Ordine degli Ingegneri della Provincia di Roma

PMI CENTRAL ITALY CHAPTER

Ing. Gianluca Albera (Project Manager – BIM Manager)

METRO SYDNEY - NORTH WEST RAIL LINK

BIM MANAGEMENT

Un passo obbligato verso il Facility Management

IL PROJECT MANAGEMENT NELLE COSTRUZIONI IN EDILIZIA ED INFRASTRUTTURE

30/11/2019

Latina

OBIETTIVI

1) ***ILLUSTRATE LA GESTIONE DI UN OFFERTA DI UNA COMMESSA BIM***

2) ***ILLUSTRARE UN ESEMPIO DI COMMESSA BIM «NON CONVENZIONALE»***

3) ***CONSIDERAZIONI SULLA NECESSARIA TRANSIZIONE DALLA «PROGETTAZIONE TRADIZIONALE» ALLA «PROGETTAZIONE BIM»***

METRO SYDNEY

NORTH WEST RAIL LINK

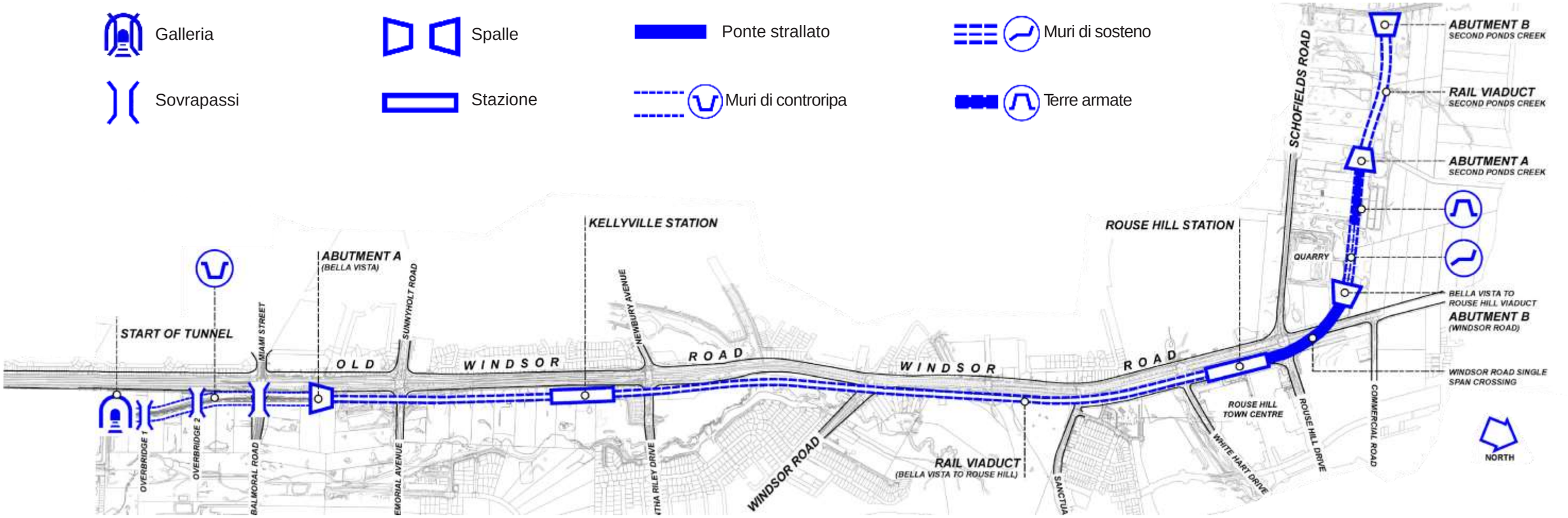
Modellazione Bim Esecutiva e As Built &
Implementazione Cobie file per Facility Management

CLIENTE

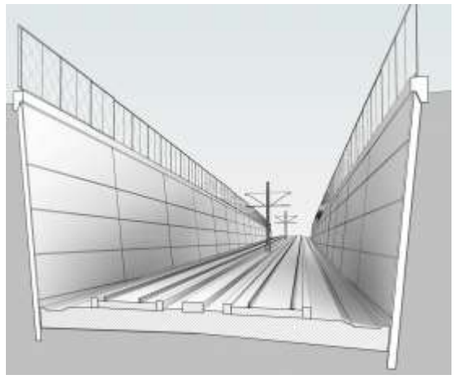
APPALTATORE

CONSULENTE BIM

OGGETTO DELL'INCARICO: MODELLAZIONE BIM DELLA NORTH WEST RAIL LINK

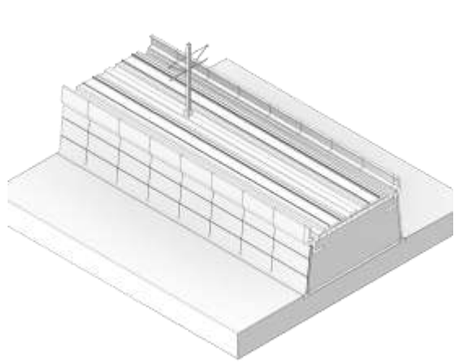


La linea ha una lunghezza complessiva di circa 8 km, è composta da 24 aree che vanno da Bellavista a Cudgegong Road e comprende un ponte strallato, cavalcavia, viadotti, ponti pedonali e stradali, strutture di sostegno in terra rinforzata, strutture in c.a. di contenimento e strutture civili che si sviluppano lungo 4,6 km



Muri di controripa

Viadotto e pila

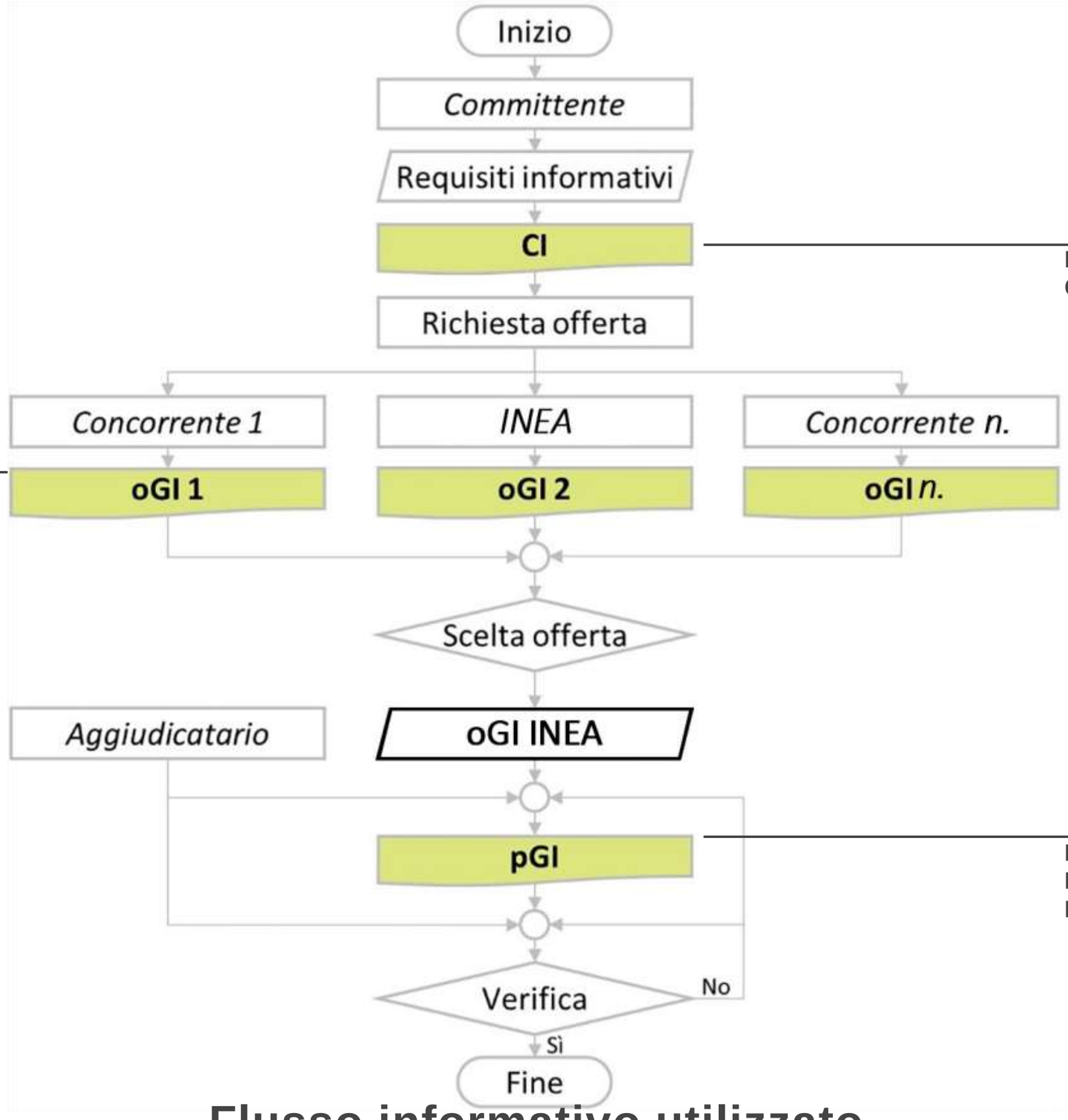


Terre armate

Sovrapassi

Ponte strallato

La gestione dei requisiti informativi è avvenuta seguendo il flusso di lavoro previsto dal British Standards Institution (BSI)



FASE 1:
CAPITOLATO INFORMATIVO

FASE 2:
OFFERTA PER LA GESTIONE INFORMATIVA

FASE 3:
PIANO PER LA GESTIONE INFORMATIVA

Flusso informativo utilizzato

FASE 1:

CAPITOLATO INFORMATIVO

Il committente definisce le esigenze e i requisiti informativi che dovranno essere soddisfatti dagli affidatari.

North West Rail Link

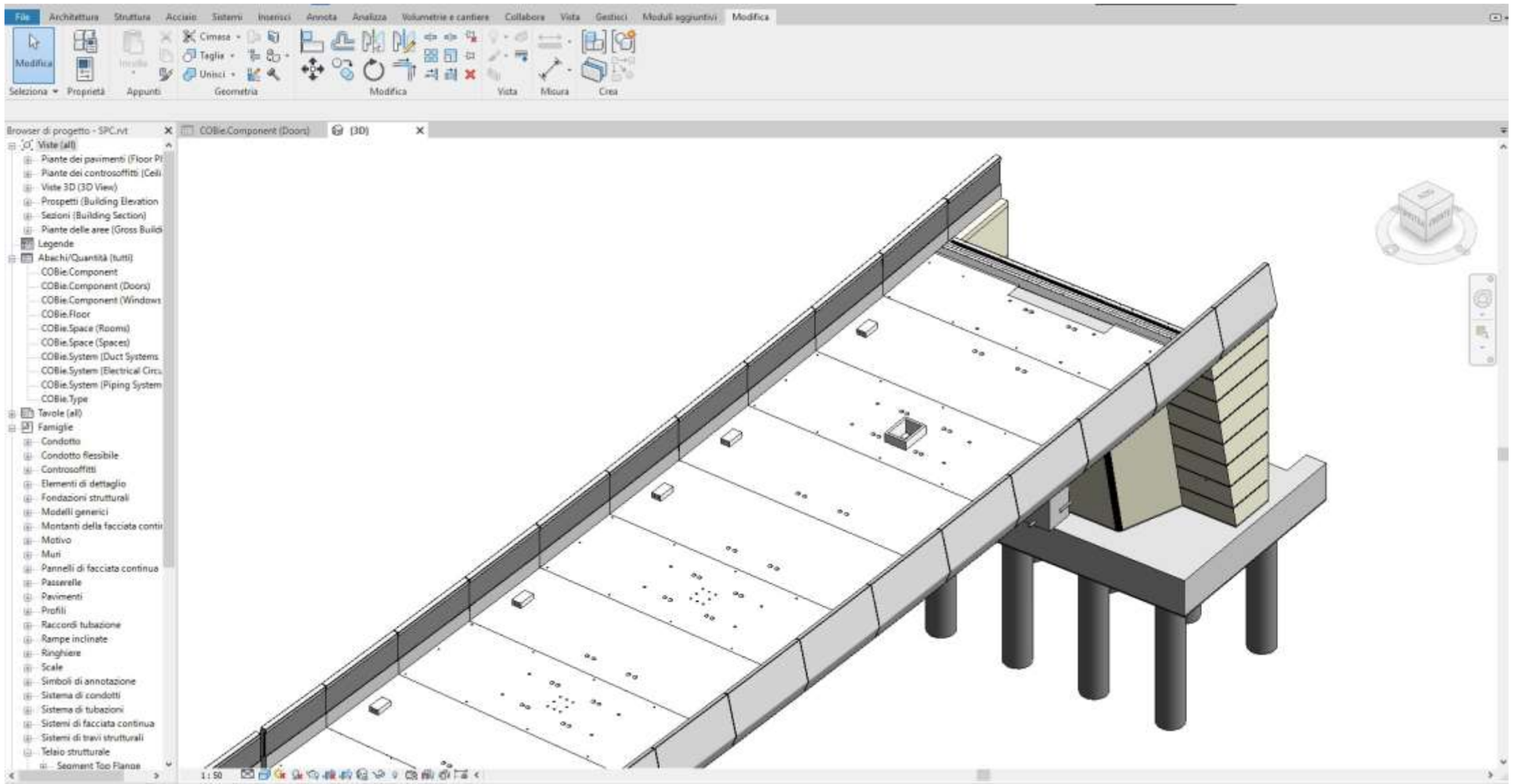
Design and Construction of Surface and Viaduct Civil Works

BIM Scope of work

Revision 1.0

17 September 2015

Capitolato Informativo



Modello BIM allegato

Richiesta offerta

FASE 2:

OFFERTA PER LA GESTIONE INFORMATIVA

Il concorrente esprime e specifica la propria modalità di gestione informativa del processo, in risposta alle esigenze della committenza formulate nel CI.

BIM Execution Plan pre-contract award

INEA Ingegneria e Architettura

PROJECT:
(PROGETTO:)
O1508_ NORTH WEST RAIL LINK - SYDNEY

DOCUMENT:
(DOCUMENTO:)
BIM Execution Plan pre-contract award

PROJECT N.	TOPIC	DOC. TYPE	PROGRESSIVE	REVISION
P1501	PMG	PR	001	0

REV.	DATE	DESCRIPTION	EDIT	CHECK	APP.
00	18/07/2015	First Issue	DG	AK	GA
01	12/08/2015	Revision	DG	AK	GA

CONFIDENCE LEVE L: RESTRICTED

INEA Ingegneria e Architettura

SUMMARY

INEA Ingegneria e Architettura

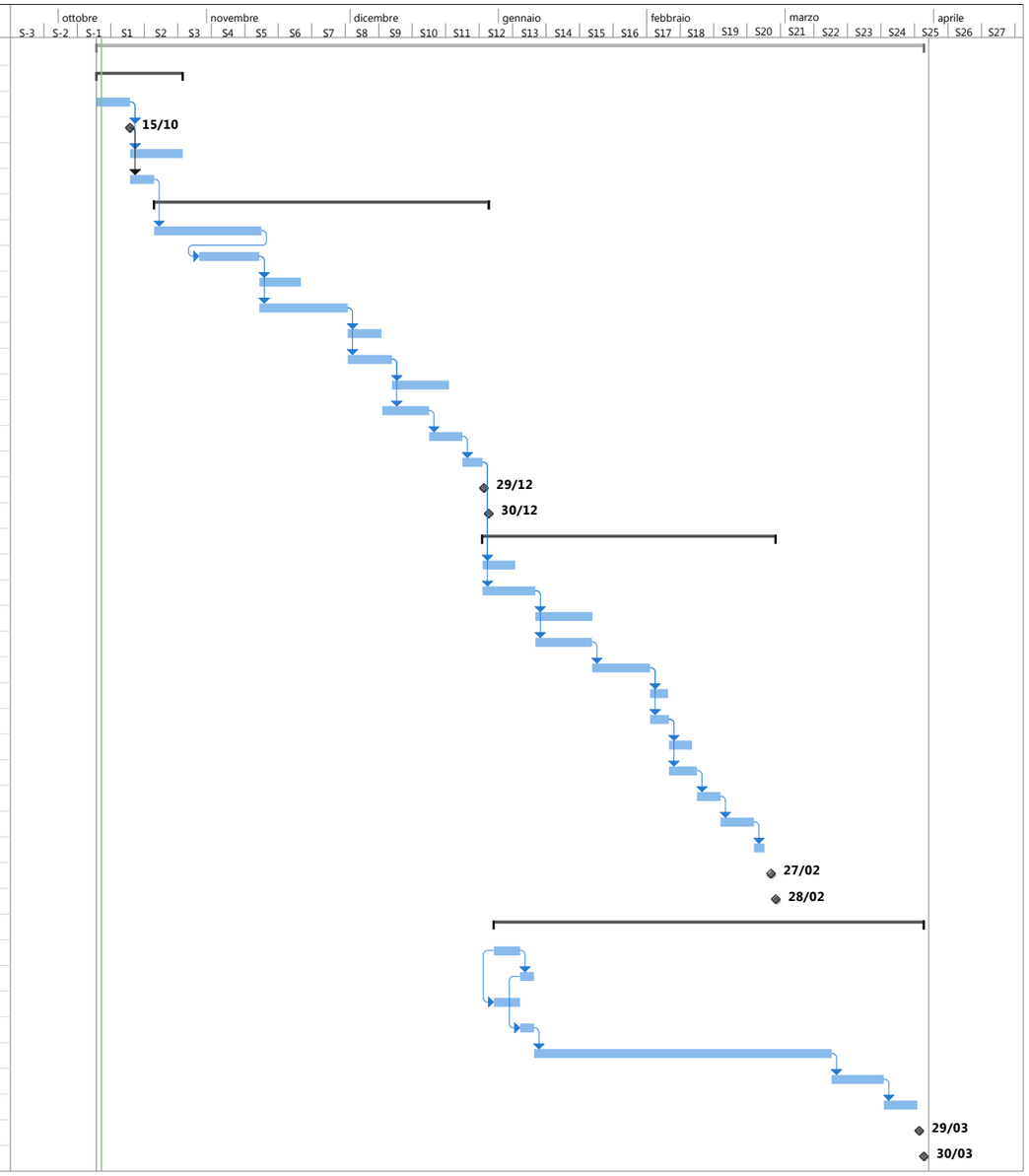
PROJECT TITLE AND DESCRPTION	**O1508 – North West Rail Link - Sydney** The project consist in the BIM modelling trough Autodesk REVIT software of the infrastructures of the new metro line named North West Rail Link – Sydney. The 3d modelling will be developed on the base of AutoCAD drawings that will be provided for the scope. The line is about 8km length and is divided into 24 sections The
PROJECT CONTEXT AND BACKGROUND	Our Client has been awarded to construct the North West Rail Link in Sydney. The project involves the construction of the new metro line north-west of Sydney, which will connect Chatswood station with Cudgegong Road. The Finale Design phase is almost completed. The works are ongoing.
PROJECT PURPOSE	The project Propose is to provide BIM service as per the request of the Client in order to satisfy the Client and establish a profitable business relationship for future cooperation.
PROJECT MANAGER AUTHORITY LEVEL	Eng. Gianluca Albera is appointed as the Project Manager. He will negotiate the design team, the site supervision team. He have the authority to manage the budget of the project. He will report directly to INEA Management
PROJECT SCOPE AND EXCLUSION Reference document: "BIM Scope of work" Revision 1 September 2015	**Project Scopes:** BIM modelling in Autodesk REVIT Software of the object typology identified in the reference document "BIM Scope of work" along the whole alignment of the project. **Exclusion:** As reference document "BIM Scope of work", i.e. but not limited to; Reinforcement, couplers, bolting, soils nails, rock bolt etc. will not be modelled. Temporary element will not be modelled. 2D Plane view and layout will not be provided

FASE 2:

OFFERTA PER LA GESTIONE INFORMATIVA

Time Schedule

ID	Modalità attività	Nome attività	Durata	Inizio	Fine	Predecessori
0		**NWRL_Gantt_Rev02**	**984 h**	**ven 09/10/15**	**mer 30/03/16**	
1		**Preliminary activity**	**96 h**	**ven 09/10/15**	**lun 26/10/15**	
2		Negotiation for Contract	5 g	ven 09/10/15	gio 15/10/15	
3		Contract signing	0 g	gio 15/10/15	gio 15/10/15	2
4		Site Visit	7 g	ven 16/10/15	lun 26/10/15	2
5		BIM standard definition	24 h	ven 16/10/15	mar 20/10/15	3
6		**Delivery 30/12/2015**	**400 h**	**mer 21/10/15**	**mer 30/12/15**	
7		S02: Viaduct (Pier 9 to Pier 18)	129 h	mer 21/10/15	gio 12/11/15	5
8		S03: Viaduct (Ab A to Pier 9)	71 h	ven 30/10/15	mer 11/11/15	7FI-9 g
9		S04: Viaduct (Pier 18 to Pier 27)	55 h	gio 12/11/15	ven 20/11/15	8
10		S06: Kellyville Station (Pier 27 to Pier 34)	98 h	gio 12/11/15	lun 30/11/15	8
11		S07: Approach Viaduct (Pier 107 to Pier 111)	41 h	lun 30/11/15	lun 07/12/15	10
12		S08: Viaduct (Pier 34 to Pier 44)	61 h	lun 30/11/15	mer 09/12/15	10
13		S09: Rouse Hill Station (Pier 100 to Pier 107)	63 h	mer 09/12/15	lun 21/12/15	12
14		S10: Viaduct (Pier 44 to Pier 54)	59 h	lun 07/12/15	gio 17/12/15	12FI-2 g
15		TAGS and COBie data extraction	40 h	gio 17/12/15	gio 24/12/15	14
16		Final check	20 h	gio 24/12/15	lun 28/12/15	15
17		Client approval	0 h	mar 29/12/15	mar 29/12/15	
18		**Delivery**	**0 g**	**mer 30/12/15**	**mer 30/12/15**	
19		**Delivery 28/02/2016**	**354 h**	**lun 28/12/15**	**dom 28/02/16**	
20		S11: Viaduct (Pier 94 to Pier 100)	37 h	lun 28/12/15	lun 04/01/16	16
21		S12: Viaduct (Pier 54 to Pier 64)	73 h	lun 28/12/15	ven 08/01/16	16
22		S13: Viaduct (Pier 84 to Pier 94)	62 h	ven 08/01/16	mer 20/01/16	21
23		S14: Viaduct (Pier 74 to Pier 84)	61 h	ven 08/01/16	mer 20/01/16	21
24		S15: Viaduct (Pier 64 to Pier 74)	67 h	mer 20/01/16	lun 01/02/16	23
25		S16: Retaining wall	27 h	lun 01/02/16	ven 05/02/16	24
26		S17: Retaining wall	30 h	lun 01/02/16	ven 05/02/16	24
27		S18: Retaining wall	22 h	ven 05/02/16	mer 10/02/16	26
28		S19: Balmoral Overbridge	30 h	ven 05/02/16	gio 11/02/16	26
29		S20: Retaining wall	22 h	gio 11/02/16	mar 16/02/16	28
30		TAGS and COBie data extraction	40 h	mar 16/02/16	mar 23/02/16	29
31		Final check	20 h	mar 23/02/16	gio 25/02/16	30
32		Client approval	0 h	sab 27/02/16	sab 27/02/16	
33		**Delivery**	**0 g**	**dom 28/02/16**	**dom 28/02/16**	
34		**Delivery 31/03/2016**	**512 h**	**gio 31/12/15**	**mer 30/03/16**	
35		S21: Overbridge No 02	27 h	gio 31/12/15	mar 05/01/16	
36		S22: Retaining wall	22 h	mar 05/01/16	ven 08/01/16	35
37		S23: Overbridge No 01	27 h	gio 31/12/15	mar 05/01/16	35II
38		S24: Retaining wall	22 h	mar 05/01/16	ven 08/01/16	36II
39		S05: Cable stayed Bridge (Pier 111 to Ab b)	356 h	ven 08/01/16	gio 10/03/16	38
40		TAGS and COBie data extraction	55 h	gio 10/03/16	lun 21/03/16	39
41		Final check	40 h	lun 21/03/16	lun 28/03/16	40
42		Client approval	0 h	mar 29/03/16	mar 29/03/16	
43		**Delivery**	**0 g**	**mer 30/03/16**	**mer 30/03/16**	



Progetto: NWRL_Gantt_Rev02

Attività · Divisione · Cardine · Riepilogo · Riepilogo progetto · Attività inattiva · Cardine inattiva · Riepilogo inattiva · Attività manuale · Solo-durata · Riporto riepilogo manuale · Riepilogo manuale · Solo inizio · Solo-fine · Attività esterne · Cardine esterno · Scadenza · Avanzamento · Avanzamento manuale

FASE 2:

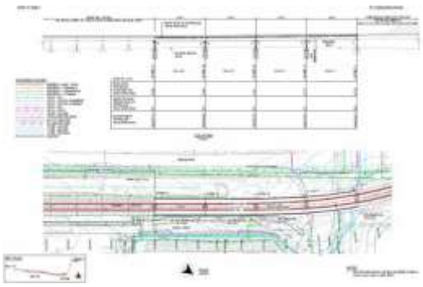
OFFERTA PER LA GESTIONE INFORMATIVA

Deliverable Description

INEA Ingegneria e Architettura

DELIVERABLE S07 - Approach Viaduct (Pier 107 to Pier 111) – (ch 45.139 to 45.326 Km)

Reference Image:



Ref. Drawings: DL75-1 Current Drawings Combined 150909.pdf

Description**:** Windsor RD single span crossing – Approach Viaduct – design LOT No 75-1

Object to be modelled:

- N. 3 Piers (108 to 110)
- N. 3 RC bored pile/Pier
  - Type for each Pier (tot=12)
- N. 1 Pile cap for each Pier (tot=3)
- N. 1 Viaduct drainage Pit
  - Type B for each Piers (tot=3)
- N.4 bearing for each Pier (tot=12)
- N.1 Earthing and electrolysis protection (Point only) for each Piers (tot=3)
- N. 1 Vertical Drainage (internal piers) for each Pier (tot=3)

Figure 5-4 - Illustration of Revit Families for the Viaduct Sub-Structure

- N. 1 Deck for L~ 187 m (N°60 segment)

Segment Types:

Type N°	D1	P1	P2	T1	T2
	8	7	1	20	24

- N. 1 Parapet + Panel acoustic for L~ 187m (both side)

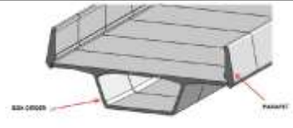


Figure 5-3 - Illustration of Revit Families for the Viaduct Super-Structure

Responsible: Eng. Roberto Perna

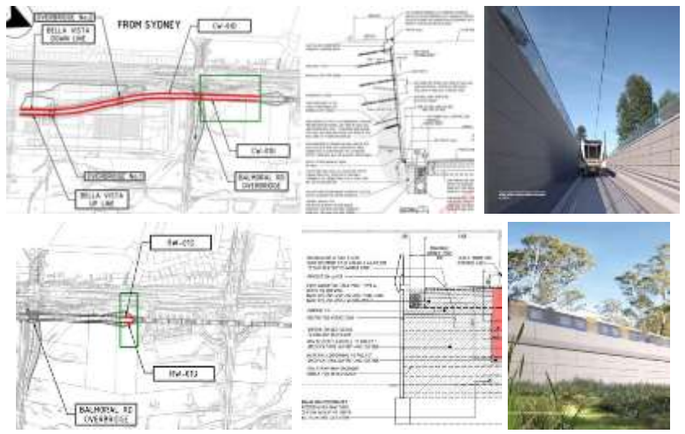
Resources: n. 1 Engineer/ Architect Revit Operator

Time: [41 hours]

INEA Ingegneria e Architettura

DELIVERABLE S18 - Retaining wall (ch. 41.062 to 41.324 Km) + (ch. 41.324 to 41.355 Km)

Reference Image:



Ref. Drawings: DL14 Current Drawings Combined 150908.pdf

Description: Soil nails wall L=289.00m
(about) Retaining wall L=
23.40m (about)

Object to be modelled:

Soil nails wall (both sides):

- Shotcrete
- Concrete cupping beam
- Handrail
- Platform
- Drainage pipe
- Drainage gutter

Retaining wall (both sides)

- Concrete footing
- Precast concrete panels
- Concrete blinding
- Precast parapet
- Subsoil drain
- Platform

Responsible: Arch. Luciana Bianchini

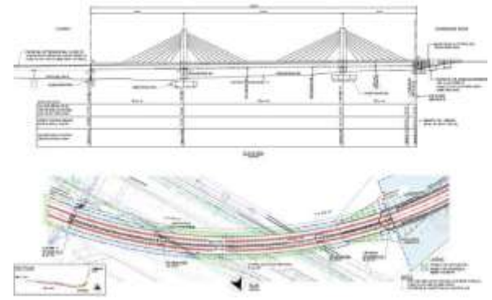
Resources: n. 1 Engineer/ Architect Revit Operator

Time: [22 hours]

INEA Ingegneria e Architettura

DELIVERABLE S05 - Cable stayed viaduct (Pier 111 to Ab B) – (ch 45.326 to 45.595 Km)

Reference Image:

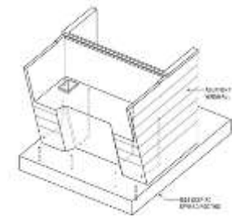


Ref. Drawings: DL75-2 Current Drawings Combined 150722 (FDD).pdf

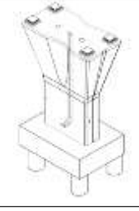
Description: Cable stayed viaduct L=269.00m

Object to be modelled:

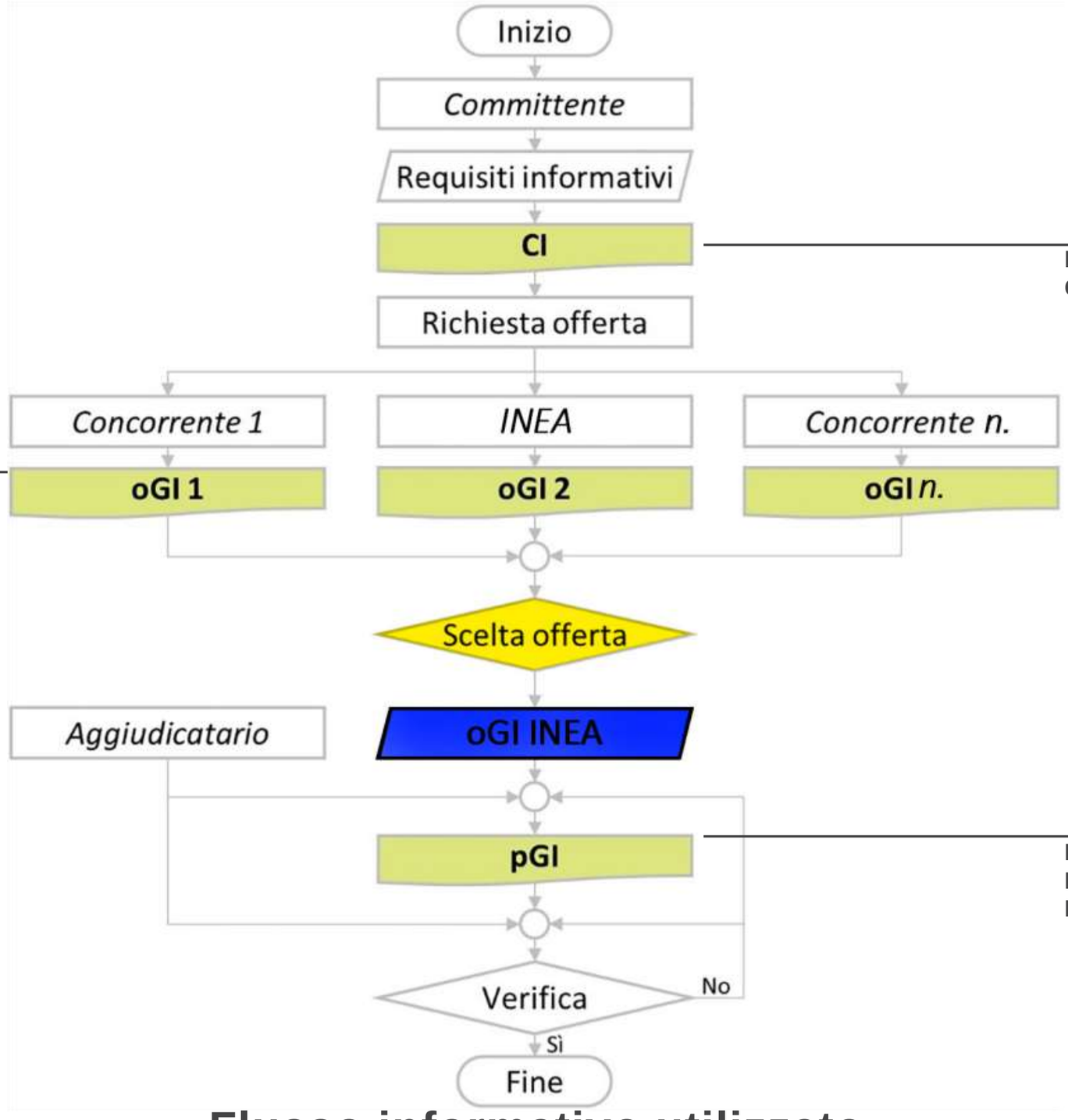
N1. Abutment with spread footing and elevation RC structures and internal access chamber
N.2 Bearing
N.2 Pipe 300 DIA drainage pipe



Pier 111
N.4 RC bored pile/Pier
N. 1 Pile cap
N.4 bearing
N.2 225 DIA drainage pipe



INEA è l'affidatario individuato dell'incarico, e deve provvedere a redigere il pGI (piano per la gestione informativa) in cui viene precisata l'originaria offerta.



FASE 1:
CAPITOLATO INFORMATIVO

FASE 2:
OFFERTA PER LA GESTIONE INFORMATIVA

FASE 3:
PIANO PER LA GESTIONE INFORMATIVA

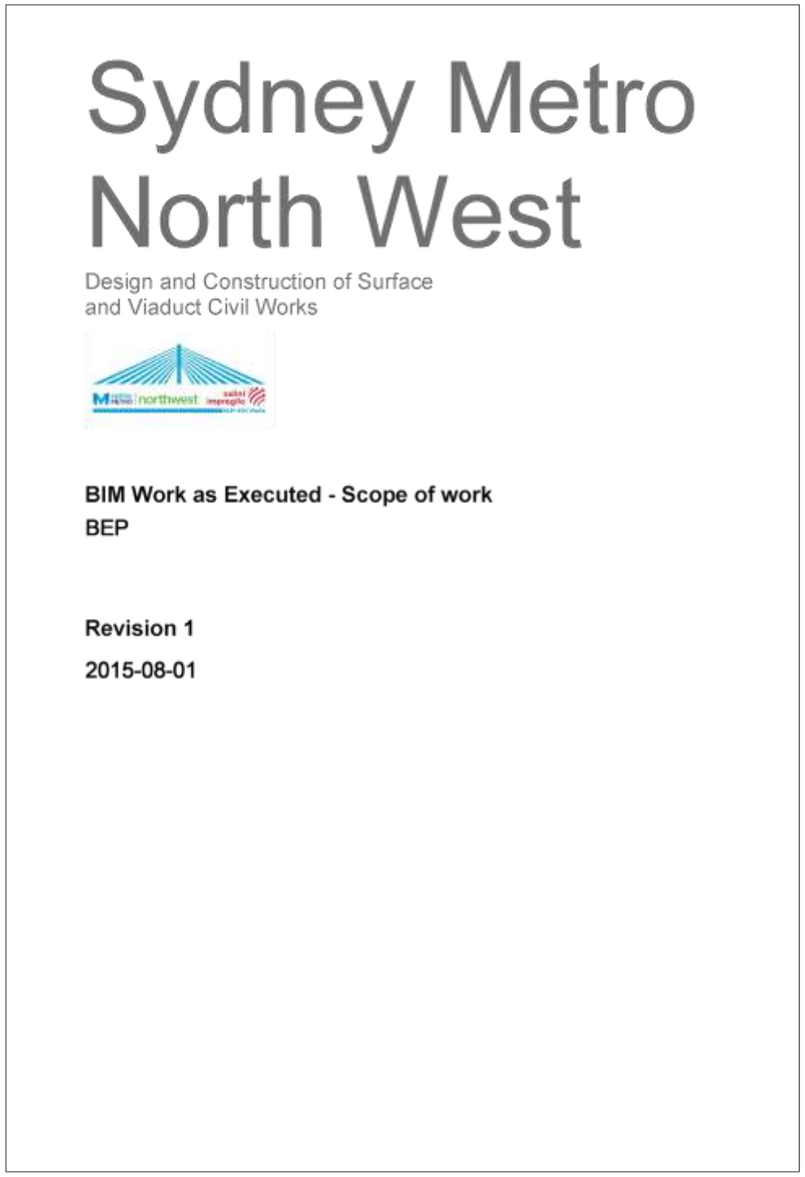
Flusso informativo utilizzato

FASE 3:

PIANO PER LA GESTIONE INFORMATIVA

Esplicitazione definitiva ed operativa delle modalità di gestione informativa del processo predisposta dall'affidatario.

BIM Execution Plan



Sydney Metro North West

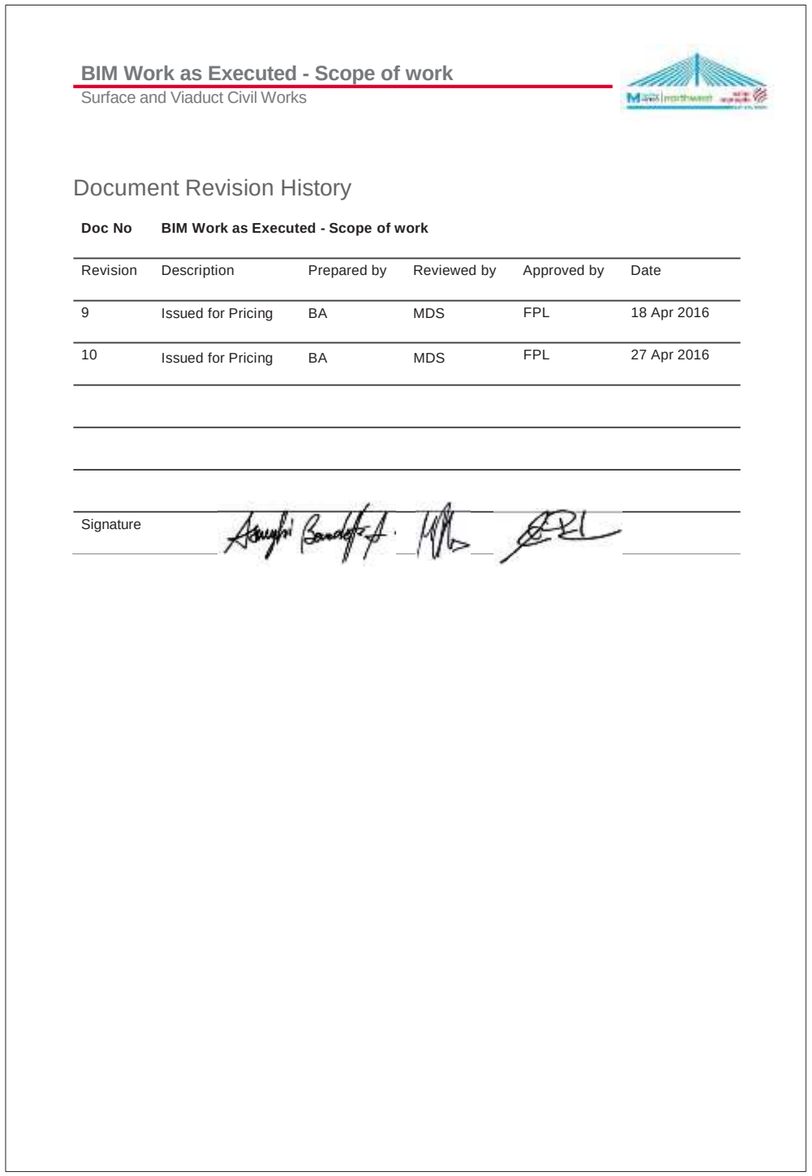
Design and Construction of Surface and Viaduct Civil Works

BIM Work as Executed - Scope of work

BEP

Revision 1

2015-08-01



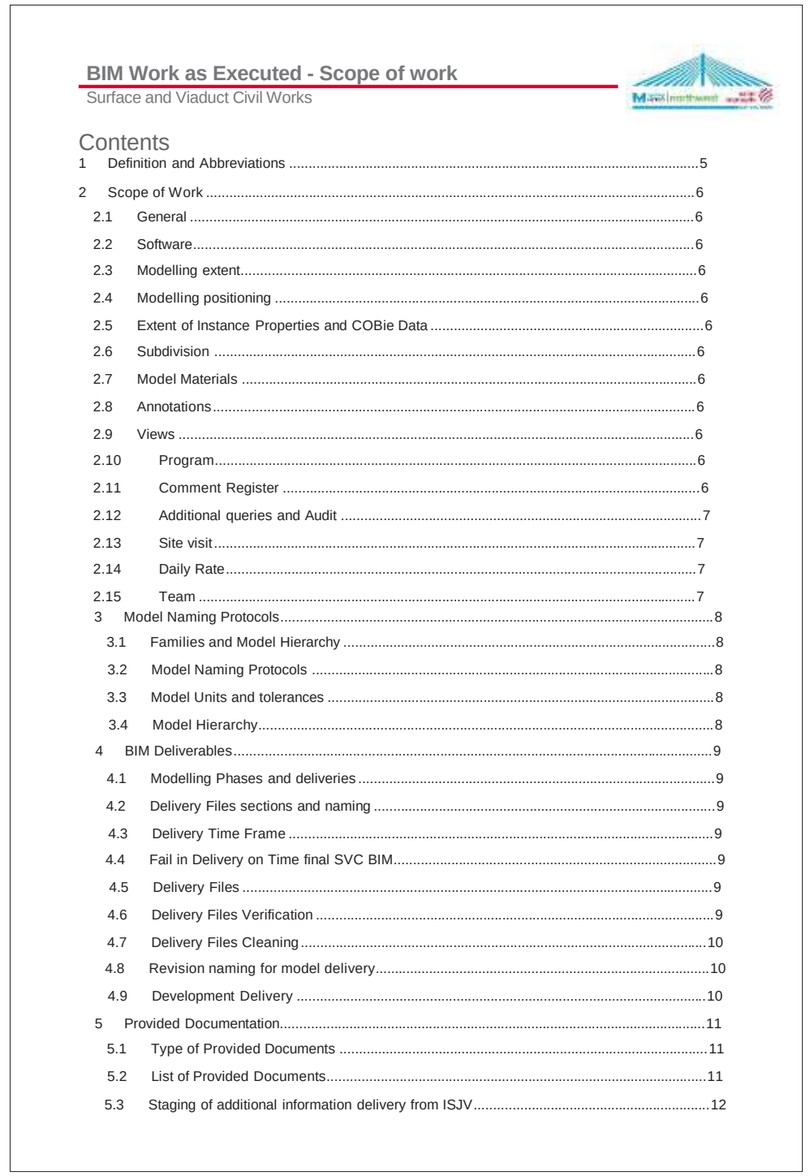
BIM Work as Executed - Scope of work

Surface and Viaduct Civil Works

Document Revision History

Doc No	BIM Work as Executed - Scope of work				
Revision	Description	Prepared by	Reviewed by	Approved by	Date
9	Issued for Pricing	BA	MDS	FPL	18 Apr 2016
10	Issued for Pricing	BA	MDS	FPL	27 Apr 2016

Signature



BIM Work as Executed - Scope of work

Surface and Viaduct Civil Works

Contents

FASE 3:

PIANO PER LA GESTIONE INFORMATIVA

2 Scope of Work

1. General

The scope of this contract is to create the SVC BIM Model, populate COBie data and Instance Properties.

2. Software

Autodesk Revit 2015 shall be used for create and deliver the SVC BIM.

3. Modelling extent

The extent of the SVC BIM object modelling is addressed in Appendix A

4. Modelling positioning

The SVC BIM shall be located as per the drawings marked Easting, Northing and elevation datum.

5. Extent of Instance Properties and COBie Data

The Instance Properties and COBie data listed in Appendix B shall be provided.

6. Subdivision

The SVC BIM Model, COBie data and Properties shall be divided in 16 sections as per described in Appendix C.

7. Model Materials

Each single element Material shall be defined as per drawings.

8. Annotations

Spot elevations shall be placed at centre of: Piers, Abutments.

Spot coordinate shall be placed at centre of: Piers, Abutments.

9. Views

The Contractor shall insert keys Plans, 3d views and elevations sufficient to allow the client to visualize the model. The parties shall agree on the number and properties of the views.

10. Program

A program addressing the status of the work shall be issued to ISJV on a weekly base.

11. Comment Register

A comment register shall be used for all comments and kept updated on a daily base. The Register shall address the issues or comments considered non-compliant with this contract.

A minimum notice of 2 working days shall be given for any matter to be addressed.

Any outstanding item in the register shall be closed before the final submission or the submission will be considered unacceptable.

BIM Work as Executed - Scope of work
Surface and Viaduct Civil Works

3 Model Naming Protocols

3.1 Families and Model Hierarchy

Families are to be used for the components (Piers, Segments, Bearings etc.) used to build the SVC BIM model. Each family can have multiple types.

Families Category shall be used and selected according to the real function of the object when possible. (Beam should be a “Metric Structural Framing - Beams and Braces”)

Type Parameters should be used for variables that vary for each Type. Instance Parameters should be used for variables that vary for each Instance.

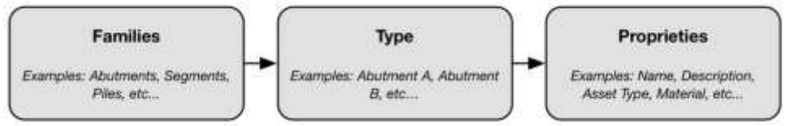


Figure 4-1 – Model Hierarchy

3.2 Model Naming Protocols

Naming methodology (square brackets indicate variables):

Family:	SVC- [Location]- [Object]
Type	[Object] [Type]
Properties:	[Object] [No.]

Example:

Family:	SVC- SPC- Pier
Type	Pier A
Properties:	Pier 7

Each component shall have a **unique** name; the name shall be more descriptive as possible.

3.3 Model Units and tolerances

Units of measurement shall be metric and will follow the International System of Units (S.I.) of measurement convention. All linear dimensions shall be in millimeters (mm).

The accepted error for positioning of works related with the survey grid, +- 0.4mm

3.4 Model Hierarchy

When necessary (e.g. COBie Data on Appendix B) the top hierarchy of the project elements will be defined by three sections major categories:

1. Civil Work
2. Substructure
3. Superstructure

FASE 3:

PIANO PER LA GESTIONE INFORMATIVA

4 BIM Deliverables

4.1 Modelling Phases and deliveries

The SVC BIM shall be modelled accordingly with the latest drawings/information provided for each phase. (See section 5)

The phases will be:

- AFC (incorporating the latest AFC, no WaE)
- WaE (incorporating red marks drawings)
- Survey (modify position of segments and add formation surfaces)

The Contractor shall issue the model, as per described in section 4, at least 4 times:

- Final AFC;
- Interim WaE Issue; and
- Final WaE.
- Final Survey

4.2 Delivery Files sections and naming

SVC BIM shall be split into sections as described in Appendix C

The COBie data, *.nwd, *.nwc, *.ifc and *.rvt will be split and issue with a consistent name for each section deliverable, the name of the file shall be as per Appendix C.

4.3 Delivery Time Frame

The contractor shall deliver the SVC BIM on dates shown in Appendix C.

All deadlines are by 24:00 (midnight) Rome Time (GTM+2).

4.4 Fail in Delivery on Time final SVC BIM

If the client shall fail in provide the information's request by the contractor or the contractor shall fail in provide the final model on schedule, the contractor shall issue the latest version of the SVC BIM available.

The Contractor shall then issue the final model as soon as possible or as per agreed in written with the client.

5. Delivery Files

The contractor shall deliver at each issue the SVC BIM in 4 ways to ISJV:

- In native format (*.rvt)
  - and relatives attached *.dwg
- As a Navisworks export file (*.nwd); and
- As a Navisworks export file (*.nwc); and
- IFC format export (ISO 16739:2013)

6. Delivery Files Verification

The contractor shall verify, at each issue after export, the consistency of the *.nwd, *.nwc and *.ifc files with the source *.rvt file.

BIM Work as Executed - Scope of work
Surface and Viaduct Civil Works

4.7 Delivery Files Cleaning

All models shall be purged of all unused or temporary reference items, including:

- Foreign CAD content (DWG/DGN/ADSK)
- Unused nested items
- Free from linked files (unless files are being provided as part of federated model)

Exception will be made for survey references.

4.8 Revision naming for model delivery

Each delivery shall have a unique revision number. Deliveries that fail to do this shall not be considered valid.

For all the AFC versions a consecutive number starting from 2 shall be used for each revision number, e.g. [02], [03], [04].

For all the WaE versions a consecutive number starting from 50 shall be used for each revision number, e.g. [50], [51], [52].

For all the WaE Survey versions a consecutive number starting from the latest WaE revision number shall be used, unless agreed otherwise.

4.9 Development Delivery

Access to the latest model shall be provided to ISJV on a weekly base.

ISJV will not be obliged to check the compliance and the content of weekly submission.

4.10 Federated model

A federated model shall be inserted in the revit folder and shall be named: NWRLSVC-ISJ-MOD-DN-230301 [??] - FEDERATED BIM MODEL

[??] stands for revision number.

FASE 3:

PIANO PER LA GESTIONE INFORMATIVA

5 Provided Documentation

1.Type of Provided Documents

The documents provided within this Scope of Work are Adobe Acrobat *.pdf, AutoCAD *.dwg, and Civil 3D *.dwg files.

(a)The information shall be derived primarily from the PDF files.

(b)In case the PDF files shall fail to provide enough information's then the Civil 3D *.dwg files shall be used.

(c)In case the Civil 3D *.dwg files shall fail to provide enough information's then AutoCAD files shall be used.

(d)In case the AutoCAD shall fail to provide enough information's then the Contractor shall ask to ISJV.

Civil 3D *.dwg will be provided as AutoCAD *.dwg if required by the Contractor.

ISJV may issue PDF DL's cleaned from all not relevant drawings for speed up the contractor.

2.List of Provided Documents Within this

Scope of Work ISJV has provided: Design

Lots

DL01	BVR Viaduct
DL02	SPC
DL11	BV to Balmoral
DL12	Windsor to SPC
DL13	Retaining Walls
DL14	Soil Nail Walls
DL15	Viaduct Surface Drainage
DL21	Balm Rd road works
DL30	Overbridge Balmoral Rd
DL31	Overbridges 1 & 2
DL75.1	WRSSC-Approach Viaduct
DL75.2	WRSCC
DL80	Architecture, Urban Design & Landscape

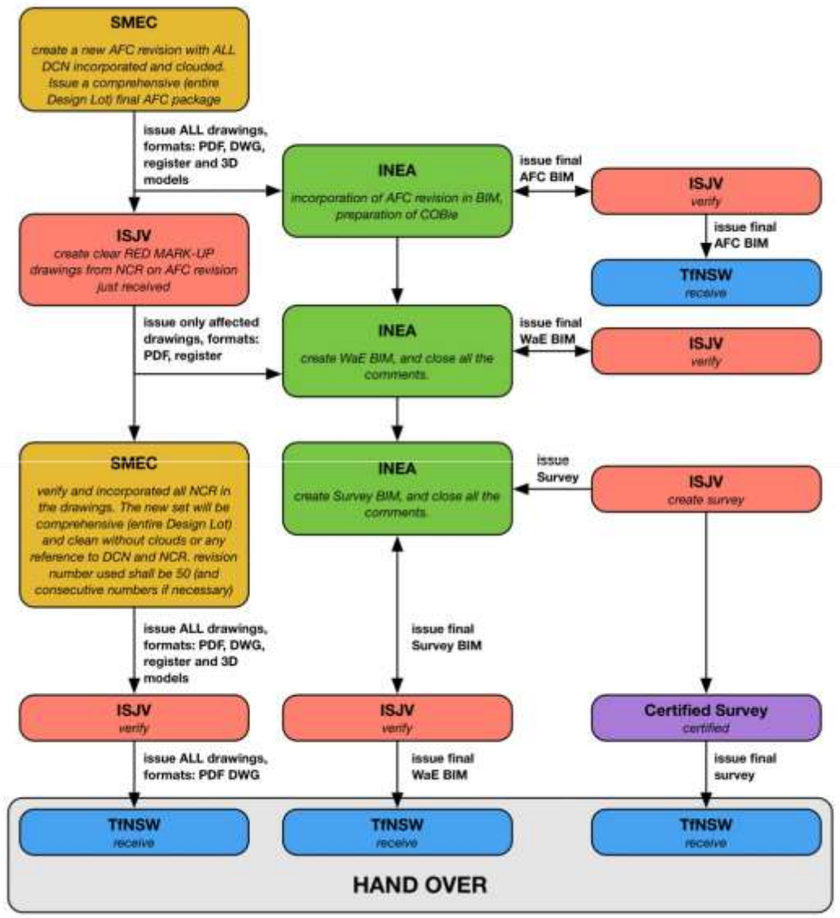
Alignment

NWRL-10013-60-SWD-DRG-CI-32226-A	Horizontal & Vertical Alignment
NWRL-10013-60-SWD-DRG-CI-32227-A	Horizontal & Vertical Alignment
NWRL-10013-60-SWD-DRG-CI-32228-A	Horizontal & Vertical Alignment
NWRL-10013-60-SWD-DRG-CI-32230-A	Horizontal & Vertical Alignment
project-alignment-chainages.dwg	Horizontal Alignment (file with world coordinate)
project-alignment-chainages-text-nwrl.dwg	Horizontal Alignment (file with world coordinate)
project-alignment-track.dwg	Horizontal Alignment (file with world coordinate)

Additional Information

Extract - Cad Manual v06	Codes for Locations

BIM Work as Executed - Scope of work
Surface and Viaduct Civil Works



FASE 3:

PIANO PER LA GESTIONE INFORMATIVA

BIM Work as Executed - Scope of work

Surface and Viaduct Civil Works

7 Appendix A (Element)

1. General

This appendix addresses the extent of the SVC BIM object modelling for each phase.

2. Exclusion

The extent of modelling the above mentioned elements will be limited to the dimensioning of the solid with associated 'object attributes' only. Items within the solid concrete including, but not limited to, reinforcement, couplers, bolting etc, will not be modelled in 3D.

Temporary elements and works shall not be modelled.

3. Geometry for Viaduct box girder clarification

The Viaduct box girder is composed by segments.

For the AFC phase the shape of the segmentation is governed by the viaduct horizontal and vertical alignment (e.g. 015030, also folder "Alignment" provided within this package) and the match casting methodology (e.g. 015031).

Note: viaduct horizontal and vertical alignment ad match casting methodology varies for viaduct, stations, approach viaduct, bridge and SPC Viaduct.

4. Model element extent for each phase

The following list addresses the extent of the SVC BIM object modelling request for each phase.

BIM - Design Lot List

Elements	Notes	WaE - Model and COBie	AFC - Model and COBie	current contract - Model and COBie
Design Lot List				
this list need to be read in conjunction with the elements list				
DL01-BVR Viaduct				
Subgrup - Viaduct drainage		Yes	Yes	Yes
Subgrup - Earthing		Yes	Yes	Yes
Subgrup - Viaduct		Yes	Yes	Yes
Subgrup - Stations		Yes	Yes	Yes
DL02-SPC				
Subgrup - Viaduct drainage		Yes	Yes	Yes
Subgrup - Earthing		Yes	Yes	Yes
Subgrup - Viaduct		Yes	Yes	Yes
DL11 Cut and Filling				
Subgrup - Retaining wall		Yes	Yes	Yes
Subgrup - Soil Nails		Yes	Yes	Yes
Subgrup - Water Drainage and treatments		Yes	Yes	Yes
Subgrup - Parapets and Handrail		Yes	Yes	Yes
Subgrup - Earthing		Yes	Yes	Yes
DL12 Windsor to SPC				
Subgrup - Retaining wall		Yes	Yes	Yes
Subgrup - Soil Nails		Yes	Yes	Yes
Subgrup - Water Drainage and treatments		Yes	Yes	Yes
Subgrup - Parapets and Handrail		Yes	Yes	Yes
Subgrup - Earthing		Yes	Yes	Yes
Subgrup - Windsor to SPC		Yes	Yes	Yes
DL13 Retaining Walls				
Subgrup - Retaining wall		Yes	Yes	Yes
Subgrup - Water Drainage and treatments		Yes	Yes	Yes
Subgrup - Parapets and Handrail		Yes	Yes	Yes
Subgrup - Earthing		Yes	Yes	Yes
DL14-Soil Nail Walls				
Subgrup - Soil Nails		Yes	Yes	Yes
Subgrup - Water Drainage and treatments		Yes	Yes	Yes
Subgrup - Parapets and Handrail		Yes	Yes	Yes
Subgrup - Earthing		Yes	Yes	Yes
DL15-Viaduct Surface Drainage				
Subgrup - Water Drainage and treatments		Yes	Yes	Yes
DL20 WR road works				
DL21 Balm Rd road works				
DL22 TWay Car Park				
DL23 Tempus St				
DL24-Riley Tway Temp Cark Park				
DL25-Southern Bus Layover				
DL26-Picket Pl & Mungerie House				
DL29.10-Miscellaneous Roadworks				
No modelling		No	No	No
DL30-Overbridge Balmoral Rd				
Subgrup - Overbridge		Yes	Yes	Yes
Subgrup - Parapets and Handrail		Yes	Yes	Yes

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BIM - Elements List

Elements	Notes	WaE - Model	WaE - COBie	AFC - Model	AFC - COBie	current contract - Mo	current contract - CO
Elements List							
this list need to be read in conjunction with the Design Lot list							
Water Drainage and treatments							
Back fill and general ground surface	*Top Surface Only*	WaE	No	AFC	No	No	No
Pits		WaE	Yes	AFC	Yes	AFC	Yes
Pits grating		WaE	No	AFC	No	AFC	Yes
Pits steps		WaE	No	AFC	No	AFC	Yes
Drainage pipes		WaE	Yes	AFC	Yes	AFC	Yes
Subsoil drain	*Pipe only*	WaE	Yes	AFC	Yes	AFC	Yes
Subsoil drainage flushing point		WaE	Yes	AFC	Yes	AFC	Yes
Vegetate swale	*Top Surface Only, no substrates*	WaE	No	AFC	No	No	No
Bio swale	*Top Surface Only, no substrates*	WaE	No	AFC	No	No	No
Bio swale pipe		WaE	Yes	AFC	Yes	AFC	Yes
Rip rap	*Top Surface Only, no substrates*	WaE	No	AFC	No	No	No
Channel spreader	*e.g. Drawings 155063*	WaE	No	AFC	No	No	No
Headwall		WaE	Yes	AFC	Yes	AFC	Yes
Headwall safety steel grate		WaE	No	AFC	No	AFC	No
Layers, ground, and other elements underground		No	No	No	No	No	No
Soil Nails							
Surface of formation	*Protection layer Only, 1m thick*	Survey	Yes	AFC	No	AFC	No
Layers, ground, and other elements underground		No	No	No	No	No	No
Capping beam		WaE	Yes	AFC	Yes	AFC	Yes
Cess drain	*Surface only*	Survey	Yes	AFC	Yes	AFC	Yes
Soil nails zones	*volume or surface offset from shotcrete*	WaE	No	AFC	No	No	No
Shotcrete wall		WaE	Yes	AFC	Yes	AFC	Yes
Shotcrete wall grooves		WaE	No	AFC	No	AFC	No
Reinforced concrete wall		WaE	Yes	AFC	Yes	AFC	Yes
Chip seal	*100mm thick Only*	WaE	Yes	AFC	Yes	No	No
Back fill and general ground surface	*Top Surface Only*	WaE	No	AFC	No	No	No
Exclusion zones		WaE	No	AFC	No	No	No
Soil nails and rock bolts		No	No	No	No	No	No
Expansion joints		No	No	No	No	AFC	Yes
Retaining wall							
Surface of formation	*only protection layer 1m thick*	Survey	Yes	AFC	No	AFC	Yes
Layers, ground, and other elements underground		No	No	No	No	No	No
Cess drain	*Surface only*	WaE	Yes	AFC	Yes	AFC	Yes
Retaining wall		WaE	Yes	AFC	Yes	AFC	Yes
Polyethylene pad between panels		WaE	No	AFC	No	AFC	No
Panel grooves		WaE	No	AFC	No	AFC	No
Concrete footings		WaE	Yes	AFC	Yes	AFC	Yes
Parapet footings		WaE	Yes	AFC	Yes	AFC	Yes
Back fill and general ground surface	*Top Surface Only*	WaE	No	AFC	No	No	No
Exclusion zones		WaE	No	AFC	No	No	No
Reinforced earth		No	No	No	No	No	No
Parapets and Handrail							
Parapets	*Survey only deck side top*	WaE	Yes	AFC	Yes	AFC	Yes
Parapet cast in situ stich	*Survey only top*	WaE	Yes	AFC	Yes	AFC	Yes
Parapet metal plate	*Survey only top*	WaE	Yes	AFC	Yes	AFC	Yes
Handrail		WaE	Yes	AFC	Yes	AFC	Yes
Parapet noise panel		No	No	No	No	AFC	No
Viaduct drainage							
Steel channels		WaE	Yes	AFC	Yes	AFC	Yes
Pipes in segments	*Insert in description: Pipe for pier to insert info here in the description*	WaE	Yes	AFC	Yes	AFC	Yes
Pier pipes		WaE	No	AFC	No	AFC	No
Pier pipes exit funnel		WaE	No	AFC	No	AFC	No
Drainage Hanger		No	No	No	No	No	No
Packers		No	No	No	No	AFC	No
Viaduct							

BIM - Elements List

Deck		Survey	Yes	AFC	Yes	AFC	Yes
Segments		WaE	Yes	AFC	Yes	AFC	Yes
Anchors in segments		No	No	No	No	AFC	Yes
Posttensioning visible		WaE	Yes	AFC	Yes	AFC	Yes
Pile		WaE	Yes	AFC	Yes	AFC	Yes
Pilecaps		WaE	Yes	AFC	Yes	AFC	Yes
Piers		WaE	Yes	AFC	Yes	AFC	Yes
Abutments		WaE	Yes	AFC	Yes	AFC	Yes
Abutments groves		WaE	No	AFC	No	AFC	No
Piers Drain pipes		WaE	Yes	AFC	Yes	AFC	No
Piers Bearings plinth		WaE	No	AFC	No	AFC	No
Piers Bearings		WaE	Yes	AFC	Yes	AFC	Yes
Ladders		WaE	Yes	AFC	Yes	No	No
Hatch		WaE	Yes	AFC	Yes	AFC	Yes
Service reticulation openings	*Drawings 015359*	WaE	No	AFC	No	No	No
Cast in situ slabs		WaE	Yes	AFC	Yes	AFC	Yes
Walkways		WaE	Yes	AFC	Yes	No	No
Blisters inside girder		WaE	No	AFC	No	AFC	Yes
Launching gantry support hole		No	No	No	No	No	No
Expansion joints		No	No	No	No	No	No
Top slab blister		No	No	No	No	No	No
Segments Shear key		No	No	No	No	No	No
Deck Rail Shear key	*box out only*	WaE	No	AFC	No	No	No
Earthing							
Earthing Terminals		WaE	Yes	AFC	Yes	AFC	Yes
Earthing Conduits in Pilecaps or Footings		WaE	Yes	AFC	Yes	AFC	Yes
Earthing Conduits in Piers		WaE	Yes	AFC	Yes	AFC	Yes
Earthing Conduits in Abutments		WaE	Yes	AFC	Yes	AFC	Yes
Earthing Conduits in Segments		WaE	Yes	AFC	Yes	AFC	Yes
Electrolysis monitoring terminals		WaE	Yes	AFC	Yes	AFC	Yes
Bore hole with enhancement material	*Drawings 755605*	WaE	Yes	AFC	Yes	No	No
Overbridge							
Super-T girders		WaE	Yes	AFC	Yes	AFC	Yes
Super-T girders underside only		WaE	Yes	AFC	Yes	AFC	Yes
Stairs		WaE	Yes	AFC	Yes	AFC	Yes
Abutment		WaE	Yes	AFC	Yes	AFC	Yes
Pile		WaE	Yes	AFC	Yes	AFC	Yes
Steel sleeve for pile		WaE	Yes	AFC	Yes	AFC	Yes
Wingwall		WaE	Yes	AFC	Yes	AFC	Yes
Approach slab		WaE	Yes	AFC	Yes	AFC	Yes
Bearings		WaE	Yes	AFC	Yes	AFC	Yes
Bearings plinth (cement mortar pad)		WaE	No	AFC	No	AFC	No
Capping beam		WaE	Yes	AFC	Yes	AFC	Yes
Safety protection screen	*Drawings 305181*	No	No	No	No	No	No
Safety steel car barrier	*Drawings 305178,305170 etc.*	WaE	Yes	AFC	Yes	AFC	Yes
Water pipes	*Survey only if the pipe protrude below the bridge beam level*	Survey	No	AFC	No	AFC	Yes
Pipes Hanger	*Drawings 305156*	WaE	No	AFC	No	No	No
Steel removable protective cover and connections	*Drawings 305122*	No	No	No	No	No	No
Geotextile		No	No	No	No	No	No
Backfill		No	No	No	No	No	No
Elastomeric strip		No	No	No	No	No	No
Lateral restraint blocks		WaE	Yes	AFC	Yes	AFC	Yes
Concrete Barrier		WaE	Yes	AFC	Yes	AFC	Yes
Road Surface on overbridge		WaE	No	AFC	No	AFC	Yes
Kerb, Median		WaE	No	AFC	No	AFC	Yes
Immediately surrounding ground	*Only apply at Overbridge 1,2*	WaE	No	AFC	No	No	No
Services in the slab	*Only apply at Overbridge Balmoral*	WaE	No	AFC	No	AFC	No
Stations							
Fins	*Survey only for sides*	WaE	Yes	AFC	Yes	AFC	Yes
Platforms		WaE	Yes	AFC	Yes	AFC	Yes
Upstand Walls (cast in situ)	*Drawings 015247*	WaE	Yes	AFC	Yes	No	No
Upstand Walls (precast)	*Drawings 015247*	WaE	Yes	AFC	Yes	AFC	Yes
Station Bearings	*Drawings 015253*	WaE	Yes	AFC	Yes	AFC	Yes
Penetrations	*Drawings 015251*	WaE	No	AFC	No	AFC	No
Windsor to SPC							
All the surface to the permanent boundary		WaE	No	AFC	No	No	No
Quarry fill		WaE	No	AFC	No	No	No
Subsoil connection pipe	*Drawings 125113*	WaE	Yes	AFC	Yes	No	No

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BIM Work as Executed - Scope of work

Surface and Viaduct Civil Works

8 Appendix B (COBie)

1. General

This appendix address SVC BIM extends of populating for Instance Properties and COBie data.

2. Additional fields

Allow for 5 additional fields/tags to be added or modified at any time during production of the SVC BIM.

3. COBie Extract simplified procedure

A COBie data drop can be performed using the following simplified procedure:

1. Download and install COBie Toolkit for Revit: http://www.autodesk.com/campaigns/interoperability.
2. Access COBie Toolkit from Revit "Add-ins" ribbon.
3. Edit settings within COBie Toolkit to achieve desired formatting style. (this will be discussed with ISJV at further stage)
4. Input COBie data for each element.
5. Choose desired output location and click "Export" feature within COBie Toolkit.

8.4 Additional note

a. Some COBie data need to have unique name, refer to Appendix B note column.
b. If the Contractor has any doubt, do not hesitate to ask for clarification.
c. Failing to provide even a single COBie data will be considered as non-conformity with this contract.

8.5 Model Instance Properties and COBie data extent for each phase

The following list addresses the extent of the SVC BIM object properties and COBie data request for each phase.

BIM - COBie

Elements	Description	Notes	WaE and Survey	AFC	current contract	Segment	Pile	Parapect	Abutment	Cable Stay
COBie										
Identity Data - Type										
Length	-		No	No	No	-	-	-	-	-
Type Image	-		No	No	No	-	-	-	-	-
Keynote	-		No	No	No	-	-	-	-	-
Model	-		No	No	No	-	-	-	-	-
Manufacturer	-		No	No	No	-	-	-	-	-
Type Comments	-		No	No	No	-	-	-	-	-
URL	-		No	No	No	-	-	-	-	-
Description	-		No	No	No	-	-	-	-	-
Assembly Code	-		No	No	No	-	-	-	-	-
Fire Rating	-		No	No	No	-	-	-	-	-
Cost	-		No	No	No	-	-	-	-	-
Type Mark	-		No	No	No	-	-	-	-	-
COBie Data - Type										
COBie.Type	Active	tick in the box	Yes	Yes	Yes	Active	Active	Active	Active	Active
COBie.Type.Name	Object name	UNIQUE	Yes	Yes	Yes	Segment	Pile	Parapect	Abutment	Cable Stay
COBie.Type.CreatedBy	Type drafted by	Name or initial of frafter	Yes	Yes	Yes	Mike	Mike	Mike	Mike	Mike
COBie.Type.CreatedOn	Type creation year	Coild be 1 date for the entire file or only the year.	Yes	Yes	Yes	2015	2015	2015	2015	2015
COBie.Type.Category	Type		Yes	Yes	Yes	D	900	Left	A	-
COBie.Type.Description	Additional description		Yes	Yes	Yes	Deviator	900 Diameter	-	-	-
COBie.Type.AssetType	Fabrication location	if in doubt ask ISJV for this information	Yes	Yes	Yes	Precast	Cast in situ	Precast	Cast in situ	Assembled on si
COBie.Type.Manufacturer	Company	ask ISJV for this information	Yes	Yes	Yes	Handson	Hyatt	Handson	Darcon	Frayssinet
COBie.Type.ModelNumber	-		No	No	No	-	-	-	-	-
COBie.Type.ReplacementCost	-		No	No	No	-	-	-	-	-
COBie.Type.ExpectedLife	100y		Yes	Yes	Yes	100y	100y	100y	100y	100y
COBie.Type.DurationUnit	-		No	No	No	-	-	-	-	-
COBie.Type.WarrantyDescription	-		No	No	No	-	-	-	-	-
COBie.Type.NominalLength	-		No	No	No	-	-	-	-	-
COBie.Type.NominalWidth	-		No	No	No	-	-	-	-	-
COBie.Type.NominalHeight	-		No	No	No	-	-	-	-	-
COBie.Type.ModelReference	Unique name!	UNIQUE	Yes	Yes	No	svc-Segment-D	svc-Pile-900	svc-Parapect-Le	svc-Abutment-A	svc-Cable Stay--
COBie.Type.Shape	-		No	No	No	-	-	-	-	-
COBie.Type.Size	-		No	No	No	-	-	-	-	-
COBie.Type.Color	Colore		Yes	Yes	Yes	As per matirial	As per matirial	As per matirial	Mix	As per matirial
COBie.Type.Finish	Concrete finish		Yes	Yes	Yes	2C	2C	2C	2C	-
COBie.Type.Grade	Concrete, Steel grade		Yes	Yes	Yes	50MPa	50MPa	40MPa	40MPa	fyk
COBie.Type.Material	Material		Yes	Yes	Yes	Reinforeced Co	Reinforeced Co	Reinforeced Co	Reinforeced Co	Steel
COBie.Type.Constituents	Mix design used	ask ISJV for this information	Yes	Yes	Yes	(Mix design nam	(Mix design nam	(Mix design nam	(Mix design nam	Strands
COBie.Type.Features	-		No	No	No	-	-	-	-	-
COBie.Type.AccessibilityPerformance	-		No	No	No	-	-	-	-	-
COBie.Type.CodePerformance	-		No	No	No	-	-	-	-	-
COBie.Type.SustainabilityPerformance	-		No	No	No	-	-	-	-	-
COBie.Type.Area	-		No	No	No	-	-	-	-	-
COBie.Type.Length	-		No	No	No	-	-	-	-	-
Identity Data - Properties										
Image	-		No	No	No	-	-	-	-	-
Comments	-		No	No	No	-	-	-	-	-
Mark	-		No	No	No	-	-	-	-	-
COBie Data - Properties										
COBie.Properties.CreatedBy	Type drafted by		Yes	Yes	Yes	Mike	Mike	Mike	Mike	Mike
COBie.Properties.CreatedOn	Type creation year		Yes	Yes	Yes	2015	2015	2015	2015	2015
COBie.Properties.Name	Object name	UNIQUE as per - Extract - Cad Manual	Yes	Yes	Yes	Segment D 1	Pile	Parapect	Abutment	Cable Stay

FASE 3:

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BIM Work as Executed - Scope of work

Surface and Viaduct Civil Works

9 Appendix C (Time, Portions and Design Lots)

1. General

This appendix addresses SVC BIM sections subdivision and naming.

2. Project subdivision

All documents and references need to consider the project portions as per Appendix C

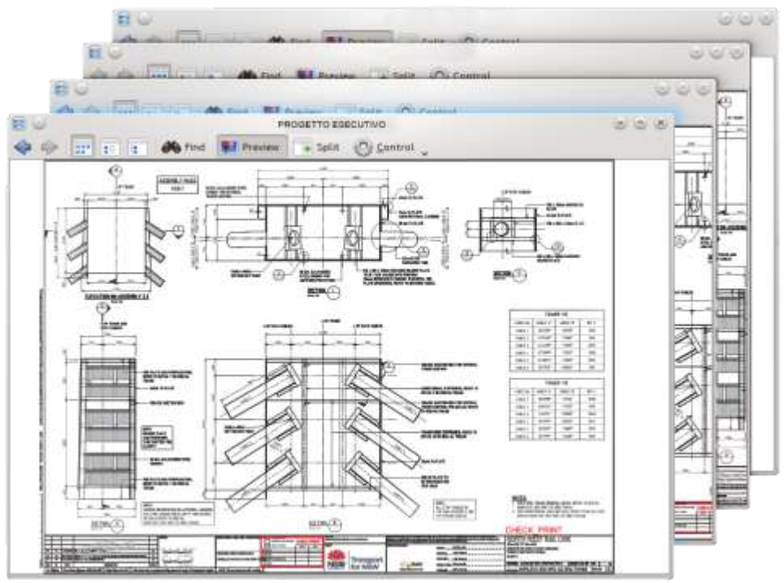
BIM - Delivery Dates

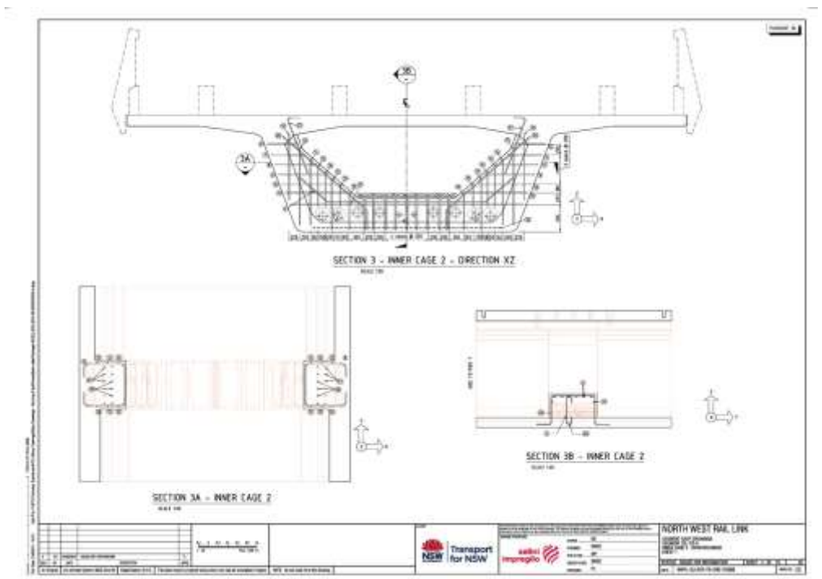
Portions code	Asset Group No.	Description	Spans	Approximate Chaina	Approximate Chaina	Survey	WaE final	WaE Interim	AFC final	Design Lots													
										1	2	11	12	13	14	15	30	31	75-1	75-2	77	80
1_a	AG-01	Second Ponds Creek	Cudgigong to AbA	46km 233.326	46km 760.000	25/07/2016	9/05/2016	25/04/2016	9/05/2016		x		x	x		x						x
1_b	AG-02	Rouse Hill Sub-station	80 to 84	44km 218.171	44km 413.171	25/07/2016	13/06/2016	30/05/2016	13/06/2016	x						x						
1_c	AG-03	Kellyville Station	27 to 35	42km 318.271	42km 560.604	25/07/2016	13/06/2016	30/05/2016	13/06/2016	x						x						
1_d	AG-04	Rouse Hill Station	98 to 108	44km 888.376	45km 186.486	25/07/2016	20/06/2016	6/06/2016	20/06/2016	x						x			x			
1_e	AG-05	Balmoral Road to Kellyville	1 to 26	~41km 349	42km 318.271	25/07/2016	27/06/2016	13/06/2016	27/06/2016	x						x						
1_f	AG-06	Viaduct - Riley Tway Cark Park - NR	36 to 45	42km 560.604	42km 935.271	25/07/2016	4/07/2016	20/06/2016	4/07/2016	x						x						
1_i	AG-07	WRSSC (incomplete, deck and substructures only)	112 to 114	45km 326.616	45km 595.626	N/A	N/A	11/07/2016	30/07/2016											x		
1_l	AG-08	Sydney Water	46-79	42km 935.271	44km 218.171	25/07/2016	25/07/2016	11/07/2016	25/07/2016	x						x						
1_m	AG-09	Sanctuary Road to White Hart Drive	85-97	44km 413.171	44km 888.376	25/07/2016	25/07/2016	11/07/2016	25/07/2016	x						x						
1_n	AG-10	Approch Viaduct	109-111	45km 186.486	45km 326.616	25/07/2016	25/07/2016	11/07/2016	25/07/2016	x						x			x		x	
1_o	AG-11	Knights Quarry	WRSSC-SPC	45km 595.626	46km 233.326	25/07/2016	25/07/2016	11/07/2016	25/07/2016				x	x	x	x						x
1_t	AG-07	WRSSC (complete)	112 to 114	45km 326.616	45km 595.626	25/07/2016	25/07/2016	11/07/2016	25/07/2016							x					x	
1_u	AG-12	BVR Abutment A to Portion2	N/A	~41km 258.000	~41km 349	25/07/2016	25/07/2016	11/07/2016	25/07/2016			x		x								
2	AG-13	Bella Vista to Portion1	N/A	40km 461.400 (down line) 40km 464.010 (up line)	~41km 258.000	17/12/2016	17/12/2016	3/12/2016	17/12/2016			x			x		x	x				x

note:All deadlines are by 24:00 (midnight) Rome Time (GTM+2)

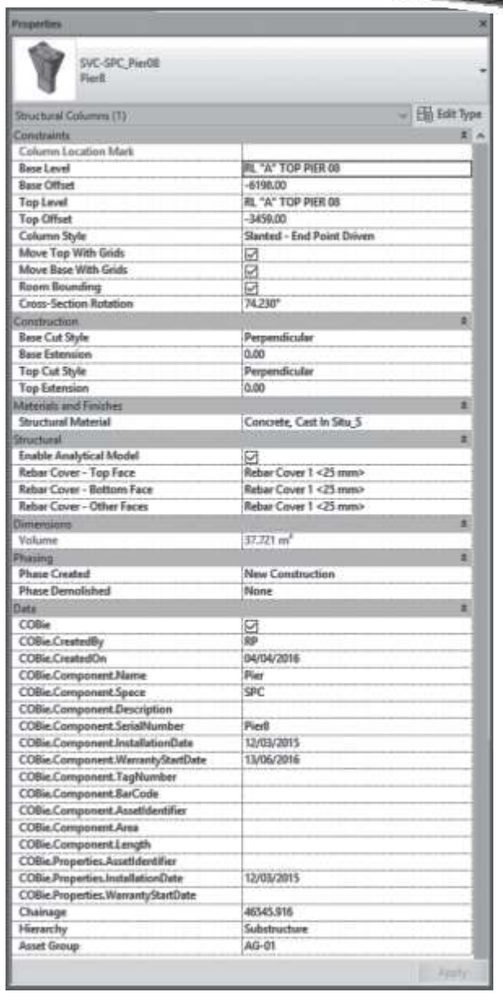
PROCESSO INFORMATIVO BIM

Modellazione BIM del progetto esecutivo sulla base degli elaborati del progetto esecutivo



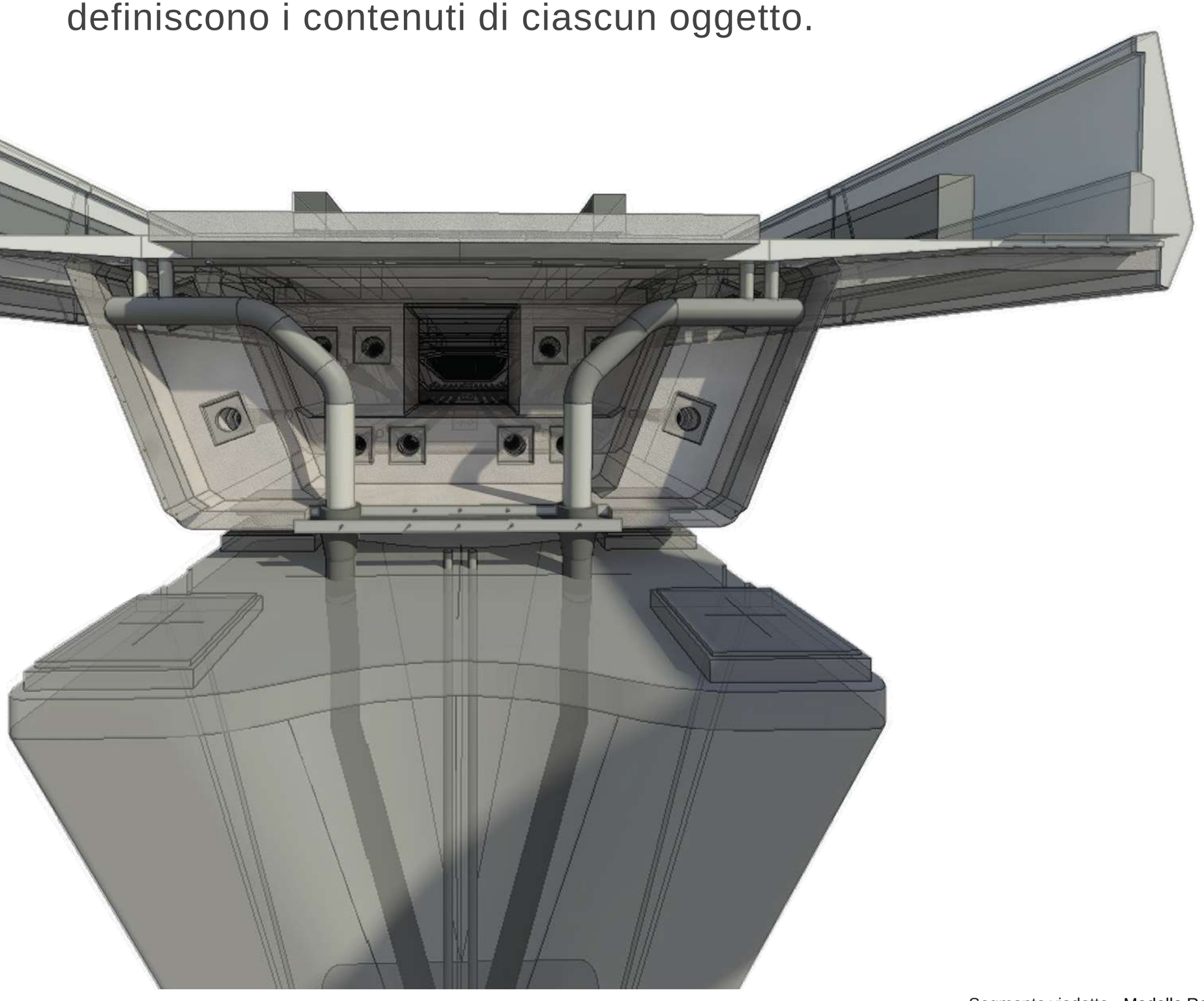


Ad ogni elemento del modello, per ogni fase vengono definiti gli obbiettivi informativi, che definiscono i contenuti di ciascun oggetto.



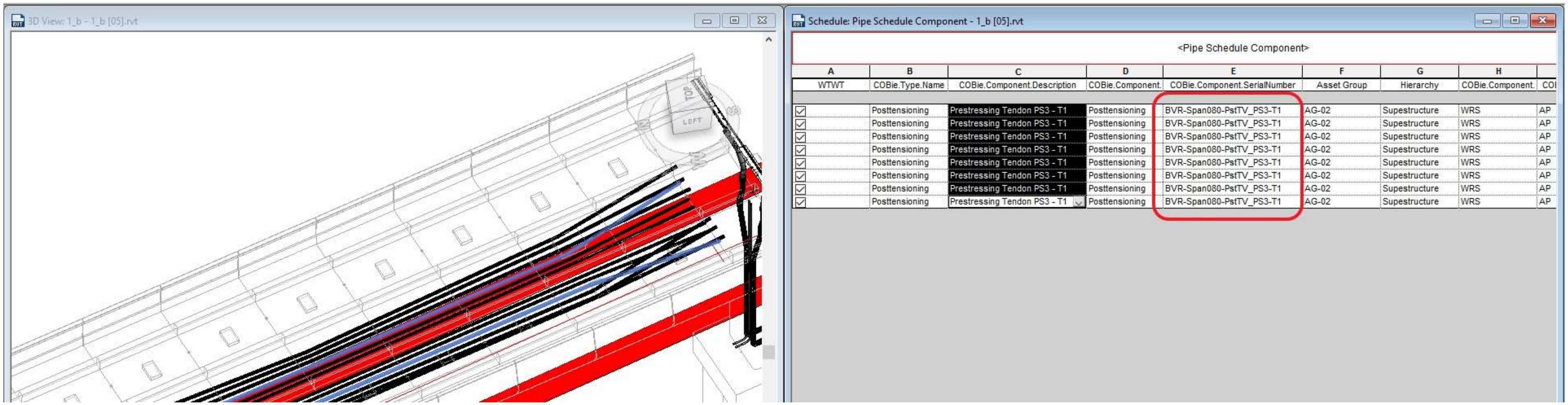
Properties	
SVC-SPC_Pier08 Pier8	
Structural Columns (1)	Edit Type
Constraints	
Column Location Mark	
Base Level	RL "A" TOP PIER 08
Base Offset	-6198.00
Top Level	RL "A" TOP PIER 08
Top Offset	-3459.00
Column Style	Slanted - End Point Driven
Move Top With Grids	☑
Move Base With Grids	☑
Room Bounding	☑
Cross-Section Rotation	74.230°
Construction	
Base Cut Style	Perpendicular
Base Extension	0.00
Top Cut Style	Perpendicular
Top Extension	0.00
Materials and Finishes	
Structural Material	Concrete, Cast In Situ_S
Structural	
Enable Analytical Model	☑
Rebar Cover - Top Face	Rebar Cover 1 <25 mm>
Rebar Cover - Bottom Face	Rebar Cover 1 <25 mm>
Rebar Cover - Other Faces	Rebar Cover 1 <25 mm>
Dimensions	
Volume	37.721 m³
Phasing	
Phase Created	New Construction
Phase Demolished	None
Data	
COBie	☑
COBie.CreatedBy	RP
COBie.CreatedOn	04/04/2016
COBie.Component.Name	Pier
COBie.Component.Space	SPC
COBie.Component.Description	
COBie.Component.SerialNumber	Pier8
COBie.Component.InstallationDate	12/03/2015
COBie.Component.WarrantyStartDate	13/06/2016
COBie.Component.TagNumber	
COBie.Component.BarCode	
COBie.Component.AssetIdentifier	
COBie.Component.Area	
COBie.Component.Length	
COBie.Properties.AssetIdentifier	
COBie.Properties.InstallationDate	12/03/2015
COBie.Properties.WarrantyStartDate	
Chainage	46345.916
Hierarchy	Substructure
Asset Group	AG-01

Implementazione COBie Data



Segmento viadotto - Modello Revit

CONTENUTO INFORMATIVO LOD 400 (BRITISH STANDARD)



<Pipe Schedule Component>

A	B	C	D	E	F	G	H	
WTWT	COBie.Type.Name	COBie.Component.Description	COBie.Component.	COBie.Component.SerialNumber	Asset Group	Hierarchy	COBie.Component.	COI
☑	Posttensioning	Prestressing Tendon PS3 - T1	Posttensioning	BVR-Span080-PstTV_PS3-T1	AG-02	Supestructure	WRS	AP
☑	Posttensioning	Prestressing Tendon PS3 - T1	Posttensioning	BVR-Span080-PstTV_PS3-T1	AG-02	Supestructure	WRS	AP
☑	Posttensioning	Prestressing Tendon PS3 - T1	Posttensioning	BVR-Span080-PstTV_PS3-T1	AG-02	Supestructure	WRS	AP
☑	Posttensioning	Prestressing Tendon PS3 - T1	Posttensioning	BVR-Span080-PstTV_PS3-T1	AG-02	Supestructure	WRS	AP
☑	Posttensioning	Prestressing Tendon PS3 - T1	Posttensioning	BVR-Span080-PstTV_PS3-T1	AG-02	Supestructure	WRS	AP
☑	Posttensioning	Prestressing Tendon PS3 - T1	Posttensioning	BVR-Span080-PstTV_PS3-T1	AG-02	Supestructure	WRS	AP
☑	Posttensioning	Prestressing Tendon PS3 - T1	Posttensioning	BVR-Span080-PstTV_PS3-T1	AG-02	Supestructure	WRS	AP
☑	Posttensioning	Prestressing Tendon PS3 - T1	Posttensioning	BVR-Span080-PstTV_PS3-T1	AG-02	Supestructure	WRS	AP

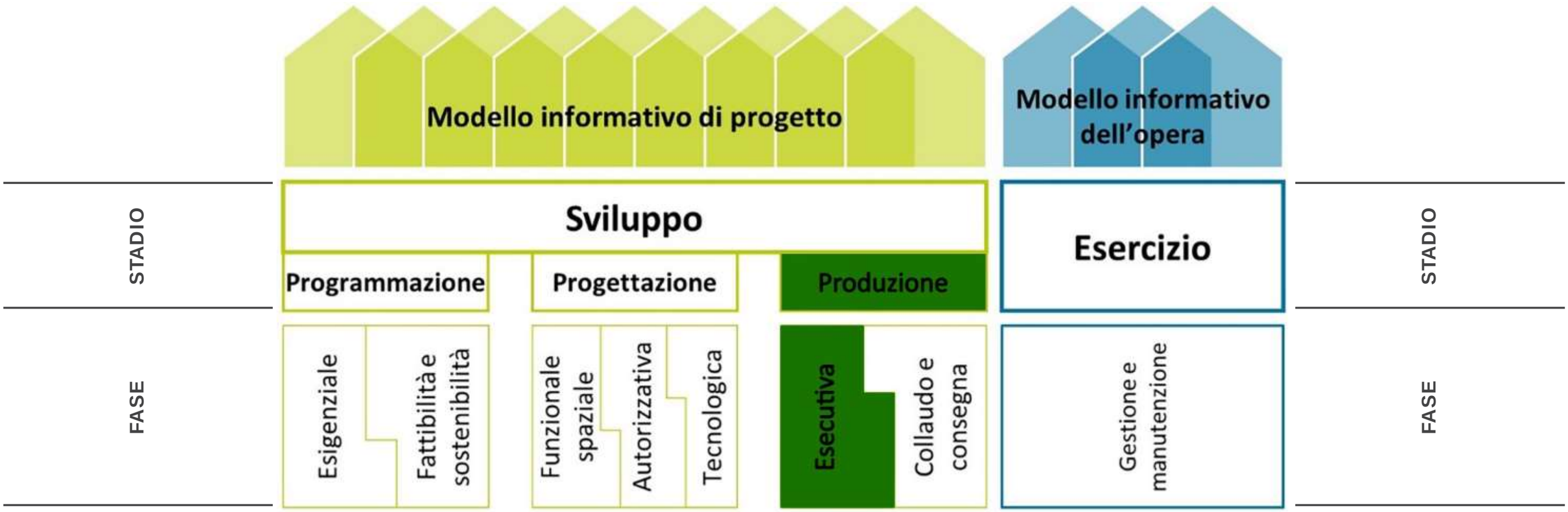
Estrazione COBie Data dal modello Revit

Name	CreatedBy	CreatedOn	Category	Description	AssetType	Manufacturer	ExtSystem	ExtObject
BVR- Drainage Abutments A	jafar.ali@isjv.com.au	2015-12-14T06:27:0	23-60 30 00 : General Pipework an	BVR- Drainage Abutments A Drainage Abutme	n/a		Autodesk Revit 2015, Build: 20151007 1515(x64	Autodesk.Revit.DB.FamilySymbol
BVR- Span Drainage	jafar.ali@isjv.com.au	2015-12-14T06:27:0	23-60 30 11 : Pipework Products fo	BVR- Drainage Abutments A Drainage Abutme	n/a		Autodesk Revit 2015, Build: 20151007 1515(x64	Autodesk.Revit.DB.FamilySymbol
BVR- Span Drainage	jafar.ali@isjv.com.au	2015-12-14T06:27:0	23-60 30 11 : Pipework Products fo	BVR- Span Drainage BVR- Span Drainage	n/a		Autodesk Revit 2015, Build: 20151007 1515(x64	Autodesk.Revit.DB.FamilySymbol
Drain Grate	jafar.ali@isjv.com.au	2015-12-14T06:27:0	Drainage	Drain grating Abutments	Precast	n/a	Autodesk Revit 2015, Build: 20151007 1515(x64	Autodesk.Revit.DB.FamilySymbol
Drainage Piers	jafar.ali@isjv.com.au	2015-12-14T06:27:0	Drainage	BVR - Drainage Piers	n/a		Autodesk Revit 2015, Build: 20151007 1515(x64	Autodesk.Revit.DB.FamilySymbol
Electrolysis Point	jafar.ali@isjv.com.au	2015-12-14T06:27:0	Electrolysis	Electrolysis Protection	n/a	n/a	Autodesk Revit 2015, Build: 20151007 1515(x64	Autodesk.Revit.DB.FamilySymbol
HDPVC conduits	jafar.ali@isjv.com.au	2015-12-14T06:27:0	Conduits	Conduits Elbow	n/a		Autodesk Revit 2015, Build: 20151007 1515(x64	Autodesk.Revit.DB.FamilySymbol
HDPVC conduits	jafar.ali@isjv.com.au	2015-12-14T06:27:0	Conduits	HDPVC conduits - pier A	n/a		Autodesk Revit 2015, Build: 20151007 1515(x64	Autodesk.Revit.DB.Electrical.ConduitType
Insitu Deck at Abutments	jafar.ali@isjv.com.au	2015-12-14T06:27:0	Insitu Deck	Insitu Deck at Abutments Deck Abutment A BV	Precast	n/a	Autodesk Revit 2015, Build: 20151007 1515(x64	Autodesk.Revit.DB.FamilySymbol
Pipe	jafar.ali@isjv.com.au	2015-12-14T06:27:0	Drainage Pipe	Pipes PIER A - Drainage Pipe 225	n/a	Handson	Autodesk Revit 2015, Build: 20151007 1515(x64	Autodesk.Revit.DB.Plumbing.PipeType
Pipe	jafar.ali@isjv.com.au	2015-12-14T06:27:0	Drainage Pipe	Pipes PIER A - Drainage Pipe 225	n/a	Handson	Autodesk Revit 2015, Build: 20151007 1515(x64	Autodesk.Revit.DB.Plumbing.PipeType
Prestressing PS1 - T3E	jafar.ali@isjv.com.au	2015-12-14T06:27:0	Tendon	Prestressing Tendon PS1 - T3E	n/a	Handson	Autodesk Revit 2015, Build: 20151007 1515(x64	Autodesk.Revit.DB.Plumbing.PipeType
Prestressing P12 - T1E	jafar.ali@isjv.com.au	2015-12-14T06:27:0	Tendon	Prestressing Tendon PS1 - T1E	n/a	Handson	Autodesk Revit 2015, Build: 20151007 1515(x64	Autodesk.Revit.DB.Plumbing.PipeType
Prestressing PS1 - T2E	jafar.ali@isjv.com.au	2015-12-14T06:27:0	Tendon	Prestressing Tendon PS1 - T2E	n/a	Handson	Autodesk Revit 2015, Build: 20151007 1515(x64	Autodesk.Revit.DB.Plumbing.PipeType
Prestressing PS2 - T1E	jafar.ali@isjv.com.au	2015-12-14T06:27:0	Tendon	Prestressing Tendon PS2 - T1E	n/a	Handson	Autodesk Revit 2015, Build: 20151007 1515(x64	Autodesk.Revit.DB.Plumbing.PipeType
Prestressing PS2 - T2E	jafar.ali@isjv.com.au	2015-12-14T06:27:0	Tendon	Prestressing Tendon PS2 - T2E	n/a	Handson	Autodesk Revit 2015, Build: 20151007 1515(x64	Autodesk.Revit.DB.Plumbing.PipeType
Prestressing PS2 - T2E	jafar.ali@isjv.com.au	2015-12-14T06:27:0	Tendon	Prestressing Tendon PS2 - T4E	n/a	Handson	Autodesk Revit 2015, Build: 20151007 1515(x64	Autodesk.Revit.DB.Plumbing.PipeType
Prestressing PS2 - T2E	jafar.ali@isjv.com.au	2015-12-14T06:27:0	Tendon	Prestressing Tendon PS2 - T5E	n/a	Handson	Autodesk Revit 2015, Build: 20151007 1515(x64	Autodesk.Revit.DB.Plumbing.PipeType
Prestressing PS2 - T3E	jafar.ali@isjv.com.au	2015-12-14T06:27:0	Tendon	Prestressing Tendon PS2 - T3E	n/a	Handson	Autodesk Revit 2015, Build: 20151007 1515(x64	Autodesk.Revit.DB.Plumbing.PipeType
Prestressing PS3 - T1	jafar.ali@isjv.com.au	2015-12-14T06:27:0	Tendon	Prestressing Tendon PS3 - T1	n/a	Handson	Autodesk Revit 2015, Build: 20151007 1515(x64	Autodesk.Revit.DB.Plumbing.PipeType
Prestressing PS3 - T2	jafar.ali@isjv.com.au	2015-12-14T06:27:0	Tendon	Prestressing Tendon PS3 - T2	n/a	Handson	Autodesk Revit 2015, Build: 20151007 1515(x64	Autodesk.Revit.DB.Plumbing.PipeType
Prestressing PS3 - T3	jafar.ali@isjv.com.au	2015-12-14T06:27:0	Tendon	Prestressing Tendon PS3 - T3	n/a	Handson	Autodesk Revit 2015, Build: 20151007 1515(x64	Autodesk.Revit.DB.Plumbing.PipeType
Prestressing PS3 - T4	jafar.ali@isjv.com.au	2015-12-14T06:27:0	Tendon	Prestressing Tendon PS3 - T4	n/a	Handson	Autodesk Revit 2015, Build: 20151007 1515(x64	Autodesk.Revit.DB.Plumbing.PipeType
Prestressing PS3 - T5	jafar.ali@isjv.com.au	2015-12-14T06:27:0	Tendon	Prestressing Tendon PS3 - T5	n/a	Handson	Autodesk Revit 2015, Build: 20151007 1515(x64	Autodesk.Revit.DB.Plumbing.PipeType
Prestressing PS3 - T6	jafar.ali@isjv.com.au	2015-12-14T06:27:0	Tendon	Prestressing Tendon PS3 - T6	n/a	Handson	Autodesk Revit 2015, Build: 20151007 1515(x64	Autodesk.Revit.DB.Plumbing.PipeType
Prestressing PS4 - T1	jafar.ali@isjv.com.au	2015-12-14T06:27:0	Tendon	Prestressing Tendon PS4 - T1	n/a	Handson	Autodesk Revit 2015, Build: 20151007 1515(x64	Autodesk.Revit.DB.Plumbing.PipeType
Prestressing PS4 - T2	jafar.ali@isjv.com.au	2015-12-14T06:27:0	Tendon	Prestressing Tendon PS4 - T2	n/a	Handson	Autodesk Revit 2015, Build: 20151007 1515(x64	Autodesk.Revit.DB.Plumbing.PipeType
Prestressing PS4 - T3	jafar.ali@isjv.com.au	2015-12-14T06:27:0	Tendon	Prestressing Tendon PS4 - T3	n/a	Handson	Autodesk Revit 2015, Build: 20151007 1515(x64	Autodesk.Revit.DB.Plumbing.PipeType
Prestressing PS4 - T4	jafar.ali@isjv.com.au	2015-12-14T06:27:0	Tendon	Prestressing Tendon PS4 - T4	n/a	Handson	Autodesk Revit 2015, Build: 20151007 1515(x64	Autodesk.Revit.DB.Plumbing.PipeType
Prestressing PS4 - T5	jafar.ali@isjv.com.au	2015-12-14T06:27:0	Tendon	Prestressing Tendon PS4 - T5	n/a	Handson	Autodesk Revit 2015, Build: 20151007 1515(x64	Autodesk.Revit.DB.Plumbing.PipeType
Prestressing PS4 - T6	jafar.ali@isjv.com.au	2015-12-14T06:27:0	Tendon	Prestressing Tendon PS4 - T6	n/a	Handson	Autodesk Revit 2015, Build: 20151007 1515(x64	Autodesk.Revit.DB.Plumbing.PipeType
Segment A1 S1-1	jafar.ali@isjv.com.au	2015-12-14T06:27:0	Structural Frames	SVC-BVR-Viaduct-A1 Segment A1 S1-1	Precast	Handson	Autodesk Revit 2015, Build: 20151007 1515(x64	Autodesk.Revit.DB.FamilySymbol
Segment D1 S1-3	jafar.ali@isjv.com.au	2015-12-14T06:27:0	Structural Frames	SVC-BVR-Viaduct-D1 Segment D1 S1-3	Precast	Handson	Autodesk Revit 2015, Build: 20151007 1515(x64	Autodesk.Revit.DB.FamilySymbol
Segment D1 S1-4	jafar.ali@isjv.com.au	2015-12-14T06:27:0	Structural Frames	SVC-BVR-Viaduct-D1 Segment D1 S1-4	Precast	Handson	Autodesk Revit 2015, Build: 20151007 1515(x64	Autodesk.Revit.DB.FamilySymbol
Segment D1B S2-3	jafar.ali@isjv.com.au	2015-12-14T06:27:0	Structural Frames	SVC-BVR-Viaduct-D1B Segment D1B S2-3	Precast	Handson	Autodesk Revit 2015, Build: 20151007 1515(x64	Autodesk.Revit.DB.FamilySymbol
Segment D1B S2-7	jafar.ali@isjv.com.au	2015-12-14T06:27:0	Structural Frames	SVC-BVR-Viaduct-D1B1 Segment D1B S2-7	Precast	Handson	Autodesk Revit 2015, Build: 20151007 1515(x64	Autodesk.Revit.DB.FamilySymbol

STATO DI LAVORAZIONE E STATO DI APPROVAZIONE DEL CONTENUTO INFORMATIVO

No.	Stage	PACKAGE	Rev	Reviewer	Initial Comment Date	Discipline	Organisation	Document Reference	Reviewer Initial Comment	Project Deed ref	Compliance Status	ISJV Response	Initial Response Date	Response Status	Reviewer Comment on Response	Date Comment Closed	Incorporation Status / Date
1	Test	SVC BIM models	A	Steve Appleby/Shane Reilly	27-Mar-2015	BIM	TfNSW	BIM models (NWRLSVC-ISJ-TX-00624)	Data elements modelled – Foundations, Piers , Bearings, abutments, Parapets, Grated drains. Data elements not in model – Drainage pipes and pits , Earthing and electrolysis protection. Provide evidence of how this will be modelled.	SVC Main Body section 3.12 & SVC SPR Appendix 23 table 23.1	M	21/10/2015 - Noted, we will provide you with those elements in the next issue. 27/01/2016 - Earthing conduits and electrolysis point are in the model. Please check again.	21/10/2015	CS C	18/01/2016 - Still can't see earth and electrolysis protection modelled elements.	18-Feb-2016	18-Feb-2016
2	Test	SVC BIM models	A	Steve Appleby/Shane Reilly	27-Mar-2015	BIM	TfNSW	BIM models (NWRLSVC-ISJ-TX-00624)	COBie data is included within all modelled elements. The data as presented needs to be agreed in relation to componentry Eg. Facility, Floor, Space, Zone Component. This includes the amount of data within the elements modelled.	SVC Main Body section 3.12 & SVC SPR Appendix 23 table 23.1	O	21/10/2015 - COBie data agreed in relation to existimg componentry as far as our undestanging. If you wish a different componentry allocation, please consider a meeting for discussion. 27/01/2016 - We are still waiting for comments if any. 13/04/2016 - Updated	21/10/2015	CS C	18/01/2016 - Finalisation and agreement to be reached at meeting 21/01/16. 11/04/16 - BIM Execution Plan to be updated with Appendix for each COBie Modelled element	27-Apr-2016	27-Apr-2016
3	AFC	SVC BIM models	A	Toby Maple	15-Oct-2015	BIM	TfNSW	Second Ponds Creek AFC BIM model (NWRLSVC-ISJ-NWR- C_CN-000933)	**COBie data sheet - CoBie.xlsx** a)Contact: currently shown as N/A; suggestion is to include in the green fields details of address, phone number, street, etc. b)Facility - consider including name of project - Northwest Rail link viaducts between ..... Type: •consider naming each individual type as per Revit family types in the model e.g. SPC-S01_v2:S01 - A1 UP not just 'Segment' •consider model reference to refer to which file name this type object can be found in - not the Element ID Component: • name - suggest it be family name •ExtIdentifier - consider using GUID - not Revit ID - due to potential for 2 Revit ID whilst GUID is unique •Assume installation date, warranty start date, asset identifier etc. will be completed at a later date once WAE is completed		O	21/10/2015 - Noted, thanks for your suggestions, we will incorporate your comments as much as we can in the next issue. 27/01/2016 - We are performing a general check, if you spot any mistake please notify us.	21/10/2015	CS C	18/01/2016 - Most comments have been included however there are common spelling mistakes in either parameters or in family names and descriptions or the use of multiple naming conventions 9e.g. Pier 1, P1, 1 etc).	18-Feb-2016	18-Feb-2016
4	AFC	SVC BIM models	A	Toby Maple	15-Oct-2015	BIM	TfNSW	Second Ponds Creek AFC BIM model (NWRLSVC-ISJ-NWR- C_CN-000933)	**Revit File - SPC.rvt** The model is looking good. The objects have COBie data attached small coordination issues with SPC - Drainage Piers family and SPC - Span Drainage family - the drains appear not to be aligned		O	21/10/2015 - Noted, thanks, we will investigate and if necessary we will fix the drain, the change will be incorporated in the next issue. 27/01/2016 - We are still working on it, the change will be incorporated in the next issue. 28/04/2016 - Solved, will be incorporated in the next issue.	21/10/2015	O	18/01/2016 - The drainage family still does not appear to align. This is still an issue 6 months on.		
5	AFC	SVC BIM models	A	Toby Maple	15-Oct-2015	BIM	TfNSW	Second Ponds Creek AFC BIM model (NWRLSVC-ISJ-NWR- C_CN-000933)	**Navisworks Model - SPC.nwc** Looks Ok - geometry and data exported OK Model coordinates line up to IFC file		O	21/10/2015 - Noted.	21/10/2015	C		18-Jan-2016	18-Jan-2016
6	AFC	SVC BIM models	A	Toby Maple	15-Oct-2015	BIM	TfNSW	Second Ponds Creek AFC BIM model (NWRLSVC-ISJ-NWR- C_CN-000933)	**IFC Model -** Looks Ok - geometry and data exported OK Model coordinates line up to NWC file		O	21/10/2015 - Noted.	21/10/2015	C		18-Jan-2016	18-Jan-2016
7	AFC	BIM Model Delivery - DL01 – Bella Vista to Rouse Hill viaduct - from Abutment A BVR to pier 44 and from pier 100 to pier 107		Toby Maple	18-Jan-2016	BIM	TfNSW	SVC Project Deed - SWTC	All information and data to be uploaded onto the PDCS must be in both electronic (.NWD) and native format. Also noted in SVC BEP Rev 2 in Figure 3.6 & 9-1 that Navisworks Freedom to be used. Navisworks files need to be provided in NWD. NWC's were issued in a folder called NWD. NWD format is able to be opened in the free veiwer - Navisworks Freedom.	SVC Project Deed - SWTC (page 28 item (h))	M	27/01/2016 - As discussed next issue will incorporate both. 13/04/2016 - Done		C	correct files types (.nwd) have been provided	27-Apr-2016	27-Apr-2016
8	AFC	BIM Model Delivery - DL01 – Bella Vista to Rouse Hill viaduct - from Abutment A BVR		Toby Maple	18-Jan-2016	BIM	TfNSW	8-Viaduct (Ab A to Pier 9).ifc	All Abutments and Pilecaps are missing from issued .ifc files. This could be from the families being modelled on Structural connections category and the export settings for IFC not including this category		N	27/01/2016 - We are currently investigating, we will incorporate in the next issue. 13/04/2016 - Issued Fixed		C	Elements are in the ifc	27-Apr-2016	27-Apr-2016
9	AFC	BIM Model Delivery - DL01 – Bella Vista to Rouse Hill viaduct - from Abutment A BVR to pier 44 and from pier 100 to pier 107		Toby Maple	18-Jan-2016	BIM	TfNSW	8-Viaduct (Ab A to Pier 9).xlsx	Consistency - In the component tab within the COBie extract the Serial number column uses abbreviations for bearings for piers (such as P1) then drainage pipes use the long name (e.g. Pier 1) then Piles are named differently (e.g. 1).		O	27/01/2016 - As discussed this is not an issue, the abbreviatios are originated by serial numbering or taken from the design drawings.		C	Agree	27-Apr-2016	27-Apr-2016
10	AFC	BIM Model Delivery - DL01 – Bella Vista to Rouse Hill viaduct - from Abutment A BVR to pier 44 and from pier 100 to pier 107		Toby Maple	18-Jan-2016	BIM	TfNSW	All Cobie extracts, Revit, Navis and IFC files	As advised by TfNSW at the meeting in ISJV's offices at Kellyville on 06/11/2015 chainages are to be included in COBie extract. TM advised TfNSW 9/12/15 the way in which a "chainage" shared parameter could be added to Revit and then added to the COBie plugin exporter settings.		N	27/01/2016 - Please refer to COBie at page "Attribute", Column "Value". We will change the naming of the column for clarity but the Chainage data are incorporated. 09/05/2016 - Chainage moved to Component		O	These values cannot be tied to each individual element as there is no unique identifier in the Attribute Tab that can be referenced back to each element. Suggest if this is ISJV approach to include Chainage in the Attribute Tab the Extidentifer values are changed to unique values as per the component tab Extidentifer value to create a cross reference.		
11	AFC	BIM Model Delivery - DL01 – Bella Vista to Rouse Hill viaduct - from Abutment A BVR		Toby Maple	18-Jan-2016	BIM	TfNSW	All Revit models	All Post tensioning modelled as Pipe Category in Revit. This will export to IFC as Pipes and confuse other disciplines.		N	27/01/2016 - We are currently investigating, we will incorporate in the next issue. 13/04/2016 - Issued Fixed		C	Named Pipe Type to be Prestressing SPC	27-Apr-2016	27-Apr-2016
12	AFC	BIM Model Delivery - DL11, DL12, DL13, DL14, DL30 & DL31		Toby Maple	11-Apr-2016	BIM	TfNSW	4-Overbridge No.02.nwd	Overbridge 2 (4-Overbridge No.02.nwd) has the Capping Beam for all 4 sides modelled as 1 object where as every other overbridge has 4 individual elements. Same applies for Wallstairs retaining wall.		N	13/04/2016 - Ok, we will separate.					
13	AFC	BIM Model Delivery - DL11, DL12, DL13, DL14, DL30 & DL31		Toby Maple	11-Apr-2016	BIM	TfNSW	Top of Abt A Pile RL 'A' and 1-3-5 Soil Nail Wall_CW-01	Combination of Railings used. 1 type 'Monowillis' and 1 type Steel Handrailing System however both look identical. What is the difference and why are 2 types needed? There is also a clash between the railings where they meet between both files when the overbridges are linked to 1-3-5-Soil Nail Wall_CW-01		O	13/04/2016 - The clash will be fixed in the next issue, the 2 families are differten, see connections.					
14	AFC	BIM Model Delivery - DL11, DL12, DL13, DL14, DL30 & DL31		Toby Maple	11-Apr-2016	BIM	TfNSW	1-3-5-Soil Nail Wall_CW-01.rvt	There is colliding geometry between the SVC-CW-01_Concrete Wall 1D curtain system used to represent the shotcrete wall-185mm -cw01u. Misalignment of horizontal panel at this location between the 2 separate curtain walls Revit id's 6921324 and 6948481 - this occurs in many locations - is this the design intent to have differing height panels?		M	13/04/2016 - We are working on it, they will be fixed for the next issue					
15	AFC	BIM Model Delivery - DL11, DL12, DL13, DL14, DL30 & DL31		Toby Maple	11-Apr-2016	BIM	TfNSW	1-3-5-Soil Nail Wall_CW-01.rvt	Pit and pipe connections do not align at all locations. Pit opening does not align with pipe Revit id: 6409017		M	13/04/2016 - Issued Fixed					
16	AFC	BIM Model Delivery - DL11, DL12, DL13, DL14, DL30 & DL31		Toby Maple	11-Apr-2016	BIM	TfNSW	4-Overbridge No.02.xlsx	SVC-OVB2-Capping beam is one element whereas in all other COBie files this is 4 individual objects. Also the GUID for this element in COBie cannot be found in the Navisworks file. suggest separating into 4 elements as per other overbridges.		N	13/04/2016 - Please refer to comment 12					
17	AFC	BIM Model Delivery - DL11, DL12, DL13, DL14, DL30 & DL31		Toby Maple	11-Apr-2016	BIM	TfNSW	All COBie	Chainage parameter does not appear to be added yet to any file.		M	13/04/2016 - Please refer to comment 10					
18	AFC	BIM Model Delivery - DL02 Second Ponds Creek viaduct (based		Toby Maple	27-Apr-2016	BIM	TfNSW	23-Second Pond Creek Viaduct.rvt	Drainage pipes are missing from Abutment A		M	28/04/2016 - Issued Fixed		C	Agreed		
19	AFC	BIM Model Delivery - DL02 Second Ponds Creek viaduct (based		Toby Maple	27-Apr-2016	BIM	TfNSW	23-Second Pond Creek Viaduct.rvt	incorrect alignment of drainage holes at all piers and abutments. See Comment 4 from October 2015		N	28/04/2016 - Issued Fixed		O	Drainage pipes aligned at Abutment A, but not at Abutment B. See comments 23 & 24		
20	AFC	BIM Model Delivery - DL02 Second Ponds Creek viaduct (based		Toby Maple	27-Apr-2016	BIM	TfNSW	23-Second Pond Creek Viaduct.rvt	Misalignment of drainage pipes at piers 8, 9		M	28/04/2016 - Issued Fixed		C	Agreed		
21	AFC	BIM Model Delivery - DL02 Second Ponds Creek viaduct (based		Toby Maple	27-Apr-2016	BIM	TfNSW	23-Second Pond Creek Viaduct.nwf	Parapet panels are missing at pier 8, 6, 5, abutment A		M	28/04/2016 - Issued Fixed		C	Agreed		
22	AFC	BIM Model Delivery - DL02 Second Ponds Creek viaduct (based		Toby Maple	27-Apr-2016	BIM	TfNSW	23-Second Pond Creek Viaduct.nwf	Electrolysis points on all piers are malformed in Navisworks compared to Revit file		M	28/04/2016 - Issued Fixed		CS	Electrolysis points now look geometrically OK in NWC, however, refer to item 28		

PROCESSO INFORMATIVO BIM



Il sistema BIM supporta il cantiere durante la fase di messa in opera del manufatto e raccoglie tutte le informazioni legate alla costruzione

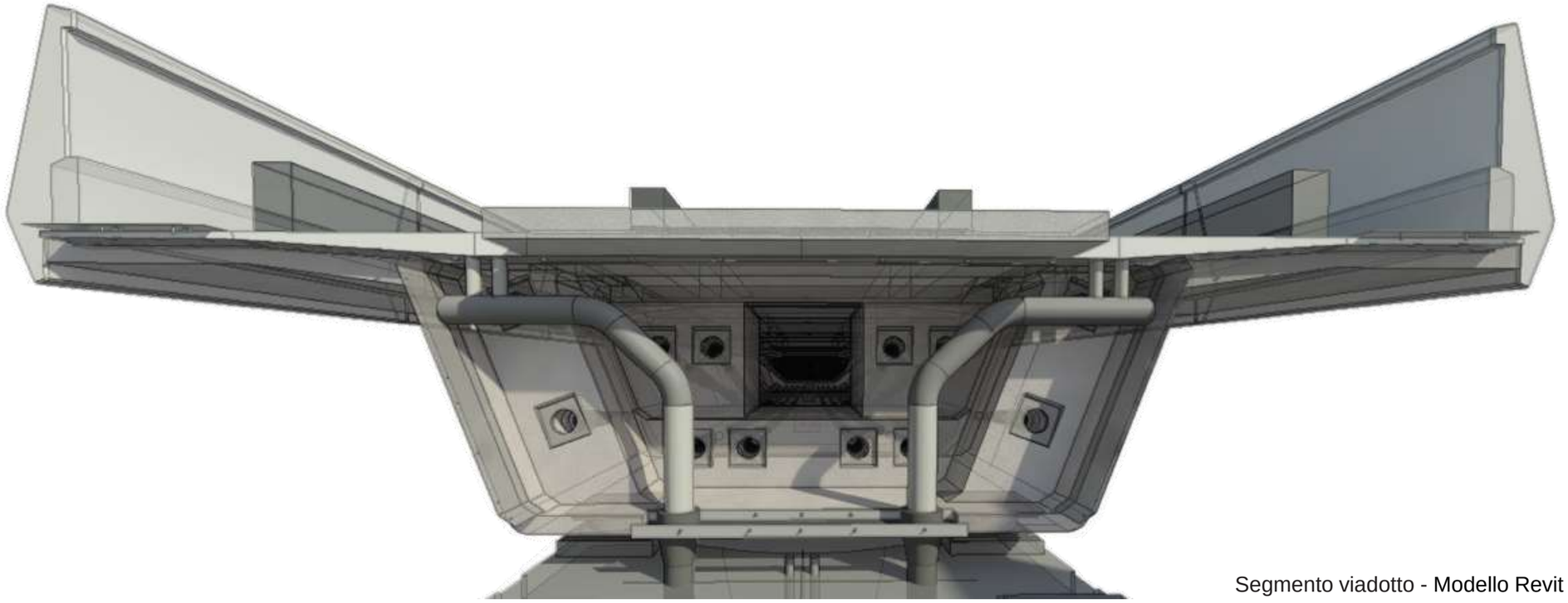
MESSA IN OPERA DEL VIADOTTO

Viadotto - Modello Revit

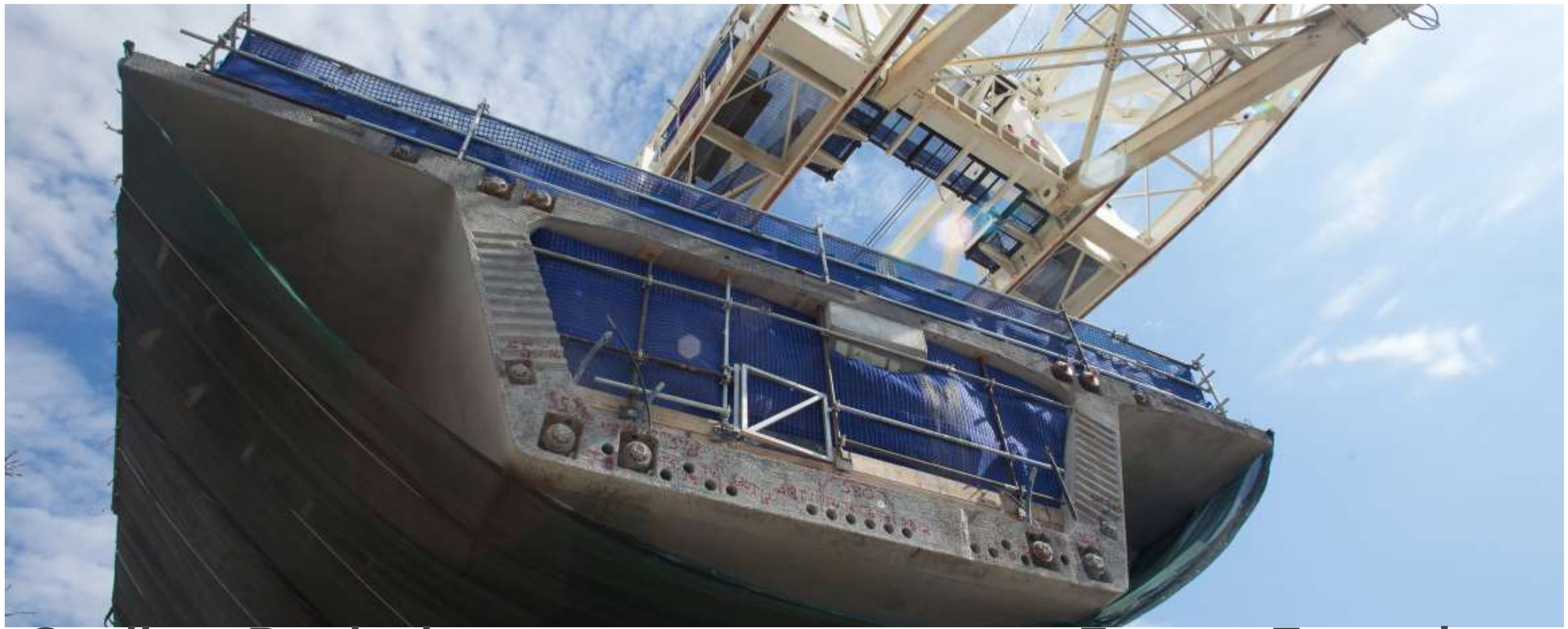
Stadio → Produzione

Fase → Esecutiva

MESSA IN OPERA SEGMENTO VIADOTTO



Segmento viadotto - Modello Revit

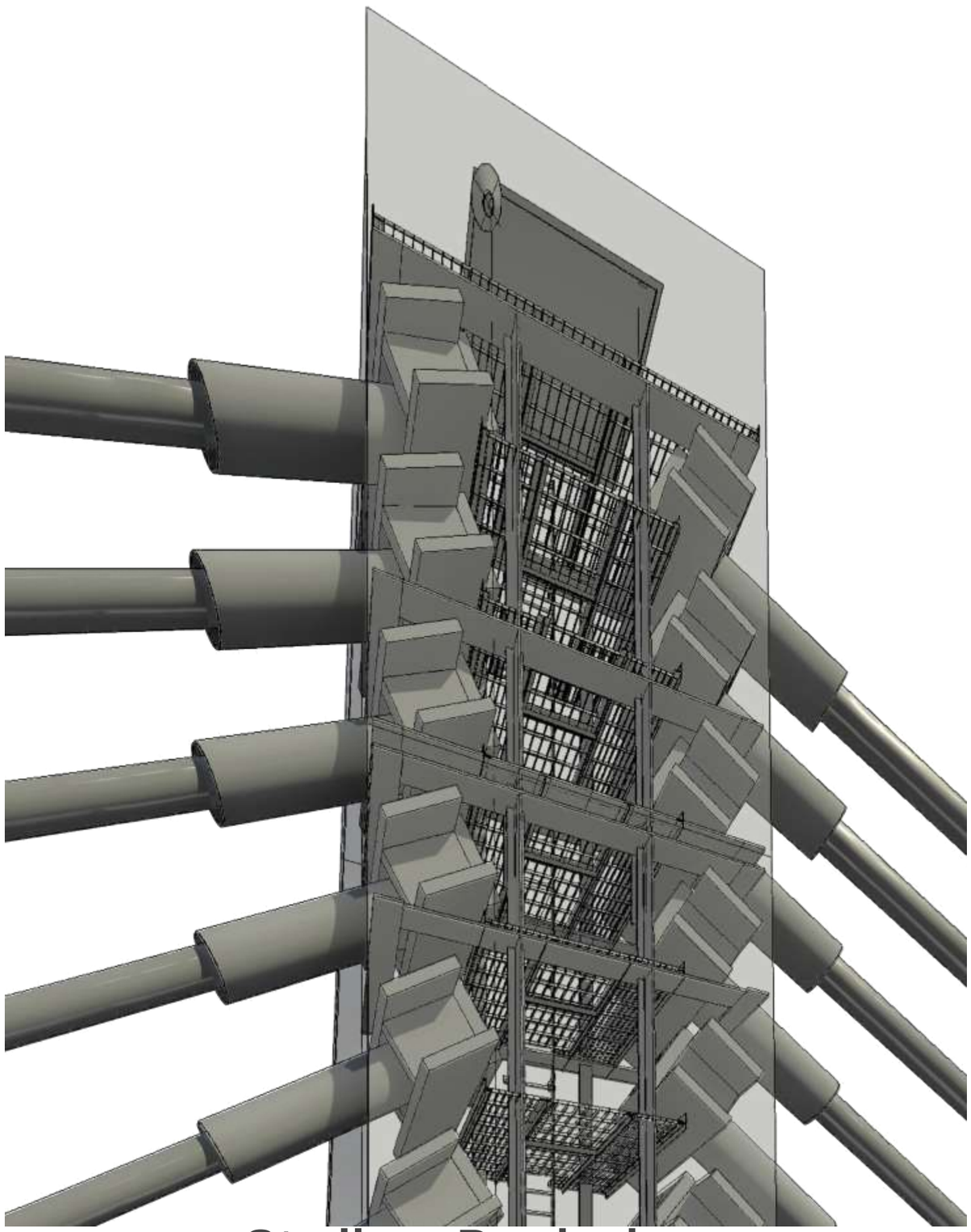


Stadio → Produzione **Fase → Esecutiva**

MESSA IN OPERA PONTE STRALLATO

Ponte strallato - Modello Revit

MESSA IN OPERA TORRE PONTE STRALLATO



Stadio → Produzione

Fase → Esecutiva

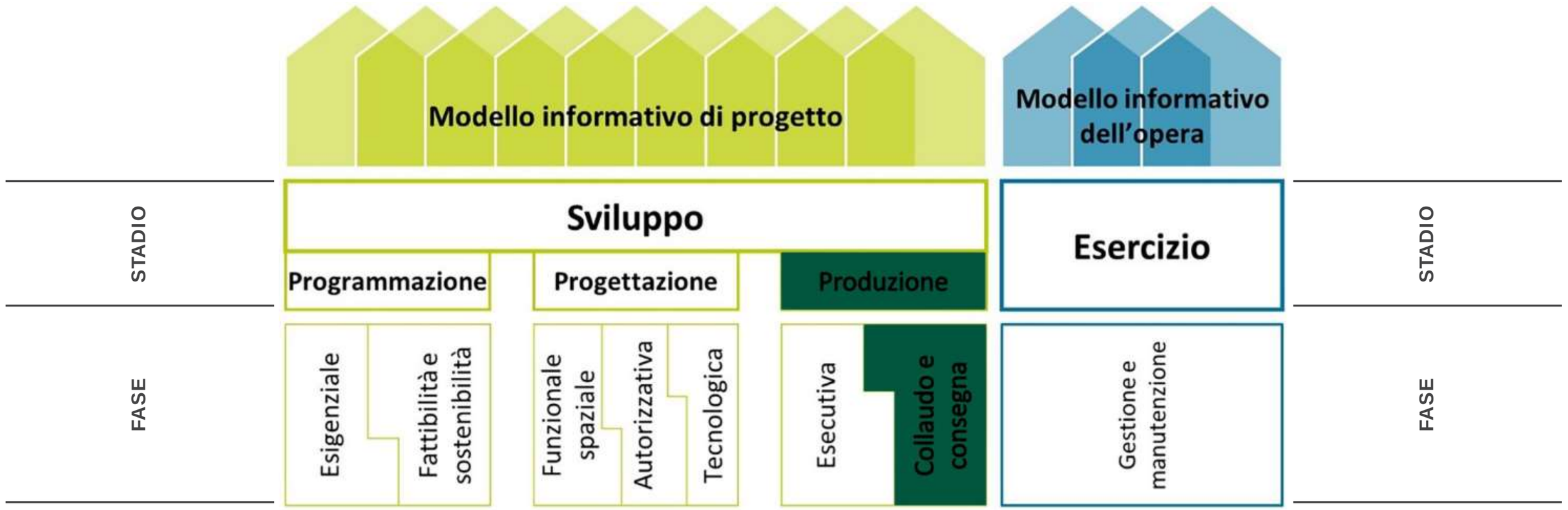
MESSA IN OPERA SOVRAPPASSI

Stadio → Produzione

Fase → Esecutiva

Sovrappasso - Modello Revit

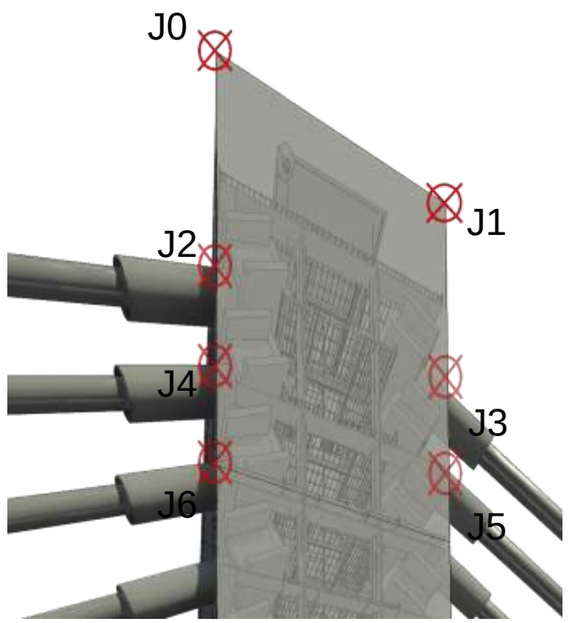
PROCESSO INFORMATIVO BIM



Aggiornamento del modello come "As Built"

Rilievo del manufatto

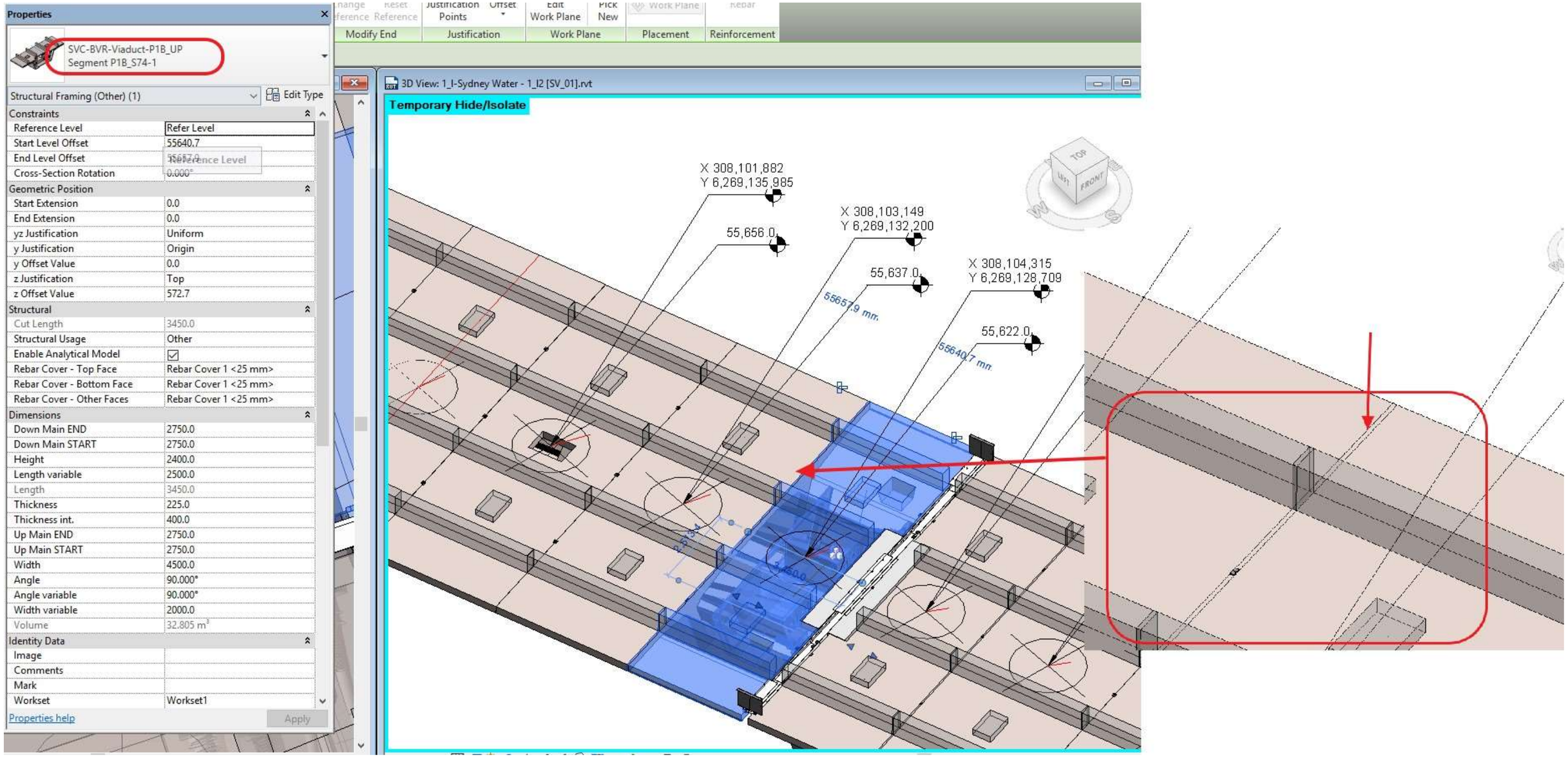
Joint nr.	R			G			
J0	308459,653	6268138,541	54,331				
J1	308458,075	6268141,517	54,252	BVR-S46-01	308456,288	6268138,659	54,291
J2	308456,195	6268145,051	54,137	BVR-S46-02	308454,558	6268141,913	54,193
J3	308454,314	6268148,583	54,033	BVR-S46-03	308452,677	6268145,444	54,084
J4	308452,437	6268152,110	53,925	BVR-S46-04	308450,799	6268148,974	53,979
J5	308450,559	6268155,635	53,817	BVR-S46-05	308448,921	6268152,500	53,872
J6	308448,680	6268159,166	53,705	BVR-S46-06	308447,042	6268156,028	53,766
J7	308446,799	6268162,693	53,596	BVR-S46-07	308445,163	6268159,559	53,656
J8	308444,916	6268166,222	53,487	BVR-S46-08	308443,281	6268163,086	53,544
J9	308443,335	6268169,194	53,398	BVR-S46-09	308441,549	6268166,336	53,446

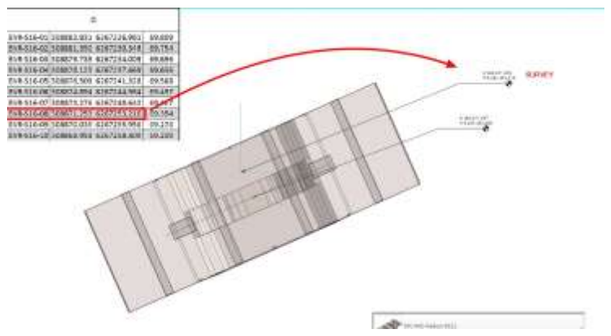


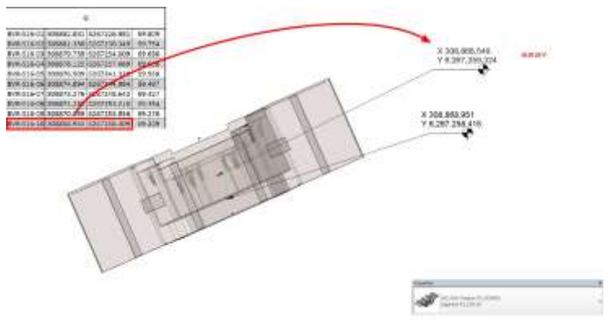
Dimensions	
Volume	37.721 m³
Phasing	
Phase Created	New Construction
Phase Demolished	None
Data	
COBie	☑
COBie.CreatedBy	RP
COBie.CreatedOn	04/04/2016
COBie.Component.Name	Pier
COBie.Component.Space	SPC
COBie.Component.Description	
COBie.Component.SerialNumber	Pier8
COBie.Component.InstallationDate	12/03/2015
COBie.Component.WarrantyStartDate	13/06/2016
COBie.Component.TagNumber	
COBie.Component.BarCode	
COBie.Component.AssetIdentifier	
COBie.Component.Area	
COBie.Component.Length	
COBie.Properties.AssetIdentifier	
COBie.Properties.InstallationDate	12/03/2015
COBie.Properties.WarrantyStartDate	
Chainage	46545.916
Hierarchy	Substructure
Asset Group	AG-01

Aggiornamento del modello come "As-Built"

Aggiornamento del modello redatto dal progetto esecutivo, con le informazioni relative il costruito.







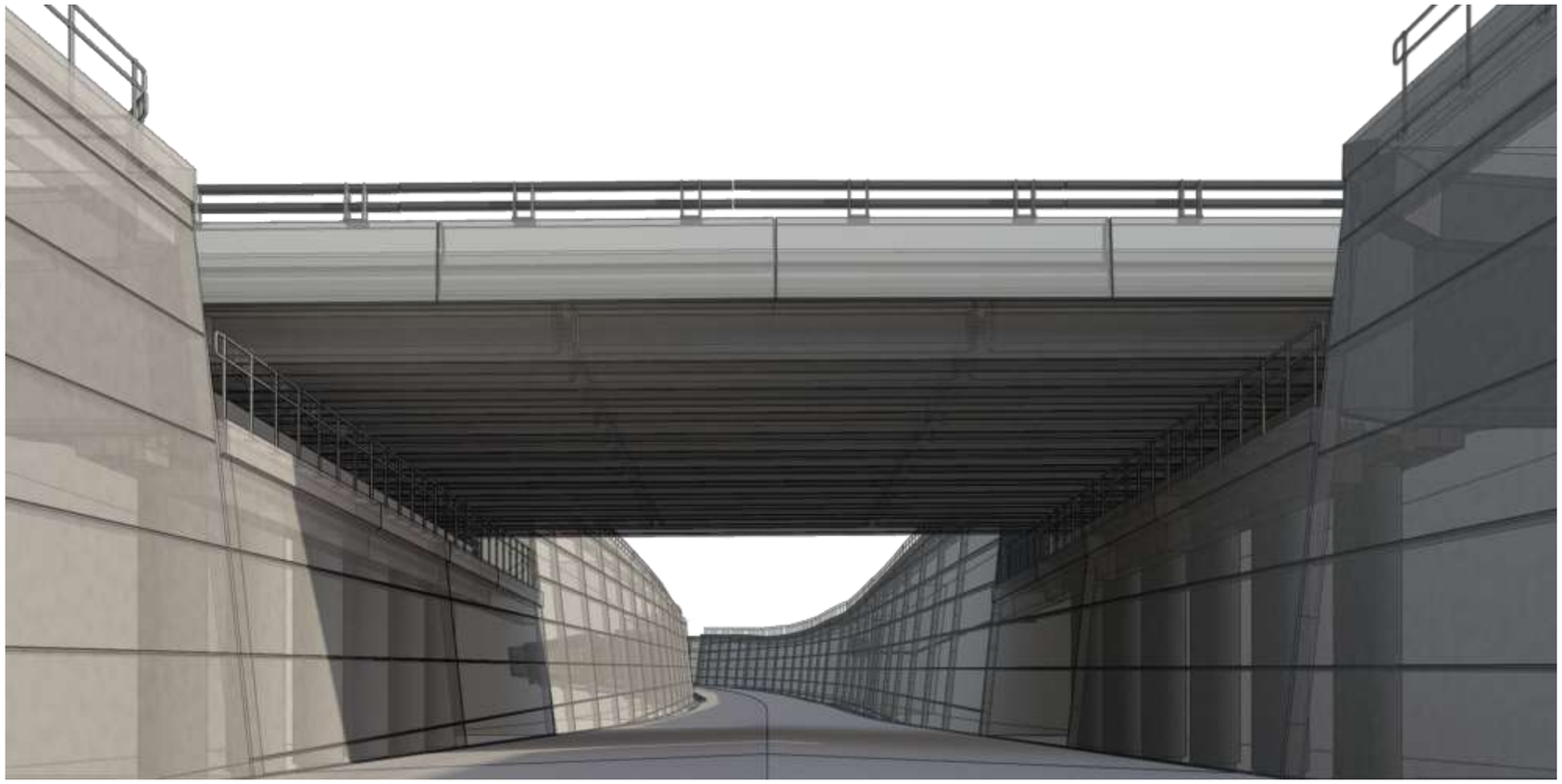
Aggiornamento COBie Data come “As-Built”

Aggiornamento modellazione come “As-Built”

INEA PRIMO PREMIO AL DIGITAL & BIM AWARD 2017

BIM& DIGITAL AWARD — PREMIO PER LA DIGITALIZZAZIONE DELL'AMBIENTE COSTRUITO — SAIE

Il premio è stato assegnato con le seguenti motivazioni: “Avanzata applicazione di standard internazionali nella modellazione esecutiva, nella fase costruttiva e nel “Facility Management”.



SALINI IMPREGILO VINCE IL PREMIO “PROJECT OF THE YEAR” 2018

ENR Engineering News-Record GLOBAL BEST PROJECTS AWARDS

“GLOBAL BEST PROJECT” SETTORE FERROVIE

IRJ International Railway Journal

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