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Study on environmental pollution control method of building construction under uncertain influence

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Abstract: In order to overcome the problems of poor pollution control effect of the traditional methods, an environmental pollution control method of building construction under uncertain influence is proposed. Firstly, the control standard of indoor environmental pollutants is given, and the influence of different construction stages on ecological environment is analysed. Then, the influencing factors of construction pollution control under uncertain influence conditions are screened. Finally, the analytic hierarchy process is used to calculate the weight of the influencing factors and obtain the scale table of the judgment matrix. The important evaluation results of the influence degree of different factors are obtained, and the water pollution, air pollution and noise pollution are controlled according to the results. The experimental results show that when the number of painting days is five days, the concentration of formaldehyde and ammonia in this method is 0.006 mg/m^3 and 0.013 mg/m^3, and has a good noise reduction effect.

Keywords: uncertain influence conditions; construction; environmental pollution control; influencing factors; analytic hierarchy process; weight calculation; the noise reduction.

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1 Introduction

Due to the accelerated pace of urbanisation and industrialisation, the environmental carrying capacity has been seriously damaged, and the problem of sustainable development has attracted widespread attention. Building construction is a pillar industry of the national economy, which will not only consume a lot of natural resources, but also lead to environmental pollution (Suárez et al., 2020; Yang et al., 2020; Hou et al., 2020). Therefore, as a human activity that causes serious damage to the environment, building construction must change the traditional construction method and comprehensively consider the environmental impact. The pollution caused by construction to the environment has the following characteristics: the quantity is large, and a large amount of construction waste will be formed in the process of demolition and construction every year in China, which accounts for nearly half of the overall urban waste. In addition, with the increase of infrastructure projects such as bridges and roads, the emission of construction waste has always remained high (Ning et al., 2019); Generally, every city in China is basically carrying out the transformation of shanty towns and demolishing a large number of old buildings, so the construction pollution is more common. Generally, the waste generated during construction can become stable only after decades of landfill. During this period, the waste will undergo chemical reaction, pollute the surrounding soil and surface water, and continuously spread to other places, resulting in lasting environmental problems (He and Zhu, 2019).

Zhou (2020) proposed a dust pollution control method in road soft foundation reinforcement construction, analysed the situation of road construction site according to the actual situation, constructed the road dust pollution emission model according to the actual characteristics, designed the dust pollution monitoring points for soft foundation reinforcement construction, determined the TSP increment of road construction site, and obtained the dust pollution amount according to the wind speed value, the marginal cost method is used to realise the dust pollution control of soft foundation reinforcement construction. This method can effectively reduce the dust pollution emission, but there is a lack of treatment methods for other pollution conditions. Lin (2017a) proposed a control method of dust pollution on the construction site. According to the specific situation of the construction site, the vertical diffusion analytical formula is used to obtain the dust pollution emission on the construction site, and the albino weight function is used to determine the pollution rate on the construction site, so as to realise the effective control of dust pollution on the construction site. This method can improve the monitoring efficiency. However, the effect of building environmental pollution control is poor. Ye (2020) proposed a construction dust pollution risk early warning method based on real-time monitoring data, designed the pollution threshold according to the national pollution standard, built the construction dust pollution monitoring model, obtained the pollution value through the internet of things collection method, input the collected data into the dust pollution monitoring model, and compare the results of iterative training with the pollution threshold, the early warning results of construction dust pollution risk are obtained. This method can improve the early warning effect of pollution risk, but the monitoring efficiency is poor.

Due to the strong uncertainty of the construction environment, the current construction environmental pollution control method is not thorough enough in the analysis of various influencing factors of construction, resulting in the decrease of the weight calculation accuracy of the influencing factors of construction environmental pollution. Therefore, this paper aims to solve the problems of poor pollution control effect existing in the traditional methods. A method for environmental pollution control of construction under uncertain influence conditions is proposed. The overall design scheme of the method is as follows:

1 Analyse the control standard of indoor environmental pollution substances, study the influence of different construction stages on the ecological environment, screen the influence factors of construction pollution prevention under uncertain influence conditions, among which the first-level index factors include organisation and management, economic cost, construction environment, and technical methods. Secondary index factors include organisation system, management system, management consciousness, management system, management level, management cost, saving material reward, engineering cost, government incentives, government support, the owners motivation, material plan, policy, environment, education and training, design requirements for contract execution, construction process, industry standards, technical specifications, design requirements and construction technology.

2 the use of analytic hierarchy process to calculate weight construction environmental pollution influence factors, and to obtain judgment matrix proportion scale, it is concluded that different factors influence the degree of importance evaluation results, and according to the result of the design of green construction goal planning, environmental pollution prevention to achieve for the construction of water pollution, air pollution, noise pollution, light pollution, construction waste pollution control.

3 The formaldehyde concentration, ammonia concentration and noise reduction effect of different methods are compared through experiments.

2 Analysis on the impact of construction stage on ecological environment

2.1 Control standard for indoor environmental pollutants

The relevant indoor environmental pollutant control standards in China are summarised as follows:

Table 1 Summary of indoor environmental pollutant control standards for civil construction projects

Standard name and number	*Scope of application*	*Approval department*
GB3095-1996 ambient air quality standard	Nationwide environmental air quality assessment	National Environmental Protection Agency
GB9663-1996 hygienic standard for hotel industry	Suitable for all kinds of hotels	State Bureau of Technical Supervision
GB9664-1996 hygienic standard for cultural and entertainment places	Theaters (clubs), concert halls, video halls (rooms), amusement halls, dance halls (including karaoke karaoke halls), bars, cafes, coffee shops and multi-functional cultural and entertainment venues, etc.	State Bureau of Technical Supervision

Table 1 Summary of indoor environmental pollutant control standards for civil construction projects (continued)

Standard name and number	*Scope of application*	*Approval department*
GB9665-1996 hygienic standard for public bathrooms	Various public baths	State Bureau of Technical Supervision
GB9666-1996 hygienic standards for barber shops and beauty shops	Barber shop, beauty salon (shop)	State Bureau of Technical Supervision
GB9667-1996 hygienic standards for swimming places	All artificial and natural swimming places	State Bureau of Technical Supervision
GB9668-1996 hygienic standard of gymnasium	A gymnasium with more than 1,000 spectator seats	State Bureau of Technical Supervision
GB9669-1996 hygienic standards for libraries, museums, art galleries and exhibition halls	Libraries, museums, art galleries and exhibition halls	State Bureau of Technical Supervision
GB9670-1996 hygienic standards for shopping malls (shops) and bookstores	Indoor places and bookstores with urban business areas above 300 m^2 and counties, townships, and towns with business areas above 200 m^2.	State Bureau of Technical Supervision
GB9671-1996 hygienic standard of hospital waiting room	Waiting rooms (including waiting rooms for registration and medicine collection) in hospitals at or above the district and county levels (including district and county levels)	State Bureau of Technical Supervision
GB9672-1996 hygienic standard of public transport waiting room	The train waiting rooms of the first – and second-class stations, the second-class and above waiting rooms, the airport waiting rooms and the second-class and above long-distance bus station waiting rooms	State Bureau of Technical Supervision
GB/T16146-1995 standard for the control of radon concentration in houses	Public housing (including underground space used as housing)	State Bureau of Technical Supervision
GB16153-1996 restaurant (restaurant) hygiene standard	Air-conditioned restaurants (restaurants)	State Bureau of Technical Supervision
GB16356-1996 radon and its daughters control standard for underground buildings	It is suitable for underground buildings that have been built and to be built, but not for underground buildings where no one stays.	State Bureau of Technical Supervision
Health Law Regulatory Issue [2001] No. 255 Notice of the Ministry of Health on Issuing the 'Indoor Air Quality, Hygienic Specifications for Formaldehyde in Wooden Panels and Indoor Coatings'	Notify residential and office buildings	Ministry of Health

Analyse the impact of the construction stage on the ecological environment according to the above standards.

2.2 Main manifestations of impact on ecological environment during construction stage

The damage of building construction to the surrounding ecological environment is mainly reflected in the following aspects:

1 Water pollution. During construction, underground water resources will be damaged due to earthwork construction, and the wastewater and sewage discharged during construction will also pollute the water source.

2 Air pollution. The dust generated during construction is the main air pollution. The dust will not only affect the health of nearby residents, but also make the air turbid.

3 Noise pollution. The noise source formed during construction will change with the progress of construction, causing great trouble to nearby residents.

4 Light pollution. Light pollution mainly comes from construction lighting and welding, which will affect residents' rest and harm their vision.

5 Construction waste pollution. Garbage pollution is a very important kind of construction pollution (Hong et al., 2019). The treatment of construction waste is difficult, so it does great harm to the ecological environment.

3 Influence factors and weight calculation of environmental pollution in building construction

3.1 Screening of influencing factors of construction pollution prevention and control

The construction process will be affected by many factors. Through the research on the problems existing in the construction pollution management, it can be concluded that there are both construction environmental factors and subjective factors. These factors are important indicators affecting construction pollution. Therefore, this paper selects these factors and analyses the impact degree, which is helpful to the development of ecological pollution prevention and control (Wang et al., 2020).

Construction management is diversified, and there are many factors affecting construction pollution. The ultimate purpose of screening these factors is to provide a reference and reference basis for the prevention and control of environmental pollution.

3.1.1 Factor index division

The influencing factors of construction pollution prevention and control are not obtained out of thin air, but obtained in the form of questionnaire. Only in this way can the index system be regarded as the most influential factor in pollution prevention and control (Wang and Wang, 2021; Ma et al., 2020; Cheriyan and Choi, 2020).

According to the problems existing in pollution prevention and control, the most representative four factors are selected: organisation and management, economic cost, construction environment and technical methods.

Assuming that S is used to represent the above four different primary indicators, it is expressed as $S = \{S_1, S_2, S_3, S_4\}$ in the form of set. Any primary index includes some secondary indexes, as shown in Table 2.

Table 2 Index system of influencing factors

Primary index	*Secondary index*
Organisation management	Organisation system S_{11}, management system S_{12}, management awareness S_{13}, management system S_{14}, management level S_{15}
Economic cost	Management cost S_{21}, material saving reward S_{22}, project cost S_{23}, government incentive S_{24}, government support S_{25}, owner incentive S_{26}, material plan S_{27}
Construction environment	Policy environment S_{31}, education and training S_{32}, design requirements contract execution S_{33}, construction process S_{34}
Technical method	Industry standard S_{41}, technical specification S_{42}, design requirements, construction process S_{44}

3.2 Weight calculation of environmental impact factors of building construction

There are many ways to calculate the weight. According to the research content, this paper uses analytic hierarchy process to calculate the weight. The specific process is as follows:

Step 1 Establish hierarchical structure and construct judgment matrix. The influencing factors are grouped to form different hierarchical structures. The importance of any x_i and x_j is compared through pairwise comparison (Zhang et al., 2019; Lin, 2019b), and I is assigned according to the scale in Table 3. The judgment matrix is shown in equation (1).

Table 3 Scale of judgment matrix

Scale	*Definition*
1	The influence degree of the two factors is the same
3	One of the two factors has a slightly higher degree of influence than the other
5	Among the two factors, the influence degree of one is significantly higher than that of the other
7	Compared with the two factors, one has a greater influence than the other
8	Compared with the two factors, one has a greater impact than the other
2,4,6,8	Represents the judgment of the adjacent intermediate value
1, 1/2,…,1/9	It represents the reciprocal number whose ratio of x_j and x_i is x_{ij}

$$A=\left(x_{ij}\right)=\begin{bmatrix} 1 & x_1/x_2 & \cdots & x_1/x_n \\ x_2/x_1 & 1 & \cdots & x_2/x_n \\ \cdots & \cdots & \cdots & \cdots \\ x_n/x_1 & x_n/x_2 & \cdots & 1 \end{bmatrix}, x_{ij}>0, 1/x_{ij}$$

Step 2 First level weight calculation. Combined with the survey data and statistical results, the summary of the importance evaluation of the impact degree of the four factors is shown in Table 4.

Table 4 Importance of influencing factors of pollution prevention and control

	No effect	*Uncertain*	*Influential*	*Greater impact*	*Great impact*
Organisation management	0	0	30	39	31
Economic cost	0	10	39	50	0
Construction environment	0	20	58	20	0
Technical method	19	30	41	15	0

According to the above statistical results, it is necessary to compare different factors to obtain specific weights. The results are shown in Table 5.

Table 5 Weight of primary indicators

	Organisation management	*Economic cost*	*Construction environment*	*Technical method*
Organisation management	1	2	3	1
Economic cost	1/2	1	1	1/2
Construction environment	1/3	1	1	1/2
Technical method	1	2	2	1

Therefore, the weight calculation formulas corresponding to organisation management, economic cost, construction environment and technical methods are as follows:

$$\omega_1=\sqrt[4]{1\times 2\times 3\times 1}\approx 1.57 \tag{2}$$

$$\omega_2=\sqrt[4]{1/2\, 1\times 1\times 1/2}\approx 0.71 \tag{3}$$

$$\omega_3=\sqrt[4]{1/3\times 1\times 1\times 1/2}\approx 0.64 \tag{4}$$

$$\omega_4=\sqrt[4]{1\times 2\times 2\times 1}\approx 1.41 \tag{5}$$

According to the above calculation results, among the influencing factors of construction pollution prevention and control, the influence of organisation management and technical methods is relatively large.

4 Analysis on prevention and control strategy of environmental pollution in building construction

Combined with the main factors affecting the construction pollution prevention and control obtained above, this paper analyses the prevention and control strategies from the perspectives of organisation management and technical methods, formulates the pollution prevention and control objectives, constructs the organisation management system, and achieves the purpose of protecting the ecological environment through certain technologies.

4.1 Planning of environmental pollution prevention and control objectives for green construction

Before the prevention and control of ecological environment, we should first carry out target planning, not only pay attention to environmental benefits, but also comprehensively analyse the construction characteristics, cost and technical level. The prevention and control strategies of different projects shall be formulated in combination with the actual situation. The target decomposition of ecological environment prevention and control is shown in Table 6.

Table 6 Breakdown of pollution control objectives

Environmental protection objectives	*Target decomposition*
Dust control	Visually check whether the dust height, monthly average concentration of particles and other indicators meet the standards
Light pollution control	Construction lighting and electric arc
Noise control	Upper limit of construction noise at different times
Water pollution control	Water quality degree
Solid waste control	Production and recovery efficiency of construction waste

4.2 Noise control method

Reasonably plan the construction site. In the construction site, the location of some noise sources is not fixed, such as some walking machinery and operation contents whose construction location changes with the construction progress of the main building; However, some places mainly for the processing of foundation construction materials are fixed. They are processed at the same place, and then transported to other places by manual or transportation and hoisting tools, that is, the sound source position is fixed, such as reinforcement processing, woodworking, etc. See Table 7 for specific classification.

For this type of fixed noise source, reasonable planning can be carried out in the early stage of site layout to keep it away from the surrounding sensitive buildings, and the principles of ‘dynamic and static zoning’ and ‘reasonable layout’ can be adopted for design. It should be noted that when the land on the construction site is tight, the location arrangement of fixed noise sources may be limited; However, when the site is relatively open and there is a certain amount of spare land in the site, the following methods can be used to summarise in Table 7.

Table 7 Fixed noise sources in construction site

Fixed noise source	*Noise cause*
Reinforcement processing area	Noise of steel bar cutting machine
Reinforcement stacking	Located near the reinforcement processing area, the collision sound of vehicles during transportation and loading and unloading
Woodworking area	Noise when cutting bamboo boards with electric saws, etc.
Woodworking stacking	Located near the woodworking area, the collision sound of vehicles during transportation and loading and unloading
Mortar mixing area	Noise of mixer and manual operation
Masonry stacking	Collision sound during vehicle transportation and loading and unloading
Vehicle passage and car washing tank	Noise of vehicle engine and water pump

1 Keep the fixed noise source in construction away from noise sensitive buildings, select the relatively insensitive direction around, and try to make the sound pressure level at the sensitive buildings low through the attenuation of distance and the obstruction of noise in the process of long propagation distance. The attenuation formula of noise is:

$$\Delta L_p = 10lg\frac{1}{4\pi r^2} \tag{6}$$

The sound pressure level of the fixed noise source is 70~110dB (A). If the noise at the boundary is controlled at 65dB (A), according to equation 1, the fixed noise source needs to be more than 50 m away from the sensitive building.

2 When the construction site is located around the road, the fixed noise source shall be arranged on the side of the relatively noisy road. Firstly, the road side mainly affects pedestrians, but the impact duration is short, and the impact on residents in the building is long; In addition, this is because the vehicle traffic noise at the road also has a high sound pressure level, which will produce sound masking phenomenon and weaken the impact of sudden noise.

3 When there is a large amount of greening around the construction site, it shall be arranged near the green belt to reduce the impact of noise on the buildings behind the green belt by using the absorption of trees. However, it should be noted that greening will be effective only when there is a certain density.

4 Make effective use of the natural sound barrier. Firstly, when the terrain such as mound and height difference between the noise source and the noise sensitive area, it shall be arranged at a lower ground height to prevent or shield part of the noise propagation; Secondly, the volume of earthwork excavation in the early stage can also be planned, and the earthwork to be transported can be stacked to form acoustic mounds to block the transmission of noise; Finally, the area where a large number of materials or parts are stacked on the construction site can also play a certain role in

sound insulation. Through loose arrangement, it can form multiple reflections of noise and achieve the effect of reducing noise.

5 When there are many buildings to be built in the site, the fixed noise source shall be set between the buildings. In this way, during the construction in the main stage and decoration stage, the noise emitted by the sound source will be blocked in the specific propagation direction, and the part propagating upward will also be reduced through multiple reflections.

6 Compared with noise sensitive buildings, the maximum impact value of wind noise can be obtained when the fixed noise source is arranged in the downwind direction of the local dominant wind direction.

4.3 Detection of ammonia concentration in indoor air

Detection and calculation steps

Prepare seven groups of standard samples with different concentrations (the concentration value is known), put them into the instrument, and input the concentration value of the corresponding sample through the keyboard, the instrument can measure its absorbance and establish the regression equation. Put one group of outdoor blank air sampling samples and three groups of indoor air sampling samples into the instrument to measure their absorbance and content. Result calculation: convert the sampling volume into the sampling volume in the standard state:

$$V_0 = V_t \times \frac{T_0}{273+t} \times \frac{P}{P_0} \tag{7}$$

where: V_0 represents sampling volume under standard state, L; V_t represents sampling volume, L; T_0 represents absolute temperature under standard state, 273k; P_0 represents atmospheric pressure under standard state, 101.3kPa; P represents atmospheric pressure during sampling, K Pa; t represents air temperature during sampling, °C.

Calculation of ammonia concentration in air

$$C(NH_3) = \frac{h}{V_0} \tag{8}$$

where $C(NH_3)$ represents ammonia concentration in the air, mg/m^3; h represents measured ammonia content of the sample, ug; V_0 represents sampling volume under standard state, L. The calculation process of indoor formaldehyde concentration is similar to this, so there is no more introduction.

5 Prevention and control strategy formulation

1 Water pollution control

During construction, avoid being too close to the water source, and take isolation and protection measures for the relatively close water source to prevent water pollution. Mud wastewater generated during construction shall be precipitated first and then discharged to the designated place. If the wastewater meets the recycling conditions, it needs to be recycled and then sprayed to the construction site, which can effectively reduce the dust content and improve the resource utilisation efficiency. In addition, relevant domestic wastewater shall also be discharged through special pipelines.

2 Air pollution control

During the construction, when the transport vehicles are carrying sand, gravel, residue and other building materials, the overload problem shall be strictly controlled, and the closure measures shall be used for closure. In addition, the vehicles shall be cleaned on time to ensure clean access. The vehicles can be washed at the construction site, which can not only effectively reduce material loss, but also reduce dust content.

3 Noise pollution control

If the construction building is close to schools, residential buildings, etc., sound insulation measures can be taken to reduce the noise emitted by mechanical equipment. The noisy work shall be carried out during the day as far as possible. If the construction must be carried out at night, the permission of relevant departments shall be sought. In addition, it is also necessary to consult with nearby residents during construction. During construction, vehicles shall not whistle to ensure slow down.

4 Light pollution control

In order to reduce the impact of light generated during construction on the ecological environment, some shielding measures can be taken during electric welding construction to avoid exposure of electric arc light, and the construction time shall be reasonably planned. Construction shall not be carried out at night to reduce the impact on the ecological environment.

5 Construction waste pollution control

During construction, the construction waste shall be classified and the useful materials, such as sand and gravel, which can be used as aggregates for concrete, shall be recycled. The waste shall not be discarded arbitrarily and shall be disposed of in a centralised manner.

Construction waste is the pollution that causes the greatest damage to the ecological environment. Under the green concept, the management system of construction waste should not only reflect the connotation of green development, but also comprehensively consider its own characteristics and possible impact on the society. Therefore, the following prevention and control principles should be integrated:

Take green development as the guiding concept: implement the green development concept advocated by the state, reduce and reuse resources in construction, maximise the value of construction waste, make waste management enter a virtuous cycle, and create a new situation of ecological environment prevention and control.

Principle of operability: the management of construction waste should conform to China's basic national conditions and project characteristics, not only theory, but also application in practice is the ultimate goal.

6 Experiment

6.1 Experimental scheme

In order to verify the effectiveness of the construction environmental pollution control method designed in this paper under uncertain influence conditions, it is necessary to conduct experimental tests, and the specific experimental scheme is as follows:

1. Experimental environment: The operating system is Windows 10, the CPU is Intel Core I5-7300HQ, the memory is 32G, the hard disk is 500GB, the operating memory is 8G, the main frequency is 2.1ghz, and the simulation software is MATLAB 7.0.
2. Experimental data: Select H construction area in M city in 2019 as the research object, collect all data in the construction of the building, clean and fill the collected data, and set the optimal parameters as the initial simulation parameters, so as to improve the authenticity and reliability of simulation experiment results.
3. Evaluation indexes: Zhou (2020) method, Lin (2019) method and this paper are used as experimental comparison methods, and formaldehyde concentration, ammonia concentration and construction noise reduction effect are used as evaluation indexes. Among them, the lower the noise detection value, the better the noise reduction effect of construction; The lower the concentration of formaldehyde and ammonia, the better the pollution control effect.

6.2 Noise detection

In order to verify the effectiveness of this method, the H construction area of M city in 2019 is selected as the research object, and the noise average value of each period from April to June 2019 under the untreated state, Zhou (2020) method, Lin (2019) method and this method are counted. The noise results are obtained for comparative experiments, as shown in Table 8.

According to the analysis of Table 8, when the time is 8:00–10:00, the average noise value in the untreated state is 78dB, the average noise value after Zhou (2020) method is 70dB, the average noise value after the Lin (2019) method is 65dB, and the average noise value after the method in this paper is 43dB. When the time is 18:01–20:00, the average noise value in the untreated state is 89dB, the average noise value after the Zhou (2020) method is 63dB, the average noise value after the Lin (2019) method is 66db, and the average noise value after the method in this paper is 40dB, this method always has a good noise reduction effect.

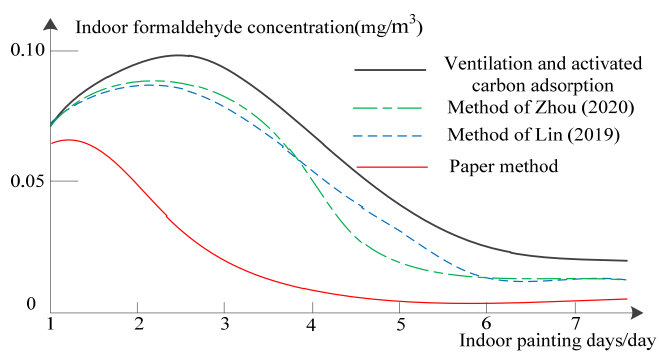
Table 8 Average value of noise under different methods

Time	*Average value of noise under different methods/dB*			
	Unprocessed status	*Zhou (2020) methods*	*Lin (2019) methods*	*Paper method*
8:00–10:00	78	70	65	43
10:01–12:00	85	71	62	46
12:01–14:00	72	68	67	45
14:01–16:00	77	62	70	38
16:01–18:00	83	70	68	42
18:01–20:00	89	63	66	43
20:01–22:00	82	60	65	40
22:01–24:00	76	70	68	32

6.3 Pollutant concentration monitoring

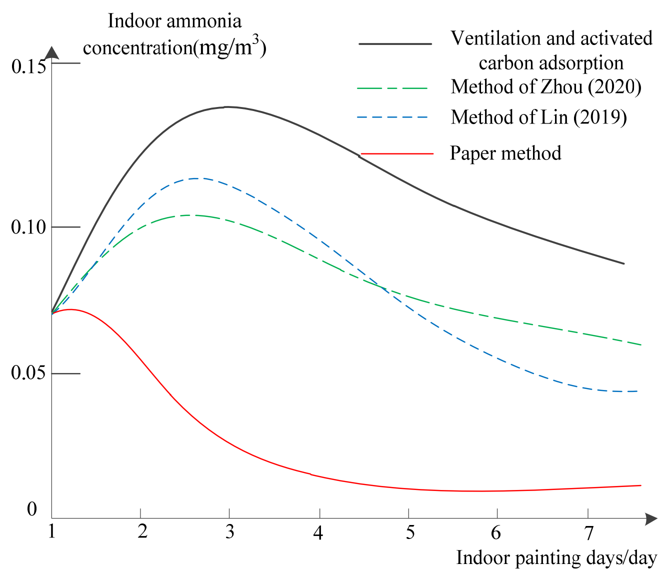
In order to verify the control effect of building construction environmental pollution under different methods, the control method of dust pollution in road soft foundation reinforcement construction (Zhou (2020) method), the control method of dust pollution on construction site (Lin (2019) method) and the method in this paper are used to analyse the changes of indoor methylaldehyde concentration and ammonia concentration. The results are shown in Figure 1 and Figure 2.

Figure 1 Variation of indoor formaldehyde concentration under different methods (see online version for colours)



According to the analysis of Figure 1, the indoor formaldehyde concentration is different under different methods. When the painting days are 2 days, when only ventilation and activated carbon adsorption are used, the indoor formaldehyde concentration of the method is 0.085 mg/m^3, the indoor formaldehyde concentration Zhou (2020) method is 0.073 mg/m^3, the indoor formaldehyde concentration of Lin (2019) method is 0.071 mg/m^3, and the indoor formaldehyde concentration of this method is 0.052 mg/m^3. When the painting days are 5 days, the indoor formaldehyde concentration of the method is 0.042 mg/m^3 when only ventilation and activated carbon adsorption are used, the indoor formaldehyde concentration of the Zhou (2020) method is 0.029 mg/m^3, the indoor formaldehyde concentration of the Lin (2019) method is 0.37 mg/m^3, and the indoor formaldehyde concentration of the method in this paper is 0.006 mg/m^3. This method has a good effect on indoor formaldehyde concentration control.

Figure 2 Variation of indoor ammonia concentration under different methods (see online version for colours)



According to the analysis of Figure 2, the indoor ammonia concentration is different under different methods. When the painting days are 2 days and only ventilation and activated carbon adsorption are used, the indoor ammonia concentration of the method is 0.012 mg/m^3, that of Zhou (2020) method is 0.082 mg/m^3, that of Lin (2019) method is 0.09 mg/m^3, and that of this method is 0.061 mg/m^3. When the painting days are 6 days and only ventilation and activated carbon adsorption are used, the indoor ammonia concentration of the method is 0.013 mg/m^3, the indoor ammonia concentration of Zhou (2020) method is 0.087 mg/m^3, the indoor ammonia concentration of Lin (2019) method is 0.071 mg/m^3, and the indoor ammonia concentration of this method is 0.011 mg/m^3. The indoor ammonia concentration of the pollution control method in this paper is significantly reduced. This shows that this method has a good effect on building environmental pollution control.

7 Conclusions

This paper presents a method of environmental pollution control method of building construction under uncertain influence. Screen the influencing factors of construction pollution prevention and control under uncertain conditions; Calculate the weight of environmental pollution influencing factors of building construction, obtain the scale table of judgment matrix, obtain the importance evaluation results of different factors, and give the environmental pollution control method of building construction according to the results. The following conclusions are drawn through experiments:

1 When the time is 18:01–20:00, the average noise value after the treatment of this method is 40 dB. This method always has a good noise reduction effect.

2 When the painting days are 5 days, the indoor formaldehyde concentration of this method is 0.00 6 mg/m^3. This method has a good effect on indoor formaldehyde concentration control.

3 When the painting days are 6 days, the indoor ammonia concentration of this method is 0.011 mg/m^3. The indoor ammonia concentration of the pollution control method in this paper is significantly reduced. This shows that this method has a good effect on building environmental pollution control.

To sum up, the method in this paper can effectively solve the problem of poor environmental pollution control effect of traditional construction methods, and lay an important theoretical foundation for the further development of construction pollution control technology, which can achieve low emission of pollutants in construction and green construction.

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