

Analysis of Construction Work Contracts in the Context of Handling Natural Disaster Emergencies

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Abstract- Handling natural disasters in Government Procurement is included Procurement in the Handling of Emergency Conditions. In terms of handling natural disasters, specifically for handling in the infrastructure sector, most of which use state finances, both APBN and/or APBD, are carried out with a specific government procurement scheme for the procurement of construction work. In Indonesia, implementation of contract is one of the stages in the procurement of government construction work. There are several types of contracts that can be used for the procurement of construction work in the handling of emergency conditions, namely lump sum, unit price, combination of lump sum and unit price, or cost-plus fee. All types of contracts have regulated contract models/standards, except for the cost-plus fee contract. This research aims to determine the existing condition implementation of contract, problem experienced, as well as suggestions and input in the procurement of government construction work in the handling emergency conditions due to natural disasters. This research is started with literature study, pilot survey, and then survey conducted by distributing questionnaires to respondents. Of the 20 respondents of Commitment-Making Officer (PPK) at the Ministry of Public Works and Housing (PUPR) who have and/or are handling of emergency conditions due to natural disasters, 17 respondents use unit price contracts and 3 respondents use combination of lump sum and unit price contracts. Problems related to the reasonableness of unit prices are (1) the unit price of each item of work is often declared unreasonable or expensive by auditors, (2) the basic price for wages and materials cannot be higher than the highest regional basic price, even though in natural disaster conditions and (3) the implementation of audits of work results is carried out on a post audit basis, often resulting in returns by contractor because the basic price is considered unreasonable or expensive. Problems related to payments to contractor, namely (1) no advance payment applied, (2) payment is single payment after the completion of work and (3) payments are delayed for too long because the budget is not yet available. The problem of lack of interest of contractor appointed to work on natural disaster. 80% of respondents suggested the need to regulate the cost-plus contract model/standard so that the use of this type of contract can be used and is assumed to minimize problems in the implementation of procurement of government construction work in the handling emergency conditions due to natural disasters.

Index Terms- construction work, contract, emergency, natural disaster, procurement.

I. INTRODUCTION

Indonesia is one of the countries that has a high level of disaster vulnerability. Based on data from the World Risk Report 2020, Indonesia ranks 40th with a risk index of 10.39 out of 181 countries (Behlert, et al., 2020). According to Law Number 24 of 2007 on Disaster Management, a disaster is an event or series of events that threatens and disrupts people's lives and livelihoods caused by natural and/or non-natural factors as well as human factors resulting in human casualties, environmental damage, property losses, and psychological impacts. Disasters can be divided into three major groups, namely natural disasters, non-natural disasters and social disasters. Natural disasters are disasters caused by events or a series of events caused by nature, including earthquakes, tsunamis, volcanic eruptions, floods, droughts, hurricanes, and landslides. According to data from the National Disaster Management Authority (BNPB), disaster events in Indonesia tend to increase every year. From 2010 to 2020 there were 28,346 disaster events in Indonesia dominated by natural disasters with an estimated death toll of 10,044 people, as can be seen in the figures and tables below.

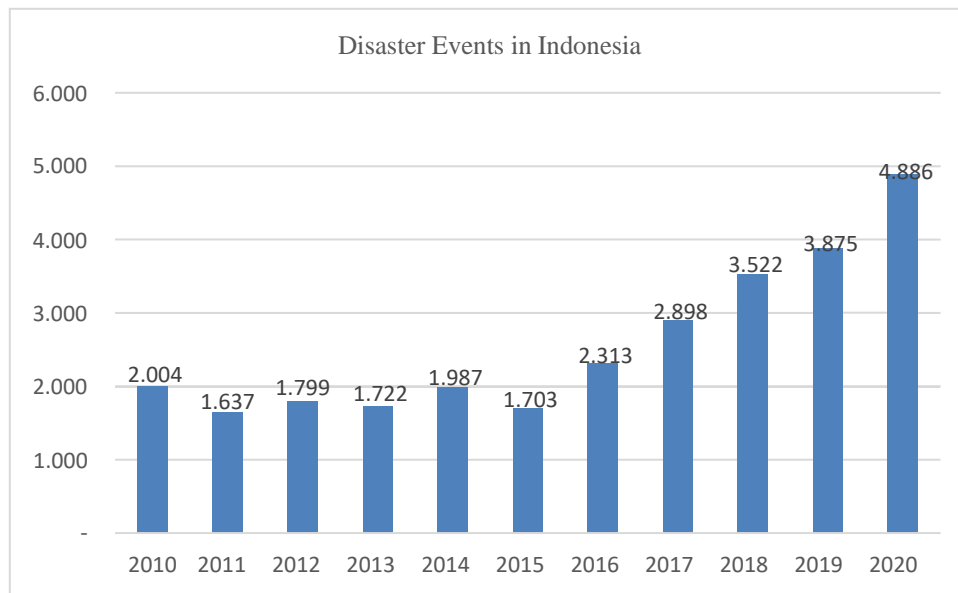


Figure 1 Number of Disaster Events in Indonesia from 2010 to 2020
 Source: dibi.bnpp.go.id

Table 1 Number of Disaster Events in Indonesia from 2010 to 2020 by Disaster Category

No.	Category	Year										
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
1	Floods	1.101	578	593	761	610	531	825	980	883	790	1.518
2	Lanslides	403	329	287	294	598	502	599	850	642	726	1.152
3	Abrasion	12	17	29	36	20	7	22	11	53	18	44
4	Whirling Wind	408	443	545	503	618	571	663	887	1.137	1.390	1.484
5	Drought	43	219	263	66	7	7	-	19	130	123	26
6	Forest Fires	4	24	49	41	102	46	178	96	536	757	618
7	Earthquake	24	22	17	13	19	26	19	41	65	57	28
8	Tsunami	1	1	9	-	2	-	-	-	7	-	-
9	Earthquake and Tsunami	-	-	-	-	-	-	-	-	5	-	-
10	Volcanic Eruption	8	4	7	8	11	13	7	14	63	7	14
11	Others	-	-	-	-	-	-	-	-	1	7	2
Total		2.004	1.637	1.799	1.722	1.987	1.703	2.313	2.898	3.522	3.875	4.886

Source: dibi.bnpp.go.id

Handling natural disasters must be carried out with quick and precise action, so that it does not cause greater losses, whether in terms of loss of life or financial loss, and this is one of the state's responsibilities. In terms of handling natural disasters, specifically for handling in the infrastructure sector, most of which use state finances, both APBN and/or APBD, are carried out with a specific government procurement scheme for the procurement of construction work. Procurement activities during a disaster cannot be equated with normal conditions due to the nature of the emergency which requires it to be carried out immediately and cannot be postponed. (Prasetyo, 2019). The statutory regulations that specifically regulate the government procurement in Indonesia at this time are Presidential Regulation Number 16 of 2018 as last amended through Presidential Regulation Number 12 of 2021 on Government Procurement, and specifically regulate the handling of emergency condition, namely the Regulation of The National Public Procurement Agency (LKPP) Number 13 of 2018 on Government Procurement in Handling Emergency Condition and Circular Letter of the Head of LKPP Number 2 of 2022 on Explanation of the Contract Mechanism for Government Procurement in the Context of Handling the Emergency Condition which is a derivative of Presidential Regulation Number 16 of 2018.

According Law Number 2 of 2017 on Construction Services, Construction Work means the whole or part of activities which include construction, operation, maintenance, demolition and reconstruction of a structure. Construction Work by the nature of its business is divided into two groups, namely general and specialist. The general classification of Construction Work businesses includes buildings and civil works. The business classifications of specialized Construction Works include installation, special construction, prefabricated construction, building completion and equipment rental. Business services that can be provided by general Construction Works include construction, maintenance, demolition and/or rebuilding. Business services that can be provided by specialized Construction Works include work on certain parts of construction buildings or other physical forms. Another term used for construction work is construction project (Djatnika, 2018). A construction project is a series of activities that are only carried out once and are generally short-term and have three characteristics, namely (1) unique, where there is never the exact same series of activities, (2) resources are needed, namely workers and something (money, machines, methods, materials), and (3) organization, has a diversity of objectives in which a number of individuals with varying expertise, differences in interests, varying personalities and uncertainties are involved (Erviyanto, 2002).

Implementation of contract is one of the stages in the procurement of government Construction Work and the work relationship between Owner and Contractor must be outlined in a construction work contract. According Law Number 2 of 2017 on Construction Services, Construction Work Contract is a contract document that regulates the legal relationship between Owner and Contractor in the Implementation of Construction Services. The term contract in Indonesia, which comes from the Dutch terms as its original source, namely *verbintenis* and *overeenkomst*, is still a matter of debate because each Indonesian civil law expert has his own arguments and different expertise (Novera & Utama, 2014). Our contract law still uses the regulations of the Dutch Colonial Government contained in Indonesian Civil Code (Salim, 2019). According to Article 1320 Indonesian Civil Code, for an agreement to be valid, four conditions are required, namely the agreement of those who bind themselves, the ability to make an agreement, a certain subject matter, and a reason that is not prohibited. The conditions for the validity of a contract can be grouped into two, namely the subjective conditions of the agreement (the parties entering into the contract) and the objective conditions of the agreement (something that is promised). If the subjective conditions of the agreement are not met, the contract can be canceled, while if the objective conditions of the agreement are not met, the contract is null and void. Can be canceled means that one of the parties can submit to the Court to cancel the agreed agreement. But if none of the parties object then the agreement is still considered valid. Null and void means that from the beginning the agreement is considered non-existent (Salim, 2019). Article 47 Law Number 2 of 2017 on Construction Services, in a Construction Work Contract, one of them must include equal rights and obligations between the Owner and the Contractor. The selection of the right type of contract and in accordance with the conditions is one of the keys to success in the implementation of construction projects. There is no best form of contract, the nature of the project and the specific needs of the owner will determine the form that is most suitable for the project (Hinze, 2011). There are a wide variety of contractual arrangements between owners and contractors that are used in the building construction industry. The two most common forms of compensation are cost-plus a stipulated fee (referred to as cost-plus) and fixed price contracts. (Bajari & Tadelis, 1999). Cost-plus contracts, also known as cost-reimbursable contracts, are very frequently negotiated and are utilized for a variety of construction projects (Clough, Sears, Segner, & Rounds, 2015).

Disaster procurement is an area which has not received much attention from the procurement research community (Atkinson & Sapat, 2012). Likewise in Indonesia, LKPP Regulation Number 13 of 2018 has not specifically regulated the type of contract used in the Procurement of Construction Work in Handling Emergency Condition, where there are several choices of contract types that can be used, namely unit price, lump sum, combination lump sum and unit price, time based, or cost plus fee. Except for the type of cost plus fee contract, the contract standards have been regulated and are contained in statutory regulations, namely LKPP Regulation Number 12 of 2021 on Guidelines for Government Procurement Through Providers which is a derivative of Presidential Regulation Number 12 of 2021. Therefore, this research is intended to find out how the existing conditions of the implementation of construction work contracts in the handling emergency conditions due to natural disasters at the Ministry of PUPR.

II. RESEARCH METHODOLOGY

The right research strategy is needed so that the results obtained are in accordance with the desired objectives of the research itself. Yin (2002) categorizes research strategies into five types: experiments, surveys, literature study, historical and case studies. The use of each strategy has its own advantages and disadvantages, depending on three conditions, namely the type of research question, the control the researcher has over the behavioral events being studied, and the focus of the research phenomenon. For this research, the research strategies used were literature study and survey conducted by distributing questionnaires to respondents. Literature study was conducted on Indonesian laws and regulations related to Government Procurement, construction work contract models/standards in Indonesia, implemented disaster management construction work contracts, books, journals and other documents relevant to this research. From the literature study conducted, a questionnaire containing 50 questions was prepared, consisting of open and closed questions. For closed questions, the scale used is the Guttman scale. This type of measurement scale will get a firm answer, namely "yes-no"; "true-false"; "ever-never"; "positive-negative"; and others. The data obtained can be interval data or dichotomous ratios (two alternatives). So if on the Likert scale there are 3,4,5,6,7 intervals, from "strongly agree" to "strongly disagree", then in the Guttman scale there are only two intervals, namely "agree" or "disagree". Research using the Guttman scale is done when you want to get a firm answer to a stated

problem (Sugiyono, 2015). The Guttman scale is one of the most difficult scales to construct and therefore is rarely used. This scale does not have much relevance for beginners in research and so is not discussed in this book (Kumar, 2011).

Before the questionnaire was distributed to respondents, a pilot survey was conducted first to several prospective respondents to test the effectiveness of the questionnaire to be used. The population used as respondents for the pilot survey and questionnaire survey were PPKs at the Ministry of Public Works and Housing. The sampling technique used is purposive sampling, which is a sampling technique with certain considerations (Sugiyono, 2015). In this case, the sample is the PPK at the Directorate General of Water Resources, Directorate General of Highways, and Directorate General of Human Settlements at the Ministry of Public Works and Housing who has and/or are handling of emergency conditions due to natural disasters. The planned sample size for the pilot survey is 5 respondents and for the questionnaire survey is 20 respondents.

III. DATA COLLECTION AND ANALYSIS

Data collection for this research was carried out in three stages, namely literature study, pilot survey and respondent survey. The respondents included in the pilot survey were 5 PPK Ministry of PUPR who have and/or are handling of emergency conditions due to natural disasters, with the following respondent profiles:

Table 2 Respondents Profile of Pilot Survey

No.	Respondents	Education Level	Work Experience as PPK (Years)	Position
1.	Respondent 1	Master Degree	3	PPK Operasi dan Pemeliharaan I Satuan Kerja Operasi dan Pemeliharaan Sumber Daya Air Sulawesi IV
2.	Respondent 2	Master Degree	3	PPK Pengembangan Kawasan Permukiman Satuan Kerja Pelaksanaan Prasarana Permukiman Wilayah I Provinsi Jawa Barat
3.	Respondent 3	Master Degree	11	PPK Operasi dan Pemeliharaan II Satuan Kerja Operasi dan Pemeliharaan Sumber Daya Air Sumatera V
4.	Respondent 4	Master Degree	7	PPK Satuan Kerja SNVT Pelaksanaan Jaringan Pemanfaatan Air WS Batanghari Provinsi Sumatera Barat
5.	Respondent 5	Bachelor Degree	5	PPK 1.4 Provinsi Sumatera Barat, Satuan Kerja Pelaksanaan Jalan Nasional Wilayah I Provinsi Sumatera Barat

Based on the results of the pilot survey of 5 (five) respondents, the following results were obtained:

1. There was 1 (one) question where 2 (two) respondents responded: (1) the answer options do not cover emergency response due to drought and (2) the answer options are mostly only related to water resources infrastructure.
2. There is 1 (one) question where 1 (one) respondent responded that the question should use optional answers.
3. All questions (50 questions) and their answer options are easy to understand so that they can be continued to be distributed to respondents.

Based on the results of the pilot survey which stated that the questionnaire could be continued to be distributed to respondents, the questionnaire was distributed to 20 (twenty) respondents. The respondents included in the questionnaire survey were 20 PPKs at the Ministry of PUPR who have and/or are handling of emergency conditions due to natural disasters, with the following respondent profiles:

Table 3 Respondents Profile of Questionnaire Survey

No.	Respondents	Education Level	Work Experience as PPK (Years)	Position
1.	Respondent 1	Master Degree	3	PPK Operasi dan Pemeliharaan I Satuan Kerja Operasi dan Pemeliharaan Sumber Daya Air Sulawesi IV
2.	Respondent 2	Master Degree	11	PPK Operasi dan Pemeliharaan II Satuan Kerja Operasi dan Pemeliharaan Sumber Daya Air Sumatera V
3.	Respondent 3	Master Degree	5	PPK Operasi dan Pemeliharaan I, Satuan Kerja Operasi dan Pemeliharaan Sumber Daya Air Sumatera V
4.	Respondent 4	Master Degree	8	PPK Operasi dan Pemeliharaan I, Satuan Kerja Operasi dan Pemeliharaan Sumber Daya Air Sumatera VI
5.	Respondent 5	Master Degree	7	PPK Satuan Kerja, SNVT Pelaksanaan Jaringan Pemanfaatan Air WS Batanghari Provinsi Sumatera Barat

No.	Respondents	Education Level	Work Experience as PPK (Years)	Position
6.	Respondent 6	Bachelor Degree	5	PPK Operasi dan Pemeliharaan III, Satuan Kerja Operasi dan Pemeliharaan Sumber Daya Air Sulawesi III
7.	Respondent 7	Master Degree	4	PPK Irigasi dan Rawa I, SNVT PJPA WS IAKR Provinsi Sumatera Barat
8.	Respondent 8	Master Degree	5	PPK Operasi dan Pemeliharaan I, Satuan Kerja Operasi dan Pemeliharaan Sumber Daya Air Bangka Belitung
9.	Respondent 9	Bachelor Degree	3	PPK Operasi dan Pemeliharaan SDA III, Satuan Kerja OPSDA Citarum
10.	Respondent 10	Bachelor Degree	5	PPK 1.4 Provinsi Sumatera Barat, Satuan Kerja Pelaksanaan Jalan Nasional Wilayah I Provinsi Sumatera Barat
11.	Respondent 11	Master Degree	3	PPK 1.2 Provinsi Sumatera Barat, Satuan Kerja Pelaksanaan Jalan Nasional Wilayah 1 Prov. Sumatera Barat
12.	Respondent 12	Master Degree	5	PPK 3.2 Provinsi Sulawesi Tengah, Satuan Kerja Pelaksanaan Jalan Nasional Wilayah III Provinsi Sulawesi Tengah
13.	Respondent 13	Bachelor Degree	3	PPK 1.3 Provinsi Jawa Barat, Satuan Kerja Pelaksanaan Jalan Nasional Wilayah I Provinsi Jawa Barat
14.	Respondent 14	Master Degree	7	PPK 2.3 Provinsi Kalimantan Timur, Satuan Kerja Pelaksanaan Jalan Nasional Wilayah II Kalimantan Timur
15.	Respondent 15	Master Degree	5	PPK 1.5 Provinsi Banten, Satuan Kerja Pelaksanaan Jalan Nasional Wilayah I Provinsi Banten
16.	Respondent 16	Master Degree	4	PPK 2.6 Provinsi Riau, Satuan Kerja Pelaksanaan Jalan Nasional Wilayah II Provinsi Riau
17.	Respondent 17	Master Degree	3	PPK Pengembangan Kawasan Permukiman Satuan Kerja Pelaksanaan Prasarana Permukiman Wilayah I Provinsi Jawa Barat
18.	Respondent 18	Bachelor Degree	4	PPK Satuan Kerja Pelaksanaan Prasarana Permukiman Wilayah I Provinsi Jawa Tengah
19.	Respondent 19	Bachelor Degree	3	PPK Pelaksanaan Prasarana Permukiman Wilayah Sulawesi Utara
20.	Respondent 20	Master Degree	3	PPK Infrastruktur Permukiman Mendukung Relokasi Akibat Badai Siklon Tropis Seroja, Satuan Kerja Pelaksanaan Prasarana Permukiman Wilayah I Provinsi Nusa Tenggara Timur

From the answers that have been submitted by 20 respondents to the questions contained in the questionnaire, the data is then analyzed descriptively. Included in descriptive statistics include the presentation of data through tables, graphs, pie charts, pictograms, calculation of mode, median, mean (measurement of central tendency), calculation of deciles, percentiles, calculation of data distribution through calculation of mean and standard deviation, percentage calculation (Sugiyono, 2015). Descriptive analysis of the results of the respondent's questionnaire is as follows.

1. Respondents Based on the Number of Disaster Packages

The number of disaster packages that have been and/or are being implemented is divided into 5 (five) groups of package amounts, the number of packages 1, the number of packages 2, the number of packages 3, the number of packages 4, and the number of packages ≥ 5 . Respondents based on the number of packages: the number of package 1 as many as 6 respondents with a percentage of 30% of the total respondents, the number of package 2 as many as 6 respondents with a percentage of 30% of the total respondents, the number of package 3 as many as 5 respondents with a percentage of 25% of the total respondents, the number of package 4 as many as 1 respondent with a percentage of 5% of the total respondents, and the number of package ≥ 5 as many as 2 respondents with a percentage of 10% of the total respondents. The number of packages that have been and/or are being handled by the most respondents is in the number of packages 1 and the number of packages 2.

2. Types of Construction Work in the Handling of Emergency Conditions Due Natural Disaster

Tabel 4 Number of Packages

No.	Types of Construction Work	Number of Packages
1.	Improving the quality of clean water sources at disaster sites	2
2.	Repair/construction of waste water channels for toilets and environmental drainage	1

No.	Types of Construction Work	Number of Packages
3.	Community shelter for destroyed/lost/wiped/damaged houses through the construction of temporary or permanent shelters	3
4.	Immediate restoration of the function of vital facilities/infrastructure	9
5.	Buildings of an emergency nature in Emergency Countermeasures on damaged water resources infrastructure directly related to disaster impacts (closing embankment breaches with sacks of soil and stones, constructing embankments and stream directors from gabions for cold lava flood protection).	6
6.	Temporary buildings in Emergency Management of damaged water resources infrastructure directly related to disaster impacts (bailey bridges to temporarily replace damaged bridges, sheet piles to cover broken embankments, sheet piles installed upstream of weirs to restore water levels at broken weirs, pumps to pump raw water from rivers to temporarily replace water intake from rivers).	1
7.	Semi-permanent buildings in Emergency Management of damaged water resources infrastructure directly related to disaster impacts (gabion construction to create emergency flood spillways, so that later the emergency flood spillway can be upgraded to a permanent flood spillway).	5
8.	Buildings that are permanent in Emergency Management on damaged water resources infrastructure directly related to disaster impacts.	4

3. Availability of Budget in Budget Execution Checklist (DIPA) prior to Implementation of Work
 - a. Of the 20 respondents, 7 respondents or 35% of respondents stated that the Budget Ceiling in DIPA was available before the implementation of the work, while 13 respondents or 65% of respondents stated that it was not available.
 - b. Of the 13 respondents with a Budget Ceiling that was not yet available in DIPA, what was the reference for the maximum limit on budget use, 9 respondents stated that there was no budget limit for Emergency Handling, 1 respondent stated that it was limited to the budget available in the current fiscal year, 1 respondent stated a maximum of 10 billion rupiah, 1 respondent stated that the volume calculation was according to the planner's survey and for the unit price discussion up to the center, 1 respondent stated that it was in accordance with the ceiling set by the directorate.
 - c. Of the 13 respondents with a budget ceiling that is not yet available in DIPA, what is the basis for payment for work implementation, 13 respondents stated that payment is made after the budget is available.

4. Availability of Owner Estimate (HPS) prior to Implementation of Work
 - a. Of the 20 respondents, 16 respondents or 80% of respondents stated that they had their own HPS before carrying out the work, while 4 respondents or 20% of respondents stated that it was not yet available.
 - b. Of the 16 respondents who had HPS available before the implementation of the work, stated that the HPS was compiled by the PPK Team itself.
 - c. Of the 4 respondents who did not have HPS before the implementation of the work, stated that this was due to the unavailability of designs/drawings because the handling of emergencies resulting from natural disasters needed to be carried out quickly.
 - d. Of the 4 respondents who did not have HPS before the implementation of the work, stated that the reference in the reasonableness of the contract price was HPS and / or Construction Contracts around the location of the work implementation.

5. Availability of Drawings/Designs prior to Implementation of Work
 - a. Of the 20 respondents, 7 respondents or 35% of respondents stated that drawings/designs were available before the implementation of the work, 11 respondents or 55% of respondents stated that drawings/designs were prepared simultaneously with the implementation of construction work, and 2 respondents or 10% of respondents stated that the implementation of construction work was without drawings/designs.
 - b. Of the 7 respondents who stated that drawings/designs were available before the implementation of the work, 5 respondents stated that the drawings/designs were prepared by the PPK Team, 1 respondent stated that the drawings/designs were prepared by an individual consulting service provider, and 1 respondent stated that the drawings/designs were prepared by a consulting business entity service provider.
 - c. Of the 11 respondents who stated that the drawings/designs was prepared simultaneously with the implementation of construction work, 7 respondents stated that the drawings/designs was prepared by the PPK Team itself, 2 respondents stated that the drawings/designs was prepared by the Contractor applying the Design and Build method, and 2 respondents stated that the Drawing/Design was prepared by a combination of the PPK Team and the Contractor.
 - d. Of the 2 respondents who stated that the implementation of construction work without a drawings/designs, 1 respondent stated that the reference in carrying out the work was based on recommendations on field conditions together with the Rapid Assessment Team, and 1 respondent stated that the reference in carrying out the work was the initial sketch of urgent handling.

6. Availability of Technical Specification prior to Implementation of Work

- a. Of the 20 respondents, 13 respondents or 65% of respondents stated that Technical Specifications were available before the implementation of construction work, 6 respondents or 30% of respondents stated that Technical Specifications were prepared simultaneously with the implementation of construction work, and 1 respondent or 5% of respondents stated that the implementation of construction work without Technical Specifications.
- b. Of the 13 respondents who stated that the Technical Specifications were available before the implementation of construction work, 12 respondents stated that the Technical Specifications were prepared by the PPK Team itself, 1 respondent stated that the Technical Specifications were prepared by the Individual Consultancy Service Provider.
- c. Of the 6 respondents who stated that the Technical Specifications were prepared simultaneously with the implementation of construction work, 3 respondents stated that the Technical Specifications were prepared by the PPK Team itself, 1 respondent stated that the Technical Specifications were prepared by the Contractor applying the Design and Build method, and 2 respondents stated that the Technical Specifications were prepared by a combination of the PPK Team and the Contractor.
- d. Of the 1 respondent who stated that the implementation of construction work without Technical Specifications, stated that the reference in carrying out the work was to use similar work.

7. Supervision of Work Implementation

Of the 20 respondents, 20 respondents or 100% of respondents stated that Construction Work in the Handling Emergency Condition due natural disasters was supervised by Work Supervisors, 12 respondents or 60% of respondents stated that Work Supervisors from Ministry of PUPR Personnel and 8 respondents or 40% stated that Work Supervisors from Consultancy Business Service Providers.

8. Type of Contract Used in the Implementation of Work

- a. Of the 20 respondents, 18 respondents or 90% of respondents stated that they knew the types of contracts that could be used in the Procurement of Construction Work in Handling Emergency Condition, as stated in LKPP Regulation Number 13 of 2018 on Government Procurement in Handling Emergency Condition and 2 respondents or 10% of respondents did not know.
- b. Of the 20 respondents, 17 respondents or 85% stated that they used the Unit Price contract type and 3 respondents or 15% stated that they used the Combination Lump Sum and Unit Price contract type.
- c. Of the 17 respondents who used the Unit Price contract type, 12 respondents stated that the reason for using the Unit Price contract type was that they followed the contract for the previous similar work package and the standard contract was available according to the government procurement regulations, and 5 respondents stated that the reason for using the Unit Price contract type was that the standard contract was available according to the government procurement regulations.
- d. Of the 3 respondents who used the Combination Lump Sum and Unit Price contract type, all of them stated that the reason for using the Combination Lump Sum and Unit Price contract type was that they followed the contract for a similar work package previously and the standard contract was available according to the government procurement regulations.
- e. Of the 20 respondents, 11 respondents or 55% of respondents stated that the Contract used consisted of an Agreement Letter, General Condition of Contract (SSUK) and Particular Condition of Contract (SSKK), 6 respondents or 30% of respondents stated that the Contract used only consisted of an Agreement Letter/SPK, 1 respondent or 5% of respondents stated that it only consisted of an Agreement Letter and SSUK, and 2 respondents or 10% of respondents stated that they did not know.

9. Contract Signing Time

Of the 20 respondents, 11 respondents or 55% stated that the contract was signed after the work was completed, 8 respondents or 40% stated that the contract was signed before the work was completed, and 1 respondent stated that the contract was signed after the budget was available.

10. Availability of Bill of Quantity and Price

- a. Of the 20 respondents, 19 respondents or 95% stated that the Bill of Quantity and Price was available in the contract, and 1 respondent or 5% stated that it was not available.
- b. Of the 19 respondents for whom a Bill of Quantity and Price was available, the method of determining the unit price for each payment item was based on a unit price analysis prepared by the PPK referring to the Regulation of the Minister of PUPR on Guidelines for Preparing Construction Cost Estimates for Public Works and Housing, with payment items and volumes according to work realisation and basic unit prices in accordance with market prices.

11. Percentage of Overhead and Profit Allowed to the Contractor

- a. Of the 20 respondents, 8 respondents or 40% of respondents stated that the overhead and profit given to the Contractor was 15%, 10 respondents or 50% of respondents stated that the overhead and profit given to the Provider was 10%, 2 respondents or 10% of respondents did not answer or forgot.
- b. Of the 18 respondents who conveyed the amount of overhead and profit given to Contractor, 15 respondents stated that there was no separation of the amount of general costs (overhead) and profit (profit) (merged into 1 percentage amount), 2 respondents stated 10% overhead and 10% profit, and 1 respondent stated 10% overhead and 5% profit.

12. Performance Bond

Of the 20 respondents, 17 respondents or 85% of respondents stated that construction work contracts in the handling emergency conditions due to natural disasters that have been and/or are being carried out do not use Performance Bond, and 3 respondents or 15% stated that they use Performance Bond.

13. Advance Payment

- a. Of the 20 respondents, 18 respondents or 90% of respondents stated that no advance payment was given to the Contractor, and 2 respondents or 10% of respondents stated that an advance payment was given to the Contractor.
- b. Of the 2 respondents who stated that an advance payment was given to the Contractor, 2 respondents stated that it was given at 20%.
- c. Of the 18 respondents who stated that no advance payment was given to the Contractor, 8 respondents stated that the reason for not giving advance payment was because the work was carried out before the signing of the contract, 6 respondents stated that the reason for not giving advance payment was because the budget was not yet available in DIPA, 1 respondent stated that the reason for not giving advance payment was because of the short implementation period, 1 respondent stated the reason because Direct Appointment was carried out and paid at once 100% after the work was completed, 1 respondent stated the reason because the work was urgent and the payment value had not been determined at work, and 1 respondent stated the reason because the payment was made only after an APIP audit.
- d. Of the 20 respondents, 12 respondents or 60% stated that it was not necessary to give advance payments to Contractor, and 8 respondents or 40% stated that it was necessary to give advance payments to Contractor.

14. Payment and Calculation of Work Result

- a. Of the 20 respondents, 17 respondents or 85% of respondents stated that payment was made by single payment after the completion of work, and 3 respondents or 15% stated that payment was made by term.
- b. Of the 20 respondents, 12 respondents or 60% of respondents stated that for the smooth implementation of work, payment for work should be made by lump sum, and 8 respondents or 40% stated by term or monthly.
- c. Of the 20 respondents, 19 respondents or 95% of respondents stated that the calculation of work results before payment was made, namely the work results were measured as installed after that multiplied by the unit price stated in the Bill of Quantities and Prices, 1 respondent or 5% of respondents did not answer.

15. Maintenance Period

- a. Of the 20 respondents, 12 respondents or 60% of respondents stated that the Maintenance Period was applied, 8 respondents or 40% stated that the Maintenance Period was not applied.
- b. Of the 12 respondents who stated that a Maintenance Period was imposed, 6 respondents stated that the Maintenance Period was 180 calendar days, 3 respondents stated that the Maintenance Period was 365 calendar days, 1 respondent stated that the Maintenance Period was 369 calendar days, 1 respondent stated that the Maintenance Period was 60 calendar days, and 1 respondent did not answer.
- c. Of the 8 respondents who stated that the Maintenance Period was not applied, 6 respondents stated the reason was because the construction produced was temporary/non-permanent, 1 respondent stated the reason was because payment was made after the budget, and 1 respondent did not answer.

16. Contract Changes

- a. Of the 20 respondents, 10 respondents or 50% of respondents stated that there was a Contract Change, 10 respondents or 50% of respondents stated that it did not occur.
- b. Of the 10 respondents who stated that a Contract Change occurred, 2 respondents stated that there was 1 Contract Change, 3 respondents stated that there were 2 Contract Changes, 1 respondent stated that there was 1 Contract Change, 1 respondent stated that there was 1 Contract Change, and 3 respondents did not state how many times the Contract Change occurred but stated according to the conditions.

Table 5 Contract Change Condition

No.	Causes of Contract Change	Respondent	Increase in Contract Price	Amount of Contract Price Increase from Initial Contract
1.	adding or reducing the volume stated in the Contract;	2	No	
2.	adding and/or reducing the type of activity/work	2	Yes	10%
3.	adding or reducing the volume stated in the Contract; change the schedule for the implementation of the work; change of PPK.	1	No	

No.	Causes of Contract Change	Respondent	Increase in Contract Price	Amount of Contract Price Increase from Initial Contract
4.	adding or reducing the volume stated in the Contract; increase and/or decrease the type of activity/work; change the technical specifications and/or drawings of the work; change the schedule for the implementation of the work; Compensation Event, change of PPK.	1	Condition Dependent	
		1	Yes	10%
5.	change the schedule of work implementation, after the audit for 100% payment has been carried out.	1	Yes	In accordance with audit results
6.	adding or reducing the volume stated in the Contract; adding and/or reducing the type of activity/work; change technical specifications and/or work drawing.;	1	Yes	10%
7	adding or reducing the volume stated in the Contract; change the schedule for the implementation of the work; change of PPK.	1	Yes	It can be above 10%

17. Audits

- a. Of the 20 respondents, 14 respondents or 70% stated that the audit of the work results was carried out by the Indonesia's National Government Internal Auditor (BPKP), 3 respondents or 15% stated that it was audited by the Inspectorate General of the Ministry of PUPR, 1 respondent stated that it was audited by the Audit Board of Indonesia (BPK), 1 respondent stated that it was audited by BPK and BPKP, and 1 respondent stated that no audit had been carried out.
- b. Of the 20 respondents, 20 respondents stated that the Auditor checked the volume installed in the field and checked the unit price analysis of the work and the audit was carried out in a post audit.

18. Problem in Contract Implementation

- a. Of the 20 respondents, 17 respondents or 85% of respondents stated that there were problems in carrying out the Work, 1 respondent or 5% of respondents stated that there were no problems, 1 respondent or 5% of respondents stated that there were no problems, and 1 respondent or 5% of respondents did not answer.
- b. Of the 17 respondents who stated that there were problems in implementing the Work, these problems can be grouped into three broad categories, as follows.
 - 1) Problems related to the reasonableness of unit prices
 - a) the unit price of each item of work is often declared unreasonable or expensive by auditors
 - b) the basic price for wages and materials cannot be higher than the highest regional basic price, even though in natural disaster conditions
 - c) the implementation of audits of work results is carried out on a post audit basis, often resulting in returns by contractor because the basic price is considered unreasonable or expensive
 - 2) Problems related to payments to contractor
 - a) no advance payment applied;
 - b) payment is single payment after the completion of work
 - c) payments are delayed for too long because the budget is not yet available
 - 3) The problem of lack of interest of contractor appointed to work on natural disaster

19. Cost Plus Fee Contract

- a. Of the 20 respondents, 17 respondents or 85% of respondents stated that one of the reasons why cost plus fees contracts have not been widely or not at all used in the procurement of construction work in the context of handling emergencies due to natural disasters is because there are no standard contract arrangements such as unit price contract types and other types of contracts, 1 respondent stated because it had not been thoroughly socialized, 1 respondent stated because of the risk of unclear indicators of Fees, and 1 respondent stated because it could not be proven that the costs were actually incurred by the Contractor.
- b. Of the 20 respondents, so that the implementation of the procurement of construction work using the cost plus reward contract type can be applied, 20 respondents or 100% of respondents agreed if the cost plus fee contract model/standard was regulated the same as other types of contracts.
- c. Of the 20 respondents, 16 respondents or 80% of respondents thought that using the cost plus fee contract type could minimize problems in the implementation of procurement of construction work in the context of handling emergencies due to natural disasters, 3 respondents said no, and 1 respondent did not answer.

IV.

FINDING AND DISCUSSION

Finding

From the analysis that has been carried out on the results of a questionnaire of 20 respondents, it can be obtained that the existing conditions for the procurement of government construction work in the context of handling emergencies due to natural disasters are as follows:

1. The type of work that is handled the most is the type of work to restore the function of vital facilities/infrastructure immediately.
2. Most respondents (65%) stated that the budget had not been available in DIPA before the implementation of the work
3. Most respondents (80%) stated that the HPS was available before the implementation of the work
4. Most respondents (55%) stated that the drawings/designs were prepared at the same time as the work was carried out.
5. Most respondents (65%) stated that technical specifications were available before the implementation of the work.
6. All respondents stated that the implementation of the work was supervised by the Works Supervisor.
7. Most respondents (85%) stated that the type of contract used was a Unit Price Contract
8. Most respondents (55%) stated that the signing of the contract was carried out after the implementation of the work
9. Most respondents (95%) stated that the contract provided a Bill of Quantities and Prices
10. Most respondents (50%) stated that the amount of overhead and profit given to the Contractor is 10%.
11. Most respondents (85%) stated that the contract does not use an performance bond
12. Most respondents (95%) stated that no advance payment was given
13. Most respondents (85%) stated that payment was made by single payment after the completion of work
14. Most respondents (60%) stated that the Maintenance Period was applied
15. Most respondents (50%) stated that there were contract changes
16. Most respondents (70%) stated that audits were carried out by the Indonesia's National Government Internal Auditor (BPKP)
17. Most respondents (85%) stated that there were problems in in implementing the Work, as follows:
18. Sebagian besar responden (85%) menyatakan terdapat permasalahan dalam pelaksanaan pekerjaan. Permasalahan yang dihadapi:
 - a. Problems related to the reasonableness of unit prices
 - 1) the unit price of each item of work is often declared unreasonable or expensive by auditors
 - 2) the basic price for wages and materials cannot be higher than the highest regional basic price, even though in natural disaster conditions
 - 3) the implementation of audits of work results is carried out on a post audit basis, often resulting in returns by contractor because the basic price is considered unreasonable or expensive
 - b. Problems related to payments to contractor
 - 1) no advance payment applied;
 - 2) payment is single payment after the completion of work
 - 3) payments are delayed for too long because the budget is not yet available
 - c. The problem of lack of interest of contractor appointed to work on natural disaster
19. Advice and feedback:
 - a. If it is to be used, it is necessary to set up a cost-plus-fee contract model/standards
 - b. With the current conditions, 80% are of the opinion that using the cost plus fee contract type can minimize problems in the implementation of construction work in the context of handling emergencies due to natural disasters.

Discussion

Based on the results of the questionnaire survey, several problems were found during the procurement of construction work in handling emergency condition due to natural disasters, as mentioned above. In the following, the author presents several opinions that can be used as a reference in solving these problems.

Cost-plus contracts, also known as cost-reimbursable contracts, are very frequently negotiated and are utilized for a variety of construction projects (Clough, Sears, Segner, & Rounds, 2015). According to Levy (2010), *cost of the work plus a fee contract* is a rather open-ended type contract that simply states that the contractor will be directed to perform the work as specified by the owner and will be paid on the basis of the costs plus a preset fee, usually a percentage of the costs. This form of contract is often used for emergency work, such as flood repairs, fire, or weather-related damage where immediacy of work precludes assembling firm costs and when the actual cost to complete the work is difficult to determine. According to Hinze (2011), a cost-plus contract is one in which the contractor is reimbursed for most of the direct expenditures associated with a particular project plus an allowance for overhead and profit. It is common for the allowance for overhead and profit to be based on a percentage of the costs. If the allowance for overhead and profit is reasonable, the contractor is almost assured of not losing money. When is a cost-plus contract appropriate? In general, these contracts are used when the actual costs of a project or portions of a project are difficult to estimate with accuracy. This may occur when the plans are not complete, or when the project cannot be accurately portrayed. It also may occur when a project is to be completed within a fairly short time period and the plans and specifications cannot be completed before construction starts. There are three variants

of cost-plus based on the payment method, namely cost plus percentage of cost, cost plus fixed cost, and cost plus percentage of cost with maximum guarantee. In a cost-plus contract, It is imperative that the contract clarify which costs will be reimbursed. According to Clough, Sears, Segner, & Rounds (2015), the basic provisions of cost-plus contracts are that the owner will pay or will reimburse the contractor's costs of construction (as defined in the contract), and in addition will pay the contractor an agreed-upon fee or dollar amount for his services. Cost-plus contracts are commonly employed for any of the following reasons: (1) when the work to be done does not lend itself well to the preparation of complete drawings and specifications in advance of construction; (2) when the exact scope of work is unknown at the time construction commences; (3) when the nature of the work does not lend itself to exact quantity determinations and/or price determinations before construction is to get under way; (4) when speed in commencing construction is an objective; and (5) when one of the objectives is to remove or minimize risk in the project for the contractor, thereby making the project more attractive and/or resulting in a better price for the owner. To minimize the polemic over the reasonableness of unit prices for construction work contracts for handling natural disasters, which previously used unit price contracts, an alternative use of cost plus fee contracts can be used. This is in line with the provisions in Presidential Regulation Number 12 of 2021 Article 27 paragraph (10) that the Cost Plus Fee Contract is a type of contract used for the procurement of Goods / Construction Works / Other Services in the context of handling emergencies with the value of the Contract being a calculation of actual costs plus a fee based on a fixed percentage of the actual costs or a fee based on fixed amount.

The standard form of contract plays a significant role in a construction project as it communicates the procedures to be adopted in executing the project including the determination of the rights and obligations of contracting parties (Rameezdeen & Rajapakse, 2007). The perceived benefit of working to standard forms of contract is that they represent a degree of fairness in contracting between the two parties, the conditions having been drafted by experts beforehand and away from the heat of the particular project, with the balanced representation of all relevant industry participants, and representing a fair allocation of risk between the contractor and the employer (Kwakye, 1997). Such standard forms of contract are intended to reduce the inefficiencies associated with the repeated drafting and reviewing of contracts, and to facilitate a greater sense of partnership between contractors and employers (Jergeas & Hartman, 1994). The main benefit of the implementation of standard form is to provide education and good understanding on the principles of construction contract to the public. Currently there are still many people who do not understand how to make a correct contract and how to distribute the rights, obligations and risks appropriately. Since preparing and negotiating construction contract is part of the principle of freedom of contract, this standard form may at least serve as a guideline for people when they are starting a contract negotiation (Hansen, 2015). Article 77 Paragraph (2) Government Regulation Number 22 of 2020 as most recently amended through Government Regulation Number 14 of 2021 on Implementing Regulations of Law Number 2 of 2017 on Construction Services, regulates that construction work contracts financed with state finances use standardized documents. Therefore, for cost plus fee contracts, contract standards need to be issued, such as unit price contracts, lump sum contracts, and combination lump sum and unit price contracts.

Based on Article 180 and Article 198 of the Minister of Finance Regulation Number 62 of 2023 on Budget Planning, Budget Implementation, and Accounting and Financial Reporting, DIPA applies as the basis for the implementation of state expenditure after obtaining authorization from the Minister of Finance as the State General Treasurer (BUN) and for the implementation of activities and the use of the budget on DIPA which results in state expenditure, is carried out through making commitments in the form of Contracts for Government Procurement. Article 52 paragraph (2) of Presidential Regulation Number 16 of 2018 on Government Procurement, PPK is prohibited from entering into an agreement or signing a Contract with a Provider, in the event that there is no budget available or not enough budget available which may result in exceeding the budget limit available for activities financed by the APBN/APBD. Therefore, it is necessary for the Government to ensure the availability of a fast budget or provide a standby budget for disaster management, so that for disaster management a contract can be signed before the implementation of the Work. With the existence of a contract between the PPK and the Provider before the implementation of the work, problems related to not being given an advance payment, payment of work results in a lump sum, late payments due to an unavailable budget which has an impact on the decline in the interest of business entities to work on handling emergencies due to natural disasters can be overcome.

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