

CEL 774 CONSTRUCTION PRACTISES

***Concrete: Production
(Pre-fabrication)
B. Bhattacharjee***

***CIVIL ENGINEERING DEPARTMENT
IIT DELHI***



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Definition

- PREFABRICATION REFERS To PRODUCTION AWAY FROM ACTUAL SITE OF CONSTRUCTION.***
- WITH REFERENCE TO PRE CAST CONCRETE CASTING IS DONE IN ONE PLACE AND IS USED ELSEWHERE***



Advantages

- ***ADVANTAGES OF PRECAST CONCRETE PARALLEL ACTIVITIES, REDUCED TIME***
- ***FACTORY LIKE BETTER QUALITY CONTROL EXPERIENCE GAINED BY WORK FORCE THROUGH REPETITIVE WORKS.***
- ***STANDARDIZATION IS POSSIBLE, ADVANTAGES OF MODULAR COORDINATION CAN BE REALIZED.***
- ***IN THE LONG RUN IT MAY BE ECONOMICAL***
- ***TECHNOLOGICALLY ADVANCED INDUSTRIALIZED CONSTRUCTION AND APPLICATION OF ROBOTICS IS POSSIBLE***



Disadvantages

- BUSINESS SUSTAINABILITY IS MARKET DEPENDENT***
- CAN INTRODUCE MONOTONY, MAY NOT BE PLEASANT TO LOOK AT***



TYPES OF PREFABRICATION PLANT

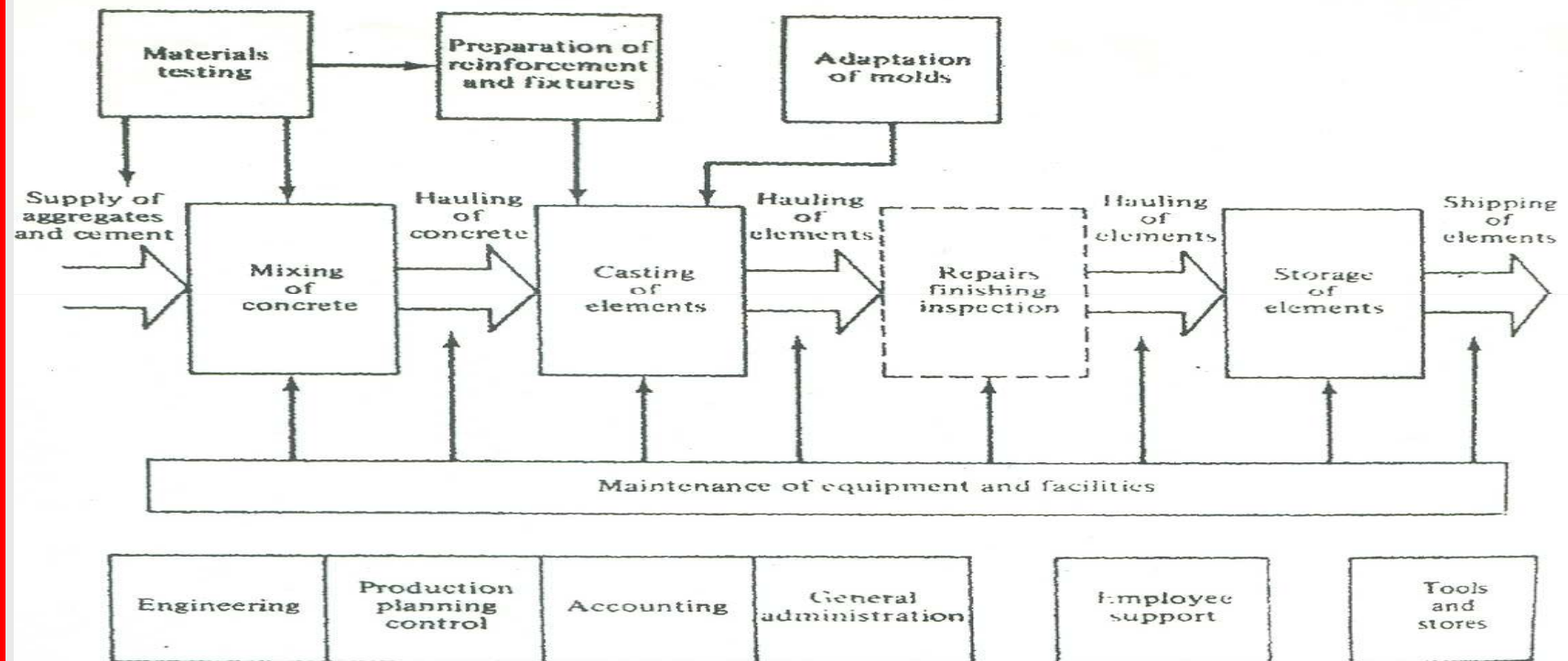
- PERMANENT PLANT***
- FIELD PLANT***
- FABRICATION ON A BUILDING SITE***

THREE MAIN GROUPS OF ACTIVITIES

- 1) MAIN PRODUCTION ACTIVITY***
- 2) AUXILIARY PRODUCTION ACTIVITIES***
- 3) MANAGERIAL, TECHNICAL AND GENERAL SUPPORT***



LAYOUT



MAIN FUNCTIONS IN A PRE FABRICATION PLANT



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CAPACITY & SYSTEMS

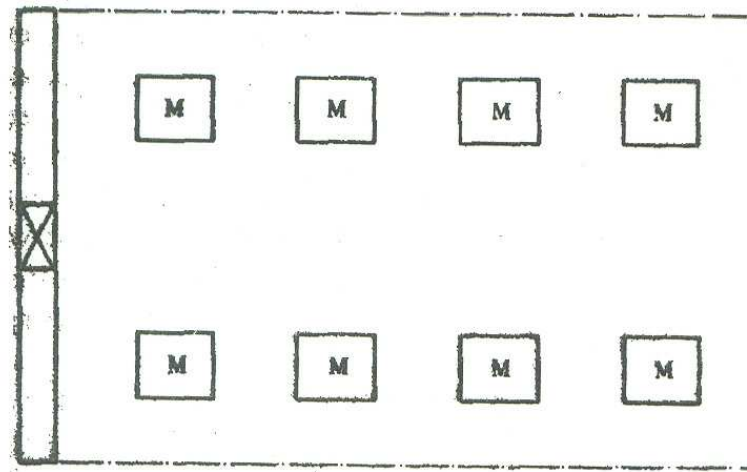
- $Q = M \ln (Q_1, Q_2, Q_3, \dots)$
- $Q = Q_1 = Q_2 = Q_3 \dots = Q$

TWO BASIC TYPE OF PRODUCTION SYSTEMS

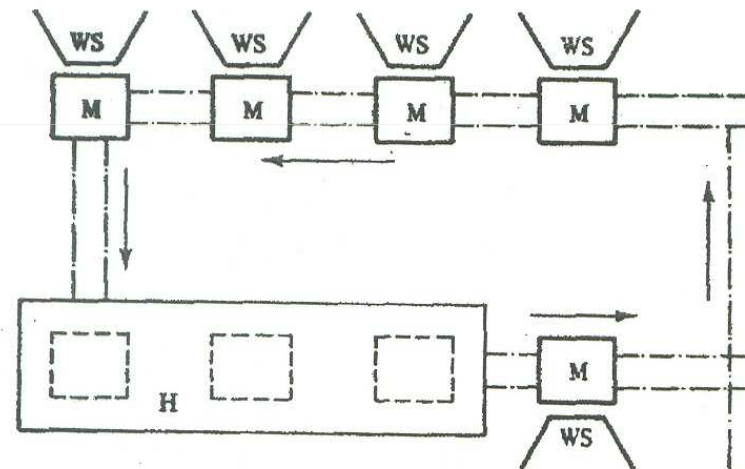
- 1) STATIONARY MOULD,*
- 2) MOVABLE MOULDS*



STATIONARY & MOVABLE MOULDS



(a)



PRODUCTION SYSTEMS

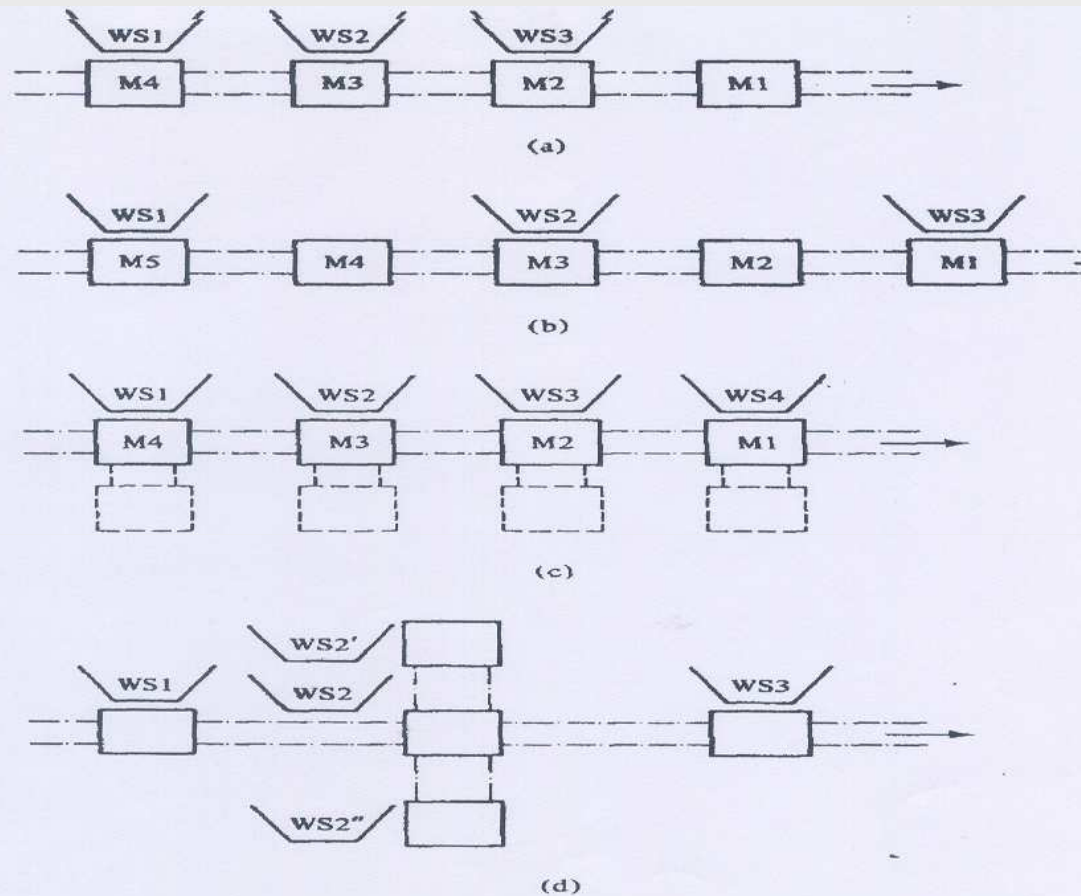
a-stationary molds served by crane ,a-movable molds on tracks



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MOVABLE MOULDS



DIFFERENT ARRANGEMENTS OF MOVABLE MOLD LINES

a-continious workstations, b-provision for reserve molds, c-provision for side tracking, d-multipurpose stations



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ELEMENTS HANDLING

***RAILMOUNTED GANTRY (PORTAL)
CRANE, WHEEL MOUNTED GANTRY
CRANES***

OVERHEAD CRANES

TOWER CRANES

MOBILE CRANES



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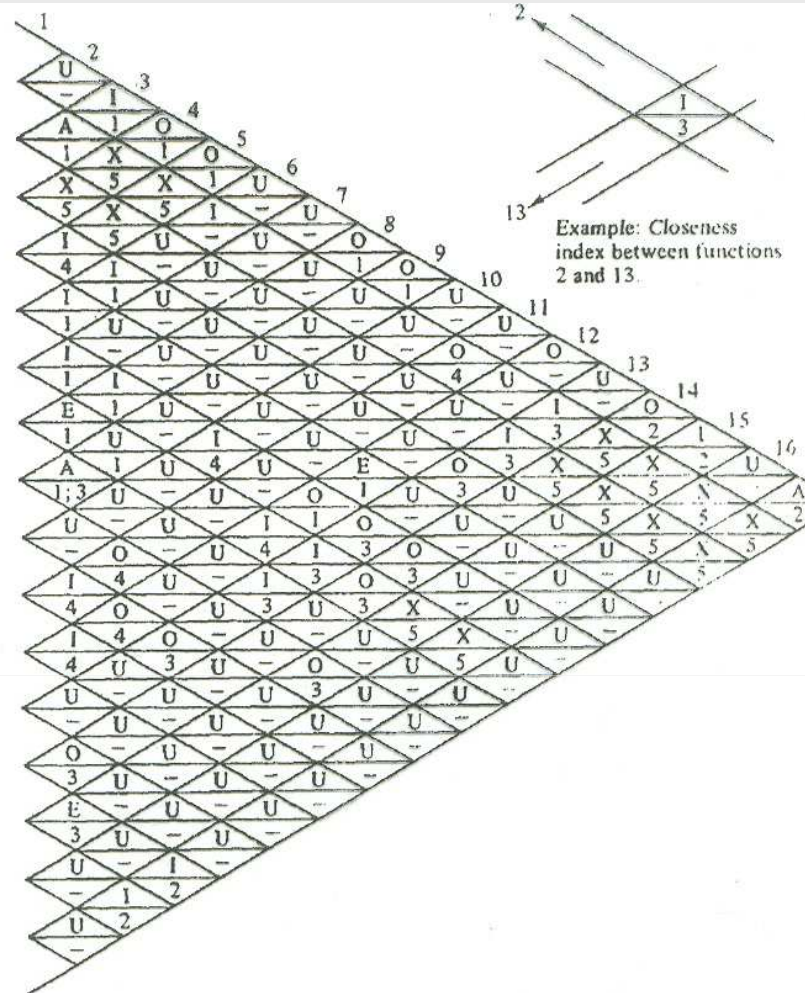
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STORAGE CAPACITY

- THE STORAGE CAPACITY OF STOCKYARD THE MINIMUM TIME NECESSARY For CONCRETE TO DEVELOP s_u FF | $((E/y \ T \text{ STRENGTH PRIOR TO ERECT} | \text{ ON } (T_1) \ A_1 = T_1 \ Q$
- AN ADDITIONAL BUFFER STORAGE FOR POSSIBLE INTDRRUPT l_{ou} OF PRODUCTION AT CAST IN a YARD OR PLANT. T_z DAYS ERE (Tom is THE $B/31=F/I-R \ A_2 = T_z \ Q$
- INTERRUPTION OF ERECTION ON SITE CAN BE ACCOUNTED FOR T_z DAY $s \ A_3 = T_3 \ Q$
- A FLEXIBILITY OF PRODUCTION PLANNING



1. Entry gate
2. Concrete mixing
3. Aggregates storage (off-line)
4. Preparation of reinforcement
5. Preparation of electrical assemblies
6. Elements casting
7. Elements finishing and repair
8. Elements storage
9. Elements loading
10. Molds transformation
11. Equipment maintenance
12. Storage of tools, materials
13. Testing laboratory
14. Engineering
15. Administration and management
16. Support activities
17. Parking

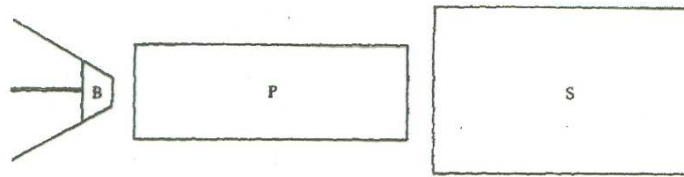


CLOSENESS PREFERENCE SCHEME FOR MAIN FUNCTIONS IN PREFABRICATION PLANT

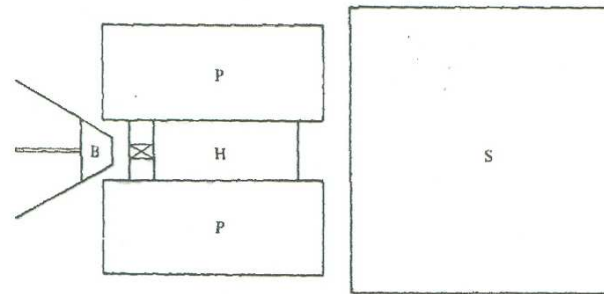


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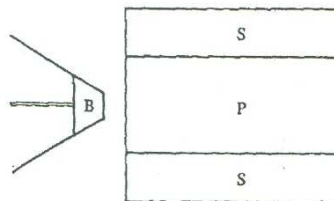
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(a)



(b)



(c)

B – Concrete mixing center
P – Production of elements
S – Storage of elements
H – Heating chamber

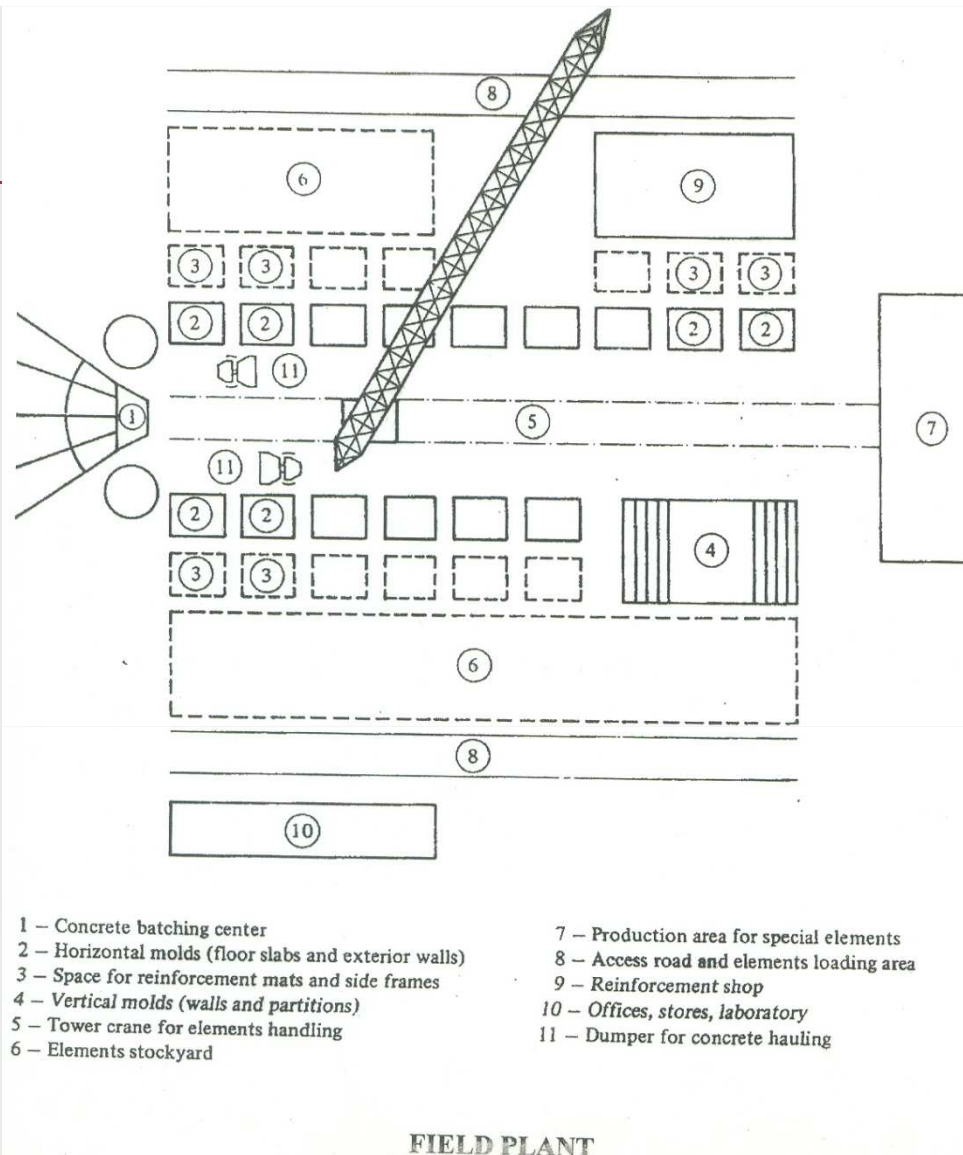
SCHEMATIC LAYOUT SOLUTIONS

a- concrete centre, production area & storage in direct continuation ,b- common concrete center ,curing chamber & storage area for two dept. c- storage alongside production area



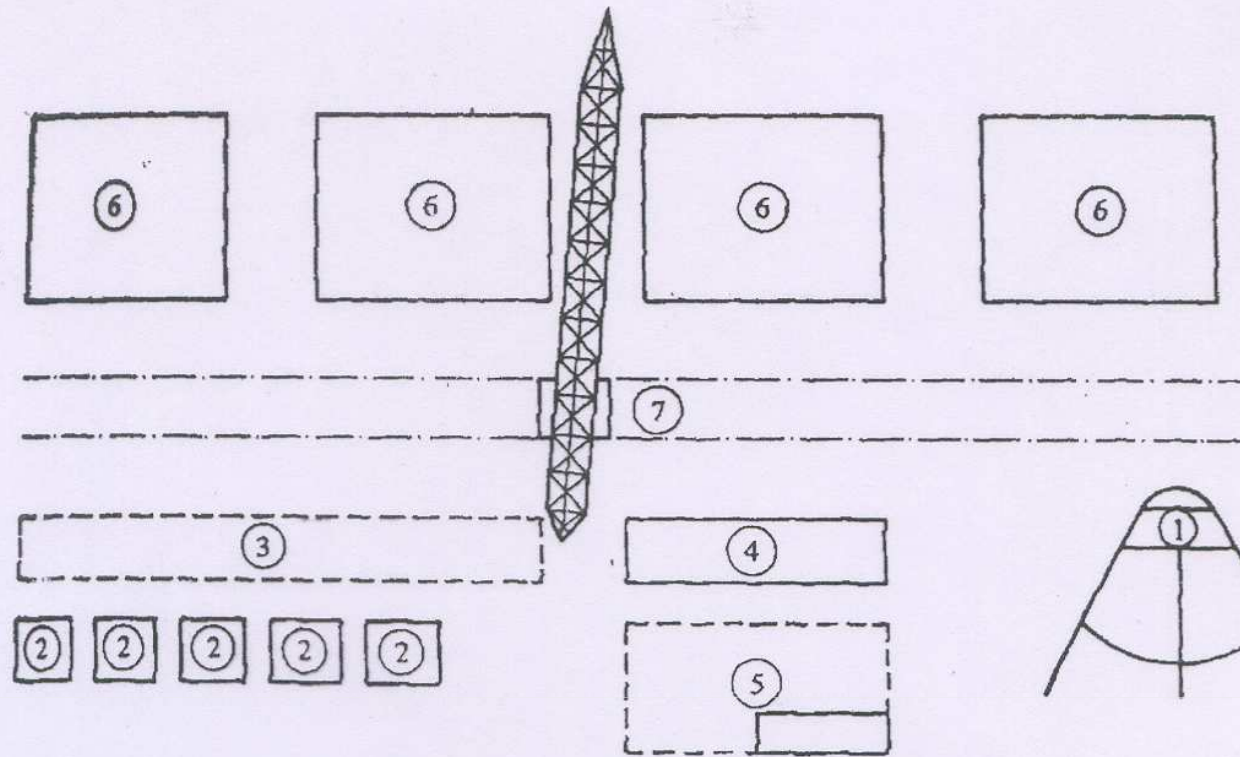
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- 1 – Concrete batching center
- 2 – Table molds for exterior walls
- 3 – Casting bed for membrane floor slabs
- 4 – Storage area for cast elements
- 5 – Reinforcement preparation shed and storage area
- 6 – Buildings under construction
- 7 – Tower crane

PREFABRICATION ON BUILDING SITES



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***THANK YOU FOR
HEARING***



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