Roofs 2
Unit 15 – Finishing
Glossany

5 Safety Equipment



Dear Site Managers,

Last week, an employee was injured. A cement block fell and broke his toes. We want to avoid these injuries.

Remind all employees to wear personal protective equipment (PPE). To enter the construction site, everyone needs steel-toe boots, hard hats, and safety glasses or goggles. Employees need to wear leather gloves when nailing, doing electrical work, and sanding or cutting wood. Dust masks or face shields are also essential for wood cutting. Earplugs are necessary when working with loud tools like jackhammers. Anyone handling a power tool must also wear grip gloves. Kneepads must be worn when working on the ground.

Finally, keep **first aid kits** on site. Make sure everyone knows where they are. If we follow these guidelines, injuries won't be a problem.

Thanks,
Tim Klein
Owner, Desert Construction

Get ready!

- Before you read the passage, talk about these questions.
 - **1** What is some safety equipment used on a construction site?
 - 2 What safety equipment protects a worker's feet?



2 Read the email on safety equipment. Then, complete the table using information from the email.

Situation	PPE needed
Arriving at the construction site	
Working with wood	
Using loud power tools	

Vocabulary

- 3 Write a word or phrase that is similar in meaning to the underlined part.
 - Wear a partial face covering that protects your mouth and nose when you sand wood.
 ___t m___
 - 2 When installing floors, wear <u>equipment that</u> <u>protects the knees</u>. ___ p _ d s
 - **3** John wore <u>small pieces of plastic</u> so that the noise from the machinery didn't hurt his ears.
 - __rp___
 - 4 To avoid head injuries from falling objects, wear a <u>helmet made of plastic or metal.</u>
 - __r_ t
 - **5** Greg wasn't hurt when he dropped the wood because he was wearing shoes that have extra reinforcement at the toes.
 - ____ts
 - **6** Using some chemicals or tools requires a protective covering for your entire face.
 - _a__ _h___d
 - 7 Protective eyewear that shields the eyes and area around them are necessary when drilling.
 - ___l_s

4	Match the words (1-4) with t	he definitions
	(A-D).	

1 __ first aid kit2 __ grip gloves3 __ safety glasses4 __ leather gloves

A safety equipment that protects the hands

B a container that has items needed to treat a small injury

C protective eyewear that uses shatterproof glass

D protective equipment that helps people to hold things firmly

5 Solution Listen and read the email on safety equipment again. What do you think is the most important piece of safety equipment? Why?

Listening

- 6 Listen to a conversation between a manager and a construction worker. Mark the following statements as true (T) or false (F).
 - **1** __ The man is not wearing his safety equipment.
 - 2 __ The company was fined by an inspector.
 - **3** __ The man received a written warning.

Manager:	Richard, where are your hard hat and safety glasses?		
Worker:	l just 1		
Manager:	Well, you need to wear them 2		
	Otherwise, the safety inspectors can fine us.		
Worker:	I'm sorry. It's just that it's so hot 3!		
Manager:	I know it is. But you could be hurt or killed 4		
Worker:	Okay. I'll put them 5		
Manager:	Thank you. This is just a verbal warning.		
	6 , it'll be a written warning.		
Worker:	I understand!		

Speaking

8 With a partner, act out the roles below based on Task 7. Then, switch roles.

USE LANGUAGE SUCH AS:

Where are your ...?
You need to wear ...
Next time ...

Student A: You are a construction site manager. Talk to Student B about:

- a piece of safety equipment
- why the person needs to wear it
- the consequences of not wearing it

Student B: You are a construction worker. Talk to Student A about proper personal protective equipment.

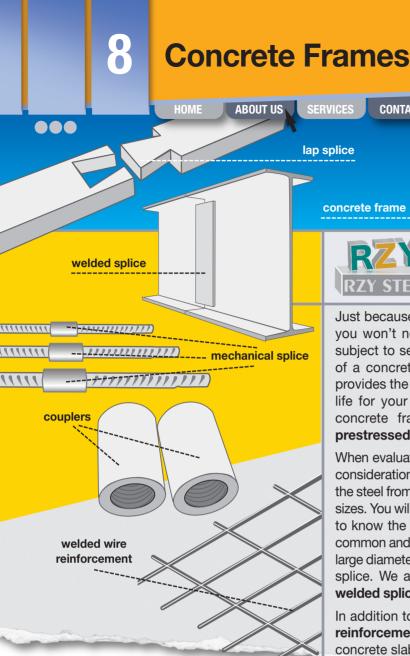
Writing

Use the email and the conversation from Task 8 to fill out the written warning.



Written Warning

Employee name: Date of incident:
Reason for warning:
Actions Taken:



Reinforcing Steel in Concrete Frames

Just because your structure has a concrete frame does not mean you won't need steel components. Plain concrete is brittle and subject to serious failure. Steel reinforcement is an essential part of a concrete frame to improve its tensile strength. RZY Steel provides the reinforcing bars necessary to guarantee a long, secure life for your structure. They can be applied to either a precast concrete frame or one that is cast-in-place, as well as to prestressed concrete.

When evaluating your reinforcing steel needs, you should keep a few considerations in mind. First, there must be enough cover to protect the steel from the environment. Second, our steel bars come in certain sizes. You will likely need to splice them together on site. It is important to know the proper kind of splice for your job. A lap splice is very common and easy. A **mechanical splice** may be used when bars have large diameters. We can supply you with the couplers required for this splice. We also manufacture special steel that is well-suited to a welded splice.

In addition to bars, we also make wire mesh used in welded wire reinforcement. This type of reinforcement is easy to place with large concrete slabs.

Get ready!

- Before you read the passage, talk about these questions.
 - 1 What type of reinforcement uses wire mesh?
 - 2 What are some different ways to splice reinforcing steel?

Reading

- Read the website from a rebar and coupler manufacturer. Then, mark the following statements as true (T) or false (F).
 - **1** __ Reinforcing steel is not needed with cast-in-place concrete frames.
 - 2 __ A coupler is needed for a mechanical splice.
 - Wire mesh works well with concrete slabs.

Vocabulary

CONTACT

- 3 Match the words (1-8) with the definitions (A-H).
 - 1 __ wire mesh 4 __ splice 8 __ prestressed **2** __ reinforcement **5** __ precast
 - 3 coupler 6 brittle
 - A something that is placed over something else in order to hide or protect it
 - **B** formed and cured at a plant and brought to a building site
 - C breaks or snaps easily
 - D a device used to splice pieces of reinforced steel consisting of two female ends
 - **E** to permanently join pieces of reinforcing steel together
 - F concrete that has had tendons added to overcome its weakness in tension
 - **G** something that is added to something else to make it stronger
 - **H** a material made of wire rods formed into grids with little spacing between wires, used to reinforce concrete

- 4 Read the sentence pairs. Choose which word or phrase best fits each blank.
 - 1 concrete frame / lap splice

A	A	is the most commor
	way to join reinforcing st	eel together.

- **B** This _____ needs to be reinforced with steel to be stronger.
- 2 welded splice / welded wire reinforcement
 - A Special reinforcing steel is used because a needs a lot of heat.
 - **B** This concrete is reinforced by a sheet of
- 3 tensile strength / mechanical splice
 - A Reinforcement is required to overcome concrete's lack of _____
 - **B** A metal sleeve joins pieces of steel in a
- 5 Ships Listen and read the website for a rebar and coupler manufacturer again. What products does the company sell?

Listening

- 6 Solution Listen to a conversation between a contractor and a worker. Choose the correct answers.
 - 1 What is the conversation mainly about?
 - A the benefits of a concrete frame
 - B why welded splices are necessary
 - C requirements for a new framing job
 - **D** why rebars are better than wire mesh reinforcement
 - 2 Why does the client not like lap slices?
 - A They do not look good.
 - **B** They are too expensive.
 - **C** They are not strong enough.
 - **D** They take too long to install.



Contractor:	The pieces we ordered are all 1 segments.
Worker:	So we'll need to do a lot of splicing.
Contractor:	Right. We have a few different 2 available.
Worker:	Well, there's always lap splicing. That's the quickest and 3 way to do it, right?
Contractor:	Yes, but the client doesn't like 4 They think it's not secure enough.
Worker:	That's too bad. 5instead?
Contractor:	Well, the client paid for larger diameter bars. They're 6 mechanical splices.

Speaking

8 With a partner, act out the roles below based on Task 7. Then, switch roles.

USE LANGUAGE SUCH AS:

Our next project will be ...

We'll use ...

That client doesn't like ...

Student A: You are a contractor on a new concrete frame project. Talk to Student B about:

- · what kind of reinforcement to use
- the client's opinion of a kind of splicing

Student B: You are a worker. Talk to Student A about a new concrete frame project.

Writing

- Use the website and the conversation from Task 8 to write a project summary. Write about:
 - the kind of project
 - the need for reinforcement
 - · the kind of splicing that will be used

Glossary

add [V-T-U8] To add numbers is to combine them.

adjustable wrench [N-COUNT-U2] An adjustable wrench is a wrench with an opening that can be changed in size.

air compressor [N-COUNT-U3] An **air compressor** is a tool that creates energy by increasing pressure on gas or electrical power and releases it in short bursts. This energy is used to power other devices.

anchor [N-COUNT-U4] An **anchor** is a fastener often used when screws, nails, or other fasteners are impractical or ineffective.

bathroom [N-COUNT-U14] A bathroom is a room where people use the toilet and take a shower or bath.

bedroom [N-COUNT-U14] A bedroom is a room where a person sleeps.

bolt [N-COUNT-U4] A **bolt** is a metal fastener with a threaded body that is held in place with a nut on the end opposite the head.

box-end wrench [N-COUNT-U2] A **box-end wrench** is a wrench with an enclosed opening that grasps the face of a bolt.

brad [N-COUNT-U4] A brad is a thin, small nail with a slight projection at the top on one side.

brick [N-COUNT-U11] Brick is a building material made of rectangular blocks of hardened clay.

cement mixer [N-COUNT-U3] A **cement mixer** is a machine that combines the components that make cement in a large circular barrel that rotates.

center [V-T-U7] To center something is to move it so that it is in the middle of an area.

centimeter [N-COUNT-U10] A **centimeter** is a metric unit of length equal to 1/100th of a meter.

chalk line reel [N-COUNT-U2] A chalk line reel is a tool for marking a long, straight line on a flat surface.

check [V-T-U7] To check something is to make sure it is correct.

cinder block [N-COUNT-U11] A cinder block is a lightweight building block made from concrete.

circular saw [N-COUNT-U3] A **circular saw** is a tool that uses a rotating metal disk with sharp teeth to cut through wood or metal.

claw hammer [N-COUNT-U1] A claw hammer is a tool used to insert nails into a wall or other object.

come to [PHR V-T-U8] To come to an amount is to add up to that amount.

communication [N-UNCOUNT-U13] Communication is sharing information with someone.

compactor [N-COUNT-U3] A compactor is a machine that bounces on the ground to compact soil.

concrete [N-UNCOUNT-U11] Concrete is a mix of cement, water, gravel, and sand used as a building material.

confirm [V-T-U13] To confirm a statement is to make sure it is true.

consult [V-T-U13] To consult someone is to ask him or her for his or her opinion or advice.

contact [V-T-U13] To contact someone is to begin exchanging messages with him or her.

convert [V-T-U9] To convert a number is to change it from a fraction into a decimal, or vice versa.

cut [V-T-U6] To cut something is to divide it with a sharp instrument such as a saw.

decimal [N-COUNT-U9] A **decimal** is a number with digits to the right of a decimal point, expressing part of a whole number.

denominator [N-COUNT-U9] A **denominator** is the bottom number of a fraction.

depth [N-UNCOUNT-U12] **Depth** is the distance measurement of something from its front to its back or its bottom to its top.

dimensions [N-PLURAL-U12] Dimensions are basic physical properties of an object, such as height, width, or weight.

divide by [V-T-U8] To divide one number by another is to split the first number into an equal number of parts.

drill [V-T-U6] To drill something is to create a hole in it by using a drill.



Career Paths: Construction I—Buildings is a new educational resource for construction professionals who want to improve their English communication in a work environment. Incorporating career-specific vocabulary and contexts, each unit offers step-by-step instruction that immerses students in the four key language components: reading, listening, speaking, and writing. Career Paths: Construction I—Buildings addresses topics including tools, foundations, structures, roofs, and finishing.

The series is organized into three levels of difficulty and offers a minimum of 400 vocabulary terms and phrases. Every unit includes a test of reading comprehension, vocabulary, and listening skills, and leads students through written and oral production.

Included Features:

- · A variety of realistic reading passages
- Career-specific dialogues
- 45 reading and listening comprehension checks
- Over 400 vocabulary terms and phrases
- · Guided speaking and writing exercises
- · Complete glossary of terms and phrases

The **Teacher's Book** contains a full answer key and audio scripts.

The Teacher's Guide contains detailed lesson plans, a full answer key and audio scripts.

The audio CDs contain all recorded material.



