Section 1

REBAR ARRANGEMENT & CONSTRUCTION CARRYOUT
1. Understanding of Drawing

1) Examination of drawing

When construction contract is completed, the contents of the drawings are surveyed and checked before construction work.

Although it is a rule to survey the drawings right from the 1st page, it is common to check the scale and the number of floors of the building and then plan, elevation, exterior appearance, lines and windows of the building.

Not only orientation, precautions and specifications, but front elevation, rear side elevation, right side elevation, left side elevation, partial development, partial section, and detail section, etc should be also looked over to be reminded in the construction site.

As construction work progresses, present work should be checked and compared with instructions on the drawings, and an entire understanding of drawings should be preceded before the next step.

Plan, structural plan, foundation, section, etc are checked if there is any suspicious portion because all the drawings are not made by only 1 person.

There is also necessity of discussion when there is any question or changes in the work.

In order to make smooth and steady progress of the work, a lot of time and repeated practice are required.

In case of small scale of construction, it is progressed from the ground to the upper floor in general, however there is no determined rule.
As construction work is not a simple one but rather complicated, it is difficult or impossible to explain all of the construction methods satisfactorily in written or spoken words alone.

Clear understanding of basic knowledge is quite helpful.

Plan of reinforcement should be drawn before reinforcement, however, when the scale of construction is large, plan of reinforcement is given in advance or shop reinforcement are also available.

Although the trend has been to increase the usage of shop reinforcement for the smooth progress in the crowded city, field reinforcement is explained in this book due to the necessity of prompt applications in the field and its convenience.

Every reinforcement has its own rule, however it could be changed when necessary under the permission of supervisor.

For example, hooks at the tip of stirrup could be changed from Figure 1 to Figure 2.

![Figure 1](image1.png) ![Figure 2](image2.png)
2) What is drawing?

Drawings are used in every industrial field with the development of industries.

Although their types and applications are different, there are agreed rules that are called IPC (International Graphic Code), accepted by everyone in each field.

Specified rules and standards with reference to symbols, numbers, lines and letters are adapted to drawings to help everyone understand what they mean.

When one begins to construct a building, one should carefully consider the implications of drawings.

In this book, plan of reinforcement is briefed to help the workers understand them more easily.

Drawings of construction work are grouped roughly as civil engineering and architecture.

Although there are some differences, all the contents could be understood since they are all in accordance with IPC mentioned above.

3) Classification of drawing

① Shop Drawing

Drawings that suggest overall dimensions of each member with symbols, numbers and lines for the construction work

② Detailed Drawing

Detailed drawings that describe shapes, types and dimensions of each element for the bar-fabrication
③ Understanding of Drawing

Drawings are in their own sequence beginning with the title and contents on the 1st page.
Structure drawing of Rebar is for this case.
There are several types of drawings which include machinery, electricity, sanitation, fire protection, communication, etc according to the type of work and there are details as follows.

A) Construction
   i. Building layout
   ii. Elevation
   iii. Plane figure
   iv. Cross Section
   v. Part Detailed drawing

B) Structure
   i. Drawing of column center
   ii. Plane figure of structure
   iii. Drawing of stairway and slab rebar arrangement
   iv. List of pillar, beam and retaining walls
   v. Detailed drawing of rahmen rebar arrangement

C) In general, the order of drawing is in a sequence mentioned above, and all the drawings are in scale.

④ Scale (All the units in "mm")

Among several types of rulers used in drawings, scale is indispensable.
There are many types of scale. Among them 300mm scale is frequently used.
It has carved line in the middle of each side, colored red, blue and black to distinguish its scale.

Scale in red \( \frac{1}{100}, \frac{1}{200} \)
Scale in blue \( \frac{1}{300}, \frac{1}{400} \)
Scale in black \( \frac{1}{500}, \frac{1}{600} \)

Other different scales are available like \( \frac{1}{50}, \frac{1}{150} \)

4) Usage of symbol

① General symbol

<table>
<thead>
<tr>
<th>Description</th>
<th>Symbol</th>
<th>Indication</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>L</td>
<td>Rebar indication</td>
<td></td>
</tr>
<tr>
<td>Area</td>
<td>A</td>
<td>Part cross section</td>
<td></td>
</tr>
<tr>
<td>Volume</td>
<td>V</td>
<td>Part detailed drawing</td>
<td></td>
</tr>
<tr>
<td>Radius</td>
<td>R</td>
<td>Level indication(Plane)</td>
<td></td>
</tr>
<tr>
<td>Main entrance</td>
<td>↑</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sub entrance</td>
<td>↑</td>
<td>Level indication(elevation, cross section)</td>
<td></td>
</tr>
<tr>
<td>Scale</td>
<td>S 1/200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finish</td>
<td>▽</td>
<td>No of layer &amp; Member</td>
<td></td>
</tr>
<tr>
<td>Structural plane</td>
<td>▼</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Distance of Rebar
Diameter of Rebar
High density
No. of Rebar
No. of cross section
No. of drawing
(Civil engineering, Architecture, Structure)
[Diagram of Rebar indication]

No. of layer & Member
Serial No. of Member
Symbol per part of structure
No. per layer
[Diagram of structural plane]

(Civil engineering, Architecture, Structure)

[Diagram of level indication(Plane)]

EL. 0.0000
EL. 0.0000
## Drawing Symbol

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
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<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Bottom</td>
<td>T</td>
<td>Top</td>
</tr>
<tr>
<td>N.F.</td>
<td>Near Face</td>
<td>F.F.</td>
<td>Far Face</td>
</tr>
<tr>
<td>E.F.</td>
<td>Each Face</td>
<td>E.W.</td>
<td>Each way</td>
</tr>
<tr>
<td>B.O.F</td>
<td>Bottom of Foundation</td>
<td>T.O.C</td>
<td>Top of Concrete</td>
</tr>
<tr>
<td>T.O.F</td>
<td>Top of Foundation</td>
<td>E.J.</td>
<td>Expansion Joint</td>
</tr>
<tr>
<td>Ab</td>
<td>Size of a rebar((\text{cm}^2))</td>
<td>C.J.</td>
<td>Construction Joint</td>
</tr>
<tr>
<td>(f_{ck})</td>
<td>Strength of Concrete(kgf/\text{cm}^2)</td>
<td>(f_y)</td>
<td>Resistance strength of rebar(kgf/\text{cm}^2)</td>
</tr>
<tr>
<td>(f_{cu(t)})</td>
<td>Compression strength of concrete per date(kgf/\text{cm}^2)</td>
<td>(f_e)</td>
<td>Available resistance power of ground(tonf/\text{m}^2)</td>
</tr>
<tr>
<td>(D_{(db)})</td>
<td>Nominal diameter of deformed rebar(mm)</td>
<td>(F_p)</td>
<td>Available resistance power per pile(tonf/\text{m}^2)</td>
</tr>
<tr>
<td>(G_L)</td>
<td>Center Line</td>
<td>&amp;</td>
<td>And</td>
</tr>
<tr>
<td>H</td>
<td>Height</td>
<td>@</td>
<td>Distance</td>
</tr>
<tr>
<td>THK.</td>
<td>Thickness</td>
<td>W</td>
<td>Width</td>
</tr>
<tr>
<td>CONC.</td>
<td>Concrete</td>
<td>TYP.</td>
<td>Typical</td>
</tr>
<tr>
<td>N.T.S</td>
<td>Not to Scale</td>
<td>ST’L</td>
<td>Steel</td>
</tr>
<tr>
<td>EL.</td>
<td>Elevation Level</td>
<td>FL.</td>
<td>Floor Level</td>
</tr>
</tbody>
</table>