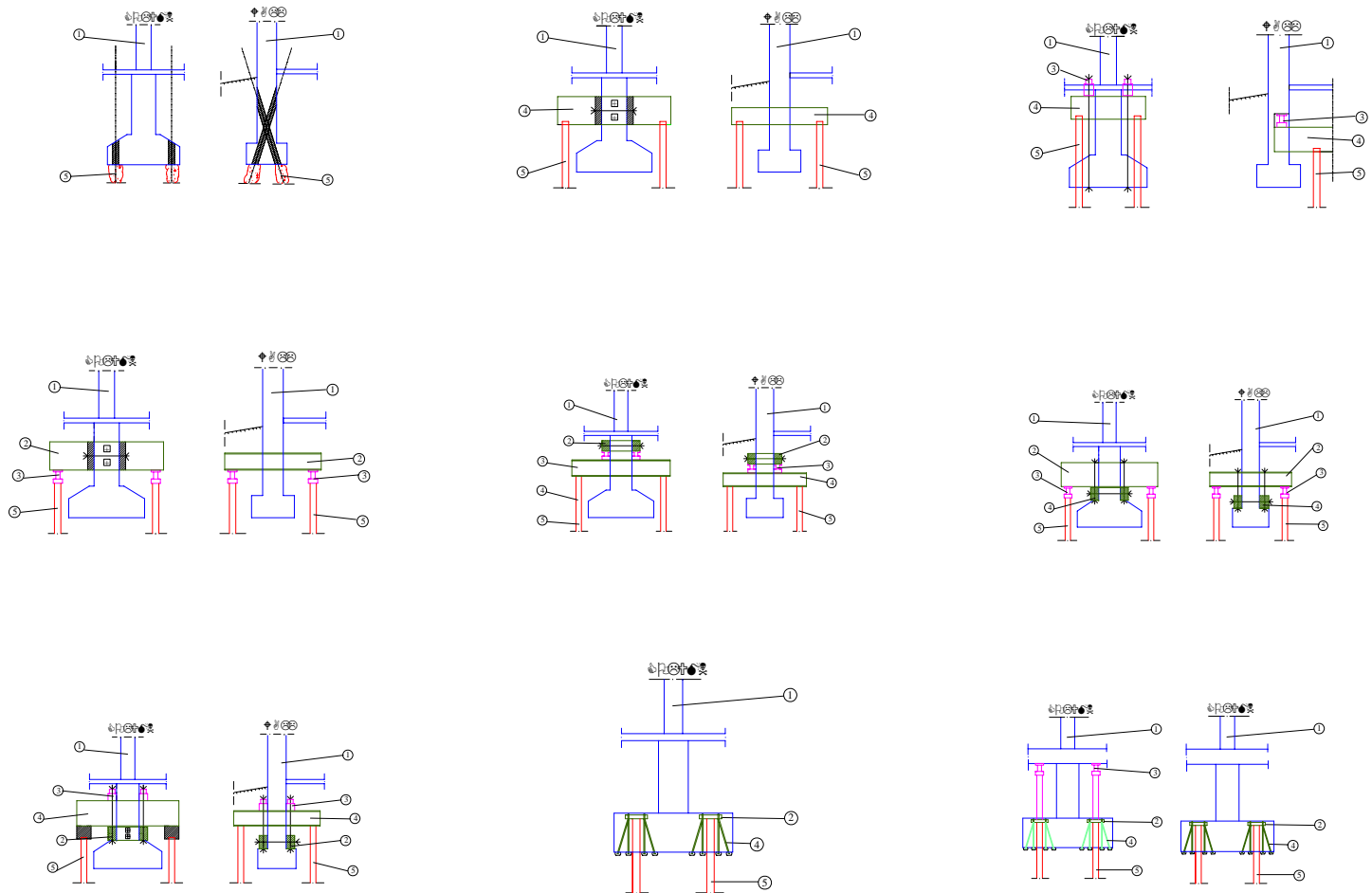


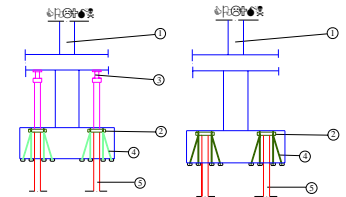
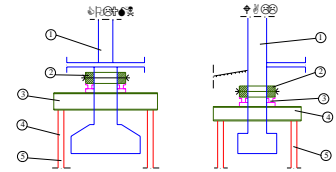
# Jouko Lehtonen

## LOAD TRANSFER SYSTEM ANALYSIS IN UNDERPINNING



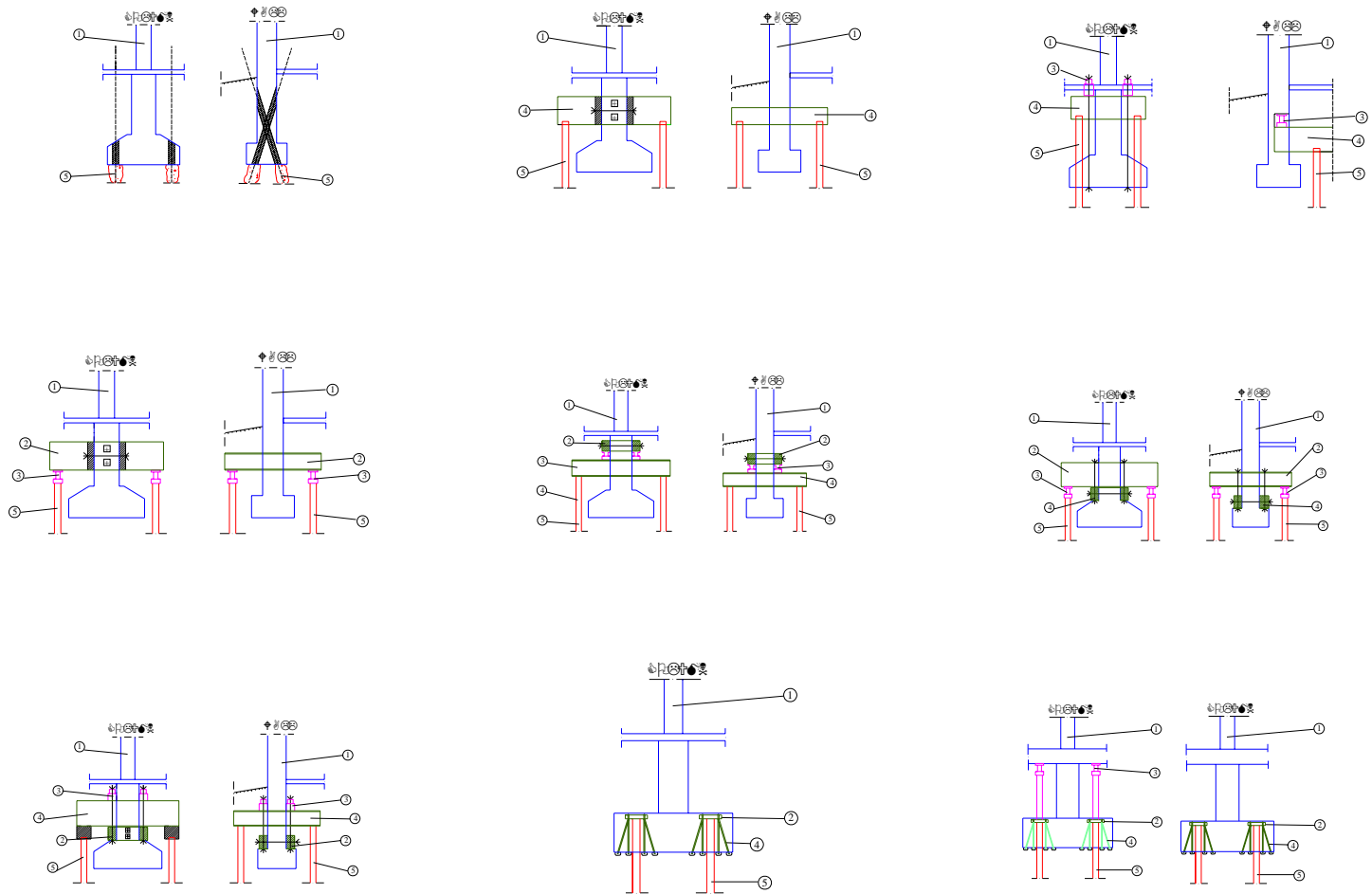
# INTRODUCTION

- The first analysis on load transfer system in underpinning was introduced by Dr Ismo Tawast, TUT 1993
- The analysis has been updated and enlarged in the DATU project at Turku Polytechnic
- The load transfer system has many impacts to superstructures and implementation of underpinning
  - Settlements
  - Costs
  - Duration of the underpinning project

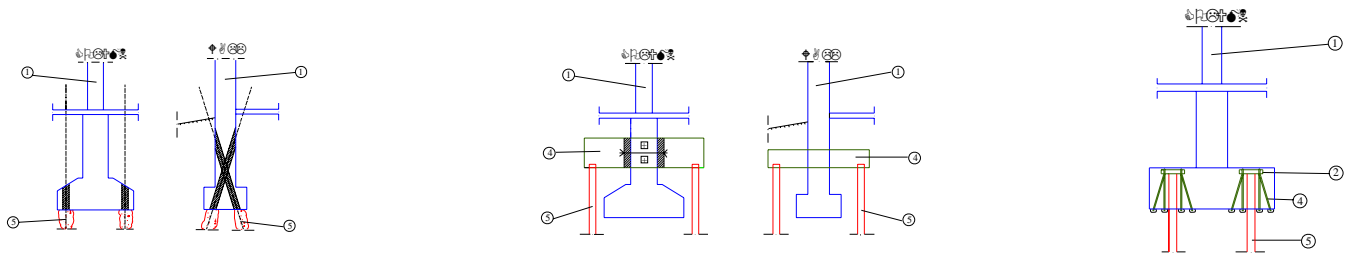


# TOTALLY 9 DIFFERENT BASIC TYPES HAVE BEEN IDENTIFIED IN 2 CATEGORIES:

- SETTLING SUPERSTRUCTURE
- NON-SETTLING SUPERSTRUCTURE



# SETTLING SUPERSTRUCTURE



# Load transfer system No. 1

SUPERSTRUCTURE

1

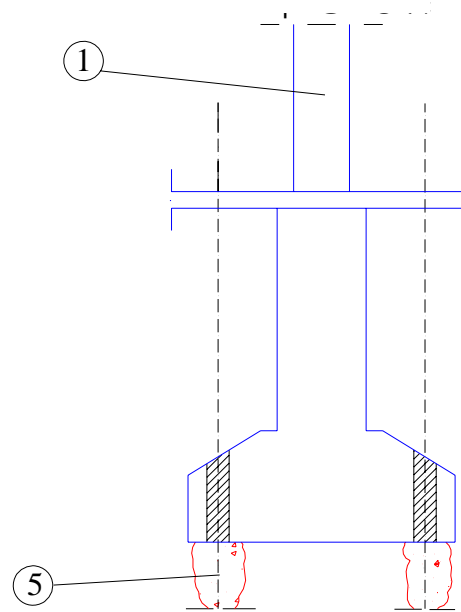


NEW MICROPILE

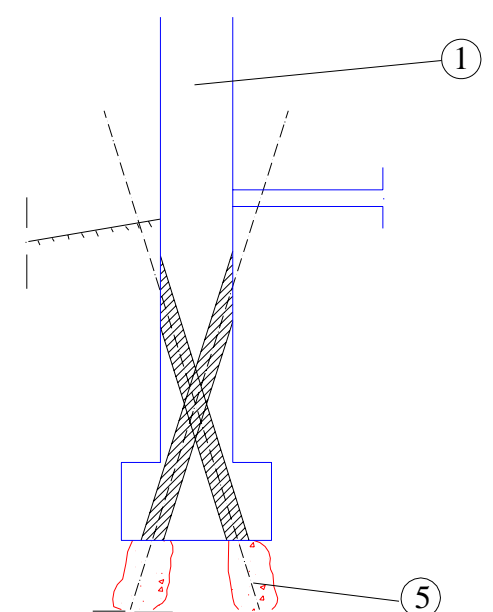
5

THE ARROWS SYMBOLIZE THE TRANSITION OF LOADS BETWEEN DIFFERENT ELEMENTS

Column



Wall



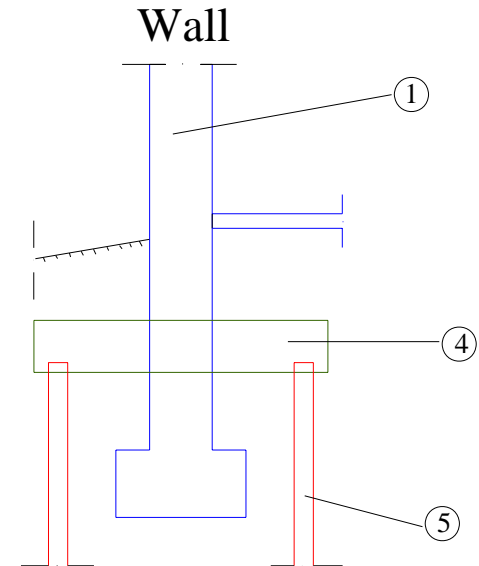
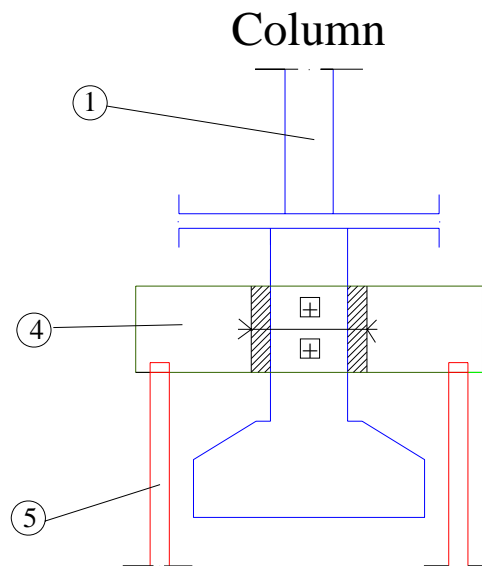
# Load transfer system No. 2

SUPERSTRUCTURE 1

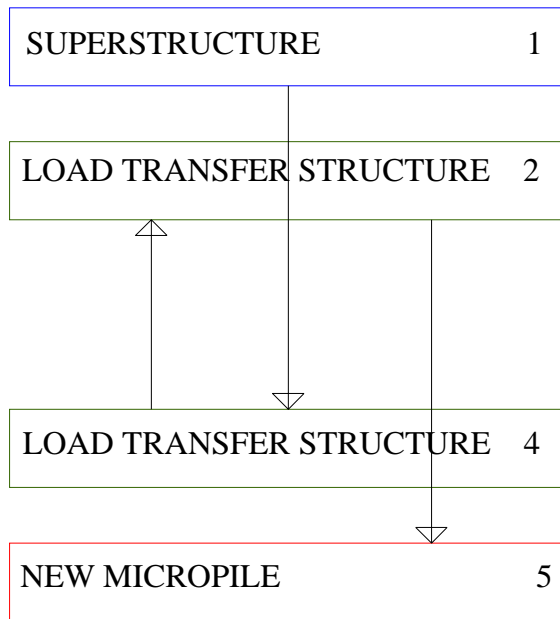
LOAD TRANSFER STRUCTURE 4

NEW MICROPILE 5

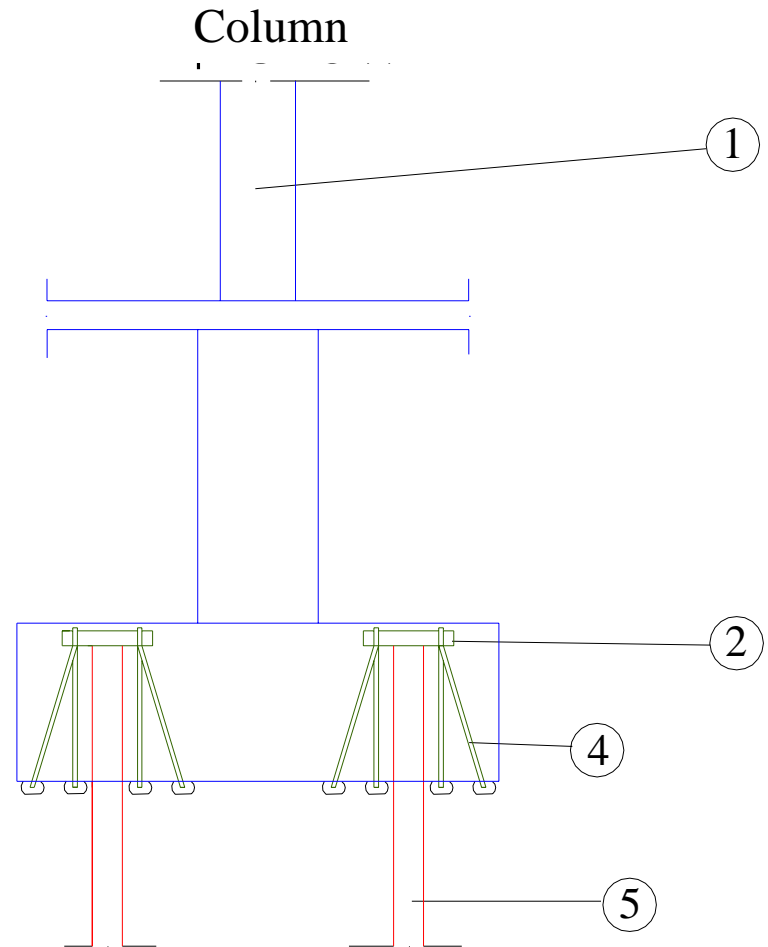
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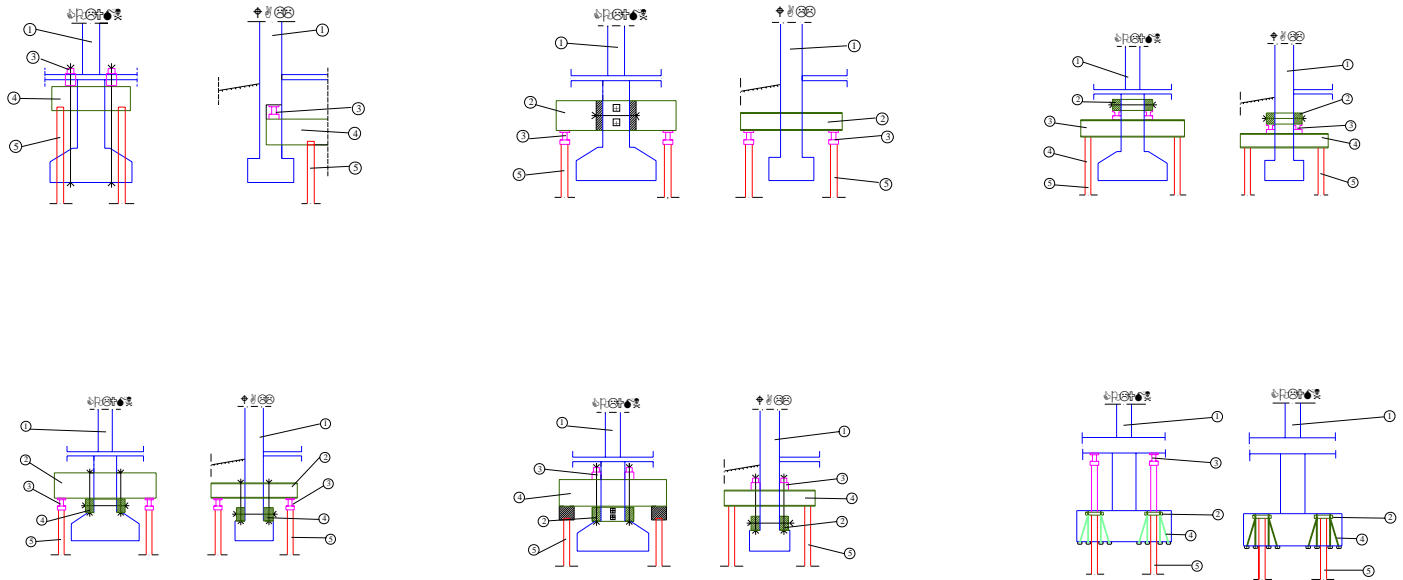
# Load transfer system No. 8



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# NON-SETTLING SUPERSTRUCTURE



# Load transfer system No. 3

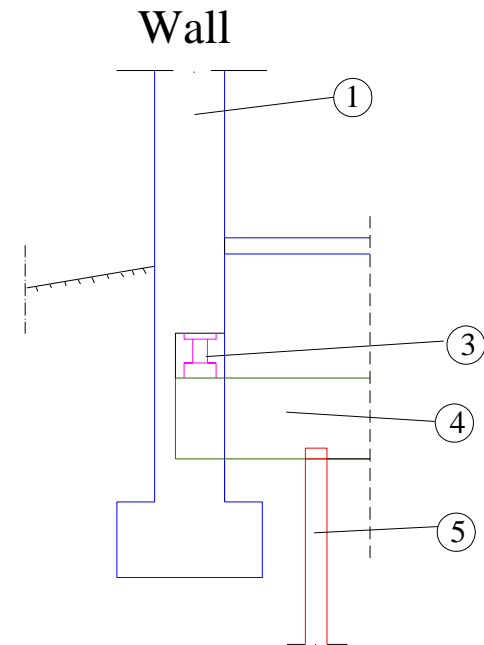
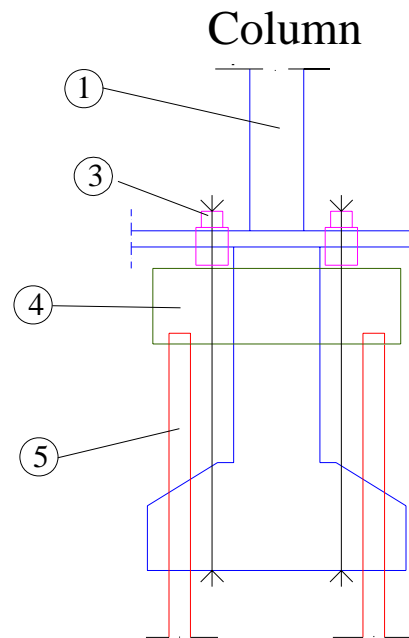
SUPERSTRUCTURE 1

JACK 3

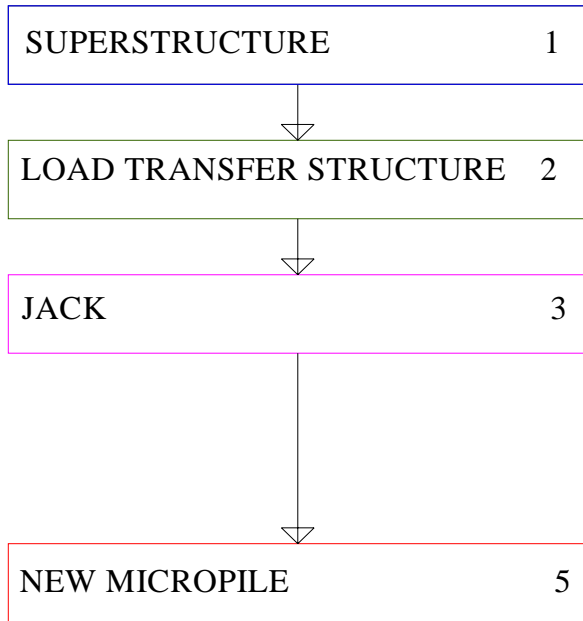
LOAD TRANSFER STRUCTURE 4

NEW MICROPILE 5

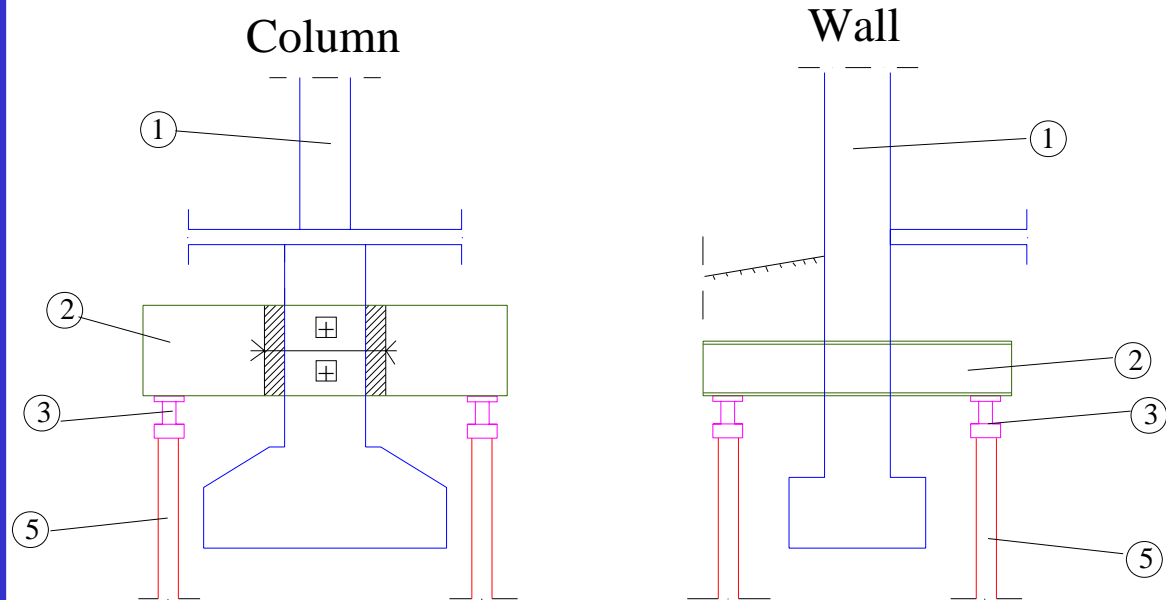
THE ARROWS SYMBOLIZE THE TRANSITION OF LOADS BETWEEN DIFFERENT ELEMENTS



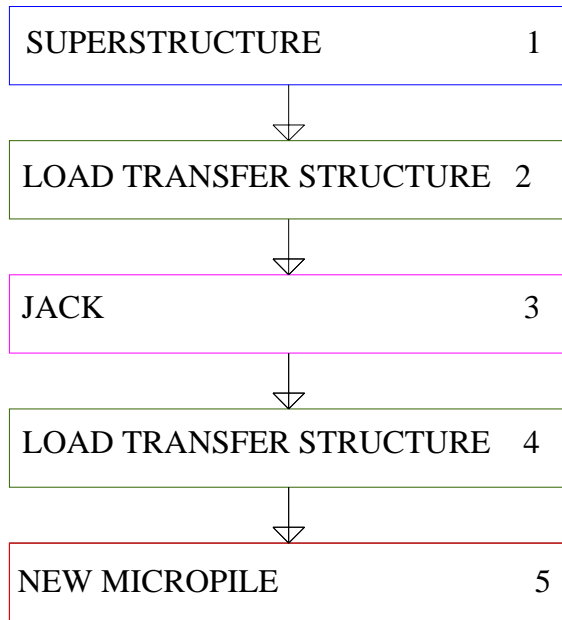
# Load transfer system No. 4



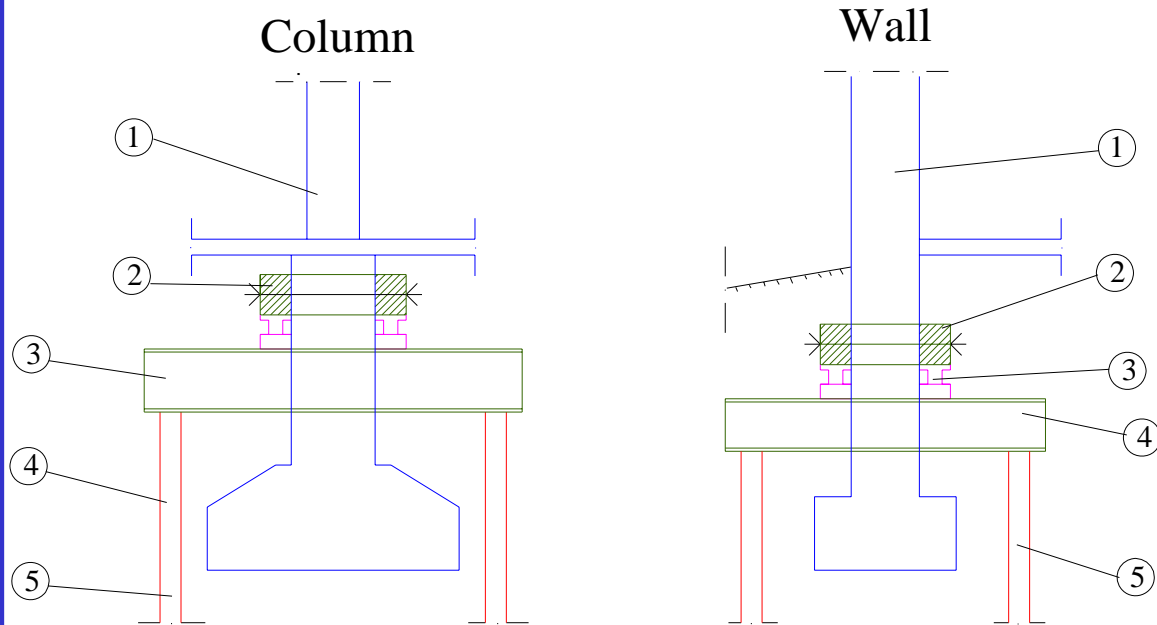
THE ARROWS SYMBOLIZE THE TRANSITION OF LOADS BETWEEN DIFFERENT ELEMENTS



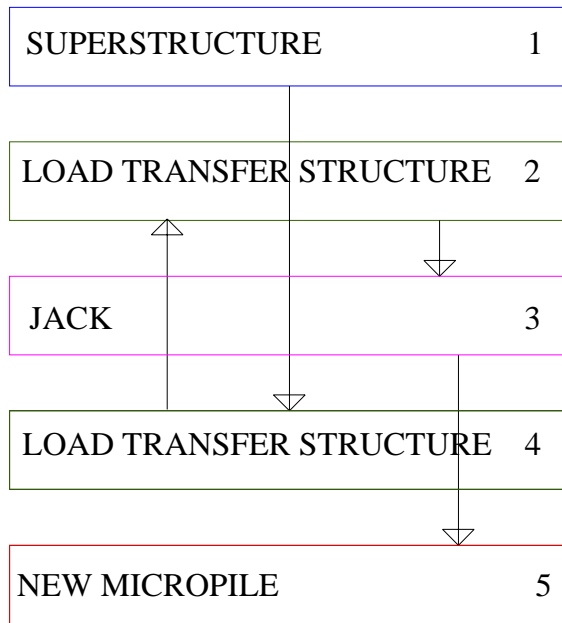
# Load transfer system No. 5



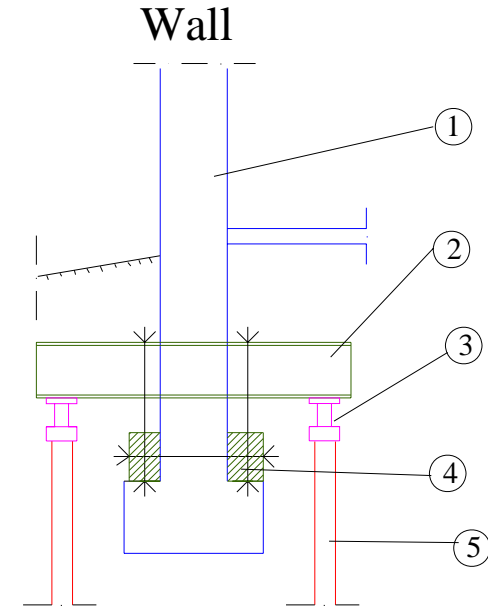
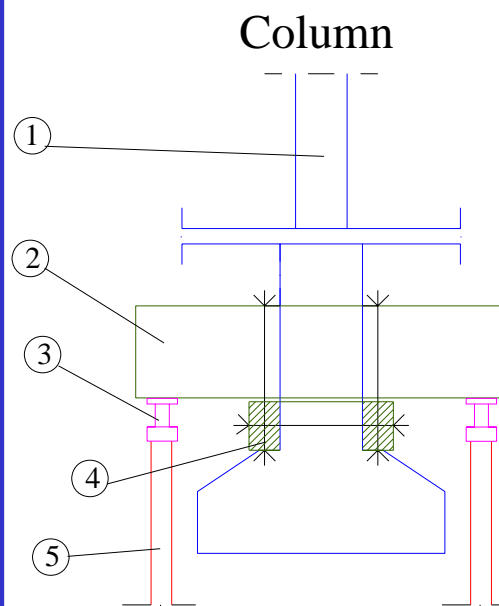
THE ARROWS SYMBOLIZE THE TRANSITION OF LOADS BETWEEN DIFFERENT ELEMENTS



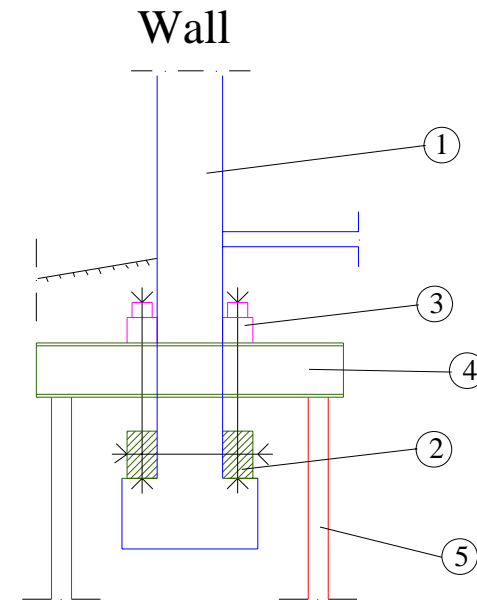
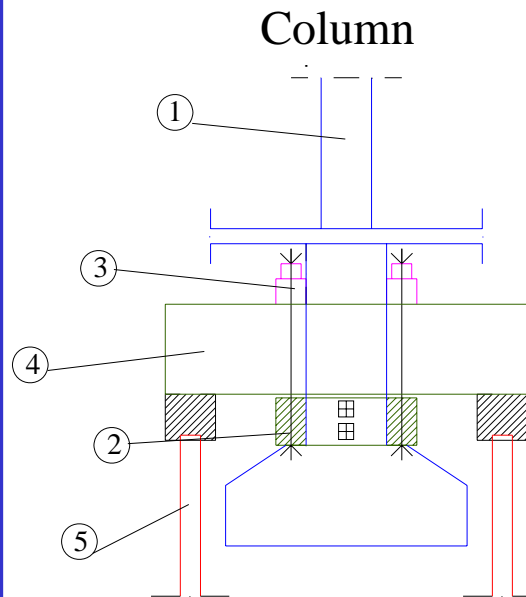
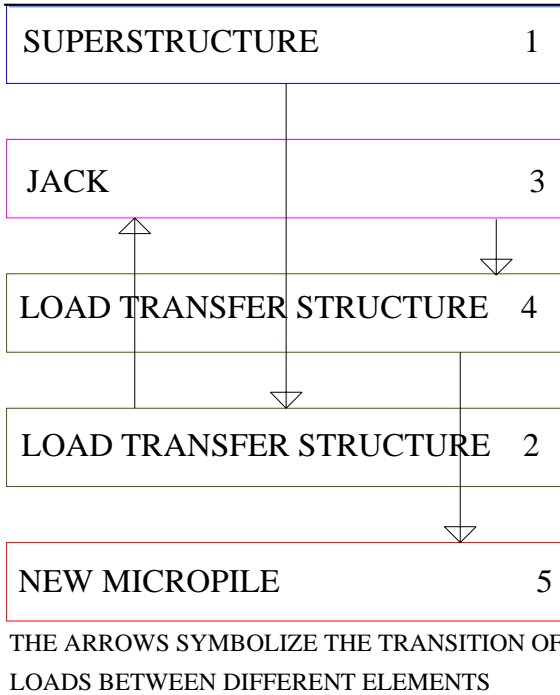
# Load transfer system No. 6



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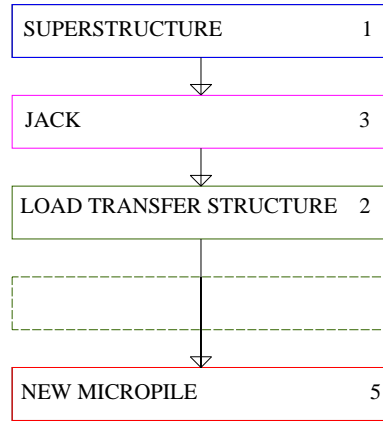


# Load transfer system No. 7



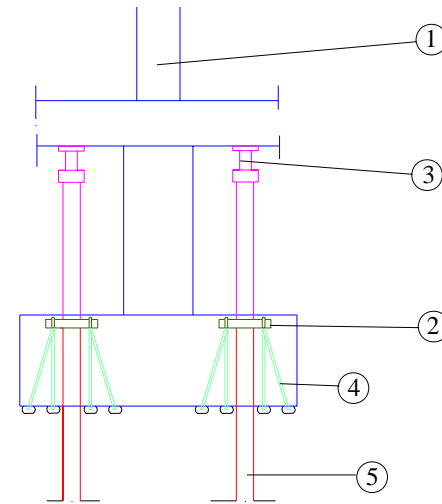
# Load transfer systems No. 9A and 9B

PHASE A  
(Comparable with system No. 3)

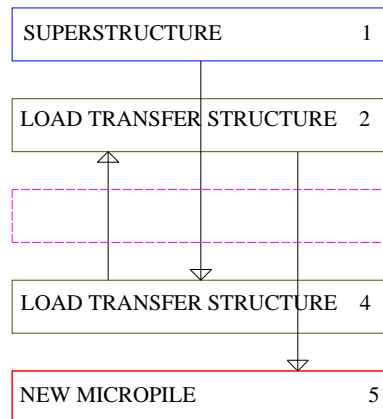


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Column

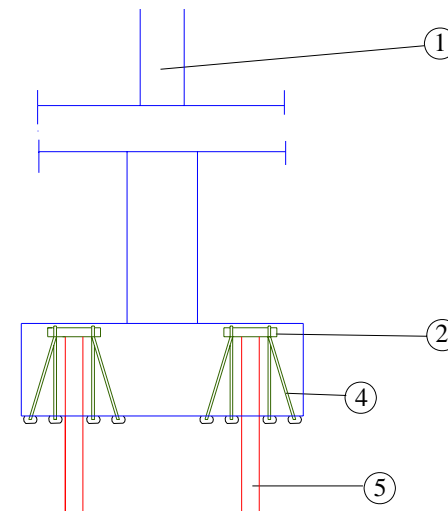


PHASE B  
(Comparable with system No. 8)



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Column



# THANK YOU FOR YOUR ATTENTION!

