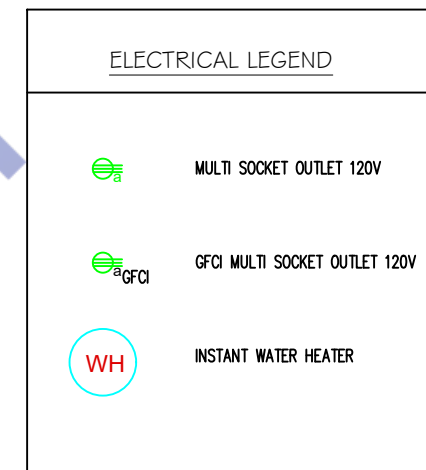
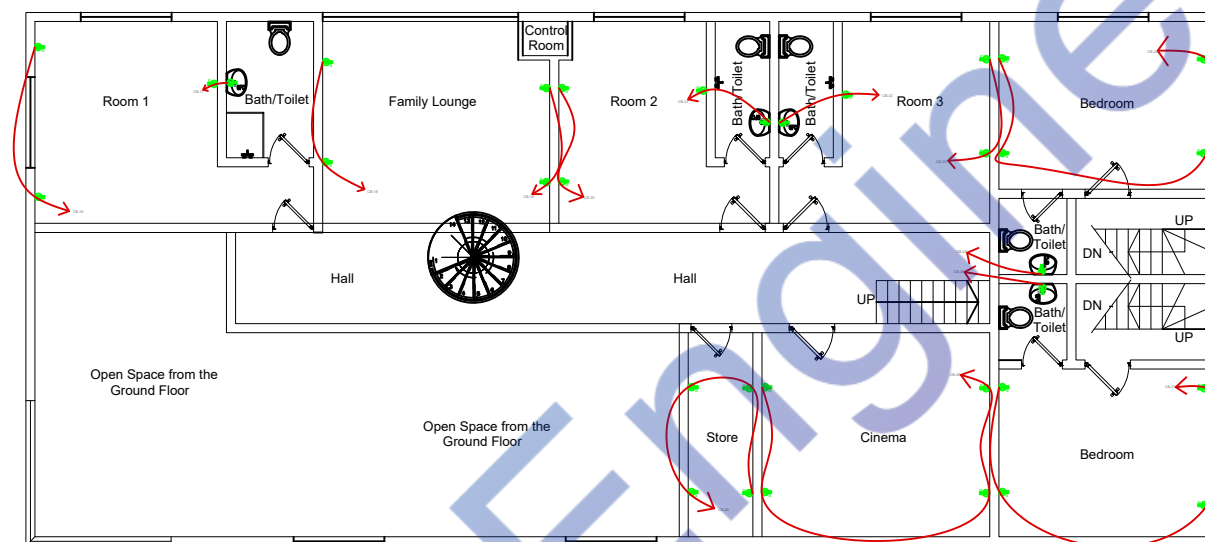
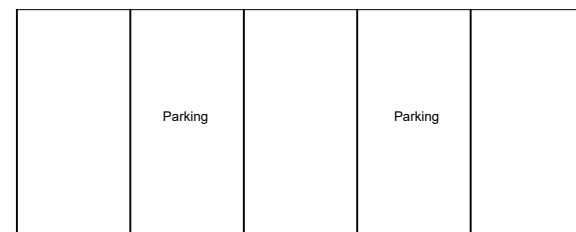
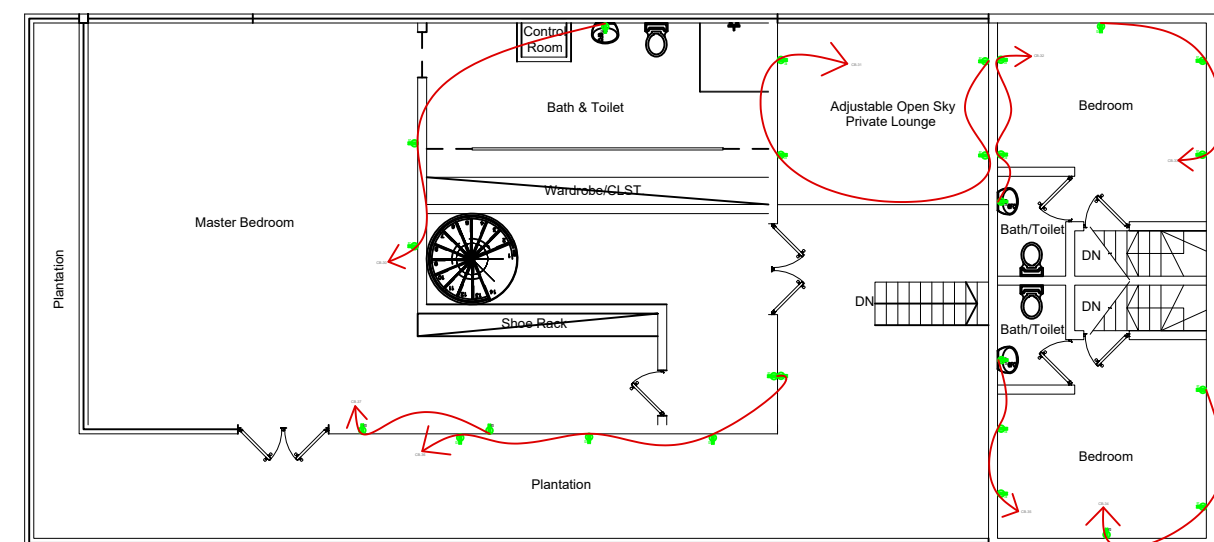




Ground Floor



First Floor



Second Floor

PROJECT :
Renovation
Houtlaan 2, 2243 CB Wassenaar, Netherlands

TITLE:

Electrical Power Plan

DRG NO: E2

SCALE: 1/8" = 1' 0" @ A1

DESIGNED BY:	MD Al Amin
--------------	------------

REF.NO:

DRAWN BY:

REVISION NO:

CHECKED BY:	
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PAGE: 02
DATE: 25/08/2024

	ENGINEER
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1 PANEL SCHEDULE & SERVICE CALCULATION

1 PANEL SCHEDULE & SERVICE CALCULATION

ELECTRICAL PANEL-MAIN (01)											
LOAD SERVED	OKT #	TYPE	BKR TRIP SIZE	WIRE SIZE	PHASE A	PHASE A	BKR TRIP SIZE	WIRE SIZE	OKT #	LOAD SERVED	
HEAT	1		20	#12	1798.5		510	20	#12	2	LIGHTING LOAD
CLOTHES DRYER	3		20	#12	3000		2000	20	#12	4	WATER HEATER
COFFEE MAKER/TOASTER	5		20	#12	1200		500	20	#12	6	REFRIGERATOR
ELECTRIC KETTLE	7		20	#12	1500		1000	20	#12	8	OVEN
VACUUM CLEANER/IRON	9		20	#12	1500		1300	20	#12	10	DISHWASHER
SPARE	11		20	#12	0		400	20	#12	12	WASHING MACHINE
SPARE	7		20	#12	0		1000	20	#12	8	HAIR DRYER
TOTAL VA PHASE A					8959	670				15659	
TOTAL VOLT-AMPS										15659	
DIVIDE TOTAL VOLT-AMPS BY SYSTEM VOLTAGE (PHASE TO PHASE)						230	AMPS		68		
TOTAL CONNECTED LOAD (AMPS) @ 125%						85					
MAIN TYPE AND AMPERE RATING						100-150 AMP MCCB					
PANEL FEEDER SIZE - SEE RISER DIAGRAM											

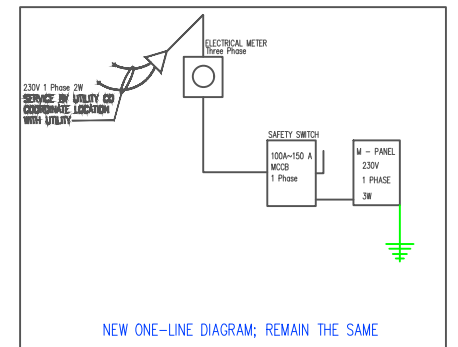
230V 1 Phase 2W
SERVICE BY UTILITY CO
COORDINATE LOCATION
WITH UTILITY

ELECTRICAL METER
Three Phase

SAFETY SWITCH
120A-150 A
MCB
1 Phase

M - PANEL
230V
1 PHASE
3W

NEW ONE-LINE DIAGRAM; REMAIN THE SAME



1 PANEL SCHEDULE & SERVICE CALCULATION

230V 1 Phase 3W
SERVICE BY UTILITY CO.
COORDINATE LOCKOUT
WITH UTILITY

ELECTRICAL METER
Three Phase

SAFETY SWITCH
100A-150 A
MCCB
1 Phase

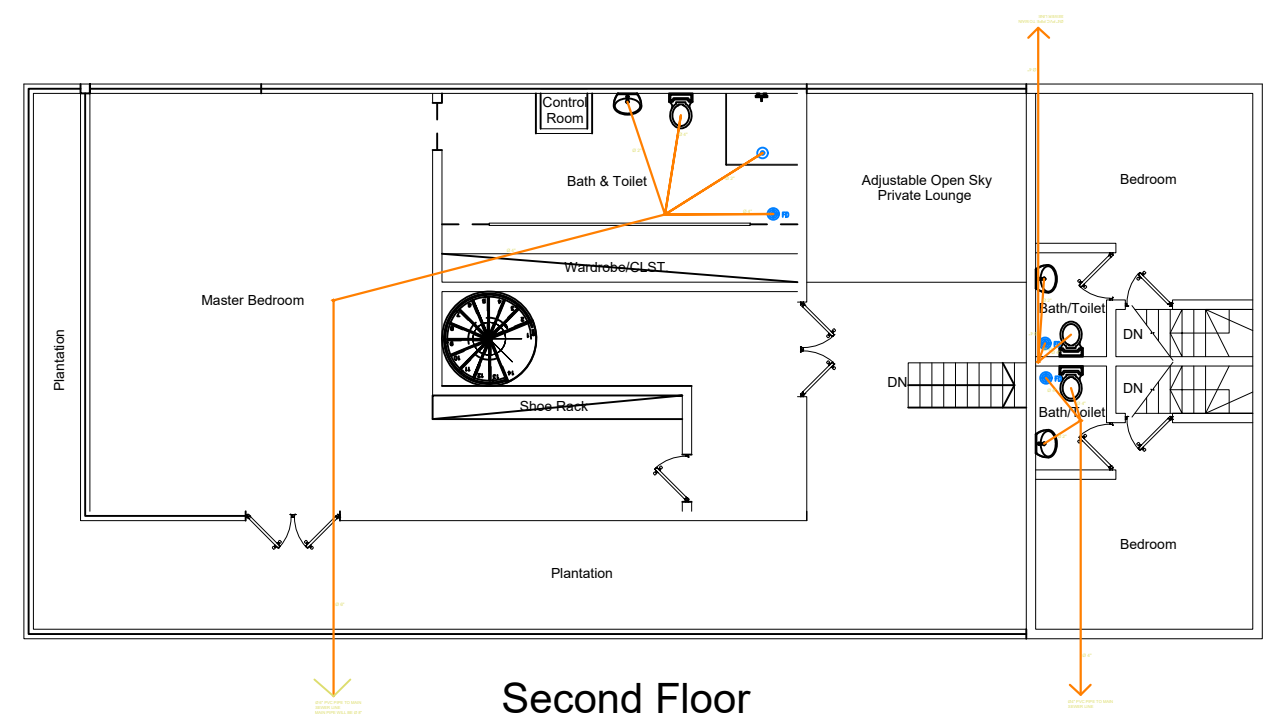
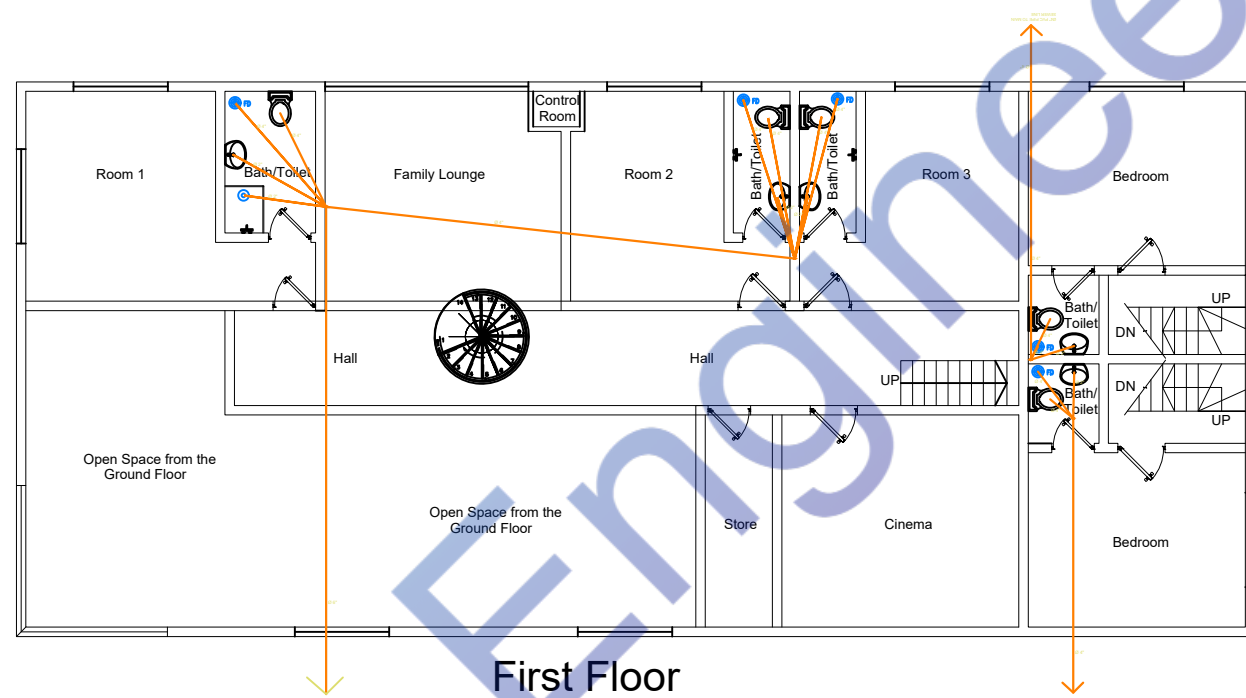
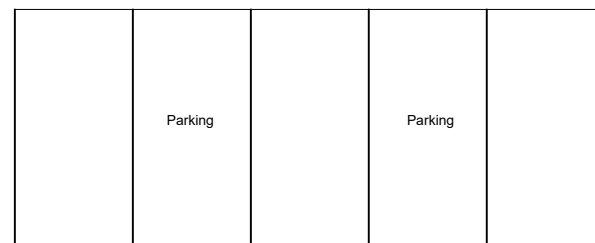
M - PANEL
230V
1 PHASE
3W

NEW ONE-LINE DIAGRAM; REMAIN THE SAME



Material (D1)	
Name	Watt
CEILING FAN	55W
CEILING MOUNT ROUND LED LIGHT	20W
WALL MOUNT LED LIGHT	10W
CEILING MOUNT 2"X2" SQUARE LED LIGHT	40W
HANGING LIGHT	20W

ENGINEER	
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The design has been executed in full compliance with these standards to ensure that the sewerage system is safe, efficient, and environmentally responsible.

SEWERAGE LEGEND

	WASTE WATER/ SEWER LINE (UPVC PIPE)
	TOILET WASTE/ SEWER LINE (UPVC PIPE)

PROJECT :
Renovation
Houtlaan 2, 2243 CB Wassenaar, Netherlands

TITLE:
Plumbing Sewerage Plan

DRG NO: P1

SCALE: 1/8" = 1' 0" @ A1

DESIGNED BY: MD Al AminREF.NO:DRAWN BY:REVISION NO:

CHECKED BY: _____

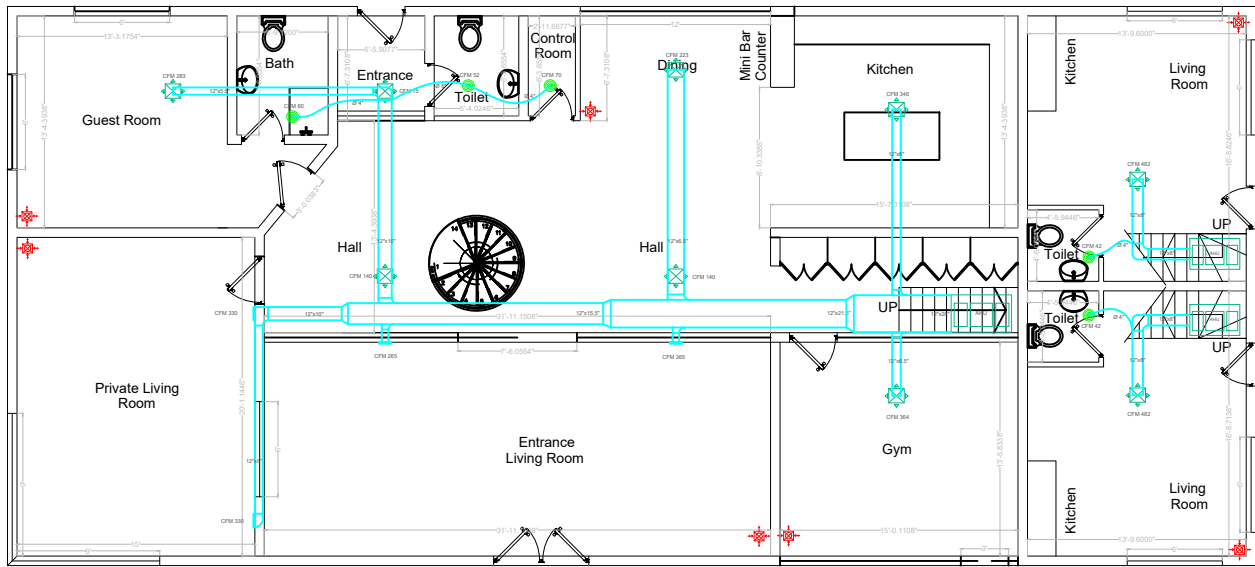
PAGE: 06

DATE: 25/08/2024

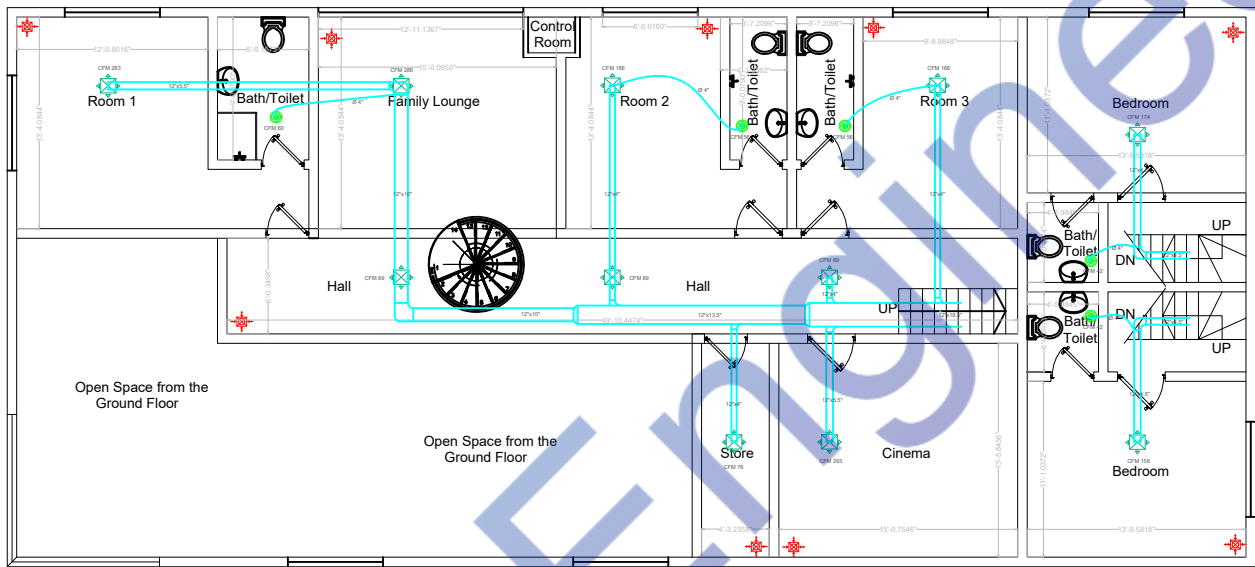
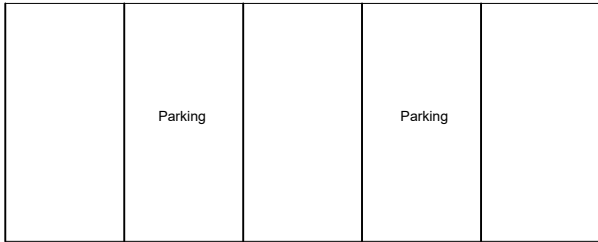
ENGINEER	
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Watermarkly

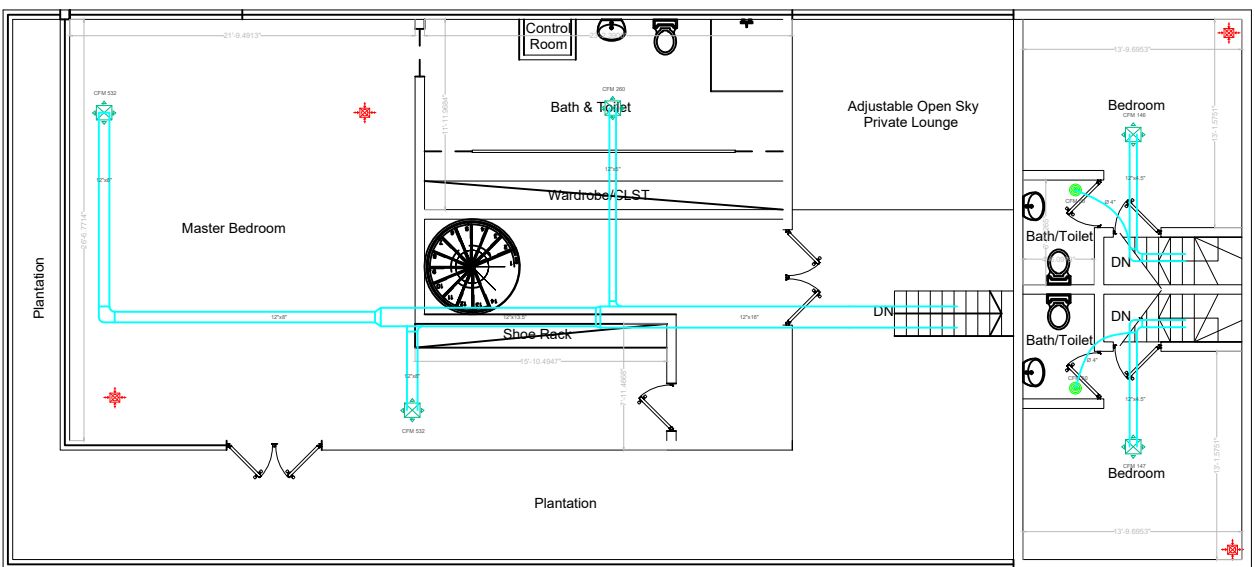
REV	DESCRIPTION	DATE	BY	CHECKED	APPROVED



Ground Floor



First Floor



Second Floor

Note:
This HVAC layout plan has been meticulously designed to ensure optimal performance, energy efficiency, and compliance with the specific requirements for the project located in Wassenaar, Netherlands. The plan includes the design and sizing of three geothermal heating and cooling systems, each tailored to meet the unique demands of the designated zones.

System Overview:

System 1: Geothermal Heating & Cooling (Main System)
Air System Type: Ground Source Heat Pump (GSHP)
Number of Zones: 3
Floor Area: 4247.2 ft²
Total Cooling Coil Load: 2.0 Tons (23.5 MBH)
Sensible Cooling Load: 18.3 MBH
Maximum Coil CFM: 628 CFM
Heating Coil Load: 36.6 MBH

System 2: Geothermal Heating & Cooling (D1)
Air System Type: Ground Source Heat Pump (GSHP)
Number of Zones: 1
Floor Area: 610.3 ft²
Total Cooling Coil Load: 0.3 Tons (3.6 MBH)
Sensible Cooling Load: 2.8 MBH
Maximum Coil CFM: 96 CFM
Heating Coil Load: 5.6 MBH

System 3: Geothermal Heating & Cooling (D2)
Air System Type: Ground Source Heat Pump (GSHP)
Number of Zones: 1
Floor Area: 610.3 ft²
Total Cooling Coil Load: 0.3 Tons (3.6 MBH)
Sensible Cooling Load: 2.8 MBH
Maximum Coil CFM: 96 CFM
Heating Coil Load: 5.6 MBH

Design Considerations:
Cooling and Heating Loads: The cooling and heating coil loads have been calculated for all relevant months (January to December), ensuring year-round comfort and efficiency.
Airflow Rates: Airflow rates have been optimized for each zone, taking into consideration peak space loads and ensuring balanced air distribution.
Ventilation and Exhaust Fans: The ventilation and exhaust fans are sized to maintain appropriate indoor air quality, with detailed calculations for CFM per square foot and per person.

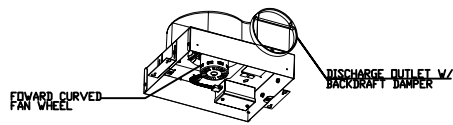
Compliance and Standards:
This design adheres to all relevant codes and standards for geothermal systems, ensuring compliance with both local regulations in the Netherlands and internationally recognized best practices for HVAC systems.

Note:
This HVAC layout plan, designed for a geothermal heating and cooling system, has been developed in strict adherence to the latest codes and regulations applicable in the Netherlands. The following codes and standards have been meticulously followed:

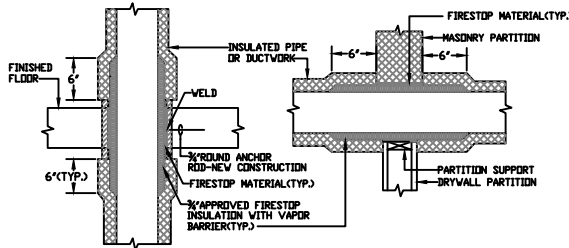
- NEN 7120:2011/A1:2016 - Dutch standard for energy performance of buildings, ensuring compliance with energy efficiency requirements.
- NEN 1078:2004 - Governs the installation and design of heating systems, including geothermal installations.
- NEN 1010:2015 - Ensures electrical installations, particularly in connection with geothermal systems, comply with safety standards.
- NEN-EN 12828:2012 - Regulates the design and installation of heating systems in buildings.
- Bouwbesluit 2012 - The Dutch Building Decree, providing comprehensive guidelines for building safety, health, and energy efficiency.
- BRL KBI 6000 - Certification scheme for the installation of geothermal heat pump systems, ensuring the quality and safety of geothermal HVAC systems.

This plan has been crafted with these updated standards in mind to ensure an efficient, safe, and compliant geothermal heating and cooling system.

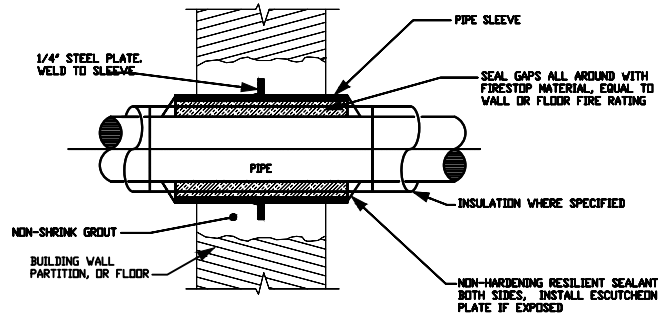
Mechanical Legends	
	GEOTHERMAL AIR HANDLING UNIT
	OUTDOOR CONDENSER
	SUPPLY AIR DIFFUSER
	EXHAUST AIR DIFFUSER
	KITCHEN CHIMNEY
	EXHAUST FAN
	SUPPLY AIR DUCT



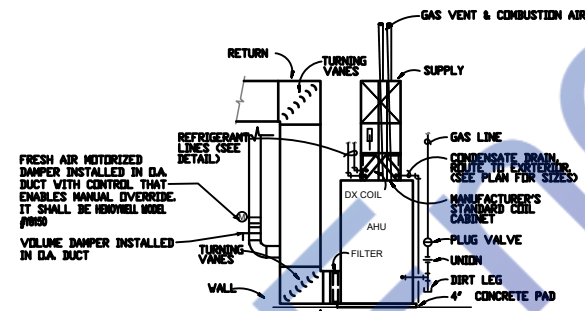
CEILING FAN DETAIL
NOT TO SCALE
CEILING RADIATION DAMPERS SHALL BE
INSTALLED IN ACCORDANCE WITH UL 555C



PENETRATION OF FIRE/SMOKE BARRIERS
NOT TO SCALE
NOTE:
APPLICABLE TO PENETRATIONS OF ALL FIRE RATED MEMBRANES, IN ACCORDANCE WITH
2012 IBC 714. REFER UL LISTED FIRE STOPPING SYSTEMS UL-1479, UL-2043

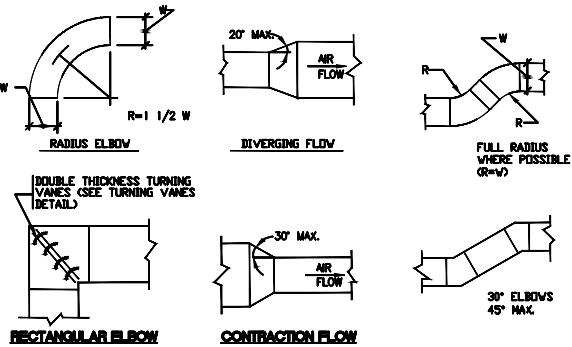


INTERIOR MASONRY WALL AND FLOOR PENETRATION
NOT TO SCALE

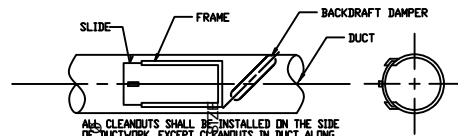


GAS-FIRED AIR HANDLING UNIT DETAIL
N.T.S.

LOW VELOCITY ELBOWS LOW VELOCITY TRANSITIONS LOW VELOCITY OFFSETS

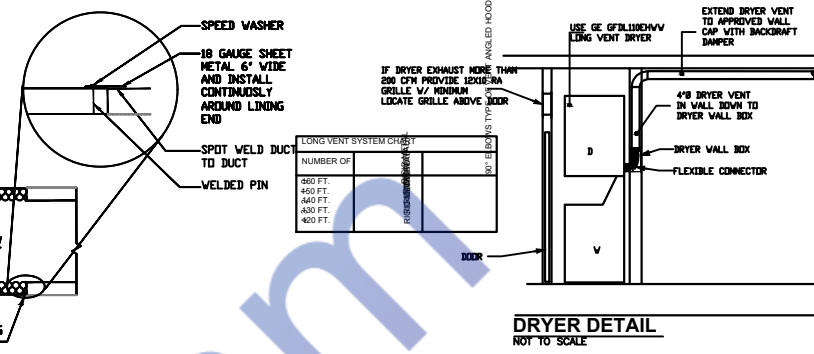


LOW VELOCITY TRANSITIONS, OFFSETS AND ELBOWS
NOT TO SCALE



CLEAN OUT / INSPECTION DETAIL
NO SCALE

TYPICAL SOUND LINING DETAIL
NOT TO SCALE

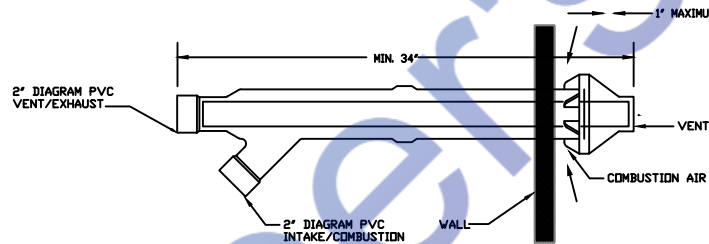


DRYER DETAIL
NOT TO SCALE

RESIDENTIAL GRILLES & REGISTERS SCHEDULE

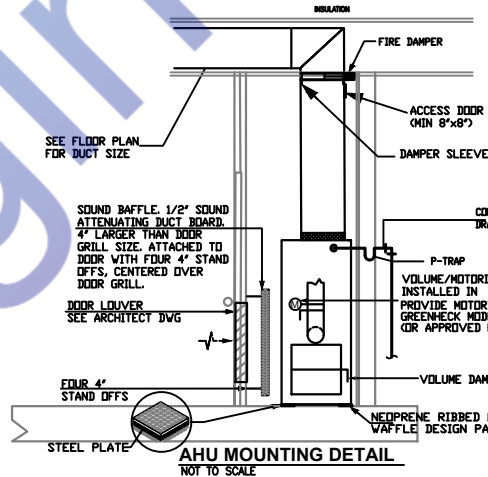
DESIG	TYPE (REFER TO DETAILS)	SERVICE	AIR FLOW RANGE (CFM)	NOMINAL SIZE/ DESCRIPTION (INCH)	INLET/ NECK SIZE (IN)	BASIS OF DESIGN/REMARKS
A	REGISTER	SA	0-50	6x4	4"	300RL, BORDER TYPE A
B	REGISTER	SA	51-100	6x6 OR 10x4	6"	300RL, BORDER TYPE A
C	REGISTER	SA	101-150	10x6	7"	300RL, BORDER TYPE A
D	REGISTER	SA	151-200	12x6	8"	300RL, BORDER TYPE A
E	REGISTER	SA	201-250	14x6	9"	300RL, BORDER TYPE A
F	RG	RA/EA	0-100	6x6	6x6	350RL, BORDER TYPE A
G	RG	RA/EA	101-200	8x8	8x8	350RL, BORDER TYPE A
H	RG	RA/EA	201-300	10x10	10x10	350RL, BORDER TYPE A
I	RG	RA/EA	301-450	12x12	12x12	350RL, BORDER TYPE A
J	RG	RA/EA	451-600	14x14	14x14	350RL, BORDER TYPE A
K	RG	RA/EA	601-800	16x16	16x16	350RL, BORDER TYPE A
L	RG	RA/EA	801-1100	18x18	18x18	350RL, BORDER TYPE A
M	RG	RA/EA	1101-1300	20x20	20x20	350RL, BORDER TYPE A
N	RG	RA/EA	1301-1800	22x22	22x22	350RL, BORDER TYPE A

- NOTES:
1. REFER TO ARCHITECT DRAWINGS FOR TYPE OF CEILING.
2. MODEL NUMBERS IN "BASIS OF DESIGN" ARE TITUS
3. PROVIDE HEAVY DUTY FRAME AND CORE WHERE MOUNTED IN FLOORS.
4. PROVIDE WITH FIRE DAMPER FOR UL LISTED CEILING
5. PROVIDE ROUND TO SQUARE ADAPTOR BOOT

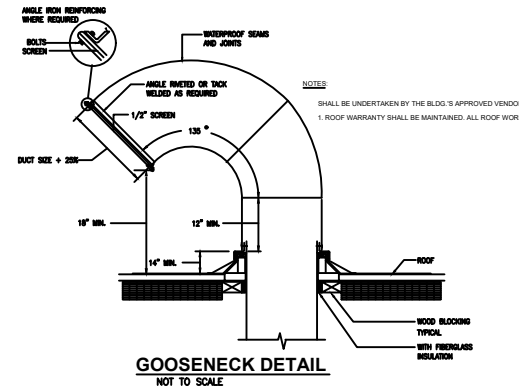


HORIZONTAL VENT TERMINAL/COMBUSTION AIR INLET

NOT TO SCALE
NOTE-PLASTIC PIPE AND FITTINGS USED TO VENT APPLIANCES SHALL BE INSTALLED IN
ACCORDANCE WITH THE APPLIANCE MANUFACTURER'S INSTRUCTIONS. PLASTIC PIPE VENTING
MATERIALS LISTED AND LABELED IN ACCORDANCE WITH UL 1738 SHALL BE INSTALLED IN
ACCORDANCE WITH THE VENT MANUFACTURER'S INSTALLATION INSTRUCTIONS. FLUID PVC PIPING
SHALL NOT BE USED FOR COMBUSTION GAS VENTING.



AHU MOUNTING DETAIL
NOT TO SCALE



GOOSENECK DETAIL
NOT TO SCALE

PROJECT :
Renovation
Houtlaan 2, 2243 CB Wassenaar, Netherlands

TITLE:
HVAC Plan

DRG NO: H2

SCALE: 1/8" = 1' 0" @ A1
REF.NO:
REVISION NO:
PAGE: 09
DATE: 25/08/2024

DESIGNED BY: MD Al Amin
DRAWN BY:
CHECKED BY:
ENGINEER

Watermarkly

REV DESCRIPTION DATE BY CHECKED APPROVED



Designed By Engr. Al Amin (MEP Engineer | Director - Engineer's Team LTD)

 support@engrteam.com

 <https://engrteam.com>

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