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STUDY ON MONITORING METHOD OF DUST POLLUTION IN GREEN CONSTRUCTION OF CONSTRUCTION ENGINEERING

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Abstract: Considering the low monitoring accuracy of traditional methods, the research on monitoring methods of fugitive dust pollution in green construction of building engineering is proposed. Firstly, the spatial distribution function of dust pollution monitoring and the characteristic matrix of pollution sources are constructed, and the positioning of the dust pollution sources of green construction of construction projects is completed by combining the three dimensional reconstruction technology. Then, the diffusion coefficient of the dust pollution emission factors is calculated by constructing the emission model of the dust pollution factors. Based on the adsorption of the dust pollution emission factors, the dust pollution emission factors of green construction of construction projects are calculated. Combined with the design of the dust pollution monitoring algorithm for green construction of construction engineering, the dust pollution monitoring for green construction of construction engineering is realized. The experimental results show that the method in this paper is less affected by the dust intensity when monitoring the dust pollution caused by green construction of construction projects, and can improve the monitoring accuracy.
Keywords: Dust pollution; Green construction; Monitoring methods; Architectural engineering; Pollution source location

1. INTRODUCTION

Nowadays, while the society is developing, the domestic economic strength is also getting stronger and stronger, and the construction industry is also developing rapidly. Urban construction and industrial construction Both construction and transportation construction are growing substantially [1], brought a series of environmental pollution problems. Medium and large cities are facing severe smog and dust weather, which is closely related to dust pollution during construction separable link, these suspended respirable pollution particles have been severely The problem of urban ecological environment protection has become a key issue that needs to be solved urgently in today's society [2]. Most of the existing dust pollution monitoring methods for green construction of construction projects present a data quantification model, and the results seem to be relatively accurate, but in the actual construction process, the monitoring accuracy cannot be guaranteed [3]. Therefore, the study of scientific and effective monitoring methods for green construction dust in construction projects has become a key research direction in this field.
Dai Yuan et al. [4] A water based spectroscopic analysis technique is proposed quality pollution level detection method, used to monitor the water pollution status of the surface today. To assist in the treatment of water pollution problems at this stage. Bai Yazhou et al. [5] for In order to accurately detect hydraulic oil pollution, image processing technology is used to design a detection method, first use image processing technology to collect hydraulic oil samples are processed, and according to the composition of some components, obtain the linear law diagram of hydraulic oil, and then combine the linear analysis method to construct the hydraulic oil pressure oil detection model, and the detection degree of the model is carried out through the attenuation curve. The results show that although the hydraulic oil based on image processing technology. There are certain errors in the measurement process of the pollution detection method, but the measurement. The pollution level of the hydraulic oil in the same amount is basically the same, and the model can meet the requirements of the current stage accuracy requirements for hydraulic oil pollution detection.
Based on the above research background, this article focuses on the green construction of construction projects. Gong Yang dust, set count one kind sewage dye supervise measurement square law, from and carry high supervise measurement precision.

2. DESIGN OF MONITORING METHOD FOR FLYING DUST POLLUTION IN GREEN CONSTRUCTION OF CONSTRUCTION ENGINEERING

2.1 Locating Dust Pollution Sources Of Green Construction In Construction Projects

Before the monitoring of green construction dust in construction projects, it is necessary to first The pollution source of green construction dust in construction projects is located, and the utilization area Domain feature matching method [6] , Constructing the spatial distribution function of dust pollution monitoring number, expressed as formula (1):

$$\Omega \text{ fien} = \frac{1}{\phi}\Omega \text{ tife} + (1 - \frac{1}{\phi})\Omega \text{ fib} \quad (1)$$

Among them, ϕ Indicates the distribution function coefficient, Ω tife Indicates construction work Kernel function of green construction dust pollution, Ω fib Indicates that the spatial region matched dust characteristics, the expression is as (2):

$$\begin{cases} \Omega \text{ tife} = (x1 \quad i\_)2 + 1 \end{cases}$$

$$\Omega \text{ fib} = \exp(- \phi \| x\ 1 - x\ i \quad (2)$$

If there is dust in the medium polluted by green construction of construction projects in single scattered shoot strip piece, that What? Young dust Sewage dye source of muddy turbidity Spend for male Formula (3):

$$\vartheta = \pi\ \Psi\ d\ 2\ \text{lambda} \quad (3)$$

Among them, Ψ s Represents the area where the polluted medium spreads in the air, λ exc Represents the extinction coefficient of dust pollution source, d Represents dust pollution particles. The diameter of the particle, the calculation formula is as (4):

$$d = \sqrt{\frac{S_p}{\pi}} \quad (4)$$

In the above formula, Sp Table representing the measured dust-polluted media area. In order to extract the characteristics of dust pollution sources in green construction of construction projects, Accurate positioning of dust pollution sources in green construction of construction projects [7], Construct the pollution source characteristic matrix by the following formula:(| ∂P)|

$$J(x, \text{the } y, \sigma) = < \frac{|\partial x|}{\left|\frac{\partial P}{\partial y}\right|} \quad (5)$$

The images of dust pollution sources collected during green construction of construction projects were analyzed and analyzed. processing, using the characteristic analysis method to analyze the characteristics of dust pollution sources. The position is marked, and the obtained pixel value of the pollution source space is:

$$\text{kappa } 2 = (\varphi; F\ X) = \sum_{i>j} \frac{f_{ij}(\phi)}{f_x(x_i, x_j)} \quad (6)$$

In the above formula, f ij (φ) Gray representing feature extraction of dust pollution sources degree value, f X (x i , x j) Represents the characteristic component value of the dust pollution source. Feature extraction of dust pollution sources in green construction of construction projects In the process, through three-dimensional reconstruction, the promotion of green construction of construction projects is realized. The accurate location of dust pollution, the location information obtained is:

$$\{ w\ x = (\bar{R}\ x,\ \bar{G}\ x,\ \bar{B}\ x) \quad W_y = (\bar{R}_y, \bar{G}_y, \bar{B}_y) \quad (7)$$

Among them, w x and w the y Respectively represent the green construction dust of construction projects The horizontal and vertical feature components of pollution. Using the regional feature matching method above, the dust pollution monitoring system was built. The measured spatial distribution function, according to the green construction dust pollution of construction projects According to the characteristics of pollution sources, construct a pollution source characteristic matrix, combined with 3D reconstruction technology. The technology locates the source of dust pollution in the green construction of construction projects.

2.2 Calculation Of Dust Pollution Emission Factors In Green Construction Of Construction Projects

After locating the source of dust pollution from green construction of construction projects, it is necessary to plan calculation of dust pollution emission factors for green construction of construction projects, in the calculation process Among them, the fugitive dust emission factor is divided into construction engineering factor and vehicle emission factor sub, and according to the construction conditions on site, the main construction area. Research on emission factors of dust pollution. In determining the green construction of construction projects. In the process of dust pollution emission factors, various influencing factors need to be considered. Use the following formula to express the dust pollution factor emission model:

$$\sigma * \left(\frac{C}{12}\right)_e * \left(\frac{V}{30}\right)_f \quad PC\_ = \left(\frac{L}{0\ 5}\right)_g \quad (8)$$

In the above formula, P c Indicates the emission of dust pollution during construction Amplification factor, σ is the radius of the pollution emission factor, e, f, g respectively A general constant in the calculation process, C is the dust content in the construction process, V is the water content of the dust emission factor, L Pollutants during construction Emissions, ε l Exhaust emissions from vehicles during construction. In the daily construction process of construction projects, it is usually a relatively It is a long process, so the dust and pollution during the construction process The dyed particles will show irregular movement in the air, affected by the air vortex The influence of vortex and external force

will change the direction and intensity of motion, which depends on the speed of air movement. Diffusion of Dust Pollution Emission Factors coefficient λ p for:

$$\frac{\lambda_p}{\lambda} = 1 - \frac{T_E^2}{T_E^2}\left(\frac{3\beta}{\beta + 2}\right)_+ o\left(\frac{1}{T_E^+}\right) \quad (9)$$

In the above formula, β Indicates the interaction of dust pollution emission factors in the air. As a result of the action, T E Indicates the emission factor of dust pollution in the air vortex The eigenvalues in, λ Indicates the diffusion speed of dust pollution emission factor,T E represents the microscale. Emission factors of dust pollution in the process of green construction of construction projects During the calculation process, the calculation of the dust pollution emission factor is constructed model, get the formula (10):

$$G\ f = 0.001\ 6 \cdot \left(\frac{H}{2}\right)1.4 + \varpi \cdot \left(\frac{V_f}{2\ 2}\right)1.3 \quad (10)$$

In the above formula, G f Indicates that dust is raised during the green construction of construction projects Pollution emission factor, ϖ Indicates the radius of the building material, V f said to build Wind speed at the construction site, H Indicates the moisture content of construction waste. Considering that the construction process of the construction project will be affected by many factors noise, the emission factor of dust pollution will have adsorption effect, so it will be raised. The adsorption calculation formula of dust pollution emission factor is shown in (11):

$$x = j\ M \cdot \frac{H \cdot d}{\pi L^2} \quad (11)$$

In the formula, X Indicates the adhesion of dust pollution emission factor, M Indicates the movement speed of the dust pollution emission factor, J means dusty adhesion degree of pollution emission factor, L Indicates the emission factor of dust pollution Movement distance. Based on the adsorption of dust pollution emission factors, the calculation of construction engineering emission factor of dust pollution from Chenggreen construction:

$$\sum c = z\ h * \left(\frac{s}{225}\right) \cdot \left(\frac{365 - t_{day}}{235}\right) \quad (12)$$

In the above formula, ∑ Indicates the emission factor of dust pollution, ζ said to build the radius of the building material, s Indicates the moisture content of building materials, t day Show Shi duration of work, h Indicates the accumulation height of construction waste. According to the above process, the green construction dust of construction project is calculated pollution emission factor.

2.3 Algorithm For Designing Green Construction Dust Pollution Monitoring In Construction Engineering

In order to improve the precision of dust pollution monitoring in green construction of construction projects degree, it is necessary to monitor the dust pollution in the green construction of construction projects in the image The shadow part of the shadow part is removed, and the accuracy can be obtained through training. The monitoring image separated from the background and shadow, the specific steps are as follows:

Step1: Select training samples of dust pollution

Selected in the monitoring image of dust pollution in green construction of construction engineering image information with shadows, and monitor the shadow information of images and The feature vector of the background information is extracted, and the sample is defined as (x i, y i), so that the x i green construction Dust pollution monitoring training samples. y i Monitoring images for dust pollution Feature classification vector, y i $\in$ {1,- 1} is the value of the eigenvector. Fake set up y i = 1, you can get the green construction dust pollution monitoring of construction projects shaded portion of the test ; assume y i =- 1, then the background area can be obtained.

Step2: Normalization processing

The green construction dust pollution monitoring of the above-mentioned construction projects The measured image information is normalized, respectively from the gradient value, gray value and chromaticity value to carry out attribute classification to obtain new features to Quantity, and so on to get a relatively stable promotion of green construction of construction projects

Classification vector of dust pollution monitoring images.

Step3: Using image processing technology to construct green buildings Construction dust pollution monitoring model, and use classifier for sample training. After practice, the obtained mathematical expression is as (3):

$$m\ i\ no\ \frac{1}{2}\ \|\omega\|\ 2 + D\ \sum_i\ A\ i \quad (13)$$

Among them, ω Indicates the green color of construction engineering after image processing The feature vector of construction dust pollution monitoring image, A i Indicates the characteristic direction volume set, D represents the error function.

Step 4: Monitoring images of dust pollution from green construction of construction projects target pixels i Collect, and then after intensive training, get to the classifier to identify the pollution sources individually, and to monitor the dust pollution Normalize the test results. This step completes the construction project green The stripping of the shadow part and the background part of the monitoring image of the dust pollution of the construction Finally, use the image binarization method to get the final construction The monitoring images of dust pollution in construction projects of green construction projects show that the green construction projects of construction projects

The industrial dust pollution monitoring algorithm can be expressed as formula (14):

$$gamma = Q\ e\ \cdot \frac{P}{C_M} + no\ i\ \frac{\chi}{g'} \quad (14)$$

Among them, Q e Indicates the movement speed of the dust pollution factor, g ' express Reflectivity of the building works area, P Indicates the monitoring and correction of dust pollution. As a result, C M For the green construction dust situation of construction projects, n i for collection number of dust pollution factors, χ In order to monitor the dust situation in the area.

To sum up, the dust pollution monitoring of green construction of construction projects is designed. Algorithm, realized the dust pollution monitoring of green construction of construction projects.

3. SIMULATION ANALYSIS

3.1 Arrangement Of Monitoring Points

According to the distribution of wind field and dust pollution of construction projects. Diffusion characteristics of the concentration, in the upper and lower wind direction of the prevailing wind direction do not arrange a monitoring point, and use the monitoring point at the enclosure in the upper wind direction as the monitoring point. for reference. In the case of building shelter, according to the dust particles diffusion features, also arrange a space between the two buildings monitoring points. Considering the limitation of monitoring cost and time, choose 10 indivual The monitoring points are used to monitor the dust pollution of green construction of construction projects, with
see table 1.

3. 2 Experimental Sample Data

Use Internet technology to connect dust pollution monitoring equipment and computing Machine equipment, and then connect the dust pollution monitoring sensor to the alarm equipment together to ensure that the monitoring sensors are always running. Simulation Analysis Institute The materials used include fine coal powder, dust pollution monitoring sensors and plugs Small electric fan, the experimental sample data is shown in the table 2.

Table 1 Layout of Monitoring Points

Monitoring points serial number	specific location	Monitoring points bit height
1	windward enclosure	1. 5 m
2	downwind enclosure	0. 75 m
3		1. 5 m
4		2. 5 m
5	windward side of building 3 m place	1. 5 m
6		2. 5 m
7	windward side of building 1 m place	2. 5 m
8	between buildings	1. 5 m
9	main exit	1. 5 m
10	main entrance	1. 5 m

Table 2 Sample Data

dusty type	dyeSources of dust pollution	strength
sawdust	Cutting of wooden building materials	mild
sandy soil	Dust and mixing process of building construction	moderate
dust	deposition of the building itself	severe

3. 3 Result Analysis

In order to improve the performance of the monitoring method in this paper, the 2 middle Sawdust, sand and dust are the experimental objects, and three-dimensional fluorescent light is introduced The monitoring method of spectral technology and the monitoring method based on filter blocking technology For comparison, in the table 1 Under the

arranged monitoring points, test the green quality of construction projects. The monitoring accuracy of dust pollution during construction is as follows.

For wood dust pollution, when the monitoring method based on three-dimensional fluorescence spectroscopy is used, the monitoring accuracy is between method based on filter clogging technology. The monitoring accuracy of sawdust dust pollution is in the 70% The above, and adopt the text in Chinese When using the method to monitor wood chip dust pollution, the monitoring accuracy can be controlled within 90% by above, it shows that the method in this paper has the highest accuracy in monitoring light pollution. Based on three-dimensional fluorescence spectroscopy. The monitoring method based on the technique and the monitoring method based on the filter blocking technology are in the monitoring When measuring sand and soil dust pollution, the monitoring accuracy is in the 80% The following, while using When the method in this paper monitors sandy dust pollution, the monitoring of sandy dust pollution accuracy in 85%. The above shows that when the construction project green construction dust pollution.

When it is moderate, the monitoring accuracy of the method in this paper is still the highest, with wood dust pollution and sand Compared with soil dust pollution, three methods are used in monitoring dust dust pollution The accuracy is low, but the method in this paper is effective in monitoring dust pollution When, the monitoring accuracy can still be controlled at 80% above, in the description Method When monitoring heavy dust pollution, the monitoring accuracy meets the requirements of construction workers. Cheng Green construction dust pollution monitoring requirements.

4. CONCLUSION

With the continuous advancement of China's urbanization process, the construction industry has gained rapid development, the construction dust problem is difficult to solve, causing environmental pollution extremely bad influence. With the development of high technology, construction enterprises. The pollution situation should be monitored in time, and effective measures should be put forward way to modify it. The research focuses on the precision of traditional dust pollution monitoring The problem of low degree of dust pollution in construction projects has been put forward. Measurement method research. Research introduces 3D reconstruction technology to complete construction work. The location of the dust pollution source of Cheng Green construction, and then the cause of the dust pollution The sub-emission model is constructed to complete the diffusion of dust pollution emission factors The calculation of the coefficient is finally completed through the characteristics of the emission factor of dust pollution Its calculation realizes the monitoring of dust pollution in the green construction of construction projects. The test found that this method can effectively improve the monitoring accuracy, and its effect on wood. The monitoring accuracy of dust pollution has reached 90% Above, to the sand and dust pollution monitoring accuracy is in the 85% Above, the monitoring of dust and dust pollution measurement accuracy is in 80% The above is better than the comparative method, and has certain research value.

COMPETING INTERESTS

The authors have no relevant financial or non-financial interests to disclose.

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