

A-120 STEEL PIPING SYSTEMS

5. PROCEDURE FOR ESTIMATING MATERIALS USING THE RICHARDSON RAPID SYSTEM
To simplify estimating material quantities, extending material prices and arranging the takeoff so manhours may be properly determined and extended, the materials should be taken off and listed in this order:

(a) Take off the Pipe by Lines in the direction of the material flowing thru it. Consider branches as separate lines. List the pipe by quantity, size and type. Measure the distance in feet from the starting point to the terminal connection and do not deduct from this footage the lengths occupied by fittings and valves. That is, measure thru all fittings and valves. This method will allow sufficient material costs to cover scrap loss.

When a line has more than one size pipe, list each size separately in the order in which they occur.

When a line is to be installed under two or more conditions (inside a building, inside battery limits of a process area, etc.) as defined in Note 4, list each portion of that line separately.

Next, go back over the line checking the lengths, size, and type.

Go back over the line again listing the quantity, size, and type of items and connections found as follows:

- (b) Pipe Fittings and Flanges including those required for Branch Line Connections.
- (c) Field Erection joint cutting and threading.
- (d) Valves.
- (e) Specials. (A special is defined as any item that has material flowing thru it and it is not Pipe, Pipe Fittings, Pipe Flanges, Valves or Equipment.)
- (f) Bolt and Gasket Sets required to bolt the Flanges, Valves, and Specials in the line together.
- (g) All Hangers, Pipe Supports and Miscellaneous Fabricated Items that are required to support or install the line.

Repeat quantity takeoff for (b) thru (g) and compare with original takeoff to confirm data.

Repeat (a), (b), (c), (d), (e), (f) and (g) for Branch Lines.

When the piping has been taken off and listed by lines in accord with the foregoing, the work has been checked, the material may be properly priced, manhours correctly applied, and at the same time, the exact quantity of insulation and painting can be determined and estimated. This procedure has the advantage of being easily understood by others and, in particular, is most useful when estimating and evaluating Change Orders.

6. PROCEDURE FOR ESTIMATING MANHOURS USING THE RICHARDSON RAPID SYSTEM

Proceeding in the order in which the takeoffs are made:

- (a) Select the condition under which the pipe is to be installed, as shown on Pages 1 thru 4, and apply manhours to the pipe as shown for the condition.
- (b) thru (g). Apply manhours exactly as shown on the Standards as follows:
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| (b) Fittings | Pages 8 thru 26 of this Account |
| (c) Field Erection joint cutting and threading | Page 7 of this Account |
| (d) Valves | Pages 27 thru 37 of this Account |
| (e) Specials | From Account 15-69 and 15-71 |
| (f) Boltups | From Account 15-72 |
| (g) Hangers and Pipe Supports | From Account 15-76 |
| Miscellaneous Fabricated Items | From Account 5-10 |

7. EXTRA MANHOURS TO BE ADDED TO THE ESTIMATE AS A SEPARATE ITEM

- (a) Confined Working Area. When pipe is run horizontally with overhead height less than 6'0", increase manhours by 10% for each foot of declining head room. This applies to the total manhours arrived at as described above.
- (b) Penetration. Count the number of penetrations each line makes thru each wall or slab. For each penetration, add manhours equal to 20'0" lineal feet of pipe to the estimate as a separate item. This extra does not allow for sleeves or openings which are assumed included by other trades.
- (c) Floor Obstructions. When the pipe is installed from scaffolding and the floor is of such a nature that rolling scaffolding cannot be used (as a floor with many projecting foundations for equipment), add 15% to manhours shown for pipe.

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