sport, arts, culture & recreation
Department of
Sport, Arts, Culture and Recreation
FREE STATE PROVINCE

FRANKFORT MULTI-PURPOSE INDOOR SPORT CENTRE

MECHANICAL ENGINEERING DRAWINGS & SPECIFICATION

Quantum
BUILT & ENVIRONMENT CONSULTANTS (PTY) LTD

TENDER DOCUMENT

34581M

SMITHFLIED INDOOR SPORT CENTRE

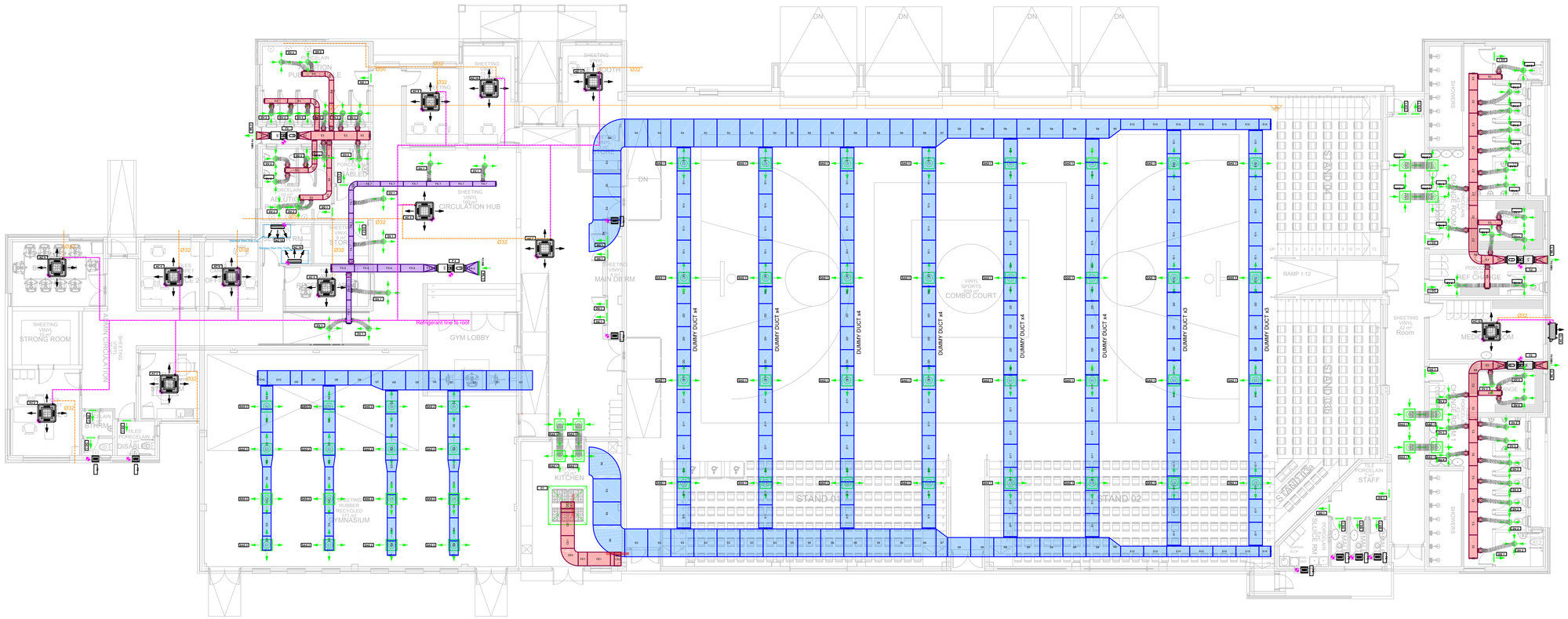
DRAWINGS / DOCUMENTS ISSUE LIST

MECHANICAL WORKS

* issued for information only

REVISIONS

BVI DRW NO	SHORT DESCRIPTION	SIZE	SCALE	qty	TYPE (INFO, DESIGN, CONSTRUCTION)	CONSTRUCTION							
						0		1		2		3	
						% COMPLETED	Date	% COMPLETED	Date	% COMPLETED	Date	% COMPLETED	Date
34581M-750-01-1	HVAC - Ground Floor	A1	1:125	1	TENDER	100%	2022/07/29						
34581M-750-01-2	HVAC - Ground Floor Sections	A1	1:125	1	TENDER	100%	2022/07/29						
34581M-750-02-1	HVAC - Groundskeeper House	A1	1:20	1	TENDER	100%	2022/07/29						
34581M-750-03-1	HVAC - Guard House	A1	1:10	1	TENDER	100%	2022/07/29						
34581M-850-01-1	Fire Protection - Ground Floor	A1	1:125	1	TENDER	100%	2022/08/04						
34581M-850-02-1	Fire Protection - Groundkeeper and Guard House	A1	1:20	1	TENDER	100%	2022/08/04						
34581M-850-03-1	Fire Protection: Smoke Extraction - Ground Floor	A1	1:125	1	TENDER	100%	2022/08/04						
34581M-950-01-1	Plumbing - Ground Floor, Groundkeeper, Guard House	A1	1:125	1	TENDER	100%	2022/07/29						



Mechanical Equipment Schedule

MARK	DESCRIPTION	COOLING_BTU	HEATING_BTU	SIZE	FLOW	PRESSURE	POWER	PHASE	VOLTAGE	Count
AC 1	4-Way Cassette Split Inverter	7.03 kW	7.74 kW		347 l/s		2.11kW	1Ph	240V	1
AC 10	4-Way Cassette Split Inverter	3.52 kW	3.81 kW		197 l/s		1.095 kW	1Ph	240V	1
AC 11	4-Way Cassette Split Inverter	3.52 kW	3.81 kW		197 l/s		1.095 kW	1Ph	240V	1
AC 12	4-Way Cassette Split Inverter	3.52 kW	3.81 kW		197 l/s		1.095 kW	1Ph	240V	1
AC 13	High Wall Split Inverter	3.52kW	3.81kW		127l/s		1.095kW	1Ph	240V	1
AC 14	High Wall Split Inverter	3.52kW	3.81kW		127l/s		1.095kW	1Ph	240V	1
AC 2	4-Way Cassette Split Inverter	3.52 kW	3.81 kW		197 l/s		1.095 kW	1Ph	240V	1
AC 3	4-Way Cassette Split Inverter	3.52 kW	3.81 kW		197 l/s		1.095 kW	1Ph	240V	1
AC 4	4-Way Cassette Split Inverter	3.52 kW	3.81 kW		197 l/s		1.095 kW	1Ph	240V	1
AC 5	4-Way Cassette Split Inverter	3.52 kW	3.81 kW		197 l/s		1.095 kW	1Ph	240V	1
AC 6	4-Way Cassette Split Inverter	3.52 kW	3.81 kW		197 l/s		1.095 kW	1Ph	240V	1
AC 7	4-Way Cassette Split Inverter	16.11 kW	16.99 kW		414 l/s		6.7 kW	3Ph	400V	1
AC 8	4-Way Cassette Split Inverter	16.11 kW	16.99 kW		414 l/s		6.7 kW	3Ph	400V	1
AC 9	4-Way Cassette Split Inverter	3.52 kW	3.81 kW		197 l/s		1.095 kW	1Ph	240V	1
EV 1	Evaporative Cooler				9120 l/s		4.5kW	3Ph	400V	2
F 4	Axial Fan c/w S/A			Ø315	650 l/s	250 Pa	400 W	3 Ph	400V	1
F2	Window Wall Fan			Ø300	150 l/s	50 Pa	70 W	1Ph	230V	8
F3	Axial Fan c/w S/A			Ø315	1080 l/s	150 Pa	400 W	3 Ph	400V	3
F7	Axial Fan c/w S/A			Ø400	2200l/s	260Pa	2.6kW	3 Ph	400V	1
RT 1	Rooftop Package Unit	117.8kW	130kW		5664l/s		40kW	3Ph	400V	1

Air Terminal Schedule

MARK	DESCRIPTION	SIZE	AIR_FLOW	DUCTS_NO	FLOW	COLOUR	Count
C1	Island Canopy c/w drip trays and filters	2000x2000	2200l/s	1 off700x350			1
DG 1	Door Grille	300x300				Powder Coated as per Architect	23
DV 1	Disc Valve	Ø200				Powder Coated as per Architect	7
DV 2	Disc Valve	Ø200				Powder Coated as per Architect	42
RAG 1	Return Air Grille	2000x1500				Powder Coated as per Architect	3
RAG 1	Grille c/w Ø350Spigot	600x600				Powder Coated as per Architect	12
SAG 1	RVD-NP c/w Ø400 Spigot	600x600				Powder Coated as per Architect	32
SAG 2	RVD-NP c/w Ø315 Spiggot	600x600				Powder Coated as per Architect	16
WL 2	Hinged Weather Louvre c/w 50mm Pleated Filter	70 x400			650 l/s	Powder Coated as per Architect	1
WL 3	Hinged Weater Louvre	400x800			1080 l/s	Powder Coated as per Architect	3

Ducting Schedule

MARK	DESCRIPTION	SIZE	Count
C1	Endcap	550x1000	2
C10	Endcap	750x500	1
C11	Endcap	Ø450	4
C12	Spigot	Ø630	4
C2	Spigot	Ø710	16
C3	Endcap	Ø710	16
C5	Spigot	Ø200	49
C6	Endcap	400x400	1
C7	Spigot	250x250	10
C8	Endcap	250x250	10
C9	Endcap	450x450	3
CE1	Straight	350x350	1
CE1	Straight	700x350	7
CE2	Bend 90°	700x350	2
CE3	Bend 90°	700x350	1
CE4	Equal Square to Round	350x700 > Ø400	1
CE5	Lobster Bend 90° c/w Cowl and mesh	Ø400	1
DD	Dummy Duct Straight	Ø710	16
DD	Dummy Duct Straight	Ø710	14
E1	Equal Square to Round	400x800 > Ø315	3
E2	Equal Square to Round	Ø315 > 450x450	3
E3	Straight	450x450	21
E4	Straight	250x250	15
E5	Bend 90°	250x250	4
E6	Bend 90°	450x450	2
FA 4	Equal Square to Round	700x400 > Ø315	1
FA 5	Equal Square to Round	Ø315 > 400x400	1
FA 6	Straight	400x400	4
FA 7	Straight	250x250	11
FA8	Bend 90°	250x250	1
G1	Straight c/w 25mm FRK	1000x1000	4
G10	Straight c/w 25mm FRK	750x500	2
G2	Straight	Ø630	12
G3	Equal Taper	Ø630 > Ø450	4
G4	Straight	Ø450	16
G5	Flat on Side Taper c/w 25mm FRK	1000x1000 > 1000x750	1
G6	Straight c/w 25mm FRK	1000x750	2
G7	Flat on Side Taper c/w 25mm FRK	1000x750 > 750x750	1
G8	Straight c/w 25mm FRK	750x750	3
G9	Flat on Side Taper c/w 25mm FRK	750x750 > 750x500	1
R1	Straight Double Skin	1450x1000	7
R2	Bend 90° Double Skin	1450x1000	2
R3	Bend 90° c/w FRK 25mm	1450x1000	2
R4	Equal Taper Double Skin	1450x1000 > 2000x1500	3
S1	Bend 90° Double Skin	1450x1450	5
S10	Straight c/w 25mm FRK	550x1000	14
S11	Straight	Ø710	72
S11	Straight	Ø710	38
S2	Straight Double Skin	1450x1450	2
S3	Straight Double Skin	1450x1450	3
S3	Straight c/w 25mm FRK	1450x1450	19
S4	Bend 90° c/w FRK 25mm	1450x1450	4
S5	Flat on Side Taper c/w 25mm FRK	1450x1450 > 1450x1000	2
S6	Straight c/w 25mm FRK	1450x1000	12
S7	Flat on Side Taper c/w 25mm FRK	1450x1000 > 1000x1000	2
S8	Straight c/w 25mm FRK	1000x1000	14
S9	Flat on Side Taper c/w 25mm FRK	1000x1000 > 550x1000	2
VCD1	Volume Control Damper	Ø200	36
VCD2	Volume Control Damper	250x250	5

NOTES / LEGEND

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FREE STATE

CONSULTING ENGINEERS

Civil, Structural & Electrical Engineers. Environmental & Project Management

Registration no. 1998/000185/07

CLIENT

FREE STATE DEPARTMENT OF SPORTS, ART, CULTURE & RECREATION

PROJECT

SMITHFILED INDOOR SPORTS CENTRE

DRAWING TITLE

MECHANICAL INSTALLATION HVAC GROUND LEVEL

APPROVED BY BVI

R. Horn | 2020300889. | 23 Jul 2022

ENGINEER/TECHNOLOGIST | REG. NO. | DATE

SCALE	1:125	DRAWN	N. Rothman
DESIGNED	R. Horn	CHECKED	R. Horn

PLAN NUMBER	REVISION NO.	DATE SAVED
LAYERS USED: 34581M-750-01-1	0	23 Jul 2022



SECTION AA



SECTION AA

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SMITHFILED INDOOR SPORTS CENTRE

DRAWING TITLE

MECHANICAL INSTALLATION HVAC SECTIONS

APPROVED BY BVi

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ENGINEER/TECHNOLOGIST | REG. NO. | DATE

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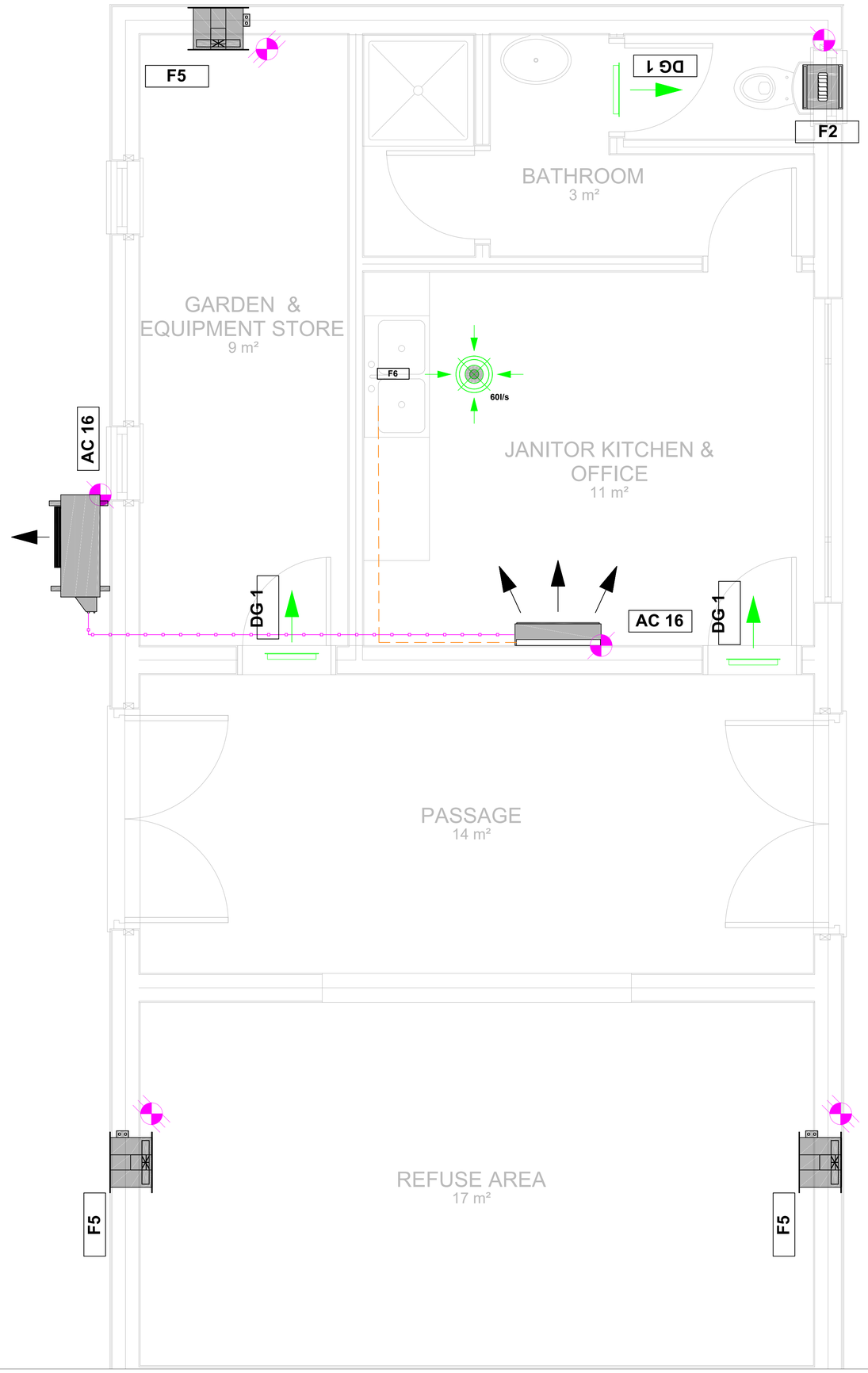

Mechanical Equipment Schedule

MARK	DESCRIPTION	SIZE	FLOW	PRESSURE	POWER	PHASE	VOLTAGE	COOLING_BTU	HEATING_BTU	Count
F2	Window Wall Fan	Ø300	150 l/s	50 Pa	70 W	1Ph	230V			1
F5	Plate fan c/w matching pressure relief louvre	Ø250	120l/s	30Pa	70W	3Ph	400V			1
F6	Ceiling Mounted Fan	Ø300	60l/s	30Pa	30W	1Ph	230V			1
AC 16	High Wall Split Inverter		127l/s		1.095kW	1Ph	240V	3.52kW	3.81kW	1
AC 16	Outdoor									1
F5	Plate fan c/w matching pressure relief louvre	Ø250	120l/s	30Pa	70W	1Ph	230V			2

AIR TERMINAL SCHEDULE

MARK	DESCRIPTION	SIZE	COLOUR	Count
DG 1	Door Grille	300x300	Powder Coated as per Architect	3

NOTES / LEGEND

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PROJECT

SMITHFIELD INDOOR SPORTS CENTRE

DRAWING TITLE

MECHANICAL INSTALLATION HVAC GROUNDSKEEPER

APPROVED BY BVi

R. Horn | 2020300889. | 23 Jul 2022
ENGINEER/TECHNOLOGIST | REG. NO. | DATE

SCALE	1:20	DRAWN	N. Rothman
DESIGNED	R. Horn	CHECKED	R. Horn

PLAN NUMBER	REVISION NO.	DATE SAVED
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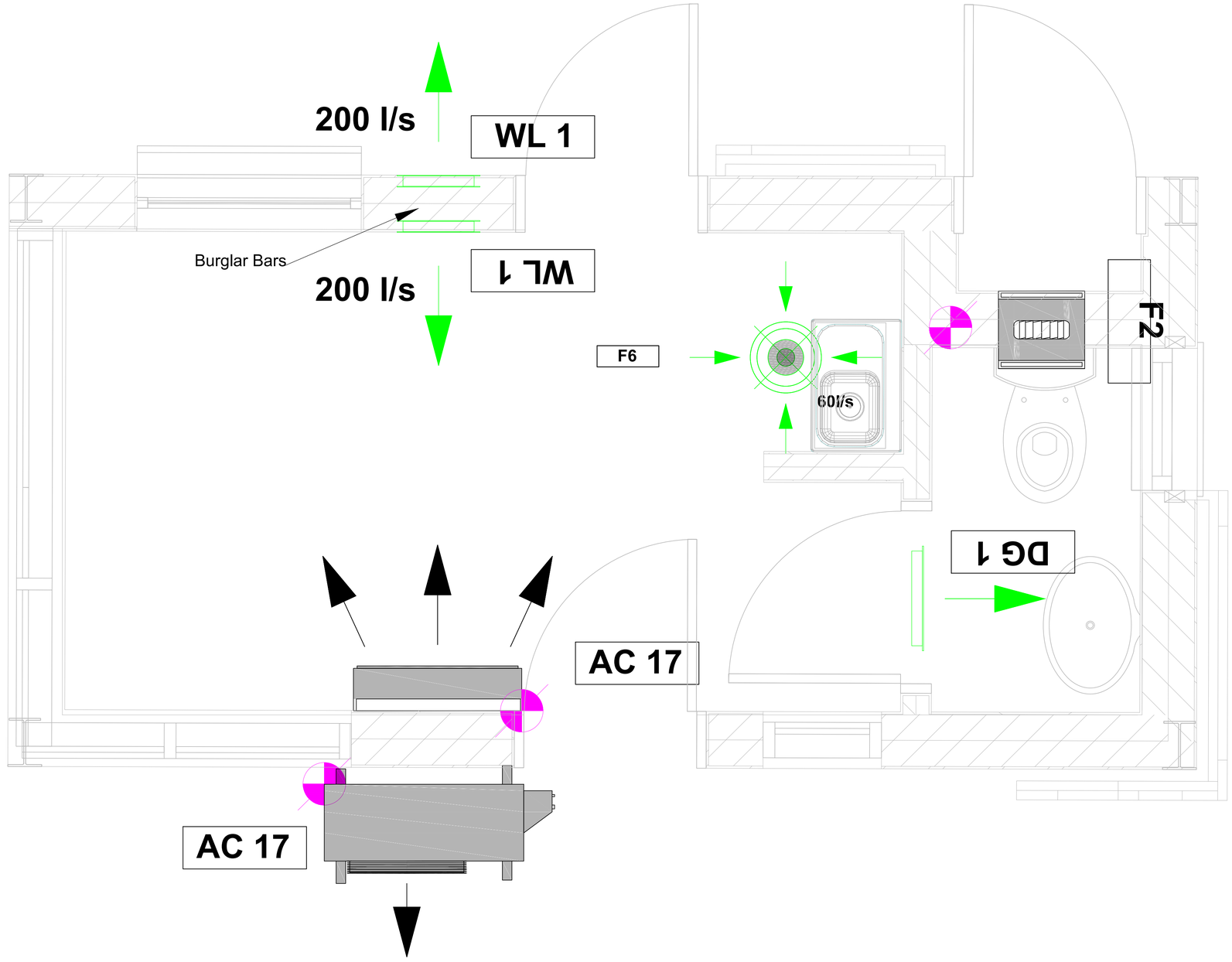
MECHANICAL EQUIPMENT SCHEDULE

MARK	DESCRIPTION	SIZE	FLOW	PRESSURE	POWER	PHASE	VOLTAGE	COOLING_BTU	HEATING_BTU	Count
AC 17	Outdoor									1
AC 17	High Wall Split Inverter		127l/s		1.095kW	1Ph	240V	3.52kW	3.81kW	1
F2	Window Wall Fan	Ø300	150 l/s	50 Pa	70 W	1Ph	230V			1
F6	Ceiling Mounted Fan	Ø300	60l/s	30Pa	30W	1Ph	230V			1

AIR TERMINAL SCHEDULE

MARK	DESCRIPTION	SIZE	FLOW	COLOUR	Count
DG 1	Door Grille	300x300		Powder Coated as per Architect	1
WL 1	Hinged Weater Louvre	300x300	200 l/s	Powder Coated as per Architect	2



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SMITHFILED INDOOR SPORTS CENTRE

DRAWING TITLE

MECHANICAL INSTALLATION HVAC GUARD HOUSE

APPROVED BY BVi

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ENGINEER/TECHNOLOGIST | REG. NO. | DATE

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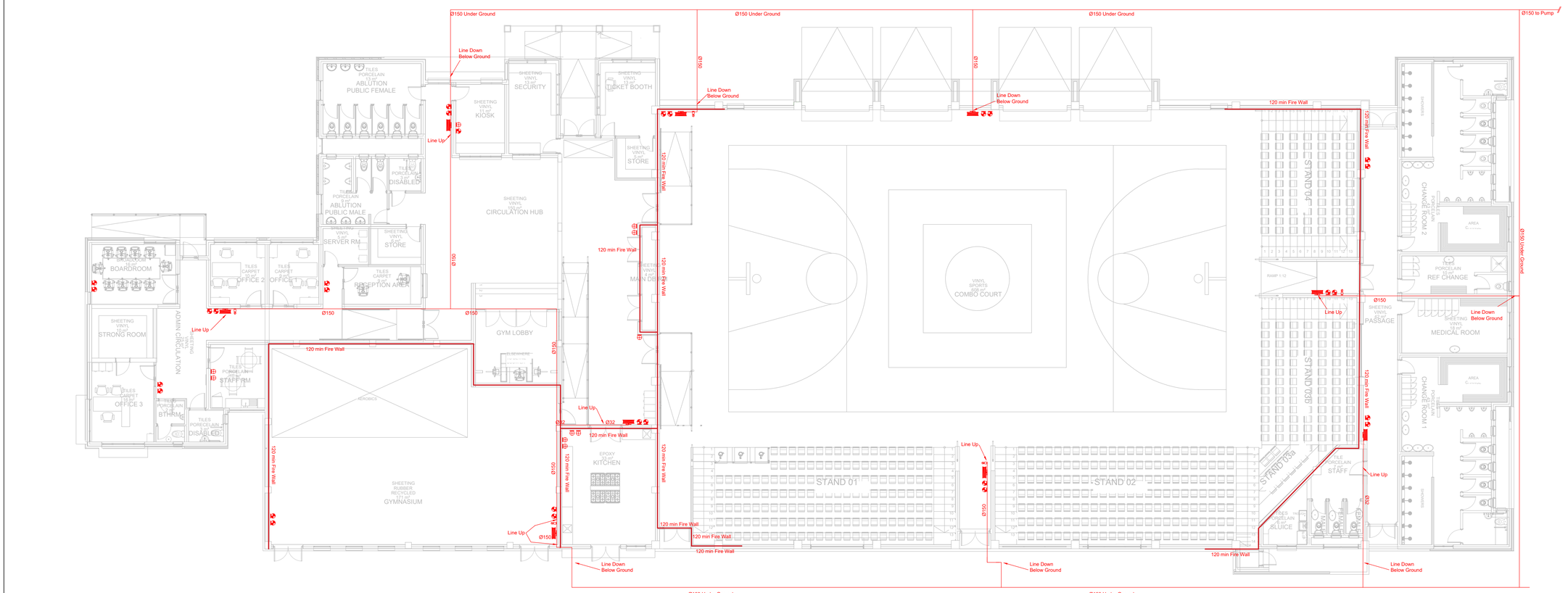
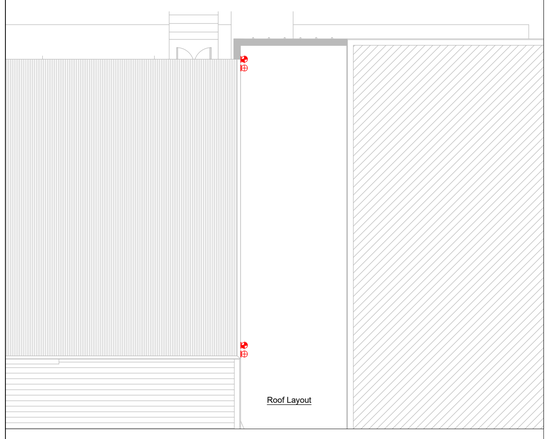
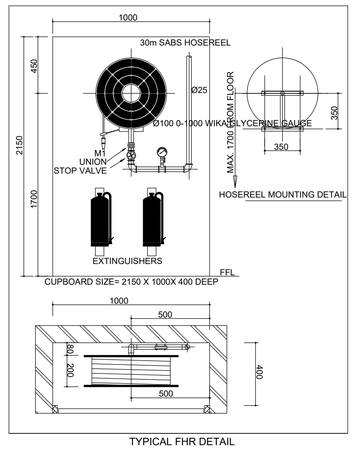


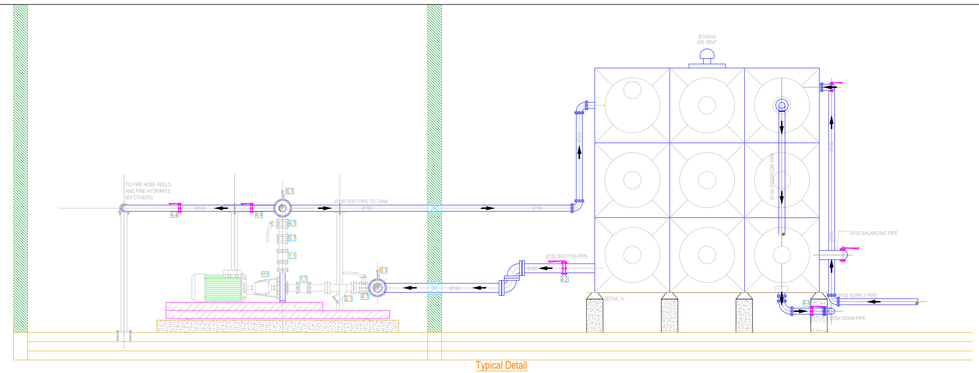


DETAIL A :OF TYPICAL HOSEREEL CUPBOARD



TYPICAL FHR DETAIL
NTS

LEGEND	
	HOSE REEL
	HYDRANT
	4.5 kg DCP
	5kg CO2



LEGENDS: N.T.S

1. JOCKEY FIRE PUMP, REF FP1
2. ELECTRIC FIRE PUMP, REF FP2
3. DIESEL FIRE PUMP, REF FP3
4. DIESEL ENGINE COMPLETE WITH FUEL TANK
5. FIRE PUMP CONTROL PANEL, REF CP2
6. 300 LITRE EXPANSION VESSEL
7. ISOLATING VALVES
8. STRAINER
9. NON RETURN VALVE
10. FLEXIBLE JOINT
11. ENLARGER
16. CONTROL PANEL-DOMESTIC WATER LIFT PUMPS
17. ISOLATING VALVE
18. IN-LINE STRAINERS
19. FLEXIBLE JOINT
20. NON RETURN VALVE
21. ELECTRIC MOTOR
22. ELECTRIC MOTOR
23. PRESSURE VESSEL

ELECTRIC JOCKEY FIRE PUMP:(FP1)

1.0 Pump supply includes annunciator/control panel.
2.0 No cast iron shall be used for parts in sliding contact.
3.0 The controls shall include Direct On Line (DOL) starting, alarm circuits and test emergency start button.
4.0 The starting sequence and running facilities shall be controlled by an ASIB approved controller.
5.0 The jockey pump shall be connected across the common suction and delivery pipework, and started/stopped by pressure switches connected to the delivery pipe.
6.0 Dual indicating or double filament lamp shall display the following conditions: "Pump Run/Pump Trip"
7.0 Manual / Auto switch required.
8.0 All equipment shall comply with the ASIB requirement for fire water pumps, an ASIB inspection test and acceptance of the installed equipment shall be included

ELECTRIC FIRE PUMP:(FP2)

1.0 Pump supply includes annunciator/control panel.
2.0 No cast iron shall be used for parts in sliding contact.
3.0 Pump and motor to be mounted on a galvanised mild steel bed – plate.
4.0 The controls shall include Direct On Line (DOL) starting, alarm circuits and test emergency start button.
5.0 Automatic starting of the pump to be initiated by a single pressure switch connected to the pump delivery pipe.
6.0 The fire pump shall (only) be switched off manually.
7.0 Dual indicating lamps or double filament lamps shall display the following conditions: "Pump Run/Pump Fail/Fire Alarm
8.0 Facilities shall be included for remote monitoring of the fire alarm condition.
9.0 The system shall be supplied complete with visual and audible alarms at the pump house.
10.0 The fire pump shall be tested for 6 hours on a suitable test bed. The unit shall be given an ASIB clearance certificate, and shall be fitted with an ASIB approval plate and number.
11.0 All equipment shall comply with the ASIB requirement for fire water pumps, an ASIB inspection test and acceptance of the installed equipment shall be included

N.T.S

DIESEL-DRIVEN FIRE PUMP:

1.0 Pump supply includes annunciator/control panel.
2.0 Pump operates as an emergency back-up for the electric fire pump.
3.0 No cast iron shall be used for parts in sliding contact.
4.0 Pump, engine and controller to be mounted on a galvanised mild steel bed – plate.
5.0 The starting sequence and running facilities shall be controlled by an ASIB approved controller.
6.0 The controller shall include starting relays, cyclic cranking controls, twin battery and charger circuits, monitored alarm circuits and test emergency start buttons.
7.0 Automatic starting of the pump to be initiated by a duplicate pressure switches connected to the pump delivery pipe.
8.0 The fire pump shall (only) be switched off manually.
9.0 Dual indicating lamps or double filament lamps shall display the following conditions: Pump Run/Pump Fail/Fire Alarm
10.0 Facilities shall be included for remote monitoring of the fire alarm condition.
11.0 The system shall be supplied complete with visual and audible alarms at the pump house.
12.0 An FM approved flow test meter shall be installed in the pump house pipework, and installed as per ASIB/ NFPA requirements.
13.0 The fire pump shall be tested for 6 hours on a suitable test bed. The unit shall be given an ASIB clearance certificate, and shall be fitted with an ASIB approval plate and number.
14.0 All equipment shall comply with the ASIB requirement for fire water pumps, an ASIB inspection test and acceptance of the installed equipment shall be included

NOTES / LEGEND

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Registration no. 1996/000185/07

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Bloemfontein
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CLIENT

FREE STATE DEPARTMENT OF SPORTS, ART, CULTURE & RECREATION

PROJECT

SMITHFIELD INDOOR SPORTS CENTRE

DRAWING TITLE

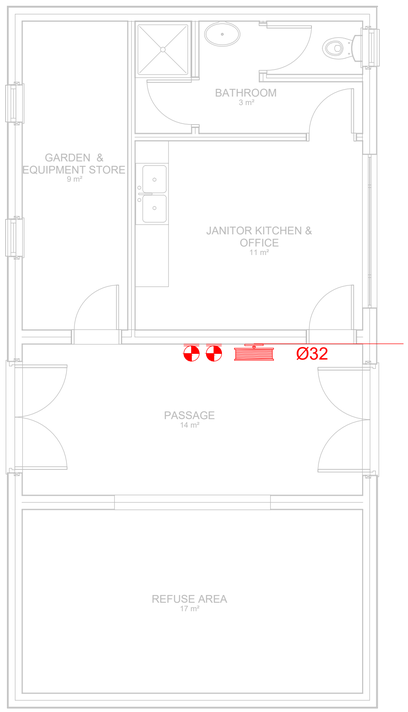
MECHANICAL INSTALLATION FIRE PROTECTION GROUND LEVEL

APPROVED BY BVi

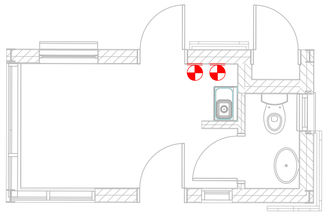
R. Horn | 2020300889. | 03 Aug 2022
ENGINEER/TECHNOLOGIST | REG. NO. | DATE

SCALE	1:125	DRAWN	N. Rothman
DESIGNED	R. Horn	CHECKED	R. Horn

PLAN NUMBER	REVISION NO.	DATE SAVED
LAYERS USED 34581M-850-01-1	0	03 Aug 2022

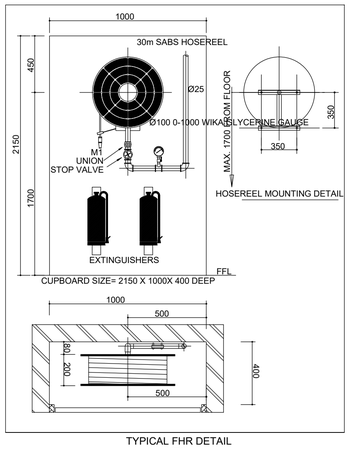


GROUNDSKEEPER



GUARD HOUSE

DETAIL A :OF TYPICAL HOSEREEL CUPBOARD



TYPICAL FHR DETAIL
NTS

LEGEND	
	HOSE REEL
	HYDRANT
	4.5 kg DCP
	5kg CO2

NOTES / LEGEND

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CLIENT

FREE STATE DEPARTMENT OF SPORTS, ART, CULTURE & RECREATION

PROJECT

SMITHFIELD INDOOR SPORTS CENTRE

DRAWING TITLE

MECHANICAL INSTALLATION FIRE PROTECTION GROUNDSKEEPER AND GUARD HOUSE

APPROVED BY BVi

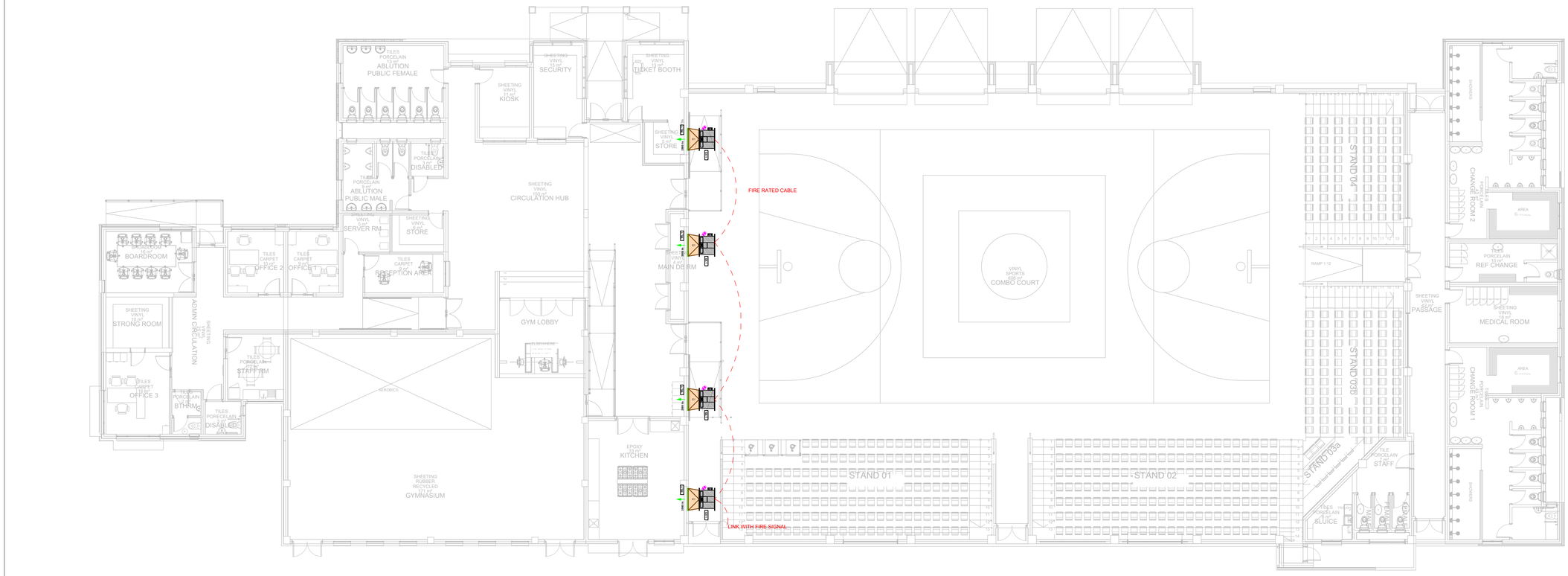
R. Horn | 2020300889. | 03 Aug 2022
ENGINEER/TECHNOLOGIST | REG. NO. | DATE

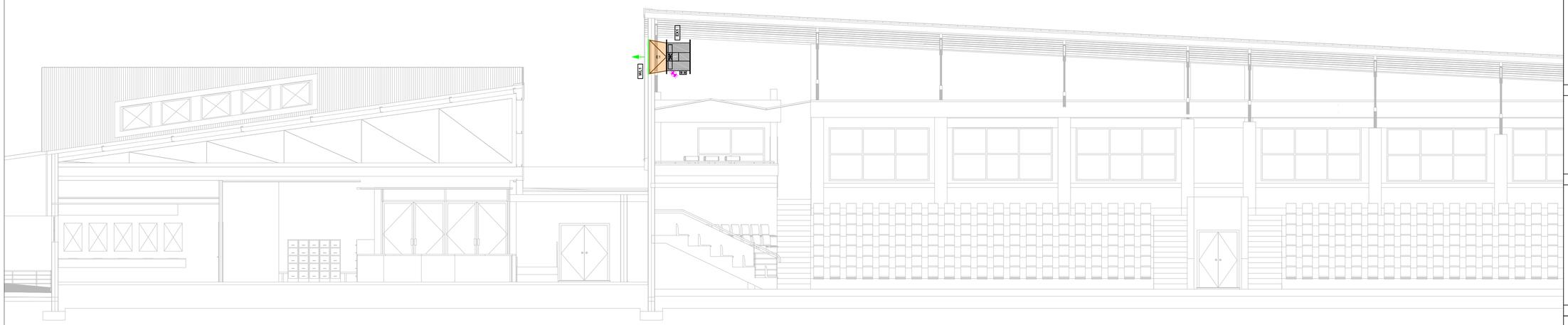
SCALE	1:20	DRAWN	N. Rothman
DESIGNED	R. Horn	CHECKED	R. Horn

PLAN NUMBER	REVISION NO.	DATE SAVED
LAYERS USED 34581M-850-02-1	0	03 Aug 2022

Mechanical Equipment Schedule

MARK	DESCRIPTION	SIZE	FLOW	PRESSURE	POWER	PHASE	VOLTAGE	Count
EX 1	Smoke Extraction Fan c/w Pressure Relief Louvre	Ø1000	2500 l/s	150Pa	0.6 kW	3 Ph	400V	4





SECTION AA
N.T.S

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PROJECT

SMITHFIELD INDOOR SPORTS CENTRE

DRAWING TITLE

GROUND FLOOR FIRE PROTECTION SMOKE EXTRACTION LAYOUT

APPROVED BY BVi

R. Horn | 2020300889. | 02 Aug 2022
ENGINEER/TECHNOLOGIST | REG. NO. | DATE

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DESIGNED	R. Horn	CHECKED	R. Horn

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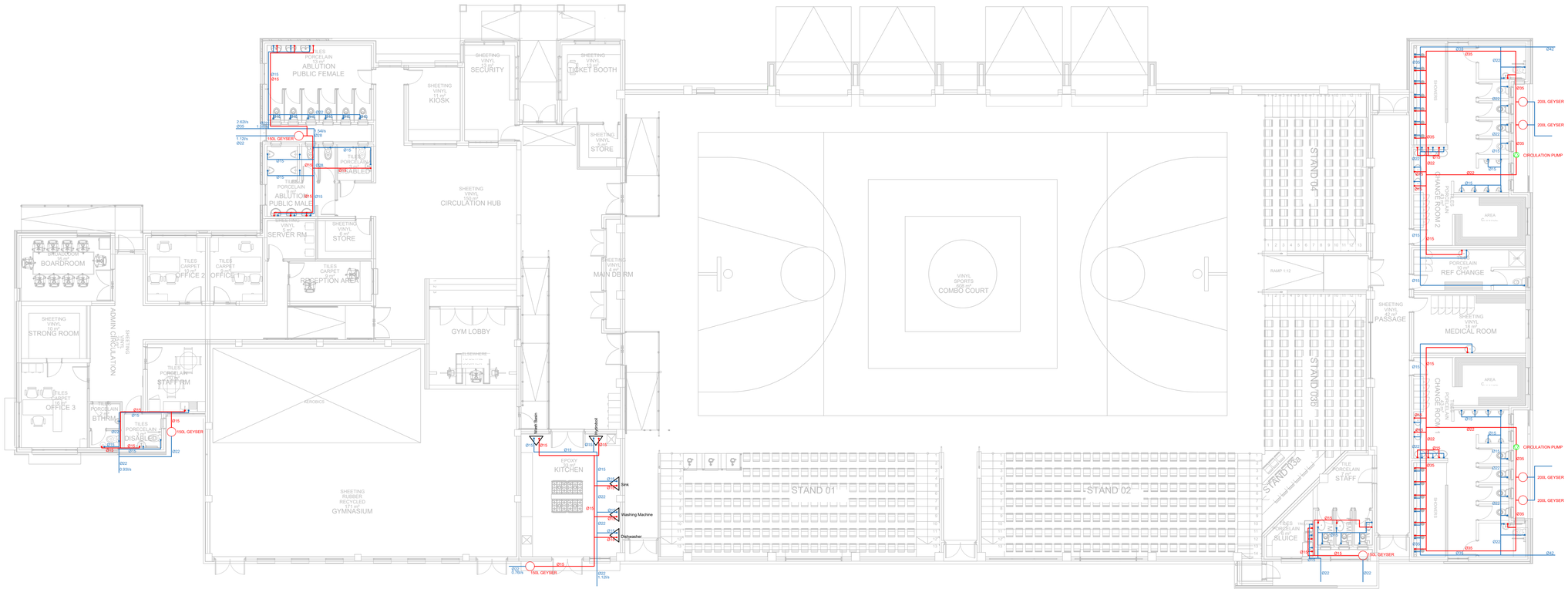

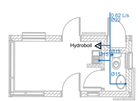

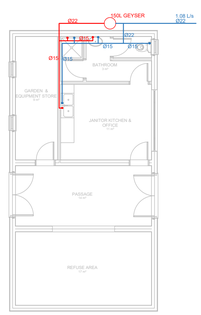

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PROJECT

**SMITHFILED:
NEW MULTI-PURPOSE
INDOOR SPORT CENTRE**

DRAWING TITLE

**GROUND LEVEL
PLUMBING LAYOUT**

APPROVED BY BVi

R. Horn | 2020300889. | 02 Aug 2022
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