

# Estimating

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# Estimates in Agency Decision Making

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- Program Management Group (PMG)
  - Decision Making group on INDOT budget and program needs
  - Utilizes estimate and program data
  - 20 year asset plan and 7 year funding program
  - Future of Estimating
- Working with industry to assess market
  - Estimates and Past Bid data
  - Communicating expectations



# Importance of Accurate Cost Estimates

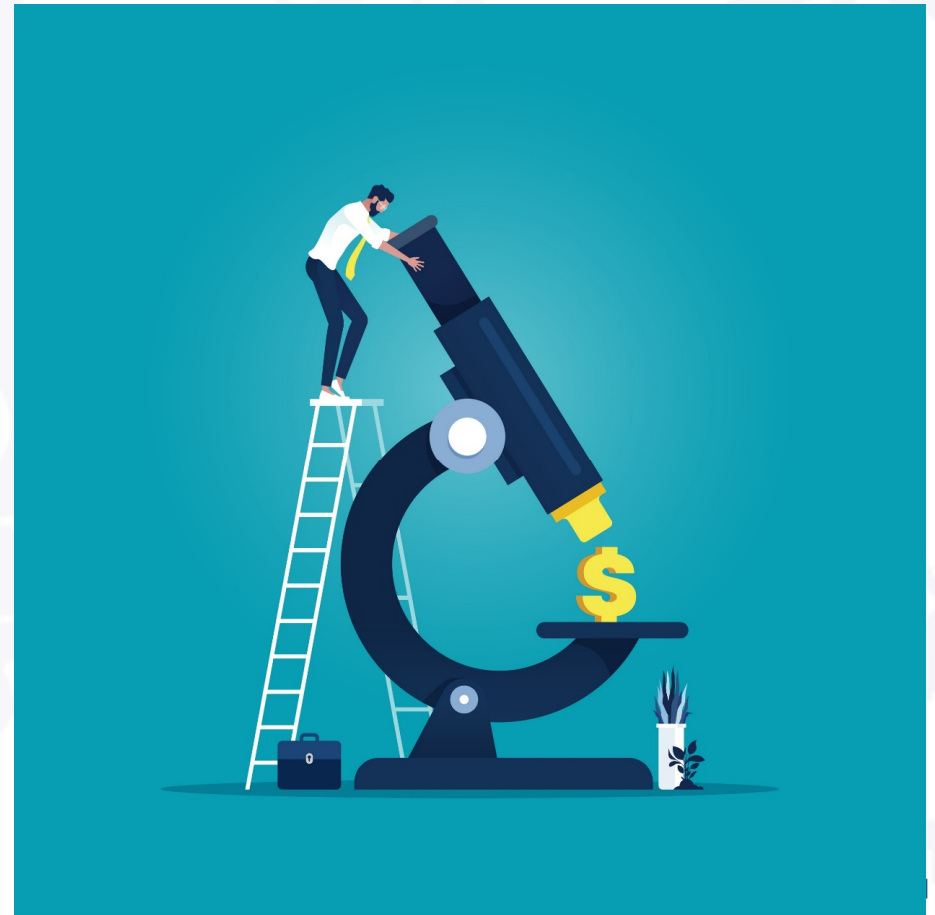
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- An accurate cost estimate is important to keep correct estimates of program wide budget and funding needs.
- An estimate that is too low will result in either a missed letting or scrambling to find additional funding at the end of the project.
- An estimate that is too high will result in funding being taken away from another project or potential project. In the end this could end up causing funds to be lost if they cannot be moved to another fiscal year.
- Contingency cost correction as project gets developed.
- Inflation is always added at the programmatic level.

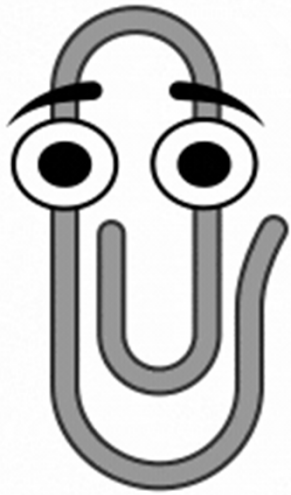
# How Engineers Calculate Estimates

(For all the non-engineers in the audience.)

- Engineers calculate Quantities and unit prices are determined from past letting bid information.
- Engineers are not able to predict the future financial markets and prices.
- Even if we contact manufacturers for pricing there is still variability in transportation to the construction site, labor costs, and supply Chain issues.



# Cost Estimation Programs Tips

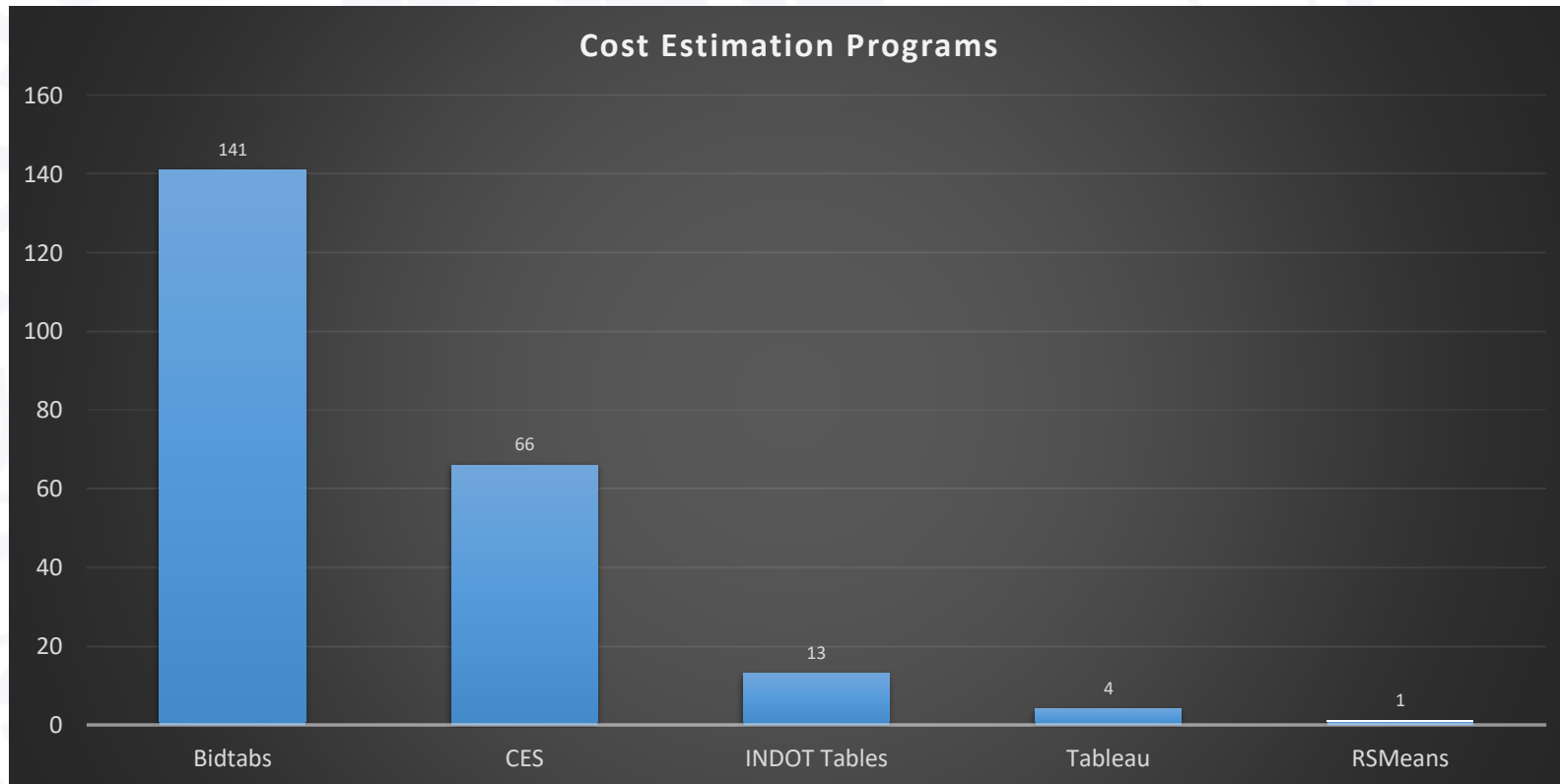


## Tips:

- Bidtabs and Tableau allow you to download the full pay item list into excel. You can place a tab into your quantity calculations to automatically assign unit prices.
  - Filter the pay items based on your project.
  - Download the entire pay item list into excel.
  - Use excel equations (vlookup) or simple macro to automatically assign unit prices for quantities.
  - Always update the unit prices before each submittal.
- Always scan through all unit prices to make sure that they make sense.
- Perform a more in-depth review of the unit prices for top 10 to 15 pay items.
- Always consider the project when looking at the weighted average. Is the project being phased, on the interstate, small work area, or other issues that could make it more difficult for the Contractor than a normal project.

# Cost Estimation Programs

- Which program is everyone using?



# Cost Estimation Programs

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- How were the programs reviewed?
  - Is the data source transparent or is it a black box? Can you easily review the specific data?
  - Can you filter the data based on project requirements? Can you filter the letting year, location, bid order, etc.?
  - How frequently is the data being updated? Can you easily verify the last update and letting date of the data?

# Cost Estimation Programs

- BidTabs

- Bidtabs is managed by Oman Systems.
- Make sure that you are using the cloud based version for the updated pricing information.
- Updated with each letting. (On 2/12/24 Bidtabs was showing 12/13/23 Letting Data)
- Unit prices can be filtered based on project requirements.





# Cost Estimation Programs

- INDOT Tableau Spreadsheets

- Managed by INDOT.
- INDOT Personnel Only (Contains Sensitive Data so State Employees Only).
- Program is updated with each letting. (On 2/12/24 Tableau was showing 1/18/24 Letting Data)
- Unit prices can be filtered based on project requirements.

Explore / INDOT - MAAN / E 07 All Bidders Analysis by Contract / Main Set ☆

Device Layouts Data Sources | Search | ? | SM

Data Details Edit View: Original | Data Guide Watch | Share

Start Main Set A) One PI Est B) Multi PI Est Top PI Estimate for Excel Estimate by Group Moving Average Chart Comparison Unit Tabs by Cont Top Data per Cont Pay Items Reference Work Types Reference Stat Reference Median

Letting Year: (All) 2024 2023 2022 2021 2020

Data of: (All) 2 Months 3 Months 6 Months 9 Months Others

Letting Season: (All) Apr-Jun Jan-Mar Jul-Sep Oct-Dec

N of Vendors: (All) 2-3 Bids >= 4 Bids One Bid

Bidrank: (All) 1 2 3 4

Item No and Desc Contains: (All) 104-05404 Design Build 105-06807 Additional

Crosstab, CSV Back

N of Records At least: 1 5,947

Pay Items Analysis at the Contract Level using 95% confidence level for low and high limits

Item	Item Description	Unit	Min. Quantity	Max. Quantity	Median Quantity	Avg. Quantity	Limit Low	Limit High	Median Unit Price	Weighted Average	N of Items	N Case
104-05404	Design Build	LS	1	1	1	1.00	\$625,104.68	\$17,662,796.29	\$110,000.00	\$9,143,951.49	39	Good
105-06807	Additional	LS	1	1	1	1.00	(\$680,227.50)	\$812,727.50	\$66,250.00	\$66,250.00	2	Neg Low
105-06845	Construction Engineering	LS	1	1	1	1.00	\$28,382.10	\$35,828.75	\$10,000.00	\$32,105.43	5,714	Good
105-09645	Const Eng And Inspect Utility Relocation	LS	1	1	1	1.00	\$15,571.08	\$44,656.72	\$21,000.00	\$30,113.90	14	Too Low N
105-11823	Construction Engineering Gps Rover	LS	1	1	1	1.00	\$21,210.72	\$35,082.70	\$30,000.00	\$28,146.71	23	Low N
105-12018	Utility Protection	LS	1	1	1	1.00	\$5,787.98	\$16,105.87	\$7,660.00	\$10,946.92	13	Too Low N

Lead District: (All) Null

Award Size: (All) 0-0.5M 0.5-1M 1-5M 5-10M 10-15M 15-20M

Proj Per Cont: (All) 1 only 2-4 5-10 11 and more

Lead WT Group: (All) Bridge Road Small Structures Traffic Miscellaneous

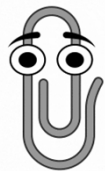
WT Sub Group: (All) B1-New Bridge B2-Bridge Replacement B3-Superstructure Replacement B4-Deck Replacement B5-Bridge Widening

# Cost Estimation Programs

- INDOT Unit price Summary (Online Excel Spreadsheet)
  - Updated periodically.
  - Does not allow you to filter unit prices based on project.
  - On **2/12/24** spreadsheet was updated on **1/12/24** but cannot tell which letting data is incorporated into spreadsheet.
  - Would NOT recommend as primary cost estimation program.



YEAR	SECTION	ITEM	DESCRIPTION	UNIT	LOW PRICE	HIGH PRICE	WGT AVG	NO ITEMS	TOTAL
2023	105	105-06845	CONSTRUCTION ENGINEERING	LS	\$1.00	\$3,161,391.57	\$56,604.28	457.00	\$25,868,157.42
2023	105	105-09645	CONSTRUCTION ENGINEERING AND INSPECTION UTILITY RELOCATION UTILITY RELOCATION	LS	\$16,150.00	\$16,150.00	\$16,150.00	1.00	\$16,150.00
2023	107	107-09358	INSPECTION HOLE, DEEPER THAN 3 FT	EACH	\$55.00	\$5,979.99	\$891.98	711.00	\$634,197.82
2023	107	107-09367	INSPECTION HOLE, 3 FT DEEP OR LESS	EACH	\$55.00	\$3,200.01	\$634.78	291.00	\$184,721.68
2023	107	107-12874	BACK-UP GENERATOR	IS	\$150,000.00	\$150,000.00	\$150,000.00	1.00	\$150,000.00



Tip: Unit prices in this spreadsheet are generated by the same group who add unit prices to CES.

# Cost Estimation Programs

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- CES
  - Updated monthly from letting data.
  - Weighted average unit price.
  - Does not allow you to filter unit prices based on project.
  - Would NOT recommend as primary cost estimation program.



# How to Deal with Inflation???

- Unit prices used in cost estimates should be in the CURRENT (TODAYS) PRICES.
- DO NOT adjust unit prices for future inflation or interest.
- SPMS accounts for inflation based on the cost estimate provided at the stage submittals.
- Using inflation in unit prices will result in inflation being counted twice in SPMS.



# SPMS



Estimate

Inflated CN Estimate: 999,999,999.00 From

This value is inflated.

Phase Code	Phase							Final LOCKED
		Initial LOCKED	Stage 1 Design LOCKED	Stage 2 Design LOCKED	Stage 3 Design LOCKED	Ready for Contracts LOCKED	Letting LOCKED	
PE1	Preliminary Engineering 1	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
PE2	Preliminary Engineering 2	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
RW1	Right of Way Purchase	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
RW2	Right of Way Services	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
UT1	Utilities PE	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
UT2	Utilities CN	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
RR1	Railroad PE	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
RR2	Railroad CN	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
CN	Construction	\$888,888,888.00	\$898,888,888.00	\$0.00	\$899,888,888.00	\$0.00	\$900,888,888.00	\$900,888,888.00
CE	Construction Engineering	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
RQP	Relinquishment Payment	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
WZP	WrkZone Patrol & Enforcement	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
<b>Grand Total</b>		<b>\$888,888,888.00</b>	<b>\$898,888,888.00</b>	<b>\$0.00</b>	<b>\$899,888,888.00</b>	<b>\$0.00</b>	<b>\$900,888,888.00</b>	<b>\$900,888,888.00</b>

These values are not inflated.

# SPMS

**TOTAL EST PROJECT COSTS**

PE1	\$0.00	12/29/2525
PE2	\$0.00	12/29/2525
RW1	\$0.00	12/29/2525
RW2	\$0.00	12/29/2525
UT1	\$0.00	12/29/2525
UT2	\$0.00	12/29/2525
RR1	\$0.00	12/29/2525
RR2	\$0.00	12/29/2525
CN	\$999,999,999.00	09/17/2525
CE	\$0.00	12/29/2525
RQP	\$0.00	12/29/2525
WZP	\$0.00	12/29/2525
<b>Total</b>	<b>\$999,999,999.00</b>	

**PROJECT #**

Phase	Project Number
CE	123456789123
CN	123456789123

**FUNDING PROGRAM**      **BUDGET TRACKING:** No

2525	CN	Bridge Construction	\$999,999,999
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This value is inflated.

**TRAFFIC INFORMATION**

SIGNALS REQ:

PHASE	FEDERAL FUNDS AUTHORIZED DATE
Preliminary Engineering	
Right of Way	
Construction	
SPR	
Other	

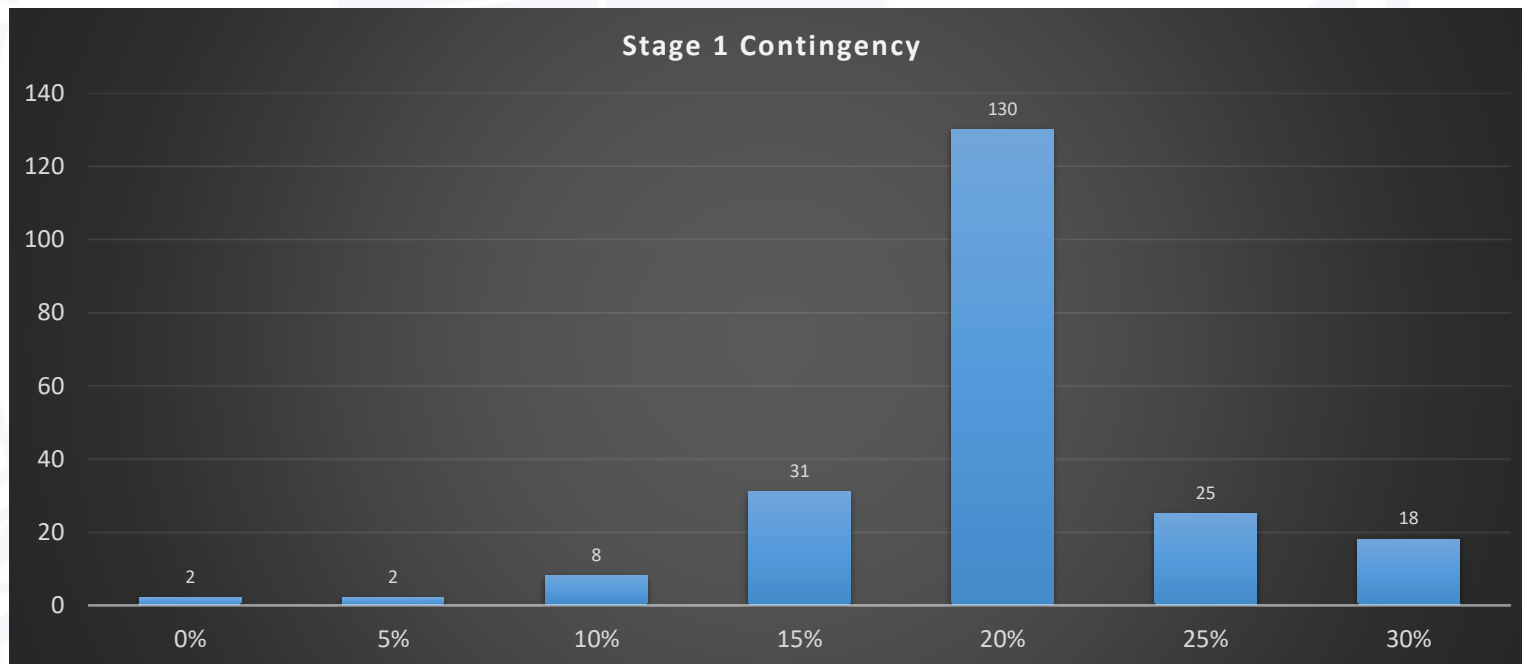
**PROJECT ASSETS**

ASSET TYPE	ASSET #	ESTIMATED COST
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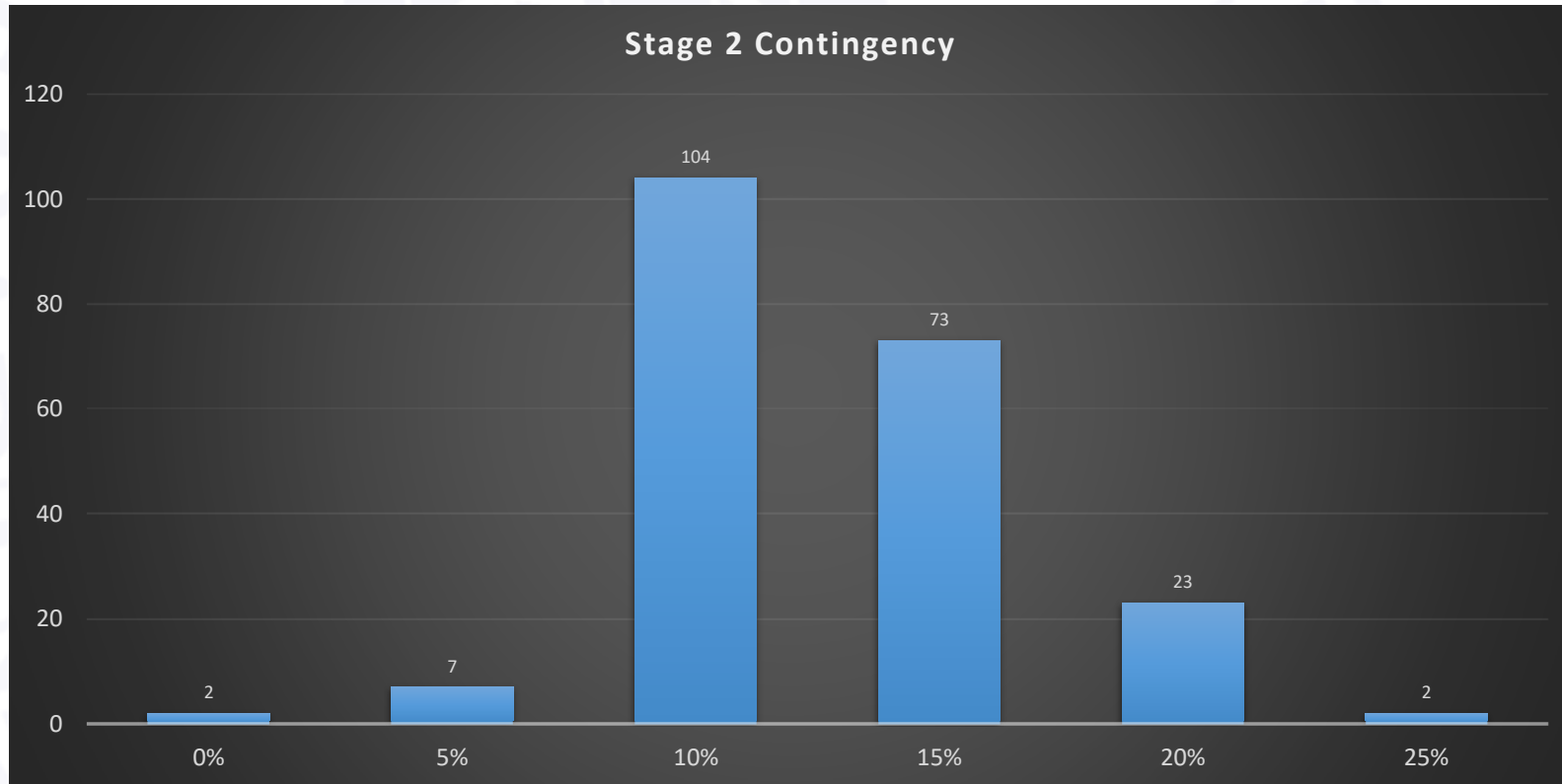
# Stage 1 Contingency

- Recommend to use a stage 1 contingency of 15% to 20%.
  - Contingency should depend on the work type. A straightforward thin deck overlay would not need a 15% contingency.



# Stage 2 Contingency

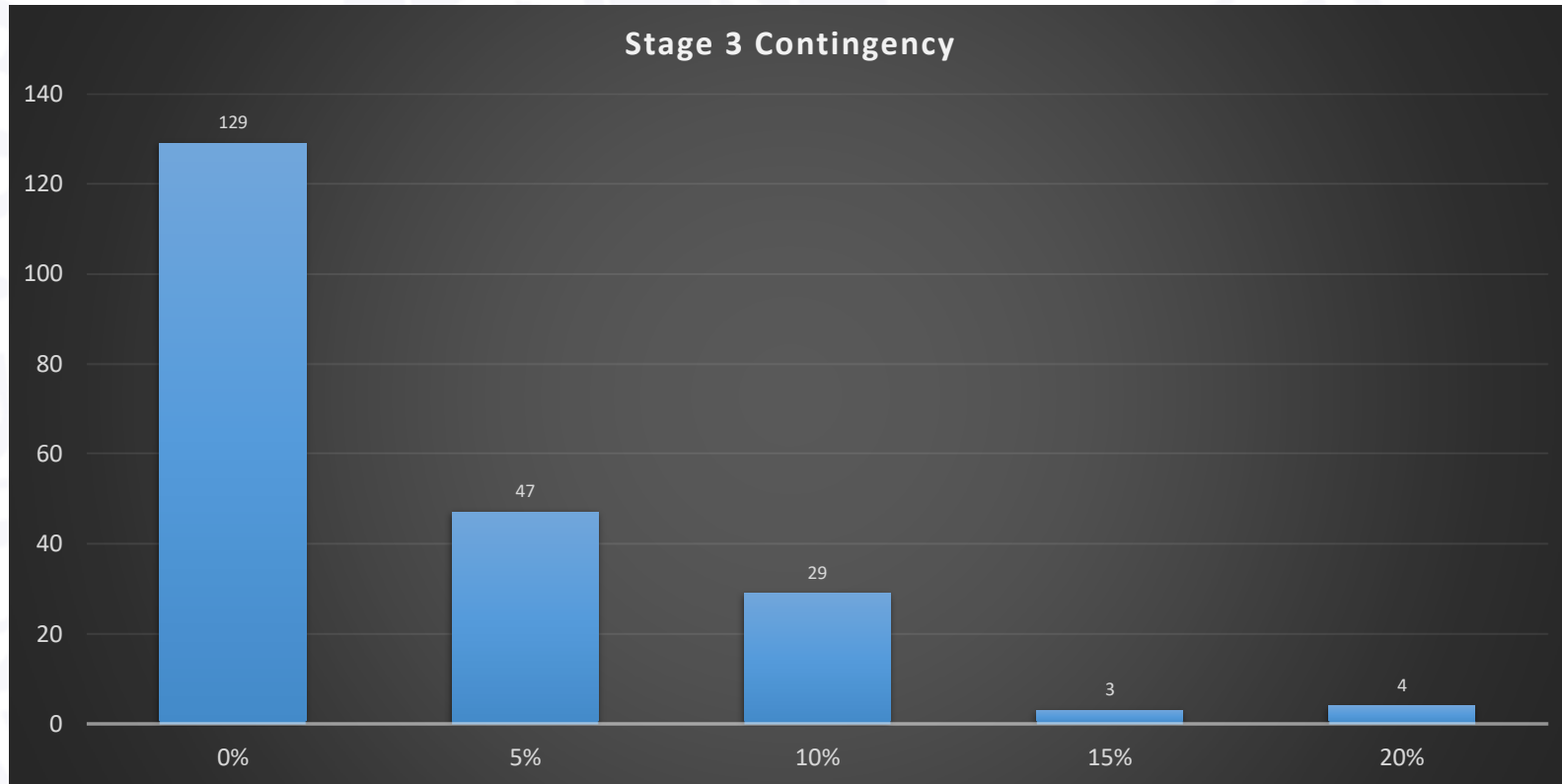
- Recommend to use a stage 2 contingency of 10% to 15%.





# Stage 3 Contingency

- Recommend to use a stage 3 contingency of 0%.



# Tracings Contingency

- Recommend to use a tracings contingency of 0%.

