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Road construction project waste material recommendations

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Road construction project waste material recommendations

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Abstract. After risk identification and risk analysis done, so risk response is carried out. Risk response is handled by the service provider. Recommendation is the final result of risk management of road construction project waste material. The recommendation is the aggregate B and Ready Mix Concrete is necessary to pay attention to the waiting time and pay attention to the critical trajectory on material scheduling so that breakdowns and scheduling updates are made per week. Need to pay attention to rainfall and implementation methodology. Recommendations for lean concrete waste material are necessary to pay attention to the waiting time and pay attention to the critical trajectory on material scheduling so that breakdowns and scheduling updates are carried out per week. Need to pay attention to rainfall and implementation methodology. And the causes for minimizing waste material must be considered.

1. Introduction

Risk Analysis was carried out on 51 road construction projects which stated that Aggregate B, Concrete Ready Mix and Lean Concrete which produced a number of causes of waste material and most have a high risk rating is emphasis on time and cost emphasis (Waty and Sulistio, 2019)

And now will do recommendation for waste material on road construction project after risk response.

2. Respon risk

The Risk Response generates risks received by the contractor on the first worksheet and on the second worksheet results in transfers to the implementing contractor because the contractor as the service provider must accept the consequences if a problem occurs except natural disasters and the handling of the most important risks and who handles them. After the risk response is generated, recommendations are sought. Before recommendations are made, Focus Group Discussions are conducted.

3. Focus group discussion

Group Discussion is conducted to get the expected recommendations. There were seven FGD participants. Focus Group Discussion (FGD) is a way of several ways that are used to gather opinions or perceptions from experts in their fields, thus it can be used for input into a study. The discussion invites experts at a specific place and time. It starts with giving a presentation beforehand on the model that has been obtained then the analysis that produces the sources and causes of the waste material that has been produced, then a discussion is held to determine the right recommendations.

Expert Judgment
Expert Judgment are urgently needed at the meeting. There are about 35 questions that need to be made recommendations. For example, one of the questions is taken number one, which is information on road design drawings that are less complete.
Expert Judgment 1:
Recommendations for the causes of incomplete road design drawing information are necessary to verify before the auction is conducted.
Expert Judgment 2:
Recommendations are: It is necessary to do a typical picture with only long and cross section drawing. The recommendation is to disagree with the expert 1
Expert Judgment 3
Recommended factors for incomplete road design image information.
The recommendation is to agree with expert 1 but also agree with expert 2 because if expert 1 only discusses the auction and not too detailed. But agree with expert 2 because it is more detailed.
Expert Judgment 5
The recommendation is to agree with expert 1 and expert 2 by adding design details to avoid change orders.
Expert Judgment 6
Recommendation for the causes of incomplete road design image information is to agree with expert 5.
Expert Judgment 7
Recommendations The factors that cause image information to be incomplete are to agree with expert 1 and expert 2
Expert Judgment 4
Recommendations The factors that cause image information to be described as incomplete are those that do not agree with expert 5.

4. Result dan discussion

From the Focus Group Discussion produces recommendations, where there is one recommendation , namely Road Construction Project recommendations recommendations as listed in Table 1 below.

Recommendations for the Road Construction Project relating to material management which will be discussed below.

Table 1. Minimization of material waste for road construction project. (a)

Waste Material Aggregate B
Source: Design Causes: - Information on road design drawings that are incomplete Minimization recommendations: - Verification needs to be done before the auction is carried out, not only with typical long and cross section, but with detailed design so as to avoid change order.
Source: Material Procurement Order errors result in excess or lack of material for Minimization recommendations: - Orders must be made in accordance with auction requirements, needs and looking for responsible suppliers.
Source: Material Handling Causes: - Errors in the use of materials that need to be replaced, for example, do not comply with specified specifications such as abrasion and gradation and aggregate grain hardness - Material sent in less condition. - The amount of material needed is not clearly known because of imperfect planning.

Table 1. Minimization of material waste for road construction project. (b)

- Measurement of inaccurate field dimensions resulting in excess volume. Minimization recommendations: - Must be in accordance with the reference standards including SNI 03-4141-1996, SNI 1744: 2012 and SNI 7619: 2012 so that the aggregate used has a minimum immersion CBR value of at least 60% and a plasticity index of 0-10. - Find the appropriate borrow pit and avoid irresponsible suppliers. - Review design with re-measurement so that when shop 0%, a shop drawing can be made. Leveling of sub grade must be properly checked with Theodolite at each implementation and confirmed solid soil conditions.
Source: Behavior Control Factors that cause: - Material scheduling control deviations - Deviations in controlling material costs Minimization recommendations: - Need to pay attention to the waiting time and pay attention to the critical trajectory on material scheduling so that breakdowns and scheduling updates are carried out per week. Need to pay attention to rainfall and implementation methodology. It is necessary to pay attention to the Variant Schedule (SV) and Cost Variant (CV) because if SV and CV = negative then the work is finished late and costs higher than the budget. - Paying attention to the Work Breakdown Structure of each type of work so that if there is a delay in immediate handling, for example if there is a 5% delay, a meeting must be held and if the delay of 10% is necessary, the Show Cause Meeting should also take into account the weather and implementation methodology. It is necessary to pay attention to the Variant Schedule (SV) and Cost Variant (CV) because if SV and CV are negative so the work is finished late and costs higher than the budget.
Waste Material Lean Concrete
Source: Design Causes: - Order error due to choosing different product specifications Minimization Recommendation: - Must pay attention to specifications that are in accordance with the required terms of reference.
Source: Material Handling Causative factors - Material sent in less condition Minimization recommendations: Pay more attention to the sub contractor to get the right volume according to the specifications.
Source: Behavior Control Causes: - Material scheduling control deviations Minimization Recommendation: Need to pay attention to the waiting time and pay attention to the critical trajectory of project scheduling so that breakdowns and scheduling updates are made per week. Need to pay attention to rainfall and implementation methodology. It is necessary to pay attention to the Variant Schedule (SV) and Cost Variant (CV) because if SV and CV are negative so the work is finished late and costs higher than the budget.

Table 1. Minimization of material waste for road construction project. (c)

Waste Material Concrete Ready Mix
Source: Behavior Control Causes: - Deviations in controlling material costs
Minimization Recommendation: - Paying attention to the Work Breakdown Structure of each type of work so that if there is a delay in immediate handling, for example if there is a 5% delay, a meeting must be held and if the delay of 10% is necessary, the Show Cause Meeting should also take into account the weather and implementation methodology. It is necessary to pay attention to the Variant Schedule (SV) and Cost Variant (CV) because if SV and CV are negative so the work is finished late and costs higher than the budget.
Source: Material Handling Causes: - Damage to material in the place due to the slow cutting of concrete Minimization recommendations: - Immediately conduct a special team to cut before 8 hours. Source: Implementation Causes: - Work accidents in the field. - Unreliable equipment Minimization recommendations: - Applying the correct K3 in accordance with OHSAS or SMK3 with clear and precise PPE. - Repairing tools or using appropriate equipment in accordance with the requirements in the work reference frame of at least 90% of its novelty.

5. Recommendation

The recommendations for the causes of each of the most extreme materials are as shown below.for Road Construction Projects:

1. B Aggegate
Source: Behavior Control
Cause: Material scheduling control deviations
Recommendation: Need to pay attention to the waiting time and pay attention to the critical trajectory on material scheduling so that breakdowns and scheduling updates are carried out per week. Need to pay attention to rainfall and implementation methodology. It is necessary to pay attention to the Variant Schedule (SV) and Cost Variant (CV) because if SV and CV are negative so the work is finished late and costs higher than the budget.

2. Lean Concrete Source: Behavior Control
Cause: Material scheduling control deviations
Recommendation: Need to pay attention to the waiting time and pay attention to the critical trajectory on material scheduling so that breakdowns and scheduling updates are carried out per week. Need to pay attention to rainfall and implementation methodology. It is necessary to pay attention to the Variant Schedule (SV) and Cost Variant (CV) because if SV and CV are negative, so the work is finished late and costs higher than the budget.

3. Concrete Ready Mix Source: Behavior Control
Cause: Deviation in controlling material costs
Recommendation: Pay attention to the Work Breakdown Structure of each type of work so that if there

is a delay in immediate handling, for example, if a 5% delay occurs, a meeting must be held and if the delay of 10% is necessary, the Show Cause Meeting should also take into account the weather and implementation methodology. More concentration on the cost of implementation. It is necessary

to pay attention to the Variant Schedule (SV) and Cost Variant (CV) because if SV and CV are negative so the work is finished late and costs higher than the budget.

6. Conclusion

The causal factors that need to be considered to minimize waste material with risk management during the implementation phase of the road contruction project are as follows:

a. Waste Material B Aggregate Causes:

- Information on road design drawings that are incomplete.
- Order errors result in material overload or lack.
- Errors in the use of materials that need to be replaced, for example, do not conform to specifications specified such as abrasion and gradation and aggregate grain hardness.
- Material sent in less condition.
- The amount of material needed is not clearly known because of imperfect planning.
- Measurement of inaccurate field dimensions resulting in excess volume.
- Material scheduling control deviations.
- Deviations in controlling material costs.

b. Waste Material Lean Concrete Causes:

- Error ordering because choose a different specification.
- Material sent in less condition.
- Material scheduling control deviations.

c. Waste Material Concrete Ready Mix Causes:

- Deviations in controlling material costs.
- Damage to material in the place due to the delay in cutting concrete.
- Work accidents in the field.
- Unreliable equipment.

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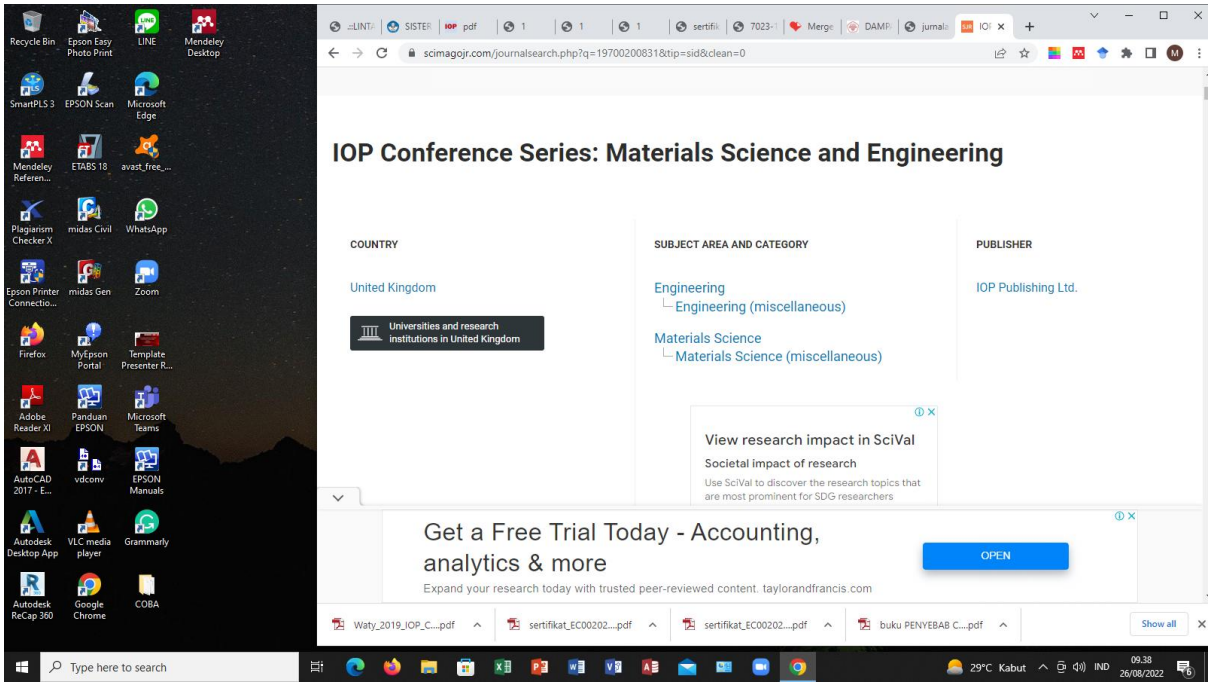
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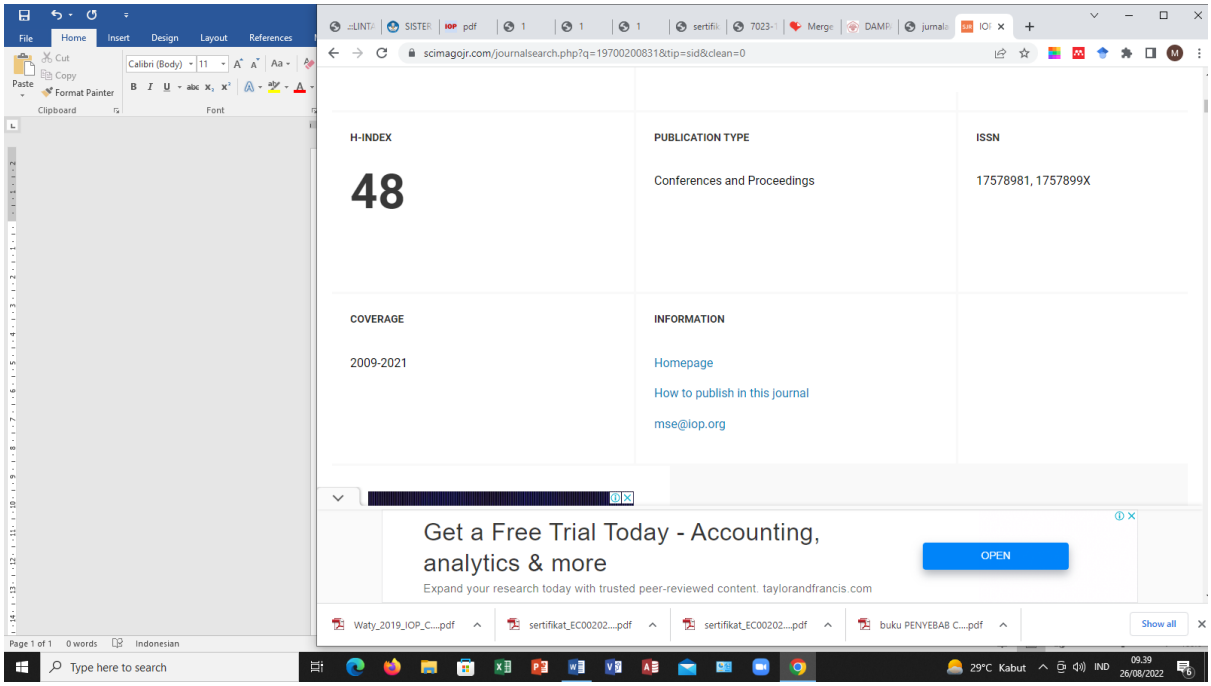
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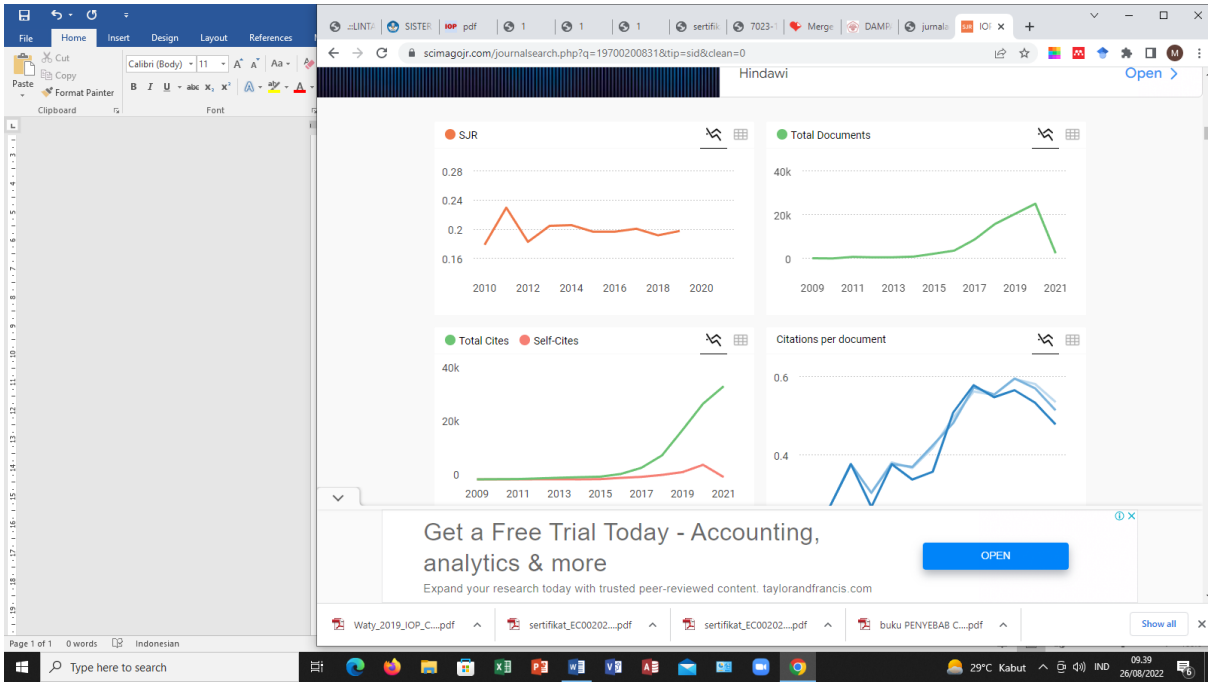
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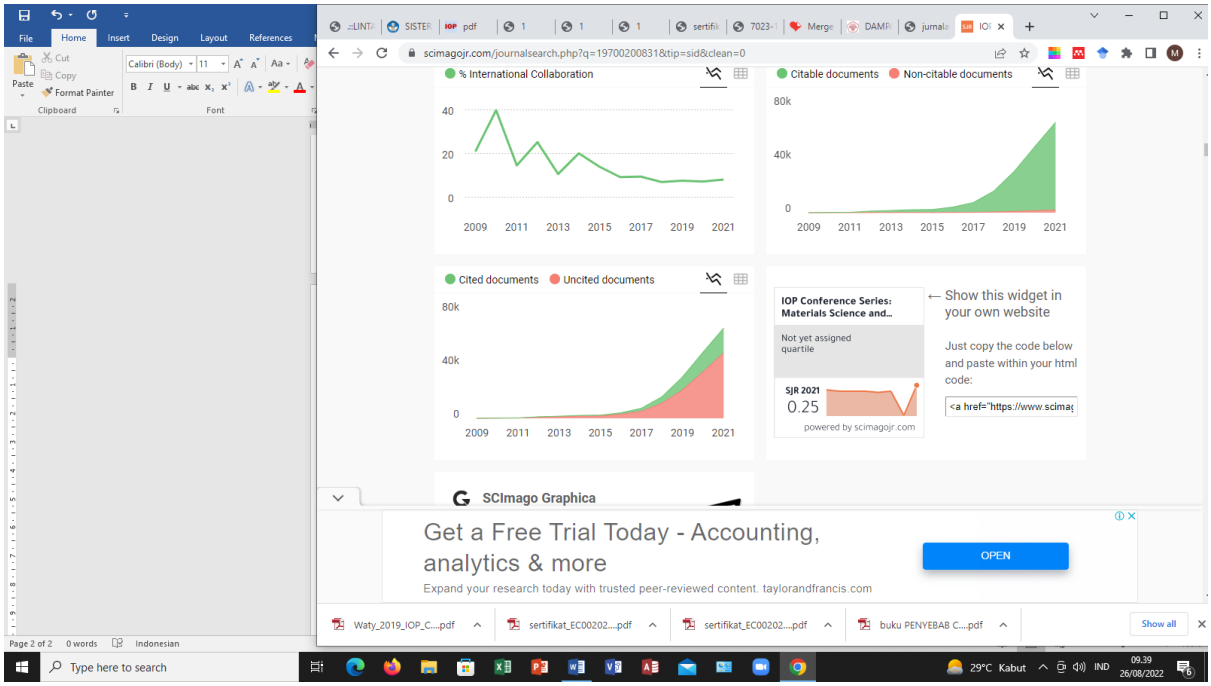
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