



HONG KONG
CONSTRUCTION
MATERIALS
ASSOCIATION LIMITED

Updates of Prefabricated Rebar Supply in HK

Presented by Kelvin Lau

[Executive Director of Golik Holding Ltd and
Chairman of Reinforcement Processing Solution
Committee (RPSC)/HKCMA]



1. Understandings of CEDD Prefabrication Yard Operations
2. Accept Changes and Challenges in Government projects
3. Business Challenges in Non-Government projects
4. Rebar BIM (Construction 2.0) – Future Production Workflow



Members of RPSC & locations of CEDD Approved yards

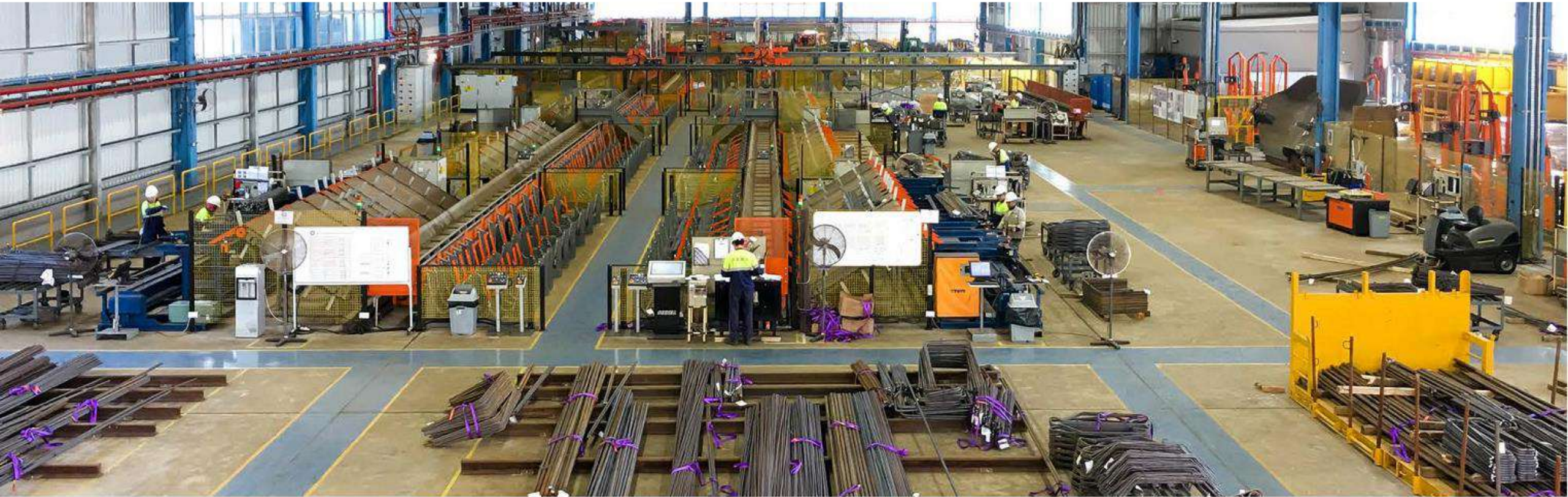


Plant	Capacity per year (tons)
VSC Construction Steel Solutions Ltd	96,000
Golik Steel HK Ltd (Tai Po Plant)	100,000
Golik Steel HK Ltd. (Tsing Yi Plant)	60,000
SW Construction Ltd. (Shiu Wing)	60,000
Total	316,000

Location of Off-Site Rebar Prefabrication Yards



Operation of Automated Prefabrication Yards



Rebar Processing Solutions Committee (HKCMA RPSC)

GOLIK

**SW
STEEL**

VSC
VSC 万顺昌


HKCMARPSC




Understanding of CEDD Prefabrication Yard Operations (1) – DEVB TC 10/2018



Requirements for Admission and Retaining in the list are stringent.

 APPROVED STEEL REINFORCING BAR PRESCRIPTION FORM	
For Issuance of Approved Steel Reinforcing Bar Performance Data	
Name of the Company	Globe Metal Manufacturing Co., Ltd.
Name of Tied	Globe Metal Manufacturing Co., Ltd. (M/F) (Fixed)
Address of Tied	Taipei Industrial District, 1 Shih Sheng Road, Sec. 2, New Taiwan
Contact Information	Mr. P.W. Lai (Deputy General Manager) Tel. No. 2679-1180, Email: laipw@globalmetal.com.tw
Approved Scope of Performance Data Issuance	
(1) Cutting and bending of various tapered threads (2) Fabrication of reinforcement cages	
Conditions of Approval	
<p>The approval is granted only in the steel reinforcing bar performance type of Grade 420d Manufacturing Co., Ltd. as follows: 1. Steel Reinforcing Bar, Tied, No. New Taiwan. In other words, company, size, process may hold or create any reinforced tie approved.</p> <p>In granting this approval, the Civil Engineering and Development Department must not compromise the intellectual property of the approved party and may not use legal rights or the approved party's intellectual materials, trade or service to the public.</p> <p>When the performance test confirming the grade of this approval and as used in government projects, the applicant applied tied strictly with the maximum of three different industrial specifications, standards and quality assurance system is stipulated in PDPA-TC-003-010708.</p>	
Civil Engineering and Development Department 22 February 2009	

<p>香港特別行政區政府 The Government of the Hong Kong Special Administrative Region</p>		
<p>政府總部 發展局 工務科</p>		<p>Works Branch Development Bureau Government Secretariat</p>
<p>香港灣仔維多利亞道2號 政府總部西翼18樓</p>		
<p>18/F, West Wing, Central Government Offices, 2 Tim Mei Avenue, Tamar, Hong Kong</p>		
<p>Ref : DEVB(W) 520/70/1 Group : 2, 5, 7</p>	<p>26 September 2018</p>	
<p>Development Bureau Technical Circular (Works) No. 10/2018</p>		
<p>Quality Assurance for Use of Off-site Prefabricated <u>Steel Reinforcing Bar Products</u></p>		
<p>Scope</p>		
<p>This Circular promulgates the quality assurance requirements of an off-site prefabrication yard for admission to the “List of Approved Steel Reinforcing Bar Prefabrication Yards” maintained by the Civil Engineering and Development Department (“CEDD”). It also provides the implementation arrangement for new and existing public works contracts to use prefabricated steel reinforcing bar (“rebar”) products supplied by the approved yards.</p>		
<p>2. The Director of Housing has agreed the contents of the Circular.</p>		
<p>Effective Date</p>		
<p>3. This Circular takes immediate effect.</p>		
<p>Effect on Existing Circular</p>		
<p>4. This Circular supersedes DEVB TC(W) No. 1/2016, which is hereby cancelled.</p>		
<div style="display: flex; justify-content: space-between;"> DEVB TC(W) No. 10/2018 Page 1 of 5 </div>		

Technical and Quality Assurance Requirements for Admission and Retention

12. A highly automated off-site rebar prefabrication yard may include the processes of (a) cutting and bending of rebars; (b) fabrication of reinforcement cages; and (c) threading of rebars and coupling with reinforcement connectors in the application for admission to the List. Subject to CEDD's assessment on the application, process (a) alone, together with process(es) (b) and/or (c) where appropriate, may be allowed as the approved fabrication process(es) for an approved yard.



Understandings of CEDD Prefabrication Yard Operations (2) – Performance of Independent Audit Team (IAT) appointed by CEDD

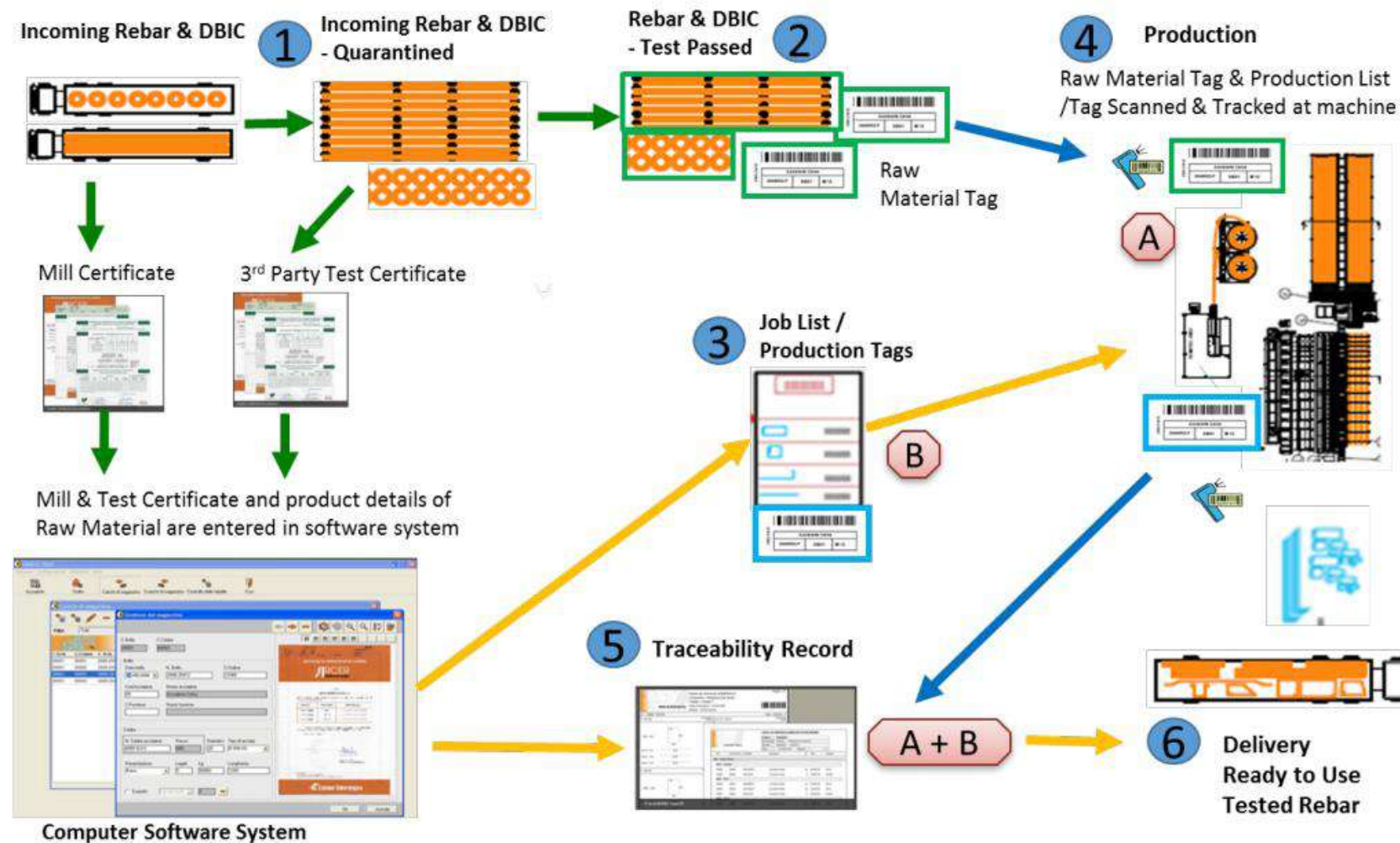
Requirements of Public Works Contracts

17. With the implementation of QMS and the confirmation of acceptance of all test results by the **IAT** before the fabrication process, prefabricated rebar products supplied by the approved yards shall meet the required standards, and that approval of particulars and further testing of rebars (i.e. purchaser's test) are not required. The relevant particulars and testing results should be provided to the Engineer/Architect for record purposes only.

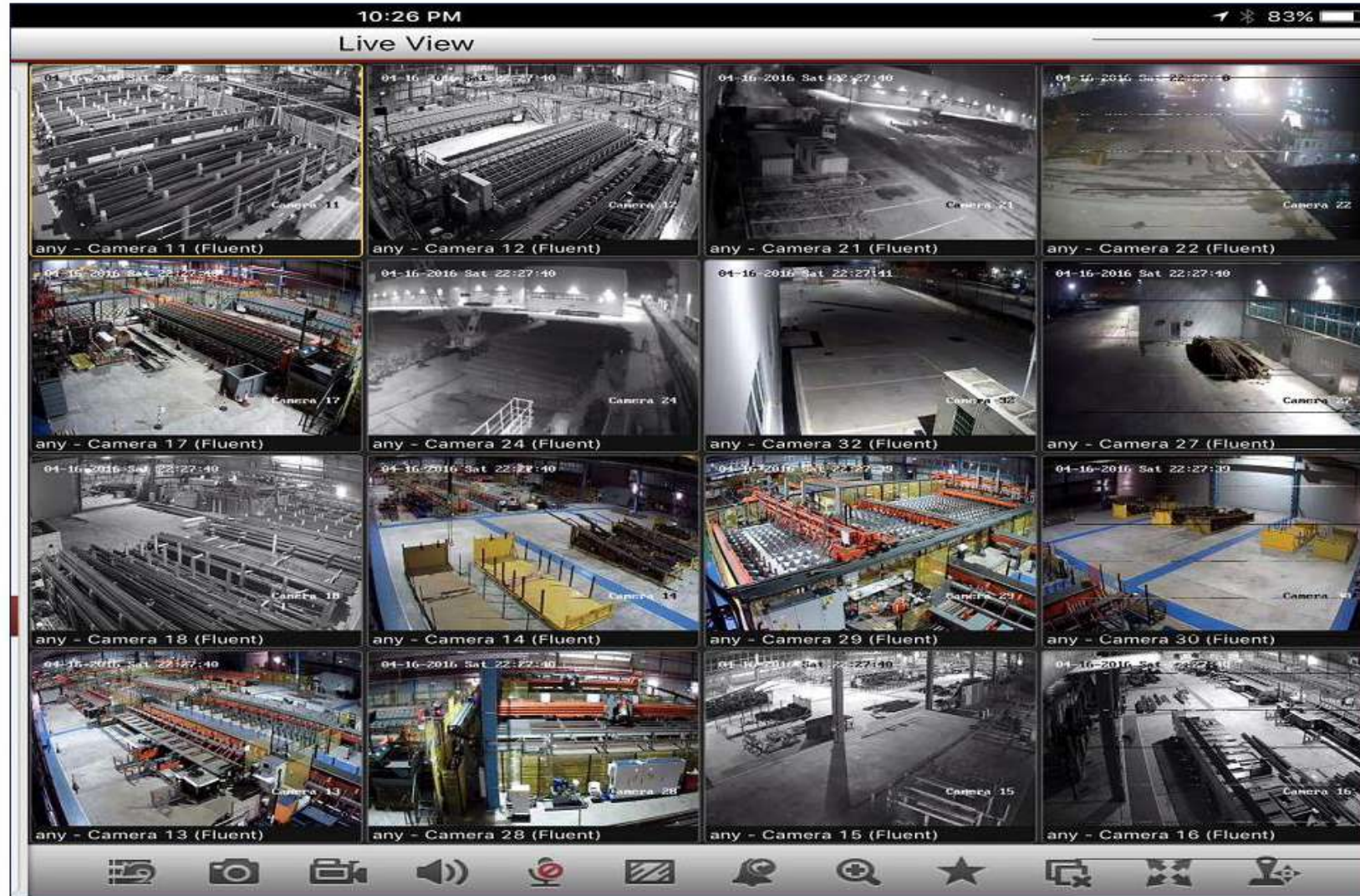


Understandings of CEDD Prefabrication Yard Operations (3) – Workflow

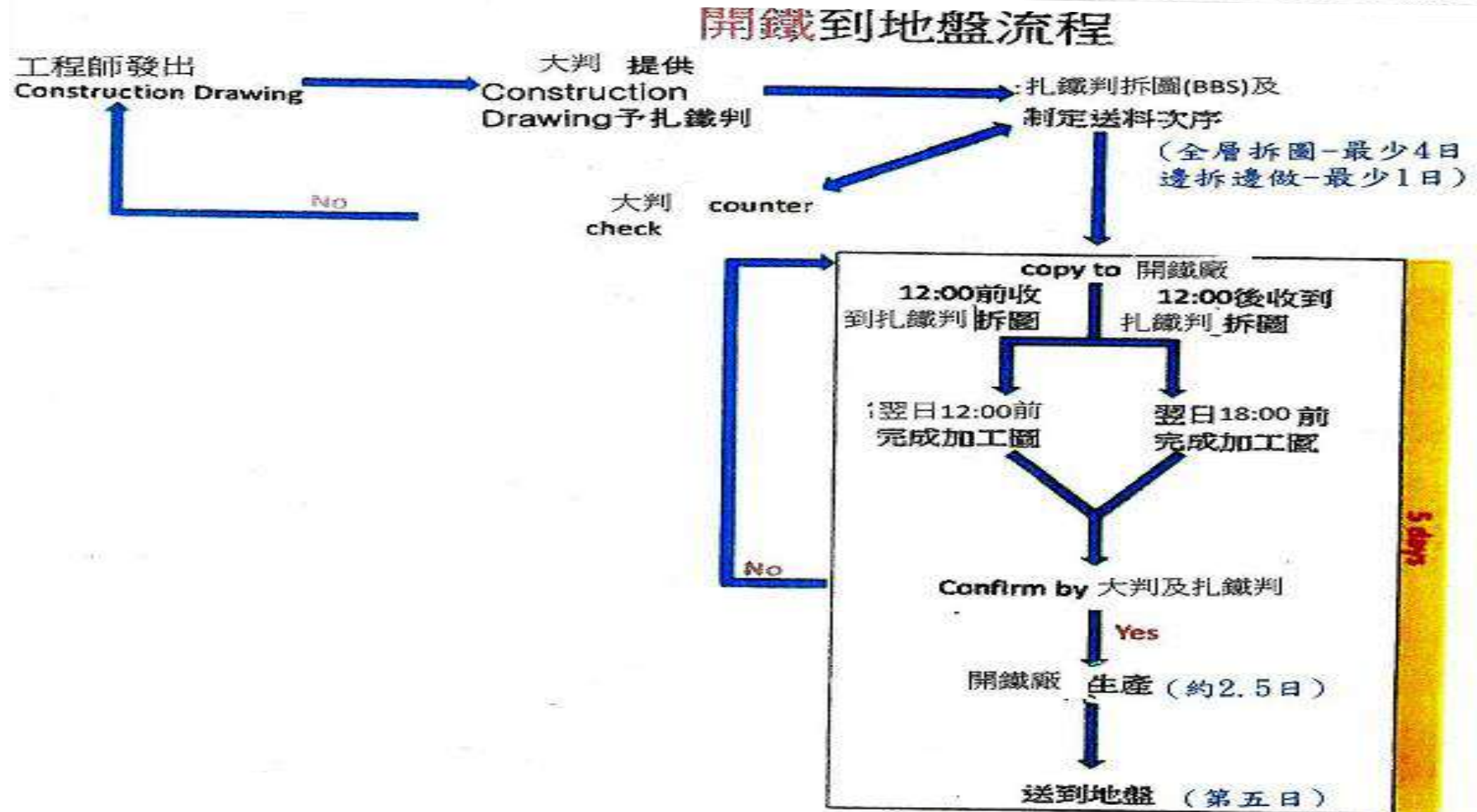
Fully Traceable Automated Steel Reinforcing Bar Prefabrication



Round-the-clock CCTV Coverage



Standard Prefabrication Workflow (5 days)



Summary of Production in 2019 & 2020 (Q1-Q2)

Year	2019 (ton)	2020 (Q1&Q2) (ton)
Prefabricated Rebar Supplies to Government Projects	27000	11600
Prefabricated Rebar Supplies to Non-Government Projects	50900	37300
Total	77900 (24.7% of total cap)	48900 (30.9% of total cap)

Remark : Since 2016 Approximately 80 contractors have been using Off-site prefabrication yards;
Approx. 60 contractors applied CITF subsidies



Accept Changes in Government Projects



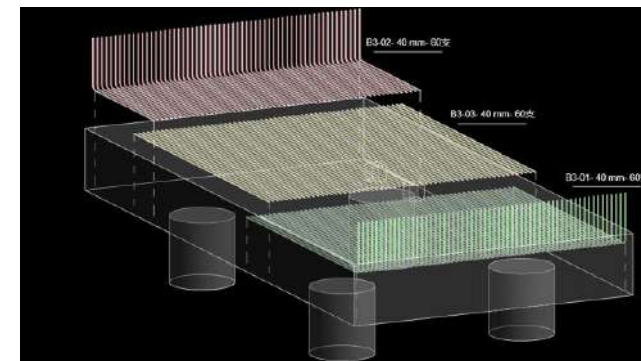
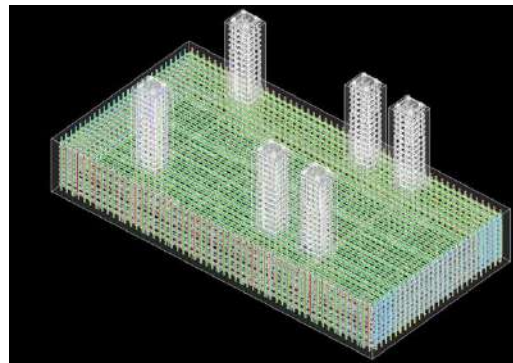
Paradigm Shift (模式轉變) in Government Projects

- **New Government Policy** to use off-site rebar prefabrication in public works (24 mandated projects in the pipeline; Ultimate Goal – ALL to use)
- **Innovation & Industrialisation** – Improve site tidiness, safety & steel wastage
- **Centralised Testing - No rebar sampling on site** as the rebars are tested by Public Work Lab and then produced in CEDD approved yard. i.e. Quality of Rebars assured.
- Information of Rebars produced from Yard are **traceable**

- **New Workflow**



- Trend to adopt **Rebar BIM** to facilitate automation



Common challenges in Government Projects



HONG KONG
CONSTRUCTION
MATERIALS
ASSOCIATION LIMITED

➤ **Unfamiliarity of adoption in contractor & site supervision team**

1. No Sound justifications to use Off-site Rebar Cut & Bend services if space is available on site
2. Concerns of flexibility for unpredictable design changes
3. Impacts on contractor's own procurement & audit system
4. Change of Steel Fixer's usual working practice
5. Uncertainty in acceptance criteria and documentation
6. Concerns of limitation in transportation

➤ **Unwillingness to use rebar prefabrication yards**

1. Fixer's works (normal practice). No intention to divide the job for fixer and prefabrication yards.
2. Let other project to go ahead, not in my backyard
3. Lack of supporting cases



Business Challenges in Non-Government Projects



Typical concerns in Non-Government Projects



HONG KONG
CONSTRUCTION
MATERIALS
ASSOCIATION LIMITED

- Concerns of adoption (mainly from developer's view)
 - ◆ BD acceptance
 - ◆ RSE's responsibility
 - ◆ Impacts on Developer's own procurement & audit system
 - ◆ Documentation for OP
- Concerns of product quality
- Concerns of flexibility for unpredictable design changes
- Control of wastage
- Affecting BEAM+ i.e. Grading of Award

Answers of FAQ are in next few slidesor www.hkcma.asia



General Questions and Answers for Rebar Prefabrication Yard

1. Will BD accept ?
2. What are the documentation required in OP application?
3. Is it possible to use customer rebar?
4. Can the project RSE / RE participate in the sampling of rebar when the rebar prefabrication yard is chosen?
5. What is the production flexibility that allows urgent orders?
6. How to ensure all prefabricated rebar products conform the specification and delivery to site ?
7. IF CB product lost its ID tag, how to identify its position to be used?
8. Any contingency plan in case the off-site rebar prefabrication yard fails to supply?
9. Who does actually control the wastage?
10. Does the Yard ready for BIM inputs? What kind of data format that can be fed for direct production?



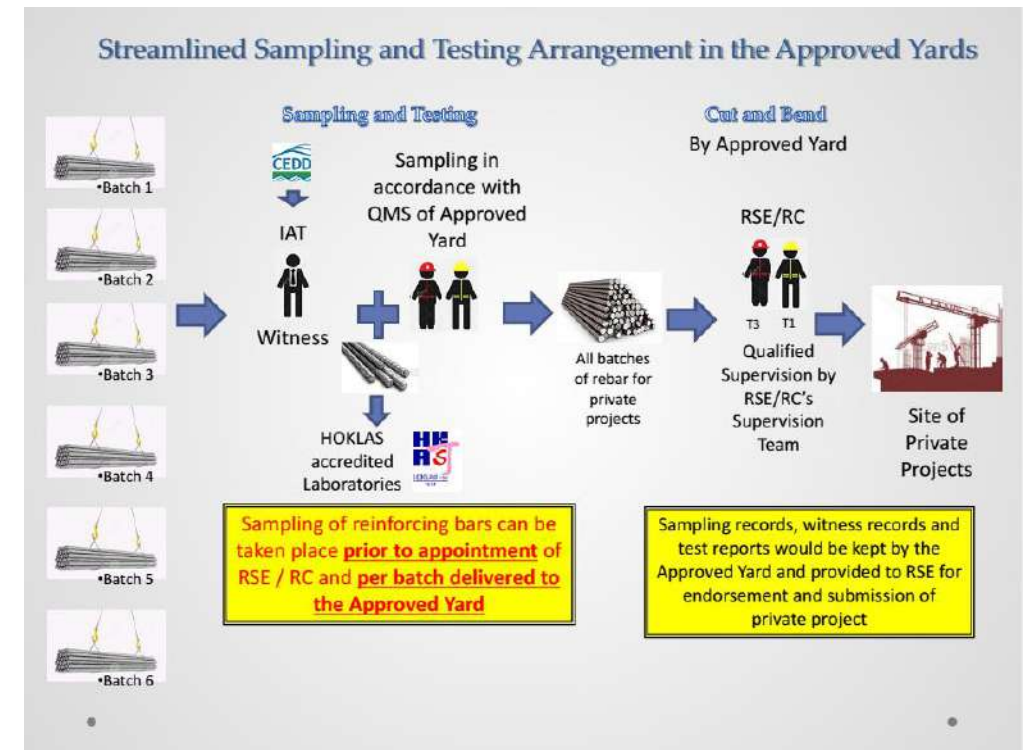
1. Will BD accept ?

- **SURE!** BD will accept. To facilitate the use, a streamlined process has been agreed with BD

Streamlined Arrangement for Sampling and Testing of Steel Reinforcing Bars for Private Projects in Approved Reinforcing Bar Prefabrication Yards

Mr. LUK Man-kit

Technical Secretary / Structural, Buildings Department



Source of information from BD presentation material at CIC Technical Talk held on 3-9-2019



2. What are the documentation required in OP application?


- Copy of Sampling Records
- Copy of Witness Records of IAT
- Copy of test reports issued by HOKLAS Laboratory
- A Statement signed by the RSE to confirm the rebars used in the building project in compliance with the BO and its subsidiary regulations

Streamlined Sampling and Testing Arrangement in the Approved Yards

Documents to be submitted

RSE should submit the following documents upon delivery of the prefabricated rebar products to the site:

- Copy of sampling records
- Copy of witness records of IAT
- Copy of test reports issued by HOKLAS Laboratories
- A statement signed by the RSE to confirm the rebars used in the building project in compliance with the BO and its subsidiary regulations



3. Is it possible to use customer rebar?

SO SORRY!!!

NO, rebar processing factories are producing rebar products supplying all projects in hand, it is not possible to select specific rebar for production



4. Can the project RSE / RE participate in the sampling of rebar when the rebar prefabrication yard is chosen?

- government projects – DB TC 10/2018, the IAT will be responsible for supervising and conducting the batch sampling of rebar.
- For non-government projects – BD APP-45 Apr 2019, batch sampling of rebar conducted in accordance with the QMS of the Approved Yard and witnessed by the IAT is accepted as satisfying the requirement of qualified site supervision in respect of sampling of rebar in accordance to purchaser's testing...
- The site RSE / RE are welcome to participate in witnessing of the sampling process by the IAT or the CAB processor quality team (T3)
- Only rebar that passes the purchaser's test are allowed to be used for processing.
- The batches of passed rebar will be used in various job sites.

Streamlined Sampling and Testing Arrangement in

the Approved Yards

Role and responsibility of RSE's and RC's team

Prior to the use of the tested rebars, RSE and RGBC / RSC opting for the streamlined arrangement should :

- Check Approved Yard's sampling records
- Check IAT's witness records
- Check test reports of rebars certified by a HOKLAS accredited laboratory kept by the Approved Yard



They should also :

- Provide qualified supervision to rebar prefabrication works (e.g. cut and bend) in accordance with provisions of the Buildings Ordinance and its subsidiary regulations

Source of information from BD presentation material at CIC Technical Talk held on 3-9-2019



5. What is the production flexibility that allows urgent orders?

- Normal production requires 5-6 working days
- Urgent delivery can be accommodated (depends on yard's spare capacity and the required quantity) ; Few hrs to few days for delivery depends on the shapes/sizes/quantities of the requested urgent order
- Reasonable special request can be agreed between fixer and yard
- Deliveries that are required within 48 hours usually attract a premium



6. How to ensure all prefabricated rebar products conform the specification and delivery to site ?

- ISO and recognized IAT QA system
- Computerized info mapping BBS to Production machineries; BBS conformity of General Notes and Standards.
- Digitized input and traceability, e.g bar code scanning inputs, server direct production schedule downloading, data mapping ...etc
- Standardized and automatic mapping of bending former/pins, bar size, lengths, angles and directions
- All cutting and bending is performed by controls of hydraulic and pneumatic system to ensure high degree of repeatability and accuracy.
- Delivery truck GPS and car cam for continuous monitoring and record



7. IF Rebar product lost its ID tag, how to identify its position to be used?

- tag per shape per BBS item
- fixed on binding wires or rebar by steel wire
- Grouped in elements, members, position...etc
- Single tag lost → ID by other grouped products
- Detailed BBS upon delivery can help to check the physical size if needed.



8. Any contingency plan in case the off-site rebar prefabrication yard fails to supply?

All CEDD yards are members of RPSC-HKCMMA. They have an agreement to back-up each other, in case one factory has supply difficulty, other member's factories will back up each other to ensure the project progress unaffected.



9. Who does actually control the wastage?

- Prefabrication Yard controls
- ✓ Both BBS compiler and Cut & Bend processor
- ✓ For stock length rebar usage : BBS compiler and Cut & Bend processor should well communicate:
- ✓ BBS compiler : beware of multiple length and use of odd lengths
- ✓ Cut & Bend processor : Multi-batch processing vs Just In Time order completion
- ✓ For rebar-in-coil DBIC usage:
- ✓ Single length of rebar nearly NO WASTAGE !!!



10. Does the Yard ready for BIM inputs? What kind of data format that can be directly fed for production?

- Yes, data from BIM software can be directly input to Cut & Bend system
- Detailing and scheduling works have to be done on upstream BIM software (e.g Revit, Tekla ...etc)
- Selected elements/parts can be exported into BVBS data format (i.e. *.abs)
- BVBS data format can be directly feed into Yard's cut and bend system for production arrangement.





HONG KONG
CONSTRUCTION
MATERIALS
ASSOCIATION LIMITED

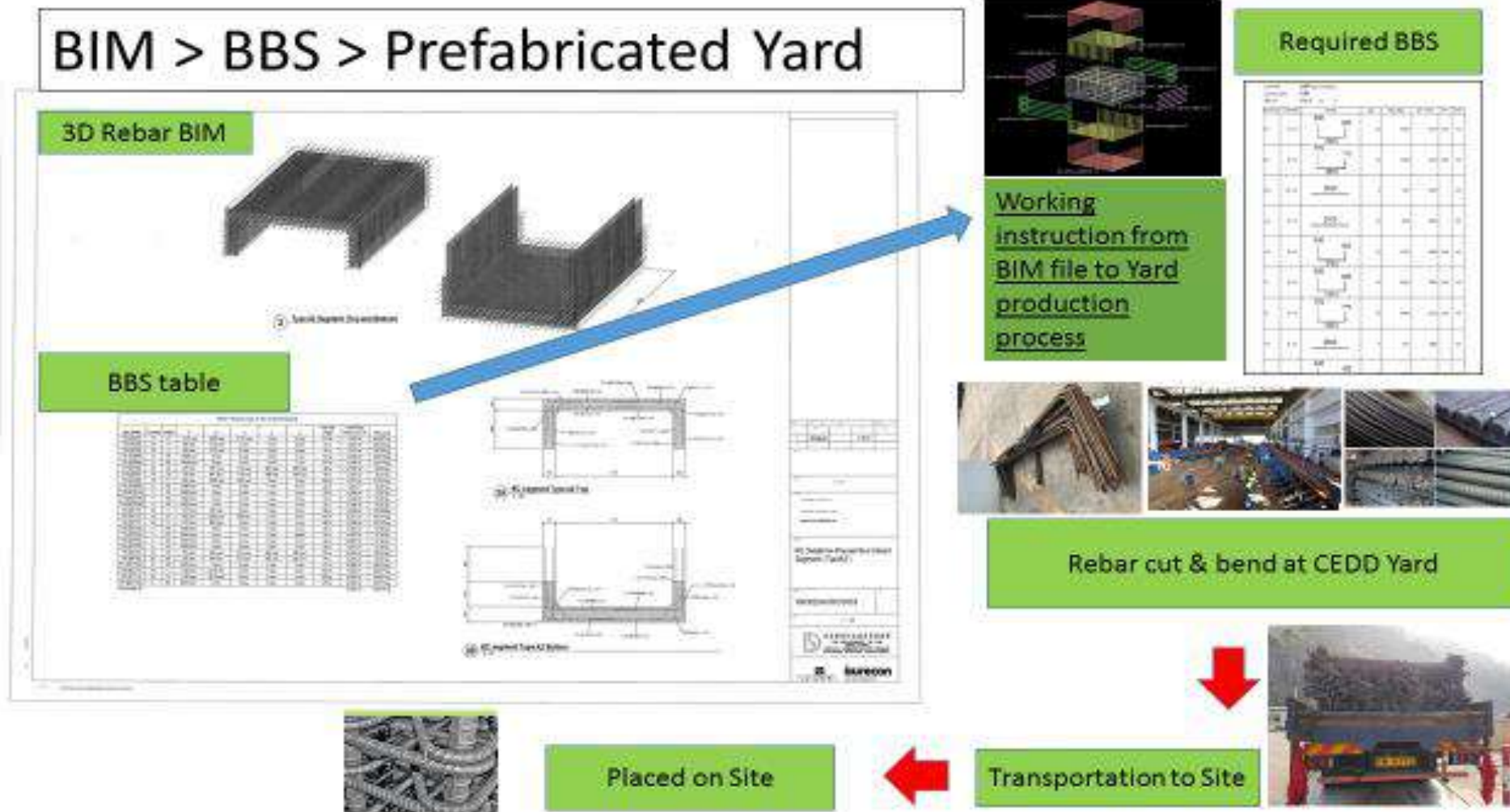
Rebar BIM (Construction 2.0) – Future Production Workflow



Rebar BIM (Construction 2.0) – Future Workflow

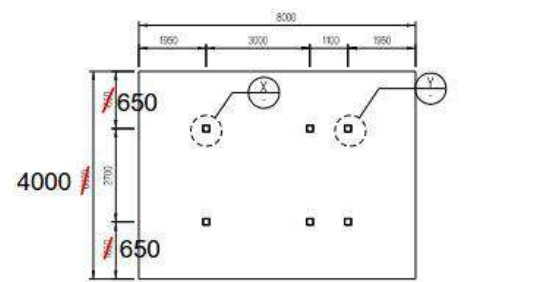


HONG KONG
CONSTRUCTION
MATERIALS
ASSOCIATION LIMITED

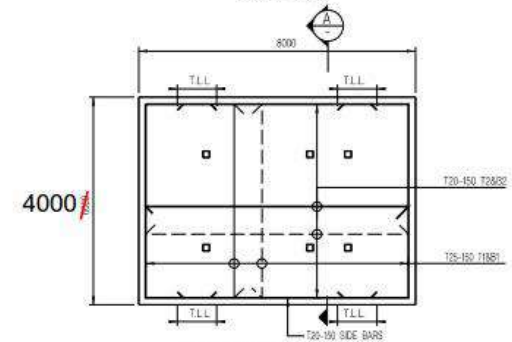


User Name : Fung_ikhi

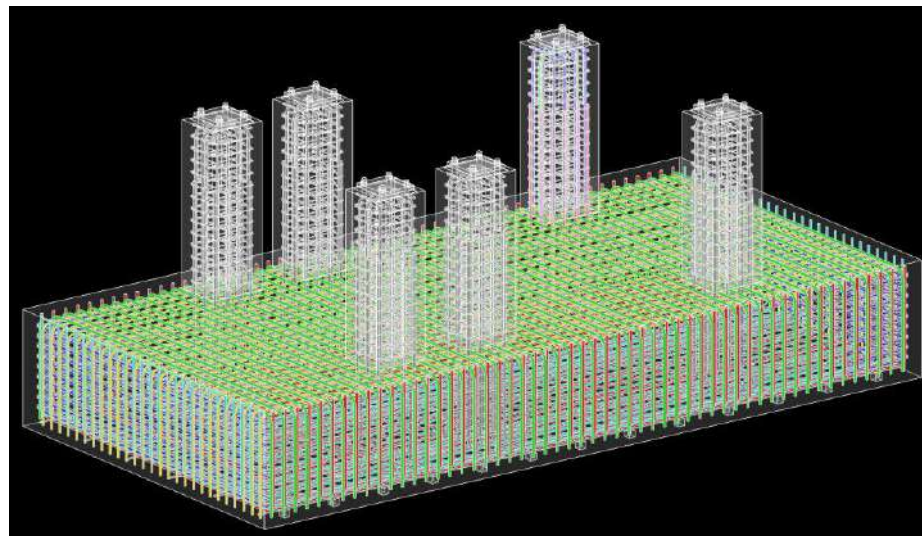
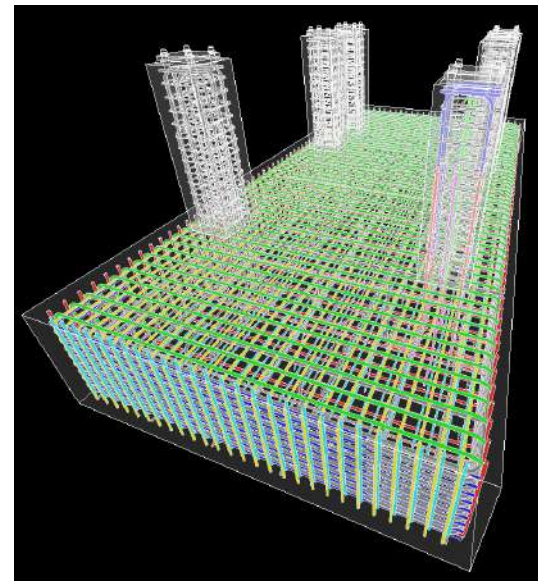
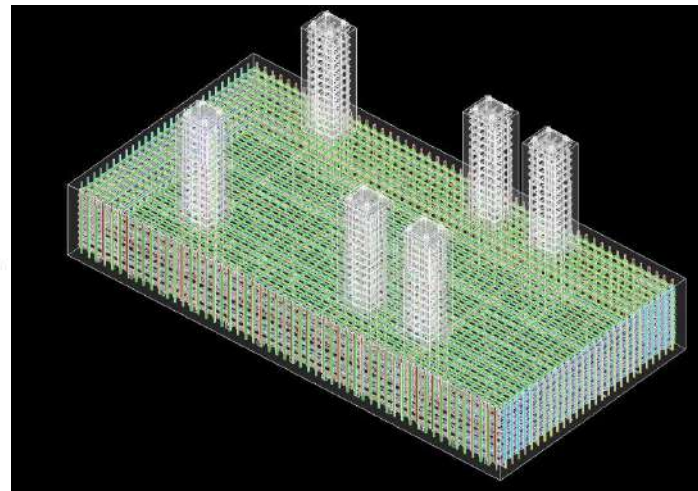
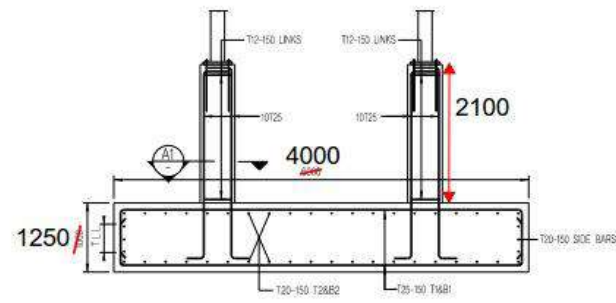
Successful Example



FOOTING LAYOUT PLAN FOR PARDS 1~4 AND CPAD
 SCALE 1:200

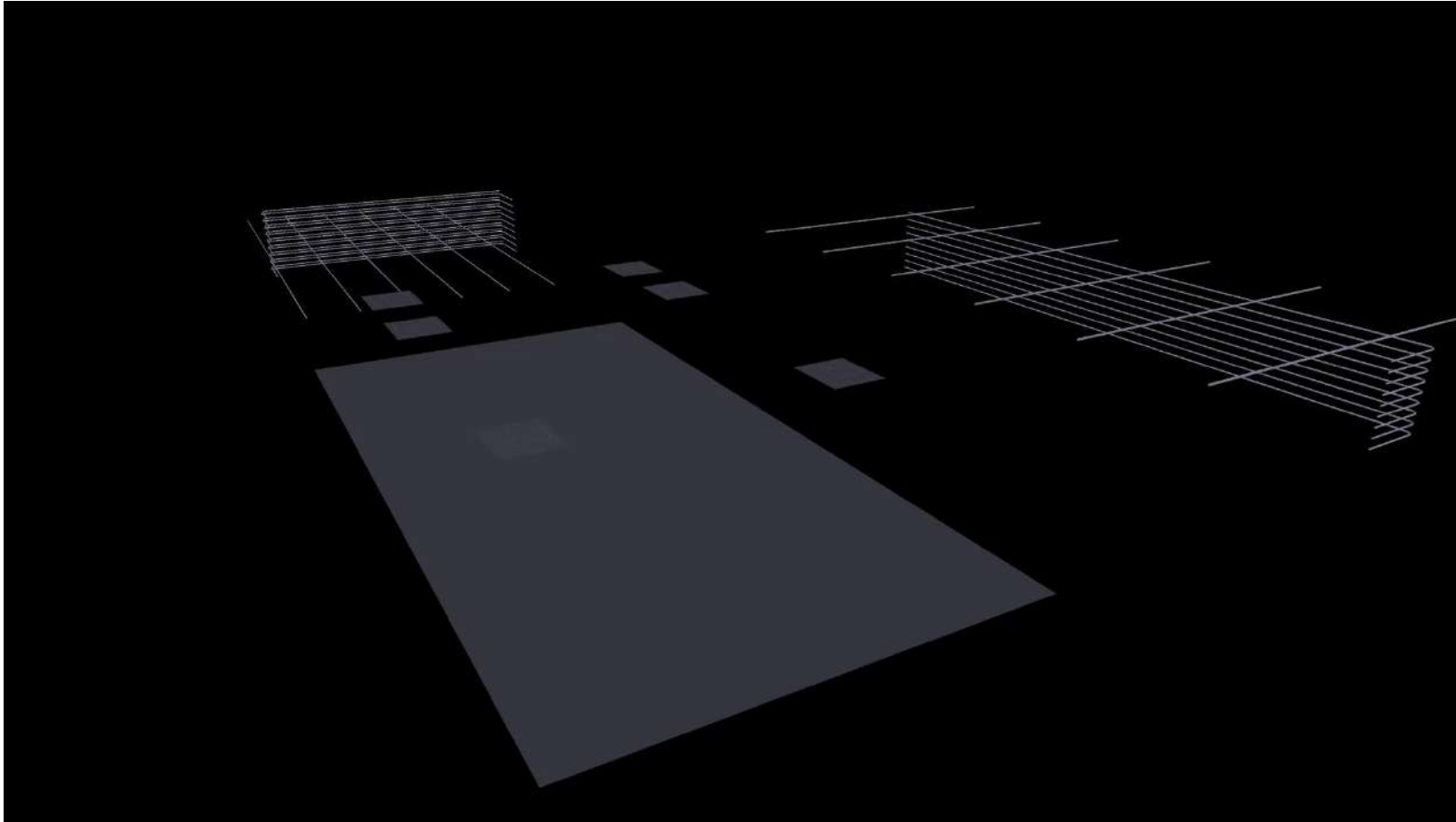


RC DETAILS FOR FT1
 SCALE 1:200



Airport Road Signage Footing Rebar Construction Animation

Successful Example



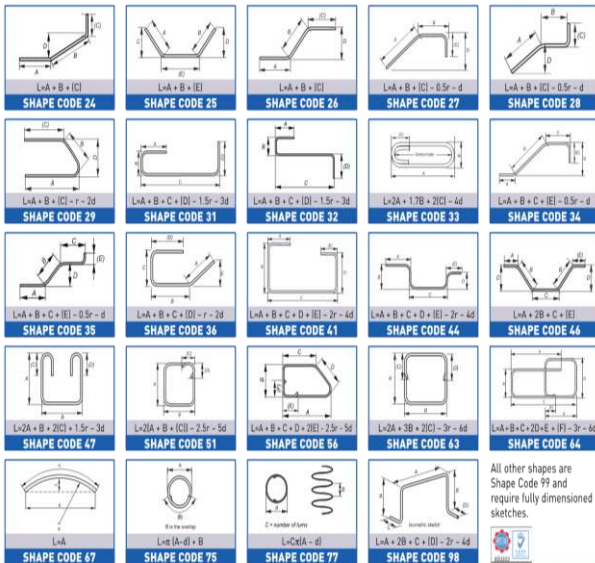
Formation of Automated Rebar Code (ARC)



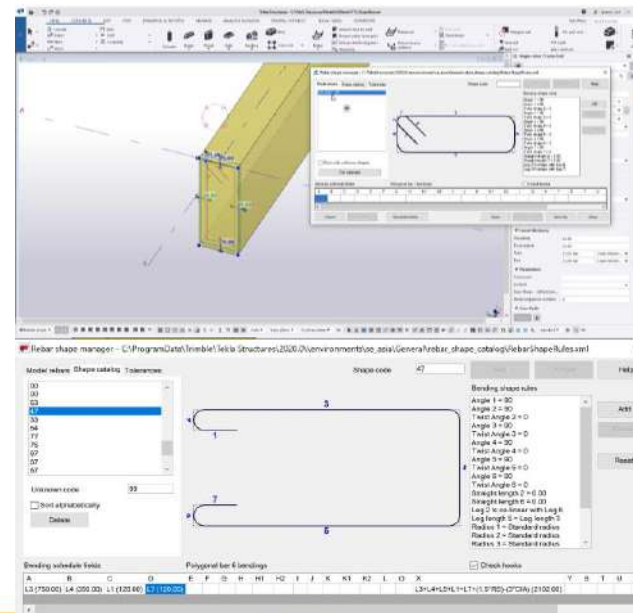
HONG KONG
CONSTRUCTION
MATERIALS
ASSOCIATION LIMITED

HKCMA & HKIBIM have a joint target to develop a coding system [Automated Rebar Code (ARC)] to ease the rebar fixing industry with or without Rebar BIM.

CEDD Yards Shape Code (HKCMA)



BIM Rebar Shape Code Library (HKIBIM)



A common Rebar Language System to be shared with client, designers, BIM consultant, fixer, contractor, prefabrication yard.

Automated Rebar
Code (ARC)



Public Works Contracts requiring Rebar BIM

5 Pilot Projects from different departments specified BIM for Rebar at construction stage (contractor detailing)

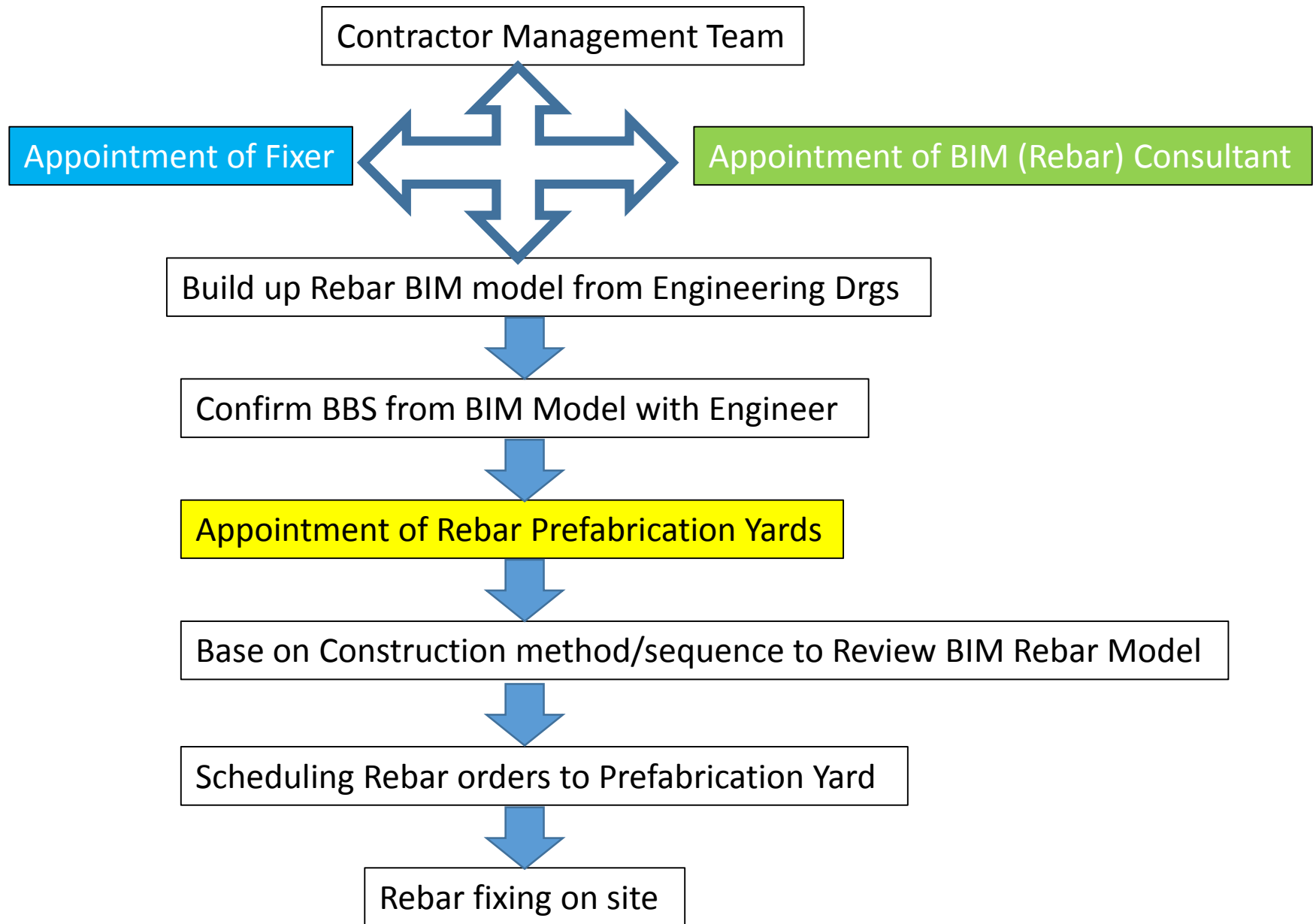
Dept	Contract No.	Contract Title	Status	BIM for Rebar (Yes/No)
HyD	HY/2019/02	Lift and Pedestrian Walkway System between Castle Peak Road and Kung Yip Street, Kwai Chung	Awarded	Yes
DSD	DC/2018/06	Shek Wu Hui Effluent Polishing Plant – Main Works Stage 1 – Civil Works for Sludge Treatment Facilities and 132kV Primary Substation	Awarded	Yes
ArchSD	SSH503	Construction of Drainage Services Department Building at Cheung Sha Wan Sewage Pumping Station		Yes
WSD	4/WSD/19	Development of Anderson Road Quarry Site - Construction of Grey Water Treatment Plant (NEC ECC Opt C, BIM)		Yes
CEDD	ED/2018/05	Kai Tak Development - Stage 5B Infrastructure Works at the Former North Apron		Yes

Effort required from:

1. Main Contractor
2. BIM Consultant
3. Fixer
4. Prefabrication Yard



Contractor Rebar Detailing Workflow under the requirement of BIM at Construction Stage



Thank You

