

Asphalt Laboratory Testing Equipments List and Recommendation

The main content:

I.Asphalt Laboratory Basic Detectability Requirements and Main Equipments.....	1
II.Recommended Asphalt Equipments	2
III.Asphalt Laboratory Design Scheme.....	20
IV.A Part of Asphalt Laboratory Projects Pictures.....	31



I.Asphalt Laboratory Basic Detectability Requirements and Main Equipments


No.	Test Item	Main Test Parameters	Main Test Equipments
1	Bitumen	1.Density,2.Needle penetration,3.Penetration index,4.Ductility,5.Softening point,6.Solubility,7.Thin film heating test(Quality change,Residue penetration ratio,Softening point increment,9.60℃ viscosity ratio,Aging index),8.Rotary thin film test(Quality change,Residue penetration ratio, 60℃ viscosity ratio, Softening point increment),9.Flash point,10.Fire point,11.Wax content,12.Adhesion of coarse aggregate,13.Kinematic viscosity,14.Dynamic viscosity,15.Standard viscosity,16.Engler viscosity,17.Brookfield rotational viscosity,18.Asphalt chemical constituents(four components),19.Tenacity,20.Toughness,21.Bending creep stiffness test,22.Rheological property(Dynamic shear modulus,Phase angle),23.Fracture property(Failure strain,Breakdown stress),24.Pressure aging container accelerates asphalt aging(Aging time,Aging temperature),25.Performance evaluation of asphalt anti-stripping agent(Asphalt and coarse aggregate adhesiveness,Soaking residual stability, Frozenthawed splitting tensile strength ratio),(1).Emulsified asphalt: 1.Evaporated residue content,2.Residuum on sieve,3.Particle ionic charge,4.Adhesiveness to coarse aggregate,5.Storage stability,6.Mixing test with cement(Residuum content on sieve),7.Demulsification speed,8.Mixing test with mineral aggregate.(2).Polymer Modified Asphalt: 1.Storage stability(Liquate or 48h softening point difference),2.Elastic recovery rate	1.Asphalt pycnometer,2.Scales,3.Thermostatic water bath,4.Penetrometer,5.Ductility machine,6.Softening point tester,7.Oven,8.Thin film heating oven,9.Rotary thin film oven,10.Cleveland Open Cup Flash Point Tester,11.Wax content tester,12.Standard sieve,13.Capillary viscometer,14.Vacuum pressure capillary viscometer,15.Vacuum decompression system,16.Pavement asphalt standard viscometer,17.Engler viscometer,18.Brookfield viscometer,19.Filter sieve(1.18mm),20.Emulsified asphalt particle ionic charge testing apparatus,21.Asphalt emulsion stability test tube,22.Refrigerator,23.Asphaltene extractor,24.High temperature furnace,25.Tenacity tester,26.Bending beam rheometer,27.Dynamic shear rheometer,28.Direct stretch tester,29.Pressure aging vessel
2	Asphalt Mixture	1.Mix proportion design,2.Density,3.Voidage,4.Mineral aggregate voids,5.Saturability,6.Marshall stability,7.Flow value,8.Theoretical maximum relative density,9.Dynamic stability,10.Asphalt content,11.Mineral aggregate gradation,12.Water permeability coefficient,13.Bending test(Bending tensile strength,Maximum bending strain,Bending stiffness modulus),14.Frozenthawed splitting tensile strength ratio,15.Cherenburg asphalt leakage loss,16.Cantabro flying loss,(1).Slurry mixture: 1.Consistence,2.Wear value,3.Demulsification time,4.Cohesion,5.Adhesion sand amount,6.Wheel track deformation (Width deformation rate,Wheel track depth) ,7.Mixing and stirring test(Mixable time),8.Compatibility level,(2).Lignin fibre: 1.Length,2.pH value,3.Ash content,4.Oil absorption,5.Water content,6.Heat resistance	1.Bituminous mixture blender,2.Oven,3.Soaking scales,4.scales,5.Temperature controlled overflow tank,6.Constant temperature refrigerator,7.Marshall compactor,8.Ejector,9.Marshall tester,10.Constant temperature water bath,11.Theoretical maximum relative density instrument,12.Roll forming machine,13.Wheel track testing machine,14.Bitumen extractor(or combustion furnace),15.Standard sieve,16.Sieve shaker,17.Pavement water seepage instrument,18.Universal material tester,19.LVDT displacement sensor,20.Environmental cabinet,21.Asphalt mixture plate cutting machine,22.Frozenthawed splitting special fixture and bar,23.Los Angeles abrasion tester,24.Emulsified asphalt slurry seal mixture consistency instrument,25.Wet wheel abrasion tester,26.Ring test sample,27.Adhesion tester,28.Load wheel tester,29.Rotary bottle abrasion tester,30.Microscope,31.pH test paper,32.Oil absorption rate tester,33.High temperature furnace

II. Recommended Asphalt Equipments



Test material		No	Test project	Instruments	Changji Instruments	Item	Characteristics	Technical parameters	Picture
Asphalt	Bitumen	1	Density	Bituminous pycnometer	Asphalt density and relative density tester	SYD-0603	1. Desktop and unibody design. Stainless steel bath cover. Two temperature regulating system(heating and cooling). The temperature can be controlled automatically. 2. High temperature control precision. Temperature maintaining effect is good. 3. A circulation system is equipped in the constant temperature bath. The bath can be used for a multifunctional purpose.	1. Power supply: AC (220±10%) V, 50Hz 2. Bath volume: 10L 3. Temperature range: (-10~95)℃ 4. Temperature precision: ±0.1℃ 5. Water circulating rate: ≥4L/min 6. Pycnometer: 20ml~30ml 7. Ambient temperature: -10℃~+30℃ 8. Relative humidity: ≤85% ; 9. Dimension: 530mm×400mm×430mm 10. Maximum power consumption: 1100W	
		2	Needle penetration, penetration index	Penetrometer	Penetration tester	SYD-28011	1.The instrument is designed and made as per the standards GB/T4509 Standard Test Method for Penetration of Bitumen, T0604 Bitumen Penetration Test in the standard JTJ052-2000 Specifications and Test Methods of Bitumen and Bituminous Mixtures for Highway Engineering and ASTM D5. 2.The instrument is suitable to determine the penetration of highway bitumen, modified asphalt, as well as liquid petroleum asphalt or residue of emulsified asphalt after evaporation. 3.The penetration of bituminous materials is expressed as the distance that a 100 g±0.05 g standard needle vertically penetrates into the sample without measurable fraction in 5 s at a constant temperature bath of 25±0.1 ℃. It is used for evaluating the consistency of asphalt. The larger the penetration is; the thinner and softer the asphalt is. 4.The instrument can also be used for inspecting industry materials such as solid granule, powder, colloid, as well as food materials such as cream, glycine, etc. It has been widely used in the field of food industry, highway and traffic departments and other departments.	1.Measurement range: 0 penetration~600 penetrations; 2.Resolution: 0.1 penetration; 3.Timing range: 0s~60 s, and the error is less than ±0.1 s. 4.Heating power: 200 W; 5.Temperature controlling accuracy: 25±0.1 ℃ (Note: the ambient temperature should not be higher than 20 ℃); 6.Data saved: 30 groups; 7.Constant temperature bath: harden glass container a.Bath volume:5.5L b.Temperature range: (5.0~100.0)℃ c.Temperature accuracy: ±0.1℃ d.Total consumption:less 1800W e.Outline dimension: 420mm×380mm×900mm(L*W*H) f:Power supply: AC (220±10%) V,50Hz 8.Stirrer: a magnetic stirrer; 9.Standard needle: 2.5±0.05 g and it conforms to the requirements of GB/T4509 and T0604. 10.Shifting holder: It has two ways to adjust the height of standard needle, so it is convenient to let the needle tip just touch the sample surface. 11.Power supply: AC 220 V±10%, 50 Hz. 12.Outline dimension: 280mm×350mm×700mm(L*W*H)	
		3	Ductility	Ductility machine	Asphalt ductility machine	SYD-4508C	1. It adopts humanized design philosophy. There is no leading screw, lead rail or other components in the test trough. The sample can be easily installed in and the maximum measurement distance can reach 1.5m. 2. It adopts high-accuracy digital temperature controller.The resolution is 0.01℃ and accuracy is 0.1℃. 3. It adopts innovative transmission design. The stretching is stable and synchronous. There is no tremble and the speed is uniform.	1. Power supply: AC220V (-5%~+10%), 50Hz 2. Measurement distance: 1.5m (±10mm) 3. Heating mode: Electric heater 4. Heating power: 3000W 5. Liquid circulation: By magnet circulation pump 6. Temperature control range : (5~50)℃ , adjustable. Resolution is 0.01℃ 7. Temperature control accuracy: ±0.05℃。 8. Tensile speed: 10mm/min and 50mm/min, two grades	



						<p>4. Three specimens. Suitable to the test standard for asphalt ductility.</p> <p>5. The specimen can return and positioning automatically after the determination.</p> <p>6. It adopts membrane panel and LCD temperature controller. Water-proof, durable and easy to clean.</p>	<p>9. Measurement accuracy: ± 1 mm。</p> <p>10. Ductility display: Digital display after data processed by a single chip machine.</p> <p>11. Refrigeration: Compressor 1.25P, input power is 950W</p> <p>12. Ambient temperature: $(-10\sim+35)^{\circ}\text{C}$</p> <p>13. Relative humidity: $\leq 85\%$</p> <p>14. Maximum power consumption: 4100W</p> <p>15. Overall dimension: 2365mm×520mm×1000mm</p>	
	4	Softening point	Softening point tester	Automatic asphalt softening point tester	SYD-2806G	<p>1. This instruments adopts microcomputer to control the test. Automatically stir,linear heating, automatically detect the result, automatically print test result.</p> <p>2. The beaker adopts high temperature resisting glass material. The sizes of steel ring and ball can meet standards.</p> <p>3. Small desktop structure. LCD display. Light touch panel. It can determine two samples at a time. Easy to use and results reliable.</p> <p>4. Equips a RS-323C port. Can communicate with PC</p>	<p>1. Power supply: AC 220V $(-5\%\sim+10\%)$, 50 Hz;</p> <p>2. Measurement range: $32^{\circ}\text{C}\sim 160^{\circ}\text{C}$.</p> <p>(1) Heating medium: distilled water(softening point under 80°C)</p> <p>(2) Heating medium: glycerin (softening point over 80°C)</p> <p>3. Temperature resolution: 0.01°C</p> <p>4. Cubage of beaker: 1000 ml</p> <p>5. Stirrer: the stirring speed can be adjusted continuously.</p> <p>6. Heating rate: it will be adjusted to $5.0\pm 0.5^{\circ}\text{C}/\text{min}$ automatically after three minutes</p> <p>7. Heating power: 600 W</p> <p>8. Test result: LCD screen shows results and printer to print.</p> <p>9. Computer communication interface: RS232C communication interface</p> <p>10. Ambient temperature: The temperature should be lower than 35°C and keep stable. There should not have any air draft.</p> <p>11. Relative humidity: $\leq 85\%$</p> <p>12. Total power consumption: ≤ 700 W</p> <p>13. Test sample: 2 samples</p>	
	5	Solubility			No			
	6	Film or rotating film heating tester	Film(or rotating film) heating oven	Asphalt rotating thin film oven	SYD-0610	<p>1. This Oven is composed of electric control component, working oven and mechanical drive. An illuminating light is equipped in the oven for convenient observation.</p> <p>2. There is an air compressor in the oven to supply the air needed for the test. The air can be controlled by a flowmeter on the panel.</p> <p>3. It adopts high precise temperature controller which can meet test requirements.</p>	<p>1. Power supply: AC $(220\pm 10\%)$ V, 50Hz</p> <p>2. Heating power: 2.4kW</p> <p>3. Working temperature: 163°C</p> <p>4. Temperature control precision: $\pm 0.5^{\circ}\text{C}$</p> <p>5. Rotating speed of turn plate: (15 ± 0.2) r/min</p> <p>6. Air flow rate: $(4000\pm 200)\text{mL}/\text{min}$</p> <p>7. Timing unit: Alert at 85 min</p> <p>8. Ambient temperature: $(5\sim 50)^{\circ}\text{C}$</p> <p>9. Relative humidity: $\leq 85\%$</p> <p>10. Maximum power consumption: 2.6kW</p>	
	7	Flash point and fire point	Cleveland open cup flash point tester	Fully-automatic Cleveland open cup flash point tester	SYD-3536D	<p>1.This instrument adopts LCD screen to display and full English man-machine interface. It can preset expected flash point temperature, sample mark number, barometric pressure and other parameters.It has menu prompt and input guide.</p> <p>2.It adopts simulation tracking to display the function curve</p>	<p>1. Power supply: AC 220V$(-10\%\sim+5\%)$, 50 Hz</p> <p>2. Temperature measurement:</p> <p>(1) Full scale: Ambient to 400°C</p> <p>(2) Resolution: 0.1°C</p> <p>3. Repeatability: $\leq 8^{\circ}\text{C}$(Flash point and fire point)</p> <p>4. Reproducibility: $\leq 17^{\circ}\text{C}$(Flash point) ,14°C (fire point)</p>	


						<p>of temperature rising and test time. It has the functions of English mis-operation prompt,test date,test time and other parameters.</p> <p>3.With standard RS232 communication port(can connect with external USB),can store 10 creen,120 groups of history data,be connected with computer to save bulk-storage memory for a long time.</p> <p>4. Automatically calibrate the effect of atmospheric pressure to test and calculate the corrected value.</p> <p>5. Differential coefficient detection.Automatically correct the system deviation.</p> <p>6. Automatically open the lid,detect the flash point and print test data.The test arm automatically rise up and lower down.</p> <p>7.Reasonable design, safe and convenient to operate,electronic igniting gas flame,forced cooling system(note.the manual igniting button on the left side of instrument cabinet)</p>	<p>5. Temperature rising speed: conform to GB/T3536</p> <p>6. Flame application: electronic ignition ; gas flame is about 3.2~4.8 mm in length</p> <p>7. Ambient temperature: 10℃~40℃</p> <p>8. Relative humidity: ≤80%</p> <p>9. Maximum power consumption: 500 W</p> <p>10. Dimension:520mm×360mm×310mm (When test arm is not risen) ,520mm×360mm×420mm (When test arm is risen)</p>	
8	Wax content	Wax content tester	Asphalt wax content tester	SYD-0615	<p>1. This instrument adopts method of distillation cooling to determine the wax content of sample. The instrument has two parts: Upper part contains stirring motor, temperature sensor, air flow distributor and hook for sample vessel. Lower part is the cooling filter.</p> <p>2. The special designed air flow distributor and hook for sample vessel make the instrument more reasonable and convenient for use.</p> <p>3. The constant temperature bath adopts glass material. It has good heat preservation. There is no mist on the observation window. Convenient to observe.</p> <p>4. This instrument equips a high accuracy digital temperature controller with clear temperature show and simple temperature set.</p> <p>5. This instrument is floor-type structure. It can determine 3 samples at the same time. The test efficiency is high.</p>	<p>1. Power supply: AC (220±10%) V, 50Hz。</p> <p>2. Heating power: 700W。</p> <p>3. Cooling power: 1000W。</p> <p>4. Stirring rate of motor: 1200 r/min。</p> <p>5. Temperature sensor: Pt100。</p> <p>6. Refrigeration medium: F22。</p> <p>7. Temperature accuracy: ±0.1℃。</p> <p>8. Working environment: -30℃~40℃, RH<85。</p> <p>9. Total power consumption: ≤1800W。</p> <p>10.Overall dimension: 620mm×500mm×1600mm (The air flow distributor is included)</p> <p>Optional accessories</p> <p>1.Vacuum pump: Model 2XZ-2L/S (Recommend)</p> <p>2.Vacuum drying oven: Model DZF-6020 (Recommend)</p> <p>3. Burning furnace: Model SYD-0615-1 Cracking furnace (Recommend)</p> <p>4. Balance: 0.1mg 、0.1g one set for each</p>		
			Cracking heating furnace	SYD-0615-1	<p>1. This instrument adopts the mode of electric heating ,and the constant temperature can be controlled the range of 550℃+10℃.The heating power can be adjusted continuously and it can satisfy the needs of the distillation of samples .</p> <p>2. The instrument adopts heating furnace and elevator-platform.Two parts are independently and in use two is made one ,it is convenient to use .</p> <p>3. The housing washer of heating furnace adopts humanized design of heat insulation and reduce the effect</p>	<p>1. Power supply: AC(220±10%)V, 50 Hz</p> <p>2. The electric furnace heating power: 2000W</p> <p>3. Heating control: solid adjustable pressure model can be adjusted continuously.</p> <p>4. Constant temperature control: 550℃+10℃</p> <p>5. Ambient temperature: ≤35℃</p> <p>6. Relative humidity: ≤85%</p> <p>7. Total power consumption:≤2100W</p> <p>8. Dimension: heating furnace: 220mm*330mm*400mm elevator-platform:150mm*1750mm*120mm</p>		



						of the heat radiation to the operator . 4. The temperature controller adopts LCD display, single chip control technology. Advanced technology and small overshoot .It can reach to 550℃+10℃constant temperature ,which only needs 15 minutes at normal atmospheric temperature.	9. Weight: 5kg	
				Vacuum drying oven	DZF-6020		1.Chamber material:stainless steel 2.Temperature range:room temperature~250℃ 3.Accuracy:±1℃ 4.Vacuum degree:<133pa	
				Vacuum pump	2XZ-2		1.Extreme pressure:6×10-2 (pa) 2.Rotate speed:1400r/min	
	9	Adhesion to coarse aggregate			No			
	10	Kinematic viscosity	Capillary viscometer	Petroleum product kinematic viscometer	SYD-265E (180℃)	1.High precision digital temperature controller. Electric stirring motor. 2.High temperature resistant glass bath. Double layer structure. 3.Desktop structure. All-in-one design. 4.The maximum heating temperature is 135℃(or 180℃).	1. Power supply: AC 220 V±10%, 50 Hz 2. Heating power: 1700 W 3. Temperature range: Ambient to 135.0℃(or 180℃). 4. Temperature control accuracy: ±0.1℃ 5. Mercury-in-glass thermometer: Scale division 0.1℃. Range 100℃~150℃(for maximum 135.0℃) Range 100℃~150℃ and range 150℃~200℃(for maximum 180.0℃) 6. Bath capacity: about 23 L 7. Sample quantity: You can make determination using 3 capillary viscometers at a time. 8. Stirring motor (1) Power: 6W (2) Speed: 1200 RPM 9. Ambient temperature: -10℃~+35℃ 10. Relative humidity: <85% 11. Temperature sensor: RTD, Pt100 12. Maximum power consumption: 1800 W 13. Capillary viscometer: One group of Cannon-Fenske Opaque capillary viscometers; 7 pieces in total. They are N0.200, 300, 350, 450, 500 and 600 (The inner diameters of R tube of them are 1.02, 1.26, 1.48, 1.88, 2.20, 3.10 and 4.00 mm respectively). 14. Overall dimension: 530mm×400mm×670mm (Bath is included)	
	11	Dynamic viscosity	Vacuum pressure capillary viscometer, vacuum pressure system	Bitumen dynamic viscosity tester	SYD-0620B	1. It has a data base for coefficients of capillary viscometers. It can save 10 groups of coefficients at most. Operator can callout the data whenever need. 2. It adopts high accuracy pressure sensor. The vacuum degree can be kept at 300mmHg±0.5mmHg. It can be shown on the screen clearly. 3. The system will ignore the results which timing is less than 60s and enter next measurement step. The system will calculate the viscosity automatically for the results	1. Temperature control mode: Point controlled by digital temperature controller. 2. Temperature control arrange: 0.00℃~100.00℃ 3. Temperature control accuracy: ±0.01℃ 4. Pressure range: 300mmHg±0.5mmHg 5. Timing mode: 4 built-in timer. Can do timing for 4 capillary viscometers 6. Timing range: 0.0s~99999.9s (27.7h); Bias ≤0.02% 7. Measurement range: About 18 Pa.s~580000Pa.s	




						<p>which timing is beyond 60s.</p> <p>4. Operator can choose and set automatic calculation of average value and bias percentage for 2~4 parallel tests at will. The calculation can be done for several times to remove the unsatisfied results for operator. The test report can be printed.</p>	<p>8. Test samples: 4 samples</p> <p>9. Operation interface: Touch-type colored LCD</p> <p>10. Power supply: AC (220±10%) V, 50Hz</p> <p>11. Ambient temperature: 5℃~50℃</p> <p>12. Relative humidity: ≤85%</p> <p>13. Overall dimension: 590mm×430mm×630mm</p> <p>14. Net weight: 32.5kg (no water in bath)</p> <p>15. Maximum power consumption: 1800W</p> <p>Optional part:</p> <p>1. Capillary viscometer washer: SYD-0620-3 Capillary Viscometer Washing Apparatus</p>	
	12	Standard viscosity	Pavement asphalt standard viscometer	Asphalt standard viscometer	SYD-0621	<p>The instrument use the high precision temperature controller, the accuracy is 0.1℃.</p>	<p>1. Power supply: AC 220 V±10%, 50 Hz</p> <p>2. Circular trough:</p> <p>(1) Inner diameter: 160 mm</p> <p>(2) Depth: 116 mm</p> <p>3. Sample tube: four pieces in a set. The diameter of effuse tube is: φ10 mm±0.025 mm, φ5 mm±0.025 mm, φ4 mm±0.025 mm and φ3 mm±0.025 mm.</p> <p>4. Ball stopper specification:</p> <p>A: Diameter of ball: 12.7 mm±0.05 mm; Sign height: 92 mm±0.25 mm.</p> <p>B: Diameter of ball: 6.35 mm±0.05 mm; Sign height: 90.3 mm±0.25 mm.</p> <p>5. Temperature controlling range: room temperature~90℃.</p> <p>6. Temperature controlling accuracy: ±0.1℃</p> <p>7. Time resolution: 0.1 s, maximum time value: 999.9 s</p> <p>8. Heating type: electric heater. Use a circulation pump circulating water bath liquid to control the temperature in the circular trough. Heating power is 600 W.</p> <p>9. Ambient temperature: -10℃~35℃</p> <p>10. Relative humidity: ≤85%</p> <p>11. Dimension: length 420 mm, width 340 mm, height 570 mm</p> <p>12. Maximum power consumption: 700 W</p>	
	13	Engler viscosity	Engler viscometer	Asphalt Engler viscometer	WNE-1C	<p>1. The instrument is composed of tester and temperature controller. Desktop structure. Both of inner and outer crucible adopt stainless materials. Inner crucible has been specially processed. The smooth finish corresponds with the test requirements.</p> <p>2. PID temperature controller. The parameters set is convenient. The temperature control precision is high.</p>	<p>1. Standard water value: 51±1 s (Water temperature 20±0.1℃; 200 ml; It can be converted into water value at 25±0.1℃, 50 ml)</p> <p>2. Temperature range: 0℃~100℃</p> <p>3. Temperature control accuracy: ±0.1℃</p> <p>4. Thermometer: In accordance with T0622</p> <p>5. Flask: 100 ml</p> <p>6. Inner container: Made of stainless steel</p> <p>7. Power of heater: 550 W</p> <p>8. Timer accuracy: 1/100 s</p> <p>9. Outline dimension: 200 mm×200 mm×400 mm (L×W×H, without temperature controller)</p>	

							<p>Optional accessories</p> <p>1.Receiving flask: (200ml) 2 pieces</p> <p>2.Engler thermometer: 0~60℃,scale mark 0.5℃ 1 piece</p> <p>3.Engler thermometer: 50~110℃,scale mark 0.5℃ 1 piece</p>	
	14	Rotational viscometer	Brookfield viscometer	Brookfield rotational viscometer	NDJ-1C	Determine absolute viscosity of Newtonian liquids and apparent viscosity of Non-Newtonian liquids,determine viscosity of asphalt, hot melt adhesive, paraffin, high polymer, and various fluids.	<p>1. Measurement range: 100 mPa•s~2×105 mPa•s (If you select the No.30 spindle, the measurement range can be extended to 4×105 mPa•s)</p> <p>2. Spindle: No.21, 27, 28 and 29 total 4 pieces of spindles (the No.30 spindle is optional)</p> <p>3. Rotation speed: 5RPM, 10 RPM, 20 RPM, and 50 RPM</p> <p>4. Measurement error: ±2% (F•S); (If you select the No.30 spindle, it will be ±3% (F•S))</p> <p>5. Temperature control range: 45 ℃~200 ℃</p> <p>6. Temperature control accuracy: ±0.1 ℃</p> <p>7. Sample cylinder: 20 ml</p> <p>8. Power supply: AC 220V±10%, 50 Hz</p> <p>9. Ambient temperature: 5 ℃~35 ℃ (when the controlling temperature is close to ambient temperature, please run the air conditioner to let the ambient temperature be 5 ℃ lower than the controlling temperature)</p> <p>10. Relative humidity: ≤80%</p> <p>11.Printing output:needle printer</p> <p>12.Comunication port:RS232 port</p> <p>Optional accessories</p> <p>1.NDJ-1C Brookfield Viscometer and Computer communication software(CD)</p> <p>2. 300℃ high temperature heating furnace</p> <p>3. 30# rotator</p>	
	15	Bituminous chemical composition(four-component)	Asphaltene extractor	Petroleum asphalt four-component tester	SYD-0618B	Measuring petroleum asphalt saturate, aromatic, resin and asphaltene four components.	<p>(I) Heating furnace</p> <p>1. Electric heater power range: 100W ~ 1000W, stepless adjustable;</p> <p>2. Dimension: 270mm × 160mm × 115mm (length × width × height);</p> <p>3. Total power consumption: less than 1200W.</p> <p>(II) Circulating water bath --HWY-10 multifunction circulation water bath</p> <p>1. Bath volume: 10L;</p> <p>2. Temperature range: -10 ℃ ~ 95 ℃;</p> <p>3. Constant temperature accuracy: ± 0.2 ℃;</p> <p>4. The cycle of water: ≥4L / min;</p> <p>5. Dimensions: 530 mm × 400 mm × 430 mm (length × width × height);</p> <p>6. Total power consumption: less than 1100W.</p> <p>(III) Base and column</p> <p>1. Base size: 345mm × 210 mm;</p>	


							<p>2. Column total height: 1120 mm.</p> <p>Optional accessories</p> <p>1. Vacuum drying oven: a vacuum of 267Pa (2 mm Hg);</p> <p>2. High temperature furnace: 0 ℃ ~ 1000 ℃, there is an automatic temperature controller;</p> <p>3. Balance: Weighing 120g, the sense of the amount of 0.1mg.</p>	
	16	Tenacity	Tenacity tester	Asphalt tenacity tester	SYD-0624	<p>1.The instrument adopts the requirements of traffic industry and chemical industry .It can choose 300mm or 610mm stretch elongation .The tensile testing machine adopts double wire rod design.Stable and reliable operation , it also has high measuring precision .</p> <p>2.The test software that we designed can draw load changing curve ,calculate the tenacity and toughness automatically and print test report .</p> <p>3.The instrument test and test results calculation can be finished by the computer.It is convenient to use .</p> <p>4.The design of the control panel is simple ,it can be easy to operate and finish the determination by the uplink key ,down key and the stop key.The test results calculation can be finished by the computer automatically .</p> <p>5.It is equipped with A4 printer,so it can automatically draw and print out load-deformation curve ,and tenacity of asphalt .</p> <p>6.The instrument adopts advanced design ,making fastidious ,beautiful appearance and simple operation.It also has noble character for high grade instrument.It is ideal choice of relevant construction ,supervision,scientific research institutes and colleges.</p> <p>The best characteristic :it can operate and control the whole procedure by computer.And it can realize the test automatically for the tenacity of asphalt.</p>	<p>1.Drag speed:(500mm+10mm)/min;</p> <p>2.Max drag force:1000N;</p> <p>3.Dragging force un-linear error:<0.5%;</p> <p>4.Dragging force sampling interval:0.5mm;</p> <p>5.Max dragging length:610mm;</p> <p>6.Power supply:AC220V+10%,50Hz;</p> <p>7.Maximum power consumption:≤500W;</p> <p>8.Dimension:520mm*400mm*1220mm.</p> <p>Choice of the accessories</p> <p>1.Constant temperature water bath:HWY-10 multifunctional circulation constant temperature water bath(recommend)</p>	
	17	Flexural creep stiffness test			No			
	18	Rheological property			No			
	19	Fracture property			No			
	20	Pressure aging accelerates asphalt aging(aging time,aging temperature)	Pressure aging vessel	Bitumen pressure aging vessel system	PAV-1	<p>1. This system is composed of PAV-1-1 pressuring aging vessel and PAV-1-2 aging vacuum vessel.</p> <p>2. This system is equipped with a PC. The high pressure aging test is controlled by a PC. All test procedures can be controlled by a PC.</p>	<p>(1) PAV-1-1 pressuring aging vessel</p> <p>1.Electricity</p> <p>Power supply: AC (220±10%) V、50Hz</p> <p>Rated power: 1100W</p> <p>Rated current: 10A</p> <p>2.Vessel</p> <p>Volume: 13L</p> <p>Medium: Air</p> <p>Rated working temp.: 110℃±5℃</p> <p>Rated working pressure:2.1MPa</p>	

Emulsified asphalt							Designed pressure: 2.2 MPa Water pressure: 2.75 MPa Safety valve opening pressure: 2.15 MPa Explosive pressure for rupture disk: 2.6 MPa 3. Pressure controller Model: WP962-2(WP-D90) Precision: ±0.01MPa 4.Temperature and time controller Model WP962-1(WP-D90) Temperature control precision: ±0.1℃ Grading: 64×1080min Outage maintaining function: Yes Dimension 630mm×450mm×500mm (2) PAV-1-2 aging vacuum vessel 1.Electricity Power supply: AC (220±10%) V、50Hz Rated power: 900W Rated current: 10A 2.Vessel Volume: 13L Medium: Air Rated working temp.: 180℃±5℃ Rated working pressure: Absolute pressure 15kPa Pressure control mode: Electric contact pressure gauge 3. Temperature and time controller Model XMT-E55T2 Temperature control precision: ±0.1℃ Time control mode: Button 4. Dimension 560mm×390mm×350mm	
	21	Performance bottleneck of asphalt anti-stripping agent (adhesion between asphalt and coarse aggregate, residual stability in water immersion, ratio of tensile strength of freeze-thaw cleavage)			No			
	22	Evaporated residue content			No			
	23	Sieve residue quantity			No			
	24	Particle ion charge	Emulsified asphalt particle ion charge testing equipments	Emulsified asphalt particle ionic charge tester	SYD-0653	1. Desktop structure. Novel design and easy to use. 2. All test tools and vessels fully meet requirements of standard T 0653. 3. The outer shell are processed with spraying plastics. It has good anti-corrosive ability.	1. Power supply: AC(220±10%)V,50Hz 2. Working temperature: Room temp.<35℃ 3. Timing accuracy: 3min±6s 4. Capacity of beaker: 300ml 5. Test voltage: DC(6V±0.3V) 6. Dimension: 280mm×180mm×260mm	
	25	Adhesion to coarse aggregate			No			
	26	Storage stability	Asphalt emulsion stability test tube	Emulsified asphalt storage stability tester	SYD-0655	Determination of various types of emulsified asphalt storage stability	1. Base with 10 mm chrome-plated steel plate, stable and reliable; 2. The glass tube holder structure is unique and can be adjusted up and down; 3. Overall design structure is reasonable, elegant	



Polymer modified asphalt							appearance. II. Main technical specifications 1. Glass tube: The effective height 310 mm ± 10mm;Mark line 250ml; Sample loading entrance Φ32 mm ± 0.1mm. 2. Dimension: 210 mm × 110 mm × 370 mm (length × width × height). Optional accessories 1. Balance: Weighing 1000g, the sense of it not more than 0.1g; 2. Filter screen: Sieve to 0.18μm.	
	27	Mixing test with cement (sieve residue content)			No			
	28	Demulsification speed			No			
	29	Mixing test with mineral aggregate			No			
	30	Storage stability(segregation or 48h softening point difference			No			
	31	Elastic recovery rate	Elastic recovery test	Bitumen ductility machine	SYD-4508G	<p>1. It adopts humanized design philosophy. There is no leading screw, lead rail or other components in the test trough. It adopts innovative transmission design. The stretching is stable and synchronous. There is no tremble and the speed is uniform. The sample can be easily installed in and the maximum measurement distance can reach 1.5m.</p> <p>2. It can determine ductilities of three samples and tensile forces of two sample by one analysis.</p> <p>3. It adopts PC control technology. The temperature control accuracy is high. It has the function of automatic specimen positioning. The ductility determination can be operated remotely. Equipped with a communication port, it achieves the communication with PC conveniently.</p> <p>4. It adopts large LCD to show the temperature, ductility, tensile force clearly.</p> <p>5. It equips a needle micro-printer to printer out the test results automatically(Ductility, average value, maximum tensile force and the changing curves).</p> <p>6. The specimen can return and positioning automatically after the determination.</p>	<p>1. Power supply: AC (220±10%) V,50Hz</p> <p>2. Measurement distance: 1.5m (±10mm)</p> <p>3. Heating method:Electric heater</p> <p>4.Bath circulation:Strong magnetic circulation pump to circulate the bath liquid</p> <p>5. Temperature control: Range: 5℃~50℃, Temperature display resolution: ±0.01℃</p> <p>6.Accuracy:±0.1℃</p> <p>7. Tensile speed: 10mm/min and 50mm/min</p> <p>8.Accuracy: ±1mm</p> <p>9.Ductility display:Real-time display on screen</p> <p>10.Ductility record:</p> <p>a.record through the wireless ductility recorder(remote controller)</p> <p>b.record through the ductility recorder 1/2/3 keys of touch screen</p> <p>11.Tensile test: Range: (0~300)N,resolution: 0.1N</p> <p>12.Accuracy: ±1N</p> <p>13.Data output:</p> <p>(1) Communication port RS232</p> <p>(2) Printed by micro-printer</p> <p>14.Refrigeration: Compressor</p> <p>15.Ambient temperature: (-10~+35)℃</p> <p>16.Relative humidity: ≤85%</p> <p>17.Maximum power consumption: 4100W</p> <p>18.Overall dimension: 2365mm×530mm×950mm(L*W*H)</p>	
	32	Water bath	Thermostatic water bath	Low temperature thermostatic water bath	HWY-1	1.Adopting stainless steel bath container and operating platform,spraying plastics tank,transparent glass bath cover,strong anti-corrosion capacity,convenient observation.	<p>1. Power supply: AC 220 V (-5%~+10%), 50 Hz;</p> <p>2. Size of water bath: 370mm ×300mm ×300mm;</p> <p>3. Suitable water cubage: 28 L;</p> <p>4. Heating device: Electric heater, power is 1300 W;</p>	


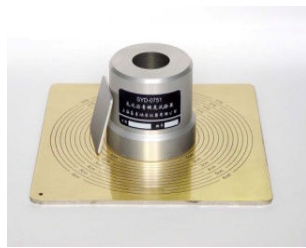

						<p>2.With high precision LCD display temperature controller,circulating pump works in liquid of bath,completely circulation,uniform temperature of inner container,high precision temperature control,elegant appearance.</p> <p>3.Big volume,reasonable design,convenient operation.</p>	<p>5. Refrigeration device: refrigeration compressor of new type;</p> <p>6. Temperature controlling range: 5 ℃~80 ℃;</p> <p>7. Temperature controlling accuracy: ±0.1 ℃;</p> <p>8. Ambient temperature: ≤30 ℃;</p> <p>9. Relative humidity: ≤85%;</p> <p>10. Total power consumption: not more than 2000 W;</p> <p>11. Size: 750mm ×540mm × 580mm;</p> <p>12. Net weight: 30 kg;</p>	
		33	Balance					
		34	Drying oven					
		35	Standard sieve					
		36	Filter sieve(1.18mm)					
		37	Refrigerator					
		38	High temperature furnace					
		39	BBR Bending beam rheometer					
		40	DDT Direct tension tester					
Bituminous mixture	Bituminous mixture	41	Mix design (Density, voidage, mineral clearance rate, saturability)	Marshall compaction test apparatus	Marshall electric compactor	<p>SYD-0702A-1</p> <p>1.The instrument adopts the new advanced electroplating process,metal yogon,high hardness,good abrasion resistance.</p> <p>2.With the electric control method to realize the automatic lifting of heavy hammer,self-locking,the start button - raise automatically,automatic stop,automatic reset,It will decrease the operators' working strength and simplify the work procedure.</p> <p>3.The instrument with dual use function,it can be used in both Φ101.6mm×63.5mm cylinder mold and Φ152.4mm×95.3mm big cylinder mold.</p> <p>4.Tthe electric control adopts the large color touch screen technology,and has the key control to realize the double insurance.It's convenient operation and high accuracy control.</p> <p>5.mold accurate positioning,dead locking structure of compaction test mold,safe reliability of instrument operation.</p> <p>6.Preset the compaction times to realize the automatic compaction technology.It's convenient to debug and do self-inspection.</p> <p>7.With the automatic emergency stop button,it can stop at any time and any condition by pressing the button.</p>	<p>1. Hammer 1: 4536g±9g(Φ 101.6mm×63.5mm mold)</p> <p>2. Hammer 2: 10210g±10g(Φ 152.4mm×95.3mm mold)</p> <p>3. Fall of Hammer: 457mm±1.5mm;</p> <p>4. Compaction speed: (60±5)times/min</p> <p>5. Compaction times: (0~999)times</p> <p>6. Wooden compaction pedestal: 457mm×200mm×200mm</p> <p>7. Concrete compaction pedestal: 120mm×460mm×480mm</p> <p>8.Lifting motor power: 0.01KW</p> <p>9.Color touch screen: 480x270 mm</p> <p>10.Power supply: AC (220±10%) V,50Hz</p> <p>11.Motor power: 370W</p> <p>12.Work environment:temperature -10 ℃ ~ 35 ℃ ,relative humidity ≤85%</p> <p>13.Outline dimension: 1950mm×540mm×540mm</p> <p>14.Net weight: About 180kg</p> <p>Optional accessory</p> <p>1. Mold professional ejector</p> <p>2. Asphalt mixture blender: SYD-F02-20 automatic asphalt mixture blender(recommended)</p>	
		42		Ejector	Electro-hydraulic ejector	<p>SYD-200S</p> <p>1. Multifarious specimens to demould</p> <p>1)Marshall mold</p> <p>Specimen dimension: Φ 101.6 mm×63.5mm; Φ 152.4 mm×95.3mm</p> <p>2)Cement compression resistance mold</p> <p>Specimen dimension: Φ 150mm×150mm; Φ 100×</p>	<p>1.Peakload: 20T</p> <p>2.Maximun stripper length: 240mm</p> <p>3.Oil pump working pressure: 30MPa</p> <p>4.Demoulding speed: 200mm/min</p> <p>5.Motor power: 1.1kW</p> <p>6.Power supply: AC380V/50Hz</p>	


						<p>100mm; $\Phi 50 \times 50$mm</p> <p>3)Earthwork heavy(light) type compactor mold Volume:2177cm³,997cm³</p> <p>2. Effective demould and noiseless</p> <p>3. All steel material,sturdy and durable.</p> <p>4. Bi-direction work oil cylinder,free up and down</p>	<p>7.Machine gross weight: 200kg</p> <p>8.Outline dimension: 530mm×500mm×1050mm(L*W*H)</p>	
	43		Wheel-track molding machine	Pneumatic Wheel-Track Molding Machine	SYD-0703-1	<p>1.Adopting the touch screen to control and display,the savable work parameters,easy operation and convenient set.</p> <p>2.Real-time display the work process and related data.</p> <p>3.Self-diagnostic function,and fault code hint.</p> <p>4.The wheel-track pressure by pneumatic control:0 to 20 kN,freely adjustable within the range</p> <p>5. Mold thickness range:(30~100)mm,freely adjustable within the range</p> <p>6.The clamping structure to install the sample is reliable,safe and convenient.</p> <p>7.It can set the temperature of the grinding wheel freely according to the test requirement,wide temperature control range,high precision,good stability,adopts PWM adjustment method to realize the temperature PID control and real time display the current temperature.</p> <p>8.Two processes to compacting the mold sample.Each step can be completed autotmatically and reduced the operation sequence to realize the one-key completion.</p> <p>9.High precision to control the compaction load,and real-time display the current pressure value during the compacting process.</p>	<p>1.Mill pinion specification :radius is 500mm ,width is 300mm ,</p> <p>2.Mill pinion compaction load control range :(200~700)/cm (adjustment at random,300N/cm before delivery)</p> <p>3.Mill pinion compaction load controlling accuracy :+3N/cm ;</p> <p>4.Mill pinion temperature controlling range : ambient temperature ~200℃</p> <p>5.Mill pinion temperature controlling accuracy :+5℃ ;</p> <p>6.Compaction speed: 6 times/min ±0.5time/min</p> <p>7.Compaction times: software set,default P1 as 4 times,P2 as 12 times</p> <p>8.Test mode specification :300mm*300mm*(30~100)mm:</p> <p>9.Outline dimension :1200mm*700mm*2000mm(L*W*H)</p> <p>10.Total weight :350kg ;</p> <p>11.Work air source: pressure 0.7Mpa,gas displacement 40L/min</p> <p>12.Power supply :AC380V,50Hz,3.0kW (three-phase four-wire system ,yellow and green cable as zero line)</p>	
	44		Gyratory compactor	Bituminous mixture gyratory compactor	SYD-XY-150-1	<p>1. Adopting the high hardness high quality steel as the frame to ensure the high accuracy of angle control.</p> <p>2.Electro-pneumatic servo control adjustment,it can measure and real-time display the rotary angle of the model,compaction pressure,sample compactness,rotary times etc.important parameters during the process of compaction.</p> <p>3.Color display screen and touch control system,the PC port to connect with the PC directly and display all kinds of curve graph.There are no interference between PC and the touch screen to realize the joint control of the instrument.</p> <p>4.Easy to set the rotary angle,compaction pressure,rotary speed,rotary times etc.measurement parameters,and to save,plot and print the results of compaction test.</p> <p>5.With two types operating scheme to finish the compaction molding: ①presetting rotary times. ②</p>	<p>1. Movement range for compactor: (0~250) mm</p> <p>2.Moding sample height range: (50~170) mm</p> <p>3.Rotary compaction movement accuracy:less 0.10mm</p> <p>4. Range of gyrate compaction angle: (0~2) ° , ±0.02° adjustable. (Calibrated at 1.16°±0.02° internal angle when leaving factory)</p> <p>5. Rotary compaction pressure: (0~1000) Kpa±3%, (Calibrated at 600Kpa±2% when leaving factory,bigger pressure can be customizable)</p> <p>6. Rotation speed: 30±0.3) r/min,customizable continuous adjustable speed</p> <p>7.Spining times: 0~999</p> <p>8.Displace measurement: (0~220) mm</p> <p>9.Test model diameter: standard $\Phi 150$mm,optional $\Phi 100$mm</p> <p>10.Pressure mode: pneumatic</p> <p>11.Instrument dimension: 850mm×640mm×</p>	


						presetting appoint height. 6.Port configuration:1 USB port,1 RS232 port. 7.Integrated inner stripper 8.Optional:to heat the model rotary room.	1800mm(L*W*H) 12.Package dimension: 1000mm×800mm×1950mm(L*W*H) 13.Model weight:7.5kg 14.Gross weight:350kg	
	45		Temperature control overflow tank	Compacted bituminous mixture density tester	SYD-0705	1. The instrument has many uses of one machine, and it can satisfy the requirement of the Industry Standard of People's Republic of China JTG E20-2011 "Highway Engineering Bitumen and Bituminous Mixtures Test Code" and calculate the density and relative density according to surface drying method, water weight method, wax sealing method and volumetric method. 2. The instrument adopts microcomputer controlling water bath temperature, and the operation is convenient, easy and reliable. 3. The electronic control box of the instrument adopts the detachable structure, and it can realize the circuit connection of the electric controlling box and water bath controlling temperature, water tank liquid level control and water bath circulatory stirring by the aviation plug and socket. 4. The instrument adopts high accuracy electric balance, and it has wide measuring range, high measuring accuracy .The work is stable and reliable. 5. The overflow water tank adopts stainless steel material .It is durable and clean conveniently .It can refill and stabilize water level automatically, convenient to operate. 6. The instrument adopts electric lifting structure, and the motor adopts handspike motor .Stable operation and lower noise .It can reduce labor intensity effectively. 7. The working table adopts natural marble material .It provides a stable bench for electric balance.	1.Effective volume of the water bath: 83L 2.The power of the refrigeration compressor: 1/4 P 3.Power of heating element: 1.3kw 4.Flow rate of circulation water pump: 10L/min 5.Electric balance Max.weight: 15kg Reciprocal sensibility: 0.1kg 6.Water bath controlling temperature accuracy: (25+0.5)℃ 7.Power supply: AC(220V+10%)V,50Hz 8.Maximum power consumption: ≤1600w 9.Dimension: 930mm*750mm*1150mm	
	46		Submerged balance					
	47		Thermostatic water bath	Thermostatic water bath	SYD-501A	1. With stainless steel water container,strong anti-corrosion,elegant appearance. 2. With high precision,LCD display temperature controller,high temperature control accuracy 3. .With circulating pump to ensure the liquid circulation of water bath,completely circulation,uniform temperature in bath. 4.Reasonable design,convenient operation,high precision of temperature control.	1. Power supply: AC220V±10% 50Hz 2. Volume of water bath: 48L,480 mm×330 mm×320 mm (L×W×H) 3. Temperature control range: Room temperature+10℃～70.0℃ 4. Temperature control accuracy: ±0.1℃ 5.Heating device:Electric heater,power 1000W 6. Circulating water: Automatic magnetic circulating pump 7. Ambient temperature: ≤30℃ 8. Relative humidity: ≤85% 9. Outline dimension: 740 mm×420 mm×410 mm (L×W×H) 10.Total power consumption: Less 1100W	


		48	Marshall stability, flow value	Marshall tester	Marshall stability tester	SYD-0709A-1	<p>1.Adopting the advanced technologies including sensor and microcomputer processing,it can automatically measure,calculate and process to kinds of test data,and realize the automatic and intelligent operation during the test procedure.</p> <p>2.With high precision instrument amplifier and overturn function,imported color large screen PLC controller,directly display the stability value,flow value,curves,results and test time.</p> <p>3. 100 groups of test data and test time can be stored in the instrument and call out whenever needed. All procedures will be controlled automatically.</p> <p>4. RS232 communication port. Realize the communication with upper computer. The data process, store, print and display can be controlled by a PC. Also the test procedures can be controlled by a PC.</p> <p>5. The instrument use the advanced plating technology,metal yogan,high hardness,abrasion resistance and durable service.</p> <p>6.This instrument also has functions for manual lifting, lowering and stopping. Convenient to use.</p>	<p>1.Maximum load: 50kN</p> <p>2.Measuring range: $\leq 40\text{kN}$</p> <p>3.Overload protection: Automatically protect when load is over 39kN</p> <p>4.Measuring bias: $\leq \pm 0.1\text{kN}$</p> <p>5.Vertical deformation (flow value): Range 0~20mm, bias $\leq \pm 0.05\text{mm}$</p> <p>6.Lifting rate for pressure machine: $(50 \pm 5)\text{mm/min}$</p> <p>7.Communication port: RS232</p> <p>8.Motor power: 550W</p> <p>9.Power supply: AC220V$\pm 10\%$, 50Hz</p> <p>10.Overall power consumption: Less 800W</p> <p>11.Ambient temperature: $0^{\circ}\text{C} \sim 60^{\circ}\text{C}$</p> <p>12.Dimension: 650mm\times380mm\times840mm(L*W*H)</p> <p>13.Net weight: 98kg</p> <p>Optional accessories</p> <p>1,Constant water bath: HWY-1 low temperature constant water bath(recommended)</p>	
		49	Theoretical maximum relative density	Theoretical maximum relative density tester	Bituminous Mixtures Theoretical Maximum Specific Gravity Tester	SYD-0711A	<p>1. It adopts single chip machine technology to vacuumize, shake, fill air and relieve pressure automatically.</p> <p>2. Equipped with a high-accuracy absolute pressure sensor, the negative pressure can reach 3.7 kPa± 0.3 kPa.</p> <p>3. The working status of the vacuum pump can be reflected by a vacuum meter.</p> <p>4. It equips a water buffer device to prevent the water in the negative pressure container from flowing into the vacuum pump.</p> <p>5. It can determine two samples at the same time.Test efficiency is high.The structure is reasonably designed. It is easy to use.</p>	<p>1. Power supply: AC(220$\pm 10\%$)V, 50Hz.</p> <p>2. Volume of vessel: 4000ml$\times 2$</p> <p>3. Power of vacuum pump: 160W</p> <p>4. Negative pressure: 3.7 kPa (27.75mmHg).Allowable bias is ± 0.3 kPa.</p> <p>5. Power of shaking machine: 30W</p> <p>6. Dimension: 510mm\times520mm\times380mm</p> <p>Optional accessory</p> <p>1. Constant temperature water bath: HWY-1</p> <p>Low-temperature water bath</p>	
		50	Dynamic stability			No			
		51	Asphalt content	Asphalt content tester(combustion furnace method)	Asphalt content tester	SYD-6307	<p>1. The body of the combustion furnace adopts aerospace insulation materials .It has good warm-keeping effect and short preheating time .The heating rate is rapid and it can arrive to standard temperature 538$^{\circ}\text{C}$ in the 30 minutes .</p> <p>2. It has good heat insulation characteristic ,when the inner of the furnace body arrives to the standard temperature , the temperature of outer furnace body will be lower than 45$^{\circ}\text{C}$,and it has high operation safety ,for avoid the influence of the high temperature on the electronic scales measurement accuracy .</p> <p>3. It adopts the second combustion function and high</p>	<p>1. Max. sample weight : 4000g , recommended sample weight :(1000~2000) g .</p> <p>2. Combustion chamber maximum temperature :800$^{\circ}\text{C}$,accuracy :$\pm 5^{\circ}\text{C}$,standard working temperature :538 $^{\circ}\text{C}$</p> <p>3. Maximum temperature after burning : It can reach to 900 $^{\circ}\text{C}$.</p> <p>4. Combustion and filtration : It adopts after-burner the second combustion and high temperature filtration technology. The test exhaust emission can reach the standard.</p> <p>5. Balance accuracy :0.1g ,range of balance :10kg(American</p>	

						<p>temperature filtration technology .The test exhaust emission reach the standard .</p> <p>4. The function of the software is powerful .It can display temperature ,sample weight ,weight loss ,correction coefficient ,asphalt content and asphalt aggregate ratio .</p> <p>5. The temperature adopts fuzzy control plan,the temperature controlling accuracy is high and it has good stability</p> <p>6. Safety protection ,no use organic solvent that can damage the human's healthy and environment ,it is a green product .</p> <p>7. It adopts special structure .and ensure not to produce state error in the high temperature at the key measuring site .</p> <p>8. 7inch industrial stage touch-screen .and the screen display large information ,operation is simple and convenient ,the work is reliable .Put the sample into the furnace and close the furnace door ,press the open key ,the instrument can be finished the determination automatically.</p> <p>9.Real-time display test procedure data ,and it has self diagnostic function ,fault code indication function ,it can inquire about the history data and deal with it .</p> <p>10. After the test finished ,the instrument has voice indication function and it can save and print out the test results.</p> <p>11. The processing mode is flexible ,it can choose the software and hardware as accessories, it can connect with computer and common printer .It can use the USB drives to download the data and connect with the network function of the wet .</p>	<p>imported balance)</p> <p>6. Test precision :0.10% ;</p> <p>7. Test time : 1200g sample only needs 30 minutes ;</p> <p>8. The dimension of the combustion chamber :350mm*440mm*330mm ;</p> <p>9. Overall dimension : 700mm*800mm*1550mm ;</p> <p>10. Power supply : AC380V+10V,50Hz, current meter \leq 40A(three-phase four-wire system, with zero line)</p>	
	52			Automatic asphalt centrifugal extractor	SYD-0722A	<p>1. Floor-type structure. It is a fully-automatic and intelligent instrument for testing the bitumen content in the bituminous mixture.</p> <p>2. Micro-processing technology. Man-machine dialog. The parameter settings, working status and data are all displayed directly on the LCD. Easy to operate.</p> <p>3. The bitumen extraction and solvent recycling become one. Low pollution. Unique high-low-high speed extraction setting can make the fine ores collect more completely. The test result is reliable.</p>	<p>1. Capacity: 1000g~1500g</p> <p>2. Extracting precision: \leq0.1%</p> <p>3. Extracting time: (20~40)minutes per time</p> <p>4. Centrifuging speed: 5500r.p.m, 11000r.p.m</p> <p>5. Working environment: (5~40)$^{\circ}$C, RH < 80%</p> <p>6. Power supply: AC380V\pm 10%, 50 Hz</p> <p>7. Maximum power consumption: About 5kw</p> <p>8. Cooling water: Pressure: \leq2bar, temperature: \geq12$^{\circ}$C</p> <p>9. Net weight: About 300kg</p> <p>10. Dimension: 1400 mm(L)\times800 mm(W)\times1600 mm(H)</p>	
	53	Mineral aggregate gradation			No			
	54	Water Permeability coefficient			No	Pavement water seepage		
	55	Bending test(flexural	Universal material	Multifunctional fully-automatic	SYD-0730A	1.One machine has many functions,fitting following standards: JTG E20-2011 including	1.Pressure 1 measurement range and accuracy: range (0~100)kN, accuracy \pm 0.01kN	

			tensile strength,maximum flexural tensile strain,flexural stiffness modulus)	testing machine,LVDT displacement sensor,environment cabinet,special fixture for	pressure tester		T 0709 Bituminous Mixtures Marshall Stability Test T 0715 Bituminous Mixtures Bending Test T 0716 Bituminous Mixtures Splitting Test T 0729 Bituminous Mixtures Freeze-thaw Splitting Test 2.The instrument test tank has the cooling constant temperature function.The temperature balance function of the compressor refrigeration and heating pipe control the temperature range of the tank in $(-20\sim 70)^{\circ}\text{C}$,and meet the tank temperature requirement of the instrument test method. 3.The instrument adopts advanced sensor technology and microcomputer processing technology, and it has functions of setting parameters, measurement calibration, automatic test control, automatic data acquisition and real-time clock. 4.The instrument can storage 100 groups test data and test time, and it also can look over readily .The whole procedure can be finished automatically and automatic reset.	2.Pressure 2 measurement range and accuracy: range $(0\sim 3)\text{kN}$, accuracy $\pm 0.01\text{kN}$ 3.Left displacement sensor range and accuracy:range $(0\sim 20)\text{mm}$,accuracy $\pm 0.001\text{mm}$ 4.Right displacement sensor range and accuracy:range $(0\sim 20)\text{mm}$,accuracy $\pm 0.001\text{mm}$ 5.Basic configuration:uniaxial compression measuring device,bending measuring device,splitting fixture,stability holder 6.Servo motor power: 1.5kW 7.Test Lifting speed: $(1\sim 50)\text{mm/min}$ 8.Quickly lifting speed: 50mm/min 9.Refrigeration compressor: AC(220~240)V 6.5A 10.Color touch screen size: 800×480mm 11.Heater power: AC220V,1.5kW 12.Environment box inner dimension: 650×340×400 (mm) 13.Power supply:three phase $(380\pm 10\%)$ V、3A、50Hz 14.Dimension: 750 mm×695 mm×1775mm (L×W×H)	
		56	Splitting tensile strength	freeze-thaw splitting and depression bar					
		57	Freeze-thaw splitting tensile strength						
		58	Sheremberg asphalt leakage loss	NO	NO	NO			
		59	Cantabro flying loss	NO	NO	NO			
	Slurry mixture	60	Consistency	Emulsified asphalt slurry sealing mixture consistency tester	Emulsified asphalt consistency tester	SYD-0751	1. Consist of truncated cone, plate and base plate, the structure is simple; 2. Truncated cone made by aluminum alloy, beautiful and generous; 3. The bottom plate is made of stainless steel, durable and with scale for easy reading.	1. The metal truncated cone: Upper caliber: 38 mm; lower caliber: 89 mm; high 76 mm; 2. The metal plate: 4 mm thick, with a concentric calibration line, spacing: 0.5 cm. 3. Dimensions: 235 mm × 235 mm × 80 mm (length × width × height). Optional accessories 1. Balance: Weighing 1000g, the sense of it not more than 0.1g;	
		61	Abrasion value	Wet wheel abrasion tester	Wet wheel abrasion tester	SYD-0752	1.The instrument adopts floor type structure ,it has novel design and stable structure .It is convenient to use . 2.The structure design of the instrument ,the specification size of the test apparatus ,act ,each meets the requirement of T0752 standard .	1.The rotating speed of electric motor :1400rpm 2.Auto-rotation rate of the wheel head :140rpm 3.Revolution rate of the wheel head :61rpm 4.The weight of the wheel head :2.27kg(working quality) 5.The length of the rubber hose for wheel head :127mm 6.Timing :5 min timing 7.Dimension :620mm*500mm*780mm 8.Weight :260kg 9.Power supply :AC 380V,50Hz,380W (three-phase four-wire system ,with zero line) Optional accessories 1.Balance :weigh 6000g ,reciprocal sensibility $\leq 1\text{g}$ 2.Bake oven :with forced draft ,the temperature can be	

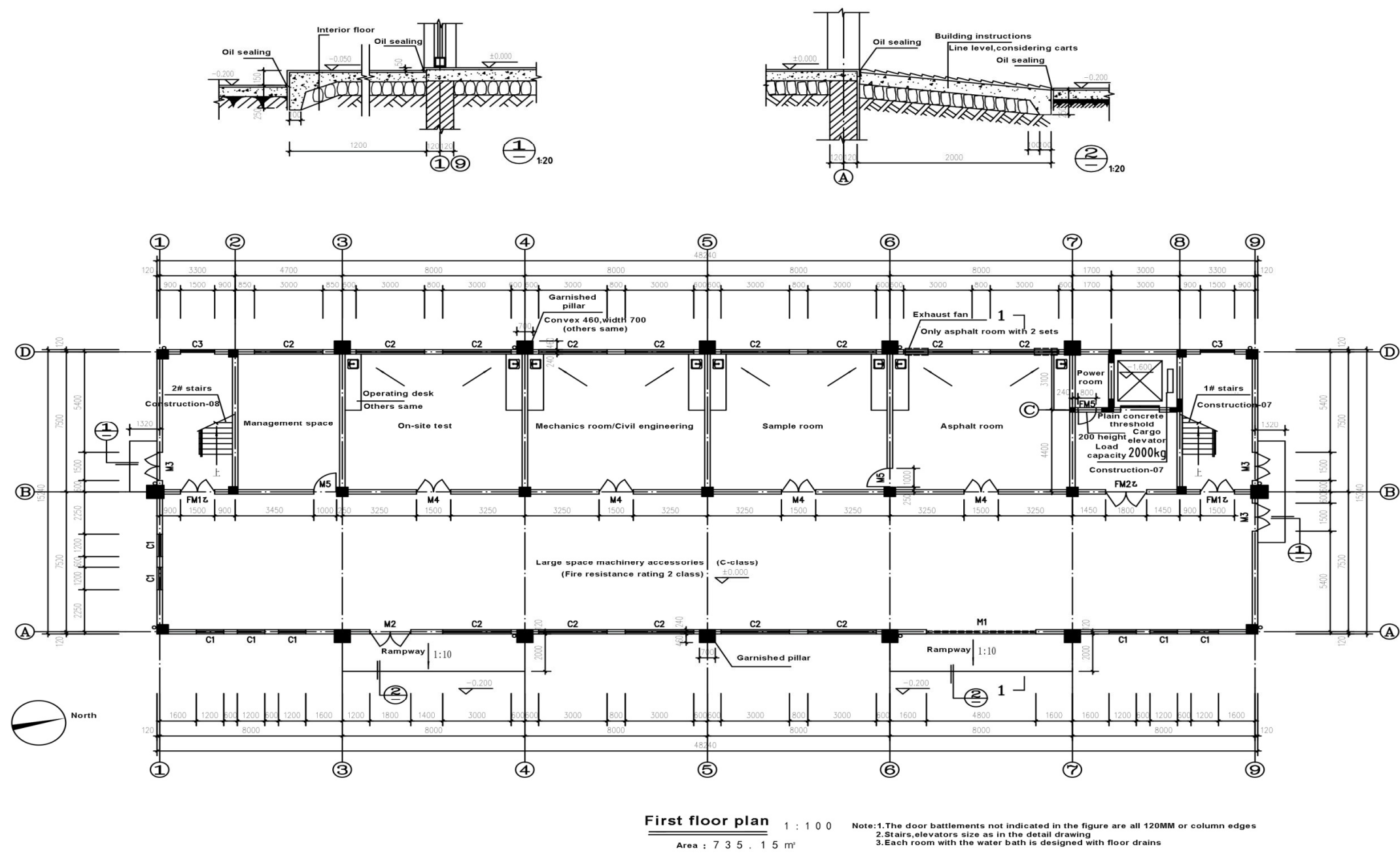
							controlled in (60+3)℃ 3.Constant temperature water bath :HWY-1 low temperature constant temperature water bath	
	62	Demulsification time	NO	NO	NO			
	63	Cohesive force	Cohesive force tester	Cohesive force tester	SYD-0754	<p>1.The instrument adopts desktop structure .Novel design ,reasonable structure and convenient to use .</p> <p>2.The structure design of the instrument ,the specification size of the test apparatus ,act ,each meets the requirement of T 0754-2011 standard .</p> <p>3.The instrument is convenient to carry .And it can be used both in lab and on site ,and it widely used in the construction organizations ,scientific research institutes to analysis and confirm the emulsified asphalt and aggregate bond degree .</p>	<p>1.The diameter of the rubber pad :Φ28.6mm</p> <p>2.The thickness of the rubber pad :6.4mm</p> <p>3.The hardness of the rubber pad :HRC60</p> <p>4.The max pressure :1Mpa</p> <p>5.Circular test mode :Φ 60mm*6mm;Φ60mm*10mm</p> <p>6.Torque spanner :(0-5)N•m</p> <p>7.Power supply :AC 220V+10%;50Hz</p> <p>Optional accessories</p> <p>1.Balance :weigh 500g ,reciprocal sensibility is less than 0.1g</p> <p>2.Bake oven :with forced draft ,the temperature can be controlled in (60+3)℃</p> <p>3.Air compressor :AU1511 compressor (recommend)</p>	
	64	Adhesion sand amount	NO	NO	NO			
	65	Wheel-track deformation(width deformation rate,rut depth)	Wheel-track testing machine	Automatic wheel-track tester	SYD-0719C	<p>1. This instrument is a floor structure, using PC control technology, automatic temperature control, automatic timing, real-time display of the displacement, and automatically record the displacement curve, print report.</p> <p>2. Simultaneous display time and displacement, time and temperature curve during the test, providing practical basis for the study of the characteristics of asphalt mixture rutting research units.</p> <p>3. The instrument can be tested under the test temperature of 45 ~ 85℃, wheel pressure is 0.7MPa, the standard test time is 60min.The instrument adopts high accuracy displacement sensor, The precision is more than +0.05mm .The data resolution is high and the speed is fast.</p> <p>4. Using absolute temperature sensor collect temperature, PWM modulation way for temperature control, high temperature stability, no overshoot, long time test, no temperature drift(The effect of the temperature shift of the general thermocouple temperature sensor on the test data is eliminated).</p> <p>5. Using high-precision A / D (16 bit), D / A (16 bit) module, ensure that the displacement measurement and temperature control accuracy and resolution. Constant temperature box adopts outer circulation heating mode, the temperature field is uniform.</p>	<p>① Main technical specifications</p> <p>(1) Applicable standards: National Ministry of Transportation industry standard JTG E20-2011</p> <p>(2) Rolling speed of grinding wheel: (42 ± 1) times/ min (one way)</p> <p>(3) Test car moving distance: (230 ± 10) mm</p> <p>(4) Rubber hardness of grinding wheel: 78 ± 2 (international standard hardness)</p> <p>(5) Contact pressure between grinding wheel and test mode: (0.7 ± 0.05) Mpa (60 ℃), it can adjust up to 0.8, 0.9Mpa</p> <p>(6) Displacement measuring range: (0 ~ 30) mm</p> <p>(7) Displacement measurement accuracy: less than ± 0.005mm</p> <p>(8) Test time: (60 ~ 240) min</p> <p>(9) Control range of constant temperature box: room temperature ~ 80 ℃ (can be set), control accuracy ± 0.2 ℃</p> <p>(10) Overall dimensions of the machine: 1300mm × 740mm × 1240mm</p> <p>(11) Weight of the whole machine: 300kg</p> <p>(12) Tryout Size: 300mm × 300mm × 50mm (standard), can do the rutting test of (30 ~ 100) mm thickness of the specimen</p> <p>② Main technical parameters</p> <p>(1) Works: Immersion and non-immersion test</p> <p>(2) Ambient temperature control accuracy: ± 1.0 ℃</p>	

							(3) Tryout temperature control accuracy: $\pm 0.5\text{ }^{\circ}\text{C}$ (4) Temperature measuring channel number: 2 channels (5) Can do specimen number at the same time: 3 (6) The number of specimens of health: 9 (7) Roller motion mode: Test wheeled ③ Power supply (1) Three-phase power supply: AC380V, 50Hz, 10A, three-phase four-wire system, with zero line (2) Single-phase power supply: AC220V, 50Hz, 5A, single-phase three-wire, with ground wire	
	66	Mixing test(Mixing time,time of no construction)	Asphalt mixture blender	Automatic asphalt mixture blender	SYD-F02-20	1. This instrument adopts advanced microcomputer control technology. Temperature can be set from ambient to $200\text{ }^{\circ}\text{C}$ at will and automatically adjusted by PID. The blending time can be controlled automatically. It achieves the automation for operation. 2. It has protecting function for phase sequence which can prevent the machine from damage because of phase sequence fault. 3. Floor type structure. Reasonable design and easy to use.	1. Blending amount: 20L 2. Temperature control range: Room temperature~ $200\text{ }^{\circ}\text{C}$ 3. Temperature control accuracy: $\pm 5\text{ }^{\circ}\text{C}$ 4. Timing range: (0~999)s 5. Timing accuracy: $\pm 0.1\text{ s}$ 6. Rotation rate of paddle: Complete revolution 47R/min, Autorotation 76R/min 7. Blending motor: Alternating current 380V, 550W; 1400R/min; 50Hz 8. Lifting motor: Alternating current 380V,250W; 1400R/min; 50Hz 9. Overall dimension: $600\text{ mm}\times 400\text{ mm}\times 1300\text{ mm}$ 10. Net weight: 215Kg 11. Power supply: AC ($380\pm 10\%$) V; 16A; 50Hz (three-phase four-wire with null line 12. Ambient temperature: $(-5\sim +50)\text{ }^{\circ}\text{C}$ 13. Relative humidity: $\leq 80\%$	
	67	Compatibility grade	NO		NO			
Lignin fibre	68	Length			NO			
	69	PH value	PH paper		NO			
	70	Ash content			NO			
	71	Oil absorption rate	Oil absorption rate tester		NO			
	72	Moisture content			NO			
	73	Heat resistance			NO			
Others	74	Oven						
	75	Balance						
	76	Constant temperature refrigerator						
	77	Standard						

		sieve						
	78	Jigging sieve						
	79	Asphalt mixture plate cutting machine	Asphalt Mixture Plate Cutting Machine	Asphalt Mixture Plate Cutting Machine	SYD-0850	1.The machine is composed of main cutting unit and electric control cabinet,floor stand. 2. Using high hardness and high quality steel as the frame, the cutting stability is good. 3. High precision driving system is adopted to ensure the cutting precision of the specimen. 4. The motor speed is high and the cutting surface of the specimen is smooth. 5. Simple operation, one clamping can cut two parallel sides. 6. Both saw blade speed and feed speed are adjustable. 7. Use full sealing protective cover, safe to use, low noise. 8. When cooling water is discharged, it is filtered by three layers.	1.Cutting power: 4000W 2.Motor waterproof grade: IP56 3.Saw blade revolution rate: 3000r/min 4.Blade diameter: Ø470mm 5.Cutting specimen:cuboid thickness 25mm to 150mm,cylinder diameter Ø 100mm(standard),cylinder diameter Ø 150mm(Optional clamping apparatus) 6.Overall dimension:cutting unit 1820mm×900mm×1550mm,control cabinet 630mm×220mm×1140mm 7.Power supply: AC380V,50Hz,3P4W 8.Total power consumption: 5000W 9.Usage environment:temperature 5℃~35℃,humidity ≤ 85% 10.Net weight: 400kg	
	80	Annular mold						
	81	Muffle furnace						

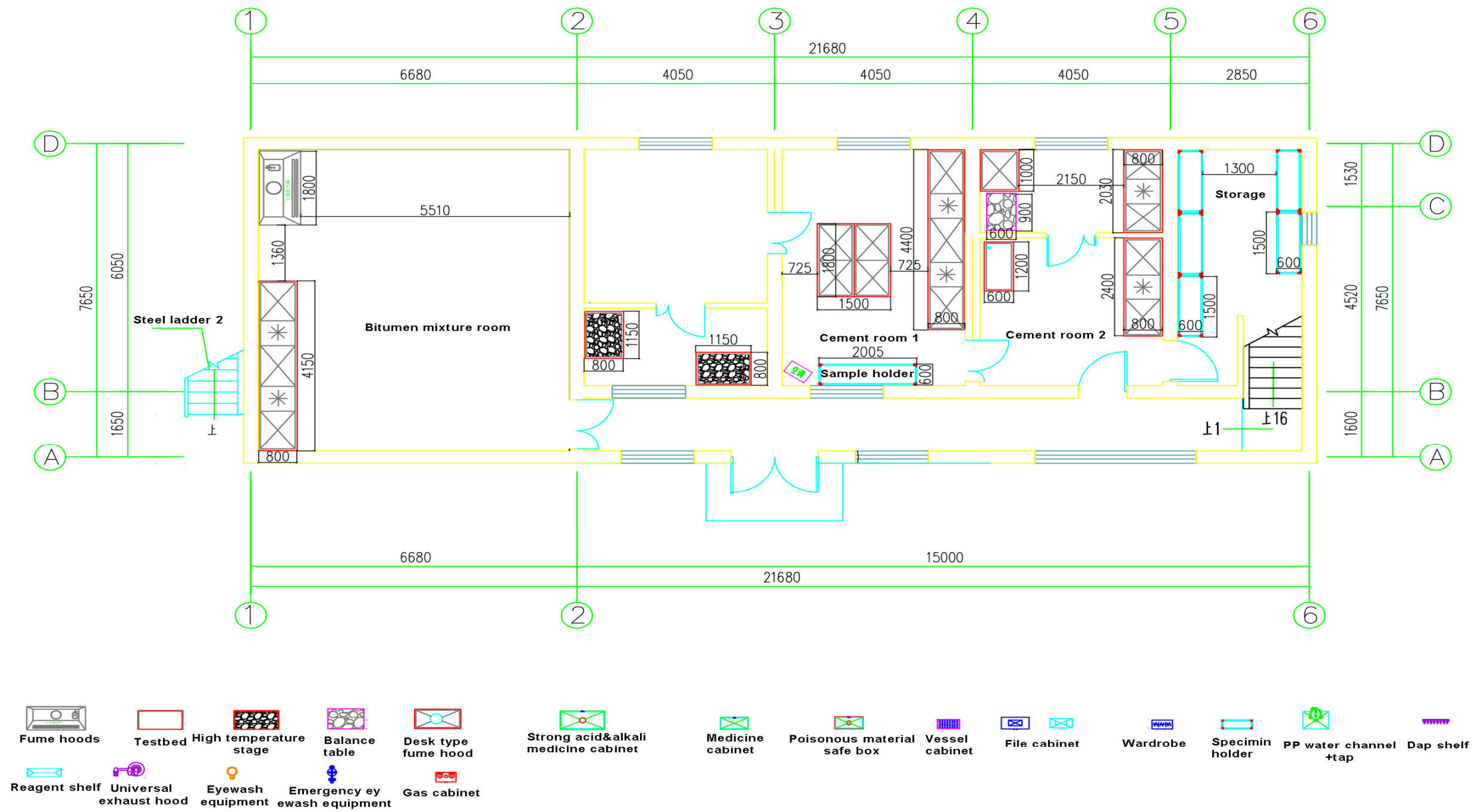
III. Asphalt Laboratory Design Scheme

1. Laboratory Test Center Design




Countersign		
Architecture		Hvac
Structure		Plumbing
Electricity		
Note		
Project: Class A		
Address: No. 528 Taiyun Road Jiading District Shanghai China Tel: +86-21-59501312 Fax: +86-21-59501302 Email: sales@syinstrument.com Website: www.syinstrument.com		
Sign		
Project Chief		
Sub Chief		
Designed by		
Drawn by		
Checked by		
Examined by		
Approved by		
Seal		
Director sign and stamp		
Client A		
Project		
Sub-Project Test center		
Drawing Title		
Project No.		
Edition No.	Date	
Drawing type	Drawing No.	

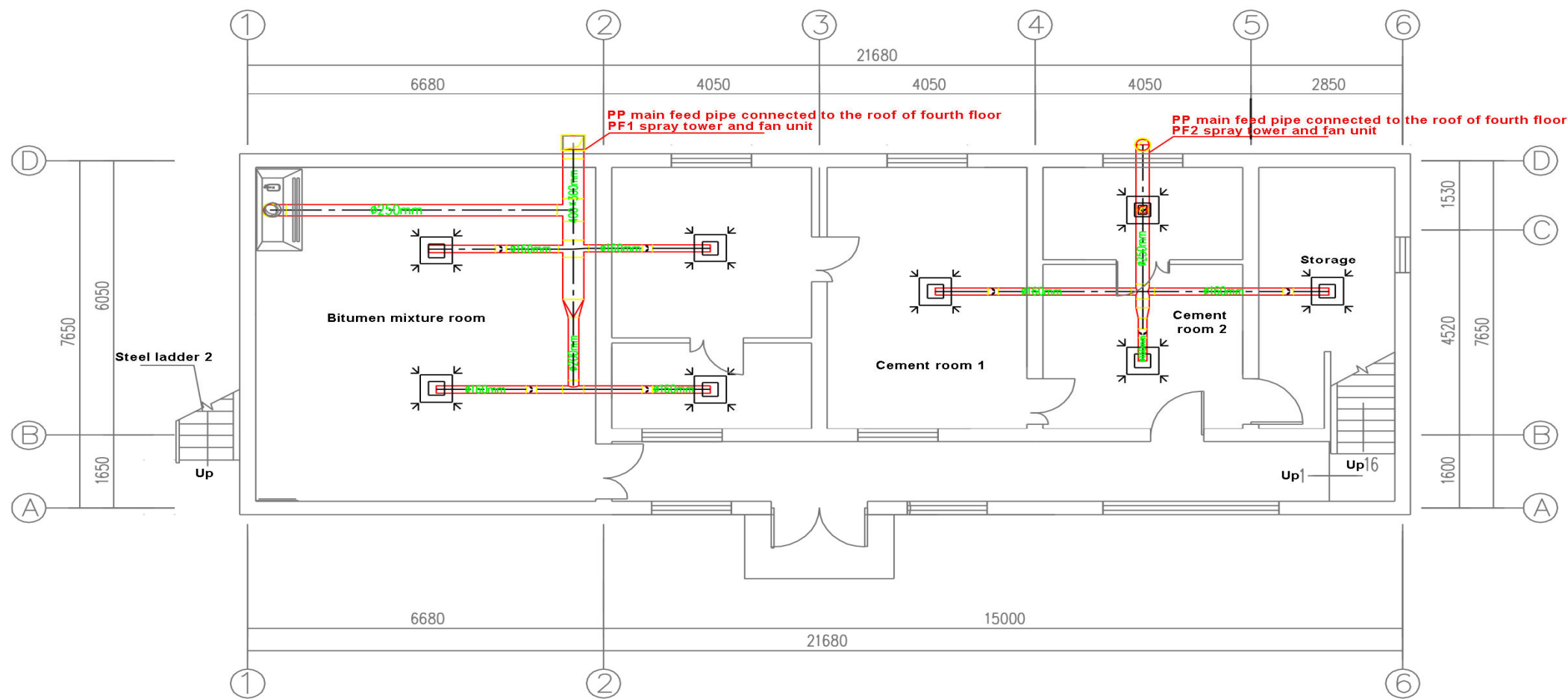
2. Laboratory floor plan-First floor design



Laboratory floor plan(First floor)

Drawing title: Lab floor plan	Customer:	Design:	Date: 2018-03-28	
		Checked:	Date: 2018-03-30	
		Customer signature:		

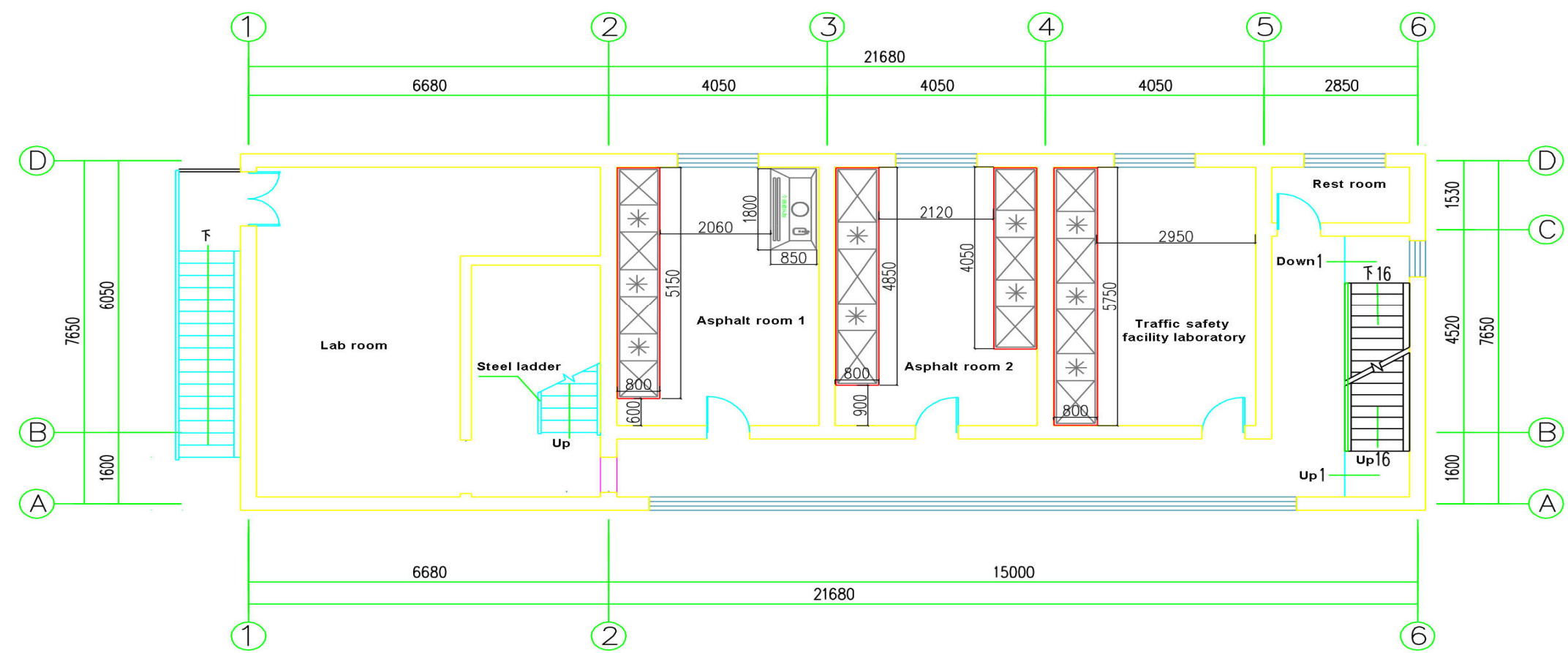
First floor laboratory ventilation and exhaust gas treatment system design



Schematic diagram of laboratory ventilation and exhaust gas treatment system(First floor)

Drawing title: Laboratory ventilation and exhaust gas treatment system diagram	Customer:	Design:	Date: 2018-03-28	
		Checked:	Date: 2018-03-30	
		Customer signature:		

3. Laboratory floor plan-Second floor design

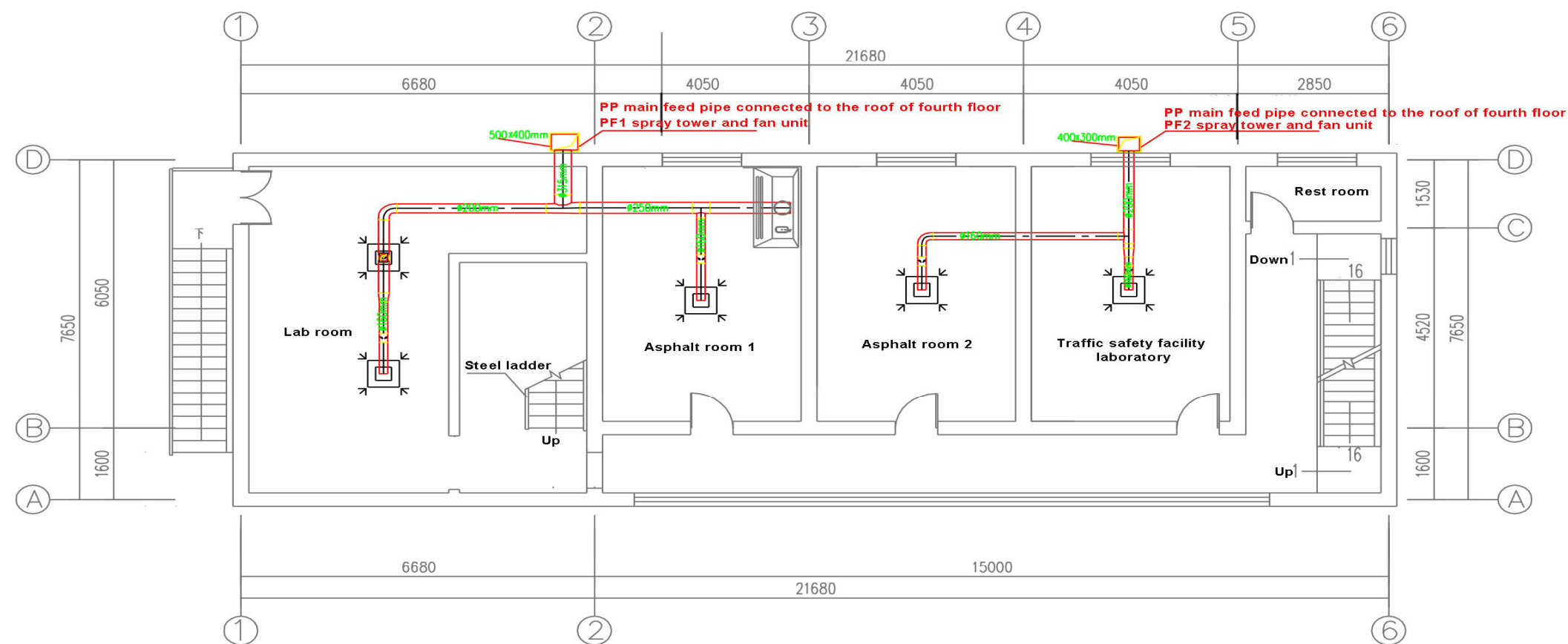


- Fume hoods
- Testbed
- High temperature stage
- Balance table
- Desk type fume hood
- Strong acid&alkali medicine cabinet
- Medicine cabinet
- Poisonous material safe box
- Vessel cabinet
- File cabinet
- Wardrobe
- Specimin holder
- PP water channel +tap
- Dap shelf
- Reagent shelf
- Universal exhaust hood
- Eyewash equipment
- Emergency eyewash equipment
- Gas cabinet

Laboratory floor plan(Second floor)

Drawing titlb: Laboratory floor plan	Customer:	Design:	Date: 2018-03-28
		Checked:	Date: 2018-03-30
		Customer signature:	

Second floor laboratory ventilation and exhaust gas treatment system design



Schematic diagram of laboratory ventilation and exhaust gas treatment system(Second floor)

Drawing title:

Laboratory ventilation and exhaust gas treatment system diagram

Customer:

Design:

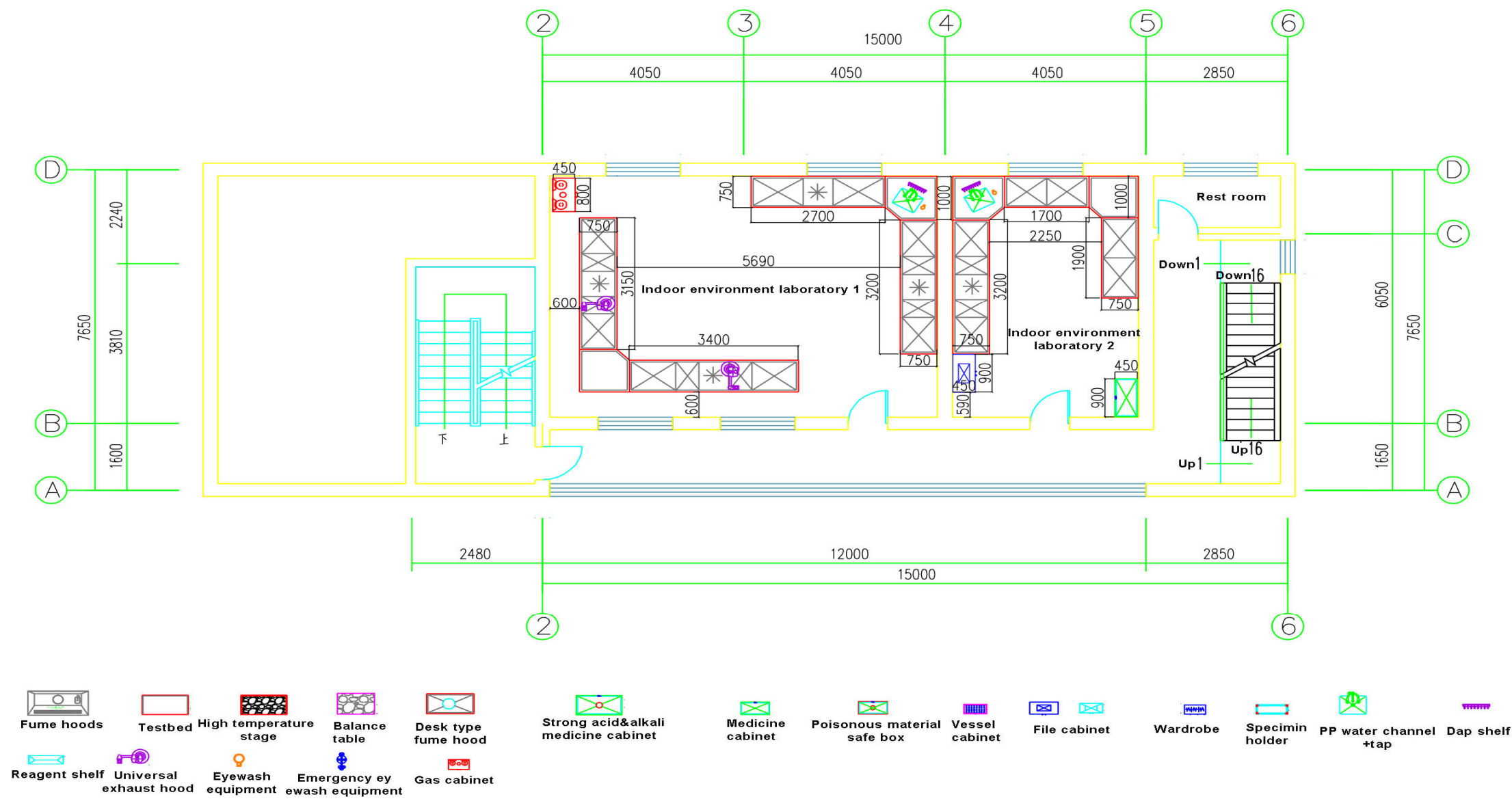
Date: 2018-03-28

Checked:

Date: 2018-03-30

Customer signature:

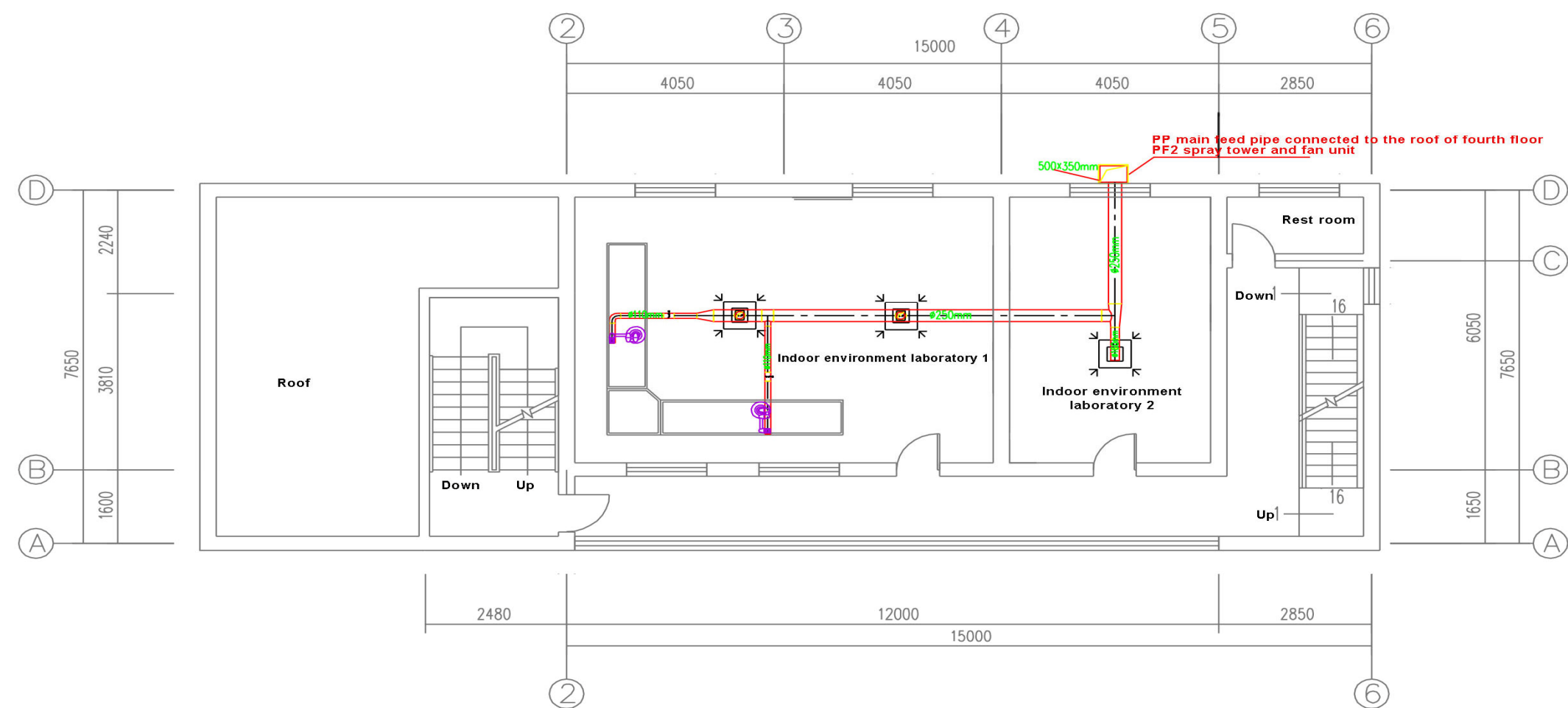
4. Laboratory floor plan-Third floor design



Laboratory floor plan(Third floor)

Drawing titlb: Laboratory floor plan	Customer:	Design:	Date: 2018-03-28	
		Checked:	Date: 2018-03-30	
		Customer signature:		

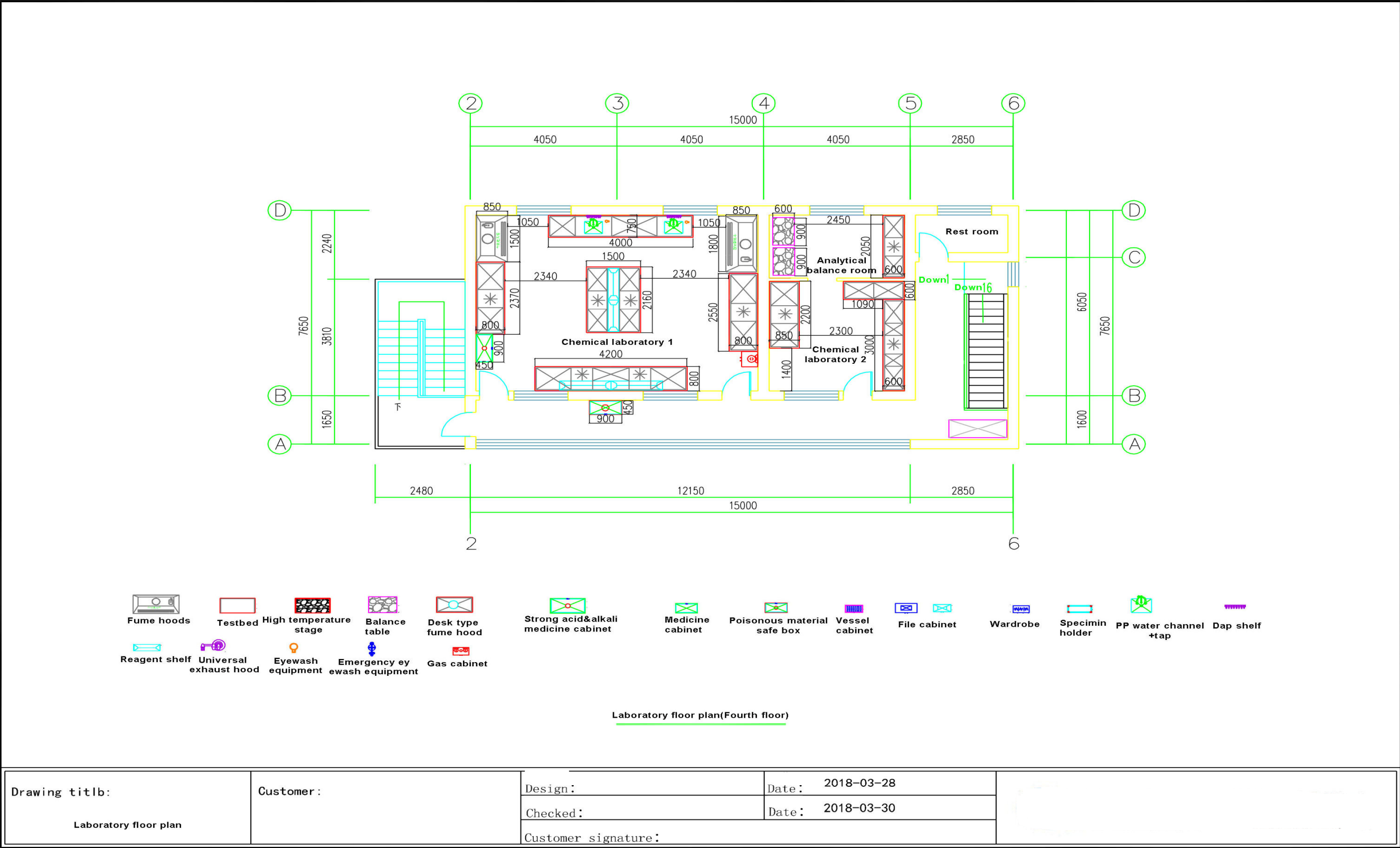
Third floor laboratory ventilation and exhaust gas treatment system design



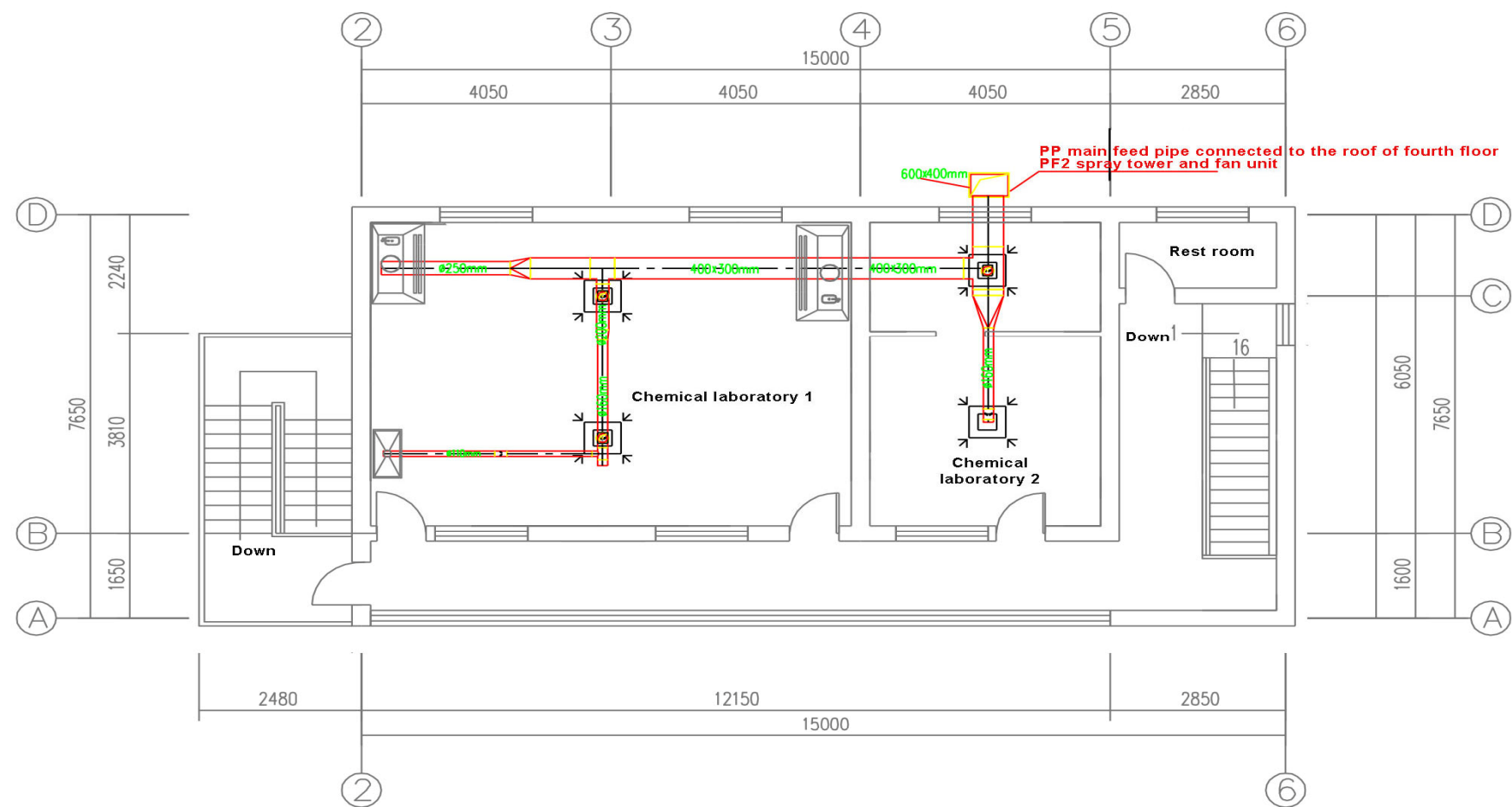
Schematic diagram of laboratory ventilation and exhaust gas treatment system(Third floor)

Drawing title: Laboratory ventilation and exhaust gas treatment system diagram	Customer:	Design:	Date: 2018-03-28	
		Checked:	Date: 2018-03-30	
		Customer signature:		

5. Laboratory floor plan-Fourth floor design



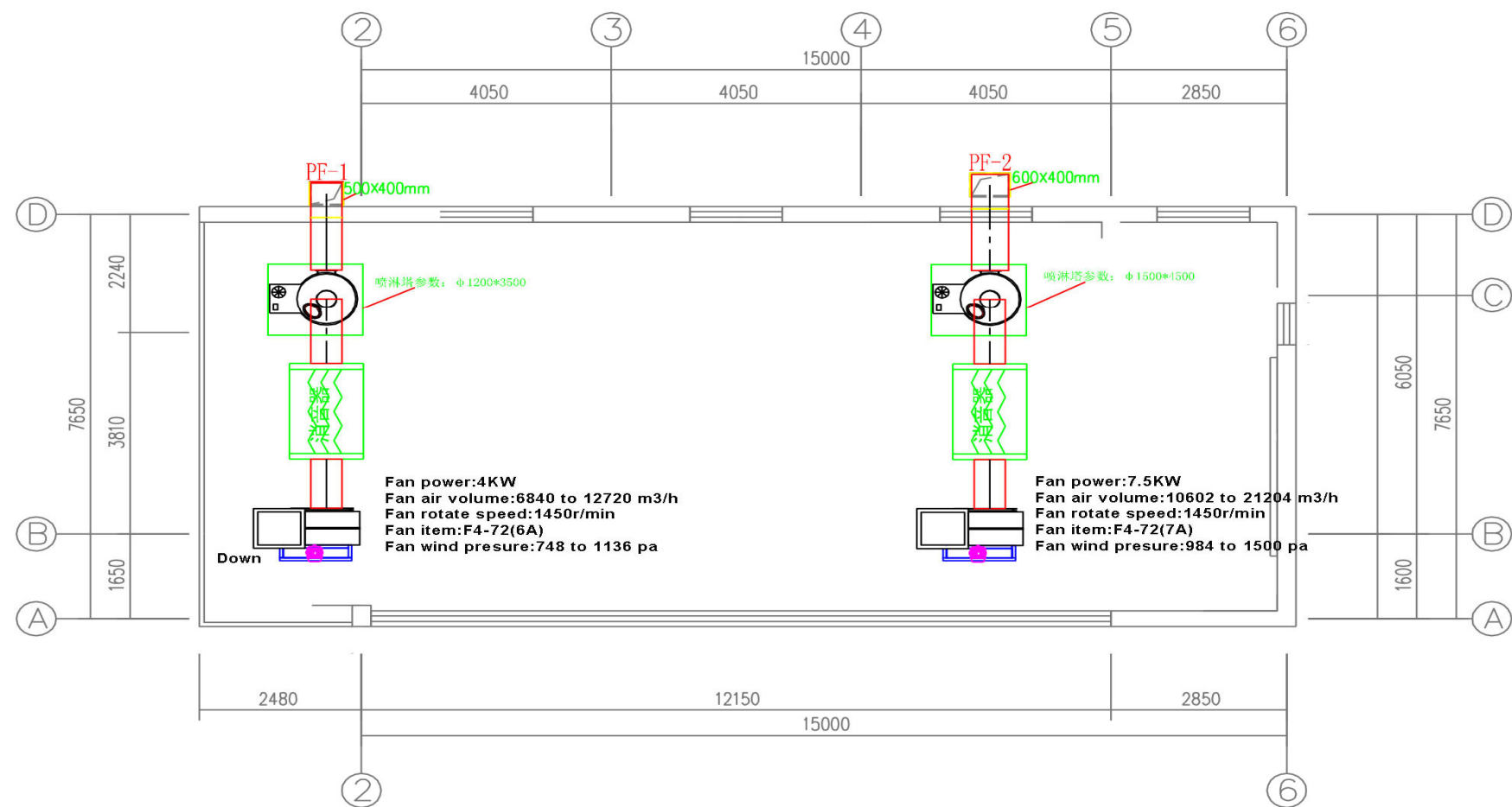
Fourth floor laboratory ventilation and exhaust gas treatment system design



Schematic diagram of laboratory ventilation and exhaust gas treatment system(Fourth floor)

Drawing title: Laboratory ventilation and exhaust gas treatment system diagram	Customer:	Design:	Date: 2018-03-28	
		Checked:	Date: 2018-03-30	
		Customer signature:		

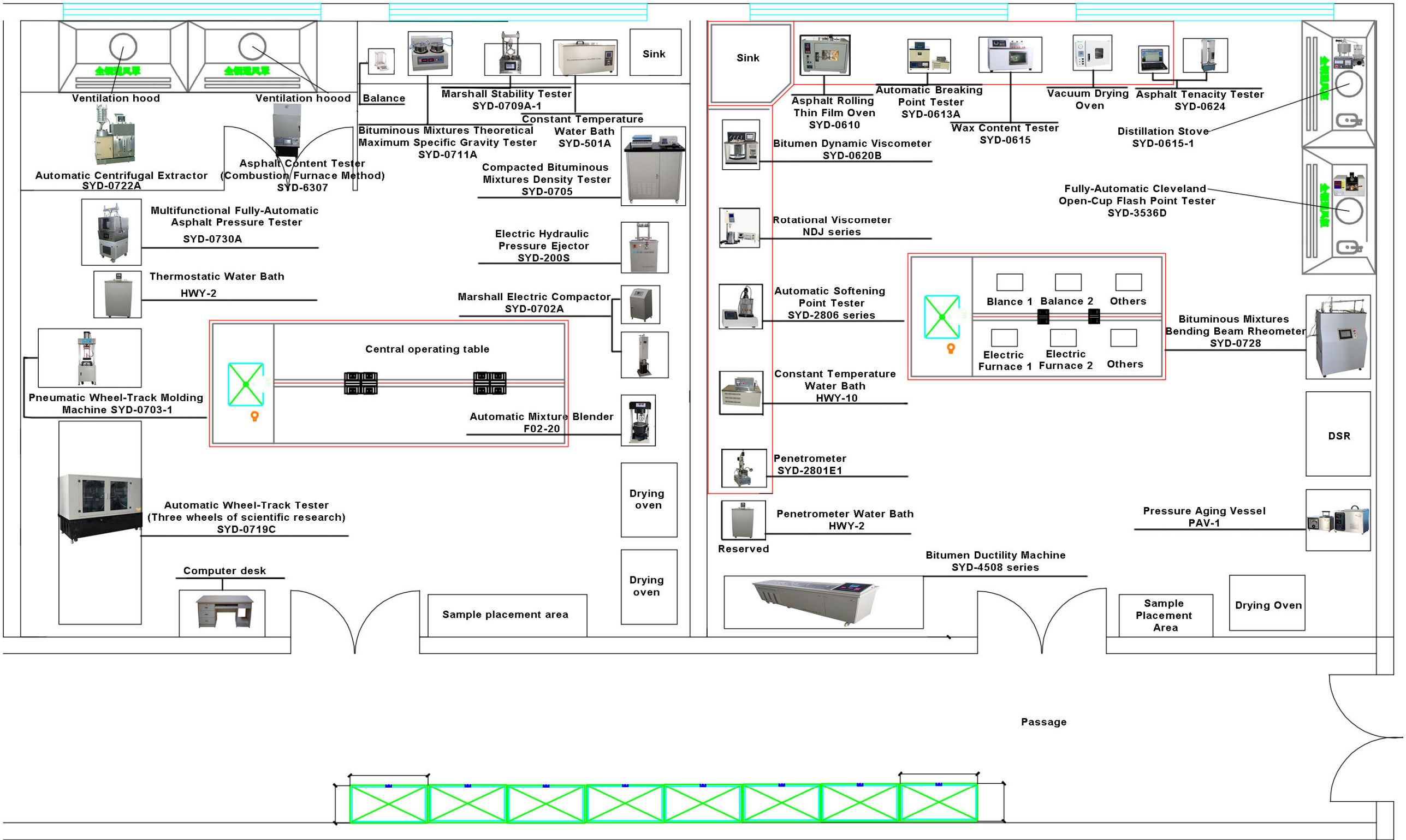
Roof of the fourth floor laboratory ventilation and exhaust gas treatment system design



Schematic diagram of laboratory ventilation and exhaust gas treatment system(Roof of the fourth floor)

Drawing title: Laboratory ventilation and exhaust gas treatment system diagram	Customer:	Design:	Date: 2018-03-28	
		Checked:	Date: 2018-03-30	
		Customer signature:		

6. Asphalt laboratory layout plan



Asphalt laboratory layout plan

IV.A Part of Changji's Asphalt Laboratory Projects Pictures

1.Laboratory-1



2.Laboratory-2



3.Laboratory-3



4.Laboratory-4

