

# NATIONAL DREDGING MEETING – COST ENGINEERING

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US Army Corps  
of Engineers®



# COST ENGINEERING



- Cost CoP consists of 350-400 Cost Engineers across all Districts
- We develop Cost products from budget estimates to bid level IGEs
- We support all Divisions across USACE
  - PPMD, OPS, Engineering, Real Estate, Construction
- Cost Engineers are responsible to develop construction schedules
- Cost Engineers develop Risk Based project and construction contingencies through a formal process of Cost and Schedule Risk Analysis
- Cost Engineers develop the price analysis to determine the reasonableness of contractors bid in support of the contracting officer during acquisition process.
- Cost Engineers lead the Price Negotiations in support of the Contracting Officer when asked.



# HOW DO WE PREPARE IGE'S



## FAR 36.203 Government estimate of construction costs.

(a) An Independent Government estimate of construction costs shall be prepared and furnished to the contracting officer at the earliest practicable time for each proposed contract and for each contract modification anticipated to exceed the simplified acquisition threshold. The Contracting Officer may require an estimate when the cost of required work is not anticipated to exceed the simplified acquisition threshold. **The estimate shall be prepared in as much detail as though the Government were competing for award.**

- **The Cost estimate will represent that “fair and reasonable” cost to the government**



# CURRENT MARKET CONDITIONS



- For more than two years the U.S. construction industry has been facing unprecedented increase in materials costs, supply-chain bottlenecks, and a tighter labor market.
- Inflation is at 40-year high
- Political climate in Europe and sanctions against Russia have disrupted production and transportation of dozens of commodities.
- China's prolonged lockdown of Shanghai and other areas to control the spread of COVID has also affected production and shipping
- New variants of COVID, as well as growing number of people with lingering or recurrent symptoms, add to uncertainty about labor supply.



# INFLATION



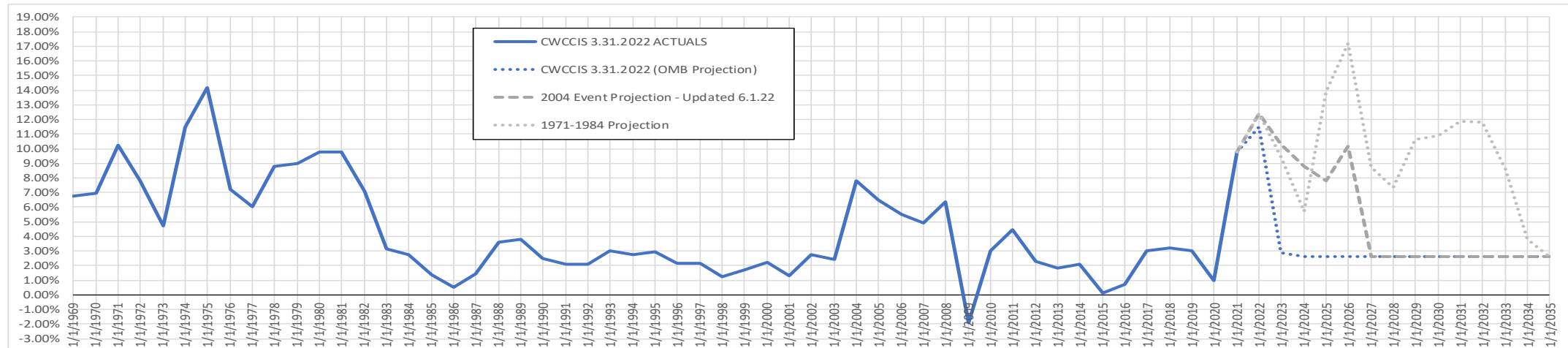
- The purchasing power of the U.S. dollar has fallen over time, as money supply has grown (Inflation)
- \$1000 allocated in 2022 for FY24 Budget will require anywhere between \$1,199 - \$1,462 to execute depending on construction schedule.

| 2022 BASIS                             | 1/1/2022    | 1/1/2023    | 1/1/2024    | 1/1/2025    | 1/1/2026    | 1/1/2027    | 1/1/2028    | 1/1/2029    | 1/1/2030    | 1/1/2031    | 1/1/2032    | 1/1/2033    | 1/1/2034    | 1/1/2035    |
|--|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| CWCCIS 3.31.2022 (OMB Projection)      | \$ 1,000.00 | \$ 1,028.90 | \$ 1,055.65 | \$ 1,083.09 | \$ 1,111.25 | \$ 1,140.15 | \$ 1,169.79 | \$ 1,200.21 | \$ 1,231.41 | \$ 1,263.43 | \$ 1,296.28 | \$ 1,329.98 | \$ 1,364.56 | \$ 1,400.04 |
| 2004 Event Projection - Updated 6.1.22 | \$ 1,000.00 | \$ 1,103.10 | \$ 1,199.78 | \$ 1,293.66 | \$ 1,424.97 | \$ 1,462.01 | \$ 1,500.03 | \$ 1,539.03 | \$ 1,579.04 | \$ 1,620.10 | \$ 1,662.22 | \$ 1,705.44 | \$ 1,749.78 | \$ 1,795.27 |
| Dollars Short                          |             | \$ 74.21    | \$ 144.13   | \$ 210.57   | \$ 313.71   | \$ 321.87   | \$ 330.24   | \$ 338.82   | \$ 347.63   | \$ 356.67   | \$ 365.94   | \$ 375.46   | \$ 385.22   | \$ 395.24   |
| % Difference 2004 Projection Vs. OMB   |             | 7.21%       | 13.65%      | 19.44%      | 28.23%      | 28.23%      | 28.23%      | 28.23%      | 28.23%      | 28.23%      | 28.23%      | 28.23%      | 28.23%      | 28.23%      |
| Total Cumulative Infaltion from BY-PY  |             | 10.31%      | 19.98%      | 29.37%      | 42.50%      | 46.20%      | 50.00%      | 53.90%      | 57.90%      | 62.01%      | 66.22%      | 70.54%      | 74.98%      | 79.53%      |

|                                       |             |             |             |             |             |             |             |             |             |             |             |             |             |             |
|---------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
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| 1971-1984 Projection                  | \$ 1,000.00 | \$ 1,094.76 | \$ 1,157.04 | \$ 1,317.95 | \$ 1,544.51 | \$ 1,679.12 | \$ 1,801.88 | \$ 1,993.59 | \$ 2,211.24 | \$ 2,473.90 | \$ 2,766.80 | \$ 3,004.29 | \$ 3,118.62 | \$ 3,199.71 |
| Dollars Short                         |             | \$ 65.87    | \$ 101.39   | \$ 234.86   | \$ 433.25   | \$ 538.97   | \$ 632.09   | \$ 793.38   | \$ 979.83   | \$ 1,210.47 | \$ 1,470.52 | \$ 1,674.31 | \$ 1,754.06 | \$ 1,799.67 |
| % Difference 1971-1984 VS. OMB        |             | 6.40%       | 9.60%       | 21.68%      | 38.99%      | 47.27%      | 54.03%      | 66.10%      | 79.57%      | 95.81%      | 113.44%     | 125.89%     | 128.54%     | 128.54%     |
| Total Cumulative Infaltion from BY-PY |             | 9.48%       | 15.70%      | 31.80%      | 54.45%      | 67.91%      | 80.19%      | 99.36%      | 121.12%     | 147.39%     | 176.68%     | 200.43%     | 211.86%     | 219.97%     |

ENTER PROJECT COST HERE =

\$ 1,000.00



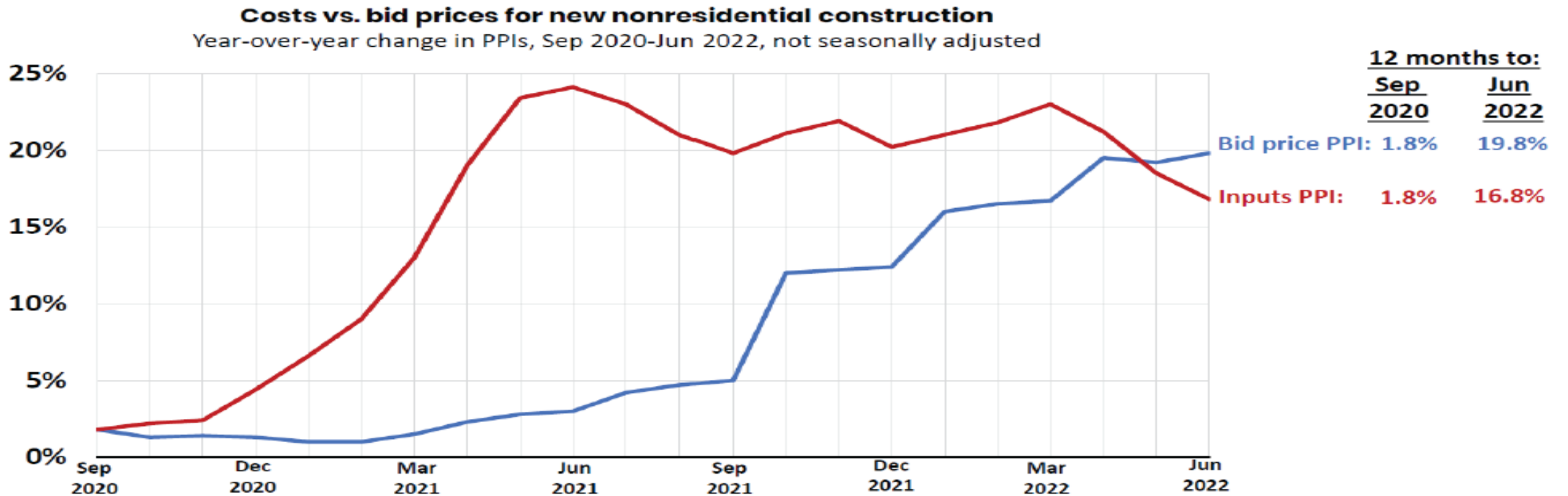


# CHANGES IN BID PRICES



- The extreme runup in so many input costs caused financial hardship for many contractor and subcontractors, especially for those whose purchases are concentrated in materials with extra-steep increases (Steel, Lumber etc.) and/or are fuel dependent.

Figure 5



Source: Bureau of Labor Statistics, producer price indexes, [www.bls.gov/ppi](http://www.bls.gov/ppi)



# CONTROLLABLE AND UNCONTROLLABLE FACTORS AFFECTING QUALITY OF COST ESTIMATES – CONTRACTOR BIDS AND IGES



- **CONTROLLABLE COSTS (KNOWN RISKS)**
  - Scope – Update Costs with Scope Changes
  - Cost changes due to lessons learned on previous contracts
  - Direct Costs – Labor, Material & Equipment
  - Cost increases due to policy changes on design requirements
  - Cost changes due to project risk classification over time
  - Cost changes due to QA, DQC, ATR, IEPR, SQRA etc. reviews
- **UNCONTROLLABLE COSTS (UNKNOWN KNOWN RISKS & UNKNOWN UNKNOWN RISKS)**
  - Above normal inflation
  - Supply Chain disruptions
  - Labor Shortages
  - Material Shortages
  - Shipping disruptions
  - Political Climate i.e., War
  - Fuel and Energy Costs
  - Acts of God i.e., Hurricanes, Earthquakes



# PROCESS – DREDGING IGE'S



- Government Cost Engineers work with the same set of plans and specs as the contractor putting the bid package together
- Cost Engineers identify the dredge type, size and location based on project requirements
- Corps of Engineers Dredging Estimating Program (CEDEP) is used to develop Dredging IGE's
- Mobilization and demobilization costs are developed based on the dredge type, location and sailing distance.
- The information, such as fuel price, dredge data etc. is updated to reflect actual data. Fuel price quotes are acquired for each contract.
- The labor availability is researched based on the location of the project by calling Union Halls and other labor sources.





# CONCLUSION



- The construction industry is going through a period of exceptionally steep and fast rising costs for a variety of materials, computed by major supply-chain disruptions and difficulty finding enough workers – a combination that threatens the financial health of many contractors.
- Contractors and Government must have an open communication regarding changes in relevant material costs and supply chain snarls that can impact cost and completion date for the project that is in construction.
- Government can be flexible to understand current market conditions and be open to necessary changes to the design (based on material availability) and completion date due to supply chain/long lead items.
- There can be a common understanding to order materials early to avoid steep price increases, however, may require secure storage areas



# QUESTIONS



- *How is USACE accounting for Inflation in current estimate? There are significant material cost increases, labor shortage and corresponding rate hikes, fuel volatility.*
- Cost Engineers develop IGE's based on the same information, i.e. Plans, specifications, scope etc. as the contractor bidding the contract. The IGE reflects the most current inflation rates, fuel prices, labor availability survey, site conditions, material prices (via quotes), delivery rates, lead times (to develop the construction duration) etc.