



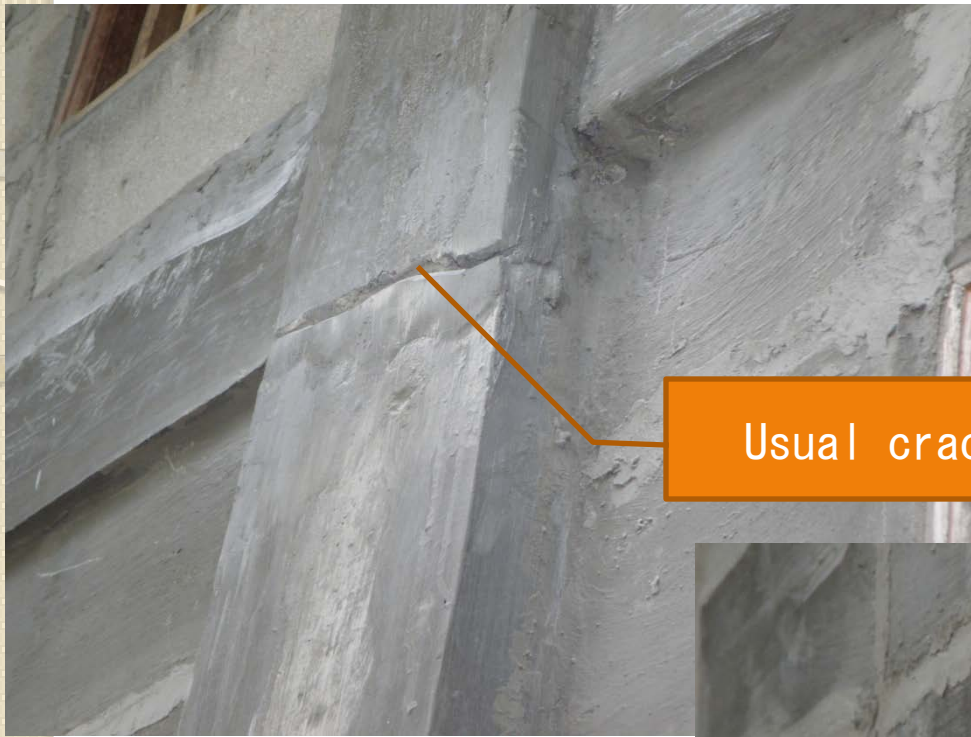
Treatment of Concrete crack

Treatment of Concrete crack

Don't misunderstand!

- Treatment of Hollow block crack is by Mortar
- **But, Treatment of Concrete crack is by Resin**
 - U-cut by chipping on crack
 - The part of U-cut is buried by Epoxy resin
 - After the resin hardens, make two holes at least
 - Inject resin from a lower hole
 - Confirm the resin flowing out from the upper hole

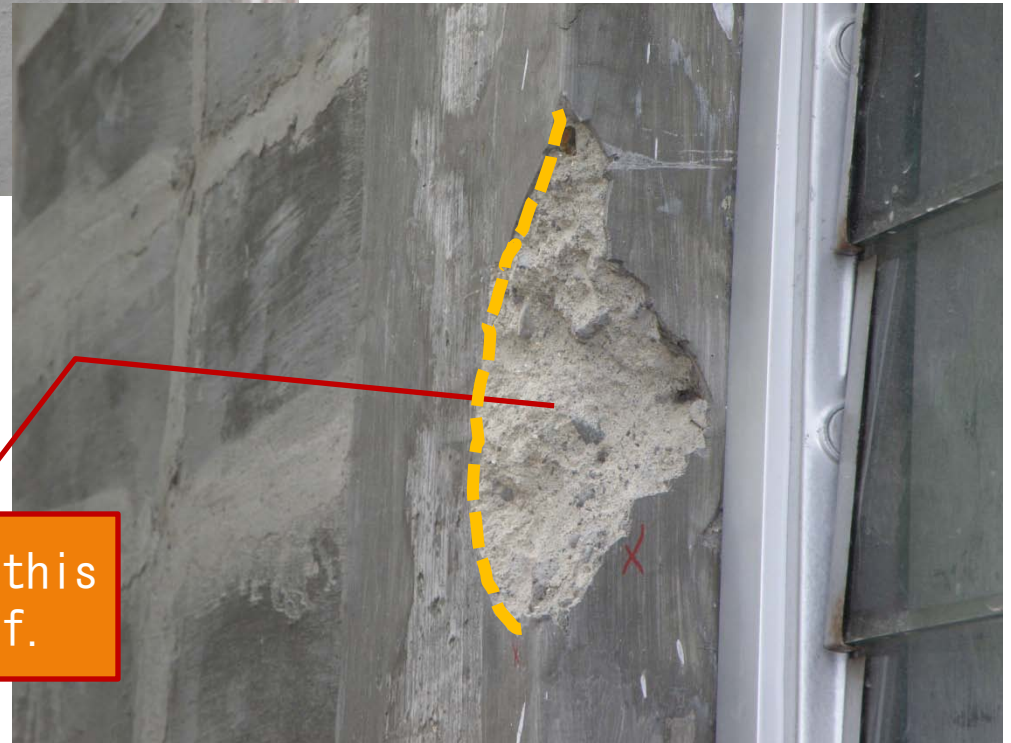
Treatment of Crack



Usual crack



There was crack and this
part was peeled off.



Judgment of Crack and Treatment

- Crack which causes peeling off or dose not
- Part of peeling off shall be repaired by resin mortar
- Usual crack which dose not cause peeling off shall be repaired by injection of resin

Steps of proper manner of Mortar work of Floor repair



**After mortar finishing,
it was checked.**

**Dry powder layer was
appeared.**

What way is the standard?





● 2nd step

Remove all debris & Powder



•3rd Step
Clean concrete surface by broom

- 4th Step
Concrete surface and surroundings are made moist enough
- 5th Step
Mortar work



Judgment of crack



Crack
How to judge only
crack or crack by loose

How to judge Crack

- When Crack is found, judge whether a loose concrete or a usual crack is done by the shock sound
- If it is light sound, Concrete piece shall be removed



Manhole cover of Absorbing well

(Not correct reinforcement work)



Who ordered?

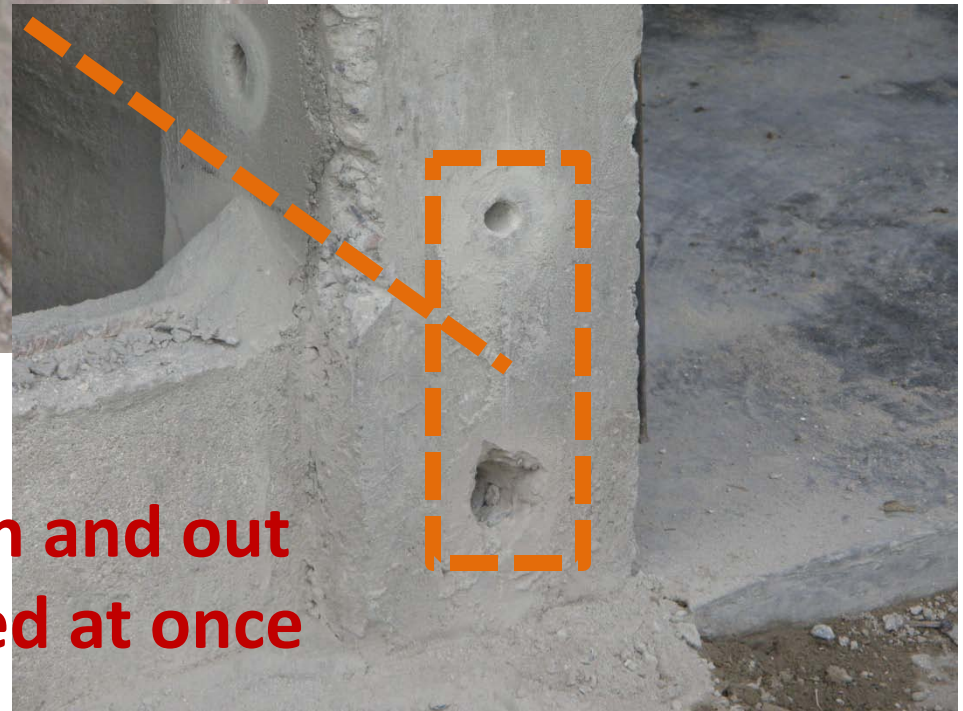
Cleaning of
Absorbing well



Work order



Base plate is one of important structure parts



All base plate of brace in and out shall be installed at once



Misunderstanding

Beam concrete size is wrong



New Construction shall be followed on the new drawings even it is partial repair.

Specified Detail on the drawing

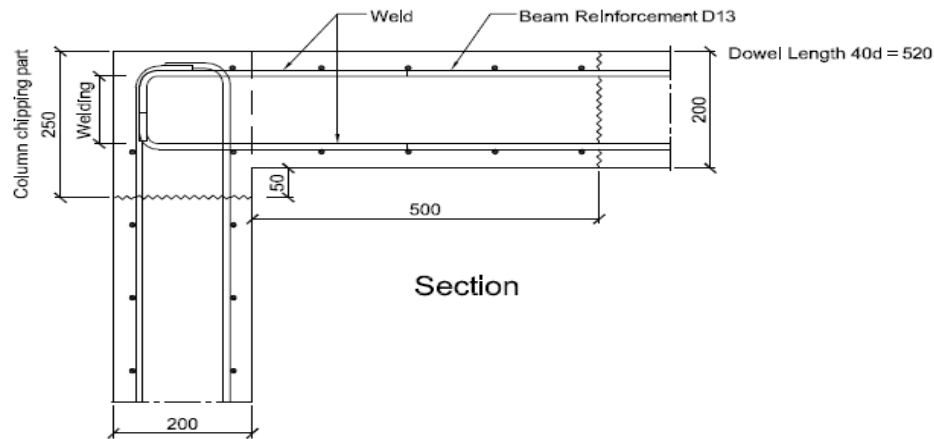
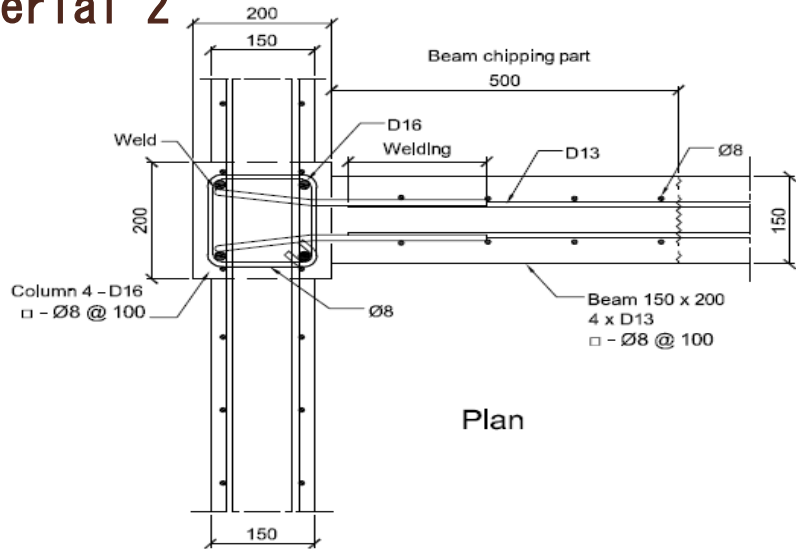
Anchor of Column main bar



What is regulation
in this country for
this detail?



Training material 2



On following case this detail shall be taken

1. Dowel length is not enough
2. Break of Beam Reinforcement

How to joint Steel bar at Column and Beam Joint

Again what is purpose of this chipping? To find the old mistake?



What is wrong from site management view point?





Only 1day past after casting concrete



Need Curing time! Why?



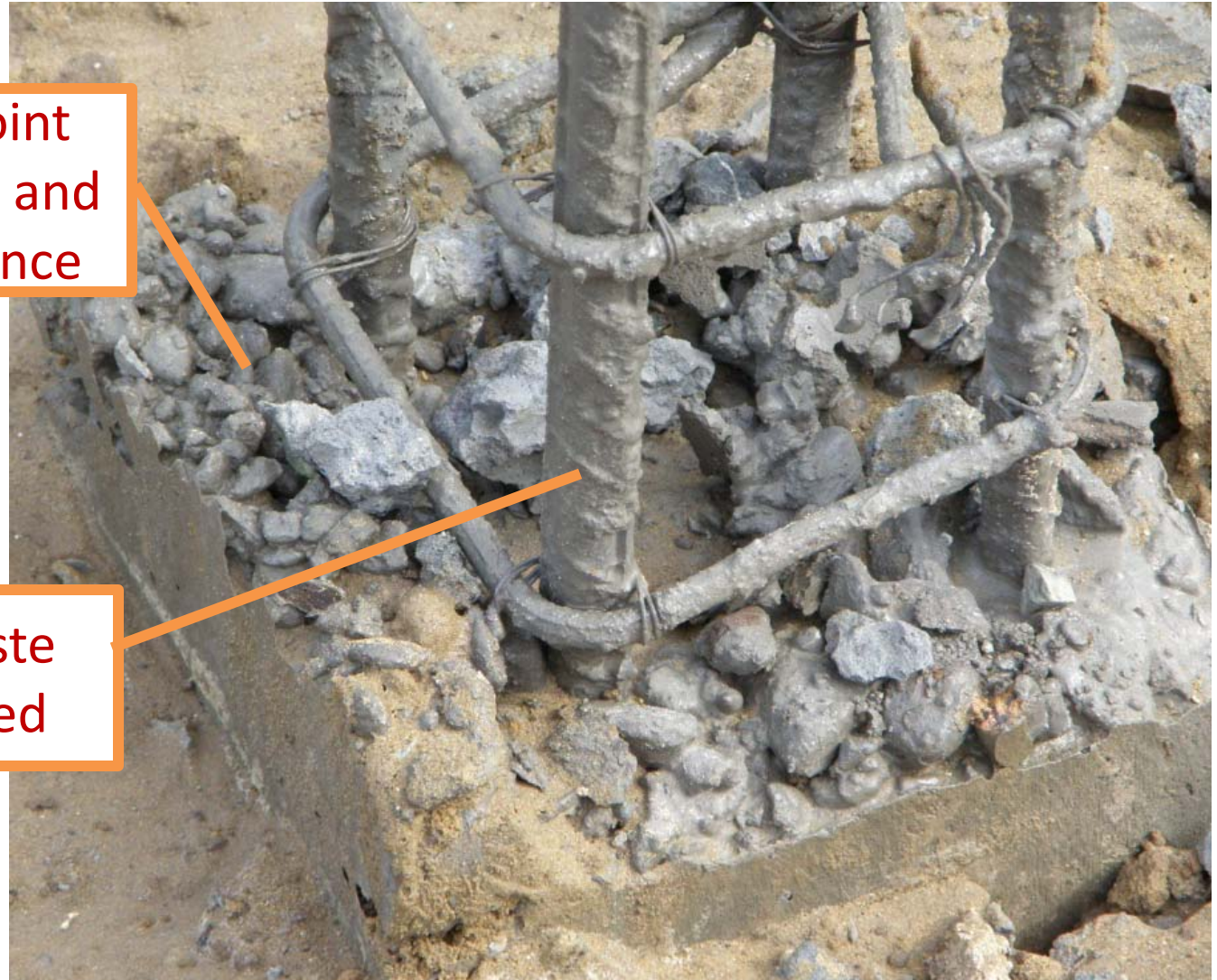
- Curing time is a period when concrete strength appears
- Fresh concrete is like a baby. If Strong power is applied on the arm, and it will be broken soon
- Baby's skin is very sensitive for dryness. Concrete is same!

Before casting next concrete,

What work shall be done?

Construction joint
shall be chipped and
remove all laitance

All concrete paste
shall be removed



Before casting concrete



All concrete paste
shall be removed





Concrete mixing time

Each type Concrete mixer has own mixing time



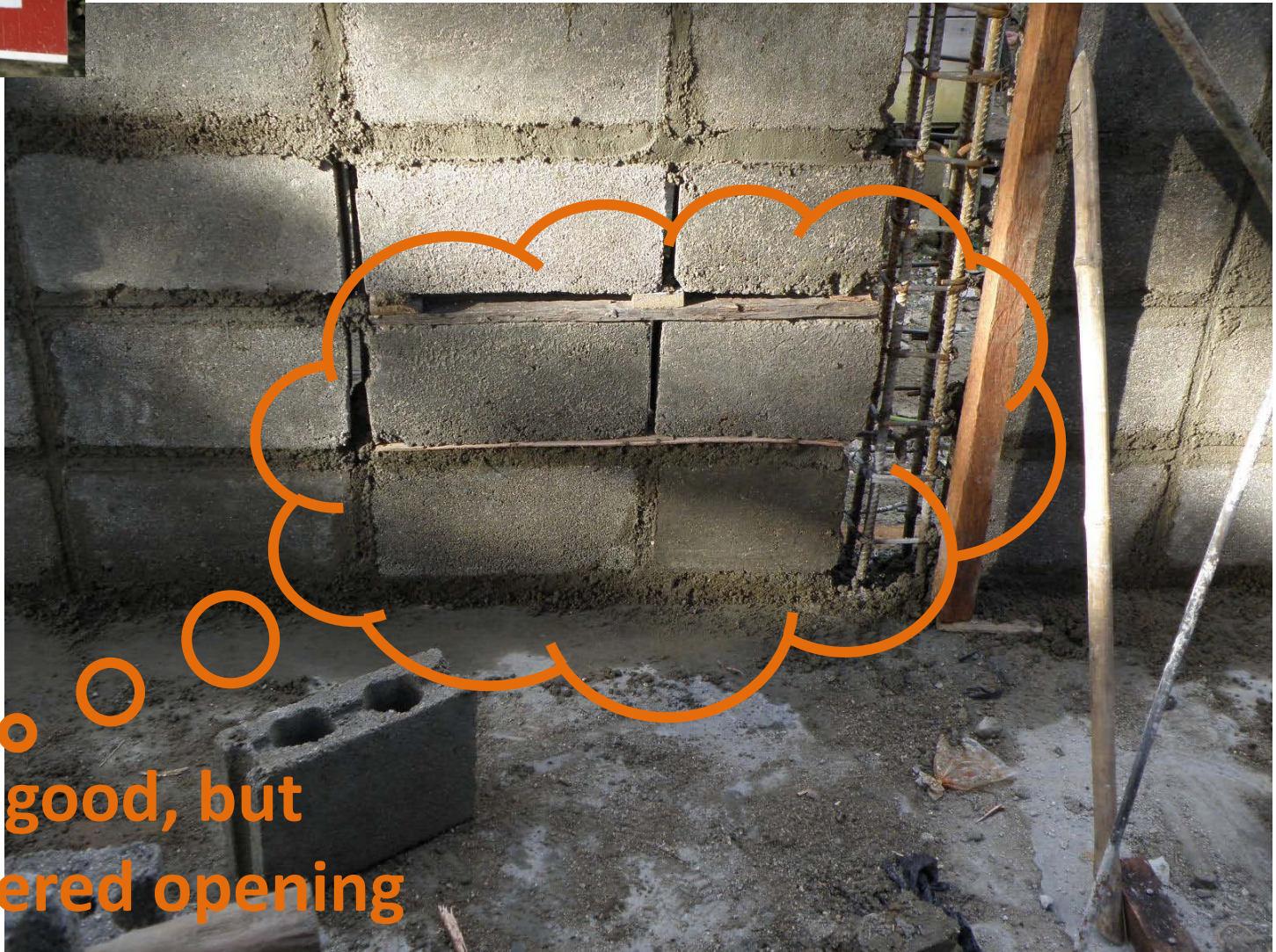
- If you do not know the mixing time of your mixer, it can be judged by your hand.
- You grip Concrete by your hand, and if it sticky, mixing is enough for concrete. Don't mix more!



Site management matter



Opening shall be estimated

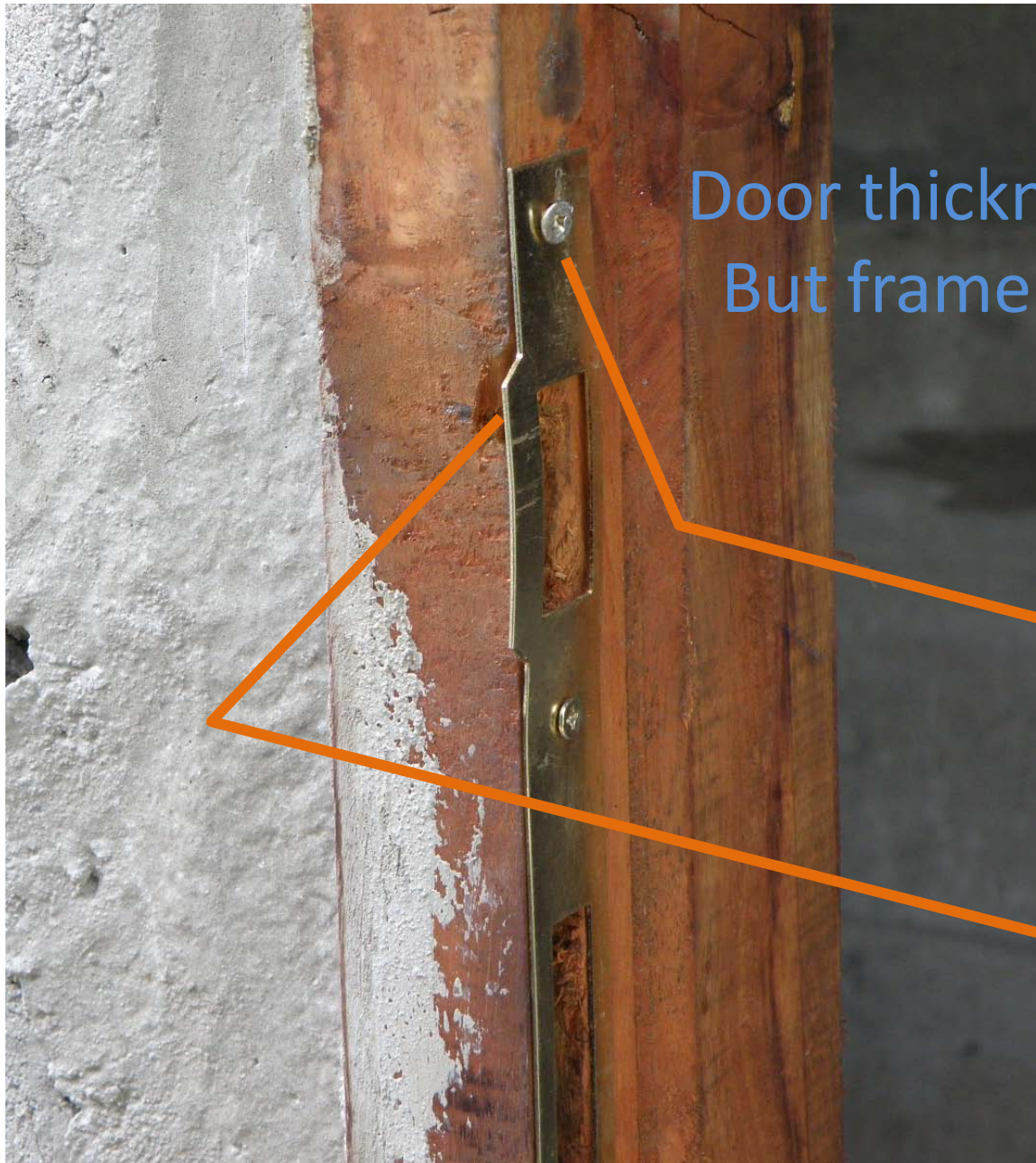


Not so good, but
Considered opening

Scope of the work



- Specify the scope of each site work
- Cleaning is one of important job



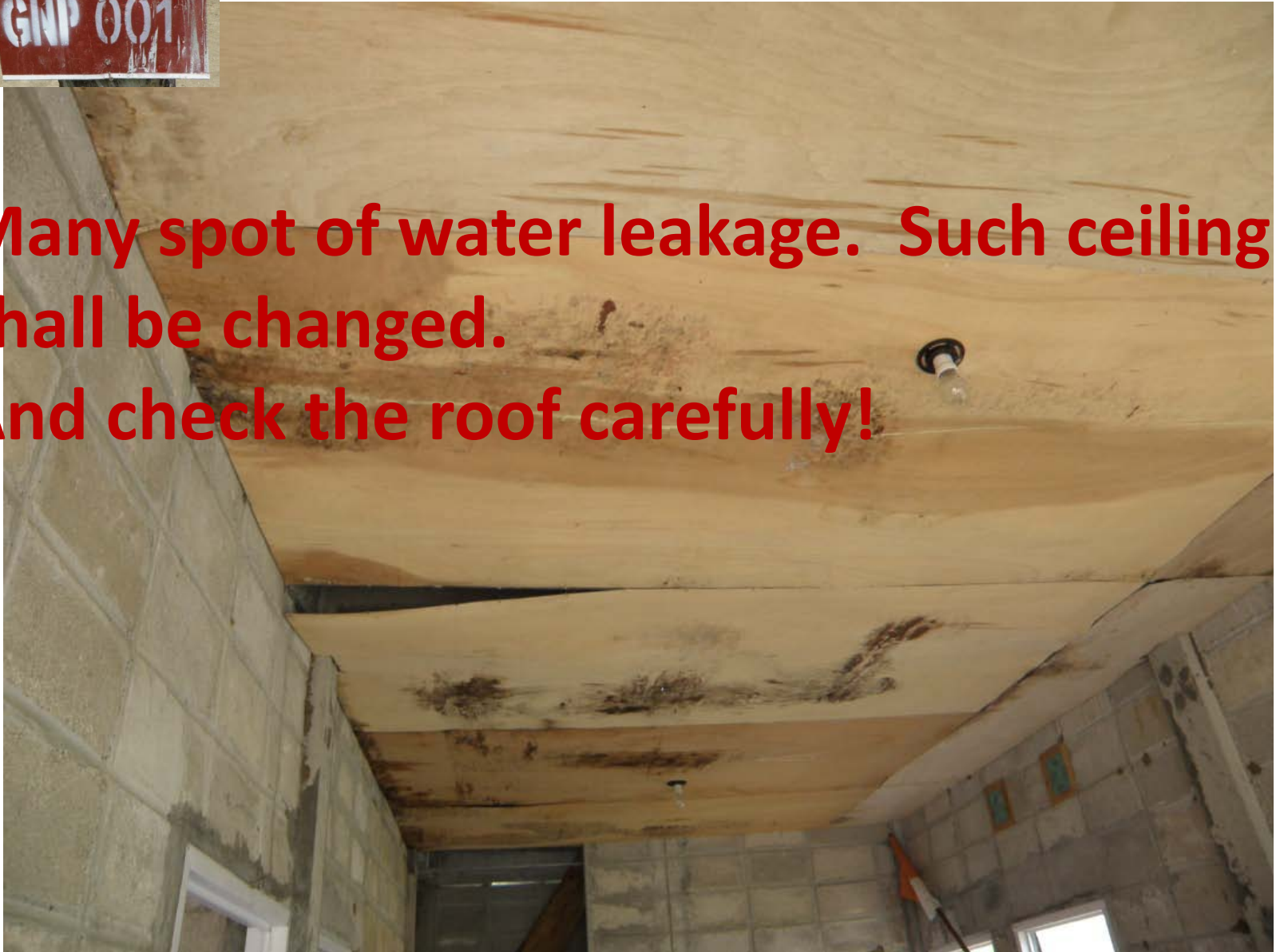
Door thickness 40mm
But frame of door 30mm

Screw nail work

Hole



**Many spot of water leakage. Such ceiling shall be changed.
And check the roof carefully!**





Site management mistake



Still aluminum door frame is remained

Still chipping work of
Brace base is remained





Well controlled site



Incase of small repair

Second step **Work order (From Team To Team)**

- ◆ Chipping work ⇒ Masonry work on Hollow block surface
(Chipping worker Team ⇒ Masonry worker Team)
- ◆ Chipping work
 1. Remove all Door Frames / 2. Door anchor part
 3. Opening for Brace plate / 4. Crack on Hollow block
 5. Crack of Concrete & its joint 6. Floor repair part
- ◆ Masonry work
 1. Hollow block crack / 2. Hollow block wall for Unify work
 3. Repair Hollow block opening / 4. Repair column for brace base
 5. Floor repair



What's wrong ?



Hoop is important to keep the steel bar position

This position Hoop





Why this contractor dose not follow the instruction?



Information transmission matter !



**Concrete cast control shall be done till
the end!**



Honeycomb





Very strange column top!

It's L-shape.

Where is Steel bar?

Honeycomb

Who check the site?



Control of Chemical Anchor work



This worker painted the point of the bolt with the epoxy by his finger, drove the bolt, and painted the entrance part of the hole with the epoxy.

There is no mark which overflows from the entrance of the hole epoxy resin and has gone out.





Camouflaged beam Height!



Top of Hollow Block Wall

Without Site Management



Mistake of Concrete mixing ratio

Old concrete shall be removed!





Honeycomb shall be treated immediately

Why?



Preventing Rain water invading and oxidizing in concrete



Strange shape of Lintel beam



Structure is most important factor
when you make building



PLH 007

Why only this
part is rust?



Foundation steel bar
has not rusted



How to avoid mistake

- Check by worker using Check-list
- Worker knows every thing
 He is specialist for his work
- But before work he has to know all detail of his job
- Contractor Engineer checks it all
- Consultant Engineer checks some points
- All check procedure shall be recorded on Check-list

Transmission Mistake of Information from whom!!

No or Late Information !



Rough surface shall be made on the oil paint surface of Block wall

Information Transmission is most important factor of Site management for Consultant and Contractor

[Information transmission way]

- Oral, Documents (Papers), Image
- Instruction, Education, Training
- Power point, Instruction sheet
- Meeting, Person to person

[Combination of the way]

- Appropriate combination way shall be selected **on time**



Why did this beam became like that?



Reason

1. Concrete strength
2. Remove support on the early stage





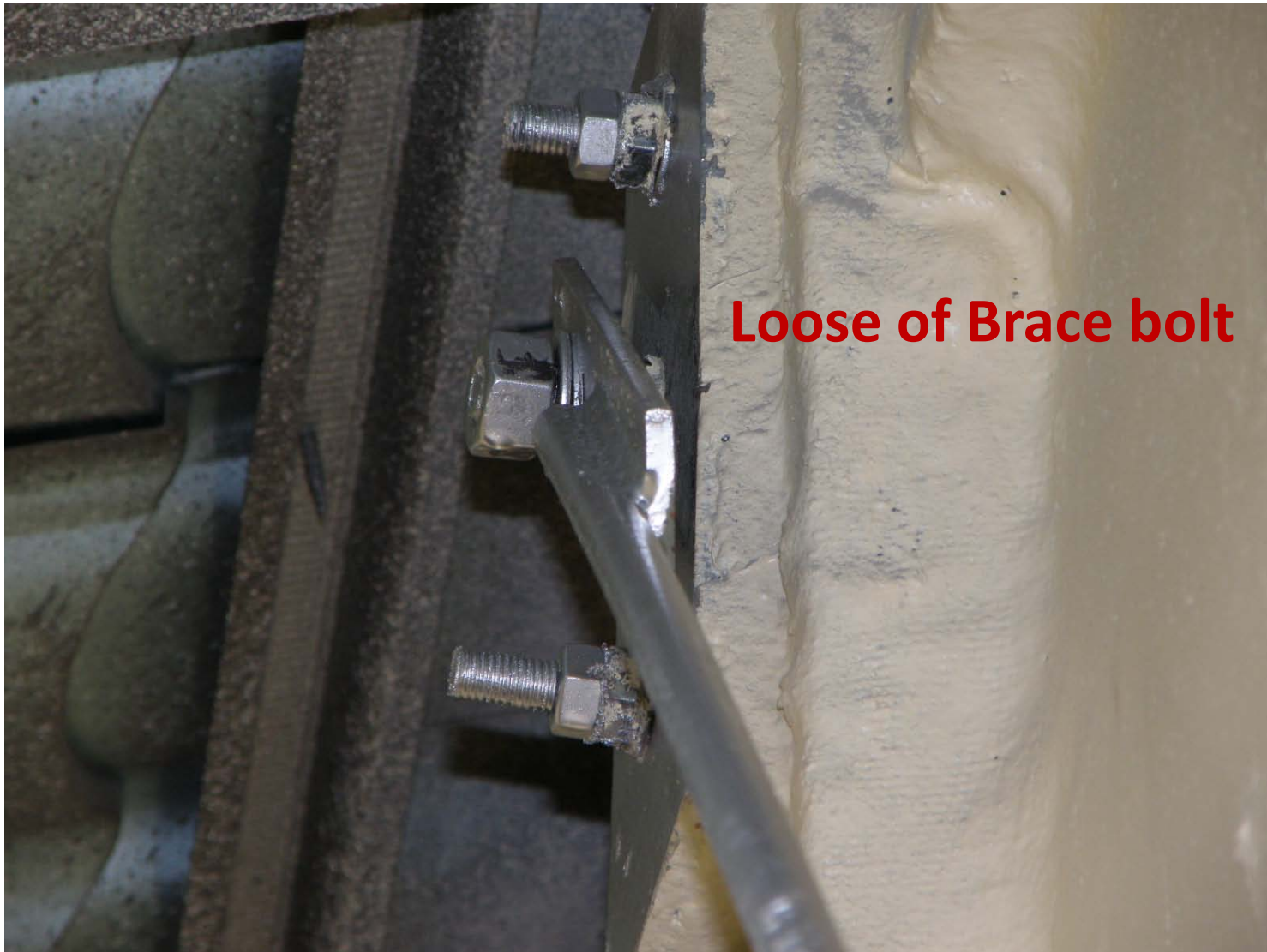
Position of Steel bar of Hollow Block work



**Position of Steel bar of
Hollow Block work shall
be center of wall**



Pointed out matter at Pre-final inspection



Pointed out matter at Pre-final inspection

Paint of Bolt top fixing aluminum plate



Pointed out matter at Pre-final inspection

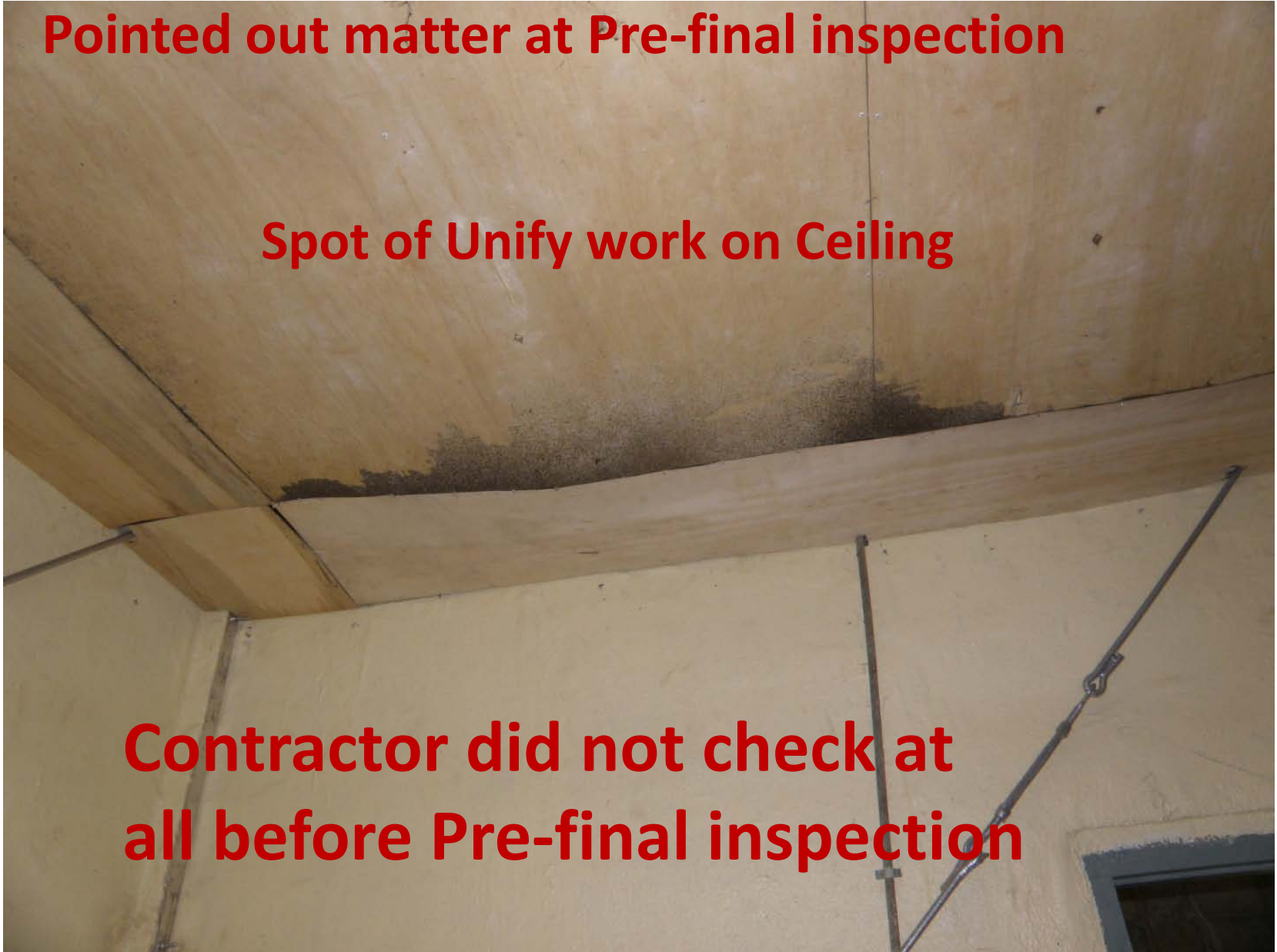
Cleaning of all door is one of the important work of door work



Pointed out matter at Pre-final inspection

Spot of Unify work on Ceiling

**Contractor did not check at
all before Pre-final inspection**



Rule of Pre-final inspection

1. Contractor shall finish all work of the object house before Pre-final inspection
2. When there are many remaining works, Pre-final inspection will not be executed and the new date of it will be informed by Engineer
3. If there are few remaining works, Pre-final inspection will be executed. In this case Pre-final inspection sheet will be issued by Engineer and the new date of Pre-final inspection will be decided by Engineer
4. When there are remaining some part of works which were some oversights, conform whether Contractor can finish those items before Final inspection. If they can, execute Final inspection on Schedule.



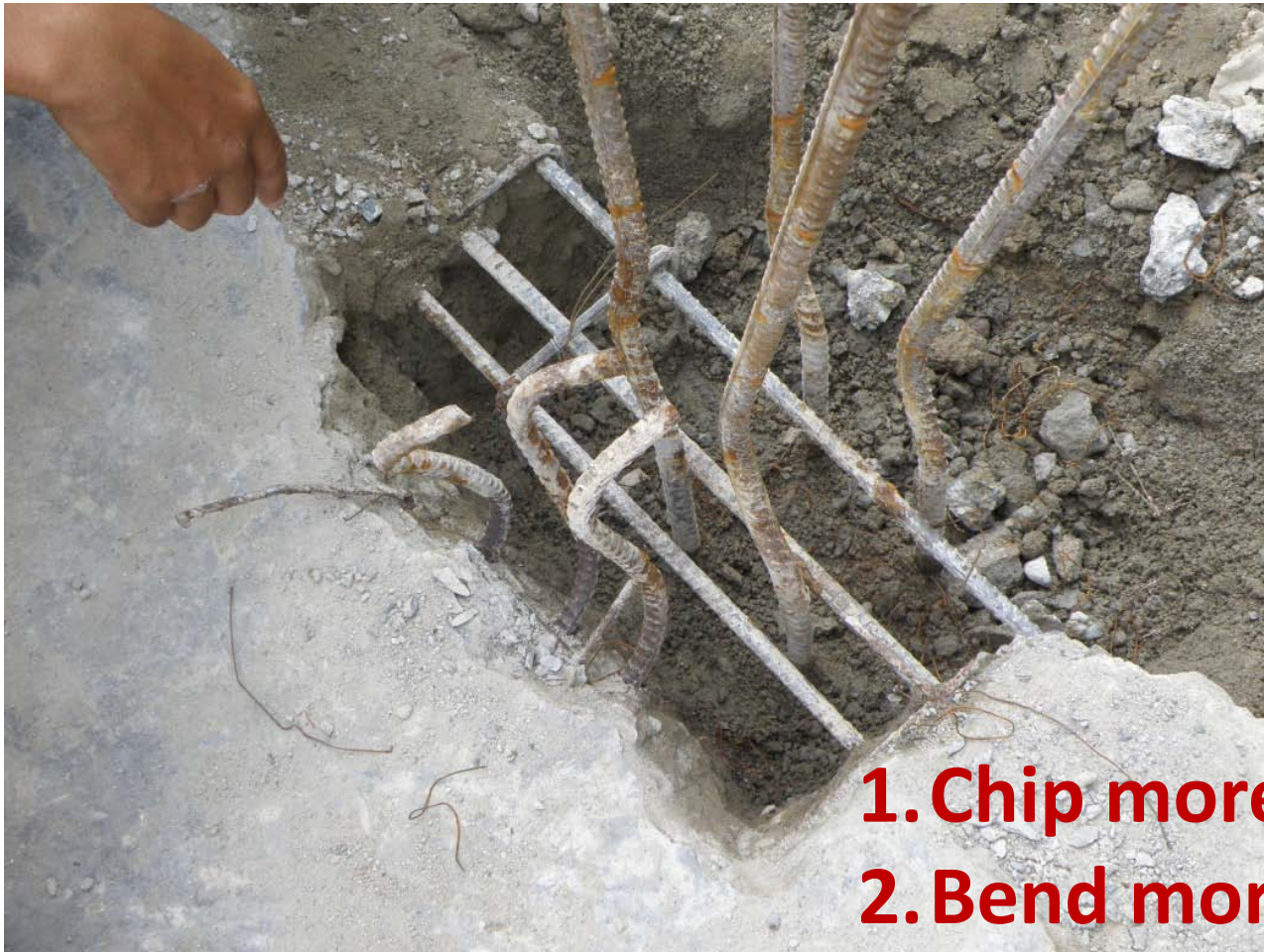
Why double nut shall be needed?



Double nut shall be used at the important point !



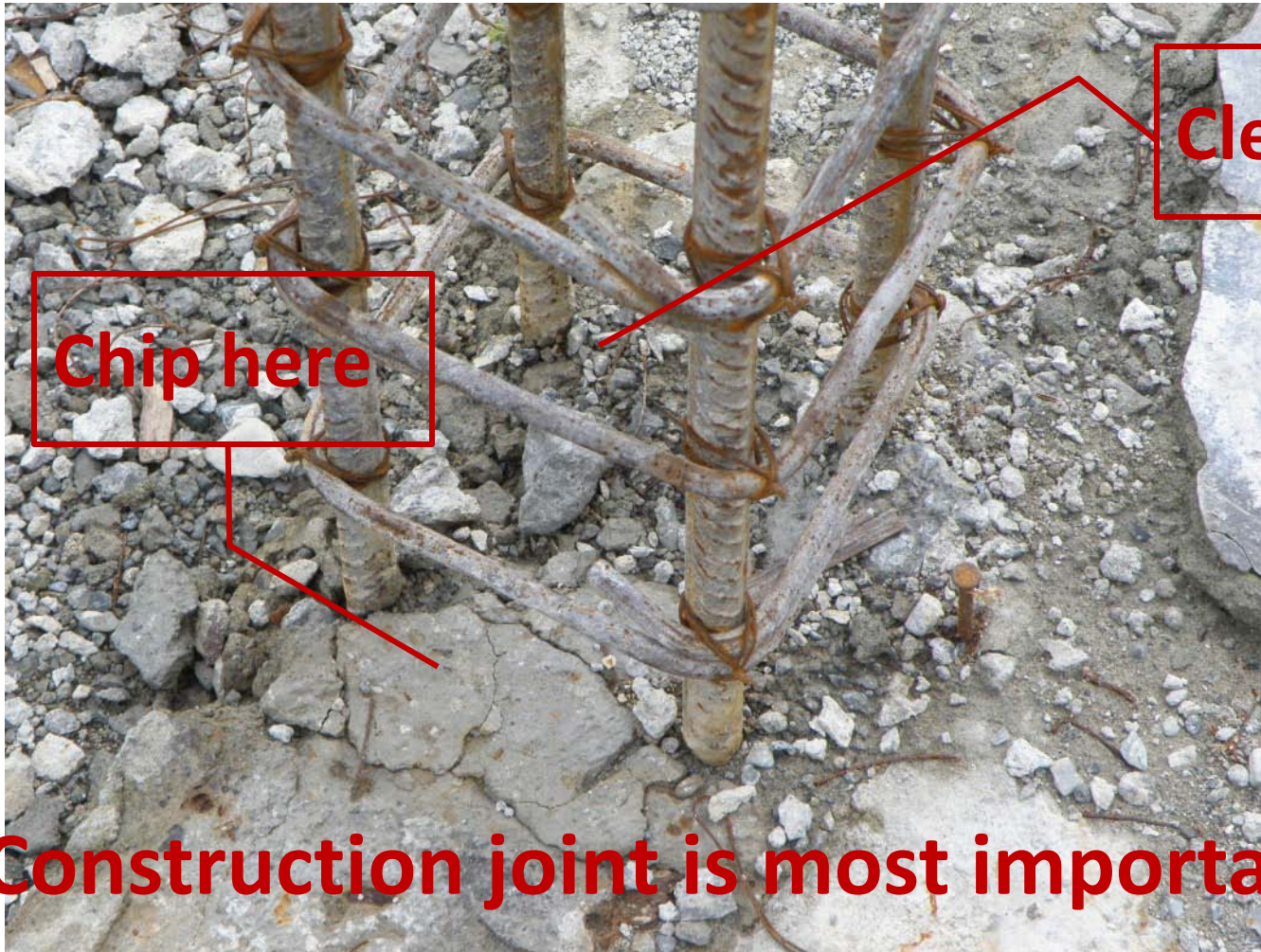
How to correct?



1. Chip more deep
2. Bend more gradual



What is wrong?



Construction joint is most important point

Strength of Horizontal & Vertical construction joint

Horizontal construction joint		Vertical construction joint	
Joint method	Strengt h ratio	Joint method	Strength ratio
Not remove Laitance	45%	Nothing any measure	57%
A concrete surface is shaved off by 1mm	77%	Plastering mortar in concrete	72%
A concrete surface is shaved off by 1mm and plastering cement paste	93%	Plastering cement paste	77%
A concrete surface is shaved off by 1mm and plastering cement paste	96%	A concrete surface is shaved off by 1mm and plastering cement paste	83%
A concrete surface is shaved off by 1mm and spread resin bond	100%	A concrete surface is shaved off by 1mm and spread resin bond	100%

How to make Gable joint!

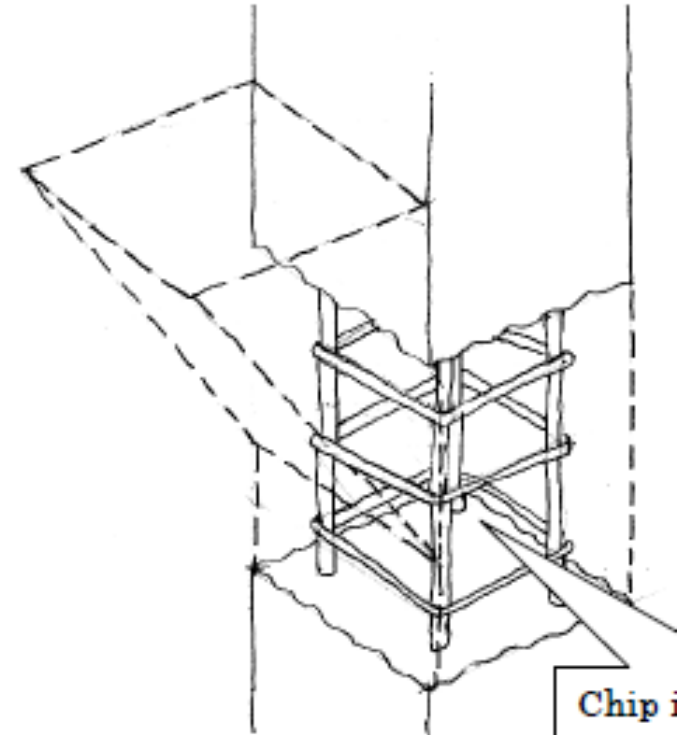


Cut at here





How to joint column concrete





Hollow Block joint shall be 2cm



What is wrong?



Work order mistake!

BNG 003

Now they are casting!

Is Reinforcement size correct?

Where is Spacer?

How about Watering?





What is wrong? & Why?

Left photos are big mistake.



Why is the right photo correct?

Why such matter occurred?

Training material from 74 to 76

- Worker knows his job itself.
 - But he dose not touch work order .
- Site Engineer shall control Work-order.

Why they could not control Work-order?

- PM ordered to the Engineer rush up! ???
- Balance of number between Unify worker & others! ???
- **In such case who sound warning bell?**
 - Consultant Engineer shall caution to Contractor**



On same place and same time!



What is strange?

Making Anchor of Hollow Block Wall

Mistakes

1. To chip existing concrete
2. Wrong welding way
(Spot welding)
3. Weld to Stirrup

Mechanical or Chemical Anchor shall be used

