Task Title: Preparations Before Pouring Concrete

OALCF Cover Sheet – Learner Copy

Learner Name: _____

Date Started: _____

Date Completed: _____

Successful Completion: Yes ☐ No ☐

Goal Path: Employment ☐ Apprenticeship ☐

Secondary School ☐ Post Secondary ☐ Independence ☐

Task Description: The learner will use texts and charts to interpret materials that are needed, or steps that must be undertaken, when pouring concrete.

Note: This task assumes some prior knowledge of construction.

Main Competency/Task Group/Level Indicator:

- Find and Use Information/Read continuous text/A1.2
- Find and Use Information/Interpret documents/A2.2
- Communicate Ideas and Information/Write continuous text/B2.1
- Understand and Use Numbers/Use measures/C3.3
- Use Digital Technology/D.2

Materials Required:

- Pen/pencil and paper and/or digital device
- Computer or digital device
- Calculator or digital device with calculator function

Learner Information

Carpenters build forms to hold concrete. They also review waterstop and rebar information to make decisions about materials to be used before the concrete is poured. This helps them estimate the amounts of materials required.

Scan the "Waterstop Chart", "Concrete Formwork Computations" and "Rebar Information".

Waterstop Chart

A waterstop made of rubber, neoprene, polyvinyl chloride (PVC), or other plastic is installed to prevent water leakage at a vertical construction joint. Center-placed waterstops (waterstops placed at the center of the wall) are available in various designs, including single piece, split fin, labyrinth, and cellular. They are placed and attached to the bulkhead before the first placement of concrete. See Figure 5-16.

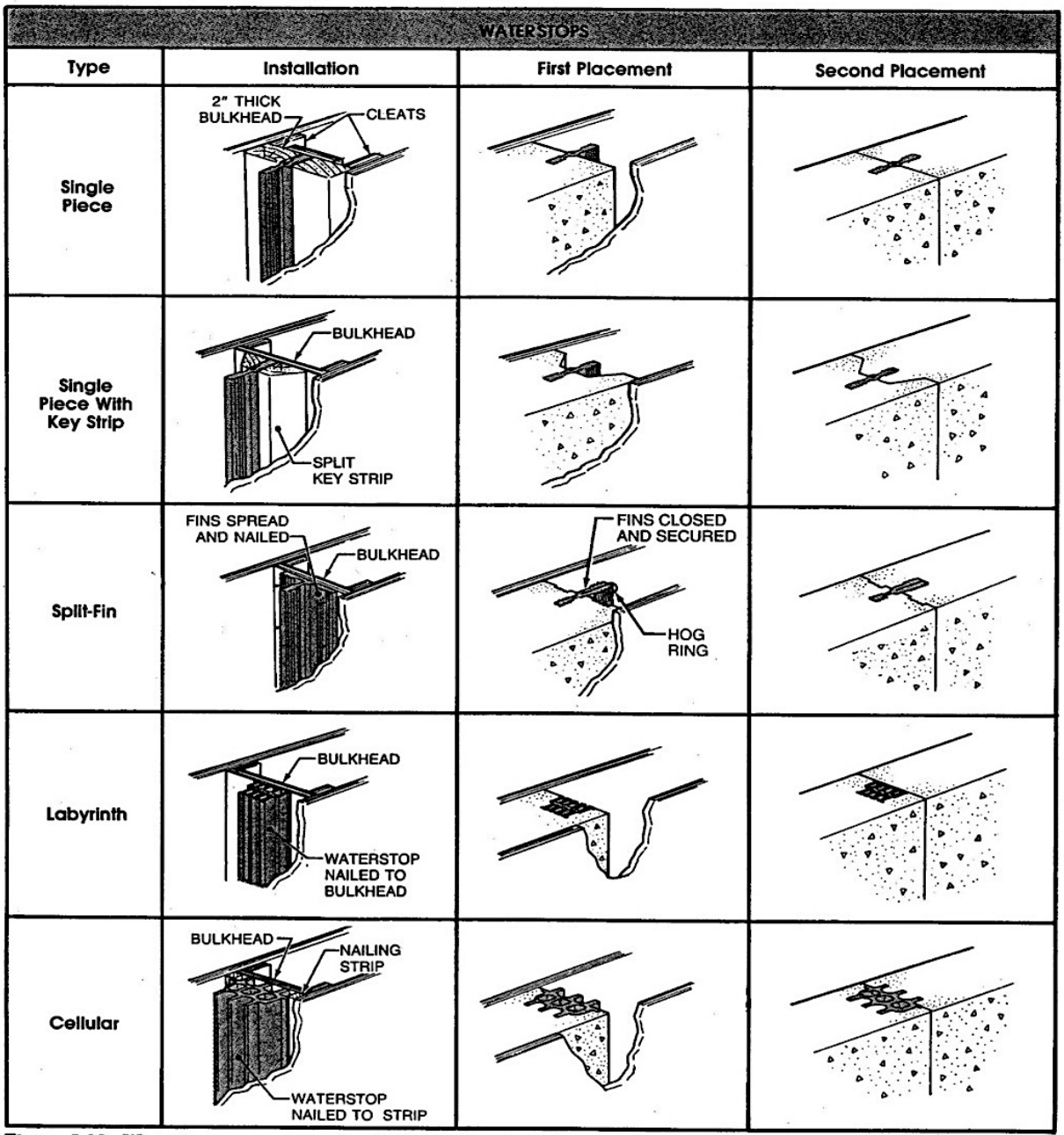

Figure 5-16. Waterstops prevent water leakage in vertical construction joints. The type of waterstop used is determined by water pressure, wall thickness, and anticipated wall movement.

Concrete Formwork Computations

Form Materials and Concrete Quantity Takeoff

Estimating form materials and concrete is a rough calculation of the amount of form materials and volume of concrete required for a specific construction project. Professional estimators commonly estimate the form materials and concrete for heavy construction projects. On small construction projects, such as construction of foundation footings and walls for a residence, the estimating is performed by the contractor or job supervisor.

Form Materials Quantity Takeoff

Form materials are estimated separately for each section of the concrete work. When estimating, dimensions of the form materials are rounded to the next highest foot increment before calculations are performed. For example, the dimension of a wall section measuring 5’ 4½” is rounded to 6’.

When estimating plywood form components, the total surface area of the forms is determined by multiplying the length of the forms by the height. When estimating dimensional lumber such as planks, studs, walers, braces, and stakes, the total length of the lumber is calculated.

Waste occurs when form components are cut from standardized sizes of form materials. Estimators add 5% to 15% of the total amount of form materials to compensate for waste. Underestimation of form materials results in a delay in form construction.

Sheathing

Sheathing is the form material in direct contact with the concrete. Plywood or 2” thick members are used as sheathing for foundation and pier footing forms. Foundation walls are sheathed with plywood reinforced with studs and/or walers, or 2” thick members reinforced with cleats and strongbacks.

Rebar Information

Reinforcing Steel

A concrete wall is subject to both compressive and lateral pressures. Concrete without reinforcement has a great deal of compressive resistance to vertical loads, but far less resistance to lateral loads. The lateral resistance of concrete walls is strengthened by placing *rebars* (steel reinforcing bars) in the walls. This combination is commonly referred to as *reinforced concrete construction*.

Rebars are steel bars with ridges and a rough surface. The uneven surface helps bond the concrete to the steel. Standard size rebars range from ⅜" to 2¼" in diameter and are identified n=by numbers from #3 to #18. The diameter of the rebar is found by multiplying the number designation by ⅛". For example, a #6 rebar is 6/8" or ¾", in diameter. The size of the rebars required for a wall, as well as their placement and spacing, is shown in section view drawings of prints.

STANDARD REBAR SIZES						
Bar Size Designation	**Weight Per Foot**		**Diameter**		**Cross-Sectional Area Squared**	
	LB	KG	IN.	CM	IN.	CM
#3	0.376	0.171	0.375	0.953	0.11	0.71
#4	0.668	0.303	0.500	1.270	0.20	1.29
#5	1.043	0.473	0.625	1.588	0.31	2.00
#6	1.502	0.681	0.750	1.905	0.44	2.84
#7	2.044	0.927	0.875	2.223	0.60	3.87
#8	2.670	1.211	1.000	2.540	0.79	5.10
#9	3.400	1.542	1.128	2.865	1.00	6.45
#10	4.303	1.952	1.270	3.336	1.27	8.19
#11	5.313	2.410	1.410	3.581	1.56	10.07
#14	7.650	3.470	1.693	4.300	2.25	14.52
#18	13.600	6.169	2.257	5.733	4.00	25.81

Work Sheet

Task 1: Use the Waterstops Chart to complete these tasks.

a) Where are center-placed waterstops attached before the concrete is placed?

Answer:

_____

b) What is done to the fins of a Split-fin waterstop at the First Placement stage?

Answer:

_____

c) Name one factor in determining the type of waterstop to be used to prevent water leakage at a vertical joint of concrete.

Answer:

_____

Task 2: Conduct an internet keyword search for "walers" and "strongbacks". In your own words, write a definition for both terms.

Answer:

Scan the "Concrete Formwork Computations" document.

Task 3: To compensate for waste, what is the estimated range of lumber in linear feet, to be ordered if 107.5 linear feet of lumber is required to form a concrete project? Note: "linear feet" means the length of the material.

Answer:

Task 4: Plywood may be used for sheathing. What forms require sheathing?

Answer:

Scan the Rebar Information document.

Task 5: What can be done to improve concrete's lateral load resistance?

Answer:

Task 6: Where will the carpenter find the information about placing and spacing of rebars?

Answer:

_____

Task 7: Rebar 2.223 cm in diameter is required to provide lateral strength to the concrete to be poured for a structure. What size of rebar is to be used?

Answer:

_____