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Building Information Modelling  
香港建築信息模擬學會

The Hong Kong Institute of Building Information Modelling

# **BUILDING INFORMATION MODELLING (BIM) AWARENESS SEMINAR**

## BIM Awareness Seminar

- ◎ Introduction to BIM
- ◎ Current and future trend
- ◎ Use in civil engineering and its benefit



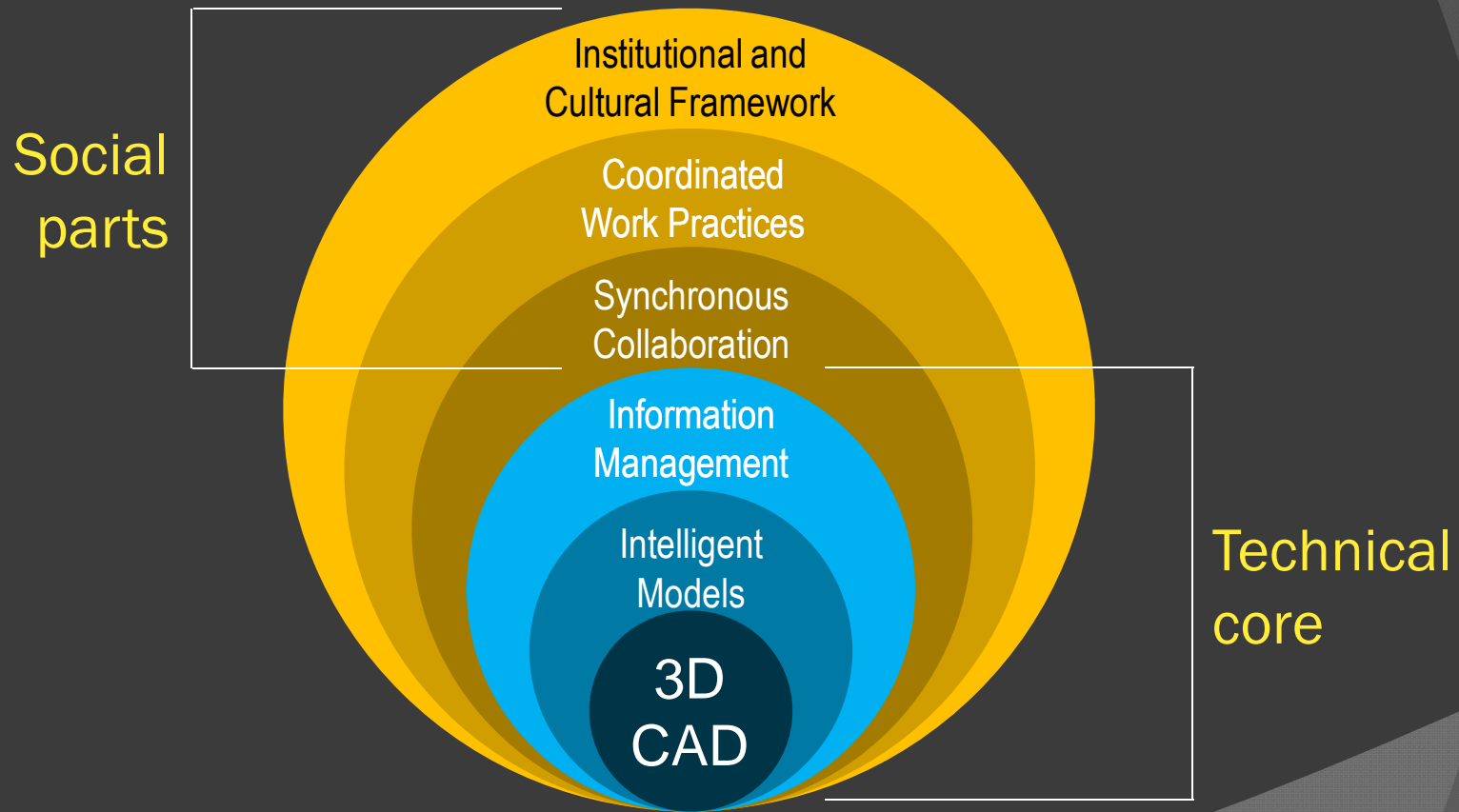
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## Introduction of BIM

- ◎ **Building Information Modelling** is the development and use of a multi-faceted computer software data model to not only document a building design, but to simulate the construction and operation of a new capital facility or a re-capitalised (modernised) facility.
- ◎ **建築信息模擬**是使用電腦數據模型但不單是把建築設計信息保存，更是模擬建造和營運新建或改造的建築設施。



# BIM Sociotechnical System



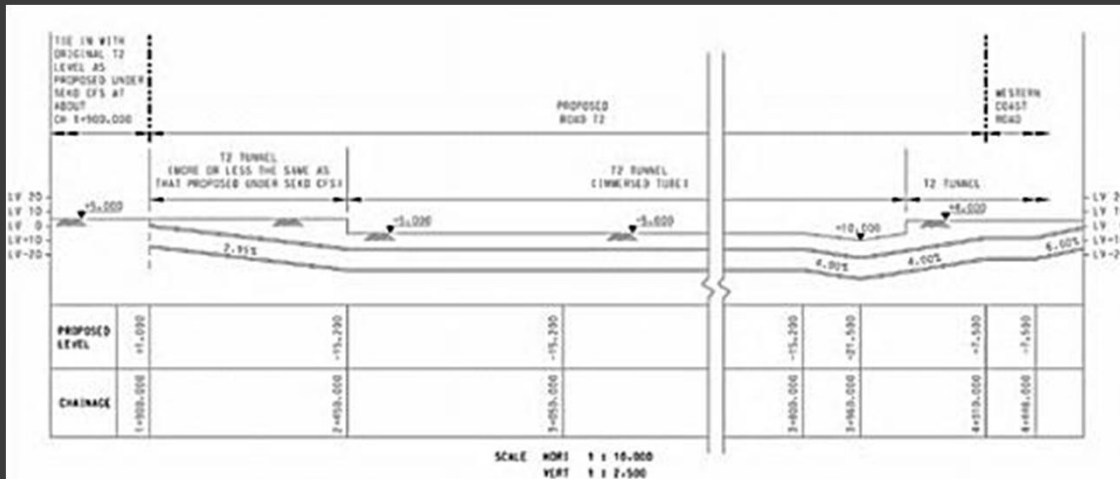
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# Technical Core

## 3D CAD

- Our projects are 3D ÷
- Enhance Efficiency
- Representation in 2D:  
£codesq  
Bit-and-pieces

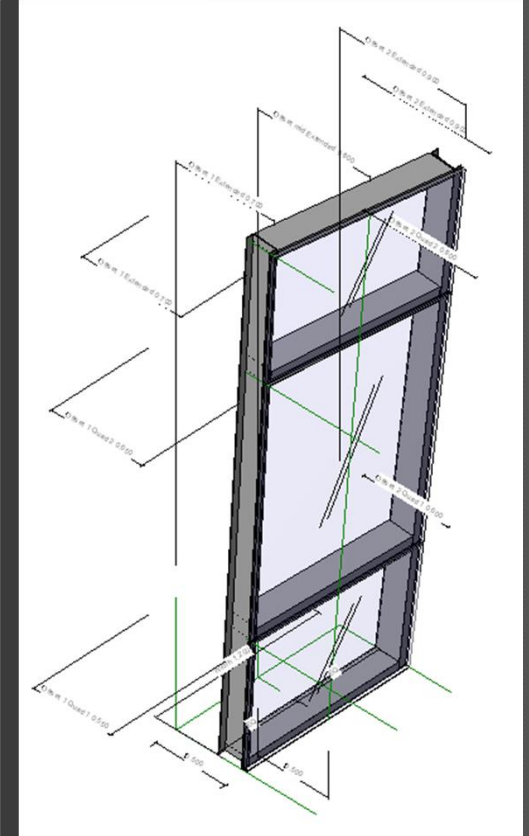
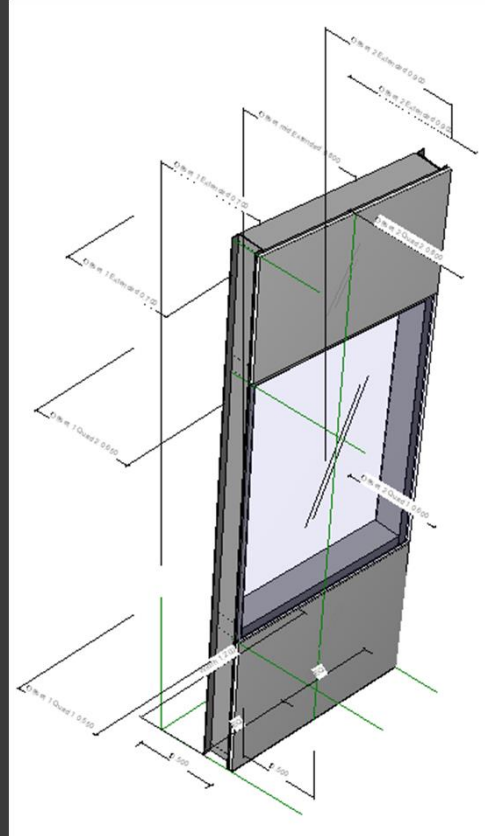


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## Technical Core

## ● Intelligent Models

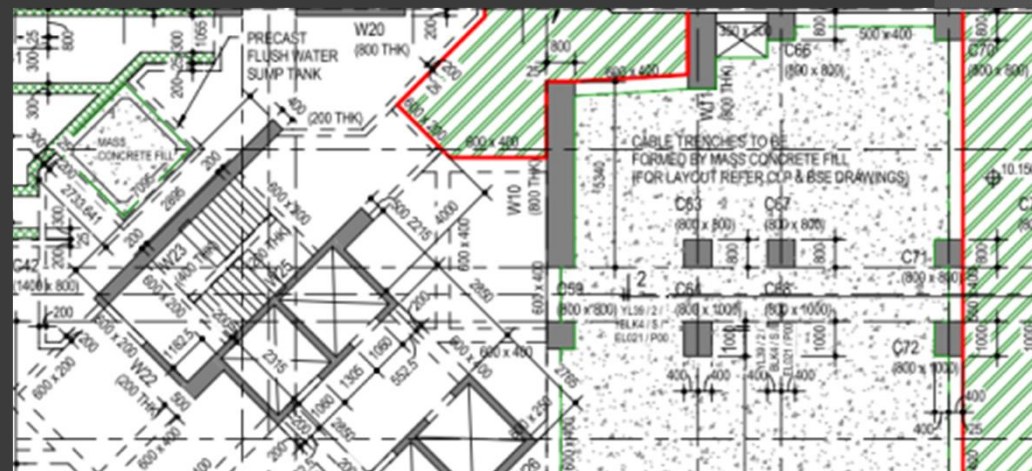
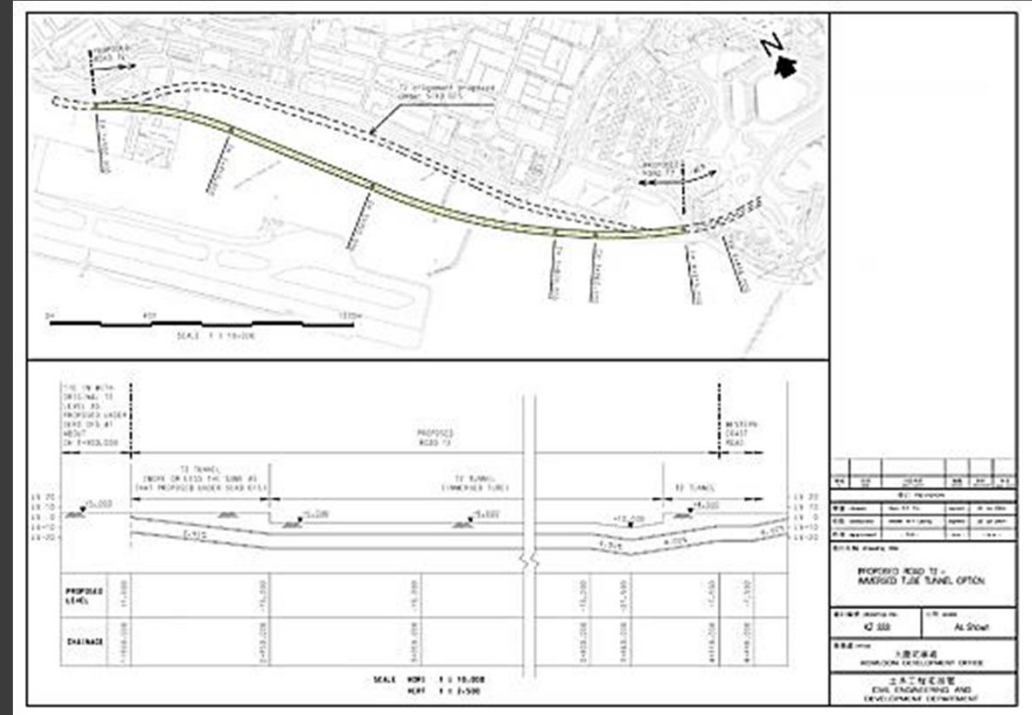
- Object shape & properties controlled by Parameters



## Technical Core

## ● Intelligent Models

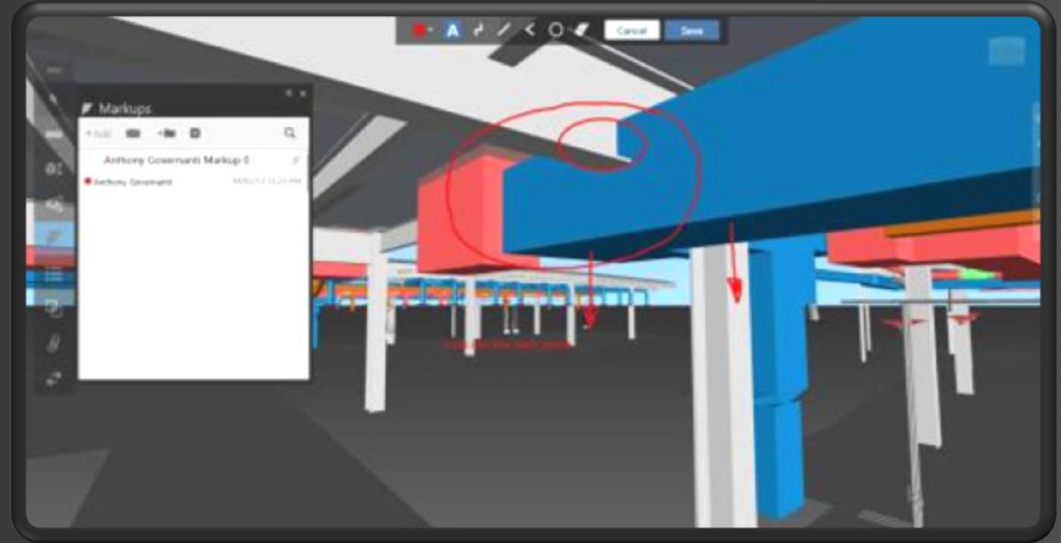
- Object shape & properties controlled by Parameters
- Automatically generate output in professional formats





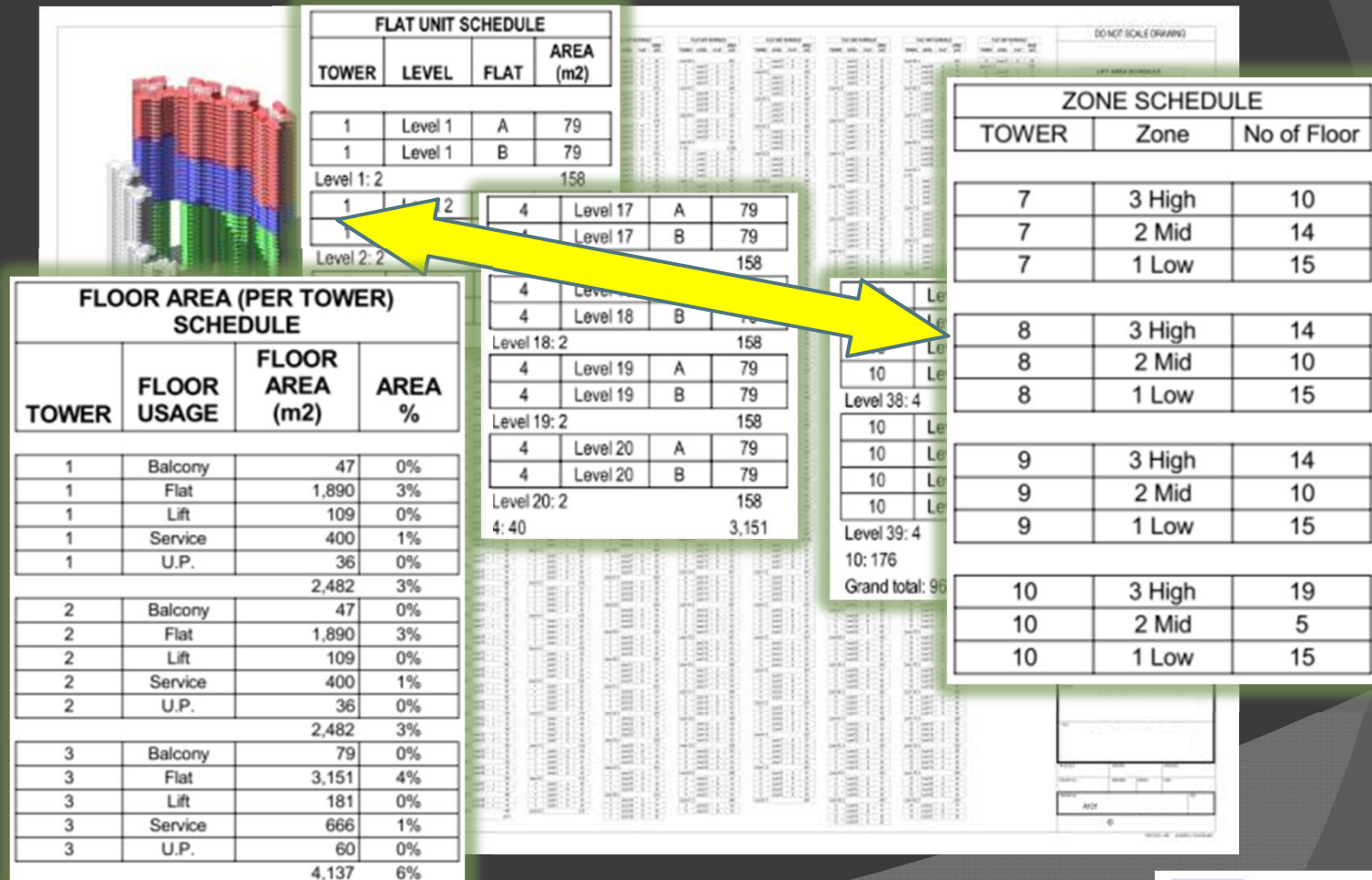
## Technical Core

- ◎ Intelligent Models
  - Object shape & properties controlled by Parameters
  - Automatically generate output in professional formats
  - Automatically build and check relationship between objects



# Technical Core

## Information Management



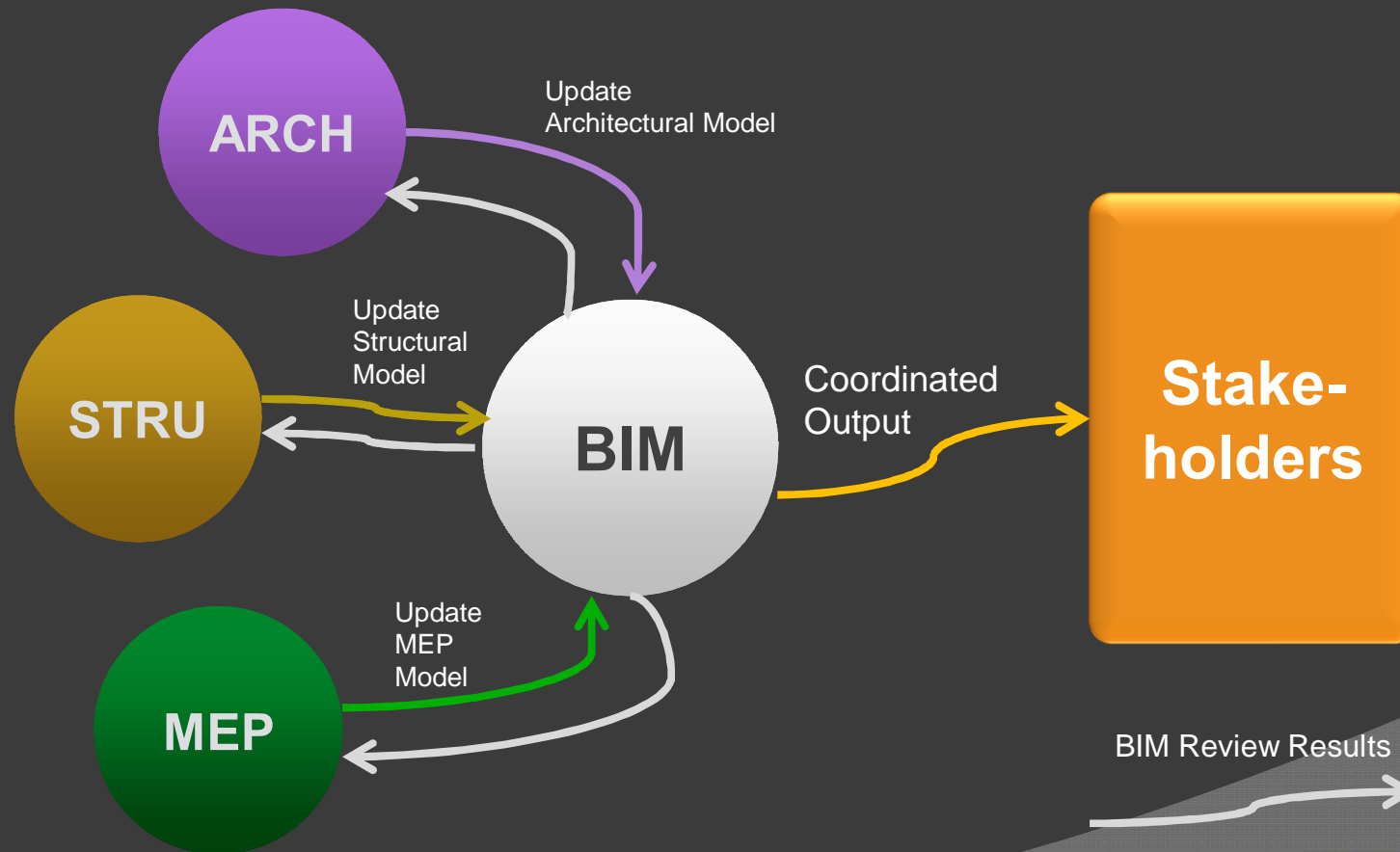
## Technical Core

- Information Management
  - A centralised database



## Social Part

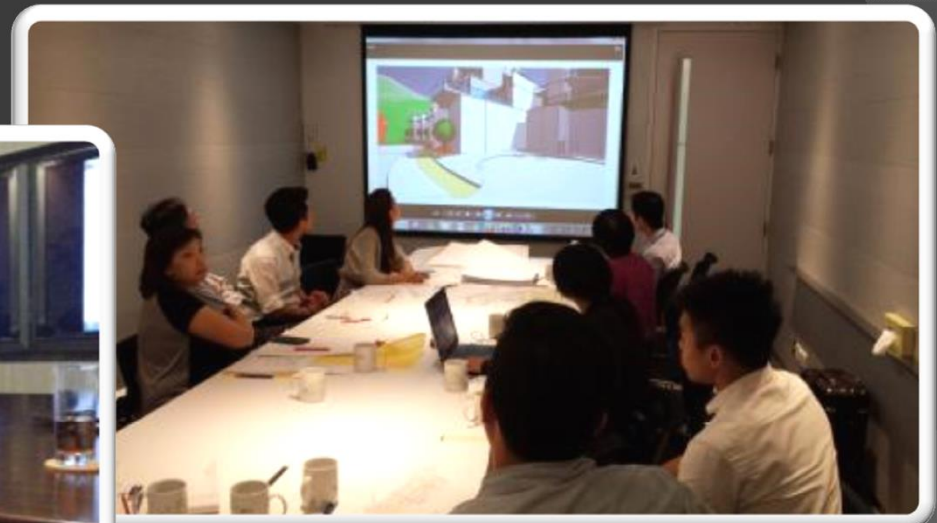
### ● Synchronous Collaboration





## Social Part

- ◉ Coordinated Work Practices
  - More Design Workshops; Less Progress Meeting
  - Problem solved before construction

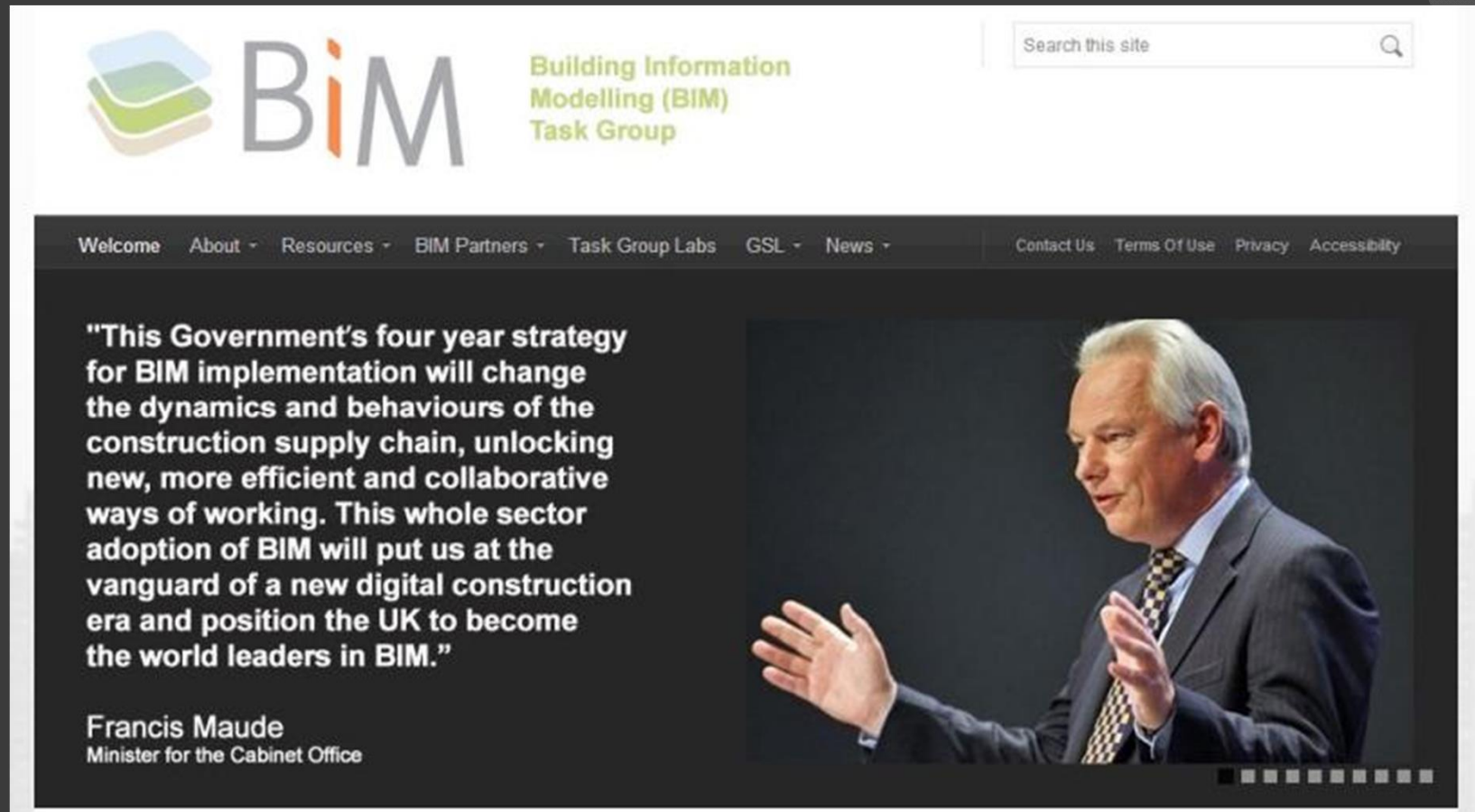


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## Social Part

### ◉ Institutional and Cultural Framework



**Building Information Modelling (BIM) Task Group**

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**"This Government's four year strategy for BIM implementation will change the dynamics and behaviours of the construction supply chain, unlocking new, more efficient and collaborative ways of working. This whole sector adoption of BIM will put us at the vanguard of a new digital construction era and position the UK to become the world leaders in BIM."**

**Francis Maude**  
Minister for the Cabinet Office

The video player shows a man in a suit speaking.

## Social Part

### ◉ Institutional and Cultural Framework

# Francis Maude's speech to the Government Construction Summit

2 July 2012



PRINT



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Cabinet Office minister's speech in full

**Draft text - check against delivery.**

It's a great pleasure to be here once again - talking directly to your sector.

Our construction industry is quite simply critical to this country's growth - both in sustaining thousands of businesses, many of them SMEs, and in providing the crucial infrastructure this country needs to compete globally.

And of course you are essential to creating the successful public services - our schools, our hospitals, our prisons, our roads - that this country depends on.

## Related Articles

Relaunch of public pre-qualification standard

22 Mar 13



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## Social Part

### ● Institutional and Cultural Framework

I am publishing an updated list of trial projects today, which look at alternative approaches to procurement, including connecting design and construction to the occupation and use of the building through the “soft landings” approach, and crucially the adoption of Building Information Modelling.

This digital way of working - constructing an asset in virtual reality before trying it for real - not only helps us work out problems in the design stage; it also allows for a more collaborative approach. Product manufacturers and specialist contractors from every trade can input critical information into the model before the design is fixed and building begins.

I am delighted that tenders for their first BIM project, at Cookham Wood Prison in Kent, are now back and that an order has already been placed.

The winning contractor Interserve has committed to fully using BIM to provide a facility that has improved quality and value for the client.

The Ministry of Justice’s positive experience in introducing BIM, and suppliers’ willingness to engage, has resulted in the department already issuing a further three projects out to tender using BIM - an illustration that the challenges laid down in the Construction Strategy are achievable.

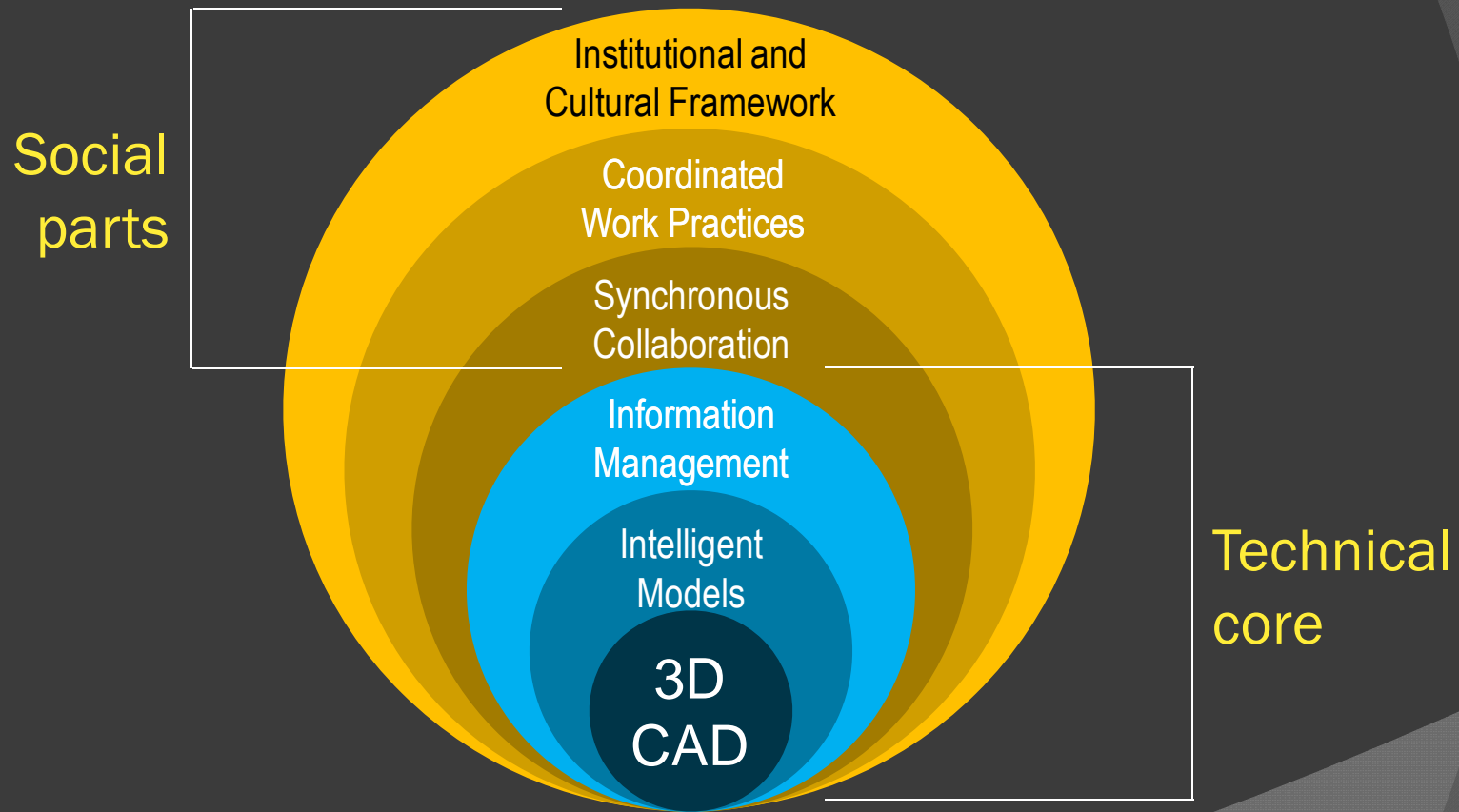
We have mandated 3D collaborative BIM on all appropriate centrally-procured projects by 2016. This whole sector approach to BIM will see the UK as the world leader in a new digitally built era, offering new ways of working, as well as massive growth potential both at home and abroad.



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# BIM Sociotechnical System



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# Current and Future Trend

## International

- ◎ BIM Roadmap
  - China: 12<sup>th</sup> 5-year Plan (May 2011)
  - Singapore: 2011 . 2015
  - UK: 2011 - 2015
- ◎ Mandatory BIM
  - USA (Government Projects): 2007
  - Singapore: 2015
  - UK: 2016



# Hong Kong

## ◎ Private Projects

- Since 2007
- Sectors adopted:

### Developers

- Chinachem, Cathay Pacific, Disneyland, Henderson Land, Hysan, Kerry, New World, Swire, 滙豐

### Corporation

- Airport Authority, HK Jockey Club, MTR, Science Park, WKCD, 香港電訊

### Education

- CUHK Architecture
- HKU Architecture
- HKU Civil Engineering
- HKU Space
- IVE



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# Use in Civil Engineering and its benefit



## Case Study

- Public Consultation: Demolition Works
- Alternative Alignment to Route 8 Che Kung Miu Road





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# Case Study: Demolition Scheme

# Demolition Sequence



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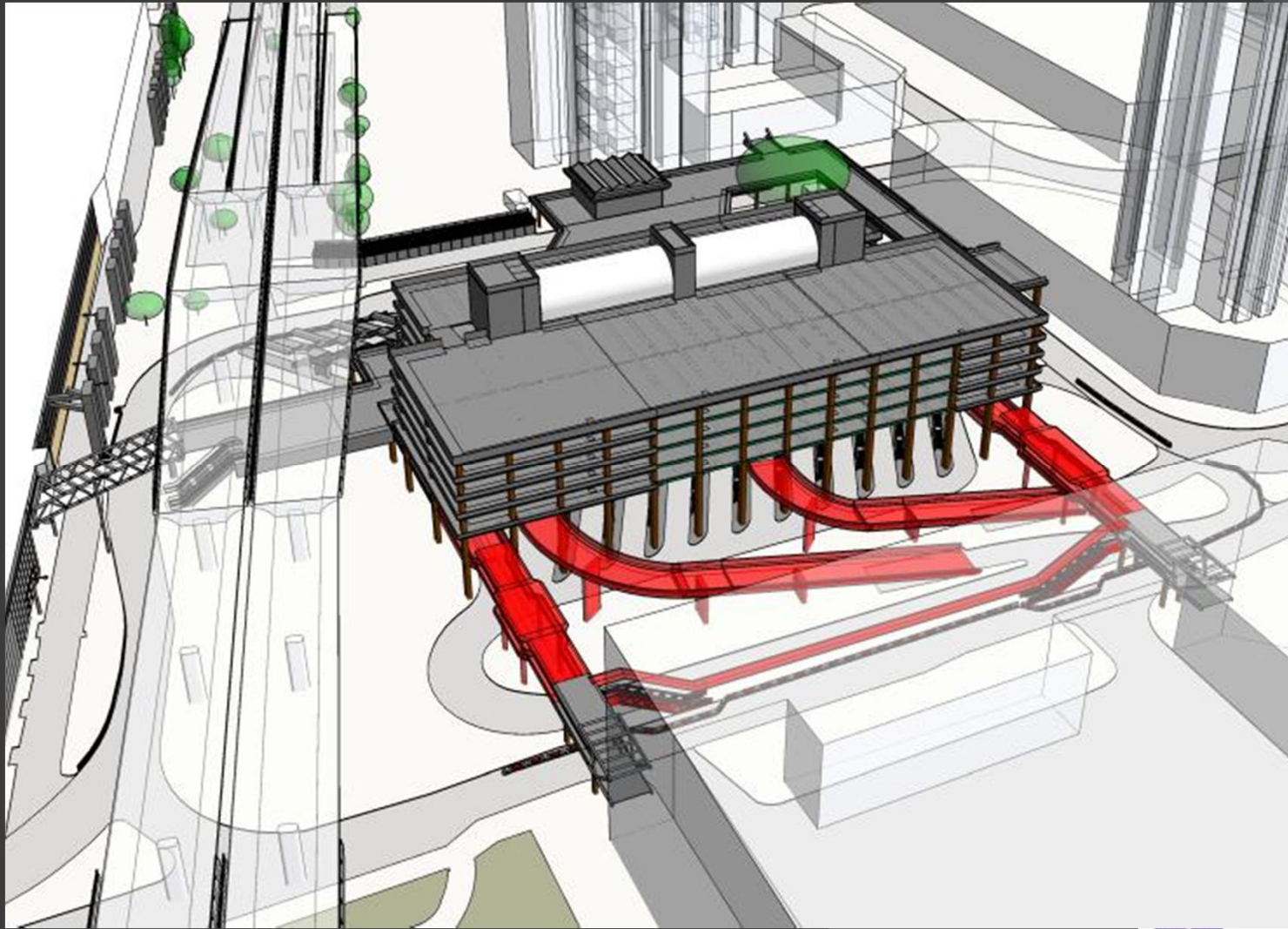


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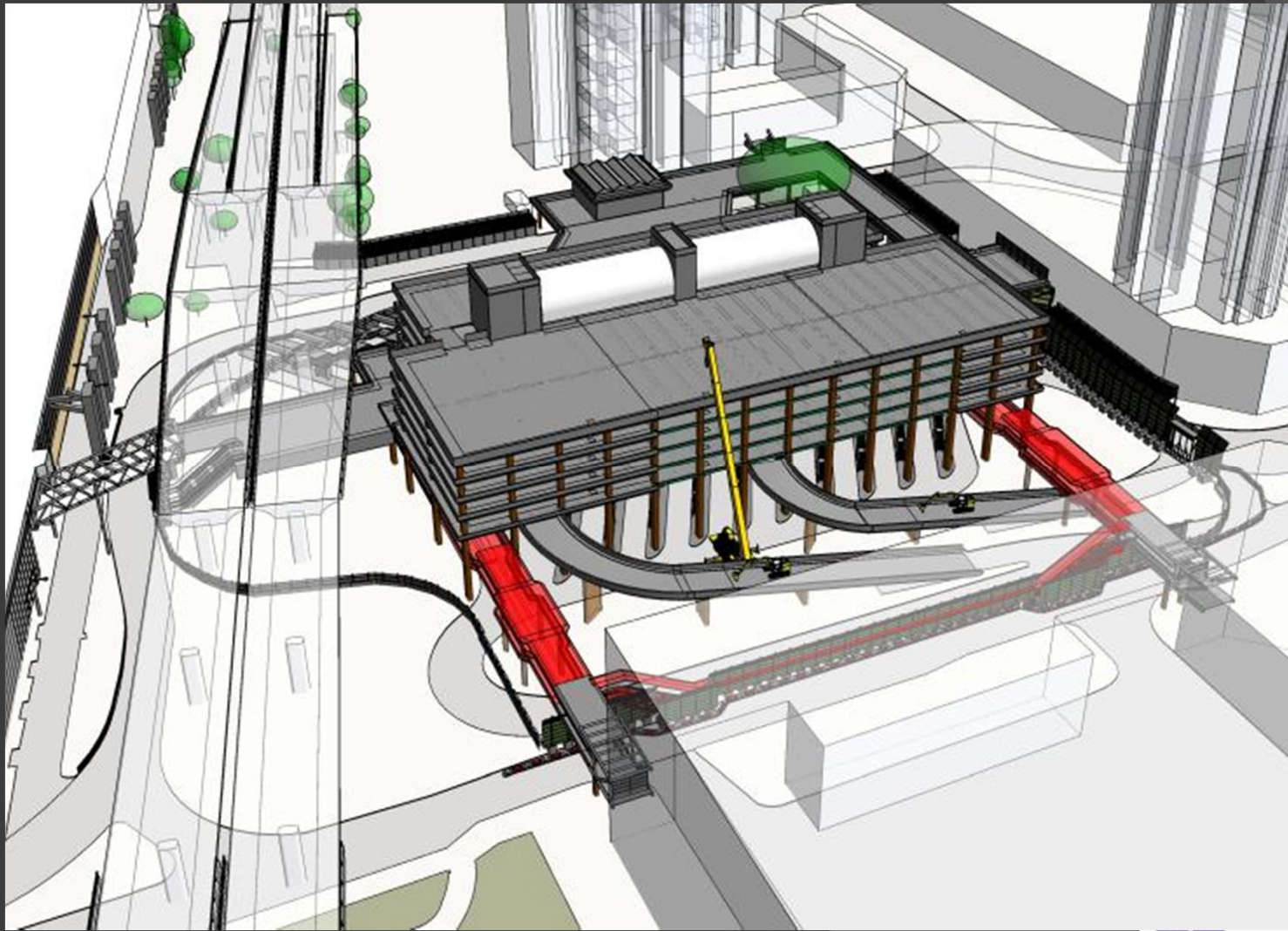
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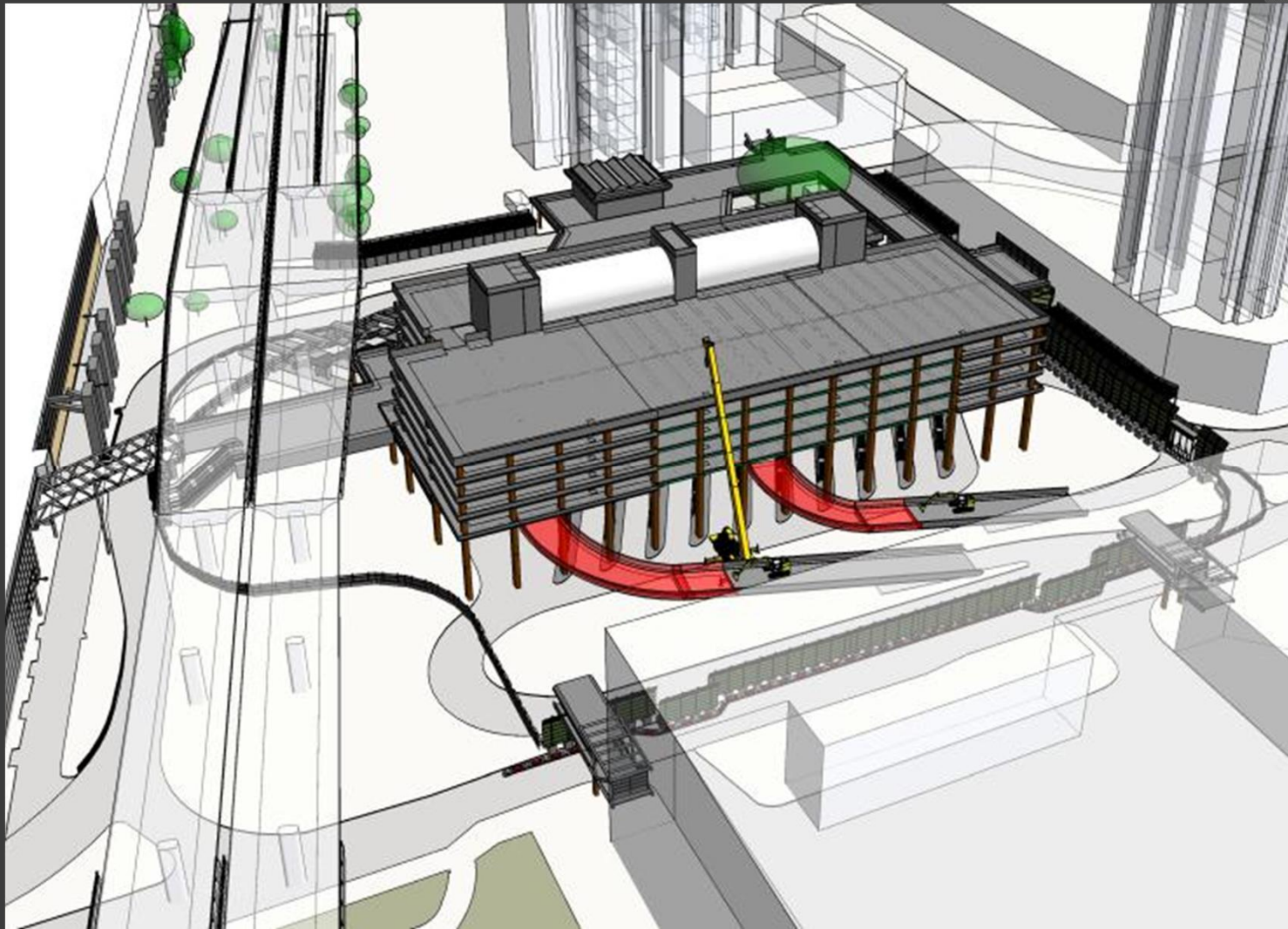


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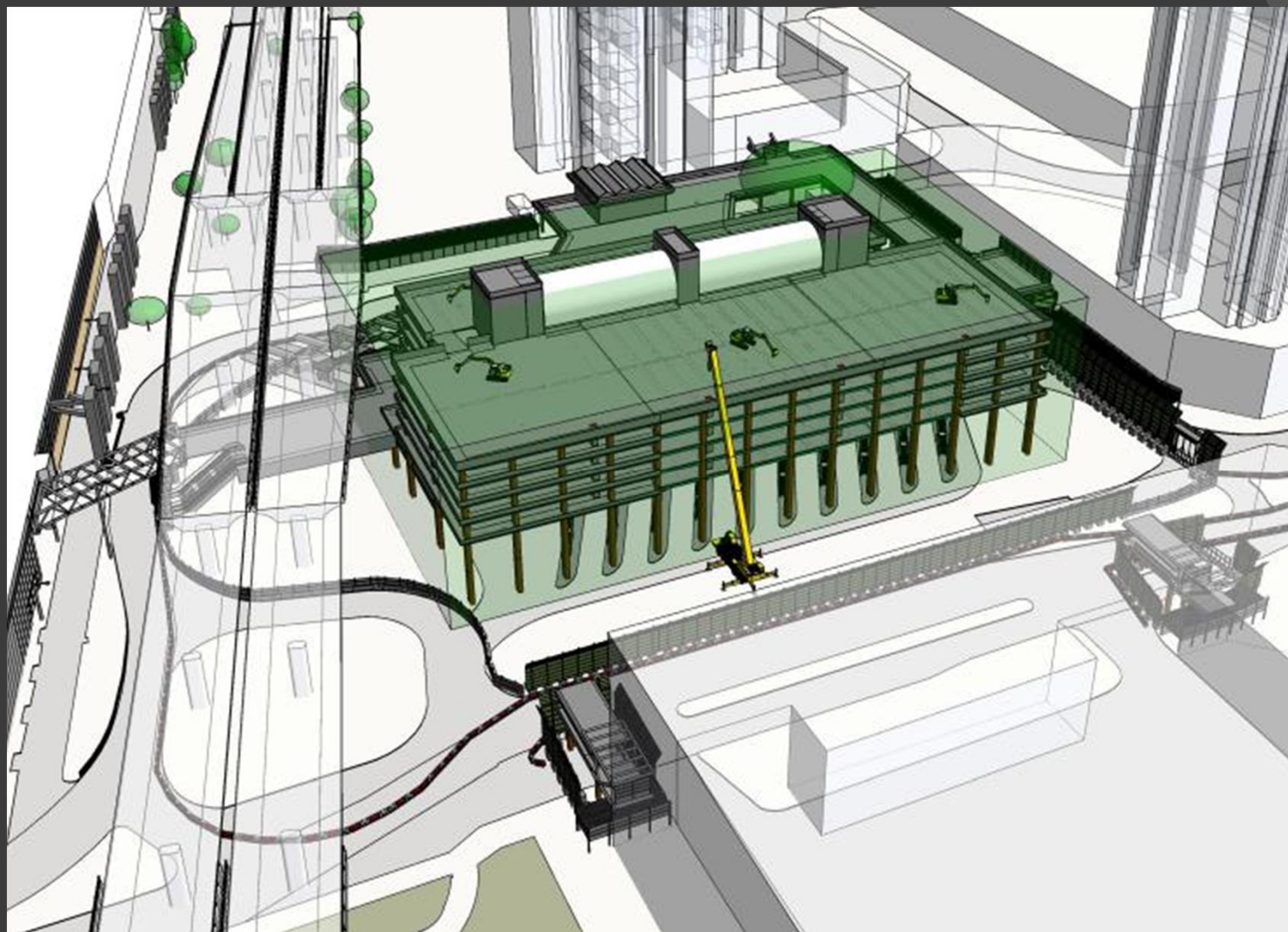


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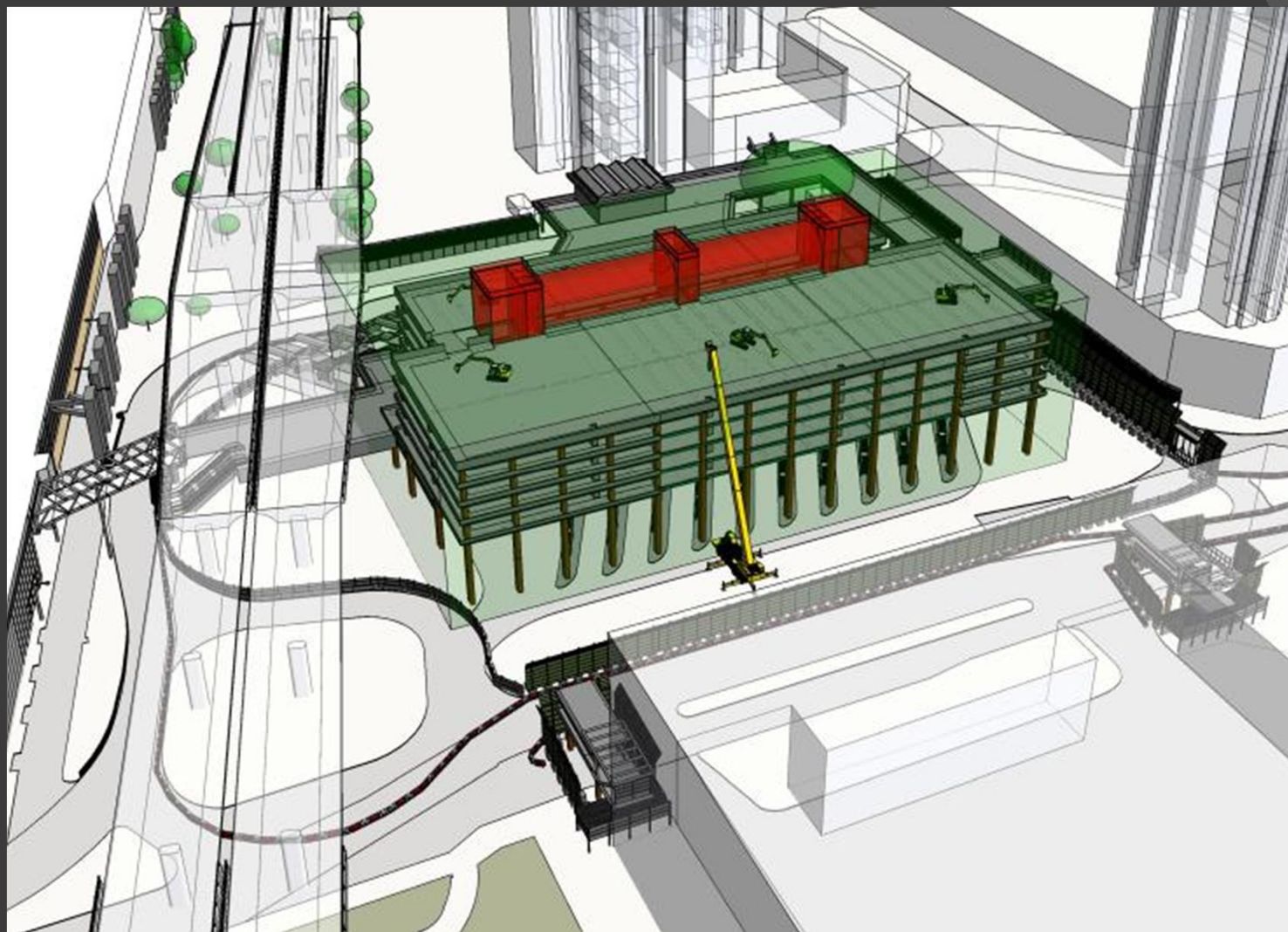
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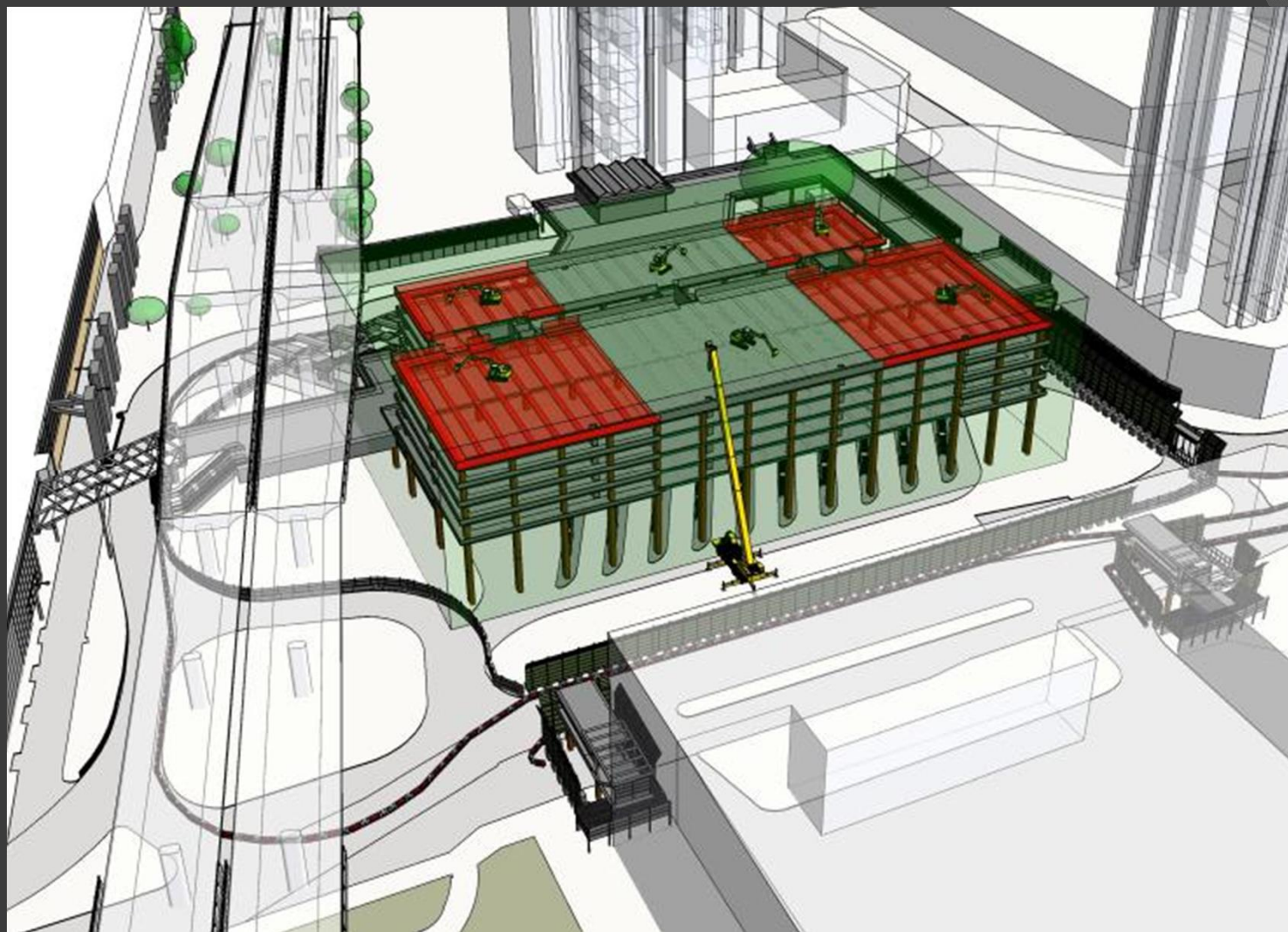


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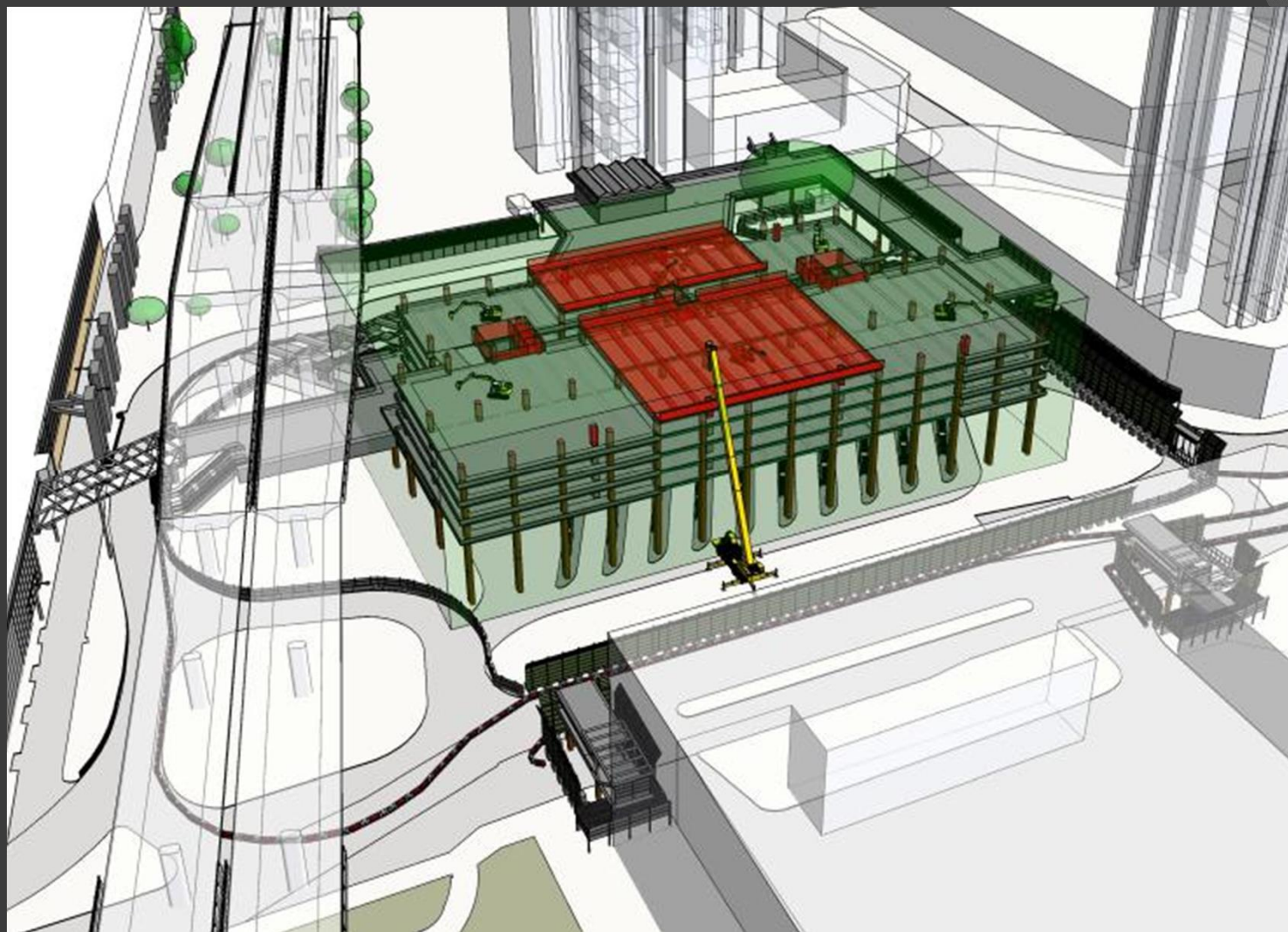
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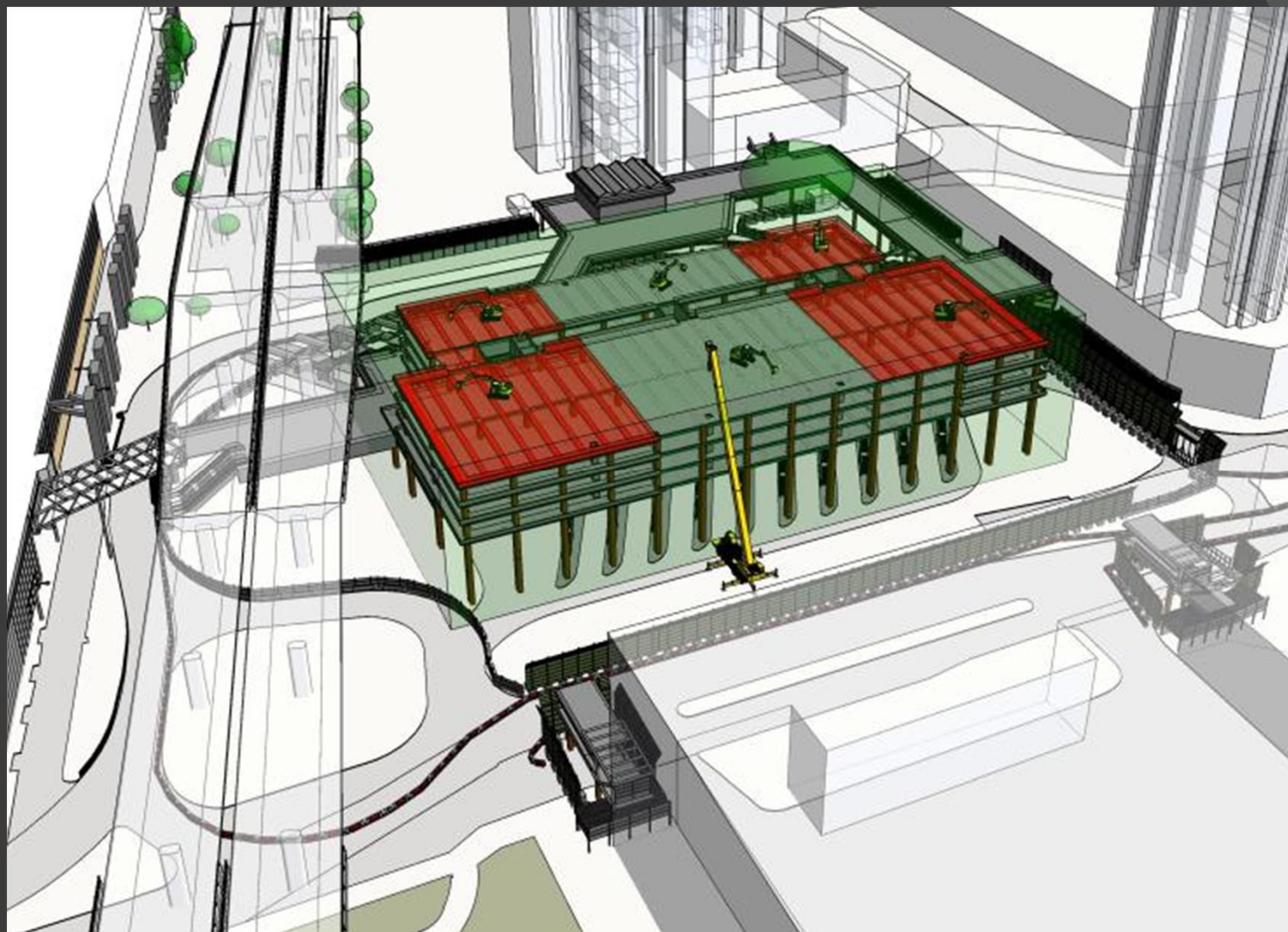


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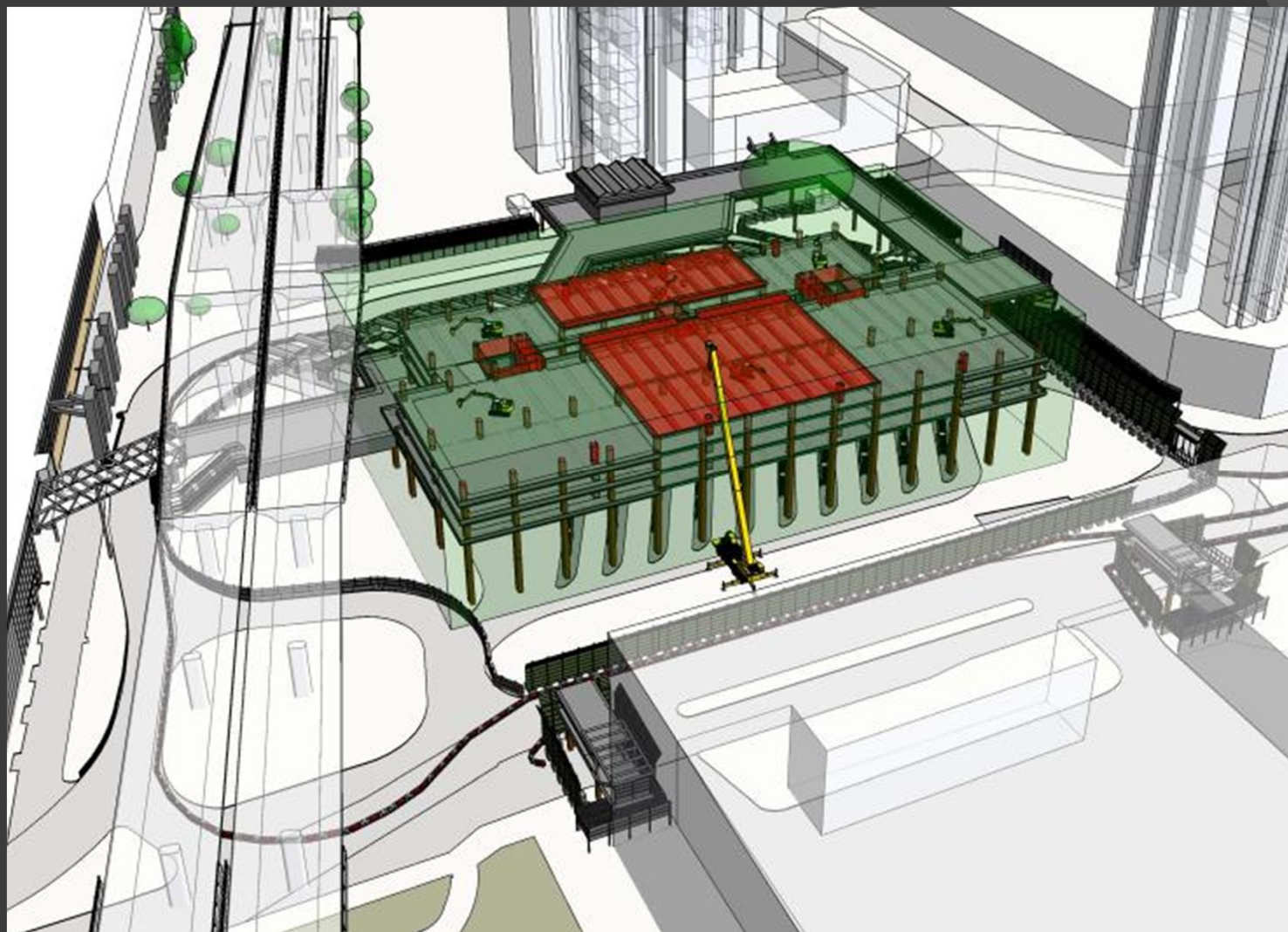
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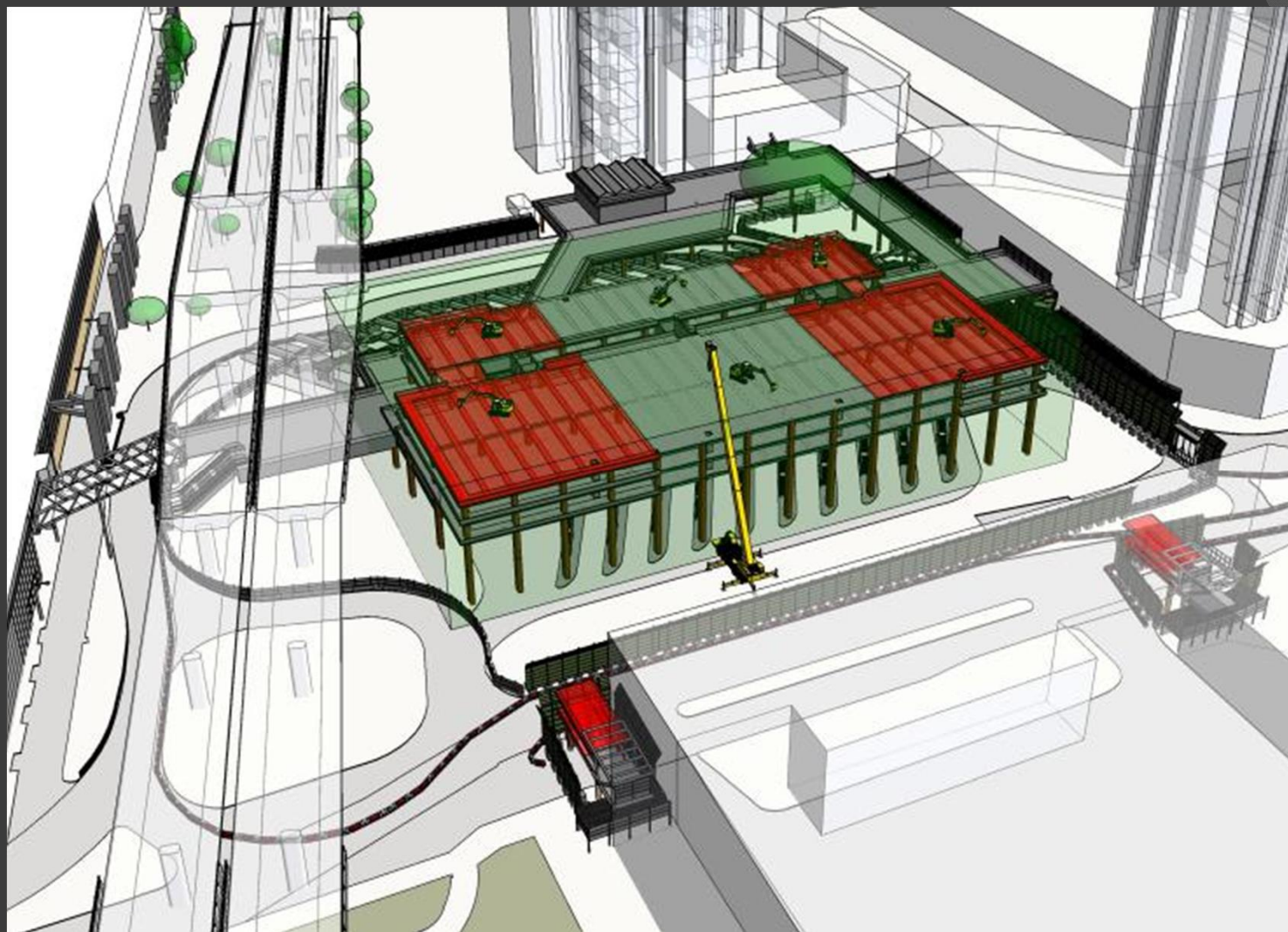


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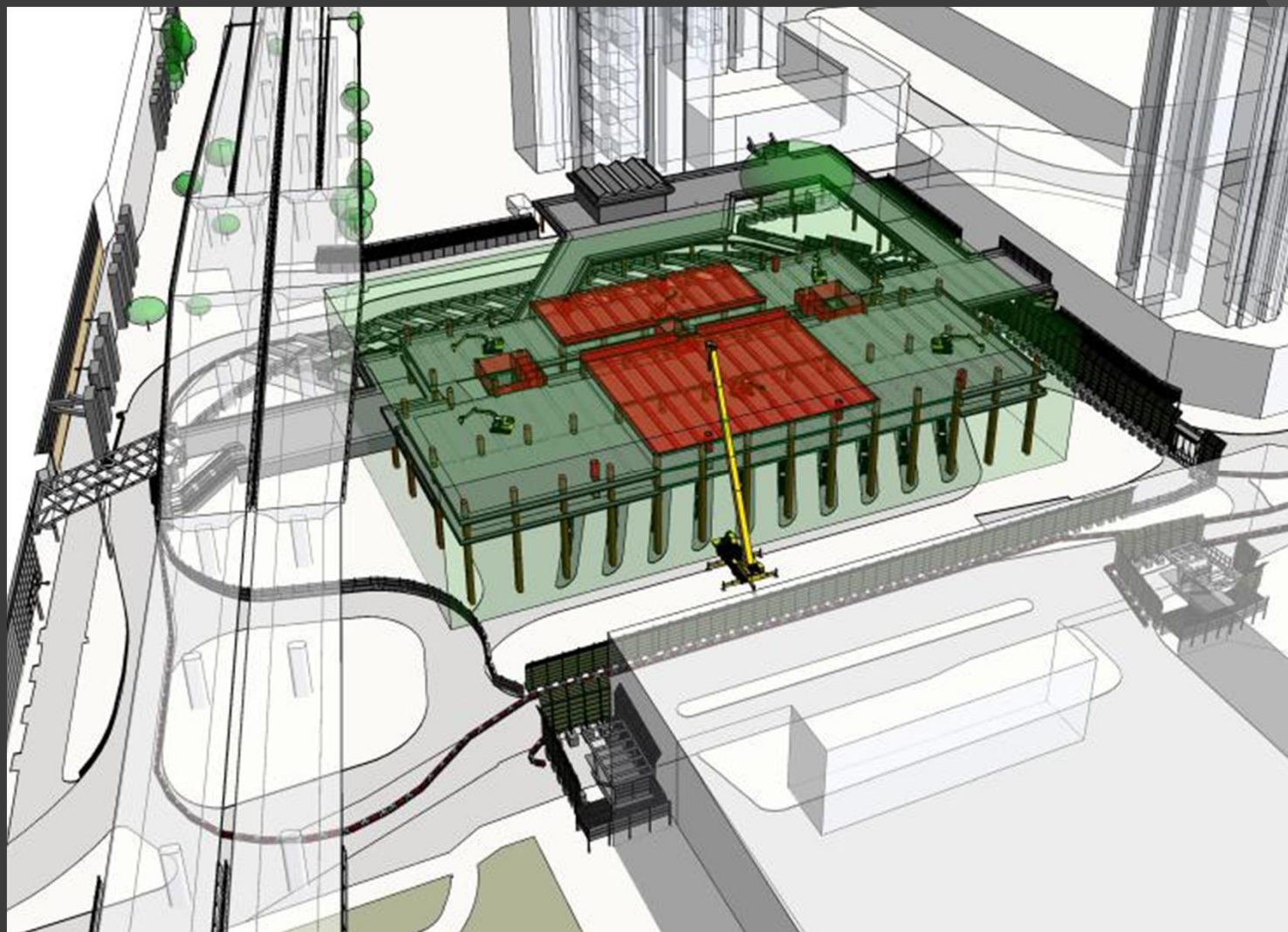
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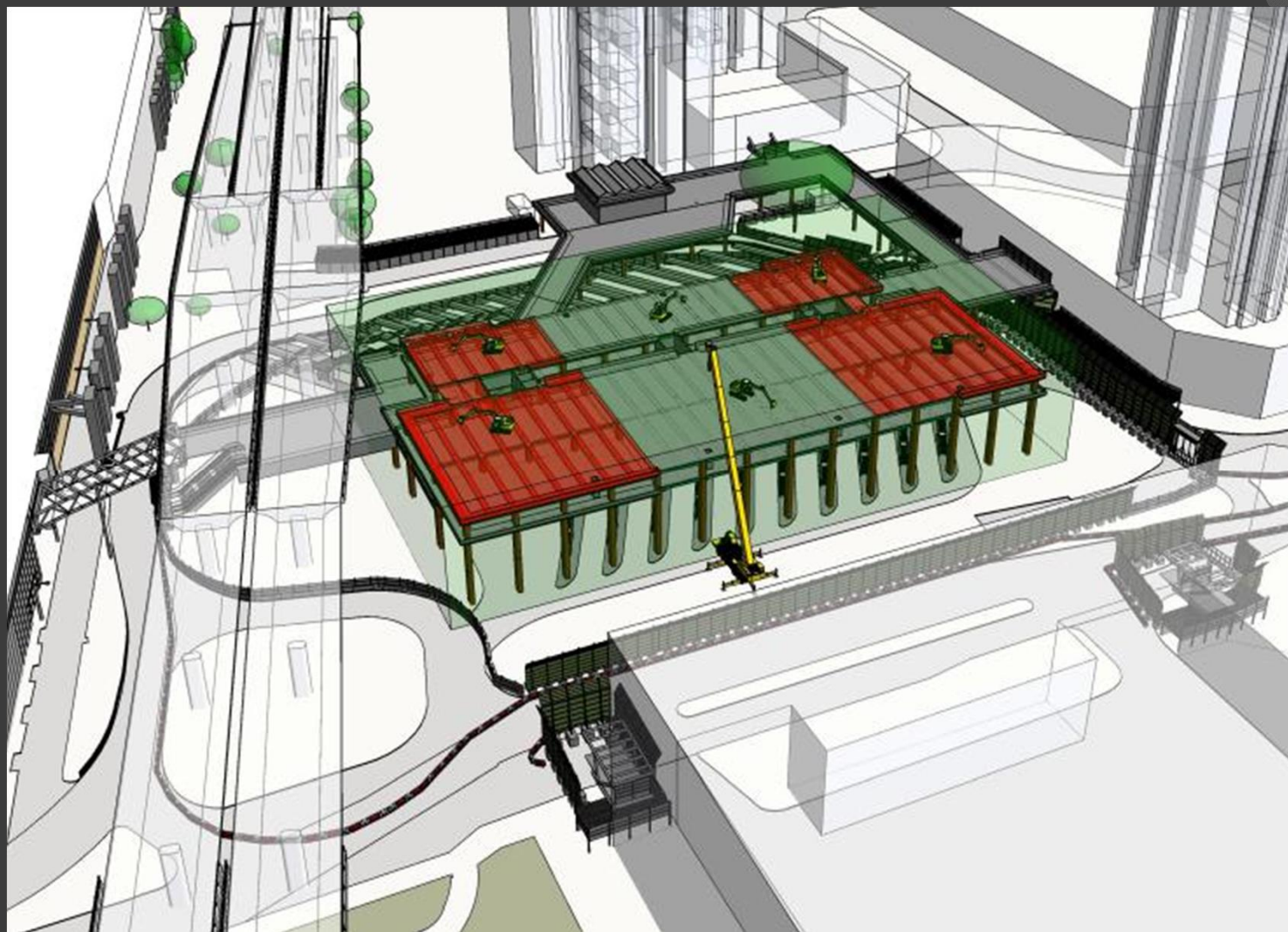


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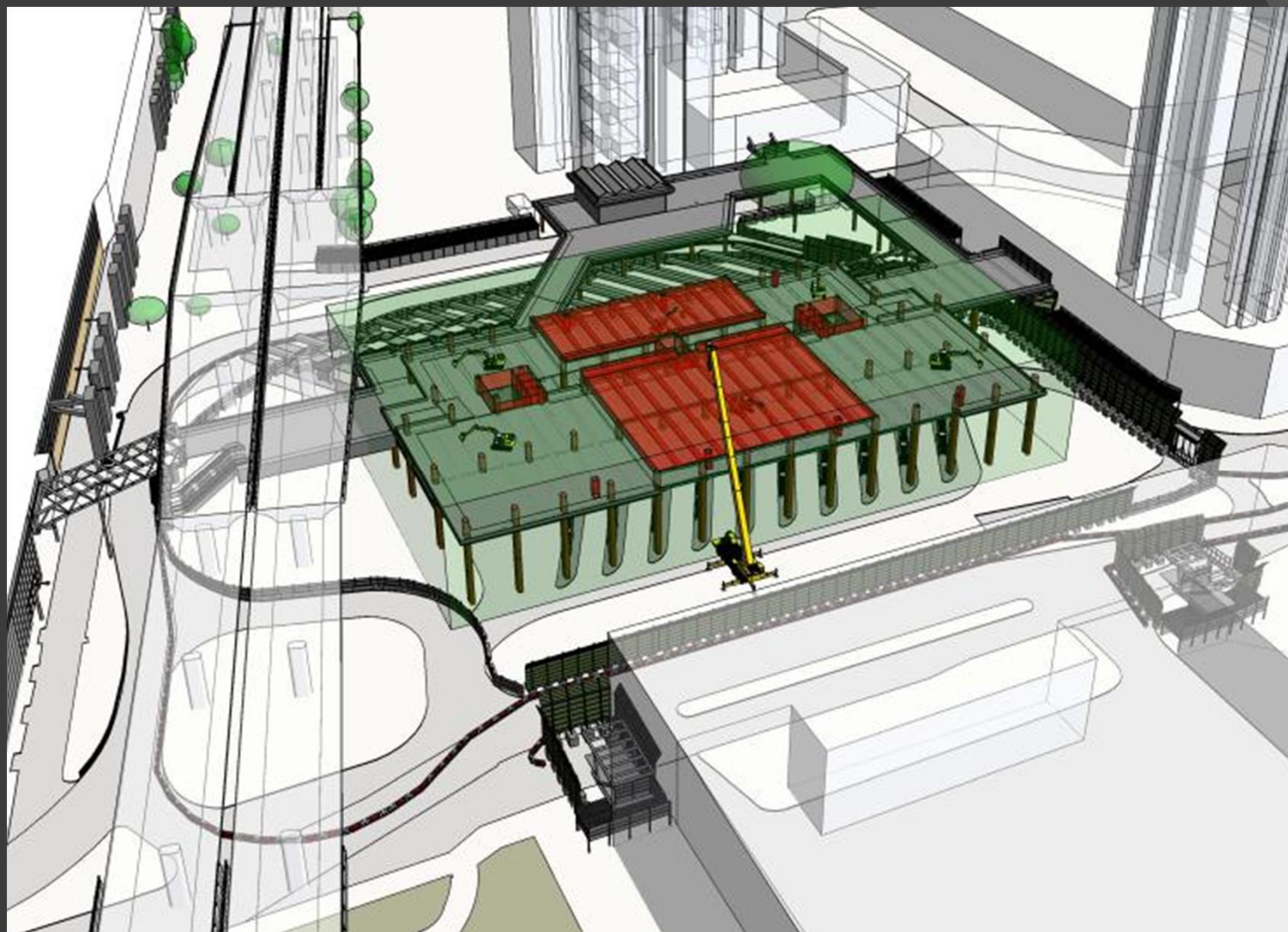
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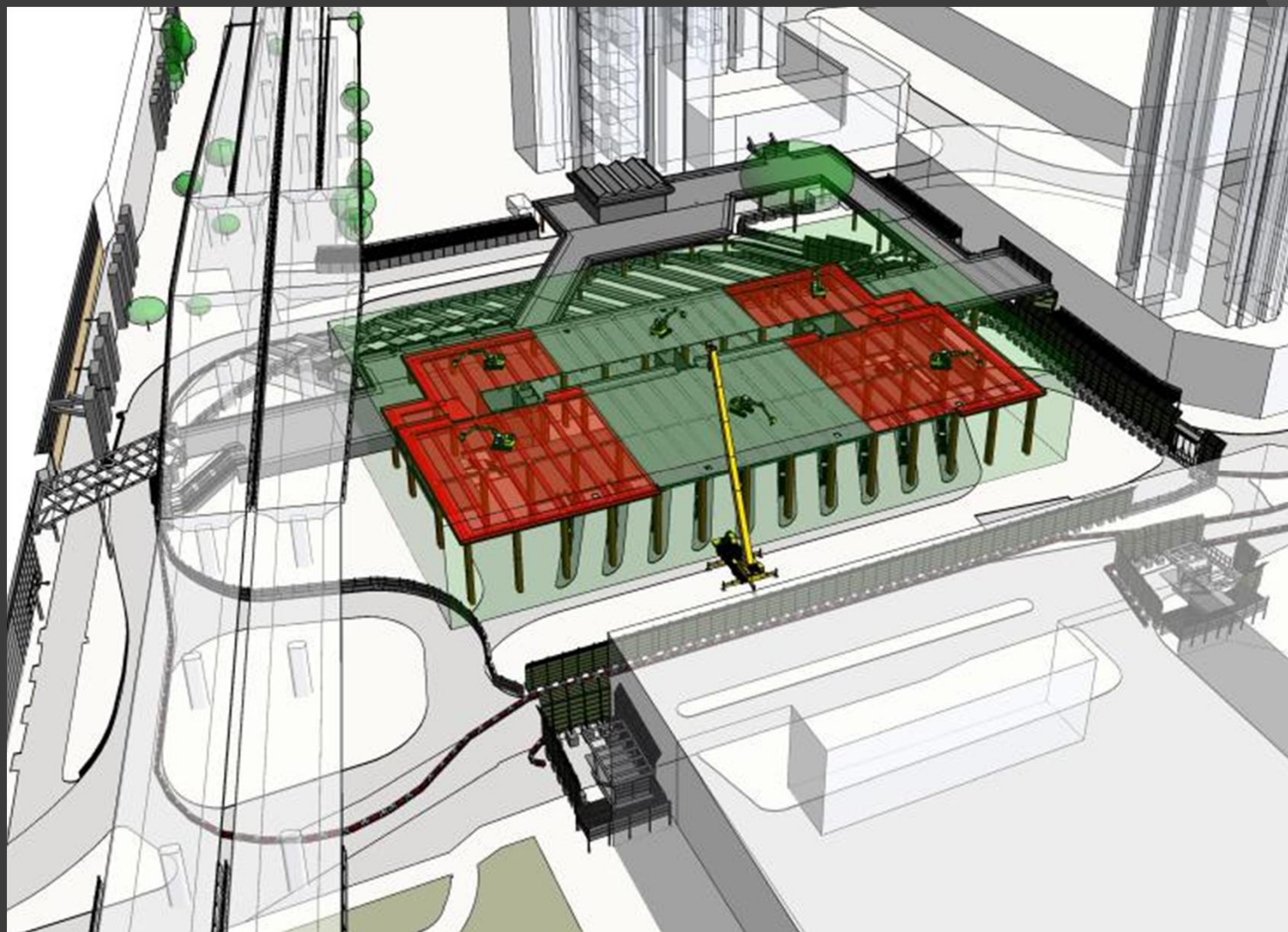


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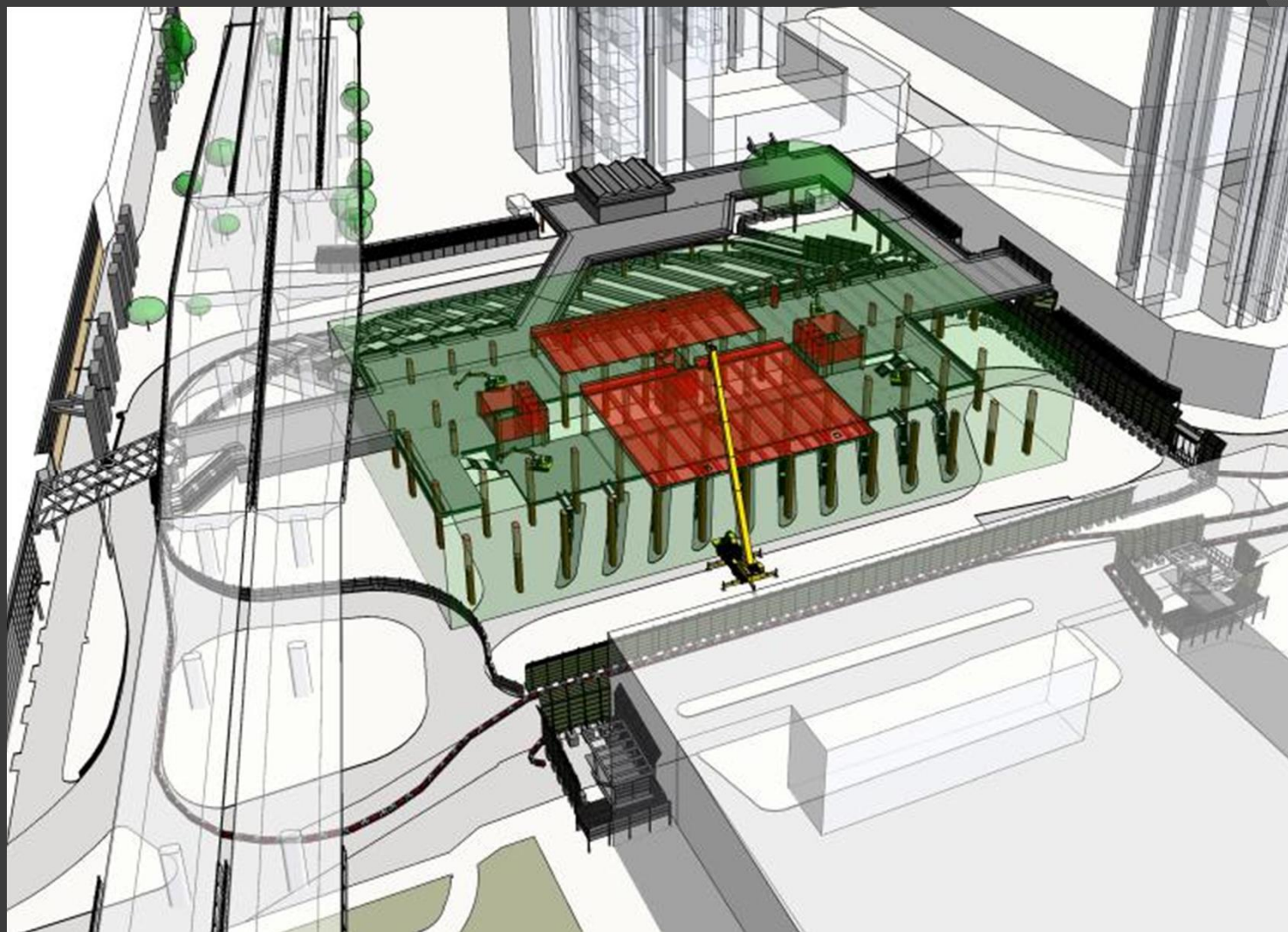
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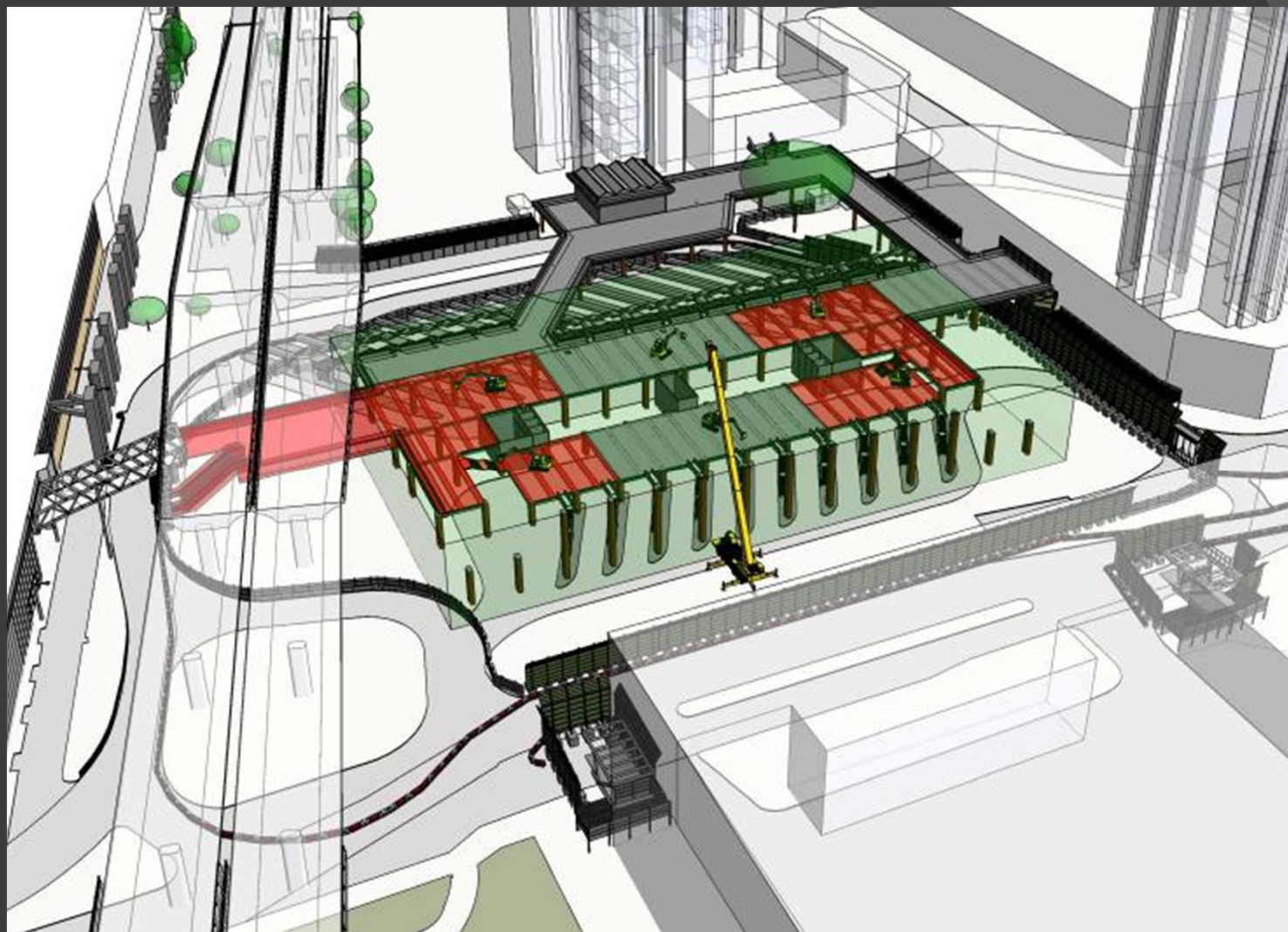


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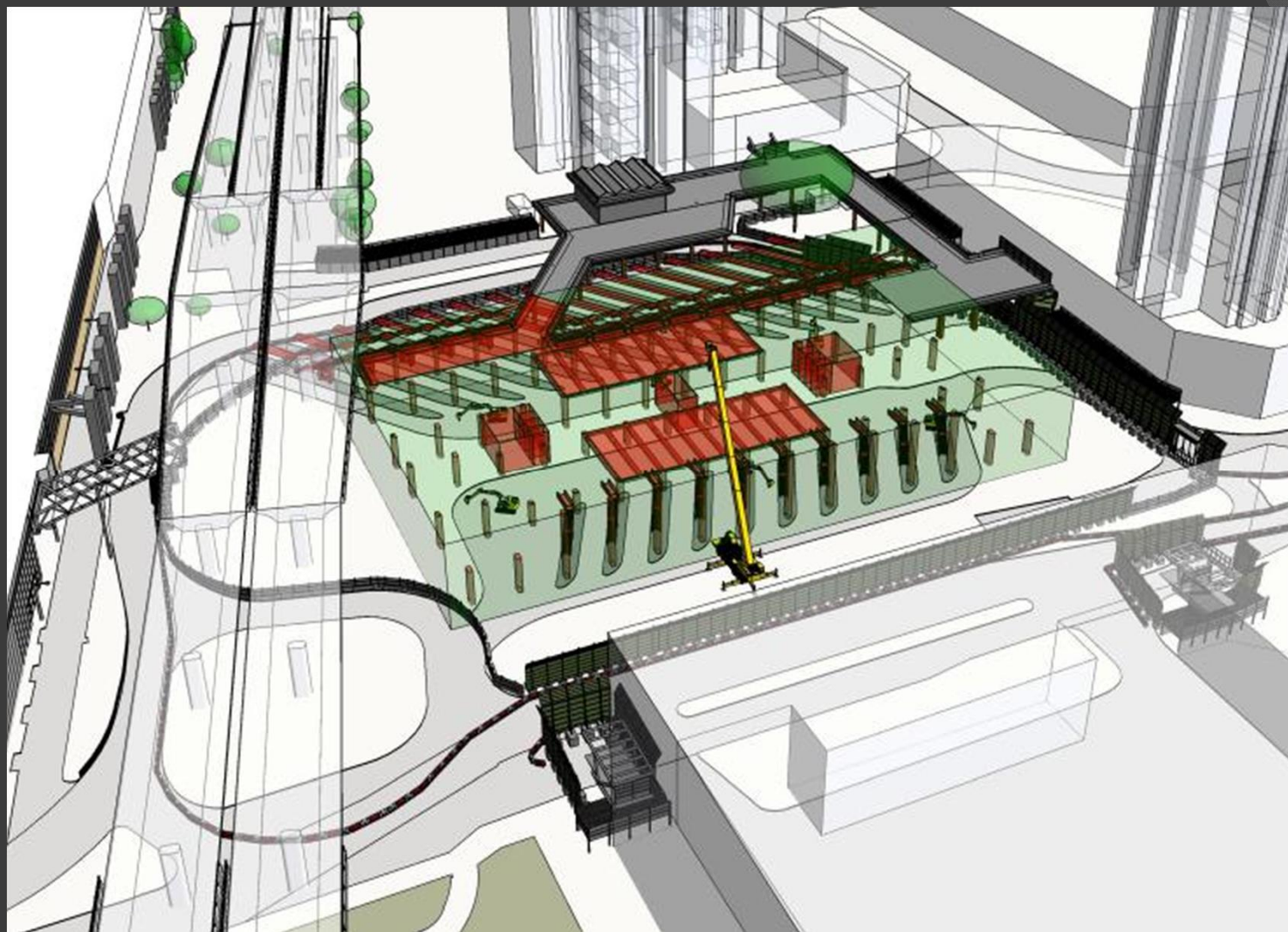
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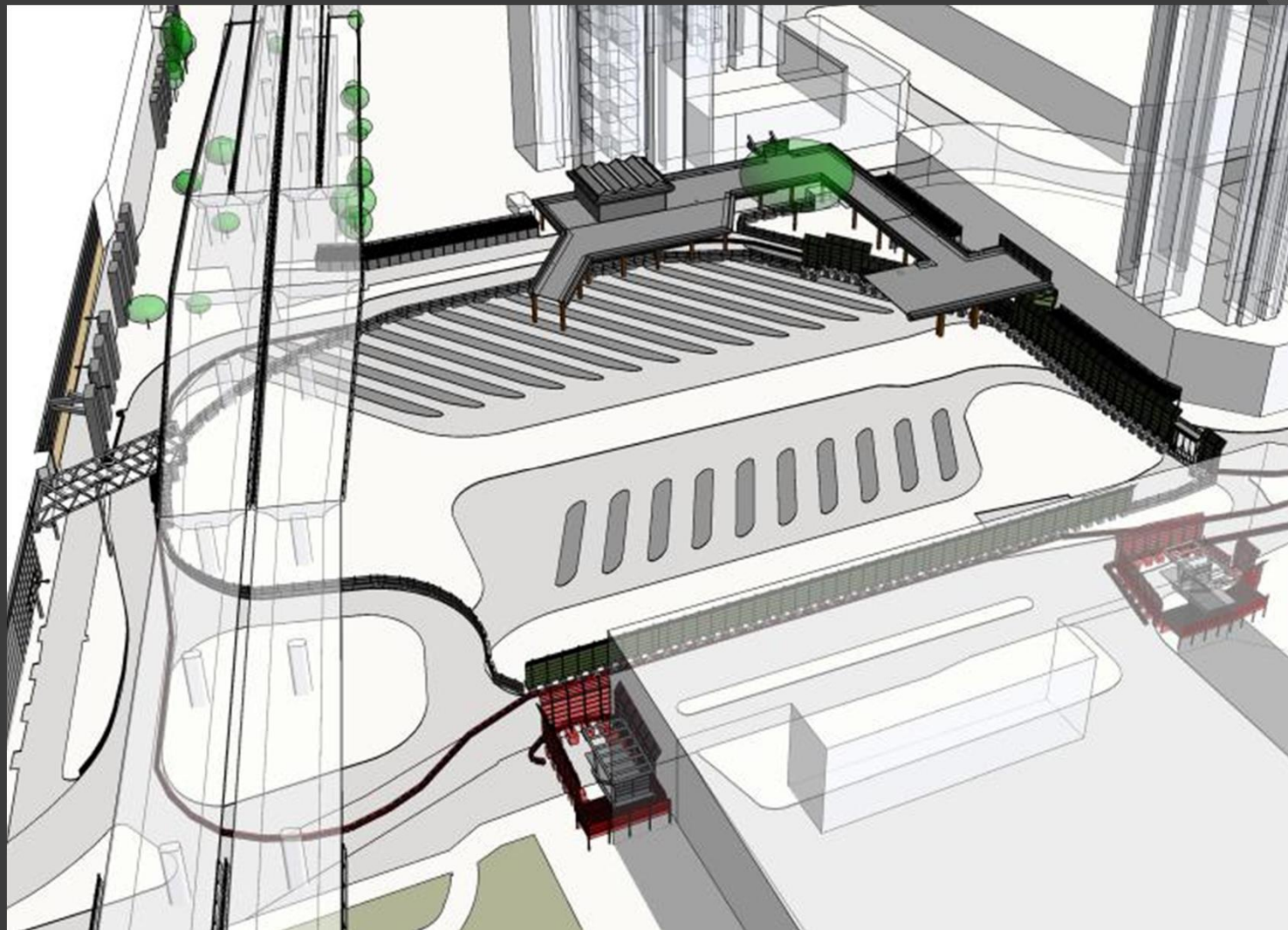


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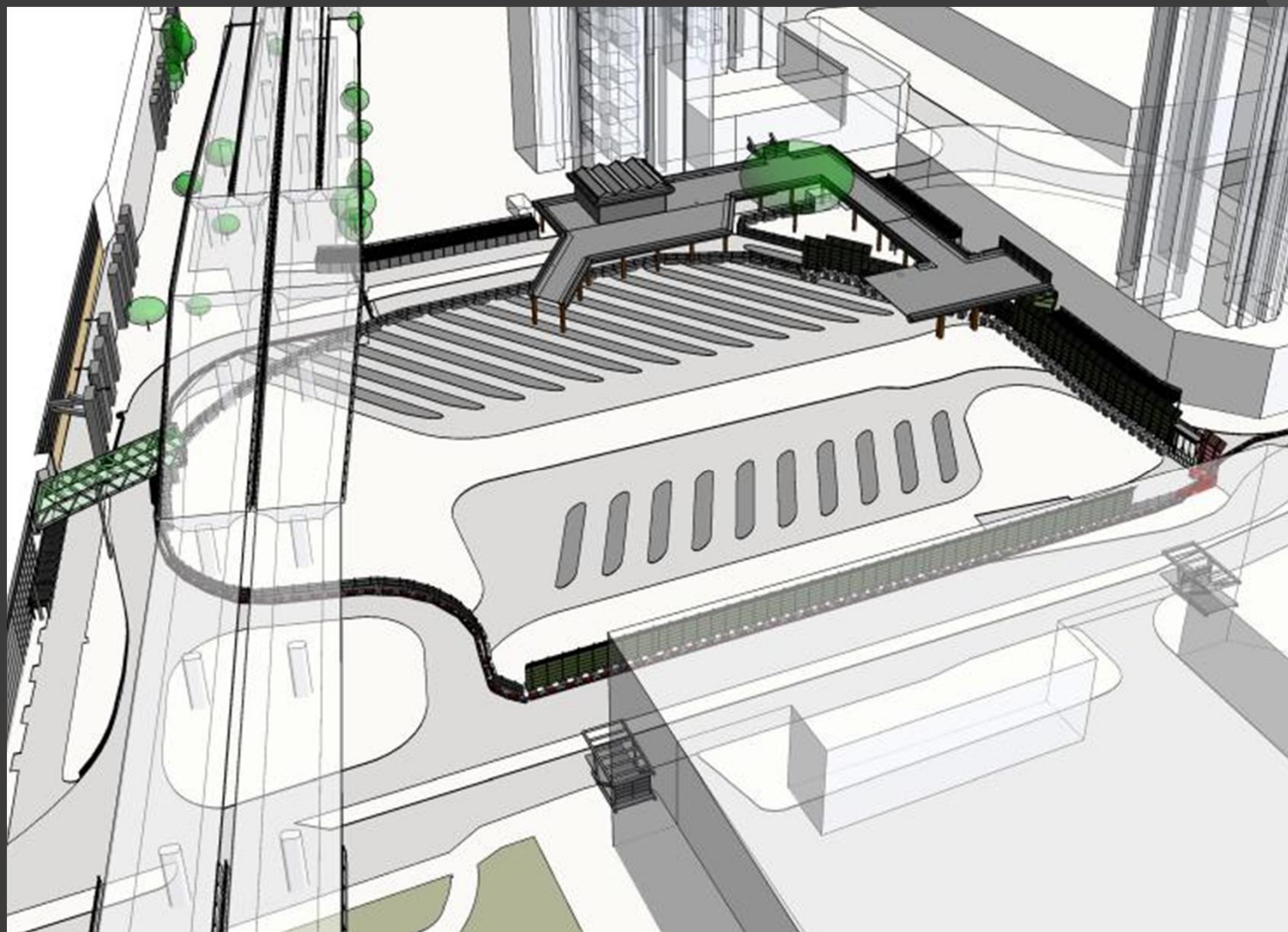
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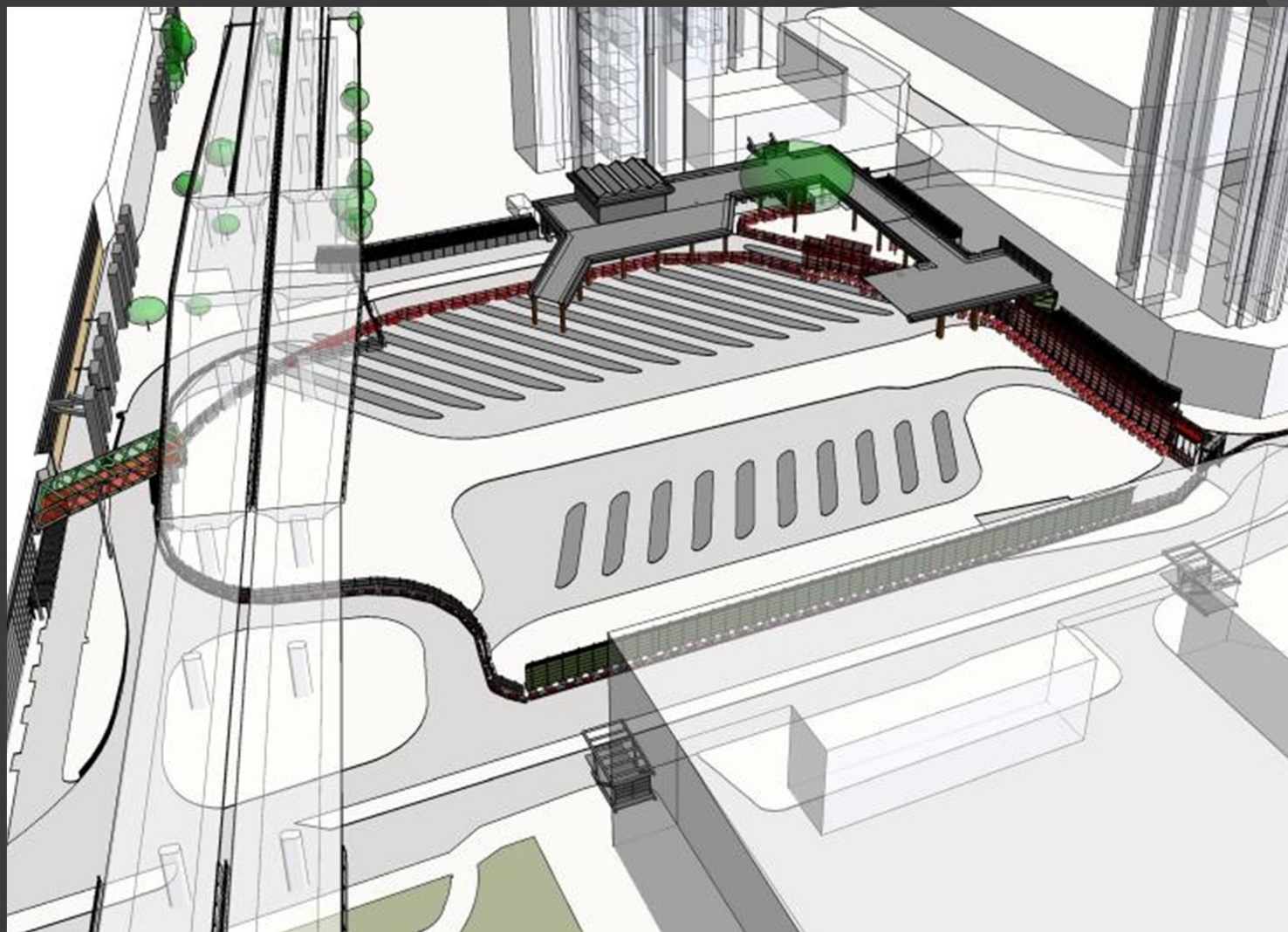
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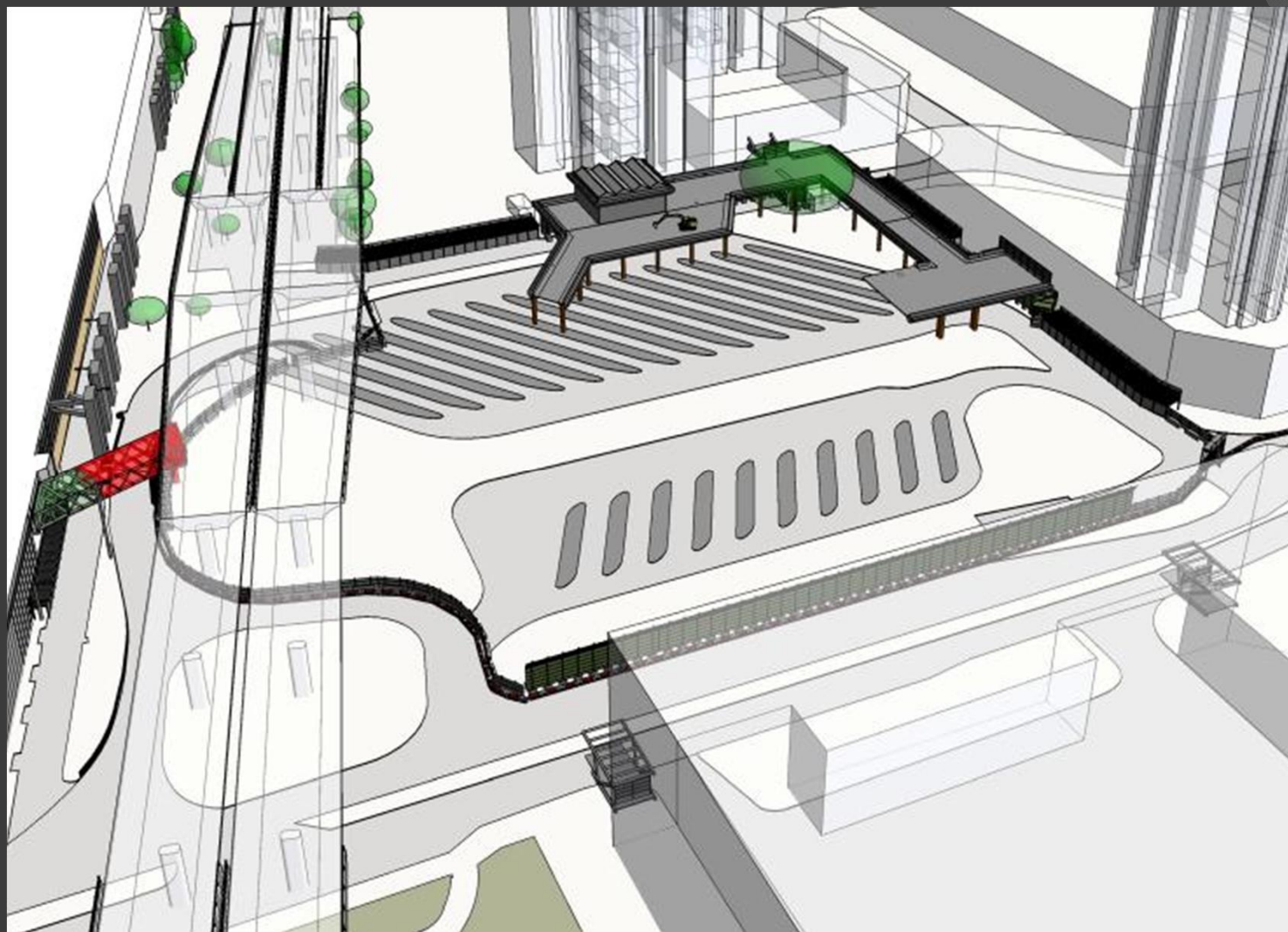


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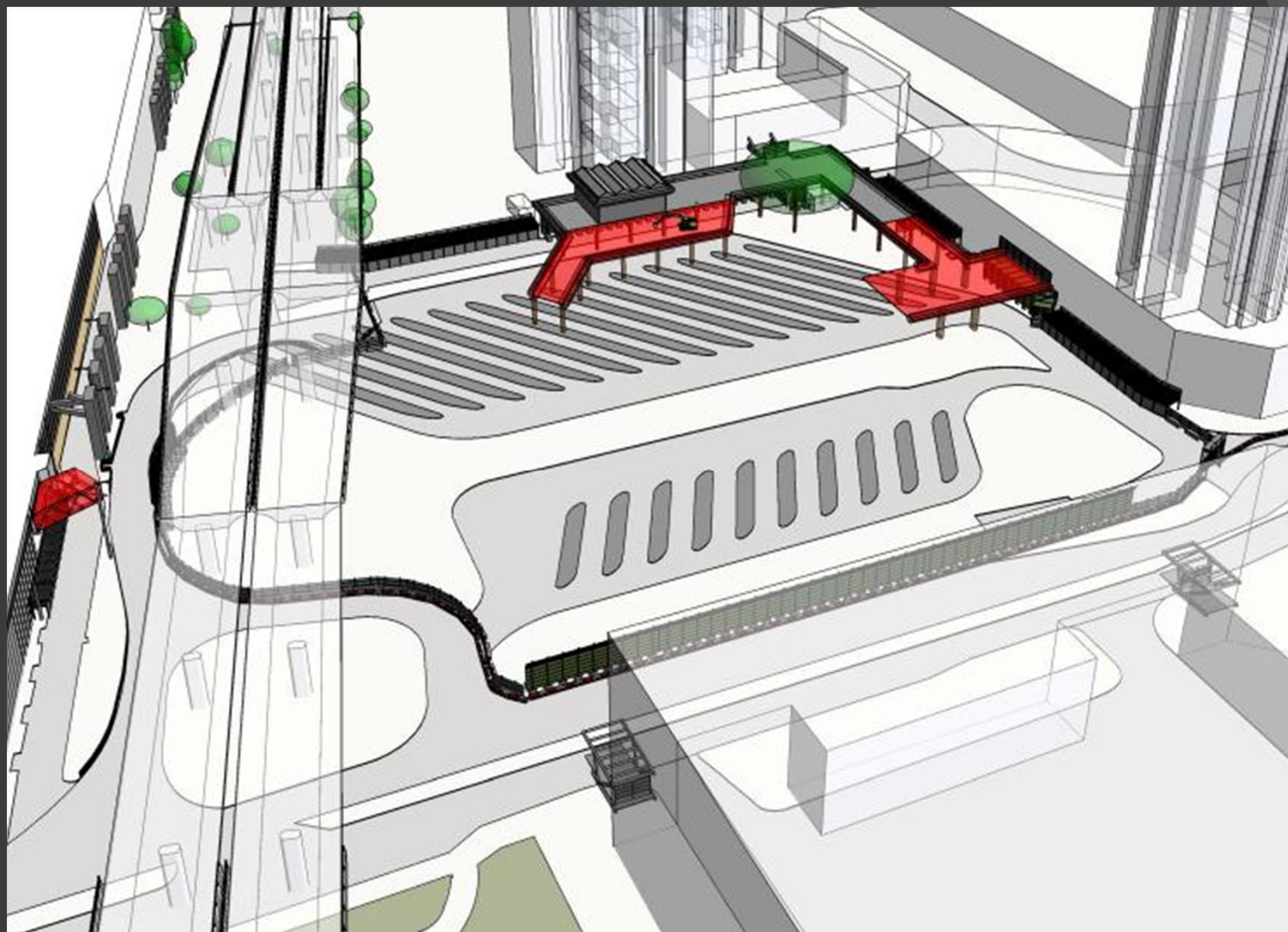
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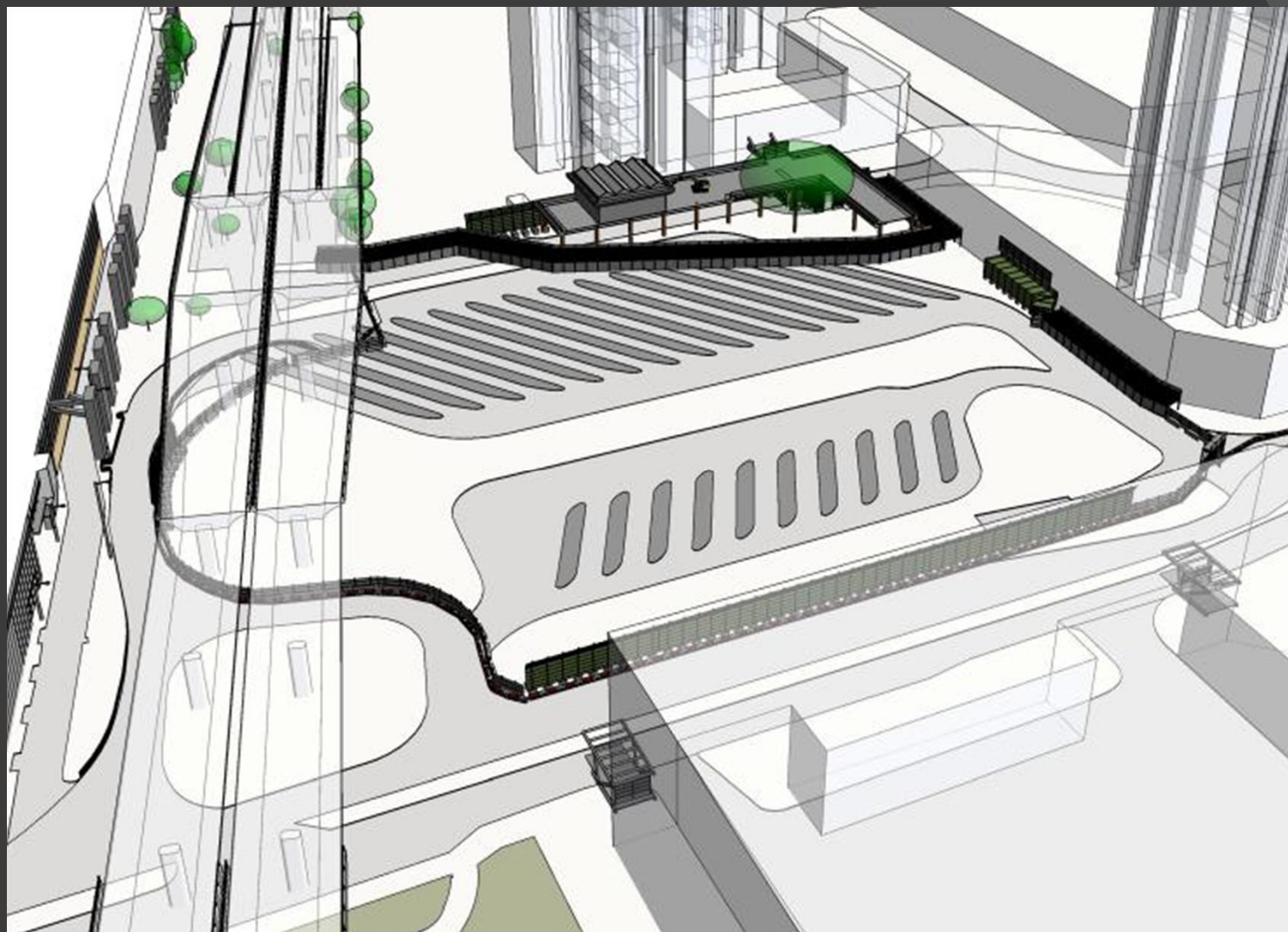
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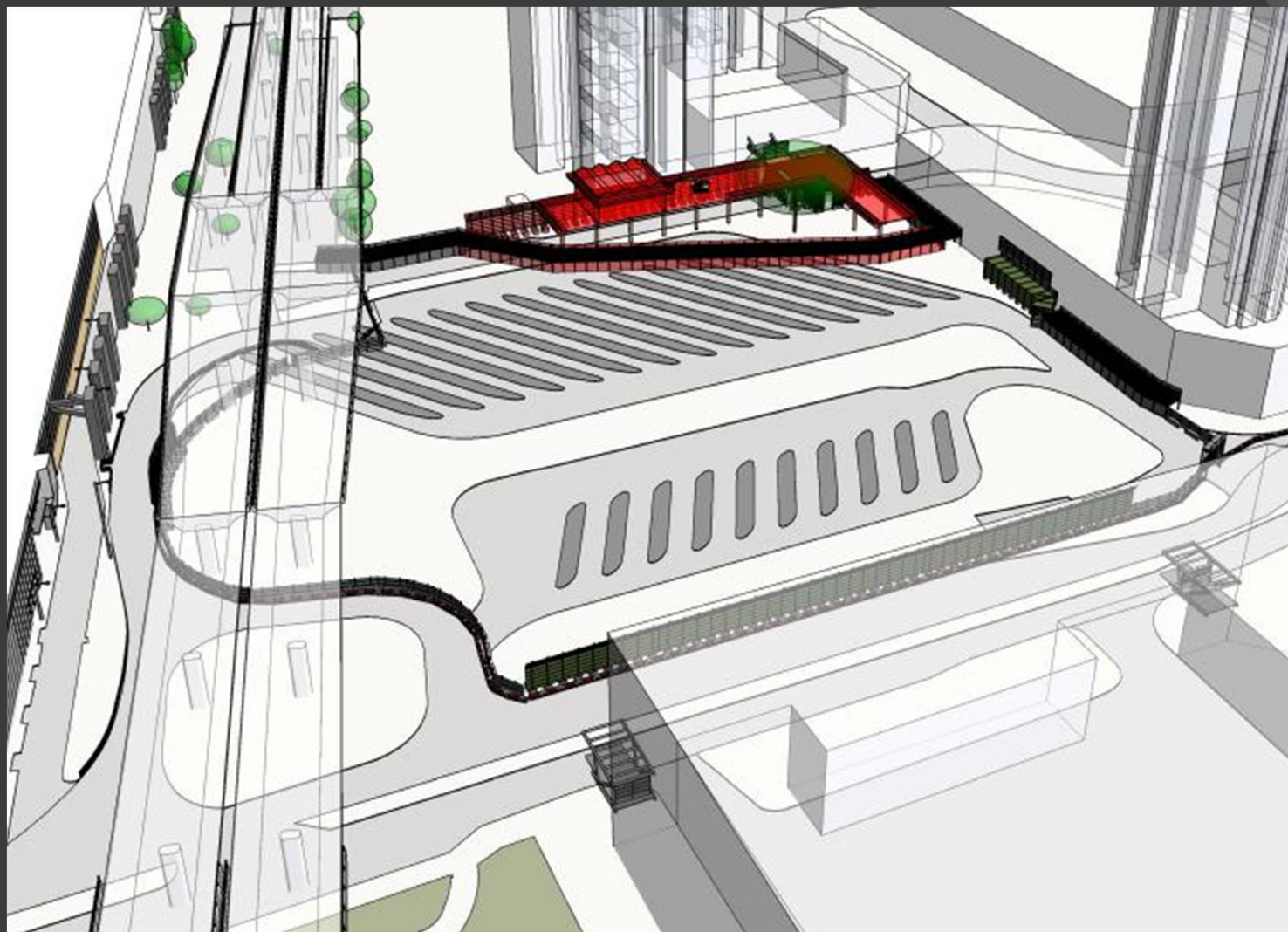


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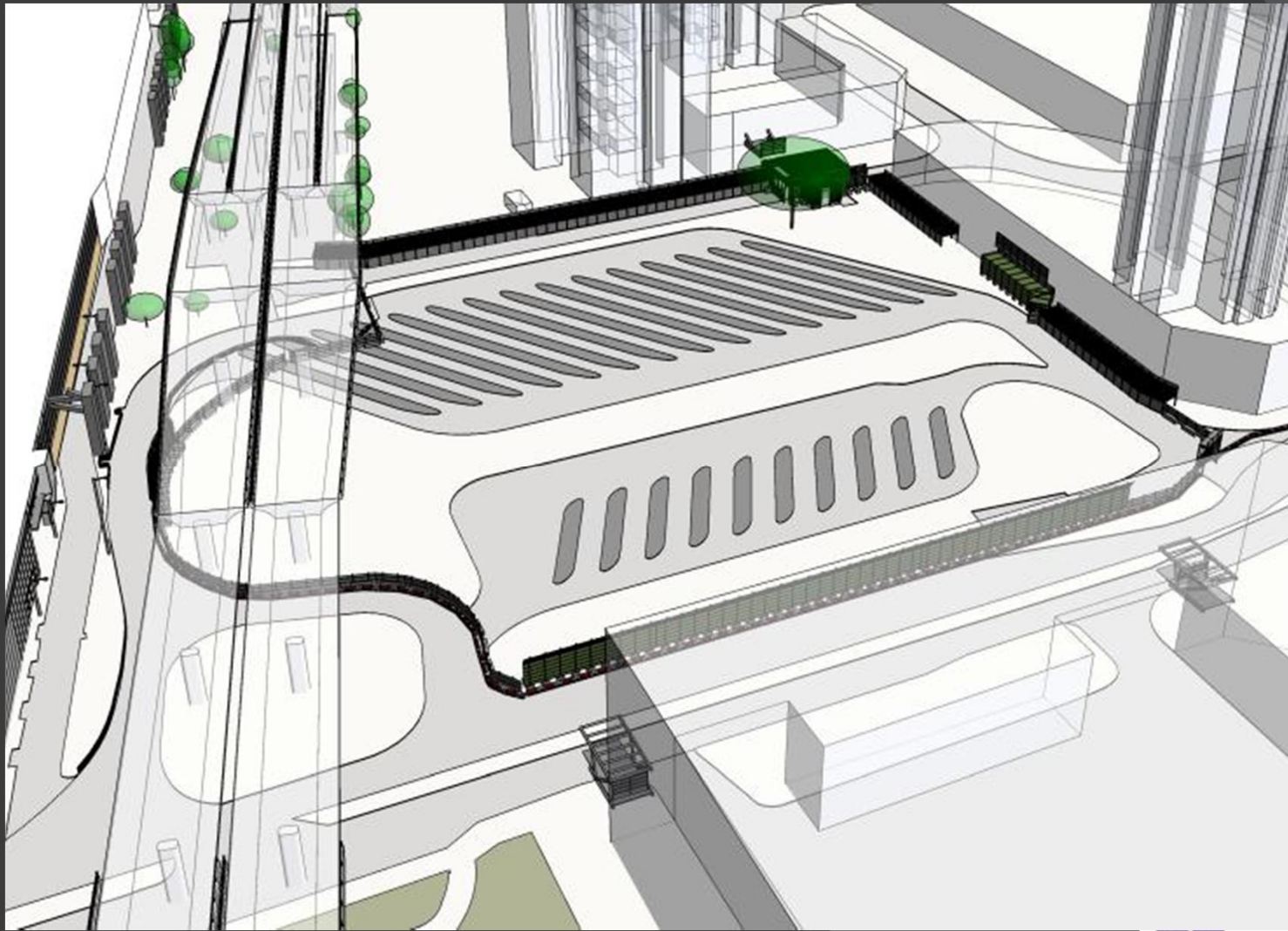
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## Demolition Sequence



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## Public Consultation & Approval

- ◎ The Sequence was shown to:
  - District Council
  - MTR Station
  - Govt Depts: Police, Transport Dept., etc.
  - Neighbour developments
- ◎ Smooth process of approval
  - Minimum negative concerns
  - No irrational objection



# Footbridge Demolition



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## Footbridge Demolition (Revised)



Demolition For Footbridge FB1



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## BIM Process

- ⦿ Through BIM modelling, the bridge demolition schemes were modelled, reviewed and revised for perfection
- ⦿ Animations shown to public are coordinated schemes
- ⦿ New ideas were updated to BIM to review and confirm for construction

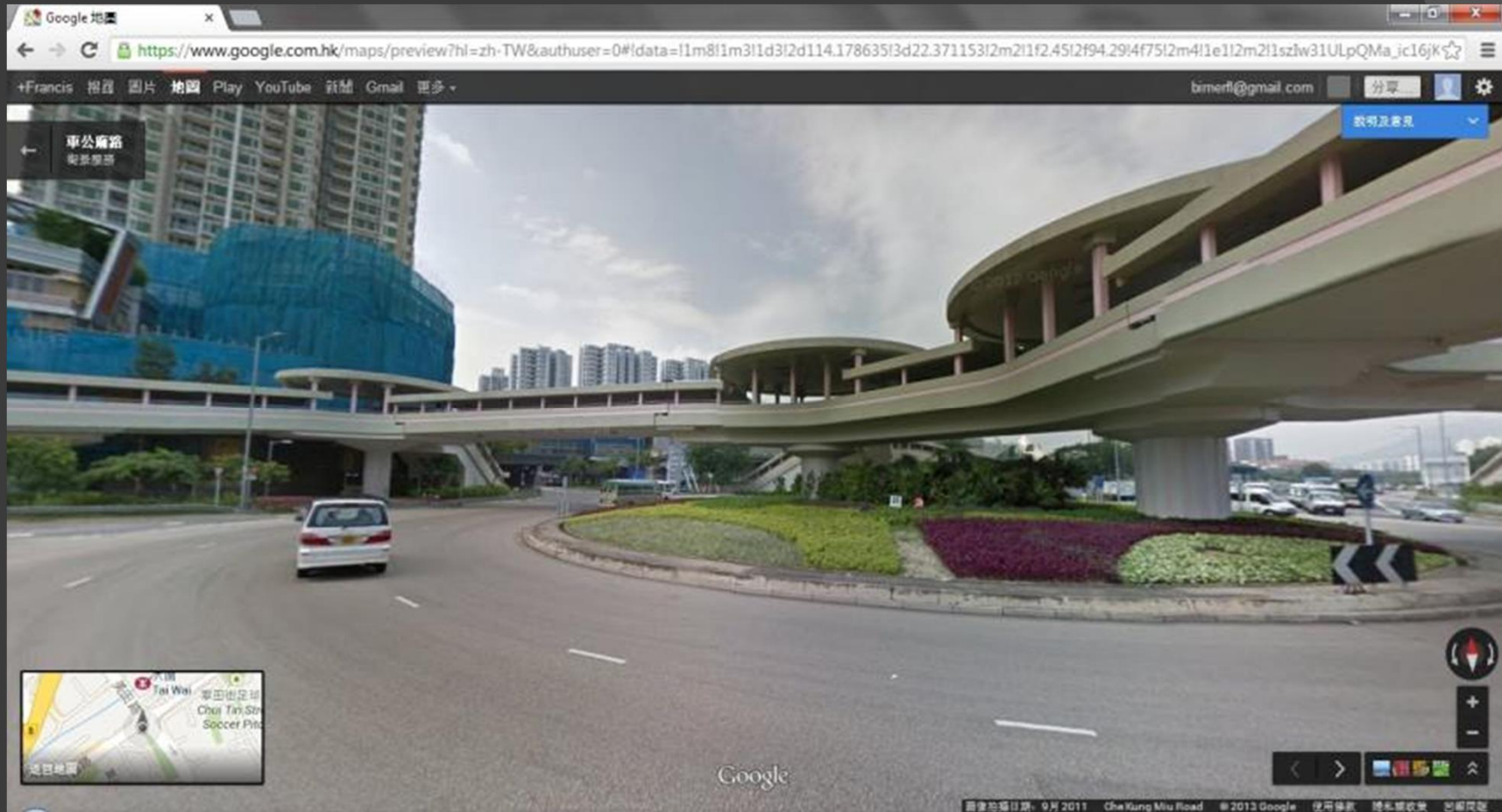




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# Case Study: Alternate Alignment

# Che Kung Miu Road Alternative Alignment



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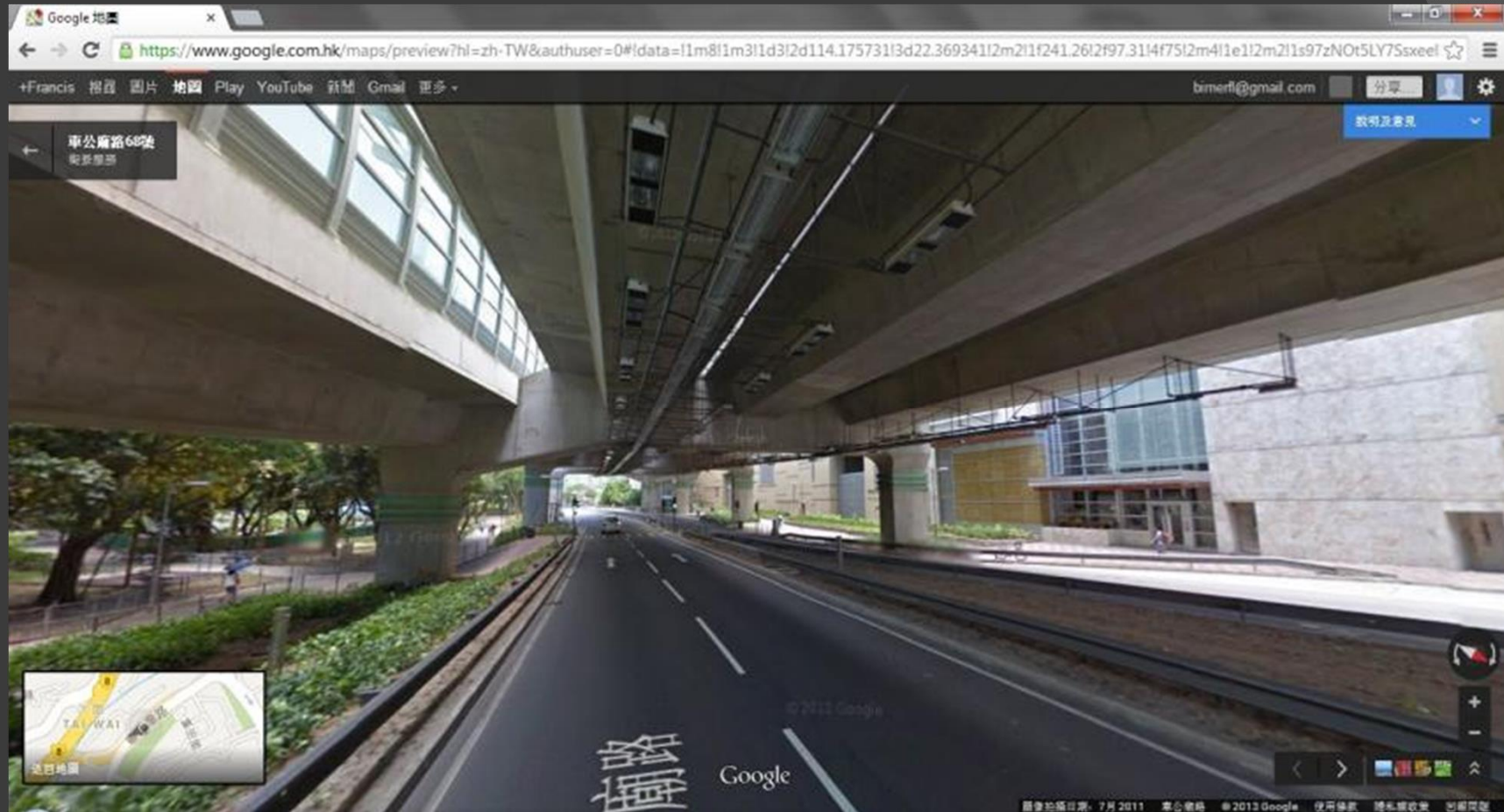


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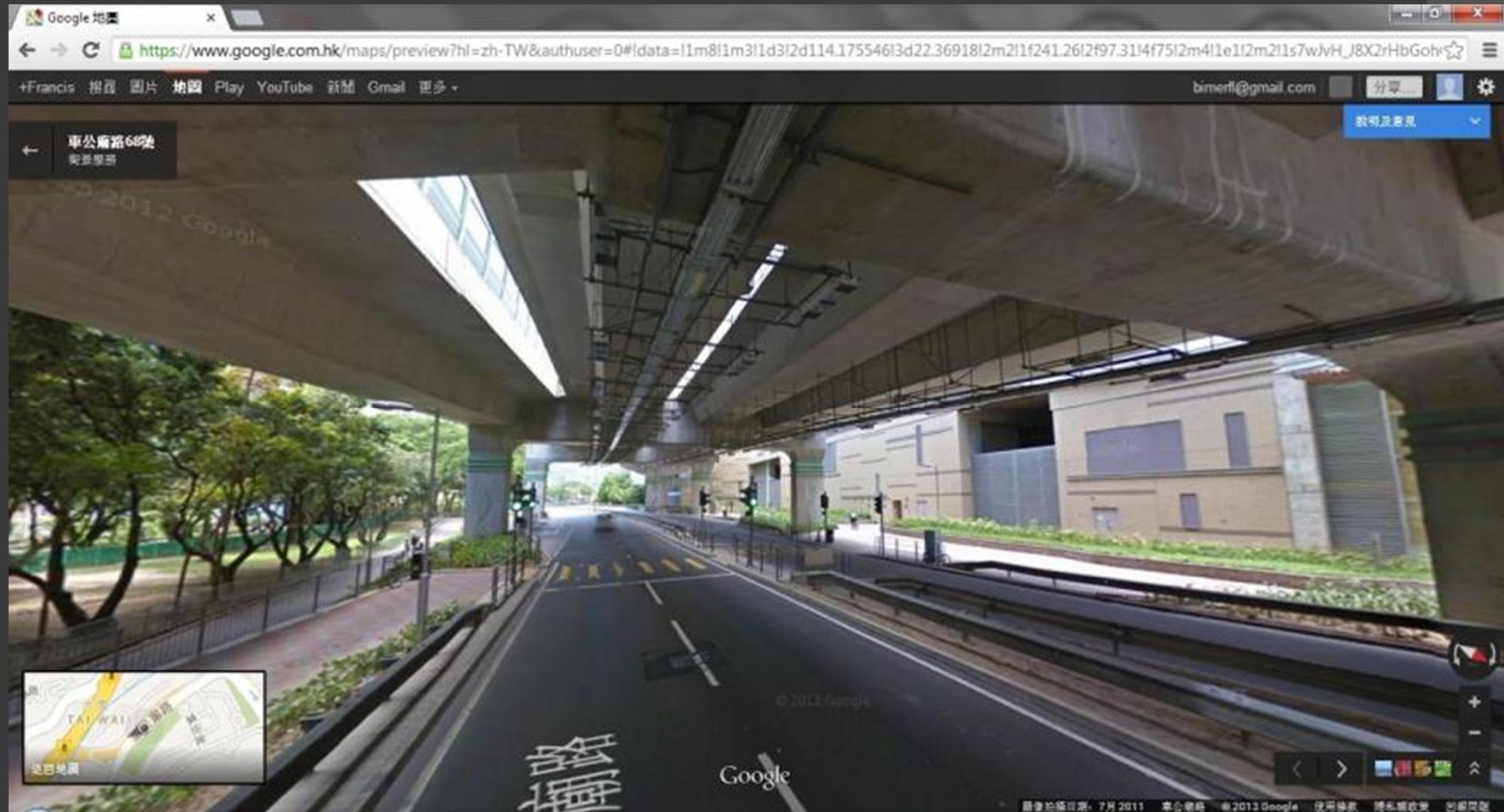


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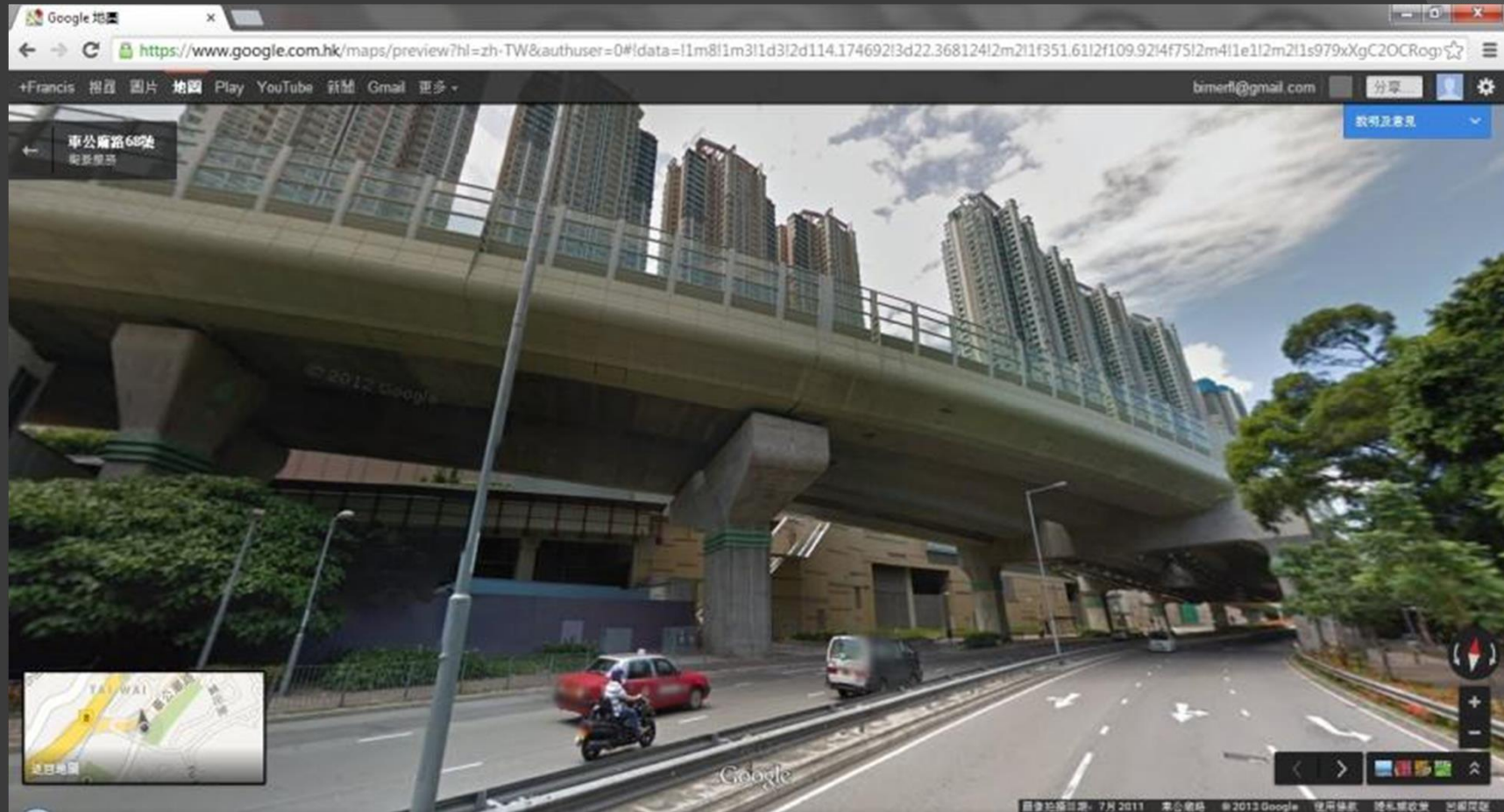
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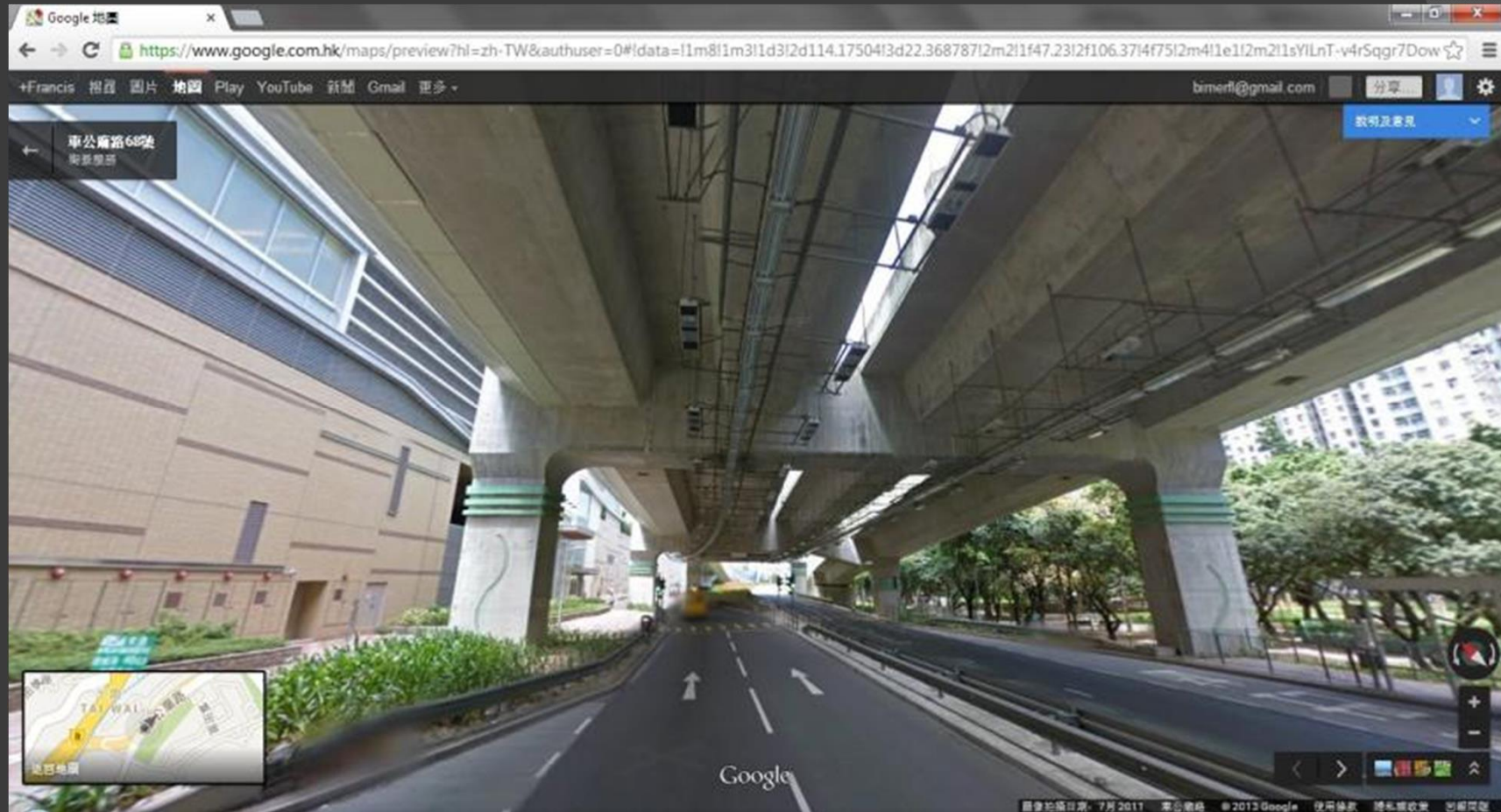
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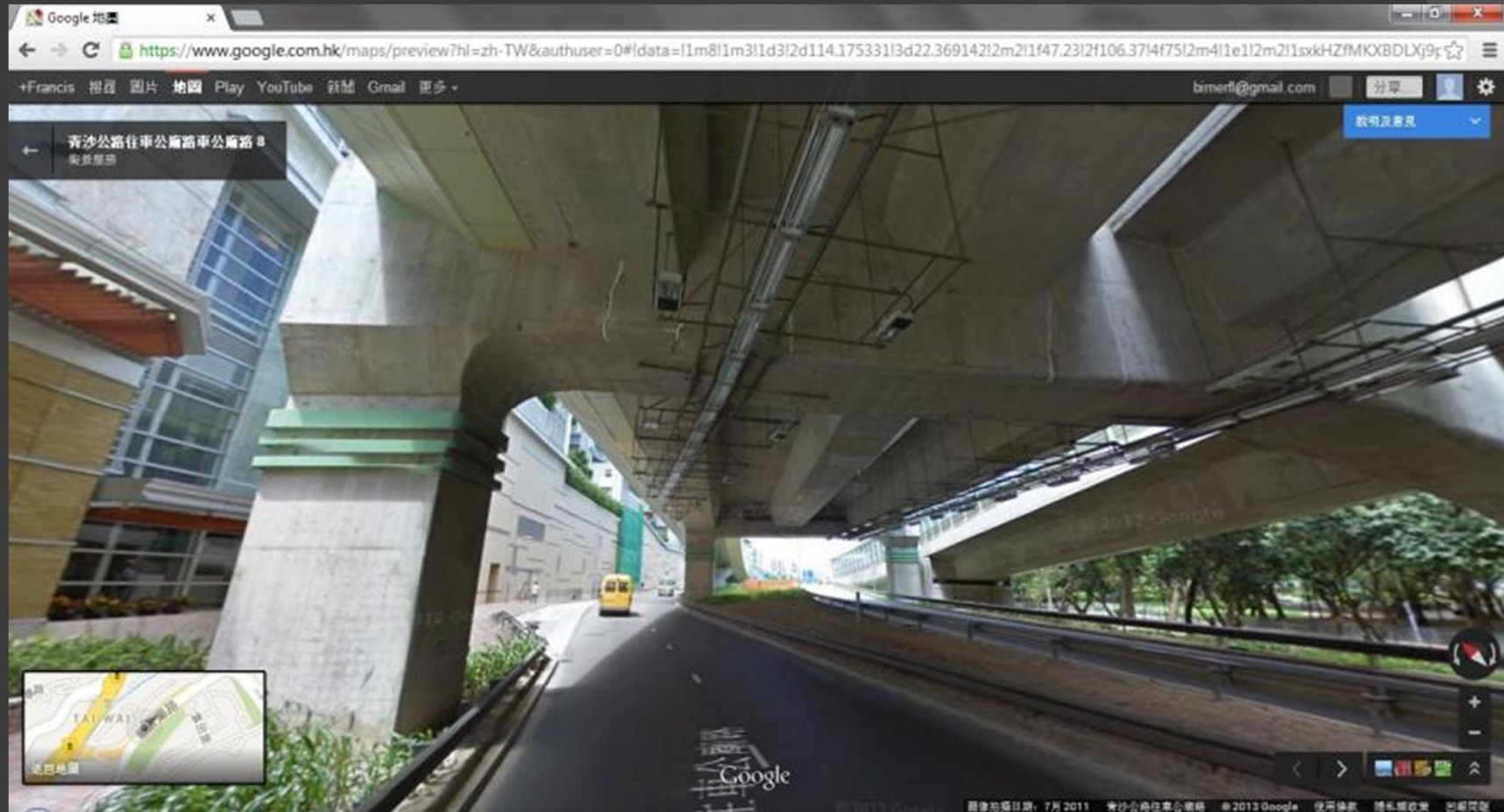
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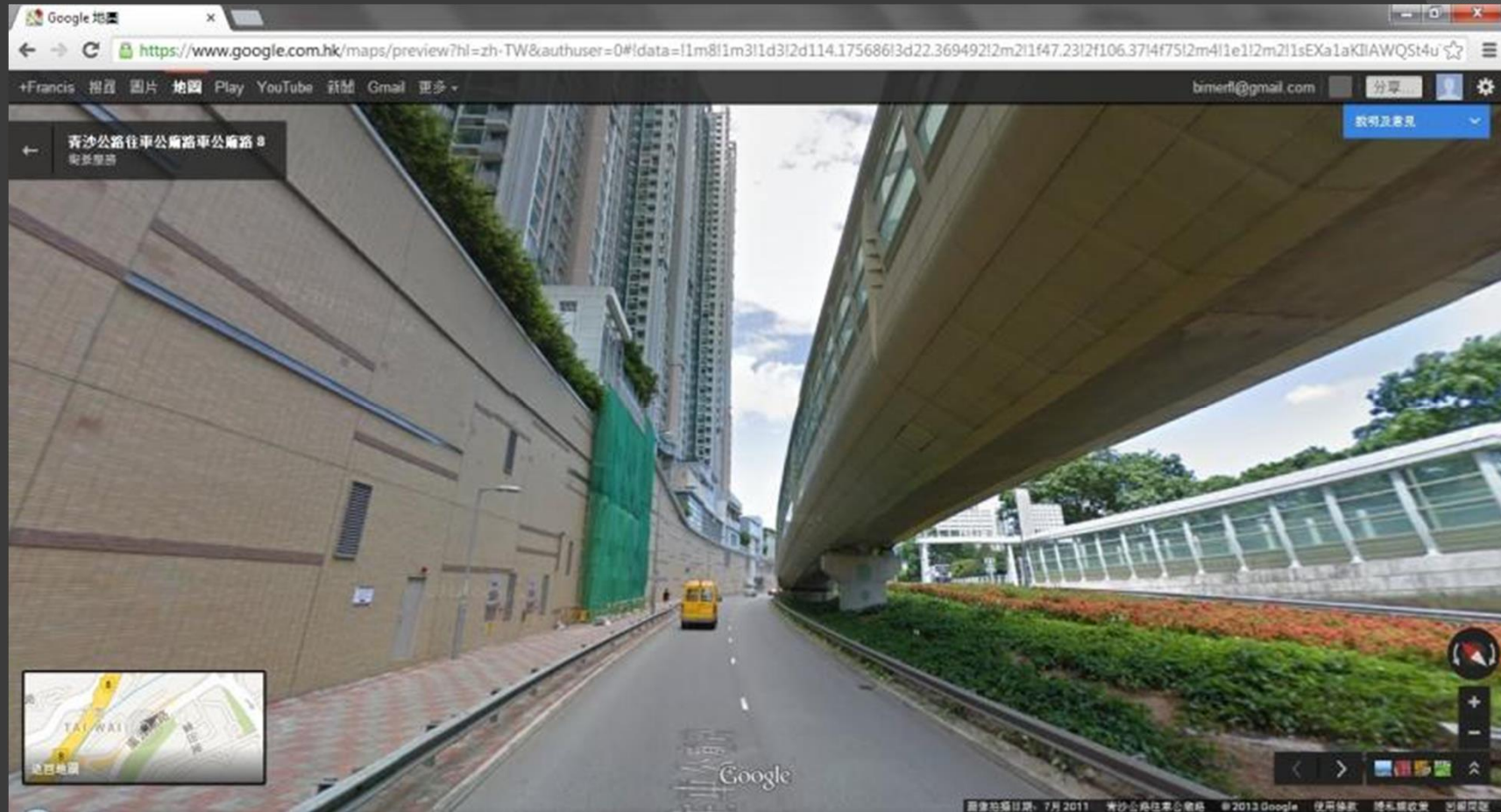
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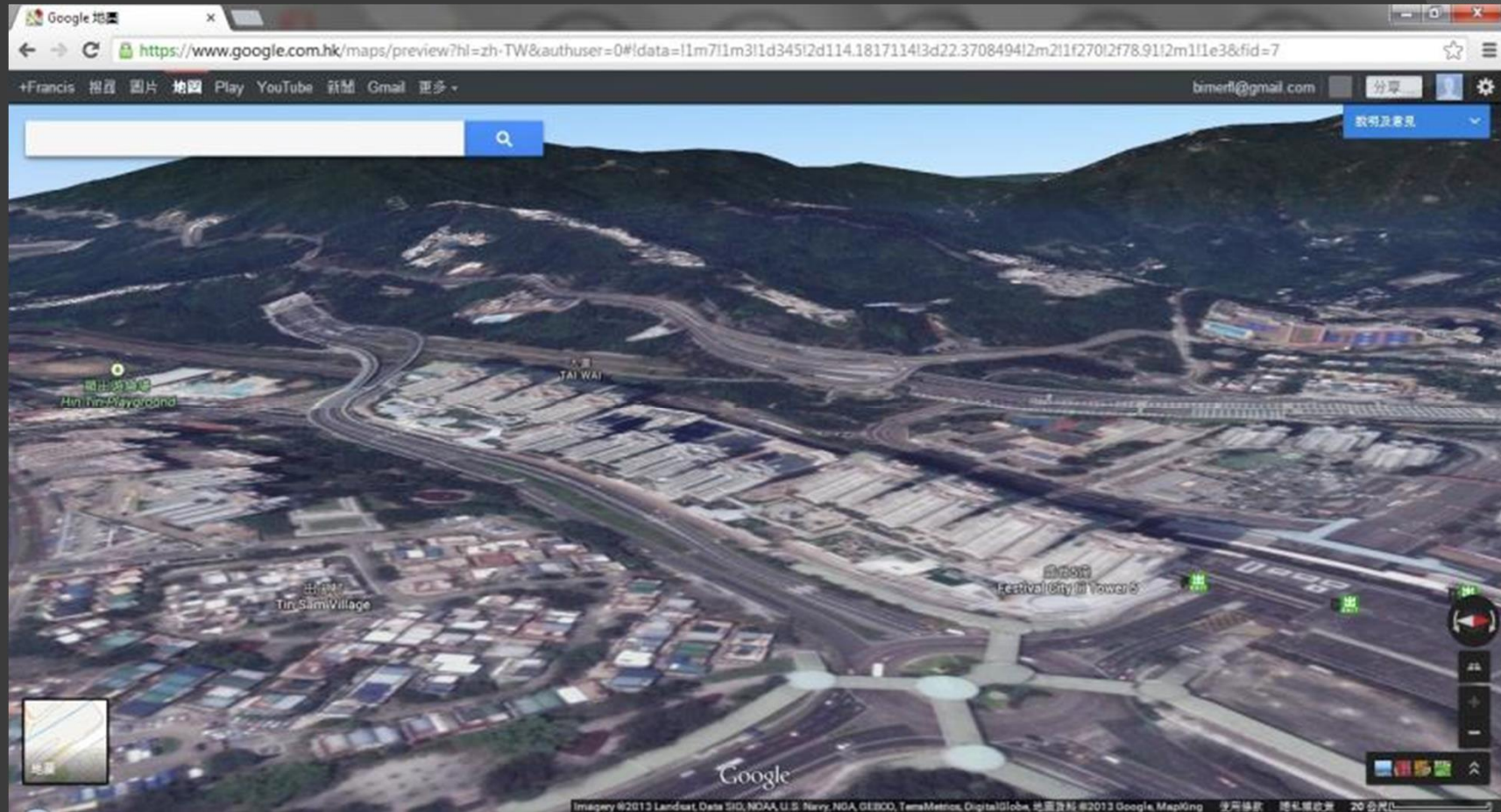
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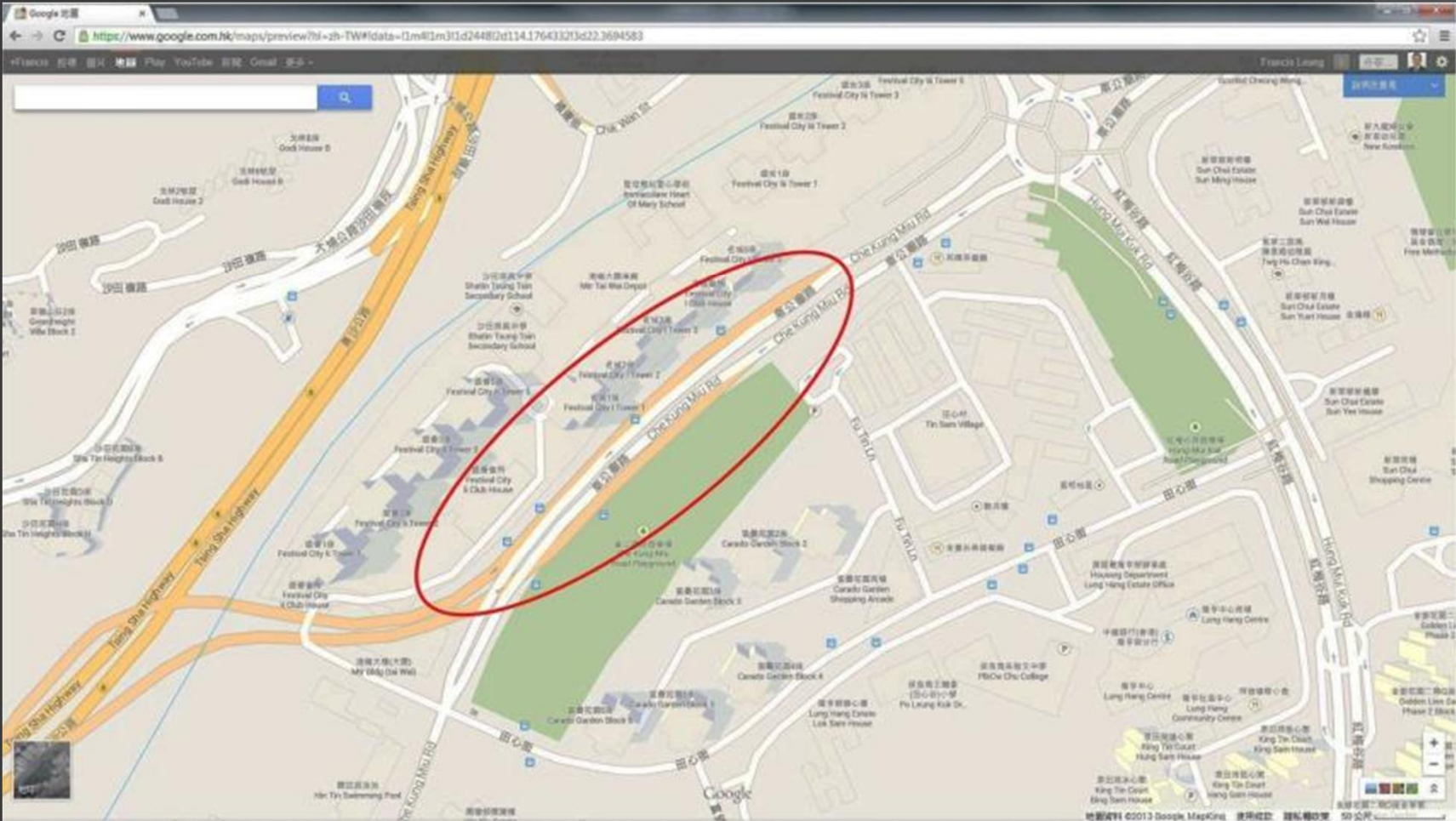


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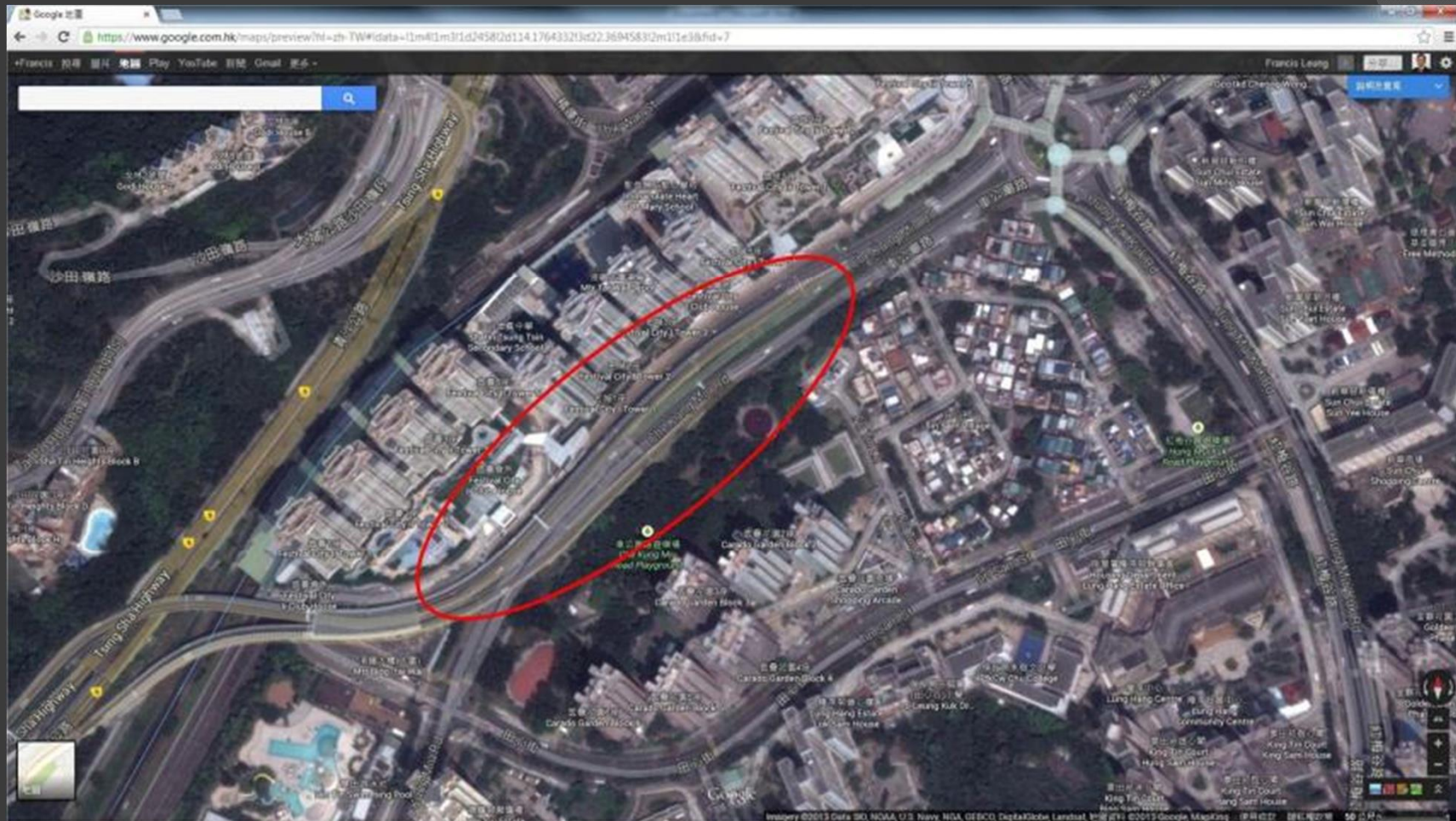
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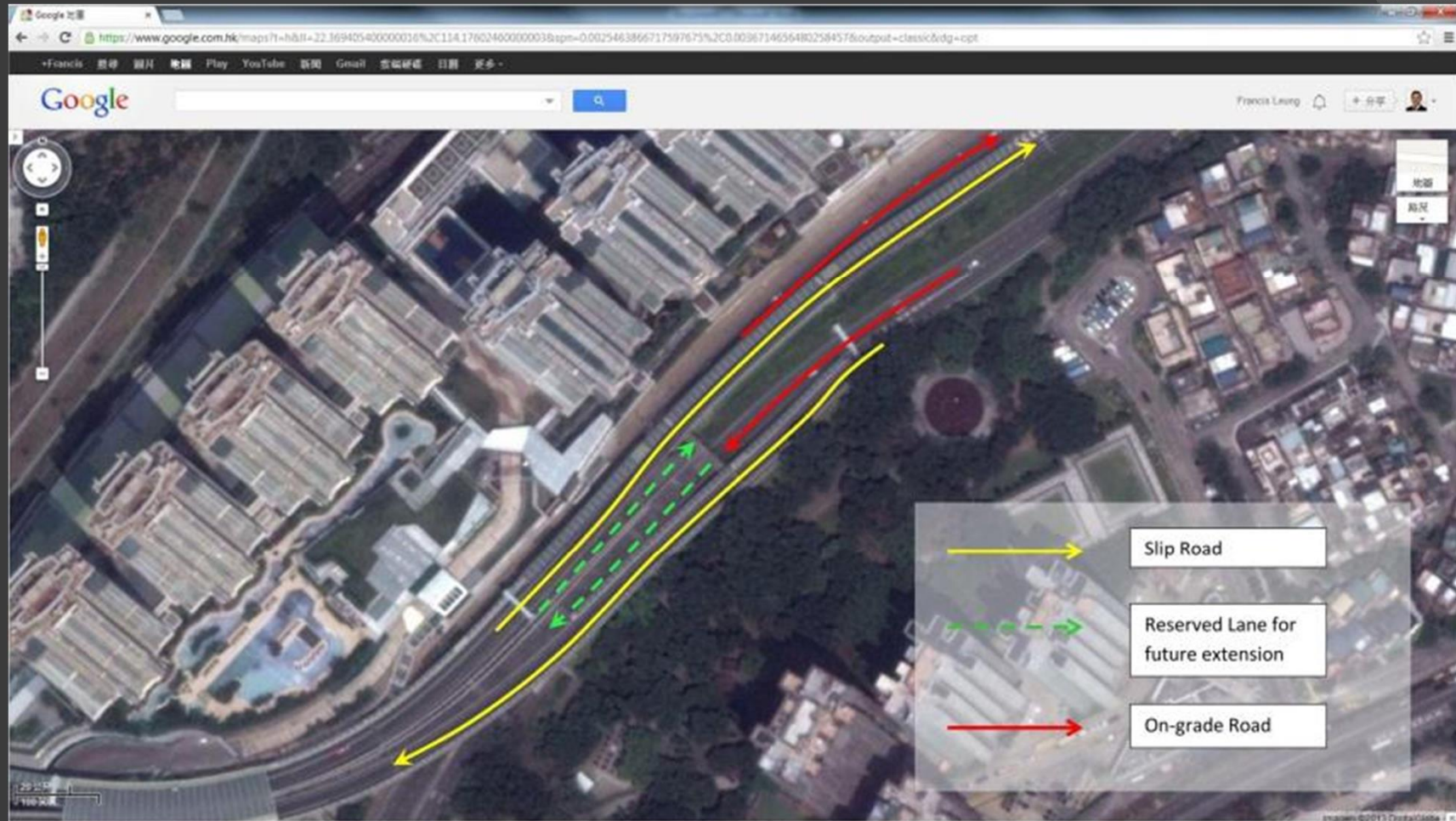
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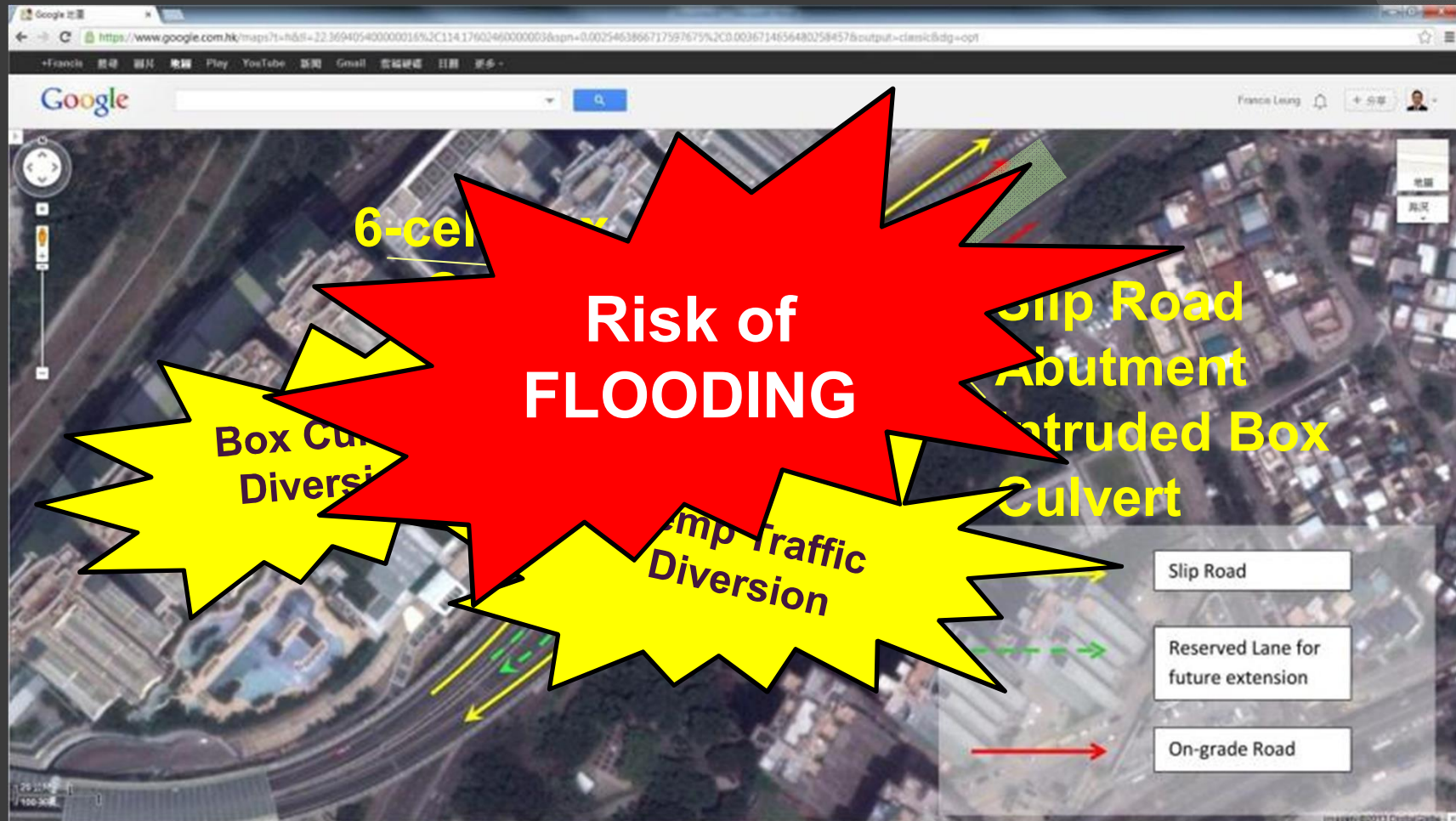
# Che Kung Miu Road as-built Alignment



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# Che Kung Miu Road **ORIGINAL** Alignment



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# RISK of FLOODING

蘋果日報

今日更新

## 路政署設計失誤 田心村慘變澤國

路政署設計失誤 田心村慘變澤國

即時新聞

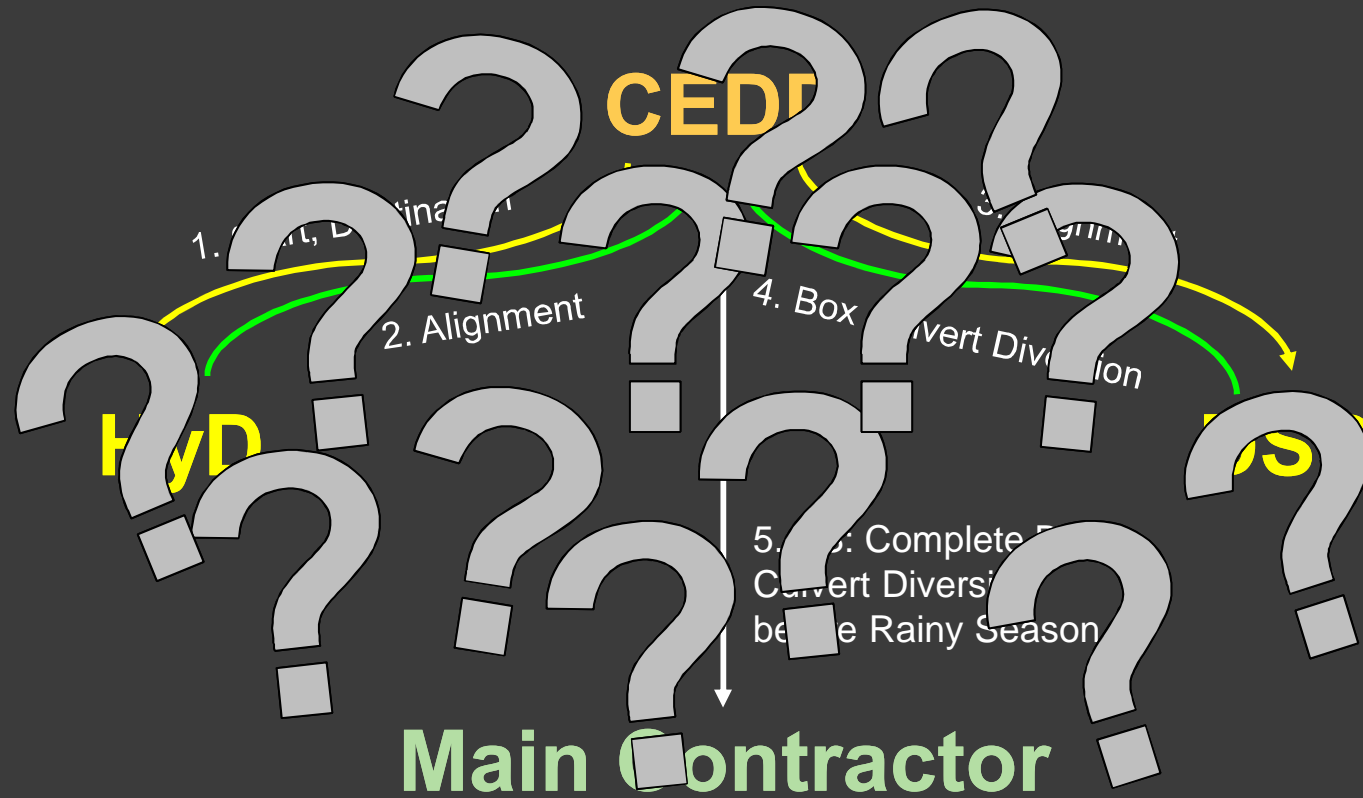
- 12:10pm 溫華少數族裔學生 感到時
- 11:55am 溫華少數族裔學生 感到時
- 11:22am 溫華少數族裔學生 感到時
- 11:00am 溫華少數族裔學生 感到時
- 10:30am 溫華少數族裔學生 感到時
- 10:15am 溫華少數族裔學生 感到時



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# The Workflow



When HyD works on the alignment, do they know there is a 6-cell Box Culvert?



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If they know there is a 6-cell Box Culvert,  
have they even thought of re-alignment?



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Or just leave it to downstream?



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How do they see VALUE of project?  
Best Alignment or Best Overall Value?



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How do Engineers see EXCELLENCE?  
Solution to solve complicated problem or  
NO PROBLEM?



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Can the alignment be revised?



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Is it because it takes too much effort and cause too much troubles so CANNOT be revised?



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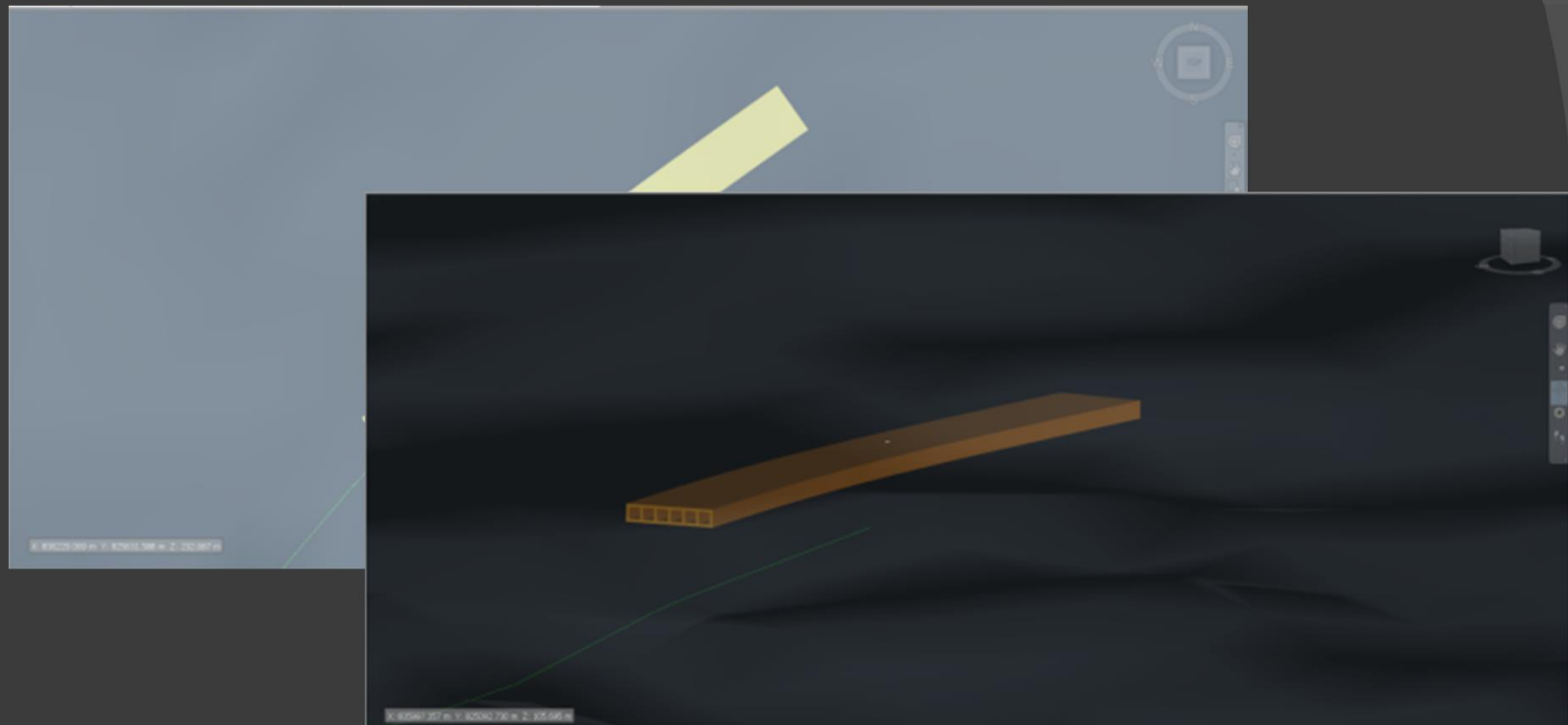
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# BIM Workflow



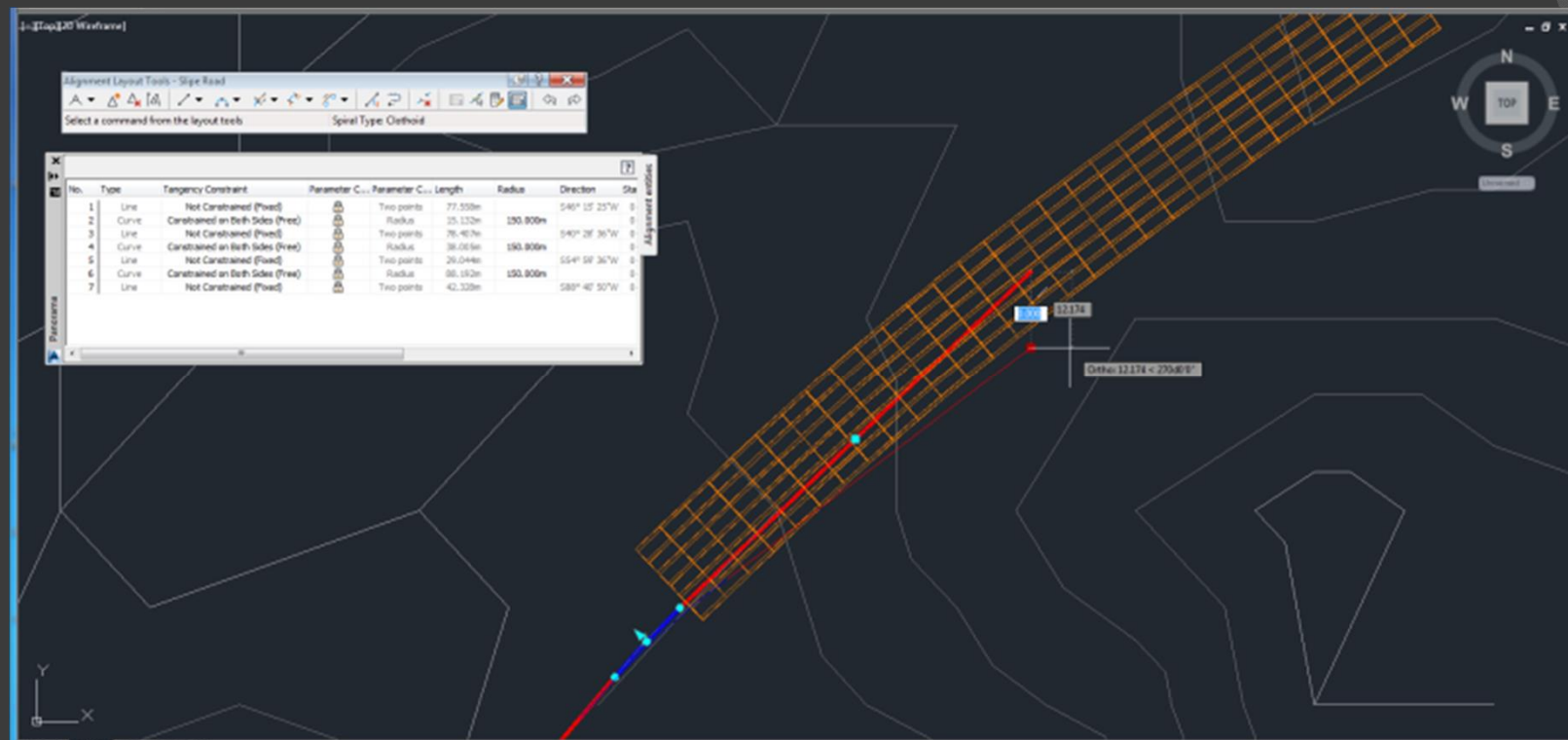
## BIM Workflow

- Before start working on the alignment, the 6-cell Box Culvert and all other site constraints are in the Information Model (IM)



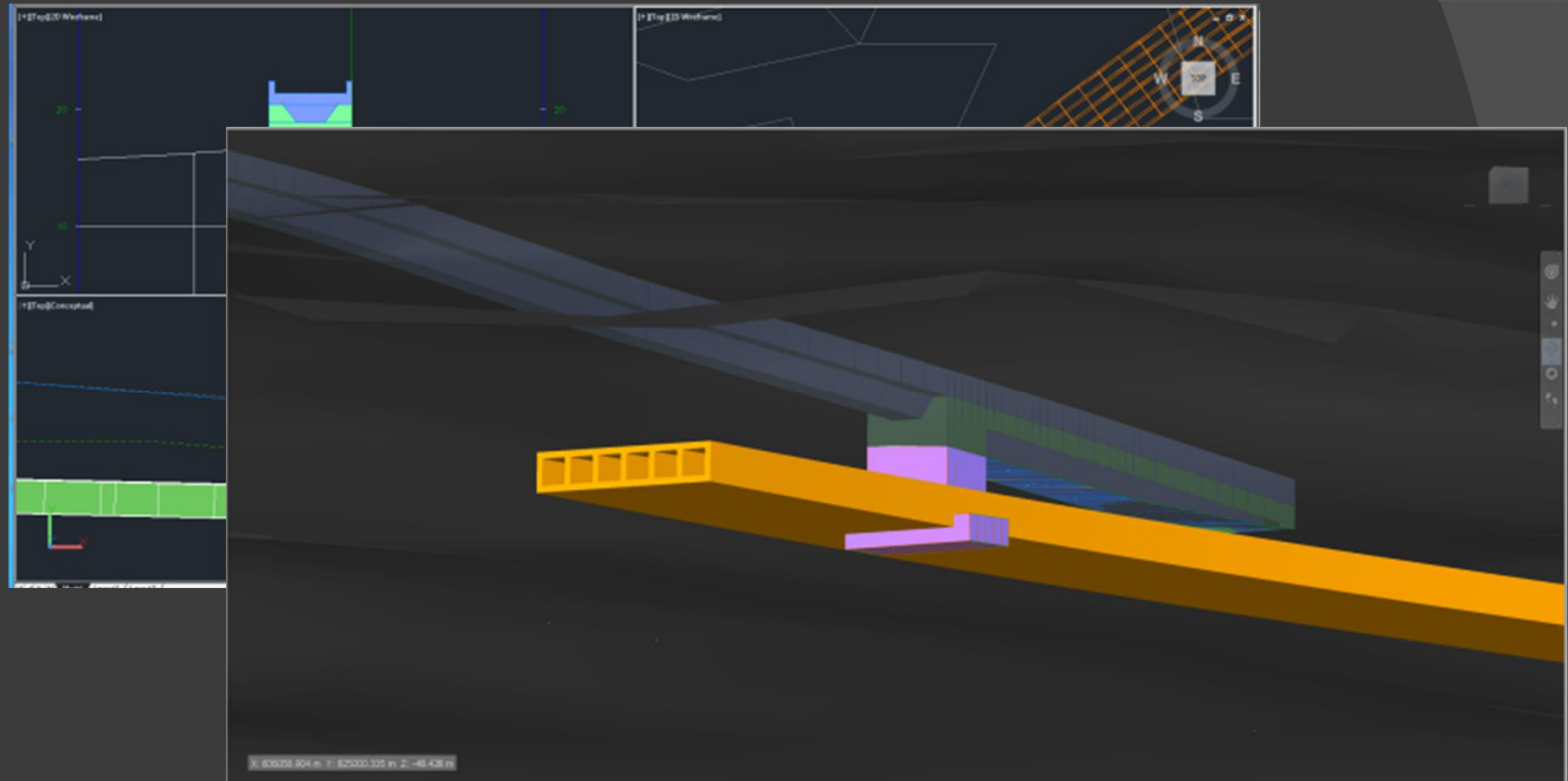
# BIM Workflow

- Alignment is easily built



# BIM Workflow

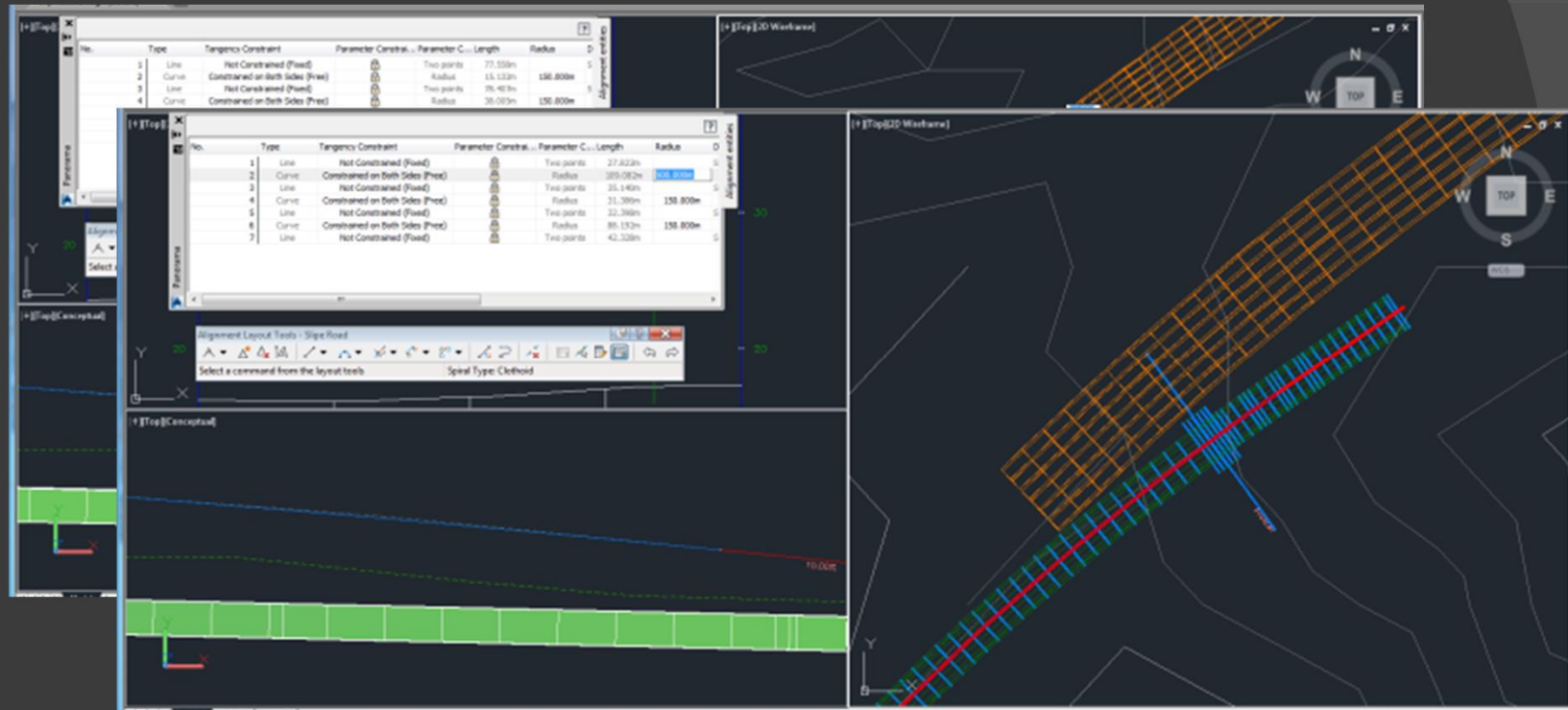
- Implication due to the alignment is immediately seen





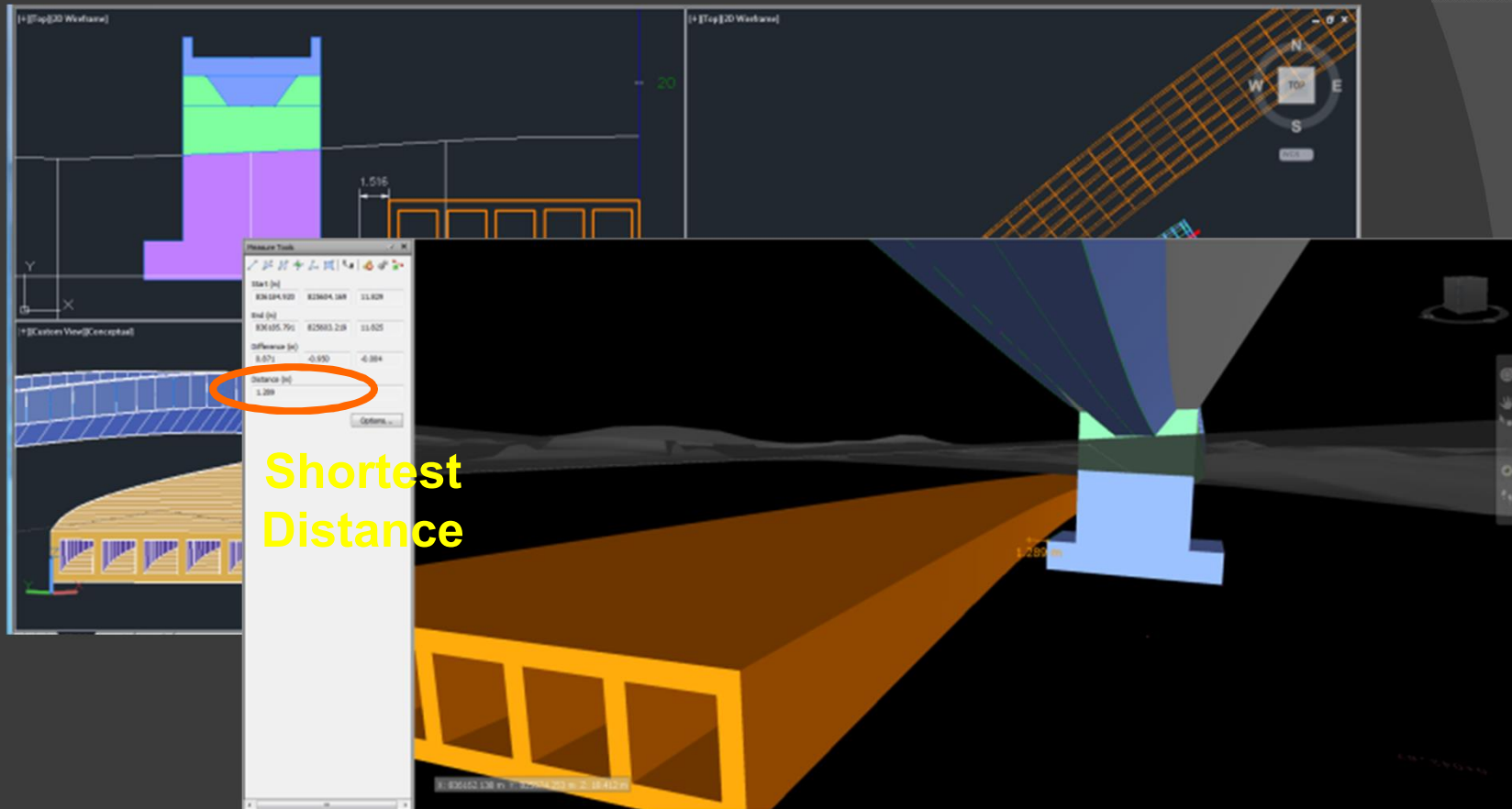
# BIM Workflow

- Options can be shown in parallel for comparison



# BIM Workflow

- Alignment can be revised with little effort



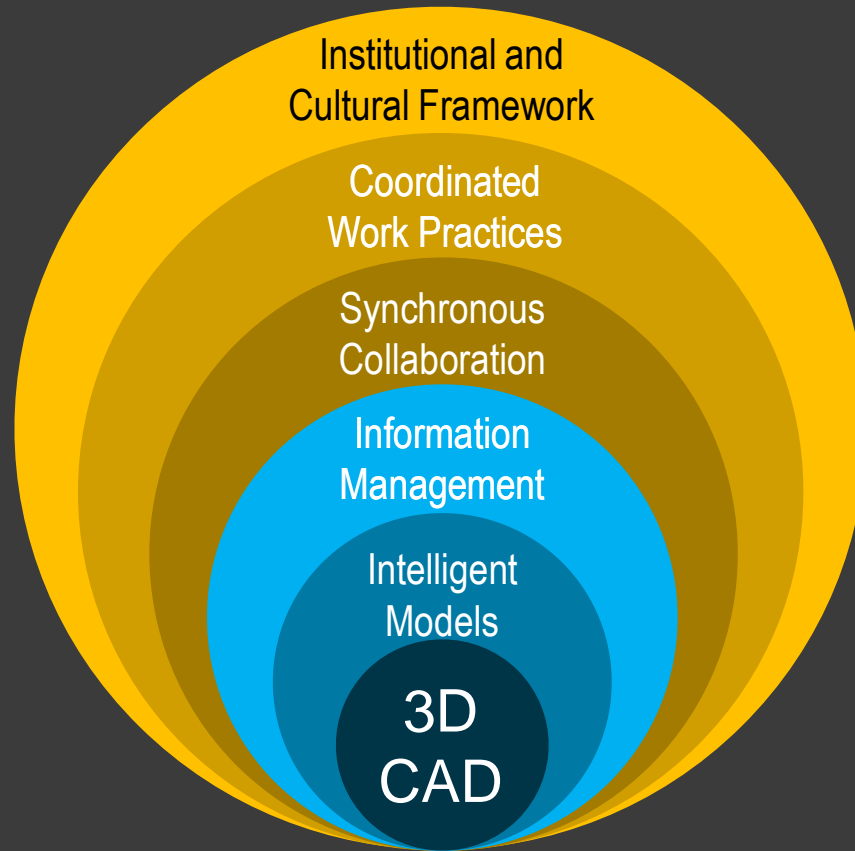
BIM is not about the model  
It is a process of  
**INTEGRATED DESIGN**



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# BIM Benefits



Accomplish non-technical Objectives

Minimise Risk / Reduce Risk

Modern Workflow

Enable Mastering of Information

Achieve Consistency / Accuracy

Enhance Efficiency / Practicality



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BIM contributes to ò

**P**lanning

**P**resentation

**T**rust



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# BUILDING INFORMATION MODELLING (BIM) AWARENESS SEMINAR

## Q&A