

BIM IMPLEMENTATION ALIGNED WITH INTERNATIONAL **BIM 19650 STANDARDS** FOR INFRASTRUCTURE & OTHER TYPES OF PROJECTS

USE CASE: **High Speed Railway Infrastructure** Project with Road Viaducts, and Highway ramps



Miltiadis Goudiras

AIDIGITS Projects Director (BIM)

“DAY ONE”

“MOMENT ONE”

”FRAMEWORK”

ISO 19650

3 main **levels** of

Information **MANAGEMENT**

aligned with ISO 19650

Agenda

01

ISO 19650-2 Appointed Parties Responsibilities.

02

AIDIGITS SOW - BIM deliverables



High Speed Railway Infrastructure Project with Road Viaducts, and Highway ramps

ISO 19650-2
Appointed Parties
responsibilities.

USE CASE: High Speed Railway Infrastructure Project with Road Viaducts, and Highway ramps

Appointed parties, Information Management Roles as per ISO 19650-2

B: Lead Appointed party

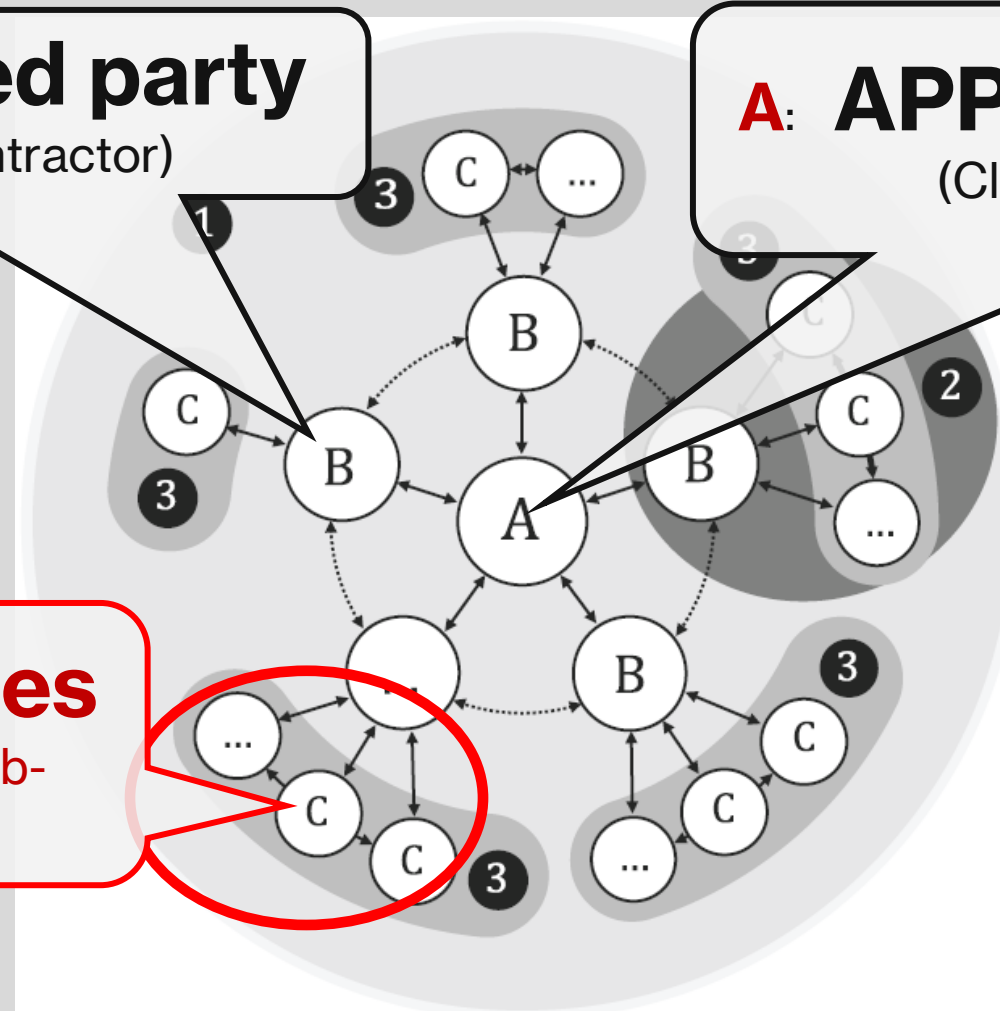
(Lead designer, Main contractor)

A: APPOINTING PARTY

(Client, Owner, Employer)

c: Appointed parties

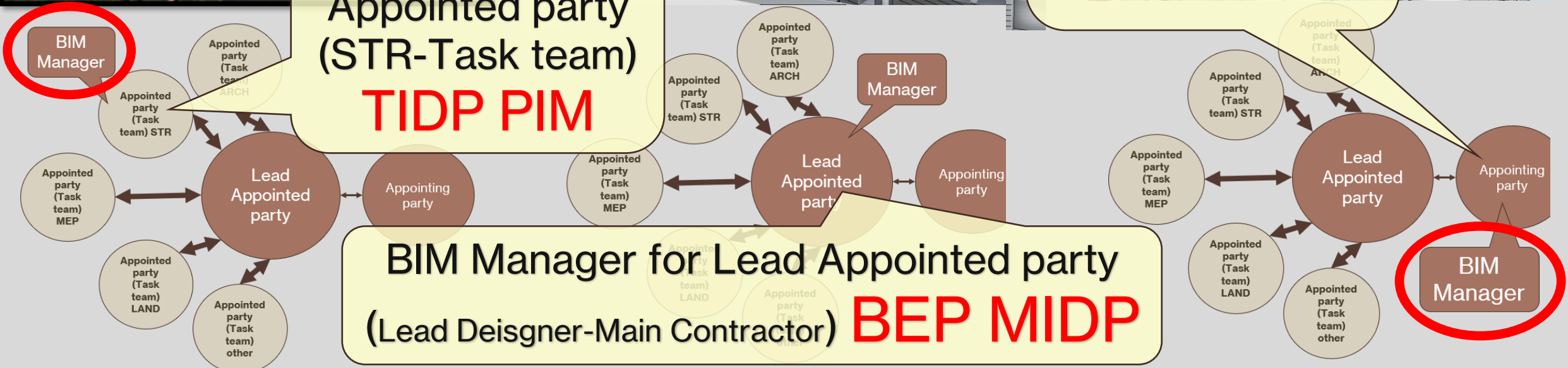
(Task teams, Design teams, sub-consultants, etc.)



From ISO 19650-2:2018 Fig.#2.

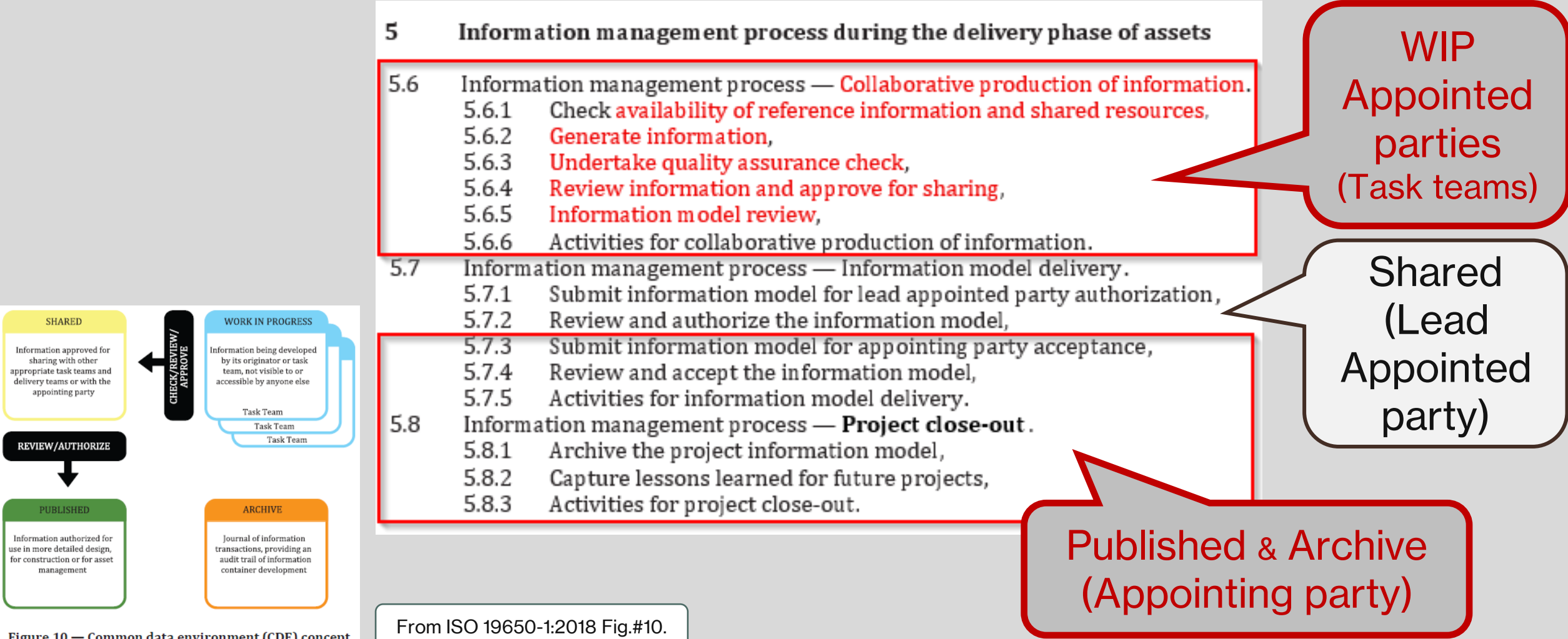
USE CASE: High Speed Railway Infrastructure Project with Road Viaducts, and Highway ramps

Appointed parties, Information Management Roles as per ISO 19650-2



USE CASE: High Speed Railway Infrastructure Project with Road Viaducts, and Highway ramps

Appointed parties, Information Management Roles as per ISO 19650-2





ISO 19650-2 par.5.6 Collaborative production of information; **each task team:**

1

- shall **NOT** generate information that: exceeds the required **LoIN**, **extends beyond** the allocated element of the information container breakdown structure, **duplicates** information generated by other task teams, or contains **superfluous** detail,

2

- **coordinate & cross-reference** all information with information shared within the project's CDE, in accordance with the project's information production methods and procedures; and,

3

- **spatially coordinate geometrical models** with other geometrical models shared with the appropriate suitability, residing within the project's CDE.



High Speed Railway Infrastructure Project with Road Viaducts, and Highway ramps

AIDIGITS SOW BIM Deliverables

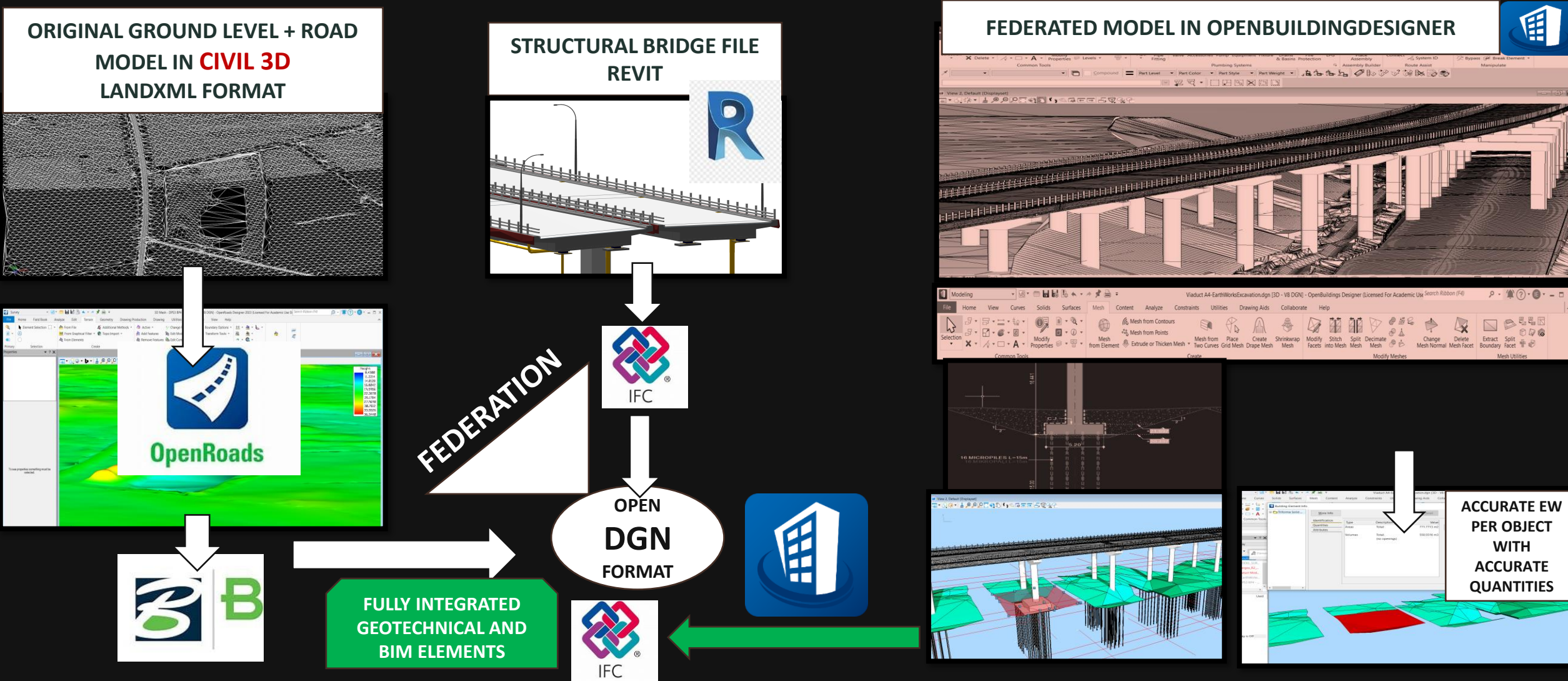
ISO-19650: BIM IMPLEMENTATION ALIGNED WITH INTERNATIONAL BIM 19650 STANDARDS FOR INFRASTRUCTURE & OTHER TYPES OF PROJECTS.

USE CASE: High Speed Railway Infrastructure Project with Road Viaducts, and Highway ramps



INTEROPERABILITY AND SYSTEMS INTEGRATION DIAGRAM

The **challenge of interoperability** between **geotechnical elements**; such as land and earthworks and **other facilities elements**, including buildings, bridges, and similar structures.



INTEROPERABILITY AND SYSTEM

The **challenge of interoperability** between **geotechnical elements** and **other facilities elements**, including buildings

An object-based earthworks (EW) **algorithm** has been developed (*based on the design earthworks guidelines, & the drawings*) and have been incorporated to include the **existing ground level** and the **bridge foundations**.

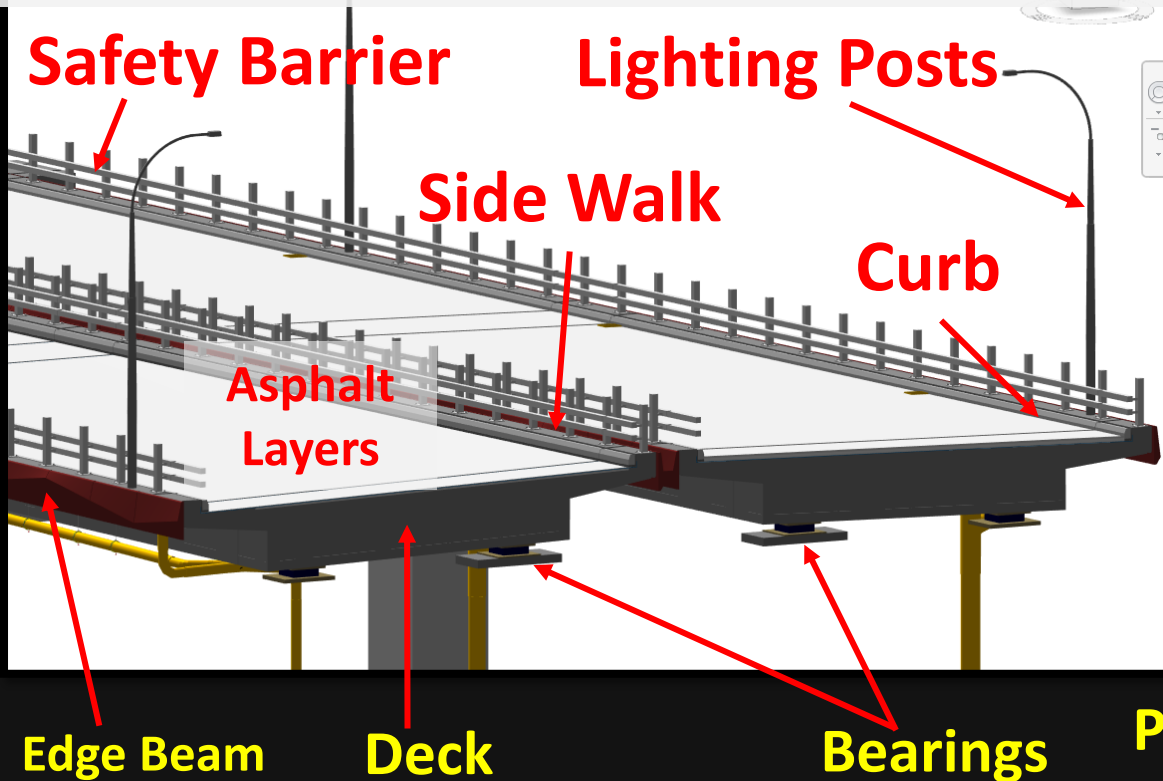
Object-based modelling of earthworks against structural elements and the existing ground level (EGL) using **OBD's strong generative mesh tools**, applying EW cut/fill slopes and guidelines.



SMART BIM PRODUCTION

The Modeling of the Viaduct super structure Decks on Revit, is a complicated process due to its **irregular geometry and many variables.**

We managed to customize **Parametric Adaptive Families** to represent the Deck with **ALL** its components (*Asphalt Layers, Curbs, Sidewalk, Safety Barriers, Noise Barriers, Edge Beams, Bearings, etc.*), considering the two directions variable slopes (*lengthwise and transversal*).



Constraints

Parameter	Value	Formula	Lock
Default Elevation	0.0000		

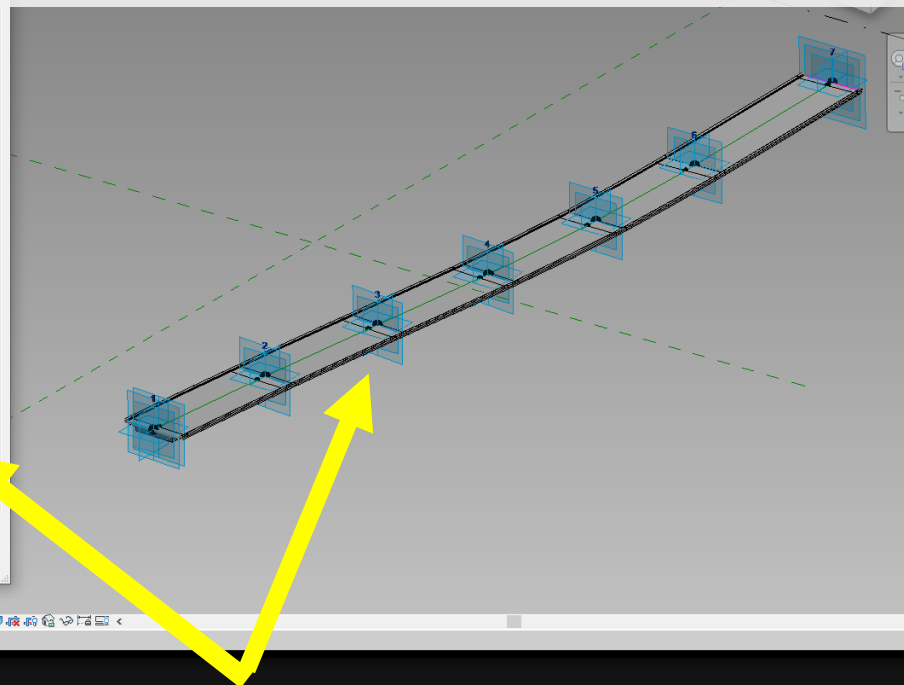
Dimensions

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Seg_L_5.2 (default)	124.0850		
Seg_L_6.1 (default)	126.4850		
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Seg_L_7 (default)	0.0000		

Identity Data

How do I manage family types?

OK Cancel Apply



Parametric Advanced Adaptive Family For the Deck

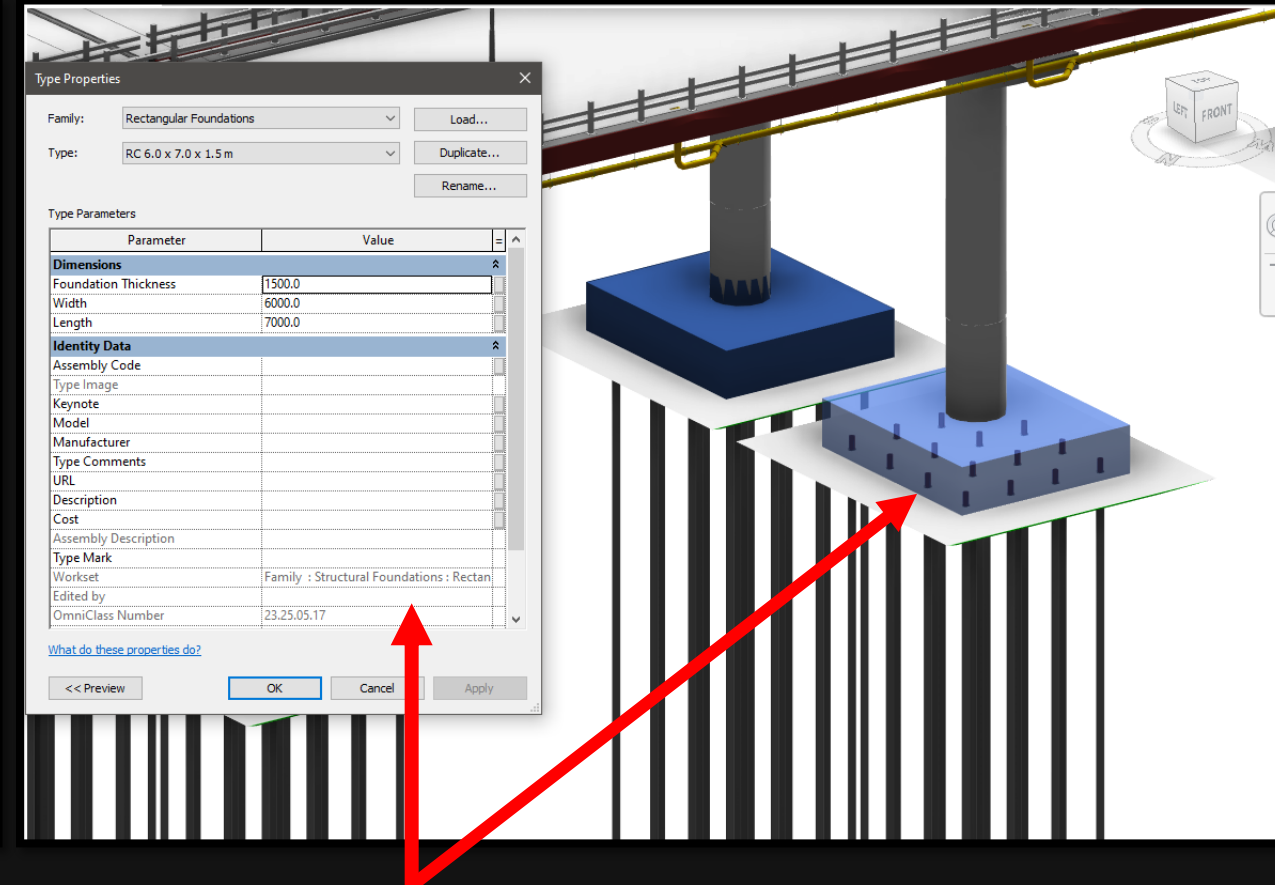
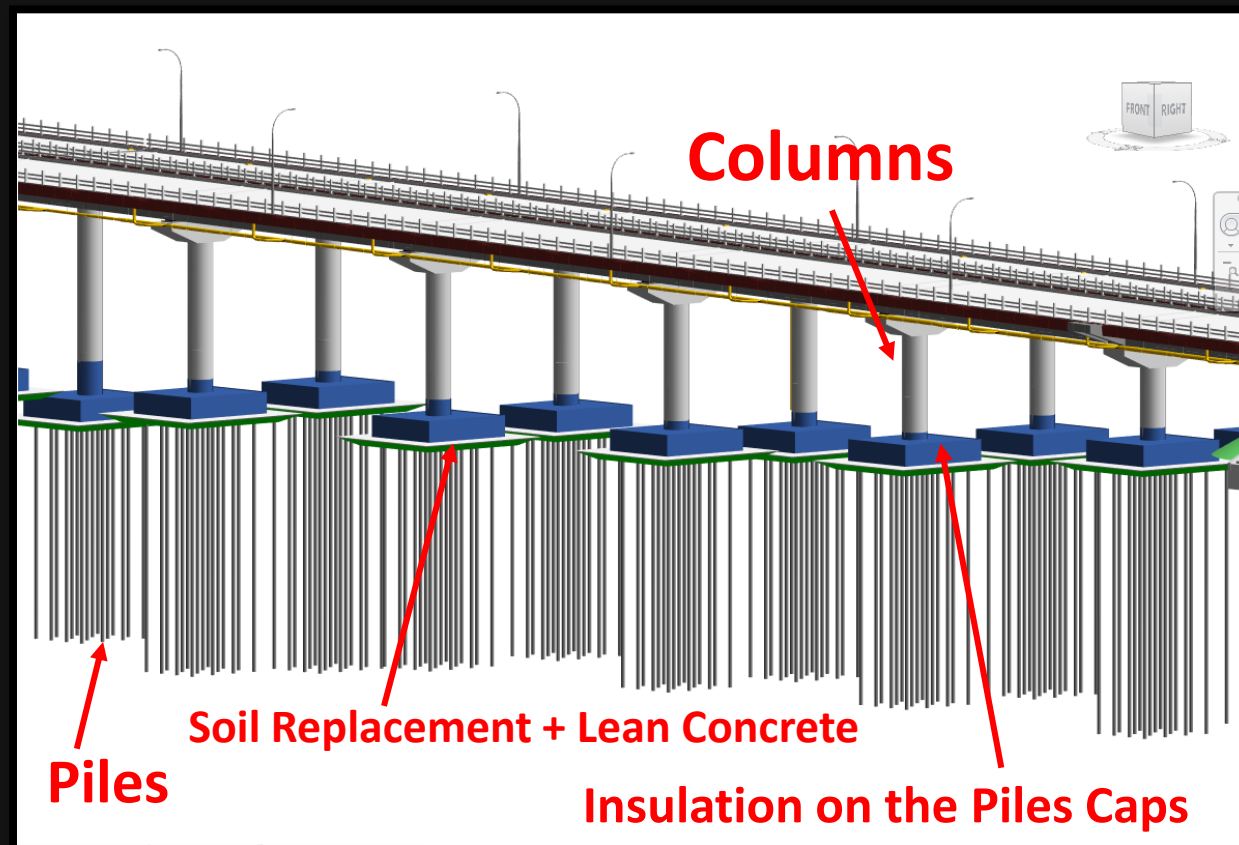
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SMART BIM PRODUCTION FOR SUB-STRUCTURES AND GEOTECHNICAL ELEMENTS

Customizing Parametric Families for the Modeling of the Viaduct sub-structure of the Piers including the Columns, Piles, Pile Caps, Foundation Insulation, Lean concrete & Soil Replacement under the footings.



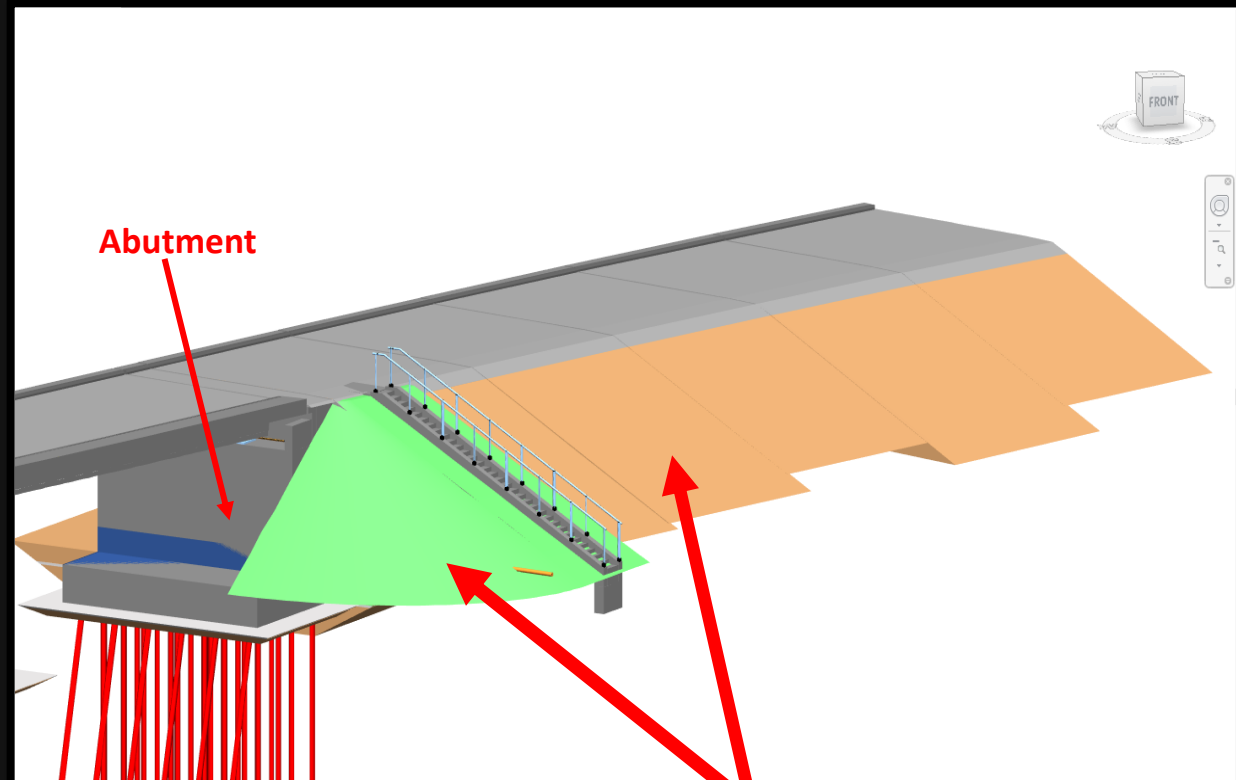
Parametric Family For the Footings

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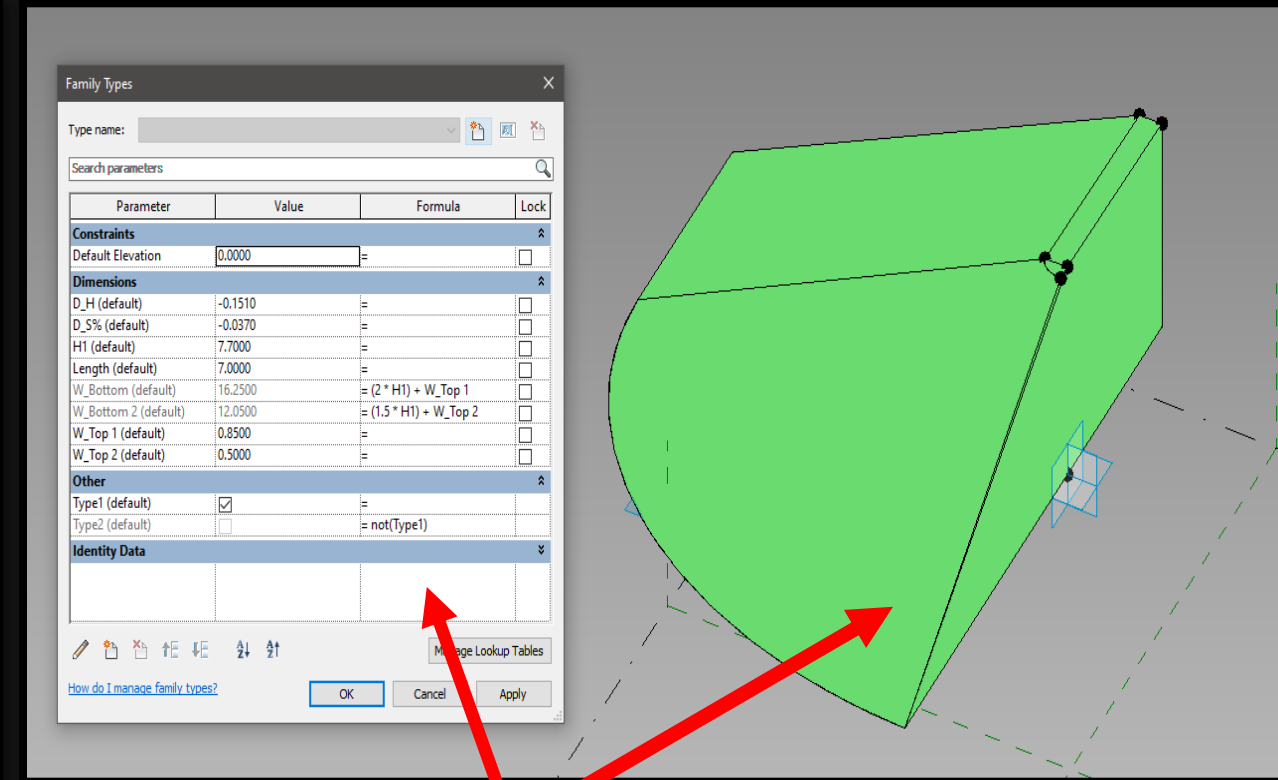
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Customizing **Parametric Adaptive Families** for the Modeling of the Embankments around the Abutments.



Embankment & Earthworks



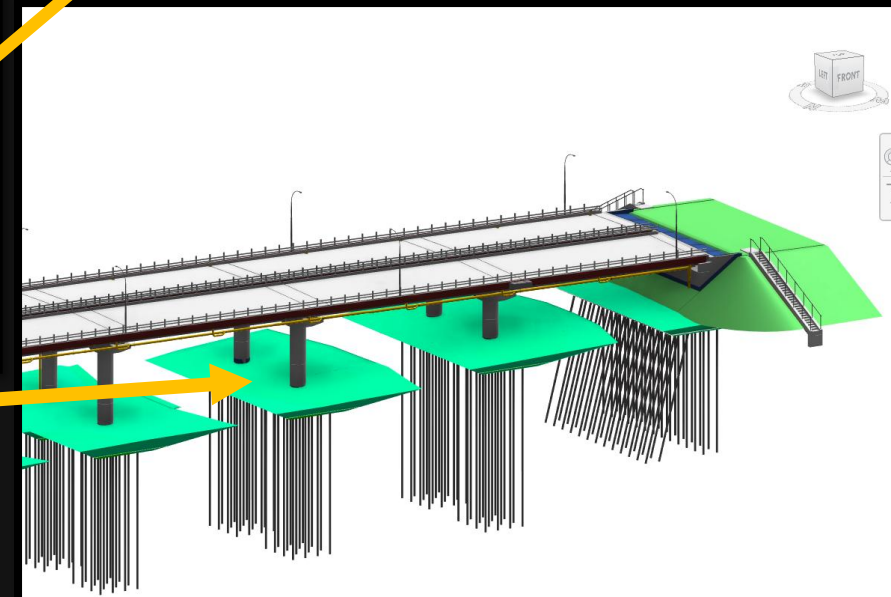
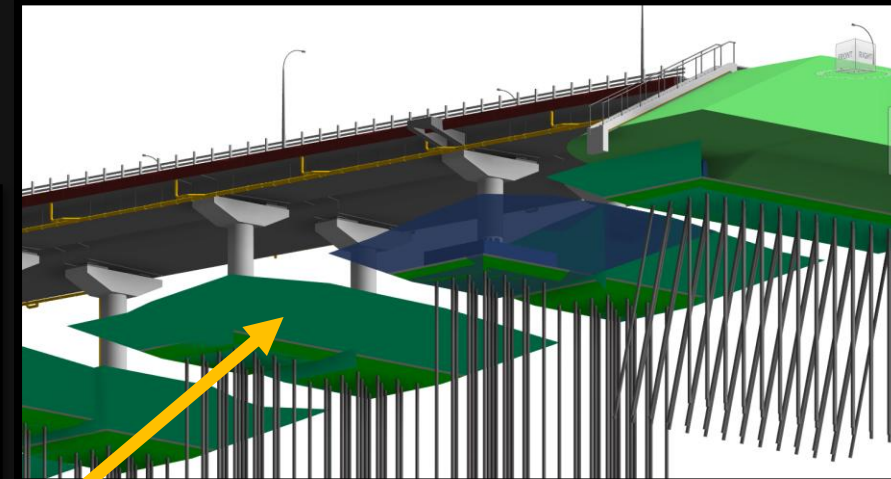
Parametric Adaptive Family

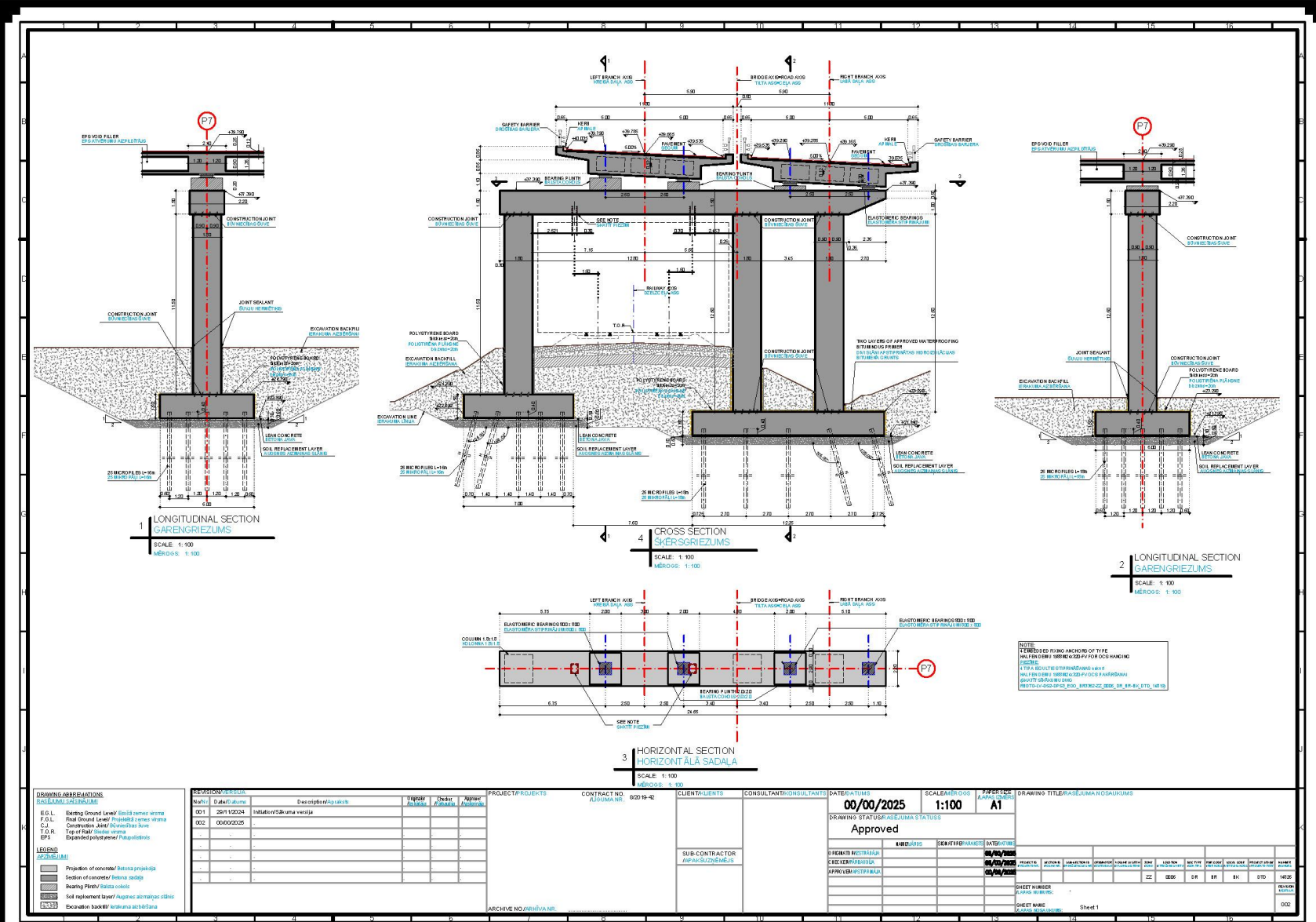
Modelling the **Excavation/ Backfill Volumes** on **Open Building Designer**, considering the non-uniform top surface of the Existing Ground Level (E.G.L)



Existing Ground Level (E.G.L)

Excavation Volumes





DRAWING ABBREVIATIONS			REVISIONS			PROJECT INFORMATION			CONTRACT NO.			CLIENT/CLIENTS			CONSULTANT/CONSULTANTS			DATE/TIME			SCALE/DATE			PAPER/TYPE			DRAWING TITLE/DESCRIPTION		
BASELINE/REVISION			DATE/DESCRIPTION			PROJECT/PROJECTS			APPROVAL			APPROVAL			APPROVAL			DATE/TIME			SCALE/DATE			PAPER/TYPE			DRAWING TITLE/DESCRIPTION		
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B.P.			069			00/00/2025			00/00/2025			00/00/2025			00/00/2025			00/00/2025			00/00/2025			00/00/2025			00/00/2025		
B.P.			070			00/00/2025			00/00/2025			00/00/2025			00/00/2025			00/00/2025			00/00/2025			00/00/2025			00/00/2025		
B.P.			071			00/00/2025			00/00/2025			00/00/2025			00/00/2025			00/00/2025			00/00/2025			00/00/2025			00/00/2025		
B.P.			072			00/00/2025			00/00/2025			00/00/2025			00/00/2025			00/00/2025			00/00/2025								

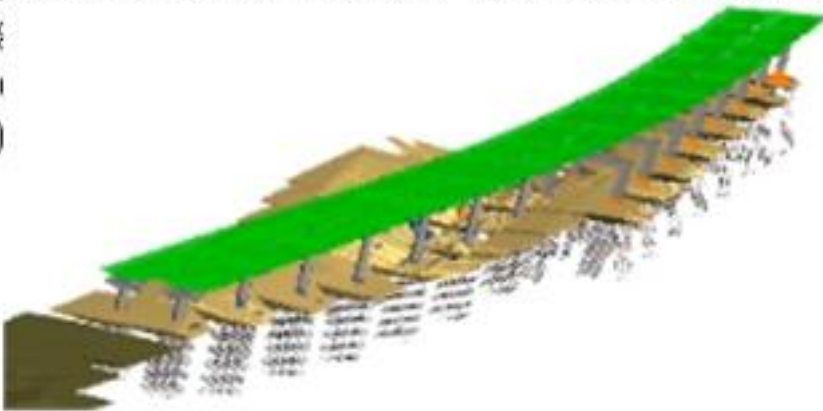
USE CASE: High Speed Railway Infrastructure Project with Road Viaducts, and Highway ramps

4D – Construction Sequence Simulation.

Friday 1:44:00 AM 7/11/2025 Day=66 Week=10
New Data Source (Root) [4%]
1.1.2-Micropiles - (1.1.2-Micropiles) [Construct 63%]



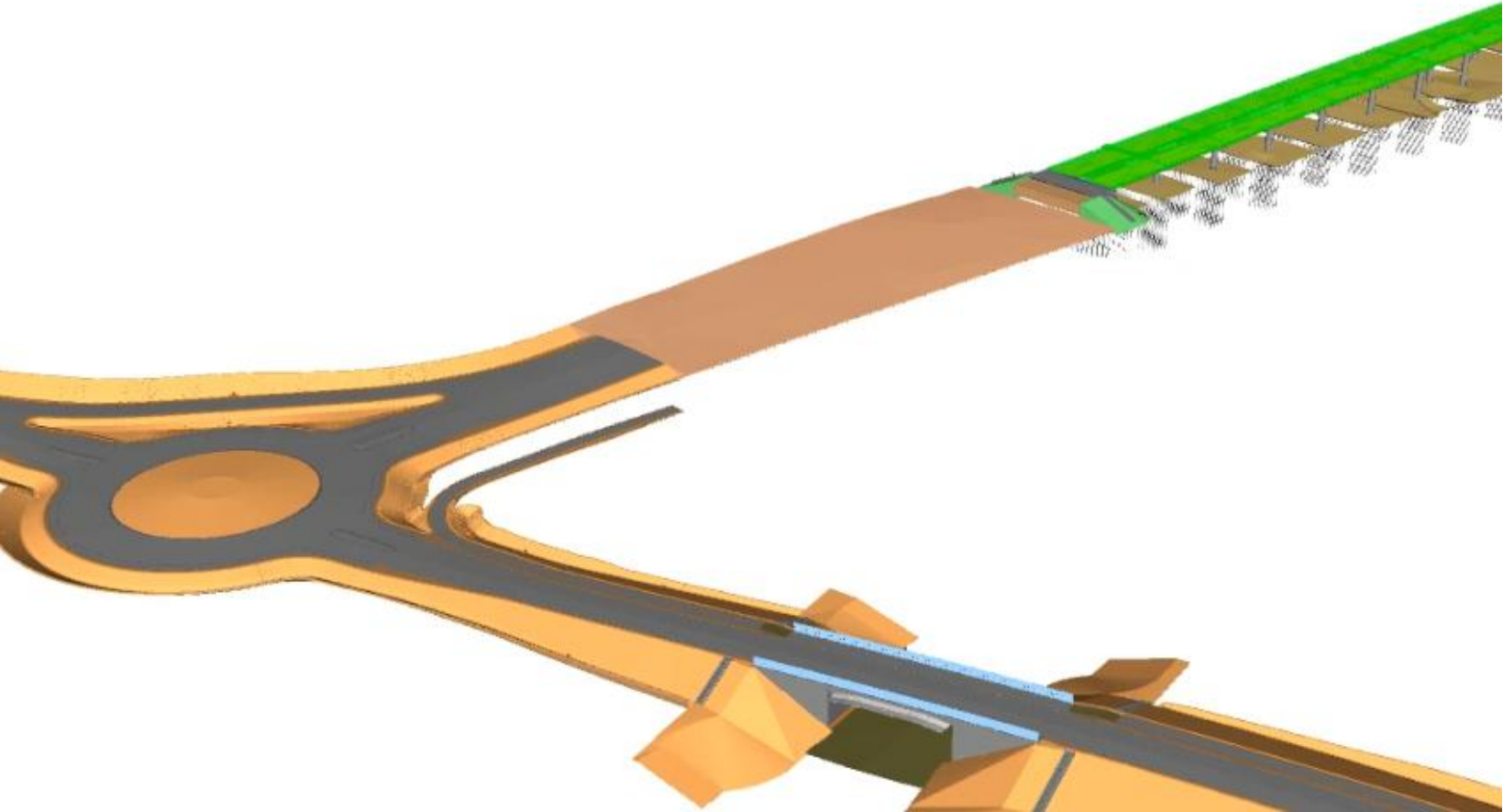
Friday 11:20:00 AM 8/28/2025 Day=479 Week=69
New Data Source (Root) [34%]
1.1.10-EPS Fillers - (1.1.10-EPS Fillers) [Construct 2%]
1.1.10-Deck- upper slab and webs - (1.1.10-Deck- upper slab and webs) [Construct 2%]
1.1.10-Cable ducts inside deck - (1.1.10-Cable ducts inside deck)
1.1.10-Manhole cable ducts - (1.1.10-Manhole cable ducts)
1.1.10-Drainage scuppers - (1.1.10-Drainage scuppers)



USE CASE: High Speed Railway Infrastructure Project with Road Viaducts, and Highway ramps

Thursday 8:32:00 PM 10/5/2023 Day=1248 Week=179
New Data Source (Root) [90%]
1.3.73-Deck- upper slab and webs - (1.3.73-Deck- upper slab and webs) [Construct 48%]
1.3.73-Cable ducts inside deck - (1.3.73-Cable ducts inside deck) [Construct 48%]
1.3.73-Manhole cable ducts - (1.3.73-Manhole cable ducts) [Construct 48%]
1.3.73-Drainage scuppers - (1.3.73-Drainage scuppers) [Construct 48%]

4D – Construction Sequence Simulation.



BIM360

Quantity Extraction (QEX) X

<Quantity Extraction (QEX)>

A	B	C	D	E	F	G	H	I	J	K	L
RBR Discipline Code	RBR Vol/Spz/Zone	RBR Location	RBR functional Classification	RBR Object ID	RBR LoG	RBR Lot	RBR OCC	RBR Pr Code	RBR Product Description	RBR Units	Quantity
STR	BR3362	0022	CV-BR-VDCT-RD	STR-PIR-2258188	400	400	303	Sa_20_50_20_70	Concrete C35/45, Pier elev	Cubic metre (m3)	9.72 m³
STR	BR3362	0022	CV-BR-VDCT-RD	STR-PIR-2289937	400	400	303	Sa_20_50_20_70	Concrete C35/45, Pier elev	Cubic metre (m3)	62.70 m³
STR	BR3362	0022	CV-BR-VDCT-RD	STR-PIR-2294681	400	400	303	Sa_20_50_20_70	Concrete C35/45, Pier elev	Cubic metre (m3)	18.59 m³
STR	BR3362	0022	CV-BR-VDCT-RD	STR-PIR-2295031	400	400	303	Sa_20_50_20_70	Concrete C35/45, Pier elev	Cubic metre (m3)	18.59 m³
STR	BR3362	0022	CV-BR-VDCT-RD	STR-PIR-2295032	400	400	303	Sa_20_50_20_70	Concrete C35/45, Pier elev	Cubic metre (m3)	18.59 m³
STR	BR3362	0022	CV-BR-VDCT-RD	STR-PIR-5550202	400	400	303	Sa_20_50_20_70	Concrete C35/45, Pier elev	Cubic metre (m3)	22.82 m³
STR	BR3362	0022	CV-BR-VDCT-RD	STR-PIR-5634320	400	400	303	Sa_20_50_20_70	Concrete C35/45, Pier elev	Cubic metre (m3)	22.82 m³
STR	BR3362	0022	CV-BR-VDCT-RD	STR-PIR-5776022	400	400	303	Sa_20_50_20_70	Concrete C35/45, Pier elev	Cubic metre (m3)	9.72 m³
STR	BR3362	0022	CV-BR-VDCT-RD	STR-PIR-5776864	400	400	303	Sa_20_50_20_70	Concrete C35/45, Pier elev	Cubic metre (m3)	9.72 m³
STR	BR3362	0022	CV-BR-VDCT-RD	STR-PIR-5777093	400	400	303	Sa_20_50_20_70	Concrete C35/45, Pier elev	Cubic metre (m3)	9.72 m³
STR	BR3362	0022	CV-BR-VDCT-RD	STR-PIR-5779011	400	400	303	Sa_20_50_20_70	Concrete C35/45, Pier elev	Cubic metre (m3)	61.11 m³
STR	BR3362	0022	CV-BR-VDCT-RD	STR-PIR-5779016	400	400	303	Sa_20_50_20_70	Concrete C35/45, Pier elev	Cubic metre (m3)	9.72 m³
STR	BR3362	0022	CV-BR-VDCT-RD	STR-PIR-5779018	400	400	303	Sa_20_50_20_70	Concrete C35/45, Pier elev	Cubic metre (m3)	9.72 m³
STR	BR3362	0022	CV-BR-VDCT-RD	STR-PIR-5779628	400	400	303	Sa_20_50_20_70	Concrete C35/45, Pier elev	Cubic metre (m3)	15.12 m³
STR	BR3362	0022	CV-BR-VDCT-RD	STR-PIR-5779534	400	400	303	Sa_20_50_20_70	Concrete C35/45, Pier elev	Cubic metre (m3)	79.45 m³
STR	BR3362	0022	CV-BR-VDCT-RD	STR-PIR-5779832	400	400	303	Sa_20_50_20_70	Concrete C35/45, Pier elev	Cubic metre (m3)	24.84 m³
STR	BR3362	0022	CV-BR-VDCT-RD	STR-PIR-5779834	400	400	303	Sa_20_50_20_70	Concrete C35/45, Pier elev	Cubic metre (m3)	9.72 m³
STR	BR3362	0022	CV-BR-VDCT-RD	STR-PIR-5779840	400	400	303	Sa_20_50_20_70	Concrete C35/45, Pier elev	Cubic metre (m3)	70.68 m³
STR	BR3362	0022	CV-BR-VDCT-RD	STR-PIR-5780597	400	400	303	Sa_20_50_20_70	Concrete C35/45, Pier elev	Cubic metre (m3)	9.72 m³
STR	BR3362	0022	CV-BR-VDCT-RD	STR-PIR-5780603	400	400	303	Sa_20_50_20_70	Concrete C35/45, Pier elev	Cubic metre (m3)	78.76 m³
STR	BR3362	0022	CV-BR-VDCT-RD	STR-PIR-5781501	400	400	303	Sa_20_50_20_70	Concrete C35/45, Pier elev	Cubic metre (m3)	9.72 m³
STR	BR3362	0022	CV-BR-VDCT-RD	STR-PIR-5781507	400	400	303	Sa_20_50_20_70	Concrete C35/45, Pier elev	Cubic metre (m3)	88.50 m³
STR	BR3362	0022	CV-BR-VDCT-RD	STR-PIR-5781924	400	400	303	Sa_20_50_20_70	Concrete C35/45, Pier elev	Cubic metre (m3)	7.63 m³
STR	BR3362	0022	CV-BR-VDCT-RD	STR-PIR-5781928	400	400	303	Sa_20_50_20_70	Concrete C35/45, Pier elev	Cubic metre (m3)	22.82 m³
STR	BR3362	0022	CV-BR-VDCT-RD	STR-PIR-5781929	400	400	303	Sa_20_50_20_70	Concrete C35/45, Pier elev	Cubic metre (m3)	22.82 m³
STR	BR3362	0022	CV-BR-VDCT-RD	STR-PIR-5782018	400	400	303	Sa_20_50_20_70	Concrete C35/45, Pier elev	Cubic metre (m3)	18.59 m³

ISO-19650: BIM IMPLEMENTATION ALIGNED WITH INTERNATIONAL BIM 19650 STANDARDS FOR INFRASTRUCTURE & OTHER TYPES OF PROJECTS.

USE CASE: High Speed Railway Infrastructure Project with Road Viaducts, and Highway ramps

SIMPLE RENDERED ANIMATION



BIM IMPLEMENTATION ALIGNED WITH INTERNATIONAL BIM 19650 STANDARDS FOR INFRASTRUCTURE & OTHER TYPES OF PROJECTS

USE CASE: **High Speed Railway Infrastructure Project with Road Viaducts, and Highway ramps**



Questions?

THANK YOU.

Miltiadis Goudiras

AIDIGITS Projects Director (BIM)