

BAB VI

KESIMPULAN DAN SARAN

6.1 Kesimpulan

Dari beberapa pembahasan yang dijelaskan dapat disimpulkan sebagai berikut:

1. Perhitungan total kebutuhan besi pelat lantai 1 menggunakan Metode *Bar Bending Schedule* mendapatkan hasil pada Tulangan Utama Arah X sebesar 99.759,91 kg, Tulangan Utama Arah Y sebesar 102.921,98 kg, dan Tulangan Extra Pelat sebesar 29.974,23. Sedangkan untuk hasil *waste* besi yang dihasilkan yaitu ada tulangan utama arah X sebesar 7,92 % kg, tulangan utama arah Y sebesar 1,88 %, dan Tulangan Extra Pelat sebesar 9,09 %.
2. Kebutuhan tekanan *hydraulic jack* untuk menarik 18 strand balok *prestress* B611 PC 9 sebesar 6918 psi.
3. Mix Desain untuk 50 kg semen OPC Jakarta membutuhkan 900 gram cebex100, 1500 gram conplats SP430, dan 76 liter air.
4. Syarat deviasi elongation menurut SNI 2014 yaitu $\pm 7\%$. Rencana tendon elongation balok *prestress* B611 PC 9 adalah 129,75 mm, sedangkan aktual tendon elongation adalah 127,3 mm dan deviasi yang terjadi hanya sebesar 1,92% yang artinya sesuai dengan syarat ACI 2014.
5. Hasil analisis harga satuan pekerjaan per m² yaitu untuk hebel Rp 156.900, plesteran Rp 49.330, dan acian Rp 36.375. Jumlah progres pekerjaan hebel Lantai 1 dan Lantai 1 *Mezzanine* terhadap totalnya sebesar 44% dan jumlah biaya yang dikeluarkan sebesar Rp 314.264.455 dari 726.005.035.

6.2 Saran

1. Sebaiknya untuk kebutuhan besi dihitung semua item pekerjaan dari kolom, balok, dan pelat menggunakan Metode *Bar Bending Schedule* agar dapat mengoptimalkan biaya dan jumlah *waste* besi.
2. Sebaiknya untuk penjadwalan pekerjaan hebel dihitung dari L1-L3M agar detail dan juga bobot pekerjaan dapat dianalisis dari keseluruhan L1-L3M.

DAFTAR PUSTAKA

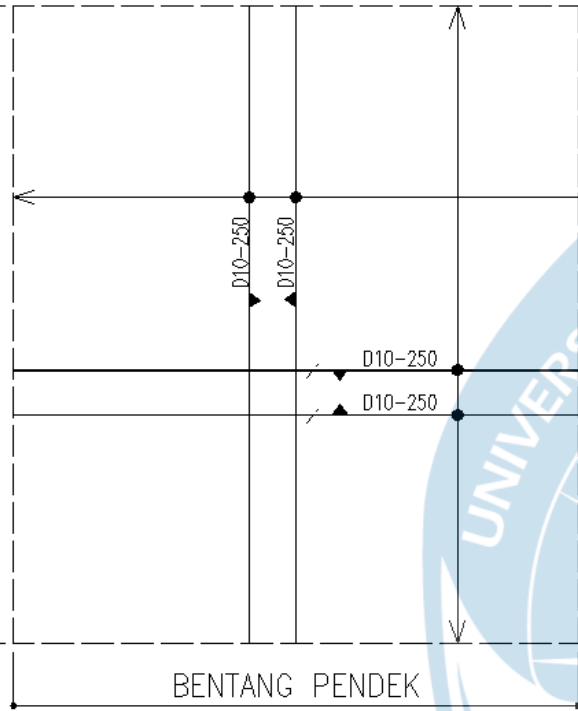
- ACI. (1999). *318-99. American Concrete Institute.*
- ACI. (2000). *Cement and Concrete Terminology (ACI 116R-00). American Concrete Institute.*
- ACI. (2014). *Notation and Terminology (318-14). American Concrete Institute.*
- Franklin, A. (1998). *Characterization of Building Related Construction and Demolition Debris in the United States.* USA: US Environmental Protection Agency.
- Gould, F. E. (1997). *Managing the Construction Process.* Upper Saddle River, New Jersey: Frederick Pearson Education, Inc.
- Nawy, E. W. (2001). *Beton Prategang: Suatu pendekatan mendasar (Ed.3.).* Jakarta: Erlangga.
- PUPR. (2022). *Menteri Pekerjaan Umum dan Perumahan Rakyat Republik Indonesia Analisis Harga Satuan SNI 2022.*
- SNI. (2002). *SNI 03-6808-2002 Metode Pengujian Kekentalan Graut untuk Beton Agregat Praletak (Metode Pengujian Corong Alir).*
- Soeharto. (1999).
- Widjaja, K. R. (2008). *Penanganan Kontraktor terhadap Direct Waste Material pada Proyek Konstruksi di Surabaya.* Skripsi, Universitas Kristen Petra Surabaya. *E-JURNAL MATRIKS TEKNIK SIPIL*, 290-295.



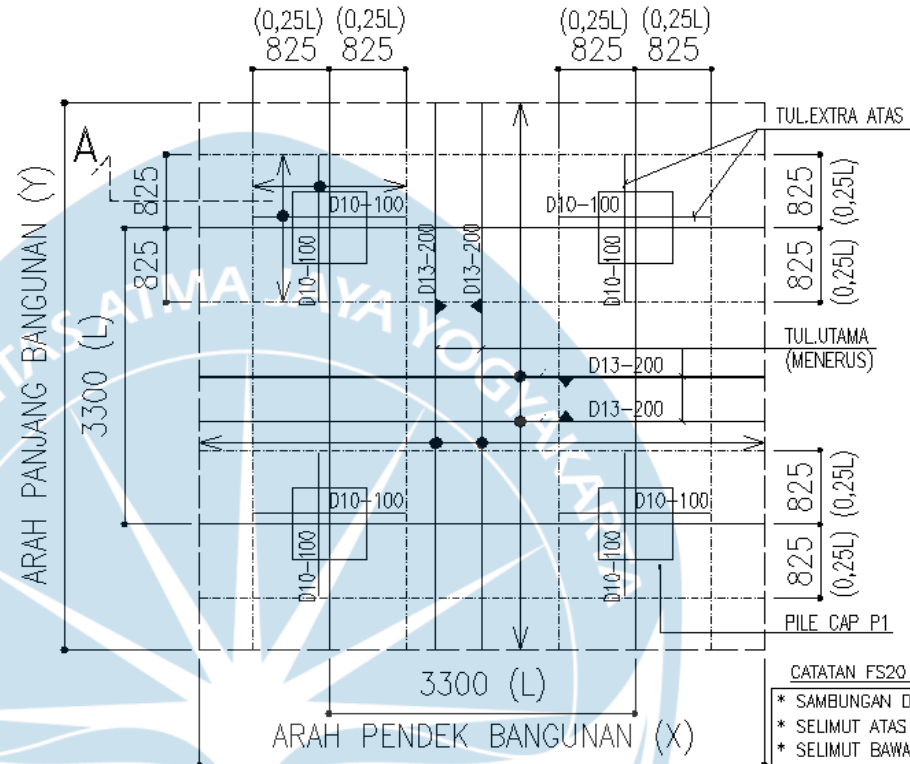
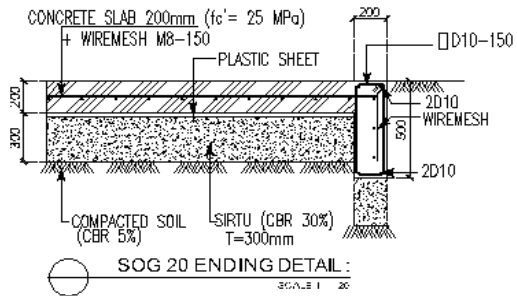
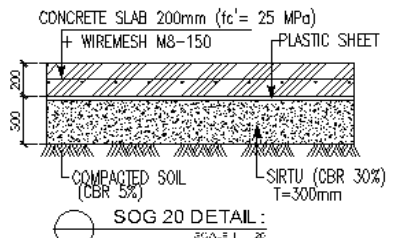
LAMPIRAN

Lampiran 1. Detail Penulangan Pelat Lantai 1

BENTANG PANJANG

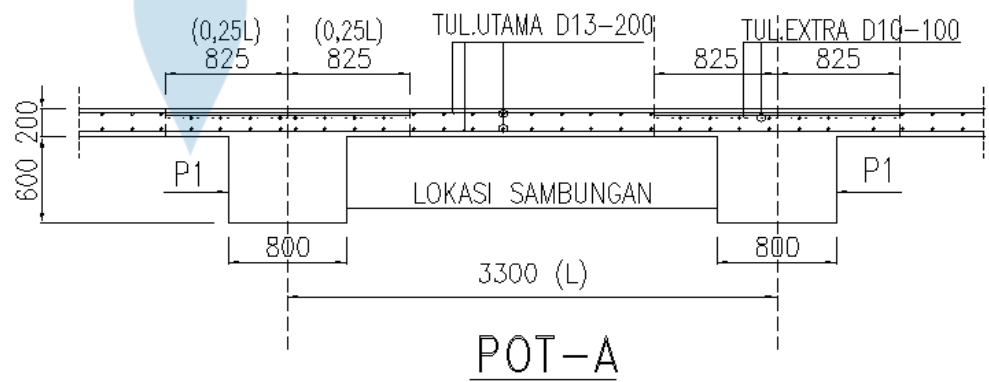


* SLAB FS15 (T=150mm)
LL = 5 kN/m² (OFFICE)



* FS20 (T=200mm)
LL= 30 kN/m² (WAREHOUSE LT.1)

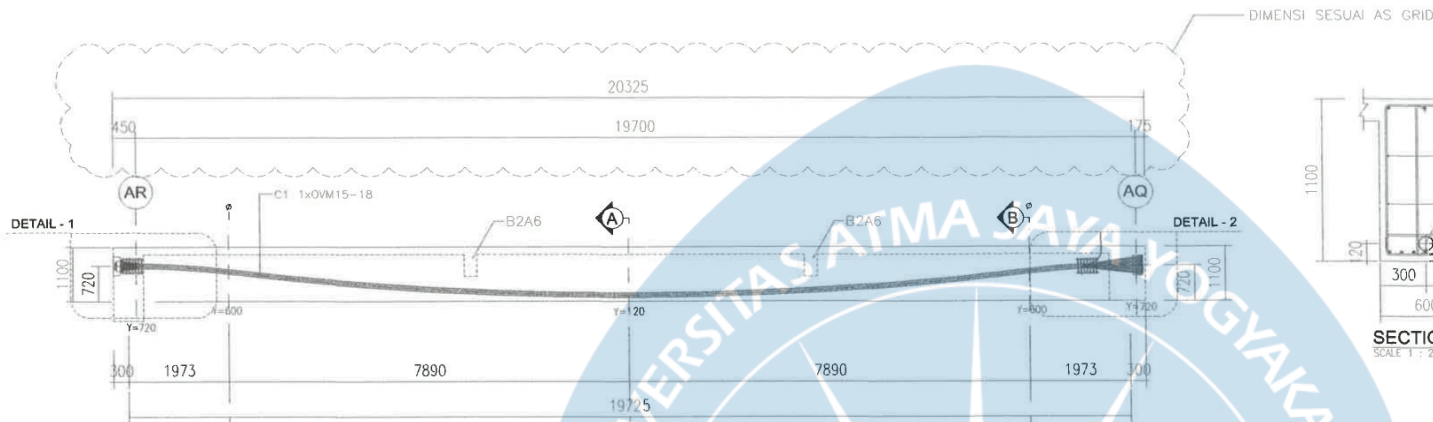
CATATAN FS20
* SAMBUNGAN DI BUAT ZIG -ZAG
* SELIMUT ATAS 25mm
* SELIMUT BAWAH 40mm



LOGOS		
Development of LOGOS Metrolink Logistic Hub - Warehouse 4 (Main Building)		
LOGOS		
PT. SARANA PRATAMA CONSULTANTS		
PT. PARTNERSHIP		
TEAMWORK		
TATA		
DETAIL PENULANGAN PLAT LANTAI 1 (1)		
Disusun Oleh:	Disetujui Oleh:	Disetujui Oleh:
SKRIPSI	E. R. N. J. S. T.	SKRIPSI
3/4	3/4	NTS
S.BBS.PLT.03		R.C
SHOP DRAWING BBS		
CAP. 3/4		

The logo of Universitas Atma Jaya Yogyakarta is a light blue watermark in the background. It features a stylized sunburst or fan shape with multiple rays emanating from a central point. The text "UNIVERSITAS ATMA JAYA YOGYAKARTA" is written in a semi-circle above the sunburst. Below the sunburst is a stylized, symmetrical shape resembling a book or a pair of wings.

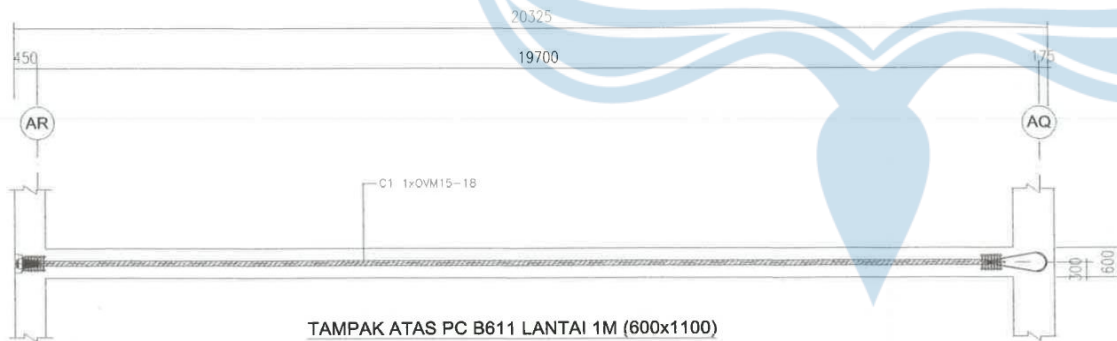
Lampiran 2. Detail Balok Prestress B611



KABEL PROFIL PC B611 LANTAI 1M (600x1100)
SCALE 1 : 75

Jarak Support Bar	643	643	986	945	945	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	945	945	986	643	743	
TENDON	Y1	720	716	690	600	492	397	312	243	189	151	128	120	178	151	189	243	312	397	492	600	690	716	720
1xOVM15-18	Y2	670	666	640	550	442	347	262	193	139	101	78	70	78	101	139	193	262	347	442	550	640	666	670
	Y3	430	434	460	550	658	753	838	907	999	1022	1030	1022	999	961	999	1022	1030	1022	999	961	907	838	753
	Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Note : Penentuan kabel profil berdasarkan design balok prestress



TAMPAK ATAS PC B611 LANTAI 1M (600x1100)
SCALE 1 : 75

- NOTE :
- Strand DIA. 15.24mm SNI 1154:2011, KBJP-P7RB Grade 270, Low Relaxation
 - Mulu beton : $f'c = 32$ MPa
 - Jacking Force : 75% UTS
 - Y1 = Tinggi dari titik berat Duct ke sisi bawah balok
 - Y2 = Tinggi dari titik bawah Duct ke sisi bawah balok
 - Y3 = Tinggi dari titik bawah Duct ke sisi atas balok.
 - ϕ Ducting
 - 100 mm (isi strand 13 s/d 19)
 - 90 mm (isi strand 8 s/d 12)
 - 80 mm (isi strand 5 s/d 7)
 - Semua ukuran dalam milimeter (mm)
 - 2 x OVM15-XX
 - ↑ Jumlah Strand per Tendon
 - ↑ Tipe Angkur Untuk Strand $\phi 15.24$ mm
 - ↑ Jumlah Tendon

PT TeamworkX Indonesia

THIS DOCUMENT HAS BEEN REVIEWED

Fauzi Y
29/10/22

PROCEED with Comment

PROCEED with Comments

DO NOT PROCEED to be Revised

THIS REVIEW DOES NOT RELIEVE THE CONSULTANT OF HIS RESPONSIBILITIES

NO	REVISION	DATE



Legend

Project Name :
Nama Proyek :
Development of LOGOS Metrolink Logistic Hub - Warehouse 4 (Main Building)

Owner :
Pembuat Tugas :
LOGOS PT. LOGOS INDONESIA BEHANI ONE Level 25, Revenue Tower SCBD Jl. Jend. Sudirman No. 52-53 Jakarta 10000, Indonesia

Architecture Consultant :
Konsultan Arsitek :
P.T. JARA FERRE PRATAMA ARSITEK, INSJENIR, PUBLIS, PERENCANA & KONSULTAN GEDUNG, PERENCANA & KONSULTAN PERENCANAAN, PERENCANAAN, PERENCANAAN, PERENCANAAN TELP. (021) 7900290 PRUNT 1, FAX. (021) 7900291 E-mail : jaraferre@jaraferre.com

Structure Consultant :
Konsultan Struktur :
PT. HARBERT (HRT) WIDYA KONSULTAN AL. THAM RANGS, RUMAH BELUKAR No. 104 JAKARTA BARAT TELEPHONE: 62-21-2915832, 2915833, 2915834 FACSIMILE: 62-21-2915826, EMAIL: phrt@indosat.net.id

Mechanical & Electrical Consultant :
Konsultan Mekanikal & Elektrikal :
PT. ARMAN PRATAMA CONSULTANTS MECHANICAL & ELECTRICAL CONSULTANTS Suite 1107, Level 11, Jl. 74 Kemuning, Depok, Jawa Barat 16122, Phone : (021) 881-7200 (panggil), Fax : (021) 791-9604 E-mail : pt.arkan@armanpp.com, Website : www.armanpp.com

Construction Cost Consultant :
Konsultan Biaya Konstruksi :
WT PARTNERSHIP CIBIS Nisa Level 6 Jl. TB Simatupang No. 2 Jakarta 12560

Supervision Consultant :
Konsultan Pengawasan :
TeamworkX Ppti Support on Labor Support Control PT. TeamworkX Indonesia Gedung Office Park, Gedung 1, Lantai 10, Jl. TB Simatupang No. 41, Cilandak South Jakarta 12560 Indonesia

Main Contractor :
Kontraktor Utama :
TATA PT.TATAMULIA NUSANTARA INDAH

Drawing Title :
Judul Gambar :
BALOK PRESTRESS PC 611 LANTAI L1M, L2M, L3M

Drawn By :
Digambar :
STEFANUS

Checked By :
Diperiksa :
Diatulul

Approved By :
Disetujui :
AR3

Date : 10/10/22
Tanggal :
Drawing Page :
Lembar gambar :
Scale :
Skala :
1:75, 1:25

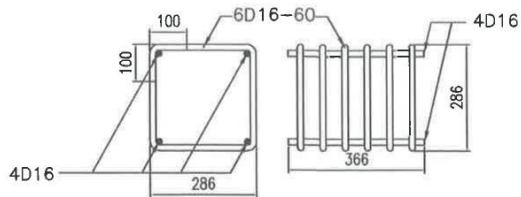
Drawing No. :
No. Gambar :
S-11.00

Revision No. :
Revisi :
Revision :
Revisi :
1

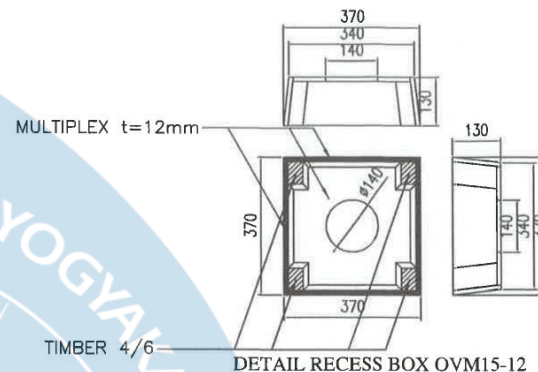
STRUCTURE SHOP DRAWING

Forcon Ref. :
CAD Ref. :

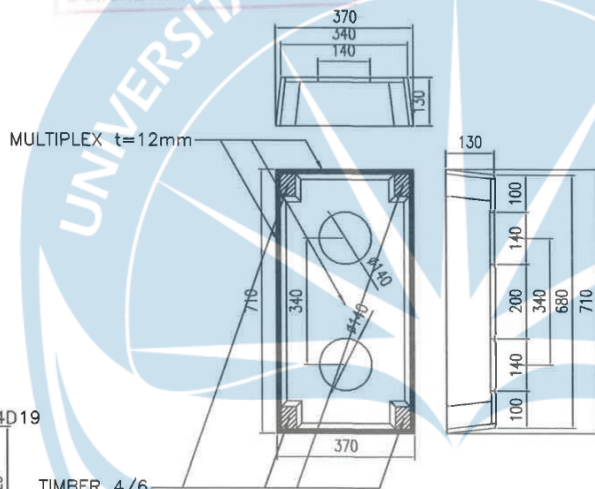
PT TeamworX Indonesia
 ALL DOCUMENT HAS BEEN REVIEWED
 PADI YUDHA
 20/8/22



DETAIL BURSTING STEEL OVM15-12

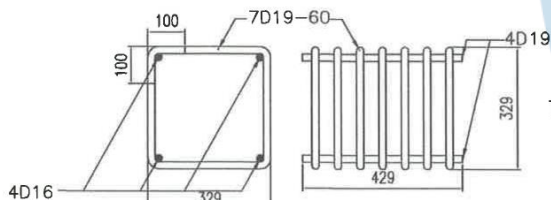


MULTIPLEX t=12mm
 TIMBER 4/6
 DETAIL RECESS BOX OVM15-12

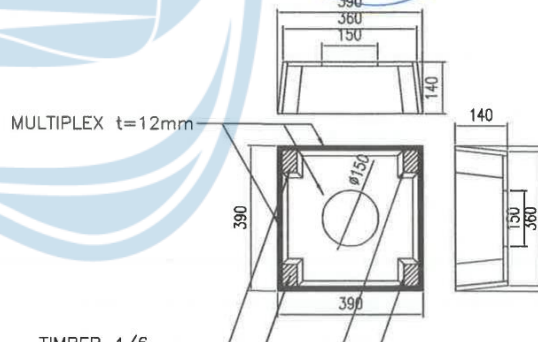


MULTIPLEX t=12mm
 TIMBER 4/6
 DETAIL RECESS BOX 2xOVM15-12

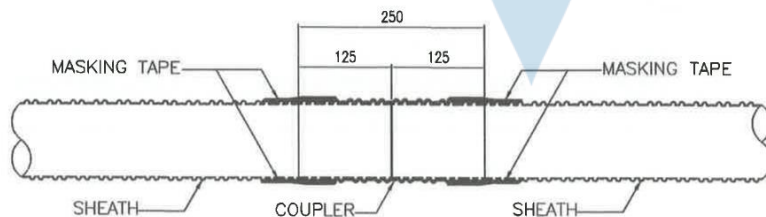
RECEIVED
 24 AUG 2022
 CM DEPARTMENT
 PT TeamworX
 Indonesia



DETAIL BURSTING STEEL OVM15-19



MULTIPLEX t=12mm
 TIMBER 4/6
 DETAIL RECESS BOX OVM15-19



DETAIL OF JOINT SHEATH

Legend:
 Legenda

NO	REVISION	DATE

Project Name:
 Name Proyek
 Development of LOGOS Metrolink Logistic Hub - Warehouse 4 (Main Building)

Owner:
 Pembuat Tugas
LOGOS PT. LOGOS INDONESIA BERKAS ONE Level 25, Revenue Tower C/25D J. Jend. Sudirman No. 52-53 Jakarta 12790, Indonesia

Architecture Consultant:
 Konsultansi Arsitek
PT. JAYA PRATAMA PRATAMA Jl. Raya Cempaka No. 100/2000001, Cempaka, Jakarta Barat 12510, DKI Jakarta (INDONESIA) Telp. 021-25111111 Fax. 021-25111111 E-mail: jayaprata@jaya-prata.com

Structure Consultant:
 Konsultansi Struktur
PT. HARTY (HRT) WIDYA KONSULTAN JANTAN APRES RIJAN BLOK DINS SABANGARAH BAKAT TELEPHONE: 021-25111111, 25111111, 25111111 FAX: 021-25111111, 25111111, 25111111 E-mail: harty@harty.com, harty@harty.com

Mechanical & Electrical Consultant:
 Konsultansi Mekanikal & Elektrikal
PT. ANJAN PRATAMA CONSULTANTS MECHANICAL & ELECTRICAL CONSULTANTS Jl. Raya Cempaka No. 100/2000001, Cempaka, Jakarta Barat 12510, DKI Jakarta (INDONESIA) Telp. 021-25111111 Fax. 021-25111111 E-mail: anjan@anjan.com, anjan@anjan.com

Construction Cost Consultant:
 Konsultansi Biaya Konstruksi
WI PARTNERSHIP CIBIS Niwa Level 5 Jl. TB. Sjahrir No. 2 Jakarta 12660

Supervision Consultant:
 Konsultansi Pengawasan
TeamworX All Rights Reserved
 PT. TeamworX Indonesia Gedung Office Park, Gedung IT, Graha Office Park, Jl. Brawijaya No. 41, Cikadipin, South Jakarta 12555 - Indonesia

Main Contractor:
 Kontraktor Utama
TATA PT. TATAMULIA NUSANTARA INDAH

Drawn By:
 Achul Giambar

DETAIL BURSTING STEEL, RECESS BOX, & JOINT SHEATH

Drawn By:
 Disenior
STEFANUS

Checked By:
 Insinyur
Paul

Approved By:
 Disetujui

Date:
 Tanggal
 18/7/22

Scale:
 Skala
 1:1

Drawing No. / No. Gambar
 S-15.00

Revision / Revisi
 R1

STRUCTURE SHOP DRAWING

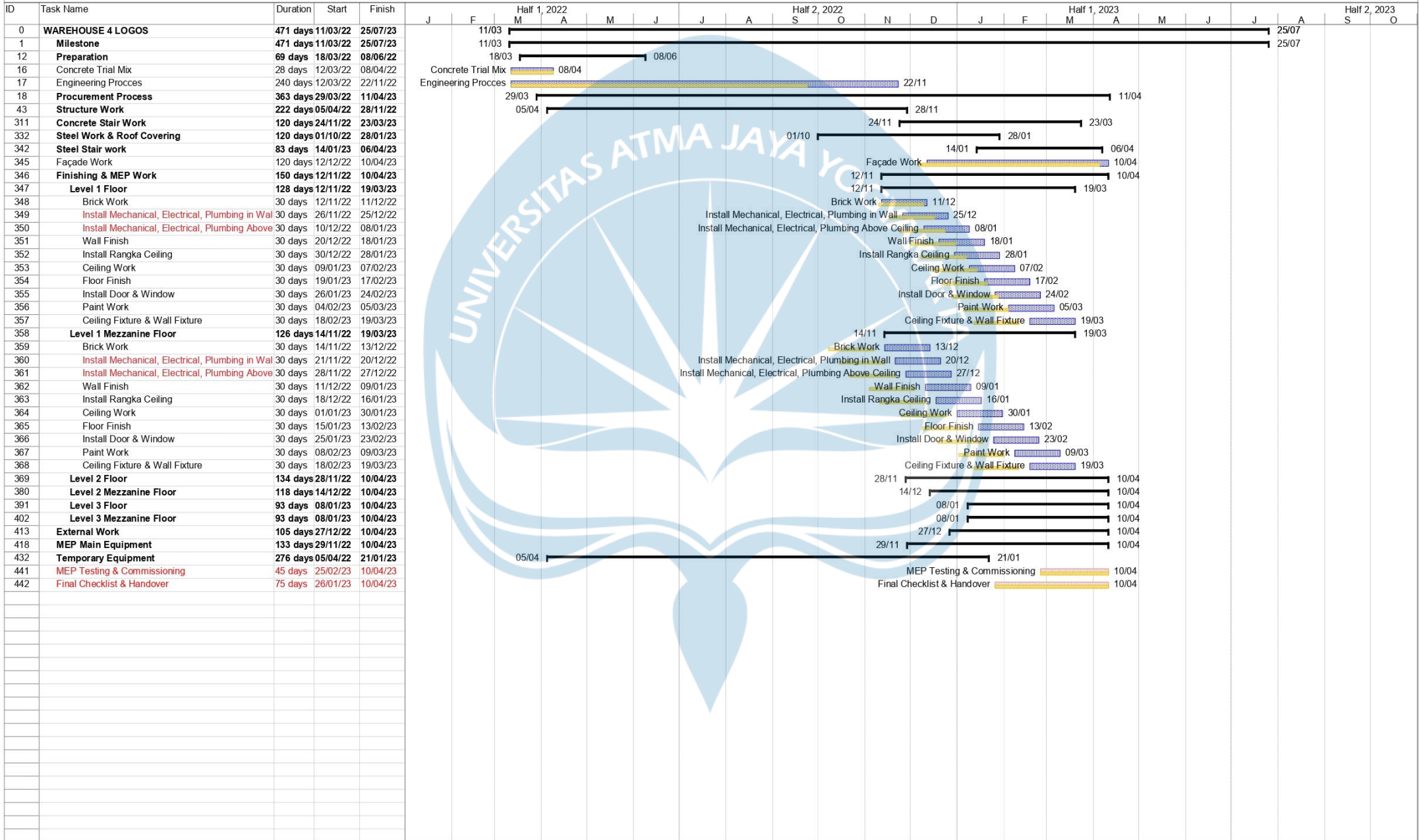
Forcan Ref.:

CAD Plot

The logo of Universitas Atma Jaya Yogyakarta is a light blue emblem. It features a central sunburst or fan-like shape with multiple rays emanating from a central point. This central shape is enclosed within a circular border. The text "UNIVERSITAS ATMA JAYA YOGYAKARTA" is written in a light blue, sans-serif font along the top inner edge of this circular border. Below the circular part, the logo continues with stylized, flowing lines that resemble an open book or a pair of wings, ending in a pointed, leaf-like shape at the bottom.

Lampiran 3. Master Schedule WH4 Logos R1

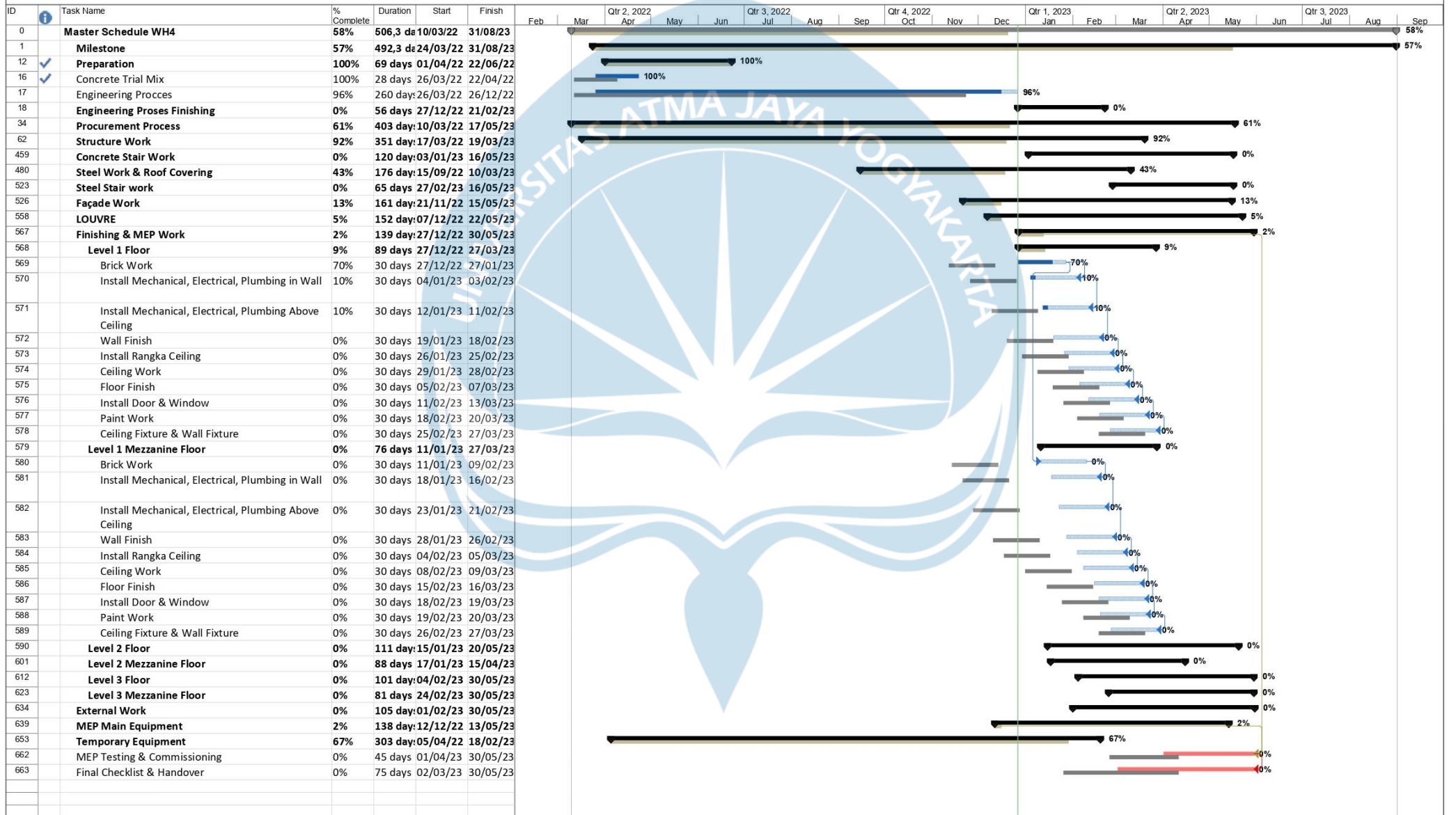
WAREHOUSE 4 LOGOS MASTER SCHEDULE



Task Summary Critical Baseline
Milestone Project Summary Critical Split Manual Progress

The logo of Universitas Atma Jaya Yogyakarta is a light blue watermark in the background. It features a stylized sunburst or fan shape with multiple rays emanating from a central point. The text "UNIVERSITAS ATMA JAYA YOGYAKARTA" is written in a semi-circle above the sunburst. Below the sunburst is a stylized, symmetrical shape resembling a book or a pair of wings.

Lampiran 4. Master Schedule WH4 Logos R2



Critical		Split		Finish-only		Baseline Milestone		Manual Summary		Inactive Task	
Critical Split		Task Progress		Duration-only		Milestone		Project Summary		Inactive Milestone	
Critical Progress		Manual Task		Baseline		Summary Progress		External Tasks		Inactive Summary	
Task		Start-only		Baseline Split		Summary		External Milestone		Deadline	

The logo of Universitas Atma Jaya Yogyakarta is a light blue emblem. It features a central sunburst or starburst design with multiple rays emanating from a central point. This central design is enclosed within a circular border. The text "UNIVERSITAS ATMA JAYA YOGYAKARTA" is written in a sans-serif font along the top inner edge of this circular border. Below the circular part, the emblem tapers into a pointed, leaf-like shape.

Lampiran 5. Draft EOT

