LAMPIRAN

UNIVERSITAS PEMBANGUNAN JAYA

Lampiran 1 Formulir Bimbingan Skripsi

NIM	2021091002	Nama Mahasiswa	LUTHFI DESTIO
Program Studi	Teknik Sipil	Jenis TA	Skripsi
Periode Mulai	2024/2025 Genap	SKS Lulus	141 SKS
Tgl. Mulai	21 Mei 2025	Judul Tugas Akhir	Analisis Pengimplementasian Building Information Modeling (BIM) 4D Terhadap Percepatan Penjadwalan Menggunakan Metode Fast Track (Studi Kasus : Proyek Pembangunan Hotel Royal Executive)
Tahap	Sidang Akhir (Ujian)	Status	Aktif

No	Tanggal	Dosen Pembimbing	Topik	Disetujui	Aksi
1	3 Maret 2025	Dr. Ir, Lukas Beladi Sihombing, S.T, M.T.	Revisi Hasil Sempro	✔	
2	12 Maret 2025	Dr. Ir, Lukas Beladi Sihombing, S.T, M.T.	pembahasan revisi setelah sempro	✔	
3	17 Maret 2025	Dr. Ir, Lukas Beladi Sihombing, S.T, M.T.	ACC laporan sempro ulang	✔	
4	17 April 2025	Dr. Ir, Lukas Beladi Sihombing, S.T, M.T.	Pembahasan terkait pengolahan BIM 3D	✔	
5	30 April 2025	Dr. Ir, Lukas Beladi Sihombing, S.T, M.T.	Pembahasan terkait BIM 3D dan Penjadwalan	✔	
6	8 Mei 2025	Dr. Ir, Lukas Beladi Sihombing, S.T, M.T.	Pembahasan terkait BIM 3D dan penjadwalan	✔	
7	16 Juni 2025	Dr. Ir, Lukas Beladi Sihombing, S.T, M.T.	Pembahasan hasil BIM 3D	✔	
8	30 Mei 2025	Dr. Ir, Lukas Beladi Sihombing, S.T, M.T.	Pembahasan terkait BIM 3D	✔	
9	25 Juni 2025	Dr. Ir, Lukas Beladi Sihombing, S.T, M.T.	Pembahasan metode fast track	✔	

Lampiran 2 Formulir Revisi Skripsi

Universitas Pembangunan Jaya	FORMULIR REVISI SKRIPSI / TA	SPT-I/04/SOP-06/F-05

Nama Mahasiswa : Luthfi Destio Ma'ruf

Prodi/NIM : Teknik Sipil / 2021091002

Judul Skripsi/TA : ANALISIS PENGIMPLEMENTASIAN BUILDING INFORMATION MODELING (BIM) 4D TERHADAP PERCEPATANN PENJADWALAN MENGGUNAKAN METODE FAST TRACK (STUDI KASUS: PROYEK PEMBANGUNAN HOTEL ROYAL EXECUTIVE)

Dosen Pembimbing : 1. Dr. Ir. Lukas Beladi Sihombing, S.T., M.T, MPU, M. ASCE., IPMA-C., IPM.

: 2.

Dosen Penguji : 1. Ir. Galih Wulandari Subagyo, S.T., M.T

: 2. Ir. Fredy Jhon Philip Sitorus, S.T., M.T.

: 3.

Jadwal Sidang : Tempat : Hari/Tanggal:

Revisi yang dilakukan :

1. dicek kembali untuk penulisan terkait typo, jenis dan ukuran font serta huruf besar dan kecil.
2. gambar kurva S jangan diletakan di bab 4, cukup di lampiran. Namun diintikan lampiran yang urana.
3. tambahkan Batasan penelitian → tidak melihat aspek tenaga pekerja.
4. dalam penulisan dilaporan di jelaskan terkait gambar, sehingga bukan hanya menampilkan gambarnya saja. → jangan hiperbola modul.
5. Wawancara mau diadakan apa? Jika data primer tambahkan kuesioner → hasilnya apa?

Tangerang Selatan, 18 Juli 2025

Ir. Galih Wulandari Subagyo, S.T., M.T

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Universitas Pembangunan Jaya	FORMULIR REVISI SKRIPSI / TA	SPT-I/04/SOP-06/F-05

Nama Mahasiswa : Luthfi Destio Ma'ruf

Prodi/NIM : Teknik Sipil / 2021091002

Judul Skripsi/TA : ANALISIS PENGIMPLEMENTASIAN BUILDING INFORMATION MODELING (BIM) 4D TERHADAP PERCEPATANN PENJADWALAN MENGGUNAKAN METODE FAST TRACK (STUDI KASUS: PROYEK PEMBANGUNAN HOTEL ROYAL EXECUTIVE)

Dosen Pembimbing : 1. Dr. Ir. Lukas Beladi Sihombing, S.T., M.T, MPU, M. ASCE., IPMA-C., IPM.

: 2.

Dosen Penguji : 1. Ir. Galih Wulandari Subagyo, S.T., M.T

: 2. Ir. Fredy Jhon Philip Sitorus, S.T., M.T.

: 3.

Jadwal Sidang : Tempat : Selasa Hari/Tanggal: 8 Juli 2025..

Revisi yang dilakukan :

- hasil analis data lebih dijelaskan.
  fast track ... dasar pemikirannya apa?
- gbr. huruf s tumpang gbr. 4.67 - 4.68.
- buat perbandingan fast track dng BIM 4D
  parameter yg difast track apa.
- Gbr hubungan kurva tidak ada keterangan.
- Gbr 7 lain dilengkapi keterangan dng jelas. jelas.
- Istilah; dijelaskan dalam ~~glossary~~ glossary.

Tangerang Selatan, 8 Juli 2025

Ir. Fredy Jhon Philip Sitorus, S.T., M.T.

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Universitas Pembangunan Jaya	FORMULIR REVISI SKRIPSI / TA	SPT-I/04/SOP-06/F-05

Nama Mahasiswa` : Luthfi Destio Ma'ruf

Prodi/NIM : Teknik Sipil / 2021091002

Judul Skripsi/TA : ANALISIS PENGIMPLEMENTASIAN BUILDING INFORMATION MODELING (BIM) 4D TERHADAP PERCEPATANN PENJADWALAN MENGGUNAKAN METODE FAST TRACK (STUDI KASUS: PROYEK PEMBANGUNAN HOTEL ROYAL EXECUTIVE)

Dosen Pembimbing : 1. Dr. Ir. Lukas Beladi Sihombing, S.T., M.T, MPU, M. ASCE., IPMA-C., IPM.

: 2.

Dosen Penguji : 1. Ir. Galih Wulandari Subagyo, S.T., M.T

: 2. Ir. Fredy Jhon Philip Sitorus, S.T., M.T.

: 3.

Jadwal Sidang : Tempat : Hari/Tanggal:

Revisi yang dilakukan :

- Buat Narasi yg baik.
- Validasi ..

Tangerang Selatan, 8/7/2025

Dr. Ir. Lukas Beladi Sihombing, S.T., M.T, MPU, M. ASCE., IPMA-C., IPM.

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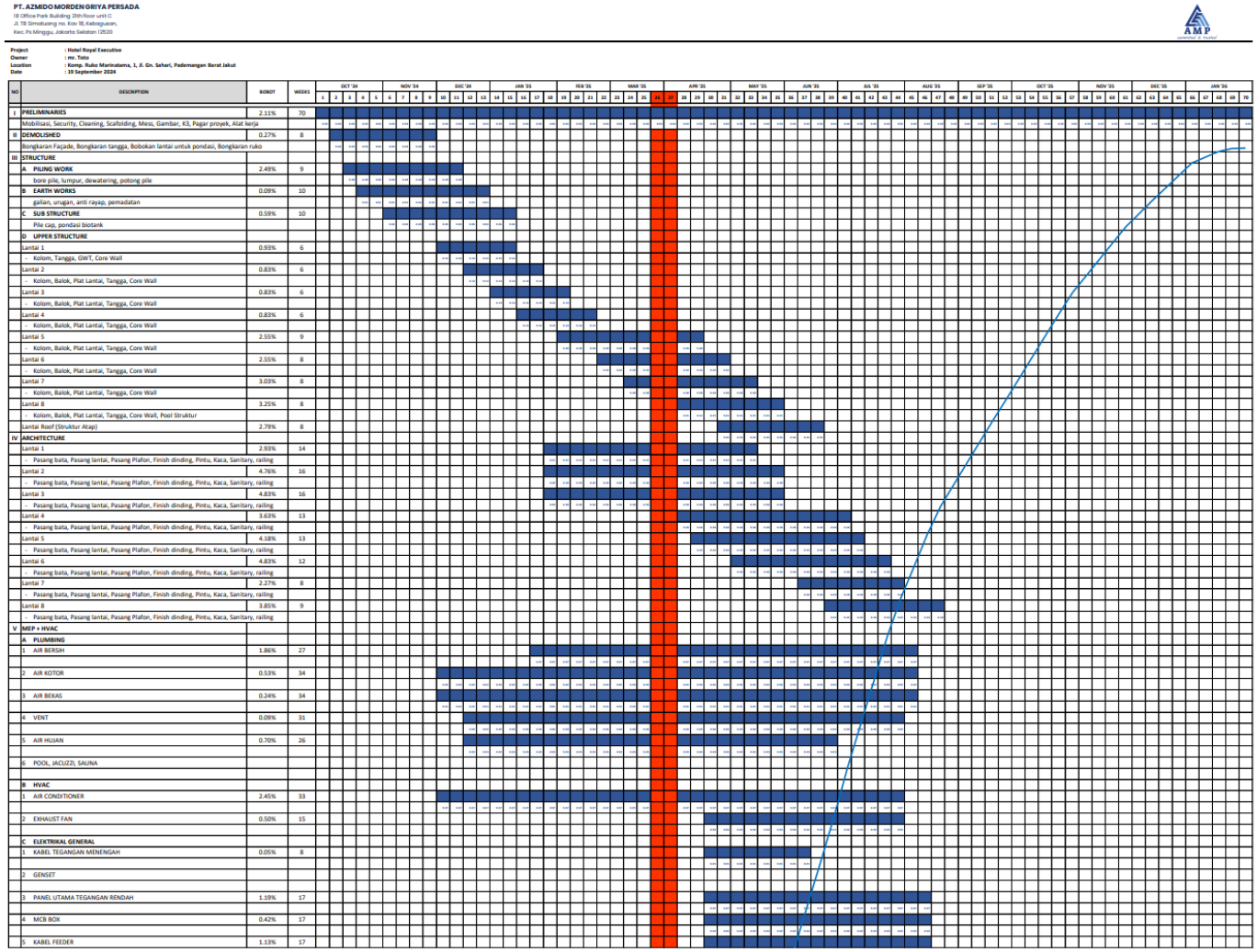
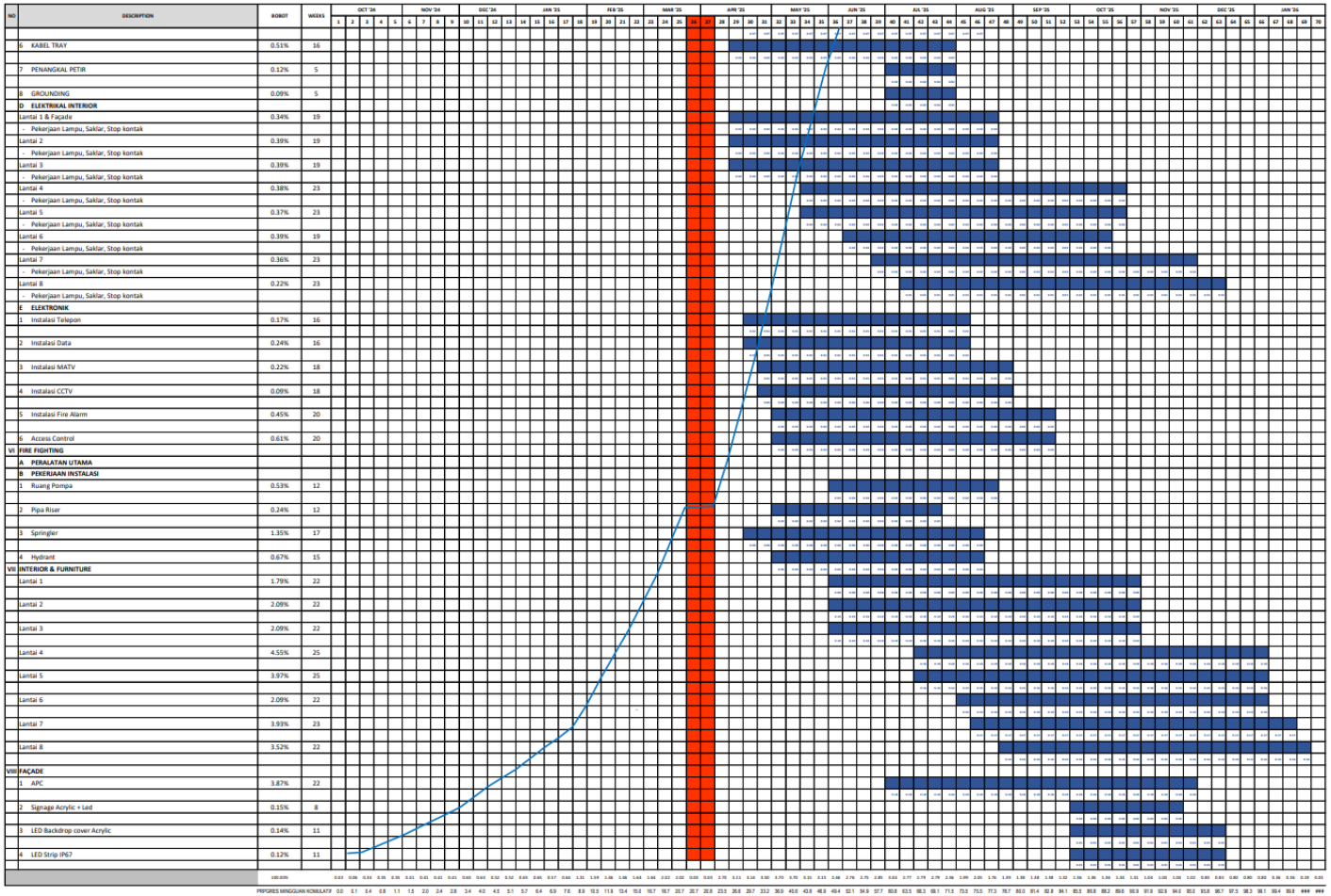
Lampiran 3 Hasil Wawancara Pendukung Pengumpulan Data Sekunder

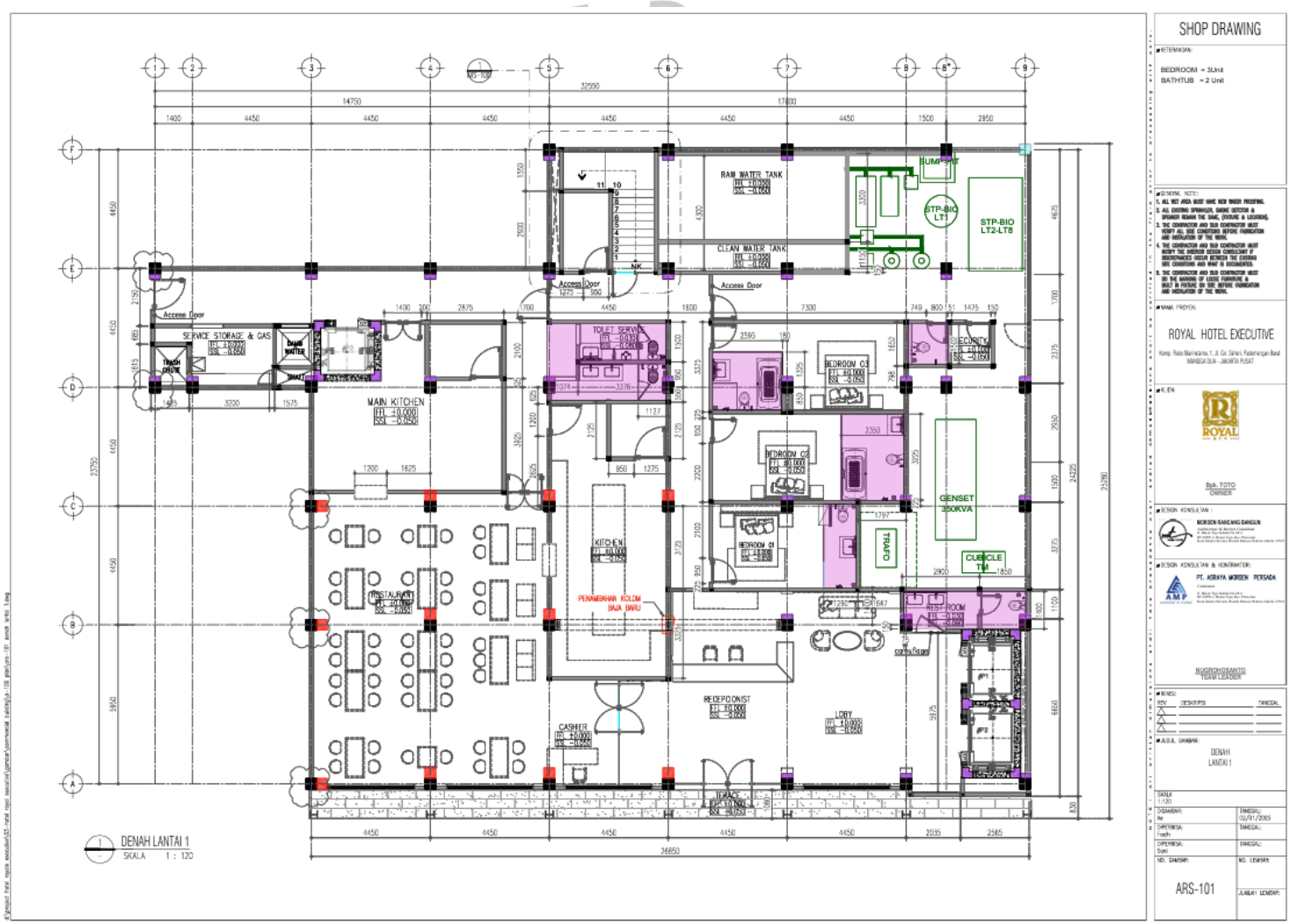
Peneliti	:	Assalamualaikum, selamat siang pak, perkenalkan saya Luthfi Destio Ma'ruf dari Universitas Pembangunan Jaya. Sebelumnya terima kasih atas kesempatannya untuk melakukan wawancara sehingga saya dapat melanjutkan penelitian ini. Saya juga mengucapkan terima kasih kepada pihak proyek yang telah mengizinkan saya menjadikan proyek ini sebagai studi kasus penelitian, yang sebagaimana telah didiskusikan saat survei pendahuluan.
Narasumber	:	Waalaikumsalam, selamat siang Luthfi, silahkan lanjutkan kepertanyaan yang ingin ditanyakan.
Peneliti	:	Berhubung penelitian ini memiliki keterkaitan dengan BIM, apakah pada proyek ini telah melakukan penerapan BIM?
Narasumber	:	Kebetulan proyek ini belum melakukan penerapan BIM apapun.
Peneliti	:	Baik pak, apakah saya boleh meminta gambar kerja proyek, untuk selanjutnya saya implementasikan penggunaan BIM 3D pada proyek ini?
Narasumber	:	Boleh luthfi, setelah wawancara ini saya akan berikan gambar kerja proyek.
Peneliti	:	Selanjutnya, untuk penelitian saya juga akan melakukan penerapan percepatan penjadwalan menggunakan metode fast track, apakah proyek ini sudah melakukan percepatan penjadwalan?
Narasumber	:	Kebetulan belum melakukan percepatan tersebut luthfi, diproyek ini masih menggunakan penjadwalan konvensional.
Peneliti	:	Baik pak, saya akan melakukan analisis percepatan penjadwalan. Apakah saya boleh meminta kurva S proyek, untuk selanjutnya saya analisis pada Microsoft project?
Narasumber	:	Boleh silahkan.
Peneliti	:	Terima kasih pak, setelah ini saya akan melakukan pengolahan data, apakah diperbolehkan saya melakukan koordinasi kepada pihak proyek terkait kesesuaian penggunaan data ini?
Narasumber	:	Boleh, silahkan koordinasi ke saya terkait hal-hal yang kamu olah.
Peneliti	:	Baik pak, terima kasih kesempatannya untuk melakukan wawancara.
Narasumber	:	Sama-sama Luthfi semoga lancar.

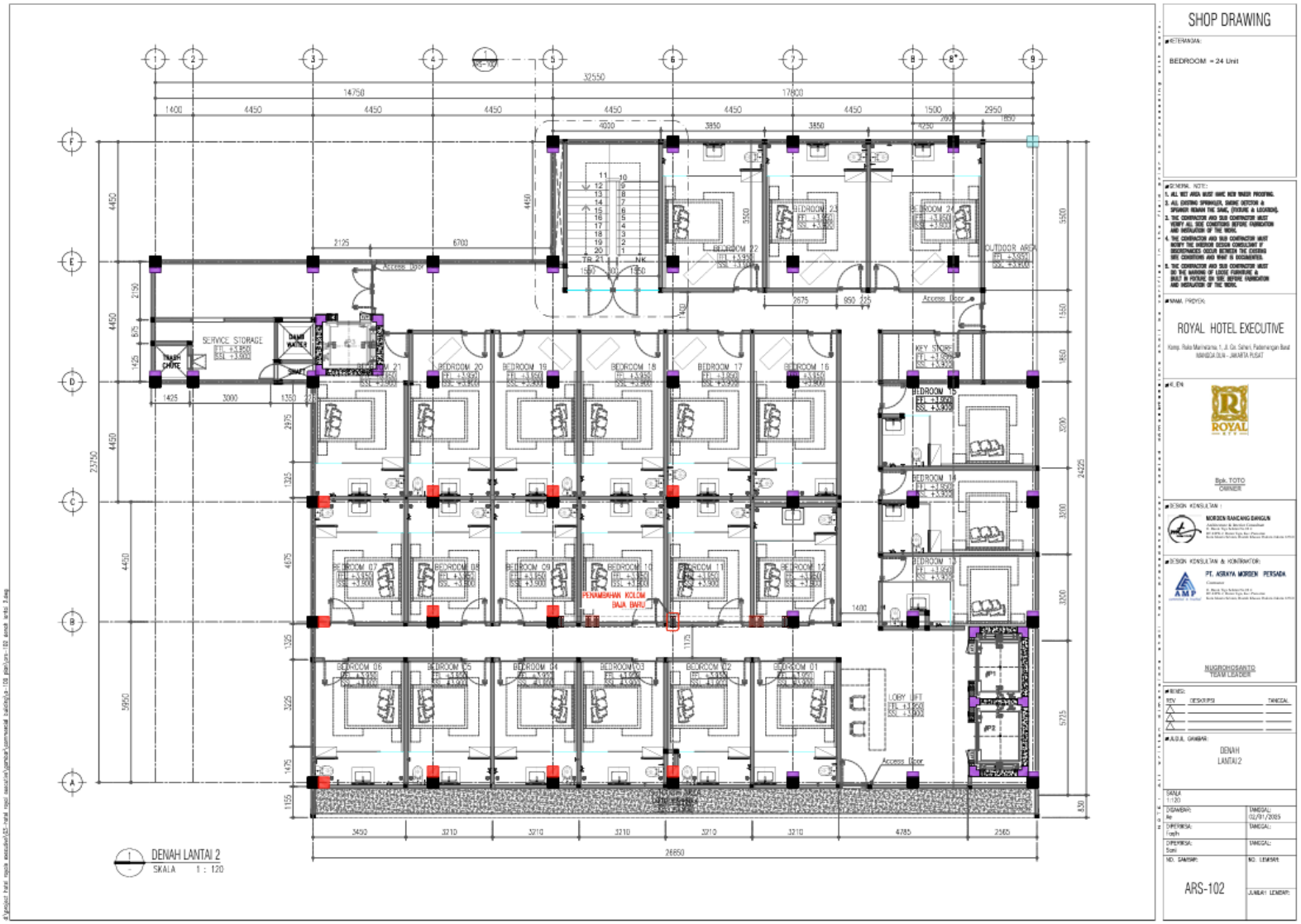
Lampiran 4 Kurva S Proyek Hotel *Royal executive*

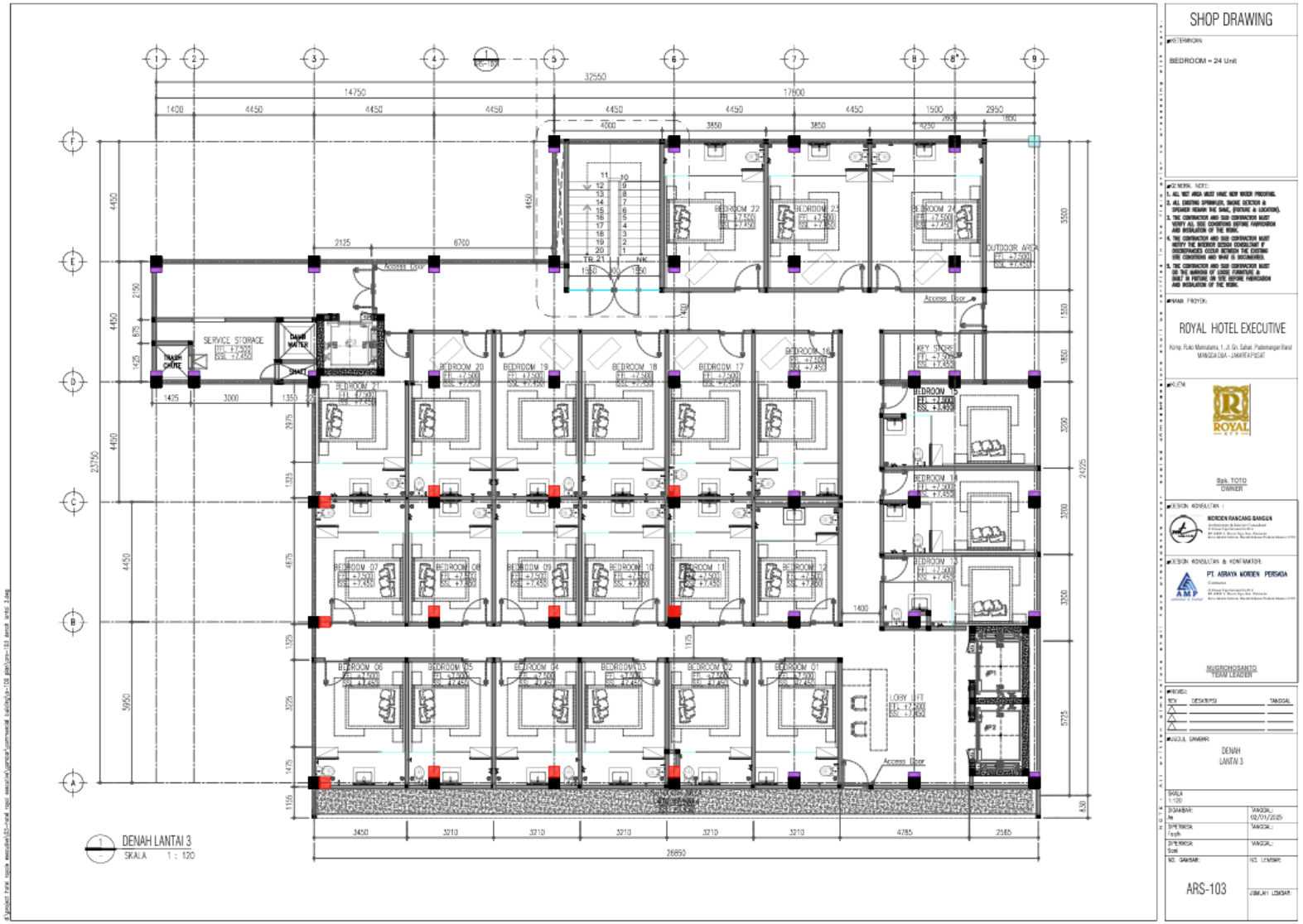



NO
DESCRIPTION
BOBOT
WEEKS
OCT '24
NOV '24
DEC '24
JAN '25
FEB '25
MAR '25
APR '25
MAY '25
JUN '25
JUL '25
AUG '25
SEP '25
OCT '25
NOV '25
DEC '25
JAN '26
6 KABEL TRAY 0.51% 16
7 PENANGKAL PETIR 0.12% 5
8 GROUNDING 0.09% 5
D ELEKTRIKAL INTERIOR
Lantai 1 & Façade 0.34% 19
- Pekerjaan Lampu, Saklar, Stop kontak
Lantai 2 0.39% 19
- Pekerjaan Lampu, Saklar, Stop kontak
Lantai 3 0.39% 19
- Pekerjaan Lampu, Saklar, Stop kontak
Lantai 4 0.38% 23
- Pekerjaan Lampu, Saklar, Stop kontak
Lantai 5 0.37% 23
- Pekerjaan Lampu, Saklar, Stop kontak
Lantai 6 0.39% 19
- Pekerjaan Lampu, Saklar, Stop kontak
Lantai 7 0.36% 23
- Pekerjaan Lampu, Saklar, Stop kontak
Lantai 8 0.22% 23
- Pekerjaan Lampu, Saklar, Stop kontak
E ELEKTRONIK
1 Instalasi Telepon 0.17% 16
2 Instalasi Data 0.24% 16
3 Instalasi MATV 0.22% 18
4 Instalasi CCTV 0.09% 18
5 Instalasi Fire Alarm 0.45% 20
6 Access Control 0.61% 20
VI FIRE FIGHTING
A PERALATAN UTAMA
B PEKERJAAN INSTALASI
1 Ruang Pompa 0.53% 12
2 Pipa Riser 0.24% 12
3 Springler 1.35% 17
4 Hydrant 0.67% 15
VII INTERIOR & FURNITURE
Lantai 1 1.79% 22
Lantai 2 2.09% 22
Lantai 3 2.09% 22
Lantai 4 4.55% 25
Lantai 5 3.97% 25
Lantai 6 2.09% 22
Lantai 7 3.93% 23
Lantai 8 3.52% 22
VIII FAÇADE
1 APC 3.87% 22
2 Signage Acrylic + Led 0.15% 8
3 LED Backdrop cover Acrylic 0.14% 11
4 LED Strip IP67 0.12% 11
100.00%
PROGRES MINGGUAN KOMULATIF
PROGRES BULANAN
ANGGARAN BULANAN
FEE BULANAN
TOTAL ANGGARAN DAN FEE
ANGGARAN KOMULATIF
1.14 1.64 2.29 3.82 6.14 5.75 12.48 13.70 10.82 13.74 7.22 5.45 6.75 4.14 3.25 1.74
485,429,794 699,032,041 978,467,708 1,631,058,495 2,624,820,464 2,434,308,389 5,332,794,494 5,853,992,627 4,624,120,743 5,872,339,997 3,074,231,421 2,327,340,587 2,884,707,907 1,770,727,627 1,390,078,636 742,965,222
48,542,979 69,903,204 97,846,771 163,105,849 262,482,046 243,430,839 533,279,449 585,399,263 462,412,074 587,234,000 307,423,142 232,734,059 288,470,791 177,072,763 213,304,386
747,575,020 1,048,370,912 1,728,905,265 2,787,926,314 2,696,790,435 5,576,225,333 6,387,272,077 5,209,520,006 6,334,752,071 3,661,465,421 2,634,763,729 3,117,441,966 2,059,198,418 1,567,151,398 956,269,608
485,429,794 1,233,004,814 2,281,375,726 4,010,280,992 6,798,207,305 9,494,997,740 15,071,223,073 21,458,495,150 26,668,015,156 33,082,767,227 36,664,232,648 39,298,996,376 42,416,438,342 44,475,636,760 46,042,788,158 46,999,057,766

Lampiran 5 Denah Proyek Hotel *Royal executive*

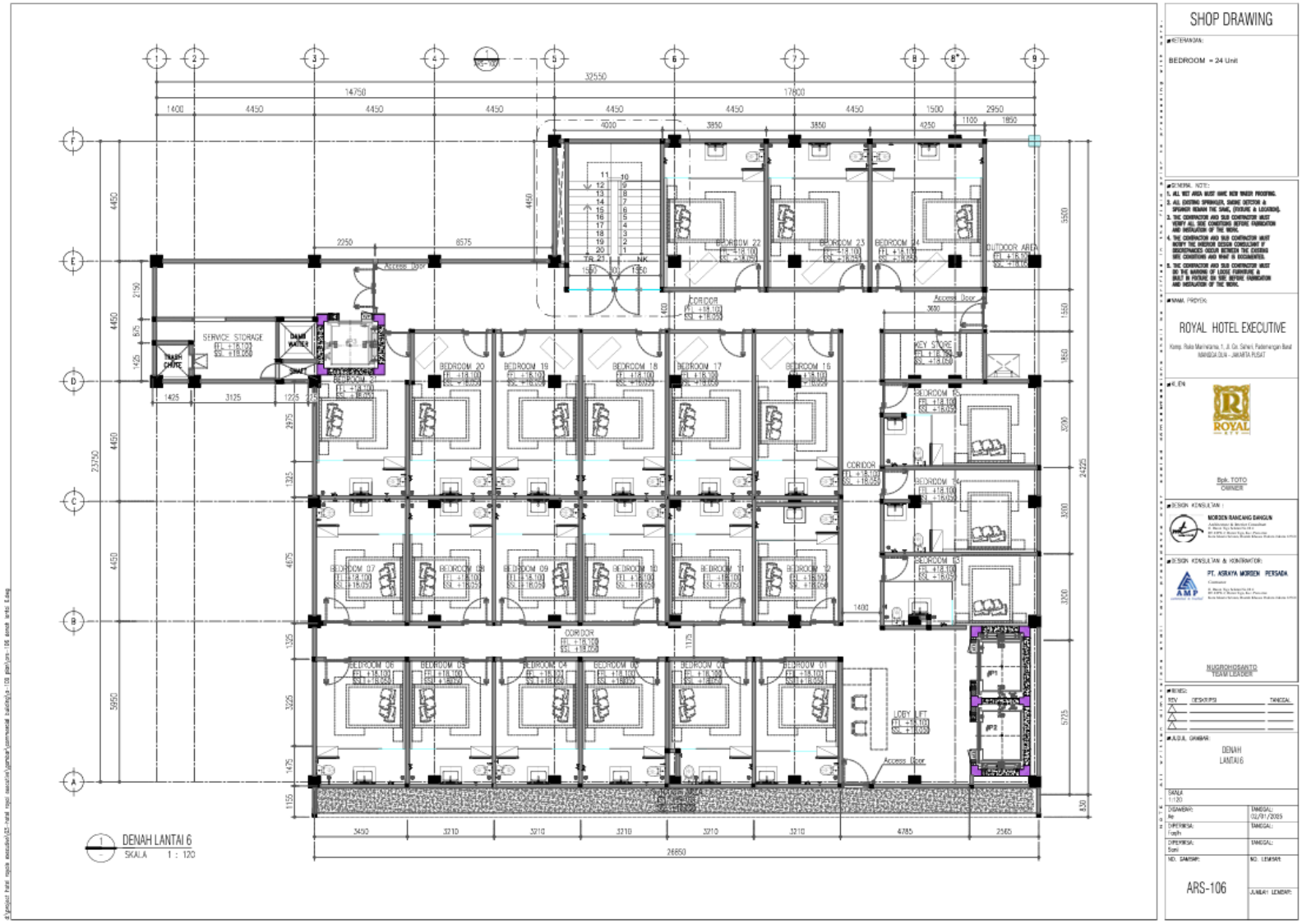


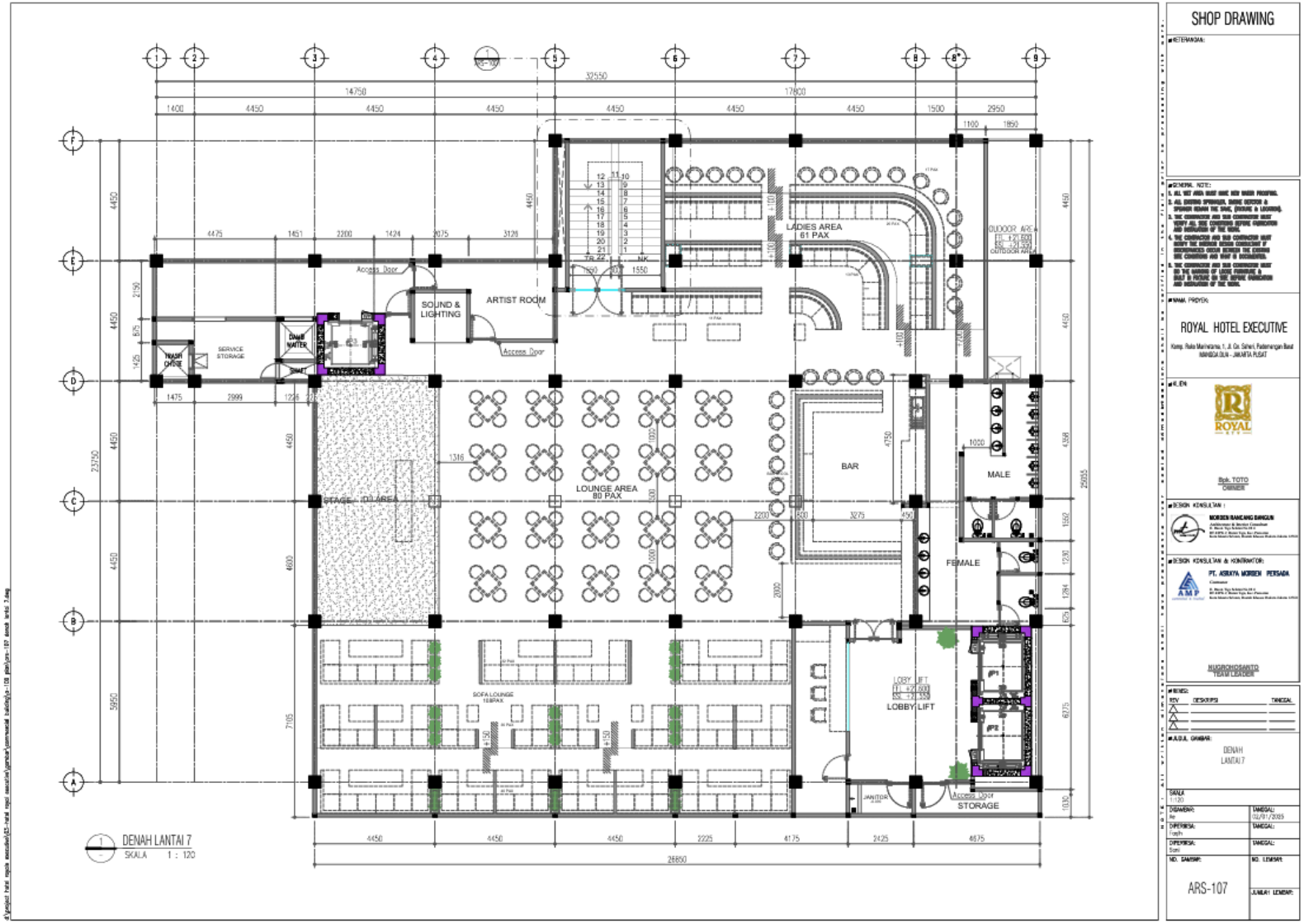

SHOP DRAWING
BEDROOM = 24 Unit
ROYAL HOTEL EXECUTIVE
DENAH LANTAI 2
DENAH LANTAI 2
SKALA 1 : 120
ARS-102
PENAMBAHAN KOLOM BAJA BARU
SERVICE STORAGE
LOBY LIFT
OUTDOOR AREA
Access Door

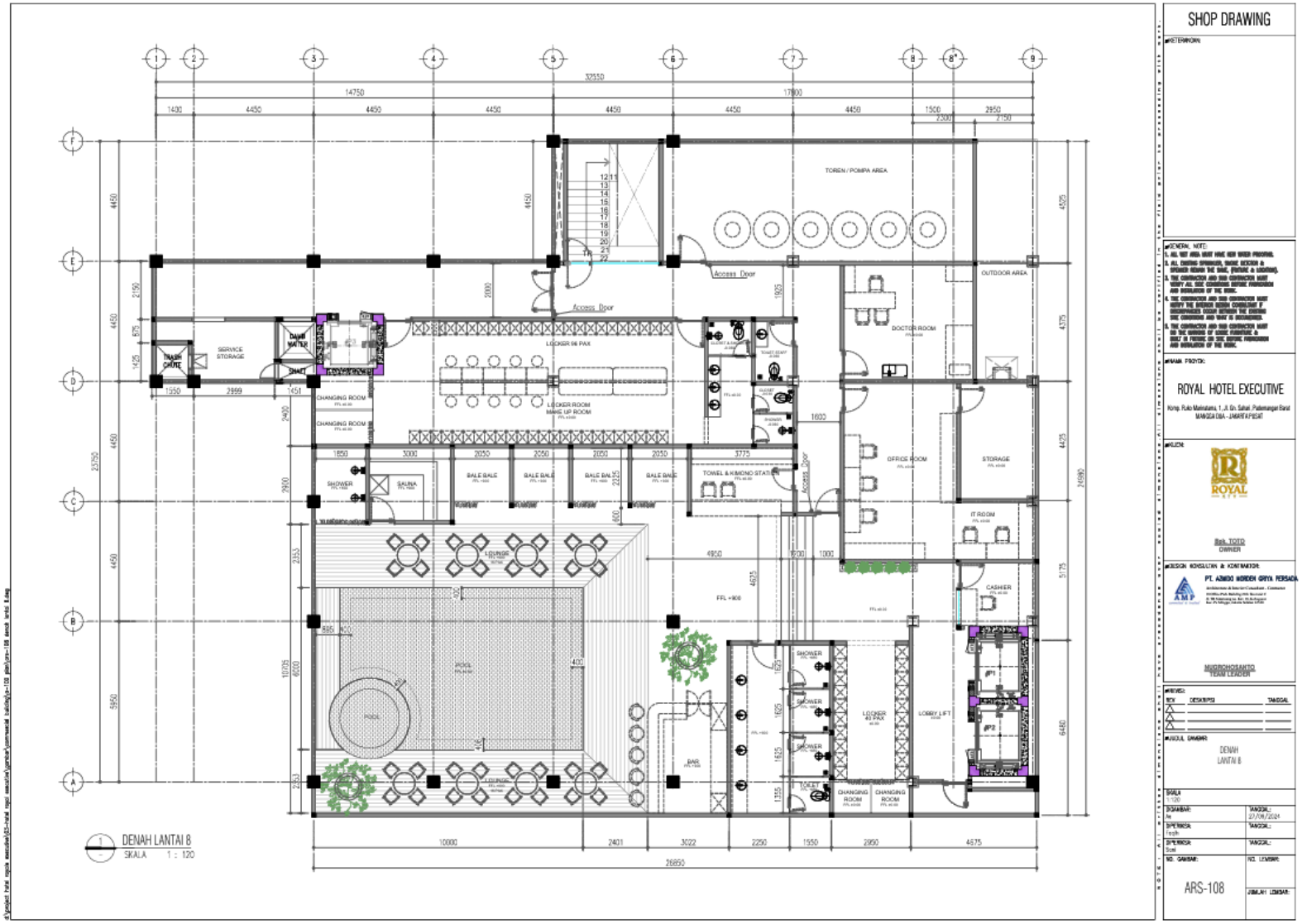

SHOP DRAWING
BEDROOM = 24 Unit
ROYAL HOTEL EXECUTIVE
Bpk. TOTO
OWNER
PT. ASRAYA MORDEN PERSADA
DENAH
LANTAI 3
ARS-103
DENAH LANTAI 3
SKALA 1 : 120
SERVICE STORAGE
KEY STORE
OUTDOOR AREA
LOBY LIFT
Access Door
32550
26850

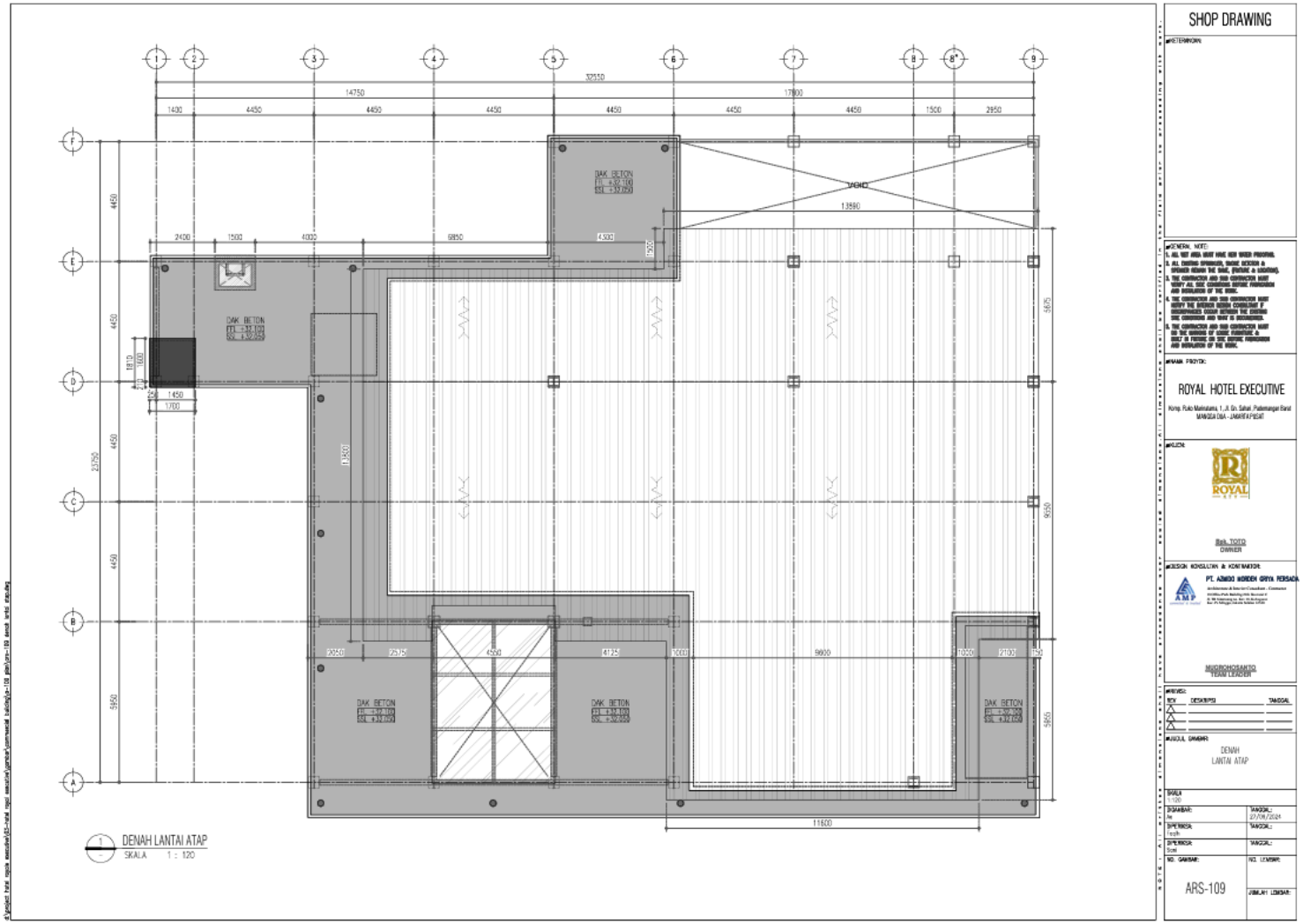
SHOP DRAWING
KTV = 7 Unit
BEDROOM = 7 Unit
JACUZZI = 1 Unit
ROYAL HOTEL EXECUTIVE
ROYAL
Bpk. TOTO
OWNER
PT. ASRAYA MOREEN PERSIDA
NUGROHOSANTO
TEAM LEADER
DENAH
LANTAI 4
ARS-104
DENAH LANTAI 4
SKALA 1 : 120
SERVICE STORAGE
TRASH CHUTE
DRINK WATER
BEDROOM 02
BEDROOM KTV 03
KTV 03
BEDROOM 07
OUTDOOR AREA
Access Door
BEDROOM KTV 04
KTV 04 15 PAX
BAR SATELLITE
KTV 05 15 PAX
KTV 02 10 PAX
KTV 01 15 PAX
KTV 06 15 PAX
BEDROOM 05
BEDROOM 03
KTV 07 12 PAX
BEDROOM KTV 06
R. POMPA JACUZZI
OUTDOOR AC
SERVICE
LIFT
Access Door
26850

SHOP DRAWING
KTV = 6 Unit
BEDROOM = 8 Unit
JACUZZI = 1 Unit
ROYAL HOTEL EXECUTIVE
Bpk. TOTO
OWNER
NUGROHOSANTO
TEAM LEADER
DENAH
LANTAI 5
ARS-105
DENAH LANTAI 5
SKALA 1 : 120
KTV 03 11 PAX
BEDROOM KTV 03
BEDROOM 01
OUTDOOR AREA
SERVICE STORAGE
BEDROOM KTV 04
CORIDOR
CLEANING
BEDROOM KTV 04 (2)
KTV 04 15 PAX
BEDROOM 02
KTV 02 8 PAX
BEDROOM KTV 05
KTV 05 15 PAX
BEDROOM KTV 06
KTV 01 8 PAX
JACUZZI KTV 06
KTV 06 11 PAX
8 PAX
LOBBY LIFT
BEDROOM KTV 06 (2)
10 PAX
10 PAX
Access Door

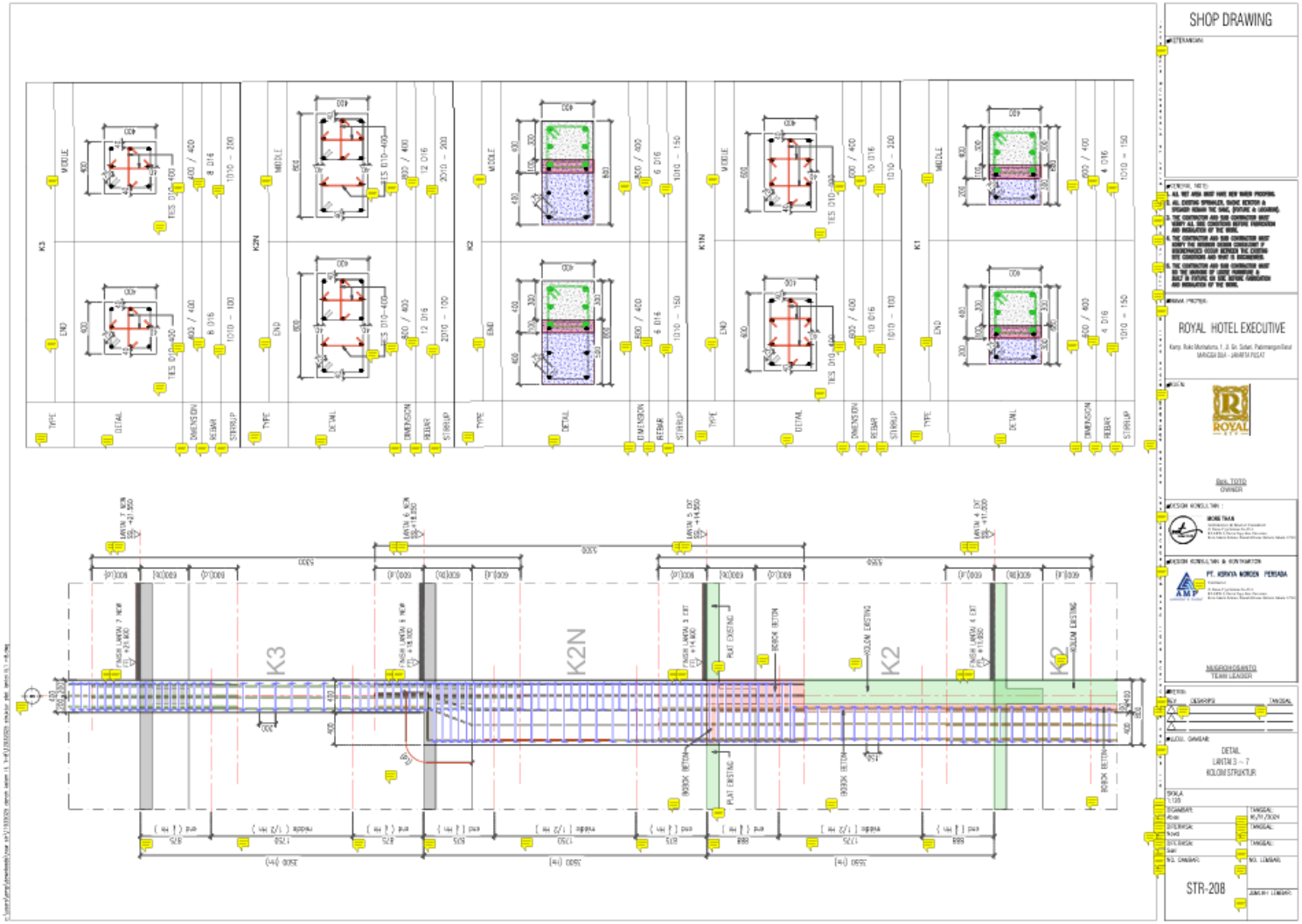

SHOP DRAWING
BEDROOM = 24 Unit
ROYAL HOTEL EXECUTIVE
DENAH LANTAI 6
SKALA 1 : 120
ARS-106
CORIDOR
SERVICE STORAGE
KEY STORE
LOBY LIFT
OUTDOOR AREA
Access Door
32550
26850

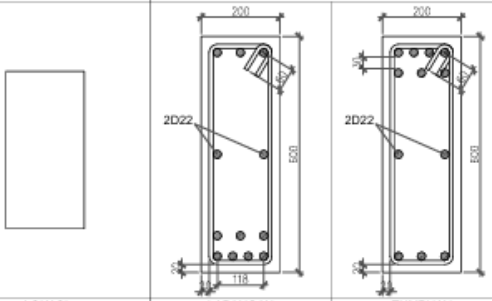

SHOP DRAWING
ROYAL HOTEL EXECUTIVE
DENAH LANTAI 7
SKALA 1 : 120
ARTIST ROOM
SOUND & LIGHTING
LADIES AREA 61 PAX
OUTDOOR AREA
LOUNGE AREA 80 PAX
BAR
MALE
FEMALE
LOBBY LIFT
STORAGE
SERVICE STORAGE
TRASH CHUTE
DAME WAITER
STAGE
SOFA LOUNGE 16PAX
JANITOR
Access Door
ARS-107


SHOP DRAWING
ROYAL HOTEL EXECUTIVE
DENAH LANTAI 8
SKALA 1 : 120
TOREN / POMPA AREA
OUTDOOR AREA
DOCTOR ROOM
OFFICE ROOM
STORAGE
IT ROOM
CASHIER
LOBBY LIFT
LOCKER 40 PAX
CHANGING ROOM
TOILET
SHOWER
BAR
POOL
LOUNGE
LOCKER 96 PAX
LOCKER ROOM MAKE UP ROOM
TOWEL & KIMONO STATION
BALE BALE
SAUNA
SERVICE STORAGE
DRAIN CHUTE
DRAIN WATER
SHAFT
Access Door
ARS-108


SHOP DRAWING
GENERAL NOTE:
1. ALL WET AREA MUST HAVE BEEN UNDER PROOFING.
2. ALL EXISTING SPRINKLER, SMOKE DETECTOR & SPRINKER REMOVE THE TAKE, (FUTURE & LOCATION).
3. THE CONTRACTOR AND SUB CONTRACTOR MUST VERIFY ALL SITE CONDITIONS BEFORE FABRICATION AND INSTALLATION OF THE WORK.
4. THE CONTRACTOR AND SUB CONTRACTOR MUST NOTIFY THE ARCHITECT WHEN CONFLICTS OR DISCREPANCIES EXISTS BETWEEN THE EXISTING SITE CONDITIONS AND WHAT IS INDICATED.
5. THE CONTRACTOR AND SUB CONTRACTOR MUST DO THE ORDERING OF LOOSE FURNITURE & BUILT IN FIXTURE ON SITE BEFORE FABRICATION AND INSTALLATION OF THE WORK.
NAMA PROYEK:
ROYAL HOTEL EXECUTIVE
Komp. Ruko Mahakarya 1, Jl. Gn. Sahari, Pademangan Barat
MANGGA DUA - JAKARTA PUSAT
KLIEN:
ROYAL
Bpk. TOTO
OWNER
DESIGN KONSULTAN & KONTRAKTOR:
PT. AZMOO MOREN GRIYA PERSADA
MUDROKOSANTO
TEAM LEADER
REVISI:
REV
DESKRIPSI
TANGGAL
JUDUL GAMBAR:
DENAH
LANTAI ATAP
SKALA
1:120
DIGAMBAR:
Ae
TANGGAL:
27/08/2024
DIPERIKSA:
Yoch
TANGGAL:
DIPERIKSA:
Scot
TANGGAL:
NO. GAMBAR:
ARS-109
NO. LEMBAR:
JUMLAH LEMBAR:
DAK BETON
DAK BETON
DAK BETON
DAK BETON
DAK BETON
DENAH LANTAI ATAP
SKALA 1 : 120

Lampiran 6 Detail Pekerjaan Struktur



BALOK	B1 600 x 200		B2 500 x 200		BA 400 x 200	
						
LOKASI	LAPANGAN	TUMPUAN	LAPANGAN	TUMPUAN	LAPANGAN	TUMPUAN
TULANGAN ATAS	3 D22	7 D22	3 D22	6 D22	4 D16	2 D16
TULANGAN BAWAH	7 D22	3 D22	6 D22	3 D22	2 D16	4 D16
SENGKANG	Ø10 - 250	Ø10 - 100	Ø10 - 180	Ø10 - 100	Ø10 - 100	Ø10 - 100

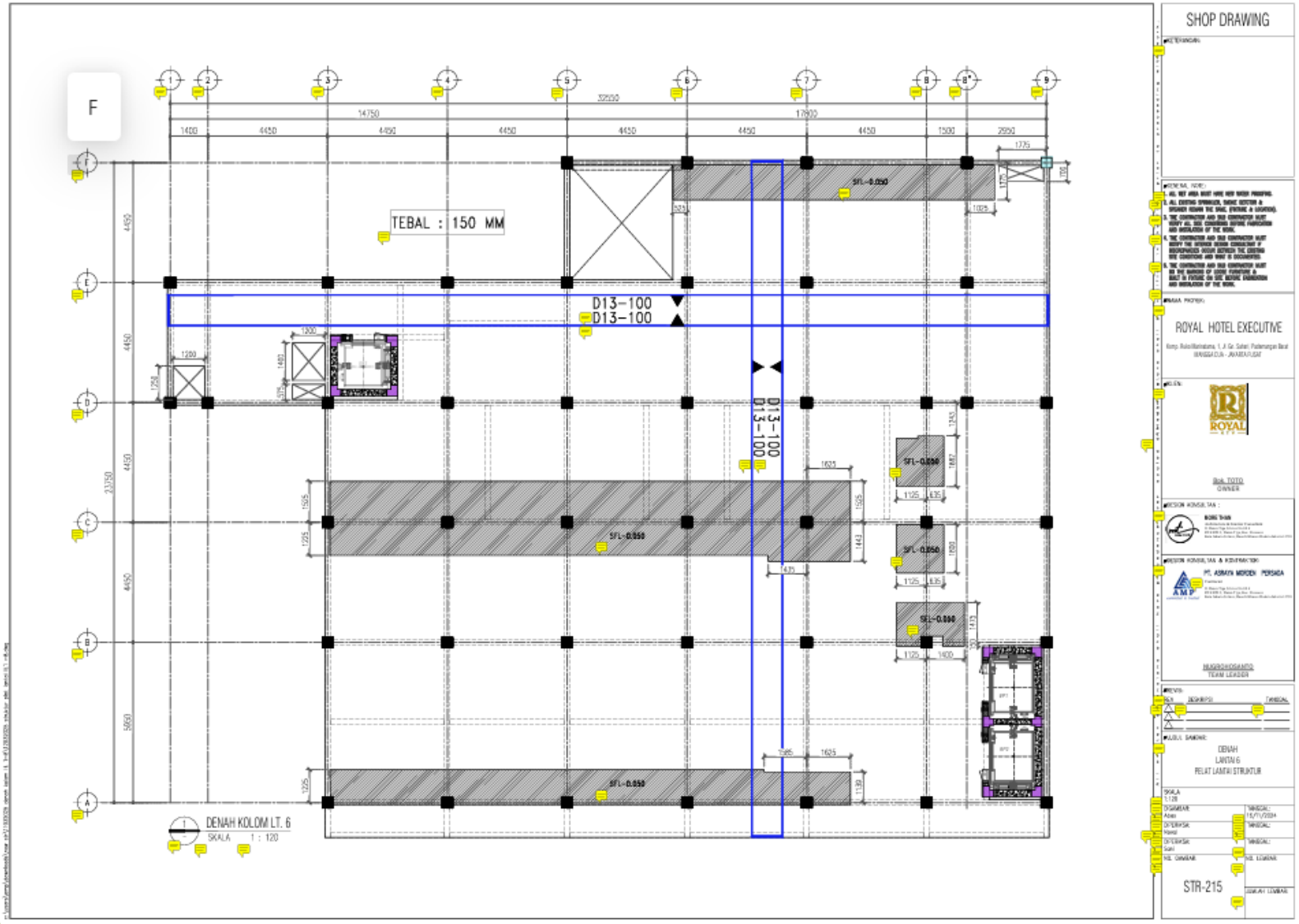
DETAIL TULANGAN BALOK
SKALA 1 : 10

SHOP DRAWING

ROYAL HOTEL EXECUTIVE

DETAIL
TULANGAN
BALOK STRUKTUR

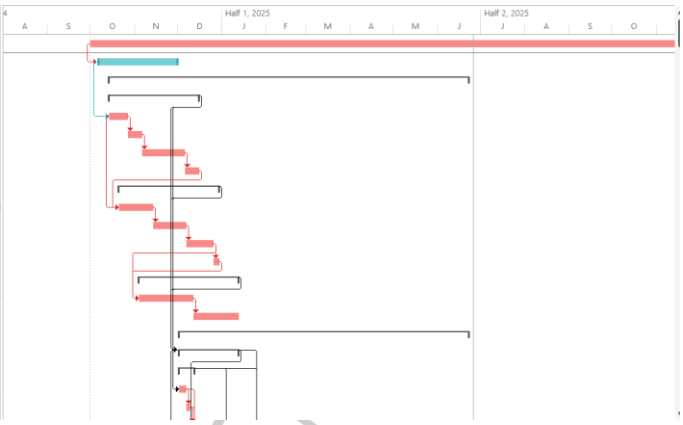
STR-213


F
TEBAL : 150 MM
D13-100
D13-100
D13-100
D13-100
SFL-0.050
DENAH KOLOM LT. 6
SKALA 1 : 120
SHOP DRAWING
ROYAL HOTEL EXECUTIVE
DENAH
LANTAI 6
PELAT LANTAI STRUKTUR
STR-215

Lampiran 7 Penjadwalan Microsoft Project Keadaan Normal

GANTT CHART

	Task Mode	Task Name	Duration	Start	Finish	Predecessors
1		**I. PRELIMINARIES**	473 days	Tue 01/10/24	Fri 30/01/26	
2		**II. DEMOLISHED**	55 days	Mon 07/10/24	Sat 30/11/24	1SS+6 days
3		**III. STRUCTURE**	**238 days**	**Mon 14/10/2**	**Sun 22/06/25**	
4		**A. Pilling Works**	**63 days**	**Mon 14/10/2**	**Sun 15/12/24**	
5		dewatering	13 days	Mon 14/10/24	Sat 26/10/24	2SS+7 days
6		lumpur	10 days	Sun 27/10/24	Tue 05/11/24	5
7		bore pile	30 days	Wed 06/11/24	Thu 05/12/24	6
8		potong pile	10 days	Fri 06/12/24	Sun 15/12/24	7
9		**B. Earts works**	**70 days**	**Mon 21/10/2**	**Sun 29/12/24**	
10		galian	24 days	Mon 21/10/24	Wed 13/11/24	5SS+7 days;1
11		urugan	23 days	Thu 14/11/24	Fri 06/12/24	10
12		pemadatan	19 days	Sat 07/12/24	Wed 25/12/24	11
13		anti rayap	4 days	Thu 26/12/24	Sun 29/12/24	12
14		**C. Sub structure**	**70 days**	**Mon 04/11/2**	**Sun 12/01/25**	
15		pile cap	38 days	Mon 04/11/24	Wed 11/12/24	12FS-52 day
16		pondasi biotank	32 days	Thu 12/12/24	Sun 12/01/25	15
17		**D. Upper structure**	**189 days**	**Mon 02/12/2**	**Sun 22/06/25**	
18		**D.1. Lantai 1**	**42 days**	**Mon 02/12/2**	**Sun 12/01/25**	**4;9;14**
19		**Kolom**	**11 days**	**Mon 02/12/2**	**Thu 12/12/24**	
20		pembesian	5 days	Mon 02/12/24	Fri 06/12/24	4FS-14 days
21		bekisting	3 days	Sat 07/12/24	Mon 09/12/24	20



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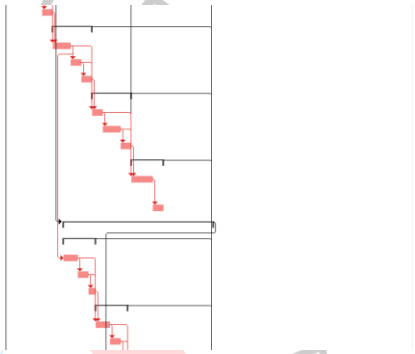
22	pengecoran	3 days	Tue 10/12/24	Thu 12/12/24	21
23	**Corewall**	**11 days**	**Fri 13/12/24**	**Mon 23/12/2**	
24	pembesian	5 days	Fri 13/12/24	Tue 17/12/24	20;21;22
25	bekisting	3 days	Wed 18/12/24	Fri 20/12/24	24
26	pengecoran	3 days	Sat 21/12/24	Mon 23/12/24	25
27	**Tangga**	**11 days**	**Tue 24/12/24**	**Fri 03/01/25**	
28	bekisting	3 days	Tue 24/12/24	Thu 26/12/24	24;25;26
29	pembesian	5 days	Fri 27/12/24	Tue 31/12/24	28
30	pengecoran	3 days	Wed 01/01/25	Fri 03/01/25	29
31	**Ground water tank**	**9 days**	**Sat 04/01/25**	**Sun 12/01/25**	
32	pemasangan pipa dan instalasi	6 days	Sat 04/01/25	Thu 09/01/25	28;29;30;19 days
33	pengujian	3 days	Fri 10/01/25	Sun 12/01/25	32
34	**D.2. Lantai 2**	**42 days**	**Mon 16/12/2**	**Sun 26/01/25**	**18**
35	**Kolom**	**9 days**	**Mon 16/12/2**	**Tue 24/12/24**	
36	pembesian	4 days	Mon 16/12/24	Thu 19/12/24	24FS-2 days
37	bekisting	3 days	Fri 20/12/24	Sun 22/12/24	36
38	pengecoran	2 days	Mon 23/12/24	Tue 24/12/24	37
39	**Corewall**	**9 days**	**Wed 25/12/2**	**Thu 02/01/25**	
40	pembesian	4 days	Wed 25/12/24	Sat 28/12/24	36;37;38
41	bekisting	3 days	Sun 29/12/24	Tue 31/12/24	40



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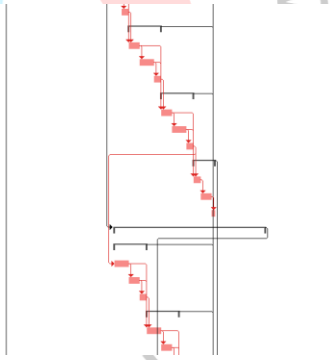
42	pengecoran	2 days	Wed 01/01/25	Thu 02/01/25	41
43	**Balok**	**9 days**	**Fri 03/01/25**	**Sat 11/01/25**	
44	bekisting	3 days	Fri 03/01/25	Sun 05/01/25	40;41;42
45	pembesian	4 days	Mon 06/01/25	Thu 09/01/25	44
46	pengecoran	2 days	Fri 10/01/25	Sat 11/01/25	45
47	**Pelat lantai**	**9 days**	**Sun 12/01/25**	**Mon 20/01/2**	
48	bekisting	3 days	Sun 12/01/25	Tue 14/01/25	44;45;46
49	pembesian	4 days	Wed 15/01/25	Sat 18/01/25	48
50	pengecoran	2 days	Sun 19/01/25	Mon 20/01/25	49
51	**Tangga**	**6 days**	**Tue 21/01/25**	**Sun 26/01/25**	
52	bekisting	2 days	Tue 21/01/25	Wed 22/01/25	48;49;50
53	pembesian	3 days	Thu 23/01/25	Sat 25/01/25	52
54	pengecoran	1 day	Sun 26/01/25	Sun 26/01/25	53
55	**D.2. Lantai 3**	**42 days**	**Mon 30/12/2**	**Sun 09/02/25**	**34**
56	**Kolom**	**9 days**	**Mon 30/12/2**	**Tue 07/01/25**	
57	pembesian	4 days	Mon 30/12/24	Thu 02/01/25	50FS-22 day
58	bekisting	3 days	Fri 03/01/25	Sun 05/01/25	57
59	pengecoran	2 days	Mon 06/01/25	Tue 07/01/25	58
60	**Corewall**	**9 days**	**Wed 08/01/2**	**Thu 16/01/25**	
61	pembesian	4 days	Wed 08/01/25	Sat 11/01/25	57;58;59
62	bekisting	3 days	Sun 12/01/25	Tue 14/01/25	61



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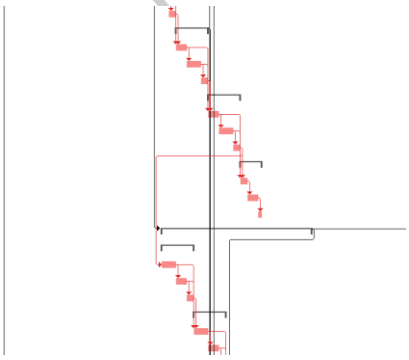
63	pengecoran	2 days	Wed 15/01/25	Thu 16/01/25	62
64	**Balok**	**9 days**	**Fri 17/01/25**	**Sat 25/01/25**	
65	bekisting	3 days	Fri 17/01/25	Sun 19/01/25	61;62;63
66	pembesian	4 days	Mon 20/01/25	Thu 23/01/25	65
67	pengecoran	2 days	Fri 24/01/25	Sat 25/01/25	66
68	**Pelat lantai**	**9 days**	**Sun 26/01/25**	**Mon 03/02/2**	
69	bekisting	3 days	Sun 26/01/25	Tue 28/01/25	65;66;67
70	pembesian	4 days	Wed 29/01/25	Sat 01/02/25	69
71	pengecoran	2 days	Sun 02/02/25	Mon 03/02/25	70
72	**Tangga**	**6 days**	**Tue 04/02/25**	**Sun 09/02/25**	
73	bekisting	2 days	Tue 04/02/25	Wed 05/02/25	69;70;71
74	pembesian	3 days	Thu 06/02/25	Sat 08/02/25	73
75	pengecoran	1 day	Sun 09/02/25	Sun 09/02/25	74
76	**D.4. Lantai 4**	**42 days**	**Mon 13/01/2**	**Sun 23/02/25**	**55**
77	**Kolom**	**9 days**	**Mon 13/01/2**	**Tue 21/01/25**	
78	pembesian	4 days	Mon 13/01/25	Thu 16/01/25	71FS-22 day
79	bekisting	3 days	Fri 17/01/25	Sun 19/01/25	78
80	pengecoran	2 days	Mon 20/01/25	Tue 21/01/25	79
81	**Corewall**	**9 days**	**Wed 22/01/2**	**Thu 30/01/25**	
82	pembesian	4 days	Wed 22/01/25	Sat 25/01/25	78;79;80
83	bekisting	3 days	Sun 26/01/25	Tue 28/01/25	82



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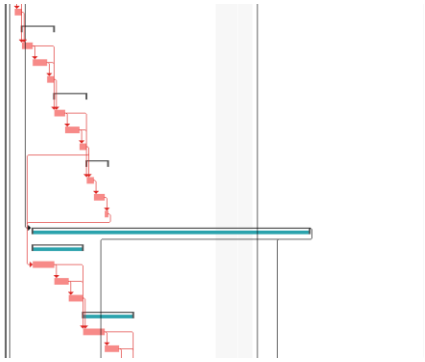
84	pengecoran	2 days	Wed 29/01/25	Thu 30/01/25	83
85	**Balok**	**9 days**	**Fri 31/01/25**	**Sat 08/02/25**	
86	bekisting	3 days	Fri 31/01/25	Sun 02/02/25	82;83;84
87	pembesian	4 days	Mon 03/02/25	Thu 06/02/25	86
88	pengecoran	2 days	Fri 07/02/25	Sat 08/02/25	87
89	**Pelat lantai**	**9 days**	**Sun 09/02/25**	**Mon 17/02/2**	
90	bekisting	3 days	Sun 09/02/25	Tue 11/02/25	86;87;88
91	pembesian	4 days	Wed 12/02/25	Sat 15/02/25	90
92	pengecoran	2 days	Sun 16/02/25	Mon 17/02/25	91
93	**Tangga**	**6 days**	**Tue 18/02/25**	**Sun 23/02/25**	
94	bekisting	2 days	Tue 18/02/25	Wed 19/02/25	90;91;92
95	pembesian	3 days	Thu 20/02/25	Sat 22/02/25	94
96	pengecoran	1 day	Sun 23/02/25	Sun 23/02/25	95
97	**D.5. Lantai 5**	**63 days**	**Mon 03/02/2**	**Sun 20/04/25**	**76**
98	**Kolom**	**14 days**	**Mon 03/02/2**	**Sun 16/02/25**	
99	pembesian	6 days	Mon 03/02/25	Sat 08/02/25	92FS-15 day
100	bekisting	4 days	Sun 09/02/25	Wed 12/02/25	99
101	pengecoran	4 days	Thu 13/02/25	Sun 16/02/25	100
102	**Corewall**	**14 days**	**Mon 17/02/2**	**Sun 02/03/25**	
103	pembesian	6 days	Mon 17/02/25	Sat 22/02/25	99;100;101
104	bekisting	4 days	Sun 23/02/25	Wed 26/02/25	103



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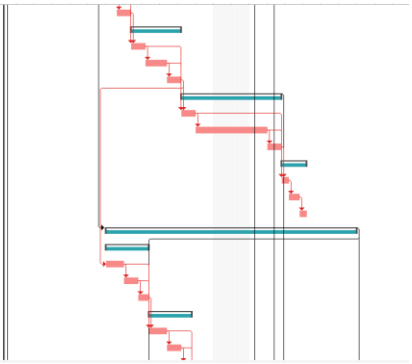
105	pengecoran	4 days	Thu 27/02/25	Sun 02/03/25	104
106	**Balok**	**14 days**	**Mon 03/03/2**	**Sun 16/03/25**	
107	bekisting	4 days	Mon 03/03/25	Thu 06/03/25	103;104;105
108	pembesian	6 days	Fri 07/03/25	Wed 12/03/25	107
109	pengecoran	4 days	Thu 13/03/25	Sun 16/03/25	108
110	**Pelat lantai**	**14 days**	**Mon 17/03/2**	**Sun 13/04/25**	
111	bekisting	4 days	Mon 17/03/25	Thu 20/03/25	107;108;109
112	pembesian	6 days	Fri 21/03/25	Wed 09/04/25	111
113	pengecoran	4 days	Thu 10/04/25	Sun 13/04/25	112
114	**Tangga**	**7 days**	**Mon 14/04/2**	**Sun 20/04/25**	
115	bekisting	2 days	Mon 14/04/25	Tue 15/04/25	111;112;113
116	pembesian	3 days	Wed 16/04/25	Fri 18/04/25	115
117	pengecoran	2 days	Sat 19/04/25	Sun 20/04/25	116
118	**D.6. Lantai 6**	**56 days**	**Mon 24/02/2**	**Sun 04/05/25**	**97**
119	**Kolom**	**12 days**	**Mon 24/02/2**	**Fri 07/03/25**	
120	pembesian	5 days	Mon 24/02/25	Fri 28/02/25	109FS-21 da
121	bekisting	4 days	Sat 01/03/25	Tue 04/03/25	120
122	pengecoran	3 days	Wed 05/03/25	Fri 07/03/25	121
123	**Corewall**	**12 days**	**Sat 08/03/25**	**Wed 19/03/2**	
124	pembesian	5 days	Sat 08/03/25	Wed 12/03/25	120;121;122
125	bekisting	4 days	Thu 13/03/25	Sun 16/03/25	124



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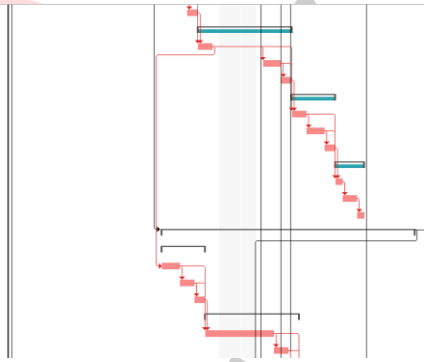
126	pengecoran	3 days	Mon 17/03/25	Wed 19/03/25	125
127	**Balok**	**12 days**	**Thu 20/03/25**	**Mon 14/04/2**	
128	bekisting	4 days	Thu 20/03/25	Sun 23/03/25	124;125;126
129	pembesian	5 days	Mon 07/04/25	Fri 11/04/25	128
130	pengecoran	3 days	Sat 12/04/25	Mon 14/04/25	129
131	**Pelat lantai**	**12 days**	**Tue 15/04/25**	**Sat 26/04/25**	
132	bekisting	4 days	Tue 15/04/25	Fri 18/04/25	128;129;130
133	pembesian	5 days	Sat 19/04/25	Wed 23/04/25	132
134	pengecoran	3 days	Thu 24/04/25	Sat 26/04/25	133
135	**Tangga**	**8 days**	**Sun 27/04/25**	**Sun 04/05/25**	
136	bekisting	2 days	Sun 27/04/25	Mon 28/04/25	132;133;134
137	pembesian	4 days	Tue 29/04/25	Fri 02/05/25	136
138	pengecoran	2 days	Sat 03/05/25	Sun 04/05/25	137
139	**D.7. Lantai 7**	**56 days**	**Mon 10/03/2**	**Sun 18/05/25**	**118**
140	**Kolom**	**12 days**	**Mon 10/03/2**	**Fri 21/03/25**	
141	pembesian	5 days	Mon 10/03/25	Fri 14/03/25	128FS-14 da
142	bekisting	4 days	Sat 15/03/25	Tue 18/03/25	141
143	pengecoran	3 days	Wed 19/03/25	Fri 21/03/25	142
144	**Corewall**	**12 days**	**Sat 22/03/25**	**Wed 16/04/2**	
145	pembesian	5 days	Sat 22/03/25	Wed 09/04/25	141;142;143
146	bekisting	4 days	Thu 10/04/25	Sun 13/04/25	145



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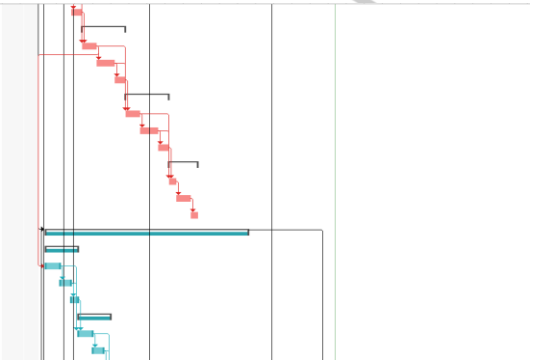
147	pengecoran	3 days	Mon 14/04/25	Wed 16/04/25	146
148	**Balok**	**12 days**	**Thu 17/04/25**	**Mon 28/04/2**	
149	bekisting	4 days	Thu 17/04/25	Sun 20/04/25	145;146;147
150	pembesian	5 days	Mon 21/04/25	Fri 25/04/25	149
151	pengecoran	3 days	Sat 26/04/25	Mon 28/04/25	150
152	**Pelat lantai**	**12 days**	**Tue 29/04/25**	**Sat 10/05/25**	
153	bekisting	4 days	Tue 29/04/25	Fri 02/05/25	149;150;151
154	pembesian	5 days	Sat 03/05/25	Wed 07/05/25	153
155	pengecoran	3 days	Thu 08/05/25	Sat 10/05/25	154
156	**Tangga**	**8 days**	**Sun 11/05/25**	**Sun 18/05/25**	
157	bekisting	2 days	Sun 11/05/25	Mon 12/05/25	153;154;155
158	pembesian	4 days	Tue 13/05/25	Fri 16/05/25	157
159	pengecoran	2 days	Sat 17/05/25	Sun 18/05/25	158
160	**D.8. Lantai 8**	**56 days**	**Mon 07/04/2**	**Sun 01/06/25**	**139**
161	**Kolom**	**9 days**	**Mon 07/04/2**	**Tue 15/04/25**	
162	pembesian	4 days	Mon 07/04/25	Thu 10/04/25	149FS-14 da
163	bekisting	3 days	Fri 11/04/25	Sun 13/04/25	162
164	pengecoran	2 days	Mon 14/04/25	Tue 15/04/25	163
165	**Corewall**	**9 days**	**Wed 16/04/2**	**Thu 24/04/25**	
166	pembesian	4 days	Wed 16/04/25	Sat 19/04/25	162;163;164
167	bekisting	3 days	Sun 20/04/25	Tue 22/04/25	166



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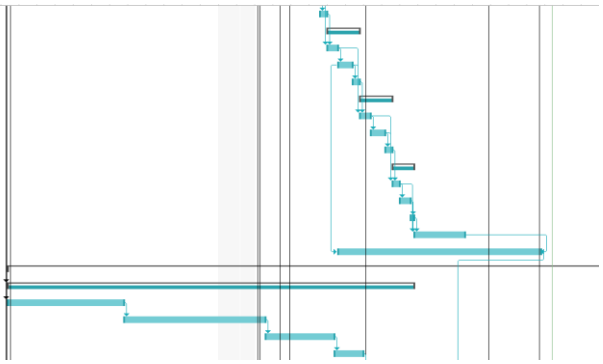
168		pengecoran	2 days	Wed 23/04/2	Thu 24/04/25	167
169		**Balok**	**9 days**	**Fri 25/04/25**	**Sat 03/05/25**	
170		bekisting	3 days	Fri 25/04/25	Sun 27/04/25	166;167;168
171		pembesian	4 days	Mon 28/04/2	Thu 01/05/25	170
172		pengecoran	2 days	Fri 02/05/25	Sat 03/05/25	171
173		**Pelat lantai**	**9 days**	**Sun 04/05/25**	**Mon 12/05/2**	
174		bekisting	3 days	Sun 04/05/25	Tue 06/05/25	170;171;172
175		pembesian	4 days	Wed 07/05/2	Sat 10/05/25	174
176		pengecoran	2 days	Sun 11/05/25	Mon 12/05/2	175
177		**Tangga**	**6 days**	**Tue 13/05/25**	**Sun 18/05/25**	
178		bekisting	2 days	Tue 13/05/25	Wed 14/05/2	174;175;176
179		pembesian	3 days	Thu 15/05/25	Sat 17/05/25	178
180		pengecoran	1 day	Sun 18/05/25	Sun 18/05/25	179
181		**Pool struktur**	14 days	Mon 19/05/2	Sun 01/06/25	178;179;180
182		**D.9. Lantai Atap**	56 days	Mon 28/04/2	Sun 22/06/25	171SS;181FF
183		**ARCHITECTURE**	**196 days**	**Mon 27/01/2**	**Sun 24/08/25**	
184		**A. Lantai 1**	**98 days**	**Mon 27/01/2**	**Sun 18/05/25**	**18**
185		Pasang bata	32 days	Mon 27/01/2	Thu 27/02/25	19FS+45 day
186		finishing dinding	25 days	Fri 28/02/25	Mon 07/04/2	185
187		pasang lantai	19 days	Tue 08/04/25	Sat 26/04/25	186
188		pasang plafond	8 days	Sun 27/04/25	Sun 04/05/25	187



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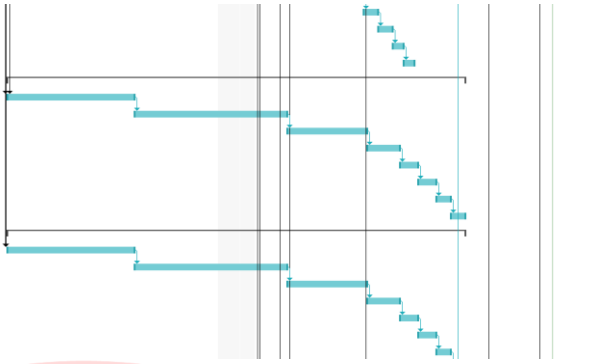
189		pintu	4 days	Mon 05/05/2	Thu 08/05/25	188
190		kaca	4 days	Fri 09/05/25	Mon 12/05/2	189
191		sanitary	3 days	Tue 13/05/25	Thu 15/05/25	190
192		railing	3 days	Fri 16/05/25	Sun 18/05/25	191
193		**B. Lantai 2**	**112 days**	**Mon 27/01/2**	**Sun 01/06/25**	
194		Pasang bata	35 days	Mon 27/01/2	Sun 02/03/25	35FS+33 day
195		finishing dinding	28 days	Mon 03/03/2	Sun 13/04/25	194
196		pasang lantai	22 days	Mon 14/04/2	Mon 05/05/2	195
197		pasang plafond	9 days	Tue 06/05/25	Wed 14/05/2	196
198		pintu	5 days	Thu 15/05/25	Mon 19/05/2	197
199		kaca	5 days	Tue 20/05/25	Sat 24/05/25	198
200		sanitary	4 days	Sun 25/05/25	Wed 28/05/2	199
201		railing	4 days	Thu 29/05/25	Sun 01/06/25	200
202		**C. Lantai 3**	**112 days**	**Mon 27/01/2**	**Sun 01/06/25**	
203		Pasang bata	35 days	Mon 27/01/2	Sun 02/03/25	56FS+19 day
204		finishing dinding	28 days	Mon 03/03/2	Sun 13/04/25	203
205		pasang lantai	22 days	Mon 14/04/2	Mon 05/05/2	204
206		pasang plafond	9 days	Tue 06/05/25	Wed 14/05/2	205
207		pintu	5 days	Thu 15/05/25	Mon 19/05/2	206
208		kaca	5 days	Tue 20/05/25	Sat 24/05/25	207
209		sanitary	4 days	Sun 25/05/25	Wed 28/05/2	208



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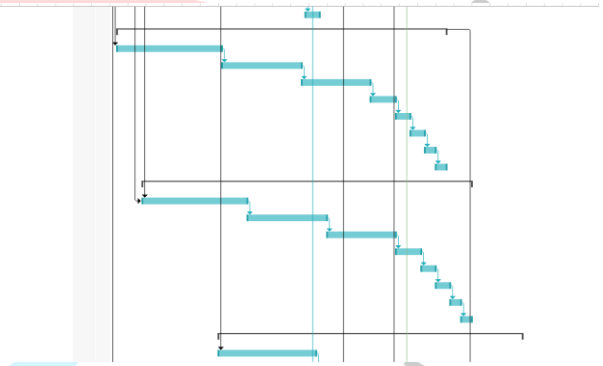
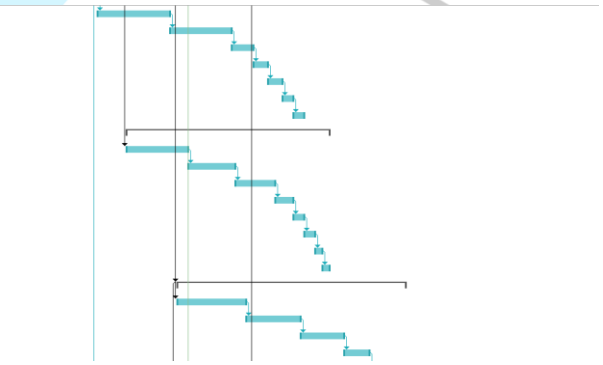
210		railing	4 days	Thu 29/05/25	Sun 01/06/25	209
211		**D. Lantai 4**	**91 days**	**Mon 07/04/2**	**Sun 06/07/25**	
212		Pasang bata	29 days	Mon 07/04/2	Mon 05/05/2	76FS+28 day
213		finishing dinding	22 days	Tue 06/05/25	Tue 27/05/25	212
214		pasang lantai	19 days	Wed 28/05/2	Sun 15/06/25	213
215		pasang plafond	7 days	Mon 16/06/2	Sun 22/06/25	214
216		pintu	4 days	Mon 23/06/2	Thu 26/06/25	215
217		kaca	4 days	Fri 27/06/25	Mon 30/06/2	216
218		sanitary	3 days	Tue 01/07/25	Thu 03/07/25	217
219		railing	3 days	Fri 04/07/25	Sun 06/07/25	218
220		**E. Lantai 5**	**91 days**	**Mon 14/04/2**	**Sun 13/07/25**	
221		Pasang bata	29 days	Mon 14/04/2	Mon 12/05/2	110;97FS-7
222		finishing dinding	22 days	Tue 13/05/25	Tue 03/06/25	221
223		pasang lantai	19 days	Wed 04/06/2	Sun 22/06/25	222
224		pasang plafond	7 days	Mon 23/06/2	Sun 29/06/25	223
225		pintu	4 days	Mon 30/06/2	Thu 03/07/25	224
226		kaca	4 days	Fri 04/07/25	Mon 07/07/2	225
227		sanitary	3 days	Tue 08/07/25	Thu 10/07/25	226
228		railing	3 days	Fri 11/07/25	Sun 13/07/25	227
229		**F. Lantai 6**	**84 days**	**Mon 05/05/2**	**Sun 27/07/25**	
230		Pasang bata	27 days	Mon 05/05/2	Sat 31/05/25	118



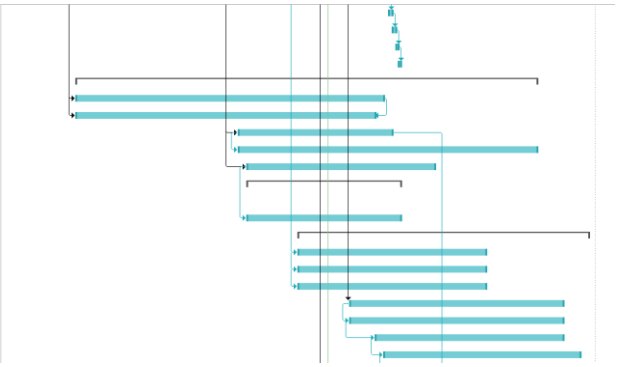
GANTT CHART

231		finishing dinding	20 days	Sun 01/06/25	Fri 20/06/25	230
232		pasang lantai	17 days	Sat 21/06/25	Mon 07/07/2	231
233		pasang plafond	6 days	Tue 08/07/25	Sun 13/07/25	232
234		pintu	4 days	Mon 14/07/2	Thu 17/07/25	233
235		kaca	4 days	Fri 18/07/25	Mon 21/07/2	234
236		sanitary	3 days	Tue 22/07/25	Thu 24/07/25	235
237		railing	3 days	Fri 25/07/25	Sun 27/07/25	236
238		**G. Lantai 7**	**56 days**	**Mon 09/06/2**	**Sun 03/08/25**	
239		Pasang bata	17 days	Mon 09/06/2	Wed 25/06/2	139FS+21 da
240		finishing dinding	13 days	Thu 26/06/25	Tue 08/07/25	239
241		pasang lantai	11 days	Wed 09/07/2	Sat 19/07/25	240
242		pasang plafond	5 days	Sun 20/07/25	Thu 24/07/25	241
243		pintu	3 days	Fri 25/07/25	Sun 27/07/25	242
244		kaca	3 days	Mon 28/07/2	Wed 30/07/2	243
245		sanitary	2 days	Thu 31/07/25	Fri 01/08/25	244
246		railing	2 days	Sat 02/08/25	Sun 03/08/25	245
247		**H. Lantai 8**	**63 days**	**Mon 23/06/2**	**Sun 24/08/25**	**160**
248		Pasang bata	19 days	Mon 23/06/2	Fri 11/07/25	160FS+21 da
249		finishing dinding	15 days	Sat 12/07/25	Sat 26/07/25	248
250		pasang lantai	12 days	Sun 27/07/25	Thu 07/08/25	249
251		pasang plafond	7 days	Fri 08/08/25	Thu 14/08/25	250

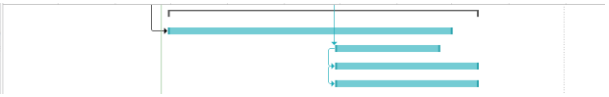


GANTT CHART

252	pintu	3 days	Fri 15/08/25	Sun 17/08/25	251
253	kaca	3 days	Mon 18/08/25	Wed 20/08/25	252
254	sanitary	2 days	Thu 21/08/25	Fri 22/08/25	253
255	railing	2 days	Sat 23/08/25	Sun 24/08/25	254
256	**MEP+HVAC**	**364 days**	**Mon 02/12/2**	**Sun 14/12/25**	
257	**A. Plumbing**	238 days	Mon 02/12/2	Sun 10/08/25	185S
258	**B. HVAC**	231 days	Mon 02/12/2	Sun 03/08/25	257FF-7 day
259	**C. Elektrikal general**	126 days	Mon 14/04/2	Sun 17/08/25	160SS+7 day
260	**D. Elektrikal interior**	245 days	Mon 14/04/2	Sun 14/12/25	259SS
261	**E. Elektronik**	154 days	Mon 21/04/2	Sun 21/09/25	160SS+14 da
262	**FIRE FIGHTING**	**126 days**	**Mon 21/04/2**	**Sun 24/08/25**	
263	**A. Peralatan utama**				
264	**B. Pekerjaan instalasi**	126 days	Mon 21/04/2	Sun 24/08/25	261SS
265	**INTERIOR DAN FURNITURE**	**238 days**	**Mon 02/06/2**	**Sun 25/01/26**	
266	lantai 1	154 days	Mon 02/06/2	Sun 02/11/25	182FS-21 da
267	lantai 2	154 days	Mon 02/06/2	Sun 02/11/25	266SS
268	lantai 3	154 days	Mon 02/06/2	Sun 02/11/25	267SS
269	lantai 4	175 days	Mon 14/07/2	Sun 04/01/26	211FS+7 day
270	lantai 5	175 days	Mon 14/07/2	Sun 04/01/26	269SS
271	lantai 6	154 days	Mon 04/08/2	Sun 04/01/26	270SS+21 da
272	lantai 7	161 days	Mon 11/08/2	Sun 18/01/26	271SS+7 day



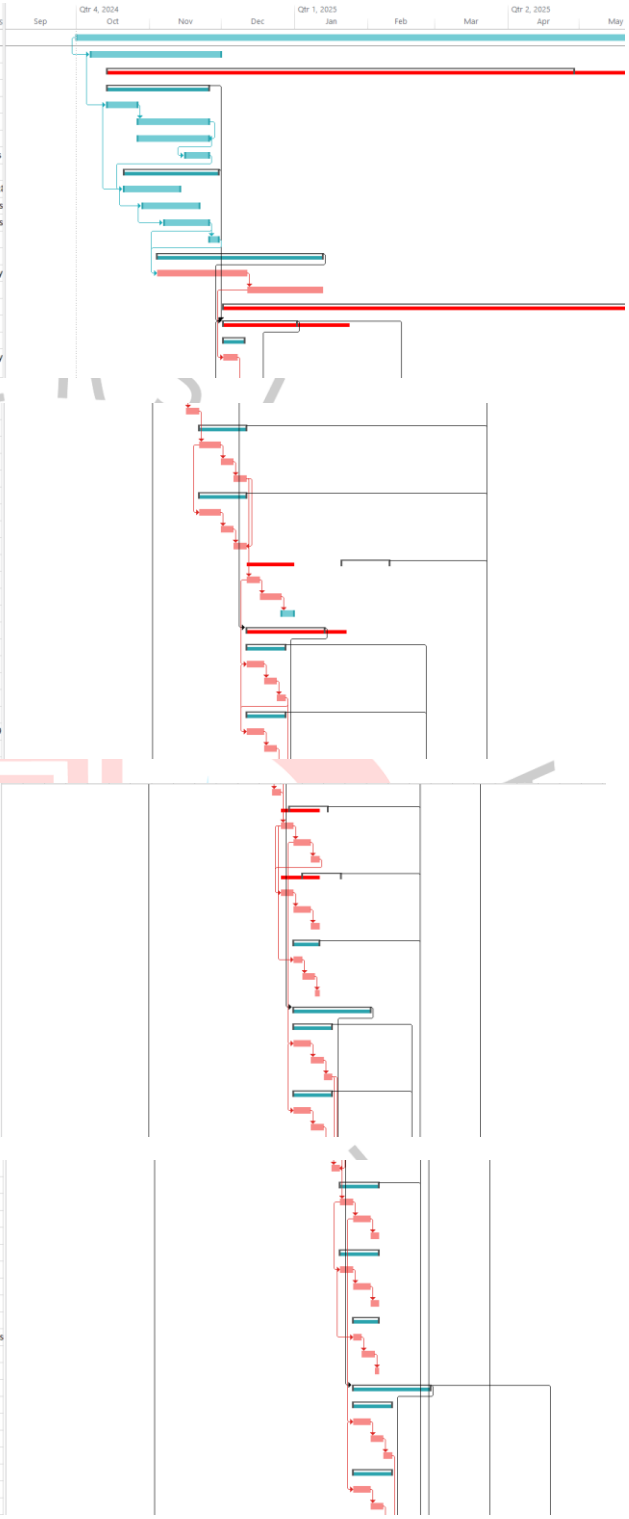
274	**FAÇADE**	**168 days**	**Mon 30/06/2**	**Sun 14/12/25**	
275	APC	154 days	Mon 30/06/2	Sun 30/11/25	247SS+7 day
276	signage acrylc + LED	56 days	Mon 29/09/2	Sun 23/11/25	259FS+42 da
277	LED backdrop cover acrylic	77 days	Mon 29/09/2	Sun 14/12/25	276SS
278	LED strip IP67	77 days	Mon 29/09/2	Sun 14/12/25	277SS



Lampiran 8 Microsoft Project Penjadwalan Metode *Fast track*

GANTT CHART

	Task Mode	Task Name	Duration	Start	Finish	Predecessors
1		**I. PRELIMINARIES**	418 days	Tue 01/10/24	Sat 06/12/25	
2		**II. DEMOLISHED**	55 days	Mon 07/10/2	Sat 30/11/24	1SS+6 days
3		**III. STRUCTURE**	**183 days**	**Mon 14/10/2**	**Mon 28/04/2**	
4		**A. Pilling Works**	**43 days**	**Mon 14/10/2**	**Mon 25/11/2**	
5		dewatering	13 days	Mon 14/10/2	Sat 26/10/24	2SS+7 days
6		lumpur	30 days	Sun 27/10/24	Mon 25/11/2	5
7		bore pile	30 days	Sun 27/10/24	Mon 25/11/2	6FF
8		potong pile	10 days	Sat 16/11/24	Mon 25/11/2	7FS-10 days
9		**B. Earts works**	**40 days**	**Mon 21/10/2**	**Fri 29/11/24**	
10		galian	24 days	Mon 21/10/2	Wed 13/11/2	5SS+7 days;1
11		urugan	24 days	Tue 29/10/24	Thu 21/11/24	10SS+8 days
12		pemadatan	19 days	Thu 07/11/24	Mon 25/11/2	11SS+9 days
13		anti rayap	4 days	Tue 26/11/24	Fri 29/11/24	12
14		**C. Sub structure**	**70 days**	**Mon 04/11/2**	**Sun 12/01/25**	
15		pile cap	38 days	Mon 04/11/2	Wed 11/12/2	12FS-52 day
16		pondasi biotank	32 days	Thu 12/12/24	Sun 12/01/25	15
17		**D. Upper structure**	**161 days**	**Mon 02/12/2**	**Sun 25/05/25**	
18		**D.1. Lantai 1**	**31 days**	**Mon 02/12/2**	**Wed 01/01/2**	**4;9;14**
19		**Ground water tank**	**9 days**	**Mon 02/12/2**	**Tue 10/12/24**	
20		pemasangan pipa dan instalasi	6 days	Mon 02/12/24	Sat 07/12/24	16SS-10 day
21		pengujian	3 days	Sun 08/12/24	Tue 10/12/24	20
22		**Kolom**	**11 days**	**Wed 11/12/2**	**Sat 21/12/24**	
23		pembesian	5 days	Wed 11/12/2	Sun 15/12/24	21
24		bekisting	3 days	Mon 16/12/2	Wed 18/12/2	23
25		pengecoran	3 days	Thu 19/12/24	Sat 21/12/24	24
26		**Corewall**	**11 days**	**Wed 11/12/2**	**Sat 21/12/24**	
27		pembesian	5 days	Wed 11/12/2	Sun 15/12/24	23SS
28		bekisting	3 days	Mon 16/12/2	Wed 18/12/2	27
29		pengecoran	3 days	Thu 19/12/24	Sat 21/12/24	28;25FF
30		**Tangga**	**11 days**	**Mon 13/01/2**	**Thu 23/01/25**	
31		bekisting	3 days	Sun 22/12/24	Tue 24/12/24	29;25
32		pembesian	5 days	Wed 25/12/2	Sun 29/12/24	31
33		pengecoran	3 days	Mon 30/12/2	Wed 01/01/2	32
34		**D.2. Lantai 2**	**18 days**	**Sun 22/12/24**	**Wed 08/01/2**	**18**
35		**Kolom**	**9 days**	**Sun 22/12/24**	**Mon 30/12/2**	
36		pembesian	4 days	Sun 22/12/24	Wed 25/12/2	31SS
37		bekisting	3 days	Thu 26/12/24	Sat 28/12/24	36
38		pengecoran	2 days	Sun 29/12/24	Mon 30/12/2	37
39		**Corewall**	**9 days**	**Sun 22/12/24**	**Mon 30/12/2**	
40		pembesian	4 days	Sun 22/12/24	Wed 25/12/2	36SS;38FS-9
41		bekisting	3 days	Thu 26/12/24	Sat 28/12/24	40
42		pengecoran	2 days	Sun 29/12/24	Mon 30/12/2	41
43		**Balok**	**9 days**	**Thu 02/01/25**	**Fri 10/01/25**	
44		bekisting	3 days	Tue 31/12/24	Thu 02/01/25	38;42
45		pembesian	4 days	Fri 03/01/25	Mon 06/01/2	44
46		pengecoran	2 days	Tue 07/01/25	Wed 08/01/2	45
47		**Pelat lantai**	**9 days**	**Sun 05/01/25**	**Mon 13/01/2**	
48		bekisting	3 days	Tue 31/12/24	Thu 02/01/25	44SS;46FS-9
49		pembesian	4 days	Fri 03/01/25	Mon 06/01/2	48
50		pengecoran	2 days	Tue 07/01/25	Wed 08/01/2	49
51		**Tangga**	**6 days**	**Fri 03/01/25**	**Wed 08/01/2**	
52		bekisting	2 days	Fri 03/01/25	Sat 04/01/25	48SS+3 days
53		pembesian	3 days	Sun 05/01/25	Tue 07/01/25	52
54		pengecoran	1 day	Wed 08/01/2	Wed 08/01/2	53
55		**D.2. Lantai 3**	**18 days**	**Fri 03/01/25**	**Mon 20/01/2**	**34**
56		**Kolom**	**9 days**	**Fri 03/01/25**	**Sat 11/01/25**	
57		pembesian	4 days	Fri 03/01/25	Mon 06/01/2	45SS
58		bekisting	3 days	Tue 07/01/25	Thu 09/01/25	57
59		pengecoran	2 days	Fri 10/01/25	Sat 11/01/25	58
60		**Corewall**	**9 days**	**Fri 03/01/25**	**Sat 11/01/25**	
61		pembesian	4 days	Fri 03/01/25	Mon 06/01/2	57SS
62		bekisting	3 days	Tue 07/01/25	Thu 09/01/25	61
63		pengecoran	2 days	Fri 10/01/25	Sat 11/01/25	62;59FF
64		**Balok**	**9 days**	**Sun 12/01/25**	**Mon 20/01/2**	
65		bekisting	3 days	Sun 12/01/25	Tue 14/01/25	63;59
66		pembesian	4 days	Wed 15/01/2	Sat 18/01/25	65
67		pengecoran	2 days	Sun 19/01/25	Mon 20/01/2	66
68		**Pelat lantai**	**9 days**	**Sun 12/01/25**	**Mon 20/01/2**	
69		bekisting	3 days	Sun 12/01/25	Tue 14/01/25	65SS
70		pembesian	4 days	Wed 15/01/2	Sat 18/01/25	69
71		pengecoran	2 days	Sun 19/01/25	Mon 20/01/2	70
72		**Tangga**	**6 days**	**Wed 15/01/2**	**Mon 20/01/2**	
73		bekisting	2 days	Wed 15/01/2	Thu 16/01/25	69SS+3 days
74		pembesian	3 days	Fri 17/01/25	Sun 19/01/25	73
75		pengecoran	1 day	Mon 20/01/2	Mon 20/01/2	74
76		**D.4. Lantai 4**	**18 days**	**Wed 15/01/2**	**Sat 01/02/25**	**55**
77		**Kolom**	**9 days**	**Wed 15/01/2**	**Thu 23/01/25**	
78		pembesian	4 days	Wed 15/01/2	Sat 18/01/25	66SS
79		bekisting	3 days	Sun 19/01/25	Tue 21/01/25	78
80		pengecoran	2 days	Wed 22/01/2	Thu 23/01/25	79
81		**Corewall**	**9 days**	**Wed 15/01/2**	**Thu 23/01/25**	
82		pembesian	4 days	Wed 15/01/2	Sat 18/01/25	78SS
83		bekisting	3 days	Sun 19/01/25	Tue 21/01/25	82



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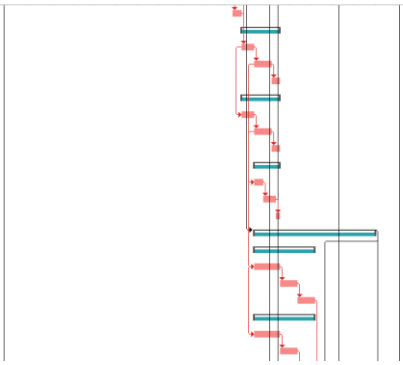
84	pengecoran	2 days	Wed 22/01/25	Thu 23/01/25	83
85	**Balok**	**9 days**	**Fri 24/01/25**	**Sat 01/02/25**	
86	bekisting	3 days	Fri 24/01/25	Sun 26/01/25	84;80
87	pembesian	4 days	Mon 27/01/25	Thu 30/01/25	86
88	pengecoran	2 days	Fri 31/01/25	Sat 01/02/25	87
89	**Pelat lantai**	**9 days**	**Fri 24/01/25**	**Sat 01/02/25**	
90	bekisting	3 days	Fri 24/01/25	Sun 26/01/25	86SS
91	pembesian	4 days	Mon 27/01/25	Thu 30/01/25	90
92	pengecoran	2 days	Fri 31/01/25	Sat 01/02/25	91
93	**Tangga**	**6 days**	**Mon 27/01/2**	**Sat 01/02/25**	
94	bekisting	2 days	Mon 27/01/25	Tue 28/01/25	91SS
95	pembesian	3 days	Wed 29/01/25	Fri 31/01/25	94
96	pengecoran	1 day	Sat 01/02/25	Sat 01/02/25	95
97	**D.5. Lantai 5**	**28 days**	**Mon 27/01/2**	**Sun 23/02/25**	**76**
98	**Kolom**	**14 days**	**Mon 27/01/2**	**Sun 09/02/25**	
99	pembesian	6 days	Mon 27/01/25	Sat 01/02/25	87SS
100	bekisting	4 days	Sun 02/02/25	Wed 05/02/25	99
101	pengecoran	4 days	Thu 06/02/25	Sun 09/02/25	100
102	**Corewall**	**14 days**	**Mon 27/01/2**	**Sun 09/02/25**	
103	pembesian	6 days	Mon 27/01/25	Sat 01/02/25	99SS
104	bekisting	4 days	Sun 02/02/25	Wed 05/02/25	103



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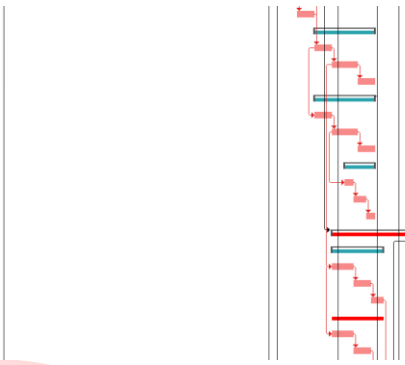
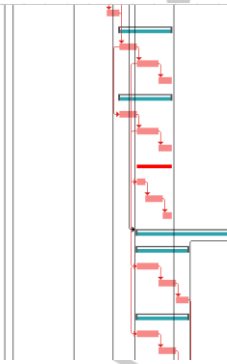
105	pengecoran	4 days	Thu 06/02/25	Sun 09/02/25	104
106	**Balok**	**14 days**	**Mon 10/02/2**	**Sun 23/02/25**	
107	bekisting	4 days	Mon 10/02/25	Thu 13/02/25	105;101
108	pembesian	6 days	Fri 14/02/25	Wed 19/02/25	107
109	pengecoran	4 days	Thu 20/02/25	Sun 23/02/25	108
110	**Pelat lantai**	**14 days**	**Mon 10/02/2**	**Sun 23/02/25**	
111	bekisting	4 days	Mon 10/02/25	Thu 13/02/25	107SS
112	pembesian	6 days	Fri 14/02/25	Wed 19/02/25	111
113	pengecoran	4 days	Thu 20/02/25	Sun 23/02/25	112
114	**Tangga**	**7 days**	**Mon 17/02/2**	**Sun 23/02/25**	
115	bekisting	2 days	Mon 17/02/25	Tue 18/02/25	112SS+3 day
116	pembesian	3 days	Wed 19/02/25	Fri 21/02/25	115
117	pengecoran	2 days	Sat 22/02/25	Sun 23/02/25	116
118	**D.6. Lantai 6**	**24 days**	**Fri 14/02/25**	**Sun 09/03/25**	**97**
119	**Kolom**	**12 days**	**Fri 14/02/25**	**Tue 25/02/25**	
120	pembesian	5 days	Fri 14/02/25	Tue 18/02/25	108SS
121	bekisting	4 days	Wed 19/02/25	Sat 22/02/25	120
122	pengecoran	3 days	Sun 23/02/25	Tue 25/02/25	121
123	**Corewall**	**12 days**	**Wed 14/05/2**	**Sun 25/05/25**	
124	pembesian	5 days	Fri 14/02/25	Tue 18/02/25	120SS
125	bekisting	4 days	Wed 19/02/25	Sat 22/02/25	124



GANTT CHART

126	pengecoran	3 days	Sun 23/02/25	Tue 25/02/25	125
127	**Balok**	**12 days**	**Wed 26/02/2**	**Sun 09/03/25**	
128	bekisting	4 days	Wed 26/02/25	Sat 01/03/25	126;122
129	pembesian	5 days	Sun 02/03/25	Thu 06/03/25	128
130	pengecoran	3 days	Fri 07/03/25	Sun 09/03/25	129
131	**Pelat lantai**	**12 days**	**Wed 26/02/2**	**Sun 09/03/25**	
132	bekisting	4 days	Wed 26/02/25	Sat 01/03/25	128SS
133	pembesian	5 days	Sun 02/03/25	Thu 06/03/25	132
134	pengecoran	3 days	Fri 07/03/25	Sun 09/03/25	133
135	**Tangga**	**8 days**	**Wed 09/04/2**	**Wed 16/04/2**	
136	bekisting	2 days	Sun 02/03/25	Mon 03/03/25	133SS
137	pembesian	4 days	Tue 04/03/25	Fri 07/03/25	136
138	pengecoran	2 days	Sat 08/03/25	Sun 09/03/25	137
139	**D.7. Lantai 7**	**25 days**	**Sun 02/03/25**	**Wed 09/04/2**	**118**
140	**Kolom**	**12 days**	**Sun 02/03/25**	**Thu 13/03/25**	
141	pembesian	5 days	Sun 02/03/25	Thu 06/03/25	129SS
142	bekisting	4 days	Fri 07/03/25	Mon 10/03/25	141
143	pengecoran	3 days	Tue 11/03/25	Thu 13/03/25	142
144	**Corewall**	**12 days**	**Sun 02/03/25**	**Thu 13/03/25**	
145	pembesian	5 days	Sun 02/03/25	Thu 06/03/25	141SS
146	bekisting	4 days	Fri 07/03/25	Mon 10/03/25	145



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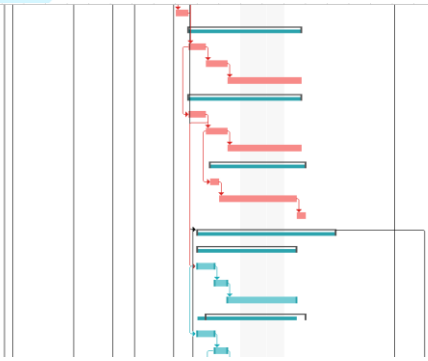
147	pengecoran	3 days	Tue 11/03/25	Thu 13/03/25	146
148	**Balok**	**12 days**	**Fri 14/03/25**	**Tue 08/04/25**	
149	bekisting	4 days	Fri 14/03/25	Mon 17/03/25	147;143
150	pembesian	5 days	Tue 18/03/25	Sat 22/03/25	149
151	pengecoran	3 days	Sun 23/03/25	Tue 08/04/25	150
152	**Pelat lantai**	**12 days**	**Fri 14/03/25**	**Tue 08/04/25**	
153	bekisting	4 days	Fri 14/03/25	Mon 17/03/25	149SS
154	pembesian	5 days	Tue 18/03/25	Sat 22/03/25	153
155	pengecoran	3 days	Sun 23/03/25	Tue 08/04/25	154
156	**Tangga**	**8 days**	**Wed 19/03/2**	**Wed 09/04/2**	
157	bekisting	2 days	Wed 19/03/25	Thu 20/03/25	154SS+1 day
158	pembesian	4 days	Fri 21/03/25	Mon 07/04/25	157
159	pengecoran	2 days	Tue 08/04/25	Wed 09/04/25	158
160	**D.8. Lantai 8**	**18 days**	**Sun 16/03/25**	**Wed 16/04/2**	**139**
161	**Kolom**	**9 days**	**Sun 16/03/25**	**Mon 07/04/2**	
162	pembesian	4 days	Sun 16/03/25	Wed 19/03/25	153FS-2 day
163	bekisting	3 days	Thu 20/03/25	Sat 22/03/25	162
164	pengecoran	2 days	Sun 23/03/25	Mon 07/04/25	163
165	**Corewall**	**9 days**	**Tue 18/03/25**	**Wed 09/04/2**	
166	pembesian	4 days	Sun 16/03/25	Wed 19/03/25	162SS
167	bekisting	3 days	Thu 20/03/25	Sat 22/03/25	166



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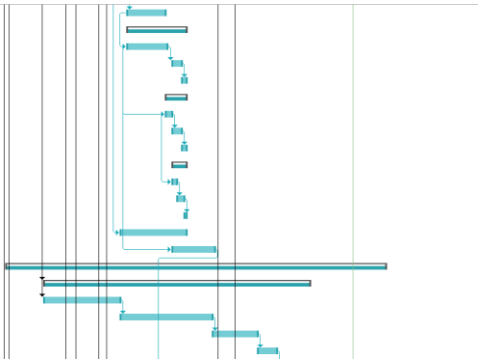
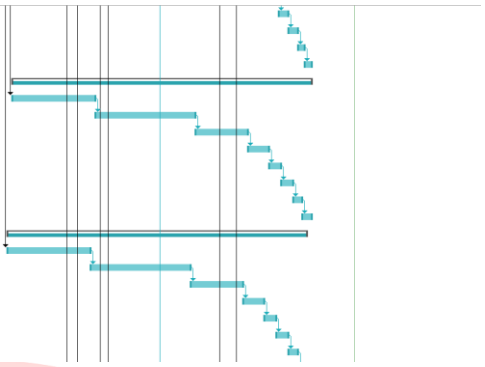
168		pengecoran	2 days	Sun 23/03/25	Mon 07/04/2	167
169		**Balok**	**11 days**	**Sun 23/03/25**	**Wed 16/04/2**	
170		bekisting	3 days	Sun 23/03/25	Tue 08/04/25	168SS
171		pembesian	4 days	Fri 11/04/25	Mon 14/04/2	170
172		pengecoran	2 days	Tue 15/04/25	Wed 16/04/2	171
173		**Pelat lantai**	**9 days**	**Tue 08/04/25**	**Wed 16/04/2**	
174		bekisting	3 days	Tue 08/04/25	Thu 10/04/25	170SS
175		pembesian	4 days	Fri 11/04/25	Mon 14/04/2	174
176		pengecoran	2 days	Tue 15/04/25	Wed 16/04/2	175
177		**Tangga**	**6 days**	**Fri 11/04/25**	**Wed 16/04/2**	
178		bekisting	2 days	Fri 11/04/25	Sat 12/04/25	174SS+3 day
179		pembesian	3 days	Sun 13/04/25	Tue 15/04/25	178
180		pengecoran	1 day	Wed 16/04/2	Wed 16/04/2	179
181		**Pool struktur**	14 days	Thu 20/03/25	Wed 16/04/2	167SS
182		**D.9. Lantai Atap**	18 days	Fri 11/04/25	Mon 28/04/2	170SS
183		**ARCHITECTURE**	**146 days**	**Fri 31/01/25**	**Wed 09/07/2**	
184		**A. Lantai 1**	**98 days**	**Sun 16/02/25**	**Sat 07/06/25**	**18**
185		Pasang bata	32 days	Sun 16/02/25	Wed 19/03/2	22FS+45 day
186		finishing dinding	25 days	Thu 20/03/25	Sun 27/04/25	185
187		pasang lantai	19 days	Mon 28/04/2	Fri 16/05/25	186
188		pasang plafond	8 days	Sat 17/05/25	Sat 24/05/25	187



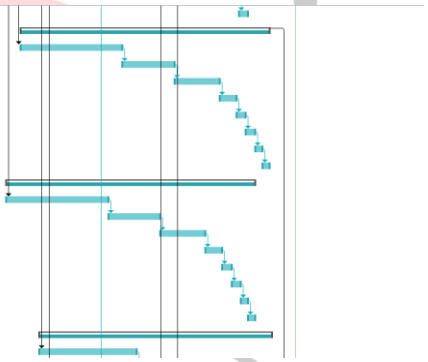
GANTT CHART

189		pintu	4 days	Sun 25/05/25	Wed 28/05/2	188
190		kaca	4 days	Thu 29/05/25	Sun 01/06/25	189
191		sanitary	3 days	Mon 02/06/2	Wed 04/06/2	190
192		railing	3 days	Thu 05/06/25	Sat 07/06/25	191
193		**B. Lantai 2**	**112 days**	**Sun 02/02/25**	**Sat 07/06/25**	
194		Pasang bata	35 days	Sun 02/02/25	Sat 08/03/25	35FS+33 day
195		finishing dinding	28 days	Sun 09/03/25	Sat 19/04/25	194
196		pasang lantai	22 days	Sun 20/04/25	Sun 11/05/25	195
197		pasang plafond	9 days	Mon 12/05/2	Tue 20/05/25	196
198		pintu	5 days	Wed 21/05/2	Sun 25/05/25	197
199		kaca	5 days	Mon 26/05/2	Fri 30/05/25	198
200		sanitary	4 days	Sat 31/05/25	Tue 03/06/25	199
201		railing	4 days	Wed 04/06/2	Sat 07/06/25	200
202		**C. Lantai 3**	**112 days**	**Fri 31/01/25**	**Thu 05/06/25**	
203		Pasang bata	35 days	Fri 31/01/25	Thu 06/03/25	56FS+19 day
204		finishing dinding	28 days	Fri 07/03/25	Thu 17/04/25	203
205		pasang lantai	22 days	Fri 18/04/25	Fri 09/05/25	204
206		pasang plafond	9 days	Sat 10/05/25	Sun 18/05/25	205
207		pintu	5 days	Mon 19/05/2	Fri 23/05/25	206
208		kaca	5 days	Sat 24/05/25	Wed 28/05/2	207
209		sanitary	4 days	Thu 29/05/25	Sun 01/06/25	208



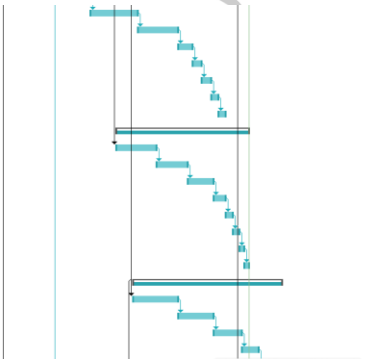
GANTT CHART

210		railing	4 days	Mon 02/06/2	Thu 05/06/25	209
211		**D. Lantai 4**	**91 days**	**Sun 02/03/25**	**Sat 14/06/25**	
212		Pasang bata	29 days	Sun 02/03/25	Sun 13/04/25	76FS+28 day
213		finishing dinding	22 days	Mon 14/04/2	Mon 05/05/2	212
214		pasang lantai	19 days	Tue 06/05/25	Sat 24/05/25	213
215		pasang plafond	7 days	Sun 25/05/25	Sat 31/05/25	214
216		pintu	4 days	Sun 01/06/25	Wed 04/06/2	215
217		kaca	4 days	Thu 05/06/25	Sun 08/06/25	216
218		sanitary	3 days	Mon 09/06/2	Wed 11/06/2	217
219		railing	3 days	Thu 12/06/25	Sat 14/06/25	218
220		**E. Lantai 5**	**91 days**	**Mon 24/02/2**	**Sun 08/06/25**	
221		Pasang bata	29 days	Mon 24/02/2	Mon 07/04/2	110;97FS-7
222		finishing dinding	22 days	Tue 08/04/25	Tue 29/04/25	221
223		pasang lantai	19 days	Wed 30/04/2	Sun 18/05/25	222
224		pasang plafond	7 days	Mon 19/05/2	Sun 25/05/25	223
225		pintu	4 days	Mon 26/05/2	Thu 29/05/25	224
226		kaca	4 days	Fri 30/05/25	Mon 02/06/2	225
227		sanitary	3 days	Tue 03/06/25	Thu 05/06/25	226
228		railing	3 days	Fri 06/06/25	Sun 08/06/25	227
229		**F. Lantai 6**	**84 days**	**Mon 10/03/2**	**Sun 15/06/25**	
230		Pasang bata	27 days	Mon 10/03/2	Sat 19/04/25	118



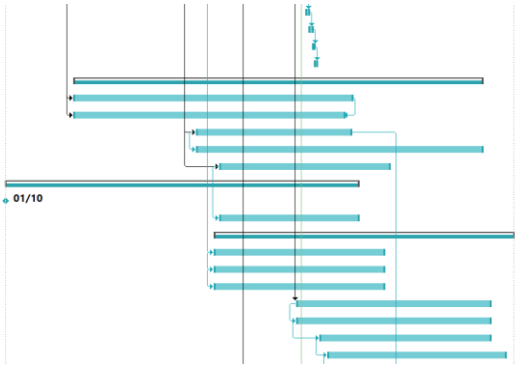
GANTT CHART

231		finishing dinding	20 days	Sun 20/04/25	Fri 09/05/25	230
232		pasang lantai	17 days	Sat 10/05/25	Mon 26/05/2	231
233		pasang plafond	6 days	Tue 27/05/25	Sun 01/06/25	232
234		pintu	4 days	Mon 02/06/2	Thu 05/06/25	233
235		kaca	4 days	Fri 06/06/25	Mon 09/06/2	234
236		sanitary	3 days	Tue 10/06/25	Thu 12/06/25	235
237		railing	3 days	Fri 13/06/25	Sun 15/06/25	236
238		**G. Lantai 7**	**56 days**	**Thu 01/05/25**	**Wed 25/06/2**	
239		Pasang bata	17 days	Thu 01/05/25	Sat 17/05/25	139FS+21 da
240		finishing dinding	13 days	Sun 18/05/25	Fri 30/05/25	239
241		pasang lantai	11 days	Sat 31/05/25	Tue 10/06/25	240
242		pasang plafond	5 days	Wed 11/06/2	Sun 15/06/25	241
243		pintu	3 days	Mon 16/06/2	Wed 18/06/2	242
244		kaca	3 days	Thu 19/06/25	Sat 21/06/25	243
245		sanitary	2 days	Sun 22/06/25	Mon 23/06/2	244
246		railing	2 days	Tue 24/06/25	Wed 25/06/2	245
247		**H. Lantai 8**	**63 days**	**Thu 08/05/25**	**Wed 09/07/2**	
248		Pasang bata	19 days	Thu 08/05/25	Mon 26/05/2	160FS+21 da
249		finishing dinding	15 days	Tue 27/05/25	Tue 10/06/25	248
250		pasang lantai	12 days	Wed 11/06/2	Sun 22/06/25	249
251		pasang plafond	7 days	Mon 23/06/2	Sun 29/06/25	250

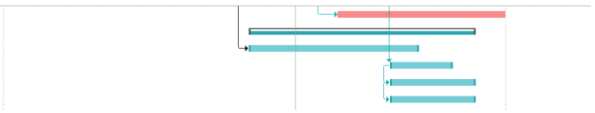


GANTT CHART

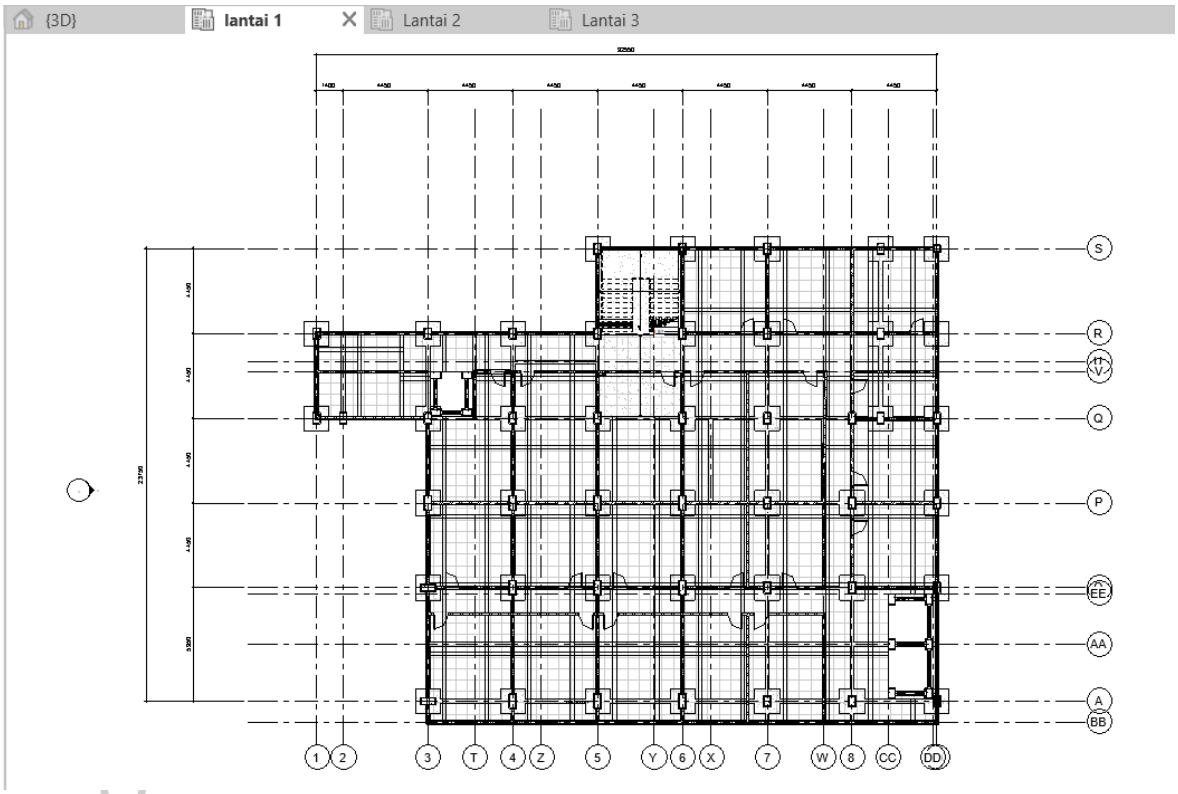
252		pintu	3 days	Mon 30/06/25	Wed 02/07/25	251
253		kaca	3 days	Thu 03/07/25	Sat 05/07/25	252
254		sanitary	2 days	Sun 06/07/25	Mon 07/07/25	253
255		railing	2 days	Tue 08/07/25	Wed 09/07/25	254
256		**MEP+HVAC**	**356 days**	**Mon 02/12/2**	**Sat 06/12/25**	
257		**A. Plumbing**	238 days	Mon 02/12/2	Sun 10/08/25	18SS
258		**B. HVAC**	231 days	Mon 02/12/2	Sun 03/08/25	257FF-7 day
259		**C. Elektrikal general**	126 days	Sun 23/03/25	Sat 09/08/25	160SS+7 day
260		**D. Elektrikal interior**	245 days	Sun 23/03/25	Sat 06/12/25	259SS
261		**E. Elektronik**	154 days	Sun 13/04/25	Sat 13/09/25	160SS+14 da
262		**FIRE FIGHTING**	**306 days**	**Tue 01/10/24**	**Sat 16/08/25**	
263		**A. Peralatan utama**	0 days	Tue 01/10/24	Tue 01/10/24	
264		**B. Pekerjaan instalasi**	126 days	Sun 13/04/25	Sat 16/08/25	261SS
265		**INTERIOR DAN FURNITURE**	**271 days**	**Tue 08/04/25**	**Sat 03/01/26**	
266		lantai 1	154 days	Tue 08/04/25	Mon 08/09/25	182FS-21 da
267		lantai 2	154 days	Tue 08/04/25	Mon 08/09/25	266SS
268		lantai 3	154 days	Tue 08/04/25	Mon 08/09/25	267SS
269		lantai 4	175 days	Sun 22/06/25	Sat 13/12/25	211FS+7 day
270		lantai 5	175 days	Sun 22/06/25	Sat 13/12/25	269SS
271		lantai 6	154 days	Sun 13/07/25	Sat 13/12/25	270SS+21 da
272		lantai 7	161 days	Sun 20/07/25	Sat 27/12/25	271SS+7 day

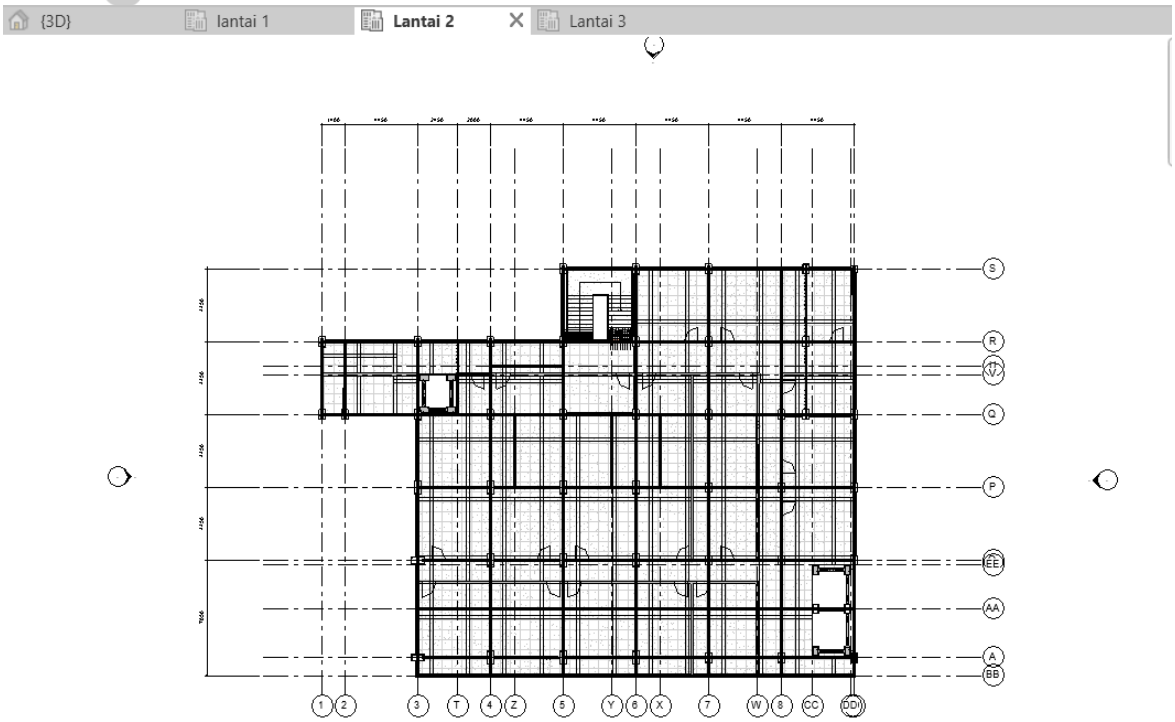


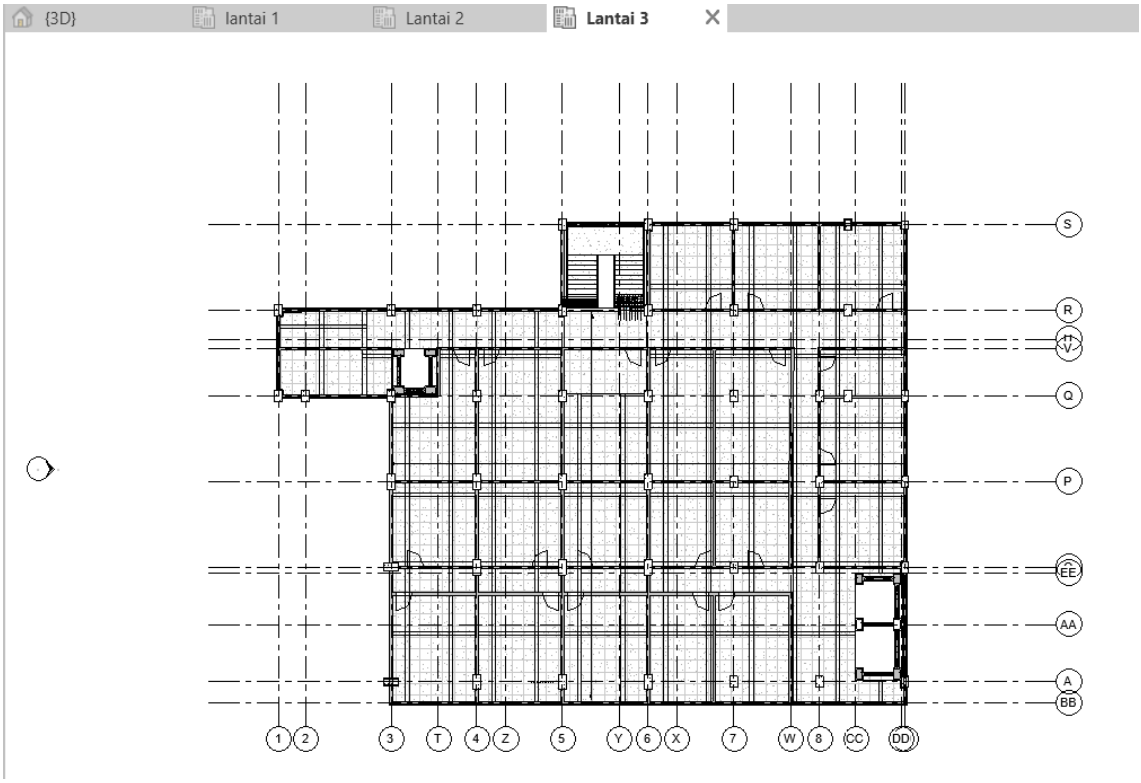
273		lantai 8	154 days	Sun 03/08/25	Sat 03/01/26	272SS+14 da
274		**FAÇADE**	**206 days**	**Thu 15/05/25**	**Sat 06/12/25**	
275		APC	154 days	Thu 15/05/25	Wed 15/10/25	247SS+7 day
276		signage acrylc + LED	56 days	Sun 21/09/25	Sat 15/11/25	259FS+42 da
277		LED backdrop cover acrylic	77 days	Sun 21/09/25	Sat 06/12/25	276SS
278		LED strip IP67	77 days	Sun 21/09/25	Sat 06/12/25	277SS



Lampiran 9 Pemodelan BIM 3D pada Autodesk Revit



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Lantai 3
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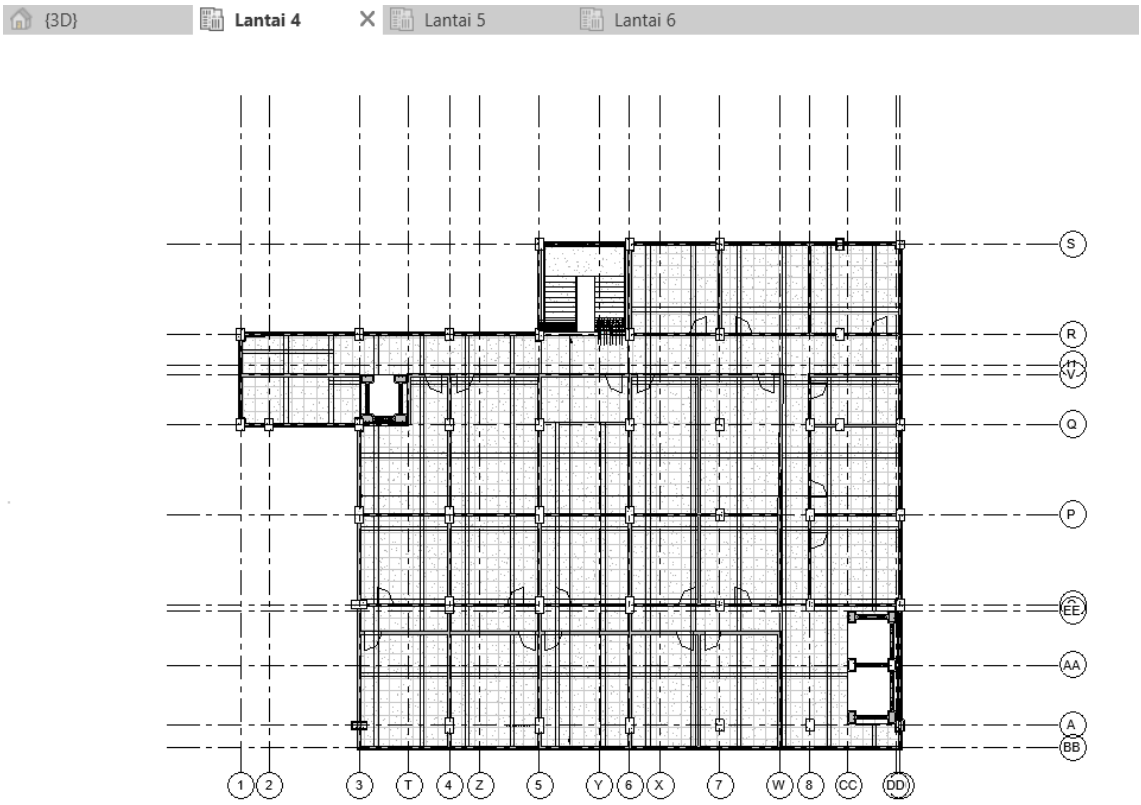
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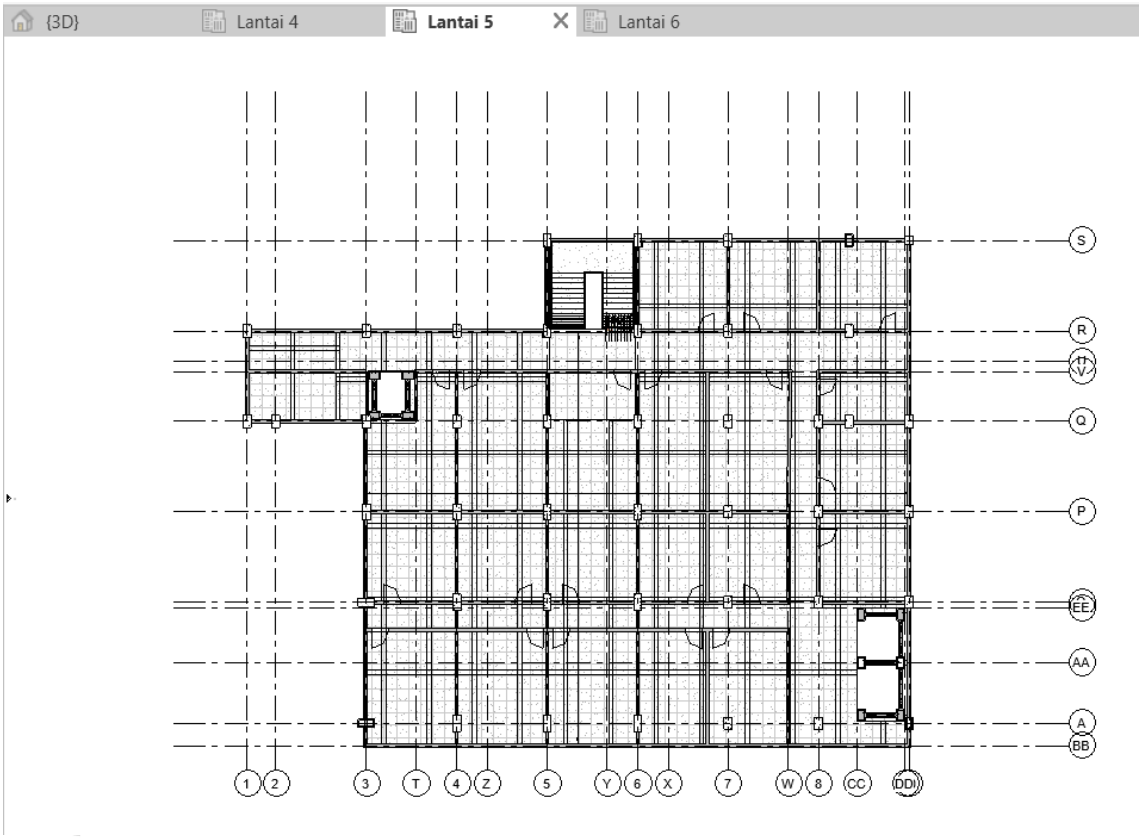
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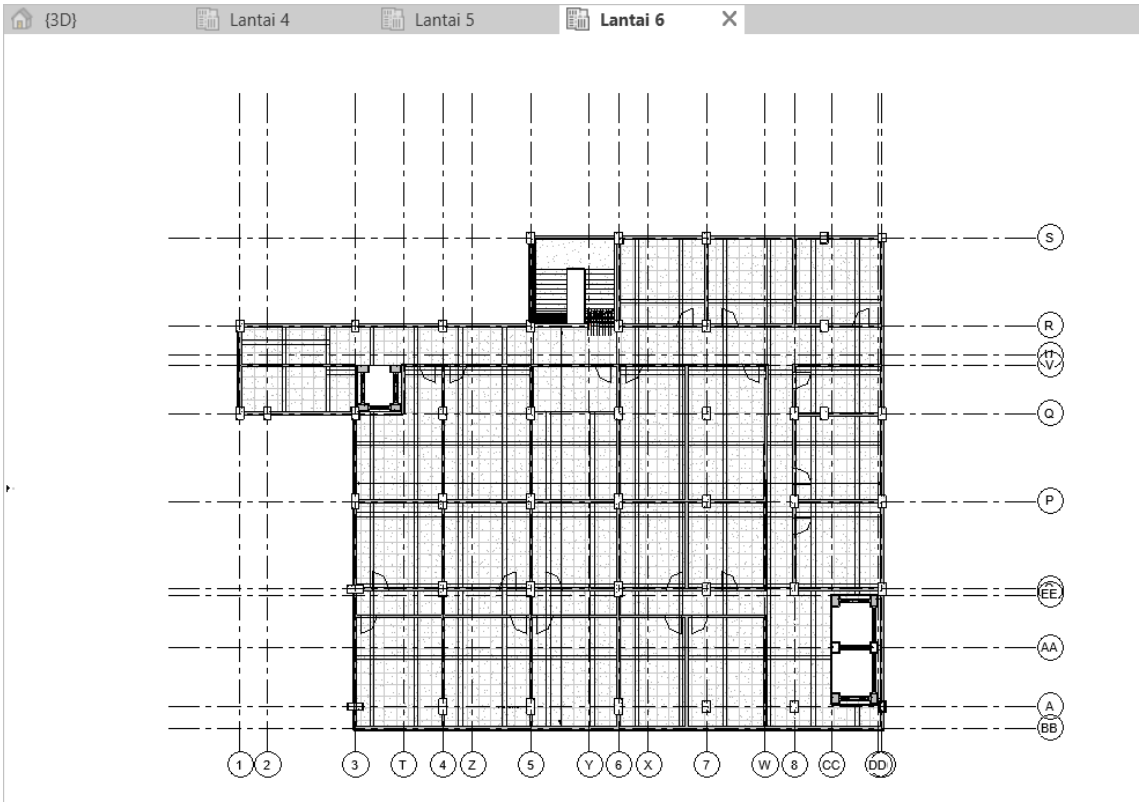
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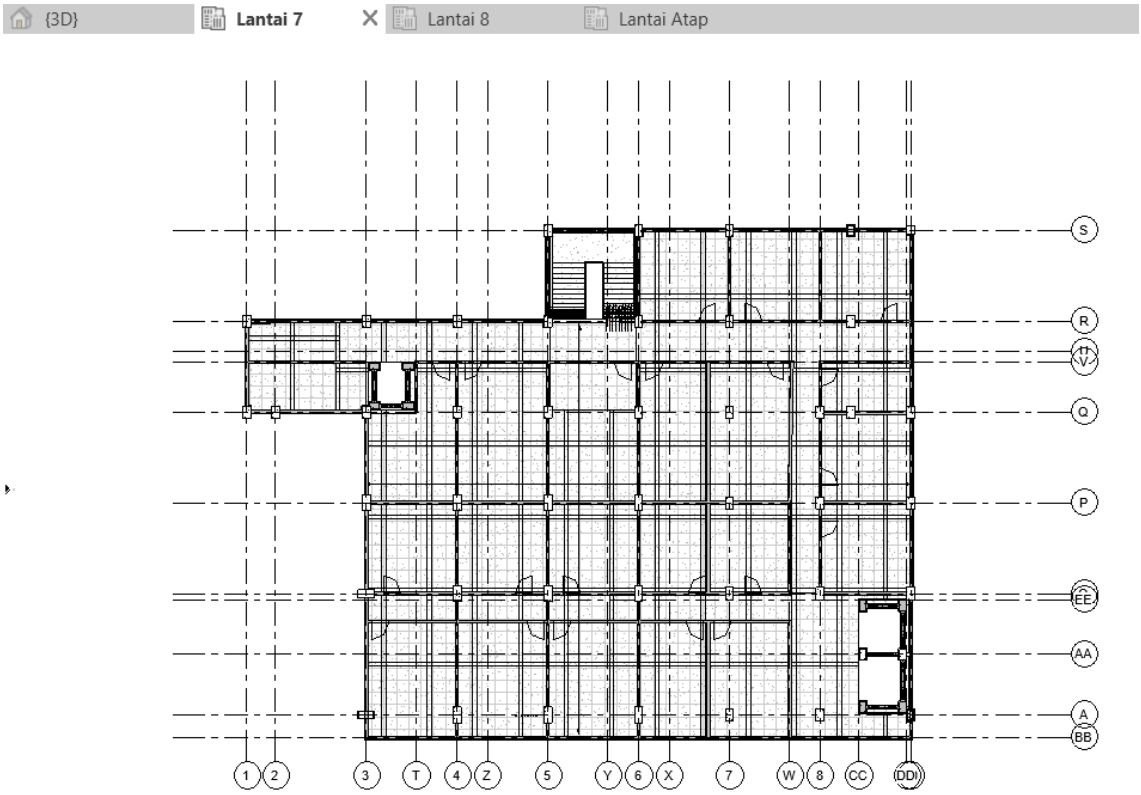
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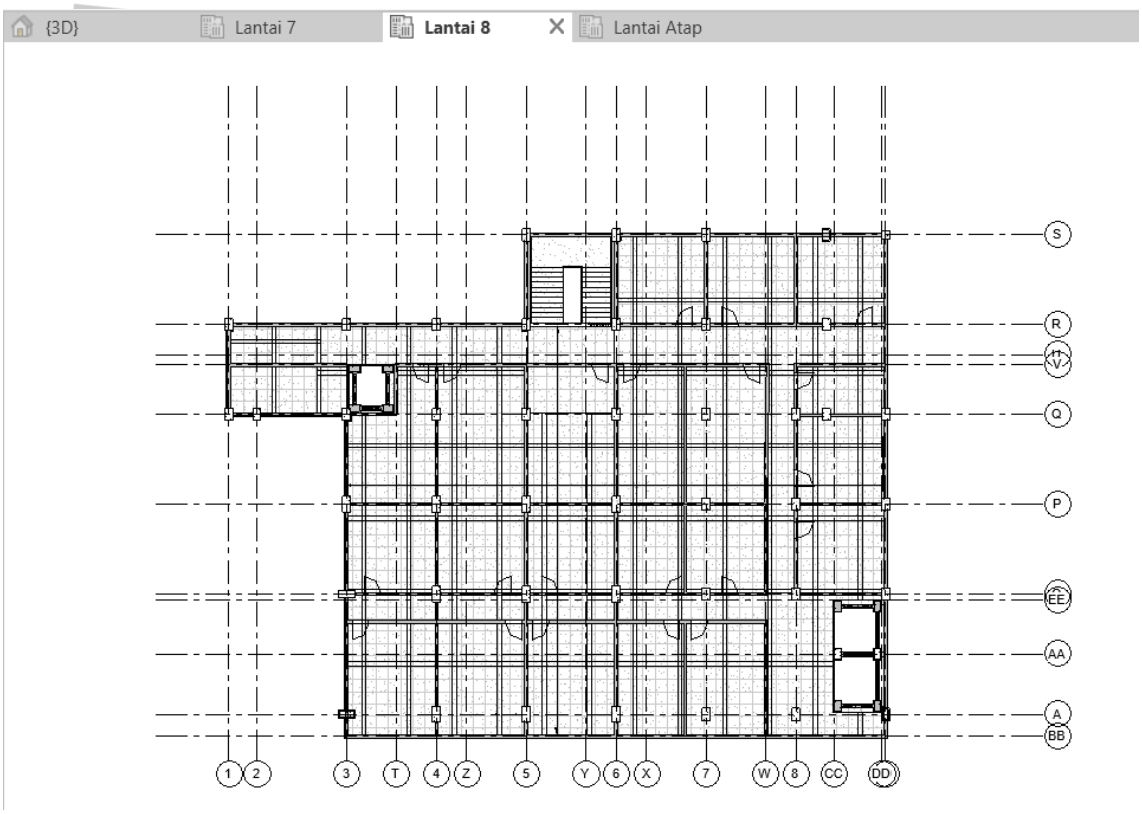
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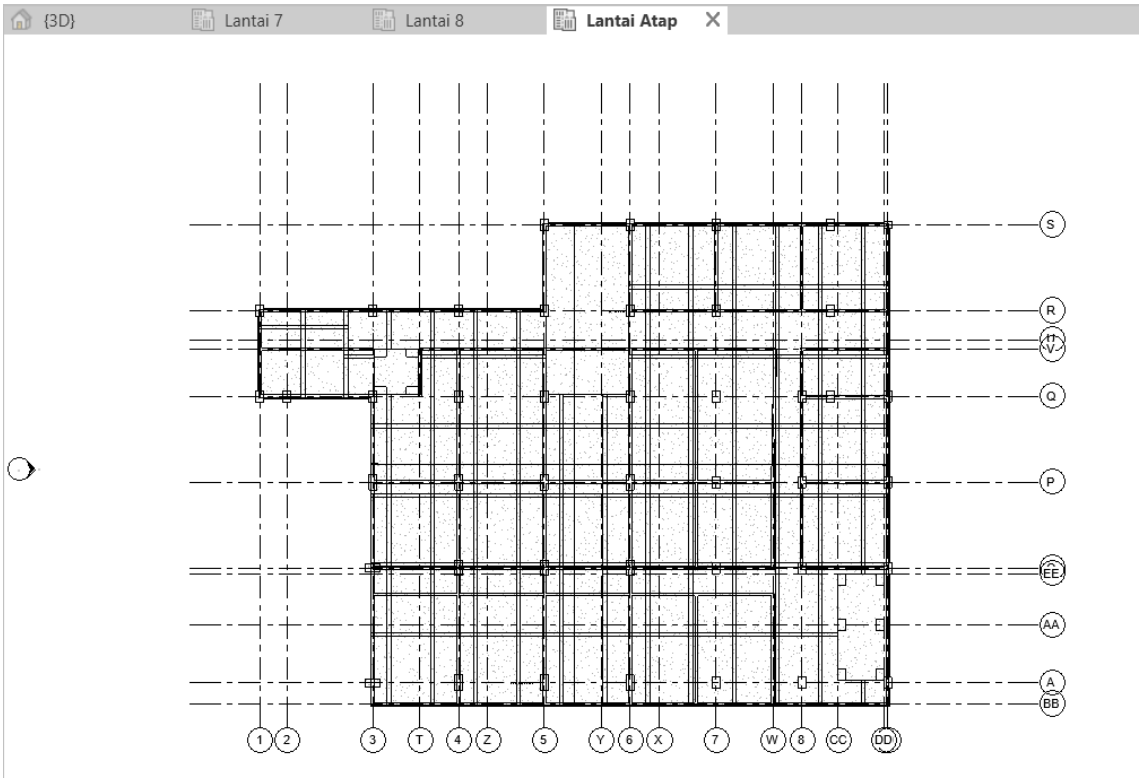
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Lantai 8
Lantai Atap
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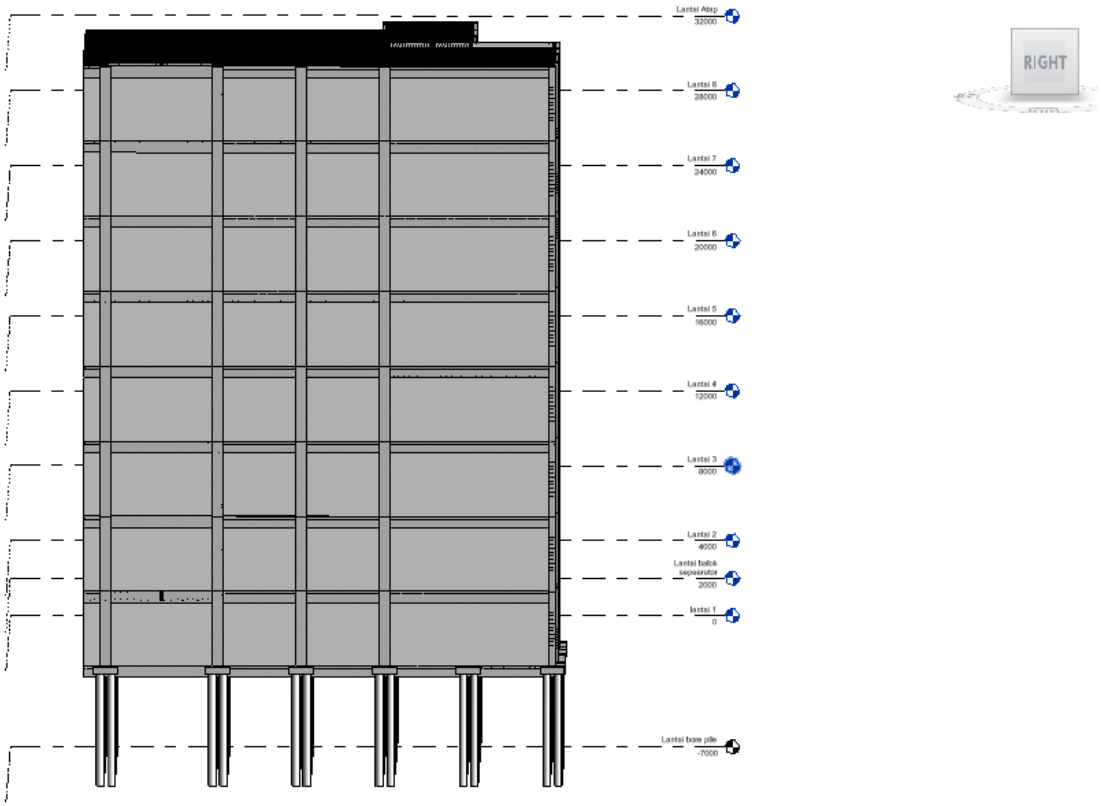
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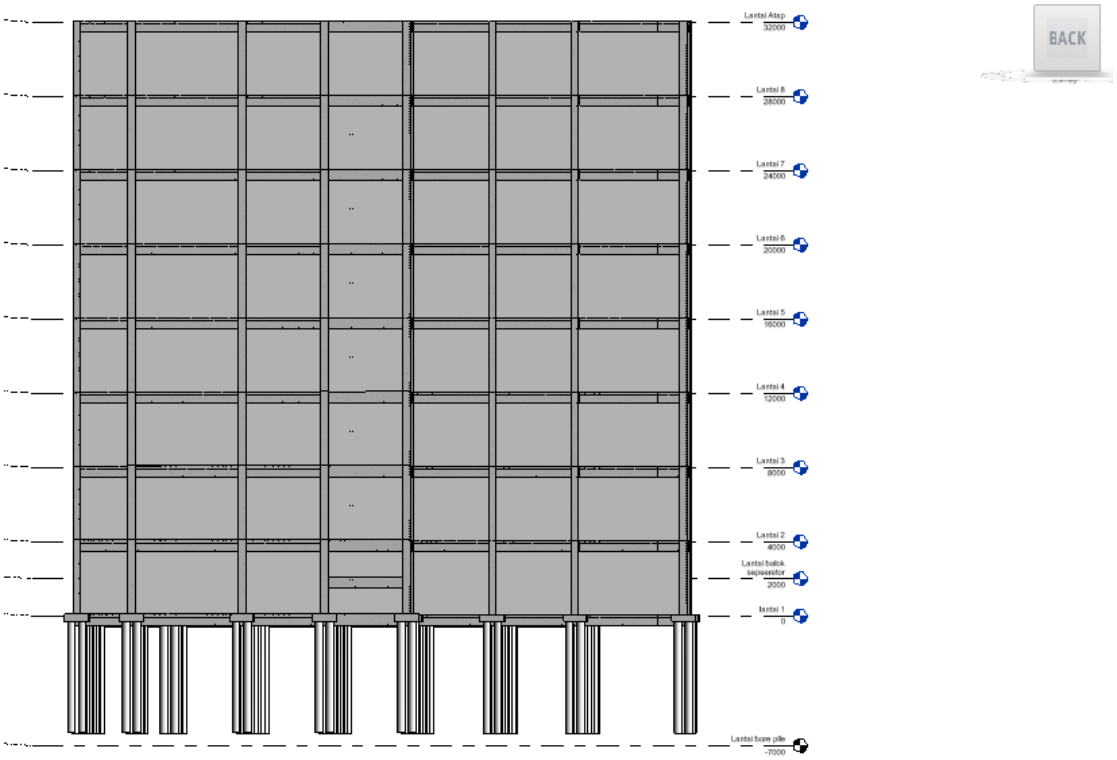
Lantai 8
28000
Lantai 7
24000
Lantai 6
20000
Lantai 5
16000
Lantai 4
12000
Lantai 3
8000
Lantai 2
4000
Lantai balok
separator
2000
lantai 1
0
Lantai bore pile
-7000
RIGHT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16000
Lantai 4
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Lantai 2
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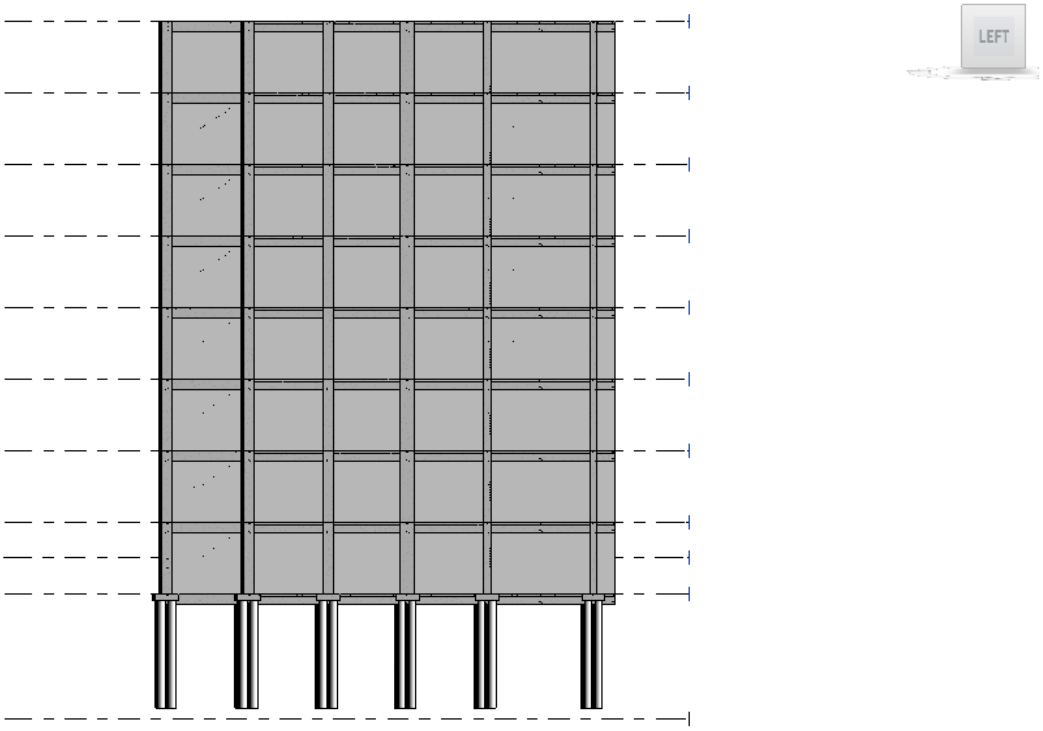
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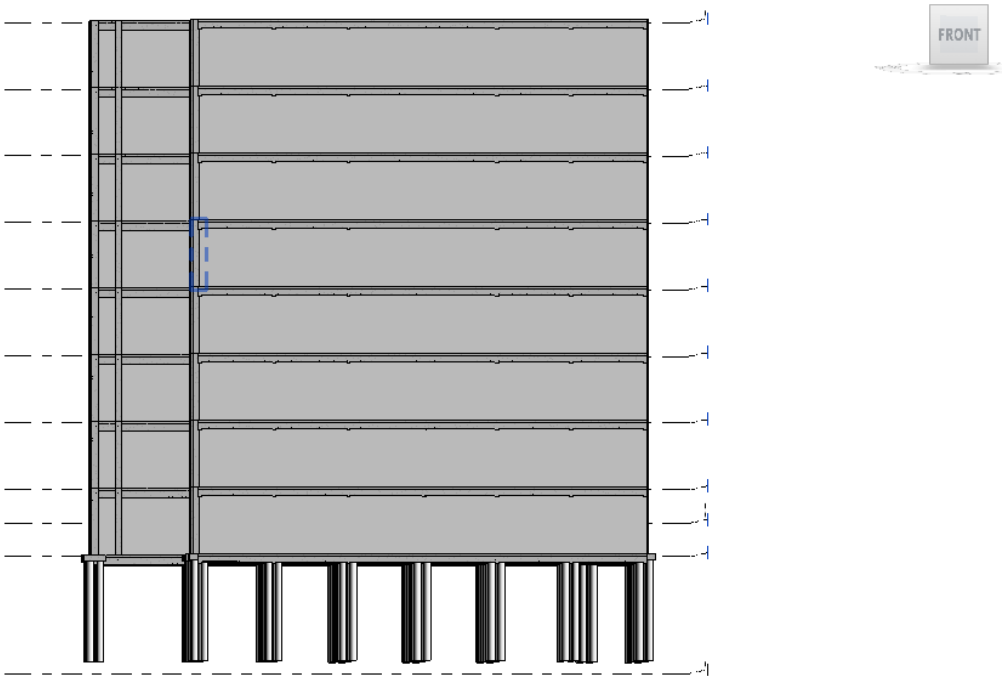
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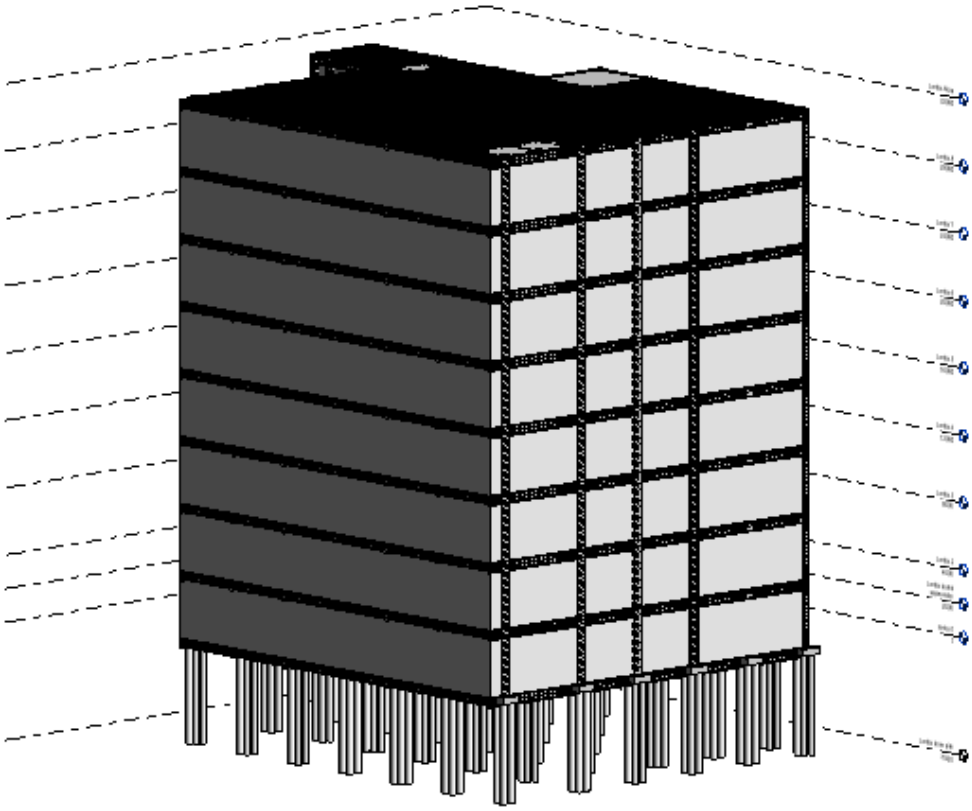

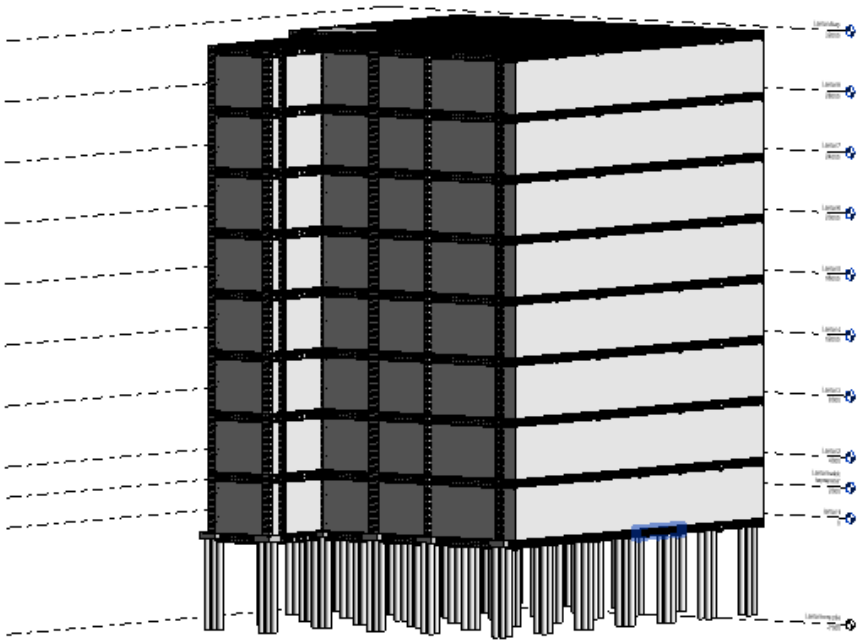

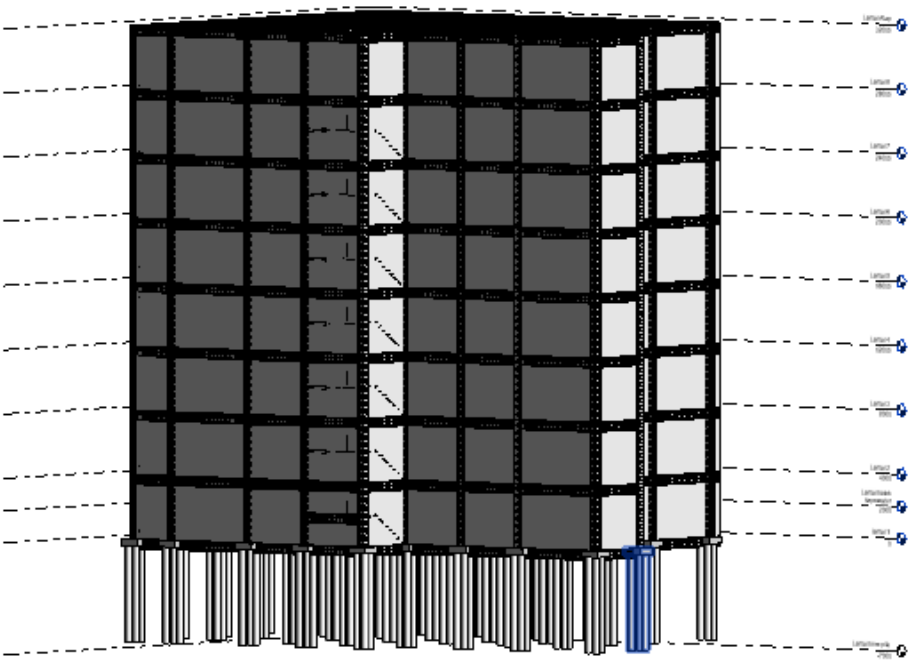

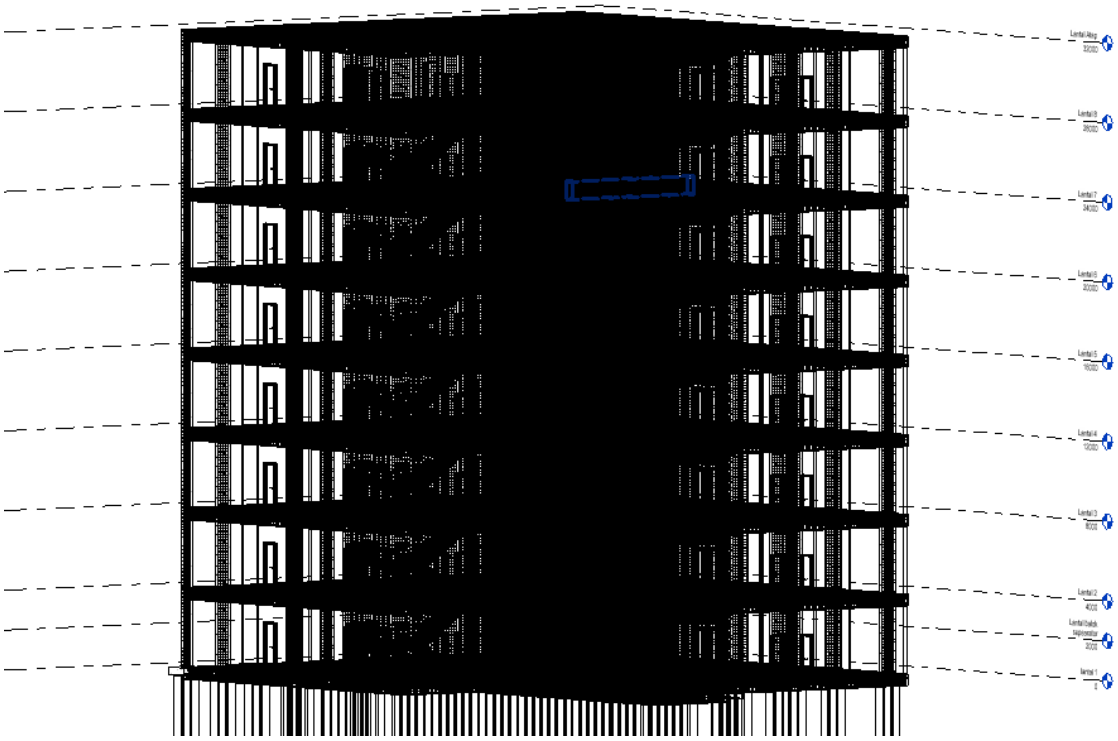

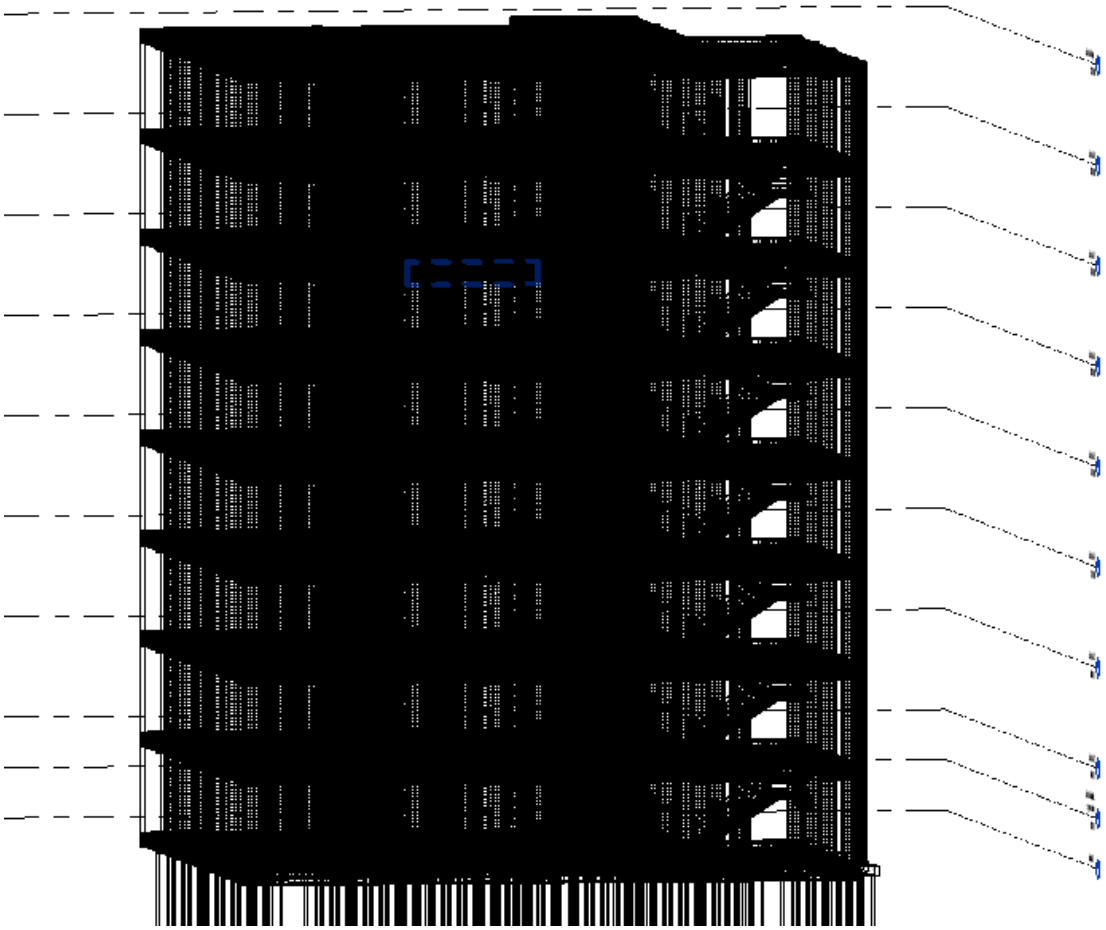

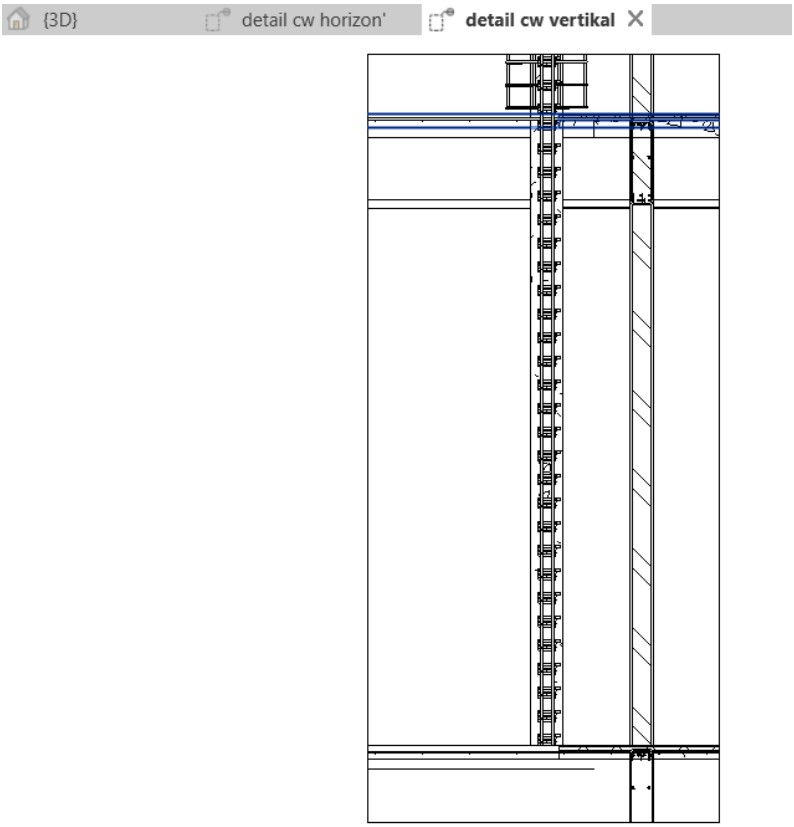
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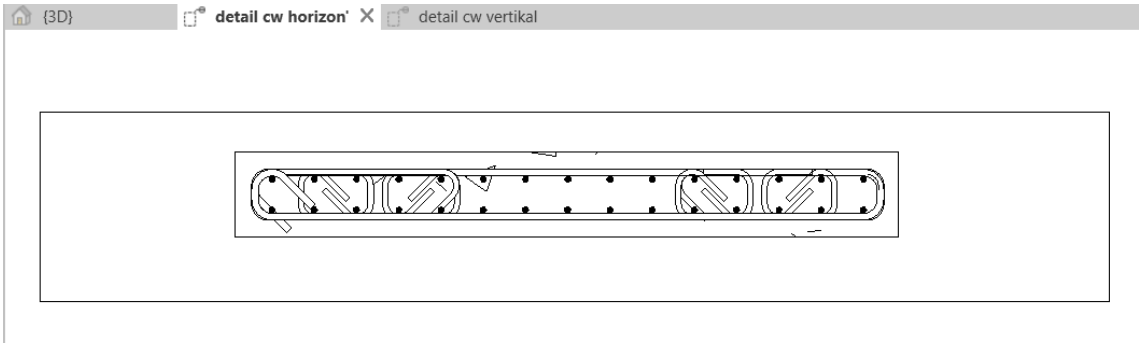
detail cw vertikal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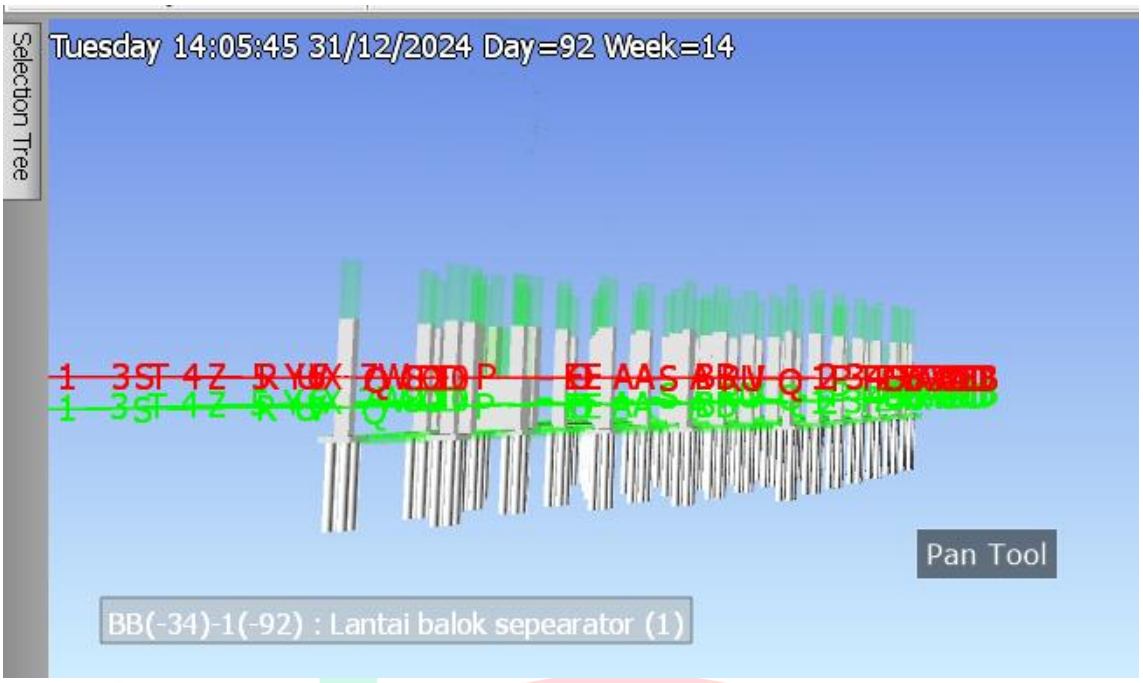
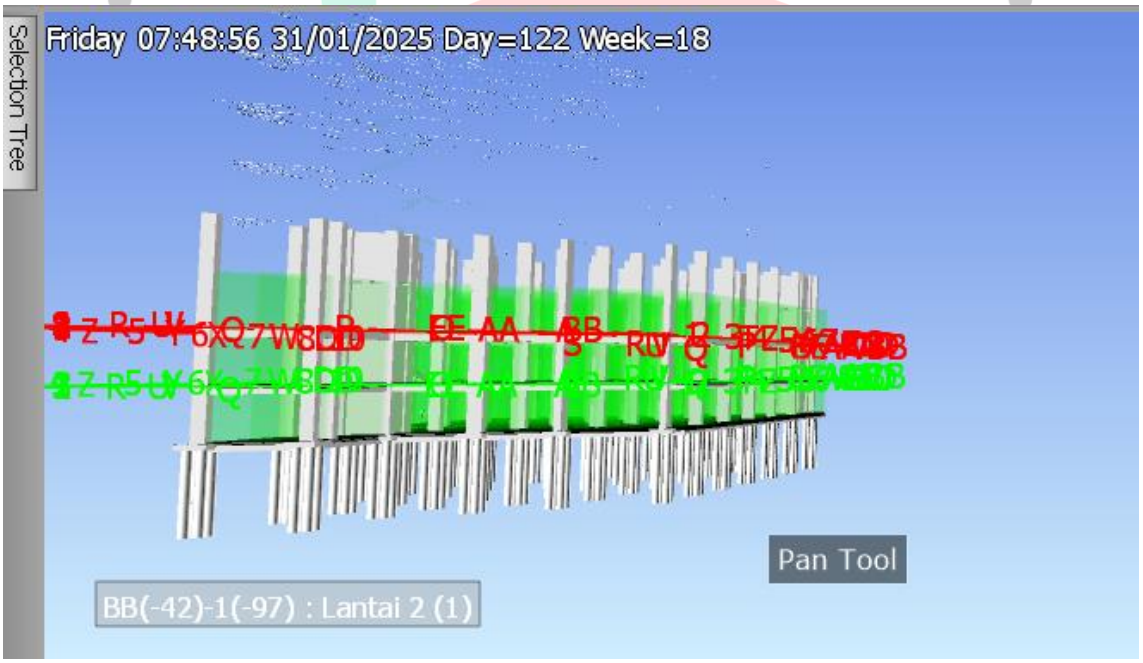
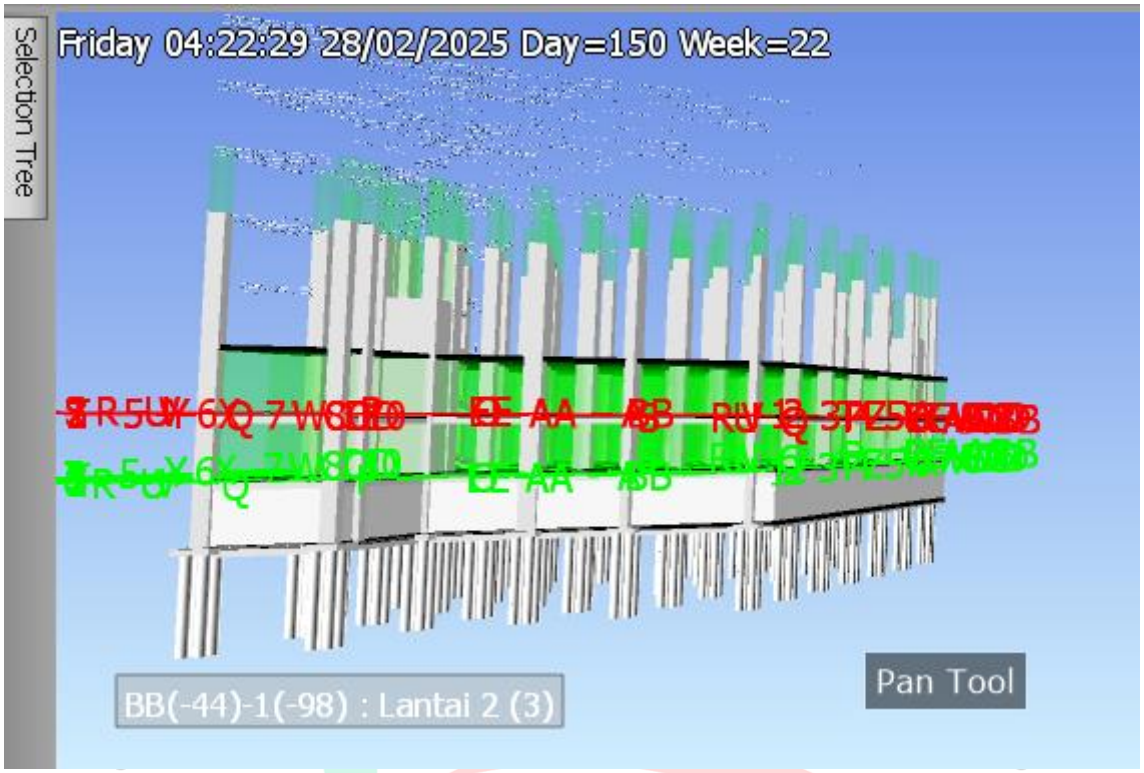
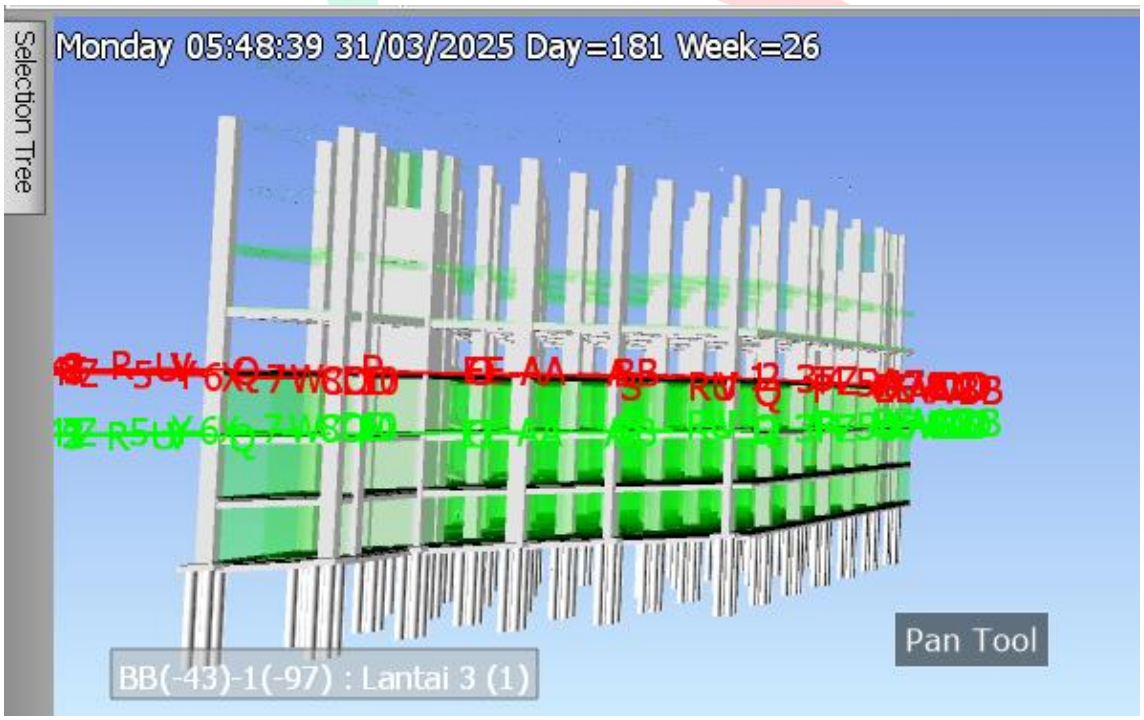
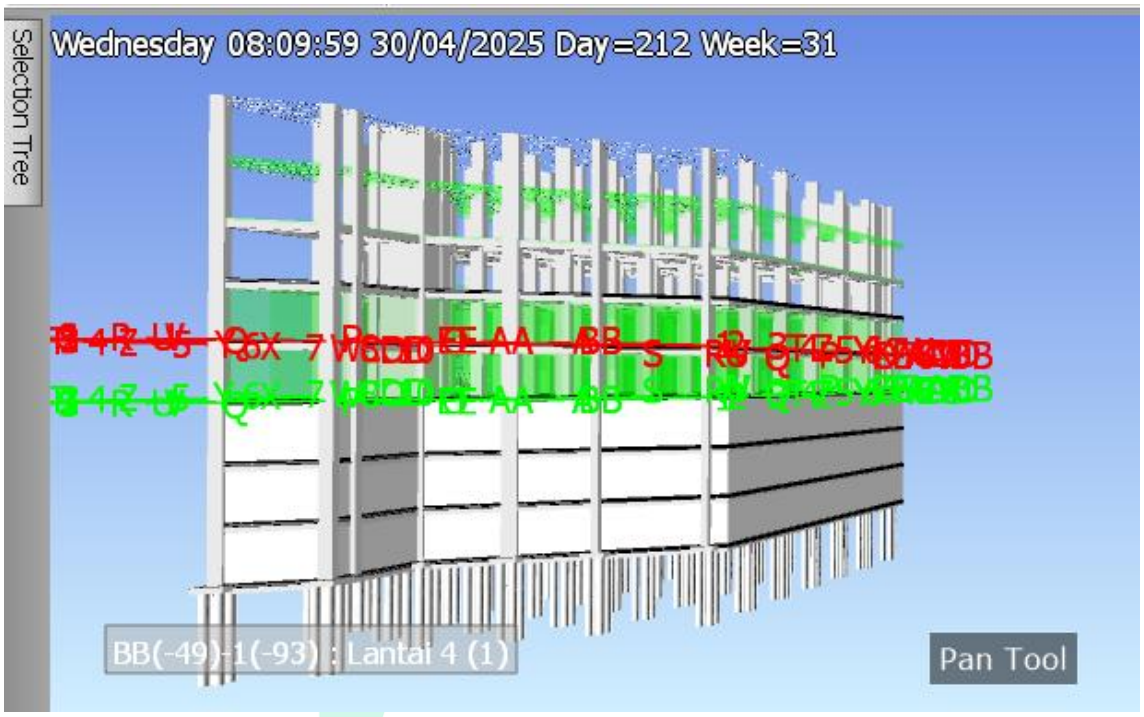
Lampiran 10 4D *Scheduling simulation* Penjadwalan Normal pada Navisworks

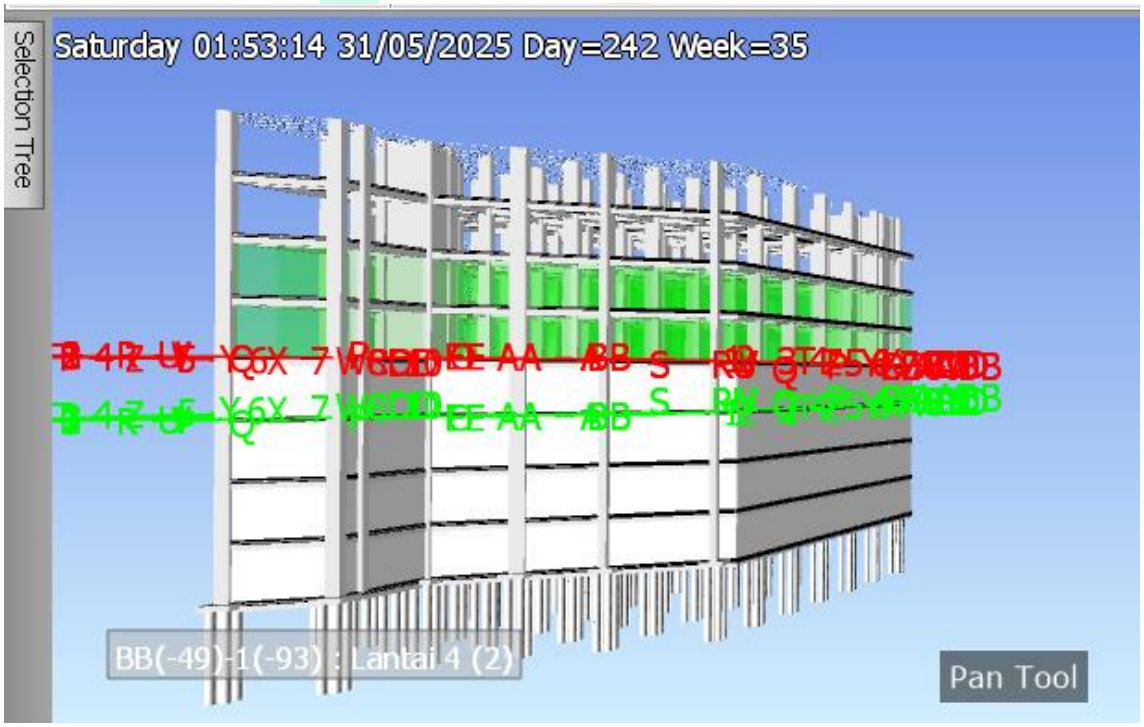


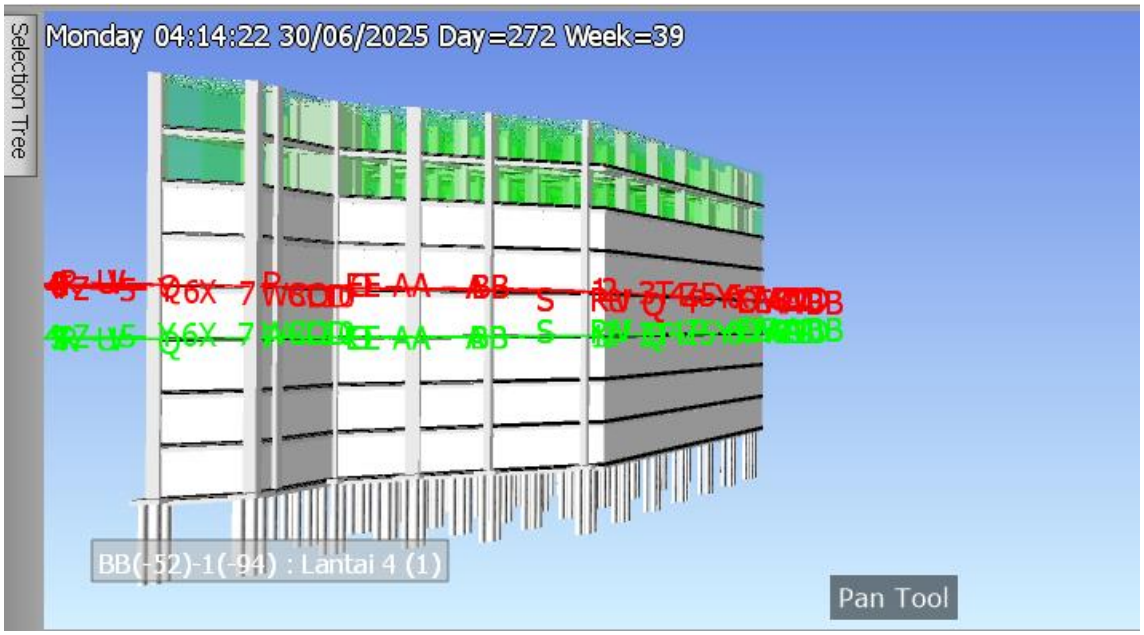



Selection Tree
Friday 04:22:29 28/02/2025 Day=150 Week=22
BB(-44)-1(-98) : Lantai 2 (3)
Pan Tool

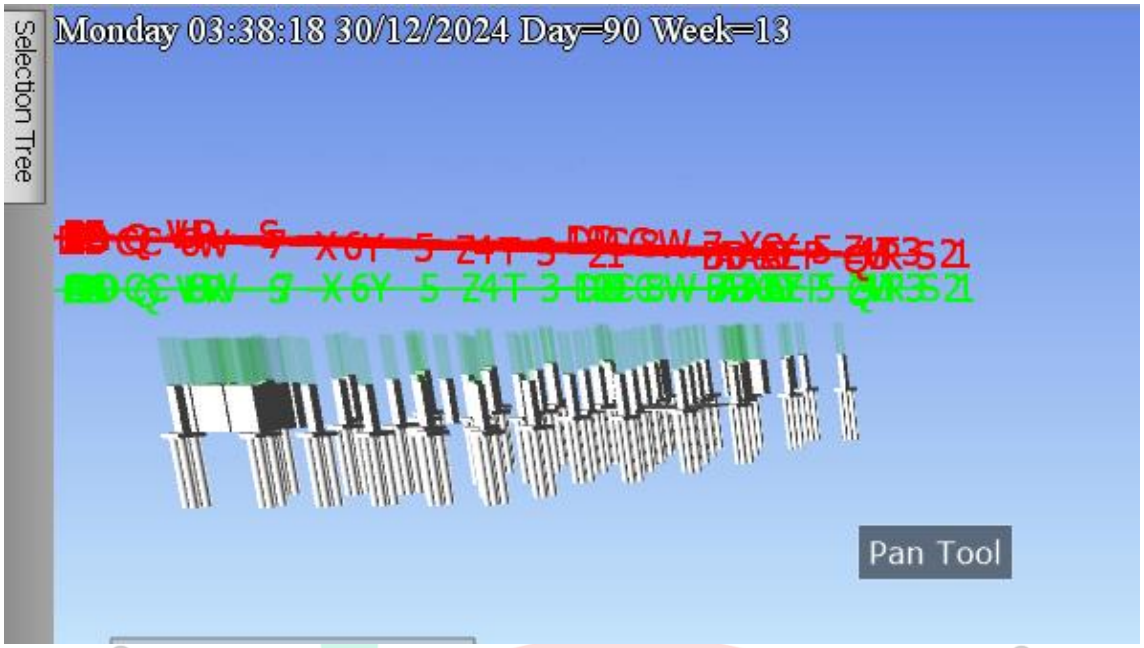

Selection Tree
Monday 05:48:39 31/03/2025 Day=181 Week=26
BB(-43)-1(-97) : Lantai 3 (1)
Pan Tool

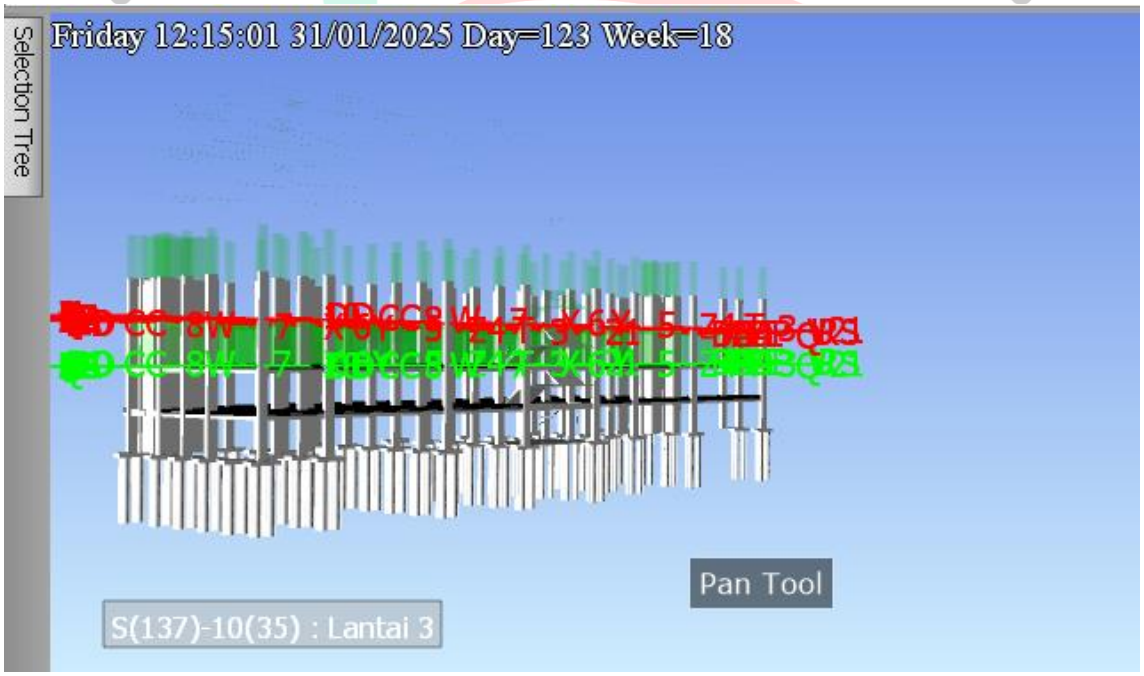

Selection Tree
Wednesday 08:09:59 30/04/2025 Day=212 Week=31
BB(-49)-1(-93) : Lantai 4 (1)
Pan Tool

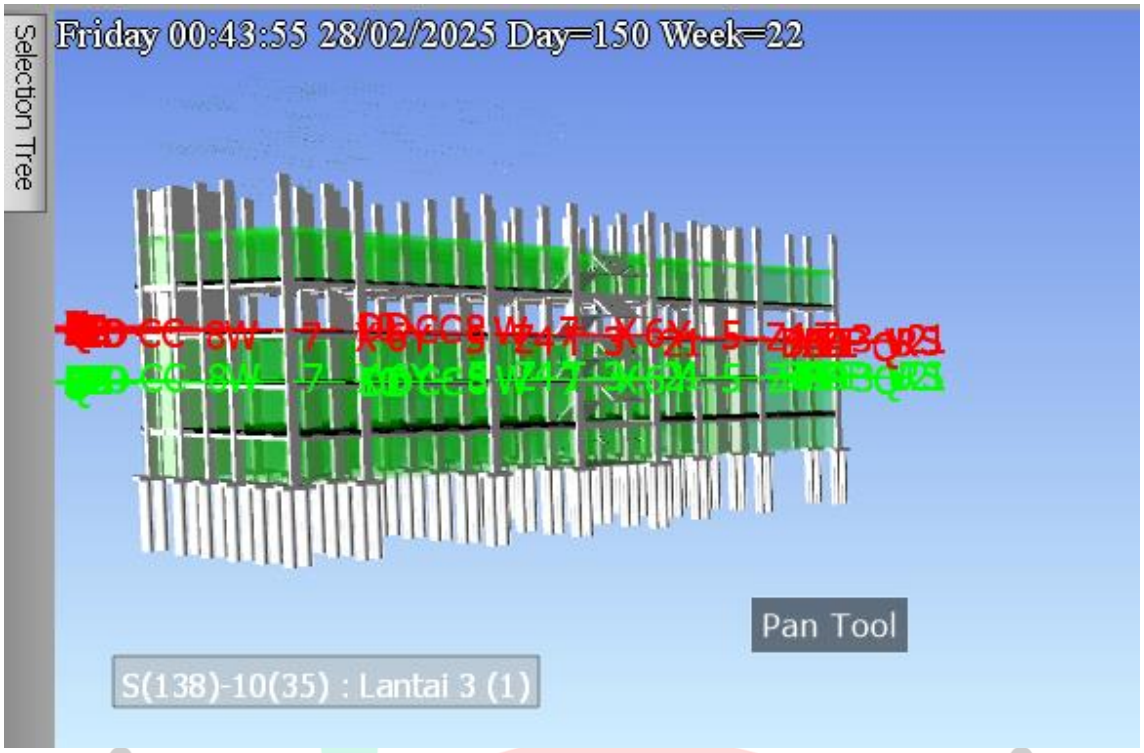

Selection Tree
Saturday 01:53:14 31/05/2025 Day=242 Week=35
BB(-49)-1(-93) : Lantai 4 (2)
Pan Tool

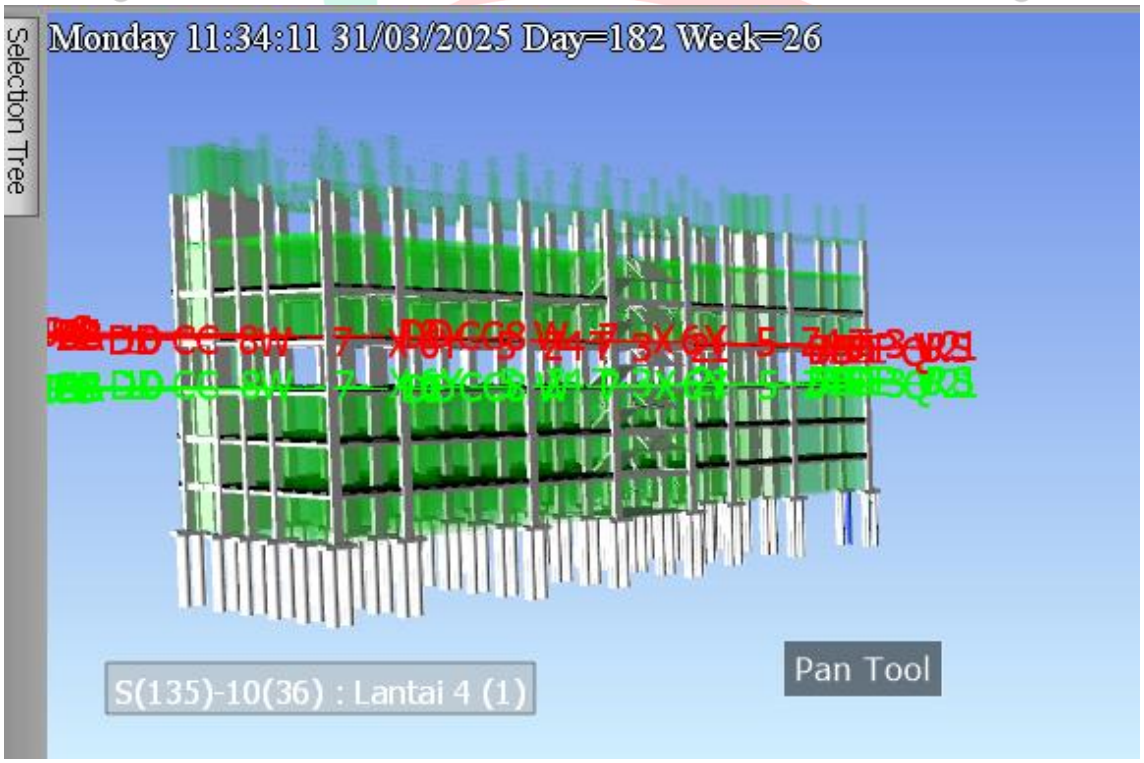

Selection Tree
Monday 04:14:22 30/06/2025 Day=272 Week=39
BB(-52)-1(-94) : Lantai 4 (1)
Pan Tool

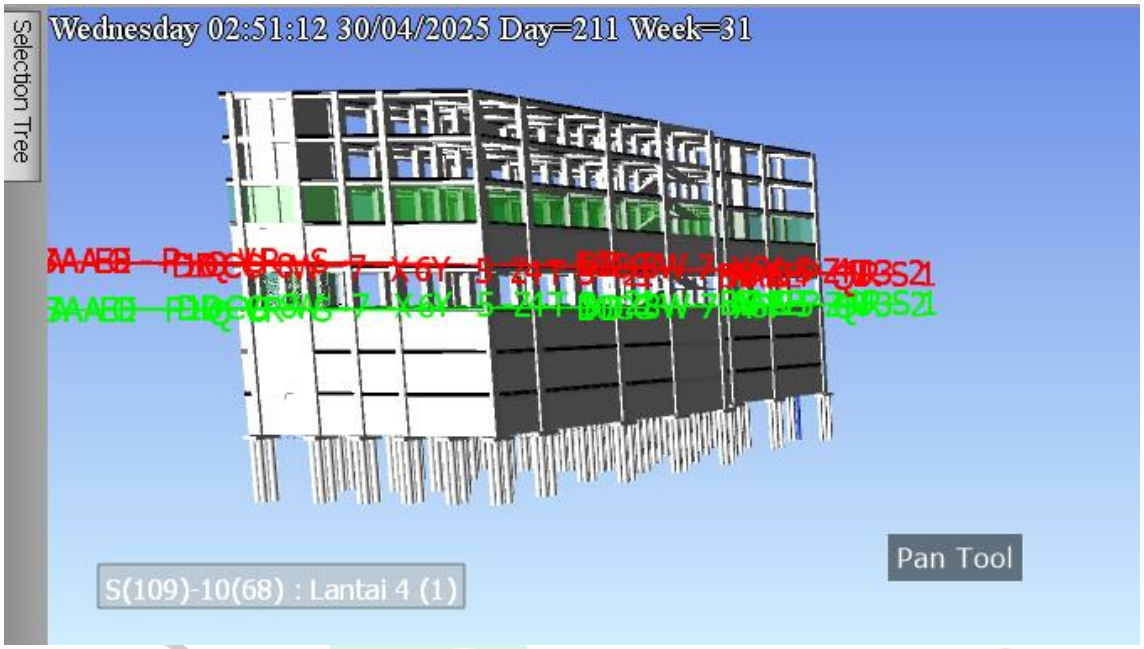
Lampiran 11 4D *Scheduling simulation* Penjadwalan setelah Penerapan Metode *Fast track* pada Navisworks

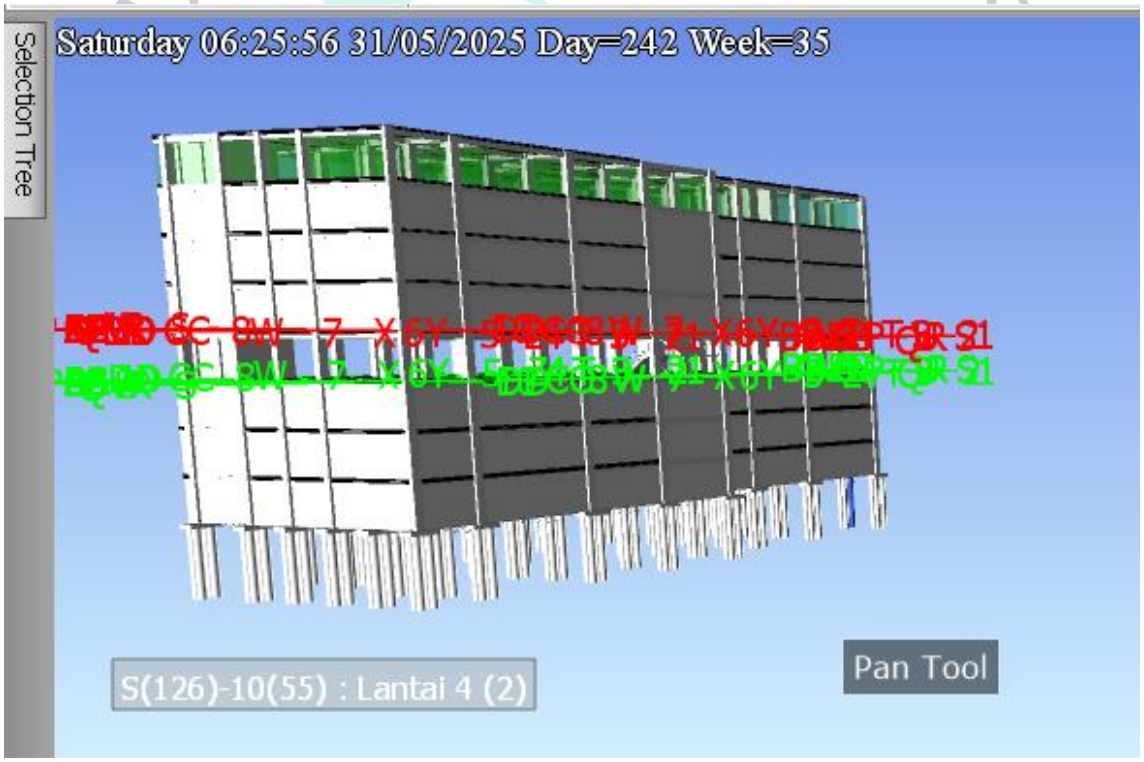


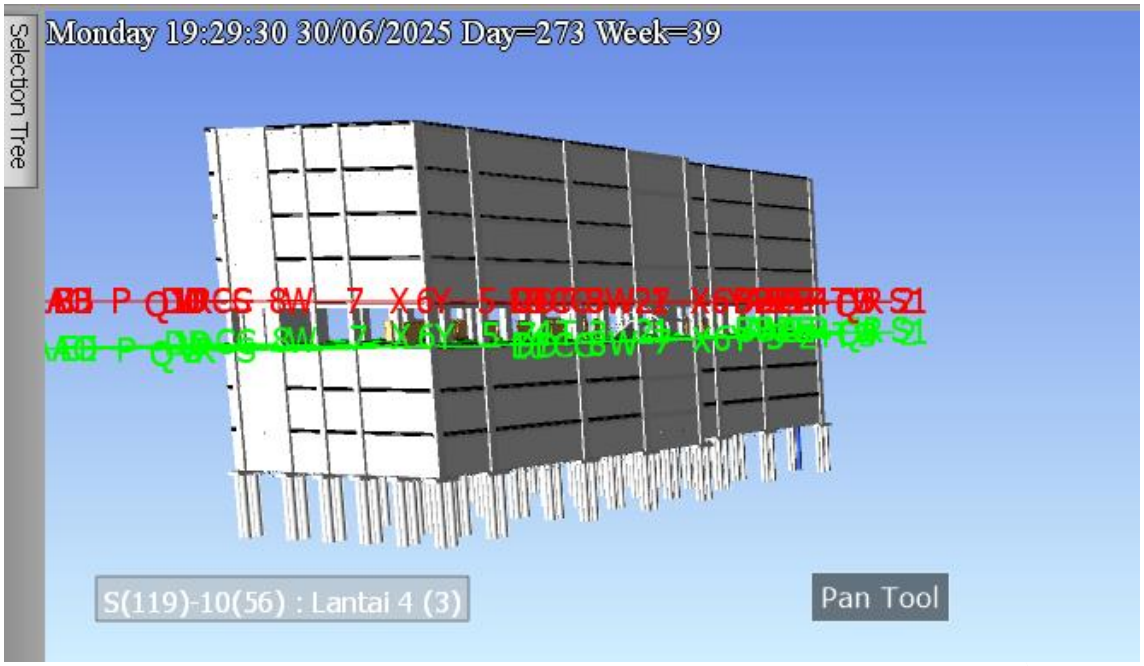



Selection Tree
Friday 00:43:55 28/02/2025 Day=150 Week=22
Pan Tool
S(138)-10(35) : Lantai 3 (1)

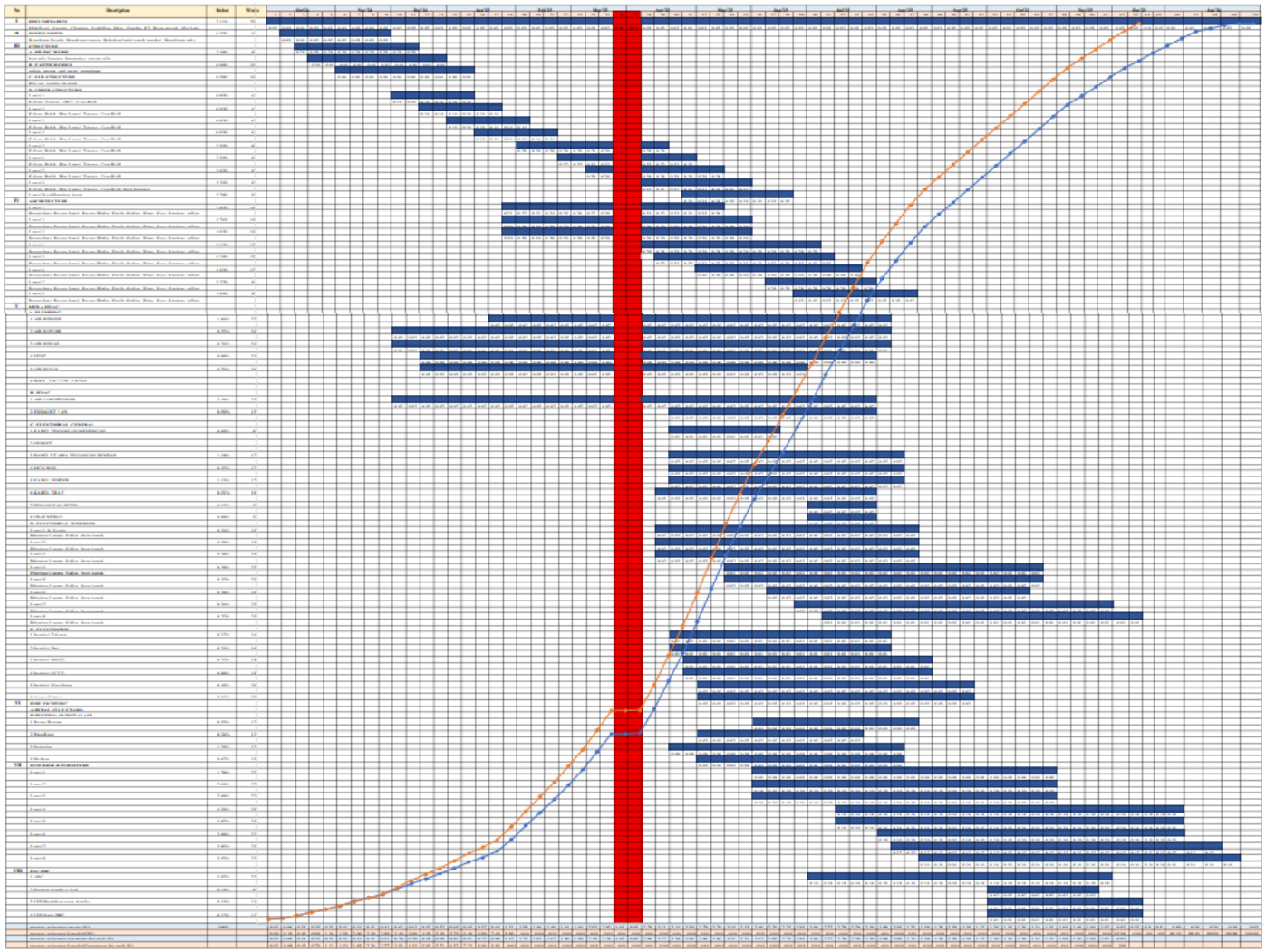

Selection Tree
Monday 11:34:11 31/03/2025 Day=182 Week=26
Pan Tool
S(135)-10(36) : Lantai 4 (1)


Selection Tree
Wednesday 02:51:12 30/04/2025 Day=211 Week=31
Pan Tool
S(109)-10(68) : Lantai 4 (1)


Selection Tree
Saturday 06:25:56 31/05/2025 Day=242 Week=35
Pan Tool
S(126)-10(55) : Lantai 4 (2)


Selection Tree
Monday 19:29:30 30/06/2025 Day=273 Week=39
S(119)-10(56) : Lantai 4 (3)
Pan Tool

Lampiran 12 Kurva S Perbandingan Sebelum dan Sesudah Penerapan *Fast Track*



Lampiran 13 Validasi Kesesuain Pengolahan Data dan Hasil Kepada Pihak Proyek

SURAT PERNYATAAN VALIDASI HASIL SKRIPSI

Yang bertanda tangan di bawah ini:

Nama : Luthfi Destio Ma'ruf

Program Studi : Teknik Sipil

Judul Skripsi : Analisis Pengimplementasian Building Information Modeling (BIM) 4D Terhadap Percepatann Penjadwalan Menggunakan Metode Fast Track (Studi Kasus: Proyek Pembangunan Hotel Royal Executive)

Dengan surat pernyataan ini, saya selaku peneliti ingin meminta bantuan kepada pihak PT. Asraya Morden Persada untuk menjawab beberapa pertanyaan sebagai berikut:

No.	Pertanyaan	Iya	Tidak
1	Apakah data proyek yang digunakan pada penelitian ini sesuai dengan data proyek yang diberikan oleh pihak PT. Asraya Morden Persada?	✓	
2	Apakah penggunaan metode pada penelitian ini belum digunakan sebelumnya oleh pihak proyek?	✓	
3	Apakah hasil yang ditampilkan pada penelitian ini, benar-benar menggunakan data yang diberikan pihak PT. Asraya Morden Persada?	✓	
4	Apakah hasil penelitian ini realistis dalam pelaksanaan proyek tersebut?	✓	
5	Apakah hasil penelitian ini dapat digunakan ataupun dijadikan referensi untuk penggunaan metode tersebut pada suatu proyek?	✓	

Berdasarkan hasil jawaban di atas, mohon bantuan kepada pihak proyek untuk menandatangani hasil surat pernyataan validasi skripsi sebagai bukti bahwa penggunaan dan pengolahan pada penelitian ini telah sesuai dan dilakukan sebaik-baiknya. Terima kasih atas bantuan pihak pihak PT. Asraya Morden Persada, berkat izin dan bantuannya, penulis dapat menyelesaikan skripsi dengan baik.

Salam Hormat,
Penulis Skripsi

(Luthfi Destio Ma'ruf)

Pihak Proyek

(Naufal Atalarik Sadil)